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Sun and Moon Almanac

Celestial navigation — 2027–2035

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How to use

*An example followed step by step: the Sun, lower limb, 12 June 2027 at
10 h 23 min 41 s UTC, height of eye 2.5 m, index error +1.4'.*

The body's altitude

- 1 Sextant altitude.** Read the sextant (H_i) and remove the index error e . With an artificial horizon, divide it by 2: the reading is twice the altitude.

$$H_s = H_i - e \qquad 62^\circ 14.6' - 1.4' = 62^\circ 13.2'$$

- 2 Dip.** On a sea horizon, add the dip (table 1, always negative). Nothing with an artificial horizon.

$$H_a = H_s + \text{dip} \qquad 62^\circ 13.2' - 2.8' = 62^\circ 10.4' \quad (\text{eye } 2.5 \text{ m})$$

- 3 True altitude.** Add the total correction for the Sun (table 2) or the Moon (table 3), read with H_a and, for the Moon, the horizontal parallax HP of the day's page. It combines refraction, parallax and semi-diameter: do not add them a second time.

$$H_o = H_a + \text{corr.} \qquad 62^\circ 10.4' + 15.4' = 62^\circ 25.8' \quad (\text{table 2})$$

The body's position

- 4 Hour angle.** On the month's page, read the GHA at the whole hour before the sight, then interpolate for the minutes and seconds since: table 4, then table 5 for v , the Δ'/h of the GHA row (the excess over $15^\circ/h$ for the Sun, $14^\circ/h$ for the Moon).

$$\text{GHA} = \text{GHA}_h + \text{table 4} + \text{table 5}(v) \qquad 330^\circ 02.6' + 5^\circ 55.2' + 0.0' = 335^\circ 57.8'$$

- 5 Declination.** Read the declination at the whole hour and add the interpolation of d , the Δ'/h of the declination row, with its sign.

$$\text{Dec} = \text{Dec}_h + \text{table 5}(d) \qquad 23^\circ 08.9' + 0.1' = 23^\circ 09.0' \quad (d = +0.2)$$

The tables assume 10°C and 1010 hPa ; below 10° altitude refraction varies with the weather and sights are less reliable. Formulas: dip $1.76'\sqrt{h}$; Bennett's refraction; parallax $0.15' \cos H_a$ (Sun), $\arcsin(\sin HP \cos H_a)$ (Moon); Moon semi-diameter $0.2725 HP$.

Table 1 — Dip of the horizon

Eye (m)	Dip
0.5	−1.2
1.0	−1.8
1.5	−2.2
2.0	−2.5
2.5	−2.8
3.0	−3.0
3.5	−3.3
4.0	−3.5
4.5	−3.7
5.0	−3.9
6.0	−4.3
7.0	−4.7
8.0	−5.0
9.0	−5.3
10.0	−5.6
12.0	−6.1
14.0	−6.6
16.0	−7.0
18.0	−7.5
20.0	−7.9
25.0	−8.8
30.0	−9.6

Table 2 — Sun: total correction

H_a	October – March		April – September	
	Lower	Upper	Lower	Upper
5°00'	+6.4	−25.8	+6.2	−25.6
5°30'	+7.1	−25.1	+6.9	−24.9
6°00'	+7.7	−24.5	+7.5	−24.3
6°30'	+8.3	−23.9	+8.1	−23.7
7°00'	+8.8	−23.4	+8.6	−23.2
7°30'	+9.2	−23.0	+9.0	−22.8
8°00'	+9.6	−22.6	+9.4	−22.4
8°30'	+10.0	−22.2	+9.8	−22.0
9°00'	+10.3	−21.9	+10.1	−21.7
9°30'	+10.6	−21.6	+10.4	−21.4
10°00'	+10.9	−21.3	+10.7	−21.1
11°00'	+11.3	−20.9	+11.1	−20.7
12°00'	+11.7	−20.5	+11.5	−20.3
13°00'	+12.1	−20.1	+11.9	−19.9
14°00'	+12.4	−19.8	+12.2	−19.6
15°00'	+12.6	−19.6	+12.4	−19.4
16°00'	+12.8	−19.4	+12.6	−19.2
17°00'	+13.0	−19.2	+12.8	−19.0
18°00'	+13.2	−19.0	+13.0	−18.8
19°00'	+13.4	−18.8	+13.2	−18.6
20°00'	+13.5	−18.7	+13.3	−18.5
25°00'	+14.1	−18.1	+13.9	−17.9
30°00'	+14.5	−17.7	+14.3	−17.5
35°00'	+14.8	−17.4	+14.6	−17.2
40°00'	+15.0	−17.2	+14.8	−17.0
45°00'	+15.2	−17.0	+15.0	−16.8
50°00'	+15.4	−16.8	+15.2	−16.6
55°00'	+15.5	−16.7	+15.3	−16.5
60°00'	+15.6	−16.6	+15.4	−16.4
65°00'	+15.7	−16.5	+15.5	−16.3
70°00'	+15.8	−16.4	+15.6	−16.2
75°00'	+15.9	−16.3	+15.7	−16.1
80°00'	+16.0	−16.2	+15.8	−16.0
85°00'	+16.0	−16.2	+15.8	−16.0
90°00'	+16.1	−16.1	+15.9	−15.9

Refraction, parallax and semi-diameter (16.1' October to March, 15.9' April to September). Add to H_a .

Table 3 — Moon: total correction

Lower limb									
$H_a \setminus \text{HP}$	54'	55'	56'	57'	58'	59'	60'	61'	62'
5°00'	+58.6	+59.9	+61.2	+62.4	+63.7	+65.0	+66.2	+67.5	+68.8
6°00'	+59.9	+61.2	+62.4	+63.7	+65.0	+66.2	+67.5	+68.8	+70.0
7°00'	+60.9	+62.1	+63.4	+64.7	+65.9	+67.2	+68.4	+69.7	+71.0
8°00'	+61.6	+62.8	+64.1	+65.4	+66.6	+67.9	+69.1	+70.4	+71.7
9°00'	+62.1	+63.4	+64.6	+65.9	+67.1	+68.4	+69.7	+70.9	+72.2
10°00'	+62.5	+63.8	+65.0	+66.3	+67.5	+68.8	+70.0	+71.3	+72.6
11°00'	+62.8	+64.1	+65.3	+66.6	+67.8	+69.1	+70.3	+71.6	+72.8
12°00'	+63.0	+64.3	+65.5	+66.8	+68.0	+69.3	+70.5	+71.8	+73.0
13°00'	+63.1	+64.4	+65.6	+66.9	+68.1	+69.4	+70.6	+71.9	+73.1
14°00'	+63.2	+64.5	+65.7	+66.9	+68.2	+69.4	+70.7	+71.9	+73.2
15°00'	+63.2	+64.5	+65.7	+67.0	+68.2	+69.4	+70.7	+71.9	+73.1
20°00'	+62.8	+64.0	+65.2	+66.4	+67.6	+68.8	+70.0	+71.2	+72.5
25°00'	+61.5	+62.7	+63.9	+65.1	+66.2	+67.4	+68.6	+69.8	+71.0
30°00'	+59.8	+60.9	+62.0	+63.2	+64.3	+65.5	+66.6	+67.7	+68.9
35°00'	+57.5	+58.6	+59.7	+60.8	+61.9	+63.0	+64.1	+65.2	+66.3
40°00'	+54.9	+55.9	+57.0	+58.0	+59.0	+60.1	+61.1	+62.2	+63.2
45°00'	+51.9	+52.9	+53.9	+54.8	+55.8	+56.8	+57.8	+58.8	+59.7
50°00'	+48.6	+49.5	+50.4	+51.3	+52.3	+53.2	+54.1	+55.0	+55.9
55°00'	+45.0	+45.8	+46.7	+47.5	+48.4	+49.2	+50.1	+50.9	+51.8
60°00'	+41.1	+41.9	+42.7	+43.5	+44.2	+45.0	+45.8	+46.5	+47.3
65°00'	+37.1	+37.8	+38.5	+39.2	+39.9	+40.5	+41.2	+41.9	+42.6
70°00'	+32.8	+33.4	+34.1	+34.7	+35.3	+35.9	+36.5	+37.1	+37.7
75°00'	+28.4	+29.0	+29.5	+30.0	+30.5	+31.1	+31.6	+32.1	+32.7
80°00'	+23.9	+24.4	+24.8	+25.3	+25.7	+26.1	+26.6	+27.0	+27.5
85°00'	+19.3	+19.7	+20.1	+20.4	+20.8	+21.1	+21.5	+21.9	+22.2
90°00'	+14.7	+15.0	+15.3	+15.5	+15.8	+16.1	+16.4	+16.6	+16.9

Upper limb									
$H_a \setminus \text{HP}$	54'	55'	56'	57'	58'	59'	60'	61'	62'
5°00'	+29.2	+29.9	+30.6	+31.4	+32.1	+32.8	+33.5	+34.3	+35.0
6°00'	+30.5	+31.2	+31.9	+32.6	+33.4	+34.1	+34.8	+35.5	+36.3
7°00'	+31.4	+32.1	+32.9	+33.6	+34.3	+35.0	+35.7	+36.5	+37.2
8°00'	+32.1	+32.9	+33.6	+34.3	+35.0	+35.7	+36.4	+37.2	+37.9
9°00'	+32.7	+33.4	+34.1	+34.8	+35.5	+36.2	+37.0	+37.7	+38.4
10°00'	+33.1	+33.8	+34.5	+35.2	+35.9	+36.6	+37.3	+38.1	+38.8
11°00'	+33.4	+34.1	+34.8	+35.5	+36.2	+36.9	+37.6	+38.3	+39.0
12°00'	+33.6	+34.3	+35.0	+35.7	+36.4	+37.1	+37.8	+38.5	+39.2
13°00'	+33.7	+34.4	+35.1	+35.8	+36.5	+37.2	+37.9	+38.6	+39.3
14°00'	+33.8	+34.5	+35.2	+35.9	+36.6	+37.3	+38.0	+38.7	+39.4
15°00'	+33.8	+34.5	+35.2	+35.9	+36.6	+37.3	+38.0	+38.7	+39.4
20°00'	+33.3	+34.0	+34.7	+35.3	+36.0	+36.7	+37.3	+38.0	+38.7
25°00'	+32.1	+32.7	+33.4	+34.0	+34.6	+35.3	+35.9	+36.5	+37.2
30°00'	+30.3	+30.9	+31.5	+32.1	+32.7	+33.3	+33.9	+34.5	+35.1
35°00'	+28.1	+28.6	+29.2	+29.7	+30.3	+30.8	+31.4	+31.9	+32.5
40°00'	+25.5	+26.0	+26.5	+26.9	+27.4	+27.9	+28.4	+28.9	+29.4
45°00'	+22.5	+22.9	+23.3	+23.8	+24.2	+24.6	+25.1	+25.5	+25.9
50°00'	+19.2	+19.5	+19.9	+20.3	+20.6	+21.0	+21.4	+21.8	+22.1
55°00'	+15.6	+15.9	+16.2	+16.5	+16.8	+17.1	+17.4	+17.7	+18.0
60°00'	+11.7	+11.9	+12.2	+12.4	+12.6	+12.8	+13.1	+13.3	+13.5
65°00'	+7.6	+7.8	+7.9	+8.1	+8.2	+8.4	+8.5	+8.7	+8.8
70°00'	+3.4	+3.5	+3.5	+3.6	+3.7	+3.7	+3.8	+3.9	+3.9
75°00'	-1.0	-1.0	-1.0	-1.0	-1.1	-1.1	-1.1	-1.1	-1.1
80°00'	-5.5	-5.6	-5.7	-5.8	-5.9	-6.0	-6.1	-6.2	-6.3
85°00'	-10.1	-10.3	-10.5	-10.7	-10.8	-11.0	-11.2	-11.4	-11.6
90°00'	-14.7	-15.0	-15.3	-15.5	-15.8	-16.1	-16.3	-16.6	-16.9

Columns: horizontal parallax HP (the day's page). Refraction, parallax and semi-diameter (0.2725 HP). Add to H_a ; interpolate between rows and columns.

Table 4 — GHA interpolation: minutes and seconds

min	Sun	Moon	min	Sun	Moon	s	Sun	Moon
0	0°00.0'	0°00.0'	30	7°30.0'	7°00.0'	0	0.0'	0.0'
1	0°15.0'	0°14.0'	31	7°45.0'	7°14.0'	2	0.5'	0.5'
2	0°30.0'	0°28.0'	32	8°00.0'	7°28.0'	4	1.0'	0.9'
3	0°45.0'	0°42.0'	33	8°15.0'	7°42.0'	6	1.5'	1.4'
4	1°00.0'	0°56.0'	34	8°30.0'	7°56.0'	8	2.0'	1.9'
5	1°15.0'	1°10.0'	35	8°45.0'	8°10.0'	10	2.5'	2.3'
6	1°30.0'	1°24.0'	36	9°00.0'	8°24.0'	12	3.0'	2.8'
7	1°45.0'	1°38.0'	37	9°15.0'	8°38.0'	14	3.5'	3.3'
8	2°00.0'	1°52.0'	38	9°30.0'	8°52.0'	16	4.0'	3.7'
9	2°15.0'	2°06.0'	39	9°45.0'	9°06.0'	18	4.5'	4.2'
10	2°30.0'	2°20.0'	40	10°00.0'	9°20.0'	20	5.0'	4.7'
11	2°45.0'	2°34.0'	41	10°15.0'	9°34.0'	22	5.5'	5.1'
12	3°00.0'	2°48.0'	42	10°30.0'	9°48.0'	24	6.0'	5.6'
13	3°15.0'	3°02.0'	43	10°45.0'	10°02.0'	26	6.5'	6.1'
14	3°30.0'	3°16.0'	44	11°00.0'	10°16.0'	28	7.0'	6.5'
15	3°45.0'	3°30.0'	45	11°15.0'	10°30.0'	30	7.5'	7.0'
16	4°00.0'	3°44.0'	46	11°30.0'	10°44.0'	32	8.0'	7.5'
17	4°15.0'	3°58.0'	47	11°45.0'	10°58.0'	34	8.5'	7.9'
18	4°30.0'	4°12.0'	48	12°00.0'	11°12.0'	36	9.0'	8.4'
19	4°45.0'	4°26.0'	49	12°15.0'	11°26.0'	38	9.5'	8.9'
20	5°00.0'	4°40.0'	50	12°30.0'	11°40.0'	40	10.0'	9.3'
21	5°15.0'	4°54.0'	51	12°45.0'	11°54.0'	42	10.5'	9.8'
22	5°30.0'	5°08.0'	52	13°00.0'	12°08.0'	44	11.0'	10.3'
23	5°45.0'	5°22.0'	53	13°15.0'	12°22.0'	46	11.5'	10.7'
24	6°00.0'	5°36.0'	54	13°30.0'	12°36.0'	48	12.0'	11.2'
25	6°15.0'	5°50.0'	55	13°45.0'	12°50.0'	50	12.5'	11.7'
26	6°30.0'	6°04.0'	56	14°00.0'	13°04.0'	52	13.0'	12.1'
27	6°45.0'	6°18.0'	57	14°15.0'	13°18.0'	54	13.5'	12.6'
28	7°00.0'	6°32.0'	58	14°30.0'	13°32.0'	56	14.0'	13.1'
29	7°15.0'	6°46.0'	59	14°45.0'	13°46.0'	58	14.5'	13.5'

The month's pages give the GHA at whole hours; in between it grows steadily, by 15° an hour for the Sun and 14° for the Moon. This table gives what it gains in the minutes (left) and the seconds (right) since the whole hour: add both to the GHA of the whole hour, then the interpolation of v (table 5). Example, Sun at 15 h 30 min 52 s: $7^\circ30.0' + 13.0' = 7^\circ43.0'$.

Table 5 — Interpolation of v and d

$\Delta'/h \setminus \min$	5	10	15	20	25	30	35	40	45	50	55	60
0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
0.3	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
0.5	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
0.7	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.7
1.0	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.8	0.9	1.0
2.0	0.2	0.3	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.7	1.8	2.0
3.0	0.2	0.5	0.8	1.0	1.2	1.5	1.8	2.0	2.2	2.5	2.8	3.0
4.0	0.3	0.7	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0
5.0	0.4	0.8	1.2	1.7	2.1	2.5	2.9	3.3	3.8	4.2	4.6	5.0
6.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
7.0	0.6	1.2	1.8	2.3	2.9	3.5	4.1	4.7	5.2	5.8	6.4	7.0
8.0	0.7	1.3	2.0	2.7	3.3	4.0	4.7	5.3	6.0	6.7	7.3	8.0
9.0	0.8	1.5	2.2	3.0	3.8	4.5	5.2	6.0	6.8	7.5	8.2	9.0
10.0	0.8	1.7	2.5	3.3	4.2	5.0	5.8	6.7	7.5	8.3	9.2	10.0
11.0	0.9	1.8	2.8	3.7	4.6	5.5	6.4	7.3	8.2	9.2	10.1	11.0
12.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0
13.0	1.1	2.2	3.2	4.3	5.4	6.5	7.6	8.7	9.8	10.8	11.9	13.0
14.0	1.2	2.3	3.5	4.7	5.8	7.0	8.2	9.3	10.5	11.7	12.8	14.0
15.0	1.2	2.5	3.8	5.0	6.2	7.5	8.8	10.0	11.2	12.5	13.8	15.0
16.0	1.3	2.7	4.0	5.3	6.7	8.0	9.3	10.7	12.0	13.3	14.7	16.0
17.0	1.4	2.8	4.2	5.7	7.1	8.5	9.9	11.3	12.8	14.2	15.6	17.0
18.0	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0
20.0	1.7	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	16.7	18.3	20.0
30.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0
40.0	3.3	6.7	10.0	13.3	16.7	20.0	23.3	26.7	30.0	33.3	36.7	40.0

The rest of the interpolation: the GHA actually grows by v more than 15° (14°) an hour, the declination by d an hour (Δ'/h on the month's page). The table gives $\Delta \times \min/60$ for the minutes since the whole hour; add it with the sign of Δ . For a Δ not listed, add rows: Moon, $v = 38.3'/h$ at $41 \min \approx 30 + 8 + 0.3$: $20.5 + 5.5 + 0.2 = 26.2'$.

SUN

January 2027

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Fr 1	269°10.2 -23°01.0	284°09.9 -23°00.8	299°09.6 -23°00.6	314°09.3 -23°00.4	329°09.0 -23°00.2	344°08.7 -23°00.0	359°08.4 -22°59.8	14°08.1 -22°59.6	26°07.8 -22°59.3	44°07.5 -22°58.9	56°07.2 -22°58.7	74°06.9 -22°58.7	-0.3 +0.2
Sa 2	269°03.1 -22°55.9	284°02.8 -22°55.7	299°02.5 -22°55.5	314°02.2 -22°55.2	329°01.9 -22°55.0	344°01.6 -22°54.8	359°01.3 -22°54.6	14°01.0 -22°54.3	26°00.8 -22°54.1	44°00.5 -22°53.9	56°00.2 -22°53.7	73°59.9 -22°53.4	-0.3 +0.2
Su 3	268°56.1 -22°50.4	283°55.8 -22°50.1	298°55.5 -22°49.9	313°55.2 -22°49.6	328°55.0 -22°49.4	343°54.7 -22°49.2	358°54.4 -22°48.9	13°54.1 -22°48.7	26°53.8 -22°48.4	43°53.5 -22°48.2	55°53.2 -22°47.9	73°52.9 -22°47.7	-0.3 +0.2
Mo 4	268°49.2 -22°44.4	283°48.9 -22°44.1	298°48.6 -22°43.9	313°48.4 -22°43.6	328°48.1 -22°43.3	343°47.8 -22°43.1	358°47.5 -22°42.8	13°47.2 -22°42.5	26°46.9 -22°42.3	43°46.7 -22°42.0	55°46.4 -22°41.7	73°46.1 -22°41.5	-0.3 +0.3
Tu 5	268°42.4 -22°37.9	283°42.1 -22°37.7	298°41.9 -22°37.4	313°41.6 -22°37.1	328°41.3 -22°36.8	343°41.0 -22°36.5	358°40.7 -22°36.3	13°40.5 -22°36.0	26°40.2 -22°35.7	43°39.9 -22°35.4	55°39.6 -22°35.1	73°39.3 -22°34.8	-0.3 +0.3
We 6	268°35.7 -22°31.0	283°35.5 -22°30.7	298°35.2 -22°30.4	313°34.9 -22°30.1	328°34.6 -22°29.8	343°34.4 -22°29.5	358°34.1 -22°29.2	13°33.8 -22°28.9	26°33.5 -22°28.6	43°33.3 -22°28.3	55°33.0 -22°28.0	73°32.7 -22°27.7	-0.3 +0.3
Th 7	268°29.2 -22°23.7	283°28.9 -22°23.4	298°28.6 -22°23.1	313°28.3 -22°22.8	328°28.1 -22°22.4	343°27.8 -22°22.1	358°27.5 -22°21.8	13°27.3 -22°21.5	26°27.0 -22°21.2	43°26.7 -22°21.0	55°26.5 -22°20.8	73°26.2 -22°20.5	-0.3 +0.2
Fr 8	268°22.7 -22°15.9	283°22.4 -22°15.6	298°22.2 -22°15.3	313°21.9 -22°14.9	328°21.6 -22°14.6	343°21.4 -22°14.2	358°21.1 -22°13.9	13°20.8 -22°13.6	26°20.6 -22°13.2	43°20.3 -22°12.9	55°20.0 -22°12.6	73°19.8 -22°12.2	-0.3 +0.2
Sa 9	268°16.4 -22°07.7	283°16.1 -22°07.4	298°15.9 -22°07.0	313°15.6 -22°06.6	328°15.3 -22°06.3	343°15.1 -22°05.9	358°14.8 -22°05.6	13°14.6 -22°05.2	26°14.3 -22°04.9	43°14.0 -22°04.5	55°13.8 -22°04.2	73°13.5 -22°03.8	-0.3 +0.4
Su 10	268°10.2 -21°59.1	283°09.9 -21°58.7	298°09.7 -21°58.3	313°09.4 -21°57.9	328°09.2 -21°57.6	343°08.9 -21°57.2	358°08.7 -21°56.8	13°08.4 -21°56.6	26°08.1 -21°56.1	43°07.9 -21°55.7	55°07.6 -21°55.3	73°07.4 -21°54.9	-0.3 +0.4
Mo 11	268°04.1 -21°50.0	283°03.9 -21°49.6	298°03.6 -21°49.2	313°03.4 -21°48.8	328°03.1 -21°48.4	343°02.9 -21°48.0	358°02.6 -21°47.6	13°02.4 -21°47.2	26°02.1 -21°46.8	43°01.9 -21°46.5	55°01.6 -21°46.1	73°01.4 -21°45.7	-0.3 +0.4
Tu 12	267°58.2 -21°40.5	282°58.0 -21°40.1	297°57.7 -21°39.7	312°57.5 -21°39.2	327°57.3 -21°38.8	342°57.0 -21°38.4	357°56.8 -21°38.0	12°56.5 -21°37.6	26°56.3 -21°37.2	42°56.1 -21°36.8	55°55.8 -21°36.4	72°55.6 -21°36.0	-0.2 +0.4
We 13	267°52.5 -21°30.5	282°52.2 -21°30.1	297°52.0 -21°29.7	312°51.8 -21°29.3	327°51.5 -21°28.8	342°51.3 -21°28.4	357°51.1 -21°28.0	12°50.8 -21°27.6	26°50.6 -21°27.1	42°50.4 -21°26.7	55°50.1 -21°26.3	72°49.9 -21°25.9	-0.2 +0.4
Th 14	267°46.4 -21°20.2	282°46.7 -21°19.8	297°46.4 -21°19.3	312°46.2 -21°18.9	327°46.0 -21°18.4	342°45.7 -21°18.0	357°45.5 -21°17.5	12°45.3 -21°17.1	26°45.1 -21°16.7	42°44.8 -21°16.2	55°44.6 -21°15.8	72°44.4 -21°15.3	-0.2 +0.4
Fr 15	267°41.5 -21°09.4	282°41.3 -21°09.0	297°41.0 -21°08.5	312°40.8 -21°08.1	327°40.6 -21°07.6	342°40.4 -21°07.2	357°40.1 -21°06.7	12°39.9 -21°06.2	26°39.7 -21°05.8	42°39.5 -21°05.3	55°39.3 -21°04.8	72°39.0 -21°04.4	-0.2 +0.5
Sa 16	267°36.2 -20°58.3	282°36.0 -20°57.8	297°35.8 -20°57.3	312°35.6 -20°56.9	327°35.4 -20°56.4	342°35.2 -20°55.9	357°34.9 -20°55.4	12°34.7 -20°55.0	26°34.5 -20°54.5	42°34.3 -20°54.0	55°34.1 -20°53.5	72°33.9 -20°53.0	-0.2 +0.5
Su 17	267°31.2 -20°46.7	282°30.9 -20°46.2	297°30.7 -20°45.8	312°30.5 -20°45.3	327°30.3 -20°44.8	342°30.1 -20°44.3	357°29.9 -20°43.8	12°29.7 -20°43.3	26°29.5 -20°42.8	42°29.3 -20°42.3	55°29.1 -20°41.8	72°28.9 -20°41.3	-0.2 +0.5
Mo 18	267°26.3 -20°34.8	282°26.1 -20°34.3	297°25.9 -20°33.8	312°25.7 -20°33.3	327°25.5 -20°32.8	342°25.3 -20°32.3	357°25.1 -20°31.7	12°24.9 -20°31.2	26°24.7 -20°30.7	42°24.5 -20°30.2	55°24.3 -20°29.7	72°24.1 -20°29.2	-0.2 +0.5
Tu 19	267°21.6 -20°22.5	282°21.4 -20°21.9	297°21.2 -20°21.4	312°21.0 -20°20.9	327°20.8 -20°20.4	342°20.6 -20°19.8	357°20.4 -20°19.3	12°20.2 -20°18.8	26°20.0 -20°18.3	42°19.8 -20°17.7	55°19.6 -20°17.2	72°19.5 -20°16.7	-0.2 +0.5
We 20	267°17.0 -20°09.7	282°16.8 -20°09.2	297°16.7 -20°08.7	312°16.5 -20°08.1	327°16.3 -20°07.6	342°16.1 -20°07.0	357°15.9 -20°06.5	12°15.7 -20°06.0	26°15.6 -20°05.4	42°15.4 -20°04.9	55°15.2 -20°04.4	72°15.0 -20°03.8	-0.2 +0.5
Th 21	267°12.7 -19°56.6	282°12.5 -19°56.1	297°12.3 -19°55.5	312°12.2 -19°55.0	327°12.0 -19°54.4	342°11.8 -19°53.9	357°11.6 -19°53.3	12°11.5 -19°52.7	26°11.3 -19°52.2	42°11.1 -19°51.6	57°10.9 -19°51.1	72°10.8 -19°50.5	-0.2 +0.6
Fr 22	267°08.6 -19°43.2	282°08.4 -19°42.6	297°08.2 -19°42.0	312°08.0 -19°41.5	327°07.9 -19°40.9	342°07.7 -19°40.3	357°07.5 -19°39.7	12°07.4 -19°39.2	26°07.2 -19°38.6	42°07.0 -19°38.0	57°06.9 -19°37.4	72°06.7 -19°36.9	-0.2 +0.6
Sa 23	267°04.6 -19°29.0	282°04.4 -19°28.8	297°04.3 -19°28.2	312°04.1 -19°27.6	327°04.0 -19°27.0	342°03.8 -19°26.4	357°03.6 -19°25.8	12°03.5 -19°25.2	26°03.3 -19°24.6	42°03.2 -19°24.1	57°03.0 -19°23.5	72°02.9 -19°22.9	-0.2 +0.6
Su 24	267°00.8 -19°15.1	282°00.7 -19°14.5	297°00.5 -19°13.9	312°00.4 -19°13.3	327°00.2 -19°12.7	342°00.1 -19°12.1	356°59.9 -19°11.5	11°59.8 -19°10.9	26°59.6 -19°10.3	41°59.5 -19°09.7	56°59.3 -19°09.1	71°59.2 -19°08.5	-0.2 +0.6
Mo 25	266°57.3 -19°00.6	281°57.1 -19°00.0	296°57.0 -18°59.4	311°56.8 -18°58.8	326°56.7 -18°58.1	341°56.6 -18°57.5	356°56.4 -18°56.9	11°56.3 -18°56.3	26°56.1 -18°55.7	41°56.0 -18°55.1	56°55.9 -18°54.4	71°55.7 -18°53.8	-0.1 +0.6
Tu 26	266°53.9 -18°45.7	281°53.8 -18°45.1	296°53.6 -18°44.4	311°53.5 -18°43.8	326°53.4 -18°43.2	341°53.3 -18°42.6	356°53.1 -18°41.9	11°53.0 -18°41.3	26°52.8 -18°40.7	41°52.7 -18°40.0	56°52.6 -18°39.4	71°52.4 -18°38.8	-0.1 +0.6
We 27	266°50.7 -18°30.5	281°50.6 -18°29.8	296°50.5 -18°29.2	311°50.4 -18°28.5	326°50.2 -18°27.9	341°50.1 -18°27.2	356°50.0 -18°26.6	11°49.8 -18°26.0	26°49.7 -18°25.3	41°49.6 -18°24.7	56°49.5 -18°24.0	71°49.3 -18°23.4	-0.1 +0.6
Th 28	266°47.8 -18°14.9	281°47.6 -18°14.2	296°47.5 -18°13.6	311°47.4 -18°12.9	326°47.3 -18°12.3	341°47.2 -18°11.6	356°47.0 -18°10.9	11°46.9 -18°10.3	26°46.8 -18°09.6	41°46.7 -18°09.0	56°46.6 -18°08.3	71°46.5 -18°07.6	-0.1 +0.7
Fr 29	266°45.0 -17°59.0	281°44.9 -17°58.3	296°44.8 -17°57.6	311°44.6 -17°57.0	326°44.5 -17°56.3	341°44.4 -17°55.6	356°44.3 -17°54.9	11°44.2 -17°54.3	26°44.1 -17°53.6	41°44.0 -17°52.9	56°43.9 -17°52.2	71°43.8 -17°51.6	-0.1 +0.7
Sa 30	266°42.4 -17°42.7	281°42.3 -17°42.1	296°42.2 -17°41.4	311°42.1 -17°40.7	326°42.0 -17°40.0	341°41.9 -17°39.3	356°41.8 -17°38.6	11°41.7 -17°37.9	26°41.6 -17°37.3	41°41.5 -17°36.6	56°41.4 -17°35.9	71°41.3 -17°35.2	-0.1 +0.7
Su 31	266°40.0 -17°26.2	281°39.9 -17°25.5	296°39.8 -17°24.8	311°39.7 -17°24.1	326°39.6 -17°23.4	341°39.5 -17°22.7	356°39.5 -17°22.0	11°39.4 -17°21.3	26°39.3 -17°20.6	41°39.2 -17°19.9	56°39.1 -17°19.2	71°39.0 -17°18.5	-0.1 +0.7

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.3'

MOON

January 2027

D	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	Δ'/h SH	
Fr 1	233°48.8 -18°26.2	248°20.9 -18°37.2	262°52.9 -18°48.2	277°24.8 -18°59.0	291°56.7 -19°09.8	306°28.6 -19°20.4	321°00.4 -19°31.0	335°32.2 -19°41.4	350°04.0 -19°51.8	4°35.6 -20°02.1	19°07.3 -20°12.3	+31.8 15.1 -10.655.2	
Sa 2	248°20.9 -18°37.2	262°52.9 -18°48.2	277°24.8 -18°59.0	291°56.7 -19°09.8	306°28.6 -19°20.4	321°00.4 -19°31.0	335°32.2 -19°41.4	350°04.0 -19°51.8	4°35.6 -20°02.1	19°07.3 -20°12.3	33°38.9 -20°22.3	+31.8 15.0 -10.555.2	
Su 3	251°27.5 -22°41.4	265°58.4 -22°49.8	280°29.1 -22°58.1	295°00.0 -23°06.3	309°30.8 -23°14.4	324°01.4 -23°22.4	338°32.1 -23°30.3	353°02.7 -23°38.1	7°33.2 -23°45.7	22°03.7 -23°53.3	36°34.2 -24°00.7	+30.7 14.9 -7.954.7	
Mo 4	254°05.9 -25°37.9	268°35.7 -25°43.4	283°05.5 -25°48.8	297°35.2 -25°54.1	312°04.9 -25°59.2	326°34.5 -26°04.3	341°04.1 -26°09.1	355°33.7 -26°13.9	10°03.3 -26°18.5	24°32.8 -26°23.1	39°02.2 -26°27.4	+29.6 14.8 -5.054.3	
Tu 5	256°21.4 -27°17.6	270°50.5 -27°19.9	285°19.6 -27°22.1	299°48.6 -27°24.1	314°17.7 -27°26.0	328°46.8 -27°27.8	343°15.8 -27°29.4	357°44.9 -27°30.9	12°13.9 -27°32.2	26°42.9 -27°33.5	41°11.9 -27°34.6	+29.1 14.7 -1.754.0	
We 6	258°27.3 -27°34.9	272°56.4 -27°33.8	287°25.5 -27°32.6	301°54.7 -27°31.3	316°23.8 -27°29.9	330°52.9 -27°28.3	345°22.1 -27°26.6	359°51.3 -27°24.8	14°20.5 -27°22.8	28°49.8 -27°20.7	43°19.0 -27°18.4	+29.2 14.7 +1.653.9	
Th 7	260°41.6 -26°29.4	275°11.3 -26°25.1	289°41.2 -26°20.7	304°11.0 -26°16.2	318°40.9 -26°11.5	333°10.9 -26°06.7	347°40.9 -26°01.8	2°10.9 -25°56.8	16°41.0 -25°51.7	31°11.2 -25°46.4	45°41.3 -25°41.0	+30.0 14.7 +4.853.9	
Fr 8	263°20.1 -24°06.5	277°51.1 -23°59.3	292°22.2 -23°52.0	306°53.3 -23°44.6	321°24.5 -23°37.0	335°55.7 -23°29.4	350°27.0 -23°21.7	4°58.4 -23°13.8	19°29.8 -23°05.9	34°01.2 -22°57.9	48°32.7 -22°49.7	+31.3 14.7 +7.753.9	
Sa 9	266°32.5 -20°35.9	281°04.9 -20°26.3	295°37.5 -20°16.5	310°10.0 -20°06.7	324°42.6 -19°56.8	339°15.3 -19°46.8	353°48.0 -19°36.7	8°20.8 -19°26.5	22°53.6 -19°16.3	37°26.5 -19°05.9	51°59.5 -18°55.5	+32.7 14.7 -10.054.1	
Su 10	270°20.0 -16°10.0	284°53.7 -15°58.4	299°27.5 -15°46.7	314°01.4 -15°35.0	328°35.3 -15°23.2	343°09.2 -15°11.3	357°43.2 -14°59.4	12°17.2 -14°47.4	26°51.3 -14°35.3	41°25.4 -14°23.2	55°59.6 -14°11.0	+34.0 14.8 +11.954.3	
Mo 11	274°36.3 -11°01.4	289°11.0 -10°48.4	303°45.7 -10°35.3	318°20.0 -10°22.1	332°55.3 -10°08.9	347°30.1 -9°55.7	3°04.9 -9°42.4	16°39.7 -9°29.1	31°14.6 -9°15.7	45°49.5 -9°02.3	60°24.4 -8°48.9	+34.8 14.9 +13.354.6	
Tu 12	277°09.9 -5°22.6	293°45.0 -5°08.6	308°20.1 -4°54.6	322°55.2 -4°40.5	337°30.3 -4°26.4	352°05.6 -4°12.3	6°21.5 -3°58.1	21°15.7 -3°43.9	35°50.8 -3°29.8	50°25.9 -3°15.5	65°00.9 -3°01.3	+35.1 15.0 +14.155.1	
We 13	283°45.7 0°34.5	298°20.9 0°49.0	312°55.4 1°03.5	327°30.1 1°18.0	342°04.9 1°32.5	356°39.6 1°47.1	11°14.3 2°01.6	25°48.9 2°16.1	40°23.6 2°30.7	54°58.1 2°45.2	69°32.7 2°59.8	+34.7 15.2 +14.555.7	
Th 14	288°05.7 6°37.6	302°39.9 6°52.0	317°13.3 7°06.5	331°46.9 7°20.9	346°20.6 7°35.3	359°54.6 7°49.7	0°54.1 8°04.1	15°27.6 8°18.5	30°01.0 8°32.8	44°34.4 8°47.1	59°07.7 9°01.4	+33.5 15.4 +14.456.4	
Fr 15	291°50.1 12°32.5	306°22.0 12°46.2	320°55.8 13°00.0	335°25.6 13°13.7	349°57.2 13°27.3	364°57.3 13°41.0	4°28.8 13°54.5	19°00.3 14°08.0	33°31.3 14°21.5	48°02.9 14°34.9	62°34.0 14°48.3	77°05.1 14°58.7	+31.5 15.6 +13.657.2
Sa 16	294°37.9 18°01.3	309°07.2 18°13.6	323°36.3 18°25.8	338°05.4 18°38.0	352°34.3 18°50.0	367°03.0 19°02.0	7°03.0 19°13.9	21°31.7 19°25.7	36°00.2 19°37.4	50°28.6 19°49.0	64°56.9 20°00.5	79°25.0 20°05.1	+28.7 15.8 +11.958.1
Su 17	296°11.3 22°40.9	310°37.3 22°50.7	325°00.3 23°00.3	339°28.9 23°09.8	353°54.5 23°19.2	368°20.2 23°28.5	8°20.0 23°37.6	22°45.3 23°46.6	37°10.5 23°55.4	51°35.6 24°04.1	66°00.8 24°12.7	80°25.3 24°15.1	+25.4 16.1 +9.259.1
Mo 18	296°21.9 26°02.8	310°44.7 26°08.8	325°07.4 26°14.7	339°29.9 26°20.3	353°52.4 26°25.8	8°14.7 26°31.1	22°37.0 26°36.3	36°59.1 26°41.2	51°21.1 26°46.0	65°43.0 26°50.6	80°04.8 26°55.0	+22.3 16.3 +5.259.9	
Tu 19	295°21.8 27°37.3	309°42.3 27°38.5	324°02.8 27°39.5	338°23.3 27°40.3	352°43.7 27°43.9	7°04.1 27°41.2	21°24.4 27°41.3	35°44.7 27°41.3	50°05.0 27°41.0	64°25.2 27°40.5	78°45.4 27°39.8	+20.3 16.5 +0.260.7	
We 20	293°47.4 27°03.3	308°07.6 26°59.1	322°27.9 26°54.8	336°48.2 26°50.2	351°08.5 26°45.4	5°28.9 26°40.4	19°49.3 26°35.2	34°09.7 26°29.8	48°30.2 26°24.2	62°50.8 26°18.4	77°11.7 26°12.4	+20.4 16.2 -5.161.2	
Th 21	292°28.9 24°18.2	306°50.7 24°09.0	321°12.6 23°59.7	335°34.7 23°50.3	349°56.8 23°40.8	4°19.0 23°30.8	18°41.3 23°20.8	33°03.8 23°10.6	47°26.3 23°00.2	61°48.9 22°49.7	76°11.7 22°39.1	+22.3 16.7 -9.961.3	
Fr 22	292°06.4 19°40.8	306°31.0 19°27.9	320°55.7 19°14.8	335°20.6 19°01.5	349°45.5 18°48.2	4°10.6 18°34.7	18°35.7 18°21.1	33°01.0 18°07.4	47°26.4 17°53.6	61°52.0 17°39.7	76°17.6 17°25.7	+25.1 16.7 -13.561.1	
Sa 23	292°56.2 13°44.2	307°23.7 13°28.8	321°51.3 13°13.3	336°19.0 12°57.8	350°46.8 12°42.2	5°14.6 12°26.5	19°42.6 12°10.8	34°10.7 11°55.0	48°38.9 11°39.2	63°07.2 11°23.4	77°35.6 11°07.4	+29.7 16.5 -15.760.5	
Su 24	294°52.7 7°04.1	309°22.5 6°47.7	323°52.4 6°31.2	338°22.4 6°14.8	352°52.4 5°58.3	7°22.6 5°41.8	21°52.7 5°25.3	36°23.0 5°08.8	50°53.4 4°52.3	65°23.8 4°35.8	79°54.2 4°19.3	+30.2 16.3 -13.659.7	
Mo 25	297°38.5 0°12.5	312°09.9 -0°03.9	326°41.9 -0°20.2	341°12.8 -0°36.5	355°44.3 -0°52.7	10°15.8 -1°08.9	24°47.4 -1°25.1	39°19.0 -1°41.3	53°50.7 -1°57.4	68°22.4 -2°13.5	82°54.4 -2°29.6	+31.6 16.0 -25.258.7	
Tu 26	312°09.9 -0°03.9	326°41.9 -0°20.2	341°12.8 -0°36.5	355°44.3 -0°52.7	10°15.8 -1°08.9	24°47.4 -1°25.1	39°19.0 -1°41.3	53°50.7 -1°57.4	68°22.4 -2°13.5	82°54.4 -2°29.6	97°25.9 -2°45.6	+31.6 16.0 -16.258.7	
We 27	315°25.3 -6°41.1	329°57.4 -6°56.4	344°29.6 -7°11.6	359°01.7 -7°26.8	13°33.8 -7°41.9	28°06.0 -7°57.0	42°38.2 -8°12.1	57°10.3 -8°27.0	71°42.5 -8°41.9	86°14.7 -8°56.8	100°46.9 -9°11.5	+32.2 15.7 -15.157.7	
Th 28	318°49.3 -12°45.1	333°21.3 -12°58.7	347°53.4 -13°12.3	362°25.5 -13°25.8	16°57.5 -13°39.2	31°29.6 -13°52.6	46°01.6 -14°05.8	60°33.6 -14°19.8	75°05.6 -14°32.1	89°37.5 -14°45.1	104°09.5 -14°58.0	+32.0 15.5 -13.356.7	
Fr 29	322°05.7 -18°01.4	336°37.2 -18°12.9	351°08.7 -18°24.3	365°40.1 -18°35.6	380°11.6 -18°48.5	34°42.9 -18°57.9	49°14.3 -19°08.9	63°45.6 -19°19.8	78°16.9 -19°30.6	92°48.2 -19°41.3	107°19.4 -19°51.9	+31.4 15.2 -11.055.8	
Sa 30	325°03.4 -22°18.1	339°34.0 -22°27.0	354°04.6 -22°35.8	368°35.2 -22°44.4	383°05.7 -22°53.0	37°36.2 -23°01.4	52°06.7 -23°09.7	66°37.1 -23°17.9	81°07.4 -23°26.0	95°37.8 -23°34.0	110°08.1 -23°41.8	+30.5 15.0 -8.455.1	
Su 31	327°38.1 -25°25.2	342°07.8 -25°31.1	356°37.5 -25°36.9	11°07.2 -25°42.5	25°36.9 -25°48.1	40°06.5 -25°53.5	54°36.0 -25°58.8	69°05.6 -26°03.9	83°35.1 -26°08.9	98°04.6 -26°13.8	112°34.1 -26°18.6	+29.6 14.9 -5.354.6	

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 7 20h24 — FQ: 15 20h34 — FM: 22 12h17 — LQ: 29 10h55

SUN

February 2027

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Mo 1	266°37.8 -17°09.3	281°37.8 -17°08.6	296°37.7 -17°07.9	311°37.6 -17°07.2	326°37.5 -17°06.5	341°37.4 -17°05.8	356°37.3 -17°05.1	11°37.2 -17°04.4	26°37.2 -17°03.6	41°37.1 -17°02.9	56°37.0 -17°02.2	71°36.9 -17°01.5	-0.1 +0.7
Tu 2	266°35.9 -16°52.2	281°35.8 -16°51.4	296°35.7 -16°50.7	311°35.6 -16°50.0	326°35.5 -16°49.3	341°35.5 -16°48.6	356°35.4 -16°47.8	11°35.3 -16°47.1	26°35.2 -16°46.4	41°35.2 -16°45.7	56°35.1 -16°44.9	71°35.0 -16°44.2	-0.1 +0.7
We 3	266°34.1 -16°34.7	281°34.0 -16°34.0	296°33.9 -16°33.2	311°33.9 -16°32.5	326°33.8 -16°31.8	341°33.7 -16°31.0	356°33.7 -16°30.3	11°33.6 -16°29.6	26°33.5 -16°28.8	41°33.5 -16°28.1	56°33.4 -16°27.3	71°33.3 -16°26.6	-0.1 +0.7
Th 4	266°32.5 -16°17.0	281°32.4 -16°16.2	296°32.4 -16°15.5	311°32.3 -16°14.7	326°32.3 -16°14.0	341°32.2 -16°13.2	356°32.1 -16°12.5	11°32.1 -16°11.7	26°32.0 -16°11.0	41°32.0 -16°10.2	56°31.9 -16°09.5	71°31.8 -16°08.7	-0.1 +0.7
Fr 5	266°31.1 -15°58.9	281°31.1 -15°58.2	296°31.0 -15°57.4	311°31.0 -15°56.6	326°30.9 -15°55.9	341°30.9 -15°55.1	356°30.8 -15°54.4	11°30.8 -15°53.6	26°30.7 -15°52.8	41°30.7 -15°52.1	56°30.6 -15°51.3	71°30.6 -15°50.6	-0.1 +0.8
Sa 6	266°29.9 -15°40.6	281°29.9 -15°39.8	296°29.9 -15°39.1	311°29.8 -15°38.3	326°29.8 -15°37.5	341°29.7 -15°36.8	356°29.7 -15°36.0	11°29.6 -15°35.2	26°29.6 -15°34.4	41°29.6 -15°33.7	56°29.5 -15°32.9	71°29.5 -15°32.1	-0.0 +0.8
Su 7	266°29.0 -15°22.0	281°28.9 -15°21.3	296°28.9 -15°20.5	311°28.9 -15°19.7	326°28.8 -15°18.9	341°28.8 -15°18.1	356°28.8 -15°17.3	11°28.7 -15°16.6	26°28.7 -15°15.8	41°28.6 -15°15.0	56°28.6 -15°14.2	71°28.6 -15°13.4	-0.0 +0.8
Mo 8	266°28.2 -15°08.2	281°28.2 -15°02.4	296°28.1 -15°01.6	311°28.1 -15°00.8	326°28.1 -15°00.0	341°28.0 -14°59.2	356°28.0 -14°58.4	11°28.0 -14°57.6	26°28.0 -14°56.9	41°27.9 -14°56.1	56°27.9 -14°55.3	71°27.9 -14°54.5	-0.0 +0.8
Tu 9	266°27.6 -14°44.1	281°27.6 -14°43.3	296°27.6 -14°42.5	311°27.6 -14°41.7	326°27.5 -14°40.9	341°27.5 -14°40.1	356°27.5 -14°39.3	11°27.5 -14°38.5	26°27.5 -14°37.7	41°27.4 -14°36.9	56°27.4 -14°36.1	71°27.4 -14°35.3	-0.0 +0.8
We 10	266°27.2 -14°24.8	281°27.2 -14°23.9	296°27.2 -14°23.1	311°27.2 -14°22.3	326°27.2 -14°21.5	341°27.2 -14°20.7	356°27.2 -14°19.9	11°27.2 -14°19.1	26°27.1 -14°18.3	41°27.1 -14°17.4	56°27.1 -14°16.6	71°27.1 -14°15.8	-0.0 +0.8
Th 11	266°27.0 -14°05.2	281°27.0 -14°04.4	296°27.0 -14°03.5	311°27.0 -14°02.7	326°27.0 -14°01.9	341°27.0 -14°01.1	356°27.0 -14°00.2	11°27.0 -13°59.4	26°27.0 -13°58.6	41°27.0 -13°57.8	56°27.0 -13°56.9	71°27.0 -13°56.1	-0.0 +0.8
Fr 12	266°27.1 -13°45.4	281°27.1 -13°44.5	296°27.1 -13°43.7	311°27.1 -13°42.9	326°27.1 -13°42.0	341°27.1 -13°41.2	356°27.1 -13°40.4	11°27.1 -13°39.5	26°27.1 -13°38.7	41°27.1 -13°37.9	56°27.1 -13°37.0	71°27.1 -13°36.2	+0.0 +0.8
Sa 13	266°27.3 -13°25.3	281°27.3 -13°24.5	296°27.3 -13°23.6	311°27.3 -13°22.8	326°27.3 -13°22.0	341°27.3 -13°21.1	356°27.3 -13°20.3	11°27.4 -13°19.4	26°27.4 -13°18.6	41°27.4 -13°17.8	56°27.4 -13°16.9	71°27.4 -13°16.1	+0.0 +0.8
Su 14	266°27.7 -13°05.1	281°27.7 -13°04.2	296°27.7 -13°03.4	311°27.7 -13°02.5	326°27.7 -13°01.7	341°27.8 -13°00.8	356°27.8 -13°00.0	11°27.8 -12°59.0	26°27.8 -12°58.3	41°27.8 -12°57.5	56°27.9 -12°56.6	71°27.9 -12°55.7	+0.0 +0.9
Mo 15	266°28.3 -12°44.6	281°28.3 -12°43.7	296°28.3 -12°42.9	311°28.3 -12°42.0	326°28.4 -12°41.2	341°28.4 -12°40.3	356°28.4 -12°39.5	11°28.5 -12°38.6	26°28.5 -12°37.7	41°28.5 -12°36.9	56°28.6 -12°36.0	71°28.6 -12°35.2	+0.0 +0.9
Tu 16	266°29.0 -12°23.9	281°29.1 -12°23.1	296°29.1 -12°22.2	311°29.1 -12°21.3	326°29.2 -12°20.5	341°29.2 -12°19.6	356°29.2 -12°18.7	11°29.3 -12°17.9	26°29.3 -12°17.0	41°29.4 -12°16.1	56°29.4 -12°15.3	71°29.4 -12°14.4	+0.0 +0.9
We 17	266°30.0 -12°03.1	281°30.0 -12°02.2	296°30.1 -12°01.3	311°30.1 -12°00.4	326°30.2 -11°59.6	341°30.2 -11°58.7	356°30.2 -11°57.8	11°30.3 -11°56.9	26°30.3 -11°56.1	41°30.4 -11°55.2	56°30.4 -11°54.3	71°30.5 -11°53.4	+0.0 +0.9
Th 18	266°31.1 -11°42.0	281°31.2 -11°41.1	296°31.2 -11°40.3	311°31.3 -11°39.5	326°31.3 -11°38.5	341°31.4 -11°37.6	356°31.4 -11°36.7	11°31.5 -11°35.8	26°31.5 -11°35.0	41°31.6 -11°34.1	56°31.6 -11°33.2	71°31.7 -11°32.3	+0.1 +0.9
Fr 19	266°32.4 -11°20.8	281°32.5 -11°19.9	296°32.5 -11°19.0	311°32.6 -11°18.1	326°32.7 -11°17.2	341°32.7 -11°16.3	356°32.8 -11°15.4	11°32.8 -11°14.5	26°32.9 -11°13.7	41°33.0 -11°12.8	56°33.0 -11°11.9	71°33.1 -11°11.0	+0.1 +0.9
Sa 20	266°33.9 -10°59.4	281°34.0 -10°58.5	296°34.0 -10°57.6	311°34.1 -10°56.7	326°34.2 -10°55.8	341°34.2 -10°54.9	356°34.3 -10°54.0	11°34.4 -10°53.1	26°34.4 -10°52.2	41°34.5 -10°51.3	56°34.6 -10°50.4	71°34.6 -10°49.5	+0.1 +0.9
Su 21	266°35.6 -10°37.8	281°35.6 -10°36.9	296°35.7 -10°36.0	311°35.8 -10°35.1	326°35.8 -10°34.2	341°35.9 -10°33.3	356°36.0 -10°32.4	11°36.1 -10°31.4	26°36.1 -10°30.5	41°36.2 -10°29.6	56°36.3 -10°28.7	71°36.4 -10°27.8	+0.1 +0.9
Mo 22	266°37.4 -9°54.1	281°37.4 -9°53.2	296°37.5 -9°52.3	311°37.6 -9°51.4	326°37.7 -9°50.5	341°37.8 -9°49.5	356°37.8 -9°48.6	11°37.9 -9°47.7	26°38.0 -9°46.8	41°38.1 -9°45.9	56°38.2 -9°44.9	71°38.2 -9°44.0	+0.1 +0.9
Tu 23	266°39.3 -9°32.1	281°39.4 -9°31.1	296°39.5 -9°30.2	311°39.6 -9°29.3	326°39.7 -9°28.4	341°39.7 -9°27.4	356°39.8 -9°26.5	11°39.9 -9°25.6	26°40.0 -9°24.7	41°40.1 -9°23.7	56°40.2 -9°22.8	71°40.3 -9°21.9	+0.1 +0.9
We 24	266°41.4 -9°09.7	281°41.5 -9°08.8	296°41.6 -9°08.0	311°41.7 -9°07.1	326°41.8 -9°06.1	341°41.9 -9°05.2	356°42.0 -9°04.3	11°42.1 -9°03.3	26°42.2 -9°02.4	41°42.3 -9°01.5	56°42.4 -9°00.6	71°42.5 -8°59.6	+0.1 +0.9
Th 25	266°43.7 -8°47.5	281°43.8 -8°46.6	296°43.9 -8°45.6	311°44.0 -8°44.7	326°44.1 -8°43.8	341°44.2 -8°42.8	356°44.3 -8°41.9	11°44.4 -8°41.0	26°44.5 -8°40.0	41°44.6 -8°39.1	56°44.7 -8°38.2	71°44.8 -8°37.2	+0.1 +0.9
Fr 26	266°46.8 -8°25.0	281°46.8 -8°24.1	296°46.9 -8°23.1	311°46.9 -8°22.2	326°46.9 -8°21.3	341°46.9 -8°20.3	356°46.9 -8°19.4	11°49.4 -8°18.4	26°49.5 -8°17.5	41°49.6 -8°16.6	56°49.7 -8°15.7	71°49.8 -8°14.7	+0.1 +0.9
Sa 27	266°51.3 -8°02.4	281°51.4 -8°01.5	296°51.5 -8°00.5	311°51.6 -7°59.6	326°51.8 -7°58.6	341°51.9 -7°57.7	356°52.0 -7°56.7	11°52.1 -7°55.8	26°52.2 -7°54.9	41°52.3 -7°53.9	56°52.5 -7°53.0	71°52.6 -7°52.0	+0.1 +0.9

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

February 2027

	D	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	Δ'/h SH
●	Mo 1	242°58.1 -26°55.7	257°27.4 -26°59.2	271°56.6 -27°02.5	286°25.8 -27°05.7	300°55.0 -27°08.8	315°24.1 -27°11.7	329°53.3 -27°14.5	344°22.4 -27°17.2	358°51.5 -27°19.8	13°20.7 -27°22.2	27°49.8 -27°24.5	+29.2 14.8 -2.9 54.3
	Tu 2	245°05.5 -27°42.6	259°34.6 -27°42.7	274°03.7 -27°42.8	288°32.7 -27°42.6	303°01.8 -27°42.4	317°30.9 -27°42.0	332°00.0 -27°41.4	346°29.1 -27°40.8	0°58.2 -27°40.0	15°27.3 -27°39.1	29°56.5 -27°38.0	+29.1 14.7 +0.5 54.0
	We 3	247°16.0 -27°06.3	261°45.6 -27°03.2	276°15.1 -26°59.9	290°44.6 -26°56.5	305°14.3 -26°54.9	319°43.9 -26°49.3	334°13.6 -26°45.5	348°43.3 -26°41.6	3°13.1 -26°37.6	17°42.8 -26°33.4	32°12.7 -26°29.1	+29.7 14.7 +3.7 53.9
●	Th 4	249°45.0 -25°10.2	264°15.5 -25°04.0	278°46.1 -24°57.7	293°16.7 -24°51.3	307°47.4 -24°44.7	322°18.1 -24°38.1	336°48.9 -24°31.3	351°19.7 -24°24.4	5°50.6 -24°17.4	20°21.5 -24°10.3	34°52.5 -24°03.1	+30.7 14.7 +6.7 54.0
	Fr 5	252°43.5 -22°02.2	267°15.3 -21°53.3	281°47.2 -21°44.4	296°19.2 -21°35.3	310°51.2 -21°26.1	325°23.2 -21°16.9	339°55.3 -21°07.5	354°27.5 -20°58.1	8°59.7 -20°48.6	23°32.0 -20°38.9	38°04.3 -20°29.2	+32.1 14.8 +9.3 54.1
	Sa 6	256°15.5 -17°53.2	270°48.6 -17°42.1	285°21.8 -17°31.0	299°55.1 -17°19.8	314°28.4 -17°08.5	329°01.7 -16°57.2	343°35.1 -16°45.7	358°08.5 -16°34.2	12°42.0 -16°22.7	27°15.5 -16°11.0	41°49.1 -15°59.3	+33.4 14.8 +11.4 54.3
●	Su 7	260°17.7 -12°55.8	274°51.9 -12°43.1	289°26.2 -12°30.3	304°00.5 -12°17.5	318°34.8 -12°04.6	333°09.1 -11°51.6	347°43.5 -11°38.7	2°17.9 -11°25.6	16°52.3 -11°12.5	31°26.8 -10°59.4	46°01.3 -10°46.2	+34.4 14.9 +13.0 54.6
	Mo 8	264°41.5 -7°23.0	279°16.3 -7°09.2	293°51.1 -6°55.3	308°26.0 -6°41.3	323°00.9 -6°27.4	337°35.7 -6°13.4	352°10.6 -5°59.4	6°45.5 -5°45.2	21°20.4 -5°31.2	35°55.3 -5°17.1	50°30.3 -5°03.0	+34.9 15.0 +14.0 55.0
	Tu 9	269°15.5 -1°28.1	283°48.9 -1°13.6	298°23.8 -0°59.1	312°58.6 -0°44.6	327°33.5 -0°30.1	342°08.3 -0°15.6	356°43.1 -0°01.0	11°17.9 0°13.5	25°52.7 0°28.0	40°27.4 0°42.6	55°02.2 0°57.2	+34.8 15.1 +14.5 55.4
●	We 10	273°40.0 4°35.7	288°14.3 4°50.2	302°48.5 5°04.7	317°22.7 5°19.2	331°56.9 5°33.7	346°31.0 5°48.2	1°05.0 6°02.7	15°39.0 6°17.2	30°13.0 6°31.6	44°46.9 6°46.0	59°20.8 7°00.5	+34.1 15.3 +14.5 55.9
	Th 11	277°42.2 10°33.8	292°15.2 10°47.8	306°48.0 11°01.7	321°20.8 11°15.6	335°53.5 11°29.5	350°26.2 11°43.3	4°58.8 11°57.1	19°31.3 12°10.9	34°03.7 12°24.6	48°38.6 12°38.2	63°08.1 12°51.8	+32.6 15.4 +13.8 56.5
	Fr 12	281°02.4 16°09.8	295°33.3 16°22.5	310°04.4 16°35.1	324°34.8 16°47.7	339°05.4 17°00.2	353°35.9 17°12.6	8°06.3 17°25.0	22°36.5 17°37.3	37°06.7 17°49.3	51°36.8 18°01.6	66°06.8 18°13.7	+30.4 15.6 +12.4 57.2
●	Sa 13	283°23.6 21°04.0	297°51.9 21°14.6	312°20.0 21°25.0	326°48.0 21°35.4	341°15.9 21°45.7	355°43.7 21°55.8	10°11.3 22°05.9	24°38.8 22°15.8	39°06.3 22°25.6	53°33.6 22°35.3	68°00.8 22°44.8	+27.7 15.8 +10.1 57.9
	Su 14	284°34.7 24°53.1	299°00.0 25°00.5	313°25.2 25°07.9	327°50.4 25°15.0	342°15.4 25°22.0	356°40.3 25°28.9	11°05.1 25°35.6	25°29.7 25°42.1	39°54.3 25°48.5	54°18.8 25°54.7	68°43.2 26°00.8	+24.8 16.0 +6.8 58.6
	Mo 15	284°37.1 27°11.8	299°00.5 27°15.2	313°22.8 27°18.3	327°45.5 27°21.3	342°08.5 27°24.0	356°30.8 27°26.6	10°53.3 27°29.0	25°15.8 27°31.3	39°38.2 27°33.3	54°00.5 27°35.1	68°22.8 27°36.8	+22.6 16.2 +2.5 59.3
●	Tu 16	283°51.5 27°38.1	298°13.1 27°36.6	312°34.8 27°34.9	326°56.4 27°33.0	341°18.1 27°30.9	355°39.7 27°28.6	10°01.3 27°26.1	24°22.9 27°23.4	38°44.6 27°20.5	53°06.2 27°17.4	67°27.8 27°14.1	+21.6 16.3 -2.4 59.9
	We 17	282°54.9 26°00.8	297°17.0 25°54.4	311°39.2 25°47.8	326°01.4 25°40.9	340°23.6 25°33.9	354°45.9 25°26.7	9°08.3 25°19.4	23°30.7 25°11.8	37°53.2 25°04.0	52°15.8 25°56.1	66°38.4 24°48.0	+22.3 16.5 -7.3 60.4
	Th 18	282°26.7 22°25.6	296°50.6 22°14.8	311°14.5 22°03.1	325°38.6 21°52.7	340°02.8 21°41.4	354°27.0 21°30.0	8°51.3 21°18.5	23°15.8 21°06.8	37°40.3 20°54.9	52°04.9 20°42.9	66°29.6 20°30.8	+24.3 16.5 -11.5 60.6
○	Fr 19	282°51.9 4°03.2	297°18.2 3°46.4	311°44.5 3°29.7	326°11.0 3°12.2	340°37.5 2°56.2	355°04.2 2°39.4	9°30.9 2°22.7	23°57.7 2°05.9	38°24.7 1°49.2	52°51.7 1°32.5	67°18.8 1°15.7	+26.7 16.5 -16.8 59.7
	Sa 20	284°16.1 10°55.3	298°44.5 10°39.2	313°13.1 10°23.1	327°41.8 10°07.0	342°10.5 9°50.8	356°39.3 9°34.5	11°08.2 9°18.2	25°37.1 9°01.9	40°06.1 8°45.6	54°35.2 8°29.2	69°04.4 8°12.7	+28.8 16.4 -16.3 60.3
	Su 21	286°29.6 -2°52.5	300°59.8 -3°09.2	315°30.0 -3°25.5	330°00.2 -3°41.8	344°30.5 -3°58.0	359°00.9 -4°14.2	13°31.3 -4°30.4	28°01.7 -4°46.5	42°32.2 -5°02.5	57°02.7 -5°18.6	71°33.3 -5°34.6	+30.4 16.3 -16.2 58.9
○	Mo 22	289°16.0 -9°27.7	303°47.1 -9°42.8	318°18.2 -9°57.8	332°49.3 -10°12.7	347°20.5 -10°27.5	1°51.6 -10°42.3	16°22.8 -10°57.0	30°54.0 -11°11.7	45°25.2 -11°26.4	59°56.4 -11°40.7	74°27.7 -11°55.1	+31.2 16.1 -14.7 57.9
	Tu 23	292°17.1 -15°21.4	306°48.4 -15°34.4	321°19.7 -15°47.4	335°51.0 -16°00.2	350°22.3 -16°13.0	4°53.6 -16°25.7	19°24.9 -16°38.3	33°56.1 -16°50.7	48°27.4 -17°03.1	62°58.7 -17°15.4	77°29.9 -17°27.6	+31.3 15.8 -12.6 57.0
	We 24	295°16.7 -15°21.4	309°47.7 -15°34.4	324°18.6 -15°47.4	338°49.5 -16°00.2	353°20.4 -16°13.0	7°51.3 -16°25.7	22°22.2 -16°38.3	36°53.0 -16°50.7	51°23.8 -17°03.1	65°54.6 -17°15.4	80°25.3 -17°27.6	+30.9 15.5 -12.6 57.0
○	Th 25	309°47.7 -15°34.4	324°18.6 -15°47.4	338°49.5 -16°00.2	353°20.4 -16°13.0	7°51.3 -16°25.7	22°22.2 -16°38.3	36°53.0 -16°50.7	51°23.8 -17°03.1	65°54.6 -17°15.4	80°25.3 -17°27.6	94°56.0 -17°39.8	+30.8 15.5 -12.5 57.0
	Fr 26	312°33.2 -20°28.4	327°03.4 -20°38.7	341°33.6 -20°49.0	356°03.8 -20°59.1	10°33.9 -21°09.2	25°04.0 -21°19.1	39°34.1 -21°28.9	54°04.1 -21°38.6	68°34.1 -21°48.2	83°04.1 -21°57.6	97°34.0 -22°07.0	+30.1 15.3 -9.9 56.1
	Sa 27	314°59.3 -24°12.4	329°28.7 -24°19.8	343°58.1 -24°27.1	358°27.5 -24°34.2	12°56.8 -24°41.2	27°26.2 -24°48.0	41°55.5 -24°54.8	56°24.7 -25°01.4	70°54.0 -25°07.8	85°23.2 -25°14.2	99°52.4 -25°20.4	+29.3 15.1 -6.8 55.3
○	Su 28	317°07.7 -26°37.8	331°36.6 -26°41.9	346°05.5 -26°45.8	0°34.3 -26°49.6	15°03.2 -26°53.3	29°32.0 -26°56.9	44°00.8 -27°00.3	58°29.6 -27°03.6	72°58.5 -27°06.7	87°27.2 -27°09.7	101°56.0 -27°12.6	+28.8 14.9 -3.5 54.7

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (— = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 6 15h56 — FQ: 14 07h58 — FM: 20 23h23 — LQ: 28 05h16

SUN

March 2027

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Mo 1	266°54.1 -7°39.7	281°54.2 -7°38.7	296°54.3 -7°37.8	311°54.5 -7°36.8	326°54.6 -7°35.9	341°54.7 -7°34.9	356°54.8 -7°34.0	11°54.9 -7°33.0	26°55.1 -7°32.1	41°55.2 -7°31.1	56°55.3 -7°30.2	71°55.4 -7°29.2	+0.1 +1.0
Tu 2	266°57.0 -7°16.9	281°57.1 -7°15.9	296°57.3 -7°14.9	311°57.4 -7°14.0	326°57.5 -7°13.0	341°57.6 -7°12.1	356°57.8 -7°11.1	11°57.9 -7°10.2	26°58.0 -7°09.2	41°58.2 -7°08.3	56°58.3 -7°07.3	71°58.4 -7°06.4	+0.1 +1.0
We 3	267°00.1 -6°53.9	282°00.2 -6°53.0	297°00.3 -6°52.0	312°00.5 -6°51.0	327°00.6 -6°50.1	342°00.7 -6°49.1	357°00.8 -6°48.2	12°01.0 -6°47.2	27°01.1 -6°46.2	42°01.2 -6°45.3	57°01.4 -6°44.3	72°01.5 -6°43.4	+0.1 +1.0
Th 4	267°03.2 -6°30.9	282°03.4 -6°29.9	297°03.5 -6°28.9	312°03.6 -6°28.0	327°03.8 -6°27.0	342°03.9 -6°26.1	357°04.0 -6°25.1	12°04.2 -6°24.1	27°04.3 -6°23.2	42°04.4 -6°22.2	57°04.6 -6°21.2	72°04.7 -6°20.3	+0.1 +1.0
Fr 5	267°06.5 -6°07.7	282°06.6 -6°06.8	297°06.8 -6°05.8	312°06.9 -6°04.8	327°07.0 -6°03.9	342°07.2 -6°02.9	357°07.3 -6°01.9	12°07.5 -6°01.0	27°07.6 -6°00.0	42°07.7 -5°59.0	57°07.9 -5°58.1	72°08.0 -5°57.1	+0.1 +1.0
Sa 6	267°09.9 -5°44.5	282°10.0 -5°43.5	297°10.2 -5°42.6	312°10.3 -5°41.6	327°10.4 -5°40.6	342°10.6 -5°39.7	357°10.7 -5°38.7	12°10.9 -5°37.7	27°11.0 -5°36.8	42°11.2 -5°35.8	57°11.3 -5°34.8	72°11.4 -5°33.8	+0.1 +1.0
Su 7	267°13.3 -5°21.2	282°13.5 -5°20.2	297°13.6 -5°19.3	312°13.8 -5°18.3	327°13.9 -5°17.3	342°14.1 -5°16.4	357°14.2 -5°15.4	12°14.4 -5°14.4	27°14.5 -5°13.4	42°14.7 -5°12.5	57°14.8 -5°11.5	72°15.0 -5°10.5	+0.1 +1.0
Mo 8	267°16.9 -4°50.6	282°17.1 -4°49.6	297°17.2 -4°48.5	312°17.4 -4°47.5	327°17.5 -4°46.5	342°17.7 -4°45.3	357°17.8 -4°44.2	12°18.0 -4°43.0	27°18.1 -4°41.9	42°18.3 -4°40.8	57°18.4 -4°39.7	72°18.6 -4°38.6	+0.2 +1.0
Tu 9	267°20.6 -4°34.4	282°20.7 -4°33.4	297°20.9 -4°32.5	312°21.1 -4°31.5	327°21.2 -4°30.5	342°21.4 -4°29.5	357°21.5 -4°28.5	12°21.7 -4°27.6	27°21.8 -4°26.6	42°22.0 -4°25.6	57°22.2 -4°24.6	72°22.3 -4°23.6	+0.2 +1.0
We 10	267°24.4 -4°10.9	282°24.5 -4°09.9	297°24.7 -4°09.0	312°24.8 -4°08.0	327°25.0 -4°07.0	342°25.1 -4°06.0	357°25.3 -4°05.0	12°25.5 -4°04.1	27°25.6 -4°03.1	42°25.8 -4°02.1	57°25.9 -4°01.1	72°26.1 -4°00.1	+0.2 +1.0
Th 11	267°28.2 -3°47.4	282°28.4 -3°46.4	297°28.5 -3°45.4	312°28.7 -3°44.4	327°28.8 -3°43.4	342°29.0 -3°42.5	357°29.2 -3°41.5	12°29.3 -3°40.5	27°29.5 -3°39.5	42°29.7 -3°38.5	57°29.9 -3°37.5	72°30.0 -3°36.6	+0.2 +1.0
Fr 12	267°32.1 -3°23.8	282°32.3 -3°22.8	297°32.5 -3°21.8	312°32.6 -3°20.8	327°32.8 -3°19.8	342°33.0 -3°18.9	357°33.1 -3°17.9	12°33.3 -3°16.9	27°33.5 -3°15.9	42°33.6 -3°14.9	57°33.8 -3°13.9	72°34.0 -3°13.0	+0.2 +1.0
Sa 13	267°36.1 -3°00.2	282°36.3 -2°59.2	297°36.5 -2°58.2	312°36.6 -2°57.2	327°36.8 -2°56.2	342°37.0 -2°55.2	357°37.1 -2°54.2	12°37.3 -2°53.3	27°37.5 -2°52.3	42°37.6 -2°51.3	57°37.8 -2°50.3	72°38.0 -2°49.3	+0.2 +1.0
Su 14	267°40.2 -2°36.5	282°40.4 -2°35.5	297°40.6 -2°34.5	312°40.7 -2°33.5	327°40.8 -2°32.5	342°41.1 -2°31.6	357°41.2 -2°30.6	12°41.4 -2°29.6	27°41.4 -2°28.6	42°41.6 -2°27.6	57°41.8 -2°26.6	72°42.1 -2°25.6	+0.2 +1.0
Mo 15	267°44.4 -2°12.8	282°44.5 -2°11.8	297°44.7 -2°10.8	312°44.9 -2°09.8	327°45.1 -2°08.9	342°45.2 -2°07.9	357°45.4 -2°06.9	12°45.6 -2°05.9	27°45.8 -2°04.9	42°45.9 -2°03.9	57°46.1 -2°02.9	72°46.3 -2°01.9	+0.2 +1.0
Tu 16	267°48.6 -1°49.1	282°48.7 -1°48.1	297°48.9 -1°47.1	312°49.1 -1°46.1	327°49.3 -1°45.2	342°49.5 -1°44.2	357°49.6 -1°43.2	12°49.8 -1°42.2	27°50.0 -1°41.2	42°50.2 -1°40.2	57°50.3 -1°39.2	72°50.5 -1°38.2	+0.2 +1.0
We 17	267°52.8 -1°25.4	282°53.0 -1°24.4	297°53.2 -1°23.4	312°53.4 -1°22.4	327°53.6 -1°21.4	342°53.7 -1°20.5	357°53.9 -1°19.5	12°54.1 -1°18.5	27°54.3 -1°17.5	42°54.5 -1°16.5	57°54.6 -1°15.5	72°54.8 -1°14.5	+0.2 +1.0
Th 18	267°57.2 -1°01.7	282°57.3 -1°00.7	297°57.5 -0°59.7	312°57.7 -0°58.7	327°57.9 -0°57.7	342°58.1 -0°56.7	357°58.3 -0°55.7	12°58.4 -0°54.8	27°58.6 -0°53.8	42°58.8 -0°52.8	57°59.0 -0°51.8	72°59.2 -0°50.8	+0.2 +1.0
Fr 19	268°01.5 -0°38.0	283°01.7 -0°37.0	298°01.9 -0°36.0	313°02.1 -0°35.0	328°02.3 -0°34.0	343°02.5 -0°33.0	358°02.6 -0°32.0	13°02.8 -0°31.0	28°03.0 -0°30.0	43°03.2 -0°29.1	58°03.4 -0°28.1	73°03.6 -0°27.1	+0.2 +1.0
Sa 20	268°06.0 -0°14.2	283°06.1 -0°13.2	298°06.3 -0°12.3	313°06.5 -0°11.3	328°06.7 -0°10.3	343°06.9 -0°09.3	358°07.1 -0°08.3	13°07.3 -0°07.3	28°07.4 -0°06.3	43°07.6 -0°05.3	58°07.8 -0°04.4	73°08.0 -0°03.4	+0.2 +1.0
Su 21	268°10.4 0°09.5	283°10.6 0°10.5	298°10.8 0°11.4	313°11.0 0°12.4	328°11.2 0°13.4	343°11.3 0°14.4	358°11.5 0°15.4	13°11.7 0°16.4	28°11.9 0°17.4	43°12.1 0°18.4	58°12.3 0°19.3	73°12.5 0°20.3	+0.2 +1.0
Mo 22	268°14.9 0°33.2	283°15.1 0°34.1	298°15.3 0°35.1	313°15.5 0°36.1	328°15.6 0°37.1	343°15.8 0°38.1	358°16.0 0°39.1	13°16.2 0°40.1	28°16.4 0°41.0	43°16.7 0°42.0	58°16.8 0°43.0	73°17.0 0°44.0	+0.2 +1.0
Tu 23	268°19.4 0°56.8	283°19.6 0°57.8	298°19.8 0°58.8	313°20.0 0°59.8	328°20.1 1°00.8	343°20.3 1°01.8	358°20.5 1°02.7	13°20.5 1°03.7	28°20.7 1°04.7	43°21.1 1°05.7	58°21.3 1°06.7	73°21.5 1°07.7	+0.2 +1.0
We 24	268°23.9 1°20.5	283°24.1 1°21.4	298°24.3 1°22.4	313°24.5 1°23.4	328°24.7 1°24.4	343°24.9 1°25.4	358°25.0 1°26.4	13°25.2 1°27.4	28°25.4 1°28.3	43°25.6 1°29.3	58°25.8 1°30.3	73°26.0 1°31.3	+0.2 +1.0
Th 25	268°28.5 1°44.1	283°28.6 1°45.1	298°28.8 1°46.0	313°29.0 1°47.0	328°29.2 1°48.0	343°29.4 1°49.0	358°29.6 1°50.0	13°29.8 1°51.0	28°30.0 1°51.9	43°30.3 1°52.9	58°30.5 1°53.9	73°30.5 1°54.9	+0.2 +1.0
Fr 26	268°33.0 2°07.6	283°33.2 2°08.6	298°33.4 2°09.6	313°33.6 2°10.6	328°33.7 2°11.6	343°33.9 2°12.5	358°34.1 2°13.5	13°34.3 2°14.5	28°34.5 2°15.5	43°34.7 2°16.5	58°34.9 2°17.5	73°35.1 2°18.4	+0.2 +1.0
Sa 27	268°37.5 2°31.2	283°37.7 2°32.1	298°37.9 2°33.1	313°38.1 2°34.1	328°38.3 2°35.1	343°38.5 2°36.1	358°38.7 2°37.0	13°38.9 2°38.0	28°39.0 2°39.0	43°39.2 2°40.0	58°39.4 2°41.0	73°39.6 2°41.9	+0.2 +1.0
Su 28	268°42.1 2°54.6	283°42.3 2°55.6	298°42.4 2°56.6	313°42.6 2°57.6	328°42.8 2°58.6	343°43.0 2°59.5	358°43.2 3°00.5	13°43.4 3°01.5	28°43.6 3°02.5	43°43.8 3°03.4	58°44.0 3°04.4	73°44.1 3°05.4	+0.2 +1.0
Mo 29	268°46.6 3°18.1	283°46.8 3°19.0	298°47.0 3°20.0	313°47.2 3°21.0	328°47.4 3°22.0	343°47.5 3°22.9	358°47.7 3°23.9	13°47.9 3°24.9	28°48.1 3°25.9	43°48.3 3°26.8	58°48.5 3°27.8	73°48.7 3°28.8	+0.2 +1.0
Tu 30	268°51.1 3°41.4	283°51.3 3°42.4	298°51.5 3°43.4	313°51.7 3°44.3	328°51.9 3°45.3	343°52.0 3°46.3	358°52.2 3°47.3	13°52.4 3°48.2	28°52.6 3°49.2	43°52.8 3°50.2	58°53.0 3°51.1	73°53.2 3°52.1	+0.2 +1.0
We 31	268°55.6 4°04.7	283°55.8 4°05.7	298°56.0 4°06.7	313°56.2 4°07.6	328°56.3 4°08.6	343°56.5 4°09.6	358°56.7 4°10.5	13°56.9 4°11.5	28°57.1 4°12.5	43°57.3 4°13.4	58°57.5 4°14.4	73°57.6 4°15.4	+0.2 +1.0

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ°/h = dec. change

Semi-diameter: 16.1'

MOON

March 2027

	D	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	Δ'/h SH
Mo 1	234 ^o 17.8 -27 ^o 29.4	248 ^o 47.0 -27 ^o 27.6	263 ^o 16.2 -27 ^o 25.6	277 ^o 45.4 -27 ^o 23.5	292 ^o 14.6 -27 ^o 21.2	306 ^o 43.9 -27 ^o 18.9	321 ^o 13.2 -27 ^o 16.4	335 ^o 42.5 -27 ^o 13.7	350 ^o 11.9 -27 ^o 11.0	4 ^o 41.3 -27 ^o 08.1	19 ^o 10.8 -27 ^o 05.0	+29.3 14.8 +2.4 54.1	
	248 ^o 47.0 -27 ^o 27.6	263 ^o 16.2 -27 ^o 25.6	277 ^o 45.4 -27 ^o 23.5	292 ^o 14.6 -27 ^o 21.2	306 ^o 43.9 -27 ^o 18.9	321 ^o 13.2 -27 ^o 16.4	335 ^o 42.5 -27 ^o 13.7	350 ^o 11.9 -27 ^o 11.0	4 ^o 41.3 -27 ^o 08.1	19 ^o 10.8 -27 ^o 05.0	33 ^o 40.2 -27 ^o 01.9	+29.3 14.8 +2.6 54.1	
We 3	251 ^o 07.0 -25 ^o 59.6	265 ^o 37.2 -25 ^o 54.5	280 ^o 07.3 -25 ^o 49.2	294 ^o 37.6 -25 ^o 43.8	309 ^o 07.8 -25 ^o 38.4	323 ^o 38.2 -25 ^o 32.7	338 ^o 08.5 -25 ^o 27.0	352 ^o 38.9 -25 ^o 21.2	7 ^o 09.4 -25 ^o 15.2	21 ^o 39.9 -25 ^o 09.2	36 ^o 10.5 -25 ^o 03.0	+30.3 14.7 +5.7 54.1	
	253 ^o 54.9 -23 ^o 16.8	268 ^o 26.3 -23 ^o 08.9	282 ^o 57.8 -23 ^o 00.8	297 ^o 29.3 -22 ^o 52.7	312 ^o 00.8 -22 ^o 44.4	326 ^o 32.4 -22 ^o 36.1	341 ^o 04.0 -22 ^o 27.7	355 ^o 35.7 -22 ^o 19.1	10 ^o 07.5 -22 ^o 10.5	24 ^o 39.3 -22 ^o 01.7	39 ^o 11.1 -21 ^o 52.9	+31.6 14.8 +8.4 54.1	
Th 4	257 ^o 15.2 -19 ^o 29.0	271 ^o 47.9 -19 ^o 18.7	286 ^o 20.6 -19 ^o 08.3	300 ^o 53.4 -18 ^o 57.8	315 ^o 26.2 -18 ^o 47.2	329 ^o 59.1 -18 ^o 36.6	344 ^o 32.0 -18 ^o 25.9	359 ^o 04.9 -18 ^o 15.1	13 ^o 37.9 -18 ^o 04.2	28 ^o 11.0 -17 ^o 53.2	42 ^o 44.1 -17 ^o 42.2	+32.9 14.8 +10.7 54.4	
	261 ^o 05.6 -14 ^o 47.5	275 ^o 39.4 -14 ^o 35.3	290 ^o 13.1 -14 ^o 23.0	304 ^o 47.0 -14 ^o 10.7	319 ^o 20.8 -13 ^o 58.3	333 ^o 54.7 -13 ^o 45.8	348 ^o 28.6 -13 ^o 33.3	3 ^o 02.6 -13 ^o 20.7	17 ^o 36.6 -13 ^o 08.1	32 ^o 10.6 -12 ^o 55.4	46 ^o 44.6 -12 ^o 42.6	+33.9 14.9 +12.5 54.7	
Su 7	265 ^o 18.5 -9 ^o 24.6	279 ^o 52.9 -9 ^o 11.0	294 ^o 27.3 -8 ^o 57.3	309 ^o 01.8 -8 ^o 43.6	323 ^o 36.3 -8 ^o 29.9	338 ^o 10.8 -8 ^o 16.1	352 ^o 45.3 -8 ^o 02.3	7 ^o 19.8 -7 ^o 48.4	21 ^o 54.3 -7 ^o 34.5	36 ^o 28.8 -7 ^o 20.6	51 ^o 03.4 -7 ^o 06.6	+34.5 15.0 +13.8 55.1	
	269 ^o 42.2 -3 ^o 33.0	284 ^o 16.8 -3 ^o 18.6	298 ^o 51.3 -3 ^o 04.1	313 ^o 25.9 -2 ^o 49.6	328 ^o 00.5 -2 ^o 35.0	342 ^o 35.0 -2 ^o 20.5	357 ^o 09.6 -2 ^o 05.9	11 ^o 44.1 -1 ^o 51.3	26 ^o 18.6 -1 ^o 36.7	40 ^o 53.1 -1 ^o 22.1	55 ^o 27.6 -1 ^o 07.5	+34.5 15.2 +14.6 55.6	
Tu 9	274 ^o 02.6 2 ^o 33.3	288 ^o 36.7 2 ^o 48.1	303 ^o 10.8 3 ^o 02.8	317 ^o 44.9 3 ^o 17.6	332 ^o 18.9 3 ^o 32.3	346 ^o 52.9 3 ^o 47.0	1 ^o 26.9 4 ^o 01.8	16 ^o 00.8 4 ^o 16.5	30 ^o 34.7 4 ^o 31.2	45 ^o 08.5 4 ^o 45.9	59 ^o 42.3 5 ^o 00.6	+34.0 15.3 +14.7 56.1	
	278 ^o 03.9 8 ^o 39.2	292 ^o 36.9 8 ^o 53.6	307 ^o 09.9 9 ^o 08.0	321 ^o 42.8 9 ^o 22.3	336 ^o 15.6 9 ^o 36.6	350 ^o 48.4 9 ^o 50.9	5 ^o 21.1 10 ^o 05.1	19 ^o 53.8 10 ^o 19.3	34 ^o 26.4 10 ^o 33.5	48 ^o 58.9 10 ^o 47.6	63 ^o 31.3 11 ^o 01.7	+32.7 15.4 +14.2 56.6	
Th 11	281 ^o 29.6 14 ^o 27.3	296 ^o 00.8 14 ^o 40.6	310 ^o 32.2 14 ^o 53.8	325 ^o 03.1 15 ^o 07.0	339 ^o 34.1 15 ^o 20.1	354 ^o 05.0 15 ^o 33.1	8 ^o 35.9 15 ^o 46.1	23 ^o 06.6 15 ^o 59.0	37 ^o 37.3 16 ^o 11.8	52 ^o 07.8 16 ^o 24.6	66 ^o 38.8 16 ^o 37.2	+30.9 15.6 +13.0 57.1	
	284 ^o 04.3 19 ^o 37.7	298 ^o 33.3 19 ^o 49.0	313 ^o 02.2 20 ^o 00.3	327 ^o 30.9 20 ^o 11.4	341 ^o 59.6 20 ^o 22.4	356 ^o 28.1 20 ^o 33.3	10 ^o 56.6 20 ^o 44.1	25 ^o 24.9 20 ^o 54.8	39 ^o 53.2 21 ^o 05.4	54 ^o 21.3 21 ^o 15.9	68 ^o 49.4 21 ^o 26.3	+28.5 15.7 +10.9 57.6	
Sa 13	285 ^o 37.9 23 ^o 47.8	300 ^o 04.3 23 ^o 56.3	314 ^o 30.6 24 ^o 04.5	328 ^o 56.8 24 ^o 12.7	343 ^o 22.9 24 ^o 20.7	357 ^o 49.0 24 ^o 28.6	12 ^o 14.9 24 ^o 36.3	26 ^o 40.7 24 ^o 43.9	41 ^o 06.5 24 ^o 51.3	55 ^o 32.1 24 ^o 58.6	69 ^o 57.7 25 ^o 05.7	+26.0 15.8 +7.8 58.1	
	286 ^o 10.3 26 ^o 34.3	300 ^o 34.4 26 ^o 39.0	314 ^o 58.6 26 ^o 43.4	329 ^o 62.6 26 ^o 47.7	343 ^o 46.7 26 ^o 51.8	358 ^o 10.5 26 ^o 55.7	12 ^o 34.3 26 ^o 59.5	26 ^o 58.1 27 ^o 03.1	41 ^o 06.1 27 ^o 06.5	55 ^o 45.5 27 ^o 09.7	70 ^o 09.1 27 ^o 12.8	+23.9 16.0 +3.8 58.5	
Mo 15	285 ^o 57.2 27 ^o 36.9	300 ^o 20.1 27 ^o 37.1	314 ^o 43.6 27 ^o 37.0	329 ^o 05.9 27 ^o 36.8	343 ^o 21.8 27 ^o 36.4	357 ^o 35.8 27 ^o 35.8	12 ^o 14.5 27 ^o 35.0	26 ^o 37.3 27 ^o 34.0	41 ^o 00.1 27 ^o 32.8	55 ^o 22.9 27 ^o 31.4	69 ^o 45.7 27 ^o 29.9	+22.8 16.1 -0.7 59.0	
	285 ^o 28.9 26 ^o 44.1	299 ^o 51.9 26 ^o 39.6	314 ^o 15.9 26 ^o 34.8	328 ^o 38.1 26 ^o 29.9	343 ^o 01.3 26 ^o 24.8	357 ^o 24.4 26 ^o 19.6	11 ^o 47.7 26 ^o 14.1	26 ^o 11.0 26 ^o 08.5	40 ^o 34.3 26 ^o 07.2	54 ^o 57.7 25 ^o 56.7	69 ^o 21.1 25 ^o 50.5	+23.2 16.2 -5.4 59.3	
We 17	285 ^o 19.3 23 ^o 57.5	299 ^o 43.7 23 ^o 48.6	314 ^o 08.2 23 ^o 39.6	328 ^o 32.8 23 ^o 30.4	342 ^o 57.4 23 ^o 21.1	357 ^o 22.1 23 ^o 11.6	11 ^o 46.9 23 ^o 01.9	26 ^o 11.8 22 ^o 52.1	40 ^o 36.7 22 ^o 42.2	55 ^o 01.8 22 ^o 32.1	69 ^o 26.9 22 ^o 21.9	+24.7 16.3 -9.6 59.6	
	285 ^o 53.3 19 ^o 31.7	300 ^o 19.7 19 ^o 19.3	314 ^o 46.2 19 ^o 06.8	329 ^o 12.8 18 ^o 54.2	343 ^o 39.5 18 ^o 41.4	358 ^o 06.3 18 ^o 28.6	12 ^o 33.1 18 ^o 15.6	27 ^o 00.1 18 ^o 02.5	41 ^o 27.1 17 ^o 49.4	55 ^o 54.2 17 ^o 36.1	70 ^o 21.4 17 ^o 22.7	+26.8 16.3 -12.9 59.8	
Fr 19	287 ^o 18.9 13 ^o 50.3	301 ^o 47.3 13 ^o 35.4	316 ^o 15.9 13 ^o 20.5	330 ^o 44.5 13 ^o 05.5	345 ^o 13.1 12 ^o 50.4	359 ^o 41.9 12 ^o 35.3	14 ^o 10.7 12 ^o 20.1	28 ^o 39.6 12 ^o 04.8	43 ^o 08.5 11 ^o 49.5	57 ^o 37.5 11 ^o 34.1	72 ^o 06.6 11 ^o 18.6	+28.8 16.3 -15.2 59.7	
	289 ^o 30.2 7 ^o 20.6	304 ^o 00.3 7 ^o 04.4	318 ^o 30.3 6 ^o 48.2	333 ^o 00.4 6 ^o 31.9	347 ^o 30.6 6 ^o 15.7	359 ^o 41.9 5 ^o 59.3	16 ^o 31.1 5 ^o 43.0	31 ^o 01.4 5 ^o 26.7	45 ^o 31.7 5 ^o 10.3	60 ^o 02.1 4 ^o 53.9	74 ^o 32.5 4 ^o 37.5	+30.2 16.2 -16.3 59.5	
Su 21	292 ^o 13.1 0 ^o 30.3	306 ^o 44.0 0 ^o 13.8	321 ^o 15.0 -0 ^o 02.7	335 ^o 46.0 -0 ^o 19.1	350 ^o 17.7 -0 ^o 35.5	364 ^o 50.7 -0 ^o 52.0	4 ^o 48.0 -1 ^o 08.4	19 ^o 19.0 -1 ^o 24.8	33 ^o 50.1 -1 ^o 41.1	62 ^o 52.1 -1 ^o 57.5	77 ^o 23.3 -2 ^o 13.8	+31.0 16.1 -16.4 59.0	
	295 ^o 10.6 -6 ^o 15.0	309 ^o 41.7 -6 ^o 30.7	324 ^o 12.9 -6 ^o 46.5	338 ^o 44.1 -7 ^o 02.1	353 ^o 15.1 -7 ^o 17.8	367 ^o 46.3 -7 ^o 33.3	22 ^o 17.5 -7 ^o 48.8	36 ^o 48.6 -8 ^o 04.3	51 ^o 19.7 -8 ^o 19.7	65 ^o 50.8 -8 ^o 35.1	80 ^o 21.9 -8 ^o 50.4	+31.1 15.9 -15.5 58.4	
Tu 23	298 ^o 06.5 -12 ^o 32.0	312 ^o 37.3 -12 ^o 46.2	327 ^o 08.3 -13 ^o 00.3	341 ^o 38.8 -13 ^o 14.4	356 ^o 09.6 -13 ^o 28.3	370 ^o 40.3 -13 ^o 42.2	25 ^o 11.0 -13 ^o 56.0	39 ^o 41.6 -14 ^o 09.7	54 ^o 12.2 -14 ^o 23.3	68 ^o 42.8 -14 ^o 36.8	83 ^o 13.4 -14 ^o 50.3	+30.7 15.7 -13.8 57.7	
	300 ^o 48.2 -18 ^o 00.7	315 ^o 18.2 -18 ^o 12.6	329 ^o 48.2 -18 ^o 24.4	344 ^o 18.2 -18 ^o 36.1	358 ^o 48.2 -18 ^o 47.7	373 ^o 18.1 -18 ^o 59.2	13 ^o 18.1 -19 ^o 10.5	27 ^o 47.9 -19 ^o 21.8	42 ^o 17.8 -19 ^o 32.9	56 ^o 47.6 -19 ^o 44.0	71 ^o 17.3 -19 ^o 54.9	+29.9 15.5 -11.4 56.9	
We 24	303 ^o 08.7 -22 ^o 24.7	317 ^o 37.9 -22 ^o 33.7	332 ^o 07.0 -22 ^o 42.6	346 ^o 36.1 -22 ^o 51.4	1 ^o 05.2 -23 ^o 00.0	15 ^o 34.2 -23 ^o 08.5	30 ^o 03.2 -23 ^o 16.9	44 ^o 32.2 -23 ^o 25.2	59 ^o 01.1 -23 ^o 33.3	73 ^o 30.0 -23 ^o 49.1	87 ^o 58.9 -23 ^o 56.9	+29.0 15.3 -8.3 56.1	
	317 ^o 37.9 -22 ^o 33.7	332 ^o 07.0 -22 ^o 42.6	346 ^o 36.1 -22 ^o 51.4	1 ^o 05.2 -23 ^o 00.0	15 ^o 34.2 -23 ^o 08.5	30 ^o 03.2 -23 ^o 16.9	44 ^o 32.2 -23 ^o 25.2	59 ^o 01.1 -23 ^o 33.3	73 ^o 30.0 -23 ^o 49.1	87 ^o 58.9 -23 ^o 56.9	102 ^o 27.7 -24 ^o 06.7	+29.0 15.3 -8.3 56.1	
Fr 26	319 ^o 37.3 -25 ^o 37.0	334 ^o 05.8 -25 ^o 42.6	348 ^o 34.2 -25 ^o 48.1	3 ^o 02.6 -25 ^o 53.4	17 ^o 31.0 -25 ^o 58.6	31 ^o 59.4 -26 ^o 03.6	46 ^o 27.8 -26 ^o 08.5	60 ^o 56.2 -26 ^o 13.9	75 ^o 24.5 -26 ^o 17.9	89 ^o 52.9 -26 ^o 22.2	104 ^o 21.2 -26 ^o 26.7	+28.4 15.1 -5.0 55.4	
	321 ^o 25.6 -27 ^o 15.1	335 ^o 53.9 -27 ^o 17.2	350 ^o 22.2 -27 ^o 19.2	4 ^o 50.5 -27 ^o 21.0	19 ^o 18.8 -27 ^o 24.2	33 ^o 47.1 -27 ^o 26.5	48 ^o 15.5 -27 ^o 28.6	62 ^o 43.8 -27 ^o 31.9	77 ^o 12.2 -27 ^o 35.0	91 ^o 40.6 -27 ^o 39.0	106 ^o 09.0 -27 ^o 42.9	+28.3 15.0 -1.5 54.8	
Mo 29	323 ^o 17.4 -27 ^o 26.1	337 ^o 46.2 -27 ^o 24.7	352 ^o 25.0 										

SUN

April 2027

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Th 1	269°00.1 4°27.9	284°00.2 4°28.9	299°00.4 4°29.9	314°00.6 4°30.8	329°00.8 4°31.8	344°01.0 4°32.8	359°01.2 4°33.7	14°01.4 4°34.7	29°01.5 4°35.7	44°01.7 4°36.6	59°01.9 4°37.6	74°02.1 4°38.6	+0.2 +1.0
Fr 2	269°04.5 4°51.1	284°04.7 4°52.0	299°04.9 4°53.0	314°05.0 4°54.0	329°05.2 4°54.9	344°05.4 4°55.9	359°05.6 4°56.9	14°05.8 4°57.8	29°06.0 4°58.8	44°06.2 4°59.7	59°06.3 5°00.7	74°06.5 5°01.7	+0.2 +1.0
Sa 3	269°08.9 5°14.1	284°09.1 5°15.1	299°09.3 5°16.1	314°09.4 5°17.0	329°09.6 5°18.0	344°09.8 5°18.9	359°10.0 5°19.9	14°10.2 5°20.8	29°10.4 5°21.8	44°10.5 5°22.8	59°10.7 5°23.7	74°10.9 5°24.7	+0.2 +1.0
Su 4	269°13.3 5°37.1	284°13.4 5°38.1	299°13.6 5°39.0	314°13.8 5°40.0	329°14.0 5°40.9	344°14.2 5°41.9	359°14.3 5°42.8	14°14.5 5°43.8	29°14.7 5°44.7	44°14.9 5°45.7	59°15.1 5°46.6	74°15.2 5°47.6	+0.2 +1.0
Mo 5	269°17.6 6°00.0	284°17.8 6°00.9	299°17.9 6°01.9	314°18.1 6°02.8	329°18.3 6°03.8	344°18.5 6°04.7	359°18.7 6°05.7	14°18.8 6°06.6	29°19.0 6°07.6	44°19.2 6°08.5	59°19.4 6°09.5	74°19.5 6°10.4	+0.2 +0.9
Tu 6	269°21.9 6°22.7	284°22.0 6°23.7	299°22.2 6°24.6	314°22.4 6°25.6	329°22.6 6°26.5	344°22.7 6°27.5	359°22.9 6°28.4	14°23.1 6°29.3	29°23.3 6°30.3	44°23.4 6°31.2	59°23.6 6°32.2	74°23.8 6°33.1	+0.2 +0.9
We 7	269°26.1 6°45.4	284°26.2 6°46.3	299°26.4 6°47.3	314°26.6 6°48.2	329°26.8 6°49.1	344°26.9 6°50.1	359°27.1 6°51.0	14°27.3 6°52.0	29°27.5 6°52.9	44°27.6 6°53.8	59°27.8 6°54.8	74°28.0 6°55.7	+0.2 +0.9
Th 8	269°30.2 7°07.9	284°30.4 7°08.9	299°30.6 7°09.8	314°30.8 7°10.7	329°30.9 7°11.7	344°31.1 7°12.6	359°31.3 7°13.5	14°31.4 7°14.5	29°31.6 7°15.4	44°31.8 7°16.3	59°32.0 7°17.3	74°32.1 7°18.2	+0.2 +0.9
Fr 9	269°34.4 7°30.3	284°34.5 7°31.3	299°34.7 7°32.2	314°34.9 7°33.1	329°35.0 7°34.1	344°35.2 7°35.0	359°35.4 7°35.9	14°35.5 7°36.8	29°35.7 7°37.8	44°35.9 7°38.7	59°36.0 7°39.6	74°36.2 7°40.6	+0.2 +0.9
Sa 10	269°38.4 7°52.6	284°38.6 7°53.5	299°38.7 7°54.5	314°38.9 7°55.4	329°39.1 7°56.3	344°39.2 7°57.2	359°39.4 7°58.2	14°39.6 7°59.1	29°39.9 8°00.0	44°39.9 8°00.9	59°40.1 8°01.9	74°40.2 8°02.8	+0.2 +0.9
Su 11	269°42.4 8°14.8	284°42.6 8°15.7	299°42.7 8°16.6	314°42.9 8°17.5	329°43.0 8°18.4	344°43.2 8°19.4	359°43.4 8°20.3	14°43.5 8°21.2	29°43.7 8°22.1	44°43.9 8°23.0	59°44.0 8°24.0	74°44.2 8°24.9	+0.2 +0.9
Mo 12	269°46.3 8°36.8	284°46.5 8°37.7	299°46.6 8°38.6	314°46.8 8°39.5	329°47.0 8°40.4	344°47.1 8°41.4	359°47.3 8°42.3	14°47.4 8°43.2	29°47.6 8°44.1	44°47.8 8°45.0	59°47.9 8°45.9	74°48.1 8°46.8	+0.2 +0.9
Tu 13	269°50.2 8°58.6	284°50.3 8°59.6	299°50.5 9°00.5	314°50.6 9°01.4	329°50.8 9°02.3	344°50.9 9°03.2	359°51.1 9°04.1	14°51.3 9°05.0	29°51.4 9°05.9	44°51.6 9°06.8	59°51.7 9°07.7	74°51.9 9°08.6	+0.2 +0.9
We 14	269°53.9 9°20.4	284°54.1 9°21.3	299°54.2 9°22.2	314°54.4 9°23.1	329°54.5 9°24.0	344°54.7 9°24.9	359°54.9 9°25.8	14°55.0 9°26.7	29°55.2 9°27.6	44°55.3 9°28.5	59°55.5 9°29.4	74°55.6 9°30.3	+0.2 +0.9
Th 15	269°57.6 9°41.9	284°57.8 9°42.8	299°57.9 9°43.7	314°58.1 9°44.6	329°58.2 9°45.5	344°58.4 9°46.4	359°58.5 9°47.3	14°58.5 9°48.2	29°58.7 9°49.1	44°59.0 9°50.0	59°59.1 9°50.9	74°59.3 9°51.7	+0.2 +0.9
Fr 16	270°01.2 10°03.3	285°01.4 10°04.2	300°01.5 10°05.1	315°01.7 10°06.0	330°01.8 10°06.9	345°02.0 10°07.8	0°02.1 10°08.6	15°02.3 10°09.5	30°02.4 10°10.4	45°02.6 10°11.3	60°02.7 10°12.2	75°02.9 10°13.1	+0.1 +0.9
Sa 17	270°04.8 10°24.5	285°04.9 10°25.4	300°05.0 10°26.3	315°05.2 10°27.2	330°05.3 10°28.1	345°05.5 10°28.9	0°05.6 10°29.8	15°05.8 10°30.7	30°05.9 10°31.6	45°06.1 10°32.5	60°06.2 10°33.3	75°06.3 10°34.2	+0.1 +0.9
Su 18	270°08.2 10°45.6	285°08.3 10°46.5	300°08.5 10°47.3	315°08.6 10°48.2	330°08.8 10°49.1	345°08.9 10°50.0	0°08.9 10°50.8	15°09.2 10°51.7	30°09.3 10°52.6	45°09.5 10°53.4	60°09.6 10°54.3	75°09.7 10°55.2	+0.1 +0.9
Mo 19	270°11.5 11°06.5	285°11.7 11°07.3	300°11.8 11°08.2	315°11.9 11°09.1	330°12.1 11°09.9	345°12.2 11°10.8	0°12.3 11°11.7	15°12.5 11°12.5	30°12.6 11°13.4	45°12.8 11°14.2	60°12.9 11°15.1	75°13.0 11°16.0	+0.1 +0.9
Tu 20	270°14.8 11°27.2	285°14.9 11°28.0	300°15.0 11°28.9	315°15.2 11°29.7	330°15.3 11°30.6	345°15.4 11°31.4	0°15.6 11°32.3	15°15.7 11°33.2	30°15.8 11°34.0	45°15.9 11°34.9	60°16.1 11°35.7	75°16.2 11°36.6	+0.1 +0.9
We 21	270°17.9 11°47.7	285°18.0 11°48.5	300°18.2 11°49.4	315°18.3 11°50.2	330°18.4 11°51.1	345°18.5 11°51.9	0°18.7 11°52.8	15°18.8 11°53.6	30°18.9 11°54.4	45°19.0 11°55.3	60°19.2 11°56.1	75°19.3 11°57.0	+0.1 +0.8
Th 22	270°20.9 12°08.0	285°21.0 12°08.8	300°21.2 12°09.7	315°21.3 12°10.5	330°21.4 12°11.3	345°21.5 12°12.2	0°21.7 12°13.0	15°21.8 12°13.9	30°21.9 12°14.7	45°22.0 12°15.5	60°22.2 12°16.2	75°22.3 12°17.2	+0.1 +0.8
Fr 23	270°23.8 12°28.1	285°24.0 12°28.9	300°24.1 12°29.7	315°24.2 12°30.6	330°24.3 12°31.4	345°24.4 12°32.2	0°24.5 12°33.1	15°24.7 12°33.9	30°24.8 12°34.7	45°24.9 12°35.6	60°25.0 12°36.4	75°25.1 12°37.2	+0.1 +0.8
Sa 24	270°26.6 14°05.5	285°26.7 14°06.3	300°26.9 14°07.0	315°27.0 14°07.8	330°27.1 14°08.6	345°27.2 14°09.4	0°27.3 14°10.2	15°27.4 14°11.0	30°27.5 14°11.8	45°27.7 14°12.5	60°27.8 14°13.3	75°27.9 14°14.1	+0.1 +0.8
Su 25	270°29.3 13°07.7	285°29.4 13°08.5	300°29.5 13°09.3	315°29.6 13°10.1	330°29.7 13°10.9	345°29.9 13°11.8	0°30.0 13°12.6	15°30.1 13°13.4	30°30.2 13°14.2	45°30.3 13°15.0	60°30.4 13°15.8	75°30.5 13°16.6	+0.1 +0.8
Mo 26	270°31.9 13°27.2	285°32.0 13°28.0	300°32.1 13°28.8	315°32.2 13°29.6	330°32.3 13°30.4	345°32.4 13°31.2	0°32.5 13°32.0	15°32.6 13°32.8	30°32.7 13°33.6	45°32.8 13°34.4	60°32.9 13°35.2	75°33.0 13°36.0	+0.1 +0.8
Tu 27	270°34.3 13°46.4	285°34.4 13°47.2	300°34.5 13°48.0	315°34.6 13°48.8	330°34.7 13°49.6	345°34.8 13°50.4	0°34.9 13°51.2	15°35.0 13°52.0	30°35.1 13°52.8	45°35.2 13°53.6	60°35.3 13°54.4	75°35.4 13°55.2	+0.1 +0.8
We 28	270°36.6 14°05.5	285°36.7 14°06.3	300°36.8 14°07.0	315°36.9 14°07.8	330°37.0 14°08.6	345°37.0 14°09.4	0°37.1 14°10.2	15°37.2 14°11.0	30°37.3 14°11.8	45°37.4 14°12.5	60°37.5 14°13.3	75°37.6 14°14.1	+0.1 +0.8
Th 29	270°38.8 14°24.3	285°38.8 14°25.1	300°38.9 14°25.8	315°39.0 14°26.6	330°39.1 14°27.4	345°39.2 14°28.2	0°39.3 14°28.9	15°39.4 14°29.7	30°39.4 14°30.5	45°39.5 14°31.2	60°39.6 14°32.0	75°39.7 14°32.8	+0.1 +0.8
Fr 30	270°40.8 14°42.8	285°40.9 14°43.6	300°40.9 14°44.4	315°41.0 14°45.2	330°41.1 14°45.9	345°41.2 14°46.7	0°41.3 14°47.5	15°41.4 14°48.2	30°41.4 14°49.0	45°41.5 14°49.7	60°41.6 14°50.5	75°41.7 14°51.3	+0.1 +0.8

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.9'

MOON

April 2027

	D	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	Δ'/h	SH
Th 1	244 [°] 11.9 -21 [°] 06.9	258 [°] 44.1 -20 [°] 57.6	273 [°] 16.4 -20 [°] 48.2	287 [°] 48.8 -20 [°] 38.8	302 [°] 21.2 -20 [°] 29.2	316 [°] 53.6 -20 [°] 19.6	331 [°] 26.1 -20 [°] 09.9	345 [°] 58.6 -20 [°] 00.1	0 [°] 31.2 -19 [°] 50.2	15 [°] 03.9 -19 [°] 40.2	29 [°] 36.6 -19 [°] 30.2	+32.5 +9.7	14.8 54.3	
	247 [°] 52.7 -16 [°] 49.4	262 [°] 26.1 -16 [°] 38.1	276 [°] 59.6 -16 [°] 26.7	291 [°] 33.1 -16 [°] 15.2	306 [°] 06.7 -16 [°] 03.6	320 [°] 40.3 -15 [°] 52.0	335 [°] 13.9 -15 [°] 40.3	349 [°] 47.5 -15 [°] 28.5	4 [°] 21.2 -15 [°] 16.7	18 [°] 55.0 -15 [°] 04.8	33 [°] 28.8 -14 [°] 52.8	+33.6 +11.7	14.9 54.6	
Fr 2	251 [°] 59.0 -11 [°] 45.6	266 [°] 33.3 -11 [°] 32.7	281 [°] 07.5 -11 [°] 19.7	295 [°] 41.8 -11 [°] 06.6	310 [°] 16.1 -10 [°] 53.5	324 [°] 50.4 -10 [°] 40.3	339 [°] 24.7 -10 [°] 27.1	353 [°] 59.1 -10 [°] 13.8	8 [°] 33.4 -10 [°] 00.5	23 [°] 07.8 -9 [°] 47.1	37 [°] 42.2 -9 [°] 33.7	+34.3 +13.2	15.0 55.0	
Sa 3	256 [°] 19.2 -6 [°] 07.0	270 [°] 53.7 -5 [°] 52.9	285 [°] 28.2 -5 [°] 38.7	300 [°] 02.7 -5 [°] 24.5	314 [°] 37.2 -5 [°] 10.3	329 [°] 11.7 -4 [°] 56.1	343 [°] 46.2 -4 [°] 41.8	358 [°] 20.7 -4 [°] 27.5	12 [°] 55.1 -4 [°] 13.2	27 [°] 29.6 -3 [°] 58.8	42 [°] 04.1 -3 [°] 44.4	+34.5 +14.3	15.1 55.5	
Mo 5	260 [°] 39.0 -0 [°] 05.7	275 [°] 13.1 0 [°] 09.0	289 [°] 47.3 0 [°] 23.8	304 [°] 21.4 0 [°] 38.5	318 [°] 55.4 0 [°] 53.3	333 [°] 29.5 1 [°] 08.1	348 [°] 03.5 1 [°] 22.8	2 [°] 37.5 1 [°] 37.6	17 [°] 11.4 1 [°] 52.4	31 [°] 45.3 2 [°] 07.2	46 [°] 19.2 2 [°] 22.0	+34.0 +14.8	15.3 56.1	
Tu 6	264 [°] 42.2 6 [°] 04.0	279 [°] 15.3 6 [°] 18.7	293 [°] 48.4 6 [°] 33.4	308 [°] 21.5 6 [°] 48.1	322 [°] 54.4 7 [°] 02.8	337 [°] 27.4 7 [°] 17.5	352 [°] 00.2 7 [°] 32.2	6 [°] 33.0 7 [°] 46.8	21 [°] 05.8 8 [°] 01.4	35 [°] 38.4 8 [°] 16.0	50 [°] 11.1 8 [°] 30.5	+32.9 +14.7	15.5 56.8	
We 7	268 [°] 12.0 12 [°] 05.1	282 [°] 43.4 12 [°] 19.1	297 [°] 14.8 12 [°] 33.1	311 [°] 46.1 12 [°] 47.0	326 [°] 17.3 13 [°] 00.8	340 [°] 48.5 13 [°] 14.6	355 [°] 19.5 13 [°] 28.4	9 [°] 50.5 13 [°] 42.0	24 [°] 21.4 13 [°] 55.7	38 [°] 52.2 14 [°] 09.2	53 [°] 22.9 14 [°] 22.8	+31.1 +13.8	15.6 57.4	
Th 8	270 [°] 52.4 17 [°] 37.3	285 [°] 21.6 17 [°] 49.6	299 [°] 50.7 18 [°] 01.9	314 [°] 19.7 18 [°] 14.1	328 [°] 48.8 18 [°] 26.1	343 [°] 17.4 18 [°] 38.1	357 [°] 46.1 18 [°] 50.0	12 [°] 14.7 19 [°] 01.9	26 [°] 43.2 19 [°] 13.6	41 [°] 11.6 19 [°] 25.2	55 [°] 39.9 19 [°] 36.7	+28.8 +12.0	15.8 57.9	
Fr 9	272 [°] 31.9 22 [°] 16.4	286 [°] 58.6 22 [°] 26.1	301 [°] 25.1 22 [°] 35.7	315 [°] 51.6 22 [°] 45.1	330 [°] 17.9 22 [°] 54.4	344 [°] 44.2 23 [°] 03.6	359 [°] 10.3 23 [°] 12.7	13 [°] 36.3 23 [°] 21.6	28 [°] 02.3 23 [°] 30.4	42 [°] 28.1 23 [°] 39.0	56 [°] 53.9 23 [°] 47.5	+26.2 +9.1	15.9 58.4	
Sa 10	273 [°] 09.1 25 [°] 37.1	287 [°] 33.4 25 [°] 43.2	301 [°] 57.7 25 [°] 49.1	316 [°] 21.9 25 [°] 54.8	331 [°] 46.0 26 [°] 00.4	345 [°] 10.3 26 [°] 05.8	359 [°] 33.9 26 [°] 11.0	13 [°] 57.8 26 [°] 16.1	28 [°] 21.7 26 [°] 21.0	42 [°] 45.4 26 [°] 25.7	57 [°] 09.1 26 [°] 30.2	+24.0 +5.3	16.0 58.7	
Su 11	273 [°] 58.1 27 [°] 17.0	287 [°] 21.0 27 [°] 18.7	301 [°] 44.0 27 [°] 20.2	316 [°] 06.8 27 [°] 21.5	330 [°] 29.7 27 [°] 22.6	344 [°] 52.6 27 [°] 23.5	359 [°] 15.4 27 [°] 24.2	13 [°] 38.2 27 [°] 24.8	28 [°] 21.0 27 [°] 25.1	42 [°] 23.8 27 [°] 25.3	56 [°] 46.6 27 [°] 25.3	+22.8 +0.8	16.1 59.0	
Mo 12	274 [°] 28.8 27 [°] 02.6	286 [°] 51.8 26 [°] 59.6	301 [°] 14.8 26 [°] 56.4	315 [°] 37.8 26 [°] 53.1	330 [°] 00.9 26 [°] 49.5	344 [°] 24.0 26 [°] 45.8	358 [°] 47.1 26 [°] 41.9	13 [°] 10.3 26 [°] 37.8	27 [°] 33.5 26 [°] 33.5	41 [°] 56.8 26 [°] 29.9	56 [°] 20.1 26 [°] 24.4	+23.1 -3.8	16.1 59.9	
Tu 13	274 [°] 16.9 24 [°] 54.1	286 [°] 41.2 24 [°] 46.7	301 [°] 05.6 24 [°] 39.2	315 [°] 30.1 24 [°] 31.5	329 [°] 54.0 24 [°] 23.7	344 [°] 19.2 24 [°] 15.7	358 [°] 44.0 24 [°] 07.5	13 [°] 08.7 23 [°] 59.2	27 [°] 36.6 23 [°] 50.8	41 [°] 58.5 23 [°] 42.1	56 [°] 23.6 23 [°] 33.4	+24.7 -8.1	16.1 59.9	
We 14	274 [°] 49.4 21 [°] 04.8	287 [°] 15.8 20 [°] 53.9	301 [°] 42.3 20 [°] 42.8	316 [°] 08.9 20 [°] 31.5	330 [°] 35.6 20 [°] 20.2	345 [°] 02.3 20 [°] 08.7	359 [°] 29.3 19 [°] 57.1	13 [°] 56.2 19 [°] 45.4	28 [°] 23.8 19 [°] 33.6	42 [°] 50.4 19 [°] 21.7	57 [°] 17.7 19 [°] 09.7	+26.8 -11.5	16.1 59.9	
Th 15	274 [°] 16.5 15 [°] 56.6	288 [°] 45.1 15 [°] 43.0	303 [°] 13.8 15 [°] 29.3	317 [°] 42.6 15 [°] 15.5	332 [°] 11.4 15 [°] 01.7	346 [°] 40.3 14 [°] 47.7	1 [°] 09.3 14 [°] 33.7	15 [°] 38.3 14 [°] 19.6	30 [°] 07.5 14 [°] 05.4	44 [°] 36.7 13 [°] 51.1	59 [°] 06.7 13 [°] 36.8	+28.9 -14.0	16.1 60.9	
Fr 16	276 [°] 33.4 9 [°] 54.3	291 [°] 03.8 9 [°] 39.1	305 [°] 34.1 9 [°] 23.8	320 [°] 04.6 9 [°] 08.4	334 [°] 35.1 8 [°] 53.0	349 [°] 05.6 8 [°] 37.6	3 [°] 36.2 8 [°] 22.1	18 [°] 06.9 8 [°] 06.6	32 [°] 37.7 7 [°] 51.0	47 [°] 08.1 7 [°] 35.4	61 [°] 39.1 7 [°] 19.8	+30.6 -15.5	16.1 60.9	
Sa 17	279 [°] 25.9 9 [°] 22.5	293 [°] 57.3 9 [°] 06.5	308 [°] 27.8 2 [°] 50.5	323 [°] 00.2 2 [°] 34.6	337 [°] 31.7 2 [°] 18.6	352 [°] 03.2 2 [°] 02.6	6 [°] 34.7 1 [°] 46.6	21 [°] 06.2 1 [°] 30.6	35 [°] 37.8 1 [°] 14.6	50 [°] 09.4 0 [°] 58.6	64 [°] 41.0 0 [°] 42.7	+31.5 -16.0	16.0 60.9	
Su 18	282 [°] 36.4 -3 [°] 15.9	297 [°] 08.1 -3 [°] 31.6	311 [°] 39.8 -3 [°] 47.4	326 [°] 11.6 -4 [°] 03.1	340 [°] 43.3 -4 [°] 18.8	355 [°] 15.0 -4 [°] 34.4	9 [°] 46.8 -4 [°] 50.0	24 [°] 18.5 -5 [°] 05.6	35 [°] 50.2 -5 [°] 21.2	53 [°] 21.9 -5 [°] 36.7	67 [°] 53.6 -5 [°] 52.2	+31.7 -15.6	15.9 60.8	
Mo 19	285 [°] 47.2 -9 [°] 39.1	300 [°] 18.6 -9 [°] 53.8	314 [°] 50.0 -10 [°] 08.5	329 [°] 21.4 -10 [°] 23.1	343 [°] 52.7 -10 [°] 37.6	358 [°] 24.0 -10 [°] 52.1	12 [°] 55.3 -11 [°] 06.5	27 [°] 26.6 -11 [°] 20.9	41 [°] 57.8 -11 [°] 35.2	56 [°] 29.0 -11 [°] 49.4	71 [°] 00.1 -12 [°] 03.5	+31.3 -14.4	15.7 60.7	
Tu 20	288 [°] 43.5 -15 [°] 26.8	303 [°] 14.1 -15 [°] 39.7	317 [°] 44.6 -15 [°] 52.5	332 [°] 15.1 -16 [°] 05.3	346 [°] 45.6 -16 [°] 17.9	1 [°] 16.0 -16 [°] 30.4	15 [°] 46.4 -16 [°] 42.9	30 [°] 16.8 -16 [°] 55.2	44 [°] 47.1 -17 [°] 07.5	59 [°] 17.3 -17 [°] 19.7	73 [°] 47.5 -17 [°] 31.7	+30.4 -12.5	15.6 60.7	
We 21	291 [°] 15.4 -20 [°] 20.4	305 [°] 44.9 -20 [°] 30.8	320 [°] 14.4 -20 [°] 41.1	334 [°] 43.8 -20 [°] 51.2	349 [°] 13.2 -21 [°] 01.1	3 [°] 42.5 -21 [°] 11.2	18 [°] 11.8 -21 [°] 21.0	32 [°] 41.1 -21 [°] 30.7	47 [°] 10.3 -21 [°] 40.2	61 [°] 39.4 -21 [°] 49.7	76 [°] 08.6 -21 [°] 59.0	+29.3 -9.9	15.4 60.5	
Th 22	293 [°] 20.6 -24 [°] 03.9	307 [°] 49.2 -24 [°] 11.2	322 [°] 17.6 -24 [°] 18.3	336 [°] 46.1 -24 [°] 25.4	351 [°] 14.5 -24 [°] 32.2	5 [°] 42.9 -24 [°] 39.0	20 [°] 11.3 -24 [°] 45.6	34 [°] 39.6 -24 [°] 52.1	49 [°] 07.9 -24 [°] 58.5	63 [°] 36.2 -25 [°] 04.7	78 [°] 04.4 -25 [°] 10.8	+28.4 -6.7	15.2 60.5	
Fr 23	295 [°] 05.8 -26 [°] 25.3	309 [°] 33.8 -26 [°] 29.2	324 [°] 01.8 -26 [°] 32.9	338 [°] 29.8 -26 [°] 36.4	352 [°] 57.7 -26 [°] 39.9	7 [°] 25.7 -26 [°] 43.1	21 [°] 53.6 -26 [°] 46.3	36 [°] 21.6 -26 [°] 49.3	50 [°] 49.5 -26 [°] 52.1	65 [°] 17.5 -26 [°] 54.8	79 [°] 45.4 -26 [°] 57.4	+28.0 -3.2	15.1 60.5	
Sa 24	296 [°] 45.9 -27 [°] 18.9	311 [°] 14.0 -27 [°] 19.2	325 [°] 42.2 -27 [°] 19.3	340 [°] 10.4 -27 [°] 19.3	354 [°] 38.6 -27 [°] 19.2	9 [°] 06.9 -27 [°] 18.6	23 [°] 35.2 -27 [°] 18.6	38 [°] 03.5 -27 [°] 18.0	52 [°] 31.8 -27 [°] 17.4	67 [°] 00.2 -27 [°] 16.6	81 [°] 28.6 -27 [°] 15.6	+28.3 +0.3	14.9 60.4	
Su 25	311 [°] 14.0 -27 [°] 19.2	325 [°] 42.2 -27 [°] 19.3	340 [°] 10.4 -27 [°] 19.3	354 [°] 38.6 -27 [°] 19.2	9 [°] 06.9 -27 [°] 18.6	23 [°] 35.2 -27 [°] 18.6	38 [°] 03.5 -27 [°] 18.0	52 [°] 31.8 -27 [°] 17.4	67 [°] 00.2 -27 [°] 16.6	81 [°] 28.6 -27 [°] 15.6	95 [°] 57.0 -27 [°] 14.5	+28.3 +0.5	14.9 60.4	
Mo 26	313 [°] 08.3 -26 [°] 42.1	327 [°] 37.4 -26 [°] 38.9	342 [°] 06.5 -26 [°] 35.6	356 [°] 35.7 -26 [°] 32.1	11 [°] 05.0 -26 [°] 28.5	25 [°] 34.3 -26 [°] 24.8	40 [°] 03.6 -26 [°] 21.0	54 [°] 33.0 -26 [°] 17.0	69 [°] 02.5 -26 [°] 12.9	83 [°] 32.0 -26 [°] 08.7	98 [°] 01.6 -26 [°] 04.4	+29.3 +3.8	14.8 60.4	
Tu 27	315 [°] 32.0 -24 [°] 45.0	330 [°] 02.5 -24 [°] 38.8	344 [°] 33.1 -24 [°] 32.4	359 [°] 03.7 -24 [°] 26.0	13 [°] 34.4 -24 [°] 19.5	28 [°] 05.2 -24 [°] 12.8	42 [°] 36.0 -24 [°] 06.1	57 [°] 06.9 -23 [°] 59.2	71 [°] 37.8 -23 [°] 52.2	86 [°] 08.8 -23 [°] 45.1	100 [°] 39.9 -23 [°] 38.0	+30.8 +6.7	14.8 60.4	
We 28	318 [°] 33.3 -21 [°] 38.1	333 [°] 05.3 -21 [°] 29.3	347 [°] 37.4 -2											

SUN

May 2027

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Sa 1	270°42.7	285°42.8	300°42.8	315°42.9	330°43.0	345°43.1	0°43.1	15°43.2	30°43.3	45°43.4	60°43.4	75°43.5	+0.1
	15°01.2	15°01.9	15°02.7	15°03.4	15°04.2	15°05.0	15°05.7	15°06.5	15°07.2	15°08.0	15°08.7	15°09.5	+0.8
Su 2	270°44.4	285°44.5	300°44.6	315°44.6	330°44.7	345°44.8	0°44.9	15°44.9	30°45.0	45°45.1	60°45.1	75°45.2	+0.1
	15°19.3	15°20.0	15°20.8	15°21.5	15°22.2	15°23.0	15°23.7	15°24.5	15°25.2	15°26.0	15°26.7	15°27.5	+0.7
Mo 3	270°46.1	285°46.1	300°46.2	315°46.2	330°46.3	345°46.4	0°46.4	15°46.5	30°46.6	45°46.6	60°46.7	75°46.7	+0.1
	15°37.1	15°37.8	15°38.6	15°39.3	15°40.0	15°40.8	15°41.5	15°42.2	15°43.0	15°43.7	15°44.4	15°45.2	+0.7
Tu 4	270°47.5	285°47.6	300°47.6	315°47.7	330°47.8	345°47.8	0°47.9	15°47.9	30°48.0	45°48.0	60°48.1	75°48.2	+0.1
	15°54.7	15°55.4	15°56.1	15°56.8	15°57.6	15°58.3	15°59.0	15°59.7	16°00.5	16°01.2	16°01.9	16°02.6	+0.7
We 5	270°48.9	285°48.9	300°49.0	315°49.0	330°49.1	345°49.1	0°49.2	15°49.2	30°49.3	45°49.3	60°49.4	75°49.4	+0.1
	16°12.0	16°12.7	16°13.4	16°14.1	16°14.8	16°15.5	16°16.2	16°17.0	16°17.7	16°18.4	16°19.1	16°19.8	+0.7
Th 6	270°50.1	285°50.1	300°50.2	315°50.2	330°50.2	345°50.3	0°50.3	15°50.4	30°50.4	45°50.5	60°50.5	75°50.6	+0.0
	16°29.0	16°29.7	16°30.4	16°31.1	16°31.8	16°32.5	16°33.2	16°33.9	16°34.6	16°35.3	16°36.0	16°36.7	+0.7
Fr 7	270°51.1	285°51.2	300°51.2	315°51.2	330°51.3	345°51.3	0°51.4	15°51.4	30°51.4	45°51.5	60°51.5	75°51.6	+0.0
	16°45.8	16°46.5	16°47.1	16°47.8	16°48.5	16°49.2	16°49.9	16°50.6	16°51.3	16°52.0	16°52.7	16°53.4	+0.7
Sa 8	270°52.0	285°52.1	300°52.1	315°52.1	330°52.2	345°52.2	0°52.2	15°52.3	30°52.3	45°52.3	60°52.4	75°52.4	+0.0
	17°02.2	17°02.9	17°03.6	17°04.3	17°05.0	17°05.6	17°06.3	17°07.0	17°07.7	17°08.4	17°09.0	17°09.7	+0.7
Su 9	270°52.8	285°52.8	300°52.9	315°52.9	330°52.9	345°52.9	0°53.0	15°53.0	30°53.0	45°53.1	60°53.1	75°53.1	+0.0
	17°18.4	17°19.1	17°19.8	17°20.4	17°21.1	17°21.8	17°22.4	17°23.1	17°23.8	17°24.4	17°25.1	17°25.8	+0.7
Mo 10	270°53.4	285°53.5	300°53.5	315°53.5	330°53.5	345°53.5	0°53.6	15°53.6	30°53.6	45°53.6	60°53.7	75°53.7	+0.0
	17°34.3	17°35.0	17°35.7	17°36.3	17°37.0	17°37.6	17°38.3	17°38.9	17°39.6	17°40.2	17°40.9	17°41.5	+0.7
Tu 11	270°53.9	285°53.9	300°54.0	315°54.0	330°54.0	345°54.0	0°54.0	15°54.0	30°54.1	45°54.1	60°54.1	75°54.1	+0.0
	17°50.0	17°50.6	17°51.2	17°51.9	17°52.5	17°53.2	17°53.8	17°54.5	17°55.1	17°55.7	17°56.4	17°57.0	+0.6
We 12	270°54.3	285°54.3	300°54.3	315°54.3	330°54.3	345°54.3	0°54.4	15°54.4	30°54.4	45°54.4	60°54.4	75°54.4	+0.0
	18°05.3	18°05.9	18°06.5	18°07.2	18°07.8	18°08.4	18°09.0	18°09.7	18°10.3	18°10.9	18°11.6	18°12.2	+0.6
Th 13	270°54.5	285°54.5	300°54.5	315°54.5	330°54.5	345°54.5	0°54.5	15°54.5	30°54.5	45°54.6	60°54.6	75°54.6	+0.0
	18°20.3	18°20.9	18°21.5	18°22.1	18°22.7	18°23.4	18°24.0	18°24.6	18°25.2	18°25.8	18°26.4	18°27.0	+0.6
Fr 14	270°54.6	285°54.6	300°54.6	315°54.6	330°54.6	345°54.6	0°54.6	15°54.6	30°54.6	45°54.6	60°54.6	75°54.6	-0.0
	18°35.0	18°35.6	18°36.2	18°36.8	18°37.4	18°38.0	18°38.6	18°39.2	18°39.8	18°40.4	18°41.0	18°41.6	+0.6
Sa 15	270°54.5	285°54.5	300°54.5	315°54.5	330°54.5	345°54.5	0°54.5	15°54.5	30°54.5	45°54.5	60°54.5	75°54.5	-0.0
	18°49.3	18°49.9	18°50.5	18°51.1	18°51.7	18°52.3	18°52.9	18°53.5	18°54.1	18°54.7	18°55.2	18°55.8	+0.6
Su 16	270°54.3	285°54.3	300°54.3	315°54.3	330°54.3	345°54.3	0°54.3	15°54.3	30°54.2	45°54.2	60°54.2	75°54.2	-0.0
	19°03.4	19°04.0	19°04.6	19°05.1	19°05.7	19°06.3	19°06.9	19°07.4	19°08.0	19°08.6	19°09.2	19°09.7	+0.6
Mo 17	270°54.0	285°54.0	300°54.0	315°54.0	330°53.9	345°53.9	0°53.9	15°53.9	30°53.9	45°53.8	60°53.8	75°53.8	-0.0
	19°17.1	19°17.7	19°18.3	19°18.8	19°19.4	19°20.0	19°20.5	19°21.1	19°21.6	19°22.2	19°22.8	19°23.3	+0.6
Tu 18	270°53.5	285°53.5	300°53.5	315°53.5	330°53.5	345°53.4	0°53.4	15°53.4	30°53.4	45°53.3	60°53.3	75°53.3	-0.0
	19°30.5	19°31.1	19°31.6	19°32.2	19°32.7	19°33.3	19°33.8	19°34.4	19°34.9	19°35.5	19°36.0	19°36.6	+0.5
We 19	270°52.9	285°52.9	300°52.9	315°52.9	330°52.8	345°52.8	0°52.8	15°52.7	30°52.7	45°52.7	60°52.6	75°52.6	-0.0
	19°43.6	19°44.2	19°44.7	19°45.2	19°45.8	19°46.3	19°46.8	19°47.4	19°47.9	19°48.4	19°49.0	19°49.5	+0.5
Th 20	270°52.2	285°52.2	300°52.1	315°52.1	330°52.1	345°52.0	0°52.0	15°52.0	30°51.9	45°51.9	60°51.9	75°51.8	-0.0
	19°56.4	19°56.9	19°57.4	19°57.9	19°58.5	19°59.0	19°59.5	20°00.0	20°00.5	20°01.1	20°01.6	20°02.1	+0.5
Fr 21	270°51.3	285°51.3	300°51.2	315°51.2	330°51.2	345°51.1	0°51.1	15°51.0	30°51.0	45°51.0	60°50.9	75°50.9	-0.0
	20°08.8	20°09.3	20°09.8	20°10.3	20°10.8	20°11.3	20°11.8	20°12.3	20°12.8	20°13.3	20°13.8	20°14.3	+0.5
Sa 22	270°50.3	285°50.3	300°50.2	315°50.2	330°50.1	345°50.1	0°50.0	15°50.0	30°50.0	45°49.9	60°49.9	75°49.8	-0.0
	20°20.8	20°21.3	20°21.8	20°22.3	20°22.8	20°23.3	20°23.8	20°24.3	20°24.8	20°25.3	20°25.7	20°26.2	+0.5
Su 23	270°49.2	285°49.1	300°49.1	315°49.0	330°49.0	345°48.9	0°48.9	15°48.8	30°48.8	45°48.7	60°48.7	75°48.6	-0.1
	20°32.5	20°33.0	20°33.5	20°34.0	20°34.5	20°34.9	20°35.4	20°35.9	20°36.4	20°36.8	20°37.3	20°37.8	+0.5
Mo 24	270°47.9	285°47.9	300°47.8	315°47.7	330°47.7	345°47.6	0°47.6	15°47.5	30°47.5	45°47.4	60°47.3	75°47.3	-0.1
	20°43.9	20°44.4	20°44.8	20°45.3	20°45.8	20°46.2	20°46.7	20°47.1	20°47.6	20°48.1	20°48.5	20°49.0	+0.5
Tu 25	270°46.5	285°46.4	300°46.4	315°46.3	330°46.3	345°46.2	0°46.1	15°46.1	30°46.0	45°45.9	60°45.9	75°45.8	-0.1
	20°54.9	20°55.3	20°55.8	20°56.2	20°56.7	20°57.1	20°57.6	20°58.0	20°58.5	20°58.9	20°59.4	20°59.8	+0.4
We 26	270°45.0	285°44.9	300°44.8	315°44.8	330°44.7	345°44.6	0°44.6	15°44.5	30°44.4	45°44.4	60°44.3	75°44.2	-0.1
	21°05.5	21°06.0	21°06.4	21°06.8	21°07.3	21°07.7	21°08.1	21°08.6	21°09.0	21°09.4	21°09.9	21°10.3	+0.4
Th 27	270°43.3	285°43.3	300°43.2	315°43.1	330°43.0	345°43.0	0°42.9	15°42.8	30°42.7	45°42.7	60°42.6	75°42.5	-0.1
	21°15.8	21°16.2	21°16.7	21°17.1	21°17.5	21°17.9	21°18.2	21°18.8	21°19.2	21°19.6	21°20.0	21°20.4	+0.4
Fr 28	270°41.6	285°41.5	300°41.4	315°41.3	330°41.2	345°41.2	0°41.1	15°41.0	30°40.9	45°40.9	60°40.8	75°40.7	-0.1
	21°25.7	21°26.1	21°26.5	21°26.9	21°27.4	21°27.8	21°28.2	21°28.6	21°29.0	21°29.4	21°29.8	21°30.2	+0.4
Sa 29	270°39.7	285°39.6	300°39.5	315°39.4	330°39.3	345°39.2	0°39.2	15°39.1	30°39.0	45°38.9	60°38.8	75°38.7	-0.1
	21°35.3	21°35.7	21°36.1	21°36.4	21°36.8	21°37.2	21°37.6	21°38.0	21°38.4	21°38.8	21°39.1	21°39.5	+0.4
Su 30	270°37.6	285°37.6	300°37.5	315°37.4	330°37.3	345°37.2	0°37.1	15°37.0	30°36.9	45°36.9	60°36.8	75°36.7	-0.1
	21°44.4	21°44.8	21°45.2	21°45.6	21°46.0	21°46.3	21°46.7	21°47.1	21°47.4	21°47.8	21°48.2	21°48.5	+0.4
Mo 31	270°35.5	285°35.4	300°35.3	315°35.2	330°35.2	345°35.1	0°35.0	15°34.9	30°34.8	45°34.7	60°34.6	75°34.5	-0.1
	21°53.2	21°53.6	21°54.0	21°54.3	21°54.7	21°55.0	21°55.4	21°55.7	21°56.1	21°56.4	21°56.8	21°57.1	+0.4

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ°/h = dec. change
Semi-diameter: 15.8'

MOON

May 2027

	D	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	Δ' /h SH
●	Sa 1	243°15.6 -8°35.7	257°50.3 -8°22.2	272°25.0 -8°08.8	286°59.7 -7°55.2	301°34.5 -7°41.7	316°09.2 -7°28.1	330°43.9 -7°14.4	345°18.7 -7°00.7	359°53.4 -6°47.0	14°28.1 -6°33.3	29°02.9 -6°19.5	+34.7 15.0 +13.6 55.1
	Su 2	247°43.3 -2°48.5	262°17.9 -2°34.2	276°52.4 -2°19.8	291°27.0 -2°05.5	306°01.5 -1°51.1	320°36.0 -1°36.7	335°10.5 -1°22.3	349°45.0 -1°07.9	4°19.4 -0°53.8	18°53.8 -0°38.9	33°28.2 -0°24.4	+34.5 15.2 +14.4 55.8
●	Mo 3	251°59.8 3°14.5	266°33.5 3°29.2	281°07.3 3°43.9	295°40.9 3°58.5	310°14.6 4°13.2	324°48.1 4°27.9	339°21.7 4°42.5	353°55.1 4°57.2	8°28.5 5°11.8	23°01.9 5°26.5	37°35.2 5°41.1	+33.5 15.4 +14.7 56.5
	Tu 4	255°46.9 9°19.1	270°19.1 9°33.5	284°51.2 9°47.9	299°23.2 10°02.2	313°55.2 10°16.5	328°27.1 10°30.7	342°58.9 10°45.0	357°30.6 10°59.1	12°02.3 11°13.3	26°33.8 11°27.4	41°05.3 11°41.5	+31.8 15.6 +14.2 57.3
●	We 5	258°46.1 15°07.0	273°16.0 15°20.3	287°45.8 15°33.5	302°15.6 15°46.6	316°45.2 15°59.7	331°14.7 16°12.6	345°44.1 16°25.6	0°13.4 16°38.4	14°42.6 16°51.2	29°11.7 17°03.8	43°40.6 17°16.5	+29.5 15.8 +12.9 58.0
	Th 6	260°41.7 20°14.9	275°08.8 20°26.0	289°35.9 20°37.0	304°02.8 20°47.9	318°29.6 20°58.6	332°56.3 21°09.3	347°22.9 21°19.8	1°49.3 21°30.2	16°15.7 21°40.5	30°41.9 21°50.7	45°08.0 22°00.8	+26.6 16.0 +10.6 58.7
●	Fr 7	261°26.3 24°15.2	275°50.7 24°23.1	290°15.0 24°30.7	304°39.1 24°38.2	319°03.2 24°45.5	333°27.1 24°52.7	347°51.0 24°59.7	2°14.8 25°06.6	16°38.5 25°13.3	31°02.1 25°19.8	45°25.6 25°26.1	+23.9 16.2 +7.1 59.2
	Sa 8	261°08.7 26°40.4	275°31.0 26°43.9	289°53.3 26°47.2	304°15.5 26°50.4	318°37.7 26°53.3	332°59.9 26°56.0	347°22.0 26°58.6	1°44.0 27°01.0	16°06.1 27°13.7	30°28.1 27°05.1	44°50.0 27°06.9	+22.1 16.2 +2.6 59.6
●	Su 9	260°17.5 27°10.2	274°39.3 27°06.9	289°01.1 27°07.7	303°23.1 27°05.6	317°44.9 27°03.7	332°06.8 27°01.5	346°28.7 26°59.2	0°50.7 26°56.7	15°12.1 26°54.0	29°34.7 26°51.1	43°56.8 26°48.0	+21.9 16.3 -2.2 59.7
	Mo 10	259°33.9 25°39.2	273°56.9 25°33.2	288°19.9 25°27.0	302°43.1 25°20.6	317°06.3 25°14.0	331°29.6 25°07.3	345°52.9 25°00.4	0°16.4 24°53.3	14°59.9 24°46.1	29°03.6 24°38.7	43°27.3 24°31.1	+23.3 16.3 -6.8 59.7
●	Tu 11	259°34.4 22°18.9	273°59.6 22°09.0	288°25.0 21°58.8	302°50.4 21°48.6	317°16.0 21°38.2	331°41.7 21°27.7	346°07.5 21°17.0	0°33.3 21°06.3	14°59.3 20°55.4	29°25.4 20°44.3	43°51.6 20°33.2	+23.7 16.2 -10.6 59.9
	We 12	260°36.8 17°32.5	275°04.7 17°19.6	289°32.6 17°06.7	304°00.6 16°53.6	318°28.7 16°40.5	332°56.9 16°27.2	347°25.2 16°13.9	1°53.6 16°00.5	16°22.1 15°47.0	30°40.7 15°33.5	45°19.4 15°19.8	+28.3 16.1 -13.3 59.2
●	Th 13	262°39.9 11°46.9	277°10.0 11°32.2	291°40.1 11°17.4	306°10.2 11°02.7	320°40.5 10°47.8	335°10.8 10°32.9	349°41.1 10°18.0	4°11.6 10°03.0	18°42.1 9°48.0	33°12.7 9°33.0	47°43.3 9°17.9	+30.3 16.0 -14.9 58.8
	Fr 14	265°29.9 5°27.7	280°01.4 5°12.1	294°33.0 4°56.6	309°04.6 4°41.0	323°36.8 4°25.4	338°07.9 4°09.8	352°39.6 3°54.2	7°11.4 3°38.6	21°43.2 3°23.0	36°15.0 3°07.4	50°46.9 2°51.7	+31.7 15.9 -15.6 58.3
●	Sa 15	268°47.8 -1°02.6	283°20.1 -1°18.1	297°52.3 -1°33.7	312°24.5 -1°49.2	326°56.5 -2°04.7	341°29.0 -2°20.2	356°01.3 -2°35.6	10°33.6 -2°51.1	25°05.8 -3°06.5	39°38.1 -3°21.9	54°10.4 -3°37.2	+32.3 15.8 -15.5 57.9
	Su 16	272°14.1 -7°23.9	286°46.3 -7°38.7	301°18.4 -7°53.5	315°50.6 -8°08.2	330°22.7 -8°22.9	344°54.8 -8°37.5	359°26.9 -8°52.1	13°58.9 -9°06.6	28°30.9 -9°21.1	43°03.0 -9°35.5	57°34.9 -9°49.8	+32.1 15.6 -14.6 57.4
●	Mo 17	275°31.2 -13°18.1	290°02.7 -13°31.5	304°34.2 -13°44.7	319°05.6 -13°57.9	333°36.9 -14°11.1	348°08.3 -14°24.1	2°39.6 -14°37.1	17°10.8 -14°50.0	31°42.0 -15°02.8	46°13.2 -15°15.6	60°44.3 -15°28.2	+31.3 15.5 -13.0 56.9
	Tu 18	278°25.7 -18°27.7	292°56.1 -18°38.9	307°26.4 -18°50.0	321°56.7 -19°01.0	336°27.0 -19°12.0	350°57.1 -19°22.8	5°27.3 -19°33.5	19°57.4 -19°44.1	34°27.4 -19°54.0	48°57.4 -20°05.0	63°27.3 -20°15.3	+30.2 15.4 -10.8 56.4
●	We 19	280°50.6 -22°36.3	295°19.8 -22°44.8	309°48.9 -22°53.1	324°18.0 -22°01.3	338°47.1 -23°09.4	353°16.1 -23°17.4	7°45.0 -23°25.3	22°13.9 -23°33.0	36°42.8 -23°40.6	51°11.6 -23°48.1	65°40.4 -23°55.4	+29.0 15.2 -7.9 55.8
	Th 20	282°48.0 -25°29.9	297°16.3 -25°35.1	311°44.5 -25°40.2	326°12.7 -25°45.2	340°40.9 -25°50.0	355°09.0 -25°54.7	9°37.2 -25°59.2	24°05.3 -26°03.6	38°33.4 -26°07.9	53°01.5 -26°12.0	67°29.6 -26°16.0	+28.2 15.1 -4.6 55.4
●	Fr 21	284°29.5 -26°58.9	298°57.5 -27°00.6	313°25.5 -27°02.2	327°53.5 -27°03.7	342°21.5 -27°05.0	356°49.5 -27°06.1	11°17.5 -27°07.2	25°45.6 -27°08.0	40°13.6 -27°08.8	54°41.7 -27°09.4	69°09.8 -27°09.8	+28.0 15.0 -1.1 54.9
	Sa 22	286°13.9 -27°00.1	300°42.4 -26°58.3	315°11.0 -26°56.4	329°39.6 -26°54.4	344°08.2 -26°52.3	358°36.9 -26°50.0	13°05.6 -26°47.6	27°34.4 -26°45.0	42°03.2 -26°42.4	56°32.0 -26°39.5	71°00.9 -26°36.6	+28.7 14.9 +2.3 54.5
●	Su 23	288°20.5 -25°37.3	302°50.3 -25°32.3	317°20.1 -25°27.3	331°50.0 -25°22.1	346°19.9 -25°16.8	0°49.9 -25°11.4	15°19.9 -25°05.9	29°50.0 -25°00.2	44°20.2 -24°55.6	58°50.5 -24°48.6	73°20.8 -24°42.6	+30.0 14.8 +5.5 54.3
	Mo 24	291°03.1 -22°59.8	305°34.4 -22°52.1	320°05.8 -22°44.3	334°37.3 -22°36.5	349°08.9 -22°28.5	3°40.5 -22°20.4	18°12.2 -22°12.2	32°43.9 -22°04.0	47°15.7 -21°55.6	61°47.6 -21°47.2	76°19.5 -21°38.6	+31.6 14.8 +8.1 54.1
●	Tu 25	305°34.4 -22°52.1	320°05.8 -22°44.3	334°37.3 -22°36.5	349°08.9 -22°28.5	3°40.5 -22°20.4	18°12.2 -22°12.2	32°43.9 -22°04.0	47°15.7 -21°55.6	61°47.6 -21°47.2	76°19.5 -21°38.6	90°51.5 -21°30.8	+31.7 14.8 +8.2 54.1
	We 26	308°59.1 -19°10.0	323°32.1 -19°00.0	338°05.2 -18°49.2	352°38.3 -18°39.7	7°11.4 -18°29.9	21°44.7 -18°19.2	36°17.9 -18°08.8	50°51.3 -17°58.4	65°24.7 -17°47.0	79°58.1 -17°37.3	94°31.6 -17°26.6	+33.3 14.8 +10.3 54.1
●	Th 27	313°00.0 -14°38.4	327°34.2 -14°26.6	342°08.5 -14°14.9	356°42.9 -14°03.0	11°17.3 -13°51.1	25°51.7 -13°39.2	40°26.1 -13°27.1	55°00.6 -13°15.1	69°35.1 -13°02.9	84°09.7 -12°50.8	98°44.3 -12°38.5	+34.4 14.8 +12.0 54.3
	Fr 28	317°26.5 -9°28.9	332°01.5 -9°15.9	346°36.5 -9°02.9	1°11.6 -8°49.8	15°46.6 -8°36.6	30°21.7 -8°23.5	44°56.8 -8°10.2	59°31.9 -7°57.0	74°07.0 -7°43.7	88°42.1 -7°30.4	103°17.2 -7°17.0	+35.1 14.9 +13.2 54.7
●	Sa 29	322°04.2 -3°52.3	336°39.3 -3°38.4	351°14.4 -3°24.5	5°49.5 -3°10.6	20°24.6 -2°56.6	34°59.6 -2°42.6	49°34.7 -2°28.6	64°09.7 -2°14.6	78°44.7 -2°00.5	93°19.7 -1°46.5	107°54.7 -1°32.4	+35.0 15.1 +14.0 55.2
	Su 30	326°36.0 2°01.0	341°10.5 2°15.3	355°45.0 2°29.6	10°19.4 2°44.3	24°53.7 2°58.3	39°28.0 3°12.6	54°02.3 3°27.0	68°36.5 3°41.3	83°10.7 3°55.7	97°44.8 4°10.0	112°18.9 4°24.4	+34.3 15.3 +14.3 55.9
●	Mo 31	330°43.0 7°59.0	345°16.0 8°13.2	359°49.0 8°27.4	14°22.0 8°41.6	28°54.8 8°55.7	43°27.6 9°09.9	58°00.3 9°24.0	72°32.9 9°38.1	87°05.5 9°52.1	101°37.9 10°06.2	116°10.3 10°20.2	+32.7 15.5 +14.1 56.8

Row 1: GHA, Δ' /h = GHA change - 14°, SH = semi-diameterRow 2: Dec (- = South), Δ' /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 6 10h58 — FQ: 13 04h43 — FM: 20 10h59 — LQ: 28 13h57

SUN

June 2027

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Tu 1	276°33.3 22°01.7	285°33.2 22°02.0	300°33.1 22°02.3	315°33.0 22°02.7	330°32.9 22°03.0	345°32.8 22°03.4	6°32.7 22°03.7	15°32.6 22°04.0	30°32.5 22°04.2	45°32.4 22°04.7	60°32.3 22°05.0	75°32.2 22°05.4	-0.1 +0.3
We 2	270°30.9 22°09.7	285°30.8 22°10.0	300°30.7 22°10.3	315°30.6 22°10.7	330°30.5 22°11.0	345°30.4 22°11.3	0°30.3 22°11.6	15°30.2 22°11.9	30°30.1 22°12.2	45°30.0 22°12.6	60°29.9 22°13.2	75°29.8 22°13.8	-0.1 +0.3
Th 3	270°28.5 22°17.3	285°28.4 22°18.6	300°28.3 22°19.9	315°28.2 22°18.2	330°28.1 22°18.6	345°28.0 22°18.9	0°27.9 22°19.2	15°27.8 22°19.5	30°27.7 22°19.8	45°27.6 22°20.1	60°27.5 22°20.4	75°27.4 22°20.7	-0.1 +0.3
Fr 4	270°26.0 22°24.6	285°25.9 22°24.9	300°25.8 22°25.2	315°25.7 22°25.4	330°25.6 22°25.7	345°25.4 22°26.0	0°25.3 22°26.3	15°25.2 22°26.6	30°25.1 22°26.9	45°25.0 22°27.2	60°24.9 22°27.5	75°24.8 22°27.8	-0.1 +0.3
Sa 5	270°23.4 22°31.4	285°23.3 22°31.7	300°23.1 22°32.0	315°23.0 22°32.3	330°22.9 22°32.5	345°22.8 22°32.8	0°22.7 22°33.1	15°22.6 22°33.3	30°22.5 22°33.6	45°22.4 22°33.9	60°22.3 22°34.2	75°22.1 22°34.4	-0.1 +0.3
Su 6	270°20.7 22°37.9	285°20.6 22°38.1	300°20.4 22°38.4	315°20.3 22°38.7	330°20.2 22°38.9	345°20.1 22°39.2	0°20.0 22°39.4	15°19.9 22°39.7	30°19.7 22°40.0	45°19.6 22°40.2	60°19.5 22°40.5	75°19.4 22°40.7	-0.1 +0.3
Mo 7	270°17.9 22°43.9	285°17.8 22°44.2	300°17.7 22°44.4	315°17.5 22°44.7	330°17.4 22°44.9	345°17.3 22°45.2	0°17.2 22°45.4	15°17.1 22°45.6	30°17.0 22°45.9	45°16.8 22°46.1	60°16.7 22°46.4	75°16.6 22°46.6	-0.1 +0.2
Tu 8	270°15.0 22°49.6	285°14.9 22°49.8	300°14.8 22°50.1	315°14.7 22°50.3	330°14.6 22°50.7	345°14.4 22°50.7	0°14.3 22°51.0	15°14.2 22°51.2	30°14.1 22°51.4	45°14.0 22°51.6	60°13.8 22°51.9	75°13.7 22°52.1	-0.1 +0.2
We 9	270°12.1 22°54.9	285°12.0 22°55.1	300°11.9 22°55.3	315°11.8 22°55.5	330°11.7 22°55.7	345°11.5 22°55.9	0°11.4 22°56.1	15°11.3 22°56.3	30°11.2 22°56.5	45°11.0 22°56.7	60°10.9 22°57.0	75°10.8 22°57.2	-0.1 +0.2
Th 10	270°09.2 22°59.7	285°09.1 22°59.9	300°08.9 22°00.1	315°08.8 22°00.3	330°08.7 22°00.5	345°08.6 22°00.7	0°08.4 23°00.9	15°08.3 23°01.1	30°08.2 23°01.3	45°08.1 23°01.5	60°07.9 23°01.6	75°07.8 23°01.8	-0.1 +0.2
Fr 11	270°06.2 23°04.2	285°06.0 23°04.4	300°05.9 23°04.5	315°05.8 23°04.7	330°05.7 23°04.9	345°05.5 23°05.1	0°05.4 23°05.2	15°05.3 23°05.4	30°05.1 23°05.6	45°05.0 23°05.8	60°04.9 23°05.9	75°04.8 23°06.1	-0.1 +0.2
Sa 12	270°03.1 23°08.2	285°03.0 23°08.4	300°02.8 23°08.6	315°02.7 23°08.7	330°02.6 23°08.9	345°02.5 23°09.0	0°02.3 23°09.2	15°02.2 23°09.3	30°02.1 23°09.5	45°01.9 23°09.7	60°01.8 23°09.8	75°01.7 23°10.0	-0.1 +0.2
Su 13	270°00.0 23°11.9	284°59.9 23°12.0	299°59.7 23°12.2	314°59.6 23°12.3	329°59.5 23°12.4	344°59.3 23°12.6	359°59.2 23°12.7	14°59.1 23°12.9	29°59.0 23°13.3	44°58.8 23°13.7	59°58.7 23°14.0	74°58.6 23°14.3	-0.1 +0.1
Mo 14	269°56.9 23°15.1	284°56.7 23°15.2	299°56.6 23°15.4	314°56.5 23°15.5	329°56.3 23°15.6	344°56.2 23°15.7	359°56.1 23°15.9	14°55.9 23°16.0	29°55.8 23°16.3	44°55.7 23°16.6	59°55.5 23°16.8	74°55.4 23°16.9	-0.1 +0.1
Tu 15	269°53.7 23°17.9	284°53.6 23°18.0	299°53.4 23°18.1	314°53.3 23°18.3	329°53.2 23°18.4	344°53.0 23°18.5	359°52.9 23°18.6	14°52.8 23°18.7	29°52.6 23°18.8	44°52.5 23°18.9	59°52.4 23°19.0	74°52.2 23°19.1	-0.1 +0.1
We 16	269°50.5 23°20.3	284°50.4 23°20.4	299°50.2 23°20.5	314°50.1 23°20.6	329°50.0 23°20.7	344°49.8 23°20.8	359°49.7 23°20.9	14°49.6 23°21.0	29°49.4 23°21.2	44°49.3 23°21.3	59°49.2 23°21.4	74°49.0 23°21.5	-0.1 +0.1
Th 17	269°47.3 23°22.3	284°47.1 23°22.4	299°47.0 23°22.5	314°46.9 23°22.6	329°46.7 23°22.6	344°46.6 23°22.7	359°46.5 23°22.8	14°46.3 23°22.8	29°46.2 23°22.9	44°46.1 23°23.0	59°45.9 23°23.1	74°45.8 23°23.1	-0.1 +0.1
Fr 18	269°44.1 23°23.9	284°43.9 23°24.0	299°43.8 23°24.0	314°43.6 23°24.1	329°43.4 23°24.1	344°43.4 23°24.2	359°43.2 23°24.3	14°43.1 23°24.3	29°43.0 23°24.4	44°42.8 23°24.4	59°42.7 23°24.5	74°42.6 23°24.5	-0.1 +0.1
Sa 19	269°40.8 23°25.1	284°40.7 23°25.1	299°40.5 23°25.2	314°40.4 23°25.2	329°40.3 23°25.3	344°40.1 23°25.3	359°40.0 23°25.3	14°39.9 23°25.4	29°39.7 23°25.4	44°39.6 23°25.4	59°39.5 23°25.5	74°39.3 23°25.5	-0.1 +0.0
Su 20	269°37.6 23°25.9	284°37.4 23°25.9	299°37.3 23°25.9	314°37.2 23°25.9	329°37.0 23°25.9	344°36.9 23°26.0	359°36.7 23°26.0	14°36.6 23°26.0	29°36.5 23°26.0	44°36.3 23°26.0	59°36.2 23°26.1	74°36.1 23°26.1	-0.1 +0.0
Mo 21	269°34.3 23°26.2	284°34.2 23°26.2	299°34.0 23°26.2	314°33.9 23°26.2	329°33.8 23°26.2	344°33.6 23°26.2	359°33.5 23°26.2	14°33.4 23°26.2	29°33.2 23°26.2	44°33.1 23°26.2	59°33.0 23°26.2	74°32.8 23°26.2	-0.1 +0.0
Tu 22	269°31.1 23°26.1	284°30.9 23°26.1	299°30.8 23°26.1	314°30.7 23°26.1	329°30.5 23°26.1	344°30.4 23°26.1	359°30.3 23°26.1	14°30.1 23°26.1	29°30.0 23°26.0	44°29.9 23°26.0	59°29.7 23°26.0	74°29.6 23°26.0	-0.1 -0.0
We 23	269°27.8 23°25.7	284°27.7 23°25.6	299°27.6 23°25.6	314°27.4 23°25.6	329°27.3 23°25.6	344°27.2 23°25.5	359°27.0 23°25.5	14°26.9 23°25.5	29°26.8 23°25.5	44°26.6 23°25.4	59°26.5 23°25.3	74°26.4 23°25.3	-0.1 -0.0
Th 24	269°24.6 23°24.8	284°24.5 23°24.7	299°24.3 23°24.7	314°24.2 23°24.6	329°24.1 23°24.6	344°23.9 23°24.5	359°23.8 23°24.5	14°23.7 23°24.5	29°23.5 23°24.2	44°23.4 23°24.3	59°23.3 23°24.3	74°23.1 23°24.2	-0.1 -0.0
Fr 25	269°21.4 23°23.5	284°21.3 23°23.4	299°21.1 23°23.4	314°21.0 23°23.3	329°20.9 23°23.2	344°20.7 23°23.2	359°20.6 23°23.1	14°20.5 23°23.0	29°20.3 23°23.0	44°20.2 23°23.0	59°20.1 23°22.8	74°20.0 23°22.7	-0.1 -0.1
Sa 26	269°18.2 23°21.8	284°18.1 23°21.7	299°18.0 23°21.6	314°17.8 23°21.5	329°17.7 23°21.4	344°17.6 23°21.4	359°17.4 23°21.3	14°17.3 23°21.2	29°17.2 23°21.1	44°17.0 23°21.0	59°16.9 23°20.9	74°16.8 23°20.8	-0.1 -0.1
Su 27	269°15.1 23°19.6	284°15.0 23°19.5	299°14.8 23°19.4	314°14.7 23°19.3	329°14.6 23°19.2	344°14.4 23°19.1	359°14.3 23°19.0	14°14.2 23°18.9	29°14.0 23°18.7	44°13.9 23°18.5	59°13.8 23°18.3	74°13.7 23°18.5	-0.1 -0.1
Mo 28	269°12.0 23°17.1	284°11.9 23°17.0	299°11.7 23°16.9	314°11.6 23°16.8	329°11.5 23°16.6	344°11.3 23°16.5	359°11.2 23°16.4	14°11.1 23°16.3	29°10.9 23°16.2	44°10.8 23°16.0	59°10.7 23°15.9	74°10.6 23°15.8	-0.1 -0.1
Tu 29	269°08.9 23°14.2	284°08.8 23°14.0	299°08.7 23°13.9	314°08.5 23°13.8	329°08.4 23°13.6	344°08.3 23°13.5	359°08.2 23°13.4	14°08.0 23°13.2	29°07.8 23°13.0	44°07.6 23°12.9	59°07.7 23°12.8	74°07.5 23°12.7	-0.1 -0.1
We 30	269°05.9 23°10.8	284°05.8 23°10.7	299°05.6 23°10.5	314°05.5 23°10.4	329°05.4 23°10.2	344°05.3 23°10.1	359°05.2 23°09.9	14°05.0 23°09.7	29°04.8 23°09.6	44°04.6 23°09.4	59°04.7 23°09.3	74°04.5 23°09.1	-0.1 -0.2

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

June 2027

	D	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	Δ/h	SH
•	Tu 1	246°57.7 12°24.9	261°29.1 12°38.6	276°00.5 12°52.2	290°31.8 13°05.8	305°03.0 13°19.3	319°34.0 13°32.8	334°05.0 13°46.3	348°35.9 13°59.7	3°06.6 14°13.0	17°37.3 14°26.3	32°07.8 14°39.6	+31.0	15.7
	We 2	249°52.6 17°50.7	264°01.3 18°02.9	278°29.9 18°15.0	292°58.4 18°27.0	307°26.7 18°38.9	321°55.0 18°50.7	336°23.1 19°02.4	350°51.1 19°14.0	5°18.9 19°25.6	19°46.6 19°37.1	34°14.2 19°48.4	+28.2	15.9
•	Th 3	250°52.7 22°25.7	265°18.2 22°35.3	279°43.7 22°44.7	294°08.9 22°53.9	308°34.1 23°03.1	322°59.1 23°12.1	337°24.0 23°20.9	351°48.8 23°29.7	6°13.5 23°38.2	20°38.0 23°46.7	35°02.8 23°55.0	+25.0	16.1
	Fr 4	250°54.9 25°40.4	265°17.5 25°46.1	279°40.1 25°51.6	294°02.5 25°57.0	308°24.9 26°02.1	322°47.1 26°07.1	337°09.3 26°11.9	351°31.4 26°16.5	5°53.4 26°20.9	20°15.3 26°25.2	34°37.2 26°29.2	+22.2	16.3
•	Sa 5	249°57.2 27°06.7	264°18.2 27°07.6	278°39.1 27°08.3	293°00.0 27°08.8	307°20.9 27°09.0	321°41.8 27°09.1	336°02.6 27°09.0	350°23.4 27°08.7	4°44.3 27°08.1	19°05.1 27°07.4	33°25.9 27°06.5	+20.9	16.5
	Su 6	248°39.6 26°27.8	263°00.8 26°23.6	277°22.0 26°19.2	291°43.2 26°14.6	306°04.6 26°09.8	320°25.9 26°04.8	334°47.4 25°59.6	349°08.9 25°54.3	3°30.4 25°48.7	17°52.1 25°43.0	32°13.8 25°37.0	+21.4	16.5
•	Mo 7	247°48.9 23°46.2	262°12.0 23°37.4	276°35.2 23°28.5	290°58.5 23°19.4	305°31.9 23°10.1	319°45.4 23°00.7	334°09.0 22°51.1	348°32.7 22°51.1	2°56.5 22°41.4	17°20.4 22°31.6	31°44.4 22°21.5	+23.5	16.5
	Tu 8	247°58.3 19°22.5	262°24.2 19°10.2	276°50.1 18°57.9	291°16.2 18°45.4	305°42.4 18°32.8	320°08.7 18°20.1	334°35.1 18°07.3	349°01.6 17°54.4	3°28.2 17°41.4	17°54.9 17°28.3	32°21.8 17°15.1	+26.3	16.4
•	We 9	249°17.4 13°46.7	263°45.9 13°32.2	278°14.6 13°17.7	292°43.3 13°03.1	307°12.1 12°48.4	321°41.0 12°33.7	336°10.0 12°18.9	350°39.1 12°04.0	5°08.3 11°49.1	19°37.6 11°34.2	34°06.9 11°19.2	+29.0	16.2
	Th 10	251°37.1 7°29.4	266°07.7 7°13.8	280°33.7 6°58.2	295°09.2 6°42.6	309°40.0 6°27.0	324°10.8 6°11.3	338°41.7 5°55.7	353°12.7 5°40.0	7°43.8 5°24.3	22°14.9 5°08.6	36°46.0 4°52.9	+30.9	16.1
•	Fr 11	254°39.1 0°56.8	269°11.0 0°41.1	283°42.9 0°25.4	298°14.8 0°09.7	312°46.8 -0°06.0	327°18.7 -0°21.6	341°50.7 -0°37.2	356°22.8 -0°52.9	10°54.8 -1°08.4	25°26.9 -1°24.0	39°59.9 -1°39.6	+32.0	15.9
	Sa 12	258°02.5 -5°29.5	272°34.7 -5°44.6	287°07.0 -5°59.6	301°39.3 -6°14.6	316°11.6 -6°29.5	330°43.9 -6°44.4	345°16.2 -6°59.3	359°48.5 -7°14.1	14°20.6 -7°28.8	28°53.0 -7°43.5	43°25.3 -7°58.2	+32.3	15.7
•	Su 13	261°27.5 -11°31.5	275°59.4 -11°45.3	290°31.4 -11°59.0	305°03.3 -12°12.6	319°35.3 -12°26.1	334°07.1 -12°39.6	348°39.0 -12°53.0	3°10.8 -13°06.3	17°42.6 -13°19.6	32°14.4 -13°32.8	46°46.1 -13°45.9	+31.9	15.5
	Mo 14	264°37.8 -16°53.2	279°08.9 -17°05.0	293°40.0 -17°16.8	308°11.0 -17°28.4	322°42.0 -17°40.0	337°13.0 -17°51.4	351°43.9 -18°02.8	6°14.8 -18°14.0	20°45.6 -18°25.2	35°16.4 -18°36.3	49°47.1 -18°47.3	+30.9	15.3
•	Tu 15	267°22.5 -21°19.8	281°52.5 -21°29.1	296°22.4 -21°38.3	310°52.3 -21°47.4	325°22.1 -21°56.3	339°51.9 -22°05.2	354°21.7 -22°14.0	8°51.4 -22°22.6	23°21.0 -22°31.1	37°50.6 -22°39.9	52°20.0 -22°47.8	+29.8	15.2
	We 16	269°38.5 -24°37.5	284°07.4 -24°43.8	298°36.2 -24°50.0	313°05.0 -24°56.0	327°33.8 -25°02.0	342°02.6 -25°07.8	356°31.3 -25°13.4	11°00.0 -25°24.4	25°28.7 -25°34.4	39°57.3 -25°40.6	54°25.9 -25°46.8	+28.7	15.1
•	Th 17	271°32.1 -26°35.6	286°00.4 -26°38.5	300°28.6 -26°41.4	314°56.9 -26°44.0	329°25.1 -26°46.6	343°53.4 -26°49.0	358°21.6 -26°51.3	12°49.8 -26°53.4	27°18.0 -26°55.4	41°46.3 -26°57.2	56°14.5 -26°58.9	+28.2	15.0
	Fr 18	273°18.6 -27°08.0	287°47.0 -27°07.5	302°15.4 -27°06.8	316°43.9 -27°06.0	331°12.3 -27°05.1	345°40.8 -27°04.1	0°09.3 -27°02.9	14°37.8 -27°01.6	29°06.4 -27°00.1	43°35.0 -26°58.5	58°03.6 -26°56.8	+28.5	14.9
•	Sa 19	275°17.6 -26°15.1	289°46.9 -26°11.3	304°16.2 -26°07.7	318°45.6 -26°03.3	333°15.0 -25°59.1	347°44.5 -25°54.8	2°14.1 -25°50.4	16°43.7 -25°45.0	31°13.3 -25°41.1	45°43.0 -25°36.3	60°12.8 -25°31.4	+29.5	14.8
	Su 20	277°46.2 -24°03.8	292°16.9 -23°57.1	306°47.7 -23°50.2	321°18.6 -23°43.3	335°49.5 -23°36.2	350°20.5 -23°29.1	4°51.6 -23°21.8	19°22.7 -23°14.4	33°53.9 -23°07.0	48°25.1 -22°59.4	62°56.4 -22°51.8	+31.0	14.7
•	Mo 21	280°54.0 -20°45.3	295°26.4 -20°36.2	309°58.8 -20°26.9	324°31.3 -20°17.6	339°03.9 -20°08.2	353°36.5 -19°58.7	8°09.2 -19°49.1	22°41.9 -19°39.5	37°14.7 -19°29.7	51°47.6 -19°19.9	66°20.5 -19°10.0	+32.7	14.7
	Tu 22	284°41.6 -16°32.7	299°15.5 -16°21.7	313°49.4 -16°10.5	328°23.3 -15°59.4	342°57.3 -15°48.1	357°31.4 -15°36.8	12°05.5 -15°25.5	26°39.1 -15°14.1	41°13.9 -15°02.6	55°48.1 -14°51.0	70°22.4 -14°39.4	+34.1	14.7
•	We 23	289°02.0 -11°38.8	303°37.0 -11°26.4	318°12.0 -11°13.9	332°47.0 -11°01.4	347°22.0 -10°48.8	1°57.1 -10°36.2	16°32.2 -10°23.5	31°07.3 -10°10.8	45°42.4 -9°58.0	60°17.6 -9°45.2	74°52.8 -9°32.4	+35.1	14.8
	Th 24	303°37.0 -11°26.4	318°12.0 -11°13.9	332°47.0 -11°01.4	347°22.0 -10°48.8	1°57.1 -10°36.2	16°32.2 -10°23.5	31°07.3 -10°10.8	45°42.4 -9°58.0	60°17.6 -9°45.2	74°52.8 -9°32.4	89°28.2 -9°19.5	+35.1	14.8
•	Fr 25	308°18.7 -0°20.0	322°54.2 -0°48.6	337°29.7 -0°53.1	352°05.2 -0°51.7	6°40.7 -0°21.7	21°16.2 -0°50.8	35°51.7 -0°54.6	50°27.2 -0°41.0	65°02.7 -0°27.5	79°38.2 -0°13.8	94°13.7 -0°00.2	+35.5	14.9
	Sa 26	313°05.3 -0°19.3	327°40.6 -0°05.3	342°15.9 0°08.6	356°51.2 0°22.6	11°26.4 0°36.5	26°01.6 0°50.5	40°36.8 1°04.5	55°12.0 1°18.5	69°47.1 1°32.5	84°22.3 1°46.5	98°57.3 2°00.6	+35.2	15.0
•	Su 27	317°39.0 5°31.0	332°13.4 5°45.0	346°47.7 5°59.0	1°22.0 6°13.0	15°56.3 6°27.0	30°30.5 6°41.0	45°04.6 6°54.9	59°38.7 7°08.9	74°12.7 7°22.8	88°46.6 7°36.7	103°20.5 7°50.6	+34.2	15.2
	Mo 28	321°40.4 11°16.6	336°13.1 11°30.1	350°45.7 11°43.6	5°18.2 11°57.0	19°50.7 12°10.4	34°23.0 12°23.8	48°55.3 12°37.1	63°27.4 12°50.4	77°59.5 13°03.7	92°31.5 13°16.9	107°03.4 13°30.1	+32.3	15.4
•	Tu 29	324°49.3 16°41.5	339°19.5 16°53.8	353°49.6 17°06.0	8°19.5 17°18.2	22°49.4 17°30.3	37°19.1 17°42.3	51°48.7 17°54.2	66°18.2 18°06.1	80°47.6 18°17.9	95°16.8 18°29.6	109°45.9 18°41.2	+29.7	15.7
	We 30	326°47.4 21°24.7	341°14.5 21°34.8	355°41.4 21°44.8	10°08.2 21°54.7	24°34.9 22°04.5	39°01.4 22°14.1	53°27.8 22°23.6	67°54.1 22°33.0	82°20.2 22°42.3	96°46.2 22°51.5	111°12.1 23°00.5	+26.5	16.0

SUN

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D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Th 1	268 ⁰ 02.9 23 ⁰ 07.0	284 ⁰ 02.8 23 ⁰ 06.9	299 ⁰ 02.7 23 ⁰ 06.7	314 ⁰ 02.6 23 ⁰ 06.5	329 ⁰ 02.4 23 ⁰ 06.4	344 ⁰ 02.3 23 ⁰ 06.2	359 ⁰ 02.2 23 ⁰ 06.0	14 ⁰ 02.1 23 ⁰ 05.9	29 ⁰ 02.0 23 ⁰ 05.7	44 ⁰ 01.8 23 ⁰ 05.5	59 ⁰ 01.7 23 ⁰ 05.4	74 ⁰ 01.6 23 ⁰ 05.2	-0.1 -0.2
Fr 2	268 ⁰ 00.0 23 ⁰ 02.9	283 ⁰ 59.9 23 ⁰ 02.7	298 ⁰ 59.8 23 ⁰ 02.5	313 ⁰ 59.7 23 ⁰ 02.3	328 ⁰ 59.5 23 ⁰ 02.1	343 ⁰ 59.4 23 ⁰ 02.0	358 ⁰ 59.3 23 ⁰ 01.8	13 ⁰ 59.2 23 ⁰ 01.6	28 ⁰ 59.1 23 ⁰ 01.4	43 ⁰ 59.0 23 ⁰ 01.2	58 ⁰ 58.8 23 ⁰ 01.0	73 ⁰ 58.7 23 ⁰ 00.8	-0.1 -0.2
Sa 3	268 ⁰ 57.2 22 ⁰ 58.3	283 ⁰ 57.1 22 ⁰ 58.1	298 ⁰ 57.0 22 ⁰ 57.9	313 ⁰ 56.8 22 ⁰ 57.7	328 ⁰ 56.7 22 ⁰ 57.5	343 ⁰ 56.6 22 ⁰ 57.3	358 ⁰ 56.5 22 ⁰ 57.1	13 ⁰ 56.4 22 ⁰ 56.9	28 ⁰ 56.3 22 ⁰ 56.7	43 ⁰ 56.1 22 ⁰ 56.5	58 ⁰ 56.0 22 ⁰ 56.3	73 ⁰ 55.9 22 ⁰ 56.1	-0.1 -0.2
Su 4	268 ⁰ 54.4 22 ⁰ 53.3	283 ⁰ 54.3 22 ⁰ 53.1	298 ⁰ 54.2 22 ⁰ 52.9	313 ⁰ 54.1 22 ⁰ 52.7	328 ⁰ 54.0 22 ⁰ 52.5	343 ⁰ 53.9 22 ⁰ 52.3	358 ⁰ 53.7 22 ⁰ 52.0	13 ⁰ 53.6 22 ⁰ 51.8	28 ⁰ 53.5 22 ⁰ 51.6	43 ⁰ 53.4 22 ⁰ 51.4	58 ⁰ 53.3 22 ⁰ 51.2	73 ⁰ 53.2 22 ⁰ 50.9	-0.1 -0.2
Mo 5	268 ⁰ 51.7 22 ⁰ 48.0	283 ⁰ 51.6 22 ⁰ 47.7	298 ⁰ 51.5 22 ⁰ 47.5	313 ⁰ 51.4 22 ⁰ 47.3	328 ⁰ 51.3 22 ⁰ 47.0	343 ⁰ 51.2 22 ⁰ 46.8	358 ⁰ 51.1 22 ⁰ 46.6	13 ⁰ 51.0 22 ⁰ 46.3	28 ⁰ 50.9 22 ⁰ 46.1	43 ⁰ 50.7 22 ⁰ 45.9	58 ⁰ 50.6 22 ⁰ 45.6	73 ⁰ 50.5 22 ⁰ 45.4	-0.1 -0.2
Tu 6	268 ⁰ 49.1 22 ⁰ 42.2	283 ⁰ 49.0 22 ⁰ 42.0	298 ⁰ 48.9 22 ⁰ 41.7	313 ⁰ 48.8 22 ⁰ 41.5	328 ⁰ 48.7 22 ⁰ 41.2	343 ⁰ 48.6 22 ⁰ 41.0	358 ⁰ 48.5 22 ⁰ 40.7	13 ⁰ 48.4 22 ⁰ 40.4	28 ⁰ 48.3 22 ⁰ 40.2	43 ⁰ 48.2 22 ⁰ 39.9	58 ⁰ 48.1 22 ⁰ 39.7	73 ⁰ 48.0 22 ⁰ 39.4	-0.1 -0.3
We 7	268 ⁰ 46.6 22 ⁰ 36.0	283 ⁰ 46.5 22 ⁰ 35.8	298 ⁰ 46.4 22 ⁰ 35.5	313 ⁰ 46.3 22 ⁰ 35.2	328 ⁰ 46.2 22 ⁰ 35.0	343 ⁰ 46.1 22 ⁰ 34.7	358 ⁰ 46.0 22 ⁰ 34.4	13 ⁰ 45.9 22 ⁰ 34.2	28 ⁰ 45.8 22 ⁰ 33.9	43 ⁰ 45.7 22 ⁰ 33.6	58 ⁰ 45.6 22 ⁰ 33.4	73 ⁰ 45.5 22 ⁰ 33.1	-0.1 -0.3
Th 8	268 ⁰ 44.2 22 ⁰ 29.5	283 ⁰ 44.1 22 ⁰ 29.2	298 ⁰ 44.0 22 ⁰ 28.9	313 ⁰ 43.9 22 ⁰ 28.6	328 ⁰ 43.8 22 ⁰ 28.4	343 ⁰ 43.7 22 ⁰ 28.1	358 ⁰ 43.6 22 ⁰ 27.8	13 ⁰ 43.5 22 ⁰ 27.5	28 ⁰ 43.4 22 ⁰ 27.2	43 ⁰ 43.3 22 ⁰ 26.9	58 ⁰ 43.2 22 ⁰ 26.6	73 ⁰ 43.1 22 ⁰ 26.3	-0.1 -0.3
Fr 9	268 ⁰ 41.9 22 ⁰ 22.6	283 ⁰ 41.8 22 ⁰ 22.3	298 ⁰ 41.7 22 ⁰ 22.0	313 ⁰ 41.6 22 ⁰ 21.7	328 ⁰ 41.5 22 ⁰ 21.4	343 ⁰ 41.4 22 ⁰ 21.1	358 ⁰ 41.3 22 ⁰ 20.8	13 ⁰ 41.3 22 ⁰ 20.5	28 ⁰ 41.2 22 ⁰ 20.2	43 ⁰ 41.1 22 ⁰ 19.9	58 ⁰ 41.0 22 ⁰ 19.5	73 ⁰ 40.9 22 ⁰ 19.2	-0.1 -0.3
Sa 10	268 ⁰ 39.7 22 ⁰ 15.2	283 ⁰ 39.6 22 ⁰ 14.9	298 ⁰ 39.5 22 ⁰ 14.6	313 ⁰ 39.4 22 ⁰ 14.3	328 ⁰ 39.3 22 ⁰ 14.0	343 ⁰ 39.3 22 ⁰ 13.7	358 ⁰ 39.2 22 ⁰ 13.3	13 ⁰ 39.1 22 ⁰ 13.0	28 ⁰ 39.0 22 ⁰ 12.7	43 ⁰ 38.9 22 ⁰ 12.4	58 ⁰ 38.8 22 ⁰ 12.2	73 ⁰ 38.7 22 ⁰ 11.7	-0.1 -0.3
Su 11	268 ⁰ 37.6 22 ⁰ 07.5	283 ⁰ 37.5 22 ⁰ 07.2	298 ⁰ 37.5 22 ⁰ 06.9	313 ⁰ 37.4 22 ⁰ 06.5	328 ⁰ 37.3 22 ⁰ 06.2	343 ⁰ 37.2 22 ⁰ 05.9	358 ⁰ 37.1 22 ⁰ 05.5	13 ⁰ 37.0 22 ⁰ 05.2	28 ⁰ 37.0 22 ⁰ 04.9	43 ⁰ 36.9 22 ⁰ 04.5	58 ⁰ 36.8 22 ⁰ 04.2	73 ⁰ 36.7 22 ⁰ 03.9	-0.1 -0.3
Mo 12	268 ⁰ 35.7 21 ⁰ 59.4	283 ⁰ 35.6 21 ⁰ 59.1	298 ⁰ 35.5 21 ⁰ 58.7	313 ⁰ 35.4 21 ⁰ 58.4	328 ⁰ 35.3 21 ⁰ 58.0	343 ⁰ 35.3 21 ⁰ 57.7	358 ⁰ 35.2 21 ⁰ 57.4	13 ⁰ 35.1 21 ⁰ 57.0	28 ⁰ 35.0 21 ⁰ 56.7	43 ⁰ 34.9 21 ⁰ 56.3	58 ⁰ 34.9 21 ⁰ 56.0	73 ⁰ 34.8 21 ⁰ 55.6	-0.1 -0.3
Tu 13	268 ⁰ 33.8 21 ⁰ 51.0	283 ⁰ 33.7 21 ⁰ 50.6	298 ⁰ 33.7 21 ⁰ 50.2	313 ⁰ 33.6 21 ⁰ 49.9	328 ⁰ 33.5 21 ⁰ 49.5	343 ⁰ 33.4 21 ⁰ 49.2	358 ⁰ 33.4 21 ⁰ 48.8	13 ⁰ 33.3 21 ⁰ 48.4	28 ⁰ 33.2 21 ⁰ 48.1	43 ⁰ 33.1 21 ⁰ 47.7	58 ⁰ 33.1 21 ⁰ 47.3	73 ⁰ 33.0 21 ⁰ 47.0	-0.1 -0.4
We 14	268 ⁰ 32.1 21 ⁰ 42.1	283 ⁰ 32.0 21 ⁰ 41.8	298 ⁰ 31.9 21 ⁰ 41.4	313 ⁰ 31.9 21 ⁰ 41.0	328 ⁰ 31.8 21 ⁰ 40.6	343 ⁰ 31.7 21 ⁰ 40.2	358 ⁰ 31.7 21 ⁰ 39.9	13 ⁰ 31.6 21 ⁰ 39.5	28 ⁰ 31.5 21 ⁰ 39.1	43 ⁰ 31.5 21 ⁰ 38.7	58 ⁰ 31.4 21 ⁰ 38.3	73 ⁰ 31.3 21 ⁰ 38.0	-0.1 -0.4
Th 15	268 ⁰ 30.5 21 ⁰ 32.9	283 ⁰ 30.4 21 ⁰ 32.5	298 ⁰ 30.3 21 ⁰ 32.1	313 ⁰ 30.3 21 ⁰ 31.8	328 ⁰ 30.2 21 ⁰ 31.4	343 ⁰ 30.2 21 ⁰ 31.0	358 ⁰ 30.1 21 ⁰ 30.6	13 ⁰ 30.0 21 ⁰ 30.2	28 ⁰ 30.0 21 ⁰ 29.8	43 ⁰ 29.9 21 ⁰ 29.4	58 ⁰ 29.8 21 ⁰ 29.0	73 ⁰ 29.8 21 ⁰ 28.6	-0.1 -0.4
Fr 16	268 ⁰ 29.0 21 ⁰ 23.4	283 ⁰ 28.9 21 ⁰ 23.0	298 ⁰ 28.9 21 ⁰ 22.5	313 ⁰ 28.8 21 ⁰ 22.1	328 ⁰ 28.8 21 ⁰ 21.7	343 ⁰ 28.7 21 ⁰ 21.3	358 ⁰ 28.6 21 ⁰ 20.9	13 ⁰ 28.6 21 ⁰ 20.5	28 ⁰ 28.5 21 ⁰ 20.1	43 ⁰ 28.5 21 ⁰ 19.7	58 ⁰ 28.5 21 ⁰ 19.3	73 ⁰ 28.4 21 ⁰ 18.9	-0.1 -0.4
Sa 17	268 ⁰ 27.7 21 ⁰ 13.4	283 ⁰ 27.6 21 ⁰ 13.0	298 ⁰ 27.5 21 ⁰ 12.6	313 ⁰ 27.5 21 ⁰ 12.2	328 ⁰ 27.4 21 ⁰ 11.7	343 ⁰ 27.4 21 ⁰ 11.3	358 ⁰ 27.3 21 ⁰ 10.9	13 ⁰ 27.3 21 ⁰ 10.5	28 ⁰ 27.2 21 ⁰ 10.2	43 ⁰ 27.2 21 ⁰ 09.6	58 ⁰ 27.1 21 ⁰ 09.2	73 ⁰ 27.1 21 ⁰ 08.8	-0.1 -0.4
Su 18	268 ⁰ 26.4 21 ⁰ 03.1	283 ⁰ 26.4 21 ⁰ 02.7	298 ⁰ 26.3 21 ⁰ 02.3	313 ⁰ 26.3 21 ⁰ 01.8	328 ⁰ 26.3 21 ⁰ 01.4	343 ⁰ 26.2 21 ⁰ 01.0	358 ⁰ 26.2 21 ⁰ 00.5	13 ⁰ 26.1 21 ⁰ 00.1	28 ⁰ 26.0 20 ⁰ 59.6	43 ⁰ 26.0 20 ⁰ 59.2	58 ⁰ 26.0 20 ⁰ 58.7	73 ⁰ 25.9 20 ⁰ 58.3	-0.0 -0.4
Mo 19	268 ⁰ 25.4 20 ⁰ 52.5	283 ⁰ 25.3 20 ⁰ 52.0	298 ⁰ 25.3 20 ⁰ 51.6	313 ⁰ 25.2 20 ⁰ 51.1	328 ⁰ 25.2 20 ⁰ 50.7	343 ⁰ 25.2 20 ⁰ 50.2	358 ⁰ 25.1 20 ⁰ 49.8	13 ⁰ 25.1 20 ⁰ 49.3	28 ⁰ 25.0 20 ⁰ 48.9	43 ⁰ 25.0 20 ⁰ 48.4	58 ⁰ 25.0 20 ⁰ 48.0	73 ⁰ 24.9 20 ⁰ 47.5	-0.0 -0.5
Tu 20	268 ⁰ 24.4 20 ⁰ 41.5	283 ⁰ 24.4 20 ⁰ 41.0	298 ⁰ 24.3 20 ⁰ 40.6	313 ⁰ 24.3 20 ⁰ 40.1	328 ⁰ 24.3 20 ⁰ 39.6	343 ⁰ 24.2 20 ⁰ 39.2	358 ⁰ 24.2 20 ⁰ 38.7	13 ⁰ 24.2 20 ⁰ 38.2	28 ⁰ 24.1 20 ⁰ 37.8	43 ⁰ 24.1 20 ⁰ 37.3	58 ⁰ 24.1 20 ⁰ 36.8	73 ⁰ 24.0 20 ⁰ 36.3	-0.0 -0.5
We 21	268 ⁰ 23.6 20 ⁰ 30.2	283 ⁰ 23.6 20 ⁰ 29.7	298 ⁰ 23.6 20 ⁰ 29.2	313 ⁰ 23.5 20 ⁰ 28.7	328 ⁰ 23.5 20 ⁰ 28.2	343 ⁰ 23.5 20 ⁰ 27.7	358 ⁰ 23.4 20 ⁰ 27.3	13 ⁰ 23.4 20 ⁰ 26.8	28 ⁰ 23.3 20 ⁰ 26.3	43 ⁰ 23.3 20 ⁰ 25.8	58 ⁰ 23.3 20 ⁰ 25.3	73 ⁰ 23.3 20 ⁰ 24.8	-0.0 -0.5
Th 22	268 ⁰ 23.0 20 ⁰ 18.5	283 ⁰ 22.9 20 ⁰ 18.0	298 ⁰ 22.9 20 ⁰ 17.5	313 ⁰ 22.9 20 ⁰ 17.0	328 ⁰ 22.9 20 ⁰ 16.5	343 ⁰ 22.8 20 ⁰ 16.0	358 ⁰ 22.8 20 ⁰ 15.5	13 ⁰ 22.8 20 ⁰ 15.0	28 ⁰ 22.8 20 ⁰ 14.5	43 ⁰ 22.7 20 ⁰ 14.0	58 ⁰ 22.7 20 ⁰ 13.5	73 ⁰ 22.7 20 ⁰ 13.0	-0.0 -0.5
Fr 23	268 ⁰ 22.4 20 ⁰ 06.4	283 ⁰ 22.4 20 ⁰ 05.9	298 ⁰ 22.4 20 ⁰ 05.4	313 ⁰ 22.4 20 ⁰ 04.9	328 ⁰ 22.4 20 ⁰ 04.4	343 ⁰ 22.3 20 ⁰ 03.9	358 ⁰ 22.3 20 ⁰ 03.4	13 ⁰ 22.3 20 ⁰ 02.9	28 ⁰ 22.3 20 ⁰ 02.4	43 ⁰ 22.3 20 ⁰ 01.8	58 ⁰ 22.3 20 ⁰ 01.3	73 ⁰ 22.2 20 ⁰ 00.8	-0.0 -0.5
Sa 24	268 ⁰ 22.0 19 ⁰ 54.1	283 ⁰ 22.0 19 ⁰ 53.5	298 ⁰ 22.0 19 ⁰ 53.0	313 ⁰ 22.0 19 ⁰ 52.5	328 ⁰ 22.0 19 ⁰ 52.0	343 ⁰ 22.0 19 ⁰ 51.4	358 ⁰ 22.0 19 ⁰ 50.9	13 ⁰ 22.0 19 ⁰ 50.4	28 ⁰ 22.0 19 ⁰ 49.9	43 ⁰ 22.0 19 ⁰ 49.3	58 ⁰ 22.0 19 ⁰ 48.8	73 ⁰ 21.9 19 ⁰ 48.3	-0.0 -0.5
Su 25	268 ⁰ 21.8 19 ⁰ 41.4	283 ⁰ 21.8 19 ⁰ 40.8	298 ⁰ 21.8 19 ⁰ 40.3	313 ⁰ 21.8 19 ⁰ 39.8	328 ⁰ 21.8 19 ⁰ 39.2	343 ⁰ 21.8 19 ⁰ 38.7	358 ⁰ 21.8 19 ⁰ 38.1	13 ⁰ 21.8 19 ⁰ 37.6	28 ⁰ 21.8 19 ⁰ 37.1	43 ⁰ 21.8 19 ⁰ 36.5	58 ⁰ 21.8 19 ⁰ 36.0	73 ⁰ 21.7 19 ⁰ 35.4	-0.0 -0.5
Mo 26	268 ⁰ 21.7 19 ⁰ 28.3	283 ⁰ 21.7 19 ⁰ 27.8	298 ⁰ 21.7 19 ⁰ 27.2	313 ⁰ 21.7 19 ⁰ 26.7	328 ⁰ 21.7 19 ⁰ 26.1	343 ⁰ 21.7 19 ⁰ 25.6	358 ⁰ 21.7 19 ⁰ 25.0	13 ⁰ 21.7 19 ⁰ 24.5	28 ⁰ 21.7 19 ⁰ 23.9	43 ⁰ 21.7 19 ⁰ 23.4	58 ⁰ 21.7 19 ⁰ 22.8	73 ⁰ 21.7 19 ⁰ 22.3	+0.0 -0.6
Tu 27	268 ⁰ 21.8 19 ⁰ 15.0	283 ⁰ 21.8 19 ⁰ 14.4	298 ⁰ 21.8 19 ⁰ 13.9	313 ⁰ 21.8 19 ⁰ 13.3	328 ⁰ 21.8 19 ⁰ 12.7	343 ⁰ 21.8 19 ⁰ 12.2	358 ⁰ 21.8 19 ⁰ 11.6	13 ⁰ 21.8 19 ⁰ 11.0	28 ⁰ 21.8 19 ⁰ 10.5	43 ⁰ 21.8 19 ⁰ 09.9	58 ⁰ 21.8 19 ⁰ 09.3	73 ⁰ 21.8 19 ⁰ 08.8	+0.0 -0.6
We 28	268 ⁰ 22.0 19 ⁰ 01.3	283 ⁰ 22.0 19 ⁰ 00.7	298 ⁰ 22.0 19 ⁰ 00.2	313 ⁰ 22.0 18 ⁰ 59.6	328 ⁰ 22.0 18 ⁰ 59.0	343 ⁰ 22.0 18 ⁰ 58.4	358 ⁰ 22.0 18 ⁰ 57.8	13 ⁰ 22.0 18 ⁰ 57.3	28 ⁰ 22.0 18 ⁰ 56.7	43 ⁰ 22.0 18 ⁰ 56.1	58 ⁰ 22.0 18 ⁰ 55.5	73 ⁰ 22.1 18 ⁰ 54.9	+0.0 -0.6
Th 29	268 ⁰ 22.3 18 ⁰ 47.3	283 ⁰ 22.3 18 ⁰ 46.7	298 ⁰ 22.3 18										

MOON

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D	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	Δ /h SH
Th 1	240°59.0 24°15.7	255°23.5 24°23.4	269°48.0 24°30.9	284°12.3 24°38.3	298°36.5 24°45.5	313°00.5 24°52.5	327°24.5 24°59.4	341°48.3 25°06.2	356°12.0 25°12.8	10°35.5 25°19.2	24°59.0 25°25.5	+24.0 16.2 +7.0 59.3
Fr 2	240°37.8 26°38.7	254°59.6 26°42.1	269°21.3 26°45.4	283°43.0 26°48.4	298°04.5 26°51.3	312°26.0 26°53.9	326°47.4 26°56.4	341°08.8 26°58.7	355°30.0 27°00.7	9°51.2 27°02.6	24°12.4 27°04.3	+21.4 16.4 +2.6 60.1
Sa 3	239°23.9 27°05.0	253°44.5 27°03.4	268°05.0 27°01.5	282°25.5 26°59.5	296°46.0 26°57.3	311°06.6 26°54.8	325°27.1 26°52.2	339°47.6 26°49.3	354°08.2 26°46.3	8°28.7 26°43.0	22°49.3 26°39.5	+20.5 16.6 -2.5 60.8
Su 4	238°01.9 25°22.8	252°23.1 25°16.1	266°44.4 25°09.2	281°05.8 25°02.1	295°27.2 24°54.8	309°48.8 24°47.3	324°10.3 24°39.7	338°32.0 24°31.8	352°53.8 24°23.8	7°15.6 24°15.6	21°37.5 24°07.2	+21.6 16.7 -7.6 61.1
Mo 5	237°17.3 21°40.9	251°40.7 21°29.8	266°04.3 21°18.7	280°28.0 21°07.3	294°51.7 20°55.8	309°15.6 20°44.2	323°39.6 20°32.5	338°03.7 20°20.6	352°28.0 20°08.6	6°52.3 19°56.4	21°16.7 19°44.1	+23.9 16.7 -11.7 61.1
Tu 6	237°36.8 16°25.5	252°03.1 16°11.4	266°29.4 15°57.2	280°55.9 15°42.9	295°22.4 15°28.6	309°49.1 15°14.1	324°15.9 14°59.6	338°42.7 14°45.0	353°09.7 14°30.3	7°36.8 14°15.5	22°04.0 14°00.6	+26.7 16.6 -14.5 60.7
We 7	239°03.8 10°10.3	253°32.6 9°54.5	268°01.4 9°38.7	282°30.3 9°22.9	296°59.3 9°07.0	311°28.4 8°51.1	325°57.5 8°35.1	340°26.7 8°19.1	354°56.1 8°03.1	9°25.5 7°47.1	23°54.9 7°31.0	+29.1 16.4 -15.9 60.1
Th 8	241°25.4 3°28.0	255°55.9 3°11.8	270°26.5 2°55.5	284°57.1 2°39.3	299°27.8 2°23.1	313°58.6 2°06.8	328°29.4 1°50.6	343°00.2 1°34.4	357°31.1 1°18.2	12°02.0 1°02.0	26°33.0 0°45.8	+30.8 16.2 -16.2 59.3
Fr 9	244°21.9 -3°14.1	258°53.4 -3°29.8	273°24.9 -3°45.5	287°56.4 -4°01.2	302°28.0 -4°16.9	316°59.5 -4°32.5	331°31.1 -4°48.0	346°02.7 -5°03.6	354°04.6 -5°19.0	10°34.4 -5°34.5	29°37.6 -5°49.9	+31.6 15.9 -15.6 58.5
Sa 10	247°32.8 -9°34.4	262°04.5 -9°48.9	276°36.2 -10°03.3	291°07.8 -10°17.7	305°39.5 -10°32.0	320°11.1 -10°46.2	334°42.7 -11°00.4	349°14.3 -11°14.5	3°45.9 -11°28.6	18°17.5 -11°42.5	32°49.1 -11°56.4	+31.6 15.7 -14.2 57.6
Su 11	250°40.2 -15°15.6	265°11.4 -15°28.2	279°42.6 -15°40.7	294°13.7 -15°53.2	308°44.8 -16°05.5	323°15.9 -16°17.8	337°47.0 -16°30.0	352°18.0 -16°42.1	6°49.0 -16°54.1	21°19.9 -17°06.0	35°50.9 -17°17.8	+31.1 15.5 -12.2 56.8
Mo 12	253°30.4 -20°03.1	268°00.7 -20°13.3	282°31.0 -20°23.4	297°01.3 -20°33.4	311°31.5 -20°43.4	326°01.6 -20°53.0	340°31.8 -21°02.7	355°01.9 -21°12.2	9°31.9 -21°21.6	24°01.9 -21°31.0	38°31.9 -21°40.2	+30.1 15.3 -9.7 56.0
Tu 13	255°56.7 -23°44.3	270°26.0 -23°51.6	284°55.3 -23°58.8	299°24.6 -24°05.8	313°53.8 -24°12.8	328°23.0 -24°19.6	342°52.3 -24°26.3	357°21.3 -24°32.8	11°50.4 -24°39.3	26°19.5 -24°45.6	40°48.5 -24°51.7	+29.2 15.1 -6.7 55.4
We 14	258°00.7 -26°08.7	272°29.3 -26°12.8	286°57.9 -26°16.7	301°26.5 -26°20.5	315°55.0 -26°24.2	330°23.6 -26°27.7	344°52.1 -26°31.1	359°20.7 -26°34.6	13°49.2 -26°37.5	28°17.7 -26°40.5	42°46.2 -26°43.4	+28.5 15.0 -3.5 54.9
Th 15	259°53.0 -27°09.7	274°21.5 -27°10.6	288°50.0 -27°10.9	303°18.5 -27°11.3	317°47.0 -27°11.5	332°15.5 -27°11.6	346°44.1 -27°11.6	1°12.6 -27°11.4	15°41.2 -27°11.1	30°09.8 -27°10.7	44°38.4 -27°10.1	+28.5 14.9 -0.0 54.5
Fr 16	261°50.5 -26°45.6	276°19.3 -26°42.9	290°48.7 -26°40.1	305°17.8 -26°37.1	319°47.0 -26°34.0	334°16.2 -26°30.8	348°45.5 -26°27.5	3°14.8 -26°24.0	17°44.1 -26°20.4	32°13.5 -26°16.7	46°43.0 -26°12.9	+29.2 14.8 +3.3 54.2
Sa 17	264°10.5 -26°00.7	278°40.7 -24°54.9	293°11.0 -24°49.1	307°41.4 -24°43.1	322°11.9 -24°37.0	336°42.4 -24°30.8	351°12.9 -24°24.5	5°43.5 -24°18.0	20°14.2 -24°11.5	34°44.9 -24°04.8	49°15.7 -23°58.1	+30.5 14.7 +6.3 54.0
Su 18	267°05.1 -22°04.4	281°36.9 -21°56.0	296°08.8 -21°47.5	310°40.7 -21°39.0	325°12.7 -21°30.3	339°44.8 -21°21.6	354°16.9 -21°12.8	8°49.1 -21°03.8	23°21.3 -20°54.8	37°53.6 -20°45.7	52°26.0 -20°36.6	+32.1 14.7 +8.8 53.9
Mo 19	270°38.9 -18°08.9	285°01.2 -17°58.5	299°45.6 -17°48.0	314°19.0 -17°37.3	328°52.5 -17°26.7	343°26.1 -17°15.9	357°59.7 -17°05.1	12°33.4 -16°54.2	27°07.1 -16°43.3	41°40.9 -16°32.3	56°14.7 -16°21.2	+33.6 14.7 +10.8 53.9
Tu 20	273°48.2 -13°27.6	289°22.8 -13°15.6	303°57.5 -13°03.5	318°32.2 -12°51.4	333°06.9 -12°39.2	347°41.6 -12°27.0	2°16.5 -12°14.7	16°51.3 -12°02.4	31°26.2 -11°50.2	46°01.1 -11°37.6	60°36.0 -11°25.1	+34.8 14.7 +12.3 54.0
We 21	279°24.1 -8°13.1	293°59.5 -8°00.0	308°34.9 -7°46.9	323°10.4 -7°33.7	337°45.8 -7°20.5	352°21.3 -7°07.3	6°56.8 -6°54.0	21°32.4 -6°40.7	36°07.9 -6°27.4	50°43.5 -6°14.1	65°19.0 -6°00.7	+35.5 14.8 +13.2 54.2
Th 22	284°13.5 -2°37.3	298°49.1 -2°23.6	313°24.8 -2°09.9	328°00.4 -1°56.1	342°36.0 -1°42.4	357°11.7 -1°28.6	11°47.3 -1°14.8	26°22.9 -1°01.0	40°58.5 -0°47.2	55°34.1 -0°33.4	70°09.7 -0°19.6	+35.6 14.9 +13.8 54.6
Fr 23	289°01.0 3°08.5	303°36.2 3°22.3	318°11.4 3°36.2	332°46.6 3°50.1	347°21.7 4°04.0	1°56.8 4°17.8	16°31.9 4°31.7	31°06.9 4°45.5	45°41.9 4°59.4	60°16.8 5°13.2	74°51.7 5°27.0	+35.1 15.0 +13.9 55.1
Sa 24	303°36.2 14°34.4	318°11.4 14°47.0	332°46.6 14°59.5	347°21.7 15°12.0	1°56.8 15°24.2	16°31.9 15°36.8	31°06.9 15°49.1	45°41.9 16°01.3	60°16.8 16°13.5	74°51.7 16°25.7	89°26.6 16°37.7	+35.0 15.0 +13.3 55.5
Su 25	308°03.5 9°06.2	322°37.5 9°19.7	337°11.5 9°33.2	351°45.4 9°46.7	6°19.2 10°00.1	20°53.0 10°13.5	35°26.7 10°26.9	50°00.3 10°40.3	64°33.8 10°53.6	79°07.3 11°06.9	93°40.7 11°20.2	+33.7 15.2 +14.3 55.7
Mo 26	311°52.4 14°34.4	326°24.5 14°47.0	340°56.5 14°59.5	355°28.4 15°12.0	10°00.2 15°24.2	24°31.9 15°36.8	39°03.5 15°49.1	53°35.0 16°01.3	68°06.4 16°13.5	82°37.8 16°25.7	97°09.0 16°37.7	+31.7 15.4 +12.3 56.5
Tu 27	314°44.4 19°30.2	329°13.9 19°41.1	343°43.2 19°51.9	358°12.4 20°02.6	12°41.5 20°13.2	27°10.5 20°23.7	41°39.4 20°34.2	56°08.2 20°44.5	70°36.8 20°56.7	85°05.3 21°04.9	99°33.7 21°14.9	+28.9 15.6 +10.5 57.3
We 28	316°24.7 23°32.3	330°51.1 23°40.5	345°17.3 23°48.6	359°43.5 23°56.6	14°09.5 24°04.4	28°35.4 24°12.1	43°01.2 24°19.6	57°26.9 24°27.0	71°52.4 24°34.3	86°17.8 24°41.4	100°43.1 24°48.4	+25.8 15.9 +7.6 58.3
Th 29	316°48.6 26°15.1	331°12.1 26°19.6	345°35.3 26°23.9	359°58.8 26°28.0	14°22.0 26°32.0	28°45.0 26°35.8	43°08.0 26°39.4	57°30.9 26°46.1	71°53.8 26°53.2	86°16.5 26°59.1	100°39.1 26°52.1	+23.0 16.2 +3.7 59.2
Fr 30	316°09.8 27°13.1	330°31.3 27°12.9	344°59.2 27°12.6	359°14.3 27°12.0	13°35.8 27°11.3	27°57.2 27°10.3	42°18.5 27°09.2	56°39.9 27°07.8	71°01.2 27°06.3	85°22.5 27°04.5	99°43.7 27°02.6	+21.4 16.4 -1.0 60.1
Sa 31	315°01.9 26°08.9	329°23.2 26°03.8	343°44.6 25°58.4	358°05.9 25°52.8	12°27.3 25°47.0	26°48.7 25°41.0	41°10.2 25°34.8	55°31.7 25°28.5	69°53.2 25°21.9	84°14.8 25°15.2	98°36.4 25°08.2	+21.4 16.6 -6.1 60.8

Row 1: GHA, Δ' /h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ' /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 4 03h02 — FQ: 10 18h39 — FM: 18 15h44 — LQ: 26 16h54

SUN

August 2027

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Su 1	268°24.2 18°03.5	283°24.2 18°02.9	298°24.3 18°02.3	313°24.3 18°01.6	328°24.3 18°01.0	343°24.4 18°00.4	358°24.4 17°59.7	13°24.5 17°59.1	28°24.5 17°58.5	43°24.5 17°57.9	58°24.6 17°57.2	73°24.6 17°56.6	+0.0 -0.6
Mo 2	268°25.1 17°48.3	283°25.2 17°47.7	298°25.2 17°47.0	313°25.3 17°46.4	328°25.3 17°45.8	343°25.4 17°45.1	358°25.4 17°44.5	13°25.4 17°43.8	28°25.4 17°43.2	43°25.5 17°42.5	58°25.6 17°41.9	73°25.6 17°41.3	+0.0 -0.6
Tu 3	268°26.2 17°32.8	283°26.3 17°32.2	298°26.3 17°31.5	313°26.4 17°30.9	328°26.4 17°30.2	343°26.5 17°29.6	358°26.5 17°28.9	13°26.6 17°28.3	28°26.6 17°27.6	43°26.7 17°27.0	58°26.7 17°26.3	73°26.8 17°25.6	+0.1 -0.7
We 4	268°27.5 17°17.1	283°27.5 17°16.4	298°27.6 17°15.7	313°27.6 17°15.1	328°27.7 17°14.4	343°27.7 17°13.7	358°27.8 17°13.1	13°27.9 17°12.4	28°27.9 17°11.7	43°28.0 17°11.1	58°28.0 17°10.4	73°28.1 17°09.7	+0.1 -0.7
Th 5	268°28.9 17°01.0	283°28.9 17°00.3	298°29.0 16°59.7	313°29.0 16°59.0	328°29.1 16°58.3	343°29.2 16°57.6	358°29.2 16°57.0	13°29.3 16°56.3	28°29.4 16°55.6	43°29.4 16°54.9	58°29.5 16°54.2	73°29.6 16°53.6	+0.1 -0.7
Fr 6	268°30.4 16°44.7	283°30.5 16°44.0	298°30.5 16°43.3	313°30.6 16°42.6	328°30.7 16°41.9	343°30.8 16°41.2	358°30.8 16°40.6	13°30.9 16°39.9	28°31.0 16°39.2	43°31.0 16°38.5	58°31.1 16°37.8	73°31.2 16°37.1	+0.1 -0.7
Sa 7	268°32.1 16°28.1	283°32.2 16°27.4	298°32.3 16°26.7	313°32.3 16°26.0	328°32.4 16°25.3	343°32.5 16°24.6	358°32.6 16°23.9	13°32.6 16°23.2	28°32.7 16°22.5	43°32.8 16°21.8	58°32.9 16°21.1	73°32.9 16°20.4	+0.1 -0.7
Su 8	268°34.0 16°11.2	283°34.0 16°10.5	298°34.1 16°09.8	313°34.2 16°09.1	328°34.3 16°08.4	343°34.4 16°07.7	358°34.4 16°07.0	13°34.5 16°06.3	28°34.6 16°05.6	43°34.7 16°04.8	58°34.8 16°04.1	73°34.9 16°03.4	+0.1 -0.7
Mo 9	268°36.0 15°54.1	283°36.1 15°53.4	298°36.1 15°52.7	313°36.2 15°51.9	328°36.3 15°51.2	343°36.4 15°50.5	358°36.5 15°49.8	13°36.6 15°48.1	28°36.7 15°47.4	43°36.8 15°46.6	58°36.8 15°45.9	73°36.9 15°45.2	+0.1 -0.7
Tu 10	268°38.1 15°36.7	283°38.2 15°36.0	298°38.2 15°35.3	313°38.4 15°34.5	328°38.5 15°33.8	343°38.6 15°33.1	358°38.7 15°32.4	13°38.8 15°31.6	28°38.9 15°30.9	43°39.0 15°30.2	58°39.0 15°29.4	73°39.2 15°28.7	+0.1 -0.7
We 11	268°40.4 15°19.1	283°40.5 15°18.4	298°40.6 15°17.6	313°40.7 15°16.9	328°40.8 15°16.2	343°40.9 15°15.4	358°41.0 15°14.7	13°41.1 15°13.9	28°41.2 15°13.2	43°41.3 15°12.4	58°41.4 15°11.7	73°41.5 15°11.0	+0.1 -0.7
Th 12	268°42.9 15°01.3	283°43.0 15°00.5	298°43.1 15°00.8	313°43.2 14°59.9	328°43.3 14°58.3	343°43.4 14°57.5	358°43.5 14°56.8	13°43.6 14°56.0	28°43.7 14°55.2	43°43.8 14°54.5	58°43.9 14°53.7	73°44.0 14°53.0	+0.1 -0.8
Fr 13	268°45.5 14°43.2	283°45.6 14°42.4	298°45.7 14°41.6	313°45.8 14°40.9	328°45.9 14°40.1	343°46.0 14°39.4	358°46.1 14°38.6	13°46.2 14°37.8	28°46.3 14°37.1	43°46.5 14°36.3	58°46.6 14°35.5	73°46.7 14°34.8	+0.1 -0.8
Sa 14	268°48.2 14°24.8	283°48.3 14°24.1	298°48.4 14°23.3	313°48.6 14°22.5	328°48.7 14°21.7	343°48.8 14°21.0	358°48.9 14°20.2	13°48.9 14°19.4	28°49.0 14°18.7	43°49.1 14°17.9	58°49.4 14°17.1	73°49.5 14°16.3	+0.1 -0.8
Su 15	268°51.1 14°06.3	283°51.2 14°05.5	298°51.3 14°04.7	313°51.4 14°03.9	328°51.6 14°03.2	343°51.7 14°02.4	358°51.8 14°01.6	13°51.9 14°00.8	28°52.1 14°00.0	43°52.2 13°59.2	58°52.3 13°58.5	73°52.4 13°57.7	+0.1 -0.8
Mo 16	268°54.1 13°47.5	283°54.2 13°46.7	298°54.3 13°45.9	313°54.5 13°45.1	328°54.6 13°44.3	343°54.7 13°43.5	358°54.8 13°42.8	13°55.0 13°42.0	28°55.1 13°41.2	43°55.2 13°40.4	58°55.4 13°39.6	73°55.5 13°38.8	+0.1 -0.8
Tu 17	268°57.2 13°28.5	283°57.3 13°27.7	298°57.5 13°26.9	313°57.6 13°26.1	328°57.7 13°25.3	343°57.9 13°24.5	358°58.0 13°23.7	13°58.5 13°22.9	28°58.3 13°22.1	43°58.4 13°21.3	58°58.6 13°20.5	73°58.7 13°19.7	+0.1 -0.8
We 18	269°00.5 13°09.3	284°00.6 13°08.5	299°00.8 13°07.7	314°00.9 13°06.9	329°01.0 13°06.0	344°01.2 13°05.2	359°01.3 13°04.4	14°01.5 13°03.6	29°01.6 13°02.8	44°01.7 13°02.0	59°01.9 13°01.2	74°02.0 13°00.4	+0.1 -0.8
Th 19	269°03.9 12°49.8	284°04.0 12°49.0	299°04.2 12°48.2	314°04.3 12°47.4	329°04.4 12°46.6	344°04.6 12°45.8	359°04.7 12°45.0	14°04.9 12°44.1	29°05.0 12°43.3	44°05.2 12°42.5	59°05.3 12°41.7	74°05.5 12°40.9	+0.1 -0.8
Fr 20	269°07.4 12°30.2	284°07.5 12°29.4	299°07.7 12°28.6	314°07.8 12°27.8	329°08.0 12°26.9	344°08.1 12°26.1	359°08.3 12°25.3	14°08.4 12°24.5	29°08.6 12°23.6	44°08.7 12°22.8	59°08.9 12°22.0	74°09.0 12°21.2	+0.2 -0.8
Sa 21	269°11.0 12°10.4	284°11.2 12°09.6	299°11.3 12°08.7	314°11.5 12°07.9	329°11.6 12°07.1	344°11.8 12°06.2	359°11.9 12°05.4	14°12.1 12°04.6	29°12.4 12°03.8	44°12.5 12°03.0	59°12.7 12°02.2	74°12.7 12°01.7	+0.2 -0.8
Su 22	269°14.8 11°50.4	284°14.9 11°49.5	299°15.1 11°48.7	314°15.2 11°47.9	329°15.4 11°47.0	344°15.6 11°46.2	359°15.7 11°45.3	14°15.9 11°44.5	29°16.0 11°43.7	44°16.2 11°42.8	59°16.3 11°42.0	74°16.5 11°41.1	+0.2 -0.8
Mo 23	269°18.6 11°30.2	284°18.8 11°29.3	299°18.9 11°28.5	314°19.1 11°27.6	329°19.3 11°26.8	344°19.4 11°25.9	359°19.6 11°25.1	14°19.8 11°24.2	29°19.9 11°23.4	44°20.0 11°22.5	59°20.0 11°21.7	74°20.4 11°20.8	+0.2 -0.8
Tu 24	269°22.6 11°09.8	284°22.7 11°08.9	299°22.9 11°08.1	314°23.1 11°07.2	329°23.2 11°06.4	344°23.4 11°05.5	359°23.6 11°04.6	14°23.7 11°03.8	29°23.9 11°02.9	44°24.1 11°02.1	59°24.2 11°01.2	74°24.4 11°00.4	+0.2 -0.9
We 25	269°26.6 10°49.2	284°26.8 10°48.3	299°27.0 10°47.5	314°27.1 10°46.6	329°27.3 10°45.8	344°27.5 10°44.9	359°27.7 10°44.0	14°27.8 10°43.2	29°28.0 10°42.3	44°28.2 10°41.4	59°28.4 10°40.6	74°28.5 10°39.7	+0.2 -0.9
Th 26	269°30.8 10°28.5	284°31.0 10°27.6	299°31.1 10°26.7	314°31.3 10°25.9	329°31.5 10°25.0	344°31.7 10°24.1	359°31.8 10°23.2	14°32.0 10°22.4	29°32.3 10°21.5	44°32.5 10°20.6	59°32.6 10°19.8	74°32.7 10°18.9	+0.2 -0.9
Fr 27	269°35.0 10°07.5	284°35.2 10°06.7	299°35.4 10°05.8	314°35.6 10°04.9	329°35.8 10°04.0	344°35.9 10°03.2	359°36.1 10°02.3	14°36.3 10°01.4	29°36.6 10°00.5	44°36.7 9°59.7	59°36.8 9°58.8	74°37.0 9°57.9	+0.2 -0.9
Sa 28	269°39.4 9°46.5	284°39.6 9°45.6	299°39.8 9°44.7	314°39.9 9°43.8	329°40.1 9°42.9	344°40.3 9°42.1	359°40.5 9°41.2	14°40.7 9°41.2	29°40.9 9°39.4	44°41.0 9°38.5	59°41.0 9°37.6	74°41.4 9°36.8	+0.2 -0.9
Su 29	269°43.8 9°25.2	284°44.0 9°24.4	299°44.2 9°23.5	314°44.4 9°22.6	329°44.6 9°21.7	344°44.8 9°20.8	359°44.9 9°19.9	14°45.1 9°19.0	29°45.4 9°18.1	44°45.5 9°17.2	59°45.5 9°16.3	74°45.9 9°15.5	+0.2 -0.9
Mo 30	269°48.3 9°03.9	284°48.5 9°03.0	299°48.7 9°02.1	314°48.9 9°01.2	329°49.1 9°00.3	344°49.3 8°59.4	359°49.5 8°58.5	14°49.7 8°57.6	29°49.9 8°56.7	44°50.1 8°55.8	59°50.2 8°54.9	74°50.4 8°54.0	+0.2 -0.9
Tu 31	269°52.9 8°42.3	284°53.1 8°41.4	299°53.3 8°40.5	314°53.5 8°39.6	329°53.7 8°38.7	344°53.9 8°37.8	359°54.1 8°36.9	14°54.3 8°36.0	29°54.5 8°35.1	44°54.7 8°34.2	59°54.9 8°33.3	74°55.1 8°32.4	+0.2 -0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.8'

MOON

August 2027

	D	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	Δ'/h	SH
●	Su 1	242°15.8 23°48.4	266°38.0 23°48.4	271°00.4 23°30.2	285°22.8 23°20.9	299°45.3 23°11.3	314°07.9 23°01.7	328°30.6 22°51.8	342°53.3 22°41.8	357°16.2 22°31.6	11°39.1 22°21.2	26°02.1 22°10.7	-22.6 -9.8	16.7 61.1
	Mo 2	241°57.7 19°14.5	266°22.2 19°01.6	270°46.7 18°48.6	285°11.4 18°35.5	299°36.1 18°22.2	314°01.0 18°08.8	328°25.9 17°55.3	342°51.0 17°41.7	357°16.1 17°27.9	11°41.4 17°14.1	26°06.7 17°00.1	-24.9 -13.4	16.7 61.3
	Tu 3	242°38.5 13°18.7	267°05.4 13°03.3	271°32.3 12°47.8	285°59.4 12°32.2	300°26.5 12°16.5	314°53.8 12°00.8	329°21.1 11°45.0	343°48.5 11°29.1	358°16.0 11°13.2	12°43.5 10°57.2	27°11.2 10°41.2	-27.3 -15.8	16.7 61.1
●	We 4	244°15.6 6°35.4	268°44.4 6°18.7	273°13.4 6°02.1	287°42.4 5°45.4	302°11.4 5°28.7	316°40.6 5°12.0	331°09.8 4°55.3	345°39.0 4°38.5	0°08.3 4°21.8	14°37.7 4°05.0	29°07.1 3°48.2	+29.2 -16.7	16.5 60.5
	Th 5	246°34.4 -0°22.6	261°04.6 -0°39.2	275°34.8 -0°55.8	290°05.0 -1°12.4	304°35.3 -1°28.9	319°05.6 -1°45.4	333°35.9 -2°01.9	348°06.3 -2°18.3	2°36.7 -2°34.8	17°07.1 -2°51.1	31°37.5 -3°07.5	+30.3 -16.5	16.3 59.7
	Fr 6	249°16.5 -7°07.3	263°47.2 -7°22.9	278°17.9 -7°38.4	292°48.6 -7°53.9	307°19.3 -8°09.3	321°50.0 -8°24.6	336°20.7 -8°39.9	350°51.4 -8°55.1	5°22.2 -9°10.3	19°52.9 -9°25.3	34°23.6 -9°40.3	+30.7 -15.3	16.0 58.8
●	Sa 7	252°03.6 -13°16.5	266°34.2 -13°30.2	281°04.7 -13°43.9	295°35.3 -13°57.5	310°05.8 -14°11.0	324°36.3 -14°24.4	339°06.8 -14°37.7	353°37.2 -14°50.9	8°07.7 -15°04.1	22°38.1 -15°17.1	37°08.5 -15°30.1	+30.5 -13.4	15.8 57.8
	Su 8	254°41.4 -18°32.4	269°11.4 -18°43.8	283°41.4 -18°55.0	298°11.3 -19°06.1	312°41.2 -19°17.1	327°11.0 -19°28.0	341°40.9 -19°38.8	356°10.6 -19°49.4	10°40.4 -20°00.0	25°10.1 -20°10.4	39°39.8 -20°20.8	+29.8 -10.8	15.5 56.9
	Mo 9	257°01.5 -22°41.5	271°30.7 -22°50.0	285°59.9 -22°58.3	300°29.9 -23°06.4	314°58.1 -23°14.5	329°27.2 -23°22.4	343°56.3 -23°30.2	358°25.3 -23°37.8	12°54.3 -23°45.3	27°23.2 -23°52.7	41°52.1 -24°00.0	+29.1 -7.8	15.3 56.0
●	Tu 10	259°03.1 -25°33.4	273°31.7 -25°38.5	288°00.3 -25°43.6	302°28.8 -25°48.5	316°57.3 -25°53.2	331°25.8 -25°57.8	345°54.3 -26°02.3	0°22.7 -26°06.6	14°51.2 -26°10.9	29°19.6 -26°14.4	43°48.1 -26°18.9	+28.5 -4.5	15.1 55.3
	We 11	260°53.9 -27°01.4	275°22.5 -27°03.1	289°50.7 -27°04.7	304°19.1 -27°06.1	318°47.5 -27°07.5	333°16.0 -27°08.6	347°44.4 -27°09.7	2°12.8 -27°10.6	16°41.3 -27°11.3	31°09.8 -27°12.0	45°38.3 -27°12.5	+28.4 -1.5	14.9 54.8
	Th 12	263°48.0 -27°03.6	277°16.8 -27°01.9	291°45.7 -27°00.1	306°14.7 -26°58.2	320°43.6 -26°56.2	335°12.6 -26°54.0	349°41.6 -26°51.6	4°10.7 -26°49.2	18°39.8 -26°46.6	33°08.9 -26°43.9	47°38.1 -26°41.1	+29.0 -2.3	14.8 54.4
●	Fr 13	265°01.1 -25°43.5	279°31.1 -25°38.6	294°01.0 -25°33.7	308°31.1 -25°28.6	323°01.1 -25°23.3	337°31.3 -25°18.2	352°01.5 -25°12.8	6°31.7 -25°07.2	21°02.0 -25°01.8	35°32.3 -24°55.9	50°02.8 -24°50.0	+30.2 +5.3	14.8 54.1
	Sa 14	267°45.9 -23°08.9	282°17.2 -23°01.4	296°48.6 -22°53.7	311°20.1 -22°45.9	325°51.6 -22°38.0	340°23.2 -22°30.1	354°54.9 -22°22.0	9°26.2 -22°13.8	23°58.4 -22°05.5	38°30.2 -21°57.2	53°02.1 -21°48.7	+31.6 -8.0	14.7 54.0
	Su 15	271°07.9 -19°31.2	285°40.7 -19°21.3	300°13.6 -19°11.4	314°46.6 -19°01.4	329°19.6 -18°51.3	343°52.7 -18°41.2	358°25.9 -18°30.9	12°59.7 -18°20.6	27°32.3 -18°10.2	42°05.6 -17°59.7	56°39.0 -17°49.2	+33.1 -10.2	14.7 53.9
●	Mo 16	275°05.6 -15°02.8	289°39.8 -14°51.2	304°14.0 -14°39.5	318°48.3 -14°27.8	333°22.6 -14°16.0	347°56.9 -14°04.2	2°31.3 -13°52.3	17°05.7 -13°40.3	31°40.2 -13°28.3	46°14.7 -13°16.3	60°49.7 -13°04.2	+34.4 -11.9	14.7 54.0
	Tu 17	279°31.9 -9°56.6	294°07.0 -9°43.7	308°42.1 -9°30.9	323°17.3 -9°17.9	337°52.5 -9°04.9	352°27.7 -8°51.9	7°02.9 -8°38.9	21°38.1 -8°25.8	36°13.4 -8°12.7	50°48.7 -7°59.5	65°24.0 -7°46.3	+35.2 -13.0	14.8 54.2
	We 18	284°15.6 -4°25.0	298°51.1 -4°11.4	313°26.6 -3°57.7	328°02.2 -3°44.1	342°37.7 -3°30.4	357°13.3 -3°16.7	11°48.8 -3°03.0	26°24.3 -2°49.3	40°59.9 -2°35.9	55°35.4 -2°17.7	70°11.0 -2°08.0	+35.5 -13.7	14.9 54.5
●	Th 19	289°03.1 1°19.9	303°38.4 1°33.8	318°13.8 1°47.7	332°49.1 2°01.6	347°24.4 2°15.5	1°59.7 2°29.4	16°35.0 2°43.3	31°10.2 2°57.1	45°45.4 3°11.0	60°20.6 3°24.9	74°55.7 3°38.8	+35.3 +13.9	14.9 54.8
	Fr 20	293°39.1 7°05.7	308°13.7 7°19.4	322°48.2 7°33.0	337°22.7 7°46.6	351°57.1 8°00.2	6°31.5 8°13.8	21°05.8 8°27.4	35°40.1 8°40.9	50°14.3 8°54.4	64°48.5 9°07.9	79°22.6 9°21.4	+34.4 +13.6	15.1 55.3
	Sa 21	297°47.3 12°39.1	312°20.4 12°52.0	326°53.4 13°04.8	341°26.4 13°17.6	355°59.3 13°30.3	10°32.1 13°43.0	25°04.8 14°08.3	39°37.5 14°20.8	54°10.1 14°33.4	68°42.6 14°45.7	83°15.0 14°58.1	+32.8 +12.7	15.2 55.8
●	Su 22	312°20.4 12°52.0	326°53.4 13°04.8	341°26.4 13°17.6	355°59.3 13°30.3	10°32.1 13°43.0	25°04.8 13°55.7	39°37.5 14°08.3	54°10.1 14°20.8	68°42.6 14°33.4	83°15.0 14°45.7	97°47.4 14°58.1	+32.7 +12.6	15.2 55.8
	Mo 23	315°42.2 17°56.3	330°13.1 18°07.6	344°43.9 18°18.9	359°14.6 18°30.0	13°45.3 18°41.1	28°15.8 18°52.1	42°46.2 19°03.1	57°16.5 19°13.1	71°46.8 19°24.9	86°16.9 19°35.4	100°46.9 19°46.0	+30.5 +11.0	15.4 56.5
	Tu 24	318°04.7 22°13.7	332°33.0 22°22.7	347°01.2 22°31.7	1°29.3 22°40.5	15°57.3 22°49.5	30°25.2 22°57.7	44°53.0 23°06.2	59°20.7 23°14.6	73°48.2 23°22.8	88°15.7 23°30.9	102°43.0 23°38.9	+27.8 +8.5	15.6 57.2
●	We 25	319°20.3 25°22.9	333°46.0 25°28.8	348°11.5 25°28.4	2°37.0 25°40.0	17°02.3 25°45.3	31°27.6 25°50.6	45°52.7 25°55.7	60°17.8 26°00.6	74°42.7 26°05.3	89°07.7 26°10.0	103°32.4 26°14.4	+25.2 +5.2	15.8 58.0
	Th 26	319°33.9 27°01.4	333°57.4 27°03.2	348°20.9 27°03.8	2°44.2 27°06.2	17°07.6 27°07.4	31°30.8 27°08.5	45°54.0 27°09.4	60°17.2 27°10.0	74°40.2 27°10.6	89°03.3 27°10.9	103°26.3 27°11.0	+23.2 +1.0	16.0 58.8
	Fr 27	319°06.9 26°50.7	333°29.4 26°47.9	347°52.0 26°45.8	2°14.5 26°41.6	16°37.0 26°38.1	30°59.5 26°34.5	45°22.0 26°30.7	59°44.5 26°26.7	74°07.0 26°17.2	88°29.5 26°18.1	102°52.1 26°13.6	+22.5 -3.7	16.3 59.6
●	Sa 28	318°32.7 24°42.7	332°55.7 24°35.1	347°18.7 24°27.4	1°41.8 24°19.6	16°04.9 24°11.5	30°28.0 24°03.3	44°51.3 23°54.9	59°14.5 23°46.3	73°37.8 23°37.6	88°01.2 23°28.6	102°24.7 23°19.5	+23.2 -8.6	16.4 60.3
	Su 29	318°23.9 20°43.9	332°48.4 20°32.3	347°13.0 20°20.5	1°37.7 20°08.6	16°02.4 19°56.6	30°27.2 19°44.4	44°52.1 19°32.1	59°17.1 19°19.7	73°42.1 19°07.1	88°07.2 18°54.4	102°32.4 18°41.6	+24.8 -12.2	16.6 60.8
	Mo 30	318°59.8 15°14.8	333°26.3 15°00.1	347°52.8 14°45.4	2°19.4 14°30.5	16°46.1 14°15.6	31°12.8 14°06.6	45°39.7 13°45.5	60°06.6 13°30.3	74°33.5 13°15.0	89°00.6 12°59.6	103°27.7 12°44.2	+26.8 -15.1	16.6 61.0
●	Tu 31	320°22.8 8°44.4	334°51.0 8°28.0	349°19.3 8°11.5	3°47.6 7°55.0	18°15.9 7°38.4	32°44.4 7°21.8	47°12.8 7°05.2	61°41.4 6°48.5	76°09.9 6°31.8	90°38.6 6°15.1	105°07.3 5°58.3	+28.4 -16.6	16.6 60.8

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (— = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 2 10h05 — FQ: 9 04h54 — FM: 17 07h28 — LQ: 25 02h27 — NM: 31 17h41

SUN

September 2027

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
We 1	260°57.6 8°20.7	284°57.8 8°19.8	299°58.0 8°18.8	314°58.2 8°17.9	329°58.4 8°17.0	344°58.6 8°16.1	359°58.8 8°15.2	14°59.0 8°14.3	29°59.0 8°13.4	44°59.4 8°12.5	59°59.6 8°11.6	74°59.8 8°10.7	+0.2 -0.9
Th 2	270°02.4 7°58.9	285°02.6 7°57.9	300°02.8 7°57.0	315°03.0 7°56.1	330°03.2 7°55.2	345°03.4 7°54.3	0°03.6 7°53.4	15°03.8 7°52.5	30°04.0 7°51.6	45°04.2 7°50.7	60°04.4 7°49.7	75°04.6 7°48.8	+0.2 -0.9
Fr 3	270°07.2 7°36.9	285°07.4 7°36.0	300°07.6 7°35.1	315°07.8 7°34.2	330°08.0 7°33.3	345°08.2 7°32.3	0°08.4 7°31.4	15°08.6 7°30.5	30°08.8 7°29.6	45°09.0 7°28.7	60°09.2 7°27.8	75°09.4 7°26.8	+0.2 -0.9
Sa 4	270°12.1 7°14.9	285°12.3 7°14.0	300°12.5 7°13.0	315°12.7 7°12.1	330°12.9 7°11.2	345°13.1 7°10.3	0°13.3 7°09.4	15°13.5 7°08.4	30°13.8 7°07.5	45°14.0 7°06.6	60°14.2 7°05.7	75°14.4 7°04.7	+0.2 -0.9
Su 5	270°17.1 6°52.7	285°17.3 6°51.8	300°17.5 6°50.9	315°17.7 6°49.9	330°17.9 6°49.0	345°18.1 6°48.1	0°18.3 6°47.2	15°18.5 6°46.2	30°18.7 6°45.3	45°18.9 6°44.4	60°19.2 6°43.4	75°19.4 6°42.5	+0.2 -0.9
Mo 6	270°22.1 6°30.4	285°22.3 6°29.5	300°22.5 6°28.6	315°22.7 6°27.6	330°22.9 6°26.7	345°23.1 6°25.8	0°23.4 6°24.9	15°23.6 6°23.9	30°23.8 6°23.0	45°24.0 6°22.1	60°24.2 6°21.1	75°24.4 6°20.2	+0.2 -0.9
Tu 7	270°27.2 6°08.1	285°27.4 6°07.1	300°27.6 6°06.2	315°27.8 6°05.3	330°28.0 6°04.3	345°28.2 6°03.4	0°28.5 6°02.5	15°28.7 6°01.5	30°28.9 6°00.6	45°29.2 5°59.6	60°29.3 5°58.7	75°29.5 5°57.8	+0.2 -0.9
We 8	270°32.3 5°45.6	285°32.5 5°44.6	300°32.7 5°43.7	315°33.0 5°42.8	330°33.2 5°41.8	345°33.4 5°40.9	0°33.6 5°39.9	15°33.8 5°39.0	30°34.0 5°38.1	45°34.3 5°37.1	60°34.5 5°36.2	75°34.7 5°35.2	+0.2 -0.9
Th 9	270°37.5 5°23.0	285°37.7 5°22.1	300°37.9 5°21.1	315°38.1 5°20.2	330°38.4 5°19.2	345°38.6 5°18.3	0°38.8 5°17.3	15°39.0 5°16.4	30°39.2 5°15.5	45°39.5 5°14.5	60°39.7 5°13.6	75°39.9 5°12.6	+0.2 -0.9
Fr 10	270°42.7 5°00.3	285°42.9 4°59.4	300°43.2 4°58.5	315°43.4 4°57.5	330°43.6 4°56.6	345°43.8 4°55.6	0°44.0 4°54.7	15°44.3 4°53.7	30°44.5 4°52.8	45°44.7 4°51.8	60°44.9 4°50.9	75°45.1 4°49.9	+0.2 -0.9
Sa 11	270°48.0 4°37.6	285°48.2 4°36.7	300°48.4 4°35.7	315°48.6 4°34.8	330°48.9 4°33.8	345°49.1 4°32.9	0°49.3 4°31.9	15°49.5 4°31.0	30°49.8 4°30.0	45°50.0 4°29.0	60°50.2 4°28.1	75°50.4 4°27.1	+0.2 -1.0
Su 12	270°53.3 4°14.8	285°53.5 4°13.8	300°53.7 4°12.9	315°53.9 4°11.9	330°54.2 4°11.0	345°54.4 4°10.0	0°54.6 4°09.1	15°54.8 4°08.1	30°55.1 4°07.2	45°55.3 4°06.2	60°55.5 4°05.2	75°55.7 4°04.3	+0.2 -1.0
Mo 13	270°58.6 3°51.9	285°58.8 3°50.9	300°59.1 3°50.0	315°59.3 3°49.0	330°59.5 3°48.1	345°59.7 3°47.1	0°59.9 3°46.1	16°00.2 3°45.2	31°00.4 3°44.2	46°00.6 3°43.3	61°00.8 3°42.3	76°01.1 3°41.4	+0.2 -1.0
Tu 14	271°04.0 3°28.9	286°04.2 3°28.0	301°04.4 3°27.0	316°04.6 3°26.0	331°04.9 3°25.1	346°05.1 3°24.1	1°05.3 3°23.2	16°05.5 3°22.2	31°05.7 3°21.2	46°06.0 3°20.3	61°06.2 3°19.3	76°06.4 3°18.4	+0.2 -1.0
We 15	271°09.3 3°05.9	286°09.6 3°04.9	301°09.8 3°04.0	316°10.0 3°03.0	331°10.2 3°02.0	346°10.4 3°01.1	1°10.7 3°00.1	16°10.9 2°59.2	31°11.1 2°58.2	46°11.3 2°57.2	61°11.6 2°56.3	76°11.8 2°55.3	+0.2 -1.0
Th 16	271°14.7 2°42.8	286°14.9 2°41.8	301°15.2 2°40.9	316°15.4 2°39.9	331°15.6 2°39.0	346°15.8 2°38.0	1°16.0 2°37.0	16°16.3 2°36.1	31°16.5 2°35.1	46°16.7 2°34.1	61°16.9 2°33.2	76°17.2 2°32.2	+0.2 -1.0
Fr 17	271°20.1 2°19.7	286°20.3 2°18.7	301°20.5 2°17.7	316°20.8 2°16.8	331°21.0 2°15.8	346°21.2 2°14.8	1°21.4 2°13.9	16°21.7 2°12.9	31°21.9 2°11.9	46°22.1 2°11.0	61°22.3 2°10.0	76°22.6 2°09.0	+0.2 -1.0
Sa 18	271°25.5 1°56.5	286°25.7 1°55.5	301°25.9 1°54.6	316°26.1 1°53.6	331°26.3 1°52.6	346°26.6 1°51.6	1°26.8 1°50.7	16°27.0 1°49.7	31°27.3 1°48.7	46°27.5 1°47.8	61°27.7 1°46.8	76°27.9 1°45.8	+0.2 -1.0
Su 19	271°30.8 1°33.3	286°31.1 1°32.3	301°31.3 1°31.3	316°31.5 1°30.4	331°31.7 1°29.4	346°31.9 1°28.4	1°32.2 1°27.4	16°32.4 1°26.5	31°32.6 1°25.5	46°33.2 1°24.5	61°33.1 1°23.6	76°33.3 1°22.6	+0.2 -1.0
Mo 20	271°36.2 1°10.0	286°36.4 1°09.0	301°36.7 1°08.1	316°36.9 1°07.1	331°37.1 1°06.1	346°37.3 1°05.1	1°37.5 1°04.2	16°37.8 1°03.2	31°38.3 1°02.2	46°38.2 1°01.3	61°38.4 1°00.3	76°38.7 0°59.3	+0.2 -1.0
Tu 21	271°41.5 0°46.7	286°41.8 0°45.7	301°42.0 0°44.8	316°42.2 0°43.8	331°42.4 0°42.8	346°42.7 0°41.8	1°42.9 0°40.9	16°43.1 0°39.9	31°43.3 0°38.9	46°43.5 0°38.0	61°43.8 0°37.0	76°44.0 0°36.0	+0.2 -1.0
We 22	271°46.9 0°23.4	286°47.1 0°22.4	301°47.3 0°21.4	316°47.5 0°20.5	331°47.8 0°19.5	346°48.0 0°18.5	1°48.2 0°17.5	16°48.4 0°16.6	31°48.6 0°15.6	46°48.9 0°14.6	61°49.1 0°13.7	76°49.3 0°12.7	+0.2 -1.0
Th 23	271°52.2 0°00.0	286°52.4 -0°00.9	301°52.6 -0°01.9	316°52.8 -0°02.9	331°53.0 -0°03.9	346°53.3 -0°04.8	1°53.5 -0°05.8	16°53.7 -0°06.8	31°53.9 -0°07.8	46°54.1 -0°08.7	61°54.4 -0°09.7	76°54.6 -0°10.7	+0.2 -1.0
Fr 24	271°57.4 -0°23.3	286°57.6 -0°24.3	301°57.9 -0°25.3	316°58.1 -0°26.2	331°58.3 -0°27.2	346°58.5 -0°28.2	1°58.7 -0°29.2	16°58.9 -0°30.1	31°59.2 -0°31.1	46°59.4 -0°32.1	61°59.6 -0°33.1	76°59.8 -0°34.0	+0.2 -1.0
Sa 25	272°02.6 -0°46.7	287°02.9 -0°47.7	302°03.1 -0°48.6	317°03.3 -0°49.6	332°03.5 -0°50.6	347°03.7 -0°51.6	2°03.9 -0°52.5	17°04.2 -0°53.5	32°04.4 -0°54.5	47°04.6 -0°55.5	62°04.8 -0°56.4	77°05.0 -0°57.4	+0.2 -1.0
Su 26	272°07.8 -1°10.1	287°08.0 -1°11.0	302°08.2 -1°12.0	317°08.5 -1°13.0	332°08.7 -1°14.0	347°08.9 -1°14.9	2°09.1 -1°15.9	17°09.3 -1°16.9	32°09.5 -1°17.9	47°09.7 -1°18.8	62°10.0 -1°19.8	77°10.2 -1°20.8	+0.2 -1.0
Mo 27	272°12.9 -1°33.4	287°13.1 -1°34.4	302°13.4 -1°35.4	317°13.6 -1°36.4	332°13.8 -1°37.3	347°14.0 -1°38.3	2°14.2 -1°39.3	17°14.4 -1°40.3	32°14.6 -1°41.2	47°14.8 -1°42.2	62°15.1 -1°43.2	77°15.3 -1°44.1	+0.2 -1.0
Tu 28	272°18.0 -1°56.8	287°18.2 -1°57.8	302°18.4 -1°58.7	317°18.6 -1°59.7	332°18.8 -2°00.7	347°19.1 -2°01.7	2°19.3 -2°02.6	17°19.5 -2°03.6	32°19.7 -2°04.6	47°19.7 -2°05.6	62°19.9 -2°06.5	77°20.3 -2°07.5	+0.2 -1.0
We 29	272°23.0 -2°20.1	287°23.2 -2°21.1	302°23.4 -2°22.1	317°23.6 -2°23.1	332°23.8 -2°24.0	347°24.1 -2°25.0	2°24.3 -2°26.0	17°24.5 -2°27.0	32°24.7 -2°27.9	47°24.9 -2°28.9	62°25.1 -2°29.9	77°25.3 -2°30.8	+0.2 -1.0
Th 30	272°28.0 -2°43.5	287°28.2 -2°44.4	302°28.4 -2°45.4	317°28.6 -2°46.4	332°28.8 -2°47.4	347°29.0 -2°48.3	2°29.2 -2°49.3	17°29.4 -2°50.3	32°29.6 -2°51.2	47°29.8 -2°52.2	62°30.0 -2°53.2	77°30.2 -2°54.1	+0.2 -1.0

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.9'

MOON

September 2027

D	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	Δ'/h SH
We 1	235°27.6	249°56.7	264°25.8	278°55.1	293°24.4	307°53.7	322°23.0	336°52.4	351°21.8	5°51.2	20°20.7	+29.3 16.5
	3°26.6	3°06.6	2°52.7	2°35.8	2°18.8	2°01.9	1°44.9	1°28.0	1°11.0	0°54.1	0°37.2	-16.9 60.5
Th 2	237°45.5	252°15.3	266°45.2	281°15.0	295°44.8	310°14.7	324°44.5	339°14.4	353°44.3	8°14.2	22°44.0	+29.9 16.3
	-3°34.4	-3°51.0	-4°07.5	-4°24.0	-4°40.4	-4°56.8	-5°13.1	-5°29.4	-5°45.6	-6°01.8	-6°18.0	-16.4 59.9
Fr 3	240°12.2	254°42.0	269°11.8	283°41.6	298°11.4	312°41.2	327°10.9	341°40.7	356°10.4	10°40.1	25°09.8	+29.8 16.1
	-10°13.1	-10°28.2	-10°43.3	-10°58.2	-11°13.2	-11°28.0	-11°42.7	-11°57.4	-12°12.0	-12°26.5	-12°40.9	-14.8 59.0
Sa 4	242°33.0	257°02.3	271°31.7	286°01.0	300°30.2	314°59.5	329°28.7	343°57.9	358°27.1	12°56.2	27°25.3	+29.2 15.8
	-16°06.0	-16°18.9	-16°31.7	-16°44.4	-16°56.9	-17°09.4	-17°21.8	-17°34.0	-17°46.2	-17°58.2	-18°10.1	-12.4 58.1
Su 5	244°38.6	259°07.2	273°35.9	288°04.5	302°33.0	317°01.6	331°30.1	345°58.6	0°27.0	14°55.5	29°23.9	+28.5 15.6
	-20°54.8	-21°04.8	-21°14.7	-21°24.5	-21°34.1	-21°43.6	-21°53.0	-22°02.2	-22°11.3	-22°20.3	-22°29.2	-9.4 57.1
Mo 6	246°27.1	260°55.1	275°23.2	289°51.2	304°19.2	318°47.2	333°15.1	347°43.1	2°11.0	16°39.0	31°06.9	+28.0 15.3
	-24°25.9	-24°32.6	-24°39.2	-24°45.6	-24°51.9	-24°58.0	-25°04.0	-25°09.9	-25°15.6	-25°21.2	-25°26.6	-6.1 56.2
Tu 7	248°05.0	262°32.8	277°00.7	291°28.6	305°56.4	320°24.3	334°52.2	349°20.1	3°48.1	18°16.0	32°43.9	+27.9 15.1
	-26°31.1	-26°34.3	-26°37.3	-26°40.2	-26°42.9	-26°45.5	-26°47.9	-26°50.3	-26°52.4	-26°54.4	-26°56.3	-2.5 55.4
We 8	249°45.4	264°13.7	278°42.1	293°10.4	307°38.8	322°07.3	336°35.7	351°04.2	5°32.8	20°01.3	34°29.9	+28.4 15.0
	-27°07.7	-27°07.3	-27°06.8	-27°06.2	-27°05.4	-27°04.5	-27°03.5	-27°02.3	-27°01.0	-26°59.6	-26°58.0	+1.0 54.8
Th 9	251°44.3	266°13.7	280°43.0	295°12.5	309°42.0	324°11.5	338°41.1	353°10.8	7°40.5	22°10.3	36°40.1	+29.6 14.8
	-26°18.6	-26°15.0	-26°11.2	-26°07.3	-26°03.3	-25°59.1	-25°54.9	-25°50.5	-25°46.0	-25°41.3	-25°36.6	+4.2 54.4
Fr 10	254°14.5	268°45.2	283°16.1	297°47.0	312°17.9	326°49.0	341°20.0	355°51.2	10°22.4	24°53.7	39°25.0	+31.1 14.8
	-24°11.6	-24°05.0	-23°58.4	-23°51.6	-23°44.7	-23°37.7	-23°30.7	-23°23.5	-23°16.2	-23°08.8	-23°01.3	+7.0 54.1
Sa 11	257°22.4	271°54.7	286°27.1	300°59.5	315°32.0	330°04.5	344°37.1	359°09.9	13°42.5	28°15.3	42°48.1	+32.6 14.7
	-20°57.3	-20°48.3	-20°39.3	-20°30.1	-20°20.8	-20°11.5	-20°02.1	-19°52.5	-19°42.9	-19°33.3	-19°23.5	+9.4 54.0
Su 12	261°07.3	275°41.0	290°14.7	304°48.5	319°22.3	333°56.2	348°30.1	3°04.1	17°38.1	32°12.2	46°34.6	+33.9 14.7
	-16°47.9	-16°36.9	-16°25.9	-16°14.8	-16°03.3	-15°52.4	-15°41.2	-15°29.8	-15°18.4	-15°06.9	-14°55.4	+11.3 54.1
Mo 13	265°22.7	279°57.4	294°32.4	309°06.9	323°41.7	338°16.5	352°51.4	7°26.3	22°01.2	36°36.1	51°11.1	+34.8 14.8
	-11°55.4	-11°43.0	-11°30.5	-11°18.0	-11°05.4	-10°52.8	-10°40.2	-10°27.5	-10°14.7	-10°01.9	-9°49.1	-12.6 54.2
Tu 14	269°05.8	284°33.2	299°05.8	313°43.8	328°19.0	342°54.3	357°29.6	12°04.9	26°40.2	41°15.6	55°50.9	+35.3 14.9
	-6°32.0	-6°18.6	-6°05.1	-5°51.7	-5°38.2	-5°24.7	-5°11.1	-4°57.5	-4°43.9	-4°30.3	-4°16.6	-13.5 54.5
We 15	274°15.4	289°15.6	303°50.8	318°26.1	333°01.3	347°36.4	2°11.6	16°46.8	31°25.9	45°57.0	60°32.1	+35.2 15.0
	-0°49.7	-0°35.7	-0°21.8	-0°07.9	0°06.1	0°20.0	0°33.9	0°47.9	1°01.9	1°15.8	1°29.8	+13.9 54.8
Th 16	279°15.4	293°50.1	308°24.7	322°59.2	337°33.8	352°08.3	6°42.7	21°17.1	35°51.5	50°25.8	65°00.0	+34.5 15.1
	4°59.0	5°12.9	5°26.8	5°40.7	5°54.5	6°08.4	6°22.2	6°36.0	6°49.8	7°03.5	7°17.3	+13.8 55.3
Fr 17	283°28.0	298°01.5	312°34.8	327°08.1	341°41.4	356°14.5	10°47.6	25°20.7	39°53.6	54°26.5	68°59.4	+33.1 15.2
	10°40.3	10°53.6	11°06.8	11°20.0	11°33.2	11°46.3	11°59.4	12°12.4	12°25.4	12°38.4	12°51.3	+13.1 55.7
Sa 18	287°03.1	301°34.7	316°06.2	330°37.7	345°09.0	359°40.3	14°11.5	28°42.6	43°13.7	57°44.6	72°15.5	+31.2 15.3
	15°58.5	16°10.5	16°22.4	16°34.3	16°46.0	16°57.8	17°09.4	17°21.0	17°32.5	17°43.9	17°55.3	+11.7 56.2
Su 19	289°47.3	304°16.7	318°46.0	333°15.1	347°44.2	2°13.2	16°42.1	31°10.9	45°39.6	60°08.2	74°36.7	+28.9 15.5
	20°35.5	20°45.5	20°55.3	21°05.1	21°14.7	21°24.3	21°33.7	21°43.0	21°52.3	22°01.4	22°10.4	+9.5 56.7
Mo 20	291°32.9	305°59.8	320°26.7	334°53.5	349°20.2	3°46.9	18°13.4	32°39.8	47°06.2	61°32.5	75°58.7	+26.6 15.6
	24°11.4	24°18.5	24°25.4	24°32.2	24°38.9	24°45.4	24°51.8	24°58.0	25°04.1	25°10.1	25°15.9	+6.5 57.3
Tu 21	305°59.8	320°26.7	334°53.5	349°20.2	3°46.9	18°13.4	32°39.8	47°06.2	61°32.5	75°58.7	90°24.8	+26.5 15.6
	24°18.5	24°25.4	24°32.2	24°38.9	24°45.4	24°51.8	24°58.0	25°04.1	25°10.1	25°15.9	25°21.6	+6.3 57.3
We 22	306°46.7	321°11.6	335°36.4	350°01.2	4°25.9	18°50.5	33°15.1	47°39.6	62°04.1	76°28.5	90°52.9	+24.6 15.7
	26°28.8	26°32.0	26°35.1	26°38.0	26°40.7	26°43.3	26°45.7	26°47.9	26°50.0	26°51.9	26°53.7	+2.5 57.9
Th 23	306°53.5	321°17.3	335°41.0	350°04.8	4°28.5	18°52.3	33°16.0	47°39.7	62°03.4	76°27.1	90°50.8	+23.7 16.0
	26°59.1	26°58.1	26°56.9	26°55.5	26°53.9	26°52.1	26°50.2	26°48.1	26°45.8	26°43.4	26°40.8	-1.8 58.6
Fr 24	306°47.3	321°11.2	335°35.1	349°59.1	4°23.1	18°47.1	33°11.2	47°35.3	61°59.4	76°23.6	90°47.8	+24.1 16.1
	25°40.1	25°34.6	25°29.0	25°23.2	25°17.2	25°11.1	25°04.8	24°58.3	24°51.7	24°44.9	24°37.9	-6.2 59.1
Sa 25	306°57.0	321°22.0	335°47.1	350°12.3	4°37.5	19°02.8	33°28.2	47°53.6	62°19.1	76°44.1	91°10.2	+25.3 16.3
	22°33.8	22°24.2	22°14.6	22°04.7	21°54.8	21°44.7	21°34.4	21°24.0	21°13.4	21°02.8	20°51.9	-10.2 59.7
Su 26	307°42.3	322°09.0	336°35.7	351°02.5	5°29.4	19°56.4	34°23.4	48°50.4	63°17.6	77°44.8	92°12.1	+27.0 16.4
	17°53.7	17°40.9	17°27.9	17°14.8	17°01.6	16°48.3	16°34.9	16°21.4	16°07.7	15°54.0	15°40.0	-13.4 60.0
Mo 27	309°08.6	323°36.9	338°05.1	352°33.5	7°01.9	21°30.4	35°58.9	50°27.4	64°56.0	79°24.7	93°53.4	+28.5 16.4
	12°01.8	11°46.6	11°31.3	11°15.9	11°00.5	10°45.0	10°29.5	10°13.9	9°58.2	9°42.5	9°26.7	-15.5 60.3
Tu 28	311°09.1	325°38.5	340°07.9	354°37.3	9°06.7	23°36.2	38°05.7	52°35.2	67°04.8	81°34.4	96°04.0	+29.5 16.4
	5°24.3	5°07.8	4°51.3	4°34.8	4°18.3	4°01.8	3°45.2	3°28.6	3°12.0	2°55.4	2°38.8	-16.6 60.2
We 29	313°30.1	327°59.9	342°29.7	356°59.6	11°29.4	25°59.3	40°29.1	54°59.0	69°28.8	83°58.7	98°28.5	+29.8 16.3
	-1°30.9	-1°47.4	-2°04.0	-2°20.5	-2°37.9	-2°53.5	-3°10.0	-3°26.5	-3°42.9	-3°59.3	-4°15.6	-16.5 59.9
Th 30	315°55.3	330°25.0	344°54.6	359°24.3	13°53.9	28°23.5	42°53.1	57°22.7	71°52.2	86°21.7	100°51.2	+29.6 16.2
	-8°16.0	-8°31.6	-8°47.2	-9°02.7	-9°18.1	-9°33.5	-9°48.8	-10°04.1	-10°19.2	-10°34.3	-10°49.4	-15.3 59.4

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 7 18h31 — FM: 15 23h03 — LQ: 23 10h20 — NM: 30 02h36

SUN

October 2027

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Fr 1	257°32.7 -3°05.8	272°32.9 -3°06.8	287°33.1 -3°07.7	302°33.3 -3°08.7	317°33.5 -3°09.7	332°33.7 -3°10.6	347°33.9 -3°11.6	2°34.1 -3°12.6	17°34.3 -3°13.6	32°34.5 -3°14.5	47°34.7 -3°15.5	62°34.9 -3°16.5	+0.2 -1.0
Sa 2	257°37.5 -3°29.1	272°37.7 -3°30.0	287°37.9 -3°31.0	302°38.1 -3°32.0	317°38.3 -3°32.9	332°38.5 -3°33.9	347°38.7 -3°34.9	2°38.9 -3°35.8	17°39.1 -3°36.8	32°39.3 -3°37.8	47°39.5 -3°38.7	62°39.7 -3°39.7	+0.2 -1.0
Su 3	257°42.2 -3°52.3	272°42.4 -3°53.2	287°42.6 -3°54.2	302°42.8 -3°55.2	317°43.0 -3°56.1	332°43.2 -3°57.1	347°43.4 -3°58.1	2°43.6 -3°59.0	17°43.8 -4°00.0	32°44.0 -4°01.0	47°44.2 -4°01.9	62°44.4 -4°02.9	+0.2 -1.0
Mo 4	257°46.9 -4°15.5	272°47.1 -4°16.4	287°47.3 -4°17.4	302°47.5 -4°18.4	317°47.6 -4°19.3	332°47.8 -4°20.3	347°48.0 -4°21.2	2°48.2 -4°22.2	17°48.4 -4°23.2	32°48.6 -4°24.1	47°48.8 -4°25.1	62°49.0 -4°26.1	+0.2 -1.0
Tu 5	257°51.5 -4°38.6	272°51.7 -4°39.5	287°51.8 -4°40.5	302°52.0 -4°41.5	317°52.2 -4°42.4	332°52.4 -4°43.4	347°52.6 -4°44.4	2°52.8 -4°45.3	17°53.0 -4°46.3	32°53.2 -4°47.2	47°53.3 -4°48.2	62°53.5 -4°49.2	+0.2 -1.0
We 6	257°56.0 -5°01.7	272°56.1 -5°02.6	287°56.3 -5°03.6	302°56.5 -5°04.5	317°56.7 -5°05.5	332°56.9 -5°06.4	347°57.1 -5°07.4	2°57.3 -5°08.4	17°57.4 -5°09.3	32°57.6 -5°10.3	47°57.8 -5°11.2	62°58.0 -5°12.2	+0.2 -1.0
Th 7	258°00.4 -5°24.7	273°00.5 -5°25.6	288°00.7 -5°26.6	303°00.9 -5°27.5	318°01.1 -5°28.5	333°01.3 -5°29.4	348°01.4 -5°30.4	3°01.6 -5°31.3	18°01.8 -5°32.3	33°02.0 -5°33.3	48°02.2 -5°34.2	63°02.3 -5°35.2	+0.2 -1.0
Fr 8	258°04.7 -5°47.6	273°04.8 -5°48.5	288°05.0 -5°49.5	303°05.2 -5°50.4	318°05.4 -5°51.4	333°05.6 -5°52.4	348°05.7 -5°53.3	3°05.9 -5°54.3	18°06.1 -5°55.2	33°06.3 -5°56.2	48°06.4 -5°57.1	63°06.6 -5°58.1	+0.2 -1.0
Sa 9	258°09.2 -6°10.4	273°09.0 -6°11.4	288°09.2 -6°12.3	303°09.4 -6°13.3	318°09.6 -6°14.2	333°09.7 -6°15.2	348°09.9 -6°16.1	3°10.1 -6°17.1	18°10.3 -6°18.0	33°10.4 -6°19.0	48°10.6 -6°19.9	63°10.8 -6°20.9	+0.2 -0.9
Su 10	258°13.0 -6°33.2	273°13.1 -6°34.2	288°13.3 -6°35.1	303°13.5 -6°36.0	318°13.6 -6°37.0	333°13.8 -6°37.9	348°14.0 -6°38.9	3°14.1 -6°39.8	18°14.3 -6°40.8	33°14.5 -6°41.7	48°14.7 -6°42.6	63°14.8 -6°43.6	+0.2 -0.9
Mo 11	258°17.0 -6°55.9	273°17.1 -6°56.8	288°17.3 -6°57.8	303°17.5 -6°58.7	318°17.6 -6°59.7	333°17.8 -7°00.6	348°17.9 -7°01.5	3°18.1 -7°02.5	18°18.3 -7°03.4	33°18.4 -7°04.4	48°18.6 -7°05.3	63°18.8 -7°06.3	+0.2 -0.9
Tu 12	258°20.8 -7°18.5	273°21.0 -7°19.4	288°21.2 -7°20.4	303°21.3 -7°21.3	318°21.5 -7°22.2	333°21.6 -7°23.2	348°21.8 -7°24.1	3°21.9 -7°25.0	18°22.1 -7°26.0	33°22.3 -7°26.9	48°22.4 -7°27.9	63°22.6 -7°28.8	+0.2 -0.9
We 13	258°24.6 -7°41.0	273°24.7 -7°41.9	288°24.9 -7°42.8	303°25.0 -7°43.8	318°25.2 -7°44.7	333°25.3 -7°45.6	348°25.5 -7°46.6	3°25.7 -7°47.5	18°25.8 -7°48.4	33°26.0 -7°49.4	48°26.1 -7°50.3	63°26.3 -7°51.2	+0.2 -0.9
Th 14	258°28.2 -8°03.3	273°28.4 -8°04.3	288°28.5 -8°05.2	303°28.6 -8°06.1	318°28.8 -8°07.1	333°28.9 -8°08.0	348°29.1 -8°08.9	3°29.2 -8°09.9	18°29.4 -8°10.8	33°29.5 -8°11.7	48°29.7 -8°12.6	63°29.8 -8°13.6	+0.2 -0.9
Fr 15	258°31.7 -8°25.6	273°31.8 -8°26.5	288°32.0 -8°27.5	303°32.1 -8°28.4	318°32.3 -8°29.3	333°32.4 -8°30.2	348°32.5 -8°31.2	3°32.7 -8°32.1	18°32.8 -8°33.0	33°33.1 -8°33.9	48°33.1 -8°34.9	63°33.2 -8°35.8	+0.1 -0.9
Sa 16	258°35.0 -8°47.8	273°35.2 -8°48.7	288°35.3 -8°49.6	303°35.5 -8°50.5	318°35.6 -8°51.4	333°35.7 -8°52.4	348°35.9 -8°53.3	3°36.0 -8°54.2	18°36.1 -8°55.1	33°36.3 -8°56.0	48°36.4 -8°57.0	63°36.5 -8°57.9	+0.1 -0.9
Su 17	258°38.2 -9°09.8	273°38.4 -9°10.7	288°38.5 -9°11.6	303°38.6 -9°12.5	318°38.8 -9°13.5	333°38.9 -9°14.4	348°39.0 -9°15.3	3°39.2 -9°16.2	18°39.3 -9°17.1	33°39.4 -9°18.0	48°39.5 -9°18.9	63°39.7 -9°19.8	+0.1 -0.9
Mo 18	258°41.3 -9°31.7	273°41.4 -9°32.6	288°41.6 -9°33.5	303°41.7 -9°34.4	318°41.8 -9°35.3	333°41.9 -9°36.2	348°42.0 -9°37.1	3°42.2 -9°38.1	18°42.3 -9°39.0	33°42.4 -9°39.9	48°42.5 -9°40.8	63°42.7 -9°41.7	+0.1 -0.9
Tu 19	258°44.2 -9°53.5	273°44.3 -9°54.4	288°44.4 -9°55.3	303°44.6 -9°56.2	318°44.7 -9°57.1	333°44.8 -9°58.0	348°44.9 -9°58.9	3°45.0 -9°59.8	18°45.1 -10°00.7	33°45.3 -10°01.6	48°45.4 -10°02.5	63°45.5 -10°03.4	+0.1 -0.9
We 20	258°47.0 -10°15.1	273°47.1 -10°16.0	288°47.2 -10°16.9	303°47.3 -10°17.8	318°47.4 -10°18.7	333°47.5 -10°19.6	348°47.6 -10°20.5	3°47.7 -10°21.4	18°47.8 -10°22.2	33°47.9 -10°23.1	48°48.1 -10°24.0	63°48.2 -10°24.9	+0.1 -0.9
Th 21	258°49.5 -10°36.5	273°49.6 -10°37.4	288°49.8 -10°38.3	303°49.9 -10°39.2	318°50.0 -10°40.1	333°50.1 -10°41.0	348°50.2 -10°41.9	3°50.3 -10°42.8	18°50.4 -10°43.7	33°50.5 -10°44.6	48°50.6 -10°45.4	63°50.7 -10°46.3	+0.1 -0.9
Fr 22	258°52.0 -10°57.9	273°52.1 -10°58.7	288°52.2 -10°59.6	303°52.2 -11°00.5	318°52.3 -11°01.4	333°52.4 -11°02.3	348°52.5 -11°03.2	3°52.6 -11°04.1	18°52.7 -11°04.9	33°52.8 -11°05.8	48°52.9 -11°06.7	63°53.0 -11°07.6	+0.1 -0.9
Sa 23	258°54.2 -11°19.0	273°54.3 -11°19.9	288°54.4 -11°20.8	303°54.5 -11°21.7	318°54.6 -11°22.6	333°54.6 -11°23.4	348°54.7 -11°24.3	3°54.8 -11°25.2	18°54.9 -11°26.0	33°55.0 -11°26.9	48°55.1 -11°27.8	63°55.2 -11°28.7	+0.1 -0.9
Su 24	258°56.3 -11°40.0	273°56.3 -11°40.9	288°56.4 -11°41.7	303°56.5 -11°42.6	318°56.6 -11°43.5	333°56.7 -11°44.4	348°56.8 -11°45.2	3°56.8 -11°46.1	18°56.9 -11°47.0	33°57.0 -11°47.8	48°57.1 -11°48.7	63°57.2 -11°49.6	+0.1 -0.9
Mo 25	258°58.2 -12°00.8	273°58.2 -12°01.7	288°58.3 -12°02.5	303°58.4 -12°03.4	318°58.4 -12°04.3	333°58.5 -12°05.1	348°58.6 -12°06.0	3°58.7 -12°06.9	18°58.7 -12°07.7	33°58.8 -12°08.6	48°58.9 -12°09.4	63°59.0 -12°10.3	+0.1 -0.9
Tu 26	258°59.9 -12°21.4	273°59.9 -12°22.3	289°00.0 -12°23.2	304°00.1 -12°24.0	319°00.1 -12°24.9	334°00.2 -12°25.7	349°00.2 -12°26.6	4°00.3 -12°27.4	19°00.4 -12°28.3	34°00.4 -12°29.1	49°00.5 -12°30.0	64°00.6 -12°30.8	+0.1 -0.9
We 27	258°01.4 -12°41.9	274°01.4 -12°42.7	289°01.5 -12°43.6	304°01.5 -12°44.4	319°01.6 -12°45.3	334°01.7 -12°46.1	349°01.7 -12°47.0	4°01.8 -12°47.8	19°01.8 -12°48.7	34°01.9 -12°49.5	49°01.9 -12°50.3	64°02.0 -12°51.2	+0.1 -0.8
Th 28	258°02.7 -13°02.1	274°02.8 -13°03.0	289°02.8 -13°03.8	304°02.9 -13°04.6	319°02.9 -13°05.5	334°03.0 -13°06.3	349°03.0 -13°07.2	4°03.1 -13°08.0	19°03.1 -13°08.8	34°03.1 -13°09.7	49°03.2 -13°10.5	64°03.2 -13°11.3	+0.0 -0.8
Fr 29	258°03.8 -13°22.2	274°03.9 -13°23.0	289°03.9 -13°23.8	304°04.0 -13°24.7	319°04.0 -13°25.5	334°04.1 -13°26.3	349°04.1 -13°27.1	4°04.1 -13°28.0	19°04.2 -13°28.8	34°04.2 -13°29.6	49°04.3 -13°30.4	64°04.3 -13°31.3	+0.0 -0.8
Sa 30	258°04.8 -13°42.0	274°04.8 -13°43.0	289°04.9 -13°43.6	304°04.9 -13°44.5	319°04.9 -13°45.3	334°05.0 -13°46.1	349°05.0 -13°47.0	4°05.0 -13°47.8	19°05.1 -13°48.6	34°05.1 -13°49.4	49°05.1 -13°50.2	64°05.2 -13°51.0	+0.0 -0.8
Su 31	258°05.5 -14°01.6	274°05.6 -14°02.4	289°05.6 -14°03.2	304°05.6 -14°04.0	319°05.6 -14°04.9	334°05.7 -14°05.7	349°05.7 -14°06.5	4°05.7 -14°07.3	19°05.7 -14°08.1	34°05.8 -14°08.9	49°05.8 -14°09.7	64°05.8 -14°10.5	+0.0 -0.8

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ°/h = dec. change

Semi-diameter: 16.0'

MOON

October 2027

	D	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	Δ/h	SH
Fr 1	245°44.8	260°14.0	274°43.1	289°12.3	303°41.4	318°10.4	332°39.5	347°08.5	1°37.4	16°06.4	30°35.3	+29.1	16.0	
	-13°15.5	-13°29.7	-13°43.7	-13°57.7	-14°11.6	-14°25.4	-14°39.1	-14°52.7	-15°06.2	-15°19.6	-15°33.0	-13°7.8		
Sa 2	247°44.6	262°13.0	276°41.3	291°09.5	305°37.7	320°05.9	334°34.1	349°02.2	3°30.3	17°58.4	32°26.4	+28.2	15.8	
	-18°40.0	-18°51.6	-19°03.0	-19°14.4	-19°25.6	-19°36.7	-19°47.7	-19°58.5	-20°09.2	-20°19.8	-20°30.3	-11.0	58.0	
Su 3	249°22.8	263°50.3	278°17.8	292°45.2	307°12.7	321°40.1	336°07.1	350°34.9	5°02.3	19°29.6	33°56.6	+27.4	15.6	
	-22°51.7	-23°00.0	-23°08.2	-23°16.3	-23°24.2	-23°32.0	-23°39.6	-23°47.1	-23°54.5	-24°01.7	-24°08.8	-7.7	57.1	
Mo 4	250°45.0	265°12.1	279°39.2	294°06.4	308°33.5	323°00.6	337°27.8	351°54.9	6°22.0	20°49.2	35°16.3	+27.1	15.3	
	-25°37.5	-25°42.2	-25°46.8	-25°51.3	-25°55.6	-25°59.7	-26°03.7	-26°07.6	-26°11.3	-26°14.8	-26°18.2	-4.1	56.3	
Tu 5	252°05.4	266°32.8	281°00.3	295°27.8	309°55.3	324°22.9	338°50.5	353°18.1	7°45.7	22°13.4	36°41.2	+27.6	15.1	
	-26°51.6	-26°52.6	-26°53.5	-26°54.3	-26°54.9	-26°55.4	-26°55.7	-26°55.9	-26°56.0	-26°55.9	-26°55.6	-0.4	55.5	
We 6	253°42.3	268°10.7	282°39.2	297°07.8	311°36.4	326°05.1	340°33.8	355°02.6	8°31.5	24°00.4	38°29.3	+28.7	15.0	
	-26°35.4	-26°32.9	-26°30.4	-26°27.6	-26°24.8	-26°21.9	-26°18.8	-26°15.5	-26°12.2	-26°08.7	-26°05.1	-3.0	54.9	
Th 7	255°51.3	270°21.3	284°51.4	299°21.5	313°51.7	328°21.9	342°52.3	357°22.6	11°53.1	26°23.6	40°54.2	+30.3	14.9	
	-24°56.4	-24°50.8	-24°45.2	-24°39.5	-24°33.6	-24°27.6	-24°21.5	-24°15.3	-24°09.0	-24°02.6	-23°56.1	-6.0	54.5	
Fr 8	258°41.3	273°13.0	287°44.7	302°16.5	316°48.4	331°20.4	345°52.4	0°24.5	14°56.6	29°28.8	44°01.1	+32.0	14.8	
	-22°06.0	-21°57.8	-21°49.6	-21°41.3	-21°32.9	-21°24.4	-21°15.8	-21°07.1	-20°58.4	-20°49.5	-20°40.6	-8.5	54.2	
Sa 9	262°12.5	276°45.7	291°19.0	305°52.4	320°25.8	334°59.2	349°32.7	4°06.3	18°39.9	33°13.5	47°47.3	+33.5	14.8	
	-18°16.7	-18°06.5	-17°56.2	-17°45.8	-17°35.4	-17°24.9	-17°14.3	-17°03.6	-16°52.9	-16°42.1	-16°31.3	-10.5	54.1	
Su 10	266°18.5	280°52.9	295°27.3	310°01.8	324°36.4	339°10.9	353°45.5	8°20.1	22°54.8	37°29.5	52°04.2	+34.6	14.8	
	-13°40.9	-13°29.0	-13°17.1	-13°05.2	-12°53.2	-12°41.1	-12°29.0	-12°16.9	-12°04.7	-11°52.4	-11°40.1	-12.1	54.2	
Mo 11	270°48.2	285°23.3	299°58.4	314°33.6	329°08.7	343°43.9	358°19.0	12°54.2	27°29.4	42°04.6	56°39.8	+35.2	14.9	
	-8°30.0	-8°17.0	-8°04.0	-7°50.9	-7°37.8	-7°24.6	-7°11.5	-6°58.2	-6°45.0	-6°31.7	-6°18.4	-13.2	54.5	
Tu 12	275°28.3	290°03.5	304°38.7	319°13.9	333°49.0	348°24.2	362°56.8	2°59.4	17°34.5	32°09.6	46°44.7	+61.9	18.8	
	-2°55.3	-2°41.6	-2°27.8	-2°14.1	-2°00.3	-1°46.5	-1°32.7	-1°18.8	-1°05.0	-0°51.1	-0°37.3	-13.8	54.0	
We 13	280°03.6	294°38.3	309°13.0	323°47.6	338°22.2	352°56.8	367°10.0	7°31.3	22°05.7	36°40.2	51°14.6	+65.8	49.8	
	2°51.7	3°05.7	3°19.7	3°33.6	3°47.6	4°01.5	4°15.5	4°29.4	4°43.3	4°57.2	5°11.2	+13.9	55.3	
Th 14	284°18.6	298°52.2	313°25.6	327°59.1	342°32.5	357°05.8	11°39.0	26°12.2	40°45.3	55°18.4	69°51.4	+33.3	15.2	
	8°38.0	8°51.6	9°05.2	9°18.8	9°32.4	9°45.9	9°59.4	10°12.8	10°26.2	10°39.6	10°52.9	+13.3	55.9	
Fr 15	287°57.6	302°29.4	317°01.1	331°32.8	346°04.3	360°35.8	15°07.2	29°38.5	44°09.8	58°40.9	73°11.9	+31.4	15.4	
	14°08.0	14°20.6	14°33.2	14°45.7	14°58.1	15°10.5	15°22.8	15°35.0	15°47.2	15°59.3	16°11.4	+12.3	56.4	
Sa 16	290°46.9	305°16.5	319°46.0	334°15.4	348°44.4	363°13.9	17°43.0	32°12.0	46°41.0	61°09.8	75°38.8	+29.2	15.5	
	19°03.1	19°13.9	19°24.6	19°35.2	19°45.7	19°56.2	20°06.5	20°16.7	20°26.8	20°36.8	20°46.8	+10.4	56.9	
Su 17	292°37.9	307°05.1	321°32.5	335°59.3	350°26.7	364°53.0	19°19.8	33°46.4	48°13.0	62°39.5	77°05.9	+26.8	15.7	
	23°02.2	23°10.3	23°18.3	23°26.1	23°33.8	23°41.4	23°48.8	23°56.1	24°03.3	24°10.3	24°17.2	+7.5	57.4	
Mo 18	293°32.1	307°57.2	322°32.5	336°47.3	351°20.4	365°44.4	5°37.2	20°02.0	34°26.8	48°51.5	63°16.1	+77.0	47.9	
	25°43.3	25°47.9	25°52.2	25°56.5	26°00.5	26°04.4	26°08.2	26°11.7	26°15.2	26°18.4	26°21.5	+38.5	57.9	
Tu 19	293°44.6	308°08.5	322°32.5	336°56.5	351°20.4	365°44.4	5°44.3	20°08.2	34°32.1	48°56.0	63°19.9	+77.4	48.3	
	26°47.7	26°48.0	26°48.2	26°48.3	26°48.1	26°47.8	26°47.3	26°46.6	26°45.8	26°44.8	26°43.6	-0.4	58.3	
We 20	308°08.5	322°32.5	336°56.5	351°20.4	365°44.4	20°08.2	34°32.1	48°56.0	63°19.9	77°43.8	92°07.6	+23.9	15.9	
	26°48.0	26°48.2	26°48.3	26°48.1	26°47.8	26°47.3	26°46.6	26°45.8	26°44.8	26°43.6	26°42.2	-0.6	58.3	
Th 21	308°06.7	322°30.8	336°54.9	351°19.1	365°13.9	20°07.5	34°31.8	48°56.1	63°20.4	77°44.8	92°09.2	+24.2	16.0	
	26°00.8	25°56.7	25°52.4	25°47.9	25°43.2	25°38.4	25°33.4	25°28.3	25°22.9	25°17.5	25°11.8	-4.9	58.7	
Fr 22	308°21.7	322°47.0	337°12.4	351°37.8	366°03.3	20°28.8	34°54.5	49°20.1	63°45.9	78°11.7	92°37.6	+25.6	16.1	
	23°27.8	23°19.6	23°11.3	23°02.8	22°54.2	22°45.5	22°36.5	22°27.5	22°18.3	22°09.0	21°59.5	-8.8	59.0	
Sa 23	309°14.5	323°41.5	338°08.6	352°35.8	367°03.0	21°30.3	35°57.7	50°25.2	64°52.7	79°20.3	93°48.4	+27.4	16.2	
	19°21.6	19°10.1	18°58.4	18°46.7	18°34.8	18°22.8	18°10.7	17°58.5	17°46.2	17°33.8	17°21.3	-12.0	59.2	
Su 24	310°51.3	325°20.0	339°48.8	354°17.7	368°46.6	23°15.5	37°44.6	52°13.6	66°42.8	81°12.0	95°41.2	+29.0	16.2	
	14°01.9	13°47.9	13°33.9	13°19.7	13°05.5	12°51.2	12°36.8	12°22.4	12°07.9	11°53.3	11°38.6	-14.3	59.4	
Mo 25	313°05.8	327°35.7	342°05.8	356°35.8	369°05.9	25°36.0	40°06.2	54°36.4	69°06.6	83°36.6	98°07.1	+30.1	16.2	
	7°51.8	7°36.3	7°20.8	7°05.2	6°49.5	6°33.9	6°18.1	6°02.4	5°46.6	5°30.8	5°15.0	-15.7	59.4	
Tu 26	315°43.8	330°14.3	344°44.9	359°15.5	373°46.5	28°16.7	42°47.3	57°17.9	71°48.5	86°19.1	100°49.7	+30.6	16.2	
	1°15.1	0°59.1	0°43.0	0°26.9	0°10.8	-0°05.3	-0°21.4	-0°37.4	-0°53.5	-1°09.6	-1°25.6	-16.1	59.3	
We 27	318°28.2	332°58.6	347°29.1	1°59.5	16°29.9	31°00.3	45°30.7	60°01.0	74°31.3	89°01.6	103°31.9	+30.4	16.1	
	-5°24.2	-5°09.9	-5°55.6	-6°11.2	-6°26.8	-6°42.4	-6°57.9	-7°13.3	-7°28.7	-7°44.1	-7°59.4	-15.5	59.1	
Th 28	321°02.4	335°32.1	350°01.8	4°31.9	19°01.2	33°30.8	48°00.3	62°29.8	76°59.3	91°28.8	105°58.8	+29.6	16.0	
	-11°42.6	-11°57.0	-12°11.3	-12°25.5	-12°39.5	-12°53.7	-13°07.7	-13°21.6	-13°35.4	-13°49.2	-14°02.9	-14.0	58.6	
Fr 29	323°13.6	337°42.3	352°10.9	6°39.5	21°08.0	35°36.5	50°04.9	64°33.3	79°01.6	93°29.9	107°58.8	+28.4	15.8	
	-17°16.9	-17°29.1	-17°41.1	-17°53.1	-18°04.9	-18°16.6	-18°28.2	-18°39.7	-18°51.9	-19°02.4	-19°13.5	-11.7	58.1	
Sa 30	324°56.2	339°23.7	353°51.2	8°18.7	22°46.1	37°13.5	51°40.8	66°08.1	80°35.4	95°02.6	109°29.8	+27.4	15.7	
	-21°46.3	-21°55.5	-22°04.5	-22°13.4	-22°22.2	-22°30.8	-22°39.3	-22°47.8	-22°55.9	-23°03.9	-23°11.9	-8.6	57.4	
Su 31	326°14.4	340°41.2	355°08.0	9°34.7	24°01.5	38°28.2	52°54.9	67°21.7	81°48.4	96°15.1	110°41.8	+26.7	15.5	
	-24°53.9	-24°59.5	-25°05.0	-25°10.4	-25°15.6	-25°20.6	-25°25.5	-25°30.2	-25°34.8	-25°39.3	-25°43.5	-5.0	56.6	

SUN

November 2027

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Mo 1	259°06.1 -14°21.0	274°06.1 -14°21.8	289°06.1 -14°22.6	304°06.2 -14°23.4	319°06.2 -14°24.2	334°06.2 -14°25.0	349°06.2 -14°25.8	4°06.2 -14°26.6	15°06.2 -14°27.4	34°06.3 -14°28.2	45°06.3 -14°29.0	64°06.3 -14°29.8	+0.0 -0.8
Tu 2	259°06.5 -14°40.2	274°06.5 -14°40.9	289°06.5 -14°41.7	304°06.5 -14°42.5	319°06.5 -14°43.3	334°06.5 -14°44.1	349°06.5 -14°44.9	4°06.5 -14°45.7	15°06.5 -14°46.5	34°06.5 -14°47.3	45°06.6 -14°48.1	64°06.6 -14°48.9	+0.0 -0.8
We 3	259°06.6 -14°59.1	274°06.6 -14°59.9	289°06.6 -15°00.6	304°06.6 -15°01.4	319°06.6 -15°02.2	334°06.6 -15°03.0	349°06.6 -15°03.8	4°06.6 -15°04.5	15°06.6 -15°05.3	34°06.6 -15°06.1	45°06.6 -15°06.9	64°06.6 -15°07.7	+0.0 -0.8
Th 4	259°06.6 -15°17.7	274°06.6 -15°18.5	289°06.6 -15°19.3	304°06.6 -15°20.1	319°06.6 -15°20.8	334°06.6 -15°21.6	349°06.5 -15°22.4	4°06.5 -15°23.1	15°06.5 -15°23.9	34°06.5 -15°24.7	45°06.5 -15°25.5	64°06.5 -15°26.2	-0.0 -0.8
Fr 5	259°06.4 -15°36.2	274°06.3 -15°36.9	289°06.3 -15°37.7	304°06.3 -15°38.5	319°06.3 -15°39.2	334°06.3 -15°40.0	349°06.3 -15°40.7	4°06.2 -15°41.5	15°06.2 -15°42.3	34°06.2 -15°43.0	45°06.2 -15°43.8	64°06.2 -15°44.5	-0.0 -0.8
Sa 6	259°05.9 -15°54.3	274°05.9 -15°55.1	289°05.9 -15°55.8	304°05.8 -15°56.6	319°05.8 -15°57.3	334°05.8 -15°58.1	349°05.8 -15°58.8	4°05.7 -15°59.6	15°05.7 -16°00.3	34°05.7 -16°01.1	45°05.7 -16°01.8	64°05.6 -16°02.6	-0.0 -0.7
Su 7	259°05.3 -16°12.2	274°05.2 -16°13.0	289°05.2 -16°13.7	304°05.2 -16°14.4	319°05.1 -16°15.2	334°05.1 -16°15.9	349°05.1 -16°16.7	4°05.0 -16°17.4	15°05.0 -16°18.1	34°05.0 -16°18.9	45°04.9 -16°19.6	64°04.9 -16°20.3	-0.0 -0.7
Mo 8	259°04.4 -16°30.3	274°04.4 -16°31.0	289°04.3 -16°31.7	304°04.3 -16°32.4	319°04.3 -16°33.1	334°04.2 -16°33.5	349°04.2 -16°34.2	4°04.1 -16°34.9	15°04.1 -16°35.7	34°04.1 -16°36.4	45°04.0 -16°37.1	64°04.0 -16°37.8	-0.0 -0.7
Tu 9	259°03.2 -16°47.9	274°03.3 -16°48.6	289°03.3 -16°48.6	304°03.3 -16°49.3	319°03.2 -16°50.1	334°03.1 -16°50.8	349°03.1 -16°51.5	4°03.0 -16°52.2	15°03.0 -16°52.9	34°02.9 -16°53.6	45°02.9 -16°54.3	64°02.8 -16°55.1	-0.1 -0.7
We 10	259°02.2 -17°04.3	274°02.0 -17°05.0	289°02.0 -17°05.7	304°01.9 -17°06.4	319°01.9 -17°07.1	334°01.8 -17°07.8	349°01.8 -17°08.5	4°01.7 -17°09.2	15°01.6 -17°09.9	34°01.6 -17°10.6	45°01.5 -17°11.3	64°01.5 -17°12.0	-0.1 -0.7
Th 11	259°00.6 -17°21.0	274°00.6 -17°21.7	289°00.5 -17°22.4	304°00.4 -17°23.1	319°00.4 -17°23.8	334°00.3 -17°24.5	349°00.2 -17°25.2	4°00.2 -17°25.9	15°00.0 -17°26.6	34°00.0 -17°27.2	45°00.0 -17°27.9	63°59.9 -17°28.6	-0.1 -0.7
Fr 12	258°59.0 -17°37.5	273°58.9 -17°38.2	288°58.8 -17°38.9	303°58.7 -17°39.5	318°58.7 -17°40.2	333°58.6 -17°40.9	348°58.5 -17°41.6	3°58.4 -17°42.2	15°58.3 -17°42.9	33°58.3 -17°43.6	45°58.2 -17°44.3	63°58.1 -17°44.9	-0.1 -0.7
Sa 13	258°57.1 -17°55.7	273°57.0 -17°54.3	288°56.9 -17°55.0	303°56.8 -17°55.7	318°56.7 -17°56.3	333°56.6 -17°57.0	348°56.6 -17°57.7	3°56.5 -17°58.3	15°56.4 -17°59.0	33°56.3 -17°59.6	45°56.2 -18°00.3	63°56.1 -18°01.0	-0.1 -0.7
Su 14	258°55.5 -18°09.9	273°54.9 -18°10.2	288°54.8 -18°10.8	303°54.7 -18°11.5	318°54.6 -18°12.1	333°54.5 -18°12.8	348°54.4 -18°13.4	3°54.3 -18°14.1	15°54.2 -18°14.7	33°54.1 -18°15.4	45°54.0 -18°16.0	63°53.9 -18°16.7	-0.1 -0.7
Mo 15	258°52.2 -18°25.1	273°52.6 -18°25.7	288°52.5 -18°26.3	303°52.3 -18°27.0	318°52.2 -18°27.6	333°52.1 -18°28.3	348°52.0 -18°28.9	3°51.9 -18°29.5	15°51.8 -18°30.2	33°51.7 -18°30.8	45°51.6 -18°31.4	63°51.5 -18°32.1	-0.1 -0.6
Tu 16	258°50.1 -18°40.3	273°50.0 -18°40.9	288°49.9 -18°41.5	303°49.8 -18°42.2	318°49.7 -18°42.8	333°49.6 -18°43.4	348°49.5 -18°44.0	3°49.4 -18°44.7	15°49.2 -18°45.3	33°49.1 -18°45.9	45°49.0 -18°46.5	63°48.9 -18°47.1	-0.1 -0.6
We 17	258°47.4 -18°55.2	273°47.3 -18°55.8	288°47.2 -18°56.4	303°47.0 -18°57.0	318°46.9 -18°57.6	333°46.8 -18°58.2	348°46.7 -18°58.8	3°46.6 -18°59.5	15°46.4 -19°00.1	33°46.3 -19°00.7	45°46.2 -19°01.3	63°46.1 -19°01.9	-0.1 -0.6
Th 18	258°44.4 -19°09.7	273°44.3 -19°10.3	288°44.2 -19°10.9	303°44.1 -19°11.5	318°43.9 -19°12.1	333°43.8 -19°12.7	348°43.7 -19°13.3	3°43.5 -19°13.9	15°43.4 -19°14.5	33°43.3 -19°15.1	45°43.2 -19°15.7	63°43.0 -19°16.3	-0.1 -0.6
Fr 19	258°41.3 -19°23.9	273°41.1 -19°24.5	288°41.0 -19°25.1	303°40.9 -19°25.7	318°40.7 -19°26.3	333°40.6 -19°26.9	348°40.5 -19°27.4	3°40.3 -19°28.0	15°40.2 -19°28.6	33°40.0 -19°29.2	45°39.9 -19°29.8	63°39.8 -19°30.3	-0.1 -0.6
Sa 20	258°37.9 -19°37.8	273°37.8 -19°38.4	288°37.6 -19°38.9	303°37.5 -19°39.5	318°37.3 -19°40.1	333°37.2 -19°40.7	348°37.0 -19°41.2	3°36.9 -19°41.8	15°36.7 -19°42.4	33°36.6 -19°42.9	45°36.4 -19°43.5	63°36.3 -19°44.0	-0.1 -0.6
Su 21	258°34.3 -19°51.3	273°34.2 -19°51.9	288°34.0 -19°52.4	303°33.9 -19°53.0	318°33.7 -19°53.5	333°33.6 -19°54.1	348°33.4 -19°54.6	3°33.2 -19°55.2	15°33.1 -19°55.7	33°32.9 -19°56.3	45°32.8 -19°56.8	63°32.6 -19°57.4	-0.2 -0.6
Mo 22	258°30.5 -20°04.5	273°30.4 -20°05.0	288°30.2 -20°05.6	303°30.1 -20°06.1	318°29.9 -20°06.6	333°29.7 -20°07.2	348°29.6 -20°07.7	3°29.9 -20°08.2	15°29.2 -20°08.8	33°29.1 -20°09.3	45°28.9 -20°09.8	63°28.7 -20°10.4	-0.2 -0.5
Tu 23	258°26.5 -20°17.3	273°26.4 -20°17.8	288°26.2 -20°18.3	303°26.0 -20°18.8	318°25.9 -20°19.3	333°25.7 -20°19.9	348°25.5 -20°20.4	3°25.3 -20°20.9	15°25.2 -20°21.4	33°25.0 -20°21.9	45°25.0 -20°22.5	63°24.6 -20°23.0	-0.2 -0.5
We 24	258°22.2 -20°29.7	273°22.2 -20°30.2	288°22.0 -20°30.7	303°21.8 -20°31.2	318°21.6 -20°31.7	333°21.5 -20°32.2	348°21.3 -20°32.7	3°21.1 -20°33.2	15°20.9 -20°33.7	33°20.7 -20°34.2	45°20.6 -20°34.7	63°20.4 -20°35.2	-0.2 -0.5
Th 25	258°18.0 -20°41.7	273°17.8 -20°42.2	288°17.6 -20°42.7	303°17.3 -20°43.2	318°17.2 -20°43.7	333°17.0 -20°44.2	348°16.8 -20°44.8	3°16.6 -20°45.1	15°16.5 -20°45.6	33°16.3 -20°46.1	45°16.1 -20°46.6	63°15.9 -20°47.1	-0.2 -0.5
Fr 26	258°13.4 -20°53.3	273°13.2 -20°53.8	288°13.0 -20°54.3	303°12.8 -20°54.8	318°12.6 -20°55.2	333°12.4 -20°55.7	348°12.2 -20°56.2	3°12.0 -20°56.7	15°11.8 -20°57.1	33°11.6 -20°57.6	45°11.4 -20°58.1	63°11.2 -20°58.6	-0.2 -0.5
Sa 27	258°08.6 -21°04.6	273°08.4 -21°05.1	288°08.2 -21°05.5	303°08.0 -21°06.0	318°07.8 -21°06.6	333°07.6 -21°07.4	348°07.4 -21°07.9	3°07.2 -21°08.2	15°07.0 -21°08.3	33°06.8 -21°08.7	45°06.6 -21°09.2	63°06.4 -21°09.6	-0.2 -0.5
Su 28	258°03.6 -21°15.5	273°03.4 -21°16.3	288°03.2 -21°16.3	303°03.0 -21°16.8	318°02.8 -21°17.2	333°02.6 -21°17.7	348°02.4 -21°18.1	3°02.2 -21°18.6	15°02.0 -21°19.0	33°01.7 -21°19.4	45°01.5 -21°19.9	63°01.3 -21°20.3	-0.2 -0.4
Mo 29	257°58.5 -21°25.9	272°58.3 -21°26.3	287°58.1 -21°26.8	302°57.9 -21°27.2	317°57.6 -21°27.6	332°57.4 -21°28.0	347°57.2 -21°28.5	2°57.0 -21°28.9	15°56.8 -21°29.3	32°56.5 -21°29.6	45°56.3 -21°30.2	62°56.1 -21°30.6	-0.2 -0.4
Tu 30	257°53.2 -21°36.0	272°53.0 -21°36.4	287°52.8 -21°36.8	302°52.5 -21°37.2	317°52.3 -21°37.6	332°52.1 -21°38.0	347°51.9 -21°38.5	2°51.6 -21°39.1	15°51.4 -21°39.2	32°51.2 -21°39.6	45°50.9 -21°40.0	62°50.7 -21°40.4	-0.2 -0.4

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

November 2027

	D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	Δ'/h SH
O	Mo 1	240°42.2 -26°15.4	255°08.9 -26°18.2	269°35.9 -26°20.8	284°02.4 -26°23.3	298°29.2 -26°25.6	312°56.0 -26°27.8	327°22.8 -26°31.7	341°49.6 -26°33.4	356°16.4 -26°35.0	10°43.3 -26°36.5	25°10.2 -26°38.5	+26.8 15.3 -2.1 56.2
	Tu 2	241°57.1 -26°40.2	256°24.6 -26°39.3	270°52.0 -26°38.3	285°19.6 -26°37.1	299°47.1 -26°35.7	314°14.8 -26°34.3	328°42.4 -26°32.6	343°10.2 -26°30.9	357°37.9 -26°29.0	12°05.8 -26°27.0	26°33.6 -26°24.8	+27.6 15.1 +1.5 55.5
	We 3	243°39.0 -25°36.3	258°07.9 -25°32.0	272°36.9 -25°27.6	287°05.9 -25°23.1	301°34.9 -25°18.5	316°04.1 -25°13.8	330°33.3 -25°08.9	345°02.6 -25°03.9	359°32.0 -24°58.8	14°01.4 -24°53.5	28°30.9 -24°48.2	+29.2 15.0 +4.8 54.9
	Th 4	246°02.5 -23°14.6	260°33.2 -23°07.5	275°04.0 -23°00.3	289°34.8 -22°53.0	304°05.7 -22°45.6	318°36.7 -22°38.1	333°07.8 -22°30.5	347°39.0 -22°22.8	2°10.2 -22°15.0	16°41.5 -22°07.1	31°12.9 -21°59.1	+31.0 14.9 +7.5 54.3
	Fr 5	249°12.2 -19°48.7	263°44.7 -19°39.3	278°17.3 -19°29.9	292°50.0 -19°20.3	307°22.7 -19°10.7	321°55.5 -19°01.1	336°28.3 -18°51.3	351°01.2 -18°41.5	5°34.2 -18°31.6	20°07.3 -18°21.6	34°40.4 -18°11.5	+32.8 14.8 +9.7 54.3
	Sa 6	253°04.0 -15°32.4	267°38.0 -15°21.3	282°12.1 -15°10.1	296°46.2 -14°58.9	311°20.4 -14°47.6	325°54.6 -14°36.2	340°28.9 -14°24.8	355°03.2 -14°13.3	9°37.5 -14°01.8	24°11.9 -13°50.2	38°46.4 -13°38.6	+34.2 14.8 +11.4 54.2
	Su 7	257°27.5 -10°38.0	272°02.6 -10°25.6	286°37.6 -10°13.1	301°12.7 -10°00.6	315°47.8 -9°48.1	330°22.9 -9°35.5	344°58.0 -9°22.9	359°33.2 -9°10.2	14°08.3 -8°57.5	28°43.6 -8°44.8	43°18.8 -8°32.0	+35.1 14.8 +12.6 54.3
	Mo 8	262°08.8 -5°16.3	276°44.2 -5°03.0	291°19.6 -4°49.7	305°55.0 -4°36.3	320°30.4 -4°22.9	335°05.8 -4°09.5	349°41.2 -3°56.1	4°16.6 -3°42.7	18°52.0 -3°29.2	33°27.4 -3°15.7	48°02.8 -3°02.2	+35.4 14.9 +13.4 54.6
	Tu 9	266°51.9 0°22.4	281°27.1 0°36.1	296°02.2 0°49.9	310°37.2 1°03.7	325°12.3 1°17.4	339°47.3 1°31.2	354°22.3 1°45.0	8°57.2 1°58.8	23°32.2 2°12.6	38°07.1 2°26.4	52°41.9 2°40.2	+35.0 15.0 +13.8 55.1
	We 10	271°20.0 6°06.9	285°54.1 6°20.6	300°28.2 6°34.3	315°02.3 6°48.0	329°36.3 7°01.7	344°10.2 7°15.4	358°44.1 7°29.0	13°18.0 7°42.3	27°51.7 7°56.3	42°25.4 8°09.9	56°59.1 8°23.4	+33.9 15.2 +13.7 55.7
O	Th 11	275°15.5 11°43.9	289°48.0 11°57.0	304°20.8 12°10.1	318°52.8 12°23.1	333°25.1 12°36.1	347°57.2 12°49.0	2°29.3 13°01.9	2°29.3 13°14.7	31°33.3 13°27.5	46°05.1 13°40.3	60°36.9 13°53.0	+32.1 15.4 +12.9 56.4
	Fr 12	278°22.0 16°56.5	292°52.0 17°08.2	307°22.4 17°19.9	321°52.4 17°31.4	336°22.3 17°42.9	350°52.2 17°54.3	5°21.9 18°05.7	5°21.9 18°16.9	34°21.0 18°28.1	48°50.5 18°39.2	63°19.8 18°50.1	+29.8 15.6 +11.4 57.0
	Sa 13	280°26.6 21°23.7	294°54.2 21°33.1	309°21.7 21°42.3	323°49.1 21°51.5	338°16.4 22°00.6	352°43.6 22°09.5	7°10.7 22°18.3	7°10.7 22°27.0	36°04.5 22°35.6	50°31.2 22°44.1	64°57.9 22°52.4	+27.1 15.7 +8.9 57.7
	Su 14	281°25.7 24°41.1	295°50.8 24°47.2	310°15.8 24°53.2	324°40.7 24°59.0	339°05.5 25°04.6	353°30.3 25°10.1	7°55.0 25°15.5	7°55.0 25°20.7	36°53.6 25°25.7	51°08.5 25°30.5	65°32.9 25°35.2	+24.7 15.9 +5.4 58.3
	Mo 15	281°30.4 26°25.7	295°53.8 26°27.7	310°17.2 26°29.5	324°40.8 26°31.1	339°03.8 26°32.6	353°27.0 26°33.9	7°50.2 26°35.0	7°50.2 26°35.9	36°53.6 26°36.3	50°59.7 26°37.2	65°22.9 26°37.5	+23.2 16.0 +1.2 58.8
	Tu 16	281°05.8 26°21.4	295°31.6 26°18.9	309°54.7 26°16.2	324°17.8 26°13.3	338°40.9 26°10.2	353°04.1 26°07.0	7°27.3 26°03.6	7°27.3 26°00.0	36°13.8 25°56.2	50°31.2 25°52.2	65°00.1 25°48.1	+23.2 16.1 -3.3 59.1
	We 17	280°55.9 24°25.5	295°20.1 24°18.6	309°44.3 24°11.6	324°08.6 24°04.4	338°33.0 23°57.1	352°57.4 23°49.6	7°21.9 23°42.0	7°21.9 23°34.2	36°53.6 23°26.3	51°20.4 23°18.2	65°00.6 23°09.9	+24.5 16.2 -7.6 59.3
	Th 18	281°22.2 20°49.1	295°48.4 20°38.6	310°14.6 20°28.0	324°40.8 20°17.3	339°07.2 20°06.5	353°33.7 19°55.5	8°00.2 19°44.4	8°00.2 19°33.2	36°53.6 19°21.9	51°20.4 19°10.5	65°47.2 18°58.9	+26.5 16.2 -11.0 59.3
	Fr 19	295°48.4 20°38.6	310°14.6 20°28.0	324°40.8 20°17.3	339°07.2 20°06.5	353°33.7 19°55.5	8°00.2 19°44.4	22°26.8 19°33.2	22°26.8 19°21.9	36°53.6 19°10.5	51°20.4 18°58.9	65°47.2 18°47.3	+26.6 16.2 -11.1 59.3
	Sa 20	297°09.0 15°40.1	311°37.3 15°26.9	326°05.7 15°13.6	340°34.2 15°00.2	355°02.2 14°46.7	3°31.3 14°33.1	24°00.0 14°19.5	24°00.0 14°05.8	38°28.8 13°52.0	52°57.7 13°38.1	67°26.6 13°24.1	+28.7 16.2 -13.6 59.2
O	Su 21	298°18.5 9°47.6	313°48.5 9°32.7	328°18.6 9°17.8	342°48.7 9°02.8	357°18.9 8°47.8	11°49.2 8°32.7	26°19.4 8°17.6	26°19.4 8°02.5	55°20.4 7°47.3	69°50.6 7°32.1	84°21.1 7°16.9	+30.3 16.1 -15.1 59.1
	Mo 22	302°02.9 3°25.0	316°34.0 3°09.4	331°05.1 2°53.8	345°36.2 2°38.2	3°07.3 2°22.6	14°38.4 2°06.9	29°09.6 1°51.3	43°40.8 1°35.6	58°12.0 1°20.0	72°43.2 1°04.3	87°14.4 0°48.7	+31.2 16.0 -15.6 58.8
	Tu 23	305°04.0 -3°05.2	319°35.3 -3°20.7	334°06.6 -3°06.2	348°37.9 -3°51.6	3°09.2 -4°07.0	17°40.5 -4°22.4	32°11.8 -4°37.7	46°43.0 -4°53.0	61°14.3 -5°08.3	75°45.5 -5°23.6	90°16.8 -5°38.8	+31.3 16.0 -15.6 58.5
	We 24	308°02.8 -9°22.4	322°33.7 -9°37.0	337°04.5 -9°51.4	351°35.3 -10°05.8	6°06.1 -10°20.2	20°36.8 -10°34.5	35°07.5 -10°48.8	49°38.2 -11°02.9	64°08.8 -11°17.1	78°39.4 -11°31.1	93°09.9 -11°45.1	+30.7 15.9 -14.3 58.2
	Th 25	310°43.1 -19°57.3	325°13.0 -20°07.5	339°42.8 -20°17.7	354°12.5 -20°27.7	8°42.2 -20°37.7	23°11.9 -20°47.5	37°41.5 -20°57.2	52°11.0 -21°06.7	66°40.5 -21°16.2	81°10.0 -21°25.5	95°39.4 -21°34.7	+29.6 15.7 -9.7 57.3
	Fr 26	312°54.0 -23°37.2	327°22.5 -23°44.3	341°51.0 -23°51.3	356°19.5 -23°58.1	10°47.9 -24°04.3	25°16.2 -24°11.4	39°44.5 -24°17.8	54°12.7 -24°24.0	68°40.9 -24°30.2	83°09.1 -24°36.1	97°37.2 -24°42.0	+28.3 15.6 -6.5 56.7
	Sa 27	314°33.0 -23°37.2	329°00.4 -23°44.3	343°27.7 -23°51.3	357°55.0 -23°58.1	12°22.3 -24°04.3	26°49.6 -24°11.4	41°16.8 -24°17.8	55°43.9 -24°24.0	70°11.1 -24°30.2	84°38.8 -24°36.1	99°05.3 -24°42.0	+27.2 15.5 -6.5 56.7
	Su 28	315°49.0 -25°52.2	330°15.8 -25°55.7	344°42.7 -25°59.0	359°09.2 -26°02.4	13°36.2 -26°05.3	28°03.0 -26°08.2	42°29.8 -26°10.9	56°56.6 -26°13.6	71°23.4 -26°16.0	85°50.2 -26°18.3	100°17.0 -26°20.5	+26.8 15.3 -8.5 56.2
	Mo 29	317°01.0 -26°35.1	331°28.1 -26°34.9	345°55.3 -26°34.5	360°22.4 -26°34.0	14°49.7 -26°33.1	29°17.0 -26°32.6	43°44.3 -26°31.7	58°11.6 -26°30.9	72°39.0 -26°29.4	87°06.4 -26°28.0	101°33.9 -26°26.9	+27.3 15.2 +0.9 55.6
	Tu 30	318°31.9 -25°47.5	333°00.3 -25°43.8	347°28.7 -25°40.0	357°15.1 -25°36.1	16°25.6 -25°32.1	30°54.2 -25°27.8	45°22.9 -25°23.5	59°51.6 -25°19.1	74°20.4 -25°14.5	88°49.2 -25°09.8	103°18.1 -25°05.0	+28.6 15.0 +4.3 55.1

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameterRow 2: Dec (— = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 6 08h00 — FM: 14 03h25 — LQ: 21 00h48 — NM: 28 03h24

SUN

December 2027

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
We 1	272°47.5 -21°46.0	287°47.3 -21°46.4	302°47.0 -21°46.8	317°46.8 -21°47.2	332°46.6 -21°47.6	347°46.3 -21°48.0	2°46.1 -21°48.3	17°45.9 -21°48.7	32°45.6 -21°49.1	47°45.4 -21°49.5	62°45.2 -21°49.9	77°44.9 -21°50.3	-0.2 -0.4
Th 2	272°41.9 -21°55.2	287°41.6 -21°55.6	302°41.4 -21°56.0	317°41.2 -21°56.3	332°40.9 -21°56.7	347°40.7 -21°57.1	2°40.4 -21°57.5	17°40.2 -21°57.8	32°40.0 -21°58.2	47°39.7 -21°58.6	62°39.5 -21°58.9	77°39.2 -21°59.3	-0.2 -0.4
Fr 3	272°36.1 -22°04.0	287°35.8 -22°04.4	302°35.6 -22°04.7	317°35.3 -22°05.1	332°35.1 -22°05.4	347°34.8 -22°05.8	2°34.6 -22°06.1	17°34.4 -22°06.5	32°34.1 -22°06.8	47°33.9 -22°07.2	62°33.6 -22°07.5	77°33.4 -22°07.9	-0.2 -0.4
Sa 4	272°30.1 -22°12.4	287°29.9 -22°12.7	302°29.6 -22°13.0	317°29.4 -22°13.4	332°29.1 -22°13.7	347°28.9 -22°14.0	2°28.6 -22°14.4	17°28.4 -22°14.7	32°28.1 -22°15.1	47°27.9 -22°15.4	62°27.6 -22°15.7	77°27.4 -22°16.0	-0.3 -0.3
Su 5	272°24.1 -22°20.3	287°23.8 -22°20.6	302°23.5 -22°20.9	317°23.3 -22°21.3	332°23.0 -22°21.6	347°22.8 -22°21.9	2°22.5 -22°22.2	17°22.3 -22°22.5	32°22.0 -22°22.8	47°21.7 -22°23.2	62°21.5 -22°23.5	77°21.2 -22°23.8	-0.3 -0.3
Mo 6	272°17.8 -22°27.8	287°17.6 -22°28.1	302°17.3 -22°28.4	317°17.1 -22°28.7	332°16.8 -22°29.0	347°16.5 -22°29.3	2°16.3 -22°29.6	17°16.0 -22°29.9	32°15.7 -22°30.2	47°15.5 -22°30.5	62°15.2 -22°30.8	77°14.9 -22°31.1	-0.3 -0.3
Tu 7	272°11.5 -22°34.8	287°11.2 -22°35.1	302°11.0 -22°35.4	317°10.7 -22°35.7	332°10.4 -22°36.0	347°10.2 -22°36.3	2°09.9 -22°36.5	17°09.6 -22°36.8	32°09.3 -22°37.1	47°09.1 -22°37.4	62°08.8 -22°37.7	77°08.5 -22°37.9	-0.3 -0.3
We 8	272°05.0 -22°41.5	287°04.8 -22°41.7	302°04.5 -22°42.0	317°04.2 -22°42.3	332°03.9 -22°42.5	347°03.7 -22°42.8	2°03.4 -22°43.0	17°03.1 -22°43.3	32°02.8 -22°43.6	47°02.6 -22°43.9	62°02.3 -22°44.1	77°02.0 -22°44.3	-0.3 -0.3
Th 9	271°58.4 -22°47.6	286°58.2 -22°47.9	301°57.9 -22°48.1	316°57.6 -22°48.4	331°57.3 -22°48.6	346°57.1 -22°48.9	1°56.8 -22°49.1	16°56.5 -22°49.3	31°56.2 -22°49.6	46°55.9 -22°49.9	61°55.7 -22°50.1	76°55.4 -22°50.3	-0.3 -0.2
Fr 10	271°51.8 -22°53.4	286°51.5 -22°53.6	301°51.2 -22°53.8	316°50.9 -22°54.0	331°50.6 -22°54.3	346°50.3 -22°54.5	1°50.1 -22°54.9	16°49.8 -22°55.2	31°49.5 -22°55.5	46°49.2 -22°55.8	61°48.9 -22°56.1	76°48.7 -22°56.8	-0.3 -0.2
Sa 11	271°45.0 -22°58.6	286°44.7 -22°58.8	301°44.4 -22°59.0	316°44.1 -22°59.3	331°43.8 -22°59.5	346°43.5 -22°59.7	1°43.2 -22°59.9	16°43.0 -23°00.1	31°42.7 -23°00.3	46°42.4 -23°00.5	61°42.1 -23°00.7	76°41.8 -23°00.9	-0.3 -0.2
Su 12	271°38.1 -23°03.1	286°37.8 -23°03.6	301°37.5 -23°03.8	316°37.2 -23°04.0	331°36.9 -23°04.2	346°36.6 -23°04.4	1°36.3 -23°04.6	16°36.0 -23°04.8	31°35.8 -23°05.0	46°35.5 -23°05.1	61°35.2 -23°05.3	76°34.9 -23°05.5	-0.3 -0.2
Mo 13	271°31.1 -23°07.8	286°30.8 -23°08.0	301°30.5 -23°08.2	316°30.2 -23°08.3	331°29.9 -23°08.5	346°29.6 -23°08.7	1°29.3 -23°08.9	16°29.0 -23°09.1	31°28.8 -23°09.2	46°28.5 -23°09.3	61°28.2 -23°09.5	76°27.9 -23°09.7	-0.3 -0.2
Tu 14	271°24.0 -23°11.7	286°23.7 -23°11.9	301°23.4 -23°12.0	316°23.1 -23°12.2	331°22.9 -23°12.3	346°22.6 -23°12.5	1°22.3 -23°12.6	16°22.0 -23°12.8	31°21.7 -23°12.9	46°21.4 -23°13.1	61°21.1 -23°13.2	76°20.8 -23°13.4	-0.3 -0.1
We 15	271°16.9 -23°15.2	286°16.6 -23°15.3	301°16.3 -23°15.4	316°16.0 -23°15.6	331°15.7 -23°15.7	346°15.4 -23°15.8	1°15.1 -23°16.1	16°14.8 -23°16.2	31°14.5 -23°16.3	46°14.2 -23°16.3	61°13.9 -23°16.5	76°13.6 -23°16.6	-0.1 -0.1
Th 16	271°09.7 -23°18.1	286°09.4 -23°18.3	301°09.1 -23°18.4	316°08.8 -23°18.5	331°08.5 -23°18.6	346°08.2 -23°18.7	1°07.9 -23°18.8	16°07.6 -23°18.9	31°07.3 -23°19.0	46°07.0 -23°19.1	61°06.7 -23°19.3	76°06.4 -23°19.4	-0.3 -0.1
Fr 17	271°02.4 -23°20.7	286°02.1 -23°20.8	301°01.8 -23°20.9	316°01.5 -23°20.9	331°01.2 -23°21.0	346°00.9 -23°21.1	1°00.6 -23°21.2	16°00.3 -23°21.3	31°00.0 -23°21.4	45°59.7 -23°21.5	60°59.4 -23°21.6	75°59.1 -23°21.7	-0.3 -0.1
Sa 18	270°55.1 -23°22.7	285°54.8 -23°22.8	300°54.5 -23°22.9	315°54.2 -23°22.9	330°53.9 -23°23.0	345°53.6 -23°23.1	0°53.3 -23°23.2	15°53.0 -23°23.2	30°52.7 -23°23.3	45°52.4 -23°23.4	60°52.1 -23°23.4	75°51.7 -23°23.5	-0.3 -0.1
Su 19	270°47.8 -23°24.3	285°47.4 -23°24.4	300°47.4 -23°24.4	315°46.8 -23°24.5	330°46.5 -23°24.5	345°46.2 -23°24.6	0°45.9 -23°24.6	15°45.6 -23°24.7	30°45.3 -23°24.7	45°45.0 -23°24.8	60°44.7 -23°24.8	75°44.4 -23°24.9	-0.3 -0.1
Mo 20	270°40.3 -23°25.4	285°40.0 -23°25.4	300°39.7 -23°25.5	315°39.4 -23°25.5	330°39.1 -23°25.5	345°38.8 -23°25.6	0°38.5 -23°25.6	15°38.2 -23°25.6	30°37.9 -23°25.7	45°37.6 -23°25.7	60°37.3 -23°25.7	75°36.9 -23°25.8	-0.3 -0.0
Tu 21	270°32.9 -23°26.0	285°32.6 -23°26.1	300°32.3 -23°26.1	315°32.0 -23°26.1	330°31.7 -23°26.1	345°31.4 -23°26.1	0°31.0 -23°26.1	15°30.7 -23°26.2	30°30.4 -23°26.2	45°30.1 -23°26.2	60°29.8 -23°26.2	75°29.5 -23°26.2	-0.3 -0.0
We 22	270°25.5 -23°26.2	285°25.1 -23°26.2	300°24.8 -23°26.2	315°24.5 -23°26.2	330°24.2 -23°26.2	345°23.9 -23°26.2	0°23.6 -23°26.2	15°23.3 -23°26.2	30°23.0 -23°26.2	45°22.7 -23°26.2	60°22.3 -23°26.2	75°22.0 -23°26.1	-0.3 +0.0
Th 23	270°18.0 -23°25.9	285°17.7 -23°25.9	300°17.4 -23°25.9	315°17.0 -23°25.8	330°16.7 -23°25.8	345°16.4 -23°25.8	0°16.1 -23°25.8	15°15.8 -23°25.7	30°15.5 -23°25.7	45°15.2 -23°25.7	60°14.9 -23°25.7	75°14.6 -23°25.6	-0.3 +0.0
Fr 24	270°10.5 -23°25.1	285°10.2 -23°25.1	300°09.9 -23°25.1	315°09.6 -23°25.0	330°09.3 -23°25.0	345°08.9 -23°24.9	0°08.6 -23°24.9	15°08.3 -23°24.8	30°08.0 -23°24.8	45°07.7 -23°24.7	60°07.4 -23°24.7	75°07.1 -23°24.6	-0.3 +0.0
Sa 25	270°03.0 -23°23.9	285°02.7 -23°23.8	300°02.4 -23°23.8	315°02.1 -23°23.7	330°01.8 -23°23.6	345°01.5 -23°23.6	0°01.2 -23°23.5	15°00.9 -23°23.5	30°00.6 -23°23.4	45°00.2 -23°23.3	59°59.9 -23°23.2	74°59.6 -23°23.2	-0.3 +0.1
Su 26	269°55.6 -23°22.1	284°55.3 -23°22.1	299°55.0 -23°22.0	314°54.7 -23°21.9	329°54.3 -23°21.8	344°54.0 -23°21.8	359°53.7 -23°21.6	14°53.4 -23°21.6	29°53.1 -23°21.5	44°52.8 -23°21.4	59°52.5 -23°21.4	74°52.2 -23°21.2	-0.3 +0.1
Mo 27	269°48.2 -23°20.0	284°47.8 -23°19.9	299°47.5 -23°19.8	314°47.2 -23°19.7	329°46.9 -23°19.6	344°46.6 -23°19.5	359°46.3 -23°19.4	14°46.0 -23°19.3	29°45.7 -23°19.2	44°45.4 -23°19.1	59°45.1 -23°19.0	74°44.8 -23°18.8	-0.3 +0.1
Tu 28	269°40.4 -23°17.4	284°40.5 -23°17.2	299°40.0 -23°17.1	314°39.8 -23°17.0	329°39.5 -23°16.9	344°39.2 -23°16.7	359°38.9 -23°16.6	14°38.6 -23°16.5	29°38.3 -23°16.4	44°38.0 -23°16.2	59°37.7 -23°16.1	74°37.4 -23°16.0	-0.3 +0.1
We 29	269°33.4 -23°14.2	284°33.1 -23°14.1	299°32.8 -23°13.9	314°32.5 -23°13.8	329°32.2 -23°13.7	344°31.9 -23°13.5	359°31.6 -23°13.4	14°31.3 -23°13.2	29°31.0 -23°13.1	44°30.7 -23°12.9	59°30.4 -23°12.8	74°30.1 -23°12.6	-0.3 +0.1
Th 30	269°26.2 -23°10.6	284°25.8 -23°10.5	299°25.5 -23°10.3	314°25.2 -23°10.2	329°24.9 -23°10.0	344°24.6 -23°09.8	359°24.3 -23°09.7	14°24.0 -23°09.5	29°23.7 -23°09.3	44°23.4 -23°09.2	59°23.1 -23°09.0	74°22.8 -23°08.8	-0.3 +0.2
Fr 31	269°18.9 -23°06.6	284°18.6 -23°06.2	299°18.3 -23°06.2	314°18.0 -23°05.9	329°17.7 -23°05.7	344°17.4 -23°05.7	359°17.1 -23°05.5	14°16.8 -23°05.3	29°16.5 -23°05.1	44°16.2 -23°05.0	59°15.9 -23°04.8	74°15.6 -23°04.6	-0.3 +0.2

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.3'

MOON

December 2027

	D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	Δ'/h	SH
We 1	233 ^o 41.7 -24 ^o 16.3	248 ^o 11.3 -24 ^o 10.3	262 ^o 41.1 -24 ^o 04.2	277 ^o 10.9 -23 ^o 58.0	291 ^o 40.7 -23 ^o 51.7	306 ^o 10.7 -23 ^o 45.3	320 ^o 40.7 -23 ^o 38.7	335 ^o 10.8 -23 ^o 32.1	349 ^o 41.0 -23 ^o 25.3	4 ^o 11.3 -23 ^o 18.5	18 ^o 41.6 -23 ^o 11.5	+30.0	14.9	
	236 ^o 26.1 -21 ^o 15.0	250 ^o 57.6 -21 ^o 06.5	265 ^o 29.3 -20 ^o 57.9	280 ^o 01.0 -20 ^o 49.2	294 ^o 32.8 -20 ^o 40.4	309 ^o 04.7 -20 ^o 31.5	323 ^o 36.7 -20 ^o 22.6	338 ^o 08.7 -20 ^o 13.6	352 ^o 40.8 -19 ^o 04.4	7 ^o 13.0 -19 ^o 55.2	21 ^o 45.3 -19 ^o 46.0	+31.9	14.8	
Th 2	239 ^o 57.6 -17 ^o 17.7	254 ^o 31.0 -17 ^o 07.2	269 ^o 04.4 -16 ^o 56.7	283 ^o 37.9 -16 ^o 46.1	298 ^o 11.5 -16 ^o 35.5	312 ^o 45.1 -16 ^o 24.8	327 ^o 18.8 -16 ^o 14.0	341 ^o 52.5 -16 ^o 03.2	356 ^o 26.3 -15 ^o 52.3	11 ^o 00.2 -15 ^o 41.3	25 ^o 34.1 -15 ^o 30.3	+33.6	14.8	
Fr 3	244 ^o 09.3 -12 ^o 38.4	258 ^o 44.0 -12 ^o 26.6	273 ^o 18.8 -12 ^o 14.7	287 ^o 53.6 -12 ^o 02.7	302 ^o 28.5 -11 ^o 50.7	317 ^o 03.4 -11 ^o 38.7	331 ^o 38.3 -11 ^o 26.6	346 ^o 13.3 -11 ^o 14.4	0 ^o 48.3 -11 ^o 02.3	15 ^o 23.4 -10 ^o 50.1	29 ^o 58.5 -10 ^o 37.8	+34.9	14.8	
Sa 4	248 ^o 48.5 -7 ^o 29.5	263 ^o 24.0 -7 ^o 16.7	277 ^o 59.6 -7 ^o 03.8	292 ^o 35.1 -6 ^o 50.9	307 ^o 10.7 -6 ^o 38.0	321 ^o 46.3 -6 ^o 25.1	336 ^o 21.9 -6 ^o 12.1	350 ^o 57.5 -5 ^o 59.1	5 ^o 33.2 -5 ^o 46.1	20 ^o 08.8 -5 ^o 33.1	34 ^o 44.5 -5 ^o 20.0	+35.6	14.8	
Su 5	253 ^o 39.8 -2 ^o 01.4	268 ^o 15.5 -1 ^o 48.0	282 ^o 51.2 -1 ^o 34.6	297 ^o 26.8 -1 ^o 21.2	312 ^o 02.5 -1 ^o 07.8	326 ^o 38.1 -0 ^o 54.3	341 ^o 13.7 -0 ^o 40.9	355 ^o 49.3 -0 ^o 27.4	10 ^o 24.9 -0 ^o 14.0	25 ^o 00.5 -0 ^o 00.5	39 ^o 36.0 0 ^o 13.0	+35.6	14.9	
Mo 6	258 ^o 26.3 3 ^o 36.0	273 ^o 01.4 3 ^o 49.5	287 ^o 36.4 4 ^o 03.0	302 ^o 11.4 4 ^o 16.6	316 ^o 46.4 4 ^o 30.1	331 ^o 21.4 4 ^o 43.6	345 ^o 56.3 4 ^o 57.1	0 ^o 31.1 5 ^o 10.6	15 ^o 05.1 5 ^o 24.2	29 ^o 40.7 5 ^o 37.6	44 ^o 15.4 5 ^o 51.1	+34.9	15.0	
Tu 7	262 ^o 49.5 9 ^o 11.7	277 ^o 23.3 9 ^o 25.0	291 ^o 57.0 9 ^o 38.2	306 ^o 30.7 9 ^o 51.3	321 ^o 04.3 10 ^o 04.5	335 ^o 37.8 10 ^o 17.6	350 ^o 11.2 10 ^o 30.7	4 ^o 44.5 10 ^o 43.8	19 ^o 17.8 10 ^o 56.8	33 ^o 51.0 11 ^o 09.8	48 ^o 24.2 11 ^o 22.8	+33.5	15.2	
We 8	266 ^o 31.0 14 ^o 32.6	281 ^o 02.7 14 ^o 44.9	295 ^o 34.3 14 ^o 57.1	310 ^o 05.3 15 ^o 09.3	324 ^o 37.9 15 ^o 21.4	339 ^o 08.6 15 ^o 33.5	353 ^o 39.9 15 ^o 45.5	8 ^o 11.0 16 ^o 09.4	22 ^o 42.1 16 ^o 29.4	37 ^o 13.0 16 ^o 21.2	51 ^o 43.8 16 ^o 33.0	+31.3	15.4	
Th 9	269 ^o 13.2 19 ^o 20.9	283 ^o 42.2 19 ^o 31.4	298 ^o 11.2 19 ^o 41.9	312 ^o 40.0 19 ^o 52.2	327 ^o 08.7 20 ^o 02.5	341 ^o 37.3 20 ^o 12.7	356 ^o 05.8 20 ^o 22.8	10 ^o 34.1 20 ^o 32.8	25 ^o 02.4 20 ^o 42.9	39 ^o 30.5 20 ^o 52.5	53 ^o 58.5 21 ^o 02.2	+28.5	15.7	
Fr 10	270 ^o 44.2 23 ^o 14.0	285 ^o 10.3 23 ^o 21.9	299 ^o 36.3 23 ^o 29.5	314 ^o 02.2 23 ^o 37.1	328 ^o 27.9 23 ^o 44.5	342 ^o 53.6 23 ^o 51.8	357 ^o 19.1 23 ^o 59.0	11 ^o 44.6 24 ^o 06.0	26 ^o 09.9 24 ^o 12.8	40 ^o 35.1 24 ^o 19.5	55 ^o 00.2 24 ^o 26.1	+25.6	15.9	
Sa 11	271 ^o 04.4 25 ^o 46.4	285 ^o 28.0 25 ^o 50.4	299 ^o 51.4 25 ^o 54.3	314 ^o 14.8 25 ^o 58.0	328 ^o 38.1 26 ^o 01.6	343 ^o 01.3 26 ^o 05.0	357 ^o 24.4 26 ^o 08.1	11 ^o 47.5 26 ^o 11.2	26 ^o 10.5 26 ^o 14.0	40 ^o 33.4 26 ^o 16.7	54 ^o 56.3 26 ^o 19.2	+23.2	16.1	
Su 12	270 ^o 32.9 26 ^o 34.4	284 ^o 55.1 26 ^o 34.0	299 ^o 17.2 26 ^o 33.3	313 ^o 39.3 26 ^o 32.4	328 ^o 01.4 26 ^o 31.4	342 ^o 23.4 26 ^o 30.1	356 ^o 45.5 26 ^o 28.7	11 ^o 07.5 26 ^o 27.1	25 ^o 29.6 26 ^o 25.3	39 ^o 51.6 26 ^o 23.4	54 ^o 13.7 26 ^o 21.1	+22.1	16.3	
Mo 13	269 ^o 46.1 25 ^o 25.4	284 ^o 08.5 25 ^o 20.2	298 ^o 30.9 25 ^o 14.8	312 ^o 53.4 25 ^o 09.3	327 ^o 15.9 25 ^o 03.5	341 ^o 38.5 24 ^o 57.6	356 ^o 01.2 24 ^o 51.5	10 ^o 23.9 24 ^o 45.2	24 ^o 46.6 24 ^o 38.7	39 ^o 29.4 24 ^o 32.1	53 ^o 32.3 24 ^o 25.3	+22.6	16.4	
Tu 14	269 ^o 23.9 22 ^o 23.1	283 ^o 47.9 22 ^o 13.6	298 ^o 12.1 22 ^o 04.1	312 ^o 36.3 21 ^o 54.3	327 ^o 00.7 21 ^o 44.5	341 ^o 25.1 21 ^o 34.5	355 ^o 49.6 21 ^o 24.3	10 ^o 14.2 21 ^o 14.0	24 ^o 38.9 21 ^o 03.6	39 ^o 03.7 20 ^o 53.0	53 ^o 28.6 20 ^o 42.3	+24.5	16.4	
We 15	269 ^o 53.2 17 ^o 46.5	284 ^o 19.6 17 ^o 33.9	298 ^o 46.1 17 ^o 21.1	313 ^o 12.7 17 ^o 08.3	327 ^o 39.4 16 ^o 55.3	342 ^o 06.2 16 ^o 42.3	356 ^o 33.1 16 ^o 29.2	11 ^o 00.0 16 ^o 15.9	25 ^o 27.1 16 ^o 02.6	39 ^o 54.4 15 ^o 49.2	54 ^o 21.5 15 ^o 35.6	+26.8	16.4	
Th 16	271 ^o 21.0 12 ^o 03.4	285 ^o 49.6 11 ^o 48.7	300 ^o 18.3 11 ^o 33.9	314 ^o 47.1 11 ^o 19.1	329 ^o 16.3 11 ^o 04.3	343 ^o 45.0 10 ^o 49.3	358 ^o 14.0 10 ^o 34.4	12 ^o 43.1 10 ^o 19.3	27 ^o 12.3 10 ^o 04.3	41 ^o 41.5 9 ^o 49.2	56 ^o 10.8 9 ^o 34.0	+29.0	16.3	
Fr 17	273 ^o 38.3 5 ^o 42.3	288 ^o 08.6 5 ^o 26.6	302 ^o 38.9 5 ^o 11.0	317 ^o 09.3 4 ^o 55.3	331 ^o 39.7 4 ^o 39.6	346 ^o 10.2 4 ^o 23.9	0 ^o 40.7 4 ^o 08.1	15 ^o 11.3 3 ^o 52.4	29 ^o 41.9 3 ^o 36.6	44 ^o 12.6 3 ^o 20.9	58 ^o 43.3 3 ^o 05.1	+30.6	16.2	
Sa 18	288 ^o 08.6 5 ^o 26.6	302 ^o 38.9 5 ^o 11.0	317 ^o 09.3 4 ^o 55.3	331 ^o 39.7 4 ^o 39.6	346 ^o 10.2 4 ^o 23.9	0 ^o 40.7 4 ^o 08.1	15 ^o 11.3 3 ^o 52.4	29 ^o 41.9 3 ^o 36.6	44 ^o 12.6 3 ^o 20.9	58 ^o 43.3 3 ^o 05.1	78 ^o 14.0 2 ^o 49.4	+30.6	16.2	
Su 19	290 ^o 58.9 -1 ^o 06.7	305 ^o 30.1 -1 ^o 22.3	320 ^o 01.3 -1 ^o 38.0	334 ^o 32.5 -1 ^o 53.6	349 ^o 03.7 -2 ^o 09.1	3 ^o 35.0 -2 ^o 24.7	18 ^o 06.2 -2 ^o 40.2	32 ^o 37.2 -2 ^o 55.8	47 ^o 08.8 -3 ^o 11.2	61 ^o 40.8 -3 ^o 26.7	76 ^o 11.4 -3 ^o 42.1	+81.3	16.0	
Mo 20	294 ^o 00.9 -7 ^o 29.3	308 ^o 32.1 -7 ^o 44.1	323 ^o 03.4 -7 ^o 58.9	337 ^o 34.6 -8 ^o 13.6	352 ^o 05.8 -8 ^o 28.2	6 ^o 37.0 -8 ^o 42.8	21 ^o 08.2 -8 ^o 57.4	35 ^o 39.3 -9 ^o 11.9	50 ^o 10.5 -9 ^o 26.3	64 ^o 41.6 -9 ^o 40.7	79 ^o 12.7 -9 ^o 55.0	+31.2	15.9	
Tu 21	296 ^o 56.1 -13 ^o 22.1	311 ^o 26.7 -13 ^o 35.3	325 ^o 57.3 -13 ^o 48.4	340 ^o 27.9 -14 ^o 01.5	354 ^o 58.4 -14 ^o 14.5	9 ^o 28.9 -14 ^o 27.4	23 ^o 59.3 -14 ^o 40.2	38 ^o 29.8 -14 ^o 53.0	53 ^o 00.1 -15 ^o 05.7	67 ^o 30.5 -15 ^o 18.3	82 ^o 00.8 -15 ^o 30.8	+30.5	15.7	
We 22	299 ^o 29.9 -18 ^o 27.3	313 ^o 59.5 -18 ^o 38.3	328 ^o 29.9 -18 ^o 49.2	342 ^o 58.5 -19 ^o 00.0	357 ^o 27.9 -19 ^o 10.6	11 ^o 57.3 -19 ^o 21.2	26 ^o 26.7 -19 ^o 31.7	40 ^o 55.9 -19 ^o 42.0	55 ^o 25.2 -19 ^o 52.3	69 ^o 54.4 -20 ^o 02.4	84 ^o 23.5 -20 ^o 12.4	+29.4	15.6	
Th 23	301 ^o 34.8 -22 ^o 28.9	316 ^o 03.2 -22 ^o 37.0	330 ^o 31.5 -22 ^o 45.0	344 ^o 59.8 -22 ^o 52.9	359 ^o 28.1 -23 ^o 00.7	13 ^o 56.3 -23 ^o 08.3	28 ^o 24.5 -23 ^o 15.8	42 ^o 52.6 -23 ^o 23.2	57 ^o 20.7 -23 ^o 30.4	71 ^o 48.7 -23 ^o 37.5	86 ^o 16.7 -23 ^o 44.5	+28.2	15.4	
Fr 24	303 ^o 12.6 -25 ^o 12.9	317 ^o 40.1 -25 ^o 17.7	332 ^o 07.6 -25 ^o 22.3	346 ^o 35.0 -25 ^o 26.8	1 ^o 02.4 -25 ^o 31.2	15 ^o 29.8 -25 ^o 35.4	29 ^o 57.2 -25 ^o 39.5	44 ^o 24.6 -25 ^o 43.4	58 ^o 51.9 -25 ^o 47.2	73 ^o 19.3 -25 ^o 50.9	87 ^o 46.6 -25 ^o 54.4	+27.4	15.3	
Sa 25	304 ^o 35.8 -26 ^o 29.7	319 ^o 03.3 -26 ^o 30.9	333 ^o 30.4 -26 ^o 32.0	347 ^o 57.7 -26 ^o 32.9	2 ^o 25.0 -26 ^o 33.7	16 ^o 52.4 -26 ^o 34.3	31 ^o 19.7 -26 ^o 34.8	45 ^o 47.1 -26 ^o 35.1	60 ^o 14.5 -26 ^o 35.3	74 ^o 41.9 -26 ^o 35.3	89 ^o 09.4 -26 ^o 35.2	+27.4	15.1	
Su 26	306 ^o 04.5 -26 ^o 16.8	320 ^o 32.5 -26 ^o 14.5	335 ^o 00.5 -26 ^o 12.0	349 ^o 28.6 -26 ^o 09.4	3 ^o 56.7 -26 ^o 06.7	18 ^o 24.8 -26 ^o 03.8	32 ^o 53.1 -26 ^o 00.8	47 ^o 21.3 -25 ^o 57.7	61 ^o 49.6 -25 ^o 54.4	76 ^o 18.0 -25 ^o 51.0	90 ^o 46.4 -25 ^o 47.1	+28.2	15.0	
Mo 27	307 ^o 59.7 -24 ^o 39.2	322 ^o 29.1 -24 ^o 33.7	336 ^o 55.8 -24 ^o 28.0	351 ^o 28.1 -24 ^o 22.3	5 ^o 57.7 -24 ^o 16.4	20 ^o 27.4 -24 ^o 10.4	34 ^o 57.1 -24 ^o 04.3	49 ^o 26.9 -23 ^o 51.8	63 ^o 56.8 -23 ^o 45.4	78 ^o 26.7 -23 ^o 38.8	92 ^o 56.8 -23 ^o 31.5	+29.7	14.9	
Tu 28	310 ^o 35.9 -21 ^o 48.1	325 ^o 07.7 -21<												

SUN

January 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Sa 1	269°11.7 -23°02.1	284°11.4 -23°01.9	299°11.1 -23°01.7	314°10.8 -23°01.5	329°10.5 -23°01.3	344°10.2 -23°01.1	359°09.9 -23°00.9	14°09.6 -23°00.7	29°09.3 -23°00.5	44°09.0 -23°00.3	59°08.7 -23°00.1	74°08.5 -22°59.9	-0.3 +0.2
Su 2	269°04.6 -22°57.1	284°04.3 -22°56.9	299°04.0 -22°56.7	314°03.7 -22°56.5	329°03.5 -22°56.2	344°03.2 -22°56.0	359°02.9 -22°55.8	14°02.6 -22°55.6	29°02.3 -22°55.3	44°02.0 -22°55.1	59°01.7 -22°54.9	74°01.4 -22°54.7	-0.3 +0.2
Mo 3	268°57.6 -22°51.7	283°57.3 -22°51.4	298°57.0 -22°51.2	313°56.8 -22°51.0	328°56.5 -22°50.7	343°56.2 -22°50.5	358°55.9 -22°50.3	13°55.6 -22°50.2	28°55.3 -22°49.8	43°55.0 -22°49.5	58°54.7 -22°49.3	73°54.4 -22°49.0	-0.3 +0.2
Tu 4	268°50.7 -22°45.8	283°50.4 -22°45.5	298°50.2 -22°45.3	313°49.9 -22°45.0	328°49.6 -22°44.8	343°49.3 -22°44.5	358°49.0 -22°44.3	13°48.7 -22°44.0	28°48.4 -22°43.7	43°48.2 -22°43.5	58°47.9 -22°43.2	73°47.6 -22°42.9	-0.3 +0.3
We 5	268°43.9 -22°39.5	283°43.6 -22°39.2	298°43.4 -22°38.9	313°43.1 -22°38.6	328°42.8 -22°38.4	343°42.5 -22°38.1	358°42.2 -22°37.8	13°42.0 -22°37.5	28°41.7 -22°37.2	43°41.4 -22°37.0	58°41.1 -22°36.7	73°40.8 -22°36.4	-0.3 +0.3
Th 6	268°37.2 -22°32.7	283°37.0 -22°32.4	298°36.7 -22°32.1	313°36.4 -22°31.8	328°36.1 -22°31.5	343°35.9 -22°31.2	358°35.6 -22°30.9	13°35.3 -22°30.6	28°35.0 -22°30.3	43°34.8 -22°30.0	58°34.5 -22°29.7	73°34.2 -22°29.4	-0.3 +0.3
Fr 7	268°30.7 -22°25.4	283°30.4 -22°25.1	298°30.1 -22°24.8	313°29.8 -22°24.5	328°29.6 -22°24.2	343°29.3 -22°23.9	358°29.0 -22°23.6	13°28.8 -22°23.3	28°28.5 -22°22.9	43°28.2 -22°22.6	58°28.0 -22°22.3	73°27.7 -22°22.0	-0.3 +0.3
Sa 8	268°24.2 -22°17.9	283°23.9 -22°17.5	298°23.7 -22°17.1	313°23.4 -22°16.8	328°23.1 -22°16.5	343°22.9 -22°16.1	358°22.6 -22°15.8	13°22.4 -22°15.5	28°22.1 -22°15.1	43°21.8 -22°14.8	58°21.6 -22°14.5	73°21.3 -22°14.1	-0.3 +0.3
Su 9	268°17.9 -22°09.7	283°17.6 -22°09.3	298°17.4 -22°09.0	313°17.1 -22°08.6	328°16.9 -22°08.3	343°16.6 -22°07.9	358°16.3 -22°07.7	13°16.1 -22°07.2	28°15.8 -22°06.9	43°15.6 -22°06.5	58°15.3 -22°06.2	73°15.0 -22°05.8	-0.3 +0.3
Mo 10	268°11.7 -22°01.7	283°11.5 -22°01.4	298°11.2 -22°01.0	313°10.9 -22°00.7	328°10.7 -22°00.4	343°10.4 -21°59.9	358°10.2 -21°58.6	13°09.9 -21°58.6	28°09.7 -21°58.2	43°09.4 -21°57.8	58°09.2 -21°57.5	73°08.9 -21°57.1	-0.3 +0.2
Tu 11	268°05.1 -21°52.2	283°04.8 -21°51.8	298°04.5 -21°51.4	313°04.9 -21°51.0	328°04.7 -21°50.6	343°04.4 -21°50.2	358°04.2 -21°49.9	13°03.9 -21°49.5	28°03.7 -21°49.1	43°03.4 -21°48.7	58°03.2 -21°48.3	73°02.9 -21°47.9	-0.2 +0.2
We 12	267°59.8 -21°42.8	282°59.5 -21°42.4	297°59.3 -21°42.0	312°59.0 -21°41.6	327°58.8 -21°41.2	342°58.6 -21°40.8	357°58.3 -21°40.4	12°58.1 -21°40.0	27°57.8 -21°39.6	42°57.6 -21°39.2	57°57.4 -21°38.7	72°57.1 -21°38.3	-0.2 +0.2
Th 13	267°54.0 -21°33.0	282°53.8 -21°32.5	297°53.6 -21°32.1	312°53.3 -21°31.7	327°53.1 -21°31.3	342°52.9 -21°30.9	357°52.6 -21°30.4	12°52.4 -21°30.0	27°52.1 -21°29.6	42°51.9 -21°29.2	57°51.7 -21°28.8	72°51.4 -21°28.3	-0.2 +0.2
Fr 14	267°48.4 -21°22.7	282°48.2 -21°22.3	297°48.0 -21°21.9	312°47.7 -21°21.4	327°47.5 -21°21.0	342°47.3 -21°20.6	357°47.1 -21°20.1	12°46.8 -21°19.7	27°46.6 -21°19.2	42°46.4 -21°18.8	57°46.2 -21°18.3	72°45.9 -21°17.9	-0.2 +0.2
Sa 15	267°43.0 -21°12.1	282°42.8 -21°11.6	297°42.6 -21°11.2	312°42.3 -21°10.7	327°42.1 -21°10.3	342°41.9 -21°09.8	357°41.7 -21°09.4	12°41.4 -21°08.9	27°41.2 -21°08.5	42°41.0 -21°08.0	57°40.8 -21°07.5	72°40.6 -21°07.1	-0.2 +0.5
Su 16	267°37.7 -21°01.0	282°37.5 -21°00.6	297°37.3 -21°00.1	312°37.1 -20°59.6	327°36.9 -20°59.2	342°36.6 -20°58.7	357°36.4 -20°58.2	12°36.2 -20°57.8	27°36.0 -20°57.3	42°35.8 -20°56.8	57°35.6 -20°56.3	72°35.4 -20°55.8	-0.2 +0.5
Mo 17	267°32.6 -20°49.6	282°32.4 -20°49.1	297°32.2 -20°48.7	312°32.0 -20°48.1	327°31.8 -20°47.6	342°31.6 -20°47.2	357°31.4 -20°46.7	12°31.2 -20°46.2	27°31.0 -20°45.7	42°30.7 -20°45.2	57°30.5 -20°44.7	72°30.3 -20°44.2	-0.2 +0.5
Tu 18	267°27.7 -20°32.9	282°27.5 -20°32.7	297°27.3 -20°32.6	312°27.1 -20°32.2	327°26.9 -20°31.7	342°26.7 -20°31.2	357°26.5 -20°30.7	12°26.3 -20°34.2	27°26.1 -20°33.7	42°25.9 -20°33.2	57°25.7 -20°32.7	72°25.5 -20°32.2	-0.2 +0.5
We 19	267°22.9 -20°25.5	282°22.7 -20°25.0	297°22.5 -20°24.5	312°22.3 -20°23.9	327°22.1 -20°23.4	342°21.9 -20°22.9	357°21.7 -20°22.4	12°21.6 -20°21.8	27°21.4 -20°21.3	42°21.2 -20°20.8	57°21.0 -20°20.3	72°20.8 -20°19.8	-0.2 +0.5
Th 20	267°18.3 -20°12.9	282°18.1 -20°12.3	297°17.9 -20°11.8	312°17.8 -20°11.3	327°17.6 -20°10.7	342°17.4 -20°10.2	357°17.2 -20°09.6	12°17.0 -20°09.1	27°16.8 -20°08.6	42°16.6 -20°08.0	57°16.5 -20°07.5	72°16.3 -20°06.9	-0.2 +0.5
Fr 21	267°13.9 -19°59.8	282°13.7 -19°59.3	297°13.6 -19°58.7	312°13.4 -19°58.2	327°13.2 -19°57.6	342°13.0 -19°57.1	357°12.8 -19°56.6	12°12.7 -19°56.0	27°12.5 -19°55.4	42°12.3 -19°54.9	57°12.1 -19°54.3	72°12.0 -19°53.8	-0.2 +0.6
Sa 22	267°09.7 -19°46.5	282°09.5 -19°45.9	297°09.3 -19°45.3	312°09.2 -19°44.8	327°09.0 -19°44.2	342°08.8 -19°43.6	357°08.7 -19°43.1	12°08.5 -19°42.5	27°08.3 -19°41.9	42°08.2 -19°41.3	57°08.0 -19°40.8	72°07.8 -19°40.2	-0.2 +0.6
Su 23	267°05.6 -19°32.7	282°05.5 -19°32.1	297°05.3 -19°31.5	312°05.2 -19°31.0	327°05.0 -19°30.4	342°04.8 -19°29.8	357°04.7 -19°29.2	12°04.5 -19°28.6	27°04.3 -19°28.0	42°04.2 -19°27.4	57°04.0 -19°26.9	72°03.9 -19°26.3	-0.2 +0.6
Mo 24	267°01.8 -19°18.6	282°01.6 -19°18.0	297°01.5 -19°17.4	312°01.3 -19°16.8	327°01.2 -19°16.2	342°01.0 -19°15.6	357°00.9 -19°15.0	12°00.7 -19°14.4	27°00.6 -19°13.8	42°00.4 -19°13.2	57°00.3 -19°12.6	72°00.1 -19°12.0	-0.2 +0.6
Tu 25	266°58.1 -19°04.1	281°58.0 -19°03.5	296°57.9 -19°02.9	311°57.7 -19°02.3	326°57.6 -19°01.7	341°57.4 -19°01.0	356°57.3 -19°00.4	11°57.1 -18°59.8	26°57.0 -18°59.2	41°56.8 -18°58.6	56°56.7 -18°58.0	71°56.5 -18°57.4	-0.1 +0.6
We 26	266°54.7 -18°49.3	281°54.6 -18°48.7	296°54.4 -18°48.0	311°54.3 -18°47.4	326°54.1 -18°46.8	341°54.0 -18°46.1	356°53.9 -18°45.5	11°53.7 -18°44.9	26°53.6 -18°44.3	41°53.4 -18°43.6	56°53.3 -18°43.0	71°53.2 -18°42.4	-0.1 +0.6
Th 27	266°51.4 -18°34.1	281°51.3 -18°33.5	296°51.2 -18°32.8	311°51.0 -18°32.2	326°50.9 -18°31.5	341°50.8 -18°30.9	356°50.7 -18°30.3	11°50.5 -18°29.6	26°50.4 -18°29.0	41°50.3 -18°28.3	56°50.1 -18°27.7	71°50.0 -18°27.0	-0.1 +0.6
Fr 28	266°48.4 -18°18.6	281°48.3 -18°17.9	296°48.1 -18°17.3	311°48.0 -18°16.6	326°47.9 -18°16.0	341°47.8 -18°15.3	356°47.6 -18°14.7	11°47.5 -18°14.0	26°47.4 -18°13.4	41°47.3 -18°12.7	56°47.2 -18°12.0	71°47.0 -18°11.4	-0.1 +0.7
Sa 29	266°45.5 -18°02.8	281°45.4 -18°02.1	296°45.3 -18°01.4	311°45.2 -18°00.8	326°45.1 -18°00.1	341°45.0 -17°59.4	356°44.8 -17°58.8	11°44.7 -17°58.1	26°44.6 -17°57.4	41°44.5 -17°56.7	56°44.4 -17°56.1	71°44.3 -17°55.4	-0.1 +0.7
Su 30	266°42.9 -17°46.6	281°42.8 -17°45.9	296°42.7 -17°45.2	311°42.6 -17°44.6	326°42.5 -17°43.9	341°42.4 -17°43.2	356°42.3 -17°42.5	11°42.1 -17°41.8	26°42.0 -17°41.1	41°41.9 -17°40.5	56°41.8 -17°39.8	71°41.7 -17°39.1	-0.1 +0.7
Mo 31	266°40.4 -17°30.1	281°40.3 -17°29.4	296°40.2 -17°28.7	311°40.2 -17°28.0	326°40.1 -17°27.3	341°40.0 -17°26.7	356°39.9 -17°26.0	11°39.8 -17°25.3	26°39.7 -17°24.6	41°39.6 -17°23.9	56°39.5 -17°23.2	71°39.4 -17°22.5	-0.1 +0.7

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change -
Semi-diameter: 16.3'

MOON

January 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ'/h SH
Sa 1	235 ⁰ 06.3 -9 ⁰ 34.3	249 ⁰ 41.7 -9 ⁰ 21.9	264 ⁰ 17.0 -9 ⁰ 09.4	278 ⁰ 52.4 -8 ⁰ 56.8	293 ⁰ 27.9 -8 ⁰ 44.2	308 ⁰ 03.4 -8 ⁰ 31.6	322 ⁰ 38.9 -8 ⁰ 19.0	337 ⁰ 14.4 -8 ⁰ 06.4	351 ⁰ 49.9 -7 ⁰ 53.7	6 ⁰ 25.5 -7 ⁰ 40.9	21 ⁰ 01.1 -7 ⁰ 28.2	+35.5 14.7 -12.6 54.0
Su 2	239 ⁰ 57.8 -4 ⁰ 14.0	254 ⁰ 33.7 -4 ⁰ 00.9	269 ⁰ 09.6 -3 ⁰ 47.8	283 ⁰ 45.5 -3 ⁰ 34.7	298 ⁰ 21.4 -3 ⁰ 21.5	312 ⁰ 57.4 -3 ⁰ 08.3	327 ⁰ 33.3 -2 ⁰ 55.2	342 ⁰ 09.2 -2 ⁰ 42.0	356 ⁰ 45.2 -2 ⁰ 28.7	11 ⁰ 21.1 -2 ⁰ 15.5	25 ⁰ 57.0 -2 ⁰ 02.3	+35.9 14.8 -13.2 54.1
Mo 3	244 ⁰ 55.5 1 ⁰ 17.3	259 ⁰ 31.3 1 ⁰ 30.6	274 ⁰ 07.3 1 ⁰ 44.0	288 ⁰ 42.8 1 ⁰ 57.3	303 ⁰ 18.6 2 ⁰ 10.6	317 ⁰ 54.3 2 ⁰ 24.0	332 ⁰ 30.0 2 ⁰ 37.3	347 ⁰ 05.7 2 ⁰ 50.7	1 ⁰ 41.3 3 ⁰ 04.0	16 ⁰ 16.9 3 ⁰ 17.3	30 ⁰ 52.6 3 ⁰ 30.7	+35.7 14.8 -13.3 54.4
Tu 4	249 ⁰ 42.4 6 ⁰ 49.5	264 ⁰ 17.4 7 ⁰ 12.7	278 ⁰ 52.4 7 ⁰ 15.8	293 ⁰ 27.3 7 ⁰ 29.0	308 ⁰ 02.1 7 ⁰ 42.1	322 ⁰ 37.0 7 ⁰ 55.2	337 ⁰ 11.7 8 ⁰ 08.2	351 ⁰ 46.4 8 ⁰ 21.3	6 ⁰ 21.1 8 ⁰ 34.3	20 ⁰ 55.6 8 ⁰ 47.3	35 ⁰ 30.2 9 ⁰ 00.3	+34.8 15.0 -13.1 54.9
We 5	254 ⁰ 00.6 12 ⁰ 11.7	268 ⁰ 34.0 12 ⁰ 24.2	283 ⁰ 07.4 12 ⁰ 36.7	297 ⁰ 40.7 12 ⁰ 49.1	312 ⁰ 13.9 13 ⁰ 01.5	326 ⁰ 47.1 13 ⁰ 13.8	341 ⁰ 20.2 13 ⁰ 26.1	355 ⁰ 53.1 13 ⁰ 38.4	10 ⁰ 26.1 13 ⁰ 50.6	24 ⁰ 58.9 14 ⁰ 02.7	39 ⁰ 31.6 14 ⁰ 14.8	+33.1 15.2 -12.3 55.6
Th 6	257 ⁰ 31.5 17 ⁰ 10.2	272 ⁰ 02.7 17 ⁰ 21.4	286 ⁰ 33.8 17 ⁰ 32.5	301 ⁰ 04.8 17 ⁰ 43.6	315 ⁰ 35.7 17 ⁰ 54.6	330 ⁰ 06.5 18 ⁰ 05.6	344 ⁰ 37.2 18 ⁰ 16.4	359 ⁰ 07.2 18 ⁰ 27.2	1 ⁰ 14.9 18 ⁰ 37.9	13 ⁰ 38.2 18 ⁰ 48.6	28 ⁰ 08.5 18 ⁰ 59.1	42 ⁰ 38.8 +10.9 56.4
Fr 7	259 ⁰ 58.7 21 ⁰ 27.2	274 ⁰ 27.1 21 ⁰ 36.3	288 ⁰ 55.3 21 ⁰ 45.4	303 ⁰ 23.5 21 ⁰ 54.3	317 ⁰ 51.5 22 ⁰ 03.1	332 ⁰ 19.4 22 ⁰ 11.8	346 ⁰ 47.2 22 ⁰ 20.3	1 ⁰ 14.9 22 ⁰ 28.8	15 ⁰ 42.4 22 ⁰ 37.2	30 ⁰ 09.8 22 ⁰ 45.4	44 ⁰ 37.1 22 ⁰ 53.6	+27.8 15.6 -8.6 57.3
Sa 8	261 ⁰ 12.3 24 ⁰ 40.5	275 ⁰ 37.7 24 ⁰ 46.5	290 ⁰ 03.0 24 ⁰ 52.4	304 ⁰ 28.2 24 ⁰ 58.2	318 ⁰ 53.2 25 ⁰ 03.8	333 ⁰ 18.2 25 ⁰ 09.3	347 ⁰ 43.0 25 ⁰ 14.6	1 ⁰ 14.9 25 ⁰ 19.8	16 ⁰ 32.4 25 ⁰ 24.8	30 ⁰ 56.9 25 ⁰ 29.6	45 ⁰ 21.4 25 ⁰ 34.3	+24.9 15.9 -5.4 58.3
Su 9	261 ⁰ 16.2 26 ⁰ 25.1	275 ⁰ 39.2 26 ⁰ 27.1	290 ⁰ 02.1 26 ⁰ 28.9	304 ⁰ 24.9 26 ⁰ 30.5	318 ⁰ 47.7 26 ⁰ 32.0	333 ⁰ 10.3 26 ⁰ 33.3	347 ⁰ 33.0 26 ⁰ 34.4	1 ⁰ 55.5 26 ⁰ 35.1	16 ⁰ 18.0 26 ⁰ 36.1	30 ⁰ 50.9 26 ⁰ 36.0	45 ⁰ 02.8 26 ⁰ 37.0	+25.7 16.2 -1.2 59.3
Mo 10	260 ⁰ 33.7 26 ⁰ 19.6	274 ⁰ 55.5 26 ⁰ 16.9	289 ⁰ 17.4 26 ⁰ 14.0	303 ⁰ 39.2 26 ⁰ 10.9	318 ⁰ 01.0 26 ⁰ 07.7	332 ⁰ 22.8 26 ⁰ 04.2	346 ⁰ 44.7 26 ⁰ 00.5	1 ⁰ 06.5 25 ⁰ 56.7	15 ⁰ 28.3 25 ⁰ 52.6	29 ⁰ 50.1 25 ⁰ 48.4	44 ⁰ 12.0 25 ⁰ 43.9	+21.8 16.4 -3.6 60.1
Tu 11	259 ⁰ 42.8 24 ⁰ 14.7	274 ⁰ 05.2 24 ⁰ 07.3	288 ⁰ 27.6 23 ⁰ 59.7	302 ⁰ 50.1 23 ⁰ 51.9	317 ⁰ 12.6 23 ⁰ 43.9	331 ⁰ 35.2 23 ⁰ 35.8	345 ⁰ 57.8 23 ⁰ 27.5	0 ⁰ 20.5 23 ⁰ 19.0	14 ⁰ 43.3 23 ⁰ 10.3	29 ⁰ 06.1 23 ⁰ 01.5	43 ⁰ 29.0 22 ⁰ 52.5	+22.6 16.6 -8.2 60.7
We 12	259 ⁰ 21.5 20 ⁰ 18.3	273 ⁰ 45.6 20 ⁰ 06.8	288 ⁰ 09.8 19 ⁰ 55.2	302 ⁰ 34.2 19 ⁰ 43.5	316 ⁰ 58.6 19 ⁰ 31.6	331 ⁰ 23.1 19 ⁰ 19.5	345 ⁰ 47.6 19 ⁰ 07.4	0 ⁰ 12.3 18 ⁰ 55.1	14 ⁰ 37.1 18 ⁰ 42.7	29 ⁰ 01.9 18 ⁰ 30.1	43 ⁰ 26.9 18 ⁰ 17.5	+24.5 16.6 -1.2 61.0
Th 13	259 ⁰ 51.9 14 ⁰ 53.9	274 ⁰ 18.3 14 ⁰ 39.5	288 ⁰ 44.8 14 ⁰ 25.1	303 ⁰ 11.4 14 ⁰ 10.5	317 ⁰ 38.0 13 ⁰ 55.9	332 ⁰ 04.8 13 ⁰ 41.2	346 ⁰ 31.6 13 ⁰ 26.4	0 ⁰ 58.5 13 ⁰ 11.5	15 ⁰ 25.5 12 ⁰ 56.5	29 ⁰ 52.6 12 ⁰ 41.5	44 ⁰ 19.8 12 ⁰ 26.4	+26.8 16.6 -14.8 60.9
Fr 14	261 ⁰ 16.9 8 ⁰ 32.7	275 ⁰ 45.3 8 ⁰ 16.8	290 ⁰ 13.7 8 ⁰ 00.7	304 ⁰ 42.3 7 ⁰ 44.7	319 ⁰ 10.9 7 ⁰ 28.6	333 ⁰ 39.6 7 ⁰ 12.5	348 ⁰ 08.3 6 ⁰ 56.4	2 ⁰ 37.1 6 ⁰ 40.2	17 ⁰ 06.0 6 ⁰ 24.0	31 ⁰ 34.9 6 ⁰ 07.8	46 ⁰ 03.9 5 ⁰ 51.6	+28.7 16.5 -1.6 60.6
Sa 15	263 ⁰ 25.1 1 ⁰ 46.7	277 ⁰ 54.8 1 ⁰ 30.3	292 ⁰ 24.7 1 ⁰ 14.0	306 ⁰ 54.5 0 ⁰ 57.7	321 ⁰ 24.4 0 ⁰ 41.3	335 ⁰ 54.4 0 ⁰ 25.0	350 ⁰ 24.3 0 ⁰ 08.7	4 ⁰ 54.3 -0 ⁰ 07.5	19 ⁰ 24.4 -0 ⁰ 23.8	33 ⁰ 54.4 -0 ⁰ 40.0	48 ⁰ 24.5 -0 ⁰ 56.2	+30.0 16.4 -1.6 60.0
Su 16	265 ⁰ 58.8 -4 ⁰ 56.1	280 ⁰ 29.2 -5 ⁰ 11.8	294 ⁰ 59.6 -5 ⁰ 27.4	309 ⁰ 30.0 -5 ⁰ 43.0	324 ⁰ 00.5 -5 ⁰ 58.6	338 ⁰ 30.9 -6 ⁰ 14.1	353 ⁰ 01.4 -6 ⁰ 29.6	7 ⁰ 31.8 -6 ⁰ 45.0	22 ⁰ 02.3 -7 ⁰ 00.3	36 ⁰ 32.7 -7 ⁰ 15.6	51 ⁰ 03.2 -7 ⁰ 30.9	+30.4 16.1 -15.5 59.2
Mo 17	268 ⁰ 39.4 -11 ⁰ 12.2	283 ⁰ 09.8 -11 ⁰ 26.4	297 ⁰ 40.1 -11 ⁰ 40.5	312 ⁰ 10.4 -11 ⁰ 54.5	326 ⁰ 40.6 -12 ⁰ 08.5	341 ⁰ 10.9 -12 ⁰ 22.4	355 ⁰ 41.1 -12 ⁰ 36.2	10 ⁰ 11.4 -12 ⁰ 50.0	24 ⁰ 41.6 -13 ⁰ 03.6	39 ⁰ 11.7 -13 ⁰ 17.2	53 ⁰ 41.9 -13 ⁰ 44.1	+30.3 15.9 -13.8 58.4
Tu 18	283 ⁰ 09.8 -11 ⁰ 26.4	297 ⁰ 40.1 -11 ⁰ 40.5	312 ⁰ 10.4 -11 ⁰ 54.5	326 ⁰ 40.6 -12 ⁰ 08.5	341 ⁰ 10.9 -12 ⁰ 22.4	355 ⁰ 41.1 -12 ⁰ 36.2	10 ⁰ 11.4 -12 ⁰ 50.0	24 ⁰ 41.6 -13 ⁰ 03.6	39 ⁰ 11.7 -13 ⁰ 17.2	53 ⁰ 41.9 -13 ⁰ 44.1	68 ⁰ 12.0 -13 ⁰ 44.1	+30.2 15.9 -13.8 58.4
We 19	285 ⁰ 40.7 -16 ⁰ 54.3	300 ⁰ 10.4 -17 ⁰ 06.3	314 ⁰ 40.0 -17 ⁰ 18.1	329 ⁰ 09.6 -17 ⁰ 29.8	343 ⁰ 39.2 -17 ⁰ 41.4	358 ⁰ 08.7 -17 ⁰ 52.9	12 ⁰ 38.2 -18 ⁰ 04.3	27 ⁰ 07.7 -18 ⁰ 15.6	41 ⁰ 37 ¹ -18 ⁰ 26.8	56 ⁰ 06.3 -18 ⁰ 37.9	70 ⁰ 35.9 -18 ⁰ 48.9	+29.5 15.7 -11.5 57.5
Th 20	287 ⁰ 51.8 -21 ⁰ 19.9	302 ⁰ 20.6 -21 ⁰ 29.0	316 ⁰ 49.3 -21 ⁰ 38.1	331 ⁰ 18.0 -21 ⁰ 46.9	345 ⁰ 46.7 -21 ⁰ 55.7	0 ⁰ 15.3 -22 ⁰ 04.3	14 ⁰ 43.9 -22 ⁰ 12.9	29 ⁰ 12.4 -22 ⁰ 21.2	43 ⁰ 40.9 -22 ⁰ 29.9	58 ⁰ 09.4 -22 ⁰ 37.6	72 ⁰ 37.8 -22 ⁰ 45.7	+28.6 15.5 -8.6 56.8
Fr 21	289 ⁰ 40.7 -24 ⁰ 30.2	304 ⁰ 08.7 -24 ⁰ 36.1	318 ⁰ 36.6 -24 ⁰ 41.8	333 ⁰ 04.5 -24 ⁰ 47.5	347 ⁰ 32.4 -24 ⁰ 53.0	2 ⁰ 00.3 -24 ⁰ 58.3	16 ⁰ 28.1 -25 ⁰ 03.5	30 ⁰ 55.9 -25 ⁰ 08.6	45 ⁰ 23.8 -25 ⁰ 13.6	59 ⁰ 51.5 -25 ⁰ 18.4	74 ⁰ 19.3 -25 ⁰ 23.0	+27.9 15.3 -5.3 56.1
Sa 22	291 ⁰ 14.5 -26 ⁰ 16.1	305 ⁰ 42.2 -26 ⁰ 18.1	320 ⁰ 09.8 -26 ⁰ 20.8	334 ⁰ 37.4 -26 ⁰ 22.9	349 ⁰ 05.1 -26 ⁰ 24.9	3 ⁰ 32.7 -26 ⁰ 26.7	18 ⁰ 00.4 -26 ⁰ 28.4	32 ⁰ 28.0 -26 ⁰ 30.0	46 ⁰ 55.7 -26 ⁰ 31.4	61 ⁰ 32.4 -26 ⁰ 32.7	75 ⁰ 51.1 -26 ⁰ 33.8	+27.7 15.1 -1.8 55.5
Su 23	292 ⁰ 48.5 -26 ⁰ 34.0	307 ⁰ 16.5 -26 ⁰ 32.9	321 ⁰ 44.6 -26 ⁰ 31.6	336 ⁰ 12.7 -26 ⁰ 30.2	350 ⁰ 40.8 -26 ⁰ 28.7	5 ⁰ 09.0 -26 ⁰ 27.1	19 ⁰ 37.2 -26 ⁰ 25.3	34 ⁰ 05.4 -26 ⁰ 23.4	48 ⁰ 33.7 -26 ⁰ 21.3	63 ⁰ 02.0 -26 ⁰ 19.1	77 ⁰ 30.3 -26 ⁰ 16.8	+28.2 15.0 -1.7 55.0
Mo 24	294 ⁰ 41.1 -25 ⁰ 26.4	309 ⁰ 10.3 -25 ⁰ 22.0	323 ⁰ 39.4 -25 ⁰ 17.5	338 ⁰ 08.7 -25 ⁰ 12.9	352 ⁰ 38.0 -25 ⁰ 08.1	7 ⁰ 07.4 -25 ⁰ 03.3	21 ⁰ 36.8 -24 ⁰ 58.3	36 ⁰ 06.2 -24 ⁰ 53.2	50 ⁰ 35.8 -24 ⁰ 48.0	65 ⁰ 05.4 -24 ⁰ 42.6	79 ⁰ 35.0 -24 ⁰ 37.2	+29.4 14.9 -4.9 54.6
Tu 25	297 ⁰ 07.7 -23 ⁰ 01.9	311 ⁰ 38.4 -22 ⁰ 54.7	326 ⁰ 09.2 -22 ⁰ 47.4	340 ⁰ 40.1 -22 ⁰ 40.0	355 ⁰ 11.0 -22 ⁰ 32.5	9 ⁰ 42.0 -22 ⁰ 17.1	24 ⁰ 13.0 -22 ⁰ 09.3	38 ⁰ 44.1 -22 ⁰ 01.4	53 ⁰ 15.3 -22 ⁰ 01.4	67 ⁰ 46.6 -21 ⁰ 53.4	82 ⁰ 17.9 -21 ⁰ 45.3	+31.0 14.8 -7.7 54.3
We 26	300 ⁰ 16.2 -19 ⁰ 33.1	314 ⁰ 48.7 -19 ⁰ 23.6	329 ⁰ 21.2 -19 ⁰ 14.1	343 ⁰ 53.7 -19 ⁰ 04.4	358 ⁰ 26.4 -18 ⁰ 54.7	12 ⁰ 59.1 -18 ⁰ 44.9	27 ⁰ 31.8 -18 ⁰ 35.0	42 ⁰ 04.6 -18 ⁰ 25.1	56 ⁰ 37.5 -18 ⁰ 15.1	71 ⁰ 10.5 -18 ⁰ 05.0	85 ⁰ 43.5 -17 ⁰ 54.8	+32.7 14.8 -9.8 54.1
Th 27	304 ⁰ 06.3 -15 ⁰ 14.2	318 ⁰ 40.3 -15 ⁰ 03.0	333 ⁰ 14.4 -15 ⁰ 11.8	347 ⁰ 48.5 -14 ⁰ 40.5	2 ⁰ 22.6 -14 ⁰ 29.1	16 ⁰ 56.8 -14 ⁰ 17.7	31 ⁰ 31.1 -14 ⁰ 06.2	46 ⁰ 05.4 -13 ⁰ 54.7	60 ⁰ 39.8 -13 ⁰ 43.1	75 ⁰ 14.2 -13 ⁰ 31.5	89 ⁰ 48.7 -13 ⁰ 19.8	+34.2 14.7 -11.4 53.9
Fr 28	308 ⁰ 31.2 -10 ⁰ 19.2	323 ⁰ 06.4 -10 ⁰ 06.9	337 ⁰ 41.6 -9 ⁰ 54.5	352 ⁰ 16.9 -9 ⁰ 42.0	6 ⁰ 52.1 -9 ⁰ 29.5	21 ⁰ 27.5 -9 ⁰ 17.0	36 ⁰ 02.8 -9 ⁰ 04.5	50 ⁰ 38.2 -8 ⁰ 51.9	65 ⁰ 13.6 -8 ⁰ 39.3	79 ⁰ 49.1 -8 ⁰ 26.7	94 ⁰ 24.5 -8 ⁰ 14.0	+35.3 14.7 -12.5 53.9
Sa 29	313 ⁰ 19.8 -5 ⁰ 01.0	327 ⁰ 55.7 -4 ⁰ 27.9	342 ⁰ 31.3 -4 ⁰ 34.8	357 ⁰ 07.4 -4 ⁰ 21.8	11 ⁰ 43.3 -4 ⁰ 08.7	26 ⁰ 19.2 -3 ⁰ 55.5	40 ⁰ 55.2 -3 ⁰ 42.4	55 ⁰ 31.1 -3 ⁰ 29.3	70 ⁰ 07.0 -3 ⁰ 16.1	84 ⁰ 43.0 -3 ⁰ 02.9	99 ⁰ 19.8 -2 ⁰ 49.8	+35.9 14.7 -13.1 53.9
Su 30	318 ⁰ 18.6 0 ⁰ 29.0	332 ⁰ 54.5 0 ⁰ 42.2	347 ⁰ 30.5 0 ⁰ 55.5	356 ⁰ 06.4 1 ⁰ 08.8	16 ⁰ 42.3 1 ⁰ 22.1	31 ⁰ 18.3 1 ⁰ 35.4	45 ⁰ 54.2 1 ⁰ 48.7	60				

SUN

February 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Tu 1	266°38.2 -17°13.3	2281°38.1 -17°12.6	296°38.0 -17°11.9	311°37.9 -17°11.2	326°37.9 -17°10.5	341°37.8 -17°09.8	356°37.7 -17°09.1	11°37.6 -17°08.4	26°37.5 -17°07.7	41°37.4 -17°07.0	56°37.3 -17°06.3	71°37.3 -17°05.5	-0.1 +0.7
We 2	266°36.2 -16°56.2	2281°36.1 -16°55.5	296°36.0 -16°54.8	311°35.9 -16°54.1	326°35.9 -16°53.4	341°35.8 -16°52.6	356°35.7 -16°51.9	11°35.6 -16°51.2	26°35.6 -16°50.5	41°35.5 -16°49.8	56°35.4 -16°49.0	71°35.3 -16°48.3	-0.1 +0.7
Th 3	266°34.2 -16°38.9	2281°34.3 -16°38.1	296°34.2 -16°37.4	311°34.2 -16°36.7	326°34.1 -16°35.9	341°34.0 -16°35.2	356°33.9 -16°34.5	11°33.9 -16°33.7	26°33.8 -16°33.0	41°33.7 -16°32.3	56°33.7 -16°31.5	71°33.6 -16°30.8	-0.1 +0.7
Fr 4	266°32.8 -16°21.2	2281°32.7 -16°20.4	296°32.6 -16°19.7	311°32.6 -16°19.0	326°32.5 -16°18.2	341°32.5 -16°17.5	356°32.4 -16°16.7	11°32.3 -16°16.0	26°32.3 -16°15.2	41°32.2 -16°14.5	56°32.2 -16°13.7	71°32.1 -16°13.0	-0.1 +0.7
Sa 5	266°31.4 -16°03.2	2281°31.3 -16°02.5	296°31.3 -16°01.7	311°31.2 -16°01.0	326°31.1 -16°00.2	341°31.1 -15°59.5	356°31.0 -15°58.7	11°31.0 -15°57.9	26°30.9 -15°57.2	41°30.9 -15°56.4	56°30.8 -15°55.7	71°30.8 -15°54.9	-0.1 +0.8
Su 6	266°30.2 -15°45.0	2281°30.1 -15°44.2	296°30.1 -15°43.5	311°30.0 -15°42.7	326°30.0 -15°41.9	341°29.9 -15°41.2	356°29.9 -15°40.4	11°29.9 -15°39.6	26°29.8 -15°38.9	41°29.8 -15°38.1	56°29.7 -15°37.3	71°29.7 -15°36.6	-0.0 +0.8
Mo 7	266°29.2 -15°26.5	2281°29.1 -15°25.7	296°29.1 -15°24.9	311°29.1 -15°24.2	326°29.0 -15°23.4	341°29.0 -15°22.6	356°29.0 -15°21.8	11°28.9 -15°21.1	26°28.9 -15°20.3	41°28.9 -15°19.5	56°28.8 -15°18.7	71°28.8 -15°17.9	-0.0 +0.8
Tu 8	266°28.4 -15°07.7	2281°28.4 -15°07.0	296°28.3 -15°06.2	311°28.3 -15°05.4	326°28.3 -15°04.6	341°28.3 -15°03.8	356°28.2 -15°03.0	11°28.2 -15°02.2	26°28.2 -15°01.4	41°28.1 -15°00.6	56°28.1 -14°59.8	71°28.1 -14°59.1	-0.1 +0.8
We 9	266°27.8 -14°48.7	2281°27.8 -14°47.9	296°27.8 -14°47.1	311°27.7 -14°46.3	326°27.7 -14°45.5	341°27.7 -14°44.7	356°27.6 -14°43.9	11°27.7 -14°43.1	26°27.7 -14°42.3	41°27.6 -14°41.5	56°27.6 -14°40.7	71°27.6 -14°39.9	-0.0 +0.8
Th 10	266°27.4 -14°29.5	2281°27.4 -14°28.7	296°27.4 -14°27.8	311°27.4 -14°27.0	326°27.4 -14°26.2	341°27.4 -14°25.4	356°27.4 -14°24.6	11°27.3 -14°23.8	26°27.3 -14°23.0	41°27.3 -14°22.2	56°27.3 -14°21.4	71°27.3 -14°20.6	-0.1 +0.8
Fr 11	266°27.2 -14°10.0	2281°27.2 -14°09.1	296°27.2 -14°08.3	311°27.2 -14°07.5	326°27.2 -14°06.7	341°27.2 -14°05.9	356°27.2 -14°05.0	11°27.2 -14°04.2	26°27.2 -14°03.4	41°27.2 -14°02.6	56°27.2 -14°01.8	71°27.2 -14°00.9	-0.1 +0.8
Sa 12	266°27.2 -13°50.2	2281°27.2 -13°49.4	296°27.2 -13°48.6	311°27.2 -13°47.7	326°27.2 -13°46.9	341°27.3 -13°46.1	356°27.3 -13°45.2	11°27.3 -13°44.4	26°27.3 -13°43.6	41°27.3 -13°42.8	56°27.3 -13°41.9	71°27.3 -13°41.1	+0.0 +0.8
Su 13	266°27.2 -13°30.2	2281°27.2 -13°29.4	296°27.2 -13°28.6	311°27.2 -13°27.7	326°27.2 -13°26.9	341°27.5 -13°26.1	356°27.5 -13°25.2	11°27.5 -13°24.4	26°27.5 -13°23.5	41°27.5 -13°22.7	56°27.5 -13°21.9	71°27.6 -13°21.0	+0.0 +0.8
Mo 14	266°27.8 -13°10.1	2281°27.8 -13°09.2	296°27.8 -13°08.4	311°27.8 -13°07.5	326°27.9 -13°06.7	341°27.9 -13°05.8	356°27.9 -13°05.0	11°27.9 -13°04.1	26°27.9 -13°03.3	41°28.0 -13°02.4	56°28.0 -13°01.6	71°28.0 -13°00.7	+0.0 +0.8
Tu 15	266°28.3 -12°49.6	2281°28.4 -12°48.8	296°28.4 -12°47.9	311°28.4 -12°47.1	326°28.5 -12°46.2	341°28.5 -12°45.4	356°28.5 -12°44.5	11°28.5 -12°43.7	26°28.6 -12°42.8	41°28.6 -12°41.9	56°28.6 -12°41.1	71°28.7 -12°40.2	+0.0 +0.9
We 16	266°29.1 -12°29.0	2281°29.1 -12°28.2	296°29.1 -12°27.3	311°29.2 -12°26.4	326°29.2 -12°25.6	341°29.2 -12°24.7	356°29.3 -12°23.8	11°29.3 -12°23.0	26°29.4 -12°22.1	41°29.4 -12°21.2	56°29.4 -12°20.4	71°29.5 -12°19.5	+0.0 +0.9
Th 17	266°30.0 -12°08.2	2281°30.0 -12°07.3	296°30.0 -12°06.5	311°30.1 -12°05.6	326°30.1 -12°04.7	341°30.2 -12°03.8	356°30.2 -12°03.0	11°30.3 -12°02.1	26°30.3 -12°01.2	41°30.4 -12°00.3	56°30.4 -11°59.5	71°30.5 -11°58.6	+0.0 +0.9
Fr 18	266°31.1 -11°47.2	2281°31.1 -11°46.3	296°31.2 -11°45.4	311°31.2 -11°44.5	326°31.3 -11°43.7	341°31.3 -11°42.8	356°31.4 -11°41.9	11°31.4 -11°41.0	26°31.5 -11°40.1	41°31.5 -11°39.3	56°31.6 -11°38.4	71°31.6 -11°37.5	+0.0 +0.9
Sa 19	266°32.3 -11°26.0	2281°32.4 -11°25.1	296°32.4 -11°24.2	311°32.5 -11°23.3	326°32.5 -11°22.4	341°32.6 -11°21.5	356°32.6 -11°20.7	11°32.7 -11°19.8	26°32.8 -11°18.9	41°32.8 -11°18.0	56°32.9 -11°17.1	71°32.9 -11°16.2	+0.0 +0.9
Su 20	266°33.7 -11°04.6	2281°33.8 -11°03.7	296°33.8 -11°02.8	311°33.9 -11°01.9	326°34.0 -11°01.0	341°34.0 -11°00.1	356°34.1 -10°59.2	11°34.2 -10°58.3	26°34.2 -10°57.4	41°34.3 -10°56.5	56°34.3 -10°55.6	71°34.4 -10°54.7	+0.1 +0.9
Mo 21	266°35.3 -10°43.0	2281°35.4 -10°42.1	296°35.4 -10°41.2	311°35.5 -10°40.3	326°35.6 -10°39.4	341°35.6 -10°38.5	356°35.7 -10°37.6	11°35.8 -10°36.7	26°35.8 -10°35.8	41°35.9 -10°34.9	56°35.9 -10°34.0	71°36.1 -10°33.1	+0.1 +0.9
Tu 22	266°37.0 -10°21.3	2281°37.1 -10°20.4	296°37.2 -10°19.5	311°37.2 -10°18.6	326°37.3 -10°17.7	341°37.4 -10°16.8	356°37.5 -10°15.8	11°37.5 -10°14.9	26°37.6 -10°14.0	41°37.7 -10°13.1	56°37.8 -10°12.2	71°37.9 -10°11.3	+0.1 +0.9
We 23	266°38.9 -9°59.4	2281°39.0 -9°58.5	296°39.1 -9°57.6	311°39.1 -9°56.7	326°39.2 -9°55.7	341°39.3 -9°54.8	356°39.4 -9°53.9	11°39.5 -9°53.0	26°39.6 -9°52.1	41°39.6 -9°51.2	56°39.7 -9°50.2	71°39.8 -9°49.3	+0.1 +0.9
Th 24	266°40.9 -9°37.4	2281°41.0 -9°36.4	296°41.1 -9°35.5	311°41.2 -9°34.6	326°41.3 -9°33.7	341°41.4 -9°32.8	356°41.5 -9°31.8	11°41.6 -9°30.9	26°41.7 -9°30.0	41°41.7 -9°29.1	56°41.8 -9°28.1	71°41.9 -9°27.2	+0.1 +0.9
Fr 25	266°43.1 -9°15.2	2281°43.2 -9°14.3	296°43.3 -9°13.3	311°43.4 -9°12.4	326°43.5 -9°11.5	341°43.6 -9°10.5	356°43.7 -9°09.6	11°43.8 -9°08.7	26°43.9 -9°07.8	41°44.0 -9°06.8	56°44.1 -9°05.9	71°44.2 -9°05.0	+0.1 +0.9
Sa 26	266°45.5 -8°52.9	2281°45.6 -8°51.9	296°45.7 -8°51.0	311°45.8 -8°50.1	326°45.9 -8°49.1	341°46.0 -8°48.2	356°46.1 -8°47.3	11°46.2 -8°46.3	26°46.3 -8°45.4	41°46.4 -8°44.4	56°46.5 -8°43.5	71°46.6 -8°42.6	+0.1 +0.9
Su 27	266°47.9 -8°30.4	2281°48.1 -8°29.5	296°48.2 -8°28.5	311°48.3 -8°27.6	326°48.4 -8°26.6	341°48.5 -8°25.7	356°48.6 -8°24.8	11°48.7 -8°23.8	26°48.8 -8°22.9	41°48.8 -8°21.9	56°49.0 -8°21.0	71°49.1 -8°20.1	+0.1 +0.9
Mo 28	266°50.6 -8°07.8	2281°50.7 -8°06.9	296°50.8 -8°05.9	311°50.9 -8°05.0	326°51.0 -8°04.0	341°51.1 -8°03.1	356°51.2 -8°02.1	11°51.4 -8°01.2	26°51.5 -8°00.3	41°51.6 -7°59.3	56°51.7 -7°58.4	71°51.8 -7°57.4	+0.1 +0.9
Tu 29	266°53.3 -7°45.1	2281°53.4 -7°44.2	296°53.6 -7°43.2	311°53.7 -7°42.3	326°53.8 -7°41.3	341°53.9 -7°40.4	356°54.0 -7°39.4	11°54.1 -7°38.5	26°54.3 -7°37.5	41°54.4 -7°36.6	56°54.5 -7°35.6	71°54.6 -7°34.7	+0.1 +0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 16.2'

MOON

February 2028

	D	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ' /h SH
C	Tu 1	240°18.6 10°04.7	264°53.2 10°17.3	269°27.8 10°29.9	284°02.2 10°42.5	298°36.7 10°55.5	313°11.0 11°07.5	327°45.3 11°20.0	342°19.6 11°32.4	356°53.7 11°44.8	11°27.9 12°09.5	26°01.9 12°54.8	+34.3 14.9 -12.5 54.8
	We 2	244°24.5 15°08.9	258°57.4 15°20.5	273°30.2 15°32.0	288°02.9 15°43.5	302°35.6 15°54.9	317°08.2 16°06.2	331°40.6 16°17.5	346°13.0 16°28.8	0°45.4 20°55.9	15°17.6 21°05.0	29°49.7 21°14.1	+32.5 15.1 -11.3 55.4
	Th 3	247°40.7 19°39.3	262°11.3 19°49.2	276°41.8 19°59.0	291°12.2 20°08.7	305°42.5 20°18.3	320°12.7 20°27.8	334°42.8 20°37.3	349°12.8 20°46.6	3°42.7 20°55.9	18°12.5 21°05.0	32°42.2 21°15.1	+30.2 15.3 -9.5 56.1
	Fr 4	249°54.3 23°18.1	264°22.3 23°25.5	278°50.1 23°32.7	293°17.8 23°39.9	307°45.4 23°46.9	322°12.9 23°53.8	336°40.3 24°00.6	351°07.6 24°07.3	5°34.7 24°13.8	20°01.8 24°20.2	34°28.8 24°26.5	+27.4 15.5 +6.9 57.0
D	Sa 5	251°00.5 25°44.4	265°25.8 25°48.5	279°51.0 25°52.3	294°16.1 25°56.1	308°41.1 25°59.6	323°06.1 26°03.1	337°30.9 26°06.3	351°55.7 26°09.4	6°20.3 26°12.4	20°44.9 26°15.2	35°09.4 26°17.8	+24.9 15.8 +3.3 58.0
	Su 6	251°07.8 26°37.0	265°31.1 26°36.9	279°54.5 26°36.6	294°17.7 26°36.1	308°40.9 26°35.5	323°04.1 26°34.6	337°27.2 26°33.6	351°50.3 26°32.4	6°13.3 26°31.0	20°36.3 26°29.5	34°59.3 26°27.7	+23.1 16.1 -0.9 59.0
	Mo 7	250°40.7 25°39.4	265°03.4 25°34.7	279°26.0 25°29.8	293°48.7 25°24.7	308°11.4 25°19.5	322°34.1 25°14.0	336°56.8 25°08.4	351°19.5 25°02.6	5°42.2 24°56.6	20°05.0 24°50.4	34°27.7 24°44.0	+22.7 16.3 -5.5 60.0
	Tu 8	250°12.8 22°47.2	264°36.1 22°38.0	278°59.5 22°28.6	293°22.9 22°19.1	307°46.5 22°09.4	322°09.9 21°59.6	336°33.5 21°49.6	350°57.1 21°39.4	5°20.8 21°29.1	19°44.6 21°18.6	34°08.4 21°08.0	+23.6 16.6 -9.9 60.7
E	We 9	250°13.2 18°10.8	264°38.1 17°57.9	279°03.1 17°44.9	293°28.1 17°31.7	307°53.2 17°18.4	322°18.3 17°05.0	336°43.6 16°51.5	351°08.9 16°37.6	5°34.2 16°24.0	19°59.7 16°10.2	34°25.2 15°56.2	+25.2 16.7 -13.5 61.2
	Th 10	250°56.6 12°14.3	265°23.3 11°58.8	279°50.0 11°43.2	294°16.8 11°27.6	308°43.6 11°11.9	323°10.5 10°56.1	337°37.5 10°40.2	352°04.8 10°24.3	6°31.7 10°08.3	20°58.8 9°52.3	35°26.1 9°36.2	+27.0 16.7 -15.8 61.4
	Fr 11	253°21.5 5°29.1	266°49.6 5°12.3	281°17.8 4°55.5	295°46.0 4°38.7	310°14.2 4°21.9	324°42.5 4°05.1	339°10.9 3°48.3	353°39.3 3°31.4	8°07.7 3°14.5	22°36.1 2°57.7	37°04.8 2°40.8	+28.3 16.7 -16.8 61.2
	Sa 12	254°16.1 -1°31.9	268°45.1 -1°48.6	283°14.1 -2°05.3	297°43.1 -2°22.0	312°12.1 -2°38.6	326°41.2 -2°55.2	341°10.3 -3°11.8	355°39.3 -3°28.3	10°08.4 -3°44.8	24°37.6 -4°01.3	39°06.7 -4°17.7	+29.1 16.5 -16.6 60.6
F	Su 13	256°24.3 -8°18.2	270°53.5 -8°33.8	285°22.7 -8°49.3	299°51.9 -9°04.7	314°21.0 -9°20.1	328°50.2 -9°35.4	343°19.4 -9°50.6	357°48.5 -10°05.7	12°17.6 -10°20.9	26°46.8 -10°35.8	41°15.9 -10°50.7	+29.2 16.3 -15.3 59.8
	Mo 14	258°30.8 -14°24.2	272°59.6 -14°37.7	287°28.4 -15°11.1	301°57.2 -15°04.4	316°26.0 -15°17.6	330°54.8 -15°30.7	345°23.5 -15°43.6	359°52.2 -15°56.6	14°20.9 -16°09.3	28°49.5 -16°22.0	43°18.2 -16°34.5	+28.7 16.1 -13.0 58.9
	Tu 15	260°24.4 -19°29.3	274°52.6 -19°40.1	289°20.7 -19°50.6	303°48.9 -20°01.1	318°17.0 -20°11.4	332°45.1 -20°21.6	347°13.1 -20°31.7	361°41.2 -20°51.5	16°09.3 -21°05.1	30°37.1 -21°18.2	45°05.1 -21°10.8	+28.1 15.8 -10.1 57.9
	We 16	262°01.2 -23°18.4	276°28.8 -23°25.8	290°56.3 -23°33.1	305°23.9 -23°40.1	319°51.4 -23°47.2	334°18.9 -23°54.1	348°46.3 -24°00.8	3°13.8 -24°07.4	17°41.2 -24°13.8	32°08.7 -24°20.1	46°36.1 -24°26.3	+27.5 15.5 -6.8 57.7
G	Th 17	276°28.8 -23°25.8	290°56.3 -23°33.1	305°23.9 -23°40.2	319°51.4 -23°47.2	334°18.9 -23°54.1	348°46.3 -24°00.8	3°13.8 -24°07.4	17°41.2 -24°13.8	32°08.7 -24°20.1	46°36.1 -24°26.3	61°03.5 -24°32.3	+27.5 15.5 -6.7 56.9
	Fr 18	277°53.5 -25°45.3	292°20.8 -25°49.0	306°48.1 -25°52.5	321°15.5 -25°56.0	335°42.8 -25°59.6	350°10.1 -26°02.4	4°37.4 -26°05.3	19°04.8 -26°08.2	33°32.1 -26°10.9	47°59.5 -26°13.4	62°26.9 -26°15.8	+27.3 15.3 -3.1 56.1
	Sa 19	279°19.7 -26°34.7	293°47.4 -26°34.8	308°15.2 -26°34.8	322°42.9 -26°34.4	337°10.7 -26°34.4	351°38.6 -26°33.9	6°06.5 -26°33.3	20°34.4 -26°32.6	35°02.3 -26°31.8	49°30.3 -26°30.8	63°58.3 -26°29.7	+27.9 15.1 +0.5 55.4
	Su 20	281°04.0 -25°56.7	295°32.8 -25°53.4	310°01.6 -25°50.0	324°30.5 -25°46.5	338°59.4 -25°42.9	353°28.4 -25°39.2	7°57.5 -25°35.3	22°26.6 -25°31.3	36°55.7 -25°27.2	51°25.0 -25°22.9	65°54.2 -25°18.6	+29.0 15.0 +3.8 54.8
H	Mo 21	283°20.9 -23°59.0	297°51.2 -23°52.8	312°21.6 -23°46.5	326°52.0 -23°40.1	341°22.5 -23°33.5	355°53.1 -23°26.9	10°23.7 -23°20.2	24°54.4 -23°13.3	39°25.2 -23°06.4	53°56.0 -22°59.3	68°26.9 -22°52.2	+30.6 14.8 +6.7 54.4
	Tu 22	286°18.6 -20°53.4	300°50.6 -20°44.7	315°22.6 -20°36.0	329°54.7 -20°27.2	344°26.9 -20°18.2	358°59.2 -20°09.2	13°31.5 -19°51.0	28°03.9 -19°41.8	42°36.3 -19°41.8	57°08.8 -19°32.4	71°41.4 -19°23.0	+32.3 14.8 +9.0 54.1
	We 23	288°57.6 -16°53.0	304°31.1 -16°42.5	319°04.7 -16°31.8	333°38.4 -16°21.1	348°12.1 -16°10.4	2°45.9 -15°59.6	17°19.7 -15°48.7	31°53.6 -15°37.8	46°27.6 -15°26.8	61°01.6 -15°15.7	75°35.6 -15°04.6	+33.8 14.7 +10.8 53.9
	Th 24	294°12.2 -12°11.4	308°47.1 -11°59.4	323°21.9 -11°47.4	337°56.8 -11°35.4	352°31.7 -11°23.3	7°06.7 -11°11.2	21°41.7 -10°59.0	36°16.7 -10°46.8	50°51.8 -10°34.6	65°26.9 -10°22.3	80°02.0 -10°10.0	+35.0 14.7 +12.1 53.9
I	Fr 25	298°52.9 -7°01.1	313°28.5 -6°48.3	328°04.1 -6°35.4	342°39.7 -6°22.6	357°15.4 -6°09.6	11°51.1 -5°56.7	26°26.7 -5°43.8	41°02.5 -5°30.8	55°38.2 -5°17.8	70°13.9 -5°04.8	84°49.7 -4°51.8	+35.7 14.7 +12.9 53.9
	Sa 26	303°47.2 -1°34.4	318°23.1 -1°21.1	332°59.0 -1°07.9	347°34.8 -0°54.6	2°10.7 -0°41.3	16°46.6 -0°28.1	31°22.4 -0°14.8	45°58.3 -0°01.5	60°34.1 0°11.8	75°10.0 0°25.1	89°45.8 0°38.4	+35.9 14.7 +13.3 54.0
	Su 27	308°41.8 3°57.3	323°17.4 4°10.5	337°53.0 4°23.7	352°28.5 4°36.9	7°04.1 4°50.0	21°39.5 5°03.2	36°15.0 5°16.3	50°50.4 5°29.5	65°25.8 5°42.6	80°01.2 5°55.7	94°36.6 6°08.7	+35.5 14.8 +13.1 54.2
	Mo 28	313°22.4 9°22.2	327°57.2 9°34.9	342°31.9 9°47.5	357°06.5 10°00.1	11°41.1 10°12.7	26°15.6 10°25.3	40°50.1 10°37.8	55°24.5 10°50.2	69°58.9 11°02.7	84°33.2 11°15.1	99°07.5 11°27.5	+34.5 14.9 +12.5 54.6
J	Tu 29	317°34.6 14°27.7	332°07.9 14°39.3	346°41.1 14°50.9	1°14.2 15°02.4	15°47.3 15°13.9	30°20.3 15°25.3	44°53.3 15°36.6	59°26.1 15°47.9	73°58.9 15°59.2	88°31.7 16°10.3	103°04.3 16°21.4	+33.0 15.0 +11.4 55.0

Row 1: GHA, Δ' /h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (= South), Δ' /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 3 19h10 — FM: 10 15h03 — LQ: 17 08h08 — NM: 25 10h37

SUN

March 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
We 1	266°56.2 -7°22.3	281°56.3 -7°21.3	296°56.4 -7°20.4	311°56.6 -7°19.4	326°56.7 -7°18.5	341°56.8 -7°17.5	356°56.9 -7°16.6	11°57.1 -7°15.6	26°57.2 -7°14.7	41°57.3 -7°13.7	56°57.4 -7°12.8	71°57.6 -7°11.8	+0.1 +1.0
Th 2	266°59.2 -6°59.4	281°59.3 -6°58.4	296°59.5 -6°57.5	311°59.6 -6°56.5	326°59.7 -6°55.6	341°59.9 -6°54.6	357°00.0 -6°53.6	12°00.1 -6°52.7	27°00.3 -6°51.7	42°00.4 -6°50.8	57°00.5 -6°49.8	72°00.6 -6°48.8	+0.1 +1.0
Fr 3	267°02.3 -6°36.4	282°02.5 -6°35.4	297°02.6 -6°34.4	312°02.7 -6°33.5	327°02.9 -6°32.5	342°03.0 -6°31.6	357°03.1 -6°30.6	12°03.3 -6°29.6	27°03.4 -6°28.7	42°03.6 -6°27.7	57°03.7 -6°26.8	72°03.8 -6°25.8	+0.1 +1.0
Sa 4	267°05.6 -6°13.3	282°05.7 -6°12.3	297°05.9 -6°11.3	312°06.0 -6°10.4	327°06.2 -6°09.4	342°06.3 -6°08.4	357°06.4 -6°07.5	12°06.6 -6°06.8	27°06.7 -6°05.9	42°06.8 -6°04.6	57°07.0 -6°03.6	72°07.1 -6°02.6	+0.1 +1.0
Su 5	267°09.0 -5°50.1	282°09.1 -5°49.1	297°09.3 -5°48.1	312°09.4 -5°47.2	327°09.5 -5°46.2	342°09.7 -5°45.2	357°09.8 -5°44.3	12°10.0 -5°43.3	27°10.1 -5°42.3	42°10.3 -5°41.4	57°10.4 -5°40.4	72°10.5 -5°39.4	+0.1 +1.0
Mo 6	267°12.4 -5°26.8	282°12.6 -5°25.8	297°12.7 -5°24.9	312°12.9 -5°23.9	327°13.0 -5°22.9	342°13.2 -5°22.0	357°13.3 -5°21.0	12°13.5 -5°20.0	27°13.6 -5°19.0	42°13.8 -5°18.1	57°13.9 -5°17.1	72°14.1 -5°16.1	+0.1 +1.0
Tu 7	267°16.0 -5°03.5	282°16.2 -5°02.5	297°16.3 -5°01.5	312°16.5 -5°00.6	327°16.6 -4°59.6	342°16.8 -4°58.6	357°16.9 -4°57.6	12°17.1 -4°56.7	27°17.2 -4°55.7	42°17.4 -4°54.7	57°17.6 -4°53.7	72°17.7 -4°52.8	+0.2 +1.0
We 8	267°19.7 -4°40.1	282°19.9 -4°39.1	297°20.0 -4°38.1	312°20.2 -4°37.1	327°20.3 -4°36.2	342°20.5 -4°35.2	357°20.6 -4°34.2	12°20.8 -4°33.2	27°21.0 -4°32.3	42°21.1 -4°31.3	57°21.3 -4°30.3	72°21.4 -4°29.3	+0.2 +1.0
Th 9	267°23.5 -4°16.6	282°23.6 -4°15.6	297°23.8 -4°14.7	312°24.0 -4°13.7	327°24.1 -4°12.7	342°24.3 -4°11.7	357°24.4 -4°10.7	12°24.6 -4°09.8	27°24.8 -4°08.8	42°24.9 -4°07.8	57°25.1 -4°06.8	72°25.3 -4°05.8	+0.2 +1.0
Fr 10	267°27.4 -3°53.1	282°27.5 -3°52.1	297°27.7 -3°51.1	312°27.8 -3°50.2	327°28.0 -3°49.2	342°28.2 -3°48.2	357°28.3 -3°47.2	12°28.5 -3°46.2	27°28.7 -3°45.3	42°28.8 -3°44.3	57°29.0 -3°43.3	72°29.2 -3°42.3	+0.2 +1.0
Sa 11	267°31.3 -3°29.5	282°31.5 -3°28.6	297°31.6 -3°27.6	312°31.8 -3°26.6	327°32.0 -3°25.6	342°32.1 -3°24.6	357°32.3 -3°23.6	12°32.5 -3°22.7	27°32.6 -3°21.7	42°32.8 -3°20.7	57°33.0 -3°19.7	72°33.1 -3°18.7	+0.2 +1.0
Su 12	267°35.3 -3°05.9	282°35.5 -3°05.0	297°35.7 -3°04.0	312°35.8 -3°03.0	327°36.0 -3°02.0	342°36.2 -3°01.0	357°36.3 -3°00.0	12°36.5 -2°59.1	27°36.7 -2°58.8	42°36.9 -2°57.6	57°37.0 -2°56.1	72°37.2 -2°55.1	+0.2 +1.0
Mo 13	267°39.4 -2°42.3	282°39.6 -2°41.3	297°39.8 -2°40.3	312°39.9 -2°39.3	327°40.1 -2°38.4	342°40.3 -2°37.4	357°40.5 -2°36.4	12°40.6 -2°35.4	27°40.8 -2°34.4	42°41.0 -2°33.4	57°41.1 -2°32.4	72°41.3 -2°31.5	+0.2 +1.0
Tu 14	267°43.6 -2°18.6	282°43.7 -2°17.7	297°43.9 -2°16.7	312°44.1 -2°15.7	327°44.5 -2°14.7	342°44.4 -2°13.7	357°44.6 -2°12.7	12°44.8 -2°11.7	27°45.0 -2°10.7	42°45.1 -2°09.8	57°45.3 -2°08.8	72°45.5 -2°07.8	+0.2 +1.0
We 15	267°47.8 -1°54.9	282°48.0 -1°54.0	297°48.1 -1°53.0	312°48.3 -1°52.0	327°48.5 -1°51.0	342°48.7 -1°50.0	357°48.8 -1°49.0	12°49.0 -1°48.0	27°49.2 -1°47.0	42°49.4 -1°46.1	57°49.6 -1°45.1	72°49.7 -1°44.1	+0.2 +1.0
Th 16	267°52.1 -1°31.2	282°52.2 -1°30.2	297°52.4 -1°29.3	312°52.6 -1°28.3	327°52.8 -1°27.3	342°52.9 -1°26.3	357°53.1 -1°25.3	12°53.3 -1°24.3	27°53.5 -1°23.3	42°53.7 -1°22.3	57°53.8 -1°21.4	72°54.0 -1°20.4	+0.2 +1.0
Fr 17	267°56.4 -1°07.5	282°56.5 -1°06.5	297°56.7 -1°05.5	312°56.9 -1°04.5	327°57.1 -1°03.6	342°57.3 -1°02.6	357°57.4 -1°01.6	12°57.4 -1°00.6	27°57.8 -0°59.6	42°58.0 -0°58.6	57°58.2 -0°57.6	72°58.4 -0°56.6	+0.2 +1.0
Sa 18	268°00.7 -0°43.8	283°00.9 -0°42.8	298°01.1 -0°41.8	313°01.3 -0°40.8	328°01.4 -0°39.8	343°01.6 -0°38.8	358°01.8 -0°37.8	13°02.0 -0°36.9	28°02.2 -0°35.9	43°02.4 -0°34.9	58°02.5 -0°33.9	73°02.7 -0°32.9	+0.2 +1.0
Su 19	268°05.1 -0°20.1	283°05.3 -0°19.1	298°05.5 -0°18.1	313°05.7 -0°17.1	328°05.8 -0°16.1	343°06.0 -0°15.1	358°06.2 -0°14.1	13°06.2 -0°13.1	28°06.6 -0°12.1	43°06.8 -0°11.2	58°06.9 -0°10.2	73°07.1 -0°09.2	+0.2 +1.0
Mo 20	268°09.5 0°03.7	283°09.7 0°04.7	298°09.9 0°05.6	313°10.1 0°06.6	328°10.3 0°07.6	343°10.4 0°08.6	358°10.6 0°09.6	13°10.6 0°10.6	28°11.0 0°11.6	43°11.2 0°12.6	58°11.4 0°13.6	73°11.6 0°14.5	+0.2 +1.0
Tu 21	268°14.0 0°27.4	283°14.1 0°28.4	298°14.3 0°29.4	313°14.5 0°30.3	328°14.7 0°31.3	343°14.9 0°32.3	358°15.1 0°33.3	13°15.3 0°34.3	28°15.5 0°35.3	43°15.6 0°36.3	58°15.8 0°37.3	73°16.0 0°38.2	+0.2 +1.0
We 22	268°18.4 0°51.1	283°18.6 0°52.1	298°18.8 0°53.0	313°19.0 0°54.0	328°19.2 0°55.0	343°19.4 0°56.0	358°19.6 0°57.0	13°19.7 0°58.0	28°19.9 0°59.0	43°20.1 1°00.0	58°20.4 1°00.9	73°20.5 1°01.9	+0.2 +1.0
Th 23	268°22.9 1°14.7	283°23.1 1°15.7	298°23.3 1°16.7	313°23.5 1°17.7	328°23.7 1°18.7	343°23.9 1°19.7	358°24.0 1°20.6	13°24.0 1°21.6	28°24.4 1°22.6	43°24.6 1°23.6	58°24.8 1°24.6	73°25.0 1°25.6	+0.2 +1.0
Fr 24	268°27.4 1°38.4	283°27.6 1°39.4	298°27.8 1°40.3	313°28.0 1°41.3	328°28.5 1°42.3	343°28.6 1°43.3	358°28.5 1°44.3	13°28.5 1°45.3	28°28.9 1°46.2	43°29.1 1°47.2	58°29.3 1°48.2	73°29.5 1°49.2	+0.2 +1.0
Sa 25	268°31.9 2°02.0	283°32.1 2°02.9	298°32.3 2°03.9	313°32.5 2°04.9	328°32.7 2°05.9	343°32.9 2°06.9	358°33.0 2°07.9	13°33.2 2°08.8	28°33.6 2°09.8	43°33.8 2°10.8	58°33.8 2°11.8	73°34.0 2°12.8	+0.2 +1.0
Su 26	268°36.4 2°25.5	283°36.6 2°26.5	298°36.8 2°27.5	313°37.0 2°28.5	328°37.2 2°29.4	343°37.4 2°30.4	358°37.5 2°31.4	13°37.7 2°32.4	28°37.9 2°33.4	43°38.1 2°34.3	58°38.3 2°35.3	73°38.5 2°36.3	+0.2 +1.0
Mo 27	268°40.9 2°49.0	283°41.1 2°50.0	298°41.3 2°51.0	313°41.5 2°52.0	328°41.7 2°52.9	343°41.9 2°53.9	358°42.1 2°54.9	13°42.2 2°55.9	28°42.6 2°56.8	43°42.8 2°57.8	58°42.6 2°58.8	73°43.0 2°59.8	+0.2 +1.0
Tu 28	268°45.4 3°12.5	283°45.6 3°13.4	298°45.8 3°14.4	313°46.0 3°15.4	328°46.2 3°16.4	343°46.4 3°17.3	358°46.6 3°18.3	13°46.7 3°19.3	28°46.9 3°20.3	43°47.1 3°21.2	58°47.1 3°22.2	73°47.5 3°23.2	+0.2 +1.0
We 29	268°49.9 3°35.8	283°50.1 3°36.8	298°50.3 3°37.8	313°50.5 3°38.8	328°50.7 3°39.7	343°50.9 3°40.7	358°51.0 3°41.7	13°51.2 3°42.7	28°51.6 3°43.6	43°51.6 3°44.6	58°51.6 3°45.6	73°52.0 3°46.5	+0.2 +1.0
Th 30	268°54.4 3°59.2	283°54.6 4°00.1	298°54.8 4°01.1	313°55.0 4°02.1	328°55.2 4°03.0	343°55.3 4°04.0	358°55.5 4°05.0	13°55.7 4°05.9	28°55.9 4°06.9	43°55.9 4°07.9	58°55.9 4°08.8	73°56.5 4°09.8	+0.2 +1.0
Fr 31	268°58.9 4°22.4	283°59.1 4°23.4	298°59.2 4°24.3	313°59.4 4°25.3	328°59.6 4°26.3	343°59.8 4°27.2	359°00.0 4°28.2	14°00.0 4°29.2	29°00.0 4°30.1	44°00.0 4°31.1	59°00.7 4°32.1	74°00.9 4°33.0	+0.2 +1.0

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ'/h = dec. change

Semi-diameter: 16.1'

MOON

March 2028

	D	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ /h SH
●	We 1	248 ⁰ 26.5 18 ⁰ 08.8	262 ⁰ 58.2 18 ⁰ 19.2	277 ⁰ 29.9 18 ⁰ 29.5	292 ⁰ 01.5 18 ⁰ 39.7	306 ⁰ 33.1 18 ⁰ 49.8	321 ⁰ 04.5 18 ⁰ 59.8	335 ⁰ 35.8 19 ⁰ 09.8	350 ⁰ 07.1 19 ⁰ 19.7	4 ⁰ 38.3 19 ⁰ 29.5	19 ⁰ 09.4 19 ⁰ 39.2	33 ⁰ 40.4 19 ⁰ 48.9	+31.4 15.1 +10.0 55.4
	Th 2	251 ⁰ 14.6 22 ⁰ 02.7	265 ⁰ 44.1 22 ⁰ 10.8	280 ⁰ 13.6 22 ⁰ 18.9	294 ⁰ 42.9 22 ⁰ 26.8	309 ⁰ 12.2 22 ⁰ 34.6	323 ⁰ 41.4 22 ⁰ 42.4	338 ⁰ 10.4 22 ⁰ 50.0	352 ⁰ 39.4 22 ⁰ 57.5	7 ⁰ 08.3 23 ⁰ 04.9	21 ⁰ 37.1 23 ⁰ 12.2	36 ⁰ 05.8 23 ⁰ 19.3	+29.1 15.3 +7.7 56.0
	Fr 3	253 ⁰ 05.3 24 ⁰ 52.6	267 ⁰ 32.5 24 ⁰ 57.8	281 ⁰ 59.7 25 ⁰ 02.9	296 ⁰ 26.7 25 ⁰ 07.8	310 ⁰ 53.7 25 ⁰ 12.7	325 ⁰ 20.6 25 ⁰ 17.3	339 ⁰ 47.4 25 ⁰ 21.9	354 ⁰ 14.1 25 ⁰ 26.2	8 ⁰ 40.8 25 ⁰ 30.5	23 ⁰ 07.3 25 ⁰ 34.6	37 ⁰ 33.8 25 ⁰ 38.6	+26.9 15.5 +4.6 56.8
	Sa 4	254 ⁰ 02.0 26 ⁰ 20.4	268 ⁰ 27.3 26 ⁰ 22.0	282 ⁰ 52.6 26 ⁰ 23.4	297 ⁰ 17.8 26 ⁰ 24.7	311 ⁰ 42.9 26 ⁰ 25.8	326 ⁰ 08.0 26 ⁰ 26.7	340 ⁰ 33.0 26 ⁰ 27.5	354 ⁰ 58.0 26 ⁰ 27.5	9 ⁰ 22.9 26 ⁰ 28.5	23 ⁰ 47.8 26 ⁰ 28.8	38 ⁰ 12.6 26 ⁰ 28.9	+25.1 15.7 +0.8 57.6
	Su 5	254 ⁰ 20.2 26 ⁰ 10.6	268 ⁰ 44.4 26 ⁰ 08.0	283 ⁰ 08.7 26 ⁰ 05.3	297 ⁰ 32.9 26 ⁰ 02.4	311 ⁰ 57.1 25 ⁰ 59.3	326 ⁰ 21.3 25 ⁰ 56.0	340 ⁰ 45.4 25 ⁰ 52.6	355 ⁰ 09.6 25 ⁰ 49.9	9 ⁰ 33.7 25 ⁰ 45.2	23 ⁰ 57.9 25 ⁰ 41.2	38 ⁰ 22.0 25 ⁰ 37.1	+24.2 16.0 -3.3 58.6
	Mo 6	254 ⁰ 24.5 24 ⁰ 14.7	268 ⁰ 48.7 24 ⁰ 07.9	283 ⁰ 13.0 24 ⁰ 00.8	297 ⁰ 37.3 23 ⁰ 53.7	312 ⁰ 01.6 23 ⁰ 46.3	326 ⁰ 26.0 23 ⁰ 38.8	340 ⁰ 50.4 23 ⁰ 31.1	355 ⁰ 14.8 23 ⁰ 23.3	9 ⁰ 39.2 23 ⁰ 15.3	24 ⁰ 03.7 23 ⁰ 07.1	38 ⁰ 28.2 22 ⁰ 58.8	+24.4 16.2 -7.6 59.5
	Tu 7	254 ⁰ 40.1 20 ⁰ 35.2	269 ⁰ 05.3 20 ⁰ 24.4	283 ⁰ 30.5 20 ⁰ 13.5	297 ⁰ 55.7 20 ⁰ 02.4	312 ⁰ 21.0 19 ⁰ 51.2	326 ⁰ 46.3 19 ⁰ 39.9	341 ⁰ 11.7 19 ⁰ 28.4	355 ⁰ 37.1 19 ⁰ 16.7	10 ⁰ 02.6 19 ⁰ 05.0	24 ⁰ 28.2 18 ⁰ 53.1	38 ⁰ 53.7 18 ⁰ 41.1	+25.4 16.4 -11.4 60.3
	We 8	255 ⁰ 23.8 15 ⁰ 25.8	269 ⁰ 50.2 15 ⁰ 11.8	284 ⁰ 16.7 14 ⁰ 57.8	298 ⁰ 43.2 14 ⁰ 43.6	313 ⁰ 09.8 14 ⁰ 29.4	327 ⁰ 36.4 14 ⁰ 15.0	342 ⁰ 03.1 14 ⁰ 00.6	356 ⁰ 29.8 13 ⁰ 46.4	10 ⁰ 56.6 13 ⁰ 31.4	25 ⁰ 23.4 13 ⁰ 16.6	39 ⁰ 50.3 13 ⁰ 01.8	+26.7 16.6 -14.4 60.9
	Th 9	256 ⁰ 39.1 9 ⁰ 09.6	271 ⁰ 06.7 8 ⁰ 53.6	285 ⁰ 34.3 8 ⁰ 37.5	300 ⁰ 02.0 8 ⁰ 21.3	314 ⁰ 29.7 8 ⁰ 05.1	328 ⁰ 57.5 7 ⁰ 48.9	343 ⁰ 25.3 7 ⁰ 32.5	357 ⁰ 53.1 7 ⁰ 16.2	12 ⁰ 20.9 6 ⁰ 59.8	26 ⁰ 48.8 6 ⁰ 43.3	41 ⁰ 16.8 5 ⁰ 28.1	+27.8 16.7 -6.1 61.2
	Fr 10	258 ⁰ 19.0 9 ⁰ 15.6	272 ⁰ 47.3 1 ⁰ 58.7	287 ⁰ 15.7 1 ⁰ 41.8	301 ⁰ 44.0 1 ⁰ 24.9	316 ⁰ 12.4 1 ⁰ 07.9	330 ⁰ 40.8 0 ⁰ 51.0	345 ⁰ 09.2 0 ⁰ 34.1	359 ⁰ 37.6 0 ⁰ 17.1	14 ⁰ 06.1 0 ⁰ 00.2	28 ⁰ 34.5 -0 ⁰ 16.7	43 ⁰ 03.0 -0 ⁰ 33.6	+28.4 16.7 -16.9 61.2
○	Sa 11	260 ⁰ 10.2 -4 ⁰ 45.0	274 ⁰ 38.7 -5 ⁰ 01.6	289 ⁰ 07.2 -5 ⁰ 18.0	303 ⁰ 35.6 -5 ⁰ 34.5	318 ⁰ 04.1 -5 ⁰ 50.9	332 ⁰ 32.5 -6 ⁰ 07.2	347 ⁰ 01.0 -6 ⁰ 23.5	1 ⁰ 29.4 -6 ⁰ 39.8	15 ⁰ 57.8 -6 ⁰ 56.0	30 ⁰ 26.2 -7 ⁰ 12.1	44 ⁰ 54.0 -7 ⁰ 28.2	+28.4 16.6 -26.3 60.8
	Su 12	261 ⁰ 58.3 -11 ⁰ 21.8	276 ⁰ 26.4 -11 ⁰ 36.7	290 ⁰ 54.4 -11 ⁰ 51.6	305 ⁰ 22.5 -12 ⁰ 06.4	319 ⁰ 50.5 -12 ⁰ 21.1	334 ⁰ 18.4 -12 ⁰ 35.7	348 ⁰ 46.4 -12 ⁰ 50.3	3 ⁰ 14.3 -13 ⁰ 04.7	17 ⁰ 42.2 -13 ⁰ 19.1	32 ⁰ 10.1 -13 ⁰ 33.3	46 ⁰ 37.9 -13 ⁰ 47.5	+28.0 16.4 -14.6 60.2
	Mo 13	263 ⁰ 31.8 -17 ⁰ 07.3	277 ⁰ 59.2 -17 ⁰ 19.8	292 ⁰ 26.5 -17 ⁰ 32.1	306 ⁰ 53.8 -17 ⁰ 44.3	321 ⁰ 21.0 -17 ⁰ 56.3	335 ⁰ 48.2 -18 ⁰ 08.3	350 ⁰ 15.4 -18 ⁰ 20.1	4 ⁰ 42.6 -18 ⁰ 31.8	16 ⁰ 09.7 -18 ⁰ 43.4	33 ⁰ 36.8 -18 ⁰ 54.8	48 ⁰ 03.8 -19 ⁰ 06.1	+27.2 16.2 -11.9 59.3
	Tu 14	264 ⁰ 46.2 -21 ⁰ 39.9	279 ⁰ 12.9 -21 ⁰ 49.9	293 ⁰ 39.4 -21 ⁰ 58.0	308 ⁰ 06.0 -22 ⁰ 06.9	322 ⁰ 32.6 -22 ⁰ 15.6	336 ⁰ 59.1 -22 ⁰ 24.2	351 ⁰ 25.6 -22 ⁰ 32.6	5 ⁰ 52.1 -22 ⁰ 49.0	16 ⁰ 18.5 -22 ⁰ 57.2	34 ⁰ 45.0 -22 ⁰ 67.0	49 ⁰ 11.4 -23 ⁰ 04.8	+26.5 15.9 -8.5 58.3
	We 15	265 ⁰ 46.4 -24 ⁰ 44.5	280 ⁰ 12.7 -24 ⁰ 49.9	294 ⁰ 39.0 -24 ⁰ 55.2	309 ⁰ 05.3 -25 ⁰ 00.3	323 ⁰ 31.3 -25 ⁰ 05.3	337 ⁰ 57.9 -25 ⁰ 10.1	352 ⁰ 24.1 -25 ⁰ 14.7	6 ⁰ 50.4 -25 ⁰ 19.2	21 ⁰ 16.8 -25 ⁰ 23.6	35 ⁰ 43.1 -25 ⁰ 27.8	50 ⁰ 09.4 -25 ⁰ 31.8	+26.3 15.6 -4.7 57.3
	Th 16	266 ⁰ 46.3 -26 ⁰ 14.2	281 ⁰ 12.9 -26 ⁰ 15.8	295 ⁰ 39.6 -26 ⁰ 17.3	310 ⁰ 06.3 -26 ⁰ 18.6	324 ⁰ 33.0 -26 ⁰ 19.8	338 ⁰ 59.8 -26 ⁰ 20.8	353 ⁰ 26.6 -26 ⁰ 21.6	7 ⁰ 53.5 -26 ⁰ 22.4	22 ⁰ 20.3 -26 ⁰ 22.9	36 ⁰ 47.3 -26 ⁰ 23.4	51 ⁰ 14.2 -26 ⁰ 23.6	+26.8 15.4 -0.9 56.3
	Fr 17	281 ⁰ 12.9 -26 ⁰ 15.8	295 ⁰ 39.6 -26 ⁰ 17.3	310 ⁰ 06.3 -26 ⁰ 18.6	324 ⁰ 33.0 -26 ⁰ 19.8	338 ⁰ 59.8 -26 ⁰ 20.8	353 ⁰ 26.6 -26 ⁰ 21.6	7 ⁰ 53.5 -26 ⁰ 22.4	22 ⁰ 20.3 -26 ⁰ 22.9	36 ⁰ 47.3 -26 ⁰ 23.4	51 ⁰ 14.2 -26 ⁰ 23.6	51 ⁰ 14.2 -26 ⁰ 23.8	+26.8 15.4 -0.8 56.3
	Sa 18	282 ⁰ 32.1 -26 ⁰ 08.6	296 ⁰ 59.9 -26 ⁰ 06.4	311 ⁰ 27.8 -26 ⁰ 04.2	325 ⁰ 55.7 -26 ⁰ 01.8	340 ⁰ 23.7 -25 ⁰ 59.3	354 ⁰ 51.6 -25 ⁰ 56.6	9 ⁰ 19.9 -25 ⁰ 53.8	23 ⁰ 48.0 -25 ⁰ 50.9	38 ⁰ 16.3 -25 ⁰ 47.8	52 ⁰ 44.6 -25 ⁰ 44.6	67 ⁰ 13.0 -25 ⁰ 41.3	+28.1 15.1 +2.7 55.5
	Su 19	284 ⁰ 26.7 -24 ⁰ 36.6	298 ⁰ 56.2 -24 ⁰ 31.3	313 ⁰ 25.8 -24 ⁰ 25.9	327 ⁰ 55.4 -24 ⁰ 20.4	342 ⁰ 25.1 -24 ⁰ 14.8	356 ⁰ 54.9 -24 ⁰ 09.1	11 ⁰ 24.8 -24 ⁰ 03.2	25 ⁰ 54.7 -23 ⁰ 57.3	40 ⁰ 24.7 -23 ⁰ 51.2	54 ⁰ 54.8 -23 ⁰ 45.1	69 ⁰ 24.9 -23 ⁰ 38.8	+29.8 15.0 +5.8 54.9
	Mo 20	287 ⁰ 06.2 -21 ⁰ 52.4	301 ⁰ 37.5 -21 ⁰ 44.5	316 ⁰ 09.0 -21 ⁰ 36.5	330 ⁰ 40.5 -21 ⁰ 28.5	345 ⁰ 12.0 -21 ⁰ 20.3	359 ⁰ 43.7 -21 ⁰ 12.1	14 ⁰ 15.4 -21 ⁰ 03.8	28 ⁰ 47.4 -20 ⁰ 55.4	46 ⁰ 57.9 -20 ⁰ 46.9	61 ⁰ 31.2 -20 ⁰ 38.3	72 ⁰ 23.0 -20 ⁰ 29.6	+31.7 14.8 +8.3 54.4
●	Tu 21	290 ⁰ 31.2 -18 ⁰ 09.9	305 ⁰ 04.3 -18 ⁰ 00.0	319 ⁰ 37.4 -17 ⁰ 50.0	334 ⁰ 10.7 -17 ⁰ 39.9	348 ⁰ 43.9 -17 ⁰ 29.8	3 ⁰ 17.3 -17 ⁰ 19.6	17 ⁰ 50.6 -17 ⁰ 09.3	32 ⁰ 24.1 -16 ⁰ 59.0	46 ⁰ 57.6 -16 ⁰ 48.8	61 ⁰ 31.2 -16 ⁰ 38.1	76 ⁰ 04.8 -16 ⁰ 27.4	+33.4 14.8 -10.2 54.1
	We 22	294 ⁰ 35.7 -13 ⁰ 42.6	309 ⁰ 10.2 -13 ⁰ 31.1	323 ⁰ 44.7 -13 ⁰ 19.7	338 ⁰ 19.3 -13 ⁰ 08.1	352 ⁰ 53.9 -12 ⁰ 56.9	7 ⁰ 28.5 -12 ⁰ 44.9	22 ⁰ 03.2 -12 ⁰ 33.2	36 ⁰ 37.9 -12 ⁰ 21.4	51 ⁰ 12.7 -12 ⁰ 09.7	65 ⁰ 47.5 -11 ⁰ 57.8	80 ⁰ 22.6 -11 ⁰ 46.6	+34.7 14.7 -11.7 54.0
	Th 23	299 ⁰ 09.4 -8 ⁰ 42.9	313 ⁰ 44.8 -8 ⁰ 30.4	328 ⁰ 20.2 -8 ⁰ 17.9	342 ⁰ 55.6 -8 ⁰ 05.4	357 ⁰ 31.0 -7 ⁰ 52.8	12 ⁰ 06.5 -7 ⁰ 40.1	26 ⁰ 42.0 -7 ⁰ 27.5	41 ⁰ 17.5 -7 ⁰ 14.8	55 ⁰ 53.1 -7 ⁰ 02.1	70 ⁰ 28.6 -6 ⁰ 49.4	85 ⁰ 04.2 -6 ⁰ 36.6	+35.5 14.7 -12.6 54.0
	Fr 24	303 ⁰ 59.5 -3 ⁰ 22.4	318 ⁰ 35.3 -3 ⁰ 09.3	333 ⁰ 11.0 -2 ⁰ 56.2	347 ⁰ 46.8 -2 ⁰ 43.1	2 ⁰ 22.5 -2 ⁰ 30.0	16 ⁰ 58.3 -2 ⁰ 16.8	31 ⁰ 34.1 -2 ⁰ 03.7	46 ⁰ 09.8 -1 ⁰ 50.5	60 ⁰ 45.6 -1 ⁰ 37.5	75 ⁰ 21.3 -1 ⁰ 24.1	89 ⁰ 57.1 -1 ⁰ 10.9	+35.8 14.7 +13.2 54.1
	Sa 25	308 ⁰ 52.4 2 ⁰ 07.7	323 ⁰ 28.0 2 ⁰ 20.9	338 ⁰ 03.5 2 ⁰ 34.2	352 ⁰ 39.0 2 ⁰ 47.4	7 ⁰ 14.6 3 ⁰ 00.6	21 ⁰ 50.1 3 ⁰ 13.8	36 ⁰ 25.5 3 ⁰ 27.0	51 ⁰ 01.0 3 ⁰ 40.3	65 ⁰ 36.4 3 ⁰ 53.5	80 ⁰ 11.8 4 ⁰ 06.6	94 ⁰ 47.2 4 ⁰ 19.8	+35.5 14.8 +13.2 54.3
	Su 26	313 ⁰ 34.0 7 ⁰ 35.7	328 ⁰ 08.8 7 ⁰ 48.6	342 ⁰ 43.6 8 ⁰ 01.5	357 ⁰ 18.3 8 ⁰ 14.4	11 ⁰ 53.0 8 ⁰ 27.2	26 ⁰ 27.7 8 ⁰ 40.0	41 ⁰ 02.3 8 ⁰ 52.8	55 ⁰ 36.9 9 ⁰ 05.5	70 ⁰ 11.4 9 ⁰ 18.2	84 ⁰ 45.8 9 ⁰ 30.9	99 ⁰ 20.3 9 ⁰ 43.5	+34.6 14.9 +12.8 54.6
	Mo 27	317 ⁰ 50.3 12 ⁰ 48.9	332 ⁰ 23.8 13 ⁰ 00.9	346 ⁰ 57.3 13 ⁰ 12.9	1 ⁰ 30.7 13 ⁰ 24.8	16 ⁰ 04.1 13 ⁰ 36.7	30 ⁰ 37.3 13 ⁰ 48.5	45 ⁰ 10.6 14 ⁰ 00.3	59 ⁰ 43.7 14 ⁰ 12.0	74 ⁰ 16.8 14 ⁰ 23.7	88 ⁰ 49.8 14 ⁰ 35.3	103 ⁰ 22.8 14 ⁰ 46.9	+33.3 15.0 +11.8 54.9
	Tu 28	321 ⁰ 28.5 17 ⁰ 32.8	336 ⁰ 00.3 17 ⁰ 43.4	350 ⁰ 33.0 17 ⁰ 53.8	5 ⁰ 03.9 18 ⁰ 04.2	19 ⁰ 35.1 18 ⁰ 14.5	34 ⁰ 06.6 18 ⁰ 24.7	48 ⁰ 38.0 18 ⁰ 34.8	63 ⁰ 09.3 18 ⁰ 44.9	77 ⁰ 04.5 18 ⁰ 54.9	92 ⁰ 11.6 19 ⁰ 04.8	106 ⁰ 42.7 19 ⁰ 14.6	+31.4 15.1 +10.2 55.4
	We 29	324 ⁰ 18.6 21 ⁰ 31.2	338 ⁰ 48.4 21 ⁰ 39.5	353 ⁰ 31.0 21 ⁰ 54.7	7 ⁰ 47.5 21 ⁰ 55.9	22 ⁰ 17.0 22 ⁰ 03.9	36 ⁰ 46.4 22 ⁰ 11.9	51 ⁰ 15.7 22 ⁰ 19.7	65 ⁰ 44.9 22 ⁰ 27.4	80 ⁰ 14.1 22 ⁰ 35.0	94 ⁰ 43.1 22 ⁰ 42.5	109 ⁰ 12.1 22 ⁰ 49.9	+29.3 15.2 +7.9 55.9

SUN

April 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Sa 1	269°03.3 4°45.5	284°03.5 4°46.5	299°03.7 4°47.5	314°03.9 4°48.4	329°04.0 4°49.6	344°04.2 4°50.4	359°04.4 4°51.3	14°04.6 4°52.3	29°04.5 4°53.2	44°05.0 4°54.2	59°05.2 4°55.2	74°05.3 4°56.1	+0.2 +1.0
Su 2	269°07.7 5°08.6	284°07.9 5°09.6	299°08.1 5°10.5	314°08.3 5°11.5	329°08.5 5°12.5	344°08.6 5°13.4	359°08.8 5°14.4	14°09.0 5°15.3	29°09.2 5°16.3	44°09.4 5°17.2	59°09.6 5°18.2	74°09.7 5°19.2	+0.2 +1.0
Mo 3	269°12.1 5°31.6	284°12.3 5°32.5	299°12.5 5°33.5	314°12.7 5°34.5	329°12.8 5°35.4	344°13.0 5°36.4	359°13.2 5°37.3	14°13.4 5°38.3	29°13.6 5°39.2	44°13.8 5°40.2	59°13.9 5°41.1	74°14.1 5°42.1	+0.2 +1.0
Tu 4	269°16.5 5°54.5	284°16.6 5°55.4	299°16.8 5°56.4	314°17.0 5°57.3	329°17.2 5°58.3	344°17.4 5°59.2	359°17.5 6°00.2	14°17.7 6°01.1	29°17.9 6°02.1	44°18.1 6°03.0	59°18.3 6°04.0	74°18.4 6°04.9	+0.2 +0.9
We 5	269°20.8 6°17.2	284°21.0 6°18.2	299°21.1 6°19.1	314°21.3 6°20.1	329°21.5 6°21.0	344°21.7 6°22.0	359°21.9 6°22.9	14°22.0 6°23.9	29°22.2 6°24.8	44°22.4 6°25.8	59°22.6 6°26.7	74°22.7 6°27.6	+0.2 +0.9
Th 6	269°25.1 6°39.9	284°25.2 6°40.8	299°25.4 6°41.8	314°25.6 6°42.7	329°25.8 6°43.7	344°25.9 6°44.6	359°26.1 6°45.6	14°26.3 6°46.5	29°26.5 6°47.4	44°26.6 6°48.4	59°26.8 6°49.3	74°27.0 6°50.3	+0.2 +0.9
Fr 7	269°29.3 7°02.4	284°29.4 7°03.4	299°29.6 7°04.3	314°29.8 7°05.3	329°30.0 7°06.2	344°30.1 7°07.1	359°30.3 7°08.1	14°30.5 7°09.0	29°30.7 7°09.9	44°30.8 7°10.9	59°31.0 7°11.8	74°31.2 7°12.7	+0.2 +0.9
Sa 8	269°33.4 7°24.9	284°33.6 7°25.8	299°33.8 7°26.7	314°34.0 7°27.7	329°34.1 7°28.6	344°34.3 7°29.5	359°34.5 7°30.5	14°34.6 7°31.4	29°34.8 7°32.3	44°35.0 7°33.3	59°35.2 7°34.3	74°35.3 7°35.1	+0.2 +0.9
Su 9	269°37.5 7°47.2	284°37.7 7°48.1	299°37.9 7°49.0	314°38.0 7°50.0	329°38.2 7°50.9	344°38.4 7°51.8	359°38.6 7°52.7	14°38.7 7°53.7	29°38.8 7°54.6	44°39.1 7°55.5	59°39.2 7°56.4	74°39.4 7°57.4	+0.2 +0.9
Mo 10	269°41.6 8°09.3	284°41.7 8°10.3	299°41.9 8°11.2	314°42.1 8°12.1	329°42.2 8°13.0	344°42.4 8°13.9	359°42.6 8°14.9	14°42.7 8°15.8	29°42.9 8°16.7	44°43.1 8°17.6	59°43.2 8°18.5	74°43.4 8°19.5	+0.2 +0.9
Tu 11	269°45.5 8°31.4	284°45.7 8°32.3	299°45.9 8°33.2	314°46.0 8°34.1	329°46.2 8°35.0	344°46.4 8°35.9	359°46.5 8°36.9	14°46.7 8°37.8	29°46.9 8°38.7	44°47.0 8°39.6	59°47.2 8°40.5	74°47.3 8°41.4	+0.2 +0.9
We 12	269°49.4 8°53.3	284°49.6 8°54.2	299°49.8 8°55.1	314°49.9 8°56.0	329°50.1 8°56.9	344°50.2 8°57.8	359°50.4 8°58.7	14°50.6 8°59.6	29°50.7 9°00.5	44°50.9 9°01.4	59°51.0 9°02.3	74°51.2 9°03.3	+0.2 +0.9
Th 13	269°53.3 9°15.0	284°53.4 9°15.9	299°53.6 9°16.8	314°53.7 9°17.7	329°53.9 9°18.6	344°54.0 9°19.5	359°54.2 9°20.4	14°54.3 9°21.3	29°54.5 9°22.2	44°54.7 9°23.1	59°54.8 9°24.0	74°55.0 9°24.9	+0.2 +0.9
Fr 14	269°57.0 9°36.6	284°57.1 9°37.5	299°57.3 9°38.4	314°57.4 9°39.3	329°57.6 9°40.2	344°57.7 9°41.1	359°57.9 9°42.0	14°58.0 9°42.9	29°58.2 9°43.8	44°58.4 9°44.7	59°58.5 9°45.6	74°58.7 9°46.5	+0.2 +0.9
Sa 15	270°00.6 9°58.0	285°00.8 9°58.9	300°00.9 9°59.8	315°01.1 10°00.7	330°01.2 10°01.6	345°01.4 10°02.5	15°01.5 10°03.4	15°01.7 10°04.3	30°01.8 10°05.2	45°02.0 10°06.0	60°02.1 10°06.9	75°02.2 10°07.8	+0.1 +0.9
Su 16	270°04.2 10°19.3	285°04.3 10°20.2	300°04.4 10°21.1	315°04.6 10°22.0	330°04.7 10°22.8	345°04.9 10°23.7	15°05.0 10°24.6	15°05.2 10°25.5	30°05.3 10°26.4	45°05.5 10°27.3	60°05.6 10°28.1	75°05.7 10°29.0	+0.1 +0.9
Mo 17	270°07.6 10°40.4	285°07.7 10°41.3	300°07.9 10°42.2	315°08.0 10°43.1	330°08.2 10°43.9	345°08.3 10°44.8	15°08.4 10°45.7	15°08.6 10°46.5	30°08.7 10°47.4	45°08.9 10°48.3	60°09.0 10°49.2	75°09.1 10°50.0	+0.1 +0.9
Tu 18	270°11.2 11°01.4	285°11.1 11°02.2	300°11.2 11°03.1	315°11.4 11°04.0	330°11.5 11°04.8	345°11.6 11°05.7	15°11.8 11°06.6	15°11.9 11°07.4	30°12.0 11°08.3	45°12.2 11°09.2	60°12.3 11°10.0	75°12.4 11°10.9	+0.1 +0.9
We 19	270°14.2 11°22.1	285°14.3 11°23.0	300°14.4 11°23.8	315°14.6 11°24.7	330°14.7 11°25.5	345°14.8 11°26.4	15°15.0 11°27.3	15°15.1 11°28.1	30°15.3 11°29.0	45°15.4 11°29.8	60°15.5 11°30.7	75°15.6 11°31.6	+0.1 +0.9
Th 20	270°17.3 11°42.7	285°17.4 11°43.5	300°17.6 11°44.4	315°17.7 11°45.2	330°17.8 11°46.1	345°17.9 11°46.9	15°18.1 11°47.8	15°18.2 11°48.6	30°18.3 11°49.5	45°18.4 11°50.3	60°18.6 11°51.2	75°18.7 11°52.0	+0.1 +0.9
Fr 21	270°20.3 12°03.0	285°20.4 12°03.9	300°20.6 12°04.7	315°20.7 12°05.6	330°20.9 12°06.4	345°20.9 12°07.3	15°21.1 12°08.1	15°21.2 12°08.9	30°21.3 12°09.8	45°21.4 12°10.6	60°21.5 12°11.5	75°21.7 12°12.3	+0.1 +0.8
Sa 22	270°23.2 12°43.2	285°23.3 12°44.0	300°23.5 12°44.8	315°23.6 12°45.7	330°23.7 12°46.5	345°23.8 12°47.3	15°23.9 12°48.1	15°24.0 12°49.0	30°24.3 12°49.9	45°24.3 12°50.6	60°24.4 12°51.4	75°24.5 12°52.3	+0.1 +0.8
Su 23	270°26.0 12°43.2	285°26.1 12°44.0	300°26.2 12°44.8	315°26.4 12°45.7	330°26.5 12°46.5	345°26.6 12°47.3	15°26.7 12°48.1	15°26.8 12°49.0	30°26.9 12°49.9	45°27.0 12°50.6	60°27.1 12°51.4	75°27.2 12°52.3	+0.1 +0.8
Mo 24	270°28.7 13°02.9	285°28.8 13°03.8	300°28.9 13°04.6	315°29.0 13°05.4	330°29.1 13°06.2	345°29.2 13°07.0	15°29.3 13°07.8	15°29.4 13°08.7	30°29.5 13°09.5	45°29.6 13°10.3	60°29.8 13°11.1	75°29.9 13°11.9	+0.1 +0.8
Tu 25	270°31.2 13°22.5	285°31.3 13°23.3	300°31.4 13°24.1	315°31.5 13°24.9	330°31.6 13°25.7	345°31.7 13°26.5	15°31.8 13°27.3	15°31.9 13°28.1	30°32.3 13°28.9	45°32.2 13°29.8	60°32.3 13°30.6	75°32.4 13°31.4	+0.1 +0.8
We 26	270°33.7 13°41.8	285°33.8 13°42.6	300°33.9 13°43.4	315°33.9 13°44.2	330°34.0 13°45.0	345°34.1 13°45.8	15°34.2 13°46.6	15°34.3 13°47.4	30°34.4 13°48.2	45°34.5 13°49.0	60°34.6 13°49.8	75°34.7 13°50.6	+0.1 +0.8
Th 27	270°36.0 14°00.9	285°36.0 14°01.7	300°36.1 14°02.5	315°36.2 14°03.3	330°36.3 14°04.1	345°36.4 14°04.9	15°36.5 14°05.6	15°36.6 14°06.4	30°36.7 14°07.2	45°36.8 14°08.0	60°36.9 14°08.8	75°37.0 14°09.6	+0.1 +0.8
Fr 28	270°38.1 14°19.8	285°38.2 14°20.5	300°38.3 14°21.3	315°38.4 14°22.1	330°38.5 14°22.9	345°38.6 14°23.7	15°38.7 14°24.4	15°38.7 14°25.2	30°38.8 14°26.0	45°38.9 14°26.8	60°39.0 14°27.6	75°39.1 14°28.3	+0.1 +0.8
Sa 29	270°40.2 14°38.4	285°40.3 14°39.2	300°40.3 14°39.9	315°40.4 14°40.7	330°40.5 14°41.5	345°40.6 14°42.2	15°40.7 14°43.0	15°40.8 14°43.8	30°40.8 14°44.6	45°40.9 14°45.3	60°41.0 14°46.1	75°41.1 14°46.9	+0.1 +0.8
Su 30	270°42.1 14°56.8	285°42.2 14°57.5	300°42.3 14°58.3	315°42.3 14°59.1	330°42.4 14°59.8	345°42.5 15°00.6	15°42.6 15°01.3	15°42.6 15°02.1	30°42.7 15°02.9	45°42.8 15°03.6	60°42.9 15°04.4	75°42.9 15°05.1	+0.1 +0.8

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ'/h = dec. change

Semi-diameter: 15.9'

MOON

April 2028

	D	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	Δ'/h	SH
O	Sa 1	241°35.9 26°12.2	266°01.2 26°11.2	270°26.0 26°10.0	284°51.9 26°08.7	299°17.2 26°05.5	313°42.5 26°03.7	328°07.7 26°01.7	342°33.0 25°59.6	356°58.2 25°57.3	11°23.4 25°54.8	25°48.7 25°54.8	-25.3 -1.7	15.7 5.6
	Su 2	242°06.8 24°58.5	266°32.1 24°53.4	270°57.4 24°48.3	285°22.7 24°42.9	299°48.0 24°37.6	314°13.4 24°31.7	328°38.7 24°25.9	343°04.1 24°19.9	357°29.5 24°13.8	11°54.9 24°07.5	26°20.4 24°01.1	-25.4 -5.7	15.9 5.3
	Mo 3	242°46.0 22°06.2	267°12.0 21°48.4	271°38.0 21°48.4	286°04.1 21°39.3	300°30.2 21°30.0	314°56.4 21°20.6	329°22.6 21°11.1	343°48.8 20°51.6	358°15.1 20°51.6	12°41.4 20°41.6	27°07.8 20°31.6	-26.2 -9.5	16.1 5.0
O	Tu 4	243°49.1 17°44.9	268°16.2 17°32.8	272°43.4 17°20.6	287°10.6 17°08.2	301°37.9 16°55.8	316°05.2 16°43.3	330°32.6 16°30.6	345°00.0 16°17.9	359°27.4 16°05.0	13°54.9 15°52.0	28°22.5 15°39.0	-27.3 -12.6	16.3 5.6
	We 5	245°20.9 12°11.3	259°49.1 11°56.7	274°17.3 11°42.1	288°45.6 11°27.4	303°13.9 11°12.6	317°42.3 10°57.8	332°10.7 10°42.8	346°39.1 10°27.8	1°07.5 10°12.8	15°36.0 9°42.4	30°04.6 9°42.4	+28.4 -14.9	16.4 6.0
	Th 6	247°15.5 5°47.5	261°44.4 5°31.4	276°13.3 5°15.3	290°42.2 4°59.2	305°11.1 4°43.1	319°40.1 4°26.9	334°09.1 4°10.7	348°38.0 3°54.4	3°07.0 3°38.2	17°36.0 3°21.9	32°05.0 3°05.5	+29.0 -16.2	16.5 6.0
O	Fr 7	249°20.3 -1°00.9	263°49.3 -1°17.4	278°18.3 -1°33.9	292°47.3 -1°50.3	307°16.2 -2°06.7	321°45.2 -2°23.2	336°14.1 -2°39.6	350°43.0 -2°56.0	5°11.9 -3°12.3	19°40.8 -3°28.7	34°09.7 -3°45.0	+28.9 -16.4	16.5 6.0
	Sa 8	251°20.1 -7°46.2	265°48.6 -8°01.9	280°17.1 -8°17.6	294°45.5 -8°33.2	309°13.9 -8°48.8	323°42.2 -9°04.3	338°10.5 -9°19.8	352°38.8 -9°35.2	7°07.0 -9°50.5	21°35.2 -10°05.8	36°03.4 -10°21.0	+28.3 -15.5	16.5 6.4
	Su 9	253°01.1 -13°59.8	267°28.6 -14°13.7	281°56.0 -14°27.5	296°23.4 -14°41.2	310°56.0 -14°54.8	325°18.1 -15°08.3	339°45.4 -15°21.7	354°12.6 -15°35.0	8°39.8 -15°48.2	23°06.9 -16°01.3	37°34.0 -16°14.3	+27.3 -13.5	16.3 5.9
O	Mo 10	254°14.8 -19°14.9	268°41.3 -19°26.0	283°07.5 -19°36.9	297°33.8 -19°47.7	312°00.1 -19°58.4	326°26.3 -20°08.9	340°52.4 -20°19.3	355°18.5 -20°29.5	9°44.6 -20°39.6	24°10.7 -20°49.2	38°36.7 -20°59.4	+26.2 -10.5	16.2 5.9
	Tu 11	255°02.9 -23°09.4	269°28.9 -23°16.8	284°29.0 -23°24.1	298°19.4 -23°31.3	312°44.9 -23°38.3	327°10.3 -23°45.1	341°35.8 -23°51.8	356°01.2 -23°58.4	10°26.6 -24°04.7	24°52.0 -24°10.9	39°17.4 -24°17.0	+25.4 -6.8	15.9 5.8
	We 12	255°38.1 -25°28.8	270°03.5 -25°32.3	284°29.0 -25°35.6	298°54.5 -25°38.8	313°19.9 -25°41.8	327°45.4 -25°44.7	342°11.0 -25°47.4	356°36.5 -25°49.4	11°02.1 -25°52.3	25°27.7 -25°54.5	39°53.3 -25°56.6	+25.5 -2.8	15.7 5.5
O	Th 13	256°22.2 -26°08.9	270°48.5 -26°08.5	285°14.8 -26°07.9	299°41.2 -26°07.2	314°07.6 -26°06.3	328°34.1 -26°05.3	343°00.7 -26°04.2	357°27.3 -26°02.9	11°54.0 -26°01.4	26°20.7 -25°59.1	40°57.4 -25°58.1	+26.5 +1.1	15.4 5.6
	Fr 14	257°37.8 -25°15.4	272°05.7 -25°11.5	286°33.7 -25°07.5	301°01.3 -25°03.3	315°30.8 -24°59.0	329°58.2 -24°54.5	344°26.5 -24°50.0	358°54.9 -24°45.5	13°23.3 -24°40.5	27°52.0 -24°35.6	42°20.7 -24°30.5	+28.3 +4.5	15.2 5.7
	Sa 15	259°40.5 -23°01.1	274°10.5 -22°54.4	288°40.6 -22°47.3	303°10.8 -22°40.3	317°41.0 -22°33.1	332°11.4 -22°25.9	346°41.8 -22°18.5	12°12.3 -22°11.1	15°42.9 -22°03.6	30°13.6 -21°55.9	44°44.3 -21°55.9	+30.4 -21°48.2	15.0 5.1
O	Su 16	274°10.5 -27°54.3	288°40.6 -27°47.3	303°10.8 -27°40.3	317°41.0 -27°33.1	332°11.4 -27°25.9	346°41.8 -27°18.5	12°12.3 -27°11.1	15°42.9 -27°03.6	30°13.6 -21°55.9	44°44.3 -21°55.9	59°15.2 -21°40.4	+30.5 -7.4	15.0 5.0
	Mo 17	277°07.6 -19°32.4	291°39.7 -19°23.2	306°12.7 -19°13.9	320°44.2 -19°04.6	335°16.6 -18°55.1	349°49.0 -18°45.6	4°21.5 -18°36.1	18°54.1 -18°26.4	33°26.8 -18°16.7	47°59.5 -18°06.9	62°32.3 -17°57.0	+32.5 +9.5	14.9 5.4
	Tu 18	280°52.3 -15°21.2	295°26.1 -15°10.3	310°00.0 -14°59.4	324°34.0 -14°48.4	339°08.0 -14°37.3	353°42.0 -14°26.2	8°16.2 -14°15.1	22°50.3 -14°03.9	37°24.6 -13°52.6	51°58.8 -13°41.3	66°33.2 -13°29.9	+34.1 -11.1	14.8 5.2
O	We 19	285°13.8 -10°34.0	299°48.8 -10°22.0	314°23.9 -10°09.9	328°59.0 -9°57.7	343°34.2 -9°57.7	358°09.3 -9°45.6	12°44.6 -9°21.1	27°19.8 -9°08.8	41°55.1 -8°56.5	56°30.4 -8°44.2	71°05.7 -8°31.8	+35.2 +12.2	14.7 5.4
	Th 20	289°58.5 -5°02.2	304°34.1 -5°09.9	319°09.8 -4°57.0	333°45.5 -4°44.2	348°21.2 -4°31.3	2°56.9 -4°18.4	17°32.6 -4°05.5	32°08.3 -3°52.6	46°44.0 -3°39.6	61°19.8 -3°26.7	75°55.5 -3°13.7	+35.7 +12.9	14.8 5.4
	Fr 21	294°51.3 0°02.4	309°27.0 0°15.5	324°02.7 0°28.7	338°38.3 0°41.8	353°13.9 0°55.0	7°49.6 1°08.1	22°25.2 1°21.3	37°00.7 1°34.4	51°36.3 1°47.6	66°11.8 2°00.7	80°47.4 2°13.9	+35.6 +13.2	14.8 5.4
O	Sa 22	299°37.1 5°30.5	314°12.2 5°43.5	328°47.2 5°56.5	343°22.2 5°09.5	357°57.1 6°22.2	12°32.1 6°35.5	27°06.9 6°48.4	41°41.8 7°01.3	56°16.5 7°14.2	70°51.3 7°27.1	85°26.6 7°40.0	+34.9 +13.0	14.9 5.6
	Su 23	304°00.6 10°49.8	318°34.4 11°02.2	333°08.3 11°14.5	347°42.0 11°26.9	2°15.7 11°51.4	16°49.3 11°51.4	31°22.9 12°03.6	45°56.4 12°03.6	60°29.8 12°27.8	75°03.2 12°40.0	89°36.5 12°52.0	+33.6 +12.2	15.0 5.0
	Mo 24	307°47.6 15°46.4	322°19.7 15°57.6	336°51.8 16°08.7	351°23.8 16°19.7	5°55.7 16°30.7	20°27.5 16°41.6	34°59.3 16°52.4	49°31.0 17°03.2	64°02.6 17°13.9	78°34.1 17°24.5	93°05.5 17°35.1	+31.8 +10.9	15.1 5.5
O	Tu 25	310°46.7 20°03.9	325°16.8 20°13.2	339°46.8 20°22.3	354°16.6 20°31.3	8°46.4 20°40.3	23°16.2 20°49.1	37°45.8 20°57.9	52°15.3 21°06.5	66°44.8 21°15.1	81°14.1 21°23.6	95°43.4 21°31.9	+29.7 +8.8	15.3 5.6
	We 26	312°52.3 23°23.9	327°20.2 23°30.5	341°04.8 23°36.9	356°15.8 23°43.2	10°43.5 23°49.4	25°11.1 23°55.4	39°38.6 24°01.3	54°06.1 24°01.3	68°33.4 24°06.1	83°00.7 24°18.3	97°28.0 24°23.6	+27.6 +6.0	15.4 5.6
	Th 27	314°08.1 25°08.1	328°34.3 25°31.1	343°00.4 25°34.1	357°26.4 25°37.0	11°52.5 25°39.0	26°18.4 25°42.2	40°44.3 25°44.6	55°10.2 25°46.9	69°36.0 25°50.9	84°01.8 25°50.9	98°27.6 25°52.7	+25.9 +2.5	15.5 5.7
O	Fr 28	314°49.5 26°00.9	329°14.8 26°00.2	343°40.0 25°59.3	358°05.3 25°58.3	12°30.5 25°57.7	26°55.7 25°55.7	41°20.9 25°54.2	55°46.1 25°52.6	70°11.3 25°50.3	84°36.5 25°48.7	99°01.7 25°46.6	+25.2 -1.4	15.7 5.5
	Sa 29	315°20.5 24°55.2	329°45.9 24°50.5	344°11.3 24°45.6	358°36.8 24°40.6	13°02.2 24°35.5	27°27.7 24°30.2	41°53.3 24°24.7	56°18.8 24°19.1	70°44.4 24°13.3	85°10.1 24°07.4	99°35.7 24°01.3	+25.5 -5.4	15.8 5.8
	Su 30	316°05.6 22°12.7	330°32.0 22°04.3	344°58.4 21°55.8	359°24.9 21°47.2	13°51.4 21°38.4	28°18.0 21°29.5	42°44.6 21°20.4	57°11.3 21°11.2	71°38.0 21°01.9	86°04.8 20°52.5	100°31.6 20°42.9	+26.6 -9.0	15.9 5.8

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 2 19h15 — FM: 9 10h26 — LQ: 16 16h36 — NM: 24 19h46

SUN

May 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Mo 1	270°43.9	285°44.0	300°44.0	315°44.1	330°44.2	345°44.3	0°44.3	15°44.4	30°44.5	45°44.5	60°44.6	75°44.7	+0.1
	15°14.9	15°15.7	15°16.4	15°17.2	15°17.9	15°18.7	15°19.4	15°20.2	15°20.9	15°21.7	15°22.4	15°23.1	+0.7
Tu 2	270°45.6	285°45.6	300°45.7	315°45.8	330°45.8	345°45.9	0°46.0	15°46.0	30°46.1	45°46.2	60°46.2	75°46.3	+0.1
	15°32.8	15°33.5	15°34.3	15°35.0	15°35.8	15°36.5	15°37.2	15°38.0	15°38.7	15°39.4	15°40.2	15°40.9	+0.7
We 3	270°47.1	285°47.2	300°47.2	315°47.3	330°47.3	345°47.4	0°47.5	15°47.5	30°47.6	45°47.6	60°47.7	75°47.8	+0.1
	15°50.4	15°51.1	15°51.9	15°52.6	15°53.3	15°54.1	15°54.8	15°55.5	15°56.2	15°57.0	15°57.7	15°58.4	+0.7
Th 4	270°48.5	285°48.6	300°48.6	315°48.7	330°48.7	345°48.8	0°48.8	15°48.9	30°48.9	45°49.0	60°49.0	75°49.1	+0.1
	16°07.8	16°08.5	16°09.2	16°09.9	16°10.6	16°11.4	16°12.1	16°12.8	16°13.5	16°14.2	16°14.9	16°15.6	+0.7
Fr 5	270°49.8	285°49.8	300°49.9	315°49.9	330°50.0	345°50.0	0°50.1	15°50.1	30°50.2	45°50.2	60°50.3	75°50.3	+0.0
	16°24.9	16°25.6	16°26.3	16°27.0	16°27.7	16°28.4	16°29.1	16°29.8	16°30.5	16°31.2	16°31.9	16°32.6	+0.7
Sa 6	270°50.9	285°50.9	300°51.0	315°51.0	330°51.1	345°51.1	0°51.2	15°51.2	30°51.2	45°51.3	60°51.3	75°51.4	+0.0
	16°41.7	16°42.4	16°43.1	16°43.8	16°44.5	16°45.2	16°45.8	16°46.5	16°47.2	16°47.9	16°48.6	16°49.3	+0.7
Su 7	270°51.9	285°51.9	300°52.0	315°52.0	330°52.0	345°52.1	0°52.1	15°52.2	30°52.2	45°52.2	60°52.3	75°52.3	+0.0
	16°58.2	16°58.9	16°59.6	17°00.3	17°00.9	17°01.6	17°02.3	17°03.0	17°03.7	17°04.3	17°05.0	17°05.7	+0.7
Mo 8	270°52.7	285°52.8	300°52.8	315°52.8	330°52.9	345°52.9	0°52.9	15°53.0	30°53.0	45°53.0	60°53.1	75°53.1	+0.0
	17°14.5	17°15.1	17°15.8	17°16.5	17°17.2	17°17.8	17°18.5	17°19.2	17°19.8	17°20.5	17°21.2	17°21.8	+0.7
Tu 9	270°53.5	285°53.5	300°53.5	315°53.5	330°53.6	345°53.6	0°53.6	15°53.6	30°53.7	45°53.7	60°53.7	75°53.7	+0.0
	17°30.4	17°31.1	17°31.8	17°32.4	17°33.1	17°33.7	17°34.4	17°35.0	17°35.7	17°36.4	17°37.0	17°37.7	+0.7
We 10	270°54.0	285°54.0	300°54.1	315°54.1	330°54.1	345°54.1	0°54.1	15°54.2	30°54.2	45°54.2	60°54.2	75°54.2	+0.0
	17°46.1	17°46.8	17°47.4	17°48.1	17°48.7	17°49.3	17°50.0	17°50.6	17°51.3	17°51.9	17°52.6	17°53.2	+0.6
Th 11	270°54.4	285°54.5	300°54.5	315°54.5	330°54.5	345°54.5	0°54.5	15°54.5	30°54.6	45°54.6	60°54.6	75°54.6	+0.0
	18°01.5	18°02.1	18°02.8	18°03.4	18°04.0	18°04.7	18°05.3	18°05.9	18°06.5	18°07.2	18°07.8	18°08.4	+0.6
Fr 12	270°54.7	285°54.7	300°54.7	315°54.7	330°54.8	345°54.8	0°54.8	15°54.8	30°54.8	45°54.8	60°54.8	75°54.8	+0.0
	18°16.6	18°17.2	18°17.8	18°18.4	18°19.0	18°19.7	18°20.3	18°20.9	18°21.5	18°22.1	18°22.8	18°23.4	+0.6
Sa 13	270°54.9	285°54.9	300°54.9	315°54.9	330°54.9	345°54.9	0°54.9	15°54.9	30°54.9	45°54.9	60°54.9	75°54.9	+0.0
	18°31.3	18°31.9	18°32.6	18°33.2	18°33.8	18°34.4	18°35.0	18°35.6	18°36.2	18°36.8	18°37.4	18°38.0	+0.6
Su 14	270°54.8	285°54.8	300°54.8	315°54.8	330°54.8	345°54.8	0°54.8	15°54.8	30°54.8	45°54.8	60°54.8	75°54.8	-0.0
	18°45.8	18°46.4	18°47.0	18°47.6	18°48.2	18°48.8	18°49.4	18°50.0	18°50.5	18°51.1	18°51.7	18°52.3	+0.6
Mo 15	270°54.7	285°54.7	300°54.7	315°54.7	330°54.6	345°54.6	0°54.6	15°54.6	30°54.6	45°54.6	60°54.6	75°54.6	-0.0
	18°59.9	19°00.5	19°01.1	19°01.7	19°02.3	19°02.8	19°03.4	19°04.0	19°04.6	19°05.2	19°05.7	19°06.3	+0.6
Tu 16	270°54.4	285°54.4	300°54.3	315°54.3	330°54.3	345°54.3	0°54.3	15°54.3	30°54.3	45°54.2	60°54.2	75°54.2	-0.0
	19°13.8	19°14.3	19°14.9	19°15.5	19°16.0	19°16.6	19°17.2	19°17.7	19°18.3	19°18.9	19°19.4	19°20.0	+0.6
We 17	270°53.9	285°53.9	300°53.9	315°53.9	330°53.8	345°53.8	0°53.8	15°53.8	30°53.7	45°53.7	60°53.7	75°53.7	-0.0
	19°27.3	19°27.8	19°28.4	19°28.9	19°29.5	19°30.0	19°30.6	19°31.1	19°31.7	19°32.2	19°32.8	19°33.3	+0.6
Th 18	270°53.3	285°53.3	300°53.3	315°53.3	330°53.2	345°53.2	0°53.2	15°53.1	30°53.1	45°53.1	60°53.0	75°53.0	-0.0
	19°40.4	19°41.0	19°41.5	19°42.0	19°42.6	19°43.1	19°43.7	19°44.2	19°44.7	19°45.3	19°45.8	19°46.3	+0.5
Fr 19	270°52.6	285°52.6	300°52.5	315°52.5	330°52.5	345°52.4	0°52.4	15°52.4	30°52.3	45°52.3	60°52.3	75°52.2	-0.0
	19°53.3	19°53.8	19°54.3	19°54.8	19°55.4	19°55.9	19°56.4	19°56.9	19°57.5	19°58.0	19°58.5	19°59.0	+0.5
Sa 20	270°51.7	285°51.7	300°51.6	315°51.6	330°51.6	345°51.5	0°51.5	15°51.4	30°51.4	45°51.4	60°51.3	75°51.3	-0.0
	20°05.7	20°06.3	20°06.8	20°07.3	20°07.8	20°08.3	20°08.8	20°09.3	20°09.8	20°10.3	20°10.8	20°11.4	+0.5
Su 21	270°50.7	285°50.7	300°50.6	315°50.6	330°50.5	345°50.5	0°50.4	15°50.4	30°50.3	45°50.3	60°50.3	75°50.2	-0.0
	20°17.9	20°18.4	20°18.9	20°19.4	20°19.9	20°20.4	20°20.9	20°21.4	20°21.9	20°22.4	20°22.9	20°23.3	+0.5
Mo 22	270°49.6	285°49.5	300°49.5	315°49.4	330°49.4	345°49.3	0°49.3	15°49.2	30°49.2	45°49.1	60°49.0	75°49.0	-0.1
	20°29.7	20°30.2	20°30.7	20°31.1	20°31.6	20°32.1	20°32.6	20°33.1	20°33.5	20°34.0	20°34.5	20°35.0	+0.5
Tu 23	270°48.3	285°48.2	300°48.2	315°48.1	330°48.1	345°48.0	0°47.9	15°47.9	30°47.8	45°47.8	60°47.7	75°47.7	-0.1
	20°41.1	20°41.6	20°42.1	20°42.5	20°43.0	20°43.5	20°43.9	20°44.4	20°44.9	20°45.3	20°45.8	20°46.3	+0.5
We 24	270°46.9	285°46.8	300°46.8	315°46.7	330°46.6	345°46.6	0°46.5	15°46.4	30°46.4	45°46.3	60°46.3	75°46.2	-0.1
	20°52.2	20°52.7	20°53.1	20°53.6	20°54.0	20°54.5	20°55.0	20°55.4	20°55.9	20°56.3	20°56.8	20°57.2	+0.5
Th 25	270°45.3	285°45.3	300°45.2	315°45.1	330°45.1	345°45.0	0°44.9	15°44.9	30°44.8	45°44.7	60°44.7	75°44.6	-0.1
	21°03.0	21°03.4	21°03.8	21°04.3	21°04.7	21°05.2	21°05.6	21°06.0	21°06.5	21°06.9	21°07.3	21°07.8	+0.4
Fr 26	270°43.7	285°43.6	300°43.5	315°43.5	330°43.4	345°43.3	0°43.3	15°43.2	30°43.1	45°43.0	60°43.0	75°42.9	-0.1
	21°13.3	21°13.8	21°14.2	21°14.6	21°15.0	21°15.5	21°15.9	21°16.3	21°16.7	21°17.1	21°17.6	21°18.0	+0.4
Sa 27	270°41.9	285°41.8	300°41.8	315°41.7	330°41.6	345°41.5	0°41.5	15°41.4	30°41.3	45°41.2	60°41.1	75°41.1	-0.1
	21°23.3	21°23.7	21°24.2	21°24.6	21°25.0	21°25.4	21°25.8	21°26.2	21°26.6	21°27.0	21°27.4	21°27.8	+0.4
Su 28	270°40.0	285°40.0	300°39.9	315°39.8	330°39.7	345°39.6	0°39.5	15°39.5	30°39.4	45°39.3	60°39.2	75°39.1	-0.1
	21°33.0	21°33.4	21°33.8	21°34.1	21°34.5	21°34.9	21°35.3	21°35.7	21°36.1	21°36.5	21°36.9	21°37.3	+0.4
Mo 29	270°38.0	285°38.0	300°37.9	315°37.8	330°37.7	345°37.6	0°37.5	15°37.4	30°37.4	45°37.3	60°37.2	75°37.1	-0.1
	21°42.2	21°42.6	21°43.0	21°43.4	21°43.7	21°44.1	21°44.5	21°44.9	21°45.2	21°45.6	21°46.0	21°46.3	+0.4
Tu 30	270°35.9	285°35.9	300°35.8	315°35.7	330°35.6	345°35.5	0°35.4	15°35.3	30°35.2	45°35.1	60°35.0	75°35.0	-0.1
	21°51.1	21°51.5	21°51.8	21°52.2	21°52.6	21°52.9	21°53.3	21°53.6	21°54.0	21°54.3	21°54.7	21°55.1	+0.4
We 31	270°33.8	285°33.7	300°33.6	315°33.5	330°33.4	345°33.3	0°33.2	15°33.1	30°33.0	45°32.9	60°32.8	75°32.7	-0.1
	21°59.6	22°00.0	22°00.3	22°00.6	22°01.0	22°01.3	22°01.7	22°02.0	22°02.4	22°02.7	22°03.0	22°03.4	+0.3

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ°/h = dec. change
Semi-diameter: 15.8'

MOON

May 2028

	D	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	Δ'/h SH
O	Mo 1	245°03.1 19°00.3	259°30.6 18°49.4	273°58.1 18°38.4	288°25.7 18°27.2	302°53.3 18°16.0	317°21.0 18°04.6	331°48.7 17°53.1	346°16.5 17°41.6	0°44.3 17°29.9	15°12.2 17°18.1	29°40.2 17°06.2	+27.7 16.0 -11.4 58.8
	Tu 2	246°46.0 13°55.8	261°14.7 13°42.4	275°43.6 13°28.9	290°12.5 13°15.4	304°41.4 13°01.7	319°10.4 12°48.0	333°39.4 12°34.2	348°08.4 12°20.3	2°37.5 12°06.3	17°06.7 11°52.3	31°35.8 11°38.2	+29.0 16.1 -13.8 59.2
	We 3	248°57.9 7°59.0	263°27.7 7°43.9	277°57.4 7°28.8	292°27.2 7°13.6	306°57.0 6°58.4	321°26.8 6°43.2	335°56.6 6°27.9	350°26.5 6°12.6	4°56.4 5°57.2	19°26.3 5°41.8	33°56.4 5°26.4	+29.8 16.2 -15.3 59.5
	Th 4	251°26.2 1°31.5	265°56.2 1°15.7	280°26.2 0°59.9	294°56.3 0°44.1	309°26.3 0°28.2	323°56.3 0°12.4	338°26.3 -0°03.5	352°56.3 -0°19.3	7°26.3 -0°35.2	21°56.3 -0°51.0	36°26.3 -1°06.9	+30.0 16.3 -15.8 59.7
O	Fr 5	253°54.0 -5°03.3	268°23.7 -5°18.9	282°53.3 -5°34.5	297°22.9 -5°50.1	311°52.5 -6°05.5	326°22.1 -6°21.0	340°51.6 -6°36.5	355°21.0 -6°51.9	9°50.5 -7°07.3	24°19.9 -7°22.6	38°49.3 -7°37.9	+29.5 16.3 -15.5 59.7
	Sa 6	256°04.9 -11°21.1	270°33.6 -11°35.5	285°02.2 -11°49.8	299°30.8 -12°04.1	313°59.3 -12°18.3	328°27.8 -12°32.4	342°56.2 -12°46.4	357°24.6 -13°00.4	11°52.9 -13°14.3	26°21.1 -13°28.1	40°49.3 -13°41.8	+28.4 16.2 -14.1 59.6
	Su 7	257°45.7 -16°56.6	272°13.0 -17°08.8	286°40.3 -17°20.9	301°07.5 -17°32.9	315°34.6 -17°44.7	330°01.7 -17°56.5	344°28.7 -18°08.1	358°55.6 -18°19.6	13°22.5 -18°31.0	27°49.4 -18°42.3	42°16.2 -18°53.5	+27.0 16.1 -11.7 59.2
	Mo 8	258°51.5 -21°25.6	273°17.4 -21°34.7	287°43.3 -21°43.6	302°09.2 -21°52.4	316°35.7 -22°01.1	331°00.8 -22°09.6	345°26.5 -22°17.9	359°52.2 -22°26.2	14°17.9 -22°34.2	28°43.5 -22°42.1	43°40.1 -22°49.9	+25.8 16.0 -8.4 58.7
O	Tu 9	259°29.0 -24°28.2	273°54.1 -24°33.5	288°19.3 -24°38.6	303°44.4 -24°43.6	317°09.5 -24°48.5	332°04.6 -24°53.1	346°30.1 -24°57.6	0°24.8 -25°02.0	14°49.9 -25°06.2	29°15.0 -25°10.2	43°00.1 -25°14.0	+25.1 15.8 -4.6 58.0
	We 10	259°57.6 -25°52.6	274°23.0 -25°53.9	288°48.3 -25°55.1	303°13.7 -25°56.0	317°39.1 -25°56.8	332°04.6 -25°57.5	346°30.1 -25°58.0	0°55.6 -25°58.3	15°21.2 -25°58.5	29°46.8 -25°58.5	44°12.5 -25°58.4	+25.5 15.6 -0.6 57.2
	Th 11	260°43.6 -25°38.2	275°10.2 -25°35.7	289°36.8 -25°33.0	304°03.5 -25°30.2	318°30.3 -25°27.3	332°57.1 -25°24.2	347°24.0 -25°20.9	1°51.0 -25°17.6	16°18.1 -25°14.1	30°45.2 -25°10.4	45°12.4 -25°06.6	+26.9 15.4 +3.2 56.5
	Fr 12	263°10.4 -23°54.4	276°38.9 -23°48.6	291°07.6 -23°42.6	305°36.3 -23°36.6	320°05.1 -23°30.4	334°34.0 -23°24.2	349°03.0 -23°17.8	3°32.0 -23°11.3	18°01.2 -23°04.7	32°30.5 -22°58.0	46°59.8 -22°51.2	+28.9 15.2 +6.3 55.7
O	Sa 13	264°30.8 -20°56.7	279°01.5 -20°48.3	293°32.4 -20°39.8	308°03.4 -20°31.2	322°34.4 -20°22.6	337°05.5 -20°13.8	351°36.7 -20°05.0	6°08.0 -19°56.1	20°39.4 -19°47.1	35°10.9 -19°38.0	49°42.4 -19°28.8	+31.2 15.0 +8.5 55.1
	Su 14	267°45.5 -18°02.4	282°18.4 -16°52.1	296°51.3 -16°41.7	311°24.2 -16°31.3	325°57.3 -16°20.8	340°30.4 -16°10.2	355°03.6 -15°59.6	9°36.9 -15°48.9	24°10.2 -15°38.2	38°43.6 -15°27.3	53°17.0 -15°16.5	+33.2 14.9 +10.6 54.6
	Mo 15	287°18.4 -16°52.1	296°51.3 -16°41.7	311°24.2 -16°31.3	325°57.3 -16°20.8	340°30.4 -16°10.2	355°03.6 -15°59.6	9°36.9 -15°48.9	24°10.2 -15°38.2	38°43.6 -15°27.3	53°17.0 -15°16.5	67°50.6 -15°05.6	+33.2 14.9 +10.7 54.6
	Tu 16	286°20.9 -12°15.7	300°55.4 -12°04.0	315°29.9 -11°52.3	330°04.5 -11°40.5	344°39.1 -11°28.7	359°13.2 -11°16.8	373°48.5 -11°04.9	38°23.3 -10°53.0	42°58.1 -10°41.0	57°32.9 -10°29.0	72°07.8 -10°16.9	+34.7 14.8 +11.9 54.3
O	We 17	290°55.7 -7°12.2	305°31.2 -6°59.7	320°06.1 -6°47.1	334°42.2 -6°34.5	349°17.7 -6°21.9	363°53.2 -6°09.3	378°21.8 -5°56.6	39°43.4 -5°44.0	47°40.0 -5°31.3	62°15.6 -5°18.5	76°51.2 -5°05.8	+35.6 14.8 -12.6 54.2
	Th 18	295°47.2 -1°52.7	310°23.0 -1°39.7	324°58.7 -1°26.8	339°34.5 -1°13.8	354°10.3 -1°00.8	3°46.0 -0°47.8	23°21.8 -0°34.8	37°57.5 -0°21.7	52°33.3 -0°08.7	67°09.0 0°04.3	81°44.8 0°17.3	+35.8 14.8 +13.0 54.3
	Fr 19	300°38.8 3°32.9	315°14.2 3°45.9	329°49.7 3°58.9	344°25.0 4°11.9	359°00.4 4°24.8	13°35.7 4°37.8	28°11.0 4°50.8	42°46.2 5°03.7	57°21.5 5°16.7	71°56.6 5°29.6	86°31.8 5°42.5	+35.3 14.9 +13.0 54.3
	Sa 20	305°14.0 8°54.1	319°48.4 9°06.7	334°22.8 9°19.2	348°57.1 9°31.8	3°31.4 9°44.3	18°05.6 9°56.8	32°39.8 10°09.2	47°13.8 10°21.6	61°47.9 10°34.0	76°21.9 10°46.4	90°55.8 10°58.7	+34.2 15.0 +12.5 54.9
O	Su 21	309°16.5 13°58.8	323°49.3 14°10.4	338°22.0 14°22.0	352°54.7 14°33.6	7°27.3 14°45.1	21°59.8 14°56.5	36°32.2 15°07.9	51°04.5 15°19.2	65°36.8 15°30.5	80°08.9 15°41.7	94°41.0 15°52.8	+32.5 15.1 +11.4 55.4
	Mo 22	312°32.0 18°32.0	327°02.6 18°42.0	341°33.2 18°52.0	356°03.7 19°01.8	10°34.1 19°11.6	25°04.4 19°21.3	39°34.6 19°30.9	54°04.7 19°40.4	68°34.8 19°49.9	83°04.7 19°59.2	97°34.5 20°08.5	+30.3 15.3 +9.7 56.0
	Tu 23	314°50.5 22°15.5	329°18.8 22°15.5	343°47.1 22°30.6	358°15.2 22°38.0	12°43.2 22°45.3	27°11.1 22°52.5	41°39.0 22°59.5	56°06.7 23°06.4	70°34.4 23°13.3	85°02.0 23°19.9	99°29.4 23°26.5	+27.9 15.4 +7.1 56.6
	We 24	316°11.4 24°49.2	330°37.5 24°53.6	345°03.6 24°57.9	359°29.6 25°02.0	13°55.6 25°06.0	28°21.5 25°09.9	42°47.3 25°13.6	57°13.0 25°17.1	71°38.7 25°20.4	86°04.7 25°23.7	100°29.8 25°26.8	+25.8 15.6 +3.8 57.2
O	Th 25	316°46.6 25°54.6	331°11.4 25°55.1	345°36.2 25°55.5	0°00.9 25°55.8	14°25.6 25°55.8	28°50.2 25°55.5	43°14.9 25°55.5	57°39.5 25°55.1	72°04.1 25°54.6	86°28.6 25°53.8	100°53.2 25°52.9	+24.6 15.8 -0.2 57.8
	Fr 26	317°00.9 25°19.5	331°25.5 25°16.0	345°50.0 25°12.3	0°14.6 25°08.4	14°39.2 25°04.4	29°03.9 25°00.2	43°28.5 24°55.8	57°53.2 24°51.3	72°17.9 24°46.9	86°42.7 24°41.8	101°07.4 24°36.8	+24.6 15.9 -4.3 58.3
	Sa 27	317°23.7 23°03.1	331°49.1 22°55.6	346°14.0 22°48.0	0°40.2 22°40.2	15°05.8 22°32.0	29°31.5 22°24.3	43°57.3 22°16.1	58°23.1 22°07.8	72°48.9 21°59.4	87°14.8 21°50.8	101°40.8 21°42.0	+25.7 16.0 -8.1 58.7
	Su 28	318°18.1 19°15.4	332°45.1 19°04.6	347°12.2 18°53.7	1°39.3 18°42.7	16°06.6 18°31.6	30°33.9 18°20.4	45°01.2 18°09.1	59°28.6 17°57.6	73°56.1 17°46.1	88°23.6 17°34.4	102°51.3 17°22.7	+27.3 16.1 -11.3 59.0
O	Mo 29	319°53.6 14°14.8	334°22.3 14°01.5	348°51.0 13°48.2	3°19.8 13°34.8	17°48.7 13°21.4	32°17.6 13°07.8	46°46.5 12°54.2	61°15.5 12°40.5	75°44.6 12°26.8	90°13.7 12°12.9	104°42.9 11°59.0	+28.9 16.1 -13.6 59.1
	Tu 30	322°06.5 8°23.3	336°36.4 8°08.5	351°06.4 7°53.6	5°36.4 7°38.7	20°06.5 7°23.8	34°36.5 7°08.9	49°06.6 6°53.9	63°36.6 6°38.8	78°07.0 6°23.7	92°37.2 6°08.6	107°07.4 5°53.5	+30.1 16.1 -15.0 59.2
	We 31	324°43.8 2°03.4	339°14.3 1°47.9	353°44.9 1°32.4	8°15.5 1°17.0	22°46.1 1°01.5	37°16.7 0°46.0	51°47.3 0°30.5	66°17.9 0°15.0	80°48.5 -0°00.5	95°19.1 -0°16.0	109°49.7 -0°31.5	+30.6 16.1 -15.5 59.2

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (— South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 2 02h25 — FM: 8 19h48 — LQ: 16 10h43 — NM: 24 08h16 — FQ: 31 07h36

SUN

June 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Th 1	270°31.5 22°07.7	285°31.4 22°08.1	300°31.3 22°08.4	315°31.2 22°08.7	330°31.1 22°09.0	345°31.0 22°09.4	6°30.9 22°09.7	15°30.8 22°10.0	30°30.7 22°10.3	45°30.6 22°10.7	60°30.5 22°11.0	75°30.4 22°11.3	-0.1 +0.3
Fr 2	270°29.1 22°15.4	285°29.0 22°15.8	300°28.9 22°16.1	315°28.8 22°16.4	330°28.7 22°16.7	345°28.6 22°17.0	0°28.5 22°17.3	15°28.4 22°17.6	30°28.3 22°17.9	45°28.2 22°18.2	60°28.1 22°18.6	75°28.0 22°18.9	-0.1 +0.3
Sa 3	270°26.6 22°22.8	285°26.5 22°23.4	300°26.4 22°23.4	315°26.3 22°23.7	330°26.2 22°24.0	345°26.1 22°24.3	0°26.0 22°24.6	15°25.9 22°24.9	30°25.8 22°25.1	45°25.7 22°25.4	60°25.6 22°25.7	75°25.5 22°26.0	-0.1 +0.3
Su 4	270°24.1 22°29.7	285°24.0 22°30.0	300°23.9 22°30.3	315°23.7 22°30.6	330°23.6 22°30.9	345°23.5 22°31.1	0°23.4 22°31.4	15°23.3 22°31.7	30°23.2 22°32.0	45°23.1 22°32.2	60°23.0 22°32.5	75°22.9 22°32.8	-0.1 +0.3
Mo 5	270°21.4 22°36.3	285°21.3 22°36.6	300°21.2 22°36.8	315°21.1 22°37.1	330°21.0 22°37.3	345°20.9 22°37.6	0°20.8 22°37.9	15°20.7 22°38.1	30°20.5 22°38.4	45°20.4 22°38.6	60°20.3 22°38.9	75°20.2 22°39.2	-0.1 +0.3
Tu 6	270°18.7 22°42.4	285°18.6 22°42.7	300°18.5 22°42.9	315°18.4 22°43.2	330°18.3 22°43.4	345°18.2 22°43.7	0°18.0 22°43.9	15°17.9 22°44.2	30°17.8 22°44.4	45°17.7 22°44.7	60°17.6 22°44.9	75°17.5 22°45.1	-0.1 +0.2
We 7	270°15.9 22°48.2	285°15.8 22°48.4	300°15.7 22°48.7	315°15.6 22°48.9	330°15.5 22°49.1	345°15.4 22°49.4	0°15.2 22°49.6	15°15.1 22°49.8	30°15.0 22°50.0	45°14.9 22°50.3	60°14.8 22°50.5	75°14.7 22°50.7	-0.1 +0.2
Th 8	270°13.1 22°53.6	285°13.0 22°53.8	300°12.9 22°54.0	315°12.7 22°54.2	330°12.6 22°54.4	345°12.5 22°54.6	0°12.4 22°54.8	15°12.3 22°55.1	30°12.1 22°55.3	45°12.0 22°55.5	60°11.9 22°55.7	75°11.8 22°55.9	-0.1 +0.2
Fr 9	270°10.2 22°58.5	285°10.1 22°58.7	300°09.9 22°58.9	315°09.8 22°59.1	330°09.7 22°59.3	345°09.6 22°59.5	0°09.4 22°59.7	15°09.3 22°59.9	30°09.2 23°00.1	45°09.1 23°00.3	60°09.0 23°00.5	75°08.8 23°00.7	-0.1 +0.2
Sa 10	270°07.2 23°03.1	285°07.1 23°03.3	300°07.0 23°03.4	315°06.8 23°03.6	330°06.7 23°03.8	345°06.6 23°04.0	0°06.5 23°04.2	15°06.3 23°04.3	30°06.2 23°04.5	45°06.1 23°04.7	60°06.0 23°04.9	75°05.8 23°05.0	-0.1 +0.2
Su 11	270°04.2 23°07.2	285°04.1 23°07.4	300°03.9 23°07.6	315°03.8 23°07.7	330°03.7 23°07.9	345°03.5 23°08.0	0°03.4 23°08.2	15°03.3 23°08.4	30°03.2 23°08.5	45°03.0 23°08.7	60°02.9 23°08.9	75°02.8 23°09.0	-0.1 +0.2
Mo 12	270°01.1 23°11.0	285°01.0 23°11.1	300°00.8 23°11.3	315°00.7 23°11.4	330°00.6 23°11.6	345°00.5 23°11.7	0°00.3 23°11.9	15°00.2 23°12.0	30°00.0 23°12.3	45°00.0 23°12.3	60°00.0 23°12.3	75°00.0 23°12.6	-0.1 +0.1
Tu 13	269°58.0 23°14.3	284°57.8 23°14.4	299°57.7 23°14.6	314°57.6 23°14.7	329°57.4 23°14.8	344°57.3 23°15.0	359°57.2 23°15.1	14°57.1 23°15.2	29°56.9 23°15.3	44°56.8 23°15.5	59°56.7 23°15.6	74°56.5 23°15.7	-0.1 +0.1
We 14	269°54.8 23°17.2	284°54.7 23°17.4	299°54.5 23°17.5	314°54.4 23°17.6	329°54.3 23°17.7	344°54.1 23°17.8	359°54.0 23°17.9	14°53.9 23°18.0	29°53.7 23°18.1	44°53.6 23°18.2	59°53.5 23°18.3	74°53.3 23°18.4	-0.1 +0.1
Th 15	269°51.6 23°19.8	284°51.5 23°19.8	299°51.3 23°19.9	314°51.2 23°20.0	329°51.1 23°20.1	344°50.9 23°20.2	359°50.8 23°20.3	14°50.7 23°20.4	29°50.5 23°20.5	44°50.4 23°20.6	59°50.3 23°20.7	74°50.1 23°20.8	-0.1 +0.1
Fr 16	269°48.4 23°21.9	284°48.2 23°21.9	299°48.1 23°22.0	314°48.0 23°22.1	329°47.8 23°22.2	344°47.7 23°22.2	359°47.6 23°22.3	14°47.4 23°22.4	29°47.3 23°22.5	44°47.2 23°22.5	59°47.0 23°22.6	74°46.9 23°22.7	-0.1 +0.1
Sa 17	269°45.1 23°23.5	284°45.0 23°23.6	299°44.8 23°23.7	314°44.7 23°23.7	329°44.6 23°23.8	344°44.4 23°23.8	359°44.3 23°23.9	14°44.2 23°24.0	29°44.0 23°24.0	44°43.9 23°24.1	59°43.8 23°24.1	74°43.6 23°24.2	-0.1 +0.1
Su 18	269°41.8 23°24.8	284°41.7 23°24.9	299°41.6 23°24.9	314°41.4 23°24.9	329°41.3 23°25.0	344°41.2 23°25.0	359°41.0 23°25.1	14°40.9 23°25.1	29°40.8 23°25.1	44°40.6 23°25.2	59°40.5 23°25.2	74°40.3 23°25.3	-0.1 +0.0
Mo 19	269°38.6 23°25.7	284°38.4 23°25.7	299°38.3 23°25.7	314°38.1 23°25.8	329°38.0 23°25.8	344°37.9 23°25.8	359°37.7 23°25.8	14°37.6 23°25.8	29°37.5 23°25.9	44°37.3 23°25.9	59°37.2 23°25.9	74°37.1 23°25.9	-0.1 +0.0
Tu 20	269°35.3 23°26.1	284°35.1 23°26.1	299°35.0 23°26.1	314°34.9 23°26.2	329°34.7 23°26.2	344°34.6 23°26.2	359°34.4 23°26.2	14°34.3 23°26.2	29°34.2 23°26.2	44°34.0 23°26.2	59°33.9 23°26.2	74°33.8 23°26.2	-0.1 +0.0
We 21	269°32.0 23°26.2	284°31.8 23°26.1	299°31.7 23°26.1	314°31.6 23°26.1	329°31.4 23°26.1	344°31.3 23°26.1	359°31.2 23°26.1	14°31.0 23°26.1	29°30.9 23°26.1	44°30.8 23°26.1	59°30.6 23°26.0	74°30.5 23°26.0	-0.1 -0.0
Th 22	269°28.7 23°25.8	284°28.6 23°25.8	299°28.4 23°25.7	314°28.3 23°25.7	329°28.2 23°25.7	344°28.0 23°25.6	359°27.9 23°25.6	14°27.7 23°25.6	29°27.6 23°25.6	44°27.5 23°25.5	59°27.3 23°25.5	74°27.2 23°25.5	-0.1 -0.0
Fr 23	269°25.4 23°25.0	284°25.3 23°24.9	299°25.2 23°24.9	314°25.0 23°24.9	329°24.8 23°24.8	344°24.8 23°24.7	359°24.6 23°24.7	14°24.5 23°24.7	29°24.4 23°24.7	44°24.2 23°24.6	59°24.1 23°24.5	74°24.0 23°24.5	-0.1 -0.0
Sa 24	269°22.2 23°23.8	284°22.1 23°23.7	299°21.9 23°23.7	314°21.8 23°23.6	329°21.7 23°23.5	344°21.5 23°23.5	359°21.4 23°23.4	14°21.3 23°23.3	29°21.1 23°23.3	44°21.0 23°23.2	59°20.9 23°23.2	74°20.7 23°23.1	-0.1 -0.1
Su 25	269°19.0 23°22.2	284°18.9 23°22.1	299°18.7 23°22.0	314°18.6 23°21.9	329°18.5 23°21.8	344°18.3 23°21.8	359°18.2 23°21.7	14°18.1 23°21.6	29°17.9 23°21.5	44°17.8 23°21.4	59°17.7 23°21.4	74°17.5 23°21.3	-0.1 -0.1
Mo 26	269°15.8 23°20.1	284°15.7 23°20.0	299°15.6 23°19.9	314°15.4 23°19.8	329°15.3 23°19.7	344°15.2 23°19.7	359°15.0 23°19.6	14°14.9 23°19.5	29°14.8 23°19.4	44°14.6 23°19.3	59°14.5 23°19.2	74°14.4 23°19.1	-0.1 -0.1
Tu 27	269°12.7 23°17.7	284°12.6 23°17.6	299°12.4 23°17.5	314°12.3 23°17.4	329°12.2 23°17.2	344°12.0 23°17.1	359°11.9 23°17.0	14°11.8 23°16.9	29°11.7 23°16.8	44°11.5 23°16.7	59°11.4 23°16.5	74°11.3 23°16.4	-0.1 -0.1
We 28	269°09.6 23°14.8	284°09.5 23°14.7	299°09.4 23°14.6	314°09.2 23°14.5	329°09.1 23°14.3	344°09.0 23°14.2	359°08.8 23°14.1	14°08.7 23°13.9	29°08.6 23°13.8	44°08.5 23°13.7	59°08.3 23°13.5	74°08.2 23°13.4	-0.1 -0.1
Th 29	269°06.6 23°11.6	284°06.5 23°11.4	299°06.3 23°11.3	314°06.2 23°11.1	329°06.1 23°11.0	344°06.0 23°10.9	359°05.8 23°10.7	14°05.7 23°10.6	29°05.6 23°10.5	44°05.5 23°10.3	59°05.3 23°10.1	74°05.2 23°10.0	-0.1 -0.1
Fr 30	269°03.6 23°07.9	284°03.5 23°07.8	299°03.4 23°07.6	314°03.3 23°07.4	329°03.3 23°07.3	344°03.0 23°07.1	359°02.9 23°06.9	14°02.8 23°06.8	29°02.7 23°06.7	44°02.5 23°06.4	59°02.4 23°06.3	74°02.3 23°06.1	-0.1 -0.2

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

June 2028

	D	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	Δ'/h SH
O	Th 1	240°25.0 -2°50.7	254°55.5 -3°06.1	269°26.4 -3°21.5	283°56.6 -3°36.9	298°27.1 -3°52.2	312°57.6 -4°07.5	327°28.1 -4°22.8	341°58.5 -4°38.1	356°29.0 -4°53.3	10°59.4 -5°08.5	25°29.8 -5°23.7	+30.5 16.1 -15.3 59.2
	Fr 2	243°02.5 -9°07.2	257°32.2 -9°21.7	272°02.3 -9°36.2	286°32.2 -9°50.6	301°02.0 -10°05.0	315°31.7 -10°19.3	330°01.5 -10°33.6	344°31.1 -10°47.8	359°00.8 -11°01.9	13°30.3 -11°16.0	27°59.9 -11°30.0	+29.7 16.1 -14.3 59.0
	Sa 3	245°17.0 -14°51.6	259°45.8 -15°04.3	274°14.4 -15°17.1	288°43.0 -15°29.7	303°11.6 -15°42.2	317°40.1 -15°54.6	332°08.5 -16°07.0	346°36.9 -16°19.2	1°05.2 -16°31.4	15°33.5 -16°43.4	30°01.7 -16°55.4	+28.5 16.0 -12.4 58.7
	Su 4	246°57.6 -19°42.0	261°24.9 -19°52.2	275°52.1 -20°02.3	290°19.2 -20°12.2	304°46.3 -20°22.1	319°13.3 -20°31.8	333°40.3 -20°41.4	348°07.2 -20°50.8	2°34.1 -21°00.1	17°00.9 -21°09.3	31°27.6 -21°18.4	+27.0 15.9 -9.6 58.3
	Mo 5	248°02.9 -23°18.2	262°28.9 -23°25.0	276°54.8 -23°31.7	291°20.7 -23°38.3	305°46.6 -23°44.7	320°12.5 -23°51.0	334°38.3 -23°57.1	349°04.1 -24°03.1	3°29.8 -24°08.9	17°55.5 -24°14.6	32°21.2 -24°20.1	+25.8 15.8 -6.2 57.9
	Tu 6	248°44.2 -25°53.2	263°09.6 -25°52.4	277°35.1 -25°51.4	292°00.5 -25°50.2	306°26.0 -25°48.9	320°51.4 -25°47.4	335°16.9 -25°45.8	349°42.3 -25°44.0	4°07.8 -25°42.1	18°33.3 -25°40.1	32°58.8 -25°37.9	+25.5 15.6 +1.5 56.7
	We 7	249°24.0 -25°53.2	263°50.0 -25°52.4	278°16.0 -25°51.4	292°42.0 -25°50.2	307°08.1 -25°48.9	321°34.2 -25°47.4	336°00.4 -25°45.8	350°26.6 -25°44.0	4°52.9 -25°42.1	19°19.2 -25°40.1	33°45.6 -25°37.9	+26.1 15.5 +1.5 56.7
	Th 8	250°28.7 -24°47.8	264°56.1 -24°43.4	279°23.6 -24°38.8	293°51.2 -24°34.1	308°18.9 -24°29.3	322°46.6 -24°24.3	337°14.4 -24°19.2	351°42.3 -24°14.0	6°10.3 -24°08.7	20°38.3 -24°03.3	35°06.5 -23°57.7	+27.8 15.3 +5.0 56.1
	Fr 9	252°18.6 -22°20.0	266°48.1 -22°12.6	281°17.7 -22°05.1	295°47.7 -21°57.5	310°17.3 -21°49.8	324°47.0 -21°42.0	339°16.9 -21°34.1	353°46.8 -21°26.1	8°17.1 -21°18.1	22°47.3 -21°09.8	37°17.6 -21°01.5	+29.9 15.1 +7.9 55.5
	Sa 10	255°02.5 -18°46.7	269°34.1 -18°37.0	284°05.9 -18°27.3	298°37.7 -18°17.5	313°09.6 -18°07.6	327°41.7 -17°57.7	342°13.7 -17°47.7	356°45.9 -17°37.6	11°18.1 -17°27.4	25°50.5 -17°17.2	40°22.9 -17°06.9	+32.0 15.0 +10.0 55.0
O	Su 11	258°37.8 -14°25.2	273°11.4 -14°13.9	287°45.0 -14°02.7	302°18.7 -13°51.3	316°52.5 -13°39.9	331°26.3 -13°28.5	346°00.2 -13°17.0	0°34.1 -13°05.5	15°08.1 -12°53.9	29°42.2 -12°42.3	44°16.3 -12°30.7	+33.9 14.9 +11.5 54.6
	Mo 12	262°54.6 -9°31.0	277°29.5 -9°18.8	292°04.5 -9°06.5	306°39.5 -8°54.2	321°14.6 -8°41.8	335°49.7 -8°29.5	350°24.8 -8°17.1	5°00.0 -8°04.6	19°35.2 -7°52.2	34°10.4 -7°39.7	53°35.9 -7°27.2	+35.1 14.8 +12.4 54.3
	Tu 13	267°38.4 -14°17.1	282°14.1 -14°04.3	296°49.8 -13°51.5	311°25.5 -13°38.6	326°01.2 -13°25.8	340°37.0 -13°12.9	355°12.8 -13°00.1	9°48.5 -12°47.2	24°24.3 -12°34.3	39°00.1 -12°21.4	53°35.9 -12°08.5	+35.8 14.8 +12.9 54.2
	We 14	282°14.1 -04°04.3	296°49.8 -3°51.5	311°25.5 -3°38.6	326°01.2 -3°25.8	340°37.0 -3°12.9	355°12.8 -3°00.1	9°48.5 -2°47.2	24°24.3 -2°34.3	39°00.1 -2°21.4	53°35.9 -2°08.5	68°11.7 -1°55.6	+35.8 14.8 +12.9 54.2
	Th 15	287°09.0 1°18.8	301°44.7 1°31.7	316°20.5 1°44.7	330°56.2 1°57.7	345°32.2 2°10.6	0°07.7 2°23.6	14°43.4 2°36.5	29°19.1 2°49.4	43°54.8 3°02.4	58°30.4 3°15.3	73°06.0 3°28.2	+35.7 14.8 +12.9 54.3
	Fr 16	291°57.3 6°40.6	306°32.3 6°53.3	321°07.6 7°06.0	335°42.2 7°18.7	350°17.7 7°31.3	4°52.7 7°43.9	19°27.7 7°56.6	34°02.6 8°09.1	48°37.4 8°21.7	63°12.2 8°34.2	77°47.0 8°46.7	+35.0 14.9 +12.6 54.6
	Sa 17	296°22.1 11°50.8	310°55.9 12°02.8	325°29.7 12°14.7	340°03.5 12°26.6	354°37.1 12°38.8	9°10.7 12°50.3	23°44.2 13°02.1	38°17.2 13°13.9	52°51.1 13°25.6	67°24.1 13°37.2	81°57.6 13°50.7	+33.6 15.0 +11.8 55.0
	Su 18	300°06.7 16°36.7	314°38.6 16°47.4	329°10.5 16°58.1	343°42.2 17°08.7	358°13.9 17°19.2	12°45.5 17°29.7	27°17.0 17°40.1	41°48.4 17°50.4	56°19.7 18°00.6	70°50.9 18°10.8	85°22.0 18°20.9	+31.5 15.2 +10.4 55.6
	Mo 19	302°57.1 20°42.7	317°26.6 20°51.1	331°56.1 21°00.2	346°25.4 21°08.7	0°54.7 21°17.2	15°23.8 21°25.5	29°52.8 21°33.8	44°21.8 21°42.0	58°50.6 21°50.0	73°19.3 21°58.0	87°48.0 22°05.8	+29.1 15.4 +8.3 56.3
O	Tu 20	304°45.3 23°49.8	319°12.3 23°55.8	333°39.3 24°01.6	348°06.1 24°07.3	2°32.9 24°12.9	16°59.5 24°18.3	31°26.1 24°23.6	45°52.5 24°28.8	60°18.9 24°33.8	74°45.2 24°38.7	89°11.4 24°43.5	+26.6 15.6 +5.4 57.1
	We 21	305°34.6 25°37.3	319°59.6 25°39.7	334°24.5 25°41.9	348°49.3 25°43.9	3°14.1 25°45.8	17°38.8 25°47.6	32°03.4 25°49.1	46°28.0 25°50.6	60°52.6 25°51.8	75°17.1 25°52.9	89°41.5 25°53.8	+24.7 15.8 +1.7 57.9
	Th 22	305°43.3 25°47.6	320°07.2 25°45.8	334°31.1 25°43.9	348°55.0 25°41.7	3°18.8 25°39.0	17°42.7 25°37.0	32°06.5 25°34.5	46°30.0 25°31.6	60°55.2 25°28.6	75°19.7 25°25.4	89°44.9 25°22.1	+23.8 16.0 -2.5 58.6
	Fr 23	305°41.0 24°12.0	320°05.2 24°06.0	334°29.4 23°58.9	348°53.6 23°53.5	3°17.8 23°47.0	17°42.1 23°40.4	32°06.5 23°33.6	46°30.0 23°26.6	60°55.2 23°19.5	75°19.7 23°12.2	89°44.9 23°04.7	+24.3 16.1 -6.7 59.2
	Sa 24	305°58.5 20°55.0	320°24.0 20°45.3	334°49.5 20°35.3	349°15.0 20°25.2	3°40.7 20°15.0	18°06.4 20°04.7	32°32.2 19°54.2	46°58.0 19°43.6	61°23.9 19°32.9	75°49.9 19°22.9	90°16.0 19°11.1	+25.7 16.2 -10.4 59.5
	Su 25	306°55.5 16°12.8	321°22.7 16°00.1	335°50.0 15°47.2	350°17.4 15°34.3	4°44.8 15°21.3	19°12.3 15°08.1	33°39.8 14°54.9	48°07.5 14°41.6	62°35.2 14°28.3	77°03.0 14°14.8	91°30.8 14°01.2	+27.5 16.3 -13.2 59.7
	Mo 26	308°36.3 10°29.1	323°05.2 10°14.4	337°34.1 9°59.7	352°03.1 9°44.9	6°32.1 9°30.1	21°01.2 9°15.3	35°30.3 9°00.3	49°59.5 8°45.4	64°28.7 8°30.4	78°58.0 8°15.3	93°27.4 8°00.2	+29.1 16.3 -14.9 59.7
	Tu 27	310°52.7 4°09.7	325°22.7 3°54.2	339°52.7 3°38.6	354°22.7 3°23.0	8°52.8 3°07.4	23°22.9 2°51.8	37°53.0 2°36.2	52°23.2 2°20.5	66°53.4 2°04.9	81°23.6 1°49.3	95°53.6 1°33.6	+30.1 16.2 -15.6 59.9
	We 28	313°29.0 -2°20.5	327°59.4 -2°36.0	342°29.9 -2°51.5	357°00.3 -3°06.9	11°30.7 -3°22.4	26°01.1 -3°37.8	40°31.5 -3°53.2	55°01.9 -4°08.5	69°33.4 -4°23.9	84°02.4 -4°39.2	98°33.2 -4°54.4	+30.4 16.2 -15.4 59.3
	Th 29	316°07.5 -8°38.2	330°37.6 -8°53.3	345°07.7 -9°07.8	359°37.8 -9°22.3	14°07.8 -9°36.7	28°37.9 -9°51.0	43°07.8 -10°05.3	57°37.8 -10°19.6	72°07.8 -10°33.7	86°37.7 -10°47.8	101°07.5 -11°01.9	+30.0 16.1 -14.3 58.9
O	Fr 30	318°31.1 -14°23.8	333°00.4 -14°36.7	347°29.6 -14°49.4	1°58.7 -15°02.1	16°27.8 -15°14.7	30°56.9 -15°27.1	45°25.9 -15°39.5	59°54.9 -15°51.8	74°23.8 -16°04.0	88°52.6 -16°16.2	103°21.5 -16°28.2	+29.0 15.9 -12.4 58.5

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter
 Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax
 Column = (UTC hour - day) mod 24
 FM: 7 06h08 — LQ: 15 04h27 — NM: 22 18h27 — FQ: 29 12h10

SUN

July 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Sa 1	268°00.7 23°03.9	284°00.6 23°03.7	299°00.5 23°03.5	314°00.4 23°03.3	329°00.3 23°03.1	344°00.1 23°03.0	359°00.0 23°02.8	13°59.9 23°02.6	28°59.3 23°02.4	43°59.7 23°02.2	58°59.6 23°02.0	73°59.4 23°01.9	-0.1 -0.2
Su 2	268°57.9 22°59.4	283°57.8 22°59.2	298°57.7 22°59.0	313°57.6 22°58.8	328°57.5 22°58.6	343°57.3 22°58.4	358°57.2 22°58.2	13°57.1 22°58.0	28°57.0 22°57.8	43°56.9 22°57.6	58°56.8 22°57.4	73°56.7 22°57.2	-0.1 -0.2
Mo 3	268°55.2 22°54.5	283°55.1 22°54.3	298°55.0 22°54.1	313°54.8 22°53.9	328°54.7 22°53.7	343°54.6 22°53.5	358°54.5 22°53.2	13°54.4 22°53.0	28°54.3 22°52.8	43°54.3 22°52.6	58°54.1 22°52.4	73°53.9 22°52.2	-0.1 -0.2
Tu 4	268°52.5 22°49.3	283°52.4 22°49.0	298°52.3 22°48.8	313°52.2 22°48.6	328°52.1 22°48.3	343°52.0 22°48.1	358°51.9 22°47.9	13°51.8 22°47.6	28°51.7 22°47.4	43°51.5 22°47.2	58°51.4 22°46.9	73°51.3 22°46.7	-0.1 -0.2
We 5	268°49.9 22°43.6	283°49.8 22°43.3	298°49.7 22°43.1	313°49.6 22°42.9	328°49.5 22°42.6	343°49.4 22°42.4	358°49.3 22°42.1	13°49.2 22°41.9	28°49.1 22°41.6	43°49.0 22°41.4	58°48.9 22°41.1	73°48.8 22°40.9	-0.1 -0.2
Th 6	268°47.5 22°37.5	283°47.4 22°37.3	298°47.3 22°37.0	313°47.2 22°36.8	328°47.1 22°36.5	343°47.0 22°36.2	358°46.8 22°36.0	13°46.7 22°35.7	28°46.6 22°35.4	43°46.5 22°35.2	58°46.4 22°34.9	73°46.3 22°34.6	-0.1 -0.3
Fr 7	268°45.1 22°31.1	283°45.0 22°30.8	298°44.9 22°30.5	313°44.8 22°30.3	328°44.7 22°30.0	343°44.6 22°29.7	358°44.5 22°29.4	13°44.4 22°29.1	28°44.3 22°28.8	43°44.2 22°28.6	58°44.1 22°28.3	73°44.0 22°28.0	-0.1 -0.3
Sa 8	268°42.8 22°24.3	283°42.7 22°24.0	298°42.6 22°23.7	313°42.5 22°23.4	328°42.4 22°23.1	343°42.3 22°22.8	358°42.2 22°22.5	13°42.1 22°22.2	28°42.0 22°21.9	43°41.9 22°21.6	58°41.8 22°21.3	73°41.7 22°21.0	-0.1 -0.3
Su 9	268°40.6 22°17.0	283°40.5 22°16.7	298°40.4 22°16.4	313°40.3 22°16.1	328°40.2 22°15.8	343°40.1 22°15.5	358°40.0 22°15.2	13°39.9 22°14.9	28°39.8 22°14.6	43°39.7 22°14.2	58°39.6 22°13.9	73°39.6 22°13.6	-0.1 -0.3
Mo 10	268°38.5 22°09.4	283°38.4 22°09.1	298°38.3 22°08.8	313°38.2 22°08.5	328°38.1 22°08.2	343°38.1 22°07.8	358°38.0 22°07.5	13°37.9 22°07.1	28°37.8 22°06.8	43°37.7 22°06.5	58°37.6 22°06.1	73°37.6 22°05.8	-0.1 -0.3
Tu 11	268°36.5 22°01.4	283°36.4 22°01.1	298°36.3 22°00.8	313°36.3 22°00.4	328°36.2 22°00.1	343°36.1 21°59.7	358°36.0 21°59.4	13°35.9 21°59.0	28°35.8 21°58.7	43°35.7 21°58.3	58°35.6 21°58.0	73°35.6 21°57.7	-0.1 -0.3
We 12	268°34.6 21°53.1	283°34.5 21°52.7	298°34.5 21°52.4	313°34.4 21°52.0	328°34.3 21°51.6	343°34.2 21°51.3	358°34.2 21°50.9	13°34.1 21°50.6	28°34.0 21°50.2	43°33.9 21°49.8	58°33.9 21°49.5	73°33.8 21°49.1	-0.1 -0.4
Th 13	268°32.9 21°44.3	283°32.8 21°44.0	298°32.7 21°43.6	313°32.6 21°43.2	328°32.6 21°42.8	343°32.5 21°42.5	358°32.4 21°42.1	13°32.4 21°41.7	28°32.3 21°41.3	43°32.2 21°41.0	58°32.2 21°40.6	73°32.1 21°40.2	-0.1 -0.4
Fr 14	268°31.2 21°35.2	283°31.1 21°34.8	298°31.1 21°34.4	313°31.0 21°34.1	328°30.9 21°33.7	343°30.9 21°33.3	358°30.8 21°32.9	13°30.8 21°32.5	28°30.7 21°32.1	43°30.6 21°31.7	58°30.6 21°31.3	73°30.5 21°30.9	-0.1 -0.4
Sa 15	268°29.7 21°25.7	283°29.6 21°25.3	298°29.6 21°24.9	313°29.5 21°24.5	328°29.4 21°24.1	343°29.4 21°23.7	358°29.3 21°23.3	13°29.3 21°22.9	28°29.2 21°22.5	43°29.1 21°22.1	58°29.1 21°21.7	73°29.0 21°21.3	-0.1 -0.4
Su 16	268°28.3 21°15.9	283°28.2 21°15.5	298°28.2 21°15.0	313°28.1 21°14.6	328°28.1 21°14.2	343°28.0 21°13.8	358°28.0 21°13.4	13°27.9 21°12.9	28°27.8 21°12.5	43°27.8 21°12.1	58°27.7 21°11.7	73°27.7 21°11.3	-0.1 -0.4
Mo 17	268°27.0 21°05.7	283°27.0 21°05.2	298°26.9 21°04.8	313°26.9 21°04.4	328°26.8 21°03.9	343°26.8 21°03.5	358°26.7 21°03.1	13°26.7 21°02.6	28°26.6 21°02.2	43°26.6 21°01.8	58°26.5 21°01.3	73°26.5 21°00.9	-0.0 -0.4
Tu 18	268°25.9 20°55.1	283°25.8 20°54.7	298°25.8 20°54.2	313°25.7 20°53.8	328°25.7 20°53.3	343°25.6 20°52.9	358°25.6 20°52.4	13°25.6 20°52.0	28°25.5 20°51.5	43°25.5 20°51.1	58°25.4 20°50.6	73°25.4 20°50.1	-0.0 -0.5
We 19	268°24.8 20°44.2	283°24.8 20°43.7	298°24.8 20°43.3	313°24.7 20°42.8	328°24.7 20°42.3	343°24.7 20°41.9	358°24.6 20°41.4	13°24.6 20°40.9	28°24.5 20°40.5	43°24.5 20°40.0	58°24.5 20°39.5	73°24.4 20°39.1	-0.0 -0.5
Th 20	268°24.0 20°32.9	283°23.9 20°32.4	298°23.9 20°32.0	313°23.9 20°31.5	328°23.8 20°31.0	343°23.8 20°30.5	358°23.8 20°30.0	13°23.7 20°29.6	28°23.7 20°29.2	43°23.7 20°28.6	58°23.6 20°28.1	73°23.6 20°27.6	-0.0 -0.5
Fr 21	268°23.2 20°21.5	283°23.2 20°20.8	298°23.2 20°20.3	313°23.1 20°19.8	328°23.1 20°19.3	343°23.1 20°18.8	358°23.1 20°18.3	13°23.0 20°17.8	28°23.0 20°17.4	43°23.0 20°16.8	58°23.0 20°16.3	73°22.9 20°15.9	-0.0 -0.5
Sa 22	268°22.6 19°57.0	283°22.6 19°56.5	298°22.6 19°56.0	313°22.6 19°55.5	328°22.5 19°55.1	343°22.5 19°54.4	358°22.5 19°53.9	13°22.5 19°53.4	28°22.5 19°52.9	43°22.4 19°52.3	58°22.4 19°51.8	73°22.4 19°51.3	-0.0 -0.5
Su 23	268°21.9 19°44.4	283°21.9 19°43.9	298°21.9 19°43.3	313°21.8 19°42.8	328°21.8 19°42.3	343°21.8 19°41.7	358°21.8 19°41.2	13°21.8 19°40.7	28°21.8 19°40.4	43°21.8 19°39.6	58°21.8 19°39.0	73°21.8 19°38.5	-0.0 -0.5
Tu 25	268°21.7 19°31.5	283°21.7 19°30.9	298°21.7 19°30.4	313°21.7 19°29.8	328°21.7 19°29.3	343°21.7 19°28.7	358°21.7 19°28.2	13°21.7 19°27.6	28°21.7 19°27.1	43°21.7 19°26.5	58°21.7 19°26.0	73°21.7 19°25.4	-0.0 -0.5
We 26	268°21.7 19°18.2	283°21.7 19°17.6	298°21.7 19°17.1	313°21.7 19°16.5	328°21.7 19°15.9	343°21.7 19°15.4	358°21.7 19°14.8	13°21.7 19°14.2	28°21.7 19°13.7	43°21.7 19°13.1	58°21.8 19°12.5	73°21.8 19°12.0	+0.0 -0.6
Th 27	268°21.9 19°04.6	283°21.9 19°04.0	298°21.9 19°03.4	313°21.9 19°02.9	328°21.9 19°02.3	343°21.9 19°01.7	358°21.9 19°01.1	13°21.9 19°00.6	28°21.9 19°00.0	43°21.9 18°59.4	58°22.0 18°58.8	73°22.0 18°58.2	+0.0 -0.6
Fr 28	268°22.2 18°50.7	283°22.2 18°50.1	298°22.2 18°49.5	313°22.2 18°48.9	328°22.2 18°48.3	343°22.3 18°47.7	358°22.3 18°47.1	13°22.3 18°46.5	28°22.3 18°46.0	43°22.3 18°45.4	58°22.4 18°44.8	73°22.4 18°44.2	+0.0 -0.6
Sa 29	268°22.6 18°36.4	283°22.6 18°35.8	298°22.7 18°35.2	313°22.7 18°34.6	328°22.7 18°34.0	343°22.8 18°33.4	358°22.8 18°32.8	13°22.8 18°32.2	28°22.8 18°31.6	43°22.8 18°31.0	58°22.9 18°30.4	73°22.9 18°30.8	+0.0 -0.6
Su 30	268°23.3 18°21.9	283°23.3 18°21.3	298°23.3 18°20.7	313°23.4 18°20.1	328°23.4 18°19.5	343°23.4 18°18.9	358°23.4 18°18.2	13°23.5 18°17.6	28°23.5 18°17.0	43°23.5 18°16.4	58°23.6 18°15.8	73°23.6 18°15.2	+0.0 -0.6
Mo 31	268°24.0 18°07.1	283°24.1 18°06.5	298°24.1 18°05.9	313°24.1 18°05.2	328°24.2 18°04.6	343°24.2 18°04.0	358°24.3 18°03.4	13°24.3 18°02.7	28°24.3 18°02.1	43°24.4 18°01.5	58°24.4 18°00.8	73°24.5 18°00.2	+0.0 -0.6

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 15.7'

MOON

July 2028

	D	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	Δ'/h	SH
O	Sa 1	248°06.9 -18°22.8	262°35.1 -18°33.7	277°03.4 -18°44.5	291°31.5 -18°55.1	305°59.6 -19°05.7	320°27.7 -19°16.1	334°55.7 -19°26.5	349°23.6 -19°36.8	3°51.5 -19°46.8	18°19.4 -19°56.8	32°47.7 -20°06.6	+28.0	15.8
	Su 2	245°38.1 -22°19.7	264°05.1 -22°27.6	278°32.1 -22°35.3	292°59.0 -22°42.9	307°25.9 -22°50.3	321°52.7 -22°57.6	336°19.5 -23°11.8	350°46.3 -23°11.8	5°13.0 -23°18.7	19°39.7 -23°25.4	34°06.4 -23°32.0	+26.8	15.7
	Mo 3	250°42.3 -24°53.9	265°08.4 -24°58.1	279°34.6 -25°02.3	294°00.8 -25°06.3	308°26.9 -25°10.1	322°53.1 -25°13.8	337°19.2 -25°17.3	351°45.3 -25°20.7	6°11.4 -25°23.9	20°37.5 -25°27.0	35°03.3 -25°29.9	+26.1	15.6
	Tu 4	251°35.1 -25°55.6	266°01.3 -25°56.4	280°27.5 -25°56.4	294°53.7 -25°56.6	309°20.0 -25°56.7	323°46.3 -25°56.6	338°12.6 -25°56.3	352°38.9 -25°55.9	7°05.3 -25°54.7	21°31.7 -25°54.7	35°58.1 -25°53.8	+26.3	15.4
	We 5	252°39.6 -25°23.7	267°06.7 -25°20.6	281°33.9 -25°17.3	296°01.2 -25°13.9	310°28.5 -25°10.3	324°55.9 -25°06.6	339°23.3 -25°02.8	353°50.8 -24°58.8	8°18.4 -24°50.6	22°46.0 -24°50.5	37°13.7 -24°46.2	+27.4	15.3
●	Th 6	254°17.6 -23°25.7	268°46.4 -23°19.4	283°15.4 -23°12.9	297°44.4 -23°06.4	312°13.5 -22°59.7	326°42.6 -22°52.9	341°11.9 -22°46.0	355°41.2 -22°39.0	10°10.6 -22°31.9	24°40.1 -22°24.7	39°09.6 -22°17.4	+29.2	15.1
	Fr 7	256°42.9 -20°15.6	271°13.8 -20°06.7	285°44.7 -19°57.8	300°15.8 -19°48.7	314°46.9 -19°39.6	329°18.1 -19°30.4	343°49.4 -19°21.1	358°20.7 -19°11.7	12°52.2 -19°02.2	27°23.7 -18°52.7	41°55.3 -18°43.1	+31.2	15.0
	Sa 8	259°58.6 -16°10.1	274°31.4 -15°59.4	289°04.3 -15°48.6	303°37.2 -15°37.7	318°10.3 -15°26.8	332°43.4 -15°15.8	347°16.5 -15°04.8	1°49.8 -14°53.7	16°23.1 -14°42.2	30°56.4 -14°31.4	45°29.9 -14°20.1	+33.1	14.9
	Su 9	263°58.8 -11°25.7	278°33.2 -11°13.7	293°07.6 -11°01.7	307°42.1 -10°49.6	322°16.2 -10°37.6	336°51.2 -10°25.4	351°25.8 -10°13.3	6°00.5 -10°01.7	20°35.3 -9°48.9	35°10.0 -9°36.6	49°44.9 -9°24.3	+34.6	14.8
	Mo 10	268°32.1 -6°16.8	283°07.5 -6°04.2	297°43.0 -5°51.5	312°18.5 -5°38.7	326°54.0 -5°26.0	341°29.5 -5°13.3	356°05.1 -5°00.5	10°40.1 -4°47.7	25°16.3 -4°34.9	39°51.9 -4°22.1	54°27.6 -4°09.3	+35.6	14.8
●	Tu 11	273°24.3 -0°55.9	288°00.2 -0°42.9	302°36.1 -0°30.0	317°11.9 -0°17.0	331°47.8 -0°04.1	346°23.7 0°08.8	0°59.6 0°21.8	15°35.4 0°34.7	30°11.3 0°47.7	44°47.2 1°00.6	59°23.1 1°13.5	+35.9	14.8
	We 12	278°19.9 4°26.6	292°55.6 4°39.4	307°31.2 4°52.2	322°06.8 5°04.9	336°42.4 5°17.7	351°18.0 5°30.4	5°53.5 5°43.1	20°29.1 5°55.8	35°04.6 6°08.5	49°40.0 6°21.1	64°15.4 6°33.8	+35.6	14.8
	Th 13	292°55.6 4°39.4	307°31.2 4°52.2	322°06.8 5°04.9	336°42.4 5°17.7	351°18.0 5°30.4	356°05.1 5°43.1	20°29.1 5°55.8	35°04.6 6°08.5	49°40.0 6°21.1	64°15.4 6°33.8	78°50.8 6°46.4	+35.5	14.8
	Fr 14	297°37.4 9°52.7	312°12.2 10°04.9	326°46.9 10°17.0	341°21.5 10°29.2	355°56.1 10°41.3	10°30.7 10°53.3	25°05.2 11°05.4	39°39.6 11°17.3	54°14.0 11°29.3	68°48.4 11°41.2	83°22.7 11°53.1	+34.5	14.9
	Sa 15	301°49.3 14°46.0	316°22.6 14°57.2	330°55.7 15°08.3	345°28.8 15°19.3	360°01.8 15°30.3	14°34.7 15°41.2	29°07.6 15°52.1	43°40.4 16°02.9	58°13.0 16°13.6	72°45.7 16°24.3	87°18.4 16°35.0	+32.9	15.0
●	Su 16	306°15.9 19°06.4	319°47.1 19°15.9	334°18.1 19°25.3	348°49.0 19°34.7	363°19.9 19°44.0	17°50.6 19°53.2	32°21.3 20°02.3	46°51.9 20°11.3	61°23.6 20°20.2	75°52.7 20°29.1	90°23.0 20°37.8	+30.7	15.2
	Mo 17	307°45.1 22°37.7	322°13.7 22°44.9	336°42.4 22°51.9	351°10.8 22°58.9	365°39.1 23°05.7	20°07.4 23°12.4	34°35.6 23°19.0	49°03.6 23°25.5	63°31.6 23°31.9	77°59.5 23°38.2	92°27.2 23°44.3	+28.2	15.4
	Tu 18	309°12.1 25°01.0	323°38.4 25°05.0	338°04.6 25°08.9	352°30.6 25°12.7	366°56.6 25°16.3	21°22.5 25°19.8	35°48.4 25°23.1	50°14.1 25°26.3	64°39.8 25°29.3	79°05.3 25°32.2	93°30.8 25°34.9	+25.9	15.6
	We 19	309°44.9 25°37.0	324°09.3 25°57.2	338°33.7 25°57.2	352°58.1 25°57.1	367°22.4 25°56.7	21°46.6 25°56.3	36°10.8 25°55.6	50°35.0 25°54.8	64°59.1 25°53.8	79°23.2 25°52.7	93°47.2 25°51.4	+24.2	15.9
	Th 20	309°45.0 25°10.9	324°08.7 25°06.8	338°32.5 25°02.6	352°56.2 24°58.1	367°20.0 24°53.5	21°43.7 24°48.8	36°07.5 24°43.8	50°31.2 24°38.7	64°55.0 24°33.4	79°18.8 24°28.0	93°42.6 24°22.4	+23.8	16.1
●	Fr 21	309°42.5 22°38.0	324°06.8 22°29.8	338°31.1 22°21.4	352°55.4 22°12.8	367°19.8 22°04.1	21°44.3 21°55.2	36°08.8 21°46.2	50°33.3 21°37.0	64°57.9 21°27.7	79°22.5 21°18.2	93°47.2 21°08.5	+24.5	16.3
	Sa 22	310°04.4 18°27.2	324°30.4 18°15.6	338°55.7 18°17.5	353°21.5 17°51.4	367°47.3 17°39.2	22°13.2 17°26.9	36°39.1 17°14.5	51°05.2 17°02.0	65°31.2 16°49.3	79°57.4 16°36.6	94°23.8 16°23.7	+25.9	16.5
	Su 23	311°04.7 12°58.7	325°32.0 12°44.4	339°59.3 12°29.9	354°26.7 12°15.4	368°54.1 12°00.7	23°21.6 11°46.0	37°49.2 11°31.3	52°16.6 11°16.5	66°44.5 11°01.6	81°12.2 10°46.6	95°40.0 10°31.6	+27.5	16.5
	Mo 24	312°43.3 6°39.7	327°12.0 6°23.1	341°40.6 6°08.1	356°09.3 5°52.2	368°36.0 5°36.3	25°06.8 5°20.4	39°35.7 5°04.4	54°04.5 4°48.4	68°33.4 4°32.4	83°02.3 4°16.4	97°31.3 4°00.4	+28.8	16.5
	Tu 25	314°49.5 -0°01.1	329°18.9 -0°17.2	343°48.3 -0°33.2	358°17.7 -0°49.3	372°47.2 -1°05.3	27°16.6 -1°21.4	41°46.1 -1°37.4	56°15.6 -1°53.4	70°45.1 -2°09.4	85°14.6 -2°25.3	99°44.1 -2°41.2	+29.5	16.4
●	We 26	317°07.3 -6°36.2	331°36.9 -6°51.6	346°06.8 -7°06.8	359°05.9 -7°22.1	373°05.4 -7°37.3	29°34.9 -7°52.4	44°04.3 -8°07.5	58°33.8 -8°22.5	73°03.2 -8°37.4	87°32.7 -8°52.3	102°02.1 -9°07.2	+29.5	16.3
	Th 27	319°20.7 -12°41.4	333°49.8 -12°55.1	348°18.8 -13°08.6	362°47.7 -13°22.2	377°16.7 -13°35.6	31°45.6 -13°48.9	46°14.5 -14°02.1	60°43.3 -14°15.3	75°12.2 -14°28.4	89°40.9 -14°41.3	104°09.7 -14°54.2	+28.9	16.1
	Fr 28	321°16.5 -17°55.3	335°44.7 -18°06.6	350°12.8 -18°17.7	364°40.8 -18°28.7	379°08.9 -18°39.6	33°36.8 -18°50.2	48°04.8 -19°01.0	62°32.7 -19°11.6	77°00.5 -19°22.0	91°28.5 -19°32.3	105°56.2 -19°42.5	+28.0	15.9
	Sa 29	322°48.2 -22°00.2	337°15.4 -22°08.4	351°42.5 -22°16.4	366°09.6 -22°24.3	380°36.7 -22°32.0	35°03.7 -22°39.6	49°30.7 -22°47.1	63°57.7 -22°54.1	78°24.6 -23°01.6	92°51.5 -23°08.7	107°18.4 -23°15.6	+27.0	15.7
	Su 30	323°58.6 -24°42.3	338°25.2 -24°46.9	352°51.4 -24°51.4	367°18.2 -24°55.7	381°44.7 -24°59.9	36°11.2 -25°03.9	50°37.6 -25°07.8	65°04.1 -25°11.5	79°30.6 -25°15.1	93°57.0 -25°15.1	108°23.5 -25°21.8	+26.5	15.5
●	Mo 31	325°00.7 -25°53.3	339°27.3 -25°54.2	353°53.9 -25°55.0	368°20.5 -25°55.6	382°47.1 -25°56.1	37°13.8 -25°56.4	51°40.4 -25°56.6	66°07.2 -25°56.6	80°33.9 -25°56.5	95°00.7 -25°56.2	109°27.4 -25°55.8	+26.7	15.4
													-0.2	56.4

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter
Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax
Column = (UTC hour - day) mod 24
FM: 6 18h10 — LQ: 14 20h56 — NM: 22 03h01 — FQ: 28 17h40

SUN

August 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Tu 1	268 ^{25.0} 17°52.0	283 ^{25.0} 17°51.4	298 ^{25.1} 17°50.7	313 ^{25.1} 17°50.1	328 ^{25.1} 17°49.4	343 ^{25.2} 17°48.8	358 ^{25.2} 17°48.2	13°25.3	28°25.3	343°25.4	58°25.4	73°25.5	+0.0
We 2	268 ^{26.1} 17°36.6	283 ^{26.1} 17°35.9	298 ^{26.2} 17°35.3	313 ^{26.2} 17°34.6	328 ^{26.3} 17°34.0	343 ^{26.3} 17°33.3	358 ^{26.4} 17°32.7	13°26.4	28°26.5	343°26.5	58°26.6	73°26.6	+0.1
Th 3	268 ^{27.3} 17°20.9	283 ^{27.4} 17°20.2	298 ^{27.4} 17°19.6	313 ^{27.5} 17°18.9	328 ^{27.5} 17°18.3	343 ^{27.6} 17°17.6	358 ^{27.6} 17°16.9	13°27.7	28°27.7	343°27.8	58°27.9	73°27.9	+0.1
Fr 4	268 ^{28.7} 17°04.9	283 ^{28.8} 17°04.3	298 ^{28.8} 17°03.6	313 ^{28.9} 17°02.9	328 ^{29.0} 17°02.2	343 ^{29.0} 17°01.6	358 ^{29.1} 17°00.9	13°29.1	28°29.2	343°29.3	58°29.3	73°29.4	+0.1
Sa 5	268 ^{30.2} 16°48.7	283 ^{30.3} 16°48.0	298 ^{30.4} 16°47.3	313 ^{30.5} 16°46.6	328 ^{30.5} 16°45.9	343 ^{30.6} 16°45.3	358 ^{30.7} 16°44.6	13°30.7	28°30.8	343°30.9	58°30.9	73°31.0	+0.1
Su 6	268 ^{31.9} 16°32.2	283 ^{32.0} 16°31.5	298 ^{32.1} 16°30.8	313 ^{32.2} 16°30.1	328 ^{32.2} 16°29.4	343 ^{32.3} 16°28.7	358 ^{32.4} 16°28.0	13°32.5	28°32.5	343°32.6	58°32.7	73°32.8	+0.1
Mo 7	268 ^{33.8} 16°15.4	283 ^{33.9} 16°14.7	298 ^{33.9} 16°14.0	313 ^{34.0} 16°13.3	328 ^{34.1} 16°12.6	343 ^{34.2} 16°11.9	358 ^{34.3} 16°11.1	13°34.4	28°34.4	343°34.5	58°34.6	73°34.7	+0.1
Tu 8	268 ^{35.8} 15°58.3	283 ^{35.9} 15°57.6	298 ^{35.9} 15°56.9	313 ^{36.0} 15°56.2	328 ^{36.1} 15°55.5	343 ^{36.2} 15°54.8	358 ^{36.3} 15°54.0	13°36.8	28°36.8	343°36.9	58°36.9	73°37.0	+0.1
We 9	268 ^{37.9} 15°41.0	283 ^{38.0} 15°40.3	298 ^{38.1} 15°39.6	313 ^{38.2} 15°38.9	328 ^{38.3} 15°38.1	343 ^{38.4} 15°37.4	358 ^{38.5} 15°36.7	13°38.6	28°38.7	343°38.7	58°38.8	73°38.9	+0.1
Th 10	268 ^{40.2} 15°23.5	283 ^{40.3} 15°22.7	298 ^{40.4} 15°22.0	313 ^{40.5} 15°21.3	328 ^{40.6} 15°20.5	343 ^{40.7} 15°19.8	358 ^{40.8} 15°19.1	13°40.9	28°41.0	343°41.1	58°41.2	73°41.3	+0.1
Fr 11	268 ^{42.6} 15°05.7	283 ^{42.7} 15°04.9	298 ^{42.8} 15°04.2	313 ^{42.9} 15°03.4	328 ^{43.0} 15°02.7	343 ^{43.1} 15°01.9	358 ^{43.2} 15°01.2	13°43.3	28°43.3	343°43.5	58°43.6	73°43.8	+0.1
Sa 12	268 ^{45.1} 14°47.6	283 ^{45.3} 14°46.9	298 ^{45.4} 14°46.1	313 ^{45.5} 14°45.4	328 ^{45.6} 14°44.6	343 ^{45.7} 14°43.8	358 ^{45.8} 14°43.1	13°45.9	28°46.0	343°46.1	58°46.3	73°46.4	+0.1
Su 13	268 ^{47.8} 14°29.4	283 ^{47.9} 14°28.6	298 ^{48.1} 14°27.8	313 ^{48.2} 14°27.1	328 ^{48.3} 14°26.3	343 ^{48.4} 14°25.5	358 ^{48.5} 14°24.7	13°48.6	28°48.8	343°48.9	58°49.0	73°49.1	+0.1
Mo 14	268 ^{50.6} 14°10.8	283 ^{50.8} 14°10.1	298 ^{50.9} 14°09.3	313 ^{51.0} 14°08.5	328 ^{51.1} 14°07.7	343 ^{51.3} 14°07.0	358 ^{51.4} 14°06.2	13°51.5	28°51.5	343°51.7	58°51.9	73°52.0	+0.1
Tu 15	268 ^{53.6} 13°52.1	283 ^{53.7} 13°51.3	298 ^{53.8} 13°50.5	313 ^{54.0} 13°49.7	328 ^{54.0} 13°49.0	343 ^{54.2} 13°48.2	358 ^{54.4} 13°47.4	13°54.5	28°54.5	343°54.7	58°54.9	73°55.0	+0.1
We 16	268 ^{56.7} 13°33.1	283 ^{56.8} 13°32.3	298 ^{56.9} 13°31.5	313 ^{57.1} 13°30.8	328 ^{57.2} 13°30.0	343 ^{57.3} 13°29.2	358 ^{57.5} 13°28.4	13°57.6	28°57.7	343°57.9	58°58.0	73°58.1	+0.1
Th 17	268 ^{59.9} 13°14.0	284 ^{00.0} 13°13.2	299 ^{00.0} 13°12.3	314 ^{00.3} 13°11.5	329 ^{00.3} 13°10.7	344 ^{00.5} 13°09.9	359 ^{00.7} 13°09.1	14°00.8	29°01.0	344 ^{00.1} 13°07.5	59°01.1	74°01.4	+0.1
Fr 18	269 ^{03.2} 12°54.6	284 ^{03.3} 12°53.6	299 ^{03.5} 12°52.9	314 ^{03.6} 12°52.1	329 ^{03.8} 12°51.3	344 ^{03.9} 12°50.5	359 ^{04.0} 12°49.7	14°04.0	29°04.4	344 ^{03.4} 12°47.2	59°04.6	74°04.7	+0.1
Sa 19	269 ^{06.6} 12°35.0	284 ^{06.8} 12°34.1	299 ^{06.9} 12°33.3	314 ^{07.0} 12°32.5	329 ^{07.1} 12°31.7	344 ^{07.4} 12°30.9	359 ^{07.5} 12°30.0	14°07.7	29°07.8	344 ^{07.0} 12°27.6	59°07.8	74°08.2	+0.1
Su 20	269 ^{10.2} 12°15.2	284 ^{10.3} 12°14.3	299 ^{10.5} 12°13.5	314 ^{10.6} 12°12.7	329 ^{10.8} 12°11.9	344 ^{10.9} 12°11.0	359 ^{11.1} 12°10.2	14°11.3	29°11.4	344 ^{10.5} 12°09.7	59°11.7	74°11.9	+0.2
Mo 21	269 ^{13.9} 11°55.2	284 ^{14.0} 11°54.4	299 ^{14.2} 11°53.5	314 ^{14.3} 11°52.7	329 ^{14.5} 11°51.8	344 ^{14.6} 11°51.0	359 ^{14.8} 11°50.2	14°15.0	29°15.4	344 ^{14.0} 11°48.5	59°15.7	74°15.6	+0.2
Tu 22	269 ^{17.7} 11°35.0	284 ^{17.8} 11°34.2	299 ^{18.0} 11°33.3	314 ^{18.1} 11°32.5	329 ^{18.3} 11°31.6	344 ^{18.5} 11°30.8	359 ^{18.6} 11°29.9	14°18.9	29°19.4	344 ^{17.9} 11°28.2	59°19.6	74°19.4	+0.2
We 23	269 ^{21.6} 10°54.1	284 ^{21.7} 10°53.3	299 ^{21.9} 10°52.4	314 ^{22.1} 10°51.5	329 ^{22.2} 10°50.7	344 ^{22.4} 10°49.8	359 ^{22.6} 10°49.0	14°22.7	29°24.2	344 ^{21.7} 10°47.2	59°24.3	74°24.3	+0.2
Th 24	269 ^{25.6} 10°33.4	284 ^{25.8} 10°32.5	299 ^{25.9} 10°31.7	314 ^{26.1} 10°30.8	329 ^{26.3} 10°29.9	344 ^{26.4} 10°29.1	359 ^{26.6} 10°28.2	14°26.8	29°26.9	344 ^{25.9} 10°25.6	59°27.1	74°27.5	+0.2
Fr 25	269 ^{29.7} 10°12.5	284 ^{29.9} 10°11.7	299 ^{30.1} 10°10.8	314 ^{30.2} 10°09.9	329 ^{30.4} 10°09.0	344 ^{30.6} 10°08.2	359 ^{30.8} 10°07.3	14°30.9	29°31.1	344 ^{30.3} 10°06.4	59°31.3	74°31.6	+0.2
Sa 26	269 ^{33.8} 9°51.5	284 ^{34.0} 9°50.6	299 ^{34.3} 9°49.8	314 ^{34.5} 9°48.9	329 ^{34.7} 9°48.0	344 ^{34.8} 9°47.1	359 ^{35.0} 9°46.2	14°35.2	29°35.5	344 ^{34.7} 9°44.5	59°35.7	74°35.9	+0.2
Su 27	269 ^{37.3} 9°30.3	284 ^{37.4} 9°29.4	299 ^{37.6} 9°28.6	314 ^{37.8} 9°27.7	329 ^{38.0} 9°26.8	344 ^{38.2} 9°25.9	359 ^{38.4} 9°25.0	14°39.5	29°39.7	344 ^{38.9} 9°23.2	59°39.9	74°40.3	+0.2
Mo 28	269 ^{41.2} 8°47.5	284 ^{41.3} 8°46.6	299 ^{41.6} 8°45.7	314 ^{41.8} 8°44.8	329 ^{42.0} 8°43.9	344 ^{42.2} 8°42.9	359 ^{42.4} 8°42.1	14°44.0	29°44.4	344 ^{43.4} 8°41.2	59°44.5	74°44.8	+0.2
Tu 29	269 ^{45.2} 8°25.9	284 ^{45.3} 8°25.0	299 ^{45.6} 8°24.1	314 ^{45.7} 8°23.2	329 ^{45.7} 8°22.3	344 ^{45.8} 8°21.4	359 ^{46.0} 8°20.5	14°48.5	29°48.8	344 ^{45.9} 8°39.4	59°48.9	74°49.3	+0.2
We 30	269 ^{49.0} 8°04.7	284 ^{49.1} 8°03.8	299 ^{49.4} 8°02.9	314 ^{49.6} 8°02.0	329 ^{49.8} 8°01.1	344 ^{49.9} 8°00.2	359 ^{50.1} 8°00.0	14°53.2	29°53.5	344 ^{49.5} 8°16.9	59°53.8	74°54.0	+0.2
Th 31	269 ^{52.8} 8°25.9	284 ^{52.9} 8°25.0	299 ^{53.2} 8°24.1	314 ^{53.4} 8°23.2	329 ^{53.6} 8°22.3	344 ^{53.8} 8°21.4	359 ^{54.0} 8°20.5	14°57.9	29°58.1	344 ^{53.3} 8°17.8	59°58.5	74°58.7	+0.2
													-0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 15.8'

MOON

August 2028

	D	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	Δ' /h SH
O	Tu 1	239 ⁰ 30.1 -25 ⁰ 45.7	253 ⁰ 57.3 -25 ⁰ 43.8	268 ⁰ 24.5 -25 ⁰ 41.9	282 ⁰ 51.8 -25 ⁰ 39.7	297 ⁰ 19.0 -25 ⁰ 37.5	311 ⁰ 46.4 -25 ⁰ 35.1	326 ⁰ 13.8 -25 ⁰ 32.6	340 ⁰ 41.2 -25 ⁰ 29.9	355 ⁰ 08.7 -25 ⁰ 27.1	9 ⁰ 36.3 -25 ⁰ 24.1	24 ⁰ 03.9 -25 ⁰ 21.1	+27.4 15.3 +2.555.9
	We 2	241 ⁰ 04.8 -24 ⁰ 19.2	255 ⁰ 33.3 -24 ⁰ 14.1	270 ⁰ 02.0 -24 ⁰ 08.8	284 ⁰ 30.7 -24 ⁰ 03.4	298 ⁰ 59.4 -23 ⁰ 57.9	313 ⁰ 28.3 -23 ⁰ 52.3	327 ⁰ 57.2 -23 ⁰ 46.6	342 ⁰ 26.2 -23 ⁰ 40.7	356 ⁰ 55.2 -23 ⁰ 34.8	11 ⁰ 24.3 -23 ⁰ 28.7	25 ⁰ 53.5 -23 ⁰ 22.5	+28.9 15.1 +5.755.4
	Th 3	243 ⁰ 20.3 -21 ⁰ 36.5	257 ⁰ 50.7 -21 ⁰ 28.7	272 ⁰ 21.1 -21 ⁰ 20.7	286 ⁰ 51.7 -21 ⁰ 12.6	301 ⁰ 22.3 -21 ⁰ 04.4	315 ⁰ 53.0 -20 ⁰ 56.2	330 ⁰ 23.8 -20 ⁰ 47.8	344 ⁰ 54.6 -20 ⁰ 39.3	359 ⁰ 25.5 -20 ⁰ 30.8	13 ⁰ 56.5 -20 ⁰ 22.2	28 ⁰ 27.6 -20 ⁰ 13.4	+30.7 15.0 +8.355.0
O	Fr 4	246 ⁰ 22.7 -17 ⁰ 52.6	260 ⁰ 54.9 -17 ⁰ 42.6	275 ⁰ 27.2 -17 ⁰ 32.5	289 ⁰ 59.6 -17 ⁰ 22.4	304 ⁰ 32.1 -17 ⁰ 12.2	319 ⁰ 04.6 -16 ⁰ 01.9	333 ⁰ 37.3 -16 ⁰ 51.5	348 ⁰ 09.9 -16 ⁰ 41.1	2 ⁰ 42.7 -16 ⁰ 30.6	17 ⁰ 15.5 -16 ⁰ 20.1	31 ⁰ 48.4 -16 ⁰ 09.4	+32.6 14.9 +10.354.6
	Sa 5	250 ⁰ 09.3 -13 ⁰ 23.2	264 ⁰ 43.2 -13 ⁰ 11.7	279 ⁰ 17.1 -13 ⁰ 00.1	293 ⁰ 51.1 -12 ⁰ 48.5	308 ⁰ 25.1 -12 ⁰ 36.9	322 ⁰ 59.2 -12 ⁰ 25.2	337 ⁰ 33.4 -12 ⁰ 13.5	352 ⁰ 07.6 -12 ⁰ 01.7	6 ⁰ 41.9 -11 ⁰ 49.9	21 ⁰ 16.2 -11 ⁰ 38.0	35 ⁰ 50.6 -11 ⁰ 26.1	+34.1 14.8 +11.754.3
	Su 6	254 ⁰ 31.6 -8 ⁰ 23.3	269 ⁰ 06.7 -8 ⁰ 10.8	283 ⁰ 41.8 -7 ⁰ 58.4	298 ⁰ 17.0 -7 ⁰ 45.9	312 ⁰ 52.1 -7 ⁰ 33.4	327 ⁰ 27.4 -7 ⁰ 20.8	342 ⁰ 02.6 -7 ⁰ 08.3	356 ⁰ 37.9 -6 ⁰ 55.7	11 ⁰ 13.2 -6 ⁰ 43.1	25 ⁰ 48.6 -6 ⁰ 30.4	40 ⁰ 23.9 -6 ⁰ 17.8	+35.2 14.8 +12.654.1
O	Mo 7	259 ⁰ 17.6 -3 ⁰ 06.1	273 ⁰ 53.4 -2 ⁰ 53.3	288 ⁰ 29.1 -2 ⁰ 40.4	303 ⁰ 04.9 -2 ⁰ 27.5	317 ⁰ 40.7 -2 ⁰ 14.6	332 ⁰ 16.5 -2 ⁰ 01.7	346 ⁰ 52.3 -1 ⁰ 48.8	1 ⁰ 28.1 -1 ⁰ 35.9	16 ⁰ 04.0 -1 ⁰ 23.0	30 ⁰ 39.8 -1 ⁰ 10.1	45 ⁰ 15.6 -0 ⁰ 57.1	+35.8 14.7 +12.954.0
	Tu 8	264 ⁰ 13.6 2 ⁰ 16.4	278 ⁰ 49.5 2 ⁰ 29.3	293 ⁰ 25.3 2 ⁰ 42.1	308 ⁰ 01.1 2 ⁰ 55.0	322 ⁰ 37.0 3 ⁰ 07.8	337 ⁰ 12.8 3 ⁰ 20.6	351 ⁰ 48.6 3 ⁰ 33.4	6 ⁰ 24.3 3 ⁰ 46.2	21 ⁰ 00.1 3 ⁰ 59.0	35 ⁰ 35.9 4 ⁰ 11.8	50 ⁰ 11.6 4 ⁰ 24.5	+35.8 14.7 +12.854.0
	We 9	269 ⁰ 05.1 7 ⁰ 33.6	283 ⁰ 40.5 7 ⁰ 46.0	298 ⁰ 15.8 7 ⁰ 58.4	312 ⁰ 51.1 8 ⁰ 10.8	327 ⁰ 26.3 8 ⁰ 23.1	342 ⁰ 01.5 8 ⁰ 35.4	356 ⁰ 36.7 8 ⁰ 47.7	11 ⁰ 11.9 9 ⁰ 00.0	25 ⁰ 47.0 9 ⁰ 12.2	40 ⁰ 22.1 9 ⁰ 24.4	54 ⁰ 57.1 9 ⁰ 36.6	+35.2 14.8 +12.354.1
O	Th 10	273 ⁰ 37.2 12 ⁰ 34.6	288 ⁰ 11.5 12 ⁰ 46.2	302 ⁰ 45.7 12 ⁰ 57.7	317 ⁰ 19.9 13 ⁰ 09.1	331 ⁰ 54.0 13 ⁰ 20.5	346 ⁰ 28.0 13 ⁰ 31.9	1 ⁰ 02.0 13 ⁰ 43.2	15 ⁰ 35.9 13 ⁰ 54.5	30 ⁰ 49.8 14 ⁰ 05.7	44 ⁰ 43.6 14 ⁰ 16.8	59 ⁰ 17.4 14 ⁰ 27.9	+34.0 14.8 +11.354.4
	Fr 11	277 ⁰ 35.5 17 ⁰ 07.9	292 ⁰ 08.1 17 ⁰ 18.0	306 ⁰ 40.7 17 ⁰ 28.1	321 ⁰ 13.3 17 ⁰ 38.2	335 ⁰ 45.6 17 ⁰ 48.1	350 ⁰ 17.9 17 ⁰ 58.0	4 ⁰ 50.2 18 ⁰ 07.9	19 ⁰ 22.3 18 ⁰ 17.6	33 ⁰ 54.4 18 ⁰ 27.3	48 ⁰ 26.4 18 ⁰ 36.9	62 ⁰ 58.4 18 ⁰ 46.4	+32.3 15.0 +9.554.9
	Sa 12	292 ⁰ 08.1 17 ⁰ 18.0	306 ⁰ 40.7 17 ⁰ 28.1	321 ⁰ 13.3 17 ⁰ 38.2	335 ⁰ 45.6 17 ⁰ 48.1	350 ⁰ 17.9 17 ⁰ 58.0	4 ⁰ 50.2 18 ⁰ 07.9	19 ⁰ 22.3 18 ⁰ 17.6	33 ⁰ 54.4 18 ⁰ 27.3	48 ⁰ 26.4 18 ⁰ 36.9	62 ⁰ 58.4 18 ⁰ 46.4	77 ⁰ 30.2 18 ⁰ 55.9	+32.2 15.0 +9.854.9
O	Su 13	295 ⁰ 17.7 21 ⁰ 08.1	309 ⁰ 48.3 21 ⁰ 16.2	324 ⁰ 18.6 21 ⁰ 24.2	338 ⁰ 48.9 21 ⁰ 32.1	353 ⁰ 19.1 21 ⁰ 40.0	7 ⁰ 49.2 21 ⁰ 47.7	22 ⁰ 19.2 21 ⁰ 55.3	36 ⁰ 49.1 22 ⁰ 02.9	51 ⁰ 18.9 22 ⁰ 10.3	65 ⁰ 48.7 22 ⁰ 17.6	80 ⁰ 18.3 22 ⁰ 24.9	+30.1 15.1 +7.755.5
	Mo 14	297 ⁰ 32.1 24 ⁰ 00.4	312 ⁰ 00.3 24 ⁰ 05.9	326 ⁰ 28.4 24 ⁰ 11.2	340 ⁰ 56.4 24 ⁰ 16.4	355 ⁰ 24.3 24 ⁰ 21.5	9 ⁰ 52.1 24 ⁰ 26.5	24 ⁰ 19.9 24 ⁰ 31.3	38 ⁰ 47.5 24 ⁰ 36.0	53 ⁰ 15.1 24 ⁰ 40.6	67 ⁰ 42.6 24 ⁰ 45.1	82 ⁰ 18.0 24 ⁰ 49.4	+27.8 15.4 +4.956.3
	Tu 15	298 ⁰ 51.1 25 ⁰ 37.9	313 ⁰ 17.3 25 ⁰ 40.0	327 ⁰ 43.3 25 ⁰ 41.9	342 ⁰ 09.3 25 ⁰ 43.7	356 ⁰ 35.3 25 ⁰ 45.4	11 ⁰ 01.1 25 ⁰ 46.9	25 ⁰ 26.9 25 ⁰ 48.2	39 ⁰ 52.6 25 ⁰ 49.4	54 ⁰ 18.3 25 ⁰ 50.5	68 ⁰ 43.9 25 ⁰ 51.4	83 ⁰ 09.4 25 ⁰ 52.1	+25.8 15.6 +1.457.2
O	We 16	299 ⁰ 26.3 25 ⁰ 44.3	313 ⁰ 51.1 25 ⁰ 42.5	328 ⁰ 15.8 25 ⁰ 40.5	342 ⁰ 40.5 25 ⁰ 38.3	357 ⁰ 05.2 25 ⁰ 36.0	11 ⁰ 29.9 25 ⁰ 33.6	25 ⁰ 54.5 25 ⁰ 30.9	40 ⁰ 19.1 25 ⁰ 28.1	54 ⁰ 43.7 25 ⁰ 25.1	69 ⁰ 08.7 25 ⁰ 22.0	83 ⁰ 32.7 25 ⁰ 18.7	+24.6 15.9 -2.658.2
	Th 17	299 ⁰ 39.3 24 ⁰ 09.1	314 ⁰ 03.7 24 ⁰ 03.2	328 ⁰ 28.2 23 ⁰ 57.0	342 ⁰ 52.6 23 ⁰ 50.7	357 ⁰ 17.1 23 ⁰ 44.3	11 ⁰ 41.5 23 ⁰ 37.7	26 ⁰ 06.0 23 ⁰ 30.9	40 ⁰ 30.5 23 ⁰ 23.9	54 ⁰ 55.0 23 ⁰ 16.8	69 ⁰ 19.5 23 ⁰ 09.5	83 ⁰ 44.1 23 ⁰ 02.1	+24.5 16.1 -6.759.2
	Fr 18	299 ⁰ 55.4 20 ⁰ 51.8	314 ⁰ 20.4 20 ⁰ 41.9	328 ⁰ 45.5 20 ⁰ 31.9	343 ⁰ 10.6 20 ⁰ 21.7	357 ⁰ 35.7 20 ⁰ 11.3	12 ⁰ 00.9 20 ⁰ 00.9	26 ⁰ 28.1 19 ⁰ 50.2	40 ⁰ 51.4 19 ⁰ 39.5	55 ⁰ 16.7 19 ⁰ 28.6	69 ⁰ 42.1 19 ⁰ 17.6	84 ⁰ 07.4 19 ⁰ 06.4	+25.2 16.4 -10.560.1
O	Sa 19	300 ⁰ 34.0 16 ⁰ 03.4	315 ⁰ 00.2 15 ⁰ 50.2	329 ⁰ 26.4 15 ⁰ 37.0	343 ⁰ 52.6 15 ⁰ 23.6	358 ⁰ 18.9 15 ⁰ 10.1	12 ⁰ 45.3 14 ⁰ 28.2	27 ⁰ 11.7 14 ⁰ 24.8	41 ⁰ 38.2 14 ⁰ 29.0	56 ⁰ 04.7 14 ⁰ 15.1	70 ⁰ 31.2 14 ⁰ 01.1	84 ⁰ 57.8 13 ⁰ 47.0	+26.4 16.6 -13.660.7
	Su 20	301 ⁰ 42.6 10 ⁰ 05.1	316 ⁰ 10.0 9 ⁰ 49.7	330 ⁰ 37.4 9 ⁰ 34.3	345 ⁰ 04.8 9 ⁰ 18.7	359 ⁰ 32.3 9 ⁰ 03.1	13 ⁰ 59.8 8 ⁰ 47.5	28 ⁰ 27.3 8 ⁰ 31.8	42 ⁰ 54.9 8 ⁰ 16.0	57 ⁰ 22.5 7 ⁰ 00.2	71 ⁰ 50.2 7 ⁰ 44.3	86 ⁰ 17.9 7 ⁰ 28.4	+27.5 16.7 -15.761.1
	Mo 21	303 ⁰ 17.3 3 ⁰ 24.9	317 ⁰ 45.5 3 ⁰ 08.5	332 ⁰ 13.7 2 ⁰ 52.0	346 ⁰ 41.9 2 ⁰ 35.6	1 ⁰ 10.2 2 ⁰ 19.1	15 ⁰ 38.4 2 ⁰ 02.6	30 ⁰ 06.7 1 ⁰ 46.0	44 ⁰ 35.0 1 ⁰ 29.5	59 ⁰ 03.3 1 ⁰ 13.0	73 ⁰ 31.7 0 ⁰ 56.5	88 ⁰ 00.0 0 ⁰ 40.0	+28.3 16.7 -15.661.1
O	Tu 22	305 ⁰ 06.4 -3 ⁰ 26.7	319 ⁰ 34.9 -3 ⁰ 42.9	334 ⁰ 03.4 -3 ⁰ 59.2	348 ⁰ 31.8 -4 ⁰ 15.4	3 ⁰ 00.3 -4 ⁰ 31.6	17 ⁰ 28.7 -4 ⁰ 47.7	31 ⁰ 57.2 -5 ⁰ 03.8	46 ⁰ 25.6 -5 ⁰ 19.9	60 ⁰ 54.1 -5 ⁰ 35.9	75 ⁰ 22.1 -5 ⁰ 51.8	89 ⁰ 50.9 -6 ⁰ 07.8	+28.5 16.6 -16.160.8
	We 23	306 ⁰ 55.7 -10 ⁰ 00.0	321 ⁰ 23.9 -10 ⁰ 14.9	335 ⁰ 52.1 -10 ⁰ 29.8	350 ⁰ 20.2 -10 ⁰ 44.6	4 ⁰ 48.3 -10 ⁰ 59.3	19 ⁰ 16.4 -11 ⁰ 14.0	33 ⁰ 44.5 -11 ⁰ 28.6	48 ⁰ 12.6 -11 ⁰ 43.0	62 ⁰ 40.6 -11 ⁰ 57.5	77 ⁰ 08.6 -12 ⁰ 11.8	91 ⁰ 36.5 -12 ⁰ 26.0	+28.1 16.4 -14.660.3
	Th 24	308 ⁰ 32.6 -15 ⁰ 48.2	323 ⁰ 00.0 -16 ⁰ 00.9	337 ⁰ 27.5 -16 ⁰ 13.4	351 ⁰ 54.9 -16 ⁰ 25.9	6 ⁰ 22.3 -16 ⁰ 50.4	20 ⁰ 49.7 -17 ⁰ 02.5	35 ⁰ 17.0 -17 ⁰ 14.5	49 ⁰ 44.3 -17 ⁰ 26.4	64 ⁰ 11.5 -17 ⁰ 38.2	78 ⁰ 38.7 -17 ⁰ 49.8	93 ⁰ 05.9 -17 ⁰ 59.8	+27.3 16.2 -12.259.5
O	Fr 25	309 ⁰ 49.8 20 ⁰ 29.4	324 ⁰ 16.4 20 ⁰ 39.0	338 ⁰ 43.1 20 ⁰ 48.4	353 ⁰ 09.7 20 ⁰ 57.8	7 ⁰ 36.3 -21 ⁰ 07.7	22 ⁰ 02.8 -21 ⁰ 16.0	36 ⁰ 29.4 -21 ⁰ 24.9	50 ⁰ 55.9 -21 ⁰ 33.7	65 ⁰ 22.3 -21 ⁰ 42.3	79 ⁰ 48.8 -21 ⁰ 50.8	94 ⁰ 15.2 -21 ⁰ 50.8	+26.5 16.0 -9.058.6
	Sa 26	310 ⁰ 49.0 -23 ⁰ 47.2	325 ⁰ 15.1 -23 ⁰ 53.2	339 ⁰ 41.2 -23 ⁰ 59.0	354 ⁰ 07.3 -24 ⁰ 04.8	8 ⁰ 33.4 -24 ⁰ 10.3	22 ⁰ 59.5 -24 ⁰ 15.8	37 ⁰ 25.6 -24 ⁰ 21.0	51 ⁰ 51.7 -24 ⁰ 26.1	66 ⁰ 17.7 -24 ⁰ 31.1	80 ⁰ 43.8 -24 ⁰ 35.9	95 ⁰ 09.9 -24 ⁰ 40.6	+26.1 15.7 -5.357.7
	Su 27	311 ⁰ 41.4 -25 ⁰ 32.3	326 ⁰ 07.6 -25 ⁰ 34.5	340 ⁰ 33.8 -25 ⁰ 36.6	355 ⁰ 00.1 -25 ⁰ 38.5	9 ⁰ 26.3 -25 ⁰ 40.3	23 ⁰ 52.6 -25 ⁰ 41.9	38 ⁰ 18.9 -25 ⁰ 43.4	52 ⁰ 45.2 -25 ⁰ 44.7	67 ⁰ 11.6 -25 ⁰ 45.9	81 ⁰ 38.0 -25 ⁰ 46.9	96 ⁰ 04.4 -25 ⁰ 47.8	+26.3 15.5 -1.656.9
O	Mo 28	312 ⁰ 45.0 -25 ⁰ 43.4	327 ⁰ 12.0 -25 ⁰ 43.4	341 ⁰ 39.1 -25 ⁰ 43.4	356 ⁰ 06.3 -25 ⁰ 38.6	10 ⁰ 33.5 -25 ⁰ 36.8	25 ⁰ 00.7 -25 ^{0</}						

SUN

September 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Fr 1	270°01.3 8°04.1	285°01.5 8°03.2	300°01.7 8°02.3	315°01.9 8°01.4	330°02.1 8°00.5	345°02.3 7°59.6	0°02.5 7°58.7	15°02.7 7°57.8	30°02.9 7°56.9	45°03.1 7°55.0	60°03.3 7°53.1	75°03.5 7°51.1	+0.2 -0.9
Sa 2	270°06.1 7°42.3	285°06.4 7°41.4	300°06.5 7°40.4	315°06.7 7°39.5	330°06.9 7°38.6	345°07.1 7°37.7	0°07.4 7°36.8	15°07.6 7°35.9	30°07.8 7°34.9	45°08.0 7°34.0	60°08.2 7°33.1	75°08.4 7°32.2	+0.2 -0.9
Su 3	270°11.0 7°20.3	285°11.3 7°19.3	300°11.5 7°18.4	315°11.7 7°17.5	330°11.9 7°16.6	345°12.1 7°15.7	0°12.3 7°14.7	15°12.5 7°13.8	30°12.7 7°12.9	45°12.9 7°12.0	60°13.1 7°11.1	75°13.3 7°10.1	+0.2 -0.9
Mo 4	270°16.0 6°58.1	285°16.2 6°57.2	300°16.4 6°56.3	315°16.6 6°55.4	330°16.9 6°54.4	345°17.1 6°53.5	0°17.3 6°52.6	15°17.5 6°51.7	30°17.7 6°50.7	45°17.9 6°49.8	60°18.1 6°48.9	75°18.3 6°48.0	+0.2 -0.9
Tu 5	270°21.1 6°35.9	285°21.3 6°35.0	300°21.5 6°34.1	315°21.7 6°33.1	330°21.9 6°32.2	345°22.1 6°31.3	0°22.3 6°30.3	15°22.5 6°29.4	30°22.8 6°28.5	45°23.0 6°27.5	60°23.2 6°26.6	75°23.4 6°25.7	+0.2 -0.9
We 6	270°26.2 6°13.6	285°26.4 6°12.6	300°26.6 6°11.7	315°26.8 6°10.8	330°27.0 6°09.8	345°27.2 6°08.9	0°27.4 6°08.0	15°27.6 6°07.0	30°27.9 6°06.1	45°28.1 6°05.2	60°28.3 6°04.2	75°28.5 6°03.3	+0.2 -0.9
Th 7	270°31.3 5°51.1	285°31.5 5°50.2	300°31.7 5°49.2	315°31.9 5°48.3	330°32.2 5°47.4	345°32.4 5°46.4	0°32.6 5°45.5	15°32.8 5°44.6	30°33.0 5°43.6	45°33.2 5°42.7	60°33.4 5°41.7	75°33.7 5°40.8	+0.2 -0.9
Fr 8	270°36.5 5°28.6	285°36.7 5°27.6	300°36.9 5°26.7	315°37.1 5°25.7	330°37.3 5°24.8	345°37.6 5°23.9	0°37.8 5°22.9	15°38.0 5°22.0	30°38.2 5°21.0	45°38.4 5°20.1	60°38.6 5°19.1	75°38.9 5°18.2	+0.2 -0.9
Sa 9	270°41.7 5°05.9	285°41.9 5°05.0	300°42.1 5°04.0	315°42.3 5°03.1	330°42.6 5°02.1	345°42.8 5°01.2	0°43.0 5°00.3	15°43.2 4°59.3	30°43.4 4°58.4	45°43.7 4°57.4	60°43.9 4°56.5	75°44.1 4°55.5	+0.2 -0.9
Su 10	270°46.9 4°43.2	285°47.2 4°42.3	300°47.4 4°41.3	315°47.6 4°40.4	330°47.8 4°39.4	345°48.0 4°38.5	0°48.3 4°37.5	15°48.5 4°36.6	30°48.7 4°35.6	45°48.9 4°34.7	60°49.1 4°33.7	75°49.4 4°32.8	+0.2 -0.9
Mo 11	270°52.2 4°20.4	285°52.4 4°19.4	300°52.7 4°18.5	315°52.9 4°17.5	330°53.1 4°16.6	345°53.3 4°15.6	0°53.6 4°14.7	15°53.8 4°13.7	30°54.0 4°12.8	45°54.2 4°11.8	60°54.4 4°10.9	75°54.7 4°09.9	+0.2 -1.0
Tu 12	270°57.5 3°57.5	285°57.8 3°56.5	300°58.0 3°55.6	315°58.2 3°54.6	330°58.4 3°53.7	345°58.6 3°52.7	0°58.9 3°51.8	15°59.1 3°50.8	30°59.3 3°49.9	45°59.5 3°48.9	60°59.7 3°47.9	75°60.0 3°47.0	+0.2 -1.0
We 13	271°02.8 3°34.5	286°03.1 3°33.6	301°03.3 3°32.6	316°03.5 3°31.7	331°03.7 3°30.7	346°04.0 3°29.7	1°04.2 3°28.8	16°04.4 3°27.8	31°04.6 3°26.9	46°04.8 3°25.9	61°05.1 3°24.9	76°05.3 3°24.0	+0.2 -1.0
Th 14	271°08.2 3°11.5	286°08.4 3°10.5	301°08.6 3°09.6	316°08.8 3°08.6	331°09.1 3°07.7	346°09.3 3°06.7	1°09.5 3°05.7	16°09.7 3°04.8	31°10.0 3°03.8	46°10.0 3°02.9	61°10.4 3°01.9	76°10.6 3°00.9	+0.2 -1.0
Fr 15	271°13.5 2°48.4	286°13.7 2°47.5	301°14.0 2°46.5	316°14.2 2°45.5	331°14.4 2°44.6	346°14.6 2°43.6	1°14.9 2°42.6	16°15.1 2°41.7	31°15.3 2°40.7	46°15.5 2°39.7	61°15.7 2°38.8	76°16.0 2°37.8	+0.2 -1.0
Sa 16	271°18.9 2°25.3	286°19.1 2°24.3	301°19.3 2°23.3	316°19.5 2°22.4	331°19.8 2°21.4	346°20.0 2°20.4	1°20.2 2°19.5	16°20.4 2°18.5	31°20.6 2°17.5	46°20.6 2°16.6	61°21.1 2°15.6	76°21.3 2°14.6	+0.2 -1.0
Su 17	271°24.2 2°02.1	286°24.4 2°01.1	301°24.6 2°00.1	316°24.9 1°59.2	331°25.1 1°58.2	346°25.3 1°57.2	1°25.5 1°56.3	16°25.8 1°55.3	31°26.0 1°54.3	46°26.2 1°53.4	61°26.4 1°52.4	76°26.6 1°51.4	+0.2 -1.0
Mo 18	271°29.5 1°38.8	286°29.8 1°37.9	301°30.0 1°36.9	316°30.2 1°35.9	331°30.4 1°35.0	346°30.6 1°34.0	1°30.9 1°33.0	16°31.1 1°32.1	31°31.3 1°31.1	46°31.5 1°30.1	61°31.8 1°29.1	76°32.0 1°28.2	+0.2 -1.0
Tu 19	271°34.9 1°15.6	286°35.1 1°14.6	301°35.3 1°13.6	316°35.5 1°12.7	331°35.7 1°11.7	346°36.0 1°10.7	1°36.2 1°09.7	16°36.4 1°08.8	31°36.6 1°07.8	46°36.9 1°06.8	61°37.1 1°05.9	76°37.3 1°04.9	+0.2 -1.0
We 20	271°40.2 0°52.3	286°40.4 0°51.3	301°40.6 0°50.3	316°40.8 0°49.4	331°41.1 0°48.4	346°41.3 0°47.4	1°41.5 0°46.4	16°41.7 0°45.5	31°41.9 0°44.5	46°42.2 0°43.5	61°42.4 0°42.5	76°42.6 0°41.6	+0.2 -1.0
Th 21	271°45.5 0°28.9	286°45.7 0°28.0	301°45.9 0°27.0	316°46.1 0°26.0	331°46.4 0°25.0	346°46.6 0°24.1	1°46.8 0°23.1	16°47.0 0°22.1	31°47.2 0°21.2	46°47.5 0°20.2	61°47.7 0°19.2	76°47.9 0°18.2	+0.2 -1.0
Fr 22	271°50.7 0°05.6	286°51.0 0°04.6	301°51.2 0°03.6	316°51.4 0°02.7	331°51.6 0°01.7	346°51.8 0°00.7	1°52.1 -0°00.2	16°52.3 -0°01.2	31°52.5 -0°02.2	46°52.7 -0°03.2	61°52.9 -0°04.1	76°53.2 -0°05.1	+0.2 -1.0
Sa 23	271°56.0 -0°17.8	286°56.2 -0°18.7	301°56.4 -0°17.8	316°56.6 -0°20.7	331°56.9 -0°21.7	346°57.1 -0°22.6	1°57.3 -0°23.6	16°57.5 -0°24.6	31°57.7 -0°25.7	46°58.0 -0°26.5	61°58.2 -0°27.5	76°58.4 -0°28.5	+0.2 -1.0
Su 24	272°01.2 -0°41.1	287°01.4 -0°42.1	302°01.6 -0°43.1	317°01.9 -0°44.1	332°02.1 -0°45.0	347°02.3 -0°46.0	2°02.5 -0°47.0	17°02.7 -0°47.9	32°02.9 -0°48.9	47°03.2 -0°49.9	62°03.4 -0°50.9	77°03.6 -0°51.8	+0.2 -1.0
Mo 25	272°06.4 -1°04.5	287°06.6 -1°05.5	302°06.8 -1°06.4	317°07.0 -1°07.4	332°07.3 -1°08.4	347°07.5 -1°09.4	2°07.7 -1°10.3	17°07.9 -1°11.3	32°08.1 -1°12.3	47°08.3 -1°13.3	62°08.5 -1°14.2	77°08.8 -1°15.2	+0.2 -1.0
Tu 26	272°11.5 -1°27.9	287°11.8 -1°28.8	302°12.0 -1°29.8	317°12.2 -1°30.8	332°12.4 -1°31.8	347°12.6 -1°32.7	2°12.8 -1°33.7	17°13.0 -1°34.7	32°13.2 -1°35.6	47°13.5 -1°36.6	62°13.7 -1°37.6	77°13.9 -1°38.6	+0.2 -1.0
We 27	272°16.6 -1°51.2	287°16.9 -1°52.2	302°17.1 -1°53.2	317°17.3 -1°54.1	332°17.5 -1°55.1	347°17.7 -1°56.1	2°17.9 -1°57.0	17°18.1 -1°58.0	32°18.3 -1°59.0	47°18.5 -2°00.0	62°18.8 -2°00.9	77°19.0 -2°01.9	+0.2 -1.0
Th 28	272°21.7 -2°14.5	287°21.9 -2°15.5	302°22.1 -2°16.5	317°22.3 -2°17.5	332°22.5 -2°18.4	347°22.7 -2°19.4	2°22.9 -2°20.4	17°23.2 -2°21.4	32°23.4 -2°22.3	47°23.6 -2°23.4	62°23.8 -2°24.3	77°24.0 -2°25.2	+0.2 -1.0
Fr 29	272°26.7 -2°37.9	287°26.9 -2°38.8	302°27.1 -2°39.8	317°27.3 -2°40.8	332°27.5 -2°41.7	347°27.7 -2°42.7	2°27.9 -2°43.7	17°28.1 -2°44.7	32°28.3 -2°45.6	47°28.5 -2°47.6	62°28.7 -2°48.6	77°29.0 -2°49.5	+0.2 -1.0
Sa 30	272°31.6 -3°01.1	287°31.8 -3°02.1	302°32.0 -3°03.1	317°32.2 -3°04.1	332°32.4 -3°05.0	347°32.6 -3°06.0	2°32.8 -3°07.0	17°33.0 -3°07.9	32°33.2 -3°08.9	47°33.4 -3°09.9	62°33.7 -3°10.8	77°33.9 -3°11.8	+0.2 -1.0

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 15.9'

MOON

September 2028

	D	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Δ' /h SH
O	Fr 1	236 ⁰⁰ 07.7 -15 ⁰³ 6.6	250 ³⁴ 2.2 -14 ⁰⁷ 8.2	265 ⁰⁷ 17.7 -14 ⁰¹ 4.7	279 ⁴¹ 4.4 -14 ⁰³ 0.7	294 ¹⁵ 0.0 -14 ⁰¹ 9.7	308 ⁴⁸ 8.8 -14 ⁰⁸ 5.5	323 ²² 5.5 -13 ⁵⁷ 4.4	337 ⁵⁶ 4.4 -13 ⁴⁶ 1.1	352 ³⁰ 3.3 -13 ³⁴ 9.9	7 ⁰⁴ 2.2 -13 ²⁶ 3.3	21 ³⁸ 2.2 -13 ¹² 2.2	-33.8 14.8 -11.1 15.3
	Sa 2	240 ¹⁴ 3.3 -10 ¹⁶ 3.3	254 ⁴⁹ 1.1 -10 ⁰⁴ 2.2	269 ²³ 2.2 -9 ⁵² 2.2	283 ⁵⁸ 7.7 -9 ⁴⁰ 0.0	298 ³³ 6.6 -9 ²⁷ 9.9	313 ⁰⁸ 5.5 -9 ¹⁵ 7.7	327 ⁴³ 5.5 -9 ⁰³ 5.5	342 ¹⁸ 5.5 -8 ⁵¹ 3.3	356 ⁵³ 6.6 -8 ³⁹ 9.9	11 ²⁸ 6.6 -8 ²⁶ 7.7	26 ⁰³ 8.8 -8 ¹⁰ 4.4	-34.9 14.7 -12.2 54.1
	Su 3	244 ⁵⁴ 1.1 -5 ⁰⁶ 5.5	259 ²⁹ 6.6 -4 ⁵³ 8.8	274 ⁰⁵ 2.2 -4 ⁴¹ 1.1	288 ⁴⁰ 8.8 -4 ²⁸ 4.4	303 ¹⁶ 4.4 -4 ¹⁵ 7.7	317 ⁵² 1.1 -4 ⁰² 9.9	332 ²⁷ 7.7 -3 ⁵⁰ 2.2	347 ⁰³ 4.4 -3 ³⁷ 4.4	3 ¹⁹ 1.1 -3 ²⁴ 6.6	16 ¹⁴ 8.8 -3 ¹¹ 8.8	30 ⁵⁰ 5.5 -2 ⁵⁹ 0.0	-35.6 14.7 -12.7 53.9
O	Mo 4	249 ⁴⁷ 3.3 0 ¹³ 7.7	264 ²³ 2.2 0 ²⁶ 5.5	278 ⁵⁹ 0.0 0 ³⁹ 4.4	293 ³⁴ 8.8 0 ⁵² 2.2	308 ¹⁰ 6.6 1 ⁰⁵ 1.1	322 ⁴⁶ 4.4 1 ¹⁷ 9.9	337 ²² 2.2 1 ³⁰ 8.8	351 ⁵⁸ 0.0 1 ⁴³ 6.6	6 ³³ 8.8 1 ⁵⁶ 4.4	21 ⁰⁹ 6.6 2 ⁰⁹ 3.3	35 ⁴⁵ 4.4 2 ²² 1.1	-35.8 14.7 -12.8 53.9
	Tu 5	254 ⁴⁰ 7.7 5 ³² 8.8	269 ¹⁶ 2.2 5 ⁴⁵ 4.4	283 ⁵¹ 8.8 5 ⁵⁷ 9.9	298 ²⁷ 3.3 6 ¹⁰ 5.5	313 ⁰² 7.7 6 ²³ 0.0	327 ³⁸ 2.2 6 ³⁵ 5.5	342 ¹³ 6.6 6 ⁴⁸ 0.0	356 ⁴⁹ 0.0 7 ⁰⁰ 4.4	11 ²⁴ 4.4 7 ¹² 9.9	25 ⁵⁹ 7.7 7 ²⁵ 3.3	40 ³⁵ 0.0 7 ³⁷ 6.6	-35.4 14.7 -12.5 54.0
	We 6	259 ²⁰ 7.7 10 ³⁹ 6.6	273 ⁵⁵ 4.4 10 ⁵¹ 5.5	288 ³⁰ 1.1 11 ⁰³ 3.3	303 ⁰⁴ 8.8 11 ¹⁵ 1.1	317 ³⁹ 4.4 11 ²⁶ 8.8	332 ¹³ 9.9 11 ³⁸ 5.5	346 ⁴⁸ 4.4 11 ⁵⁰ 2.2	3 ²² 9.9 12 ⁰¹ 8.8	15 ⁵⁷ 3.3 12 ¹³ 4.4	30 ³¹ 7.7 12 ²⁴ 9.9	45 ⁰⁶ 0.0 12 ³⁶ 3.3	-34.5 14.8 -11.7 54.1
O	Th 7	263 ³⁴ 4.4 15 ²² 5.5	278 ⁰⁷ 8.8 15 ³³ 1.1	292 ⁴¹ 2.2 15 ⁴³ 7.7	307 ¹⁴ 5.5 15 ⁵⁴ 2.2	321 ⁴⁷ 7.7 16 ⁰⁴ 7.7	336 ²⁰ 9.9 16 ¹⁵ 1.1	350 ⁵⁴ 0.0 16 ²⁵ 4.4	5 ²⁷ 0.0 16 ³⁵ 7.7	20 ⁰⁰ 4.4 16 ⁴⁵ 9.9	34 ³² 9.9 16 ⁵⁶ 0.0	49 ⁰⁵ 8.8 17 ⁰⁶ 1.1	-33.1 14.8 -10.4 54.4
	Fr 8	267 ¹⁰ 2.2 19 ²⁸ 6.6	281 ⁴¹ 9.9 19 ³⁷ 5.5	296 ¹³ 5.5 19 ⁴⁶ 3.3	310 ⁴⁵ 1.1 19 ⁵⁵ 0.0	325 ¹⁶ 6.6 20 ⁰³ 6.6	339 ⁴⁸ 0.0 20 ¹² 2.2	354 ¹⁹ 3.3 20 ²⁰ 6.6	8 ⁵⁰ 6.6 20 ²⁹ 9.9	23 ²¹ 7.7 20 ³⁷ 3.3	37 ⁵² 8.8 20 ⁴⁵ 5.5	52 ²³ 9.9 20 ⁵³ 6.6	-31.4 15.0 -8.5 54.8
	Sa 9	269 ⁵⁹ 8.8 22 ⁴³ 8.8	284 ²⁹ 6.6 22 ⁵⁰ 4.4	298 ⁵⁷ 2.2 22 ⁵⁶ 8.8	313 ²⁸ 9.9 23 ⁰³ 1.1	327 ⁵⁸ 4.4 23 ⁰⁹ 4.4	342 ²⁷ 8.8 23 ¹⁵ 5.5	356 ⁵⁷ 2.2 23 ²¹ 5.5	11 ²⁶ 5.5 23 ²⁷ 4.4	25 ⁵⁵ 7.7 23 ³³ 8.8	54 ⁵³ 9.9 23 ³⁸ 4.4	67 ⁵³ 6.6 23 ⁴⁴ 4.4	-29.4 15.1 -6.1 55.4
O	Su 10	272 ⁰⁰ 8.8 24 ⁵³ 3.3	286 ²⁸ 7.7 24 ⁵⁶ 9.9	300 ⁵⁶ 5.5 25 ⁰⁰ 3.3	315 ²⁴ 2.2 25 ⁰³ 7.7	329 ⁵¹ 9.9 25 ⁰⁶ 9.9	344 ¹⁹ 5.5 25 ⁰⁹ 9.9	358 ⁴⁷ 0.0 25 ¹² 9.9	13 ¹⁴ 5.5 25 ¹⁵ 7.7	27 ⁴¹ 9.9 25 ¹⁸ 3.3	42 ⁰⁹ 3.3 25 ²⁰ 9.9	56 ³⁶ 6.6 25 ²³ 3.3	-26.6 15.3 -3.0 56.1
	Mo 11	286 ²⁸ 7.7 24 ⁵⁶ 9.9	300 ⁵⁶ 5.5 25 ⁰⁰ 3.3	315 ²⁴ 2.2 25 ⁰³ 7.7	329 ⁵¹ 9.9 25 ⁰⁶ 9.9	344 ¹⁹ 5.5 25 ⁰⁹ 9.9	358 ⁴⁷ 0.0 25 ¹² 9.9	13 ¹⁴ 5.5 25 ¹⁵ 7.7	27 ⁴¹ 9.9 25 ¹⁸ 3.3	42 ⁰⁹ 3.3 25 ²⁰ 9.9	56 ³⁶ 6.6 25 ²³ 3.3	71 ⁰³ 8.8 25 ²⁵ 5.5	-27.5 15.3 -2.9 56.1
	Tu 12	287 ⁴⁵ 4.4 25 ⁴² 5.5	302 ¹¹ 8.8 25 ⁴² 5.5	316 ³⁸ 3.3 25 ⁴² 5.5	331 ⁰⁴ 4.4 25 ⁴² 0.0	345 ³⁰ 6.6 25 ⁴⁰ 9.9	359 ⁵⁶ 9.9 25 ⁴⁰ 9.9	14 ²³ 0.0 25 ⁴⁰ 9.9	28 ⁴⁹ 2.2 25 ³⁹ 2.2	43 ¹⁵ 3.3 25 ³⁸ 1.1	57 ⁴¹ 3.3 25 ³⁶ 8.8	72 ⁰⁷ 4.4 25 ³⁵ 5.5	-26.2 15.5 -0.7 57.0
O	We 13	288 ³⁴ 6.6 24 ⁵⁶ 3.3	303 ⁰⁰ 3.3 24 ⁵² 4.4	317 ²⁶ 0.0 24 ⁴⁸ 4.4	331 ⁵¹ 6.6 24 ⁴⁴ 3.3	346 ¹⁷ 3.3 24 ³⁹ 9.9	359 ⁵⁶ 9.9 24 ³⁵ 5.5	15 ⁰⁸ 5.5 24 ³⁰ 8.8	29 ³⁴ 1.1 24 ²⁶ 1.1	43 ⁵⁹ 8.8 24 ²¹ 6.6	58 ²⁵ 4.4 24 ¹⁶ 0.0	72 ⁵¹ 0.0 24 ¹⁰ 8.8	-25.6 15.8 -4.6 57.9
	Th 14	289 ¹⁶ 0.0 22 ³³ 6.6	303 ⁴¹ 4.4 22 ³⁵ 9.9	318 ⁰⁷ 7.7 22 ¹⁸ 1.1	332 ³³ 3.3 22 ¹⁰ 1.1	346 ⁵⁹ 1.1 22 ⁰¹ 9.9	359 ⁵⁶ 9.9 21 ⁵³ 7.7	15 ⁵⁰ 8.8 21 ⁴⁵ 2.2	30 ¹⁶ 7.7 21 ³⁶ 7.7	44 ⁴² 6.6 21 ²⁷ 9.9	59 ⁰⁸ 5.5 21 ¹⁹ 1.1	73 ³⁴ 4.4 21 ¹⁰ 1.1	-25.8 16.1 -8.4 58.9
	Fr 15	290 ⁰⁶ 9.9 18 ³⁸ 4.4	304 ³³ 4.4 18 ²⁷ 2.2	318 ⁵⁹ 8.8 18 ¹⁵ 9.9	333 ²⁶ 3.3 18 ⁰⁴ 4.4	347 ⁵² 8.8 17 ⁵² 9.9	359 ⁵⁶ 9.9 17 ⁴¹ 2.2	2 ¹⁹ 3.3 17 ²⁹ 4.4	31 ¹² 5.5 17 ¹⁷ 4.4	45 ³⁹ 2.2 17 ⁰⁵ 4.4	60 ⁰⁵ 8.8 16 ⁵³ 2.2	74 ³² 6.6 16 ⁴⁰ 9.9	-26.6 16.3 -11.7 59.9
O	Sa 16	291 ¹⁷ 2.2 13 ²³ 4.4	305 ⁴⁴ 5.5 13 ⁰⁹ 4.4	320 ¹¹ 7.7 12 ⁵⁵ 3.3	334 ³⁹ 1.1 12 ⁴¹ 1.1	349 ⁰⁶ 9.9 12 ²⁶ 8.8	3 ³³ 7.7 12 ¹² 5.5	18 ⁰¹ 1.1 11 ⁵⁸ 0.0	32 ²⁸ 6.6 11 ⁴³ 5.5	46 ⁵⁶ 0.0 11 ²⁸ 9.9	61 ²³ 5.5 11 ¹⁴ 2.2	75 ⁵¹ 0.0 10 ⁵⁹ 4.4	-27.4 16.5 -14.4 60.6
	Su 17	292 ⁴⁶ 5.5 7 ⁰⁹ 2.2	307 ¹⁴ 4.4 6 ⁵³ 3.3	321 ⁴² 3.3 6 ³⁷ 4.4	336 ¹⁰ 2.2 6 ²¹ 5.5	350 ³⁸ 1.1 6 ⁰⁵ 5.5	5 ⁰⁶ 0.0 5 ⁴⁹ 5.5	19 ³³ 9.9 5 ³³ 4.4	34 ⁰¹ 5.5 5 ¹⁷ 3.3	48 ²⁹ 9.9 5 ⁰¹ 1.1	62 ⁵⁷ 9.9 4 ⁴⁹ 4.4	77 ²⁵ 9.9 4 ²⁸ 7.7	-27.9 16.7 -16.1 61.1
	Mo 18	294 ²⁶ 4.4 0 ²² 3.3	308 ⁵⁴ 4.4 0 ⁰⁵ 7.7	323 ²² 4.4 0 ¹⁰ 8.8	337 ⁵⁰ 5.5 -0 ²⁷ 4.4	352 ¹⁸ 9.9 -0 ⁴³ 9.9	6 ⁴⁶ 5.5 -1 ⁰⁰ 4.4	21 ¹⁴ 5.5 -1 ¹⁷ 0.0	35 ⁴² 5.5 -1 ³³ 5.5	50 ¹⁰ 5.5 -1 ⁵⁰ 0.0	64 ³⁸ 5.5 -2 ⁰⁶ 5.5	79 ⁰⁶ 5.5 -2 ²³ 0.0	-28.0 16.7 -16.5 61.3
O	Tu 19	296 ⁰⁴ 1.1 -6 ²⁷ 4.4	310 ³¹ 7.7 -6 ⁴³ 4.4	324 ⁵⁹ 4.4 -6 ⁵⁹ 3.3	339 ²⁷ 0.0 -7 ¹⁵ 2.2	353 ⁵⁴ 6.6 -7 ³¹ 1.1	8 ²² 2.2 -7 ⁴⁶ 9.9	22 ⁴⁹ 7.7 -8 ⁰² 6.6	37 ¹⁷ 2.2 -8 ¹⁸ 3.3	51 ⁴⁴ 7.7 -8 ³³ 9.9	66 ¹² 2.2 -8 ⁴⁹ 5.5	80 ³⁹ 6.6 -9 ⁰⁵ 0.0	-27.6 16.7 -15.8 61.2
	We 20	297 ²⁶ 9.9 -12 ⁴⁸ 8.8	311 ⁵³ 7.7 -13 ⁰³ 0.0	326 ²⁰ 6.6 -13 ¹⁷ 2.2	340 ⁴⁷ 3.3 -13 ³¹ 3.3	355 ¹⁴ 1.1 -13 ⁴⁵ 2.2	9 ⁴⁰ 8.8 -13 ⁵⁹ 1.1	24 ⁰⁷ 5.5 -14 ¹² 9.9	38 ³⁴ 1.1 -14 ²⁶ 5.5	53 ⁰⁰ 7.7 -14 ⁴⁰ 1.1	67 ²⁷ 2.2 -14 ⁵³ 5.5	81 ⁵³ 7.7 -15 ⁰⁶ 9.9	-26.7 16.6 -13.8 60.7
	Th 21	298 ²⁶ 5.5 -18 ¹³ 3.3	312 ⁵² 4.4 -18 ²⁴ 8.8	327 ¹⁸ 2.2 -18 ³⁶ 1.1	341 ⁴⁴ 0.0 -18 ⁴⁷ 3.3	356 ⁰⁹ 8.8 -18 ⁵⁸ 3.3	10 ³⁵ 5.5 -19 ⁰⁹ 2.2	25 ⁰¹ 2.2 -19 ²⁰ 0.0	39 ²⁶ 9.9 -19 ³⁰ 6.6	53 ⁵² 5.5 -19 ⁴¹ 1.1	68 ¹⁸ 1.1 -19 ⁵¹ 5.5	82 ⁴³ 6.6 -20 ⁰¹ 7.7	-25.7 16.3 -10.8 59.9
O	Fr 22	299 ⁰³ 5.5 -22 ¹⁷ 7.7	313 ²⁸ 6.6 -22 ²⁵ 6.6	327 ⁵³ 7.7 -22 ³³ 3.3	342 ¹⁸ 8.8 -22 ⁴⁰ 8.8	356 ⁴³ 9.9 -22 ⁴⁸ 4.4	11 ⁰⁹ 0.0 -22 ⁵⁵ 5.5	25 ³⁴ 0.0 -23 ⁰² 6.6	39 ⁵⁹ 0.0 -23 ⁰⁹ 5.5	54 ²⁴ 1.1 -23 ¹⁶ 3.3	68 ⁴⁹ 1.1 -23 ²² 9.9	83 ¹⁴ 1.1 -23 ²⁹ 4.4	-25.1 16.1 -7.2 59.0
	Sa 23	299 ²⁹ 0.0 -24 ⁴⁷ 1.1	313 ⁵⁴ 1.1 -24 ⁵¹ 0.0	328 ¹⁹ 2.2 -24 ⁵⁴ 7.7	342 ⁴⁴ 2.2 -24 ⁵⁸ 3.3	357 ⁰⁹ 4.4 -25 ⁰¹ 7.7	11 ³⁴ 5.5 -25 ⁰⁵ 0.0	25 ⁵⁹ 6.6 -25 ⁰⁸ 1.1	40 ²⁴ 8.8 -25 ¹¹ 0.0	54 ⁵⁰ 0.0 -25 ¹³ 8.8	69 ¹⁵ 2.2 -25 ¹⁶ 4.4	83 ⁴⁰ 4.4 -25 ¹⁸ 8.8	-25.1 15.8 -3.2 58.0
	Su 24	300 ⁰³ 2.2 -25 ³⁶ 7.7	314 ²⁹ 1.1 -25 ³⁶ 7.7	328 ⁵⁵ 8.8 -25 ³⁶ 5.5	343 ²⁰ 9.9 -25 ³⁶ 2.2	357 ⁴⁷ 0.0 -25 ³⁵ 7.7	12 ¹³ 0.0 -25 ³⁴ 2.2	26 ³⁹ 2.2 -25 ³³ 3.3	41 ⁰⁵ 3.3 -25 ³² 2.2	55 ³¹ 6.6 -25 ³² 2.2	69 ⁵⁷ 9.9 -25 ³¹ 0.0	84 ²⁴ 2.2 -25 ²⁹ 6.6	-26.1 15.6 -0.7 57.0
O	Mo 25	301 ⁰⁷ 6.6 -24 ⁵¹ 9.9	315 ³⁵ 1.1 -24 ⁴⁸ 3.3	330 ⁰² 6.6 -24 ⁴⁴ 5.5	344 ³⁰ 2.2 -24 ⁴⁰ 7.7	358 ⁵⁷ 9.9 -24 ³⁶ 7.7	13 ²⁵ 7.7 -24 ³² 5.5	27 ⁵³ 5.5 -24 ²⁸ 3.3	42 ²¹ 5.5 -24 ²³ 9.9	56 ⁴⁹ 5.5 -24 ¹⁹ 4.4	71 ¹⁷ 6.6 -24 ¹⁴ 8.8	85 ⁴⁵ 4.4 -24 ¹⁰ 0.0	-27.8 15.3 -4.2 56.2
	Tu 26	302 ⁵⁸ 1.1 -22 ⁴⁴ 7.7	317 ²⁷ 6.6 -22 ³⁸ 2.2	331 ⁵⁷ 2.2 -22 ³⁴ 5.5	346 ²⁶ 9.9 -22 ²⁴ 4.4	356 ⁶⁶ 6.6 -22 ¹⁷ 0.0	15 ²⁶ 4.4 -22 ¹⁰ 8.8	29 ⁵⁶ 4.4 -22 ⁰³ 7.7	44 ²⁶ 4.4 -21 ⁵⁵ 9.9	58 ⁵⁶ 4.4 -21 ⁴⁹ 2.2	73 ²⁶ 6.6 -21 ⁴¹ 8.8	87 ⁵⁶ 9.9 -21 ³⁴ 3.3	-29.9 15.1 -7.0 55.4
	We 27	305 ⁴⁰ 6.6 -19 ³¹ 0.0	320 ¹² 2.2 -19 ²² 1.1	334 ⁴³ 8.8 -19 ¹³ 1.1	349 ¹⁵ 6.6 -19 ⁰⁴ 0.0	3 ⁴⁷ 4.4 -10 ⁵⁴ 8.8	18 ¹⁹ 2.2 -18 ⁴⁵ 6.6	32 ⁵¹ 2.2 -18 ³⁶ 3.3	47 ²³ 2.2 -18 ²⁷ 0.0	61 ⁵⁵ 3.3 -18 ¹⁷ 5.5	76 ²⁷ 2.2 -18 ⁰⁸ 0.0	90 ⁵⁹ 8.8 -17 ⁵⁸ 4.4	-31.9 15.0 -9.3 54.8
O	Th 28	309 ¹² 1.1 -15 ²⁶ 4.4	323 ⁴⁵ 4.4 -15 ¹⁵ 8.8	338 ¹⁸ 9.9 -15 ⁰⁵ 1.1	352 ⁵² 3.3 -14 ⁵⁴ 4.4								

SUN

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D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Su 1	257°36.3 -3°23.4	272°36.5 -3°24.4	287°36.7 -3°25.4	302°36.9 -3°26.3	317°37.1 -3°27.3	332°37.3 -3°28.3	347°37.5 -3°29.2	3°37.7 -3°30.2	17°37.9 -3°31.2	32°38.1 -3°32.1	47°38.3 -3°33.1	62°38.5 -3°34.1	+0.2 -1.0
Mo 2	257°41.1 -3°46.7	272°41.3 -3°47.6	287°41.5 -3°48.6	302°41.7 -3°49.6	317°41.9 -3°50.5	332°42.1 -3°51.5	347°42.3 -3°52.4	3°42.5 -3°53.4	17°42.7 -3°54.4	32°42.9 -3°55.3	47°43.1 -3°56.3	62°43.2 -3°57.3	+0.2 -1.0
Tu 3	257°45.8 -4°09.8	272°46.0 -4°10.8	287°46.2 -4°11.8	302°46.4 -4°12.7	317°46.6 -4°13.7	332°46.8 -4°14.6	347°47.0 -4°15.6	3°47.2 -4°16.6	17°47.3 -4°17.5	32°47.5 -4°18.5	47°47.7 -4°19.5	62°47.9 -4°20.4	+0.2 -1.0
We 4	257°50.4 -4°32.9	272°50.6 -4°33.9	287°50.8 -4°34.9	302°51.0 -4°35.8	317°51.2 -4°36.8	332°51.4 -4°37.8	347°51.6 -4°38.7	3°51.8 -4°39.7	17°51.9 -4°40.6	32°52.1 -4°41.6	47°52.3 -4°42.6	62°52.5 -4°43.5	+0.2 -1.0
Th 5	257°55.0 -4°56.0	272°55.2 -4°57.0	287°55.3 -4°57.9	302°55.5 -4°58.9	317°55.7 -4°59.9	332°55.9 -5°00.8	347°56.1 -5°01.8	3°56.3 -5°02.7	17°56.5 -5°03.7	32°56.6 -5°04.7	47°56.8 -5°05.6	62°57.0 -5°06.6	+0.2 -1.0
Fr 6	257°59.4 -5°19.0	272°59.6 -5°20.0	287°59.8 -5°20.9	303°00.0 -5°21.9	318°00.1 -5°22.9	333°00.3 -5°23.8	348°00.5 -5°24.8	3°00.7 -5°25.7	18°00.9 -5°26.7	33°01.1 -5°27.6	48°01.2 -5°28.6	63°01.4 -5°29.6	+0.2 -0.9
Sa 7	258°03.8 -5°42.0	273°03.9 -5°42.9	288°04.1 -5°43.9	303°04.3 -5°44.8	318°04.5 -5°45.8	333°04.7 -5°46.7	348°04.8 -5°47.7	3°05.0 -5°48.7	18°05.2 -5°49.6	33°05.4 -5°50.6	48°05.5 -5°51.5	63°05.7 -5°52.5	+0.2 -1.0
Su 8	258°08.0 -6°07.2	273°08.2 -6°08.2	288°08.3 -6°09.2	303°08.5 -6°10.2	318°08.7 -6°11.2	333°08.9 -6°12.2	348°09.0 -6°13.2	3°09.2 -6°14.2	18°09.4 -6°15.2	33°09.6 -6°16.2	48°09.7 -6°17.2	63°09.9 -6°18.2	+0.2 -0.9
Mo 9	258°12.1 -6°27.6	273°12.3 -6°28.6	288°12.5 -6°29.5	303°12.6 -6°30.5	318°12.8 -6°31.4	333°13.0 -6°32.4	348°13.1 -6°33.4	3°13.3 -6°34.3	18°13.5 -6°35.2	33°13.6 -6°36.2	48°13.8 -6°37.1	63°14.0 -6°38.1	+0.2 -0.9
Tu 10	258°16.1 -6°50.4	273°16.3 -6°51.3	288°16.5 -6°52.2	303°16.6 -6°53.2	318°16.8 -6°54.1	333°17.0 -6°55.1	348°17.1 -6°56.0	3°17.3 -6°57.0	18°17.4 -6°58.0	33°17.6 -6°58.8	48°17.8 -6°59.8	63°17.9 -7°00.7	+0.2 -0.9
We 11	258°20.0 -7°13.0	273°20.2 -7°13.9	288°20.3 -7°14.9	303°20.5 -7°15.8	318°20.7 -7°16.7	333°20.8 -7°17.7	348°21.0 -7°18.6	3°21.1 -7°19.6	18°21.3 -7°20.5	33°21.4 -7°21.4	48°21.6 -7°22.4	63°21.8 -7°23.3	+0.2 -0.9
Th 12	258°23.8 -7°35.5	273°23.9 -7°36.4	288°24.1 -7°37.4	303°24.2 -7°38.3	318°24.4 -7°39.2	333°24.5 -7°40.2	348°24.7 -7°41.1	3°24.8 -7°42.1	18°25.0 -7°43.0	33°25.1 -7°43.9	48°25.3 -7°44.9	63°25.5 -7°45.8	+0.2 -0.9
Fr 13	258°27.4 -7°57.9	273°27.5 -7°58.9	288°27.7 -7°59.8	303°27.8 -8°00.7	318°28.0 -8°01.7	333°28.1 -8°02.6	348°28.3 -8°03.5	3°28.4 -8°04.5	18°28.6 -8°05.4	33°28.7 -8°06.3	48°28.9 -8°07.2	63°29.0 -8°08.2	+0.1 -0.9
Sa 14	258°30.9 -8°20.2	273°31.0 -8°21.2	288°31.2 -8°22.1	303°31.3 -8°23.0	318°31.5 -8°23.9	333°31.6 -8°24.9	348°31.7 -8°25.8	3°31.9 -8°26.7	18°32.0 -8°27.7	33°32.2 -8°28.6	48°32.3 -8°29.5	63°32.4 -8°30.4	+0.1 -0.9
Su 15	258°34.2 -8°42.4	273°34.4 -8°43.4	288°34.5 -8°44.3	303°34.6 -8°45.2	318°34.8 -8°46.1	333°34.9 -8°47.0	348°35.0 -8°48.0	3°35.2 -8°48.9	18°35.3 -8°49.8	33°35.4 -8°50.7	48°35.6 -8°51.6	63°35.7 -8°52.6	+0.1 -0.9
Mo 16	258°37.4 -9°04.5	273°37.6 -9°05.4	288°37.7 -9°06.3	303°37.8 -9°07.3	318°37.9 -9°08.2	333°38.1 -9°09.1	348°38.2 -9°10.0	3°38.3 -9°10.9	18°38.5 -9°11.8	33°38.6 -9°12.8	48°38.7 -9°13.7	63°38.8 -9°14.6	+0.1 -0.9
Tu 17	258°40.5 -9°26.5	273°40.6 -9°27.4	288°40.7 -9°28.3	303°40.8 -9°29.2	318°41.0 -9°30.1	333°41.1 -9°31.0	348°41.2 -9°32.8	3°41.3 -9°33.7	18°41.5 -9°34.7	33°41.8 -9°35.6	48°41.7 -9°36.5	63°41.8 -9°37.5	+0.1 -0.9
We 18	258°43.4 -9°48.3	273°43.5 -9°49.2	288°43.6 -9°50.1	303°43.7 -9°51.0	318°43.8 -9°51.9	333°44.0 -9°52.8	348°44.1 -9°53.7	3°44.2 -9°54.6	18°44.3 -9°55.5	33°44.4 -9°56.4	48°44.5 -9°57.3	63°44.7 -9°58.2	+0.1 -0.9
Th 19	258°46.1 -10°09.9	273°46.2 -10°10.8	288°46.3 -10°11.7	303°46.4 -10°12.6	318°46.6 -10°13.5	333°46.7 -10°14.4	348°46.8 -10°15.3	3°46.9 -10°16.2	18°47.0 -10°17.1	33°47.1 -10°18.0	48°47.2 -10°18.9	63°47.3 -10°19.8	+0.1 -0.9
Fr 20	258°48.7 -10°31.5	273°48.8 -10°32.3	288°48.9 -10°33.2	303°49.0 -10°34.1	318°49.1 -10°35.0	333°49.2 -10°35.9	348°49.3 -10°36.8	3°49.4 -10°37.7	18°49.5 -10°38.6	33°49.6 -10°39.5	48°49.7 -10°40.4	63°49.8 -10°41.3	+0.1 -0.9
Sa 21	258°51.1 -10°52.8	273°51.2 -10°53.7	288°51.3 -10°54.6	303°51.4 -10°55.5	318°51.5 -10°56.4	333°51.6 -10°57.2	348°51.7 -10°58.1	3°51.8 -10°59.0	18°51.9 -10°59.9	33°52.0 -11°00.8	48°52.1 -11°01.7	63°52.2 -11°02.5	+0.1 -0.9
Su 22	258°53.4 -11°14.0	273°53.5 -11°14.9	288°53.6 -11°15.8	303°53.7 -11°16.6	318°53.7 -11°17.5	333°53.8 -11°18.4	348°53.9 -11°19.3	3°54.0 -11°20.2	18°54.1 -11°21.0	33°54.2 -11°21.9	48°54.3 -11°22.8	63°54.4 -11°23.7	+0.1 -0.9
Mo 23	258°55.5 -11°35.0	273°55.6 -11°35.9	288°55.6 -11°36.8	303°55.7 -11°37.7	318°55.8 -11°38.5	333°55.9 -11°39.4	348°56.0 -11°40.3	3°56.1 -11°41.1	18°56.1 -11°42.0	33°56.2 -11°42.9	48°56.3 -11°43.7	63°56.4 -11°44.6	+0.1 -0.9
Tu 24	258°57.4 -11°55.9	273°57.5 -11°56.8	288°57.6 -11°57.6	303°57.6 -11°58.5	318°57.7 -11°59.3	333°57.8 -12°00.2	348°57.9 -12°01.1	3°57.9 -12°01.9	18°58.0 -12°02.8	33°58.1 -12°03.7	48°58.2 -12°04.5	63°58.2 -12°05.4	+0.1 -0.9
We 25	258°59.6 -12°16.6	273°59.2 -12°17.4	288°59.3 -12°18.3	303°59.4 -12°19.1	318°59.4 -12°20.0	333°59.5 -12°20.8	348°59.6 -12°21.7	3°59.6 -12°22.5	18°59.7 -12°23.4	33°59.8 -12°24.3	48°59.8 -12°25.1	63°59.9 -12°26.0	+0.1 -0.9
Th 26	259°00.7 -12°37.0	274°00.8 -12°37.9	289°00.9 -12°38.7	304°00.9 -12°39.6	319°01.0 -12°40.4	334°01.0 -12°41.3	349°01.1 -12°42.1	4°01.2 -12°43.0	19°01.2 -12°43.8	34°01.3 -12°44.7	49°01.3 -12°45.5	64°01.4 -12°46.3	+0.1 -0.8
Fr 27	259°02.1 -12°57.7	274°02.2 -12°58.6	289°02.2 -12°59.5	304°02.3 -12°59.8	319°02.3 -13°00.7	334°02.4 -13°01.5	349°02.4 -13°02.3	4°02.5 -13°03.2	19°02.5 -13°04.0	34°02.6 -13°04.9	49°02.7 -13°05.7	64°02.7 -13°06.5	+0.1 -0.8
Sa 28	259°03.8 -13°17.4	274°03.4 -13°18.2	289°03.4 -13°19.0	304°03.5 -13°19.9	319°03.5 -13°20.7	334°03.6 -13°21.5	349°03.6 -13°22.4	4°03.7 -13°23.2	19°03.7 -13°24.0	34°03.7 -13°24.9	49°03.8 -13°25.7	64°03.8 -13°26.5	+0.0 -0.8
Su 29	259°04.4 -13°37.3	274°04.4 -13°38.1	289°04.4 -13°38.9	304°04.5 -13°39.7	319°04.5 -13°40.5	334°04.6 -13°41.4	349°04.6 -13°42.2	4°04.6 -13°43.0	19°04.7 -13°43.8	34°04.7 -13°44.6	49°04.7 -13°45.5	64°04.8 -13°46.3	+0.0 -0.8
Mo 30	259°05.2 -13°56.9	274°05.2 -13°57.7	289°05.3 -13°58.5	304°05.3 -13°59.3	319°05.3 -14°00.2	334°05.3 -14°01.0	349°05.4 -14°01.8	4°05.4 -14°02.6	19°05.4 -14°03.4	34°05.5 -14°04.2	49°05.5 -14°05.0	64°05.5 -14°05.8	+0.0 -0.8
Tu 31	259°05.8 -14°16.3	274°05.9 -14°17.1	289°05.9 -14°17.9	304°05.9 -14°18.7	319°05.9 -14°19.6	334°05.9 -14°20.4	349°06.0 -14°21.2	4°06.0 -14°22.0	19°06.0 -14°22.8	34°06.0 -14°23.6	49°06.0 -14°24.4	64°06.1 -14°25.2	+0.0 -0.8

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change = 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.0'

MOON

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	D	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Δ'/h SH
O	Su 1	235°19.1 -1°41.0	249°54.9 -1°28.2	264°30.7 -1°15.5	279°06.4 -1°02.7	293°42.2 -0°50.0	308°18.0 -0°37.2	322°53.8 -0°24.5	337°29.6 -0°11.7	352°05.3 0°01.0	6°41.1 0°13.8	21°16.9 0°26.6	+35.8 14.7 +12.8 53.9
	Mo 2	240°12.6 3°37.4	254°48.2 3°50.1	269°23.8 4°02.7	283°59.4 4°15.3	298°34.9 4°27.9	313°10.5 4°40.5	327°46.0 4°53.1	342°21.5 5°05.7	356°57.0 5°18.2	11°32.4 5°30.8	26°07.8 5°43.3	+35.5 14.7 +12.6 54.0
	Tu 3	244°55.8 8°48.3	259°30.7 9°00.4	274°05.6 9°12.5	288°40.5 9°24.5	303°15.3 9°36.5	317°50.1 9°48.5	332°24.8 10°00.5	346°59.5 10°12.4	1°34.2 10°24.3	16°08.8 10°36.1	30°43.4 10°47.9	+34.8 14.8 +12.0 54.1
O	We 4	249°16.1 13°39.8	263°49.9 13°50.9	278°23.6 14°01.9	292°57.3 14°12.9	307°30.9 14°23.8	322°04.4 14°34.7	336°37.9 14°45.5	351°11.3 14°56.2	5°44.7 15°06.9	20°18.0 15°17.6	34°51.3 15°28.1	+33.5 14.8 +10.8 54.3
	Th 5	253°02.4 17°59.0	267°34.7 18°08.5	282°06.8 18°17.9	296°38.9 18°27.3	311°10.9 18°36.6	325°42.9 18°45.7	340°14.7 18°54.9	354°46.5 19°03.9	9°18.3 19°12.8	23°49.9 19°21.7	38°21.5 19°30.5	+31.9 14.9 +9.2 54.6
	Fr 6	256°07.0 21°31.8	270°37.4 21°39.1	285°07.8 21°46.3	299°38.1 21°53.5	314°08.3 22°00.5	328°38.5 22°07.4	343°08.6 22°14.3	357°38.6 22°21.0	12°08.6 22°27.6	26°38.5 22°34.2	41°08.3 22°40.6	+30.1 15.0 +6.9 55.0
O	Sa 7	258°27.3 24°03.4	272°56.1 24°08.0	287°24.7 24°12.5	301°53.4 24°16.8	316°21.9 24°21.1	330°50.4 24°25.2	345°18.8 24°29.2	359°47.2 24°33.0	14°15.5 24°36.7	28°43.8 24°40.3	43°12.0 24°43.8	+28.5 15.1 +4.0 55.5
	Su 8	260°08.7 25°20.3	274°36.1 25°21.6	289°03.5 25°22.9	303°30.8 25°23.9	317°58.1 25°24.9	332°25.4 25°25.7	346°52.6 25°26.3	1°19.7 25°26.9	15°46.9 25°27.2	30°14.0 25°27.5	44°41.1 25°27.6	+27.2 15.3 +0.7 56.1
	Mo 9	261°24.1 25°11.9	275°50.8 25°09.7	290°17.5 25°07.3	304°44.2 25°04.8	319°10.9 25°02.2	333°37.5 25°00.4	348°04.2 24°56.5	2°30.9 24°53.4	16°57.3 24°50.2	31°24.3 24°46.8	45°50.8 24°43.3	+26.7 15.5 -2.9 56.8
O	Tu 10	262°30.8 23°33.2	276°57.6 23°24.3	291°24.3 23°21.4	305°51.1 23°15.3	320°17.9 23°09.1	334°44.7 23°02.7	349°11.5 22°56.1	3°38.3 22°49.5	18°05.2 22°42.7	32°32.1 22°35.7	46°59.0 22°28.6	+26.8 15.7 -6.5 57.6
	We 11	276°57.6 23°27.4	291°24.3 23°21.4	305°51.1 23°15.3	320°17.9 23°09.1	334°44.7 23°02.7	349°11.5 22°56.1	3°38.3 22°49.5	18°05.2 22°42.7	32°32.1 22°35.7	46°59.0 22°28.6	61°25.9 22°21.4	+26.8 15.7 -6.6 57.6
	Th 12	278°12.5 20°16.9	292°39.9 20°07.5	307°07.2 19°58.1	321°34.6 19°48.5	336°02.0 19°38.7	350°29.5 19°28.9	4°57.0 19°18.9	19°24.5 19°08.8	33°52.0 18°58.6	48°19.6 18°48.3	62°47.2 18°37.8	+27.5 15.9 -9.9 58.4
O	Fr 13	279°44.9 15°47.1	294°13.0 15°34.9	308°41.1 15°22.5	323°09.3 15°10.1	337°37.3 14°57.5	352°05.7 14°44.9	6°33.9 14°32.1	21°02.2 14°19.3	35°30.4 14°06.3	49°58.8 13°53.3	64°27.1 13°40.1	+28.2 16.2 -12.7 59.3
	Sa 14	281°34.9 10°12.8	296°03.6 9°58.3	310°32.3 9°43.8	325°01.0 9°29.2	339°29.9 9°14.5	353°58.4 8°59.8	8°27.2 8°45.0	22°55.9 8°30.1	37°24.7 8°15.2	51°53.5 8°00.2	66°22.2 7°45.2	+28.7 16.4 -14.8 60.0
	Su 15	283°34.6 3°53.4	298°03.4 3°37.7	312°32.2 3°21.8	327°01.0 3°06.0	341°29.8 2°50.1	355°58.6 2°34.2	10°27.4 2°18.3	24°56.2 2°02.3	39°24.9 1°46.4	53°53.7 1°30.4	68°22.7 1°14.4	+28.8 16.5 -15.9 60.6
O	Mo 16	285°31.0 -2°46.9	299°59.4 -3°02.9	314°27.8 -3°19.0	328°56.1 -3°35.0	343°24.4 -3°51.1	357°52.6 -4°07.1	12°20.8 -4°23.1	26°49.0 -4°39.0	41°17.2 -4°55.0	55°45.3 -5°10.9	70°13.4 -5°26.8	+28.2 16.6 -16.0 61.0
	Tu 17	-29°09.6 -9°20.5	301°36.9 -9°35.6	316°04.3 -9°50.8	330°31.5 -10°05.8	344°58.8 -10°20.8	359°25.9 -10°35.7	13°53.1 -10°50.6	28°20.1 -11°05.4	42°47.2 -11°20.1	57°14.1 -11°34.8	71°41.1 -11°49.3	+27.2 16.6 -14.9 61.0
	We 18	288°18.1 -15°17.4	302°44.1 -15°30.3	317°10.1 -15°43.5	331°36.0 -15°56.4	346°01.8 -16°09.9	360°10.8 -16°21.8	14°53.4 -16°34.4	29°10.0 -16°46.8	43°44.7 -16°59.1	58°10.2 -17°11.3	72°35.7 -17°23.4	+25.8 16.5 -12.6 60.7
O	Th 19	288°52.2 -20°08.8	303°16.9 -20°18.8	317°41.5 -20°28.6	332°06.2 -20°38.2	346°30.7 -20°47.7	360°50.7 -20°57.0	15°59.8 -21°06.2	29°44.2 -21°15.3	44°08.6 -21°24.1	58°33.0 -21°32.9	72°57.4 -21°41.5	+24.5 16.4 -9.3 60.1
	Fr 20	288°59.4 -23°31.2	303°23.3 -23°37.2	317°47.3 -23°43.1	332°11.3 -23°48.8	346°35.2 -23°54.3	360°55.2 -23°59.6	15°59.8 -24°04.8	29°44.2 -24°09.8	44°15.6 -24°14.6	58°40.2 -24°19.3	73°04.9 -24°23.8	+24.0 16.2 -5.5 60.2
	Sa 21	289°00.2 -25°11.2	303°24.5 -25°13.0	317°48.3 -25°14.7	332°13.2 -25°16.1	346°37.0 -25°17.5	360°56.1 -25°18.6	15°59.8 -25°19.6	29°44.2 -25°20.4	44°15.6 -25°21.4	58°40.2 -25°21.6	73°04.9 -25°21.9	+24.5 15.9 -1.1 58.3
O	Su 22	289°22.0 -25°08.1	303°47.7 -25°06.0	318°13.5 -25°03.7	333°39.3 -25°01.2	347°05.2 -24°58.6	361°01.2 -24°55.9	15°57.3 -24°53.0	30°23.4 -24°50.0	44°15.6 -24°46.8	59°16.0 -24°43.5	73°42.3 -24°40.1	+26.0 15.6 +2.8 57.3
	Mo 23	290°28.8 -23°32.5	304°56.6 -23°27.0	319°24.6 -23°23.1	333°52.6 -23°15.6	348°20.7 -23°09.7	362°48.9 -23°03.7	17°17.2 -22°57.6	31°45.6 -22°51.4	46°14.1 -22°45.4	60°42.7 -22°38.6	75°11.4 -22°32.0	+28.3 15.4 +6.0 56.4
	Tu 24	292°33.2 -20°41.3	307°03.4 -20°33.1	321°33.7 -20°24.9	336°04.1 -20°16.6	350°34.6 -20°08.1	365°05.2 -19°59.6	17°05.2 -19°51.0	19°35.8 -19°42.3	34°06.6 -19°33.6	48°37.4 -19°24.7	63°08.4 -19°15.8	+30.6 15.2 +8.6 55.6
O	We 25	295°35.3 -16°52.9	310°07.7 -16°42.8	324°40.2 -16°32.6	339°12.7 -16°22.4	353°45.4 -16°12.2	368°18.1 -16°01.8	22°50.8 -15°51.4	37°23.7 -15°41.0	51°56.6 -15°30.5	66°29.6 -15°19.9	81°02.7 -15°09.3	+32.7 15.0 +10.4 54.9
	Th 26	299°26.7 -12°23.8	314°00.8 -12°12.4	328°34.9 -12°01.0	343°09.2 -11°49.5	357°43.4 -11°38.4	372°17.7 -11°26.4	26°52.1 -11°14.8	41°26.5 -11°03.1	56°01.0 -10°51.5	70°35.5 -10°39.7	85°10.1 -10°28.0	+34.3 14.8 +11.6 54.4
	Fr 27	303°53.9 -7°28.0	318°29.1 -7°15.7	333°04.3 -7°03.5	347°39.6 -6°51.2	362°14.9 -6°38.9	376°50.3 -6°26.6	31°25.7 -6°14.3	46°01.1 -6°01.9	60°36.5 -5°49.8	75°11.9 -5°37.2	89°47.4 -5°24.8	+35.4 14.8 +12.3 54.1
O	Sa 28	308°41.8 -2°16.9	323°17.5 -2°04.3	337°53.3 -1°51.7	352°29.0 -1°39.1	367°04.8 -1°26.5	381°40.5 -1°13.8	36°16.3 -1°01.2	50°52.0 -0°48.6	65°27.8 -0°35.9	80°03.6 -0°23.3	94°39.3 -0°10.6	+35.8 14.7 +12.6 54.0
	Su 29	313°35.1 2°58.8	328°10.8 3°11.4	342°46.4 3°24.0	357°22.0 3°36.6	372°07.6 3°49.1	386°33.3 4°01.6	41°08.7 4°14.2	55°44.2 4°26.7	70°19.7 4°39.2	84°55.2 4°51.2	99°30.6 5°04.2	+35.6 14.7 +12.5 54.0
	Mo 30	318°19.1 8°08.9	332°54.0 8°21.1	347°28.9 8°33.2	362°03.8 8°45.3	376°38.7 8°57.3	391°13.5 9°09.3	45°48.2 9°21.3	60°22.9 9°33.9	74°57.6 9°45.6	89°32.3 9°52.1	104°06.8 10°08.9	+34.8 14.8 +12.0 54.2
O	Tu 31	322°39.7 13°02.1	337°13.5 13°13.3	351°47.2 13°24.4	366°20.8 13°35.5	380°54.4 13°46.5	395°27.9 13°57.5	50°01.4 14°08.5	64°34.8 14°19.4	79°08.2 14°30.2	93°41.4 14°41.0	108°14.7 14°51.7	+33.5 14.8 +11.0 54.4

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (— = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 3 16h24 — LQ: 11 11h56 — NM: 18 02h56 — FQ: 25 04h53

SUN

November 2028

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
We 1	259°06.3 -14°35.5	274°06.3 -14°36.3	289°06.3 -14°37.1	304°06.3 -14°37.9	319°06.3 -14°38.7	334°06.4 -14°39.5	349°06.4 -14°40.3	4°06.4 -14°41.1	15°06.4 -14°41.9	34°06.4 -14°42.7	45°06.4 -14°43.5	64°06.4 -14°44.3	+0.0 -0.8
Th 2	259°06.5 -14°54.8	274°06.5 -14°55.3	289°06.5 -14°56.1	304°06.5 -14°56.9	319°06.6 -14°57.6	334°06.6 -14°58.4	349°06.6 -14°59.2	4°06.6 -15°00.0	15°06.6 -15°00.8	34°06.6 -15°01.6	45°06.6 -15°02.3	64°06.6 -15°03.1	+0.0 -0.8
Fr 3	259°06.6 -15°13.2	274°06.6 -15°14.0	289°06.6 -15°14.8	304°06.6 -15°15.5	319°06.6 -15°16.3	334°06.6 -15°17.1	349°06.6 -15°17.9	4°06.5 -15°18.6	15°06.5 -15°19.4	34°06.5 -15°20.2	45°06.5 -15°21.0	64°06.5 -15°21.7	-0.0 -0.8
Sa 4	259°06.4 -15°31.7	274°06.4 -15°32.5	289°06.4 -15°33.2	304°06.4 -15°34.0	319°06.4 -15°34.8	334°06.4 -15°35.5	349°06.3 -15°36.3	4°06.3 -15°37.0	15°06.3 -15°37.8	34°06.3 -15°38.6	45°06.3 -15°39.3	64°06.3 -15°40.1	-0.0 -0.8
Su 5	259°06.0 -15°49.9	274°06.0 -15°50.7	289°06.0 -15°51.4	304°06.0 -15°52.2	319°06.0 -15°52.9	334°05.9 -15°53.7	349°05.9 -15°54.4	4°05.9 -15°55.2	15°05.9 -15°55.9	34°05.9 -15°56.7	45°05.8 -15°57.4	64°05.8 -15°58.2	-0.0 -0.8
Mo 6	259°05.5 -16°07.9	274°05.4 -16°08.6	289°05.4 -16°09.4	304°05.4 -16°10.1	319°05.3 -16°10.9	334°05.3 -16°11.6	349°05.3 -16°12.3	4°05.3 -16°13.1	15°05.2 -16°13.8	34°05.2 -16°14.5	45°05.2 -16°15.3	64°05.1 -16°16.0	-0.0 -0.7
Tu 7	259°04.7 -16°25.6	274°04.6 -16°26.3	289°04.6 -16°27.0	304°04.6 -16°27.8	319°04.5 -16°28.5	334°04.5 -16°29.2	349°04.4 -16°30.0	4°04.4 -16°30.7	15°04.4 -16°31.4	34°04.3 -16°32.1	45°04.3 -16°32.9	64°04.2 -16°33.6	-0.0 -0.7
We 8	259°03.7 -16°43.0	274°03.6 -16°43.7	289°03.6 -16°44.4	304°03.5 -16°45.2	319°03.5 -16°45.9	334°03.4 -16°46.6	349°03.4 -16°47.3	4°03.3 -16°48.0	15°03.3 -16°48.7	34°03.2 -16°49.5	45°03.2 -16°50.2	64°03.1 -16°50.9	-0.0 -0.7
Th 9	259°02.4 -17°00.1	274°02.3 -17°00.8	289°02.3 -17°01.5	304°02.3 -17°02.3	319°02.2 -17°03.7	334°02.2 -17°03.7	349°02.1 -17°04.1	4°02.0 -17°05.1	15°02.0 -17°05.8	34°01.9 -17°06.5	45°01.9 -17°07.2	64°01.8 -17°07.9	-0.1 -0.7
Fr 10	259°01.0 -17°17.0	274°00.9 -17°17.7	289°00.9 -17°18.4	304°00.8 -17°19.1	319°00.7 -17°19.8	334°00.7 -17°20.5	349°00.6 -17°21.1	4°00.5 -17°21.1	15°00.5 -17°22.5	34°00.4 -17°23.2	45°00.3 -17°23.9	64°00.3 -17°24.6	-0.1 -0.7
Sa 11	258°59.3 -17°33.5	273°59.3 -17°34.2	288°59.2 -17°34.9	303°59.1 -17°35.6	318°59.1 -17°36.3	333°59.0 -17°36.9	348°58.9 -17°37.6	3°58.8 -17°38.3	15°58.7 -17°39.0	33°58.7 -17°39.7	45°58.6 -17°40.5	63°58.5 -17°41.0	-0.1 -0.7
Su 12	258°57.5 -17°49.8	273°57.4 -17°50.5	288°57.3 -17°51.1	303°57.2 -17°51.8	318°57.1 -17°52.5	333°57.1 -17°53.1	348°57.0 -17°53.5	3°56.9 -17°54.5	15°56.8 -17°55.1	33°56.7 -17°55.8	45°56.6 -17°56.5	63°56.5 -17°57.1	-0.1 -0.7
Mo 13	258°55.2 -18°05.7	273°55.3 -18°06.4	288°55.2 -18°07.0	303°55.1 -18°07.7	318°55.0 -18°08.4	333°54.9 -18°09.0	348°54.8 -18°09.7	3°54.7 -18°10.3	15°54.6 -18°11.0	33°54.5 -18°11.6	45°54.4 -18°12.3	63°54.4 -18°12.9	-0.1 -0.7
Tu 14	258°53.1 -18°21.4	273°53.0 -18°22.0	288°52.9 -18°22.6	303°52.8 -18°23.3	318°52.7 -18°23.9	333°52.6 -18°24.6	348°52.5 -18°25.2	3°52.4 -18°25.9	15°52.3 -18°26.5	33°52.2 -18°27.1	45°52.0 -18°27.8	63°51.9 -18°28.4	-0.1 -0.6
We 15	258°50.6 -18°36.7	273°50.4 -18°37.3	288°50.3 -18°37.9	303°50.2 -18°38.6	318°50.1 -18°39.2	333°50.0 -18°39.8	348°49.9 -18°40.4	3°49.8 -18°41.1	15°49.7 -18°41.7	33°49.6 -18°42.3	45°49.4 -18°42.9	63°49.3 -18°43.6	-0.1 -0.6
Th 16	258°47.8 -18°51.6	273°47.7 -18°52.3	288°47.6 -18°52.9	303°47.5 -18°53.5	318°47.3 -18°54.1	333°47.2 -18°54.7	348°47.1 -18°55.3	3°47.0 -18°55.9	15°46.9 -18°56.6	33°46.7 -18°57.2	45°46.6 -18°57.8	63°46.5 -18°58.4	-0.1 -0.6
Fr 17	258°44.9 -19°06.3	273°44.7 -19°06.9	288°44.6 -19°07.5	303°44.5 -19°08.1	318°44.4 -19°08.7	333°44.2 -19°09.3	348°44.1 -19°09.9	3°44.0 -19°10.5	15°43.8 -19°11.1	33°43.7 -19°11.7	45°43.6 -19°12.3	63°43.5 -19°12.9	-0.1 -0.6
Sa 18	258°41.7 -19°20.6	273°41.6 -19°21.2	288°41.4 -19°21.8	303°41.3 -19°22.3	318°41.2 -19°22.9	333°41.0 -19°23.5	348°40.9 -19°24.1	3°40.8 -19°24.7	15°40.6 -19°25.3	33°40.5 -19°25.9	45°40.4 -19°26.4	63°40.2 -19°27.0	-0.1 -0.6
Su 19	258°38.4 -19°34.5	273°38.2 -19°35.1	288°38.1 -19°35.7	303°37.9 -19°36.2	318°37.8 -19°36.8	333°37.6 -19°37.4	348°37.5 -19°38.0	3°37.3 -19°38.5	15°37.2 -19°39.1	33°37.1 -19°39.7	45°36.9 -19°40.2	63°36.8 -19°40.8	-0.1 -0.6
Mo 20	258°34.8 -19°48.1	273°34.7 -19°48.7	288°34.5 -19°49.2	303°34.3 -19°49.8	318°34.2 -19°50.4	333°34.0 -19°50.9	348°33.9 -19°51.5	3°33.7 -19°52.0	15°33.6 -19°52.6	33°33.4 -19°53.1	45°33.3 -19°53.7	63°33.1 -19°54.2	-0.2 -0.6
Tu 21	258°31.0 -20°01.4	273°30.9 -20°01.9	288°30.7 -20°02.4	303°30.6 -20°03.0	318°30.4 -20°03.5	333°30.2 -20°04.1	348°30.1 -20°04.6	3°29.9 -20°05.2	15°29.8 -20°05.7	33°29.6 -20°06.2	45°29.4 -20°06.8	63°29.3 -20°07.3	-0.2 -0.5
We 22	258°27.1 -20°14.2	273°26.9 -20°14.8	288°26.8 -20°15.3	303°26.6 -20°15.8	318°26.4 -20°16.3	333°26.2 -20°16.9	348°26.1 -20°17.4	3°25.9 -20°17.9	15°25.7 -20°18.4	33°25.6 -20°19.0	45°25.4 -20°19.5	63°25.2 -20°20.0	-0.2 -0.5
Th 23	258°23.2 -20°26.7	273°22.8 -20°27.2	288°22.6 -20°27.7	303°22.4 -20°28.3	318°22.2 -20°28.8	333°22.1 -20°29.3	348°21.9 -20°29.8	3°21.7 -20°30.3	15°21.5 -20°30.8	33°21.3 -20°31.3	45°21.2 -20°31.8	63°21.0 -20°32.3	-0.2 -0.5
Fr 24	258°18.6 -20°38.8	273°18.4 -20°39.3	288°18.2 -20°39.8	303°18.1 -20°40.3	318°17.9 -20°40.8	333°17.7 -20°41.3	348°17.5 -20°41.8	3°17.3 -20°42.3	15°17.1 -20°42.8	33°16.9 -20°43.3	45°16.8 -20°43.8	63°16.6 -20°44.3	-0.2 -0.5
Sa 25	258°14.6 -20°50.6	273°13.9 -20°51.1	288°13.7 -20°51.5	303°13.0 -20°52.0	318°13.3 -20°52.5	333°13.1 -20°53.0	348°12.9 -20°53.4	3°12.7 -20°53.9	15°12.6 -20°54.4	33°12.4 -20°54.9	45°12.3 -20°55.3	63°12.0 -20°55.8	-0.2 -0.5
Su 26	258°09.4 -21°01.9	273°09.2 -21°02.4	288°09.0 -21°02.8	303°08.8 -21°03.3	318°08.6 -21°03.8	333°08.4 -21°04.2	348°08.2 -21°04.7	3°08.0 -21°05.2	15°07.8 -21°05.6	33°07.6 -21°06.1	45°07.4 -21°06.5	63°07.2 -21°07.0	-0.2 -0.5
Mo 27	258°04.5 -21°12.9	273°04.3 -21°13.3	288°04.1 -21°13.8	303°03.9 -21°14.2	318°03.7 -21°14.7	333°03.5 -21°15.1	348°03.3 -21°15.6	3°03.1 -21°16.0	15°02.9 -21°16.4	33°02.6 -21°16.9	45°02.4 -21°17.3	63°02.2 -21°17.8	-0.2 -0.4
Tu 28	257°59.5 -21°23.8	272°59.3 -21°24.3	287°59.0 -21°24.7	302°58.8 -21°25.1	317°58.6 -21°25.6	332°58.4 -21°26.0	347°58.2 -21°26.5	2°58.0 -21°26.9	15°57.7 -21°27.3	32°57.5 -21°27.7	45°57.3 -21°28.1	62°57.1 -21°28.6	-0.2 -0.4
We 29	257°54.2 -21°38.3	272°54.0 -21°38.4	287°53.8 -21°38.4	302°53.6 -21°38.5	317°53.4 -21°38.5	332°53.1 -21°38.6	347°52.9 -21°38.6	2°52.7 -21°39.0	15°52.5 -21°39.4	32°52.2 -21°39.7	45°52.0 -21°40.1	62°51.8 -21°40.6	-0.2 -0.4
Th 30	257°48.9 -21°43.3	272°48.6 -21°43.7	287°48.4 -21°44.1	302°48.2 -21°44.5	317°47.9 -21°44.9	332°47.7 -21°45.3	347°47.5 -21°45.7	2°47.2 -21°46.1	15°47.0 -21°46.4	32°46.8 -21°46.8	45°46.6 -21°47.2	62°46.3 -21°47.6	-0.2 -0.4

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

November 2028

	D	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	0h	Δ'/h SH
We 1	239 ^o 10.8 16 ^o 25.5	253 ^o 43.3 16 ^o 35.7	268 ^o 15.8 16 ^o 45.7	282 ^o 48.3 16 ^o 55.7	297 ^o 20.6 17 ^o 05.6	311 ^o 52.9 17 ^o 15.4	326 ^o 25.1 17 ^o 25.2	340 ^o 57.3 17 ^o 34.9	355 ^o 29.4 17 ^o 44.5	10 ^o 01.4 17 ^o 54.1	24 ^o 33.3 18 ^o 03.6	+32.3 14.9 +9.8 54.7	
	242 ^o 23.6 20 ^o 16.2	256 ^o 54.4 20 ^o 24.3	271 ^o 25.1 20 ^o 32.4	285 ^o 55.7 20 ^o 40.3	300 ^o 26.3 20 ^o 48.2	314 ^o 56.7 20 ^o 56.0	329 ^o 27.1 21 ^o 11.3	343 ^o 57.4 21 ^o 18.8	358 ^o 27.7 21 ^o 28.2	12 ^o 57.9 21 ^o 36.2	27 ^o 28.0 21 ^o 44.7	+30.4 15.0 +7.7 55.1	
Fr 3	244 ^o 50.9 23 ^o 10.3	259 ^o 19.8 23 ^o 15.8	273 ^o 48.7 23 ^o 21.3	288 ^o 17.6 23 ^o 26.6	302 ^o 46.4 23 ^o 31.9	317 ^o 15.1 23 ^o 37.0	331 ^o 43.7 23 ^o 41.9	346 ^o 12.3 23 ^o 45.8	360 ^o 40.8 23 ^o 51.5	15 ^o 09.3 23 ^o 56.2	29 ^o 37.6 24 ^o 00.7	+28.7 15.1 +5.0 55.5	
Sa 4	246 ^o 36.8 24 ^o 52.9	261 ^o 04.4 24 ^o 55.3	275 ^o 31.9 24 ^o 57.6	289 ^o 59.3 24 ^o 59.8	304 ^o 26.7 25 ^o 01.8	318 ^o 54.1 25 ^o 03.7	333 ^o 21.4 25 ^o 05.5	347 ^o 48.7 25 ^o 07.1	362 ^o 16.0 25 ^o 08.6	16 ^o 43.2 25 ^o 09.9	31 ^o 10.4 25 ^o 11.1	+27.3 15.3 +1.8 56.0	
Su 5	247 ^o 54.8 25 ^o 12.3	262 ^o 21.6 25 ^o 11.2	276 ^o 48.4 25 ^o 10.0	291 ^o 15.1 25 ^o 08.6	305 ^o 41.9 25 ^o 07.2	320 ^o 08.7 25 ^o 05.5	334 ^o 35.4 25 ^o 03.7	349 ^o 02.2 25 ^o 01.8	363 ^o 28.9 24 ^o 59.7	17 ^o 55.6 24 ^o 57.5	32 ^o 22.4 24 ^o 55.2	+26.8 15.4 -1.7 56.5	
Mo 6	249 ^o 04.0 24 ^o 02.6	263 ^o 30.9 23 ^o 58.0	277 ^o 57.7 23 ^o 53.2	292 ^o 24.7 23 ^o 48.3	306 ^o 51.6 23 ^o 43.2	321 ^o 18.5 23 ^o 38.0	335 ^o 45.5 23 ^o 32.7	350 ^o 12.5 23 ^o 27.2	364 ^o 39.5 23 ^o 21.6	19 ^o 06.6 23 ^o 15.8	33 ^o 33.6 23 ^o 09.9	+27.0 15.6 -5.3 57.1	
Tu 7	250 ^o 23.3 21 ^o 25.6	264 ^o 50.9 21 ^o 17.6	279 ^o 18.6 21 ^o 09.5	293 ^o 46.2 21 ^o 01.3	308 ^o 13.9 20 ^o 52.9	322 ^o 41.7 20 ^o 44.4	337 ^o 09.4 20 ^o 35.8	351 ^o 37.3 20 ^o 27.0	365 ^o 05.1 20 ^o 18.2	20 ^o 33.0 20 ^o 09.2	35 ^o 01.0 20 ^o 00.1	+27.8 15.7 -8.6 57.6	
We 8	252 ^o 05.0 17 ^o 29.9	266 ^o 33.6 17 ^o 19.1	281 ^o 02.2 17 ^o 08.1	295 ^o 30.9 16 ^o 57.0	309 ^o 59.6 16 ^o 45.5	324 ^o 28.3 16 ^o 34.5	338 ^o 57.1 16 ^o 23.1	353 ^o 26.0 16 ^o 11.6	367 ^o 54.8 16 ^o 00.0	22 ^o 23.7 15 ^o 48.3	36 ^o 52.7 15 ^o 36.6	+28.8 15.9 -11.3 58.2	
Th 9	254 ^o 11.1 12 ^o 29.2	268 ^o 40.6 12 ^o 16.1	283 ^o 10.2 12 ^o 02.8	297 ^o 39.7 11 ^o 49.5	312 ^o 09.3 11 ^o 36.2	326 ^o 38.9 11 ^o 22.7	341 ^o 08.5 11 ^o 09.2	355 ^o 38.1 10 ^o 55.6	369 ^o 07.8 10 ^o 28.2	24 ^o 37.5 10 ^o 14.4	39 ^o 07.2 10 ^o 00.6	+29.6 16.0 -13.6 58.8	
Fr 10	268 ^o 40.6 12 ^o 16.1	283 ^o 10.2 12 ^o 02.8	297 ^o 39.7 11 ^o 49.5	312 ^o 09.3 11 ^o 36.2	326 ^o 38.9 11 ^o 22.7	341 ^o 08.5 11 ^o 09.2	355 ^o 38.1 10 ^o 55.6	369 ^o 07.8 10 ^o 41.9	383 ^o 37.5 10 ^o 28.2	39 ^o 07.2 10 ^o 14.4	53 ^o 37.0 10 ^o 00.6	+29.6 16.0 -13.6 58.8	
Sa 11	271 ^o 05.0 6 ^o 25.7	285 ^o 35.0 6 ^o 10.9	300 ^o 05.0 5 ^o 56.1	314 ^o 35.0 5 ^o 41.3	329 ^o 04.9 5 ^o 26.5	343 ^o 34.9 5 ^o 11.6	358 ^o 04.9 4 ^o 56.6	372 ^o 34.9 4 ^o 41.6	387 ^o 04.9 4 ^o 26.6	41 ^o 34.8 4 ^o 11.6	56 ^o 04.8 3 ^o 56.5	+30.0 16.2 -14.9 59.4	
Su 12	273 ^o 33.5 0 ^o 07.2	288 ^o 03.3 -0 ^o 08.2	302 ^o 33.0 -0 ^o 23.6	317 ^o 02.8 -0 ^o 39.1	331 ^o 32.5 -0 ^o 54.5	346 ^o 02.2 -1 ^o 09.9	360 ^o 31.9 -1 ^o 25.4	375 ^o 01.9 -1 ^o 40.8	389 ^o 31.2 -1 ^o 56.3	44 ^o 00.8 -2 ^o 11.7	58 ^o 30.3 -2 ^o 27.2	+29.7 16.3 -15.4 59.8	
Mo 13	275 ^o 49.5 -0 ^o 17.3	290 ^o 18.5 -6 ^o 32.4	304 ^o 47.4 -6 ^o 47.6	319 ^o 16.2 -7 ^o 02.7	333 ^o 45.0 -7 ^o 17.7	348 ^o 13.8 -7 ^o 32.7	362 ^o 42.5 -7 ^o 47.7	376 ^o 11.1 -8 ^o 02.7	389 ^o 39.7 -8 ^o 17.6	46 ^o 08.3 -8 ^o 32.5	60 ^o 36.8 -8 ^o 47.3	+28.7 16.4 -15.0 60.1	
Tu 14	277 ^o 37.1 -12 ^o 23.0	292 ^o 04.6 -12 ^o 36.8	306 ^o 32.2 -12 ^o 50.6	320 ^o 59.5 -13 ^o 04.3	335 ^o 26.8 -13 ^o 18.0	349 ^o 54.1 -13 ^o 31.5	364 ^o 21.3 -13 ^o 45.0	378 ^o 48.2 -13 ^o 58.4	392 ^o 15.4 -14 ^o 11.7	47 ^o 42.4 -14 ^o 24.9	62 ^o 09.9 -14 ^o 38.0	+27.2 16.4 -13.5 60.2	
We 15	278 ^o 14.7 -17 ^o 42.9	293 ^o 10.5 -17 ^o 54.4	307 ^o 36.2 -18 ^o 05.7	322 ^o 01.9 -18 ^o 16.9	336 ^o 27.5 -18 ^o 28.0	350 ^o 53.0 -18 ^o 39.0	365 ^o 18.5 -18 ^o 49.9	379 ^o 43.9 -19 ^o 00.6	393 ^o 09.2 -19 ^o 11.2	48 ^o 34.5 -19 ^o 21.7	62 ^o 59.7 -19 ^o 32.0	+25.5 16.4 -10.9 60.1	
Th 16	279 ^o 10.7 -21 ^o 50.4	293 ^o 35.0 -21 ^o 58.5	307 ^o 59.2 -22 ^o 06.4	322 ^o 01.9 -22 ^o 14.1	336 ^o 27.5 -22 ^o 21.7	350 ^o 53.0 -22 ^o 29.2	365 ^o 18.5 -22 ^o 36.5	379 ^o 43.9 -22 ^o 43.6	393 ^o 09.2 -22 ^o 50.6	48 ^o 34.5 -22 ^o 57.4	63 ^o 11.8 -23 ^o 04.0	+24.1 16.3 -7.4 59.7	
Fr 17	279 ^o 07.8 -24 ^o 24.1	293 ^o 31.5 -24 ^o 28.8	307 ^o 55.1 -24 ^o 31.9	322 ^o 01.9 -24 ^o 35.5	336 ^o 27.5 -24 ^o 39.0	350 ^o 53.0 -24 ^o 42.3	365 ^o 18.5 -24 ^o 45.5	379 ^o 43.9 -24 ^o 48.5	393 ^o 09.2 -24 ^o 51.3	48 ^o 34.5 -24 ^o 53.9	63 ^o 04.3 -24 ^o 56.4	+23.6 16.1 -3.2 59.9	
Sa 18	279 ^o 02.6 -25 ^o 13.0	293 ^o 26.8 -25 ^o 12.8	307 ^o 51.0 -25 ^o 12.4	322 ^o 01.9 -25 ^o 11.9	336 ^o 27.5 -25 ^o 11.2	350 ^o 53.0 -25 ^o 10.3	365 ^o 18.5 -25 ^o 09.3	379 ^o 43.9 -25 ^o 08.1	393 ^o 09.2 -25 ^o 06.7	48 ^o 34.5 -25 ^o 05.5	63 ^o 06.9 -25 ^o 03.5	+24.4 15.9 +1.0 58.2	
Su 19	279 ^o 26.1 -24 ^o 20.1	293 ^o 52.0 -24 ^o 16.1	308 ^o 18.0 -24 ^o 11.9	322 ^o 44.1 -24 ^o 07.5	337 ^o 10.2 -24 ^o 03.0	351 ^o 36.6 -23 ^o 58.4	366 ^o 02.9 -23 ^o 53.7	380 ^o 29.4 -23 ^o 48.8	394 ^o 55.9 -23 ^o 43.8	49 ^o 22.6 -23 ^o 38.6	63 ^o 49.3 -23 ^o 33.3	+26.3 15.6 +4.7 57.4	
Mo 20	280 ^o 42.1 -21 ^o 59.4	295 ^o 10.4 -21 ^o 52.2	309 ^o 38.9 -21 ^o 44.9	324 ^o 07.4 -21 ^o 37.5	338 ^o 36.0 -21 ^o 30.2	353 ^o 04.7 -21 ^o 22.4	367 ^o 33.6 -21 ^o 14.7	382 ^o 02.5 -21 ^o 06.8	396 ^o 31.5 -20 ^o 58.9	51 ^o 00.7 -20 ^o 50.9	65 ^o 29.9 -20 ^o 42.8	+28.8 15.4 +7.7 56.5	
Tu 21	283 ^o 00.4 -18 ^o 30.4	297 ^o 31.2 -18 ^o 20.9	312 ^o 02.1 -18 ^o 11.3	326 ^o 33.1 -18 ^o 01.7	341 ^o 04.2 -17 ^o 51.9	355 ^o 35.4 -17 ^o 42.2	370 ^o 06.6 -17 ^o 32.3	384 ^o 38.0 -17 ^o 22.4	398 ^o 09.5 -17 ^o 12.4	53 ^o 41.0 -17 ^o 02.3	68 ^o 12.7 -16 ^o 52.2	+31.2 15.2 +9.8 55.7	
We 22	286 ^o 17.4 -14 ^o 12.9	300 ^o 50.6 -14 ^o 01.8	315 ^o 23.4 -13 ^o 50.7	329 ^o 56.5 -13 ^o 39.5	344 ^o 29.7 -13 ^o 28.3	359 ^o 03.0 -13 ^o 17.1	373 ^o 36.3 -13 ^o 05.8	387 ^o 09.4 -12 ^o 54.5	401 ^o 43.2 -12 ^o 43.1	57 ^o 16.7 -12 ^o 31.7	71 ^o 50.3 -12 ^o 20.2	+33.3 15.0 +11.3 55.0	
Th 23	290 ^o 21.7 -9 ^o 23.7	304 ^o 56.2 -9 ^o 11.7	319 ^o 30.8 -8 ^o 59.7	334 ^o 05.4 -8 ^o 47.6	348 ^o 40.1 -8 ^o 35.5	363 ^o 14.8 -8 ^o 23.4	377 ^o 49.6 -8 ^o 11.2	392 ^o 24.4 -7 ^o 59.0	406 ^o 59.3 -7 ^o 46.8	61 ^o 34.2 -7 ^o 34.6	76 ^o 09.9 -7 ^o 22.4	+34.8 14.9 +12.1 54.5	
Fr 24	294 ^o 57.6 -4 ^o 16.5	309 ^o 33.1 -4 ^o 04.0	324 ^o 08.6 -3 ^o 51.5	338 ^o 44.1 -3 ^o 38.9	353 ^o 19.6 -3 ^o 26.4	367 ^o 55.2 -3 ^o 13.9	382 ^o 30.7 -3 ^o 01.3	396 ^o 06.3 -2 ^o 48.7	409 ^o 31.4 -2 ^o 36.2	64 ^o 17.5 -2 ^o 23.6	80 ^o 53.2 -2 ^o 11.0	+35.6 14.8 +12.5 54.2	
Sa 25	299 ^o 48.7 6 ^o 09.7	314 ^o 24.5 6 ^o 22.0	329 ^o 00.2 6 ^o 34.3	343 ^o 35.9 6 ^o 46.5	358 ^o 11.6 6 ^o 58.7	372 ^o 47.3 7 ^o 10.9	387 ^o 23.0 7 ^o 23.1	401 ^o 58.7 7 ^o 35.2	415 ^o 34.4 7 ^o 47.4	56 ^o 34.4 7 ^o 55.5	71 ^o 10.1 8 ^o 11.5	85 ^o 45.7 9 ^o 11.2	+35.7 14.8 +12.6 54.1
Su 26	304 ^o 38.6 6 ^o 09.7	319 ^o 13.9 6 ^o 22.0	333 ^o 49.2 6 ^o 34.3	348 ^o 24.5 6 ^o 46.5	362 ^o 59.8 6 ^o 58.7	377 ^o 35.0 7 ^o 15.0	392 ^o 10.2 7 ^o 23.1	406 ^o 45.3 7 ^o 35.2	420 ^o 16.4 7 ^o 47.4	61 ^o 20.4 7 ^o 55.5	75 ^o 55.5 8 ^o 11.5	90 ^o 30.6 9 ^o 11.5	+35.2 14.8 +12.5 54.2
Mo 27	309 ^o 11.3 11 ^o 08.9	323 ^o 45.7 11 ^o 20.5	338 ^o 19.9 11 ^o 32.0	352 ^o 54.2 11 ^o 43.4	367 ^o 28.3 11 ^o 54.9	381 ^o 02.5 12 ^o 06.3	395 ^o 26.5 12 ^o 17.6	409 ^o 45.0 12 ^o 28.9	423 ^o 18.4 12 ^o 40.2	65 ^o 44.6 12 ^o 51.4	80 ^o 18.5 13 ^o 02.6	94 ^o 55.2 13 ^o 14.1	+34.1 14.8 +11.4 54.4
Tu 28	313 ^o 12.5 15 ^o 44.0	327 ^o 45.3 15 ^{o5}											

SUN

December 2028

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Fr 1	272°43.1 -21°53.0	287°42.8 -21°53.4	302°42.6 -21°53.8	317°42.4 -21°54.1	332°42.1 -21°54.5	347°41.9 -21°54.9	3°41.6 -21°55.3	17°41.4 -21°55.6	32°41.2 -21°56.0	47°40.9 -21°56.4	62°40.7 -21°56.7	77°40.5 -21°57.1	-0.2 -0.4
Sa 2	272°37.3 -22°01.9	287°37.1 -22°02.2	302°36.9 -22°02.6	317°36.6 -22°03.0	332°36.4 -22°03.3	347°36.1 -22°03.7	2°35.9 -22°04.0	17°35.6 -22°04.4	32°35.4 -22°04.7	47°35.2 -22°05.1	62°34.9 -22°05.5	77°34.7 -22°05.8	-0.2 -0.4
Su 3	272°31.5 -22°10.3	287°31.2 -22°10.7	302°31.0 -22°11.0	317°30.7 -22°11.4	332°30.5 -22°11.7	347°30.2 -22°12.0	2°30.0 -22°12.4	17°29.7 -22°12.7	32°29.5 -22°13.1	47°29.2 -22°13.4	62°29.0 -22°13.7	77°28.7 -22°14.1	-0.2 -0.3
Mo 4	272°25.5 -22°18.4	287°25.2 -22°18.7	302°24.9 -22°19.0	317°24.7 -22°19.3	332°24.4 -22°19.7	347°24.2 -22°20.0	2°23.9 -22°20.3	17°23.7 -22°20.6	32°23.4 -22°21.0	47°23.2 -22°21.3	62°22.9 -22°21.6	77°22.7 -22°21.9	-0.3 -0.3
Tu 5	272°19.3 -22°26.0	287°19.0 -22°26.3	302°18.8 -22°26.6	317°18.5 -22°26.9	332°18.3 -22°27.2	347°18.0 -22°27.5	2°17.7 -22°27.8	17°17.5 -22°28.1	32°17.2 -22°28.4	47°16.9 -22°28.7	62°16.7 -22°29.0	77°16.4 -22°29.3	-0.3 -0.3
We 6	272°13.0 -22°33.1	287°12.7 -22°33.4	302°12.5 -22°33.7	317°12.2 -22°34.0	332°11.9 -22°34.3	347°11.7 -22°34.6	2°11.4 -22°34.9	17°11.1 -22°35.2	32°10.9 -22°35.4	47°10.6 -22°35.7	62°10.3 -22°36.0	77°10.1 -22°36.3	-0.3 -0.3
Th 7	272°06.6 -22°39.9	287°06.3 -22°40.1	302°06.0 -22°40.4	317°05.7 -22°40.7	332°05.5 -22°40.9	347°05.2 -22°41.2	2°04.9 -22°41.5	17°04.7 -22°41.7	32°04.4 -22°42.0	47°04.1 -22°42.3	62°03.8 -22°42.5	77°03.6 -22°42.8	-0.3 -0.3
Fr 8	272°00.0 -22°52.0	286°59.7 -22°52.2	301°59.5 -22°52.5	316°59.2 -22°52.7	331°58.9 -22°52.9	346°58.6 -22°53.1	1°58.3 -22°53.4	16°58.1 -22°53.6	31°57.8 -22°53.8	46°57.5 -22°54.1	61°57.2 -22°54.3	76°57.0 -22°54.5	-0.3 -0.2
Sa 9	271°53.3 -22°59.3	286°53.0 -22°59.6	301°52.8 -22°59.8	316°52.5 -22°59.9	331°52.2 -22°59.9	346°51.9 -22°59.9	1°51.6 -22°59.9	16°51.4 -22°59.9	31°51.1 -22°59.9	46°50.8 -22°59.9	61°50.5 -22°59.9	76°50.2 -22°59.9	-0.3 -0.2
Su 10	271°46.5 -22°56.4	286°46.2 -22°56.6	301°46.0 -22°56.8	316°45.7 -22°56.8	331°45.4 -22°56.8	346°45.1 -22°56.8	1°44.8 -22°56.8	16°44.5 -22°56.8	31°44.2 -22°56.8	46°44.0 -22°56.8	61°43.7 -22°56.8	76°43.4 -22°56.8	-0.3 -0.2
Mo 11	271°39.9 -23°02.3	286°39.3 -23°02.5	301°39.1 -23°02.7	316°38.8 -23°02.9	331°38.5 -23°03.1	346°38.2 -23°03.3	1°37.9 -23°03.3	16°37.6 -23°03.7	31°37.3 -23°03.8	46°37.0 -23°04.0	61°36.7 -23°04.2	76°36.4 -23°04.4	-0.3 -0.2
Tu 12	271°33.2 -23°06.8	286°32.3 -23°07.0	301°32.1 -23°07.2	316°31.8 -23°07.3	331°31.5 -23°07.5	346°31.2 -23°07.6	1°30.9 -23°07.8	16°30.6 -23°08.0	31°30.3 -23°08.2	46°30.0 -23°08.3	61°29.7 -23°08.4	76°29.4 -23°08.7	-0.3 -0.2
We 13	271°25.6 -23°10.8	286°25.3 -23°10.9	301°25.0 -23°11.1	316°24.7 -23°11.3	331°24.4 -23°11.6	346°24.1 -23°11.7	1°23.8 -23°11.9	16°23.5 -23°12.0	31°23.2 -23°12.0	46°22.9 -23°12.0	61°22.6 -23°12.3	76°22.3 -23°12.5	-0.3 -0.2
Th 14	271°18.4 -23°14.8	286°18.1 -23°14.5	301°17.8 -23°14.6	316°17.3 -23°14.8	331°17.2 -23°14.9	346°16.9 -23°15.0	1°16.6 -23°15.2	16°16.3 -23°15.3	31°16.0 -23°15.4	46°15.7 -23°15.6	61°15.4 -23°15.7	76°15.1 -23°15.8	-0.3 -0.2
Fr 15	271°11.2 -23°17.4	286°10.9 -23°17.5	301°10.5 -23°17.7	316°10.2 -23°17.8	331°09.9 -23°17.9	346°09.6 -23°18.0	1°09.3 -23°18.2	16°09.0 -23°18.2	31°08.7 -23°18.4	46°08.4 -23°18.5	61°08.1 -23°18.6	76°07.8 -23°18.7	-0.3 -0.3
Sa 16	271°03.9 -23°20.1	286°03.6 -23°20.2	301°03.2 -23°20.3	316°02.9 -23°20.4	331°02.6 -23°20.5	346°02.3 -23°20.6	1°02.0 -23°20.6	16°01.7 -23°20.7	31°01.4 -23°20.8	46°01.1 -23°20.9	61°00.8 -23°21.0	76°00.5 -23°21.1	-0.3 -0.3
Su 17	270°56.5 -23°22.2	285°56.2 -23°22.3	300°55.9 -23°22.4	315°55.6 -23°22.5	330°55.3 -23°22.5	345°55.0 -23°22.6	0°54.7 -23°22.7	15°54.4 -23°22.8	30°54.0 -23°22.8	45°53.7 -23°22.9	60°53.4 -23°23.0	75°53.1 -23°23.0	-0.3 -0.1
Mo 18	270°49.1 -23°23.9	285°48.8 -23°24.0	300°48.5 -23°24.1	315°48.2 -23°24.1	330°47.9 -23°24.2	345°47.6 -23°24.2	0°47.3 -23°24.2	15°47.0 -23°24.3	30°46.6 -23°24.4	45°46.3 -23°24.4	60°46.0 -23°24.5	75°45.7 -23°24.5	-0.3 -0.3
Tu 19	270°41.7 -23°25.1	285°41.4 -23°25.2	300°41.0 -23°25.2	315°40.8 -23°25.2	330°40.5 -23°25.3	345°40.1 -23°25.3	0°39.8 -23°25.4	15°39.5 -23°25.4	30°39.2 -23°25.4	45°38.9 -23°25.5	60°38.6 -23°25.5	75°38.3 -23°25.5	-0.3 -0.0
We 20	270°34.2 -23°26.8	285°33.9 -23°26.9	300°33.6 -23°26.9	315°33.3 -23°26.9	330°33.0 -23°26.0	345°32.7 -23°26.0	0°32.4 -23°26.0	15°32.1 -23°26.0	30°31.8 -23°26.0	45°31.4 -23°26.0	60°31.1 -23°26.0	75°30.8 -23°26.1	-0.3 -0.0
Th 21	270°26.8 -23°26.2	285°26.5 -23°26.2	300°26.2 -23°26.2	315°25.8 -23°26.2	330°25.5 -23°26.2	345°25.2 -23°26.2	0°24.9 -23°26.1	15°24.6 -23°26.1	30°24.3 -23°26.1	45°24.0 -23°26.1	60°23.7 -23°26.1	75°23.4 -23°26.1	-0.3 +0.0
Fr 22	270°19.3 -23°26.0	285°19.0 -23°25.9	300°18.7 -23°25.9	315°18.4 -23°25.9	330°18.1 -23°25.9	345°17.8 -23°25.9	0°17.4 -23°25.8	15°17.1 -23°25.8	30°16.8 -23°25.8	45°16.5 -23°25.8	60°16.2 -23°25.7	75°15.9 -23°25.7	-0.3 +0.0
Sa 23	270°11.9 -23°25.3	285°11.5 -23°25.3	300°11.2 -23°25.2	315°10.9 -23°25.2	330°10.6 -23°25.1	345°10.3 -23°25.1	0°10.0 -23°25.1	15°09.7 -23°25.0	30°09.4 -23°25.0	45°09.1 -23°25.0	60°08.7 -23°24.9	75°08.4 -23°24.8	-0.3 +0.0
Su 24	270°04.4 -23°24.2	285°04.1 -23°24.1	300°03.8 -23°24.1	315°03.5 -23°24.0	330°03.2 -23°23.9	345°02.9 -23°23.9	0°02.5 -23°23.8	15°02.2 -23°23.7	30°01.9 -23°23.7	45°01.6 -23°23.6	60°01.3 -23°23.6	75°01.0 -23°23.5	-0.3 +0.1
Mo 25	269°56.7 -23°22.6	284°56.7 -23°22.5	299°56.4 -23°22.4	314°56.0 -23°22.3	330°55.7 -23°22.3	344°55.4 -23°22.2	359°55.1 -23°22.1	14°54.8 -23°22.0	29°54.5 -23°21.9	44°54.2 -23°21.8	59°53.9 -23°21.8	74°53.6 -23°21.7	-0.3 +0.1
Tu 26	269°49.6 -23°20.5	284°49.3 -23°20.4	299°49.0 -23°20.3	314°48.6 -23°20.2	330°48.3 -23°20.1	344°48.0 -23°20.0	359°47.7 -23°19.9	14°47.4 -23°19.8	29°47.1 -23°19.7	44°46.8 -23°19.6	59°46.5 -23°19.6	74°46.2 -23°19.4	-0.3 +0.1
We 27	269°42.2 -23°18.0	284°41.9 -23°17.8	299°41.6 -23°17.7	314°41.3 -23°17.6	330°41.0 -23°17.5	344°40.7 -23°17.4	359°40.4 -23°17.2	14°40.1 -23°17.1	29°39.8 -23°17.0	44°39.5 -23°16.9	59°39.1 -23°16.8	74°38.8 -23°16.6	-0.3 +0.1
Th 28	269°34.9 -23°14.9	284°34.6 -23°14.8	299°34.3 -23°14.7	314°34.0 -23°14.6	330°33.7 -23°14.4	344°33.4 -23°14.3	359°33.1 -23°14.1	14°32.8 -23°14.0	29°32.5 -23°13.8	44°32.2 -23°13.7	59°31.9 -23°13.6	74°31.5 -23°13.4	-0.3 +0.1
Fr 29	269°27.6 -23°11.5	284°27.3 -23°11.3	299°27.0 -23°11.2	314°26.7 -23°11.0	330°26.4 -23°10.9	344°26.1 -23°10.7	359°25.8 -23°10.5	14°25.5 -23°10.4	29°25.2 -23°10.2	44°24.9 -23°10.1	59°24.6 -23°09.9	74°24.3 -23°09.7	-0.3 +0.2
Sa 30	269°20.2 -23°07.5	284°20.1 -23°07.3	299°19.8 -23°07.2	314°19.5 -23°07.0	330°19.2 -23°06.8	344°18.9 -23°06.7	359°18.6 -23°06.5	14°18.3 -23°06.3	29°18.0 -23°06.1	44°17.7 -23°05.9	59°17.4 -23°05.8	74°17.1 -23°05.6	-0.3 +0.2
Su 31	269°13.3 -23°03.1	284°13.0 -23°03.0	299°12.7 -23°02.8	314°12.4 -23°02.6	330°12.1 -23°02.4	344°11.8 -23°02.2	359°11.5 -23°02.0	14°11.2 -23°01.8	29°10.9 -23°01.6	44°10.6 -23°01.4	59°10.3 -23°01.2	74°10.0 -23°01.0	-0.3 +0.2

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.3'

MOON

December 2028

	D	15h	16h	17h	18h	19h	20h	21h	22h	23h	0h	1h	Δ'/h	SH
O	Fr 1	248 ⁰² 22.7 24 ⁰² 23.3	262 ⁰⁵ 50.2 24 ⁰² 26.8	277 ¹⁷ 17.7 24 ⁰³ 30.3	291 ⁴⁵ 45.0 24 ⁰³ 36.6	306 ¹² 12.3 24 ⁰³ 36.7	320 ³⁹ 66.8 24 ⁰³ 39.8	335 ⁰⁶ 06.8 24 ⁰⁴ 42.7	349 ³⁴ 50.0 24 ⁰⁴ 45.5	4 ⁰¹ 01.1 24 ⁰⁴ 48.1	18 ⁰² 28.1 24 ⁰⁵ 00.2	32 ⁵⁵ 55.1 24 ⁰⁵ 29.9	+27.2	15.3
	Sa 2	249 ⁰³ 34.7 25 ¹¹ 11.4	264 ⁰¹ 01.1 25 ¹¹ 11.5	278 ²⁷ 27.4 25 ¹¹ 11.4	292 ⁵³ 53.7 25 ¹¹ 12.2	307 ²⁰ 20.0 25 ¹⁰ 10.8	321 ⁴⁶ 33.0 25 ¹⁰ 10.3	336 ¹² 15.5 25 ⁰⁹ 09.6	350 ³⁸ 7.7 25 ⁰⁸ 08.7	5 ⁰⁴ 04.9 25 ⁰⁷ 07.9	19 ³¹ 31.1 25 ⁰⁶ 06.8	33 ⁵⁷ 57.3 25 ⁰⁵ 05.5	+26.3	15.5
	Su 3	250 ²⁹ 29.2 24 ²⁹ 29.0	264 ⁵⁵ 54.4 24 ²⁵ 25.3	279 ²¹ 21.5 24 ²¹ 21.6	293 ⁴⁷ 47.7 24 ¹⁷ 17.6	308 ¹³ 13.9 24 ¹³ 13.6	322 ⁴⁰ 40.1 24 ⁰⁹ 40.4	337 ⁰⁶ 06.3 24 ⁰⁵ 05.0	351 ³² 6.6 24 ⁰⁰ 05.5	5 ⁵⁸ 58.8 23 ⁵⁵ 55.9	20 ²⁵ 25.1 23 ⁵¹ 51.1	34 ⁵¹ 51.4 23 ⁴⁶ 11.1	+26.2	15.6
O	Mo 4	251 ⁰² 29.5 22 ¹⁵ 15.2	265 ⁵⁶ 56.3 22 ⁰⁸ 08.1	280 ²³ 23.2 22 ⁰⁰ 00.8	294 ⁵⁰ 15.1 21 ⁵³ 53.3	309 ¹⁷ 17.0 21 ⁴⁵ 45.8	323 ⁴⁴ 00.0 21 ³⁸ 11.1	338 ¹¹ 11.3 21 ³⁰ 30.3	352 ³⁸ 1.1 21 ²² 32.3	7 ⁰⁵ 05.3 21 ¹⁴ 13.3	21 ³² 4.4 21 ⁰⁶ 11.1	35 ⁵⁹ 59.6 20 ⁵⁷ 57.7	+27.0	15.7
	Tu 5	252 ⁵³ 53.8 18 ³⁸ 38.4	267 ²¹ 21.8 18 ²⁸ 28.2	281 ⁴⁹ 49.9 18 ¹⁷ 17.8	296 ¹⁸ 00.0 18 ⁰⁷ 07.4	310 ⁴⁶ 22.2 17 ⁵⁶ 56.9	325 ¹⁴ 55.5 17 ⁴⁶ 46.2	339 ⁴² 7.7 17 ³⁵ 35.5	354 ¹¹ 1.1 17 ²⁴ 24.7	8 ³⁹ 39.5 17 ¹³ 13.7	23 ⁰⁷ 07.9 17 ⁰² 02.7	37 ³⁶ 36.4 16 ⁵¹ 51.5	+28.3	15.9
	We 6	254 ⁴⁹ 49.8 13 ⁵³ 53.2	269 ¹⁹ 19.1 13 ⁴⁰ 40.7	283 ⁴⁸ 48.4 13 ²⁸ 28.0	298 ¹⁷ 17.8 13 ¹⁵ 15.3	312 ⁴⁷ 47.2 13 ⁰² 02.5	327 ¹⁶ 16.7 12 ⁴⁹ 49.6	341 ⁴⁶ 22.2 12 ³⁶ 36.6	356 ¹⁵ 7.7 12 ²³ 23.6	10 ⁴⁵ 45.3 12 ¹⁰ 10.5	25 ¹⁵ 15.0 11 ⁵⁷ 47.4	39 ⁴⁴ 44.6 11 ⁴⁴ 44.1	+29.5	16.0
O	Th 7	257 ⁰¹ 14.1 8 ¹⁸ 18.2	271 ⁴⁴ 44.3 8 ⁰⁴ 04.0	286 ¹⁴ 14.6 7 ⁴⁹ 49.8	300 ⁴⁴ 44.8 7 ³⁵ 35.6	315 ¹⁵ 15.1 7 ²¹ 21.3	329 ⁴⁵ 45.4 7 ⁰⁶ 06.9	344 ¹⁵ 15.8 6 ⁵² 52.6	358 ⁴⁶ 1.1 6 ³⁸ 38.1	13 ¹⁶ 16.5 6 ²³ 23.7	27 ⁴⁶ 46.9 6 ⁰⁹ 09.2	42 ¹⁷ 17.3 5 ⁵⁴ 54.6	+30.3	16.0
	Fr 8	259 ⁵⁵ 55.1 2 ¹³ 13.0	274 ²⁵ 25.7 1 ⁵⁸ 1.1	288 ⁵⁶ 56.2 1 ⁴³ 13.1	303 ²⁶ 26.8 1 ²⁸ 1.1	317 ⁵⁷ 57.4 1 ¹³ 13.1	332 ²⁷ 27.9 0 ⁵⁸ 11.1	346 ⁵⁸ 5.5 0 ⁴³ 11.1	1 ²⁹ 00.0 0 ²⁸ 11.1	15 ⁵⁹ 59.6 0 ¹³ 11.1	30 ³⁰ 30.1 -0 ⁰¹ 01.9	45 ⁰⁰ 00.7 -0 ¹⁷ 17.0	+30.6	16.1
	Sa 9	274 ²⁵ 25.7 1 ⁵⁸ 1.1	288 ⁵⁶ 56.2 1 ⁴³ 13.1	303 ²⁶ 26.8 1 ²⁸ 1.1	317 ⁵⁷ 57.4 1 ¹³ 13.1	332 ²⁷ 27.9 0 ⁵⁸ 11.1	346 ⁵⁸ 5.5 0 ⁴³ 11.1	6 ²⁴ 27.0 -11 ⁴² 05.9	20 ⁵³ 5.5 -11 ⁵⁶ 4.4	35 ²² 3.3 -12 ⁰⁹ 09.9	49 ⁵¹ 0.0 -12 ²³ 23.3	64 ¹⁹ 19.8 -12 ³⁶ 36.7	+28.9	16.2
O	Su 10	277 ⁰⁶ 06.9 -4 ¹⁷ 10.0	291 ³⁷ 1.1 -4 ³¹ 9.9	306 ⁰⁷ 07.3 -4 ⁴⁶ 7.7	320 ³⁷ 5.5 -5 ⁰¹ 06.6	335 ⁰⁷ 6.6 -5 ¹⁶ 16.4	349 ³⁷ 6.6 -5 ³¹ 21.2	4 ⁰⁷ 7.7 -5 ⁴⁶ 00.8	18 ³⁷ 7.7 -6 ⁰⁰ 00.8	33 ⁰⁷ 7.7 -6 ¹⁵ 15.5	47 ³⁷ 6.6 -6 ³⁰ 30.2	62 ⁰⁷ 5.5 -6 ⁴⁴ 48.8	+30.1	16.2
	Mo 11	279 ³⁰ 7.7 -10 ¹⁹ 19.9	293 ⁵⁹ 8.8 -10 ³³ 0.0	308 ²⁸ 9.9 -10 ⁴⁷ 8.8	325 ⁵⁸ 0.0 -11 ⁰¹ 06.6	337 ²⁶ 0.0 -11 ¹⁵ 15.4	351 ⁵⁵ 9.9 -11 ²⁹ 1.1	6 ²⁴ 27.0 -11 ⁴² 05.9	20 ⁵³ 5.5 -11 ⁵⁶ 4.4	35 ²² 3.3 -12 ⁰⁹ 09.9	49 ⁵¹ 0.0 -12 ²³ 23.3	64 ¹⁹ 19.8 -12 ³⁶ 36.7	+28.9	16.2
	Tu 12	281 ²¹ 4.4 -15 ⁴⁸ 4.4	295 ⁴⁹ 0.0 -16 ⁰⁰ 0.4	310 ¹⁶ 5.5 -16 ¹² 4.4	324 ⁴⁴ 0.0 -16 ²⁴ 4.3	339 ¹¹ 3.3 -16 ³⁶ 4.3	353 ³⁸ 7.7 -16 ⁴⁷ 7.7	8 ⁰⁵ 05.9 -16 ⁵⁹ 3.3	22 ³³ 1.1 -17 ¹⁰ 10.8	37 ⁰⁰ 0.2 -17 ²² 22.2	51 ²⁷ 2.2 -17 ³³ 35.5	65 ⁵⁴ 4.4 -17 ⁴⁴ 47.7	+27.3	16.2
O	We 13	282 ³⁰ 2.2 -20 ¹⁸ 18.6	296 ⁵⁶ 1.1 -20 ²⁷ 9.9	311 ²¹ 9.9 -20 ³⁷ 0.0	325 ⁴⁷ 6.6 -20 ⁴⁶ 1.1	340 ¹³ 3.3 -20 ⁵⁵ 0.0	354 ³⁸ 9.9 -21 ⁰³ 7.7	9 ⁰⁴ 4.4 -21 ¹² 3.3	23 ²⁹ 9.9 -21 ²⁰ 20.0	37 ⁵⁵ 3.3 -21 ²⁹ 1.1	52 ²⁰ 7.7 -21 ³⁷ 3.3	66 ⁴⁶ 0.0 -21 ⁴⁵ 4.4	+25.6	16.1
	Th 14	282 ⁵⁹ 4.9 -23 ²⁸ 9.9	297 ²³ 9.9 -23 ³⁴ 5.5	311 ⁴⁸ 4.4 -23 ⁴⁰ 1.1	326 ¹² 9.9 -23 ⁴⁵ 4.4	340 ²³ 9.9 -23 ⁵⁰ 0.0	355 ⁰¹ 7.7 -23 ⁵⁵ 0.0	9 ²⁶ 1.1 -24 ⁰⁰ 0.0	23 ⁵⁰ 4.4 -24 ⁰⁵ 0.0	38 ¹⁴ 7.7 -24 ⁰⁹ 9.9	52 ³⁹ 0.0 -24 ¹³ 3.3	67 ⁰³ 3.3 -24 ¹⁸ 6.6	+24.4	16.0
	Fr 15	283 ⁰⁵ 9.9 -25 ⁰² 8.8	297 ³⁰ 0.0 -25 ⁰⁴ 8.8	311 ⁵⁴ 2.2 -25 ⁰⁵ 9.9	326 ¹⁸ 4.4 -25 ⁰⁷ 2.2	340 ²⁶ 5.5 -25 ⁰⁸ 3.3	355 ⁰⁶ 8.8 -25 ⁰⁹ 3.3	9 ³¹ 0.0 -25 ¹⁰ 1.1	23 ⁵⁵ 3.3 -25 ¹¹ 2.2	38 ¹⁹ 6.6 -25 ¹¹ 2.2	52 ⁴³ 9.9 -25 ¹¹ 7.7	67 ⁰⁸ 2.2 -25 ¹¹ 7.7	+24.2	15.9
O	Sa 16	283 ¹⁷ 8.8 -24 ⁵⁴ 7.7	297 ⁴² 8.8 -24 ⁵² 6.6	312 ⁰⁷ 9.9 -24 ⁴⁹ 7.7	326 ³³ 0.0 -24 ⁴⁷ 7.7	340 ⁵⁸ 2.2 -24 ⁴⁴ 4.4	355 ²³ 5.5 -24 ⁴¹ 2.2	9 ⁴⁸ 8.8 -24 ³⁸ 0.0	24 ¹⁴ 3.3 -24 ³⁴ 7.7	38 ³⁹ 4.4 -24 ³¹ 3.3	53 ⁰⁵ 2.2 -24 ²⁷ 7.7	67 ³⁰ 9.9 -24 ²³ 9.9	+25.3	15.7
	Su 17	284 ⁰⁴ 3.3 -23 ¹¹ 0.0	298 ³¹ 2.2 -23 ⁰⁵ 1.1	312 ⁵⁸ 2.2 -22 ⁵⁹ 0.0	327 ²⁵ 3.3 -22 ⁵² 9.9	341 ⁶² 5.5 -22 ⁴⁶ 0.0	356 ¹⁹ 8.8 -22 ⁴⁰ 1.1	10 ⁴⁷ 1.1 -22 ³³ 6.6	25 ¹⁴ 6.6 -22 ²⁶ 9.9	39 ⁴² 1.1 -22 ²⁰ 2.2	54 ⁰⁹ 9.9 -22 ¹³ 3.3	68 ³⁷ 5.5 -22 ⁰⁶ 2.2	+27.3	15.5
	Mo 18	285 ⁴⁵ 1.1 -20 ⁰⁸ 0.0	300 ¹⁴ 4.4 -19 ⁵⁹ 3.3	314 ⁴³ 7.7 -19 ⁵⁰ 5.5	329 ¹³ 2.2 -19 ⁴¹ 7.7	343 ⁴² 6.6 -19 ³² 7.7	358 ¹² 5.5 -19 ²³ 6.6	10 ⁴² 2.2 -19 ¹⁴ 5.5	27 ¹² 1.1 -19 ⁰⁵ 3.3	41 ⁴² 4.4 -18 ⁵⁶ 0.0	56 ¹² 1.1 -18 ⁴⁶ 6.6	70 ⁴² 3.3 -18 ³⁷ 1.1	+29.7	15.4
O	Tu 19	288 ²⁵ 6.6 -16 ⁰⁵ 8.8	302 ⁵⁷ 2.2 -15 ⁵⁵ 1.1	317 ²⁸ 9.9 -15 ⁴⁴ 4.4	333 ⁰⁰ 7.7 -15 ³³ 7.7	346 ³² 6.6 -15 ²² 9.9	360 ⁰⁰ 0.0 -15 ¹² 0.0	15 ³⁶ 6.6 -15 ⁰¹ 1.1	30 ⁰⁸ 7.7 -14 ⁵⁰ 0.0	44 ⁴⁰ 9.9 -14 ³⁹ 0.0	59 ¹³ 2.2 -14 ²⁷ 9.9	73 ⁴⁵ 6.6 -14 ¹⁶ 8.8	+32.0	15.2
	We 20	292 ⁰⁰ 1.1 -11 ²³ 9.9	306 ³³ 6.6 -11 ¹² 0.0	321 ⁰⁷ 2.2 -11 ⁰⁰ 0.0	335 ⁴⁰ 9.9 -10 ⁴⁸ 2.2	350 ¹² 4.4 -10 ³⁶ 2.2	4 ⁴⁸ 4.4 -10 ²⁴ 2.2	19 ²² 2.2 -10 ¹² 2.2	33 ⁵⁶ 2.2 -10 ⁰² 2.2	48 ³⁰ 1.1 -9 ⁴⁸ 1.1	63 ⁰⁴ 2.2 -9 ³⁵ 9.9	77 ³⁸ 2.2 -9 ²³ 8.8	+33.8	15.0
	Th 21	296 ¹⁵ 8.8 -6 ¹⁸ 7.7	310 ⁵⁰ 6.6 -6 ⁰⁶ 2.2	325 ²⁵ 5.5 -5 ⁵³ 7.7	340 ⁰⁰ 5.5 -5 ⁴¹ 2.2	354 ³⁵ 5.5 -5 ²⁸ 7.7	9 ¹⁰ 5.5 -5 ¹⁶ 1.1	23 ⁴⁵ 5.5 -5 ⁰³ 6.6	38 ²⁰ 6.6 -4 ⁵¹ 0.0	52 ⁵⁵ 8.8 -4 ³⁸ 4.4	67 ³⁰ 9.9 -4 ²⁵ 8.8	82 ⁰⁶ 1.1 -4 ¹³ 2.2	+35.0	14.9
O	Fr 22	300 ⁵⁷ 0.0 -1 ⁰³ 05.5	315 ³² 6.6 -0 ⁵⁰ 9.9	330 ⁰⁸ 1.1 -0 ³⁸ 2.2	344 ⁴³ 7.7 -0 ²⁵ 6.6	359 ¹⁹ 3.3 -0 ¹² 9.9	13 ⁵⁴ 9.9 -0 ⁰⁰ 3.3	28 ³⁰ 5.5 0 ¹² 4.4	43 ⁰⁶ 1.1 0 ²⁵ 0.0	57 ⁴¹ 8.8 0 ³⁷ 6.6	72 ¹⁷ 4.4 0 ²⁶ 0.0	86 ⁵³ 0.0 1 ⁰² 9.9	+35.6	14.8
	Sa 23	305 ⁴⁷ 4.4 4 ¹¹ 10.0	320 ²³ 4.4 4 ²³ 4.4	334 ⁵⁸ 6.6 4 ³⁵ 8.8	349 ³⁴ 1.1 4 ⁴⁸ 2.2	364 ⁰⁹ 6.6 5 ⁰⁰ 6.6	18 ⁴⁵ 1.1 5 ¹³ 10.0	33 ²⁰ 6.6 5 ²³ 5.5	47 ⁵⁶ 1.1 5 ³⁷ 6.6	62 ³¹ 6.6 5 ⁴⁹ 9.9	77 ⁰⁷ 0.0 6 ⁰² 2.2	91 ⁴² 4.4 6 ¹⁴ 5.5	+35.5	14.8
	Su 24	310 ³⁰ 5.5 9 ¹⁵ 12.9	325 ⁰⁵ 4.4 9 ²⁷ 0.0	339 ⁴⁰ 4.4 9 ³⁸ 8.8	354 ¹⁵ 2.2 9 ⁵⁰ 6.6	369 ⁰⁰ 0.0 10 ⁰² 3.3	23 ²⁴ 8.8 10 ¹⁴ 0.0	37 ⁵⁹ 6.6 10 ²⁵ 6.6	52 ³⁴ 3.3 10 ³⁷ 2.2	67 ⁰⁸ 9.9 10 ⁴⁸ 8.8	81 ⁴³ 5.5 11 ⁰⁰ 4.4	95 ¹⁸ 2.2 11 ¹¹ 9.9	+34.8	14.8
O	Mo 25	314 ⁵⁰ 5.5 13 ⁵⁹ 52.4	329 ²⁴ 4.4 14 ¹⁰ 10.0	343 ⁵⁷ 8.8 14 ²⁰ 7.7	358 ³¹ 4.4 14 ³¹ 4.4	374 ⁰⁴ 0.0 14 ⁴² 0.0	27 ³⁸ 4.4 14 ⁵² 6.6	42 ¹¹ 8.8 15 ⁰³ 1.1	56 ⁴⁵ 4.4 15 ¹³ 6.6	71 ¹⁸ 4.4 15 ²⁴ 0.0	85 ⁵¹ 6.6 15 ³⁴ 3.3	100 ²⁴ 7.7 15 ⁴⁴ 6.6	+33.4	14.9
	Tu 26	318 ³³ 0.0 18 ¹¹ 14.4	333 ⁰⁵ 0.0 18 ²⁰ 6.6	347 ³⁶ 9.9 18 ²⁹ 8.8	362 ⁰⁸ 6.6 18 ³⁸ 8.8	376 ⁴⁰ 4.4 18 ⁴⁷ 9.9	31 ¹² 0.0 18 ⁵⁶ 8.8	45 ⁴³ 6.6 19 ⁰⁵ 6.6	60 ¹⁵ 0.0 19 ¹⁴ 4.4	74 ⁴⁶ 4.4 19 ²³ 1.1	89 ¹⁷ 7.7 19 ³¹ 7.7	103 ⁴⁹ 6.6 19 ⁴⁰ 3.3	+31.6	15.0
	We 27	321 ²⁷ 4.4 21 ⁰³ 7.7	335 ⁵⁷ 2.2 21 ⁴⁴ 9.9	350 ²⁷ 0.0 21 ⁵¹ 9.9	365 ¹⁷ 0.0 21 ⁵⁸ 8.8	379 ²⁶ 4.4 22 ⁰⁵ 5.5	33 ⁵⁵ 9.9 22 ¹² 2.2	48 ²⁵ 4.4 22 ¹⁸ 2.2	62 ⁵⁴ 4.4 22 ²⁵ 3.3	77 ²⁴ 4.4 22 ³¹ 6.6	91 ⁵³ 2.2 22 ³⁷ 9.9	106 ²² 3.3 22 ⁴⁴ 0.0	+29.5	15.1
O	Th 28	323 ²⁹ 2.2 24 ⁰² 6.6	337 ⁵⁷ 1.1 24 ⁰⁶ 2.2	352 ²⁴ 8.8 24 ¹¹ 0.0	367 ⁵² 5.5 24 ¹⁵ 0.0									

SUN

January 2029

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Mo 1	269°06.2 -22°58.3	284°05.9 -22°58.1	299°05.6 -22°57.9	314°05.3 -22°57.7	329°05.0 -22°57.4	344°04.7 -22°57.2	359°04.5 -22°57.0	14°04.2 -22°56.8	29°03.9 -22°56.6	44°03.6 -22°56.4	59°03.3 -22°56.1	74°03.0 -22°55.9	-0.3 +0.2
Tu 2	268°59.2 -22°53.0	283°58.9 -22°52.7	298°58.6 -22°52.5	313°58.4 -22°52.3	328°58.1 -22°52.1	343°57.8 -22°51.8	358°57.5 -22°51.6	13°57.2 -22°51.3	28°56.9 -22°51.1	43°56.6 -22°50.9	58°56.3 -22°50.6	73°56.1 -22°50.4	-0.3 +0.2
We 3	268°52.3 -22°47.2	283°52.0 -22°47.0	298°51.8 -22°46.7	313°51.5 -22°46.5	328°51.2 -22°46.2	343°50.9 -22°46.0	358°50.6 -22°45.7	13°50.3 -22°45.4	28°50.0 -22°45.2	43°49.8 -22°44.9	58°49.5 -22°44.7	73°49.2 -22°44.4	-0.3 +0.3
Th 4	268°45.5 -22°41.0	283°45.2 -22°40.7	298°45.0 -22°40.5	313°44.7 -22°40.2	328°44.4 -22°39.9	343°44.1 -22°39.6	358°43.8 -22°39.4	13°43.6 -22°39.1	28°43.3 -22°38.8	43°43.0 -22°38.5	58°42.7 -22°38.3	73°42.4 -22°38.0	-0.3 +0.3
Fr 5	268°38.8 -22°34.3	283°38.5 -22°34.0	298°38.3 -22°33.7	313°38.0 -22°33.5	328°37.7 -22°33.2	343°37.4 -22°32.9	358°37.2 -22°32.6	13°36.9 -22°32.3	28°36.6 -22°32.0	43°36.3 -22°31.7	58°36.1 -22°31.4	73°35.8 -22°31.1	-0.3 +0.3
Sa 6	268°32.2 -22°27.2	283°32.0 -22°26.9	298°31.7 -22°26.6	313°31.4 -22°26.3	328°31.1 -22°26.0	343°30.9 -22°25.7	358°30.6 -22°25.4	13°30.3 -22°25.0	28°30.1 -22°24.7	43°29.8 -22°24.4	58°29.5 -22°24.1	73°29.2 -22°23.8	-0.3 +0.3
Su 7	268°25.7 -22°19.6	283°25.5 -22°19.3	298°25.2 -22°19.0	313°24.9 -22°18.7	328°24.7 -22°18.3	343°24.4 -22°18.0	358°24.1 -22°17.7	13°23.9 -22°17.3	28°23.6 -22°17.0	43°23.3 -22°16.7	58°23.1 -22°16.4	73°22.8 -22°16.0	-0.3 +0.3
Mo 8	268°19.4 -22°11.6	283°19.1 -22°11.3	298°18.9 -22°10.9	313°18.6 -22°10.6	328°18.3 -22°10.3	343°18.1 -22°09.9	358°17.8 -22°09.6	13°17.5 -22°09.2	28°17.3 -22°08.9	43°17.0 -22°08.5	58°16.8 -22°08.2	73°16.5 -22°07.8	-0.3 +0.3
Tu 9	268°13.1 -22°03.2	283°12.9 -22°02.8	298°12.6 -22°02.5	313°12.4 -22°02.1	328°12.1 -22°01.7	343°11.9 -22°01.4	358°11.6 -22°01.0	13°11.3 -22°00.7	28°11.1 -22°00.4	43°10.8 -21°59.9	58°10.6 -21°59.5	73°10.3 -21°59.2	-0.3 +0.4
We 10	268°07.0 -21°54.3	283°06.8 -21°53.9	298°06.5 -21°53.6	313°06.3 -21°53.2	328°06.0 -21°52.8	343°05.8 -21°52.4	358°05.5 -21°52.0	13°05.3 -21°51.7	28°05.0 -21°51.3	43°04.8 -21°50.9	58°04.5 -21°50.5	73°04.3 -21°50.1	-0.3 +0.4
Th 11	268°01.1 -21°45.0	283°00.8 -21°44.6	298°00.6 -21°44.2	313°00.3 -21°43.8	328°00.1 -21°43.4	342°59.8 -21°43.0	357°59.6 -21°42.6	12°59.3 -21°42.2	27°59.1 -21°41.8	42°58.9 -21°41.4	57°58.6 -21°41.0	72°58.4 -21°40.6	-0.2 +0.4
Fr 12	267°55.2 -21°35.3	282°55.0 -21°34.9	297°54.8 -21°34.5	312°54.5 -21°34.1	327°54.3 -21°33.6	342°54.0 -21°33.2	357°53.8 -21°32.8	12°53.6 -21°32.4	27°53.3 -21°32.0	42°53.1 -21°31.5	57°52.9 -21°31.1	72°52.6 -21°30.7	-0.2 +0.4
Sa 13	267°49.6 -21°25.2	282°49.3 -21°24.7	297°49.1 -21°24.3	312°48.9 -21°23.9	327°48.6 -21°23.4	342°48.4 -21°23.0	357°48.2 -21°22.6	12°47.9 -21°22.1	27°47.7 -21°21.7	42°47.5 -21°21.2	57°47.2 -21°20.8	72°47.0 -21°20.4	-0.2 +0.4
Su 14	267°44.0 -21°14.6	282°43.8 -21°14.1	297°43.6 -21°13.7	312°43.4 -21°13.2	327°43.1 -21°12.8	342°42.9 -21°12.3	357°42.7 -21°11.9	12°42.5 -21°11.4	27°42.2 -21°11.0	42°42.0 -21°10.5	57°41.8 -21°10.1	72°41.6 -21°09.6	-0.2 +0.5
Mo 15	267°38.7 -21°03.6	282°38.5 -21°03.2	297°38.3 -21°02.7	312°38.0 -21°02.2	327°37.8 -21°01.8	342°37.6 -21°01.3	357°37.4 -21°00.8	12°37.2 -21°00.4	27°37.0 -20°59.9	42°36.7 -20°59.4	57°36.5 -20°58.9	72°36.3 -20°58.5	-0.2 +0.5
Tu 16	267°33.5 -20°52.3	282°33.3 -20°51.8	297°33.1 -20°51.3	312°32.9 -20°50.8	327°32.7 -20°50.3	342°32.5 -20°49.8	357°32.2 -20°49.4	12°32.0 -20°48.9	27°31.8 -20°48.4	42°31.6 -20°47.9	57°31.4 -20°47.4	72°31.2 -20°46.9	-0.2 +0.5
We 17	267°28.5 -20°40.5	282°28.3 -20°40.0	297°28.1 -20°39.5	312°27.9 -20°39.0	327°27.7 -20°38.5	342°27.5 -20°38.0	357°27.3 -20°37.5	12°27.1 -20°37.0	27°26.9 -20°36.5	42°26.7 -20°36.0	57°26.5 -20°35.5	72°26.3 -20°35.0	-0.2 +0.5
Th 18	267°23.7 -20°28.3	282°23.5 -20°27.8	297°23.3 -20°27.3	312°23.1 -20°26.8	327°22.9 -20°26.3	342°22.7 -20°25.8	357°22.5 -20°25.2	12°22.3 -20°24.7	27°22.1 -20°24.2	42°21.9 -20°23.7	57°21.7 -20°23.2	72°21.5 -20°22.6	-0.2 +0.5
Fr 19	267°19.0 -20°15.8	282°18.9 -20°15.3	297°18.7 -20°14.7	312°18.5 -20°14.2	327°18.3 -20°13.7	342°18.1 -20°13.1	357°17.9 -20°12.6	12°17.7 -20°12.1	27°17.5 -20°11.5	42°17.3 -20°11.0	57°17.2 -20°10.5	72°17.0 -20°10.0	-0.2 +0.5
Sa 20	267°14.6 -20°02.9	282°14.4 -20°02.3	297°14.2 -20°01.8	312°14.0 -20°01.2	327°13.9 -20°00.7	342°13.7 -20°00.1	357°13.5 -19°59.6	12°13.3 -19°58.9	27°13.1 -19°58.5	42°13.0 -19°57.8	57°12.8 -19°57.4	72°12.6 -19°56.8	-0.2 +0.6
Su 21	267°10.3 -19°49.6	282°10.2 -19°49.0	297°10.0 -19°48.5	312°09.8 -19°47.9	327°09.6 -19°47.4	342°09.5 -19°46.8	357°09.3 -19°46.2	12°09.1 -19°45.6	27°08.9 -19°45.1	42°08.8 -19°44.5	57°08.6 -19°43.9	72°08.4 -19°43.4	-0.2 +0.6
Mo 22	267°06.3 -19°35.9	282°06.1 -19°35.3	297°05.9 -19°34.8	312°05.8 -19°34.2	327°05.6 -19°33.6	342°05.4 -19°33.0	357°05.3 -19°32.4	12°05.1 -19°31.9	27°04.9 -19°31.3	42°04.8 -19°30.7	57°04.6 -19°30.1	72°04.5 -19°29.5	-0.2 +0.6
Tu 23	267°02.4 -19°21.9	282°02.2 -19°21.3	297°02.1 -19°20.7	312°01.9 -19°20.1	327°01.8 -19°19.5	342°01.6 -19°18.9	357°01.4 -19°18.3	12°01.3 -19°17.7	27°01.1 -19°17.1	42°01.0 -19°16.5	57°00.8 -19°15.9	72°00.7 -19°15.3	-0.2 +0.6
We 24	266°58.7 -19°07.5	281°58.6 -19°06.9	296°58.4 -19°06.3	311°58.3 -19°05.7	326°58.1 -19°05.1	341°58.0 -19°04.5	356°57.8 -19°03.9	11°57.7 -19°03.2	26°57.5 -19°02.6	41°57.4 -19°02.0	56°57.2 -19°01.4	71°57.1 -19°00.8	-0.1 +0.6
Th 25	266°55.2 -18°52.8	281°55.1 -18°52.2	296°55.0 -18°51.5	311°54.8 -18°50.9	326°54.7 -18°50.3	341°54.5 -18°49.7	356°54.4 -18°49.0	11°54.3 -18°48.4	26°54.1 -18°47.8	41°54.0 -18°47.2	56°53.9 -18°46.5	71°53.7 -18°45.9	-0.1 +0.6
Fr 26	266°52.0 -18°37.7	281°51.8 -18°37.1	296°51.7 -18°36.4	311°51.6 -18°35.8	326°51.5 -18°35.2	341°51.3 -18°34.5	356°51.2 -18°33.9	11°51.1 -18°33.2	26°50.9 -18°32.6	41°50.8 -18°32.0	56°50.7 -18°31.3	71°50.6 -18°30.7	-0.1 +0.6
Sa 27	266°48.9 -18°22.3	281°48.8 -18°21.6	296°48.6 -18°21.0	311°48.6 -18°20.3	326°48.4 -18°19.7	341°48.3 -18°19.0	356°48.2 -18°18.4	11°48.1 -18°17.7	26°47.9 -18°17.1	41°47.8 -18°16.4	56°47.7 -18°15.8	71°47.6 -18°15.1	-0.1 +0.7
Su 28	266°46.4 -18°06.5	281°45.9 -18°05.9	296°45.8 -18°05.2	311°45.7 -18°04.6	326°45.6 -18°03.9	341°45.5 -18°03.2	356°45.4 -18°02.6	11°45.3 -18°01.9	26°45.2 -18°01.2	41°45.0 -18°00.6	56°44.9 -17°59.9	71°44.8 -17°59.2	-0.1 +0.7
Mo 29	266°43.4 -17°50.5	281°43.3 -17°49.8	296°43.2 -17°49.1	311°43.4 -17°48.4	326°43.3 -17°47.7	341°42.9 -17°47.1	356°42.8 -17°46.4	11°42.7 -17°45.7	26°42.6 -17°45.0	41°42.5 -17°44.4	56°42.4 -17°43.7	71°42.3 -17°43.0	-0.1 +0.7
Tu 30	266°41.0 -17°34.1	281°40.9 -17°33.4	296°40.8 -17°32.7	311°40.7 -17°32.0	326°40.6 -17°31.3	341°40.5 -17°30.6	356°40.4 -17°29.9	11°40.3 -17°29.2	26°40.0 -17°28.6	41°40.1 -17°27.9	56°40.0 -17°27.2	71°39.9 -17°26.5	-0.1 +0.7
We 31	266°38.7 -17°17.4	281°38.6 -17°16.7	296°38.5 -17°16.0	311°38.5 -17°15.3	326°38.4 -17°14.6	341°38.3 -17°13.9	356°38.2 -17°13.2	11°38.1 -17°12.5	26°38.0 -17°11.8	41°37.9 -17°11.0	56°37.8 -17°10.3	71°37.8 -17°09.6	-0.1 +0.7

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 16.3'

MOON

January 2029

	D	16h	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	Δ'/h SH
Mo 1	240°28.3	264°54.9	269°21.5	283°48.2	298°15.0	312°41.8	327°08.7	341°35.6	356°02.5	10°29.6	24°56.6	+26.8	16.0
	20°17.0	20°07.7	19°58.3	19°48.8	19°39.1	19°29.4	19°19.5	19°09.5	18°59.3	18°49.1	18°38.7	-9.8	58.7
Tu 2	241°49.0	256°17.0	270°45.0	285°13.0	299°41.1	314°09.2	328°37.4	343°05.7	357°34.0	12°02.3	26°30.8	+28.2	16.1
	15°50.0	15°37.9	15°25.8	15°13.5	15°01.2	14°48.7	14°36.2	14°23.6	14°10.9	13°58.1	13°45.2	-12.5	59.0
We 3	243°42.9	258°12.0	272°41.3	287°10.5	301°39.8	316°09.2	330°38.6	345°08.0	359°37.4	14°06.9	28°36.5	+29.4	16.2
	10°23.2	10°09.2	9°55.1	9°41.0	9°26.8	9°12.6	8°58.3	8°44.0	8°29.6	8°15.2	8°00.7	-14.3	59.3
Th 4	246°03.4	260°33.4	275°03.4	289°33.4	304°03.5	318°33.6	333°03.7	347°33.8	362°03.9	16°34.1	31°04.2	+30.1	16.2
	4°10.0	4°04.0	3°49.0	3°33.9	3°18.9	3°03.8	2°48.7	2°33.5	2°18.4	2°03.3	1°48.1	-15.1	59.4
Fr 5	248°37.3	263°07.5	277°37.7	292°07.9	306°38.1	321°08.3	335°38.5	350°08.6	364°38.8	19°08.9	33°39.0	+30.2	16.2
	-1°59.4	-2°14.5	-2°29.6	-2°44.7	-2°59.8	-3°14.8	-3°29.9	-3°44.9	-3°59.2	-4°14.8	-4°29.8	-15.0	59.3
Sa 6	251°08.4	265°38.1	280°07.8	294°37.5	309°07.2	323°36.8	338°06.4	352°35.9	367°05.4	21°34.9	36°04.3	+29.6	16.1
	-8°09.8	-8°24.2	-8°38.5	-8°52.7	-9°06.9	-9°21.0	-9°35.1	-9°49.2	-10°03.1	-10°17.0	-10°30.9	-14.1	59.2
Su 7	253°20.5	267°49.2	282°17.9	296°46.5	311°15.0	325°43.5	340°11.9	354°40.3	369°08.7	23°36.9	38°05.2	+28.5	16.1
	-13°50.6	-14°03.4	-14°16.0	-14°28.5	-14°41.0	-14°53.4	-15°05.7	-15°17.9	-15°30.0	-15°42.0	-15°53.9	-12.3	59.0
Mo 8	267°49.2	282°17.9	296°46.5	311°15.0	325°43.5	340°11.9	354°40.3	369°08.7	383°36.9	38°05.2	52°33.3	+28.4	16.1
	-14°03.4	-14°16.0	-14°28.5	-14°41.0	-14°53.4	-15°05.7	-15°17.9	-15°30.0	-15°42.0	-15°53.9	-16°05.8	-12.2	58.9
Tu 9	269°28.9	283°56.1	298°23.3	312°50.5	327°17.5	341°44.5	356°11.5	370°38.4	385°05.2	39°32.0	53°58.7	+27.0	16.0
	-18°51.2	-19°01.3	-19°11.4	-19°21.3	-19°31.1	-19°40.8	-19°50.3	-19°59.8	-20°09.1	-20°18.3	-20°27.4	-9.6	58.7
We 10	270°33.2	284°59.1	299°24.9	313°50.7	328°16.5	342°42.2	357°07.9	371°33.6	385°59.2	40°24.7	54°50.3	+25.7	15.9
	-22°28.0	-22°34.9	-22°41.7	-22°48.4	-22°54.9	-23°01.3	-23°07.6	-23°13.6	-23°19.6	-23°25.5	-23°31.1	-6.3	58.3
Th 11	271°09.7	285°34.9	300°00.0	314°25.1	328°50.2	343°15.2	357°40.3	372°05.4	386°30.5	40°55.5	55°20.6	+25.1	15.8
	-24°37.8	-24°41.0	-24°44.1	-24°47.0	-24°49.8	-24°52.4	-24°54.8	-24°57.1	-24°59.2	-25°01.2	-25°03.0	-2.5	57.9
Fr 12	271°37.9	286°03.3	300°28.6	314°53.9	329°19.4	343°44.8	358°10.3	372°35.8	387°01.3	41°26.9	55°52.6	+25.5	15.7
	-25°11.5	-25°10.8	-25°10.0	-25°09.0	-25°07.7	-25°06.5	-25°05.1	-25°03.5	-25°01.7	-24°59.9	-24°57.8	+1.4	57.4
Sa 13	272°33.2	286°49.8	301°16.3	315°43.0	330°09.7	344°36.5	359°03.3	373°30.3	387°57.3	42°24.3	56°51.5	+26.8	15.5
	-24°09.5	-24°05.5	-24°00.7	-23°55.1	-23°51.3	-23°46.4	-23°41.4	-23°36.2	-23°31.0	-23°25.5	-23°20.0	+5.0	56.9
Su 14	273°48.0	288°16.5	302°45.0	317°13.6	331°42.2	346°11.0	360°39.9	375°08.8	389°37.8	44°06.9	58°36.1	+28.8	15.4
	-21°42.1	-21°34.7	-21°27.1	-21°19.4	-21°11.7	-21°03.8	-20°55.8	-20°47.3	-20°39.5	-20°31.2	-20°22.8	+7.9	56.4
Mo 15	276°04.5	290°35.1	305°05.7	319°36.5	334°07.3	348°38.2	363°09.2	377°40.3	392°11.5	44°50.6	61°14.1	+31.0	15.2
	-18°05.9	-17°56.1	-17°46.2	-17°36.2	-17°26.2	-17°16.1	-17°05.9	-16°55.6	-16°45.3	-16°34.9	-16°24.4	-10.2	55.8
Tu 16	278°13.4	293°46.0	308°18.8	322°51.3	337°24.1	351°57.0	366°29.9	381°02.9	395°35.9	50°09.0	64°42.2	+32.9	15.1
	-13°39.8	-13°28.4	-13°17.0	-13°05.4	-12°53.9	-12°42.3	-12°30.6	-12°18.9	-12°07.2	-11°55.4	-11°43.6	-11.6	55.3
We 17	279°07.2	297°41.3	312°15.5	326°49.7	341°24.0	355°58.3	370°32.7	385°07.1	399°41.5	54°16.0	68°50.6	+34.3	14.9
	-8°42.0	-8°29.6	-8°17.2	-8°04.9	-7°52.4	-7°40.0	-7°27.5	-7°15.0	-7°02.5	-6°50.0	-6°37.5	-12.5	54.8
Th 18	287°33.4	302°08.5	316°43.7	331°18.8	345°54.0	360°29.3	375°04.5	389°39.8	404°15.1	58°50.4	73°25.7	+35.2	14.8
	-3°27.7	-3°15.0	-3°02.3	-2°49.6	-2°36.8	-2°24.1	-2°11.4	-1°58.6	-1°45.9	-1°33.2	-1°20.4	+12.7	54.4
Fr 19	292°17.5	306°53.0	321°28.8	336°04.0	350°39.5	365°15.1	379°50.6	394°26.1	409°01.7	63°37.2	78°12.7	+35.5	14.8
	1°50.0	2°02.6	2°15.2	2°27.8	2°40.4	2°53.0	3°05.6	3°18.1	3°30.6	3°43.1	3°55.6	+12.6	54.2
Sa 20	297°04.2	311°39.5	326°14.8	340°50.1	355°25.3	370°00.6	384°35.8	399°10.9	413°46.1	68°21.2	82°56.3	+35.2	14.8
	7°00.4	7°12.6	7°24.7	7°36.7	7°48.8	8°00.8	8°12.7	8°24.7	8°36.6	8°48.5	9°00.3	+12.0	54.1
Su 21	301°38.6	316°13.1	330°47.6	345°22.0	359°56.4	374°30.7	389°05.0	403°39.2	58°13.4	72°47.6	87°21.6	+34.3	14.8
	11°53.6	12°04.8	12°16.0	12°27.1	12°38.2	12°49.2	13°00.2	13°11.1	13°22.0	13°32.9	13°43.7	+11.0	54.2
Mo 22	305°46.3	320°19.4	334°52.5	349°25.5	363°58.5	378°31.4	393°04.2	407°37.0	62°09.7	76°42.7	91°14.9	+32.9	14.8
	16°19.1	16°29.0	16°38.8	16°48.5	16°58.2	17°07.9	17°17.4	17°26.9	17°36.4	17°45.7	17°55.0	+9.6	54.4
Tu 23	309°14.6	323°45.9	338°17.2	352°48.4	367°19.6	381°50.6	396°21.6	410°52.5	60°52.9	65°23.3	79°54.1	+31.0	15.0
	20°05.4	20°13.4	20°21.4	20°29.3	20°37.1	20°44.8	20°52.4	20°59.9	21°07.4	21°14.7	21°22.0	+7.7	54.9
We 24	311°54.8	326°24.2	340°55.3	355°22.7	370°51.8	385°20.8	399°49.8	53°18.7	67°47.5	82°16.2	96°44.8	+29.0	15.1
	22°59.0	23°04.6	23°10.1	23°15.5	23°20.8	23°26.0	23°31.1	23°36.1	23°40.9	23°45.7	23°50.3	+5.1	55.5
Th 25	313°45.4	328°12.9	342°40.3	357°07.6	371°34.9	385°02.1	408°29.2	54°56.3	69°23.3	83°50.3	98°17.2	+27.2	15.4
	24°44.9	24°47.5	24°50.0	24°52.3	24°54.9	24°56.6	24°58.6	25°00.4	25°02.0	25°03.6	25°05.0	+2.0	56.3
Fr 26	314°54.2	329°20.3	343°46.4	358°12.4	372°38.4	386°04.3	410°30.3	55°56.2	70°22.0	84°47.9	99°13.7	+25.9	15.6
	25°08.7	25°07.8	25°06.8	25°05.5	25°04.2	25°02.7	25°01.0	24°59.2	24°57.2	24°55.1	24°52.8	-1.6	57.2
Sa 27	315°38.6	330°04.2	344°29.8	358°55.4	373°21.0	387°46.5	402°12.1	56°37.7	71°03.3	85°28.9	99°54.6	+25.6	15.8
	24°00.3	23°55.6	23°50.7	23°45.7	23°40.5	23°35.2	23°29.7	23°24.1	23°18.3	23°12.4	23°06.3	-5.4	58.1
Su 28	316°20.8	330°46.7	345°12.7	359°38.7	374°04.7	388°30.7	402°56.8	57°22.9	71°49.1	86°15.3	100°41.5	+26.1	16.1
	21°17.3	21°08.8	21°00.3	20°51.6	20°42.7	20°33.8	20°24.7	20°15.4	20°06.0	19°56.5	19°46.9	-9.0	58.9
Mo 29	317°19.5	331°46.3	346°13.2	360°40.2	375°07.2	389°34.2	404°01.3	58°28.4	72°55.6	87°22.8	101°50.1	+27.1	16.2
	17°07.0	16°55.4	16°43.7	16°31.9	16°19.9	16°07.9	15°55.7	15°43.5	15°31.1	15°18.6	15°06.0	-12.1	59.6
Tu 30	318°44.1	333°12.1	347°40.4	361°08.1	375°36.1	390°04.2	404°32.4	60°00.6	74°28.8	88°57.0	103°25.3	+28.1	16.4
	11°46.4	11°32.4	11°18.4	11°04.2	10°50.0	10°35.8	10°21.4	10°07.0	9°52.6	9°38.0	9°23.4	-14.3	60.1
We 31	320°33.6	335°02.4	349°31.2	364°00.0	378°28.8	392°57.7	407°26.6	61°55.5	76°24.5	90°53.4	105°22.4	+28.9	16.4
	5°38.4	5°23.0	5°07.6	4°52.2	4°36.8	4°21.3	4°05.9	3°50.4	3°34.8	3°19.3	3°03.7	-15.5	60.3

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 7 13h26 — NM: 14 17h24 — FQ: 22 19h23 — FM: 30 06h03

SUN

February 2029

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Th 1	266°36.7 -17°00.4	281°36.6 -16°59.7	296°36.5 -16°59.0	311°36.4 -16°58.2	326°36.4 -16°57.5	341°36.3 -16°56.8	356°36.2 -16°56.1	11°36.1 -16°55.4	26°36.0 -16°54.6	41°36.0 -16°53.9	56°35.9 -16°53.2	71°35.8 -16°52.5	-0.1 +0.7
Fr 2	266°34.8 -16°43.1	281°34.8 -16°42.4	296°34.7 -16°41.6	311°34.6 -16°40.9	326°34.6 -16°40.2	341°34.5 -16°39.4	356°34.4 -16°38.7	11°34.3 -16°38.0	26°34.3 -16°37.2	41°34.2 -16°36.5	56°34.1 -16°35.8	71°34.1 -16°35.1	-0.1 +0.7
Sa 3	266°33.2 -16°25.5	281°33.1 -16°24.7	296°33.1 -16°24.0	311°33.0 -16°23.3	326°33.0 -16°22.5	341°32.9 -16°21.8	356°32.8 -16°21.0	11°32.8 -16°20.3	26°32.7 -16°19.6	41°32.6 -16°18.8	56°32.6 -16°18.1	71°32.5 -16°17.3	-0.1 +0.7
Su 4	266°31.8 -16°07.6	281°31.7 -16°06.8	296°31.7 -16°06.1	311°31.6 -16°05.3	326°31.5 -16°04.6	341°31.5 -16°03.8	356°31.4 -16°03.1	11°31.4 -16°02.3	26°31.3 -16°01.6	41°31.3 -16°00.8	56°31.2 -16°00.1	71°31.2 -15°59.3	-0.1 +0.8
Mo 5	266°30.5 -15°49.4	281°30.5 -15°48.7	296°30.4 -15°47.9	311°30.4 -15°47.1	326°30.3 -15°46.4	341°30.3 -15°45.6	356°30.2 -15°44.8	11°30.2 -15°44.1	26°30.2 -15°43.3	41°30.1 -15°42.5	56°30.1 -15°41.8	71°30.0 -15°41.0	-0.0 +0.8
Tu 6	266°29.5 -15°31.0	281°29.4 -15°30.2	296°29.4 -15°29.4	311°29.4 -15°28.7	326°29.3 -15°27.9	341°29.3 -15°27.1	356°29.2 -15°26.3	11°29.2 -15°25.6	26°29.2 -15°24.8	41°29.1 -15°24.0	56°29.1 -15°23.2	71°29.1 -15°22.5	-0.0 +0.8
We 7	266°28.6 -15°12.3	281°28.6 -15°11.5	296°28.6 -15°10.7	311°28.5 -15°09.9	326°28.5 -15°09.1	341°28.5 -15°08.4	356°28.4 -15°07.6	11°28.4 -15°06.8	26°28.4 -15°06.0	41°28.4 -15°05.2	56°28.3 -15°04.4	71°28.3 -15°03.6	-0.0 +0.8
Th 8	266°28.0 -14°53.3	281°27.9 -14°52.5	296°27.9 -14°51.7	311°27.9 -14°50.9	326°27.9 -14°50.1	341°27.9 -14°49.3	356°27.8 -14°48.5	11°27.8 -14°47.7	26°27.8 -14°46.9	41°27.8 -14°46.1	56°27.8 -14°45.3	71°27.7 -14°44.5	-0.0 +0.8
Fr 9	266°27.5 -14°34.1	281°27.5 -14°33.3	296°27.5 -14°32.5	311°27.5 -14°31.7	326°27.4 -14°30.9	341°27.4 -14°30.1	356°27.4 -14°29.3	11°27.4 -14°28.5	26°27.4 -14°27.6	41°27.4 -14°26.8	56°27.4 -14°26.0	71°27.4 -14°25.2	-0.0 +0.8
Sa 10	266°27.2 -14°14.6	281°27.2 -14°13.8	296°27.2 -14°13.0	311°27.2 -14°12.2	326°27.2 -14°11.4	341°27.2 -14°10.6	356°27.2 -14°09.7	11°27.2 -14°08.9	26°27.2 -14°08.1	41°27.2 -14°07.3	56°27.2 -14°06.5	71°27.2 -14°05.6	-0.0 +0.8
Su 11	266°27.1 -13°54.9	281°27.2 -13°54.1	296°27.3 -13°53.3	311°27.3 -13°52.5	326°27.2 -13°51.6	341°27.2 -13°50.8	356°27.2 -13°50.0	11°27.2 -13°49.1	26°27.2 -13°48.3	41°27.2 -13°47.5	56°27.2 -13°46.7	71°27.2 -13°45.8	+0.0 +0.8
Mo 12	266°27.3 -13°35.0	281°27.3 -13°34.2	296°27.3 -13°33.3	311°27.3 -13°32.5	326°27.3 -13°31.7	341°27.3 -13°30.8	356°27.3 -13°30.0	11°27.3 -13°29.2	26°27.3 -13°28.3	41°27.3 -13°27.5	56°27.4 -13°26.6	71°27.4 -13°25.8	+0.0 +0.8
Tu 13	266°27.5 -13°14.9	281°27.6 -13°14.0	296°27.6 -13°13.2	311°27.6 -13°12.3	326°27.6 -13°11.5	341°27.6 -13°10.6	356°27.7 -13°09.8	11°27.7 -13°08.9	26°27.7 -13°08.1	41°27.7 -13°07.3	56°27.7 -13°06.4	71°27.7 -13°05.5	+0.0 +0.8
We 14	266°28.0 -12°54.5	281°28.1 -12°53.6	296°28.1 -12°52.8	311°28.1 -12°51.9	326°28.1 -12°51.1	341°28.2 -12°50.2	356°28.2 -12°49.4	11°28.2 -12°48.5	26°28.2 -12°47.6	41°28.3 -12°46.8	56°28.3 -12°45.9	71°28.3 -12°45.1	+0.0 +0.9
Th 15	266°28.7 -12°33.9	281°28.7 -12°33.0	296°28.8 -12°32.2	311°28.8 -12°31.3	326°28.8 -12°30.5	341°28.9 -12°29.6	356°28.9 -12°28.7	11°28.9 -12°27.9	26°29.0 -12°27.0	41°29.0 -12°26.1	56°29.0 -12°25.3	71°29.1 -12°24.4	+0.0 +0.9
Fr 16	266°29.5 -12°13.6	281°29.6 -12°12.3	296°29.6 -12°11.4	311°29.7 -12°10.5	326°29.7 -12°09.6	341°29.7 -12°08.8	356°29.8 -12°07.9	11°29.8 -12°07.0	26°29.9 -12°06.2	41°29.9 -12°05.3	56°29.9 -12°04.4	71°30.0 -12°03.5	+0.0 +0.9
Sa 17	266°30.6 -11°52.2	281°30.6 -11°51.3	296°30.6 -11°50.4	311°30.7 -11°49.5	326°30.7 -11°48.6	341°30.8 -11°47.8	356°30.8 -11°46.9	11°30.9 -11°46.0	26°30.9 -11°45.1	41°31.0 -11°44.2	56°31.0 -11°43.4	71°31.1 -11°42.5	+0.0 +0.9
Su 18	266°31.8 -11°31.0	281°31.8 -11°30.1	296°31.9 -11°29.2	311°31.9 -11°28.3	326°32.0 -11°27.4	341°32.0 -11°26.6	356°32.1 -11°25.7	11°32.1 -11°24.8	26°32.2 -11°23.9	41°32.2 -11°23.0	56°32.3 -11°22.1	71°32.4 -11°21.2	+0.1 +0.9
Mo 19	266°33.1 -11°09.6	281°33.8 -11°08.8	296°33.8 -11°07.9	311°33.8 -11°07.0	326°33.9 -11°06.1	341°33.4 -11°05.2	356°33.5 -11°04.3	11°33.6 -11°03.4	26°33.6 -11°02.5	41°33.7 -11°01.6	56°33.7 -11°00.7	71°33.8 -10°59.8	+0.1 +0.9
Tu 20	266°34.7 -10°48.1	281°34.7 -10°47.2	296°34.8 -10°46.3	311°34.9 -10°45.4	326°34.9 -10°44.5	341°35.0 -10°43.6	356°35.1 -10°42.7	11°35.1 -10°41.8	26°35.2 -10°40.9	41°35.3 -10°40.0	56°35.4 -10°39.1	71°35.4 -10°38.2	+0.1 +0.9
We 21	266°36.5 -10°26.5	281°36.5 -10°25.5	296°36.5 -10°24.6	311°36.5 -10°23.7	326°36.7 -10°22.8	341°36.8 -10°21.9	356°36.8 -10°21.0	11°36.9 -10°20.1	26°37.0 -10°19.2	41°37.1 -10°18.3	56°37.1 -10°17.4	71°37.2 -10°16.5	+0.1 +0.9
Th 22	266°38.2 -10°04.6	281°38.3 -10°03.7	296°38.4 -10°02.8	311°38.5 -10°01.9	326°38.6 -10°01.0	341°38.7 -10°00.0	356°38.7 -9°59.1	11°38.8 -9°58.2	26°38.9 -9°57.3	41°39.0 -9°56.4	56°39.1 -9°55.5	71°39.2 -9°54.6	+0.1 +0.9
Fr 23	266°40.3 -9°42.6	281°40.4 -9°41.7	296°40.5 -9°40.8	311°40.5 -9°39.9	326°40.6 -9°38.9	341°40.7 -9°38.0	356°40.8 -9°37.1	11°40.9 -9°36.2	26°41.0 -9°35.3	41°41.1 -9°34.3	56°41.2 -9°33.4	71°41.3 -9°32.5	+0.1 +0.9
Sa 24	266°42.5 -8°58.2	281°42.6 -8°57.3	296°42.7 -8°56.3	311°42.8 -8°55.4	326°42.8 -8°54.5	341°42.9 -8°53.6	356°43.0 -8°52.6	11°43.1 -8°51.7	26°43.2 -8°50.8	41°43.3 -8°49.8	56°43.4 -8°48.9	71°43.5 -8°48.0	+0.1 +0.9
Su 25	266°44.8 -8°35.8	281°44.9 -8°34.9	296°45.0 -8°33.9	311°45.1 -8°33.0	326°45.2 -8°32.1	341°45.3 -8°31.1	356°45.4 -8°30.2	11°45.5 -8°29.2	26°45.6 -8°28.3	41°45.7 -8°27.4	56°45.8 -8°26.4	71°45.9 -8°25.5	+0.1 +0.9
Mo 26	266°47.3 -8°13.3	281°47.4 -8°12.3	296°47.5 -8°11.4	311°47.6 -8°10.4	326°47.7 -8°09.5	341°47.8 -8°08.6	356°47.9 -8°07.6	11°48.0 -8°06.7	26°48.1 -8°05.7	41°48.3 -8°04.8	56°48.4 -8°03.8	71°48.5 -8°02.9	+0.1 +0.9
Tu 27	266°49.9 -7°52.7	281°50.0 -7°51.8	296°50.1 -7°50.9	311°50.3 -7°50.0	326°50.4 -7°49.1	341°50.5 -7°48.2	356°50.6 -7°47.3	11°50.7 -7°46.4	26°50.8 -7°45.5	41°50.9 -7°44.6	56°51.0 -7°43.7	71°51.2 -7°42.8	+0.1 +0.9
We 28	266°52.7 -7°30.6	281°52.8 -7°29.7	296°52.9 -7°28.7	311°53.0 -7°27.8	326°53.2 -7°26.8	341°53.3 -7°25.9	356°53.4 -7°24.9	11°53.5 -7°24.0	26°53.6 -7°23.0	41°53.7 -7°22.1	56°53.9 -7°21.1	71°54.0 -7°20.2	+0.1 +0.9

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

February 2029

	D	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	3h	Δ'/h SH
Th 1	235°43.8	250°12.9	264°42.0	279°11.1	293°40.2	308°09.3	322°38.4	337°07.6	351°36.7	6°05.8	20°35.0	+29.1	16.4
	0°43.0	0°27.3	0°11.7	-0°04.0	-0°19.6	-0°35.3	-0°50.9	-1°06.6	-1°22.2	-1°37.8	-1°53.4	-15.6	60.3
Fr 2	237°51.3	252°20.3	266°49.3	281°18.3	295°47.2	310°16.2	324°45.1	339°14.0	353°42.9	8°11.7	22°40.5	+28.9	16.4
	-5°44.7	-5°59.9	-6°15.0	-6°30.1	-6°45.1	-7°00.1	-7°15.1	-7°30.0	-7°44.8	-7°59.6	-8°14.4	-15.0	60.0
Sa 3	239°49.8	254°18.2	268°46.5	283°14.8	297°43.1	312°11.3	326°39.5	341°07.6	355°35.7	10°03.8	24°31.8	+28.2	16.3
	-11°48.0	-12°01.7	-12°15.3	-12°28.8	-12°42.3	-12°55.7	-13°08.9	-13°22.1	-13°35.6	-13°48.3	-14°01.2	-13.3	59.6
Su 4	241°27.4	255°54.8	270°22.1	284°49.3	299°16.6	313°43.8	328°10.9	342°38.0	357°05.0	11°32.0	25°59.0	+27.2	16.1
	-17°03.6	-17°14.9	-17°26.1	-17°37.2	-17°48.2	-17°59.1	-18°09.8	-18°20.5	-18°31.0	-18°41.4	-18°51.7	-10.8	59.1
Mo 5	242°38.4	257°04.7	271°31.0	285°57.2	300°23.4	314°49.6	329°15.7	343°41.8	358°07.8	12°33.8	26°59.8	+26.1	16.0
	-21°11.1	-21°19.3	-21°27.4	-21°35.4	-21°43.2	-21°50.9	-21°58.5	-22°05.9	-22°13.2	-22°20.3	-22°27.3	-7.6	58.5
Tu 6	243°26.5	257°52.2	272°17.8	286°43.3	301°08.9	315°34.5	330°00.1	344°25.6	358°51.1	13°16.7	27°42.2	+25.6	15.8
	-23°54.9	-23°59.5	-24°04.0	-24°08.4	-24°12.6	-24°16.6	-24°20.5	-24°24.2	-24°27.8	-24°31.3	-24°34.6	-4.0	57.9
We 7	257°52.2	272°17.8	286°43.3	301°08.9	315°34.5	330°00.1	344°25.6	358°51.1	13°16.7	27°42.2	42°07.8	+25.6	15.8
	-23°59.5	-24°04.0	-24°08.4	-24°12.6	-24°16.6	-24°20.5	-24°24.2	-24°27.8	-24°31.3	-24°34.6	-24°37.7	-3.8	57.9
Th 8	258°31.4	272°57.1	287°22.8	301°48.5	316°14.3	330°40.0	345°05.8	359°31.7	13°57.5	28°23.4	42°49.4	+25.8	15.6
	-25°06.4	-25°07.1	-25°07.6	-25°08.0	-25°08.3	-25°08.4	-25°08.3	-25°08.3	-25°07.1	-25°07.2	-25°06.6	-0.0	57.3
Fr 9	259°23.1	273°49.7	288°16.4	302°43.1	317°09.9	331°36.8	346°03.7	0°30.7	14°57.7	29°24.8	43°51.9	+26.9	15.5
	-24°39.2	-24°36.2	-24°33.1	-24°29.9	-24°26.5	-24°23.0	-24°19.3	-24°15.6	-24°11.6	-24°07.5	-24°03.3	+3.6	56.7
Sa 10	260°47.2	275°15.5	289°43.8	304°12.2	318°40.7	333°09.3	347°37.9	2°06.6	16°35.4	31°04.2	45°33.2	+28.6	15.3
	-22°45.2	-22°39.9	-22°32.7	-22°26.3	-22°19.8	-22°13.2	-22°06.4	-21°59.1	-21°52.6	-21°45.5	-21°38.3	+6.7	56.2
Su 11	269°56.6	277°26.8	291°57.1	306°27.4	320°57.9	335°28.4	349°59.0	4°29.6	19°00.4	33°31.2	48°02.1	+30.5	15.2
	-19°38.1	-19°29.4	-19°20.5	-19°11.6	-19°02.5	-18°53.4	-18°44.2	-18°34.9	-18°25.5	-18°16.1	-18°06.5	+9.2	55.7
Mo 12	268°54.5	280°26.6	294°58.8	309°31.0	324°03.3	338°35.6	353°08.0	7°40.5	22°13.1	36°45.7	51°18.4	+32.4	15.1
	-13°34.6	-15°23.9	-15°13.2	-15°02.4	-14°51.6	-14°40.6	-14°29.7	-14°18.6	-14°07.6	-13°56.4	-13°45.2	+10.9	55.2
Tu 13	269°36.2	284°09.9	298°43.6	313°17.3	327°51.1	342°25.0	356°58.9	11°32.9	26°06.9	40°59.0	55°15.0	+33.9	15.0
	-10°51.6	-10°39.9	-10°27.8	-10°15.8	-10°03.8	-9°51.7	-9°39.6	-9°27.5	-9°15.4	-9°03.2	-8°51.0	+12.1	54.8
We 14	275°51.8	288°26.6	303°01.3	317°36.2	332°11.0	346°45.9	1°20.8	15°55.8	30°30.8	45°05.8	59°40.8	+34.9	14.9
	-5°44.9	-5°32.4	-5°19.8	-5°07.2	-4°54.6	-4°42.0	-4°29.4	-4°16.7	-4°04.1	-3°51.4	-3°38.8	+12.6	54.5
Th 15	278°28.9	293°04.3	307°39.6	322°15.0	336°50.4	351°25.8	6°01.2	20°36.6	35°12.0	49°47.4	64°22.8	+35.4	14.8
	-9°28.4	-9°15.7	-9°03.0	-8°50.7	-8°37.9	-8°25.3	-8°12.6	-8°00.3	-7°47.9	-7°35.1	-7°22.3	+12.7	54.2
Fr 16	283°14.2	297°49.6	312°25.0	327°00.4	341°35.8	356°11.1	10°46.4	25°21.8	39°57.1	54°32.4	69°07.7	+35.3	14.7
	4°45.8	4°58.1	5°10.5	5°22.8	5°35.1	5°47.4	5°59.6	6°11.8	6°24.0	6°36.2	6°48.3	+12.3	54.0
Sa 17	287°54.4	302°29.3	317°04.1	331°39.0	346°13.8	0°48.6	15°23.4	29°58.1	44°32.8	59°07.4	73°42.0	+34.8	14.7
	9°46.5	9°58.1	10°09.7	10°21.2	10°32.7	10°44.1	10°55.5	11°06.9	11°18.2	11°29.5	11°40.7	+11.4	54.0
Su 18	299°16.3	306°50.3	321°24.2	335°58.0	350°31.8	5°05.5	19°39.2	34°12.8	48°46.4	63°19.9	77°50.4	+33.7	14.7
	14°23.2	14°33.7	14°44.0	14°54.3	15°04.6	15°14.7	15°24.9	15°34.9	15°44.9	15°54.9	16°04.8	+10.2	54.1
Mo 19	296°08.5	310°41.1	325°13.5	339°45.9	354°18.3	8°50.5	23°22.7	37°54.9	52°26.9	66°59.0	81°30.9	+32.2	14.8
	18°25.0	18°33.8	18°42.5	18°51.1	18°59.6	19°08.1	19°16.5	19°24.8	19°33.1	19°41.2	19°49.3	+8.4	54.3
Tu 20	299°21.8	313°52.7	328°23.4	342°54.1	357°24.8	11°55.3	26°25.8	40°56.2	55°26.6	69°56.6	84°27.6	+30.5	14.9
	21°40.0	21°46.6	21°53.2	21°59.6	22°06.0	22°12.2	22°18.4	22°24.5	22°30.6	22°36.8	22°42.0	+6.2	54.8
We 21	301°51.7	316°20.8	330°49.8	345°18.8	359°47.7	14°16.5	28°45.3	43°14.0	57°42.6	72°11.2	86°39.9	+28.8	15.1
	23°55.5	23°59.5	24°03.4	24°07.1	24°10.8	24°14.3	24°17.7	24°21.0	24°24.2	24°27.2	24°30.1	+3.5	55.4
Th 22	303°40.3	318°07.9	332°35.4	347°02.9	1°30.4	15°57.8	30°25.2	44°52.5	59°19.8	73°47.0	88°14.2	+27.4	15.3
	24°58.7	24°59.5	25°00.3	25°00.9	25°01.6	25°01.6	25°01.6	25°01.8	25°01.7	25°01.5	25°01.1	+0.2	56.2
Fr 23	304°57.6	319°24.2	333°50.8	348°17.4	2°44.0	17°10.6	31°37.1	46°03.6	60°30.2	74°56.6	89°23.3	+26.6	15.6
	24°38.6	24°35.9	24°33.1	24°30.2	24°27.1	24°23.9	24°20.5	24°17.0	24°13.3	24°09.5	24°05.5	-3.3	57.1
Sa 24	305°59.2	320°25.6	334°52.0	349°18.4	3°44.8	18°11.2	32°37.6	47°04.0	61°30.4	75°56.8	90°23.3	+26.4	15.8
	22°48.6	22°42.3	22°35.9	22°29.3	22°22.6	22°15.7	22°08.7	22°01.5	21°54.3	21°46.8	21°39.3	-6.9	58.1
Su 25	307°01.7	321°28.5	335°55.2	350°21.9	4°48.7	19°15.5	33°42.3	48°09.2	62°36.1	77°03.0	91°29.9	+26.8	16.1
	19°29.2	19°19.5	19°09.6	18°59.6	18°49.5	18°39.2	18°28.8	18°18.3	18°07.7	17°56.9	17°46.1	-10.3	59.0
Mo 26	308°16.8	322°44.2	337°11.6	351°39.0	6°06.4	20°33.8	35°01.3	49°28.8	63°56.3	78°23.9	92°51.4	+27.5	16.3
	14°49.1	14°36.4	14°23.7	14°10.8	13°57.8	13°44.7	13°31.6	13°18.3	13°04.9	12°51.5	12°38.0	-13.1	59.9
Tu 27	309°47.9	324°15.8	338°43.8	353°11.7	7°39.9	22°07.7	36°35.7	51°03.7	65°31.8	79°59.8	94°27.9	+28.0	16.5
	9°05.0	8°50.5	8°35.3	8°20.4	8°05.4	7°50.4	7°35.3	7°20.2	7°05.0	6°49.8	6°34.4	-15.1	60.6
We 28	311°30.1	325°58.3	340°26.5	354°54.6	9°22.8	23°51.0	38°19.2	52°47.4	67°15.5	81°43.7	96°11.9	+28.2	16.6
	2°40.0	2°24.1	2°08.2	1°52.3	1°36.4	1°20.4	1°04.5	0°48.5	0°32.6	0°16.6	0°00.6	-15.9	61.0

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 5 21h52 — NM: 13 10h31 — FQ: 21 15h09 — FM: 28 17h10

SUN

March 2029

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Th 1	266°55.6 -7°27.8	281°55.7 -7°26.9	296°55.8 -7°25.9	311°55.9 -7°25.0	326°56.1 -7°24.0	341°56.2 -7°23.1	356°56.3 -7°22.1	11°56.4 -7°21.2	26°56.6 -7°20.2	41°56.7 -7°19.3	56°56.8 -7°18.3	71°56.9 -7°17.4	+0.1 +1.0
Fr 2	266°58.6 -7°05.0	281°58.7 -7°04.0	296°58.8 -7°03.1	311°59.0 -7°02.1	326°59.1 -7°01.1	341°59.2 -7°00.2	356°59.4 -6°59.2	11°59.5 -6°58.3	26°59.5 -6°57.3	41°59.7 -6°56.4	56°59.9 -6°55.4	72°00.0 -6°54.5	+0.1 +1.0
Sa 3	267°01.7 -6°42.0	282°01.9 -6°41.0	297°02.0 -6°40.0	312°02.1 -6°39.1	327°02.3 -6°38.2	342°02.4 -6°37.2	357°02.5 -6°36.2	12°02.7 -6°35.3	27°02.7 -6°34.3	42°02.9 -6°33.4	57°03.1 -6°32.4	72°03.2 -6°31.4	+0.1 +1.0
Su 4	267°05.0 -6°18.9	282°05.1 -6°18.0	297°05.2 -6°17.0	312°05.4 -6°16.0	327°05.5 -6°15.1	342°05.7 -6°14.1	357°05.8 -6°13.1	12°05.9 -6°12.2	27°06.1 -6°11.2	42°06.2 -6°10.2	57°06.4 -6°09.3	72°06.5 -6°08.3	+0.1 +1.0
Mo 5	267°08.3 -5°55.8	282°08.5 -5°54.8	297°08.6 -5°53.8	312°08.8 -5°52.9	327°08.9 -5°51.9	342°09.0 -5°50.9	357°09.2 -5°50.0	12°09.3 -5°49.0	27°09.5 -5°48.0	42°09.6 -5°47.1	57°09.8 -5°46.1	72°09.9 -5°45.1	+0.1 +1.0
Tu 6	267°11.8 -5°32.5	282°11.9 -5°31.5	297°12.1 -5°30.6	312°12.2 -5°29.6	327°12.4 -5°28.6	342°12.5 -5°27.7	357°12.7 -5°26.7	12°12.8 -5°25.7	27°13.0 -5°24.7	42°13.1 -5°23.8	57°13.3 -5°22.8	72°13.4 -5°21.8	+0.1 +1.0
We 7	267°15.3 -5°09.2	282°15.5 -5°08.2	297°15.6 -5°07.2	312°15.8 -5°06.3	327°15.9 -5°05.3	342°16.1 -5°04.3	357°16.2 -5°03.3	12°16.4 -5°02.4	27°16.6 -5°01.4	42°16.7 -5°00.4	57°16.9 -4°59.4	72°17.0 -4°58.5	+0.2 +1.0
Th 8	267°19.0 -4°45.8	282°19.1 -4°44.8	297°19.3 -4°43.8	312°19.5 -4°42.9	327°19.6 -4°41.9	342°19.8 -4°40.9	357°19.9 -4°39.9	12°20.1 -4°38.0	27°20.2 -4°37.0	42°20.4 -4°36.0	57°20.5 -4°35.1	72°20.7 -4°34.1	+0.2 +1.0
Fr 9	267°22.7 -4°22.3	282°22.9 -4°21.4	297°23.0 -4°20.4	312°23.2 -4°19.4	327°23.4 -4°18.4	342°23.5 -4°17.4	357°23.7 -4°16.5	12°23.8 -4°15.5	27°24.0 -4°14.5	42°24.2 -4°13.5	57°24.3 -4°12.5	72°24.5 -4°11.6	+0.2 +1.0
Sa 10	267°26.5 -3°58.8	282°26.7 -3°57.8	297°26.9 -3°56.9	312°27.0 -3°55.9	327°27.2 -3°54.9	342°27.4 -3°53.9	357°27.5 -3°52.9	12°27.7 -3°52.0	27°27.8 -3°51.0	42°28.0 -3°50.0	57°28.2 -3°49.0	72°28.3 -3°48.0	+0.2 +1.0
Su 11	267°30.4 -3°35.3	282°30.6 -3°34.3	297°30.8 -3°33.3	312°30.9 -3°32.3	327°31.1 -3°31.3	342°31.3 -3°30.3	357°31.4 -3°29.4	12°31.6 -3°28.4	27°31.8 -3°27.4	42°31.9 -3°26.4	57°32.1 -3°25.4	72°32.3 -3°24.4	+0.2 +1.0
Mo 12	267°34.4 -3°11.6	282°34.6 -3°10.7	297°34.7 -3°09.7	312°34.9 -3°08.7	327°35.1 -3°07.7	342°35.3 -3°06.7	357°35.4 -3°05.7	12°35.6 -3°04.8	27°35.8 -3°03.8	42°35.9 -3°02.8	57°36.1 -3°01.8	72°36.3 -3°00.8	+0.2 +1.0
Tu 13	267°38.5 -2°48.0	282°38.6 -2°47.0	297°38.8 -2°46.0	312°39.0 -2°45.0	327°39.1 -2°44.1	342°39.3 -2°43.1	357°39.5 -2°42.1	12°39.6 -2°41.1	27°39.8 -2°40.1	42°39.9 -2°39.1	57°40.2 -2°38.1	72°40.3 -2°37.2	+0.2 +1.0
We 14	267°42.6 -2°24.3	282°42.7 -2°23.3	297°42.9 -2°22.4	312°43.1 -2°21.4	327°43.3 -2°20.4	342°43.4 -2°19.4	357°43.6 -2°18.4	12°43.8 -2°17.4	27°43.9 -2°16.4	42°44.3 -2°15.4	57°44.5 -2°14.5	72°44.5 -2°13.5	+0.2 +1.0
Th 15	267°46.7 -2°00.6	282°46.9 -1°59.6	297°47.1 -1°58.7	312°47.3 -1°57.7	327°47.4 -1°56.7	342°47.6 -1°55.7	357°47.8 -1°54.7	12°48.0 -1°53.7	27°48.3 -1°52.7	42°48.3 -1°51.7	57°48.5 -1°50.7	72°48.7 -1°49.8	+0.2 +1.0
Fr 16	267°51.0 -1°36.9	282°51.1 -1°35.9	297°51.3 -1°34.9	312°51.5 -1°33.9	327°51.7 -1°33.0	342°51.8 -1°32.0	357°52.0 -1°31.0	12°52.2 -1°30.0	27°52.4 -1°29.0	42°52.6 -1°28.0	57°52.7 -1°27.0	72°52.9 -1°26.0	+0.2 +1.0
Sa 17	267°55.2 -1°13.2	282°55.4 -1°12.2	297°55.6 -1°11.2	312°55.8 -1°10.2	327°55.9 -1°09.2	342°56.1 -1°08.2	357°56.3 -1°07.3	12°56.5 -1°06.3	27°56.7 -1°05.3	42°56.8 -1°04.3	57°57.0 -1°03.3	72°57.2 -1°02.3	+0.2 +1.0
Su 18	267°59.6 -0°49.5	282°59.7 -0°48.5	297°59.9 -0°47.5	313°00.1 -0°46.5	328°00.3 -0°45.5	343°00.5 -0°44.5	358°00.6 -0°43.5	13°00.8 -0°42.5	28°01.0 -0°41.5	43°01.2 -0°40.6	58°01.4 -0°39.6	73°01.5 -0°38.6	+0.2 +1.0
Mo 19	268°03.9 -0°25.7	283°04.1 -0°24.7	298°04.3 -0°23.7	313°04.5 -0°22.8	328°04.7 -0°21.8	343°04.8 -0°20.8	358°05.0 -0°19.8	13°05.2 -0°18.8	28°05.4 -0°17.8	43°05.6 -0°16.8	58°05.7 -0°15.8	73°05.9 -0°14.8	+0.2 +1.0
Tu 20	268°08.3 -0°02.0	283°08.5 -0°01.0	298°08.7 -0°00.0	313°08.9 0°01.0	328°09.1 0°02.0	343°09.2 0°02.9	358°09.4 0°03.9	13°09.6 0°04.9	28°09.8 0°05.9	43°10.0 0°06.9	58°10.2 0°07.9	73°10.4 0°08.9	+0.2 +1.0
We 21	268°12.8 0°21.7	283°12.9 0°22.7	298°13.1 0°23.7	313°13.3 0°24.7	328°13.5 0°25.7	343°13.7 0°26.6	358°13.9 0°27.6	13°14.1 0°28.6	28°14.3 0°29.6	43°14.4 0°30.6	58°14.6 0°31.6	73°14.8 0°32.6	+0.2 +1.0
Th 22	268°17.2 0°45.4	283°17.4 0°46.4	298°17.6 0°47.4	313°17.8 0°48.4	328°18.0 0°49.3	343°18.2 0°50.3	358°18.4 0°51.3	13°18.5 0°52.3	28°18.7 0°53.3	43°18.9 0°54.3	58°19.1 0°55.3	73°19.3 0°56.2	+0.2 +1.0
Fr 23	268°21.7 1°09.1	283°21.9 1°10.0	298°22.1 1°11.0	313°22.3 1°12.0	328°22.5 1°13.0	343°22.7 1°14.0	358°22.9 1°15.0	13°23.0 1°16.0	28°23.2 1°16.9	43°23.4 1°17.9	58°23.6 1°18.9	73°23.8 1°19.9	+0.2 +1.0
Sa 24	268°26.2 1°32.7	283°26.4 1°33.7	298°26.6 1°34.7	313°26.8 1°35.6	328°27.0 1°36.6	343°27.2 1°37.6	358°27.4 1°38.6	13°27.6 1°39.6	28°27.8 1°40.6	43°27.9 1°41.5	58°28.1 1°42.5	73°28.3 1°43.5	+0.2 +1.0
Su 25	268°30.8 1°56.3	283°31.0 1°57.3	298°31.2 1°58.2	313°31.3 1°59.2	328°31.5 2°00.2	343°31.7 2°01.2	358°31.9 2°02.2	13°32.1 2°03.1	28°32.3 2°04.1	43°32.5 2°05.1	58°32.7 2°06.1	73°32.9 2°07.1	+0.2 +1.0
Mo 26	268°35.3 2°19.8	283°35.5 2°20.8	298°35.7 2°21.7	313°35.9 2°22.8	328°36.1 2°23.7	343°36.3 2°24.7	358°36.5 2°25.7	13°36.6 2°26.7	28°36.8 2°27.7	43°37.0 2°28.6	58°37.2 2°29.6	73°37.4 2°30.6	+0.2 +1.0
Tu 27	268°39.9 2°43.3	283°40.0 2°44.3	298°40.2 2°45.3	313°40.4 2°46.2	328°40.6 2°47.2	343°40.8 2°48.2	358°41.0 2°49.2	13°41.2 2°50.2	28°41.4 2°51.1	43°41.6 2°52.1	58°41.8 2°53.1	73°41.9 2°54.1	+0.2 +1.0
We 28	268°44.4 3°06.8	283°44.6 3°07.7	298°44.8 3°08.7	313°44.5 3°09.7	328°44.7 3°10.7	343°44.8 3°11.6	358°45.5 3°12.6	13°45.7 3°13.6	28°45.9 3°14.6	43°46.1 3°15.5	58°46.4 3°16.5	73°46.5 3°17.5	+0.2 +1.0
Th 29	268°48.9 3°30.1	283°49.1 3°31.1	298°49.3 3°32.1	313°49.5 3°33.0	328°49.7 3°34.0	343°49.9 3°35.0	358°50.1 3°36.0	13°50.3 3°36.9	28°50.5 3°37.9	43°50.6 3°38.9	58°50.8 3°39.9	73°51.0 3°40.8	+0.2 +1.0
Fr 30	268°53.5 3°53.4	283°53.7 3°54.4	298°53.8 3°55.4	313°54.0 3°56.4	328°54.2 3°57.3	343°54.4 3°58.3	358°54.6 3°59.3	13°54.8 4°00.2	28°55.0 4°01.2	43°55.2 4°02.2	58°55.3 4°03.1	73°55.5 4°04.1	+0.2 +1.0
Sa 31	268°58.0 4°16.7	283°58.2 4°17.6	298°58.3 4°18.6	313°58.5 4°19.6	328°58.7 4°20.5	343°58.9 4°21.5	358°59.1 4°22.5	13°59.3 4°23.4	28°59.5 4°24.4	43°59.7 4°25.4	58°59.8 4°26.3	74°00.0 4°27.3	+0.2 +1.0

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.1'

MOON

March 2029

	D	16h	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	Δ'/h SH
O	Th 1	240°53.0 -2°39.0	255°21.1 -2°54.9	269°49.6 -3°10.8	284°17.1 -3°26.7	298°45.1 -3°42.5	313°13.1 -3°58.3	327°41.1 -4°14.1	342°09.0 -4°29.9	356°36.9 -4°45.6	11°04.8 -5°01.3	25°32.7 -5°17.0	+28.0 16.7 -15.8 61.1
	Fr 2	245°27.8 -9°06.8	256°55.2 -9°21.7	271°22.6 -9°36.5	285°50.0 -9°51.2	300°17.3 -10°05.9	314°44.6 -10°20.5	329°11.9 -10°35.1	343°39.1 -10°49.5	358°06.3 -11°03.9	12°33.5 -11°18.2	27°00.6 -11°32.5	+27.3 16.6 -14.6 60.9
	Sa 3	245°42.6 -14°55.4	258°09.1 -15°08.2	272°35.6 -15°20.8	287°02.0 -15°33.4	301°28.3 -15°45.8	315°54.6 -15°58.1	330°20.9 -16°10.3	344°47.1 -16°22.4	359°13.3 -16°34.4	13°39.4 -16°46.2	28°05.5 -16°58.0	+26.3 16.5 -12.3 60.4
	Su 4	244°32.3 -19°39.2	258°57.8 -19°48.9	273°23.2 -19°58.4	287°48.7 -20°07.9	302°14.0 -20°17.1	316°39.4 -20°26.3	331°04.7 -20°35.3	345°30.0 -20°44.1	359°55.3 -20°52.9	14°20.5 -21°01.4	28°45.7 -21°09.8	+25.3 16.3 -9.1 59.7
	Mo 5	245°00.8 -22°58.3	259°25.7 -23°04.3	273°50.6 -23°10.2	288°15.4 -23°15.9	302°40.3 -23°21.4	317°05.1 -23°26.8	331°30.0 -23°32.0	345°54.8 -23°37.1	0°19.6 -23°42.0	14°44.4 -23°46.8	29°09.3 -23°51.4	+24.8 16.0 -5.3 58.8
	Tu 6	245°22.6 -24°41.4	259°47.6 -24°43.4	274°12.6 -24°45.4	288°37.7 -24°47.1	303°02.8 -24°47.1	317°27.9 -24°50.1	331°53.1 -24°51.4	346°18.3 -24°52.6	0°43.5 -24°53.5	15°08.7 -24°54.4	29°34.0 -24°55.0	+25.1 15.8 -1.4 58.0
	We 7	245°58.5 -29°16.9	260°24.6 -29°11.7	274°50.7 -29°06.3	289°16.8 -29°00.9	303°43.0 -29°05.3	318°09.3 -29°10.6	332°35.6 -29°15.2	347°02.0 -29°19.8	1°28.5 -29°23.6	15°55.0 -29°26.0	30°21.6 -29°23.0	+26.3 15.6 +2.4 57.2
	Th 8	260°24.6 -24°45.1	274°50.7 -24°41.1	289°16.8 -24°11.1	303°43.0 -24°39.0	318°09.3 -24°36.7	332°35.6 -24°34.2	347°02.0 -24°31.6	1°28.5 -24°28.9	15°55.0 -24°26.0	30°21.6 -24°23.0	44°48.3 -24°19.9	+26.4 15.6 +2.5 57.1
	Fr 9	261°36.7 -23°16.9	276°04.5 -23°11.7	290°32.4 -23°06.3	305°00.4 -23°00.9	319°28.5 -22°55.3	333°56.6 -22°49.6	348°24.9 -22°43.8	2°53.2 -22°37.9	17°21.6 -22°31.0	31°50.0 -22°25.7	46°18.6 -22°19.4	+28.2 15.4 +5.7 56.4
	Sa 10	263°36.6 -20°32.7	278°06.5 -20°24.8	292°36.5 -20°16.8	307°06.5 -20°08.7	321°36.6 -20°00.5	336°06.8 -19°52.2	350°37.1 -19°43.8	5°07.4 -19°35.5	19°37.8 -19°26.8	34°08.4 -19°18.2	48°39.0 -19°09.4	+30.2 15.2 +3.8 55.7
●	Su 11	266°27.3 -16°49.0	280°59.1 -16°39.0	295°31.0 -16°29.0	310°03.0 -16°18.9	324°35.0 -16°08.8	339°07.1 -15°58.5	353°39.3 -15°48.3	8°11.6 -15°37.9	22°43.8 -15°27.5	37°16.3 -15°17.0	51°48.7 -15°06.5	+32.2 15.1 -10.3 55.2
	Mo 12	270°03.4 -12°22.0	284°36.9 -12°10.6	299°10.4 -11°59.2	313°44.0 -11°47.8	328°17.6 -11°36.3	342°51.3 -11°24.8	357°25.0 -11°13.2	11°58.8 -11°01.6	26°32.6 -10°49.9	41°06.5 -10°38.2	55°40.5 -10°26.5	+33.7 14.9 -11.6 54.8
	Tu 13	274°15.1 -9°26.8	288°49.7 -7°14.6	303°24.4 -7°02.3	317°59.1 -6°50.1	332°43.8 -6°37.7	347°08.6 -6°25.5	1°43.4 -6°13.2	16°18.3 -6°00.9	30°53.1 -5°48.6	45°28.0 -5°36.2	60°03.0 -5°23.8	+34.8 14.8 -12.3 54.4
	We 14	278°50.0 -9°16.7	293°25.3 -2°04.2	308°00.6 -1°51.6	322°35.9 -1°39.1	337°12.3 -1°26.6	351°46.6 -1°14.0	6°21.9 -1°01.5	20°57.3 -0°48.9	35°32.7 -0°36.4	50°08.1 -0°23.8	64°43.5 -0°11.3	+35.4 14.8 -12.5 54.1
	Th 15	283°35.1 2°56.0	298°10.5 3°08.4	312°45.9 3°20.8	327°21.4 3°33.1	341°56.8 3°45.5	356°32.2 3°57.8	11°07.6 4°10.2	25°43.0 4°22.5	40°18.4 4°34.7	54°53.3 4°47.0	69°29.7 4°59.2	+35.4 14.7 -12.3 54.0
	Fr 16	288°17.7 7°59.9	302°52.7 8°11.7	317°27.8 8°23.5	332°02.8 8°35.3	346°37.8 8°47.0	1°12.8 8°58.7	15°47.8 9°10.3	30°22.7 9°21.9	44°57.6 9°33.5	59°32.4 9°45.1	74°07.4 9°56.6	+35.0 14.7 -11.7 53.9
	Sa 17	292°45.8 12°43.9	307°20.0 12°54.7	321°54.3 13°05.5	336°28.4 13°16.1	351°02.6 13°26.8	5°36.7 13°37.4	20°10.7 13°47.9	34°44.7 13°58.4	49°18.7 14°08.8	63°52.6 14°19.1	78°26.5 14°29.4	+34.1 14.7 -10.6 53.9
	Su 18	296°48.8 16°56.7	311°21.9 17°06.0	325°54.9 17°15.2	340°27.9 17°24.4	355°00.8 17°33.4	9°33.7 17°42.5	24°06.5 17°51.4	38°39.2 18°00.3	53°11.9 18°09.1	67°44.5 18°17.8	82°17.1 18°26.4	+32.8 14.7 -9.0 54.0
	Mo 19	300°18.8 20°26.4	314°50.4 20°33.8	329°22.0 20°41.0	343°53.5 20°48.2	358°25.5 20°55.2	12°56.3 21°02.2	27°27.7 21°09.1	41°58.9 21°15.8	56°30.2 21°22.5	71°01.3 21°29.1	85°32.4 21°35.6	+31.4 14.8 -6.9 54.3
	Tu 20	303°11.5 23°01.2	317°41.6 23°06.1	332°11.7 23°10.9	346°41.7 23°15.6	1°11.7 23°20.1	15°41.6 23°24.6	30°11.4 23°28.9	44°41.2 23°33.1	59°11.0 23°37.3	73°40.7 23°43.1	88°10.3 23°45.2	+29.9 14.9 +4.4 54.7
O	We 21	305°28.4 24°29.5	319°57.2 24°31.6	334°26.0 24°33.4	348°54.7 24°35.2	3°23.4 24°36.8	17°52.0 24°38.3	32°20.6 24°39.7	46°49.1 24°41.0	61°17.7 24°42.1	75°46.1 24°43.1	90°14.6 24°44.0	+28.6 15.1 +1.4 55.3
	Th 22	307°16.9 24°41.5	321°44.8 24°40.3	336°17.2 24°39.0	350°40.5 24°37.5	5°08.3 24°35.9	19°36.2 24°34.1	34°04.0 24°32.3	48°31.7 24°30.3	62°59.5 24°28.1	77°27.2 24°25.8	91°54.9 24°23.4	+27.8 15.3 -1.8 56.0
	Fr 23	308°49.1 23°30.8	323°16.6 23°26.2	337°44.2 23°21.5	352°11.7 23°16.7	6°39.2 23°11.7	21°06.8 23°06.5	35°34.3 23°01.3	50°01.8 22°55.9	64°29.4 22°50.3	78°56.9 22°44.7	93°24.4 22°38.9	+27.5 15.5 -5.2 56.8
	Sa 24	310°18.2 20°55.9	324°45.9 20°48.0	339°13.5 20°40.0	353°41.2 20°31.8	8°08.9 20°23.5	22°36.6 20°15.1	37°04.3 20°06.6	51°32.1 19°57.9	65°59.8 19°49.8	80°27.6 19°40.2	94°55.4 19°31.2	+27.7 15.8 -8.5 57.8
	Su 25	311°54.0 17°01.2	326°22.0 16°50.3	340°50.1 16°39.2	355°18.2 16°28.1	9°46.3 16°16.6	24°14.4 16°05.5	38°42.5 15°54.0	53°10.6 15°42.4	67°38.8 15°30.7	82°07.0 15°18.9	96°35.2 15°07.1	+28.1 16.0 -11.4 58.8
	Mo 26	313°39.7 11°56.9	328°08.1 11°43.5	342°36.5 11°30.0	357°04.9 11°16.5	11°33.4 10°02.8	26°01.8 10°49.1	40°30.2 10°35.3	54°58.7 10°21.4	69°27.2 10°07.4	83°55.6 9°53.3	98°24.1 9°39.2	+28.4 16.3 -13.8 59.8
	Tu 27	315°31.4 5°59.4	329°59.9 5°44.3	344°28.3 5°29.1	358°56.8 5°13.9	13°25.2 4°58.7	27°53.7 4°43.4	42°22.1 4°28.0	56°50.5 4°12.6	71°18.9 3°57.2	85°47.9 3°41.8	100°15.7 3°26.2	+28.4 16.5 -15.3 60.6
	We 28	317°19.4 -0°29.4	331°47.5 -0°45.2	346°15.5 -1°01.1	355°04.3 -1°16.9	15°11.5 -1°32.8	29°39.5 -1°48.6	44°07.4 -2°04.5	58°35.3 -2°20.3	73°03.1 -2°36.1	87°31.1 -2°52.0	101°58.8 -3°07.8	+27.9 16.7 -15.8 61.2
	Th 29	318°52.1 -0°51.5	333°18.3 -0°17.9	347°45.4 -0°73.2	352°12.5 -0°48.5	16°39.9 -0°83.8	31°06.4 -0°83.8	45°33.4 -0°84.1	60°00.2 -0°49.2	74°27.0 -0°04.3	88°53.8 -0°19.3	103°20.5 -0°34.2	+26.9 16.7 -15.2 61.4
O	Fr 30	319°54.9 -13°09.5	334°20.7 -13°23.2	348°46.5 -13°36.8	352°12.3 -13°50.3	17°38.0 -14°03.3	32°03.6 -14°17.0	46°29.2 -14°30.2	60°54.7 -14°43.3	75°20.1 -14°56.3	89°45.5 -15°09.2	104°10.9 -15°22.0	+25.6 16.1 -13.6 61.3
	Sa 31	320°24.6 -18°19.7	334°49.1 -18°30.5	349°13.5 -18°41.2	353°07.9 -18°51.7	18°02.3 -19°02.2	32°26.6 -19°12.4	46°50.9 -19°22.6	61°15.1 -19°32.6	75°39.3 -19°42.4	90°03.4 -19°52.1	104°27.5 -20°01.7	+24.3 16.6 -10.2 60.8

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (– = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour – day) mod 24

LQ: 7 07h51 — NM: 15 04h19 — FQ: 23 07h33 — FM: 30 02h26

SUN

April 2029

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Su 1	269°02.5 4°39.8	284°02.6 4°40.8	299°02.8 4°41.8	314°03.0 4°42.7	329°03.2 4°43.7	344°03.4 4°44.7	359°03.6 4°45.6	14°03.8 4°46.6	29°03.9 4°47.5	44°04.1 4°48.5	59°04.3 4°49.5	74°04.5 4°50.4	+0.2 +1.0
Mo 2	269°06.9 5°02.9	284°07.1 5°03.9	299°07.3 5°04.8	314°07.5 5°05.8	329°07.7 5°06.8	344°07.8 5°07.7	359°08.0 5°08.7	14°08.2 5°09.6	29°08.4 5°10.6	44°08.6 5°11.6	59°08.7 5°12.5	74°08.9 5°13.5	+0.2 +1.0
Tu 3	269°11.3 5°25.9	284°11.5 5°26.9	299°11.7 5°27.8	314°11.9 5°28.8	329°12.0 5°29.7	344°12.2 5°30.7	359°12.4 5°31.7	14°12.6 5°32.6	29°12.8 5°33.6	44°13.0 5°34.5	59°13.1 5°35.5	74°13.3 5°36.4	+0.2 +1.0
We 4	269°15.7 5°48.8	284°15.9 5°49.8	299°16.0 5°50.7	314°16.2 5°51.7	329°16.4 5°52.6	344°16.6 5°53.6	359°16.8 5°54.5	14°17.0 5°55.5	29°17.1 5°56.4	44°17.3 5°57.4	59°17.5 5°58.3	74°17.7 5°59.3	+0.2 +1.0
Th 5	269°20.0 6°11.6	284°20.2 6°12.6	299°20.4 6°13.5	314°20.5 6°14.5	329°20.7 6°15.4	344°20.9 6°16.4	359°21.1 6°17.3	14°21.3 6°18.3	29°21.4 6°19.2	44°21.6 6°20.1	59°21.8 6°21.1	74°22.0 6°22.0	+0.2 +0.9
Fr 6	269°24.3 6°34.3	284°24.5 6°35.3	299°24.6 6°36.2	314°24.8 6°37.2	329°25.0 6°38.1	344°25.2 6°39.0	359°25.3 6°40.0	14°25.5 6°40.9	29°25.7 6°41.9	44°25.9 6°42.8	59°26.0 6°43.7	74°26.2 6°44.7	+0.2 +0.9
Sa 7	269°28.5 6°56.9	284°28.7 6°57.8	299°28.8 6°58.8	314°29.0 6°59.7	329°29.2 7°00.7	344°29.4 7°01.6	359°29.5 7°02.5	14°29.7 7°03.5	29°29.9 7°04.4	44°30.1 7°05.3	59°30.2 7°06.3	74°30.4 7°07.2	+0.2 +0.9
Su 8	269°32.7 7°19.4	284°32.8 7°20.3	299°33.0 7°21.2	314°33.2 7°22.2	329°33.3 7°23.1	344°33.5 7°24.0	359°33.7 7°25.0	14°33.9 7°25.9	29°34.0 7°26.8	44°34.2 7°27.8	59°34.4 7°28.7	74°34.6 7°29.6	+0.2 +0.9
Mo 9	269°36.7 7°41.7	284°36.9 7°42.6	299°37.1 7°43.6	314°37.2 7°44.5	329°37.3 7°45.4	344°37.6 7°46.4	359°37.8 7°47.3	14°37.9 7°48.2	29°38.1 7°49.1	44°38.3 7°50.1	59°38.4 7°51.0	74°38.6 7°51.9	+0.2 +0.9
Tu 10	269°40.8 8°03.9	284°40.9 8°04.9	299°41.1 8°05.8	314°41.3 8°06.7	329°41.4 8°07.6	344°41.6 8°08.5	359°41.8 8°09.5	14°41.9 8°10.4	29°42.1 8°11.3	44°42.3 8°12.2	59°42.4 8°13.2	74°42.6 8°14.1	+0.2 +0.9
We 11	269°44.7 8°26.0	284°44.9 8°26.9	299°45.0 8°27.9	314°45.2 8°28.8	329°45.4 8°29.7	344°45.5 8°30.6	359°45.7 8°31.5	14°45.9 8°32.4	29°46.0 8°33.3	44°46.2 8°34.3	59°46.3 8°35.2	74°46.5 8°36.1	+0.2 +0.9
Th 12	269°48.6 8°48.0	284°48.7 8°48.9	299°48.9 8°49.8	314°49.1 8°50.7	329°49.2 8°51.6	344°49.4 8°52.5	359°49.5 8°53.4	14°49.7 8°54.3	29°49.9 8°55.2	44°50.0 8°56.1	59°50.2 8°57.1	74°50.3 8°58.0	+0.2 +0.9
Fr 13	269°52.4 9°09.8	284°52.5 9°10.7	299°52.7 9°11.6	314°52.9 9°12.5	329°53.0 9°13.4	344°53.2 9°14.3	359°53.3 9°15.2	14°53.5 9°16.1	29°53.6 9°17.0	44°53.8 9°17.9	59°53.9 9°18.8	74°54.1 9°19.7	+0.2 +0.9
Sa 14	269°56.1 9°31.4	284°56.2 9°32.3	299°56.4 9°33.2	314°56.6 9°34.1	329°56.7 9°35.0	344°56.9 9°35.9	359°57.0 9°36.8	14°57.2 9°37.7	29°57.3 9°38.6	44°57.5 9°39.5	59°57.6 9°40.4	74°57.8 9°41.3	+0.2 +0.9
Su 15	269°59.7 9°52.9	284°59.9 9°53.8	300°00.0 9°54.7	315°00.2 9°55.5	330°00.3 9°56.4	345°00.5 9°57.3	0°00.6 9°58.2	15°00.8 9°59.1	30°00.9 10°00.0	45°01.1 10°00.9	60°01.2 10°01.8	75°01.4 10°02.7	+0.1 +0.9
Mo 16	270°03.3 10°14.2	285°03.4 10°15.1	300°03.6 10°16.0	315°03.7 10°16.8	330°03.8 10°17.7	345°04.0 10°18.6	0°04.1 10°19.5	15°04.3 10°20.4	30°04.4 10°21.3	45°04.6 10°22.1	60°04.7 10°23.0	75°04.9 10°23.9	+0.1 +0.9
Tu 17	270°06.7 10°35.3	285°06.9 10°36.2	300°07.0 10°37.1	315°07.1 10°38.0	330°07.3 10°38.8	345°07.4 10°39.7	0°07.6 10°40.6	15°07.7 10°41.5	30°07.8 10°42.4	45°08.0 10°43.2	60°08.1 10°44.1	75°08.3 10°45.0	+0.1 +0.9
We 18	270°10.1 10°56.3	285°10.2 10°57.2	300°10.3 10°58.1	315°10.5 10°58.9	330°10.6 10°59.8	345°10.7 11°00.7	0°10.9 11°01.5	15°11.0 11°02.4	30°11.2 11°03.3	45°11.3 11°04.1	60°11.4 11°05.0	75°11.6 11°05.9	+0.1 +0.9
Th 19	270°13.3 11°17.1	285°13.5 11°18.0	300°13.6 11°18.8	315°13.7 11°19.7	330°13.9 11°20.6	345°14.0 11°21.4	0°14.1 11°22.3	15°14.2 11°23.1	30°14.4 11°24.0	45°14.5 11°24.9	60°14.6 11°25.7	75°14.8 11°26.6	+0.1 +0.9
Fr 20	270°16.5 11°37.7	285°16.7 11°38.6	300°16.7 11°39.4	315°16.9 11°40.3	330°17.0 11°41.1	345°17.1 11°42.0	0°17.2 11°42.8	15°17.4 11°43.7	30°17.5 11°44.5	45°17.6 11°45.4	60°17.8 11°46.2	75°17.9 11°47.1	+0.1 +0.9
Sa 21	270°19.5 11°58.1	285°19.7 11°59.0	300°19.8 11°59.8	315°19.9 12°00.7	330°20.0 12°01.5	345°20.1 12°02.3	0°20.3 12°03.2	15°20.4 12°04.0	30°20.5 12°04.9	45°20.6 12°05.7	60°20.8 12°06.5	75°20.9 12°07.4	+0.1 +0.8
Su 22	270°22.5 12°18.3	285°22.6 12°19.2	300°22.7 12°20.0	315°22.8 12°20.8	330°23.0 12°21.7	345°23.1 12°22.5	0°23.2 12°23.3	15°23.3 12°24.2	30°23.4 12°25.0	45°23.6 12°25.9	60°23.7 12°26.7	75°23.8 12°27.5	+0.1 +0.8
Mo 23	270°25.3 12°38.3	285°25.4 12°39.2	300°25.5 12°40.0	315°25.7 12°40.8	330°25.8 12°41.7	345°25.9 12°42.5	0°26.0 12°43.3	15°26.1 12°44.1	30°26.2 12°45.0	45°26.4 12°45.8	60°26.5 12°46.6	75°26.6 12°47.4	+0.1 +0.8
Tu 24	270°28.0 12°58.1	285°28.2 12°59.0	300°28.3 12°59.8	315°28.4 13°00.6	330°28.5 13°01.4	345°28.6 13°02.2	0°28.7 13°03.0	15°28.8 13°03.9	30°28.9 13°04.7	45°29.0 13°05.5	60°29.1 13°06.3	75°29.3 13°07.1	+0.1 +0.8
We 25	270°30.7 13°17.7	285°30.8 13°18.5	300°30.9 13°19.3	315°31.0 13°20.1	330°31.1 13°21.0	345°31.2 13°21.8	0°31.3 13°22.6	15°31.4 13°23.4	30°31.5 13°24.2	45°31.6 13°25.0	60°31.7 13°25.8	75°31.8 13°26.6	+0.1 +0.8
Th 26	270°33.2 13°37.1	285°33.3 13°37.9	300°33.4 13°38.7	315°33.5 13°39.5	330°33.6 13°40.3	345°33.7 13°41.1	0°33.8 13°41.9	15°33.9 13°42.7	30°34.0 13°43.5	45°34.1 13°44.3	60°34.2 13°45.1	75°34.3 13°45.9	+0.1 +0.8
Fr 27	270°35.5 13°56.2	285°35.6 13°57.0	300°35.7 13°57.8	315°35.8 13°58.6	330°35.9 13°59.4	345°36.0 14°00.2	0°36.1 14°01.0	15°36.2 14°01.8	30°36.3 14°02.5	45°36.4 14°03.3	60°36.5 14°04.1	75°36.6 14°04.9	+0.1 +0.8
Sa 28	270°37.8 14°15.1	285°37.9 14°15.9	300°38.0 14°16.7	315°38.1 14°17.5	330°38.1 14°18.3	345°38.2 14°19.0	0°38.3 14°19.8	15°38.4 14°20.6	30°38.5 14°21.4	45°38.6 14°22.2	60°38.7 14°22.9	75°38.8 14°23.7	+0.1 +0.8
Su 29	270°39.9 14°33.8	285°40.0 14°34.6	300°40.1 14°35.3	315°40.2 14°36.1	330°40.2 14°36.9	345°40.3 14°37.7	0°40.4 14°38.4	15°40.5 14°39.2	30°40.6 14°40.1	45°40.7 14°40.1	60°40.7 14°41.5	75°40.8 14°42.3	+0.1 +0.8
Mo 30	270°41.9 14°52.2	285°42.0 14°53.0	300°42.1 14°53.8	315°42.1 14°54.5	330°42.2 14°55.3	345°42.3 14°56.0	0°42.4 14°56.8	15°42.4 14°57.6	30°42.5 14°58.3	45°42.6 14°59.1	60°42.7 14°59.8	75°42.8 15°00.6	+0.1 +0.8

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.9'

MOON

April 2029

	D	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	3h	Δ '/h SH
●	Su 1	234°02.7 -21°20.9	248°26.5 -21°29.0	262°50.2 -21°36.8	277°13.9 -21°44.6	291°37.5 -21°52.1	306°01.2 -21°59.5	320°24.8 -22°06.8	334°48.4 -22°13.8	349°12.0 -22°20.8	3°35.5 -22°27.5	17°59.9 -22°34.1	+23.6 16.4 -7.3 60.2
	Mo 2	233°51.5 -23°52.9	248°15.0 -23°56.8	262°38.5 -24°00.6	277°02.1 -24°04.1	291°25.7 -24°07.5	305°49.2 -24°10.8	320°12.9 -24°13.8	334°36.5 -24°16.7	349°00.1 -24°19.5	3°23.8 -24°22.0	17°47.5 -24°24.4	+23.6 16.2 -3.1 59.4
	Tu 3	233°47.7 -24°40.4	248°12.1 -24°39.8	262°36.5 -24°39.8	277°01.0 -24°39.2	291°25.6 -24°38.5	305°50.2 -24°37.6	320°14.9 -24°36.6	334°39.7 -24°35.4	349°04.5 -24°34.1	3°29.4 -24°32.6	17°54.4 -24°30.9	+24.7 15.9 +0.9 58.4
●	We 4	234°17.8 -23°48.6	248°44.0 -23°44.6	263°10.3 -23°40.5	277°36.7 -23°36.3	292°03.2 -23°32.0	306°29.7 -23°27.5	320°56.4 -23°22.9	335°23.1 -23°18.1	349°50.0 -23°13.2	4°16.9 -23°08.2	18°43.9 -23°03.1	+26.6 15.7 +4.6 57.4
	Th 5	235°40.5 -21°31.9	250°09.0 -21°24.9	264°37.6 -21°17.9	279°06.4 -21°10.7	293°35.2 -21°03.4	308°04.1 -20°56.0	322°33.1 -20°48.5	337°02.2 -20°40.9	351°31.4 -20°33.3	6°00.7 -20°25.5	20°30.1 -20°17.6	+29.0 15.4 +7.4 56.5
	Fr 6	235°02.0 -18°08.8	252°32.9 -17°59.6	267°03.8 -17°50.3	281°34.9 -17°40.9	296°06.0 -17°31.4	310°37.2 -17°21.9	325°08.5 -17°12.3	339°39.8 -17°02.6	354°11.3 -16°52.9	8°42.8 -16°43.1	23°14.4 -16°33.2	+31.2 15.2 +9.6 55.7
●	Sa 7	255°32.9 -17°59.6	267°03.8 -17°50.3	281°34.9 -17°40.9	296°06.0 -17°31.4	310°37.2 -17°21.9	325°08.5 -17°12.3	339°39.8 -16°52.9	354°11.3 -16°43.1	8°42.8 -16°33.2	23°14.4 -16°23.2	37°46.1 -16°12.2	+31.3 15.2 +9.6 55.7
	Su 8	255°50.9 -13°46.8	270°23.8 -13°35.5	284°56.8 -13°25.0	299°29.8 -13°14.1	314°02.9 -13°03.1	328°36.1 -12°52.0	343°09.3 -12°40.9	357°42.6 -12°29.9	12°16.0 -12°18.6	26°49.4 -12°07.3	41°22.9 -11°56.0	+33.2 15.0 +11.1 55.0
	Mo 9	255°52.0 -9°02.4	274°26.3 -8°50.6	289°00.7 -8°38.7	303°35.1 -8°26.9	318°09.3 -8°14.9	332°44.1 -8°03.0	347°18.7 -7°51.0	1°53.3 -7°39.9	16°28.0 -7°27.0	31°02.7 -7°15.0	45°37.4 -7°02.9	+34.5 14.9 +12.0 54.6
●	Tu 10	264°22.2 -4°00.0	278°57.4 -3°47.6	293°32.7 -3°35.3	308°07.9 -3°23.0	322°43.7 -3°10.7	337°18.5 -2°58.3	351°53.8 -2°46.0	6°29.1 -2°33.6	21°04.5 -2°21.3	35°39.9 -2°08.9	50°15.2 -1°56.6	+35.3 14.8 +12.3 54.2
	We 11	265°07.2 1°09.0	283°42.8 1°21.3	298°18.3 1°33.6	312°53.8 1°45.9	327°29.8 1°58.3	342°04.8 2°10.6	356°40.3 2°22.9	11°15.8 2°35.1	25°51.3 2°47.4	40°26.8 2°59.7	55°02.3 3°11.9	+35.5 14.7 +12.3 54.0
	Th 12	275°53.2 6°13.5	288°28.5 6°25.4	303°03.7 6°37.3	317°38.9 6°49.2	332°14.1 7°01.1	346°49.3 7°12.9	1°24.5 7°24.7	15°59.6 7°36.5	30°34.7 7°48.2	45°09.8 8°00.0	59°44.9 8°11.6	+35.2 14.7 +11.8 53.9
●	Fr 13	275°27.2 11°02.8	293°01.8 11°13.9	307°36.3 11°25.0	322°10.8 11°36.0	336°45.2 11°46.9	351°19.6 11°57.9	5°54.0 12°08.7	20°28.3 12°19.1	35°02.5 12°30.4	49°36.8 12°41.1	64°11.0 12°51.8	+34.4 14.7 +10.9 53.9
	Sa 14	285°38.3 15°25.6	297°11.7 15°35.4	311°45.1 15°45.2	326°18.4 15°54.8	340°51.6 16°04.4	355°24.9 16°14.0	9°58.1 16°23.5	24°31.2 16°32.9	39°04.3 16°42.2	53°37.3 16°51.4	68°10.3 17°00.7	+33.2 14.7 +9.5 54.4
	Su 15	286°17.9 10°10.0	300°50.0 10°18.0	315°22.0 10°25.9	329°53.9 10°33.7	344°25.8 10°41.5	358°57.6 10°49.2	13°29.4 10°56.7	28°01.4 20°04.2	42°32.7 20°11.6	57°04.3 20°18.9	71°35.8 20°26.2	+31.8 14.8 +7.6 54.2
●	Mo 16	289°21.9 22°03.5	303°52.5 22°09.2	318°23.0 22°14.8	333°53.5 22°20.3	347°24.0 22°25.7	361°54.4 22°31.0	1°54.4 22°36.2	16°24.7 22°46.1	30°55.0 22°53.1	45°25.2 22°56.1	59°55.4 22°55.9	+30.4 14.8 +5.2 54.4
	Tu 17	291°51.5 23°54.2	306°20.8 23°57.2	320°50.1 24°00.0	335°19.4 24°02.8	349°48.8 24°05.4	363°54.7 24°07.9	4°17.8 24°10.3	18°47.0 24°12.6	33°16.1 24°14.7	47°45.2 24°16.7	62°14.2 24°16.7	+29.2 14.9 +2.4 54.8
	We 18	293°54.3 24°32.3	308°22.8 24°32.2	322°51.3 24°32.0	337°19.8 24°31.7	351°48.2 24°31.2	6°16.7 24°30.6	20°45.1 24°29.9	35°13.3 24°29.0	49°41.9 24°28.1	64°10.4 24°26.9	78°38.6 24°25.7	+28.4 15.1 -0.7 55.3
●	Th 19	295°42.7 23°51.6	310°10.9 23°48.3	324°39.2 23°44.9	339°07.4 23°41.3	353°35.6 23°37.6	8°03.9 23°33.8	22°32.1 23°29.8	37°00.4 23°25.8	51°28.6 23°21.6	65°56.9 23°17.2	80°25.8 23°12.8	+28.2 15.3 -3.9 55.9
	Fr 20	297°30.2 21°50.6	311°58.6 21°44.2	326°27.1 21°37.6	340°55.6 21°30.9	355°24.1 21°24.1	9°52.6 21°17.1	24°21.1 21°10.0	38°49.6 21°02.8	53°18.2 20°55.5	67°46.8 20°48.0	82°15.4 20°40.4	+28.5 15.5 -7.0 56.7
	Sa 21	299°26.9 18°33.1	313°55.8 18°23.7	328°24.7 18°14.2	342°53.7 18°04.6	357°22.7 17°54.9	11°51.7 17°45.1	26°20.8 17°35.2	40°49.8 17°25.1	55°18.9 17°15.9	69°48.0 17°04.7	84°17.2 16°54.4	+29.0 15.7 -9.9 57.5
●	Su 22	301°36.3 14°07.3	316°05.8 13°55.4	330°35.2 13°43.5	345°04.6 13°31.4	359°34.1 13°19.2	14°03.6 13°07.0	28°33.1 12°54.2	43°02.6 12°42.2	57°32.1 12°29.1	72°01.6 12°17.2	86°31.1 12°04.5	+29.5 15.9 -12.3 58.4
	Mo 23	303°55.0 8°45.5	318°24.6 8°31.7	332°54.2 8°17.8	347°23.8 8°03.9	361°53.4 7°49.9	16°23.0 7°35.8	30°52.6 7°21.7	45°22.2 7°07.5	59°51.8 6°53.2	74°21.4 6°39.0	88°51.0 6°24.6	+29.6 16.2 -14.1 59.3
	Tu 24	306°12.9 2°43.9	320°42.3 2°28.2	335°01.5 2°13.8	349°40.8 1°58.7	4°10.0 1°58.7	18°39.3 1°28.5	33°08.4 1°13.3	47°37.6 0°58.1	62°06.7 0°42.9	76°35.8 0°27.7	91°04.4 0°12.5	+29.2 16.4 -15.1 60.1
●	We 25	308°16.3 -3°37.2	322°44.7 -3°52.5	337°13.1 -4°07.8	351°41.4 -4°23.0	6°09.7 -4°38.3	20°37.9 -5°08.8	35°06.1 -5°24.0	49°34.2 -5°08.8	64°02.2 -5°39.2	78°30.2 -5°54.4	92°58.2 -6°09.5	+28.2 16.6 -15.2 60.7
	Th 26	309°50.1 -9°52.4	324°17.0 -10°06.9	338°43.9 -10°23.3	353°10.7 -10°35.7	7°37.5 -10°50.7	22°04.1 -11°04.2	36°30.7 -11°18.4	50°57.3 -11°32.5	65°23.7 -11°46.5	79°50.1 -12°00.5	94°16.4 -12°14.4	+26.6 16.7 -14.2 61.1
	Fr 27	310°42.3 -15°32.5	325°07.4 -15°45.0	339°32.5 -15°57.5	353°57.5 -16°21.1	8°22.4 -16°33.6	22°47.2 -16°45.5	37°12.0 -16°57.3	51°36.7 -17°09.0	66°01.3 -17°20.5	80°25.9 -17°31.9	94°50.4 -17°42.5	+24.8 16.7 -11.9 61.2
●	Sa 28	310°49.6 -20°07.2	325°13.3 -20°16.4	339°36.5 -20°25.5	353°59.9 -20°34.4	8°23.2 -20°44.2	22°46.4 -20°51.8	37°09.6 -21°00.2	51°32.8 -21°08.2	65°55.9 -21°16.7	80°18.9 -21°24.7	94°41.0 -21°32.5	+23.2 16.6 -8.5 60.9
	Su 29	310°23.1 -23°10.2	324°45.6 -23°15.3	339°08.2 -23°20.3	353°30.7 -23°25.1	7°53.3 -23°29.8	22°15.8 -23°34.2	36°38.3 -23°38.5	51°00.8 -23°42.6	65°23.4 -23°46.5	79°45.9 -23°50.3	94°08.4 -23°53.9	+22.5 16.4 -4.4 60.3
	Mo 30	309°48.6 -24°26.5	324°11.6 -24°27.2	338°34.5 -24°27.9	352°57.6 -24°28.3	7°20.6 -24°28.6	21°43.7 -24°28.6	36°06.9 -24°28.6	50°30.1 -24°28.3	64°53.4 -24°27.9	79°16.7 -24°27.3	93°40.1 -24°26.6	+23.1 16.2 -0.0 59.4

Row 1: GHA, Δ '/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (= South), Δ '/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 5 19h51 — NM: 13 21h40 — FQ: 21 19h50 — FM: 28 10h36

SUN

May 2029

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Tu 1	270°43.7	285°43.8	300°43.9	315°44.0	330°44.0	345°44.1	0°44.2	15°44.3	30°44.3	45°44.4	60°44.5	75°44.6	+0.1
	15°10.4	15°11.2	15°11.9	15°12.7	15°13.4	15°14.2	15°14.9	15°15.7	15°16.4	15°17.2	15°17.9	15°18.7	+0.8
We 2	270°45.5	285°45.5	300°45.6	315°45.7	330°45.7	345°45.8	0°45.9	15°45.9	30°46.0	45°46.1	60°46.1	75°46.2	+0.1
	15°28.4	15°29.1	15°29.9	15°30.6	15°31.3	15°32.1	15°32.8	15°33.6	15°34.3	15°35.0	15°35.8	15°36.5	+0.7
Th 3	270°47.0	285°47.1	300°47.2	315°47.2	330°47.3	345°47.4	0°47.4	15°47.4	30°47.5	45°47.6	60°47.7	75°47.7	+0.1
	15°46.1	15°46.8	15°47.5	15°48.3	15°49.0	15°49.7	15°50.4	15°51.2	15°51.9	15°52.6	15°53.4	15°54.1	+0.7
Fr 4	270°48.5	285°48.5	300°48.6	315°48.7	330°48.7	345°48.8	0°48.8	15°48.9	30°48.9	45°49.0	60°49.0	75°49.1	+0.1
	16°03.5	16°04.2	16°04.9	16°05.6	16°06.4	16°07.1	16°07.8	16°08.5	16°09.2	16°10.0	16°10.7	16°11.4	+0.7
Sa 5	270°49.8	285°49.8	300°49.9	315°49.9	330°50.0	345°50.0	0°50.1	15°50.1	30°50.2	45°50.2	60°50.3	75°50.3	+0.0
	16°20.6	16°21.4	16°22.1	16°22.8	16°23.5	16°24.2	16°24.9	16°25.6	16°26.3	16°27.0	16°27.7	16°28.4	+0.7
Su 6	270°50.9	285°51.0	300°51.0	315°51.1	330°51.1	345°51.1	0°51.2	15°51.2	30°51.3	45°51.3	60°51.4	75°51.4	+0.0
	16°37.5	16°38.2	16°38.9	16°39.6	16°40.3	16°41.0	16°41.7	16°42.4	16°43.1	16°43.8	16°44.5	16°45.2	+0.7
Mo 7	270°51.9	285°52.0	300°52.0	315°52.0	330°52.1	345°52.1	0°52.2	15°52.2	30°52.2	45°52.2	60°52.3	75°52.3	+0.0
	16°54.2	16°54.8	16°55.5	16°56.2	16°56.9	16°57.6	16°58.3	16°58.9	16°59.6	17°00.3	17°01.0	17°01.7	+0.7
Tu 8	270°52.8	285°52.8	300°52.8	315°52.9	330°52.9	345°52.9	0°53.0	15°53.0	30°53.0	45°53.1	60°53.1	75°53.1	+0.0
	17°10.5	17°11.2	17°11.8	17°12.5	17°13.2	17°13.9	17°14.5	17°15.2	17°15.9	17°16.5	17°17.2	17°17.9	+0.7
We 9	270°53.5	285°53.5	300°53.5	315°53.6	330°53.6	345°53.6	0°53.6	15°53.7	30°53.7	45°53.7	60°53.7	75°53.8	+0.0
	17°26.5	17°27.2	17°27.9	17°28.5	17°29.2	17°29.8	17°30.5	17°31.2	17°31.8	17°32.5	17°33.1	17°33.8	+0.7
Th 10	270°54.1	285°54.1	300°54.1	315°54.1	330°54.1	345°54.1	0°54.2	15°54.2	30°54.2	45°54.2	60°54.2	75°54.3	+0.0
	17°42.3	17°42.9	17°43.6	17°44.2	17°44.9	17°45.5	17°46.2	17°46.8	17°47.5	17°48.1	17°48.8	17°49.4	+0.6
Fr 11	270°54.5	285°54.5	300°54.5	315°54.5	330°54.5	345°54.5	0°54.5	15°54.5	30°54.6	45°54.6	60°54.6	75°54.6	+0.0
	17°57.7	17°58.4	17°59.0	17°59.7	18°00.3	18°00.9	18°01.6	18°02.2	18°02.8	18°03.5	18°04.1	18°04.7	+0.6
Sa 12	270°54.7	285°54.7	300°54.8	315°54.8	330°54.8	345°54.8	0°54.8	15°54.8	30°54.8	45°54.8	60°54.8	75°54.8	+0.0
	18°12.9	18°13.5	18°14.2	18°14.8	18°15.4	18°16.0	18°16.6	18°17.3	18°17.9	18°18.5	18°19.1	18°19.7	+0.6
Su 13	270°54.9	285°54.9	300°54.9	315°54.9	330°54.9	345°54.9	0°54.9	15°54.9	30°54.9	45°54.9	60°54.9	75°54.9	+0.0
	18°27.8	18°28.4	18°29.0	18°29.6	18°30.2	18°30.8	18°31.4	18°32.0	18°32.6	18°33.2	18°33.8	18°34.5	+0.6
Mo 14	270°54.9	285°54.8	300°54.8	315°54.8	330°54.8	345°54.8	0°54.8	15°54.8	30°54.8	45°54.8	60°54.8	75°54.8	-0.0
	18°42.3	18°42.9	18°43.5	18°44.1	18°44.7	18°45.3	18°45.9	18°46.5	18°47.1	18°47.7	18°48.3	18°48.8	+0.6
Tu 15	270°54.7	285°54.7	300°54.7	315°54.7	330°54.7	345°54.6	0°54.6	15°54.6	30°54.6	45°54.6	60°54.6	75°54.6	-0.0
	18°56.5	18°57.1	18°57.7	18°58.3	18°58.8	18°59.4	19°00.0	19°00.6	19°01.2	19°01.8	19°02.3	19°02.9	+0.6
We 16	270°54.4	285°54.4	300°54.4	315°54.3	330°54.3	345°54.3	0°54.3	15°54.3	30°54.3	45°54.2	60°54.2	75°54.2	-0.0
	19°10.4	19°11.0	19°11.6	19°12.1	19°12.7	19°13.3	19°13.8	19°14.4	19°15.0	19°15.5	19°16.1	19°16.7	+0.6
Th 17	270°54.0	285°53.9	300°53.9	315°53.9	330°53.9	345°53.9	0°53.8	15°53.8	30°53.8	45°53.8	60°53.7	75°53.7	-0.0
	19°24.0	19°24.5	19°25.1	19°25.7	19°26.2	19°26.8	19°27.3	19°27.9	19°28.4	19°29.0	19°29.5	19°30.1	+0.6
Fr 18	270°53.4	285°53.4	300°53.3	315°53.3	330°53.3	345°53.3	0°53.2	15°53.2	30°53.2	45°53.1	60°53.1	75°53.1	-0.0
	19°37.2	19°37.8	19°38.3	19°38.9	19°39.4	19°39.9	19°40.5	19°41.0	19°41.6	19°42.1	19°42.7	19°43.2	+0.5
Sa 19	270°52.7	285°52.7	300°52.6	315°52.6	330°52.6	345°52.5	0°52.5	15°52.5	30°52.4	45°52.4	60°52.4	75°52.3	-0.0
	19°50.1	19°50.7	19°51.2	19°51.7	19°52.3	19°52.8	19°53.3	19°53.8	19°54.4	19°54.9	19°55.4	19°55.9	+0.5
Su 20	270°51.8	285°51.8	300°51.8	315°51.7	330°51.7	345°51.7	0°51.6	15°51.6	30°51.5	45°51.5	60°51.5	75°51.4	-0.0
	20°02.7	20°03.2	20°03.7	20°04.3	20°04.8	20°05.3	20°05.8	20°06.3	20°06.8	20°07.3	20°07.8	20°08.4	+0.5
Mo 21	270°49.8	285°50.8	300°50.8	315°50.8	330°50.7	345°50.7	0°50.6	15°50.6	30°50.5	45°50.5	60°50.4	75°50.4	-0.0
	20°14.9	20°15.4	20°15.9	20°16.4	20°16.9	20°17.4	20°17.9	20°18.4	20°18.9	20°19.4	20°19.9	20°20.4	+0.5
Tu 22	270°48.8	285°49.7	300°49.7	315°49.6	330°49.6	345°49.5	0°49.5	15°49.4	30°49.4	45°49.3	60°49.3	75°49.2	-0.0
	20°26.8	20°27.3	20°27.8	20°28.3	20°28.8	20°29.2	20°29.7	20°30.2	20°30.7	20°31.2	20°31.7	20°32.1	+0.5
We 23	270°48.6	285°48.5	300°48.5	315°48.4	330°48.4	345°48.3	0°48.2	15°48.2	30°48.1	45°48.1	60°48.0	75°48.0	-0.1
	20°38.3	20°38.8	20°39.3	20°39.8	20°40.2	20°40.7	20°41.2	20°41.6	20°42.1	20°42.6	20°43.0	20°43.5	+0.5
Th 24	270°47.2	285°47.2	300°47.1	315°47.1	330°47.0	345°46.9	0°46.9	15°46.8	30°46.8	45°46.7	60°46.6	75°46.6	-0.1
	20°49.5	20°50.0	20°50.4	20°50.9	20°51.3	20°51.8	20°52.3	20°52.7	20°53.2	20°53.6	20°54.1	20°54.5	+0.5
Fr 25	270°45.8	285°45.7	300°45.6	315°45.6	330°45.5	345°45.5	0°45.4	15°45.3	30°45.3	45°45.2	60°45.1	75°45.1	-0.1
	21°00.3	21°00.8	21°01.2	21°01.7	21°02.1	21°02.5	21°03.0	21°03.4	21°03.8	21°04.2	21°04.7	21°05.1	+0.4
Sa 26	270°44.2	285°44.1	300°44.1	315°44.0	330°43.9	345°43.8	0°43.8	15°43.7	30°43.6	45°43.6	60°43.5	75°43.4	-0.1
	21°10.8	21°11.2	21°11.6	21°12.1	21°12.5	21°12.9	21°13.3	21°13.8	21°14.2	21°14.6	21°15.0	21°15.5	+0.4
Su 27	270°42.5	285°42.4	300°42.2	315°42.3	330°42.2	345°42.1	0°42.1	15°42.0	30°41.9	45°41.8	60°41.8	75°41.7	-0.1
	21°20.9	21°21.3	21°21.7	21°22.1	21°22.5	21°22.9	21°23.3	21°23.7	21°24.1	21°24.6	21°25.0	21°25.4	+0.4
Mo 28	270°40.7	285°40.6	300°40.4	315°40.4	330°40.4	345°40.3	0°40.2	15°40.1	30°40.0	45°40.0	60°39.9	75°39.8	-0.1
	21°30.6	21°31.0	21°31.4	21°31.8	21°32.2	21°32.6	21°33.0	21°33.4	21°33.7	21°34.1	21°34.5	21°34.9	+0.4
Tu 29	270°38.8	285°38.7	300°38.6	315°38.5	330°38.4	345°38.3	0°38.3	15°38.2	30°38.1	45°38.0	60°37.9	75°37.8	-0.1
	21°39.9	21°40.3	21°40.7	21°41.1	21°41.5	21°41.8	21°42.2	21°42.6	21°43.0	21°43.4	21°43.7	21°44.1	+0.4
We 30	270°36.7	285°36.6	300°36.5	315°36.5	330°36.4	345°36.3	0°36.2	15°36.1	30°36.0	45°35.9	60°35.8	75°35.7	-0.1
	21°48.9	21°49.3	21°49.6	21°50.0	21°50.4	21°50.7	21°51.1	21°51.5	21°51.8	21°52.2	21°52.5	21°52.9	+0.4
Th 31	270°34.6	285°34.5	300°34.4	315°34.3	330°34.2	345°34.1	0°34.0	15°33.9	30°33.8	45°33.7	60°33.6	75°33.6	-0.1
	21°57.5	21°57.9	21°58.2	21°58.6	21°58.9	21°59.2	21°59.6	21°59.9	22°00.3	22°00.6	22°01.0	22°01.3	+0.3

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°
 Row 2: Dec (Declination, - = South), Δ°/h = dec. change
 Semi-diameter: 15.8'

MOON

May 2029

D	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	3h	Δ'/h SH
Tu 1	223 ⁰ 13.7 -24 ⁰ 12.4	237 ⁰ 37.8 -24 ⁰ 10.1	252 ⁰ 01.9 -24 ⁰ 07.5	266 ⁰ 26.2 -24 ⁰ 04.9	280 ⁰ 50.5 -24 ⁰ 02.0	295 ⁰ 14.9 -23 ⁰ 59.0	309 ⁰ 39.4 -23 ⁰ 55.9	324 ⁰ 04.0 -23 ⁰ 52.6	338 ⁰ 28.7 -23 ⁰ 49.2	352 ⁰ 53.4 -23 ⁰ 45.6	7 ⁰ 18.3 -23 ⁰ 41.8	+24.5 16.0 +3.1 58.7
We 2	223 ⁰ 42.5 -22 ⁰ 29.0	238 ⁰ 08.9 -22 ⁰ 23.1	252 ⁰ 35.4 -22 ⁰ 17.1	267 ⁰ 02.0 -22 ⁰ 10.9	281 ⁰ 28.8 -22 ⁰ 04.6	295 ⁰ 55.6 -21 ⁰ 58.2	310 ⁰ 22.5 -21 ⁰ 51.7	324 ⁰ 49.6 -21 ⁰ 45.1	339 ⁰ 16.7 -21 ⁰ 38.3	353 ⁰ 44.0 -21 ⁰ 31.4	8 ⁰ 11.4 -21 ⁰ 24.5	+26.9 15.7 +6.5 57.7
Th 3	225 ⁰ 14.6 -19 ⁰ 27.2	239 ⁰ 43.7 -19 ⁰ 18.6	254 ⁰ 12.9 -19 ⁰ 09.9	268 ⁰ 42.1 -19 ⁰ 01.2	283 ⁰ 11.5 -18 ⁰ 52.3	297 ⁰ 41.0 -18 ⁰ 43.4	312 ⁰ 10.6 -18 ⁰ 34.3	326 ⁰ 40.3 -18 ⁰ 25.2	341 ⁰ 10.1 -18 ⁰ 16.0	355 ⁰ 39.9 -18 ⁰ 06.8	10 ⁰ 09.9 -17 ⁰ 57.4	+29.5 15.5 +9.0 56.7
Fr 4	227 ⁰ 51.4 -15 ⁰ 28.6	242 ⁰ 22.9 -15 ⁰ 18.1	256 ⁰ 54.5 -15 ⁰ 07.6	271 ⁰ 26.2 -14 ⁰ 57.1	285 ⁰ 57.9 -14 ⁰ 46.5	300 ⁰ 29.8 -14 ⁰ 35.8	315 ⁰ 01.7 -14 ⁰ 25.1	329 ⁰ 33.8 -14 ⁰ 14.3	344 ⁰ 05.9 -14 ⁰ 03.5	358 ⁰ 38.1 -13 ⁰ 52.6	13 ⁰ 10.3 -13 ⁰ 41.7	+31.9 15.2 +10.7 55.9
Sa 5	231 ⁰ 23.4 -10 ⁰ 52.4	245 ⁰ 56.9 -10 ⁰ 40.9	260 ⁰ 30.4 -10 ⁰ 29.2	275 ⁰ 03.9 -10 ⁰ 17.6	289 ⁰ 37.5 -10 ⁰ 05.9	304 ⁰ 11.2 -9 ⁰ 54.2	318 ⁰ 45.0 -9 ⁰ 42.4	333 ⁰ 18.8 -9 ⁰ 30.6	347 ⁰ 52.6 -9 ⁰ 18.8	2 ⁰ 26.6 -9 ⁰ 07.0	17 ⁰ 00.5 -8 ⁰ 55.1	+33.7 15.0 +11.7 55.2
Su 6	235 ⁰ 36.2 -5 ⁰ 54.5	250 ⁰ 10.9 -5 ⁰ 42.3	264 ⁰ 45.7 -5 ⁰ 30.1	279 ⁰ 20.5 -5 ⁰ 17.9	293 ⁰ 55.3 -5 ⁰ 05.7	308 ⁰ 30.2 -4 ⁰ 53.5	323 ⁰ 05.1 -4 ⁰ 41.2	337 ⁰ 40.0 -4 ⁰ 29.0	352 ⁰ 15.0 -4 ⁰ 16.7	6 ⁰ 50.0 -4 ⁰ 04.4	21 ⁰ 25.1 -3 ⁰ 52.1	+34.9 14.9 +12.2 54.6
Mo 7	250 ⁰ 10.9 -5 ⁰ 42.3	264 ⁰ 45.7 -5 ⁰ 30.1	279 ⁰ 20.5 -5 ⁰ 17.9	293 ⁰ 55.3 -5 ⁰ 05.7	308 ⁰ 30.2 -4 ⁰ 53.5	323 ⁰ 05.1 -4 ⁰ 41.2	337 ⁰ 40.0 -4 ⁰ 29.0	352 ⁰ 15.0 -4 ⁰ 16.7	6 ⁰ 50.0 -4 ⁰ 04.4	21 ⁰ 25.1 -3 ⁰ 52.1	36 ⁰ 00.1 -3 ⁰ 39.8	+34.9 14.9 +12.3 54.6
Tu 8	254 ⁰ 48.9 -0 ⁰ 35.0	269 ⁰ 24.3 -0 ⁰ 22.7	283 ⁰ 59.7 -0 ⁰ 10.4	298 ⁰ 35.1 0 ⁰ 01.9	313 ⁰ 10.5 0 ⁰ 14.2	327 ⁰ 45.9 0 ⁰ 26.5	342 ⁰ 21.4 0 ⁰ 38.8	356 ⁰ 56.8 0 ⁰ 51.1	11 ⁰ 32.3 1 ⁰ 03.4	26 ⁰ 07.7 1 ⁰ 15.7	40 ⁰ 43.2 1 ⁰ 27.9	+35.4 14.8 +12.3 54.2
We 9	259 ⁰ 35.0 4 ⁰ 30.5	274 ⁰ 10.4 4 ⁰ 42.5	288 ⁰ 45.8 4 ⁰ 54.5	303 ⁰ 21.1 5 ⁰ 06.5	317 ⁰ 56.5 5 ⁰ 18.5	332 ⁰ 31.8 5 ⁰ 30.5	347 ⁰ 07.2 5 ⁰ 42.4	1 ⁰ 42.5 5 ⁰ 54.3	16 ⁰ 17.8 6 ⁰ 06.2	30 ⁰ 53.1 6 ⁰ 18.1	45 ⁰ 28.6 6 ⁰ 29.9	+35.3 14.7 +11.9 54.0
Th 10	264 ⁰ 14.5 9 ⁰ 24.2	278 ⁰ 49.3 9 ⁰ 35.5	293 ⁰ 24.1 9 ⁰ 46.9	307 ⁰ 58.9 9 ⁰ 58.2	322 ⁰ 33.7 10 ⁰ 09.4	337 ⁰ 08.4 10 ⁰ 20.6	351 ⁰ 43.1 10 ⁰ 31.8	6 ⁰ 17.7 10 ⁰ 42.9	20 ⁰ 52.3 10 ⁰ 54.0	35 ⁰ 26.9 11 ⁰ 05.1	50 ⁰ 01.4 11 ⁰ 16.1	+34.7 14.7 +11.2 53.9
Fr 11	268 ⁰ 34.3 13 ⁰ 55.7	283 ⁰ 08.1 14 ⁰ 06.0	297 ⁰ 41.9 14 ⁰ 16.2	312 ⁰ 15.6 14 ⁰ 26.3	326 ⁰ 49.3 14 ⁰ 36.4	341 ⁰ 22.9 14 ⁰ 46.4	355 ⁰ 56.5 14 ⁰ 56.3	10 ⁰ 30.0 15 ⁰ 06.2	25 ⁰ 03.4 15 ⁰ 16.1	39 ⁰ 36.8 15 ⁰ 25.9	54 ⁰ 10.2 15 ⁰ 35.6	+33.6 14.7 +10.0 54.0
Sa 12	272 ⁰ 23.9 17 ⁰ 53.6	286 ⁰ 56.3 18 ⁰ 02.3	301 ⁰ 28.7 18 ⁰ 10.8	316 ⁰ 01.0 18 ⁰ 19.3	330 ⁰ 33.3 18 ⁰ 27.8	345 ⁰ 05.5 18 ⁰ 36.1	359 ⁰ 37.6 18 ⁰ 44.4	14 ⁰ 09.7 18 ⁰ 52.5	28 ⁰ 41.8 19 ⁰ 00.6	43 ⁰ 13.7 19 ⁰ 08.7	57 ⁰ 45.6 19 ⁰ 16.6	+32.2 14.8 +38.3 54.2
Su 13	275 ⁰ 36.8 21 ⁰ 05.4	290 ⁰ 07.7 21 ⁰ 12.0	304 ⁰ 38.6 21 ⁰ 18.4	319 ⁰ 09.4 21 ⁰ 24.7	333 ⁰ 40.1 21 ⁰ 31.0	348 ⁰ 10.8 21 ⁰ 37.1	2 ⁰ 41.4 21 ⁰ 43.2	17 ⁰ 12.0 21 ⁰ 49.1	31 ⁰ 42.5 21 ⁰ 55.0	46 ⁰ 12.9 22 ⁰ 00.7	60 ⁰ 43.3 22 ⁰ 06.3	+30.7 14.8 +6.1 54.4
Mo 14	278 ⁰ 12.4 23 ⁰ 18.4	292 ⁰ 42.0 23 ⁰ 22.3	307 ⁰ 11.4 23 ⁰ 26.1	321 ⁰ 40.9 23 ⁰ 29.8	336 ⁰ 10.9 23 ⁰ 33.4	350 ⁰ 39.6 23 ⁰ 36.8	5 ⁰ 08.8 23 ⁰ 40.2	19 ⁰ 38.1 23 ⁰ 43.4	34 ⁰ 07.3 23 ⁰ 46.5	48 ⁰ 36.4 23 ⁰ 49.5	63 ⁰ 05.5 23 ⁰ 52.4	+29.3 14.9 +3.4 54.8
Tu 15	280 ⁰ 17.5 24 ⁰ 21.1	294 ⁰ 46.0 24 ⁰ 22.0	309 ⁰ 14.5 24 ⁰ 22.8	323 ⁰ 43.0 24 ⁰ 23.5	338 ⁰ 11.5 24 ⁰ 24.0	352 ⁰ 39.9 24 ⁰ 24.5	7 ⁰ 08.3 24 ⁰ 24.8	21 ⁰ 36.7 24 ⁰ 24.9	36 ⁰ 05.1 24 ⁰ 25.0	50 ⁰ 33.4 24 ⁰ 24.9	65 ⁰ 01.7 24 ⁰ 24.6	+28.4 15.1 +0.4 55.2
We 16	282 ⁰ 05.0 24 ⁰ 05.9	296 ⁰ 33.2 24 ⁰ 03.7	311 ⁰ 01.3 24 ⁰ 01.2	325 ⁰ 29.5 23 ⁰ 58.7	339 ⁰ 57.7 23 ⁰ 56.0	354 ⁰ 25.8 23 ⁰ 53.2	8 ⁰ 54.0 23 ⁰ 50.3	23 ⁰ 22.2 23 ⁰ 47.3	37 ⁰ 50.3 23 ⁰ 44.1	52 ⁰ 18.5 23 ⁰ 40.8	66 ⁰ 46.7 23 ⁰ 37.3	+28.2 15.2 -2.9 55.7
Th 17	283 ⁰ 50.9 22 ⁰ 30.5	298 ⁰ 19.3 22 ⁰ 25.0	312 ⁰ 47.7 22 ⁰ 19.9	327 ⁰ 16.2 22 ⁰ 13.8	341 ⁰ 44.6 22 ⁰ 07.9	356 ⁰ 13.1 22 ⁰ 02.0	10 ⁰ 41.7 21 ⁰ 55.9	25 ⁰ 10.2 21 ⁰ 49.7	39 ⁰ 38.8 21 ⁰ 43.4	54 ⁰ 07.4 21 ⁰ 37.0	68 ⁰ 36.0 21 ⁰ 30.5	+28.5 15.3 -6.0 56.2
Fr 18	285 ⁰ 48.6 19 ⁰ 38.3	300 ⁰ 17.7 19 ⁰ 30.0	314 ⁰ 46.8 19 ⁰ 21.5	329 ⁰ 15.9 19 ⁰ 12.9	343 ⁰ 45.1 19 ⁰ 04.2	358 ⁰ 14.3 18 ⁰ 55.4	12 ⁰ 43.5 18 ⁰ 46.5	27 ⁰ 12.8 18 ⁰ 37.4	41 ⁰ 42.1 18 ⁰ 28.3	56 ⁰ 11.4 18 ⁰ 19.1	70 ⁰ 40.8 18 ⁰ 09.8	+29.2 15.5 -8.9 56.6
Sa 19	288 ⁰ 05.0 15 ⁰ 38.0	302 ⁰ 34.8 15 ⁰ 27.1	317 ⁰ 04.7 15 ⁰ 16.2	331 ⁰ 34.6 15 ⁰ 05.1	346 ⁰ 04.6 15 ⁰ 45.0	0 ⁰ 34.5 14 ⁰ 42.8	13 ⁰ 04.5 14 ⁰ 31.5	29 ⁰ 34.5 14 ⁰ 20.1	44 ⁰ 04.6 14 ⁰ 08.6	58 ⁰ 34.7 13 ⁰ 57.0	73 ⁰ 04.7 13 ⁰ 45.4	+30.0 15.7 +11.3 57.5
Su 20	290 ⁰ 38.8 10 ⁰ 41.6	305 ⁰ 09.2 10 ⁰ 28.8	319 ⁰ 39.9 10 ⁰ 15.9	334 ⁰ 10.0 10 ⁰ 03.0	348 ⁰ 40.5 9 ⁰ 50.0	3 ⁰ 11.0 9 ⁰ 36.9	17 ⁰ 41.4 9 ⁰ 23.7	32 ⁰ 11.9 9 ⁰ 10.5	46 ⁰ 42.4 8 ⁰ 57.3	61 ⁰ 12.9 8 ⁰ 44.0	75 ⁰ 43.4 8 ⁰ 30.6	+30.5 15.9 +13.1 58.2
Mo 21	293 ⁰ 21.4 5 ⁰ 03.8	307 ⁰ 51.9 4 ⁰ 49.7	322 ⁰ 22.4 4 ⁰ 35.5	336 ⁰ 52.9 4 ⁰ 21.3	351 ⁰ 23.4 4 ⁰ 07.0	5 ⁰ 53.9 3 ⁰ 52.7	20 ⁰ 24.3 3 ⁰ 38.4	34 ⁰ 54.8 3 ⁰ 24.1	49 ⁰ 25.2 3 ⁰ 09.7	63 ⁰ 55.6 2 ⁰ 55.3	78 ⁰ 26.0 2 ⁰ 40.8	+30.5 16.1 -14.3 58.9
Tu 22	295 ⁰ 59.3 -0 ⁰ 58.5	310 ⁰ 29.3 -1 ⁰ 13.2	324 ⁰ 59.2 -1 ⁰ 27.9	339 ⁰ 29.1 -1 ⁰ 42.7	353 ⁰ 59.0 -1 ⁰ 57.4	8 ⁰ 28.9 -2 ⁰ 12.2	22 ⁰ 58.7 -2 ⁰ 26.9	37 ⁰ 28.4 -2 ⁰ 41.7	51 ⁰ 58.1 -2 ⁰ 56.4	66 ⁰ 27.8 -3 ⁰ 11.2	80 ⁰ 57.5 -3 ⁰ 25.9	+29.8 16.2 -14.8 59.5
We 23	298 ⁰ 16.0 -7 ⁰ 05.4	312 ⁰ 44.8 -7 ⁰ 19.8	327 ⁰ 13.5 -7 ⁰ 34.3	341 ⁰ 42.2 -7 ⁰ 48.7	356 ⁰ 10.8 -8 ⁰ 03.0	10 ⁰ 39.4 -8 ⁰ 17.3	25 ⁰ 07.9 -8 ⁰ 31.6	39 ⁰ 36.3 -8 ⁰ 45.8	54 ⁰ 04.6 -9 ⁰ 00.0	68 ⁰ 32.9 -9 ⁰ 14.2	83 ⁰ 01.1 -9 ⁰ 28.3	+28.5 16.0 -14.3 60.1
Th 24	299 ⁰ 55.6 -12 ⁰ 53.4	314 ⁰ 22.6 -13 ⁰ 06.5	328 ⁰ 49.5 -13 ⁰ 19.6	343 ⁰ 16.4 -13 ⁰ 32.6	357 ⁰ 43.2 -13 ⁰ 45.6	12 ⁰ 09.9 -13 ⁰ 58.4	26 ⁰ 36.5 -14 ⁰ 11.2	41 ⁰ 03.0 -14 ⁰ 23.8	55 ⁰ 29.5 -14 ⁰ 36.4	69 ⁰ 55.9 -14 ⁰ 48.9	84 ⁰ 22.2 -15 ⁰ 01.3	+26.7 16.5 -12.8 60.4
Fr 25	300 ⁰ 46.6 -17 ⁰ 55.5	315 ⁰ 11.6 -18 ⁰ 06.3	329 ⁰ 36.3 -18 ⁰ 16.9	344 ⁰ 01.3 -18 ⁰ 27.4	358 ⁰ 26.0 -18 ⁰ 37.8	12 ⁰ 50.7 -18 ⁰ 48.0	27 ⁰ 15.3 -18 ⁰ 58.1	41 ⁰ 39.8 -19 ⁰ 08.1	56 ⁰ 04.2 -19 ⁰ 18.0	70 ⁰ 28.6 -19 ⁰ 27.7	84 ⁰ 52.8 -19 ⁰ 37.3	+24.6 16.5 -10.2 60.6
Sa 26	300 ⁰ 48.6 -21 ⁰ 44.1	315 ⁰ 11.9 -21 ⁰ 51.4	329 ⁰ 35.0 -21 ⁰ 58.5	343 ⁰ 58.1 -22 ⁰ 05.4	358 ⁰ 21.2 -22 ⁰ 12.2	12 ⁰ 44.2 -22 ⁰ 18.8	27 ⁰ 07.2 -22 ⁰ 25.3	41 ⁰ 30.1 -22 ⁰ 31.6	55 ⁰ 53.0 -22 ⁰ 37.7	70 ⁰ 15.8 -22 ⁰ 43.7	84 ⁰ 38.6 -22 ⁰ 49.5	+23.0 16.5 -6.5 60.4
Su 27	300 ⁰ 17.2 -23 ⁰ 56.1	314 ⁰ 39.6 -23 ⁰ 59.1	329 ⁰ 02.1 -24 ⁰ 02.0	343 ⁰ 24.5 -24 ⁰ 04.7	357 ⁰ 47.0 -24 ⁰ 07.3	12 ⁰ 09.4 -24 ⁰ 09.6	26 ⁰ 31.9 -24 ⁰ 11.8	40 ⁰ 54.3 -24 ⁰ 13.8	55 ⁰ 16.8 -24 ⁰ 15.6	69 ⁰ 39.3 -24 ⁰ 17.3	84 ⁰ 01.8 -24 ⁰ 18.8	+22.4 16.4 -2.3 60.0
Mo 28	292 ⁰ 48.4 -24 ⁰ 20.0	314 ⁰ 05.9 -24 ⁰ 18.7	328 ⁰ 29.1 -24 ⁰ 17.2	342 ⁰ 52.2 -24 ⁰ 15.6	357 ⁰ 15.5 -24 ⁰ 13.8	11 ⁰ 38.8 -24 ⁰ 09.8	26 ⁰ 02.2 -24 ⁰ 07.5	40 ⁰ 25.6 -24 ⁰ 07.5	54 ⁰ 49.1 -24 ⁰ 05.0	69 ⁰ 12.7 -24 ⁰ 02.4	83 ⁰ 36.3 -23 ⁰ 59.6	+23.3 16.2 +2.0 59.3
Tu												

SUN

June 2029

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Fr 1	276°32.3 22°05.7	285°32.2 22°06.0	300°32.1 22°06.4	315°32.0 22°06.7	330°31.9 22°07.0	345°31.8 22°07.4	0°31.7 22°07.7	15°31.6 22°08.0	30°31.5 22°08.2	45°31.4 22°08.7	60°31.4 22°09.0	75°31.3 22°09.4	-0.1 +0.3
Sa 2	270°30.0 22°13.5	285°29.9 22°13.9	300°29.8 22°14.2	315°29.7 22°14.5	330°29.6 22°14.8	345°29.5 22°15.1	0°29.4 22°15.4	15°29.3 22°15.8	30°29.2 22°16.1	45°29.1 22°16.4	60°29.0 22°16.7	75°28.9 22°17.0	-0.1 +0.3
Su 3	270°27.5 22°21.0	285°27.4 22°21.3	300°27.3 22°21.6	315°27.2 22°21.9	330°27.1 22°22.1	345°27.0 22°22.5	0°26.9 22°22.8	15°26.8 22°23.1	30°26.7 22°23.4	45°26.6 22°23.7	60°26.5 22°24.0	75°26.4 22°24.3	-0.1 +0.3
Mo 4	270°25.0 22°28.0	285°24.9 22°28.3	300°24.8 22°28.6	315°24.6 22°28.9	330°24.5 22°29.2	345°24.4 22°29.4	0°24.3 22°29.7	15°24.2 22°30.0	30°24.1 22°30.3	45°24.0 22°30.6	60°23.9 22°30.8	75°23.8 22°31.1	-0.1 +0.3
Tu 5	270°22.3 22°34.7	285°22.2 22°35.0	300°22.1 22°35.2	315°22.0 22°35.5	330°21.9 22°35.8	345°21.8 22°36.0	0°21.7 22°36.3	15°21.5 22°36.5	30°21.4 22°36.8	45°21.3 22°37.1	60°21.2 22°37.3	75°21.1 22°37.6	-0.1 +0.3
We 6	270°19.6 22°40.9	285°19.5 22°41.2	300°19.4 22°41.4	315°19.3 22°41.7	330°19.2 22°41.9	345°19.0 22°42.2	0°18.9 22°42.4	15°18.8 22°42.7	30°18.7 22°42.9	45°18.6 22°43.2	60°18.5 22°43.4	75°18.3 22°43.7	-0.1 +0.2
Th 7	270°16.8 22°46.8	285°16.7 22°47.0	300°16.6 22°47.3	315°16.5 22°47.5	330°16.3 22°47.7	345°16.2 22°48.0	0°16.1 22°48.2	15°16.0 22°48.4	30°15.9 22°48.7	45°15.7 22°48.9	60°15.6 22°49.1	75°15.5 22°49.4	-0.1 +0.2
Fr 8	270°13.9 22°52.3	285°13.8 22°52.5	300°13.7 22°52.9	315°13.6 22°52.9	330°13.5 22°53.3	345°13.3 22°53.3	0°13.2 22°53.6	15°13.1 22°53.8	30°13.0 22°54.0	45°12.8 22°54.2	60°12.7 22°54.4	75°12.6 22°54.6	-0.1 +0.2
Sa 9	270°11.0 22°57.3	285°10.9 22°57.7	300°10.8 22°57.7	315°10.6 22°57.9	330°10.5 22°58.1	345°10.4 22°58.3	0°10.3 22°58.5	15°10.1 22°58.7	30°10.0 22°58.9	45°9.9 22°59.1	60°9.8 22°59.3	75°9.6 22°59.5	-0.1 +0.2
Su 10	270°08.0 23°02.0	285°07.9 23°02.2	300°07.7 23°02.3	315°07.6 23°02.5	330°07.5 23°02.7	345°07.4 23°02.9	0°07.2 23°03.1	15°07.1 23°03.2	30°07.0 23°03.3	45°06.9 23°03.6	60°06.7 23°03.8	75°06.6 23°04.0	-0.1 +0.2
Mo 11	270°04.9 23°06.2	285°04.8 23°06.4	300°04.7 23°06.5	315°04.5 23°06.7	330°04.4 23°06.9	345°04.3 23°07.0	0°04.2 23°07.2	15°04.0 23°07.3	30°03.9 23°07.4	45°03.8 23°07.7	60°03.6 23°07.9	75°03.5 23°08.0	-0.1 +0.2
Tu 12	270°01.8 23°10.1	285°01.7 23°10.2	300°01.6 23°10.4	315°01.4 23°10.5	330°01.3 23°10.7	345°01.2 23°10.8	0°01.0 23°10.9	15°00.9 23°11.1	30°00.8 23°11.2	45°00.6 23°11.3	60°00.5 23°11.5	75°00.4 23°11.7	-0.1 +0.1
We 13	269°58.7 23°13.5	284°58.5 23°13.6	299°58.4 23°13.8	314°58.3 23°13.9	329°58.1 23°14.0	344°58.0 23°14.1	359°57.9 23°14.3	14°57.7 23°14.4	29°57.6 23°14.5	44°57.5 23°14.7	59°57.3 23°14.8	74°57.2 23°14.9	-0.1 +0.1
Th 14	269°55.5 23°16.5	284°55.4 23°16.6	299°55.2 23°16.7	314°55.1 23°16.9	329°55.0 23°17.0	344°54.8 23°17.1	359°54.7 23°17.2	14°54.5 23°17.3	29°54.4 23°17.4	44°54.3 23°17.5	59°54.1 23°17.6	74°54.0 23°17.8	-0.1 +0.1
Fr 15	269°52.3 23°19.1	284°52.1 23°19.2	299°52.0 23°19.3	314°51.9 23°19.4	329°51.7 23°19.5	344°51.6 23°19.6	359°51.5 23°19.7	14°51.3 23°19.8	29°51.2 23°19.9	44°51.1 23°20.0	59°50.9 23°20.1	74°50.8 23°20.2	-0.1 +0.1
Sa 16	269°49.0 23°21.3	284°48.9 23°21.4	299°48.8 23°21.5	314°48.6 23°21.6	329°48.5 23°21.6	344°48.3 23°21.7	359°48.2 23°21.8	14°48.1 23°21.9	29°47.9 23°22.0	44°47.8 23°22.1	59°47.6 23°22.2	74°47.5 23°22.2	-0.1 +0.1
Su 17	269°45.8 23°23.1	284°45.6 23°23.2	299°45.5 23°23.2	314°45.4 23°23.3	329°45.3 23°23.4	344°45.1 23°23.4	359°44.9 23°23.5	14°44.8 23°23.5	29°44.7 23°23.6	44°44.5 23°23.7	59°44.4 23°23.7	74°44.3 23°23.8	-0.1 +0.1
Mo 18	269°42.5 23°24.5	284°42.4 23°24.5	299°42.2 23°24.6	314°42.1 23°24.6	329°42.0 23°24.7	344°41.8 23°24.7	359°41.7 23°24.8	14°41.5 23°24.8	29°41.4 23°24.8	44°41.3 23°24.9	59°41.1 23°24.9	74°41.0 23°25.0	-0.1 +0.0
Tu 19	269°39.2 23°25.4	284°39.1 23°25.5	299°39.0 23°25.5	314°38.8 23°25.5	329°38.7 23°25.6	344°38.5 23°25.6	359°38.4 23°25.6	14°38.3 23°25.6	29°38.1 23°25.7	44°38.0 23°25.7	59°37.9 23°25.7	74°37.7 23°25.7	-0.1 +0.0
We 20	269°36.0 23°26.0	284°35.8 23°26.0	299°35.7 23°26.0	314°35.6 23°26.0	329°35.4 23°26.0	344°35.3 23°26.0	359°35.1 23°26.1	14°35.0 23°26.1	29°34.9 23°26.1	44°34.7 23°26.1	59°34.6 23°26.1	74°34.5 23°26.1	-0.1 +0.0
Th 21	269°32.7 23°26.1	284°32.6 23°26.1	299°32.4 23°26.1	314°32.3 23°26.1	329°32.2 23°26.1	344°32.0 23°26.1	359°31.9 23°26.1	14°31.8 23°26.1	29°31.6 23°26.1	44°31.5 23°26.1	59°31.3 23°26.1	74°31.2 23°26.0	-0.1 -0.0
Fr 22	269°29.5 23°25.8	284°29.3 23°25.8	299°29.2 23°25.8	314°29.1 23°25.8	329°28.9 23°25.8	344°28.8 23°25.7	359°28.6 23°25.7	14°28.5 23°25.7	29°28.4 23°25.7	44°28.2 23°25.7	59°28.1 23°25.6	74°28.0 23°25.6	-0.1 -0.0
Sa 23	269°26.2 23°25.1	284°26.1 23°25.1	299°26.0 23°25.1	314°25.8 23°25.0	329°25.7 23°25.0	344°25.6 23°25.0	359°25.4 23°24.9	14°25.3 23°24.9	29°25.2 23°24.8	44°25.0 23°24.8	59°24.9 23°24.7	74°24.8 23°24.7	-0.1 -0.0
Su 24	269°23.0 23°24.0	284°22.9 23°24.0	299°22.8 23°23.9	314°22.6 23°23.8	329°22.5 23°23.8	344°22.4 23°23.7	359°22.2 23°23.7	14°22.1 23°23.6	29°22.0 23°23.6	44°21.8 23°23.5	59°21.7 23°23.5	74°21.6 23°23.4	-0.1 -0.1
Mo 25	269°19.9 23°22.5	284°19.7 23°22.5	299°19.6 23°22.4	314°19.5 23°22.3	329°19.3 23°22.2	344°19.2 23°22.2	359°19.1 23°22.1	14°18.9 23°22.0	29°18.8 23°22.0	44°18.7 23°21.9	59°18.5 23°21.8	74°18.4 23°21.7	-0.1 -0.1
Tu 26	269°16.7 23°20.6	284°16.6 23°20.5	299°16.5 23°20.4	314°16.3 23°20.3	329°16.2 23°20.2	344°16.1 23°20.2	359°15.9 23°20.1	14°15.8 23°20.0	29°15.7 23°19.9	44°15.6 23°19.8	59°15.4 23°19.7	74°15.3 23°19.6	-0.1 -0.1
We 27	269°13.6 23°18.3	284°13.5 23°18.2	299°13.4 23°18.1	314°13.2 23°18.0	329°13.1 23°17.8	344°13.0 23°17.7	359°12.9 23°17.6	14°12.7 23°17.5	29°12.6 23°17.4	44°12.5 23°17.3	59°12.3 23°17.2	74°12.2 23°17.1	-0.1 -0.1
Th 28	269°10.6 23°15.5	284°10.4 23°15.4	299°10.3 23°15.3	314°10.2 23°15.2	329°10.1 23°15.0	344°09.9 23°14.9	359°09.8 23°14.8	14°09.7 23°14.7	29°09.6 23°14.6	44°09.4 23°14.4	59°09.3 23°14.3	74°09.2 23°14.1	-0.1 -0.1
Fr 29	269°07.6 23°12.4	284°07.4 23°12.2	299°07.3 23°12.1	314°07.2 23°12.0	329°07.1 23°11.8	344°06.9 23°11.7	359°06.8 23°11.5	14°06.7 23°11.4	29°06.6 23°11.3	44°06.4 23°11.2	59°06.3 23°10.9	74°06.2 23°10.8	-0.1 -0.1
Sa 30	269°04.6 23°08.8	284°04.5 23°08.7	299°04.4 23°08.5	314°04.2 23°08.3	329°04.1 23°08.2	344°04.0 23°08.0	359°03.9 23°07.9	14°03.7 23°07.7	29°03.6 23°07.5	44°03.5 23°07.4	59°03.4 23°07.2	74°03.3 23°07.1	-0.1 -0.2

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

June 2029

	D	19h	20h	21h	22h	23h	0h	1h	2h	3h	4h	5h	Δ'/h SH
●	Fr 1	232°59.7 -12°39.9	247°31.7 -12°28.5	262°03.8 -12°17.0	276°36.0 -12°05.4	291°08.3 -11°53.9	305°40.7 -11°42.2	320°13.1 -11°30.6	334°45.7 -11°18.9	349°18.3 -11°07.2	3°51.0 -10°55.4	18°23.7 -10°43.6	+32.4 15.3 +11.6 56.0
	Sa 2	236°43.1 -7°43.1	251°16.9 -7°30.9	265°50.8 -7°18.6	280°24.7 -7°06.4	294°58.6 -6°54.1	309°32.6 -6°41.8	324°06.7 -6°29.5	338°40.8 -6°17.2	353°15.0 -6°04.9	7°49.2 -5°52.5	22°23.4 -5°40.2	+34.0 15.1 +12.3 55.3
	Su 3	241°02.2 -2°33.8	255°37.1 -2°21.4	270°12.0 -2°08.9	284°46.9 -1°56.5	299°21.8 -1°44.0	313°56.8 -1°31.6	328°31.8 -1°19.1	343°06.8 -1°06.7	357°41.8 -0°54.3	12°16.9 -0°41.4	26°52.0 -0°29.4	+35.0 14.9 +12.4 54.7
○	Mo 4	245°40.0 2°35.9	260°15.3 2°48.2	274°50.5 3°00.4	289°25.8 3°12.6	304°01.1 3°24.8	318°36.3 3°37.0	333°11.6 3°49.2	347°46.9 4°01.3	2°22.2 4°13.4	16°57.4 4°25.6	31°32.7 4°37.6	+35.3 14.8 +12.2 54.3
	Tu 5	260°15.3 2°48.2	274°50.5 3°00.4	289°25.8 3°12.6	304°01.1 3°24.8	318°36.3 3°37.0	333°11.6 3°49.2	347°46.9 4°01.3	2°22.2 4°13.4	16°57.4 4°25.6	31°32.7 4°37.6	46°07.9 4°49.7	+35.3 14.8 +12.2 54.3
	We 6	264°55.3 7°47.7	279°30.3 7°59.3	294°05.3 8°10.9	308°40.3 8°22.5	323°15.2 8°34.0	337°50.2 8°45.6	352°25.1 8°57.0	7°00.0 9°08.5	21°34.8 9°19.9	36°09.6 9°31.2	50°44.4 9°42.6	+34.9 14.8 +11.5 54.1
●	Th 7	269°22.2 16°37.6	283°56.4 16°46.8	298°30.6 16°56.0	313°04.7 17°05.1	327°38.8 17°14.1	342°12.9 17°23.0	356°46.9 17°31.9	11°20.8 17°40.7	25°54.7 17°45.1	40°28.6 17°58.1	55°02.4 18°06.7	+34.0 14.7 +8.9 54.2
	Fr 8	273°23.2 16°37.6	287°56.1 16°46.8	302°29.0 16°56.0	317°01.8 17°05.1	331°34.6 17°14.1	346°07.3 17°23.0	0°40.0 17°31.9	15°12.6 17°40.7	29°45.1 17°45.1	44°17.6 17°58.1	58°50.0 18°06.7	+32.7 14.8 +8.9 54.2
	Sa 9	276°48.5 20°06.1	291°19.9 20°13.4	305°51.2 20°20.6	320°22.5 20°27.7	334°53.7 20°34.8	349°24.8 20°41.7	3°55.9 20°48.6	18°26.9 20°55.3	32°57.8 21°02.0	47°28.7 21°08.6	61°59.5 21°15.1	+31.1 14.9 +6.9 54.5
○	Su 10	279°34.0 22°40.4	294°03.8 22°45.3	308°33.6 22°50.0	323°03.2 22°54.7	337°32.9 22°59.2	352°02.4 23°03.6	6°32.0 23°08.0	21°01.4 23°12.2	35°30.8 23°16.5	50°00.2 23°20.2	64°29.4 23°24.1	+29.5 15.0 +4.4 54.9
	Mo 11	281°42.7 24°08.0	296°11.2 24°09.9	310°39.7 24°11.8	325°08.9 24°13.5	339°36.5 24°15.1	354°04.9 24°16.5	8°33.2 24°17.8	23°20.1 24°19.1	37°29.7 24°20.1	51°57.9 24°21.1	66°26.1 24°21.9	+28.3 15.1 +1.4 55.3
	Tu 12	283°25.7 24°18.7	297°53.5 24°17.4	312°21.3 24°16.0	326°49.1 24°14.5	341°16.9 24°12.9	355°44.6 24°11.1	10°12.4 24°09.1	24°40.2 24°07.1	39°07.9 24°04.9	53°35.6 24°02.6	68°03.4 24°00.1	+27.8 15.2 -1.9 55.8
●	We 13	284°59.8 23°07.5	299°27.6 23°03.0	313°55.5 22°58.3	328°23.3 22°53.5	342°51.2 22°48.6	357°19.1 22°43.5	11°47.0 22°38.3	26°15.0 22°33.0	40°42.9 22°27.5	55°10.9 22°22.0	69°38.9 22°16.3	+27.9 15.4 -5.1 56.3
	Th 14	286°42.1 20°36.1	301°10.6 20°28.4	315°39.7 20°20.7	330°07.6 20°12.8	344°36.2 20°04.9	359°04.8 19°56.8	13°33.4 19°48.6	28°02.0 19°40.2	42°30.8 19°31.8	56°59.5 19°23.3	71°28.3 19°14.6	+28.6 15.5 -8.1 56.8
	Fr 15	288°44.4 16°52.4	303°13.8 16°42.2	317°43.3 16°31.8	332°12.7 16°21.3	346°42.2 16°10.8	3°41.6 16°00.1	15°41.3 15°49.4	30°10.9 15°38.4	44°40.6 15°27.6	59°10.5 15°16.6	73°40.0 15°05.5	+29.6 15.6 -10.7 57.4
○	Sa 16	291°10.0 12°09.5	305°40.3 11°57.2	320°10.6 11°44.8	334°40.9 11°32.3	349°11.2 11°19.8	3°41.6 11°07.2	18°12.0 10°54.5	32°42.4 10°41.8	47°12.9 10°29.0	61°43.4 10°16.1	76°13.9 10°03.2	+30.4 15.8 -12.6 57.9
	Su 17	293°53.7 6°43.1	308°24.5 6°29.4	322°55.3 6°15.6	337°26.1 6°01.8	351°56.9 5°48.0	6°27.7 5°34.1	20°58.5 5°20.2	35°29.3 5°06.2	50°00.1 4°52.3	64°31.0 4°38.2	79°01.8 4°24.2	+30.8 15.9 -13.9 58.3
	Mo 18	296°43.9 0°50.5	311°14.7 0°36.1	325°45.4 0°21.7	340°16.1 0°07.3	354°46.8 -0°07.2	9°17.4 -0°21.6	23°48.1 -0°36.0	38°18.7 -0°50.5	52°49.3 -1°04.9	67°19.9 -1°19.3	81°50.5 -1°33.8	+30.7 16.0 -14.4 58.8
●	Tu 19	299°25.3 -5°09.7	313°55.4 -5°24.0	328°25.4 -5°38.3	343°55.3 -5°52.5	357°05.2 -6°06.8	11°55.1 -6°21.0	26°24.9 -6°35.1	40°54.7 -6°49.3	55°24.4 -7°03.4	69°54.1 -7°17.4	84°23.7 -7°31.5	+29.8 16.1 -14.2 59.2
	We 20	301°41.3 -10°57.2	316°10.0 -11°10.6	330°38.6 -11°23.8	345°07.2 -11°37.0	359°35.7 -11°50.2	14°04.1 -12°03.3	28°32.5 -12°16.3	43°00.7 -12°29.2	57°29.0 -12°42.0	71°57.1 -12°54.9	86°25.2 -13°07.7	+28.4 16.2 -13.1 59.5
	Th 21	303°17.3 -16°09.4	317°44.2 -16°20.8	332°11.0 -16°32.2	346°37.7 -16°43.4	361°07.2 -16°54.5	1°04.3 -17°05.5	15°30.9 -17°16.4	29°57.3 -17°27.2	44°23.7 -17°37.9	58°50.0 -17°48.5	73°16.3 -17°59.0	+26.5 16.3 -11.0 59.7
○	Fr 22	304°05.5 -20°22.1	318°30.4 -20°30.7	332°55.3 -20°39.1	347°20.1 -20°47.3	362°06.1 -20°55.5	1°44.8 -21°03.4	16°09.5 -21°11.3	30°34.1 -21°19.0	44°58.6 -21°26.2	59°23.1 -21°37.5	73°47.5 -21°41.3	+24.6 16.3 -7.9 59.7
	Sa 23	304°10.2 -23°12.3	318°33.7 -23°17.1	332°57.2 -23°21.8	347°20.6 -23°26.2	362°06.1 -23°30.6	1°44.0 -23°34.4	16°07.4 -23°38.7	30°30.8 -23°42.6	44°54.1 -23°46.3	59°17.4 -23°49.8	73°40.0 -23°53.1	+23.4 16.3 -4.1 59.9
	Su 24	303°51.3 -24°23.0	318°14.5 -24°23.7	332°37.6 -24°24.1	347°00.8 -24°24.4	361°00.8 -24°24.5	1°24.1 -24°24.5	15°47.3 -24°24.3	30°10.6 -24°24.3	44°33.9 -24°23.4	58°57.2 -24°23.4	73°20.5 -24°21.7	+23.3 16.2 -0.1 59.3
●	Mo 25	303°39.8 -23°49.2	318°03.9 -23°45.7	332°28.2 -23°42.1	346°52.5 -23°38.3	361°16.8 -23°34.4	1°16.8 -23°30.3	15°41.2 -23°26.1	30°05.7 -23°21.8	44°30.3 -23°17.3	58°54.9 -23°12.6	73°19.7 -23°07.5	+24.5 16.0 -4.1 59.8
	Tu 26	304°06.4 -21°39.1	318°32.6 -21°32.1	332°58.9 -21°25.8	347°25.3 -21°17.8	362°06.1 -21°04.5	1°51.7 -21°03.0	16°18.3 -20°55.5	30°45.0 -20°47.8	45°11.7 -20°40.0	59°38.6 -20°32.1	74°05.5 -20°24.0	+26.6 15.8 +7.5 58.1
	We 27	305°30.5 -18°11.3	319°59.1 -18°01.7	334°27.9 -17°52.0	348°56.7 -17°42.2	363°25.7 -17°32.4	3°25.7 -17°22.4	17°54.7 -17°12.4	32°23.9 -17°02.3	46°53.2 -16°52.1	61°22.5 -16°41.8	75°52.0 -16°31.5	+29.1 15.6 -10.0 57.3
○	Th 28	307°56.1 -13°48.4	322°27.1 -13°37.0	336°58.2 -13°25.6	351°29.4 -13°14.2	366°00.7 -13°02.7	6°00.7 -12°51.1	20°32.1 -12°39.5	35°03.5 -12°27.9	49°35.1 -12°16.2	64°06.7 -12°04.4	78°38.4 -11°52.7	+31.4 15.4 -11.6 56.5
	Fr 29	322°27.1 -13°37.0	336°58.2 -13°25.6	351°29.4 -13°14.2	366°00.7 -13°02.7	381°12.9 -12°51.1	6°00.7 -12°39.5	20°32.1 -12°27.9	35°03.5 -12°16.2	49°35.1 -12°04.4	64°06.7 -11°52.7	78°38.4 -11°40.8	+31.5 15.4 -11.6 56.5
	Sa 30	325°49.0 -8°39.3	340°22.0 -8°27.0	354°55.0 -8°14.7	369°28.2 -8°02.3	384°01.4 -7°49.9	24°01.4 -7°37.5	38°34.6 -7°25.0	53°08.0 -7°12.6	67°41.3 -7°00.1	82°14.8 -6°47.6	96°48.3 -6°35.1	+33.3 15.2 +12.4 55.8

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (– = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour – day) mod 24

LQ: 4 01h18 — NM: 12 03h50 — FQ: 19 09h54 — FM: 26 03h22

SUN

July 2029

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Su 1	268°01.7	284°01.6	299°01.5	314°01.3	329°01.2	344°01.1	359°01.0	14°00.9	29°00.7	44°00.6	59°00.5	74°00.4	-0.1
	23°04.9	23°04.7	23°04.5	23°04.3	23°04.2	23°04.0	23°03.8	23°03.6	23°03.4	23°03.3	23°03.1	23°02.9	-0.2
Mo 2	268°58.9	283°58.7	298°58.6	313°58.5	328°58.4	343°58.3	358°58.2	13°58.0	28°57.9	43°57.8	58°57.7	73°57.6	-0.1
	23°00.5	23°00.3	23°00.1	22°59.9	22°59.7	22°59.5	22°59.3	22°59.1	22°58.9	22°58.7	22°58.6	22°58.4	-0.2
Tu 3	268°56.1	283°56.0	298°55.9	313°55.8	328°55.6	343°55.5	358°55.4	13°55.3	28°55.2	43°55.1	58°55.0	73°54.8	-0.1
	22°55.7	22°55.5	22°55.3	22°55.1	22°54.9	22°54.7	22°54.5	22°54.3	22°54.0	22°53.8	22°53.6	22°53.4	-0.2
We 4	268°53.4	283°53.3	298°53.2	313°53.1	328°53.0	343°52.8	358°52.7	13°52.6	28°52.5	43°52.4	58°52.3	73°52.2	-0.1
	22°50.5	22°50.3	22°50.1	22°49.9	22°49.6	22°49.4	22°49.2	22°49.0	22°48.7	22°48.5	22°48.3	22°48.0	-0.2
Th 5	268°50.8	283°50.7	298°50.6	313°50.5	328°50.3	343°50.2	358°50.1	13°50.0	28°49.9	43°49.8	58°49.7	73°49.6	-0.1
	22°45.0	22°44.7	22°44.5	22°44.3	22°44.0	22°43.8	22°43.5	22°43.3	22°43.0	22°42.8	22°42.5	22°42.3	-0.2
Fr 6	268°48.2	283°48.1	298°48.0	313°47.9	328°47.8	343°47.7	358°47.6	13°47.5	28°47.4	43°47.3	58°47.2	73°47.1	-0.1
	22°39.0	22°38.7	22°38.5	22°38.2	22°38.0	22°37.7	22°37.5	22°37.2	22°36.9	22°36.7	22°36.4	22°36.1	-0.3
Sa 7	268°45.8	283°45.7	298°45.6	313°45.5	328°45.4	343°45.3	358°45.2	13°45.1	28°45.0	43°44.9	58°44.8	73°44.7	-0.1
	22°32.7	22°32.4	22°32.1	22°31.8	22°31.6	22°31.3	22°31.0	22°30.7	22°30.4	22°30.2	22°29.9	22°29.6	-0.3
Su 8	268°43.4	283°43.3	298°43.2	313°43.1	328°43.0	343°42.9	358°42.8	13°42.8	28°42.7	43°42.6	58°42.5	73°42.4	-0.1
	22°25.9	22°25.6	22°25.3	22°25.0	22°24.7	22°24.5	22°24.2	22°23.9	22°23.6	22°23.3	22°23.0	22°22.7	-0.3
Mo 9	268°41.2	283°41.1	298°41.0	313°40.9	328°40.8	343°40.7	358°40.6	13°40.5	28°40.4	43°40.3	58°40.2	73°40.2	-0.1
	22°18.8	22°18.5	22°18.2	22°17.8	22°17.5	22°17.2	22°16.9	22°16.6	22°16.3	22°16.0	22°15.7	22°15.4	-0.3
Tu 10	268°39.0	283°38.9	298°38.8	313°38.7	328°38.6	343°38.6	358°38.5	13°38.4	28°38.3	43°38.2	58°38.1	73°38.0	-0.1
	22°11.2	22°10.9	22°10.6	22°10.3	22°10.0	22°09.6	22°09.3	22°09.0	22°08.7	22°08.3	22°08.0	22°07.7	-0.3
We 11	268°36.9	283°36.9	298°36.8	313°36.7	328°36.6	343°36.5	358°36.5	13°36.4	28°36.3	43°36.2	58°36.1	73°36.0	-0.1
	22°03.3	22°03.0	22°02.7	22°02.3	22°02.0	22°01.6	22°01.3	22°01.0	22°00.6	22°00.3	22°00.0	22°59.9	-0.3
Th 12	268°35.0	283°34.9	298°34.9	313°34.8	328°34.7	343°34.6	358°34.5	13°34.5	28°34.4	43°34.3	58°34.2	73°34.2	-0.1
	21°55.1	21°54.7	21°54.3	21°54.0	21°53.6	21°53.3	21°52.9	21°52.6	21°52.2	21°51.9	21°51.5	21°51.1	-0.4
Fr 13	268°33.2	283°33.1	298°33.0	313°33.0	328°32.9	343°32.8	358°32.8	13°32.7	28°32.6	43°32.5	58°32.5	73°32.4	-0.1
	21°46.4	21°46.0	21°45.7	21°45.3	21°44.9	21°44.5	21°44.2	21°43.8	21°43.4	21°43.1	21°42.7	21°42.3	-0.4
Sa 14	268°31.5	283°31.4	298°31.4	313°31.3	328°31.2	343°31.2	358°31.1	13°31.0	28°30.9	43°30.8	58°30.8	73°30.8	-0.1
	21°37.4	21°37.0	21°36.6	21°36.2	21°35.8	21°35.4	21°35.1	21°34.7	21°34.3	21°33.9	21°33.5	21°33.1	-0.4
Su 15	268°29.9	283°29.9	298°29.8	313°29.7	328°29.7	343°29.6	358°29.5	13°29.5	28°29.4	43°29.3	58°29.3	73°29.2	-0.1
	21°28.0	21°27.6	21°27.2	21°26.8	21°26.4	21°26.0	21°25.6	21°25.2	21°24.8	21°24.4	21°23.9	21°23.5	-0.4
Mo 16	268°28.5	283°28.4	298°28.4	313°28.3	328°28.2	343°28.2	358°28.1	13°28.1	28°28.0	43°27.8	58°27.9	73°27.9	-0.1
	21°18.2	21°17.8	21°17.4	21°17.0	21°16.5	21°16.1	21°15.7	21°15.3	21°14.9	21°14.5	21°14.0	21°13.6	-0.4
Tu 17	268°27.2	283°27.1	298°27.1	313°27.0	328°27.0	343°26.9	358°26.9	13°26.8	28°26.8	43°26.7	58°26.7	73°26.6	-0.1
	21°08.1	21°07.7	21°07.2	21°06.8	21°06.4	21°05.9	21°05.5	21°05.1	21°04.6	21°04.2	21°03.8	21°03.3	-0.4
We 18	268°26.0	283°26.0	298°25.9	313°25.9	328°25.8	343°25.8	358°25.7	13°25.7	28°25.6	43°25.6	58°25.6	73°25.5	-0.0
	20°57.6	20°57.2	20°56.7	20°56.3	20°55.8	20°55.4	20°54.9	20°54.5	20°54.0	20°53.6	20°53.1	20°52.7	-0.4
Th 19	268°25.0	283°24.9	298°24.9	313°24.9	328°24.8	343°24.8	358°24.7	13°24.7	28°24.7	43°24.6	58°24.6	73°24.5	-0.0
	20°46.8	20°46.3	20°45.9	20°45.4	20°44.9	20°44.5	20°44.0	20°43.5	20°43.1	20°42.6	20°42.2	20°41.7	-0.5
Fr 20	268°24.1	283°24.1	298°24.0	313°24.0	328°24.0	343°23.9	358°23.9	13°23.9	28°23.8	43°23.8	58°23.8	73°23.7	-0.0
	20°35.6	20°35.1	20°34.6	20°34.2	20°33.7	20°33.2	20°32.7	20°32.2	20°31.8	20°31.3	20°30.8	20°30.4	-0.5
Sa 21	268°23.3	283°23.3	298°23.3	313°23.3	328°23.2	343°23.2	358°23.2	13°23.2	28°23.1	43°23.1	58°23.1	73°23.1	-0.0
	20°24.1	20°23.6	20°23.3	20°22.8	20°22.1	20°21.6	20°21.1	20°20.6	20°20.2	20°19.7	20°19.2	20°18.7	-0.5
Su 22	268°22.8	283°22.7	298°22.7	313°22.7	328°22.7	343°22.6	358°22.6	13°22.6	28°22.6	43°22.6	58°22.6	73°22.5	-0.0
	20°12.2	20°11.7	20°11.2	20°10.7	20°10.2	20°09.7	20°09.2	20°08.7	20°08.2	20°07.7	20°07.2	20°06.6	-0.5
Mo 23	268°22.3	283°22.3	298°22.3	313°22.3	328°22.2	343°22.2	358°22.2	13°22.2	28°22.2	43°22.2	58°22.2	73°22.2	-0.0
	20°00.0	19°59.5	19°59.0	19°58.4	19°57.9	19°57.4	19°56.9	19°56.4	19°55.9	19°55.3	19°54.8	19°54.3	-0.5
Tu 24	268°22.0	283°22.0	298°22.0	313°22.0	328°22.0	343°22.0	358°22.0	13°22.0	28°22.0	43°22.0	58°22.0	73°21.9	-0.0
	19°47.5	19°46.9	19°46.4	19°45.9	19°45.3	19°44.8	19°44.3	19°43.7	19°43.2	19°42.7	19°42.1	19°41.6	-0.5
We 25	268°21.9	283°21.9	298°21.9	313°21.9	328°21.9	343°21.9	358°21.8	13°21.8	28°21.8	43°21.8	58°21.8	73°21.8	-0.0
	19°34.6	19°34.1	19°33.5	19°33.0	19°32.4	19°31.9	19°31.3	19°30.8	19°30.2	19°29.7	19°29.1	19°28.6	-0.5
Th 26	268°21.9	283°21.9	298°21.9	313°21.9	328°21.9	343°21.9	358°21.9	13°21.9	28°21.9	43°21.9	58°21.9	73°21.9	+0.0
	19°21.4	19°20.9	19°20.3	19°19.7	19°19.2	19°18.6	19°18.1	19°17.5	19°16.9	19°16.4	19°15.8	19°15.3	-0.6
Fr 27	268°22.0	283°22.0	298°22.0	313°22.0	328°22.1	343°22.1	358°22.1	13°22.1	28°22.1	43°22.1	58°22.1	73°22.1	+0.0
	19°07.9	19°07.3	19°06.8	19°06.2	19°05.6	19°05.1	19°04.5	19°03.9	19°03.3	19°02.8	19°02.2	19°01.6	-0.6
Sa 28	268°22.3	283°22.3	298°22.3	313°22.4	328°22.4	343°22.4	358°22.4	13°22.4	28°22.4	43°22.4	58°22.5	73°22.5	+0.0
	18°54.1	18°53.5	18°52.9	18°52.3	18°51.7	18°51.2	18°50.6	18°50.0	18°49.4	18°48.8	18°48.2	18°47.6	-0.6
Su 29	268°22.8	283°22.8	298°22.8	313°22.8	328°22.8	343°22.9	358°22.9	13°22.9	28°22.9	43°23.0	58°23.0	73°23.0	+0.0
	18°39.9	18°39.3	18°38.8	18°38.2	18°37.6	18°37.0	18°36.4	18°35.8	18°35.2	18°34.6	18°34.0	18°33.4	-0.6
Mo 30	268°23.4	283°23.4	298°23.4	313°23.4	328°23.5	343°23.5	358°23.5	13°23.6	28°23.6	43°23.6	58°23.6	73°23.7	+0.0
	18°25.5	18°24.9	18°24.3	18°23.7	18°23.1	18°22.5	18°21.8	18°21.2	18°20.6	18°20.0	18°19.4	18°18.8	-0.6
Tu 31	268°24.1	283°24.1	298°24.2	313°24.2	328°24.2	343°24.3	358°24.3	13°24.3	28°24.4	43°24.4	58°24.5	73°24.5	+0.0
	18°10.8	18°10.1	18°09.5	18°08.9	18°08.3	18°07.6	18°07.0	18°06.4	18°05.8	18°05.1	18°04.5	18°03.9	-0.6

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

July 2029

	D	19h	20h	21h	22h	23h	0h	1h	2h	3h	4h	5h	Δ' /h SH
Su 1	232°13.2	246°48.0	261°22.8	275°57.7	290°32.5	305°07.4	319°42.3	334°17.2	348°52.1	3°27.1	18°02.0	+34.9 14.9	
	0°20.7	0°33.3	0°45.8	0°58.3	1°10.8	1°23.3	1°35.8	1°48.3	2°00.7	2°13.1	2°25.6	+12.5 54.8	
Mo 2	236°46.9	251°21.9	265°56.9	280°31.8	295°06.8	309°41.8	324°16.7	338°51.6	353°26.6	8°01.5	22°36.4	+35.0 14.8	
	5°29.3	5°41.4	5°53.4	6°05.4	6°17.4	6°29.3	6°41.2	6°53.1	7°05.0	7°16.8	7°28.6	+11.9 54.4	
Tu 3	241°17.7	255°52.2	270°26.2	285°01.3	299°35.8	314°10.2	328°44.6	343°19.0	357°53.3	12°27.6	27°01.9	+34.4 14.8	
	10°21.1	10°32.3	10°43.4	10°54.5	11°05.6	11°16.6	11°27.6	11°38.5	11°49.4	12°00.2	12°11.0	+11.0 54.2	
We 4	245°31.3	260°04.9	274°38.4	289°11.9	303°45.4	318°18.8	332°52.2	347°25.5	1°58.7	16°31.9	31°05.1	+33.4 14.8	
	14°46.5	14°56.4	15°06.3	15°16.1	15°25.8	15°35.5	15°45.1	15°54.7	16°04.2	16°13.6	16°23.0	+9.7 54.2	
Th 5	260°04.9	274°38.4	289°11.9	303°45.4	318°18.8	332°52.2	347°25.5	1°58.7	16°31.9	31°05.1	45°38.2	+33.3 14.8	
	14°56.4	15°06.3	15°16.1	15°25.8	15°35.5	15°45.1	15°54.7	16°04.2	16°13.6	16°23.0	16°32.3	+9.6 54.2	
Fr 6	263°47.8	278°20.0	292°52.1	307°24.2	321°56.1	336°28.1	350°59.9	5°31.7	20°03.4	34°35.1	49°06.7	+31.9 14.8	
	18°43.4	18°51.6	18°59.7	19°07.7	19°15.6	19°23.4	19°31.2	19°38.8	19°46.4	19°53.9	20°01.3	+7.8 54.4	
Sa 7	266°53.0	281°23.6	295°54.1	310°24.5	324°54.9	339°25.2	353°55.4	8°25.6	22°55.7	37°25.8	51°55.8	+30.3 14.9	
	21°41.9	21°47.8	21°53.7	21°59.4	22°05.1	22°10.6	22°16.1	22°21.4	22°26.7	22°31.8	22°36.9	+5.5 54.7	
Su 8	269°18.3	283°47.3	298°16.3	312°45.2	327°14.1	341°42.9	356°11.7	10°40.4	25°09.1	39°37.7	54°06.2	+28.8 15.1	
	23°39.4	23°42.7	23°45.8	23°48.8	23°51.7	23°54.5	23°57.2	23°59.7	24°02.2	24°04.5	24°06.7	+2.7 55.2	
Mo 9	271°09.4	285°37.3	300°05.1	314°33.0	329°00.8	343°28.5	357°56.3	12°24.0	26°51.7	41°19.4	55°47.0	+27.8 15.2	
	24°24.4	24°24.5	24°24.6	24°24.4	24°24.2	24°23.8	24°23.3	24°22.7	24°21.9	24°21.0	24°20.0	-0.4 55.8	
Tu 10	272°39.6	287°07.0	301°34.4	316°01.8	330°29.2	344°56.6	359°24.0	13°51.5	28°18.9	42°46.3	57°13.7	+27.4 15.4	
	23°48.4	23°45.2	23°41.9	23°38.4	23°34.8	23°31.1	23°27.3	23°23.3	23°19.1	23°14.9	23°10.5	-3.8 56.4	
We 11	274°06.4	288°34.0	303°01.7	317°29.0	331°57.1	346°24.8	360°52.6	15°20.4	29°48.2	44°16.0	58°43.9	+27.7 15.6	
	21°48.8	21°42.3	21°35.7	21°29.0	21°22.1	21°15.1	21°08.0	21°00.8	20°53.4	20°45.9	20°38.3	-7.0 57.0	
Th 12	275°45.7	290°14.0	304°42.5	319°10.9	333°39.4	348°08.0	362°36.5	17°05.1	31°33.8	46°02.5	60°31.2	+28.6 15.7	
	18°30.2	18°20.7	18°11.2	18°01.5	17°51.1	17°41.9	17°31.9	17°21.8	17°11.6	17°01.3	16°50.9	-9.9 57.6	
Fr 13	277°46.4	292°15.7	306°45.1	321°14.5	335°43.9	350°13.3	364°42.8	19°12.3	33°41.9	48°11.5	62°41.1	+29.5 15.9	
	14°03.8	13°55.8	13°40.1	13°28.0	13°16.0	13°03.8	12°51.6	12°39.2	12°26.8	12°14.4	12°01.8	-12.2 58.1	
Sa 14	280°09.0	294°39.1	309°09.2	323°39.3	338°09.4	352°39.6	367°09.8	21°40.0	36°10.2	50°40.4	65°10.7	+30.2 16.0	
	8°45.9	8°32.4	8°18.8	8°05.2	7°51.5	7°37.8	7°24.1	7°10.2	6°56.4	6°42.5	6°28.5	-13.7 58.6	
Su 15	282°46.1	297°16.5	311°46.9	326°17.3	340°47.7	355°18.2	369°48.6	24°19.0	38°49.4	53°19.8	67°50.2	+30.4 16.1	
	2°55.5	2°41.1	2°26.6	2°12.2	1°57.7	1°43.3	1°28.8	1°14.3	1°05.8	0°45.2	0°30.7	-14.5 58.9	
Mo 16	285°25.1	299°55.3	314°25.4	328°55.6	343°25.7	357°55.8	372°25.9	26°55.9	41°25.9	55°55.9	70°25.9	+30.1 16.1	
	-3°07.3	-3°21.7	-3°36.2	-3°50.6	-4°05.0	-4°19.4	-4°33.8	-4°48.2	-5°02.5	-5°16.8	-5°31.1	-14.4 59.1	
Tu 17	287°51.0	302°20.4	316°49.7	331°19.0	345°48.2	360°17.4	374°46.5	29°15.5	43°44.6	58°13.5	72°42.4	+29.1 16.1	
	-9°01.3	-9°15.0	-9°28.6	-9°42.2	-9°55.7	-10°09.2	-10°22.6	-10°36.0	-10°49.3	-11°02.5	-11°15.7	-13.4 59.2	
We 18	289°49.5	304°17.5	318°45.4	333°13.3	347°41.1	362°08.8	376°36.5	31°04.1	45°33.1	59°59.2	74°26.6	+27.7 16.2	
	-14°25.2	-14°37.2	-14°49.2	-15°01.0	-15°12.8	-15°24.4	-15°36.0	-15°47.5	-15°58.9	-16°10.2	-16°21.4	-11.6 59.2	
Th 19	291°10.0	305°36.4	320°02.7	334°28.9	348°55.1	3°32.1	17°47.3	32°13.2	46°39.2	61°05.0	75°30.8	+26.1 16.1	
	-18°57.1	-19°06.6	-19°15.9	-19°25.2	-19°34.3	-19°43.3	-19°52.2	-20°01.0	-20°09.9	-20°18.1	-20°26.3	-8.9 59.2	
Fr 20	291°50.9	306°15.8	320°40.6	335°05.5	349°30.2	3°55.0	18°19.7	32°44.3	47°08.9	61°33.5	75°58.0	+24.7 16.1	
	-22°16.0	-22°22.2	-22°28.3	-22°34.1	-22°39.9	-22°45.5	-22°50.9	-22°56.2	-23°01.4	-23°06.4	-23°11.2	-5.5 59.0	
Sa 21	292°02.6	306°26.7	320°50.8	335°15.0	349°39.1	4°03.2	18°27.3	32°51.5	47°15.6	61°39.7	76°03.8	+24.1 16.0	
	-24°05.2	-24°07.5	-24°09.7	-24°11.7	-24°13.5	-24°15.2	-24°16.8	-24°18.1	-24°19.4	-24°20.4	-24°21.3	-1.6 58.8	
Su 22	292°07.5	306°31.9	320°56.4	335°20.9	349°45.5	4°10.1	18°34.7	32°59.4	47°24.2	61°48.9	76°13.8	+24.6 15.9	
	-24°15.4	-24°13.8	-24°12.0	-24°10.0	-24°07.9	-24°05.6	-24°03.1	-24°00.5	-23°57.8	-23°54.9	-23°51.9	-2.4 58.4	
Mo 23	292°33.0	306°58.8	321°24.7	335°50.6	350°16.6	4°42.7	19°08.9	33°35.1	48°01.4	62°27.2	76°54.3	+26.1 15.8	
	-22°48.6	-22°43.3	-22°37.8	-22°32.2	-22°26.5	-22°20.6	-22°14.6	-22°08.4	-22°02.2	-21°55.8	-21°49.2	+5.9 57.9	
Tu 24	293°41.4	308°09.2	322°37.1	337°05.1	351°33.2	6°01.4	20°29.7	34°58.0	49°26.5	63°55.0	78°23.6	+28.2 15.6	
	-19°57.1	-19°48.7	-19°40.2	-19°31.7	-19°23.0	-19°14.2	-19°05.3	-18°56.4	-18°47.3	-18°38.1	-18°28.9	+8.8 57.4	
We 25	295°43.5	310°13.5	324°43.3	339°13.8	353°44.1	8°14.5	22°44.9	37°15.4	51°46.1	66°16.7	80°47.5	+30.4 15.5	
	-15°59.7	-15°49.1	-15°38.5	-15°27.7	-15°17.0	-15°06.1	-14°55.2	-14°44.2	-14°33.2	-14°22.1	-14°10.9	+10.9 56.8	
Th 26	298°38.4	313°10.4	327°42.5	342°14.6	356°46.8	11°19.1	25°51.4	40°23.8	54°56.3	69°28.8	84°01.4	+32.3 15.3	
	-11°17.2	-11°05.3	-10°53.3	-10°41.2	-10°29.2	-10°17.1	-10°04.9	-9°52.7	-9°40.5	-9°28.3	-9°16.0	+12.1 56.1	
Fr 27	302°17.2	316°50.7	331°24.2	345°57.8	3°31.4	15°05.1	29°38.8	44°12.6	58°46.4	73°20.2	87°54.1	+33.7 15.1	
	-6°09.1	-5°56.5	-5°43.8	-5°31.2	-5°18.5	-5°05.9	-4°53.2	-4°40.5	-4°27.8	-4°15.1	-4°02.4	+12.7 55.5	
Sa 28	306°26.7	321°01.1	335°35.3	350°10.1	4°44.5	19°19.1	33°53.6	48°28.1	63°02.7	77°37.3	92°11.9	+34.5 15.0	
	-0°51.7	-0°39.0	-0°26.4	-0°13.7	-0°01.0	0°11.6	0°24.3	0°36.9	0°49.5	1°02.1	1°14.7	+12.6 55.0	
Su 29	321°01.1	335°35.6	350°10.1	4°44.5	19°19.1	33°53.6	48°28.1	63°02.7	77°37.3	92°11.9	106°46.5	+34.5 15.0	
	-0°39.0	-0°26.4	-0°13.7	-0°01.0	0°11.6	0°24.3	0°36.9	0°49.5	1°02.1	1°14.7	1°27.3	+12.6 55.0	
Mo 30	325°27.3	340°02.1	354°36.8	9°11.6	23°46.4	38°21.1	52°55.9	67°30.7	82°05.4	96°40.2	111°14.9	+34.8 14.9	
	4°33.6	4°45.9	4°58.1	5°10.3	5°22.5	5°34.6	5°46.7	5°58.8	6°10.8	6°22.8	6°34.8	+12.1 54.6	
Tu 31	329°54.8	344°29.3	359°03.8	13°38.3	28°12.8	42°47.2	57°21.6	71°56.0	86°30.4	101°04.7	115°39.1	+34.4 14.8	
	9°30.3	9°41.7	9°53.1	10°04.4	10°15.6	10°26.9	10°38.0	10°49.2	11°00.3	11°11.3	11°22.3	+11.2 54.3	

Row 1: GHA, Δ' /h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ' /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 3 17h57 — NM: 11 15h51 — FQ: 18 14h14 — FM: 25 13h35

SUN

August 2029

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
We 1	268°25.0 17°55.7	283°25.0 17°55.1	298°25.1 17°54.4	313°25.1 17°53.8	328°25.2 17°53.2	343°25.2 17°52.5	358°25.2 17°51.9	13°25.3 17°51.3	28°25.3 17°50.6	43°25.4 17°50.0	58°25.4 17°49.4	73°25.5 17°48.7	+0.0 -0.6
Th 2	268°26.0 17°40.4	283°26.1 17°39.7	298°26.1 17°39.1	313°26.2 17°38.4	328°26.2 17°37.8	343°26.3 17°37.1	358°26.3 17°36.5	13°26.4 17°35.8	28°26.4 17°35.2	43°26.5 17°34.5	58°26.5 17°33.9	73°26.6 17°33.2	+0.0 -0.6
Fr 3	268°27.2 17°24.7	283°27.3 17°24.1	298°27.3 17°23.4	313°27.4 17°22.8	328°27.4 17°22.1	343°27.5 17°21.5	358°27.5 17°20.8	13°27.6 17°20.1	28°27.6 17°19.5	43°27.7 17°18.7	58°27.8 17°18.1	73°27.8 17°17.5	+0.1 -0.7
Sa 4	268°28.6 17°08.8	283°28.6 17°08.2	298°28.7 17°07.5	313°28.7 17°06.8	328°28.8 17°06.2	343°28.9 17°05.5	358°28.9 17°04.8	13°29.0 17°04.1	28°29.0 17°03.5	43°29.1 17°02.8	58°29.2 17°02.1	73°29.2 17°01.4	+0.1 -0.7
Su 5	268°30.0 16°52.6	283°30.1 16°52.0	298°30.2 16°51.3	313°30.2 16°50.6	328°30.3 16°49.9	343°30.4 16°49.2	358°30.4 16°48.6	13°30.5 16°47.9	28°30.6 16°47.2	43°30.6 16°46.5	58°30.7 16°45.8	73°30.8 16°45.1	+0.1 -0.7
Mo 6	268°31.7 16°36.2	283°31.7 16°35.5	298°31.8 16°34.8	313°31.9 16°34.1	328°31.9 16°33.4	343°32.0 16°32.7	358°32.1 16°32.0	13°32.2 16°31.3	28°32.2 16°30.6	43°32.3 16°29.9	58°32.4 16°29.2	73°32.5 16°28.5	+0.1 -0.7
Tu 7	268°33.4 16°19.4	283°33.5 16°18.7	298°33.6 16°18.0	313°33.7 16°17.3	328°33.7 16°16.6	343°33.8 16°15.9	358°33.9 16°15.2	13°34.0 16°14.5	28°34.0 16°13.8	43°34.1 16°13.1	58°34.2 16°12.4	73°34.3 16°11.7	+0.1 -0.7
We 8	268°35.3 16°02.4	283°35.4 16°01.7	298°35.5 16°01.0	313°35.6 16°00.3	328°35.7 15°59.6	343°35.8 15°58.9	358°35.9 15°58.2	13°35.9 15°57.4	28°36.0 15°56.7	43°36.1 15°56.0	58°36.2 15°55.3	73°36.3 15°54.6	+0.1 -0.7
Th 9	268°37.4 15°45.2	283°37.5 15°44.5	298°37.6 15°43.7	313°37.7 15°43.0	328°37.8 15°42.3	343°37.9 15°41.6	358°37.9 15°40.8	13°38.0 15°40.1	28°38.0 15°39.4	43°38.2 15°38.7	58°38.3 15°37.9	73°38.4 15°37.2	+0.1 -0.7
Fr 10	268°39.6 15°27.7	283°39.7 15°27.0	298°39.8 15°26.2	313°39.9 15°25.5	328°40.0 15°24.7	343°40.1 15°24.0	358°40.2 15°23.3	13°40.3 15°22.5	28°40.4 15°21.8	43°40.5 15°21.1	58°40.6 15°20.3	73°40.7 15°19.6	+0.1 -0.7
Sa 11	268°42.0 15°09.9	283°42.1 15°09.2	298°42.2 15°08.4	313°42.3 15°07.7	328°42.4 15°07.0	343°42.5 15°06.2	358°42.6 15°05.5	13°42.7 15°04.7	28°42.8 15°04.0	43°42.9 15°03.2	58°43.0 15°02.5	73°43.1 15°01.7	+0.1 -0.7
Su 12	268°44.5 14°51.9	283°44.6 14°51.2	298°44.7 14°50.4	313°44.8 14°49.7	328°44.9 14°48.9	343°45.0 14°48.2	358°45.1 14°47.4	13°45.2 14°46.6	28°45.3 14°45.9	43°45.4 14°45.1	58°45.5 14°44.4	73°45.6 14°43.6	+0.1 -0.8
Mo 13	268°47.1 14°33.7	283°47.2 14°32.9	298°47.3 14°32.2	313°47.4 14°31.4	328°47.5 14°30.7	343°47.6 14°29.9	358°47.8 14°29.1	13°47.9 14°28.4	28°48.0 14°27.6	43°48.1 14°26.8	58°48.2 14°26.0	73°48.3 14°25.3	+0.1 -0.8
Tu 14	268°49.9 14°15.3	283°50.0 14°14.5	298°50.1 14°13.7	313°50.2 14°12.9	328°50.3 14°12.2	343°50.4 14°11.4	358°50.6 14°10.6	13°50.7 14°09.8	28°50.8 14°09.0	43°50.9 14°08.3	58°51.0 14°07.5	73°51.1 14°06.7	+0.1 -0.8
We 15	268°52.8 13°56.6	283°52.9 13°55.8	298°53.0 13°55.0	313°53.1 13°54.2	328°53.3 13°53.4	343°53.4 13°52.6	358°53.5 13°51.9	13°53.6 13°51.1	28°53.8 13°50.3	43°53.9 13°49.5	58°54.0 13°48.7	73°54.1 13°47.9	+0.1 -0.8
Th 16	268°55.8 13°37.7	283°55.9 13°36.9	298°56.0 13°36.1	313°56.2 13°35.3	328°56.3 13°34.5	343°56.5 13°33.7	358°56.6 13°32.9	13°56.7 13°32.1	28°56.9 13°31.3	43°57.0 13°30.5	58°57.1 13°29.7	73°57.3 13°28.9	+0.1 -0.8
Fr 17	268°59.0 13°18.5	283°59.1 13°17.7	298°59.3 13°16.9	313°59.4 13°16.1	328°59.5 13°15.3	343°59.7 13°14.5	358°59.8 13°13.7	13°59.9 13°12.9	28°59.9 13°12.1	43°00.2 13°11.3	59°00.2 13°10.5	74°00.9 13°09.7	+0.1 -0.8
Sa 18	269°02.3 12°59.2	284°02.4 12°58.4	299°02.6 12°57.6	314°02.7 12°56.8	329°02.9 12°56.0	344°03.0 12°55.2	359°03.2 12°54.4	14°03.3 12°53.5	29°03.4 12°52.7	44°03.6 12°51.9	59°03.7 12°51.1	74°03.9 12°50.3	+0.1 -0.8
Su 19	269°05.8 12°39.7	284°05.9 12°38.9	299°06.1 12°38.0	314°06.2 12°37.2	329°06.3 12°36.4	344°06.5 12°35.6	359°06.6 12°34.8	14°06.8 12°33.9	29°06.9 12°33.1	44°07.1 12°32.3	59°10.7 12°31.5	74°10.9 12°30.7	+0.1 -0.8
Mo 20	269°09.3 12°20.0	284°09.5 12°19.1	299°09.6 12°18.3	314°09.7 12°17.5	329°09.9 12°16.6	344°10.1 12°15.8	359°10.2 12°15.0	14°10.4 12°14.2	29°10.5 12°13.3	44°10.7 12°12.5	59°10.8 12°11.7	74°11.0 12°10.8	+0.2 -0.8
Tu 21	269°13.0 12°00.0	284°13.2 11°59.2	299°13.3 11°58.4	314°13.5 11°57.5	329°13.6 11°56.7	344°13.8 11°55.9	359°13.9 11°55.0	14°13.9 11°54.2	29°14.1 11°53.3	44°14.4 11°52.5	59°14.6 11°51.7	74°14.7 11°50.8	+0.2 -0.8
We 22	269°16.8 11°19.6	284°17.0 11°18.8	299°17.1 11°18.2	314°17.3 11°17.4	329°17.5 11°16.5	344°17.6 11°15.7	359°17.8 11°14.9	14°17.9 11°13.9	29°18.8 11°13.0	44°18.3 11°12.2	59°18.3 11°11.4	74°18.6 11°10.6	+0.2 -0.8
Th 23	269°20.7 10°59.1	284°20.9 10°58.3	299°21.1 10°57.4	314°21.2 10°56.6	329°21.4 10°55.7	344°21.6 10°54.9	359°21.7 10°54.0	14°21.9 10°53.1	29°22.1 10°52.3	44°22.4 10°51.4	59°22.4 10°50.6	74°22.6 10°49.7	+0.2 -0.9
Fr 24	269°24.8 10°38.5	284°24.9 10°37.6	299°25.1 10°36.8	314°25.3 10°35.9	329°25.4 10°35.0	344°25.6 10°34.2	359°25.8 10°33.3	14°26.0 10°32.4	29°26.1 10°31.6	44°26.3 10°30.7	59°26.6 10°29.8	74°26.6 10°29.0	+0.2 -0.9
Sa 25	269°28.9 10°17.7	284°29.1 10°16.8	299°29.2 10°15.9	314°29.4 10°15.1	329°29.6 10°14.2	344°29.8 10°13.3	359°29.9 10°12.5	14°30.1 10°11.6	29°30.3 10°10.7	44°30.5 10°09.8	59°30.8 10°09.0	74°30.8 10°08.1	+0.2 -0.9
Su 26	269°37.5 9°56.7	284°37.6 9°55.8	299°37.8 9°54.9	314°38.0 9°54.1	329°38.2 9°53.2	344°38.4 9°52.3	359°38.6 9°51.4	14°38.7 9°50.5	29°38.9 9°49.7	44°39.1 9°48.8	59°39.3 9°47.9	74°39.5 9°47.0	+0.2 -0.9
Mo 27	269°41.9 9°35.6	284°42.1 9°34.7	299°42.2 9°33.8	314°42.4 9°32.9	329°42.6 9°32.0	344°42.8 9°31.1	359°43.0 9°30.2	14°43.2 9°29.4	29°43.4 9°28.5	44°43.6 9°27.6	59°43.7 9°26.7	74°43.9 9°25.8	+0.2 -0.9
Tu 28	269°46.4 9°14.3	284°46.6 9°13.5	299°46.8 9°12.5	314°47.0 9°11.6	329°47.2 9°10.7	344°47.3 9°09.8	359°47.5 9°08.9	14°47.7 9°08.0	29°47.9 9°07.1	44°48.1 9°06.2	59°48.1 9°05.3	74°48.3 9°04.5	+0.2 -0.9
We 29	269°51.0 8°52.8	284°51.2 8°51.9	299°51.4 8°51.0	314°51.5 8°50.1	329°51.7 8°49.2	344°51.9 8°48.3	359°52.1 8°47.4	14°52.3 8°46.5	29°52.5 8°45.6	44°52.7 8°44.7	59°52.7 8°43.8	74°53.1 8°42.9	+0.2 -0.9
Th 30	269°55.6 8°31.2	284°55.8 8°30.3	299°56.0 8°29.4	314°56.2 8°28.5	329°56.4 8°27.6	344°56.6 8°26.7	359°56.8 8°25.8	14°57.0 8°24.9	29°57.2 8°24.0	44°57.4 8°23.1	59°57.6 8°22.2	74°57.8 8°21.3	+0.2 -0.9
Fr 31													

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.8'

MOON

August 2029

	D	20h	21h	22h	23h	0h	1h	2h	3h	4h	5h	6h	Δ'/h SH
g	We 1	236°11.6 16°54.2	250°44.5 17°03.2	265°17.5 17°12.1	279°50.3 17°21.0	294°23.2 17°29.7	308°55.9 17°38.5	323°28.7 17°47.1	338°01.3 17°55.7	352°33.9 18°04.2	7°06.5 18°12.6	21°39.0 18°20.9	+32.7 14.8 +8.7 54.2
	Th 2	239°39.8 20°16.5	254°11.4 20°23.5	268°42.9 20°30.5	283°14.4 20°37.3	297°45.8 20°44.1	312°17.2 20°50.8	326°48.5 20°57.4	341°19.7 21°03.9	355°50.8 21°10.3	10°22.0 21°16.6	24°53.0 21°22.8	+31.3 14.8 +6.6 54.4
	Fr 3	242°31.5 22°44.3	257°01.6 22°48.9	271°31.5 22°53.5	286°01.6 22°57.9	300°31.5 23°02.2	315°01.3 23°06.4	329°31.1 23°10.4	344°00.9 23°14.4	358°30.5 23°18.3	13°00.2 23°22.0	27°29.7 23°25.7	+29.8 14.9 +4.1 54.8
●	Sa 4	257°01.6 22°48.9	271°31.6 22°53.5	286°01.6 22°57.9	300°31.5 23°02.2	315°01.3 23°06.4	329°31.1 23°10.4	344°00.9 23°14.4	358°30.5 23°18.3	13°00.2 23°22.0	27°29.7 23°25.7	41°59.2 23°29.2	+29.8 15.0 +4.0 54.8
	Su 5	259°15.5 24°08.3	273°44.2 24°09.9	288°12.9 24°11.5	302°41.5 24°12.9	317°10.0 24°14.2	331°38.5 24°15.3	346°07.0 24°16.3	0°35.4 24°17.3	15°03.8 24°18.0	29°32.1 24°18.7	44°00.4 24°19.2	+28.5 15.1 +1.1 55.4
	Mo 6	261°00.8 24°11.7	275°28.6 24°10.2	289°56.3 24°08.5	304°24.1 24°06.7	318°51.8 24°04.7	333°19.5 24°02.7	347°47.2 24°00.5	2°14.8 23°58.1	16°42.5 23°55.6	31°10.1 23°53.0	45°37.7 23°50.3	+27.7 15.3 +2.1 56.1
●	Tu 7	262°30.6 22°53.1	276°58.1 22°48.0	291°25.6 22°43.2	305°53.1 22°38.0	320°20.6 22°32.8	334°48.1 22°27.4	349°15.6 22°21.8	3°43.1 22°16.1	18°10.6 22°10.3	32°38.1 22°04.4	47°05.7 21°58.3	+27.5 15.5 -5.5 56.8
	We 8	264°00.2 20°12.0	278°28.0 20°03.9	292°55.7 19°55.7	307°23.5 19°47.3	321°51.4 19°39.8	336°19.2 19°30.3	350°47.1 19°21.6	5°15.0 19°12.8	19°42.9 19°09.5	34°10.9 18°54.8	48°38.8 18°45.6	+27.9 15.7 -8.6 57.6
	Th 9	265°41.5 16°14.9	280°09.9 16°04.0	294°38.4 15°53.0	309°06.8 15°41.9	323°35.3 15°30.7	338°03.8 15°19.4	352°32.2 15°08.0	7°00.9 14°56.5	21°23.9 14°44.9	35°58.1 14°33.2	50°26.8 14°21.5	+28.5 15.9 -11.3 58.4
●	Fr 10	267°39.8 11°14.8	282°08.9 11°01.7	296°38.0 10°48.6	311°07.1 10°35.4	325°36.2 10°22.1	340°05.4 10°08.8	354°34.6 9°55.3	9°03.8 9°41.9	23°33.0 9°28.3	38°02.3 9°14.7	52°31.5 9°01.1	+29.2 16.1 -13.4 59.0
	Sa 11	269°52.5 5°30.0	284°22.0 5°15.5	298°51.5 5°01.1	313°21.0 4°46.6	327°50.6 4°32.1	342°20.1 4°17.5	356°49.6 4°02.9	11°19.2 3°48.3	25°48.7 3°33.6	40°18.3 3°19.0	54°47.8 3°04.3	+29.5 16.2 -14.6 59.4
	Su 12	272°11.0 -0°38.0	286°40.5 -0°52.8	301°10.0 -1°07.7	315°39.4 -1°22.6	330°08.9 -1°37.4	344°38.3 -1°52.3	359°07.7 -2°07.1	13°37.2 -2°21.9	28°06.6 -2°36.8	42°35.9 -2°51.6	57°05.3 -3°06.4	+29.4 16.3 -14.8 59.7
●	Mo 13	274°23.0 -6°45.5	288°51.9 -6°59.8	303°20.9 -7°14.1	317°49.7 -7°28.4	332°18.6 -7°42.6	346°47.4 -8°10.9	359°07.7 -8°25.0	15°45.0 -8°25.0	30°13.7 -8°39.1	44°42.4 -8°53.0	59°11.0 -9°07.0	+28.8 16.3 -14.2 59.8
	Tu 14	276°15.6 -12°28.5	290°43.6 -12°41.4	305°11.5 -12°54.2	319°39.4 -13°06.9	334°07.1 -13°19.6	348°34.9 -13°32.1	362°34.9 -13°44.6	17°30.2 -13°57.0	31°57.8 -14°09.3	46°25.4 -14°21.5	60°52.9 -14°33.6	+27.7 16.3 -12.5 59.7
	We 15	277°39.1 -17°23.8	292°05.4 -17°34.3	307°28.0 -17°44.7	322°09.6 -17°55.0	336°34.3 -18°05.1	350°58.9 -18°15.2	364°51.8 -18°25.1	18°44.2 -18°34.9	33°10.8 -18°44.6	47°37.0 -18°54.2	62°03.2 -19°03.6	+26.4 16.2 -10.0 59.4
●	Th 16	278°30.0 -21°10.0	292°55.4 -21°17.4	307°28.0 -21°24.6	322°09.6 -21°31.7	336°34.3 -21°38.6	350°58.9 -21°45.4	364°51.8 -21°52.1	19°27.2 -21°58.6	33°52.3 -22°04.9	48°17.4 -22°11.2	62°42.5 -22°17.2	+25.2 16.1 -6.7 59.0
	Fr 17	278°55.5 -23°30.5	293°20.2 -23°34.2	307°44.2 -23°37.7	322°09.6 -23°41.0	336°34.3 -23°44.0	350°58.9 -23°47.3	364°51.8 -23°50.2	19°48.2 -23°52.9	34°12.9 -23°55.5	48°37.5 -23°58.0	63°02.2 -24°00.2	+24.7 16.0 -3.0 58.6
	Sa 18	279°12.9 -24°15.7	293°37.7 -24°15.5	308°02.6 -24°15.1	322°27.5 -24°14.6	336°52.4 -24°13.9	351°17.4 -24°13.1	365°17.4 -24°12.1	20°07.4 -24°11.0	34°32.4 -24°09.4	48°57.5 -24°08.3	63°22.7 -24°06.7	+25.0 15.9 +0.9 58.1
●	Su 19	279°45.1 -23°25.4	294°11.0 -23°21.5	308°37.0 -23°17.4	323°03.0 -23°17.4	337°29.1 -23°13.2	351°55.2 -23°08.9	365°55.2 -23°04.5	6°21.5 -22°59.9	20°47.8 -22°55.2	35°14.1 -22°50.3	49°40.5 -22°45.4	+26.2 15.7 +4.5 57.6
	Mo 20	280°52.8 -21°08.5	295°20.5 -21°01.4	309°48.2 -20°54.2	324°16.0 -20°47.0	338°43.9 -20°39.5	353°11.9 -20°32.0	367°11.9 -20°24.4	7°39.9 -20°16.7	22°08.1 -20°08.8	36°36.3 -20°00.9	51°04.6 -19°52.9	+28.0 15.6 +7.6 57.1
	Tu 21	282°48.1 -17°40.6	297°17.7 -17°31.1	311°47.5 -17°21.5	326°17.3 -17°11.8	340°47.2 -17°02.0	355°17.2 -16°52.1	369°47.2 -16°42.2	24°17.3 -16°32.2	38°47.5 -16°22.1	53°17.8 -16°11.9	67°48.2 -16°01.7	+30.0 15.4 +9.9 56.6
●	We 22	285°32.6 -13°20.1	300°04.1 -13°08.9	314°35.7 -12°57.6	329°07.4 -12°46.2	343°39.1 -12°34.8	358°10.9 -12°23.4	372°14.8 -12°11.9	27°14.8 -12°00.3	41°46.8 -11°48.7	56°18.8 -11°37.1	70°51.0 -11°25.4	+31.8 15.3 +11.5 56.1
	Th 23	289°00.1 -8°25.5	303°33.2 -8°13.3	318°06.3 -8°01.0	332°39.4 -7°48.7	347°12.6 -7°36.3	361°45.9 -7°24.0	375°19.2 -7°11.6	30°52.5 -6°59.2	45°25.9 -6°46.8	59°59.4 -6°34.4	74°32.9 -6°21.9	+33.3 15.2 +12.4 55.6
	Fr 24	292°59.9 -3°13.5	307°34.0 -3°00.9	322°08.1 -2°48.3	336°42.2 -2°35.6	351°16.4 -2°23.0	365°50.6 -2°10.4	380°24.8 -1°57.7	34°59.1 -1°45.1	49°33.4 -1°32.5	64°07.7 -1°19.8	78°42.0 -1°07.2	+34.2 15.0 +12.6 55.1
●	Sa 25	297°19.2 2°01.2	311°53.8 2°13.6	326°28.4 2°26.1	341°03.0 2°38.5	355°37.7 2°50.9	369°37.7 3°03.3	383°24.6 3°15.7	39°21.6 3°28.0	53°56.2 3°40.3	68°30.8 3°52.6	83°05.5 4°04.9	+34.6 14.9 +12.4 54.7
	Su 26	301°45.1 7°05.9	316°19.7 7°17.7	330°54.2 7°29.5	345°28.8 7°41.2	360°03.4 7°52.9	374°37.9 8°04.6	388°12.5 8°16.2	43°47.0 8°27.8	58°21.5 8°39.4	72°56.0 8°50.9	87°30.4 9°02.4	+34.5 14.8 +11.7 54.4
	Mo 27	306°05.1 12°49.3	320°39.2 12°00.0	335°10.3 11°53.7	349°47.3 12°21.4	364°21.4 12°32.0	378°55.4 12°42.5	393°29.9 12°53.0	48°03.3 13°03.4	62°37.2 13°13.8	77°11.0 13°24.1	91°44.9 13°34.3	+34.0 14.8 +10.5 54.2
●	Tu 28	320°39.2 12°00.0	335°13.3 12°10.7	349°47.3 12°21.4	364°21.4 12°32.0	378°55.4 12°42.5	393°29.9 12°53.0	408°03.3 13°03.4	62°37.2 13°13.8	77°11.0 13°24.1	91°44.9 13°34.3	106°18.7 13°44.5	+34.0 14.8 +10.5 54.1
	We 29	324°41.4 16°10.2	339°14.5 16°19.4	353°47.7 16°28.5	368°20.8 16°37.6	382°53.9 16°46.6	397°26.9 16°55.5	411°59.9 17°04.3	66°32.8 17°13.1	81°05.7 17°21.1	95°38.5 17°30.4	110°11.3 17°39.0	+33.0 14.7 +8.9 54.1
	Th 30	328°17.4 19°38.0	342°49.4 19°45.2	357°21.4 19°52.4	371°53.3 19°59.5	386°25.2 20°06.6	400°57.0 20°13.5	415°28.7 20°20.4	70°00.4 20°27.1	84°32.1 20°32.0	99°03.7 20°40.4	113°35.7 20°46.9	+31.8 14.8 +6.9 54.2
●	Fr 31	331°22.1 22°13.0	345°52.8 22°18.0	360°23.5 22°22.9	374°54.1 22°27.6	389°24.6 22°32.3	403°55.1 22°36.9	418°25.6 22°41.3	72°56.0 22°45.7	87°26.3 22°49.9	101°56.6 22°54.0	116°26.9 22°58.1	+30.5 14.8 +4.5 54.4

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 2 11h15 — NM: 10 01h55 — FQ: 16 18h55 — FM: 24 01h51

SUN

September 2029

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ' /h
Sa 1	270°00.4 8°09.5	285°00.6 8°08.6	300°00.8 8°07.7	315°01.0 8°06.8	330°01.2 8°05.9	345°01.4 8°05.0	0°01.6 8°04.1	15°01.8 8°03.1	30°02.0 8°02.4	45°02.2 8°01.3	60°02.4 8°00.4	75°02.6 7°59.5	+0.2 -0.9
Su 2	270°05.2 7°47.6	285°05.5 7°46.7	300°05.6 7°45.8	315°05.8 7°44.9	330°06.0 7°44.0	345°06.2 7°43.1	0°06.4 7°42.2	15°06.6 7°41.2	30°06.8 7°40.3	45°07.0 7°39.4	60°07.2 7°38.5	75°07.4 7°37.6	+0.2 -0.9
Mo 3	270°10.1 7°25.7	285°10.3 7°24.7	300°10.5 7°23.8	315°10.7 7°22.9	330°10.9 7°22.0	345°11.1 7°21.1	0°11.3 7°20.1	15°11.5 7°19.2	30°11.7 7°18.3	45°11.9 7°17.4	60°12.1 7°16.5	75°12.3 7°15.5	+0.2 -0.9
Tu 4	270°15.0 7°03.5	285°15.2 7°02.6	300°15.4 7°01.7	315°15.6 7°00.8	330°15.8 6°59.9	345°16.0 6°58.9	0°16.2 6°58.0	15°16.4 6°57.1	30°16.7 6°56.2	45°16.9 6°55.2	60°17.1 6°54.3	75°17.3 6°53.4	+0.2 -0.9
We 5	270°20.0 6°41.3	285°20.2 6°40.4	300°20.4 6°39.5	315°20.6 6°38.5	330°20.8 6°37.6	345°21.0 6°36.7	0°21.2 6°35.8	15°21.5 6°34.8	30°21.7 6°33.9	45°21.9 6°33.0	60°22.1 6°32.0	75°22.3 6°31.1	+0.2 -0.9
Th 6	270°25.0 6°19.0	285°25.2 6°18.1	300°25.4 6°17.1	315°25.7 6°16.2	330°25.9 6°15.3	345°26.1 6°14.3	0°26.3 6°13.4	15°26.5 6°12.5	30°26.7 6°11.5	45°26.9 6°10.6	60°27.1 6°09.7	75°27.4 6°08.7	+0.2 -0.9
Fr 7	270°30.1 5°59.5	285°30.3 5°58.6	300°30.5 5°57.7	315°30.8 5°56.8	330°31.0 5°55.8	345°31.2 5°54.9	0°31.4 5°50.9	15°31.6 5°50.0	30°31.8 5°49.0	45°32.0 5°48.1	60°32.3 5°47.2	75°32.5 5°46.2	+0.2 -0.9
Sa 8	270°35.3 5°34.0	285°35.5 5°33.1	300°35.7 5°32.1	315°35.9 5°31.2	330°36.1 5°30.2	345°36.3 5°29.3	0°36.5 5°28.4	15°36.8 5°27.4	30°37.0 5°26.5	45°37.2 5°25.5	60°37.4 5°24.6	75°37.6 5°23.7	+0.2 -0.9
Su 9	270°40.4 5°11.4	285°40.7 5°10.4	300°40.9 5°09.5	315°41.1 5°08.5	330°41.3 5°07.6	345°41.5 5°06.7	0°41.7 5°05.7	15°42.0 5°04.8	30°42.2 5°03.8	45°42.4 5°02.9	60°42.6 5°01.9	75°42.8 5°01.0	+0.2 -0.9
Mo 10	270°45.6 4°48.7	285°45.8 4°47.7	300°46.1 4°46.8	315°46.3 4°45.8	330°46.5 4°44.9	345°46.7 4°43.9	0°47.0 4°43.0	15°47.2 4°42.0	30°47.4 4°41.1	45°47.6 4°40.1	60°47.8 4°39.2	75°48.1 4°38.2	+0.2 -0.9
Tu 11	270°50.9 4°25.9	285°51.1 4°24.9	300°51.3 4°24.0	315°51.6 4°23.0	330°51.8 4°22.1	345°52.0 4°21.1	0°52.2 4°20.2	15°52.4 4°19.2	30°52.6 4°18.2	45°52.9 4°17.3	60°53.1 4°16.3	75°53.3 4°15.4	+0.2 -1.0
We 12	270°56.2 4°03.0	285°56.4 4°02.0	300°56.6 4°01.1	315°56.8 4°00.1	330°57.1 3°59.2	345°57.3 3°58.2	0°57.5 3°57.3	15°57.7 3°56.3	30°57.9 3°55.3	45°58.2 3°54.4	60°58.4 3°53.4	75°58.6 3°52.5	+0.2 -1.0
Th 13	271°01.5 3°40.8	286°01.7 3°39.1	301°01.9 3°38.1	316°02.2 3°37.2	331°02.4 3°36.2	346°02.6 3°35.3	1°02.8 3°34.3	16°03.0 3°33.3	31°03.3 3°32.4	46°03.5 3°31.4	61°03.7 3°30.5	76°03.9 3°29.5	+0.2 -1.0
Fr 14	271°06.8 3°17.0	286°07.0 3°16.1	301°07.3 3°15.1	316°07.5 3°14.2	331°07.7 3°13.2	346°07.9 3°12.2	1°08.2 3°11.3	16°08.4 3°10.3	31°08.6 3°09.4	46°08.8 3°08.4	61°09.0 3°07.4	76°09.3 3°06.5	+0.2 -1.0
Sa 15	271°12.2 2°54.0	286°12.4 2°53.0	301°12.6 2°52.0	316°12.8 2°51.1	331°13.1 2°50.1	346°13.3 2°49.2	1°13.5 2°48.2	16°13.7 2°47.2	31°13.9 2°46.3	46°14.2 2°45.3	61°14.4 2°44.3	76°14.6 2°43.4	+0.2 -1.0
Su 16	271°17.5 2°30.8	286°17.7 2°29.9	301°18.0 2°28.9	316°18.2 2°28.0	331°18.4 2°27.0	346°18.6 2°26.0	1°18.9 2°25.1	16°19.1 2°24.1	31°19.3 2°23.1	46°19.5 2°22.2	61°19.8 2°21.2	76°20.0 2°20.2	+0.2 -1.0
Mo 17	271°22.9 2°07.7	286°23.1 2°06.7	301°23.3 2°05.8	316°23.6 2°04.8	331°23.8 2°03.8	346°24.0 2°02.9	1°24.2 2°01.9	16°24.5 2°00.9	31°24.7 2°00.0	46°24.9 1°59.0	61°25.1 1°58.0	76°25.3 1°57.1	+0.2 -1.0
Tu 18	271°28.3 1°44.5	286°28.5 1°43.5	301°28.7 1°42.5	316°28.9 1°41.6	331°29.1 1°40.6	346°29.4 1°39.6	1°29.6 1°38.7	16°29.8 1°37.7	31°30.0 1°36.7	46°30.3 1°35.8	61°30.3 1°34.8	76°30.7 1°33.8	+0.2 -1.0
We 19	271°33.6 1°21.2	286°33.8 1°20.3	301°34.1 1°19.3	316°34.3 1°18.3	331°34.5 1°17.4	346°34.7 1°16.4	1°35.0 1°15.4	16°35.2 1°14.4	31°35.4 1°13.5	46°35.6 1°12.5	61°35.9 1°11.5	76°36.1 1°10.6	+0.2 -1.0
Th 20	271°39.0 0°58.0	286°39.2 0°57.0	301°39.4 0°56.0	316°39.6 0°55.0	331°39.9 0°54.1	346°40.1 0°53.1	1°40.3 0°52.1	16°40.5 0°51.2	31°40.8 0°50.2	46°41.0 0°49.2	61°41.2 0°48.2	76°41.4 0°47.3	+0.2 -1.0
Fr 21	271°44.3 0°34.6	286°44.5 0°33.7	301°44.8 0°32.7	316°45.0 0°31.7	331°45.2 0°30.8	346°45.4 0°29.8	1°45.6 0°28.8	16°45.9 0°27.8	31°46.1 0°26.9	46°46.4 0°25.9	61°46.5 0°24.9	76°46.8 0°24.0	+0.2 -1.0
Sa 22	271°49.6 0°11.3	286°49.9 0°10.4	301°50.1 0°09.4	316°50.3 0°08.4	331°50.5 0°07.5	346°50.7 0°06.5	1°51.0 0°05.5	16°51.2 0°04.5	31°51.4 0°03.5	46°51.6 0°02.6	61°51.8 0°01.6	76°52.1 0°00.6	+0.2 -1.0
Su 23	271°54.9 -0°12.0	286°55.1 -0°13.0	301°55.4 -0°14.0	316°55.6 -0°14.9	331°55.8 -0°15.9	346°56.0 -0°16.9	1°56.2 -0°17.9	16°56.5 -0°18.8	31°56.7 -0°20.1	46°56.9 -0°20.8	61°57.1 -0°21.7	76°57.3 -0°22.7	+0.2 -1.0
Mo 24	272°00.2 -0°35.4	287°00.4 -0°36.3	302°00.6 -0°37.3	317°00.8 -0°38.3	332°01.1 -0°39.3	347°01.3 -0°40.2	2°01.5 -0°41.2	17°01.7 -0°42.2	32°01.9 -0°43.2	47°02.1 -0°44.1	62°02.4 -0°45.1	77°02.6 -0°46.1	+0.2 -1.0
Tu 25	272°05.4 -0°58.7	287°05.6 -0°59.7	302°05.8 -1°00.7	317°06.0 -1°01.6	332°06.3 -1°02.6	347°06.5 -1°03.6	2°06.7 -1°04.6	17°06.9 -1°05.5	32°07.1 -1°06.5	47°07.3 -1°07.5	62°07.6 -1°08.5	77°07.8 -1°09.4	+0.2 -1.0
We 26	272°10.6 -1°22.1	287°10.8 -1°23.1	302°11.0 -1°24.0	317°11.2 -1°25.0	332°11.4 -1°26.0	347°11.6 -1°26.9	2°11.9 -1°27.9	17°12.1 -1°28.9	32°12.3 -1°29.9	47°12.5 -1°30.8	62°12.7 -1°31.8	77°12.9 -1°32.8	+0.2 -1.0
Th 27	272°15.7 -1°45.4	287°15.9 -1°46.4	302°16.1 -1°47.4	317°16.3 -1°48.3	332°16.5 -1°49.3	347°16.8 -1°50.3	2°17.0 -1°51.3	17°17.2 -1°52.2	32°17.4 -1°53.2	47°17.6 -1°54.2	62°17.8 -1°55.2	77°18.0 -1°56.1	+0.2 -1.0
Fr 28	272°20.8 -2°08.8	287°21.0 -2°09.7	302°21.2 -2°10.7	317°21.4 -2°11.7	332°21.6 -2°12.7	347°21.8 -2°13.6	2°22.0 -2°14.6	17°22.2 -2°15.6	32°22.4 -2°17.5	47°22.7 -2°18.5	62°22.9 -2°19.5	77°23.1 -2°20.5	+0.2 -1.0
Sa 29	272°25.8 -2°32.1	287°26.0 -2°33.1	302°26.2 -2°34.0	317°26.4 -2°35.0	332°26.6 -2°36.0	347°26.8 -2°37.0	2°27.0 -2°37.9	17°27.2 -2°38.9	32°27.4 -2°39.9	47°27.6 -2°40.8	62°27.8 -2°41.8	77°28.0 -2°42.8	+0.2 -1.0
Su 30	272°30.7 -2°55.4	287°30.9 -2°56.4	302°31.1 -2°57.3	317°31.3 -2°58.3	332°31.5 -2°59.3	347°31.7 -3°00.2	2°31.9 -3°01.2	17°32.1 -3°02.2	32°32.3 -3°03.2	47°32.5 -3°04.1	62°32.8 -3°05.1	77°33.0 -3°06.1	+0.2 -1.0

Row 1: GHA (Greenwich Hour Angle), Δ' /h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ' /h = dec. change

Semi-diameter: 15.9'

MOON

September 2029

	D	21h	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	Δ'/h SH
O	Sa 1	234 ^o 39.6 24 ^o 08.2	249 ^o 08.4 24 ^o 08.3	263 ^o 37.1 24 ^o 08.3	278 ^o 05.9 24 ^o 08.2	292 ^o 34.6 24 ^o 07.9	307 ^o 03.3 24 ^o 07.6	321 ^o 31.9 24 ^o 07.1	336 ^o 00.5 24 ^o 06.4	350 ^o 29.1 23 ^o 05.7	4 ^o 57.7 24 ^o 04.8	19 ^o 26.2 24 ^o 03.8	+28.7 15.1 -0.455.3
	Su 2	236 ^o 31.6 23 ^o 33.6	250 ^o 59.8 23 ^o 30.6	265 ^o 28.0 23 ^o 27.4	279 ^o 56.2 23 ^o 24.1	294 ^o 24.4 23 ^o 20.7	308 ^o 52.5 23 ^o 17.1	323 ^o 20.7 23 ^o 13.5	337 ^o 48.8 23 ^o 09.7	352 ^o 17.0 23 ^o 05.7	6 ^o 45.1 23 ^o 01.7	21 ^o 13.2 22 ^o 57.5	+28.2 15.3 -3.656.1
	Mo 3	250 ^o 59.8 23 ^o 30.6	265 ^o 28.0 23 ^o 27.4	279 ^o 56.2 23 ^o 24.1	294 ^o 24.4 23 ^o 20.7	308 ^o 52.5 23 ^o 17.1	323 ^o 20.7 23 ^o 13.5	337 ^o 48.8 23 ^o 09.7	352 ^o 17.0 23 ^o 05.7	6 ^o 45.1 23 ^o 01.7	21 ^o 13.2 22 ^o 57.5	35 ^o 41.3 22 ^o 53.1	+28.2 15.3 -3.756.1
	Tu 4	252 ^o 42.7 21 ^o 33.0	267 ^o 10.8 21 ^o 26.7	281 ^o 39.0 21 ^o 20.2	296 ^o 07.1 21 ^o 13.6	310 ^o 35.2 21 ^o 06.9	325 ^o 03.3 21 ^o 00.0	339 ^o 31.4 20 ^o 53.0	353 ^o 59.6 20 ^o 45.9	8 ^o 27.7 20 ^o 38.7	22 ^o 55.9 20 ^o 31.4	37 ^o 24.0 20 ^o 23.9	+28.1 15.5 -6.957.0
	We 5	254 ^o 27.8 18 ^o 17.5	268 ^o 56.2 18 ^o 08.2	283 ^o 24.5 17 ^o 58.7	297 ^o 52.9 17 ^o 49.1	312 ^o 21.3 17 ^o 39.5	326 ^o 49.7 17 ^o 29.7	341 ^o 18.2 17 ^o 19.7	355 ^o 46.6 16 ^o 59.6	10 ^o 15.1 16 ^o 59.6	24 ^o 43.6 16 ^o 49.4	39 ^o 12.0 16 ^o 39.0	+28.4 15.8 -9.957.9
	Th 6	256 ^o 21.3 13 ^o 51.7	270 ^o 50.0 13 ^o 39.8	285 ^o 18.7 13 ^o 27.8	299 ^o 47.5 13 ^o 15.7	314 ^o 16.3 13 ^o 03.5	328 ^o 45.1 12 ^o 51.2	343 ^o 13.9 12 ^o 38.8	357 ^o 42.7 12 ^o 26.4	12 ^o 11.5 12 ^o 13.8	26 ^o 40.4 12 ^o 01.2	41 ^o 09.2 11 ^o 48.5	+28.8 16.0 -12.358.8
●	Fr 7	258 ^o 23.1 8 ^o 28.9	272 ^o 52.1 8 ^o 15.1	287 ^o 21.1 8 ^o 01.2	301 ^o 50.1 7 ^o 47.2	316 ^o 19.1 7 ^o 33.2	330 ^o 48.1 7 ^o 19.1	345 ^o 17.1 7 ^o 05.0	359 ^o 46.1 6 ^o 50.8	14 ^o 15.1 6 ^o 36.5	28 ^o 44.1 6 ^o 22.3	43 ^o 13.1 6 ^o 07.9	+29.0 16.2 -14.159.6
	Sa 8	260 ^o 27.5 2 ^o 27.9	274 ^o 56.4 2 ^o 13.0	289 ^o 25.2 1 ^o 58.1	303 ^o 54.1 1 ^o 43.1	318 ^o 23.0 1 ^o 28.1	332 ^o 51.8 1 ^o 13.1	347 ^o 20.6 0 ^o 58.1	1 ^o 49.4 0 ^o 43.1	16 ^o 18.2 0 ^o 28.0	30 ^o 47.0 0 ^o 12.9	45 ^o 15.7 -0 ^o 02.1	+28.8 16.4 -15.060.2
	Su 9	262 ^o 24.2 -3 ^o 48.1	276 ^o 52.6 -4 ^o 03.1	291 ^o 20.9 -4 ^o 18.1	305 ^o 49.2 -4 ^o 33.0	320 ^o 17.4 -4 ^o 48.0	334 ^o 45.6 -5 ^o 02.9	349 ^o 13.8 -5 ^o 17.7	3 ^o 42.0 -5 ^o 32.6	18 ^o 10.1 -5 ^o 47.4	32 ^o 38.1 -6 ^o 02.2	47 ^o 06.2 -6 ^o 16.9	+28.2 16.5 -14.960.5
	Mo 10	264 ^o 01.8 -9 ^o 52.9	278 ^o 29.2 -10 ^o 06.8	292 ^o 56.5 -10 ^o 20.7	307 ^o 23.7 -10 ^o 34.6	321 ^o 50.9 -10 ^o 48.3	336 ^o 18.1 -11 ^o 02.0	350 ^o 45.2 -11 ^o 15.7	5 ^o 12.3 -11 ^o 29.2	19 ^o 39.3 -11 ^o 42.7	34 ^o 06.3 -11 ^o 56.1	48 ^o 33.2 -12 ^o 09.4	+27.1 16.5 -13.760.6
	Tu 11	265 ^o 10.7 -15 ^o 18.9	279 ^o 36.8 -15 ^o 30.7	294 ^o 02.9 -15 ^o 42.5	308 ^o 28.9 -15 ^o 54.1	322 ^o 54.3 -16 ^o 05.5	337 ^o 20.7 -16 ^o 17.1	351 ^o 46.5 -16 ^o 28.4	6 ^o 12.3 -16 ^o 39.9	20 ^o 38.0 -16 ^o 50.7	35 ^o 03.7 -17 ^o 01.7	49 ^o 29.3 -17 ^o 12.6	+25.9 16.5 -11.460.4
	We 12	265 ^o 47.8 -19 ^o 40.5	280 ^o 12.7 -19 ^o 49.3	294 ^o 37.6 -19 ^o 58.0	309 ^o 02.4 -20 ^o 06.5	323 ^o 27.1 -20 ^o 14.9	337 ^o 51.8 -20 ^o 23.1	352 ^o 16.5 -20 ^o 31.3	6 ^o 41.2 -20 ^o 39.2	21 ^o 05.8 -20 ^o 47.0	35 ^o 30.3 -20 ^o 54.7	49 ^o 54.9 -21 ^o 02.3	+24.7 16.3 -8.259.9
	Th 13	265 ^o 59.8 -22 ^o 37.2	280 ^o 24.0 -22 ^o 42.3	294 ^o 48.1 -22 ^o 47.3	309 ^o 12.3 -22 ^o 52.1	323 ^o 36.4 -22 ^o 56.7	338 ^o 00.6 -23 ^o 01.2	352 ^o 24.7 -23 ^o 05.5	6 ^o 48.8 -23 ^o 09.6	21 ^o 12.9 -23 ^o 13.6	35 ^o 37.1 -23 ^o 17.5	50 ^o 01.2 -23 ^o 21.2	+24.1 16.2 -4.459.3
	Fr 14	266 ^o 04.0 -23 ^o 57.2	280 ^o 28.4 -23 ^o 58.4	294 ^o 52.7 -23 ^o 59.3	309 ^o 17.1 -24 ^o 00.2	323 ^o 41.7 -24 ^o 00.8	337 ^o 51.8 -24 ^o 01.3	352 ^o 30.5 -24 ^o 01.7	6 ^o 55.0 -24 ^o 01.9	21 ^o 19.6 -24 ^o 01.9	35 ^o 44.1 -24 ^o 01.8	50 ^o 08.8 -24 ^o 01.5	+24.5 16.0 -0.458.6
	Sa 15	266 ^o 23.9 -23 ^o 39.2	280 ^o 49.3 -23 ^o 36.5	295 ^o 14.8 -23 ^o 33.7	309 ^o 14.8 -23 ^o 30.7	324 ^o 06.0 -23 ^o 27.6	338 ^o 31.7 -23 ^o 24.4	352 ^o 57.5 -23 ^o 21.0	7 ^o 23.3 -23 ^o 17.5	21 ^o 49.2 -23 ^o 10.9	36 ^o 15.2 -23 ^o 01.8	50 ^o 41.2 -23 ^o 06.1	+25.7 15.8 -3.357.9
O	Su 16	267 ^o 20.6 -21 ^o 51.5	281 ^o 47.9 -21 ^o 45.6	296 ^o 15.3 -21 ^o 39.5	310 ^o 42.6 -21 ^o 33.3	325 ^o 10.1 -21 ^o 27.0	339 ^o 37.7 -21 ^o 20.5	354 ^o 05.3 -21 ^o 14.0	8 ^o 33.1 -21 ^o 07.3	23 ^o 00.9 -21 ^o 00.5	37 ^o 28.8 -20 ^o 53.7	51 ^o 56.8 -20 ^o 46.7	+27.6 15.6 -6.657.2
	Mo 17	269 ^o 06.6 -18 ^o 49.4	283 ^o 35.9 -18 ^o 40.9	298 ^o 05.2 -18 ^o 32.2	312 ^o 34.8 -18 ^o 23.4	327 ^o 04.4 -18 ^o 14.6	341 ^o 34.1 -18 ^o 05.6	356 ^o 03.8 -17 ^o 56.6	10 ^o 33.6 -17 ^o 47.5	25 ^o 03.5 -17 ^o 38.3	39 ^o 33.5 -17 ^o 29.1	54 ^o 03.6 -17 ^o 19.7	+29.7 15.4 +9.056.6
	Tu 18	271 ^o 43.9 -14 ^o 50.7	286 ^o 15.2 -14 ^o 40.7	300 ^o 46.5 -14 ^o 29.6	315 ^o 17.9 -14 ^o 19.0	329 ^o 49.9 -14 ^o 08.4	344 ^o 21.0 -13 ^o 57.7	358 ^o 52.7 -13 ^o 46.9	13 ^o 24.4 -13 ^o 36.1	27 ^o 56.2 -13 ^o 25.2	42 ^o 28.0 -13 ^o 14.2	56 ^o 59.9 -13 ^o 03.2	+31.6 15.3 +10.756.0
	We 19	275 ^o 06.2 -10 ^o 12.8	289 ^o 39.1 -10 ^o 01.1	304 ^o 12.0 -9 ^o 49.3	318 ^o 45.0 -9 ^o 37.6	333 ^o 18.0 -9 ^o 25.8	347 ^o 51.1 -9 ^o 13.9	2 ^o 24.3 -8 ^o 50.2	16 ^o 57.5 -8 ^o 38.2	31 ^o 30.7 -8 ^o 26.3	46 ^o 04.0 -8 ^o 14.3	60 ^o 37.4 -8 ^o 01.4	+33.1 15.1 +11.855.5
	Th 20	279 ^o 02.7 -5 ^o 11.8	293 ^o 36.7 -4 ^o 59.5	308 ^o 10.7 -4 ^o 47.2	322 ^o 44.8 -4 ^o 34.8	337 ^o 18.9 -4 ^o 22.5	351 ^o 53.0 -4 ^o 10.1	6 ^o 27.2 -3 ^o 57.7	21 ^o 01.4 -3 ^o 45.4	35 ^o 35.6 -3 ^o 33.0	50 ^o 09.8 -3 ^o 20.6	64 ^o 44.1 -3 ^o 08.2	+34.1 15.0 +12.455.0
	Fr 21	283 ^o 20.9 -0 ^o 02.0	297 ^o 55.5 0 ^o 10.4	312 ^o 30.1 0 ^o 22.8	327 ^o 04.7 0 ^o 35.1	341 ^o 39.3 0 ^o 47.5	356 ^o 13.9 0 ^o 59.9	10 ^o 48.6 1 ^o 12.2	25 ^o 23.3 1 ^o 24.5	39 ^o 57.9 1 ^o 36.9	54 ^o 32.6 1 ^o 49.2	69 ^o 07.3 2 ^o 01.5	+34.6 14.9 +12.454.7
O	Sa 22	287 ^o 47.8 5 ^o 03.8	302 ^o 22.5 5 ^o 15.8	316 ^o 57.2 5 ^o 27.7	331 ^o 31.8 5 ^o 39.7	346 ^o 06.5 5 ^o 51.6	0 ^o 41.2 6 ^o 03.4	15 ^o 15.8 6 ^o 15.3	29 ^o 50.4 6 ^o 27.1	44 ^o 25.1 6 ^o 38.9	58 ^o 59.9 6 ^o 50.6	73 ^o 34.3 7 ^o 02.3	+34.7 14.8 +11.954.3
	Su 23	292 ^o 11.5 9 ^o 53.8	306 ^o 45.8 10 ^o 04.9	321 ^o 20.1 10 ^o 16.0	335 ^o 54.4 10 ^o 27.0	350 ^o 28.7 10 ^o 38.0	5 ^o 02.9 10 ^o 49.0	19 ^o 37.1 10 ^o 59.8	34 ^o 11.3 11 ^o 10.7	48 ^o 45.4 11 ^o 21.5	63 ^o 19.5 11 ^o 32.2	77 ^o 53.6 11 ^o 42.9	+34.2 14.8 +10.954.1
	Mo 24	296 ^o 21.4 14 ^o 16.9	310 ^o 55.0 14 ^o 26.7	325 ^o 28.5 14 ^o 36.4	340 ^o 02.1 14 ^o 46.1	354 ^o 35.5 14 ^o 55.8	9 ^o 09.0 15 ^o 05.3	23 ^o 42.4 15 ^o 14.8	38 ^o 15.7 15 ^o 24.2	52 ^o 49.0 15 ^o 33.6	67 ^o 22.9 15 ^o 42.9	81 ^o 55.6 15 ^o 52.1	+33.4 14.7 +9.554.0
	Tu 25	300 ^o 09.3 18 ^o 02.2	314 ^o 41.8 18 ^o 10.2	329 ^o 14.3 18 ^o 18.2	343 ^o 46.8 18 ^o 26.2	358 ^o 19.3 18 ^o 34.0	12 ^o 51.7 18 ^o 41.8	27 ^o 24.0 18 ^o 49.4	41 ^o 56.3 18 ^o 57.0	56 ^o 28.6 19 ^o 04.5	71 ^o 00.8 19 ^o 12.0	85 ^o 32.9 19 ^o 19.3	+32.4 14.7 +7.754.0
	We 26	303 ^o 29.9 20 ^o 59.2	318 ^o 01.3 21 ^o 05.1	332 ^o 32.7 21 ^o 10.9	347 ^o 04.1 21 ^o 16.7	1 ^o 35.4 21 ^o 22.3	16 ^o 06.6 21 ^o 27.9	30 ^o 37.8 21 ^o 33.4	45 ^o 09.0 21 ^o 38.7	59 ^o 40.0 21 ^o 44.0	74 ^o 11.2 21 ^o 49.2	88 ^o 42.2 21 ^o 54.2	+31.2 14.7 +5.454.1
	Th 27	318 ^o 01.3 21 ^o 05.1	332 ^o 32.7 21 ^o 10.9	347 ^o 04.1 21 ^o 16.7	1 ^o 35.4 21 ^o 22.3	16 ^o 06.6 21 ^o 27.9	30 ^o 37.8 21 ^o 33.4	45 ^o 09.0 21 ^o 38.7	59 ^o 40.0 21 ^o 44.0	74 ^o 11.2 21 ^o 49.2	88 ^o 42.2 21 ^o 54.2	103 ^o 13.2 21 ^o 59.2	+31.2 14.7 +5.454.1
	Fr 28	320 ^o 52.8 23 ^o 01.6	335 ^o 23.1 23 ^o 04.9	349 ^o 53.4 23 ^o 08.1	4 ^o 23.7 23 ^o 11.2	18 ^o 53.9 23 ^o 14.2	33 ^o 24.0 23 ^o 17.1						

SUN

October 2029

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Mo 1	257°35.4 -3°17.7	272°35.6 -3°18.7	287°35.8 -3°19.6	302°36.0 -3°20.6	317°36.2 -3°21.6	332°36.4 -3°22.5	347°36.6 -3°23.5	2°36.8 -3°24.5	17°37.0 -3°25.4	32°37.2 -3°26.4	47°37.4 -3°27.4	62°37.6 -3°28.4	+0.2 -1.0
Tu 2	257°40.2 -3°40.9	272°40.4 -3°41.9	287°40.6 -3°42.9	302°40.8 -3°43.8	317°41.0 -3°44.8	332°41.2 -3°45.8	347°41.4 -3°46.7	2°41.6 -3°47.7	17°41.8 -3°48.7	32°41.9 -3°49.6	47°42.1 -3°50.6	62°42.3 -3°51.6	+0.2 -1.0
We 3	257°44.9 -4°04.1	272°45.1 -4°05.1	287°45.3 -4°06.1	302°45.5 -4°07.0	317°45.7 -4°08.0	332°45.9 -4°09.0	347°46.0 -4°09.9	2°46.2 -4°10.9	17°46.4 -4°11.9	32°46.6 -4°12.8	47°46.8 -4°13.8	62°47.0 -4°14.8	+0.2 -1.0
Th 4	257°49.5 -4°27.3	272°49.7 -4°28.3	287°49.9 -4°29.2	302°50.1 -4°30.2	317°50.3 -4°31.1	332°50.5 -4°32.1	347°50.6 -4°33.1	2°50.8 -4°34.0	17°51.0 -4°35.0	32°51.2 -4°36.0	47°51.4 -4°36.9	62°51.6 -4°37.9	+0.2 -1.0
Fr 5	257°54.0 -4°50.4	272°54.2 -4°51.4	287°54.4 -4°52.3	302°54.6 -4°53.3	317°54.8 -4°54.2	332°55.0 -4°55.2	347°55.2 -4°56.2	2°55.3 -4°57.1	17°55.5 -4°58.1	32°55.7 -4°59.0	47°55.9 -5°00.0	62°56.1 -5°01.0	+0.2 -1.0
Sa 6	257°58.5 -5°13.4	272°58.6 -5°14.4	287°58.8 -5°15.3	302°59.0 -5°16.3	317°59.2 -5°17.3	332°59.4 -5°18.2	347°59.6 -5°19.2	2°59.7 -5°20.1	17°59.9 -5°21.1	33°00.1 -5°22.1	48°00.3 -5°23.0	63°00.5 -5°24.0	+0.2 -1.0
Su 7	258°02.8 -5°36.4	273°03.0 -5°37.4	288°03.2 -5°38.3	303°03.3 -5°39.3	318°03.5 -5°40.2	333°03.7 -5°41.2	348°03.9 -5°42.1	3°04.0 -5°43.1	18°04.2 -5°44.0	33°04.4 -5°45.0	48°04.6 -5°46.0	63°04.7 -5°46.9	+0.2 -1.0
Mo 8	258°07.0 -5°59.3	273°07.2 -6°00.3	288°07.4 -6°01.2	303°07.5 -6°02.2	318°07.7 -6°03.1	333°07.9 -6°04.1	348°08.1 -6°05.0	3°08.2 -6°06.0	18°08.4 -6°06.9	33°08.6 -6°07.9	48°08.8 -6°08.8	63°08.9 -6°09.8	+0.2 -1.0
Tu 9	258°11.4 -6°22.1	273°11.3 -6°23.1	288°11.5 -6°24.0	303°11.7 -6°25.0	318°11.8 -6°25.9	333°12.0 -6°26.9	348°12.2 -6°27.8	3°12.3 -6°28.8	18°12.5 -6°29.7	33°12.7 -6°30.7	48°12.8 -6°31.6	63°13.0 -6°32.6	+0.2 -0.9
We 10	258°15.2 -6°44.9	273°15.3 -6°45.9	288°15.5 -6°46.8	303°15.6 -6°47.7	318°15.8 -6°48.6	333°16.0 -6°49.6	348°16.1 -6°50.5	3°16.3 -6°51.5	18°16.5 -6°52.4	33°16.6 -6°53.4	48°16.8 -6°54.3	63°17.0 -6°55.3	+0.2 -0.9
Th 11	258°19.0 -7°07.5	273°19.2 -7°08.5	288°19.4 -7°09.4	303°19.5 -7°10.3	318°19.7 -7°11.3	333°19.8 -7°12.2	348°20.0 -7°13.2	3°20.2 -7°14.1	18°20.3 -7°15.0	33°20.5 -7°16.0	48°20.6 -7°16.9	63°20.8 -7°17.9	+0.2 -0.9
Fr 12	258°22.8 -7°30.5	273°23.0 -7°31.0	288°23.1 -7°31.9	303°23.3 -7°32.9	318°23.4 -7°33.8	333°23.6 -7°34.8	348°23.7 -7°35.7	3°23.9 -7°36.6	18°24.0 -7°37.6	33°24.2 -7°38.6	48°24.4 -7°39.6	63°24.5 -7°40.4	+0.2 -0.9
Sa 13	258°26.5 -7°52.5	273°26.6 -7°53.4	288°26.8 -7°54.4	303°26.9 -7°55.3	318°27.1 -7°56.2	333°27.2 -7°57.2	348°27.4 -7°58.1	3°27.5 -7°59.0	18°27.7 -8°00.0	33°27.8 -8°00.9	48°28.0 -8°01.8	63°28.1 -8°02.8	+0.1 -0.9
Su 14	258°30.0 -8°14.8	273°30.1 -8°15.8	288°30.3 -8°16.7	303°30.4 -8°17.6	318°30.6 -8°18.6	333°30.7 -8°19.5	348°30.9 -8°20.4	3°30.9 -8°21.3	18°31.1 -8°22.3	33°31.3 -8°23.2	48°31.4 -8°24.1	63°31.6 -8°25.0	+0.1 -0.9
Mo 15	258°33.4 -8°37.1	273°33.5 -8°38.0	288°33.7 -8°38.9	303°33.8 -8°39.8	318°33.9 -8°40.8	333°34.1 -8°41.7	348°34.2 -8°42.6	3°34.4 -8°43.5	18°34.5 -8°44.4	33°34.6 -8°45.4	48°34.8 -8°46.3	63°34.9 -8°47.2	+0.1 -0.9
Tu 16	258°36.2 -8°59.2	273°36.8 -9°00.1	288°36.9 -9°01.0	303°37.0 -9°01.9	318°37.2 -9°02.8	333°37.3 -9°03.7	348°37.4 -9°04.6	3°37.6 -9°05.6	18°37.7 -9°06.5	33°37.7 -9°07.4	48°38.0 -9°08.3	63°38.1 -9°09.2	+0.1 -0.9
We 17	258°39.8 -9°21.1	273°39.9 -9°22.0	288°40.0 -9°22.9	303°40.1 -9°23.9	318°40.3 -9°24.8	333°40.4 -9°25.7	348°40.5 -9°26.6	3°40.6 -9°27.5	18°40.8 -9°28.4	33°40.9 -9°29.3	48°41.0 -9°30.2	63°41.1 -9°31.1	+0.1 -0.9
Th 18	258°42.7 -9°42.9	273°42.8 -9°43.9	288°43.0 -9°44.8	303°43.1 -9°45.7	318°43.2 -9°46.6	333°43.3 -9°47.5	348°43.4 -9°48.4	3°43.6 -9°49.3	18°43.7 -9°50.2	33°43.7 -9°51.1	48°43.9 -9°52.0	63°44.0 -9°52.9	+0.1 -0.9
Fr 19	258°45.5 -10°04.6	273°45.7 -10°05.5	288°45.8 -10°06.4	303°45.9 -10°07.3	318°46.0 -10°08.2	333°46.1 -10°09.1	348°46.2 -10°10.0	3°46.3 -10°10.9	18°46.5 -10°11.8	33°46.6 -10°12.7	48°46.7 -10°13.6	63°46.8 -10°14.5	+0.1 -0.9
Sa 20	258°48.2 -10°26.2	273°48.3 -10°27.1	288°48.4 -10°28.0	303°48.5 -10°28.9	318°48.6 -10°29.7	333°48.7 -10°30.6	348°48.9 -10°31.5	3°49.0 -10°32.4	18°49.1 -10°33.3	33°49.2 -10°34.2	48°49.3 -10°35.1	63°49.4 -10°36.0	+0.1 -0.9
Su 21	258°50.7 -10°47.6	273°50.8 -10°48.4	288°50.9 -10°49.3	303°51.0 -10°50.2	318°51.1 -10°51.1	333°51.2 -10°52.0	348°51.3 -10°52.9	3°51.4 -10°53.8	18°51.5 -10°54.6	33°51.6 -10°55.5	48°51.7 -10°56.4	63°51.8 -10°57.3	+0.1 -0.9
Mo 22	258°53.3 -11°08.8	273°53.1 -11°09.7	288°53.2 -11°10.5	303°53.3 -11°11.4	318°53.4 -11°12.3	333°53.5 -11°13.2	348°53.6 -11°14.1	3°53.7 -11°14.9	18°53.8 -11°15.8	33°53.9 -11°16.7	48°53.9 -11°17.6	63°54.1 -11°18.5	+0.1 -0.9
Tu 23	258°55.2 -11°29.8	273°55.3 -11°30.7	288°55.4 -11°31.6	303°55.5 -11°32.5	318°55.6 -11°33.3	333°55.7 -11°34.2	348°55.7 -11°35.1	3°55.8 -11°35.9	18°55.9 -11°36.8	33°55.9 -11°37.7	48°56.1 -11°38.6	63°56.2 -11°39.4	+0.1 -0.9
We 24	258°57.2 -11°50.7	273°57.3 -11°51.6	288°57.3 -11°52.5	303°57.5 -11°53.3	318°57.5 -11°54.2	333°57.6 -11°55.1	348°57.7 -11°55.9	3°57.8 -11°56.8	18°57.8 -11°57.6	33°57.9 -11°58.5	48°56.9 -11°59.4	63°58.8 -12°00.2	+0.1 -0.9
Th 25	258°59.0 -12°11.4	273°59.1 -12°12.3	288°59.2 -12°13.1	303°59.3 -12°14.0	318°59.3 -12°14.9	333°59.4 -12°15.5	348°59.5 -12°16.4	3°59.5 -12°17.4	18°59.6 -12°18.3	33°59.7 -12°19.1	48°59.7 -12°20.0	63°59.8 -12°20.9	+0.1 -0.9
Fr 26	259°00.7 -12°32.0	274°00.7 -12°32.8	289°00.8 -12°33.7	304°00.9 -12°34.5	319°00.9 -12°35.4	334°01.0 -12°36.2	349°01.1 -12°37.1	4°01.1 -12°37.9	19°01.2 -12°38.7	34°01.2 -12°39.6	49°01.3 -12°40.4	64°01.4 -12°41.3	+0.1 -0.8
Sa 27	259°02.1 -12°52.3	274°02.2 -12°53.1	289°02.2 -12°54.0	304°02.3 -12°54.8	319°02.4 -12°55.6	334°02.4 -12°56.5	349°02.5 -12°57.3	4°02.5 -12°58.2	19°02.6 -12°59.0	34°02.6 -12°59.9	49°02.7 -13°00.7	64°02.7 -13°01.5	+0.1 -0.8
Su 28	259°03.4 -13°12.4	274°03.4 -13°13.2	289°03.5 -13°14.1	304°03.5 -13°14.9	319°03.6 -13°15.7	334°03.6 -13°16.6	349°03.7 -13°17.4	4°03.7 -13°18.2	19°03.8 -13°19.1	34°03.8 -13°19.9	49°03.9 -13°20.7	64°03.9 -13°21.6	+0.0 -0.8
Mo 29	259°04.5 -13°32.8	274°04.5 -13°33.2	289°04.5 -13°34.0	304°04.6 -13°34.8	319°04.6 -13°35.6	334°04.7 -13°36.5	349°04.7 -13°37.3	4°04.7 -13°38.1	19°04.8 -13°38.9	34°04.8 -13°39.8	49°04.8 -13°40.6	64°04.9 -13°41.4	+0.0 -0.8
Tu 30	259°05.8 -13°52.9	274°05.4 -13°53.7	289°05.4 -13°53.7	304°05.4 -13°54.5	319°05.4 -13°55.3	334°05.5 -13°56.1	349°05.5 -13°57.0	4°05.5 -13°57.8	19°05.6 -13°58.6	34°05.6 -13°59.4	49°05.6 -14°00.2	64°05.7 -14°01.0	+0.0 -0.8
We 31	259°06.0 -14°11.5	274°06.0 -14°12.3	289°06.0 -14°13.2	304°06.1 -14°14.0	319°06.1 -14°14.8	334°06.1 -14°15.6	349°06.1 -14°16.4	4°06.2 -14°17.2	19°06.2 -14°18.0	34°06.2 -14°18.8	49°06.2 -14°19.6	64°06.2 -14°20.4	+0.0 -0.8

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ°/h = dec. change

Semi-diameter: 16.0'

MOON

October 2029

	D	21h	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	Δ'/h SH
Mo 1	228°19.3	242°48.5	257°17.6	271°46.7	286°15.9	300°45.0	315°14.2	329°43.4	344°12.5	358°41.7	13°10.9	+29.2 15.5	
	19°53.8	19°46.3	19°38.6	19°30.8	19°22.9	19°14.8	19°06.7	18°58.5	18°50.1	18°41.7	18°33.1	-8.1 56.7	
Tu 2	230°30.3	244°59.7	259°29.0	273°58.4	288°27.8	302°57.2	317°26.6	331°56.1	346°25.5	0°54.9	15°24.4	+29.4 15.7	
	16°11.8	16°01.5	15°51.2	15°40.7	15°30.2	15°19.6	15°08.8	14°58.0	14°47.1	14°36.1	14°25.0	-10.7 57.7	
We 3	244°59.7	259°29.0	273°58.4	288°27.8	302°57.2	317°26.6	331°56.1	346°25.5	0°54.9	15°24.4	29°53.8	+29.4 15.7	
	16°01.5	15°51.2	15°40.7	15°30.2	15°19.6	15°08.8	14°58.0	14°47.1	14°36.1	14°25.0	14°13.8	-10.8 57.8	
Th 4	247°16.2	261°45.7	276°15.2	290°44.7	305°14.2	319°43.7	334°13.3	348°42.8	3 ⁰ 12.2	17°41.7	32°11.2	+29.5 16.0	
	11°15.2	11°02.6	10°50.0	10°37.3	10°24.5	10°11.6	9°58.7	9°45.7	9°32.6	9°19.4	9°06.2	-12.9 58.8	
Fr 5	249°32.4	264°01.8	278°31.1	293°00.3	307°29.6	321°58.8	336°28.0	350°57.2	5°26.4	19°55.6	34°24.7	+29.2 16.3	
	5°40.4	5°26.2	5°12.0	4°57.7	4°43.4	4°29.1	4°14.7	4°00.3	3°45.8	3°31.3	3°16.7	-14.4 59.7	
Sa 6	251°38.3	266°06.9	280°35.5	295°04.1	309°32.6	324°01.1	338°29.6	352°58.0	7°26.3	21°54.7	36°22.9	+28.5 16.5	
	-0°25.0	-0°39.9	-0°54.9	-1°09.8	-1°24.8	-1°39.8	-1°54.7	-2°09.7	-2°24.7	-2°39.7	-2°54.6	-15.0 60.5	
Su 7	253°21.3	267°48.7	282°16.1	296°43.5	311°10.8	325°38.0	340°05.2	354°32.3	8°59.4	23°26.4	37°53.3	+27.2 16.6	
	-6°37.7	-6°52.4	-7°07.0	-7°21.6	-7°36.2	-7°50.7	-8°05.2	-8°19.6	-8°34.0	-8°48.4	-9°02.7	-14.5 61.0	
Mo 8	254°29.8	268°55.7	283°21.5	297°47.3	312°13.0	326°38.6	341°04.2	355°29.7	9°55.1	24°20.5	38°45.8	+25.6 16.7	
	-12°29.9	-12°43.2	-12°56.3	-13°09.4	-13°22.4	-13°35.3	-13°48.1	-14°00.8	-14°13.4	-14°25.9	-14°38.4	-12.9 61.2	
Tu 9	254°57.5	269°21.2	283°46.0	298°10.1	312°33.2	326°58.3	341°22.2	355°46.2	10°10.0	24°33.9	38°57.6	+24.0 16.7	
	-17°31.7	-17°42.3	-17°52.8	-18°03.2	-18°13.4	-18°23.5	-18°33.5	-18°43.3	-18°53.0	-19°02.5	-19°11.9	-10.0 61.1	
We 10	254°48.7	269°11.8	283°34.8	297°57.9	312°20.9	326°43.9	341°06.8	355°29.8	9°52.7	24°15.6	38°38.5	+23.0 16.5	
	-21°15.4	-21°22.4	-21°29.2	-21°35.9	-21°42.4	-21°48.8	-21°55.0	-22°01.0	-22°06.2	-22°12.6	-22°18.2	-6.3 60.6	
Th 11	254°21.1	268°44.0	283°06.9	297°29.9	311°52.8	326°15.7	340°38.7	355°01.7	9°24.8	23°47.8	38°10.9	+23.0 16.3	
	-23°21.2	-23°24.1	-23°26.8	-23°29.3	-23°31.6	-23°33.8	-23°35.8	-23°37.7	-23°39.9	-23°40.8	-23°42.2	-2.1 59.9	
Fr 12	254°02.6	268°26.5	282°50.4	297°14.4	311°38.4	326°02.6	340°26.8	354°51.0	9°15.3	23°39.8	38°04.2	+24.2 16.1	
	-23°42.4	-23°41.1	-23°39.7	-23°38.1	-23°36.3	-23°34.4	-23°32.3	-23°30.1	-23°27.8	-23°25.2	-23°22.6	+2.0 59.0	
Sa 13	254°21.0	268°46.9	283°12.8	297°38.7	312°04.8	326°31.0	340°57.3	355°23.6	9°50.1	24°16.6	38°43.3	+26.2 15.8	
	-22°25.3	-22°20.4	-22°15.3	-22°10.1	-22°04.8	-21°59.4	-21°53.8	-21°48.1	-21°42.3	-21°36.4	-21°30.3	+5.5 58.1	
Su 14	255°34.6	270°02.8	284°31.1	298°59.5	313°27.9	327°56.5	342°25.2	356°54.0	11°22.8	25°51.8	40°20.9	+28.6 15.6	
	-19°46.0	-19°38.2	-19°30.0	-19°22.3	-19°14.2	-19°06.0	-18°57.7	-18°49.9	-18°40.9	-18°32.3	-18°23.7	+8.2 57.2	
Mo 15	257°47.9	272°18.4	286°49.0	301°19.7	315°10.5	330°21.3	344°52.3	359°23.3	13°54.4	28°25.6	42°56.9	+30.9 15.4	
	-16°04.3	-15°54.5	-15°44.5	-15°34.5	-15°24.4	-15°14.3	-15°04.1	-14°53.8	-14°43.4	-14°33.1	-14°22.6	+10.2 56.4	
Tu 16	260°55.0	275°27.4	289°59.9	304°32.5	319°05.1	333°37.8	348°10.6	2°43.4	17°16.3	31°49.3	46°22.3	+32.7 15.2	
	-11°39.6	-11°28.3	-11°17.0	-11°05.7	-10°54.4	-10°43.0	-10°31.5	-10°20.0	-10°08.5	-9°57.0	-9°45.4	+14.5 55.7	
We 17	264°43.8	279°17.6	293°51.5	308°25.4	322°59.3	337°33.3	352°07.3	6°41.4	15°15.5	35°49.6	50°23.8	+34.0 15.0	
	-6°48.4	-6°36.4	-6°24.4	-6°12.3	-6°00.3	-5°48.2	-5°36.2	-5°24.1	-5°12.0	-4°59.9	-4°47.7	+12.1 55.1	
Th 18	269°00.0	283°34.6	298°09.2	312°43.9	327°18.6	341°53.3	356°28.0	11°02.7	25°37.4	40°12.2	54°46.9	+34.7 14.9	
	-1°44.8	-1°32.6	-1°20.4	-1°08.2	-0°56.0	-0°43.7	-0°31.5	-0°19.3	-0°07.1	0°05.1	0°17.3	+12.2 54.7	
Fr 19	273°29.3	288°04.1	302°39.0	317°13.8	331°48.7	346°23.5	0°58.3	15°33.2	30°08.0	44°42.8	59°17.6	+34.8 14.8	
	3°18.8	3°30.8	3°42.8	3°54.7	4°06.7	4°18.6	4°30.5	4°42.3	4°54.2	5°06.0	5°17.8	+11.9 54.3	
Sa 20	277°58.3	292°32.9	307°07.5	321°42.0	336°16.5	350°51.0	5°25.5	20°00.0	34°34.4	49°08.4	63°44.2	+34.5 14.8	
	8°11.4	8°22.7	8°34.0	8°45.3	8°56.5	9°07.6	9°18.8	9°29.9	9°40.9	9°51.9	10°02.9	+11.2 54.1	
Su 21	282°15.5	296°49.4	311°23.3	325°57.1	340°30.9	355°04.6	9°38.4	24°12.0	38°45.7	53°19.3	67°52.9	+33.7 14.7	
	12°42.0	12°52.2	13°02.4	13°12.5	13°22.5	13°32.5	13°42.4	13°52.3	14°02.1	14°11.9	14°21.6	+10.0 53.9	
Mo 22	286°11.7	300°44.6	315°17.5	329°50.3	344°23.1	358°55.8	13°28.5	28°01.2	42°33.8	57°06.3	71°38.8	+32.7 14.7	
	16°39.6	16°48.2	16°56.8	17°05.4	17°13.8	17°22.2	17°30.5	17°38.7	17°46.8	17°54.9	18°02.9	+8.3 53.9	
Tu 23	289°41.2	304°13.0	318°44.7	333°16.4	347°48.1	2°19.7	16°51.3	31°22.8	45°54.3	60°25.7	74°57.1	+31.6 14.7	
	19°53.2	19°59.8	20°06.4	20°12.9	20°19.3	20°25.6	20°31.9	20°38.0	20°44.0	20°50.0	20°55.9	+6.3 53.9	
We 24	292°42.9	307°13.6	321°44.7	336°15.0	350°45.6	5°16.1	19°46.7	34°17.2	48°47.7	63°18.1	77°48.5	+30.6 14.7	
	22°12.2	22°16.5	22°20.7	22°24.8	22°28.8	22°32.7	22°36.5	22°40.1	22°43.7	22°47.2	22°50.5	+3.8 54.1	
Th 25	295°20.8	309°50.7	324°20.6	338°50.5	353°20.3	7°50.2	22°20.0	36°49.8	51°19.6	65°49.3	80°19.1	+29.8 14.8	
	23°27.8	23°29.4	23°30.9	23°32.3	23°33.6	23°34.7	23°35.8	23°36.7	23°37.5	23°38.2	23°38.8	+1.5 54.3	
Fr 26	297°43.3	312°12.9	326°42.4	341°11.9	355°41.4	10°10.9	24°40.4	39°09.9	53°39.4	68°08.9	82°38.4	+29.5 14.9	
	23°33.7	23°32.4	23°31.0	23°29.5	23°27.9	23°26.2	23°24.3	23°22.4	23°20.3	23°18.1	23°15.8	-1.8 54.7	
Sa 27	312°12.9	326°42.4	341°11.9	355°41.4	10°10.9	24°40.4	39°09.9	53°39.4	68°08.9	82°38.4	97°07.9	+29.5 14.9	
	23°32.4	23°31.0	23°29.5	23°27.9	23°26.2	23°24.3	23°22.4	23°20.3	23°18.1	23°15.8	23°13.3	-1.9 54.7	
Su 28	314°30.7	329°00.3	343°29.9	357°59.4	12°29.0	26°58.6	41°28.3	55°57.9	70°27.5	84°57.2	99°26.9	+29.6 15.1	
	22°22.9	22°18.6	22°14.2	22°09.7	22°05.1	22°00.4	21°55.5	21°50.6	21°45.5	21°40.3	21°35.0	-4.8 55.3	
Mo 29	316°53.6	331°23.5	345°53.4	0°23.3	14°53.3	29°23.3	43°53.3	58°23.3	72°53.3	87°23.3	101°53.4	+30.0 15.3	
	20°02.3	19°55.3	19°48.2	19°40.9	19°33.5	19°26.1	19°18.5	19°10.8	19°03.1	18°55.2	18°47.2	-7.5 55.9	
Tu 30	319°26.4	333°56.7	348°27.0	2°57.4	17°27.8	31°58.2	46°28.6	60°59.0	75°29.4	89°59.8	104°30.3	+30.4 15.5	
	16°35.6	16°26.1	16°16.5	16°06.7	15°56.9	15°47.0	15°37.0	15°26.9	15°16.7	15°06.5	14°56.1	-10.0 56.7	
We 31	322°08.2	336°38.8	351°09.3	5°39.9	20°10.5	34°41.1	49°11.7	63°42.3	78°12.9	92°43.5	107°14.1	+30.6 15.7	
	12°10.8	11°59.1	11°47.4	11°35.5	11°23.6	11°11.7	10°59.7	10°47.5	10°35.4	10°23.1	10°10.8	-12.0 57.7	

SUN

November 2029

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Th 1	259°06.5 -14°30.8	274°06.5 -14°31.6	289°06.5 -14°32.4	304°06.5 -14°33.2	319°06.5 -14°34.0	334°06.5 -14°34.8	349°06.5 -14°35.6	4°06.6 -14°36.4	15°06.6 -14°37.2	34°06.6 -14°38.0	45°06.6 -14°38.8	64°06.6 -14°39.6	+0.0 -0.8
Fr 2	259°06.7 -14°49.7	274°06.7 -14°50.6	289°06.7 -14°51.4	304°06.7 -14°52.2	319°06.7 -14°53.0	334°06.8 -14°53.8	349°06.8 -14°54.6	4°06.8 -14°55.4	15°06.8 -14°56.1	34°06.8 -14°56.9	45°06.8 -14°57.7	64°06.8 -14°58.5	+0.0 -0.8
Sa 3	259°06.8 -15°08.6	274°06.8 -15°09.4	289°06.8 -15°10.2	304°06.8 -15°11.0	319°06.8 -15°11.7	334°06.8 -15°12.5	349°06.8 -15°13.3	4°06.8 -15°14.1	15°06.7 -15°14.8	34°06.7 -15°15.6	45°06.7 -15°16.4	64°06.7 -15°17.2	-0.0 -0.8
Su 4	259°06.6 -15°27.2	274°06.6 -15°28.0	289°06.6 -15°28.7	304°06.6 -15°29.5	319°06.6 -15°30.3	334°06.6 -15°31.0	349°06.6 -15°31.8	4°06.5 -15°32.5	15°06.5 -15°33.3	34°06.5 -15°34.1	45°06.5 -15°34.8	64°06.5 -15°35.6	-0.0 -0.8
Mo 5	259°06.3 -15°45.5	274°06.2 -15°46.2	289°06.2 -15°47.0	304°06.2 -15°47.7	319°06.2 -15°48.5	334°06.2 -15°49.3	349°06.1 -15°50.0	4°06.1 -15°50.8	15°06.1 -15°51.5	34°06.1 -15°52.3	45°06.0 -15°53.0	64°06.0 -15°53.8	-0.0 -0.8
Tu 6	259°05.7 -16°03.8	274°05.7 -16°04.3	289°05.6 -16°05.0	304°05.6 -16°05.7	319°05.6 -16°06.5	334°05.5 -16°07.2	349°05.5 -16°08.0	4°05.5 -16°08.7	15°05.5 -16°09.5	34°05.4 -16°10.2	45°05.4 -16°10.9	64°05.4 -16°11.7	-0.0 -0.7
We 7	259°04.9 -16°21.3	274°04.9 -16°22.0	289°04.8 -16°22.7	304°04.8 -16°23.5	319°04.8 -16°24.2	334°04.7 -16°24.9	349°04.7 -16°25.7	4°04.6 -16°26.4	15°04.6 -16°27.1	34°04.6 -16°27.9	45°04.5 -16°28.6	64°04.5 -16°29.3	-0.0 -0.7
Th 8	259°03.9 -16°38.8	274°03.9 -16°39.5	289°03.8 -16°40.2	304°03.8 -16°40.9	319°03.7 -16°41.7	334°03.7 -16°42.4	349°03.6 -16°43.1	4°03.6 -16°43.8	15°03.5 -16°44.5	34°03.5 -16°45.3	45°03.4 -16°46.0	64°03.4 -16°46.7	-0.0 -0.7
Fr 9	259°02.7 -16°56.0	274°02.7 -16°56.7	289°02.6 -16°57.4	304°02.6 -16°58.1	319°02.5 -16°58.8	334°02.4 -16°59.5	349°02.4 -17°00.2	4°02.3 -17°00.9	15°02.3 -17°01.6	34°02.2 -17°02.4	45°02.2 -17°03.1	64°02.1 -17°03.8	-0.1 -0.7
Sa 10	259°01.3 -17°12.9	274°01.3 -17°13.6	289°01.2 -17°14.3	304°01.1 -17°15.0	319°01.1 -17°15.7	334°01.0 -17°16.4	349°00.9 -17°17.1	4°00.9 -17°17.8	15°00.8 -17°18.5	34°00.7 -17°19.2	45°00.7 -17°19.9	64°00.6 -17°20.6	-0.1 -0.7
Su 11	258°59.7 -17°29.5	273°59.6 -17°30.9	288°59.6 -17°30.9	303°59.5 -17°31.6	318°59.4 -17°32.3	333°59.3 -17°33.0	348°59.3 -17°33.6	3°59.2 -17°34.3	15°59.1 -17°35.0	33°59.0 -17°35.7	45°59.0 -17°36.4	63°58.9 -17°37.0	-0.1 -0.7
Mo 12	258°57.9 -17°45.8	273°57.8 -17°46.5	288°57.7 -17°47.2	303°57.6 -17°47.9	318°57.6 -17°48.5	333°57.5 -17°49.2	348°57.4 -17°49.9	3°57.3 -17°50.5	15°57.2 -17°51.2	33°57.1 -17°51.9	45°57.1 -17°52.6	63°57.0 -17°53.2	-0.1 -0.7
Tu 13	258°55.9 -18°03.1	273°55.8 -18°03.2	288°55.7 -18°03.2	303°55.6 -18°03.8	318°55.5 -18°04.5	333°55.4 -18°05.2	348°55.3 -18°05.8	3°55.2 -18°06.5	15°55.1 -18°07.1	33°55.0 -18°07.8	45°54.9 -18°08.4	63°54.9 -18°09.1	-0.1 -0.7
We 14	258°53.6 -18°17.6	273°53.5 -18°18.2	288°53.4 -18°18.8	303°53.3 -18°19.5	318°53.2 -18°20.1	333°53.1 -18°20.8	348°53.0 -18°21.4	3°52.9 -18°22.2	15°52.8 -18°22.7	33°52.7 -18°23.4	45°52.6 -18°24.0	63°52.5 -18°24.6	-0.1 -0.6
Th 15	258°51.2 -18°32.9	273°51.1 -18°33.6	288°51.0 -18°34.2	303°50.9 -18°34.8	318°50.7 -18°35.5	333°50.6 -18°36.1	348°50.5 -18°36.7	3°50.4 -18°37.4	15°50.3 -18°38.0	33°50.2 -18°38.6	45°50.1 -18°39.2	63°50.0 -18°39.9	-0.1 -0.6
Fr 16	258°48.5 -18°48.0	273°48.4 -18°48.6	288°48.3 -18°49.2	303°48.2 -18°49.8	318°48.1 -18°50.5	333°47.9 -18°51.1	348°47.8 -18°51.7	3°47.7 -18°52.3	15°47.6 -18°52.9	33°47.5 -18°53.5	45°47.4 -18°54.1	63°47.2 -18°54.8	-0.1 -0.6
Sa 17	258°45.7 -19°02.7	273°45.5 -19°03.3	288°45.4 -19°03.9	303°45.3 -19°04.5	318°45.2 -19°05.1	333°45.1 -19°05.7	348°44.9 -19°06.3	3°44.8 -19°06.9	15°44.7 -19°07.5	33°44.5 -19°08.1	45°44.4 -19°08.7	63°44.3 -19°09.3	-0.1 -0.6
Su 18	258°42.6 -19°17.1	273°42.5 -19°17.7	288°42.3 -19°18.2	303°42.2 -19°18.8	318°42.1 -19°19.4	333°41.9 -19°20.0	348°41.8 -19°20.6	3°41.7 -19°21.2	15°41.5 -19°21.8	33°41.4 -19°22.4	45°41.3 -19°23.0	63°41.1 -19°23.5	-0.1 -0.6
Mo 19	258°39.3 -19°31.9	273°39.2 -19°31.7	288°39.1 -19°32.2	303°38.9 -19°32.8	318°38.8 -19°33.4	333°38.6 -19°34.0	348°38.5 -19°34.5	3°38.4 -19°35.1	15°38.2 -19°35.7	33°38.1 -19°36.3	45°37.9 -19°36.8	63°37.8 -19°37.4	-0.1 -0.6
Tu 20	258°35.9 -19°44.8	273°35.7 -19°45.3	288°35.6 -19°45.9	303°35.4 -19°46.5	318°35.3 -19°47.0	333°35.1 -19°47.6	348°35.0 -19°48.1	3°34.8 -19°48.7	15°34.7 -19°49.2	33°34.5 -19°49.8	45°34.4 -19°50.4	63°34.2 -19°50.9	-0.2 -0.6
We 21	258°32.2 -19°58.1	273°32.1 -19°58.6	288°31.9 -19°59.2	303°31.7 -19°59.7	318°31.6 -20°00.3	333°31.4 -20°00.8	348°31.3 -20°01.4	3°31.1 -20°01.9	15°30.9 -20°02.4	33°30.8 -20°03.0	45°30.6 -20°03.5	63°30.5 -20°04.1	-0.2 -0.5
Th 22	258°28.3 -20°11.0	273°28.2 -20°11.6	288°28.0 -20°12.1	303°27.8 -20°12.6	318°27.7 -20°13.2	333°27.5 -20°13.7	348°27.3 -20°14.2	3°27.2 -20°14.8	15°27.0 -20°15.3	33°26.8 -20°15.8	45°26.7 -20°16.3	63°26.5 -20°16.9	-0.2 -0.5
Fr 23	258°24.3 -20°23.6	273°24.1 -20°24.1	288°23.9 -20°24.7	303°23.8 -20°25.2	318°23.6 -20°25.7	333°23.4 -20°26.2	348°23.2 -20°26.7	3°23.1 -20°27.2	15°22.9 -20°27.7	33°22.7 -20°28.3	45°22.5 -20°28.8	63°22.3 -20°29.3	-0.2 -0.5
Sa 24	258°20.2 -20°35.8	273°19.8 -20°36.3	288°19.6 -20°36.8	303°19.5 -20°37.3	318°19.3 -20°37.8	333°19.1 -20°38.3	348°18.9 -20°38.8	3°18.7 -20°39.3	15°18.5 -20°39.8	33°18.4 -20°40.3	45°18.2 -20°40.8	63°18.0 -20°41.3	-0.2 -0.5
Su 25	258°15.6 -20°47.7	273°15.4 -20°48.2	288°15.2 -20°48.6	303°15.0 -20°49.1	318°14.8 -20°49.6	333°14.6 -20°50.1	348°14.4 -20°50.5	3°14.2 -20°51.0	15°14.0 -20°51.5	33°13.8 -20°52.0	45°13.6 -20°52.5	63°13.4 -20°53.0	-0.2 -0.5
Mo 26	258°10.9 -20°59.1	273°10.7 -20°59.6	288°10.5 -21°00.0	303°10.3 -21°00.5	318°10.1 -21°01.0	333°09.9 -21°01.4	348°09.7 -21°01.9	3°09.5 -21°02.4	15°09.3 -21°02.8	33°09.1 -21°03.3	45°08.9 -21°03.8	63°08.7 -21°04.2	-0.2 -0.5
Tu 27	258°06.1 -21°10.2	273°05.9 -21°10.6	288°05.7 -21°11.1	303°05.5 -21°11.5	318°05.2 -21°12.0	333°05.0 -21°12.4	348°04.8 -21°12.9	3°04.6 -21°13.3	15°04.4 -21°13.8	33°04.4 -21°14.2	45°04.0 -21°14.6	63°03.8 -21°15.1	-0.2 -0.4
We 28	258°01.1 -21°20.8	273°00.8 -21°21.2	288°00.6 -21°21.7	303°00.4 -21°22.1	318°00.2 -21°22.5	333°00.0 -21°23.0	347°59.8 -21°23.4	2°59.6 -21°23.8	15°59.3 -21°24.3	32°59.1 -21°24.7	45°58.9 -21°25.1	62°58.7 -21°25.6	-0.2 -0.4
Th 29	257°55.9 -21°31.1	272°55.6 -21°31.5	287°55.4 -21°31.9	302°55.2 -21°32.3	317°55.0 -21°32.7	332°54.7 -21°33.1	347°54.5 -21°33.6	2°54.3 -21°34.0	15°54.1 -21°34.4	32°53.9 -21°34.8	45°53.6 -21°35.2	62°53.4 -21°35.6	-0.2 -0.4
Fr 30	257°50.5 -21°40.9	272°50.2 -21°41.7	287°50.0 -21°42.1	302°49.8 -21°42.5	317°49.6 -21°42.9	332°49.3 -21°43.2	347°49.1 -21°43.6	2°48.9 -21°44.1	15°48.6 -21°44.4	32°48.4 -21°44.8	45°48.2 -21°44.9	62°48.0 -21°45.3	-0.2 -0.4

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

November 2029

	D	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	Δ'/h SH
Th 1	225 [°] 57.4 2 [°] 51.8	240 [°] 27.4 2 [°] 37.7	254 [°] 57.5 2 [°] 23.6	269 [°] 27.4 2 [°] 09.4	283 [°] 57.4 1 [°] 55.2	298 [°] 27.3 1 [°] 41.0	312 [°] 57.2 1 [°] 26.8	327 [°] 27.0 1 [°] 12.5	341 [°] 56.8 0 [°] 58.2	356 [°] 26.6 0 [°] 43.9	10 [°] 56.3 0 [°] 29.5	+29.9 16.2 -14.2 59.3	
	240 [°] 27.4 2 [°] 37.7	254 [°] 57.5 2 [°] 23.6	269 [°] 27.4 2 [°] 09.4	283 [°] 57.4 1 [°] 55.2	298 [°] 27.3 1 [°] 41.0	312 [°] 57.2 1 [°] 26.8	327 [°] 27.0 1 [°] 12.5	341 [°] 56.8 0 [°] 58.2	356 [°] 26.6 0 [°] 43.9	10 [°] 56.3 0 [°] 29.5	25 [°] 26.0 0 [°] 15.2	+29.9 16.2 -14.3 59.3	
Sa 3	242 [°] 45.6 -3 [°] 21.9	257 [°] 14.5 -3 [°] 36.4	271 [°] 43.3 -3 [°] 50.9	286 [°] 12.1 -4 [°] 05.4	300 [°] 40.8 -4 [°] 19.9	315 [°] 09.4 -4 [°] 34.4	329 [°] 38.0 -4 [°] 48.8	344 [°] 06.6 -5 [°] 03.3	358 [°] 35.0 -5 [°] 17.8	13 [°] 03.4 -5 [°] 32.2	27 [°] 31.8 -5 [°] 46.6	+28.6 16.4 -14.5 60.2	
Su 4	244 [°] 28.4 -9 [°] 19.6	258 [°] 55.6 -9 [°] 33.5	273 [°] 22.7 -9 [°] 47.4	287 [°] 49.8 -10 [°] 01.2	302 [°] 16.7 -10 [°] 15.0	316 [°] 43.6 -10 [°] 28.7	331 [°] 10.4 -10 [°] 42.3	345 [°] 37.1 -10 [°] 55.9	0 [°] 03.7 -11 [°] 09.4	14 [°] 30.2 -11 [°] 22.9	28 [°] 56.7 -11 [°] 36.3	+26.8 16.6 -13.7 60.9	
Mo 5	245 [°] 23.4 -14 [°] 48.4	259 [°] 48.5 -15 [°] 00.5	274 [°] 13.6 -15 [°] 12.5	288 [°] 38.5 -15 [°] 24.5	303 [°] 03.3 -15 [°] 36.3	317 [°] 28.1 -15 [°] 48.0	331 [°] 52.8 -15 [°] 59.6	346 [°] 17.3 -16 [°] 11.1	0 [°] 41.8 -16 [°] 22.5	15 [°] 06.3 -16 [°] 33.8	29 [°] 30.6 -16 [°] 45.0	+24.7 16.7 -11.7 61.3	
Tu 6	245 [°] 26.1 -19 [°] 17.8	259 [°] 49.2 -19 [°] 26.9	274 [°] 12.3 -19 [°] 35.9	288 [°] 35.2 -19 [°] 44.7	302 [°] 58.1 -19 [°] 53.4	317 [°] 21.0 -20 [°] 01.9	331 [°] 43.7 -20 [°] 10.3	346 [°] 06.4 -20 [°] 18.5	0 [°] 29.1 -20 [°] 26.6	14 [°] 51.7 -20 [°] 34.5	29 [°] 14.2 -20 [°] 42.3	+22.8 16.7 -8.5 61.3	
We 7	244 [°] 46.6 -22 [°] 19.5	259 [°] 08.4 -22 [°] 24.7	273 [°] 30.3 -22 [°] 29.6	287 [°] 52.1 -22 [°] 34.4	302 [°] 13.9 -22 [°] 39.0	316 [°] 35.7 -22 [°] 43.5	330 [°] 57.5 -22 [°] 47.8	345 [°] 19.2 -22 [°] 51.9	359 [°] 41.0 -22 [°] 55.8	14 [°] 02.7 -22 [°] 59.5	28 [°] 24.4 -23 [°] 03.1	+21.8 16.6 -4.4 61.0	
Th 8	243 [°] 51.4 -23 [°] 35.3	258 [°] 13.4 -23 [°] 36.0	272 [°] 35.4 -23 [°] 36.6	286 [°] 57.5 -23 [°] 37.0	301 [°] 19.6 -23 [°] 37.2	315 [°] 41.7 -23 [°] 37.2	330 [°] 03.9 -23 [°] 37.0	344 [°] 26.1 -23 [°] 36.2	358 [°] 48.4 -23 [°] 36.2	13 [°] 10.7 -23 [°] 35.6	27 [°] 33.1 -23 [°] 34.7	+22.2 16.5 -4.1 61.0	
Fr 9	243 [°] 16.6 -23 [°] 02.3	257 [°] 40.1 -22 [°] 58.9	272 [°] 03.7 -22 [°] 55.3	286 [°] 27.3 -22 [°] 51.5	300 [°] 51.1 -22 [°] 47.6	315 [°] 14.9 -22 [°] 43.5	329 [°] 38.9 -22 [°] 39.4	344 [°] 02.9 -22 [°] 35.0	358 [°] 27.1 -22 [°] 30.5	12 [°] 51.3 -22 [°] 25.9	27 [°] 15.6 -22 [°] 15.1	+23.9 16.2 +4.1 59.5	
Sa 10	243 [°] 32.6 -20 [°] 53.1	257 [°] 58.5 -20 [°] 46.2	272 [°] 24.6 -20 [°] 39.3	286 [°] 50.8 -20 [°] 32.1	301 [°] 17.1 -20 [°] 24.9	315 [°] 43.5 -20 [°] 17.6	330 [°] 10.1 -20 [°] 10.1	344 [°] 36.7 -20 [°] 02.5	359 [°] 03.4 -19 [°] 54.9	13 [°] 30.3 -19 [°] 47.1	27 [°] 57.2 -19 [°] 39.2	+26.5 16.0 +7.4 58.5	
Su 11	244 [°] 54.8 -17 [°] 29.2	259 [°] 23.5 -17 [°] 19.8	273 [°] 52.3 -17 [°] 10.4	288 [°] 21.2 -17 [°] 00.8	302 [°] 50.2 -16 [°] 51.2	317 [°] 19.3 -16 [°] 41.8	331 [°] 48.5 -16 [°] 31.8	346 [°] 17.9 -16 [°] 21.9	0 [°] 47.3 -16 [°] 12.0	15 [°] 16.8 -16 [°] 02.0	29 [°] 46.4 -15 [°] 52.0	+29.2 15.7 +9.7 57.5	
Mo 12	247 [°] 22.5 -13 [°] 13.7	261 [°] 53.6 -13 [°] 02.7	276 [°] 24.9 -12 [°] 51.7	290 [°] 56.2 -12 [°] 40.6	305 [°] 27.6 -12 [°] 29.5	319 [°] 59.0 -12 [°] 18.3	334 [°] 30.6 -12 [°] 07.1	349 [°] 02.3 -11 [°] 55.8	3 [°] 34.0 -11 [°] 44.5	18 [°] 05.8 -11 [°] 33.1	32 [°] 37.7 -11 [°] 21.8	+31.5 15.4 +11.2 56.6	
Tu 13	250 [°] 44.8 -8 [°] 26.9	265 [°] 17.8 -8 [°] 15.0	275 [°] 50.9 -8 [°] 03.1	294 [°] 24.0 -7 [°] 51.2	308 [°] 57.2 -7 [°] 39.2	323 [°] 30.5 -7 [°] 27.3	338 [°] 03.8 -7 [°] 15.3	352 [°] 37.1 -7 [°] 03.3	7 [°] 10.6 -6 [°] 51.3	21 [°] 44.0 -6 [°] 39.2	36 [°] 17.6 -6 [°] 27.2	+33.3 15.2 +12.0 55.7	
We 14	254 [°] 46.1 -3 [°] 25.0	269 [°] 20.4 -3 [°] 12.8	283 [°] 54.6 -3 [°] 00.6	298 [°] 28.9 -2 [°] 48.4	313 [°] 03.8 -2 [°] 36.2	327 [°] 37.6 -2 [°] 24.0	342 [°] 12.0 -2 [°] 11.8	356 [°] 46.4 -1 [°] 59.6	11 [°] 20.9 -1 [°] 47.4	25 [°] 55.4 -1 [°] 35.2	40 [°] 29.9 -1 [°] 23.0	+34.4 15.0 +12.2 55.1	
Th 15	259 [°] 10.0 1 [°] 39.2	273 [°] 44.8 1 [°] 51.2	288 [°] 19.7 2 [°] 03.3	302 [°] 54.7 2 [°] 15.3	317 [°] 29.3 2 [°] 27.3	332 [°] 04.1 2 [°] 39.3	346 [°] 39.0 2 [°] 51.3	1 [°] 13.8 3 [°] 03.3	15 [°] 48.7 3 [°] 15.2	30 [°] 23.5 3 [°] 27.1	44 [°] 58.4 3 [°] 39.0	+34.8 14.9 +12.0 54.6	
Fr 16	263 [°] 41.0 6 [°] 34.8	278 [°] 15.7 6 [°] 46.3	292 [°] 50.5 6 [°] 57.8	307 [°] 25.3 7 [°] 09.2	322 [°] 00.0 7 [°] 20.6	336 [°] 34.7 7 [°] 32.0	351 [°] 09.4 7 [°] 43.4	5 [°] 44.1 7 [°] 54.7	20 [°] 18.8 8 [°] 06.0	34 [°] 53.5 8 [°] 17.2	49 [°] 28.4 8 [°] 28.4	+34.7 14.8 +11.4 54.2	
Sa 17	268 [°] 05.0 11 [°] 11.8	282 [°] 39.2 11 [°] 22.4	297 [°] 13.4 11 [°] 32.9	311 [°] 47.6 11 [°] 43.3	326 [°] 21.8 11 [°] 53.7	340 [°] 55.9 12 [°] 04.1	355 [°] 30.0 12 [°] 14.4	10 [°] 04.0 12 [°] 24.7	24 [°] 38.1 12 [°] 34.9	39 [°] 12.0 12 [°] 45.0	53 [°] 46.0 12 [°] 55.2	+34.1 14.7 +10.3 54.0	
Su 18	272 [°] 10.6 15 [°] 20.1	286 [°] 44.0 15 [°] 29.2	301 [°] 17.2 15 [°] 38.3	315 [°] 50.3 15 [°] 47.4	330 [°] 23.6 15 [°] 56.4	344 [°] 56.8 16 [°] 05.3	359 [°] 29.9 16 [°] 14.2	10 [°] 02.9 16 [°] 23.0	28 [°] 35.9 16 [°] 31.7	33 [°] 08.6 16 [°] 40.3	43 [°] 08.9 16 [°] 48.9	+33.1 14.7 +8.9 53.9	
Mo 19	275 [°] 49.8 18 [°] 48.8	290 [°] 22.0 18 [°] 56.2	304 [°] 54.1 19 [°] 03.5	319 [°] 26.1 19 [°] 10.7	333 [°] 58.1 19 [°] 17.8	348 [°] 30.1 19 [°] 24.9	3 [°] 02.0 19 [°] 31.8	17 [°] 33.8 19 [°] 38.7	32 [°] 05.6 19 [°] 45.5	46 [°] 37.4 19 [°] 52.2	61 [°] 09.1 19 [°] 58.8	+31.9 14.7 +7.0 53.9	
Tu 20	278 [°] 59.1 21 [°] 27.2	293 [°] 30.0 21 [°] 32.3	308 [°] 01.0 21 [°] 37.4	322 [°] 31.8 21 [°] 42.3	337 [°] 02.7 21 [°] 47.2	351 [°] 33.4 21 [°] 51.9	6 [°] 04.2 21 [°] 56.6	20 [°] 34.9 22 [°] 01.1	35 [°] 05.5 22 [°] 05.5	49 [°] 36.2 22 [°] 09.2	64 [°] 06.7 22 [°] 14.1	+30.8 14.7 +4.7 54.1	
We 21	281 [°] 40.8 23 [°] 05.1	296 [°] 10.8 23 [°] 07.6	310 [°] 40.8 23 [°] 10.0	325 [°] 10.7 23 [°] 12.4	339 [°] 40.6 23 [°] 14.6	354 [°] 10.5 23 [°] 16.6	8 [°] 40.3 23 [°] 18.6	23 [°] 10.2 23 [°] 20.5	37 [°] 39.9 23 [°] 22.2	52 [°] 09.7 23 [°] 23.9	66 [°] 39.5 23 [°] 25.4	+29.9 14.8 +2.0 54.3	
Th 22	284 [°] 03.2 23 [°] 34.6	298 [°] 32.7 23 [°] 34.3	313 [°] 02.2 23 [°] 33.9	327 [°] 31.6 23 [°] 33.3	342 [°] 01.0 23 [°] 32.7	356 [°] 30.5 23 [°] 31.9	10 [°] 59.9 23 [°] 31.0	25 [°] 29.3 23 [°] 29.0	39 [°] 58.7 23 [°] 28.9	54 [°] 28.1 23 [°] 27.6	68 [°] 57.5 23 [°] 26.2	+29.4 14.9 -0.8 54.6	
Fr 23	286 [°] 18.6 22 [°] 51.8	300 [°] 48.0 22 [°] 48.6	315 [°] 17.5 22 [°] 45.2	329 [°] 46.9 22 [°] 41.8	344 [°] 16.4 22 [°] 38.2	358 [°] 45.9 22 [°] 34.5	13 [°] 15.4 22 [°] 30.7	27 [°] 44.9 22 [°] 26.8	42 [°] 14.5 22 [°] 22.8	56 [°] 44.0 22 [°] 18.7	71 [°] 13.6 22 [°] 14.4	+29.5 15.0 -3.7 54.9	
Sa 24	288 [°] 39.2 20 [°] 57.3	303 [°] 09.0 20 [°] 51.3	317 [°] 38.9 20 [°] 45.1	332 [°] 08.9 20 [°] 38.9	346 [°] 38.8 20 [°] 32.6	1 [°] 08.8 20 [°] 26.2	15 [°] 38.8 20 [°] 19.6	30 [°] 08.8 20 [°] 13.0	44 [°] 38.8 20 [°] 06.2	59 [°] 08.9 19 [°] 59.4	73 [°] 39.0 19 [°] 52.4	+30.0 15.1 -6.5 55.4	
Su 25	291 [°] 13.7 17 [°] 56.1	305 [°] 44.2 17 [°] 47.6	320 [°] 14.8 17 [°] 39.0	334 [°] 45.4 17 [°] 30.3	349 [°] 16.0 17 [°] 21.5	3 [°] 46.6 17 [°] 12.6	18 [°] 17.3 17 [°] 03.6	32 [°] 47.9 16 [°] 54.5	47 [°] 18.7 16 [°] 45.4	61 [°] 49.4 16 [°] 36.1	76 [°] 20.2 16 [°] 26.8	+30.6 15.3 -8.9 56.0	
Mo 26	305 [°] 44.2 17 [°] 47.6	320 [°] 14.8 17 [°] 39.0	334 [°] 45.4 17 [°] 30.3	349 [°] 16.4 17 [°] 21.5	3 [°] 46.6 17 [°] 12.6	18 [°] 17.3 17 [°] 03.6	32 [°] 47.9 16 [°] 54.5	47 [°] 18.7 16 [°] 45.4	61 [°] 49.4 16 [°] 36.1	76 [°] 20.2 16 [°] 26.8	90 [°] 51.0 16 [°] 17.4	+30.7 15.3 -9.0 56.0	
Tu 27	308 [°] 35.7 13 [°] 46.1	323 [°] 06.8 13 [°] 35.4	337 [°] 38.0 13 [°] 24.6	352 [°] 09.2 13 [°] 13.7	6 [°] 40.4 13 [°] 02.8	21 [°] 11.6 12 [°] 51.7	35 [°] 42.9 12 [°] 40.7	50 [°] 14.1 12 [°] 29.5	64 [°] 45.4 12 [°] 18.3	79 [°] 16.7 12 [°] 07.0	93 [°] 48.0 11 [°] 55.6	+31.2 15.4 -11.0 56.6	
We 28	311 [°] 38.9 8 [°] 57.4	326 [°] 10.3 8 [°] 45.1	340 [°] 41.8 8 [°] 32.7	355 [°] 13.2 8 [°] 20.2	9 [°] 44.7 8 [°] 07.7	24 [°] 16.1 7 [°] 55.1	38 [°] 47.6 7 [°] 42.5						

SUN

December 2029

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Sa 1	272°44.7 -21°50.7	287°44.5 -21°51.1	302°44.2 -21°51.5	317°44.0 -21°51.9	332°43.8 -21°52.2	347°43.5 -21°52.6	2°43.3 -21°53.0	17°43.0 -21°53.4	32°42.8 -21°53.8	47°42.6 -21°54.1	62°42.3 -21°54.5	77°42.1 -21°54.9	-0.2 -0.4
Su 2	272°39.9 -22°59.7	287°38.7 -22°00.1	302°38.5 -22°00.4	317°38.2 -22°00.8	332°38.0 -22°01.2	347°37.8 -22°01.5	2°37.5 -22°01.9	17°37.3 -22°02.2	32°37.0 -22°02.6	47°36.8 -22°03.0	62°36.5 -22°03.3	77°36.3 -22°03.7	-0.2 -0.4
Mo 3	272°33.1 -22°08.3	287°32.8 -22°08.6	302°32.6 -22°09.0	317°32.3 -22°09.3	332°32.1 -22°09.7	347°31.9 -22°10.0	2°31.6 -22°10.3	17°31.4 -22°10.7	32°31.1 -22°11.0	47°30.9 -22°11.4	62°30.6 -22°11.7	77°30.3 -22°12.0	-0.2 -0.3
Tu 4	272°27.1 -22°16.4	287°26.8 -22°16.7	302°26.6 -22°17.1	317°26.3 -22°17.4	332°26.0 -22°17.7	347°25.8 -22°18.0	2°25.5 -22°18.4	17°25.3 -22°18.7	32°25.0 -22°19.0	47°24.8 -22°19.3	62°24.5 -22°19.7	77°24.3 -22°20.0	-0.3 -0.3
We 5	272°20.9 -22°24.1	287°20.6 -22°24.4	302°20.4 -22°24.7	317°20.1 -22°25.0	332°19.8 -22°25.4	347°19.6 -22°25.7	2°19.3 -22°26.0	17°19.1 -22°26.3	32°18.8 -22°26.6	47°18.5 -22°26.9	62°18.3 -22°27.2	77°18.0 -22°27.5	-0.3 -0.3
Th 6	272°14.6 -22°31.4	287°14.3 -22°31.7	302°14.0 -22°32.0	317°13.8 -22°32.3	332°13.5 -22°32.6	347°13.2 -22°32.8	2°13.0 -22°33.1	17°12.7 -22°33.4	32°12.4 -22°33.7	47°12.2 -22°34.0	62°11.9 -22°34.3	77°11.6 -22°34.6	-0.3 -0.3
Fr 7	272°08.1 -22°38.2	287°07.9 -22°38.5	302°07.6 -22°38.8	317°07.3 -22°39.0	332°07.0 -22°39.3	347°06.8 -22°39.6	2°06.5 -22°39.9	17°06.2 -22°40.1	32°06.0 -22°40.4	47°05.7 -22°40.7	62°05.4 -22°40.9	77°05.1 -22°41.2	-0.3 -0.3
Sa 8	272°01.6 -22°44.6	287°01.3 -22°44.9	302°01.0 -22°45.1	317°00.7 -22°45.4	332°00.5 -22°45.6	347°00.2 -22°45.9	1°59.9 -22°46.1	16°59.6 -22°46.4	31°59.4 -22°46.6	46°59.1 -22°46.9	61°58.8 -22°47.1	76°58.5 -22°47.4	-0.3 -0.3
Su 9	271°54.9 -22°50.5	286°54.6 -22°50.8	301°54.3 -22°51.0	316°54.1 -22°51.3	331°53.8 -22°51.5	346°53.5 -22°51.7	1°53.2 -22°52.0	16°52.9 -22°52.2	31°52.6 -22°52.4	46°52.4 -22°52.7	61°52.1 -22°52.9	76°51.8 -22°53.1	-0.3 -0.2
Mo 10	271°48.4 -22°56.0	286°47.8 -22°56.3	301°47.5 -22°56.5	316°47.3 -22°56.7	331°47.0 -22°56.9	346°46.7 -22°57.1	1°46.4 -22°57.3	16°46.1 -22°57.6	31°45.8 -22°57.8	46°45.5 -22°58.0	61°45.3 -22°58.2	76°45.0 -22°58.4	-0.3 -0.2
Tu 11	271°41.4 -23°01.1	286°41.0 -23°01.3	301°40.7 -23°01.5	316°40.4 -23°01.7	331°40.1 -23°01.9	346°39.8 -23°02.1	1°39.5 -23°02.3	16°39.2 -23°02.5	31°38.9 -23°02.7	46°38.6 -23°02.9	61°38.3 -23°03.1	76°38.1 -23°03.2	-0.3 -0.2
We 12	271°34.3 -23°05.7	286°34.0 -23°05.8	301°33.7 -23°06.0	316°33.4 -23°06.2	331°33.1 -23°06.4	346°32.8 -23°06.6	1°32.5 -23°06.7	16°32.2 -23°06.9	31°31.9 -23°07.1	46°31.6 -23°07.3	61°31.3 -23°07.5	76°31.1 -23°07.6	-0.3 -0.2
Th 13	271°27.2 -23°09.8	286°26.9 -23°10.0	301°26.6 -23°10.1	316°26.3 -23°10.3	331°26.0 -23°10.6	346°25.7 -23°10.7	1°25.5 -23°10.9	16°25.2 -23°11.1	31°24.9 -23°11.3	46°24.6 -23°11.5	61°24.3 -23°11.7	76°24.0 -23°11.8	-0.3 -0.2
Fr 14	271°20.2 -23°13.9	286°19.8 -23°13.6	301°19.5 -23°13.7	316°19.2 -23°13.9	331°18.9 -23°14.0	346°18.6 -23°14.2	1°18.3 -23°14.4	16°18.0 -23°14.6	31°17.7 -23°14.8	46°17.4 -23°14.9	61°17.1 -23°15.1	76°16.8 -23°15.0	-0.3 -0.1
Sa 15	271°12.9 -23°16.7	286°12.6 -23°16.8	301°12.3 -23°16.9	316°12.0 -23°17.0	331°11.7 -23°17.1	346°11.4 -23°17.3	1°11.1 -23°17.4	16°10.8 -23°17.5	31°10.5 -23°17.6	46°10.2 -23°17.7	61°09.9 -23°17.9	76°09.6 -23°18.0	-0.3 -0.1
Su 16	271°05.7 -23°19.4	286°05.4 -23°19.5	301°05.1 -23°19.6	316°04.8 -23°19.7	331°04.5 -23°19.8	346°04.2 -23°19.9	1°03.9 -23°20.0	16°03.6 -23°20.1	31°03.2 -23°20.2	46°02.7 -23°20.3	61°02.6 -23°20.4	76°02.3 -23°20.5	-0.3 -0.1
Mo 17	270°58.4 -23°21.7	285°58.1 -23°21.8	300°57.8 -23°21.8	315°57.5 -23°21.9	330°57.2 -23°22.0	345°56.9 -23°22.1	0°56.5 -23°22.2	15°56.2 -23°22.2	30°55.9 -23°22.3	45°55.6 -23°22.4	60°55.3 -23°22.5	75°55.0 -23°22.6	-0.3 -0.1
Tu 18	270°51.0 -23°23.5	285°50.7 -23°23.5	300°50.4 -23°23.6	315°50.1 -23°23.7	330°49.8 -23°23.8	345°49.5 -23°23.8	0°49.2 -23°23.8	15°48.9 -23°23.9	30°48.6 -23°24.0	45°48.3 -23°24.0	60°48.0 -23°24.1	75°47.7 -23°24.1	-0.3 -0.1
We 19	270°43.7 -23°24.8	285°43.4 -23°24.9	300°43.4 -23°24.9	315°42.7 -23°24.9	330°42.4 -23°25.0	345°42.1 -23°25.0	0°41.8 -23°25.1	15°41.5 -23°25.1	30°41.2 -23°25.1	45°40.9 -23°25.2	60°40.6 -23°25.2	75°40.3 -23°25.3	-0.3 -0.0
Th 20	270°36.3 -23°25.7	285°36.0 -23°25.7	300°35.7 -23°25.7	315°35.3 -23°25.8	330°35.0 -23°25.8	345°34.7 -23°25.8	0°34.4 -23°25.8	15°34.1 -23°25.8	30°33.8 -23°25.9	45°33.5 -23°25.9	60°33.2 -23°25.9	75°32.9 -23°25.9	-0.3 -0.0
Fr 21	270°28.8 -23°26.1	285°28.5 -23°26.1	300°28.2 -23°26.1	315°27.9 -23°26.1	330°27.6 -23°26.1	345°27.3 -23°26.1	0°27.0 -23°26.1	15°26.7 -23°26.1	30°26.4 -23°26.1	45°26.1 -23°26.1	60°25.8 -23°26.1	75°25.4 -23°26.1	-0.3 -0.0
Sa 22	270°21.4 -23°26.0	285°21.1 -23°26.0	300°20.8 -23°26.0	315°20.5 -23°26.0	330°20.2 -23°25.9	345°19.9 -23°25.9	0°19.6 -23°25.9	15°19.2 -23°25.9	30°18.9 -23°25.9	45°18.6 -23°25.9	60°18.3 -23°25.8	75°18.0 -23°25.8	-0.3 +0.0
Su 23	270°14.0 -23°25.5	285°13.7 -23°25.4	300°13.4 -23°25.4	315°13.1 -23°25.4	330°12.7 -23°25.3	345°12.4 -23°25.3	0°12.1 -23°25.3	15°11.8 -23°25.2	30°11.5 -23°25.2	45°11.2 -23°25.2	60°10.9 -23°25.1	75°10.6 -23°25.1	-0.3 +0.0
Mo 24	270°06.5 -23°24.4	285°06.2 -23°24.4	300°05.9 -23°24.3	315°05.6 -23°24.3	330°05.3 -23°24.2	345°05.0 -23°24.2	0°04.7 -23°24.1	15°04.4 -23°24.1	30°04.1 -23°24.0	45°03.8 -23°23.9	60°03.5 -23°23.9	75°03.1 -23°23.8	-0.3 +0.1
Tu 25	269°59.1 -23°23.0	284°58.8 -23°22.9	299°58.5 -23°22.8	314°58.2 -23°22.7	329°57.9 -23°22.7	344°57.6 -23°22.6	14°57.0 -23°22.5	29°56.7 -23°22.4	44°56.3 -23°22.3	59°56.0 -23°22.2	74°55.7 -23°22.1	89°55.2 -23°22.1	-0.3 +0.1
We 26	269°51.7 -23°20.0	284°51.4 -23°20.0	299°51.1 -23°20.0	314°50.8 -23°20.7	329°50.5 -23°20.6	344°50.2 -23°20.5	14°49.6 -23°20.5	29°49.3 -23°20.4	44°48.9 -23°20.3	59°48.6 -23°20.2	74°48.3 -23°20.1	89°47.8 -23°20.0	-0.3 +0.1
Th 27	269°44.3 -23°18.6	284°44.0 -23°18.5	299°43.7 -23°18.4	314°43.4 -23°18.3	329°43.1 -23°18.1	344°42.8 -23°17.9	14°42.2 -23°17.8	29°41.9 -23°17.7	44°41.6 -23°17.6	59°41.3 -23°17.4	74°41.0 -23°17.3	89°40.5 -23°17.3	-0.3 +0.1
Fr 28	269°37.0 -23°15.7	284°36.7 -23°15.6	299°36.4 -23°15.4	314°36.1 -23°15.3	329°35.8 -23°15.2	344°35.5 -23°15.0	14°34.9 -23°14.8	29°34.6 -23°14.6	44°34.3 -23°14.5	59°33.9 -23°14.3	74°33.6 -23°14.2	89°33.0 -23°14.2	-0.3 +0.1
Sa 29	269°29.7 -23°12.8	284°29.4 -23°12.2	299°29.1 -23°12.0	314°28.8 -23°11.9	329°28.5 -23°11.7	344°28.2 -23°11.6	14°27.6 -23°11.3	29°27.3 -23°11.1	44°27.0 -23°11.0	59°26.7 -23°10.8	74°26.4 -23°10.6	89°25.8 -23°10.6	-0.3 +0.2
Su 30	269°22.2 -23°08.8	284°22.1 -23°08.3	299°21.8 -23°08.2	314°21.5 -23°08.0	329°21.2 -23°07.8	344°20.9 -23°07.7	14°20.3 -23°07.5	29°20.0 -23°07.3	44°19.7 -23°07.1	59°19.4 -23°06.8	74°19.1 -23°06.6	89°18.3 -23°06.6	-0.3 +0.2
Mo 31	269°15.2 -23°04.2	284°14.9 -23°04.0	299°14.6 -23°03.8	314°14.3 -23°03.7	329°14.1 -23°03.5	344°13.8 -23°03.3	14°13.2 -23°03.1	29°12.9 -23°02.9	44°12.6 -23°02.7	59°12.3 -23°02.5	74°12.0 -23°02.3	89°11.2 -23°02.1	-0.3 +0.2

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.3'

MOON

December 2029

	D	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	Δ'/h	SH
●	Sa 1	247°33.4 -6°47.2	262°02.7 -7°00.9	276°31.8 -7°14.6	291°00.9 -7°28.3	305°30.0 -7°42.0	319°58.9 -7°55.6	334°27.8 -8°09.2	348°56.6 -8°22.2	3°25.3 -8°36.4	17°54.0 -8°49.9	32°22.2 -9°03.3	+28.9	16.3
	Su 2	249°21.5 -15°09.9	263°48.7 -12°32.5	278°15.9 -12°45.1	293°43.0 -12°57.6	307°09.9 -13°10.1	321°36.8 -13°22.5	336°03.6 -13°34.8	350°30.3 -13°47.0	4°56.9 -14°11.3	19°23.4 -14°26.6	33°49.9 -14°43.3	+26.8	16.4
	Mo 3	250°14.9 -17°12.5	264°39.8 -17°23.0	279°04.6 -17°33.3	293°29.4 -17°43.6	307°54.0 -17°53.7	322°18.5 -18°03.8	336°43.0 -18°13.7	351°07.3 -18°23.4	5°31.6 -18°33.1	19°55.8 -18°42.6	34°19.9 -18°52.6	+24.5	16.6
●	Tu 4	250°11.2 -20°57.0	264°34.0 -21°04.1	278°56.7 -21°11.2	293°19.4 -21°18.0	307°42.0 -21°24.7	322°04.5 -21°31.3	336°27.0 -21°37.7	350°49.4 -21°43.9	5°11.7 -21°50.0	19°34.0 -21°55.9	33°56.3 -22°01.7	+22.5	16.6
	We 5	249°24.6 -23°07.7	263°46.2 -23°10.8	278°07.8 -23°13.6	292°29.4 -23°16.3	306°51.0 -23°18.8	321°12.6 -23°21.1	335°34.2 -23°23.2	349°55.8 -23°25.2	4°17.3 -23°26.9	18°38.9 -23°28.5	33°00.5 -23°30.0	+21.6	16.6
	Th 6	248°26.2 -23°29.9	262°48.2 -23°28.5	277°10.2 -23°26.9	291°32.3 -23°25.2	305°54.4 -23°23.3	320°16.6 -23°21.2	334°38.8 -23°18.9	349°01.1 -23°16.5	3°23.4 -23°13.8	17°45.8 -23°11.1	32°08.3 -23°08.1	+22.2	16.5
●	Fr 7	247°54.4 -19°09.9	262°18.1 -21°59.4	276°41.9 -21°53.9	291°05.9 -21°48.1	305°29.9 -21°43.4	319°54.0 -21°36.3	334°18.3 -21°30.1	348°42.6 -21°23.8	3°07.0 -21°17.4	17°31.6 -21°10.9	31°56.2 -21°04.2	+24.2	16.3
	Sa 8	248°18.5 -19°05.8	262°44.9 -21°59.4	277°11.4 -21°53.9	291°37.9 -21°48.1	306°04.6 -21°43.4	320°31.4 -21°36.3	334°58.4 -21°30.1	349°25.4 -21°23.8	3°52.6 -21°17.4	18°19.8 -21°10.9	32°47.2 -21°04.2	+26.9	16.0
	Su 9	249°50.8 -15°06.7	264°19.9 -14°56.0	278°49.1 -14°45.2	293°18.5 -14°34.3	307°47.9 -14°23.4	322°17.4 -14°12.5	336°47.0 -14°01.4	351°16.7 -13°50.3	5°46.5 -13°39.9	20°16.4 -13°28.0	34°46.4 -13°16.8	+29.6	15.8
●	Mo 10	252°27.7 -10°22.5	266°59.1 -10°10.6	281°30.6 -9°58.6	296°02.3 -9°46.6	310°33.9 -9°34.6	325°05.7 -9°22.6	339°37.6 -9°10.5	354°09.5 -8°58.4	8°41.5 -8°46.3	23°13.6 -8°34.1	37°45.7 -8°21.9	+31.8	15.5
	Tu 11	255°56.0 -5°17.2	270°29.2 -5°04.4	285°02.2 -4°52.4	299°35.7 -4°40.0	314°09.0 -4°27.6	328°42.4 -4°15.1	343°15.8 -4°02.7	357°49.3 -3°50.3	12°22.9 -3°37.8	26°56.4 -3°25.4	41°30.1 -3°13.0	+33.4	15.3
	We 12	259°59.2 -0°06.9	274°33.8 0°05.4	289°07.7 0°17.8	303°42.9 0°30.1	318°16.3 0°42.4	332°50.6 0°54.6	347°24.9 1°06.9	1°59.3 1°19.2	16°33.7 1°31.4	31°08.1 1°43.6	45°42.5 1°55.8	+34.3	15.1
●	Th 13	264°20.5 4°56.2	258°55.1 5°08.0	293°29.7 5°19.8	308°04.3 5°31.6	322°38.9 5°43.3	337°13.5 5°55.0	351°48.1 6°06.7	6°22.7 6°18.4	20°57.2 6°30.0	35°31.8 6°41.6	50°06.4 6°53.1	+34.6	14.9
	Fr 14	268°44.0 9°42.0	283°18.3 9°52.9	297°52.7 10°03.8	312°27.0 10°14.6	327°01.0 10°25.5	341°35.7 10°36.2	356°09.9 10°46.9	10°44.2 10°57.6	25°18.4 11°08.2	39°52.6 11°18.8	54°26.9 11°29.3	+34.3	14.8
	Sa 15	275°55.9 14°01.4	287°29.6 14°10.7	302°03.2 14°20.3	316°36.8 14°29.9	331°10.4 14°39.4	345°43.9 14°48.8	359°27.9 14°58.2	0°17.4 15°07.5	14°50.8 15°16.7	24°37.2 15°25.9	38°30.9 15°35.1	+33.5	14.7
●	Su 16	276°45.4 17°43.8	291°18.0 17°51.8	305°50.6 17°59.8	320°35.2 18°07.6	334°55.3 18°15.4	349°27.9 18°23.1	363°04.8 18°30.7	4°00.3 18°38.3	18°32.6 18°45.8	27°57.9 18°53.2	40°29.2 19°00.5	+32.4	14.7
	Mo 17	280°05.5 20°40.1	294°36.9 20°46.0	309°08.2 20°51.9	323°39.4 20°57.2	338°10.4 21°03.3	352°23.8 21°08.9	365°41.1 21°14.3	7°12.9 21°44.0	18°36.5 21°25.0	30°45.9 21°30.2	65°16.8 21°35.3	+31.1	14.8
	Tu 18	282°54.9 22°39.6	297°25.1 22°43.0	311°55.2 22°46.4	326°35.3 22°49.6	340°55.4 22°52.8	355°25.4 22°55.8	369°55.4 22°58.7	9°55.4 23°01.5	24°25.4 23°01.5	38°55.3 23°04.2	53°25.1 23°06.8	+30.0	14.8
●	We 19	285°18.7 23°33.0	299°48.0 23°33.7	314°17.4 23°34.2	328°46.7 23°34.7	343°16.0 23°35.0	357°45.2 23°35.2	372°14.5 23°35.3	12°14.5 23°35.2	26°43.7 23°35.2	41°12.9 23°35.1	55°42.1 23°34.8	+29.3	14.9
	Th 20	287°27.8 23°14.2	301°56.9 23°11.9	316°25.9 23°09.5	330°55.0 23°07.2	345°24.1 23°04.3	359°53.1 23°01.5	374°22.2 22°58.6	14°22.2 22°55.6	28°51.3 22°55.6	43°30.3 22°52.5	57°49.4 22°49.9	+29.1	15.0
	Fr 21	289°36.2 21°41.5	304°05.5 21°36.3	318°34.9 21°30.9	333°04.2 21°25.5	347°33.6 21°20.0	361°32.4 21°14.3	376°13.2 21°08.5	16°32.2 21°02.7	31°01.8 21°02.7	45°31.3 21°06.7	60°00.8 21°05.6	+29.4	15.1
●	Sa 22	291°56.2 18°58.5	306°26.7 18°50.7	320°56.1 18°42.2	335°26.2 18°34.6	349°56.2 18°26.5	364°26.3 18°18.2	379°56.4 18°09.8	4°26.3 18°01.4	18°56.4 18°16.1	33°26.6 17°52.8	47°56.7 17°44.2	+30.1	15.3
	Su 23	294°34.6 15°13.7	309°05.4 15°03.6	323°36.2 14°53.4	338°07.0 14°43.1	352°37.8 14°32.7	367°08.7 14°22.3	381°39.6 14°11.8	21°39.6 14°01.2	36°10.5 14°01.2	50°41.4 13°50.5	65°12.4 13°39.8	+30.9	15.4
	Mo 24	297°31.5 10°38.6	312°02.9 10°26.8	326°34.3 10°14.9	341°05.8 10°02.9	355°37.2 9°50.9	370°08.7 9°38.8	384°40.7 9°26.6	10°08.7 9°14.4	24°40.1 9°02.2	39°11.6 8°49.9	53°43.1 8°37.5	+31.5	15.5
●	Tu 25	312°02.9 10°26.8	326°34.3 10°14.9	341°05.8 10°02.9	355°37.2 9°50.9	370°08.7 9°38.8	384°40.7 9°26.6	398°51.1 9°14.4	39°11.6 8°49.9	53°43.1 8°49.9	68°14.6 8°37.5	82°46.2 8°25.2	+31.5	15.5
	We 26	315°11.9 5°13.9	329°43.5 5°00.8	344°15.2 4°47.7	358°46.8 4°34.6	373°18.5 4°21.4	387°50.1 4°08.2	402°21.7 3°55.0	42°21.7 3°41.8	56°53.3 3°28.5	71°25.0 3°15.2	85°56.6 3°01.9	+31.6	15.7
	Th 27	318°20.5 -0°20.3	332°51.8 -0°33.9	347°23.1 -0°47.5	1°54.4 -0°47.5	16°25.7 -0°39.7	30°56.9 -0°53.1	45°28.1 -1°01.1	59°59.9 -1°15.5	74°30.4 -2°00.9	89°01.5 -2°22.7	103°32.5 -2°36.3	+31.2	15.8
●	Fr 28	321°13.7 -5°59.5	335°44.1 -6°12.9	350°14.4 -6°26.3	4°44.7 -6°39.7	19°14.9 -6°53.1	33°45.1 -7°06.4	48°15.2 -7°19.7	62°45.3 -7°32.9	77°15.2 -7°46.2	91°45.2 -7°59.4	106°15.1 -8°12.6	+30.1	16.0
	Sa 29	323°35.5 -11°25.4	338°04.3 -11°37.9	352°33.0 -11°50.3	7°01.6 -12°02.7	21°30.2 -12°15.0	35°58.7 -12°27.2	50°27.7 -12°39.4	64°55.5 -12°51.5	79°23.7 -13°03.5	93°51.9 -13°15.5	108°20.0 -13°27.4	+28.5	16.1
	Su 30	325°11.5 -16°16.9	339°38.3 -16°27.5	354°04.9 -16°38.0	8°31.5 -16°48.5	22°58.0 -16°58.8	37°24.4 -17°09.0	51°50.7 -17°19.1	66°16.9 -17°29.2	80°43.0 -17°39.1	95°09.1 -17°48.6	109°35.0 -17°58.6	+26.4	16.3
●	Mo 31	325°54.1 -20°10.4	340°18.7 -20°18.1	354°43.2 -20°25.8	9°07.6 -20°33.3	23°32.0 -20°40.7	37°56.3 -20°48.0	52°20.5 -20°55.1	66°44.6 -21°02.1	81°08.7 -21°08.9	95°32.7 -21°15.6	109°56.6 -21°22.1	+24.2	16.4
													-7.2	60.0

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameterRow 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 5 14h52 — FQ: 12 17h49 — FM: 20 22h46 — LQ: 28 09h49

SUN

January 2030

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Tu 1	269°08.1	1284°07.8	299°07.5	314°07.2	329°06.9	344°06.6	359°06.3	14°06.1	29°05.8	44°05.5	59°05.2	74°04.9	-0.3
	-22°59.5	-22°59.3	-22°59.1	-22°58.8	-22°58.6	-22°58.4	-22°58.2	-22°58.0	-22°57.8	-22°57.6	-22°57.4	-22°57.1	+0.2
We 2	269°01.1	1284°00.8	299°00.5	314°00.2	328°59.9	343°59.6	358°59.3	13°59.0	28°58.7	43°58.4	58°58.2	73°57.9	-0.3
	-22°54.3	-22°54.0	-22°53.8	-22°53.6	-22°53.3	-22°53.1	-22°52.9	-22°52.7	-22°52.4	-22°52.2	-22°52.0	-22°51.7	+0.2
Th 3	268°54.1	1283°53.8	298°53.5	313°53.2	328°52.9	343°52.7	358°52.4	13°52.1	28°51.8	43°51.5	58°51.2	73°50.9	-0.3
	-22°48.6	-22°48.3	-22°48.1	-22°47.9	-22°47.6	-22°47.4	-22°47.1	-22°46.9	-22°46.6	-22°46.4	-22°46.1	-22°45.8	+0.3
Fr 4	268°47.2	1283°46.9	298°46.7	313°46.4	328°46.1	343°45.8	358°45.5	13°45.2	28°45.0	43°44.7	58°44.4	73°44.1	-0.3
	-22°42.5	-22°42.2	-22°41.9	-22°41.7	-22°41.4	-22°41.1	-22°40.9	-22°40.6	-22°40.3	-22°40.1	-22°39.8	-22°39.5	+0.3
Sa 5	268°40.5	1283°40.2	298°39.9	313°39.6	328°39.3	343°39.1	358°38.8	13°38.5	28°38.2	43°37.9	58°37.7	73°37.4	-0.3
	-22°35.9	-22°35.6	-22°35.3	-22°35.1	-22°34.8	-22°34.5	-22°34.2	-22°33.9	-22°33.6	-22°33.3	-22°33.0	-22°32.7	+0.3
Su 6	268°33.8	1283°33.5	298°33.2	313°33.0	328°32.7	343°32.4	358°32.1	13°31.9	28°31.6	43°31.3	58°31.1	73°30.8	-0.3
	-22°28.9	-22°28.6	-22°28.3	-22°28.0	-22°27.7	-22°27.4	-22°27.1	-22°26.8	-22°26.5	-22°26.1	-22°25.8	-22°25.5	+0.3
Mo 7	268°27.3	1283°27.0	298°26.7	313°26.4	328°26.2	343°25.9	358°25.6	13°25.4	28°25.1	43°24.8	58°24.6	73°24.3	-0.3
	-22°21.4	-22°21.1	-22°20.8	-22°20.5	-22°20.1	-22°19.8	-22°19.5	-22°19.2	-22°18.8	-22°18.5	-22°18.2	-22°17.9	+0.3
Tu 8	268°20.8	1283°20.6	298°20.3	313°20.0	328°19.8	343°19.5	358°19.3	13°19.0	28°18.7	43°18.5	58°18.2	73°17.9	-0.3
	-22°15.5	-22°13.2	-22°12.2	-22°12.5	-22°12.2	-22°11.8	-22°11.5	-22°11.1	-22°10.8	-22°10.5	-22°10.1	-22°09.8	+0.3
We 9	268°14.6	1283°14.3	298°14.0	313°13.8	328°13.5	343°13.3	358°13.0	13°12.8	28°12.5	43°12.2	58°12.0	73°11.7	-0.3
	-22°05.2	-22°04.8	-22°04.5	-22°04.1	-22°03.8	-22°03.4	-22°03.0	-22°02.7	-22°02.3	-22°02.0	-22°01.6	-22°01.2	+0.3
Th 10	268°08.4	1283°08.2	298°07.9	313°07.7	328°07.4	343°07.2	358°06.9	13°06.7	28°06.4	43°06.2	58°05.9	73°05.7	-0.3
	-21°56.4	-21°56.1	-21°55.7	-21°55.3	-21°54.9	-21°54.5	-21°54.1	-21°53.8	-21°53.4	-21°53.0	-21°52.6	-21°52.3	+0.3
Fr 11	268°02.4	1283°02.2	298°01.9	313°01.7	328°01.4	343°01.2	358°01.0	13°00.7	28°00.5	43°00.2	58°00.0	72°59.7	-0.2
	-21°47.2	-21°46.8	-21°46.4	-21°46.1	-21°45.7	-21°45.3	-21°44.9	-21°44.5	-21°44.1	-21°43.7	-21°43.3	-21°42.9	+0.3
Sa 12	267°56.6	1282°56.3	297°56.1	312°55.9	327°55.6	342°55.4	357°55.1	12°54.9	27°54.7	42°54.4	57°54.2	72°54.0	-0.2
	-21°37.6	-21°37.2	-21°36.8	-21°36.4	-21°36.0	-21°35.6	-21°35.1	-21°34.7	-21°34.3	-21°33.9	-21°33.5	-21°33.1	+0.4
Su 13	267°50.9	1282°50.7	297°50.4	312°50.2	327°50.0	342°49.7	357°49.5	12°49.3	27°49.0	42°48.8	57°48.6	72°48.3	-0.2
	-21°27.6	-21°27.2	-21°26.7	-21°26.3	-21°25.9	-21°25.4	-21°25.0	-21°24.6	-21°24.1	-21°23.7	-21°23.3	-21°22.8	+0.4
Mo 14	267°45.4	1282°45.2	297°44.9	312°44.7	327°44.4	342°44.2	357°44.0	12°43.8	27°43.6	42°43.3	57°43.1	72°42.9	-0.2
	-21°17.1	-21°16.7	-21°16.2	-21°15.8	-21°15.4	-21°14.9	-21°14.5	-21°14.0	-21°13.6	-21°13.1	-21°12.7	-21°12.2	+0.4
Tu 15	267°40.0	1282°39.8	297°39.6	312°39.4	327°39.1	342°38.9	357°38.7	12°38.5	27°38.3	42°38.1	57°37.8	72°37.6	-0.2
	-21°06.3	-21°05.8	-21°05.4	-21°04.9	-21°04.4	-21°04.0	-21°03.5	-21°03.0	-21°02.6	-21°02.1	-21°01.6	-21°01.2	+0.5
We 16	267°34.8	1282°34.6	297°34.4	312°34.2	327°34.0	342°33.8	357°33.6	12°33.4	27°33.1	42°32.9	57°32.7	72°32.5	-0.2
	-20°55.0	-20°54.5	-20°54.1	-20°53.6	-20°53.1	-20°52.6	-20°52.1	-20°51.7	-20°51.2	-20°50.7	-20°50.2	-20°49.7	+0.5
Th 17	267°29.8	1282°29.6	297°29.4	312°29.2	327°29.0	342°28.8	357°28.6	12°28.4	27°28.2	42°28.0	57°27.8	72°27.6	-0.2
	-20°43.5	-20°42.9	-20°42.4	-20°41.9	-20°41.4	-20°40.9	-20°40.4	-20°39.9	-20°39.4	-20°38.9	-20°38.4	-20°37.9	+0.5
Fr 18	267°25.0	1282°24.8	297°24.6	312°24.4	327°24.2	342°24.0	357°23.8	12°23.6	27°23.4	42°23.2	57°23.0	72°22.8	-0.2
	-20°31.3	-20°30.8	-20°30.3	-20°29.8	-20°29.3	-20°28.8	-20°28.2	-20°27.7	-20°27.2	-20°26.7	-20°26.2	-20°25.7	+0.5
Sa 19	267°20.3	1282°20.2	297°20.0	312°19.8	327°19.6	342°19.4	357°19.2	12°19.0	27°18.8	42°18.6	57°18.5	72°18.3	-0.2
	-20°18.9	-20°18.3	-20°17.8	-20°17.3	-20°16.8	-20°16.2	-20°15.7	-20°15.2	-20°14.6	-20°14.1	-20°13.6	-20°13.0	+0.5
Su 20	267°15.9	1282°15.7	297°15.5	312°15.3	327°15.2	342°15.0	357°14.8	12°14.6	27°14.4	42°14.3	57°14.1	72°13.9	-0.2
	-20°06.1	-20°05.5	-20°05.0	-20°04.4	-20°03.9	-20°03.3	-20°02.8	-20°02.2	-20°01.7	-20°01.2	-20°00.6	-20°00.1	+0.5
Mo 21	267°11.6	1282°11.4	297°11.3	312°11.1	327°10.9	342°10.7	357°10.6	12°10.4	27°10.2	42°10.0	57°09.9	72°09.7	-0.2
	-19°52.9	-19°52.3	-19°51.7	-19°51.2	-19°50.6	-19°50.1	-19°49.5	-19°48.9	-19°48.4	-19°47.8	-19°47.3	-19°46.7	+0.6
Tu 22	267°07.5	1282°07.3	297°07.2	312°07.0	327°06.8	342°06.7	357°06.5	12°06.4	27°06.2	42°06.0	57°05.9	72°05.7	-0.2
	-19°39.3	-19°38.7	-19°38.1	-19°37.6	-19°37.0	-19°36.4	-19°35.8	-19°35.3	-19°34.7	-19°34.1	-19°33.5	-19°33.0	+0.6
We 23	267°03.6	1282°03.5	297°03.3	312°03.1	327°03.0	342°02.8	357°02.7	12°02.5	27°02.4	42°02.2	57°02.0	72°01.9	-0.2
	-19°25.4	-19°24.8	-19°24.2	-19°23.6	-19°23.0	-19°22.4	-19°21.8	-19°21.2	-19°20.6	-19°20.0	-19°19.4	-19°18.9	+0.6
Th 24	266°59.9	1281°59.7	296°59.6	311°59.4	326°59.3	341°59.2	356°59.0	11°58.9	26°58.7	41°58.6	56°58.4	71°58.3	-0.1
	-19°11.1	-19°10.5	-19°09.9	-19°09.3	-19°08.6	-19°08.0	-19°07.4	-19°06.8	-19°06.2	-19°05.6	-19°05.0	-19°04.4	+0.6
Fr 25	266°56.4	1281°56.2	296°56.1	311°56.0	326°55.8	341°55.7	356°55.5	11°55.4	26°55.3	41°55.1	56°55.0	71°54.8	-0.1
	-18°56.4	-18°55.8	-18°55.2	-18°54.6	-18°53.9	-18°53.3	-18°52.7	-18°52.1	-18°51.5	-18°50.8	-18°50.2	-18°49.6	+0.6
Sa 26	266°53.1	1281°52.9	296°52.8	311°52.7	326°52.5	341°52.4	356°52.3	11°52.1	26°52.0	41°51.9	56°51.7	71°51.6	-0.1
	-18°41.4	-18°40.8	-18°40.2	-18°39.5	-18°38.9	-18°38.3	-18°37.6	-18°37.0	-18°36.3	-18°35.7	-18°35.1	-18°34.4	+0.6
Su 27	266°49.9	1281°49.8	296°49.7	311°49.6	326°49.4	341°49.3	356°49.2	11°49.1	26°48.9	41°48.8	56°48.6	71°48.6	-0.1
	-18°26.1	-18°25.4	-18°24.8	-18°24.1	-18°23.5	-18°22.8	-18°22.2	-18°21.5	-18°20.9	-18°20.2	-18°19.6	-18°18.9	+0.6
Mo 28	266°47.0	1281°46.9	296°46.8	311°46.6	326°46.5	341°46.4	356°46.3	11°46.2	26°46.1	41°45.9	56°45.8	71°45.7	-0.1
	-18°10.4	-18°09.7	-18°09.1	-18°08.4	-18°07.8	-18°07.1	-18°06.4	-18°05.8	-18°05.1	-18°04.4	-18°03.8	-18°03.1	+0.7
Tu 29	266°44.3	1281°44.1	296°44.0	311°43.9	326°43.8	341°43.7	356°43.6	11°43.5	26°43.4	41°43.3	56°43.2	71°43.1	-0.1
	-17°54.4	-17°53.7	-17°53.1	-17°52.4	-17°51.7	-17°51.0	-17°50.4	-17°49.7	-17°49.0	-17°48.3	-17°47.6	-17°47.0	+0.7
We 30	266°41.7	1281°41.6	296°41.5	311°41.4	326°41.3	341°41.2	356°41.1	11°41.0	26°40.9	41°40.8	56°40.7	71°40.6	-0.1
	-17°38.1	-17°37.4	-17°36.7	-17°36.0	-17°35.3	-17°34.6	-17°34.0	-17°33.3	-17°32.6	-17°31.9	-17°31.2	-17°30.5	+0.7
Th 31	266°39.4	1281°39.3	296°39.2	311°39.1	326°39.0	341°38.9	356°38.8	11°38.7	26°38.7	41°38.6	56°38.5	71°38.4	-0.1
	-17°21.4	-17°20.7	-17°20.0	-17°19.3	-17°18.6	-17°17.9	-17°17.2	-17°16.5	-17°15.8	-17°15.1	-17°14.4	-17°13.7	+0.7

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 16.3'

MOON

January 2030

	D	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	Δ /h	SH
●	Tu 1	239°28.9 -22°14.4	253°52.1 -22°19.5	268°15.4 -22°24.3	283°38.5 -22°29.1	297°01.6 -22°33.7	311°24.7 -22°38.1	325°47.7 -22°42.3	340°10.7 -22°46.4	354°33.6 -22°50.4	8°56.5 -22°54.2	23°19.4 -22°57.8	+23.0 -4.3	16.4 60.1
	We 2	238°58.2 -23°32.0	253°20.7 -23°32.9	267°43.1 -23°33.7	282°05.6 -23°34.3	296°28.0 -23°34.7	310°50.5 -23°34.9	325°12.9 -23°35.0	339°35.4 -23°34.9	353°57.8 -23°34.6	8°20.3 -23°33.6	23°42.8 -23°33.6	+22.4 -0.2	16.4 60.1
	Th 3	238°23.3 -23°04.4	252°46.3 -23°01.1	267°09.4 -22°57.7	281°32.5 -22°54.1	295°55.6 -22°50.3	310°18.8 -22°46.4	324°42.1 -22°42.3	339°05.5 -22°38.1	353°28.9 -22°33.7	7°52.3 -22°29.2	23°15.8 -22°24.5	+23.2 -4.0	16.4 59.8
	Fr 4	238°17.6 -20°56.6	252°42.4 -20°49.5	267°07.3 -20°42.5	281°32.2 -20°35.3	295°57.3 -20°27.9	310°22.4 -20°20.4	324°47.6 -20°12.8	339°12.9 -20°05.1	353°38.3 -19°57.2	8°03.8 -19°49.2	23°29.4 -19°41.1	+25.2 +7.6	16.2 59.3
	Sa 5	239°05.2 -17°26.4	253°32.4 -17°16.6	267°59.6 -17°06.7	282°27.0 -16°56.8	296°54.5 -16°46.7	311°22.1 -16°36.6	325°49.8 -16°26.3	340°17.5 -16°16.0	354°45.4 -16°05.6	9°13.4 -15°55.1	23°41.5 -15°44.6	+27.6 +10.2	16.0 58.6
●	Su 6	240°54.3 -12°57.8	255°23.9 -12°46.2	269°53.6 -12°34.6	284°23.4 -12°22.9	298°53.3 -12°11.1	313°23.2 -11°59.3	327°53.3 -11°47.4	342°23.4 -11°35.5	356°53.7 -11°23.6	11°24.0 -11°11.6	23°54.4 -10°59.5	+30.0 +11.8	15.8 57.8
	Mo 7	243°40.1 -7°54.9	258°11.7 -7°42.4	272°43.5 -7°29.9	287°15.2 -7°17.3	301°47.1 -7°04.7	316°19.0 -6°52.1	330°51.0 -6°39.5	345°23.1 -6°26.9	359°55.2 -6°14.3	14°27.4 -6°01.6	28°59.6 -5°48.9	+32.0 +12.6	15.5 56.9
	Tu 8	247°10.1 -2°38.3	261°43.2 -2°25.5	276°16.3 -2°12.8	290°49.5 -2°00.1	305°22.7 -1°47.4	319°56.0 -1°34.8	334°29.3 -1°22.1	349°02.7 -1°09.4	3°36.1 -0°56.8	18°09.5 -0°44.1	32°43.0 -0°31.5	+33.3 +12.7	15.3 56.1
	We 9	251°08.8 2°36.1	265°42.7 2°48.5	280°16.7 3°00.8	294°50.6 3°13.1	309°24.6 3°25.3	323°58.6 3°37.6	338°32.6 3°49.8	353°06.4 4°02.0	7°40.7 4°14.1	22°14.8 4°26.3	36°48.8 4°38.4	+34.0 +12.2	15.1 55.4
	Th 10	255°20.7 7°35.8	269°54.8 7°47.3	284°29.0 7°58.8	299°03.1 8°10.2	313°37.2 8°21.6	328°11.3 8°33.0	342°45.4 8°44.3	357°19.6 8°55.6	11°53.4 9°06.8	26°27.7 9°18.0	41°01.8 9°29.2	+34.1 +11.3	14.9 55.4
●	Fr 11	259°31.2 12°10.5	274°05.0 12°20.8	288°38.8 12°31.1	303°12.5 12°41.3	317°46.3 12°51.5	332°20.0 13°01.6	346°53.7 13°11.7	3°12.7 13°21.7	16°01.0 13°31.6	30°34.6 13°41.5	45°08.1 13°51.3	+33.7 +10.1	14.8 54.4
	Sa 12	263°27.8 16°11.1	278°00.9 16°19.9	292°33.9 16°28.6	307°06.8 16°37.3	321°39.9 16°45.9	336°12.6 16°54.4	350°45.4 17°02.8	5°18.2 17°12.1	19°51.0 17°19.5	34°23.7 17°27.7	48°56.4 17°35.8	+32.9 +8.5	14.8 54.2
	Su 13	267°01.1 19°28.6	281°33.1 19°35.4	296°05.0 19°42.2	310°36.8 19°48.9	325°08.6 19°55.5	339°40.4 20°02.0	354°12.1 20°08.5	8°43.8 20°14.8	23°15.4 20°21.1	37°47.0 20°27.2	52°18.5 20°33.3	+31.7 +6.5	14.8 54.1
	Mo 14	270°05.7 21°53.4	284°36.5 21°58.4	299°07.2 22°02.4	313°37.9 22°06.8	328°08.5 22°11.1	342°39.1 22°15.2	357°09.6 22°19.3	11°40.1 22°23.2	26°10.6 22°27.1	40°41.0 22°30.9	55°11.4 22°34.5	+30.6 +4.1	14.8 54.3
	Tu 15	272°42.0 23°16.4	287°11.7 23°18.4	301°41.4 23°20.2	316°11.1 23°21.9	330°44.1 23°23.4	345°10.3 23°24.9	359°39.9 23°26.3	14°09.4 23°27.5	28°38.9 23°28.6	43°08.4 23°29.6	57°37.8 23°30.5	+29.6 +1.4	14.9 54.6
●	We 16	274°56.3 23°30.0	289°25.4 23°29.0	303°54.4 23°27.9	318°23.5 23°26.7	332°52.5 23°25.3	347°21.5 23°23.9	3°50.5 23°22.3	16°19.5 23°20.6	30°48.4 23°18.3	45°17.4 23°16.8	59°46.4 23°14.8	+29.0 -1.5	15.0 55.0
	Th 17	277°00.0 22°29.5	291°28.9 22°35.5	305°57.8 22°21.4	320°26.7 22°17.2	334°55.7 22°12.9	349°24.6 22°08.5	3°53.5 22°03.9	18°22.5 21°59.2	32°51.4 21°54.4	47°20.4 21°49.5	61°49.4 21°44.5	+28.9 -4.5	15.1 55.5
	Fr 18	279°05.8 20°15.3	293°35.0 20°08.4	308°04.2 20°01.5	322°33.5 19°54.4	337°02.8 19°47.2	351°32.1 19°40.0	6°01.5 19°32.6	20°30.9 19°25.1	35°00.9 19°17.5	49°29.7 19°09.8	63°59.1 19°02.0	+29.3 -7.3	15.3 56.1
	Sa 19	281°23.8 16°52.8	295°53.6 16°43.4	310°23.5 16°33.9	324°53.5 16°24.3	339°23.4 16°14.7	353°53.4 16°04.9	8°23.4 15°55.1	22°53.4 15°45.2	37°23.5 15°35.1	51°63.5 15°25.0	66°23.8 15°14.9	+30.0 -9.8	15.3 56.7
	Su 20	283°58.6 12°32.4	298°29.2 12°21.0	312°59.7 12°09.5	327°30.3 11°57.9	342°00.9 11°46.2	356°31.6 11°34.5	11°02.2 11°22.8	25°32.9 11°10.9	40°03.6 10°59.0	54°34.3 10°47.1	69°05.8 10°35.1	+30.6 -11.7	15.6 57.2
●	Mo 21	286°48.3 -3°28.0	301°19.4 -3°15.2	315°50.4 -3°02.3	330°21.4 -2°49.3	344°52.4 -2°36.3	359°23.5 -2°23.3	13°54.5 -2°10.2	28°25.6 -2°05.1	42°56.7 -1°54.0	57°27.7 -1°40.4	71°58.8 -1°27.6	+31.1 -13.1	15.7 57.7
	Tu 22	289°45.2 1°56.0	304°16.3 1°42.4	318°47.4 1°28.8	333°18.4 1°15.1	347°49.5 1°01.5	2°20.5 0°47.8	16°51.5 0°34.2	31°22.5 0°20.5	45°53.5 0°06.8	60°24.5 -0°06.9	74°55.5 -0°20.6	+31.0 -13.7	15.9 58.1
	We 23	292°37.6 -3°46.0	307°08.2 -3°59.6	321°38.8 -4°13.2	336°09.3 -4°26.8	350°39.9 -4°40.4	5°10.3 -4°53.9	19°40.8 -5°07.4	34°11.2 -5°21.0	48°41.6 -5°34.5	63°11.9 -5°47.9	77°42.2 -6°01.4	+30.5 -13.5	16.0 58.5
	Th 24	307°08.2 -3°59.6	321°38.8 -4°05.6	336°09.3 -4°26.8	350°39.9 -4°40.4	5°10.3 -4°53.9	19°40.8 -5°07.4	34°11.2 -5°21.0	48°41.6 -5°34.5	63°11.9 -5°47.9	77°42.2 -6°01.4	92°12.5 -6°14.8	+30.4 -13.5	16.0 58.5
	Fr 25	309°41.3 -9°31.9	324°10.8 -9°44.7	338°40.3 -9°57.5	353°09.8 -10°10.2	7°39.1 -10°22.8	22°08.4 -10°35.4	36°37.7 -10°48.0	51°06.9 -11°00.5	65°36.1 -11°12.9	80°05.2 -11°25.3	94°34.4 -11°37.6	+29.3 -12.6	16.0 58.8
●	Sa 26	311°42.3 -14°34.4	326°10.3 -14°45.6	340°33.8 -14°56.7	355°06.2 -15°07.8	9°34.0 -15°18.7	24°01.7 -15°29.6	38°29.4 -15°40.3	52°57.0 -15°51.0	67°24.5 -16°01.6	81°52.0 -16°12.1	96°19.4 -16°22.5	+27.7 -10.8	16.1 59.0
	Su 27	313°01.8 -18°46.4	327°28.1 -18°55.1	341°54.3 -19°03.7	356°20.4 -19°12.2	10°46.5 -19°20.6	25°12.5 -19°28.9	39°38.4 -19°37.0	54°04.2 -19°45.0	68°30.0 -19°52.9	82°55.7 -20°00.7	97°21.4 -20°08.4	+26.0 -8.2	16.1 59.2
	Mo 28	313°38.6 -21°47.3	328°03.3 -21°52.8	342°28.0 -21°58.1	356°52.5 -22°03.3	11°17.1 -22°10.8	25°41.6 -22°18.1	40°06.0 -22°25.2	54°30.4 -22°32.7	68°54.8 -22°39.1	83°19.1 -22°46.5	97°43.3 -22°53.7	+24.5 -8.9	16.2 59.3
	Tu 29	313°43.3 -23°19.9	328°07.1 -23°21.7	342°30.8 -23°23.2	356°54.6 -23°24.6	11°18.4 -23°25.8	25°42.1 -23°26.9	40°05.9 -23°27.8	54°29.6 -23°28.5	68°53.3 -23°29.6	83°17.1 -23°29.6	97°40.8 -23°29.8	+23.7 -1.0	16.2 59.2
	We 30	313°37.8 -23°14.9	328°01.8 -23°12.6	342°25.8 -23°10.7	356°49.8 -23°07.6	11°13.8 -23°04.9	25°37.9 -23°02.0	40°02.0 -22°59.0	54°26.2 -22°56.2	68°50.4 -22°52.8	83°14.6 -22°49.0	97°39.8 -22°45.4	+24.1 +3.0	16.1 59.0
●	Th 31	313°49.3 -21°33.3	328°14.5 -21°27.4	342°39.7 -21°21.3	357°05.0 -21°15.1	11°30.4 -21°08.8	25°55.8 -21°02.3	40°21.3 -20°55.7	54°46.9 -20°49.0	69°12.5 -20°42.2	83°38.3 -20°35.2	98°04.0 -20°28.1	+25.5 +6.5	16.0 58.8

Row 1: GHA, Δ /h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 4 02h49 — FQ: 11 14h06 — FM: 19 15h54 — LQ: 26 18h14

SUN

February 2030

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Fr 1	266°37.3 -17°04.5	281°37.2 -17°03.8	296°37.1 -17°03.1	311°37.0 -17°02.4	326°36.9 -17°01.6	341°36.8 -17°00.9	356°36.7 -17°00.2	11°36.7 -16°59.5	26°36.6 -16°58.8	41°36.5 -16°58.1	56°36.4 -16°57.3	71°36.3 -16°56.6	-0.1 +0.7
Sa 2	266°35.3 -16°47.2	281°35.2 -16°46.5	296°35.2 -16°45.8	311°35.1 -16°45.1	326°35.0 -16°44.3	341°34.9 -16°43.6	356°34.9 -16°42.9	11°34.8 -16°42.2	26°34.7 -16°41.4	41°34.6 -16°40.7	56°34.6 -16°40.0	71°34.5 -16°39.2	-0.1 +0.7
Su 3	266°33.3 -16°29.7	281°33.5 -16°29.0	296°33.5 -16°28.2	311°33.4 -16°27.5	326°33.3 -16°26.8	341°33.3 -16°26.0	356°33.2 -16°25.3	11°33.1 -16°24.5	26°33.1 -16°23.8	41°33.0 -16°23.1	56°32.9 -16°22.3	71°32.9 -16°21.6	-0.1 +0.7
Mo 4	266°32.1 -16°11.9	281°32.0 -16°11.1	296°31.9 -16°10.4	311°31.9 -16°09.6	326°31.8 -16°08.9	341°31.8 -16°08.1	356°31.7 -16°07.4	11°31.7 -16°06.6	26°31.6 -16°05.9	41°31.5 -16°05.1	56°31.5 -16°04.4	71°31.4 -16°03.6	-0.1 +0.8
Tu 5	266°30.7 -15°53.8	281°30.7 -15°53.0	296°30.6 -15°52.3	311°30.6 -15°51.5	326°30.5 -15°50.7	341°30.5 -15°50.0	356°30.4 -15°49.2	11°30.4 -15°48.4	26°30.3 -15°47.7	41°30.3 -15°46.9	56°30.3 -15°46.1	71°30.2 -15°45.4	-0.0 +0.8
We 6	266°29.6 -15°35.4	281°29.6 -15°34.6	296°29.5 -15°33.9	311°29.5 -15°33.1	326°29.5 -15°32.3	341°29.4 -15°31.5	356°29.4 -15°30.8	11°29.3 -15°30.0	26°29.3 -15°29.2	41°29.3 -15°28.4	56°29.2 -15°27.7	71°29.2 -15°26.9	-0.0 +0.8
Th 7	266°28.7 -14°57.8	281°28.7 -14°57.1	296°28.6 -14°56.3	311°28.6 -14°55.5	326°28.6 -14°54.7	341°28.5 -14°53.9	356°28.5 -14°53.1	11°28.5 -14°52.3	26°28.5 -14°51.5	41°28.4 -14°50.7	56°28.4 -14°49.9	71°28.4 -14°49.1	-0.0 +0.8
Fr 8	266°28.0 -14°57.8	281°28.0 -14°57.1	296°28.0 -14°56.3	311°27.9 -14°55.5	326°27.9 -14°54.7	341°27.9 -14°53.9	356°27.9 -14°53.1	11°27.8 -14°52.3	26°27.8 -14°51.5	41°27.8 -14°50.7	56°27.8 -14°49.9	71°27.7 -14°49.1	-0.0 +0.8
Sa 9	266°27.5 -14°38.7	281°27.5 -14°37.9	296°27.5 -14°37.1	311°27.4 -14°36.3	326°27.4 -14°35.5	341°27.4 -14°34.7	356°27.4 -14°33.9	11°27.4 -14°32.6	26°27.4 -14°31.8	41°27.4 -14°31.0	56°27.4 -14°30.6	71°27.3 -14°29.8	-0.0 +0.8
Su 10	266°27.2 -14°19.3	281°27.2 -14°18.5	296°27.2 -14°17.7	311°27.2 -14°16.9	326°27.1 -14°16.0	341°27.1 -14°15.2	356°27.1 -14°14.4	11°27.1 -14°13.6	26°27.1 -14°12.8	41°27.1 -14°12.0	56°27.1 -14°11.1	71°27.1 -14°10.3	-0.0 +0.8
Mo 11	266°27.1 -13°59.7	281°27.1 -13°58.8	296°27.1 -13°58.0	311°27.1 -13°57.2	326°27.1 -13°56.4	341°27.1 -13°55.5	356°27.1 -13°54.7	11°27.1 -13°53.9	26°27.1 -13°53.1	41°27.1 -13°52.3	56°27.1 -13°51.4	71°27.1 -13°50.6	+0.8 +0.8
Tu 12	266°27.2 -13°39.8	281°27.2 -13°39.0	296°27.2 -13°38.1	311°27.2 -13°37.3	326°27.2 -13°36.5	341°27.2 -13°35.6	356°27.2 -13°34.8	11°27.2 -13°34.0	26°27.2 -13°33.1	41°27.2 -13°32.3	56°27.2 -13°31.5	71°27.2 -13°30.6	+0.0 +0.8
We 13	266°27.4 -13°19.7	281°27.4 -13°18.9	296°27.5 -13°18.0	311°27.5 -13°17.2	326°27.5 -13°16.3	341°27.5 -13°15.5	356°27.5 -13°14.7	11°27.5 -13°13.8	26°27.6 -13°13.0	41°27.6 -13°12.1	56°27.6 -13°11.3	71°27.6 -13°10.4	+0.0 +0.8
Th 14	266°27.9 -12°59.4	281°27.9 -12°58.6	296°27.9 -12°57.7	311°28.0 -12°56.9	326°28.0 -12°56.0	341°28.0 -12°55.2	356°28.0 -12°54.3	11°28.1 -12°53.4	26°28.1 -12°52.6	41°28.1 -12°51.7	56°28.1 -12°50.9	71°28.2 -12°50.0	+0.0 +0.9
Fr 15	266°28.5 -12°38.9	281°28.6 -12°38.0	296°28.6 -12°37.2	311°28.6 -12°36.3	326°28.7 -12°35.5	341°28.7 -12°34.6	356°28.7 -12°33.7	11°28.8 -12°32.9	26°28.8 -12°32.0	41°28.8 -12°31.1	56°28.9 -12°30.3	71°28.9 -12°29.4	+0.0 +0.9
Sa 16	266°29.4 -12°18.2	281°29.4 -12°17.3	296°29.5 -12°16.4	311°29.5 -12°15.6	326°29.5 -12°14.7	341°29.6 -12°13.8	356°29.6 -12°13.0	11°29.7 -12°12.1	26°29.7 -12°11.2	41°29.7 -12°10.4	56°29.8 -12°09.5	71°29.8 -12°08.6	+0.0 +0.9
Su 17	266°30.4 -11°57.3	281°30.4 -11°56.4	296°30.5 -11°55.5	311°30.5 -11°54.6	326°30.6 -11°53.8	341°30.6 -11°52.9	356°30.6 -11°52.0	11°30.7 -11°51.1	26°30.8 -11°50.3	41°30.8 -11°49.4	56°30.8 -11°48.5	71°30.9 -11°47.6	+0.0 +0.9
Mo 18	266°31.6 -11°36.2	281°31.6 -11°35.3	296°31.7 -11°34.4	311°31.7 -11°33.5	326°31.8 -11°32.6	341°31.8 -11°31.7	356°31.9 -11°30.9	11°32.0 -11°30.0	26°32.0 -11°29.1	41°32.1 -11°28.2	56°32.1 -11°27.3	71°32.2 -11°26.4	+0.1 +0.9
Tu 19	266°32.9 -11°14.9	281°33.0 -11°14.0	296°33.1 -11°13.1	311°33.1 -11°12.2	326°33.2 -11°11.3	341°33.2 -11°10.4	356°33.3 -11°09.5	11°33.4 -11°08.6	26°33.4 -11°07.7	41°33.5 -11°06.9	56°33.6 -11°06.0	71°33.6 -11°05.1	+0.1 +0.9
We 20	266°34.5 -10°53.4	281°34.5 -10°52.5	296°34.6 -10°51.6	311°34.7 -10°50.7	326°34.7 -10°49.8	341°34.8 -10°48.9	356°34.9 -10°48.0	11°34.9 -10°47.1	26°35.0 -10°46.2	41°35.1 -10°45.3	56°35.2 -10°44.4	71°35.2 -10°43.5	+0.1 +0.9
Th 21	266°36.2 -10°31.8	281°36.2 -10°30.9	296°36.3 -10°30.0	311°36.4 -10°29.1	326°36.5 -10°28.2	341°36.5 -10°27.3	356°36.6 -10°26.4	11°36.7 -10°25.4	26°36.8 -10°24.5	41°36.8 -10°23.6	56°36.8 -10°22.7	71°37.0 -10°21.8	+0.1 +0.9
Fr 22	266°38.0 -10°10.0	281°38.1 -10°09.1	296°38.2 -10°08.2	311°38.2 -10°07.3	326°38.3 -10°06.3	341°38.4 -10°05.4	356°38.5 -10°04.5	11°38.6 -10°03.6	26°38.7 -10°02.7	41°38.7 -10°01.8	56°38.8 -10°00.9	71°38.9 -9°59.9	+0.1 +0.9
Sa 23	266°40.0 -9°48.0	281°40.1 -9°47.1	296°40.2 -9°46.2	311°40.3 -9°45.3	326°40.3 -9°44.4	341°40.4 -9°43.6	356°40.5 -9°42.5	11°40.6 -9°41.6	26°40.7 -9°40.7	41°40.8 -9°39.8	56°40.9 -9°38.8	71°41.0 -9°37.9	+0.1 +0.9
Su 24	266°42.1 -9°25.9	281°42.2 -9°25.0	296°42.3 -9°24.1	311°42.4 -9°23.2	326°42.5 -9°22.2	341°42.6 -9°21.3	356°42.7 -9°20.4	11°42.8 -9°19.5	26°42.9 -9°18.5	41°43.0 -9°17.6	56°43.1 -9°16.7	71°43.2 -9°15.7	+0.1 +0.9
Mo 25	266°44.4 -9°03.7	281°44.5 -9°02.7	296°44.6 -9°01.8	311°44.7 -9°00.9	326°44.8 -9°00.0	341°44.9 -8°59.0	356°45.0 -8°58.1	11°45.1 -8°57.2	26°45.2 -8°56.2	41°45.3 -8°55.3	56°45.4 -8°54.4	71°45.5 -8°53.4	+0.1 +0.9
Tu 26	266°46.9 -8°41.3	281°47.0 -8°40.4	296°47.1 -8°39.4	311°47.2 -8°38.5	326°47.3 -8°37.5	341°47.4 -8°36.6	356°47.5 -8°35.7	11°47.6 -8°34.7	26°47.7 -8°33.8	41°47.8 -8°32.9	56°47.9 -8°31.9	71°48.0 -8°31.0	+0.1 +0.9
We 27	266°49.4 -8°18.8	281°49.5 -8°17.8	296°49.6 -8°16.9	311°49.8 -8°15.9	326°49.9 -8°15.0	341°50.0 -8°14.1	356°50.1 -8°13.1	11°50.2 -8°12.2	26°50.3 -8°11.2	41°50.4 -8°10.3	56°50.5 -8°09.3	71°50.6 -8°08.4	+0.1 +0.9
Th 28	266°52.1 -7°56.1	281°52.2 -7°55.2	296°52.3 -7°54.2	311°52.5 -7°53.3	326°52.6 -7°52.3	341°52.7 -7°51.4	356°52.8 -7°50.4	11°52.9 -7°49.5	26°53.0 -7°48.6	41°53.2 -7°47.6	56°53.3 -7°46.7	71°53.4 -7°45.7	+0.1 +0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 16.2'

MOON

February 2030

	D	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	Δ' /h SH
●	Fr 1	242°26.2 -19°10.5	256°52.8 -19°02.1	271°19.5 -18°53.6	285°46.3 -18°44.9	300°13.2 -18°36.2	314°40.2 -18°27.4	329°07.2 -18°18.5	343°34.4 -18°09.4	358°01.6 -18°00.3	12°28.9 -17°51.1	26°56.3 -17°41.7	+27.0 15.9 +8.9 58.5
	Sa 2	243°57.1 -15°10.9	258°35.8 -15°00.2	272°54.7 -14°49.4	287°23.5 -14°38.6	301°52.5 -14°27.6	316°21.6 -14°16.6	330°50.7 -14°05.6	345°19.9 -13°54.4	359°49.2 -13°43.2	14°18.6 -13°32.0	28°48.0 -13°20.6	+29.1 15.8 +11.0 57.9
	Su 3	246°19.1 -10°24.2	260°49.8 -9°12.1	275°20.5 -9°59.9	289°51.3 -9°47.7	304°22.2 -9°35.4	318°53.1 -9°23.1	333°24.1 -9°10.8	347°55.2 -8°58.5	2°26.3 -8°46.1	16°57.5 -8°33.7	31°28.8 -8°21.2	+31.0 15.6 +12.3 57.3
	Mo 4	249°25.0 -5°11.8	263°57.2 -4°59.1	278°29.4 -4°46.3	293°01.7 -4°33.6	307°34.0 -4°20.8	322°06.4 -4°08.0	336°38.9 -3°55.2	351°11.3 -3°42.4	5°43.9 -3°29.6	20°16.4 -3°16.8	34°49.1 -3°04.0	+32.4 15.4 +12.8 56.6
●	Tu 5	253°03.0 0°07.4	267°36.2 0°20.1	282°09.4 0°32.8	296°42.6 0°45.5	311°15.9 0°58.1	325°49.2 1°10.7	340°22.6 1°23.3	354°55.9 1°35.9	9°29.3 1°48.5	24°02.7 2°01.0	38°36.1 2°13.5	+33.3 15.2 +12.6 55.9
	We 6	256°59.6 5°18.2	271°33.3 5°30.3	286°07.0 5°42.3	300°40.7 5°54.3	315°14.3 6°06.3	329°48.0 6°18.2	344°21.7 6°30.1	358°55.4 6°41.9	13°29.1 6°53.7	28°02.9 7°05.5	42°36.6 7°17.2	+33.7 15.1 +11.9 55.3
	Th 7	261°01.8 10°07.9	275°35.5 10°18.8	290°09.1 10°29.8	304°42.7 10°40.7	319°16.3 10°51.5	333°49.8 11°02.3	348°23.4 11°13.0	2°57.0 11°23.7	17°30.5 11°34.3	32°04.0 11°44.9	46°37.5 11°55.4	+33.6 14.9 +10.8 54.8
	Fr 8	264°57.6 14°25.9	279°30.8 14°35.4	294°03.9 14°44.9	308°37.0 14°54.3	323°10.1 15°03.6	337°43.1 15°12.9	352°16.1 15°22.1	6°49.1 15°31.2	21°22.1 15°40.3	35°55.0 15°49.2	50°27.9 15°58.2	+33.0 14.8 +9.2 54.4
●	Sa 9	268°37.4 18°03.0	283°09.7 18°13.0	297°42.0 18°18.3	312°14.3 18°25.9	326°46.6 18°33.3	341°18.8 18°40.7	355°50.9 18°48.0	10°23.0 18°55.2	24°55.1 19°02.4	39°27.2 19°09.4	53°59.2 19°16.4	+32.2 14.8 +7.3 54.2
	Su 10	271°54.5 20°50.4	286°25.9 20°55.9	300°57.2 21°01.3	315°28.5 21°06.7	329°59.3 21°12.0	344°31.0 21°17.1	359°02.1 21°22.2	13°33.3 21°27.2	28°04.3 21°32.0	42°35.4 21°36.8	57°06.4 21°41.5	+31.2 14.8 +5.1 54.2
	Mo 11	274°46.8 22°39.7	289°17.2 22°42.7	303°47.5 22°45.7	318°17.8 22°48.5	332°48.1 22°51.2	347°18.4 22°53.9	1°48.6 22°56.4	16°18.8 22°58.8	30°48.9 23°01.1	45°19.0 23°03.3	59°49.1 23°05.4	+30.2 14.8 +2.6 54.4
	Tu 12	277°16.6 23°23.5	291°46.2 23°23.8	306°15.8 23°24.0	320°45.4 23°24.1	335°15.0 23°24.0	349°44.5 23°23.9	4°14.0 23°23.6	18°43.5 23°23.2	33°12.9 23°22.7	47°42.4 23°22.1	62°11.8 23°21.4	+29.5 14.9 -0.2 54.7
●	We 13	279°31.2 25°56.4	294°00.4 25°53.8	308°29.6 25°51.2	322°58.7 25°48.3	337°27.9 25°45.3	351°57.1 25°42.2	6°26.2 25°39.0	20°55.4 25°35.7	35°24.5 25°32.3	49°53.7 25°28.8	64°22.8 25°25.1	+29.2 15.1 -3.1 55.2
	Th 14	281°40.0 21°16.2	296°09.9 21°10.7	310°38.4 21°05.1	325°07.6 20°59.3	339°36.8 20°53.5	354°06.0 20°47.5	8°35.2 20°41.4	23°04.4 20°35.2	37°33.4 20°28.9	52°02.9 20°22.5	66°32.2 20°16.0	+29.2 15.2 -6.0 55.9
	Fr 15	283°52.5 18°24.9	298°22.0 18°16.7	312°51.4 18°08.3	327°20.9 17°59.9	341°50.5 17°51.3	356°20.0 17°42.6	10°49.5 17°33.9	25°19.1 17°25.0	39°48.7 17°16.0	54°18.3 17°07.0	68°47.9 16°57.8	+29.5 15.4 -8.7 56.6
	Sa 16	286°14.3 14°29.2	300°44.2 14°18.6	315°14.1 14°07.9	329°44.1 13°57.1	344°14.0 13°46.2	358°44.0 13°35.2	13°14.0 13°24.2	27°44.0 13°13.1	42°14.0 13°01.9	56°44.0 12°50.6	71°14.0 12°39.2	+30.0 15.6 -11.0 57.3
●	Su 17	288°46.3 9°40.3	303°16.5 9°27.8	317°46.5 9°15.3	332°17.0 9°02.7	346°47.3 8°50.1	361°18.8 8°37.4	1°17.6 8°24.6	15°47.8 8°11.8	30°18.1 7°59.0	44°48.4 7°46.0	59°18.7 7°33.1	+30.3 15.8 -12.7 58.0
	Mo 18	291°23.8 4°13.3	305°54.1 4°15.3	320°24.4 3°46.1	334°54.6 3°42.4	349°24.9 3°18.9	3°55.2 3°04.9	18°25.5 2°51.2	32°55.7 2°51.2	47°26.0 2°23.6	61°56.0 2°09.8	76°26.4 1°55.9	+30.3 16.0 -13.7 58.6
	Tu 19	293°58.0 -1°33.2	308°27.9 -1°47.2	322°57.8 -2°01.1	337°27.7 -2°15.1	351°57.6 -2°29.1	6°27.4 -2°43.0	20°57.3 -2°57.0	35°27.1 -3°10.9	49°56.8 -3°24.8	64°26.6 -3°38.8	78°56.3 -3°52.7	+29.8 16.1 -14.0 59.1
	We 20	296°17.7 -7°18.4	310°46.8 -7°31.8	325°15.9 -7°45.3	339°45.0 -7°58.7	354°13.9 -8°12.0	8°42.9 -8°25.3	23°11.8 -8°38.5	37°40.7 -8°51.8	52°09.5 -9°04.9	66°38.3 -9°18.0	81°07.0 -9°31.1	+28.9 16.2 -13.3 59.3
●	Th 21	298°11.7 -12°39.8	312°39.6 -12°51.9	327°07.5 -13°03.9	341°35.3 -13°15.7	356°03.0 -13°27.6	10°30.7 -13°39.3	24°58.3 -13°50.9	39°25.8 -14°02.5	53°53.3 -14°14.0	68°20.8 -14°25.4	82°48.1 -14°36.7	+27.6 16.2 -11.7 59.5
	Fr 22	312°39.6 -12°51.9	327°07.5 -13°03.9	341°35.3 -13°15.7	356°03.0 -13°27.6	10°30.7 -13°39.3	24°58.3 -13°50.9	39°25.8 -14°02.5	53°53.3 -14°14.0	68°20.8 -14°25.4	82°48.1 -14°36.7	97°15.5 -14°47.9	+27.6 16.2 -11.6 59.5
	Sa 23	313°58.4 -17°24.7	328°24.7 -17°34.3	342°51.1 -17°43.8	357°17.4 -17°53.2	11°43.6 -18°07.7	26°09.7 -18°20.7	40°35.9 -18°29.7	55°01.9 -18°38.5	69°27.9 -18°47.2	83°53.8 -18°55.8	98°19.7 -19°09.7	+26.1 16.2 -9.1 59.4
	Su 24	314°41.9 -20°49.3	329°07.0 -20°55.8	343°32.0 -21°02.2	357°57.0 -21°08.4	12°22.0 -21°14.5	26°46.9 -21°20.4	41°11.8 -21°26.3	55°36.7 -21°31.9	70°01.5 -21°37.5	84°26.3 -21°42.8	98°51.0 -21°48.1	+24.9 16.2 -5.9 59.3
●	Mo 25	314°59.0 -22°49.0	329°23.3 -22°51.9	343°47.7 -22°54.6	358°12.0 -22°57.2	12°36.4 -22°59.2	27°00.7 -23°01.8	41°25.0 -23°03.9	55°49.9 -23°05.9	70°13.7 -23°07.6	84°38.0 -23°09.3	99°02.3 -23°10.8	+24.3 16.1 -2.2 59.0
	Tu 26	315°08.0 -23°14.6	329°32.5 -23°13.7	343°57.0 -23°12.6	358°21.6 -23°11.3	12°46.2 -23°09.9	27°10.8 -23°08.3	41°35.5 -23°06.6	56°00.2 -23°04.7	70°24.9 -23°02.7	84°49.6 -23°00.6	99°14.4 -22°58.2	+24.6 16.0 +1.6 58.7
	We 27	315°31.7 -22°06.3	329°57.2 -22°01.8	344°22.9 -21°57.0	358°48.5 -21°52.2	13°14.3 -21°47.2	27°40.1 -21°42.1	42°05.9 -21°36.9	56°31.8 -21°31.5	70°57.8 -21°26.0	85°23.8 -21°20.3	99°50.0 -21°14.6	+25.8 15.9 +5.2 58.3
	Th 28	316°29.7 -19°33.5	330°56.9 -19°25.9	345°24.2 -19°18.1	359°51.6 -19°10.2	14°19.0 -19°02.3	28°46.6 -18°54.2	43°14.1 -18°46.0	57°41.8 -18°37.7	72°09.6 -18°29.3	86°37.4 -18°20.8	101°05.3 -18°12.2	+27.6 15.8 +8.1 57.9

Row 1: GHA, Δ' /h = GHA change - 14°, SH = semi-diameterRow 2: Dec (- = South), Δ' /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 2 16h07 — FQ: 10 11h49 — FM: 18 06h19 — LQ: 25 01h57

SUN

March 2030

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Fr 1	266°54.9 -7°33.4	281°55.1 -7°32.4	296°55.2 -7°31.5	311°55.3 -7°30.5	326°55.4 -7°29.6	341°55.5 -7°28.6	356°55.7 -7°27.7	11°55.8 -7°26.7	26°55.9 -7°25.8	41°56.0 -7°24.8	56°56.1 -7°23.8	71°56.3 -7°22.9	+0.1 +1.0
Sa 2	266°57.9 -7°10.5	281°58.0 -7°09.5	296°58.1 -7°08.6	311°58.3 -7°07.6	326°58.4 -7°06.7	341°58.5 -7°05.7	356°58.6 -7°04.8	11°58.8 -7°03.8	26°58.9 -7°02.9	41°59.0 -7°01.9	56°59.1 -7°00.9	71°59.3 -7°00.0	+0.1 +1.0
Su 3	267°00.9 -6°47.5	282°01.1 -6°46.6	297°01.2 -6°45.6	312°01.3 -6°44.6	327°01.5 -6°43.7	342°01.6 -6°42.7	357°01.7 -6°41.8	12°01.9 -6°40.8	27°02.2 -6°39.8	42°02.1 -6°38.9	57°02.3 -6°37.9	72°02.4 -6°37.0	+0.1 +1.0
Mo 4	267°04.1 -6°24.5	282°04.3 -6°23.5	297°04.4 -6°22.5	312°04.5 -6°21.6	327°04.7 -6°20.6	342°04.8 -6°19.6	357°04.9 -6°18.7	12°05.1 -6°17.7	27°05.2 -6°16.7	42°05.3 -6°15.8	57°05.5 -6°14.8	72°05.6 -6°13.9	+0.1 +1.0
Tu 5	267°07.4 -6°01.3	282°07.6 -6°00.3	297°07.7 -5°59.4	312°07.8 -5°58.4	327°08.0 -5°57.4	342°08.1 -5°56.5	357°08.3 -5°55.5	12°08.4 -5°54.5	27°08.5 -5°53.6	42°08.7 -5°52.6	57°08.8 -5°51.6	72°09.0 -5°50.7	+0.1 +1.0
We 6	267°10.8 -5°38.1	282°11.0 -5°37.1	297°11.1 -5°36.1	312°11.3 -5°35.2	327°11.4 -5°34.2	342°11.5 -5°33.2	357°11.7 -5°32.2	12°11.8 -5°31.3	27°12.0 -5°30.3	42°12.1 -5°29.3	57°12.3 -5°28.4	72°12.4 -5°27.4	+0.1 +1.0
Th 7	267°14.3 -5°14.8	282°14.5 -5°13.8	297°14.6 -5°12.8	312°14.8 -5°11.8	327°14.9 -5°10.9	342°15.1 -5°09.9	357°15.2 -5°08.9	12°15.4 -5°07.9	27°15.5 -5°07.0	42°15.7 -5°06.0	57°15.8 -5°05.0	72°16.0 -5°04.0	+0.1 +1.0
Fr 8	267°17.9 -4°51.4	282°18.1 -4°50.4	297°18.2 -4°49.4	312°18.4 -4°48.4	327°18.5 -4°47.5	342°18.7 -4°46.5	357°18.8 -4°45.5	12°19.0 -4°44.5	27°19.2 -4°43.6	42°19.3 -4°42.6	57°19.5 -4°41.6	72°19.6 -4°40.6	+0.2 +1.0
Sa 9	267°21.6 -4°27.9	282°21.8 -4°27.0	297°21.9 -4°26.0	312°22.1 -4°25.0	327°22.3 -4°24.3	342°22.4 -4°23.0	357°22.6 -4°22.1	12°22.7 -4°21.1	27°22.9 -4°20.1	42°23.0 -4°19.1	57°23.2 -4°18.1	72°23.4 -4°17.2	+0.2 +1.0
Su 10	267°25.4 -4°04.4	282°25.6 -4°03.4	297°25.7 -4°02.5	312°25.9 -4°01.5	327°26.1 -4°00.5	342°26.2 -3°59.5	357°26.4 -3°58.5	12°26.6 -3°57.6	27°26.7 -3°56.6	42°26.9 -3°55.6	57°27.0 -3°54.6	72°27.2 -3°53.6	+0.2 +1.0
Mo 11	267°29.3 -3°40.9	282°29.5 -3°39.9	297°29.6 -3°38.9	312°29.8 -3°37.9	327°30.0 -3°37.0	342°30.1 -3°36.0	357°30.3 -3°35.0	12°30.4 -3°34.0	27°30.6 -3°33.0	42°30.8 -3°32.0	57°30.9 -3°31.1	72°31.1 -3°30.1	+0.2 +1.0
Tu 12	267°33.3 -3°17.3	282°33.4 -3°16.3	297°33.6 -3°15.3	312°33.8 -3°14.3	327°33.9 -3°13.4	342°34.1 -3°12.4	357°34.3 -3°11.4	12°34.4 -3°10.4	27°34.6 -3°09.4	42°34.8 -3°08.4	57°34.9 -3°07.5	72°35.1 -3°06.5	+0.2 +1.0
We 13	267°37.3 -2°53.7	282°37.5 -2°52.7	297°37.6 -2°51.7	312°37.8 -2°50.7	327°38.0 -2°49.7	342°38.2 -2°48.7	357°38.3 -2°47.8	12°38.5 -2°46.8	27°38.7 -2°45.8	42°38.8 -2°44.8	57°39.0 -2°43.8	72°39.2 -2°42.8	+0.2 +1.0
Th 14	267°41.4 -2°30.0	282°41.6 -2°29.0	297°41.8 -2°28.0	312°41.9 -2°27.0	327°42.1 -2°26.1	342°42.3 -2°25.1	357°42.5 -2°24.1	12°42.6 -2°23.1	27°42.8 -2°22.1	42°43.0 -2°21.1	57°43.1 -2°20.1	72°43.3 -2°19.2	+0.2 +1.0
Fr 15	267°45.6 -2°06.3	282°45.8 -2°05.3	297°45.9 -2°04.4	312°46.1 -2°03.4	327°46.3 -2°02.4	342°46.5 -2°01.4	357°46.6 -2°00.4	12°46.8 -1°59.4	27°47.0 -1°58.4	42°47.2 -1°57.4	57°47.4 -1°56.5	72°47.6 -1°55.5	+0.2 +1.0
Sa 16	267°49.8 -1°42.6	282°50.0 -1°41.6	297°50.2 -1°40.7	312°50.4 -1°39.7	327°50.5 -1°38.7	342°50.7 -1°37.7	357°50.9 -1°36.7	12°51.1 -1°35.7	27°51.3 -1°34.7	42°51.4 -1°33.7	57°51.6 -1°32.8	72°51.8 -1°31.8	+0.2 +1.0
Su 17	267°54.1 -1°18.9	282°54.3 -1°17.9	297°54.5 -1°16.9	312°54.7 -1°16.0	327°54.8 -1°15.0	342°55.0 -1°14.0	357°55.2 -1°13.0	12°55.4 -1°12.0	27°55.6 -1°11.0	42°55.8 -1°10.0	57°55.9 -1°09.0	72°56.1 -1°08.1	+0.2 +1.0
Mo 18	267°58.5 -0°55.2	282°58.7 -0°54.2	297°58.8 -0°53.2	312°59.0 -0°52.2	327°59.2 -0°51.3	342°59.4 -0°50.3	357°59.6 -0°49.3	12°59.7 -0°48.3	27°59.9 -0°47.3	42°60.0 -0°46.3	57°60.1 -0°45.3	73°00.3 -0°44.3	+0.2 +1.0
Tu 19	268°02.9 -0°31.5	283°03.0 -0°30.5	298°03.2 -0°29.5	313°03.4 -0°28.5	328°03.6 -0°27.5	343°03.8 -0°26.5	358°04.0 -0°25.6	13°04.2 -0°24.6	28°04.3 -0°23.6	43°04.5 -0°22.6	58°04.7 -0°21.6	73°04.9 -0°20.6	+0.2 +1.0
We 20	268°07.3 -0°07.8	283°07.5 -0°06.8	298°07.7 -0°05.8	313°07.8 -0°04.8	328°08.0 -0°03.8	343°08.2 -0°02.8	358°08.4 -0°01.8	13°08.6 -0°00.9	28°08.8 0°00.1	43°09.0 0°01.1	58°09.1 0°02.1	73°09.3 0°03.1	+0.2 +1.0
Th 21	268°11.8 0°15.9	283°11.9 0°16.9	298°12.1 0°17.9	313°12.3 0°18.9	328°12.5 0°19.9	343°12.7 0°20.9	358°12.9 0°21.8	13°13.1 0°22.8	28°13.1 0°23.8	43°13.4 0°24.8	58°13.6 0°25.8	73°13.8 0°26.8	+0.2 +1.0
Fr 22	268°16.2 0°39.6	283°16.4 0°40.6	298°16.6 0°41.6	313°16.8 0°42.6	328°17.0 0°43.6	343°17.2 0°44.5	358°17.4 0°45.5	13°17.6 0°46.5	28°17.7 0°47.5	43°17.9 0°48.5	58°18.1 0°49.5	73°18.3 0°50.5	+0.2 +1.0
Sa 23	268°20.7 1°03.3	283°20.9 1°04.3	298°21.1 1°05.2	313°21.3 1°06.2	328°21.5 1°07.2	343°21.7 1°08.2	358°21.9 1°09.2	13°22.1 1°10.2	28°22.3 1°11.2	43°22.4 1°12.1	58°22.6 1°13.1	73°22.8 1°14.1	+0.2 +1.0
Su 24	268°25.3 1°26.9	283°25.5 1°27.9	298°25.6 1°28.9	313°25.8 1°29.9	328°26.0 1°30.8	343°26.2 1°31.8	358°26.4 1°32.8	13°26.6 1°33.8	28°26.8 1°34.8	43°27.0 1°35.8	58°27.2 1°36.7	73°27.4 1°37.7	+0.2 +1.0
Mo 25	268°29.8 1°50.5	283°30.0 1°51.5	298°30.2 1°52.5	313°30.4 1°53.5	328°30.5 1°54.4	343°30.7 1°55.4	358°30.9 1°56.4	13°31.1 1°57.4	28°31.3 1°58.4	43°31.5 1°59.4	58°31.7 2°00.4	73°31.9 2°01.3	+0.2 +1.0
Tu 26	268°34.3 2°14.1	283°34.5 2°15.1	298°34.7 2°16.0	313°34.9 2°17.0	328°35.1 2°18.0	343°35.3 2°19.0	358°35.5 2°20.0	13°35.6 2°20.9	28°35.8 2°21.9	43°36.0 2°22.9	58°36.3 2°23.9	73°36.4 2°24.9	+0.2 +1.0
We 27	268°38.8 2°37.6	283°39.0 2°38.6	298°39.2 2°39.6	313°39.4 2°40.5	328°39.6 2°41.5	343°39.8 2°42.5	358°40.0 2°43.5	13°40.0 2°44.4	28°40.2 2°45.4	43°40.5 2°46.4	58°40.7 2°47.4	73°40.9 2°48.4	+0.2 +1.0
Th 28	268°43.4 3°01.1	283°43.6 3°02.0	298°43.7 3°03.0	313°43.9 3°04.0	328°44.1 3°05.0	343°44.3 3°05.9	358°44.5 3°06.9	13°44.4 3°07.9	28°44.6 3°08.9	43°44.9 3°09.8	58°45.1 3°10.8	73°45.4 3°11.8	+0.2 +1.0
Fr 29	268°47.9 3°24.5	283°48.1 3°25.4	298°48.2 3°26.4	313°48.4 3°27.4	328°48.6 3°28.4	343°48.8 3°29.3	358°49.0 3°30.3	13°49.0 3°31.3	28°49.4 3°32.3	43°49.6 3°33.2	58°49.7 3°34.2	73°49.9 3°35.2	+0.2 +1.0
Sa 30	268°52.4 3°47.8	283°52.5 3°48.8	298°52.7 3°49.8	313°52.9 3°50.7	328°53.1 3°51.7	343°53.3 3°52.7	358°53.5 3°53.6	13°53.7 3°54.6	28°53.9 3°55.6	43°54.0 3°56.6	58°54.5 3°57.5	73°54.4 3°58.5	+0.2 +1.0
Su 31	268°56.8 4°11.1	283°57.0 4°12.1	298°57.2 4°13.0	313°57.4 4°14.0	328°57.6 4°15.0	343°57.8 4°15.9	358°57.9 4°16.9	13°58.1 4°17.9	28°58.3 4°18.8	43°58.5 4°19.8	58°58.7 4°20.8	73°58.9 4°21.7	+0.2 +1.0

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ°/h = dec. change

Semi-diameter: 16.1'

MOON

March 2030

	D	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Δ /h	SH
●	Fr 1	245°48.3 -16°41.1	260°17.1 -16°31.5	274°45.9 -16°21.8	289°14.7 -16°12.0	303°43.7 -16°02.1	318°12.7 -15°52.2	332°41.8 -15°42.2	347°11.0 -15°32.1	1°40.2 -15°21.9	16°09.5 -15°11.7	30°38.4 -15°01.4	+29.1 +10.0	15.7 57.6
	Sa 2	248°08.3 -12°18.5	262°38.8 -12°07.2	277°09.4 -11°55.8	291°40.0 -11°44.4	306°10.0 -11°32.9	320°41.5 -11°21.3	335°12.3 -11°09.7	349°43.2 -10°58.4	4°14.1 -10°46.4	18°45.1 -10°34.7	33°16.2 -10°22.9	+30.8 +11.6	15.6 57.1
	Su 3	251°09.2 -7°29.1	265°41.1 -7°09.6	280°13.1 -6°57.2	294°45.2 -6°44.9	309°17.3 -6°32.5	323°49.4 -6°20.1	338°21.6 -6°07.6	352°53.9 -5°55.2	7°26.1 -5°42.7	21°58.5 -5°30.3	36°30.8 -5°17.8	+32.2 +12.4	15.4 56.5
●	Mo 4	254°41.0 -2°09.2	269°14.0 -1°56.6	283°47.0 -1°44.0	298°20.0 -1°31.4	312°53.0 -1°18.8	327°26.1 -1°06.2	341°59.2 -0°53.6	356°32.3 -0°41.1	11°05.4 -0°28.5	25°38.6 -0°15.9	40°11.8 -0°03.4	+33.1 +12.6	15.3 56.0
	Tu 5	258°32.0 3°03.3	273°05.5 3°15.6	287°38.9 3°27.8	302°12.4 3°40.1	316°45.9 3°52.3	331°19.4 4°04.5	345°52.9 4°16.6	0°26.4 4°28.8	15°00.0 4°40.9	29°33.5 4°52.9	44°07.0 5°05.0	+33.5 +12.2	15.1 55.5
	We 6	262°30.2 8°01.5	277°03.7 8°12.9	291°37.2 8°24.3	306°10.7 8°35.7	320°44.2 8°47.0	335°17.7 8°58.3	349°51.2 9°09.5	4°24.7 9°20.7	18°58.1 9°31.9	33°31.6 9°42.9	48°05.0 9°54.0	+33.5 +11.3	15.0 55.0
●	Th 7	266°24.9 12°33.2	280°58.0 12°43.3	295°31.2 12°53.4	310°04.4 13°03.5	324°37.5 13°13.5	339°10.6 13°23.4	353°43.6 13°33.2	8°16.7 13°43.0	22°49.7 13°52.7	37°22.7 14°02.4	51°55.7 14°12.0	+33.1 +9.9	14.9 54.6
	Fr 8	270°07.3 16°27.6	284°39.8 16°36.1	299°12.3 16°44.5	313°44.8 16°52.8	328°17.3 17°01.0	342°49.7 17°09.2	357°22.1 17°17.3	11°54.5 17°25.3	26°26.8 17°33.2	40°59.1 17°41.0	55°31.4 17°48.8	+32.4 +8.1	14.8 54.3
	Sa 9	273°31.5 19°35.3	288°03.2 19°41.7	302°34.9 19°48.0	317°06.6 19°54.8	331°38.2 20°00.4	346°09.8 20°06.4	0°41.4 20°12.4	15°13.0 20°18.3	29°44.5 20°24.1	44°15.9 20°29.9	58°47.4 20°35.3	+31.6 +6.0	14.8 54.1
●	Su 10	276°35.0 21°47.8	291°05.9 21°51.8	305°36.8 21°55.8	320°07.7 21°59.6	334°38.5 22°03.4	349°09.3 22°07.0	3°40.1 22°10.5	18°10.8 22°14.0	32°41.6 22°17.3	47°12.2 22°20.6	61°42.9 22°23.7	+30.8 +3.6	14.8 54.1
	Mo 11	279°19.5 22°58.1	293°49.7 22°59.8	308°20.0 23°00.8	322°50.2 23°02.1	337°20.3 23°03.2	351°50.5 23°04.2	6°20.6 23°05.1	20°50.8 23°05.9	35°20.9 23°06.5	49°50.9 23°07.1	64°21.0 23°07.6	+30.1 +1.0	14.8 54.3
	Tu 12	281°50.0 23°01.1	296°19.9 22°59.8	310°49.7 22°58.3	325°19.3 22°56.8	339°49.3 22°55.1	354°19.1 22°53.3	8°48.9 22°51.5	23°18.7 22°49.5	37°48.4 22°47.3	52°18.2 22°45.7	66°47.9 22°42.8	+29.8 -1.8	14.9 54.7
●	We 13	284°13.9 21°54.2	298°43.6 21°50.1	313°13.3 21°45.8	327°43.1 21°41.5	342°12.8 21°37.0	356°42.5 21°32.4	11°12.3 21°27.8	25°42.0 21°23.0	40°11.7 21°18.0	54°41.5 21°13.0	69°11.2 21°07.9	+29.7 -4.6	15.1 55.3
	Th 14	286°38.2 19°37.9	301°08.1 19°31.0	315°37.9 19°24.1	330°07.8 19°17.0	344°37.7 19°09.8	359°07.6 19°02.6	13°37.5 18°55.2	28°07.4 18°47.0	42°37.3 18°40.1	57°07.3 18°32.4	71°37.2 18°24.7	+29.9 -7.3	15.3 56.0
	Fr 15	289°07.5 16°15.9	303°37.6 16°06.6	318°07.7 15°57.1	332°37.8 15°47.6	347°07.8 15°38.0	361°38.1 15°28.2	16°08.2 15°18.4	30°38.4 15°08.5	45°08.5 14°58.5	59°38.7 14°48.5	74°08.9 14°38.3	+30.1 -9.8	15.5 56.8
●	Sa 16	291°42.2 11°55.7	306°12.5 11°44.3	320°42.7 11°32.7	335°13.0 11°21.1	349°43.0 11°09.4	364°13.8 10°57.6	18°43.8 10°45.8	33°14.1 10°33.9	47°44.3 10°21.9	62°14.6 10°09.8	76°44.8 9°57.7	+30.3 -11.8	15.7 57.7
	Su 17	294°18.2 6°48.5	308°48.4 6°35.4	323°18.5 6°22.3	337°48.7 6°09.2	352°18.4 5°55.9	366°48.9 5°42.7	21°19.0 5°29.4	35°49.1 5°16.0	50°19.2 5°02.6	64°49.3 4°49.2	79°19.3 4°35.7	+30.1 -13.8	16.0 58.6
	Mo 18	296°47.4 1°09.6	311°17.1 0°55.6	325°46.8 0°41.6	340°16.4 0°27.6	354°46.0 0°13.6	369°16.3 -0°00.4	23°45.1 -0°14.4	38°14.6 -0°28.5	52°44.1 -0°42.5	67°13.5 -0°56.6	81°42.9 -1°10.7	+29.5 -10.4	16.2 59.3
●	Tu 19	298°59.2 -4°41.5	313°27.9 -4°55.5	327°56.6 -5°09.5	342°25.3 -5°23.4	356°53.9 -5°37.3	371°22.5 -5°51.2	25°51.0 -6°05.1	40°19.4 -6°18.9	54°47.8 -6°32.7	69°16.2 -6°46.5	83°44.5 -7°00.2	+28.5 -13.9	16.3 59.9
	We 20	300°42.4 -10°21.4	315°09.8 -10°34.4	329°37.7 -10°47.4	344°04.5 -11°00.2	358°31.3 -11°13.0	372°58.8 -11°25.7	27°25.9 -11°38.4	41°53.0 -11°51.0	56°19.8 -12°03.5	70°46.8 -12°16.8	85°13.3 -12°28.4	+27.1 -16.2	16.4 60.3
	Th 21	301°48.9 -15°24.1	316°14.7 -15°35.1	330°40.5 -15°45.9	345°06.2 -15°56.7	359°31.9 -16°07.3	373°57.5 -16°17.9	28°23.0 -16°28.3	42°48.5 -16°38.7	57°13.9 -16°48.9	71°39.2 -16°59.0	86°04.5 -17°09.0	+25.6 -10.5	16.5 60.3
●	Fr 22	302°17.2 -19°24.2	316°41.6 -19°32.2	331°06.0 -19°47.7	345°30.3 -19°55.3	359°54.6 -20°02.7	374°18.9 -20°10.0	28°43.1 -20°17.1	43°07.2 -20°24.1	57°31.3 -20°31.0	71°55.4 -20°37.0	86°19.5 -20°44.3	+24.2 -7.2	16.4 60.4
	Sa 23	316°41.6 -22°04.8	331°06.0 -22°09.5	345°30.3 -22°13.0	359°54.6 -22°16.8	374°18.9 -22°20.0	389°43.1 -22°24.0	43°07.2 -22°27.3	57°31.3 -22°30.6	71°55.4 -22°33.6	86°19.5 -22°36.5	100°43.3 -22°39.2	+24.2 -3.4	16.4 59.9
	Su 24	316°40.2 -23°01.1	331°03.8 -23°01.3	345°27.4 -23°01.3	359°51.0 -23°01.2	374°14.5 -23°00.5	389°38.1 -23°00.5	43°01.7 -23°00.5	57°25.3 -23°00.5	71°48.8 -23°00.5	86°12.4 -23°00.5	100°35.9 -23°00.5	+23.6 +0.5	16.3 59.9
●	Mo 25	316°30.7 -22°20.2	330°54.5 -22°16.6	345°18.3 -22°12.9	359°42.2 -22°09.1	374°06.1 -22°05.1	389°30.0 -22°01.0	42°54.0 -21°56.8	57°18.0 -21°52.4	71°42.1 -21°47.9	86°06.2 -21°43.3	100°30.8 -21°38.5	+24.0 +4.2	16.2 58.6
	Tu 26	316°38.4 -20°11.8	331°03.4 -20°05.0	345°28.4 -20°01.5	359°53.5 -19°58.2	374°18.7 -19°51.2	389°44.0 -19°44.0	43°09.3 -19°29.7	57°34.7 -19°22.3	72°00.2 -19°14.8	86°25.7 -19°07.2	100°51.3 -18°59.5	+25.3 +7.2	16.3 58.6
	We 27	317°24.6 -16°52.2	331°51.4 -16°43.0	346°18.4 -16°33.8	360°45.4 -16°24.4	375°15.2 -16°15.6	390°39.6 -16°05.8	44°06.9 -15°55.9	58°34.2 -15°46.2	73°01.6 -15°36.4	87°29.2 -15°26.6	101°56.7 -15°16.7	+27.2 +9.6	15.8 57.7
●	Th 28	318°00.5 -12°40.3	333°29.4 -12°29.4	347°58.4 -12°18.5	362°27.5 -12°07.5	376°56.0 -11°56.4	391°25.8 -11°45.3	45°55.1 -11°34.1	60°24.5 -11°22.9	74°54.0 -11°11.7	89°23.5 -11°00.4	103°53.2 -10°49.0	+29.3 +11.1	15.7 56.8
	Fr 29	321°26.4 -7°54.3	335°57.2 -7°42.4	350°28.1 -7°30.4	364°59.0 -7°18.5	379°30.0 -7°06.5	394°01.0 -6°54.5	48°32.1 -6°42.5	63°03.3 -6°30.4	77°34.6 -6°18.4	92°05.5 -6°06.3	106°37.3 -5°54.1	+31.1 +12.0	15.5 56.3
	Sa 30	324°34.8 -2°50.8	339°07.1 -2°42.4	353°39.4 -2°26.2	368°11.7 -2°13.9	382°44.1 -2°01.6	397°16.6 -1°49.3	51°49.1 -1°37.0	66°21.6 -1°24.7	80°54.2 -1°12.4	95°26.2 -1°00.1	109°59.5 -0°47.8	+32.5 +12.3	15.3 55.7
●	Su 31	328°14.1 -2°50.8	342°47.3 -2°38.5	357°20.6 -2°26.2	371°53.8 -2°13.9	386°27.2 -2°01.6	41°00.5 -1°49.3	55°33.9 -1°37.0	70°07.3 -1°24.7	84°40.7 -1°12.4	99°14.1 -1°00.1	113°47.6 -0°47.8	+33.4 +12.3	15.2 55.7

Row 1: GHA, Δ /h = GHA change - 14°, SH = semi-diameter
Row 2: Dec (- = South), Δ /h = dec. change, SH = horizontal parallax
Column = (UTC hour - day) mod 24
NM: 4 06h34 — FQ: 12 08h47 — FM: 19 17h56 — LQ: 26 09h51

SUN

April 2030

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Mo 1	269°01.3 4°34.3	284°01.5 4°35.3	299°01.6 4°36.2	314°01.8 4°37.2	329°02.0 4°38.2	344°02.2 4°39.1	359°02.4 4°40.1	14°02.6 4°41.0	29°02.2 4°42.0	44°02.9 4°43.0	59°03.1 4°43.9	74°03.3 4°44.9	+0.2 +1.0
Tu 2	269°05.7 4°57.4	284°05.9 4°58.4	299°06.1 4°59.3	314°06.2 5°00.3	329°06.4 5°01.3	344°06.6 5°02.2	359°06.8 5°03.2	14°07.0 5°04.1	29°07.1 5°05.1	44°07.3 5°06.1	59°07.5 5°07.0	74°07.7 5°08.0	+0.2 +1.0
We 3	269°10.1 5°20.4	284°10.2 5°21.4	299°10.4 5°22.4	314°10.6 5°23.3	329°10.8 5°24.3	344°11.0 5°25.2	359°11.2 5°26.2	14°11.3 5°27.1	29°11.5 5°28.1	44°11.7 5°29.0	59°11.9 5°30.0	74°12.1 5°31.0	+0.2 +1.0
Th 4	269°14.4 5°43.4	284°14.6 5°44.3	299°14.8 5°45.3	314°14.9 5°46.2	329°15.1 5°47.2	344°15.3 5°48.1	359°15.5 5°49.1	14°15.7 5°50.0	29°15.8 5°51.0	44°16.0 5°51.9	59°16.2 5°52.9	74°16.4 5°53.8	+0.2 +1.0
Fr 5	269°18.7 6°06.2	284°18.9 6°07.2	299°19.1 6°08.1	314°19.2 6°09.1	329°19.4 6°10.0	344°19.6 6°10.9	359°19.8 6°11.9	14°20.0 6°12.8	29°20.1 6°13.8	44°20.3 6°14.7	59°20.5 6°15.7	74°20.7 6°16.6	+0.2 +0.9
Sa 6	269°23.0 6°28.9	284°23.1 6°29.9	299°23.3 6°30.8	314°23.5 6°31.8	329°23.7 6°32.7	344°23.9 6°33.7	359°24.0 6°34.6	14°24.2 6°35.5	29°24.4 6°36.5	44°24.6 6°37.4	59°24.7 6°38.4	74°24.9 6°39.3	+0.2 +0.9
Su 7	269°27.2 6°51.5	284°27.4 6°52.5	299°27.5 6°53.4	314°27.7 6°54.4	329°27.9 6°55.3	344°28.1 6°56.2	359°28.2 6°57.2	14°28.4 6°58.1	29°28.6 6°59.1	44°28.8 7°00.0	59°28.9 7°00.9	74°29.1 7°01.9	+0.2 +0.9
Mo 8	269°31.3 7°14.0	284°31.5 7°15.0	299°31.7 7°15.9	314°31.9 7°16.8	329°32.0 7°17.8	344°32.2 7°18.7	359°32.4 7°19.6	14°32.5 7°20.6	29°32.7 7°21.5	44°32.9 7°22.4	59°33.1 7°23.4	74°33.2 7°24.3	+0.2 +0.9
Tu 9	269°35.4 7°36.4	284°35.6 7°37.3	299°35.8 7°38.3	314°35.9 7°39.2	329°36.1 7°40.1	344°36.3 7°41.1	359°36.5 7°42.0	14°36.6 7°42.9	29°36.8 7°43.8	44°37.0 7°44.8	59°37.1 7°45.7	74°37.3 7°46.6	+0.2 +0.9
We 10	269°39.5 7°58.7	284°39.6 7°59.6	299°39.8 8°00.5	314°40.0 8°01.4	329°40.1 8°02.4	344°40.3 8°03.3	359°40.5 8°04.2	14°40.6 8°05.1	29°40.8 8°06.0	44°41.0 8°07.0	59°41.1 8°07.9	74°41.3 8°08.8	+0.2 +0.9
Th 11	269°43.5 8°20.8	284°43.6 8°21.7	299°43.8 8°22.6	314°43.9 8°23.5	329°44.1 8°24.4	344°44.3 8°25.4	359°44.4 8°26.3	14°44.6 8°27.2	29°44.8 8°28.1	44°44.9 8°29.0	59°45.1 8°29.9	74°45.3 8°30.8	+0.2 +0.9
Fr 12	269°47.4 8°42.7	284°47.5 8°43.6	299°47.7 8°44.6	314°47.8 8°45.5	329°48.0 8°46.4	344°48.2 8°47.3	359°48.3 8°48.2	14°48.5 8°49.1	29°48.7 8°50.0	44°48.8 8°50.9	59°49.0 8°51.8	74°49.1 8°52.7	+0.2 +0.9
Sa 13	269°51.2 9°04.5	284°51.4 9°05.5	299°51.5 9°06.4	314°51.7 9°07.3	329°51.8 9°08.2	344°52.0 9°09.1	359°52.2 9°10.0	14°52.3 9°10.9	29°52.5 9°11.8	44°52.6 9°12.7	59°52.8 9°13.6	74°52.9 9°14.5	+0.2 +0.9
Su 14	269°55.6 9°26.2	284°55.1 9°27.1	299°55.3 9°28.0	314°55.4 9°28.9	329°55.6 9°29.8	344°55.7 9°30.7	359°55.9 9°31.6	14°56.0 9°32.5	29°56.2 9°33.4	44°56.4 9°34.3	59°56.5 9°35.2	74°56.7 9°36.1	+0.2 +0.9
Mo 15	269°58.6 9°47.7	284°58.8 9°48.6	299°58.9 9°49.5	314°59.1 9°50.4	329°59.2 9°51.3	344°59.4 9°52.2	359°59.6 9°53.1	14°59.5 9°54.0	29°59.7 9°54.9	44°59.9 9°55.7	60°00.0 9°56.6	75°00.3 9°57.5	+0.2 +0.9
Tu 16	270°02.2 10°09.1	285°02.4 10°10.0	300°02.5 10°10.8	315°02.7 10°11.7	330°02.8 10°12.6	345°03.0 10°13.5	0°03.1 10°14.4	15°03.3 10°15.3	30°03.4 10°16.1	45°03.6 10°17.0	60°03.7 10°17.9	75°03.9 10°18.8	+0.1 +0.9
We 17	270°05.7 10°30.2	285°05.9 10°31.1	300°06.0 10°32.0	315°06.2 10°32.9	330°06.3 10°33.8	345°06.5 10°34.6	0°06.6 10°35.5	15°06.7 10°36.4	30°06.9 10°37.3	45°07.0 10°38.1	60°07.2 10°39.0	75°07.3 10°39.9	+0.1 +0.9
Th 18	270°09.2 10°51.2	285°09.4 10°52.1	300°09.4 10°53.0	315°09.6 10°53.9	330°09.7 10°54.7	345°09.9 10°55.6	0°10.0 10°56.5	15°10.1 10°57.3	30°10.3 10°58.2	45°10.4 10°59.1	60°10.5 10°59.9	75°10.7 11°00.8	+0.1 +0.9
Fr 19	270°12.5 11°12.1	285°12.6 11°12.9	300°12.7 11°13.8	315°12.9 11°14.7	330°13.0 11°15.5	345°13.1 11°16.4	0°13.3 11°17.2	15°13.4 11°18.1	30°13.5 11°19.0	45°13.7 11°19.8	60°13.8 11°20.7	75°13.9 11°21.6	+0.1 +0.9
Sa 20	270°15.7 11°32.7	285°15.8 11°33.6	300°15.9 11°34.4	315°16.1 11°35.3	330°16.2 11°36.1	345°16.3 11°37.0	0°16.5 11°37.8	15°16.6 11°38.7	30°16.7 11°39.6	45°16.8 11°40.4	60°16.9 11°41.3	75°17.1 11°42.1	+0.1 +0.9
Su 21	270°18.8 11°53.2	285°18.9 11°54.0	300°19.0 11°54.9	315°19.2 11°55.7	330°19.3 11°56.6	345°19.4 11°57.4	0°19.5 11°58.3	15°19.7 11°59.1	30°19.8 11°59.9	45°19.9 12°00.8	60°19.9 12°01.6	75°19.2 12°02.5	+0.1 +0.8
Mo 22	270°21.8 12°13.4	285°21.9 12°14.3	300°22.0 12°15.1	315°22.1 12°15.9	330°22.2 12°16.8	345°22.4 12°17.6	0°22.5 12°18.5	15°22.6 12°19.3	30°22.7 12°20.1	45°22.8 12°21.0	60°23.0 12°21.8	75°23.1 12°22.6	+0.1 +0.8
Tu 23	270°24.6 12°53.3	285°24.7 12°54.2	300°24.9 12°55.0	315°25.0 12°55.8	330°25.1 12°56.6	345°25.2 12°57.6	0°25.3 12°58.5	15°25.4 12°59.3	30°25.6 12°59.9	45°25.7 12°41.0	60°25.8 12°41.8	75°25.9 12°42.6	+0.1 +0.8
We 24	270°27.4 13°13.0	285°27.5 13°13.8	300°27.6 13°14.6	315°27.7 13°15.4	330°27.8 13°16.2	345°27.9 13°17.1	0°28.0 13°17.9	15°28.2 13°18.7	30°28.3 13°19.5	45°28.4 13°20.3	60°28.5 13°21.1	75°28.6 13°21.9	+0.1 +0.8
Th 25	270°30.0 13°32.4	285°30.1 13°33.2	300°30.2 13°34.0	315°30.3 13°34.8	330°30.4 13°35.6	345°30.5 13°36.4	0°30.6 13°37.2	15°30.7 13°38.0	30°30.8 13°38.8	45°30.9 13°39.6	60°31.0 13°40.4	75°31.2 13°41.2	+0.1 +0.8
Fr 26	270°32.5 13°51.6	285°32.6 13°52.4	300°32.7 13°53.2	315°32.8 13°54.0	330°32.9 13°54.8	345°33.0 13°55.6	0°33.1 13°56.4	15°33.2 13°57.2	30°33.3 13°58.0	45°33.4 13°58.8	60°33.5 13°59.6	75°33.6 14°00.3	+0.1 +0.8
Sa 27	270°34.9 14°10.6	285°35.0 14°11.4	300°35.1 14°12.2	315°35.2 14°12.9	330°35.3 14°13.7	345°35.4 14°14.5	0°35.4 14°15.3	15°35.5 14°16.1	30°35.6 14°16.9	45°35.7 14°17.7	60°35.8 14°18.4	75°35.9 14°19.2	+0.1 +0.8
Su 28	270°37.1 14°29.3	285°37.2 14°30.1	300°37.3 14°30.9	315°37.4 14°31.7	330°37.5 14°32.4	345°37.6 14°33.2	0°37.7 14°34.0	15°37.7 14°34.8	30°37.8 14°35.5	45°37.9 14°36.3	60°38.0 14°37.1	75°38.1 14°37.8	+0.1 +0.8
Mo 29	270°39.2 14°47.8	285°39.3 14°48.6	300°39.4 14°49.4	315°39.5 14°50.1	330°39.6 14°50.9	345°39.6 14°51.7	0°39.7 14°52.4	15°39.8 14°53.2	30°39.9 14°54.0	45°40.0 14°54.7	60°40.1 14°55.5	75°40.1 14°56.2	+0.1 +0.8
Tu 30	270°41.2 14°47.8	285°41.3 14°48.6	300°41.4 14°49.4	315°41.4 14°50.1	330°41.5 14°50.9	345°41.6 14°51.7	0°41.7 14°52.4	15°41.8 14°53.2	30°41.8 14°54.0	45°41.9 14°54.7	60°42.0 14°55.5	75°42.1 14°56.2	+0.1 +0.8

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 15.9'

MOON

April 2030

	D	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	Δ'/h	SH
●	Mo 1	244 ^o 49.5 1 ^o 02.5	259 ^o 23.1 1 ^o 14.7	273 ^o 56.8 1 ^o 26.9	288 ^o 30.4 1 ^o 39.0	303 ^o 04.1 1 ^o 51.2	317 ^o 37.7 2 ^o 03.3	332 ^o 11.4 2 ^o 15.5	346 ^o 45.1 2 ^o 27.6	1 ^o 18.8 2 ^o 39.7	15 ^o 52.5 2 ^o 51.8	30 ^o 26.2 3 ^o 03.8	+33.7	15.1
	Tu 2	248 ^o 52.3 6 ^o 01.8	263 ^o 26.0 6 ^o 13.4	277 ^o 59.8 6 ^o 25.0	292 ^o 33.5 6 ^o 36.6	307 ^o 07.2 6 ^o 48.2	321 ^o 40.9 6 ^o 59.7	336 ^o 14.6 7 ^o 11.1	350 ^o 48.3 7 ^o 22.6	5 ^o 22.0 7 ^o 33.9	19 ^o 55.6 7 ^o 45.3	34 ^o 29.3 7 ^o 56.6	+33.7	15.0
	We 3	252 ^o 52.6 10 ^o 41.2	267 ^o 26.0 10 ^o 51.8	281 ^o 59.4 11 ^o 02.3	296 ^o 32.8 11 ^o 12.8	311 ^o 06.1 11 ^o 23.2	325 ^o 39.5 11 ^o 33.6	340 ^o 12.8 11 ^o 43.9	354 ^o 46.2 11 ^o 54.2	9 ^o 19.4 12 ^o 04.4	23 ^o 52.6 12 ^o 14.6	38 ^o 25.8 12 ^o 24.7	+33.3	14.9
●	Th 4	256 ^o 41.2 14 ^o 49.0	271 ^o 14.0 14 ^o 58.1	285 ^o 46.8 15 ^o 07.1	300 ^o 19.6 15 ^o 16.1	314 ^o 52.3 15 ^o 25.0	329 ^o 25.0 15 ^o 33.8	343 ^o 57.7 15 ^o 42.6	358 ^o 30.3 15 ^o 51.2	13 ^o 02.9 15 ^o 59.8	27 ^o 35.5 16 ^o 08.4	42 ^o 08.0 16 ^o 16.9	+32.7	14.8
	Fr 5	260 ^o 12.3 18 ^o 14.6	274 ^o 44.3 18 ^o 21.8	289 ^o 16.3 18 ^o 29.0	303 ^o 48.3 18 ^o 36.0	318 ^o 20.2 18 ^o 43.0	332 ^o 52.1 18 ^o 49.8	347 ^o 24.0 18 ^o 56.6	1 ^o 55.8 19 ^o 03.3	16 ^o 27.7 19 ^o 09.9	30 ^o 59.4 19 ^o 16.5	45 ^o 31.2 19 ^o 22.9	+31.9	14.7
	Sa 6	263 ^o 23.5 20 ^o 48.7	277 ^o 54.8 20 ^o 53.6	292 ^o 26.0 20 ^o 58.5	306 ^o 57.2 21 ^o 03.3	321 ^o 28.3 21 ^o 08.0	335 ^o 59.5 21 ^o 12.6	350 ^o 30.6 21 ^o 17.1	5 ^o 01.6 21 ^o 21.5	19 ^o 32.7 21 ^o 25.8	34 ^o 03.7 21 ^o 30.0	48 ^o 34.7 21 ^o 34.0	+31.1	14.7
●	Su 7	266 ^o 16.7 22 ^o 23.4	280 ^o 47.3 22 ^o 25.9	295 ^o 17.9 22 ^o 28.2	309 ^o 48.5 22 ^o 30.5	324 ^o 19.1 22 ^o 32.7	338 ^o 49.6 22 ^o 34.7	353 ^o 20.1 22 ^o 36.6	7 ^o 50.6 22 ^o 38.5	22 ^o 21.1 22 ^o 40.2	36 ^o 51.6 22 ^o 41.8	51 ^o 22.1 22 ^o 43.4	+30.5	14.7
	Mo 8	268 ^o 57.4 22 ^o 53.4	283 ^o 27.6 22 ^o 53.2	297 ^o 57.9 22 ^o 52.9	312 ^o 28.2 22 ^o 52.4	326 ^o 58.4 22 ^o 51.9	341 ^o 28.6 22 ^o 51.3	355 ^o 58.9 22 ^o 50.6	10 ^o 29.1 22 ^o 49.7	24 ^o 59.3 22 ^o 48.8	39 ^o 29.6 22 ^o 47.7	53 ^o 59.8 22 ^o 46.5	+30.2	14.8
	Tu 9	271 ^o 33.1 22 ^o 15.9	286 ^o 03.3 22 ^o 13.0	300 ^o 33.3 22 ^o 10.0	315 ^o 03.8 22 ^o 06.9	329 ^o 34.8 22 ^o 03.7	344 ^o 04.3 22 ^o 00.3	358 ^o 34.5 21 ^o 56.9	13 ^o 04.8 21 ^o 53.3	27 ^o 35.1 21 ^o 49.7	42 ^o 05.4 21 ^o 45.9	56 ^o 35.7 21 ^o 42.0	+30.3	14.9
●	We 10	274 ^o 11.1 20 ^o 31.4	288 ^o 41.5 20 ^o 25.9	303 ^o 12.0 20 ^o 20.2	317 ^o 42.4 20 ^o 14.5	332 ^o 12.9 20 ^o 08.6	346 ^o 43.4 20 ^o 02.7	1 ^o 13.9 19 ^o 56.7	15 ^o 44.4 19 ^o 50.5	30 ^o 15.0 19 ^o 44.3	44 ^o 45.5 19 ^o 37.9	59 ^o 16.1 19 ^o 31.5	+30.5	15.0
	Th 11	276 ^o 55.9 17 ^o 43.0	291 ^o 26.7 17 ^o 35.0	305 ^o 57.5 17 ^o 26.9	320 ^o 28.2 17 ^o 18.8	334 ^o 59.0 17 ^o 10.5	349 ^o 29.8 17 ^o 02.1	4 ^o 00.7 16 ^o 53.7	18 ^o 31.5 16 ^o 45.1	33 ^o 02.3 16 ^o 36.5	47 ^o 33.2 16 ^o 27.8	62 ^o 04.4 16 ^o 18.9	+30.8	15.2
	Fr 12	279 ^o 47.9 15 ^o 56.4	294 ^o 18.9 13 ^o 46.2	308 ^o 49.9 13 ^o 36.0	323 ^o 20.9 13 ^o 25.6	337 ^o 51.9 13 ^o 15.2	352 ^o 22.7 13 ^o 04.7	6 ^o 53.9 12 ^o 54.2	21 ^o 24.9 12 ^o 43.5	35 ^o 55.9 12 ^o 32.8	60 ^o 26.9 12 ^o 22.0	64 ^o 57.9 12 ^o 11.2	+31.0	15.5
●	Sa 13	282 ^o 42.7 9 ^o 19.7	297 ^o 13.6 9 ^o 07.7	311 ^o 44.5 8 ^o 55.7	326 ^o 15.5 8 ^o 43.6	340 ^o 46.4 8 ^o 31.4	355 ^o 17.3 8 ^o 19.2	9 ^o 48.1 8 ^o 06.9	24 ^o 19.0 7 ^o 54.6	38 ^o 49.9 7 ^o 42.2	53 ^o 20.7 7 ^o 29.8	67 ^o 51.5 7 ^o 17.3	+30.9	15.7
	Su 14	285 ^o 31.5 4 ^o 03.8	300 ^o 02.0 3 ^o 50.6	314 ^o 33.4 3 ^o 37.3	329 ^o 02.8 3 ^o 24.0	343 ^o 33.8 3 ^o 10.6	358 ^o 03.6 2 ^o 57.2	12 ^o 33.9 2 ^o 43.8	27 ^o 04.2 2 ^o 30.3	41 ^o 34.4 2 ^o 16.8	56 ^o 04.6 2 ^o 03.3	70 ^o 34.8 1 ^o 49.7	+30.3	16.0
	Mo 15	288 ^o 02.6 -1 ^o 36.4	302 ^o 32.1 -1 ^o 50.2	317 ^o 01.6 -2 ^o 04.1	331 ^o 31.0 -2 ^o 18.0	346 ^o 00.3 -2 ^o 31.8	0 ^o 29.6 -2 ^o 45.7	14 ^o 58.8 -2 ^o 59.6	29 ^o 28.0 -3 ^o 13.5	43 ^o 57.1 -3 ^o 27.3	58 ^o 26.2 -3 ^o 41.2	72 ^o 55.2 -3 ^o 55.1	+29.3	16.2
●	Tu 16	290 ^o 02.8 -9 ^o 21.5	304 ^o 30.8 -7 ^o 35.1	318 ^o 58.7 -7 ^o 48.6	333 ^o 26.5 -8 ^o 02.1	347 ^o 54.3 -8 ^o 15.6	2 ^o 22.0 -8 ^o 29.9	16 ^o 49.6 -8 ^o 42.4	31 ^o 17.1 -8 ^o 55.8	45 ^o 44.6 -9 ^o 09.1	60 ^o 12.0 -9 ^o 22.4	74 ^o 39.3 -9 ^o 35.6	+27.7	16.5
	We 17	291 ^o 19.9 -12 ^o 47.1	305 ^o 46.0 -12 ^o 59.4	320 ^o 12.0 -13 ^o 11.5	334 ^o 37.9 -13 ^o 23.6	349 ^o 03.9 -13 ^o 35.6	3 ^o 29.5 -13 ^o 47.5	17 ^o 55.2 -13 ^o 59.3	32 ^o 20.8 -14 ^o 11.0	46 ^o 46.3 -14 ^o 22.7	61 ^o 11.7 -14 ^o 34.2	75 ^o 37.0 -14 ^o 45.7	+25.7	16.6
	Th 18	291 ^o 47.8 -17 ^o 25.2	306 ^o 12.0 -17 ^o 34.9	320 ^o 36.0 -17 ^o 44.5	335 ^o 00.0 -17 ^o 54.0	349 ^o 23.9 -18 ^o 03.4	3 ^o 47.7 -18 ^o 12.6	18 ^o 11.5 -18 ^o 21.7	32 ^o 35.2 -18 ^o 30.7	46 ^o 58.8 -18 ^o 39.5	61 ^o 22.3 -18 ^o 48.2	75 ^o 45.8 -18 ^o 56.8	+23.8	16.7
●	Fr 19	291 ^o 31.4 -20 ^o 48.1	305 ^o 54.1 -20 ^o 54.3	320 ^o 16.7 -21 ^o 00.4	334 ^o 39.2 -21 ^o 06.3	349 ^o 01.8 -21 ^o 12.0	3 ^o 24.3 -21 ^o 17.6	17 ^o 46.7 -21 ^o 23.1	32 ^o 09.2 -21 ^o 28.3	46 ^o 31.6 -21 ^o 33.4	60 ^o 54.0 -21 ^o 38.4	75 ^o 16.3 -21 ^o 43.2	+22.5	16.6
	Sa 20	290 ^o 50.1 -22 ^o 35.0	305 ^o 12.3 -22 ^o 37.1	319 ^o 34.5 -22 ^o 39.0	333 ^o 56.8 -22 ^o 40.8	348 ^o 19.1 -22 ^o 42.4	2 ^o 41.4 -22 ^o 43.8	17 ^o 03.7 -22 ^o 45.1	31 ^o 26.0 -22 ^o 46.2	45 ^o 48.4 -22 ^o 47.1	60 ^o 10.8 -22 ^o 47.9	74 ^o 33.2 -22 ^o 48.5	+22.3	16.5
	Su 21	290 ^o 14.1 -22 ^o 37.6	304 ^o 37.2 -22 ^o 35.6	319 ^o 00.4 -22 ^o 33.4	333 ^o 23.6 -22 ^o 31.0	347 ^o 47.0 -22 ^o 28.5	2 ^o 10.3 -22 ^o 25.9	16 ^o 33.8 -22 ^o 23.1	30 ^o 57.3 -22 ^o 20.2	45 ^o 20.9 -22 ^o 17.1	59 ^o 44.5 -22 ^o 13.8	74 ^o 08.3 -22 ^o 10.4	+23.4	16.3
●	Mo 22	304 ^o 37.2 -22 ^o 35.6	319 ^o 00.4 -22 ^o 33.4	333 ^o 23.6 -22 ^o 31.0	347 ^o 47.0 -22 ^o 28.5	2 ^o 10.3 -22 ^o 25.9	16 ^o 33.8 -22 ^o 23.1	30 ^o 57.3 -22 ^o 20.2	45 ^o 20.9 -22 ^o 13.8	59 ^o 44.5 -22 ^o 10.4	74 ^o 08.3 -22 ^o 07.9	88 ^o 32.1 -22 ^o 06.8	+23.5	16.3
	Tu 23	304 ^o 38.9 -20 ^o 56.5	319 ^o 04.1 -20 ^o 54.0	333 ^o 29.9 -20 ^o 44.9	347 ^o 54.7 -20 ^o 38.9	2 ^o 20.1 -20 ^o 26.4	16 ^o 45.6 -20 ^o 20.0	31 ^o 11.3 -20 ^o 20.0	45 ^o 37.0 -20 ^o 13.5	60 ^o 02.8 -20 ^o 06.9	74 ^o 28.7 -20 ^o 02.2	88 ^o 54.3 -19 ^o 53.3	+25.6	16.1
	We 24	305 ^o 36.5 -17 ^o 57.3	320 ^o 04.0 -17 ^o 48.7	334 ^o 30.1 -17 ^o 40.1	348 ^o 59.5 -17 ^o 31.4	3 ^o 27.3 -17 ^o 22.6	17 ^o 55.3 -17 ^o 13.7	32 ^o 23.3 -17 ^o 04.7	46 ^o 51.5 -16 ^o 55.6	61 ^o 19.7 -16 ^o 46.4	75 ^o 48.1 -16 ^o 37.2	90 ^o 16.7 -16 ^o 27.9	+28.0	15.9
●	Th 25	307 ^o 34.1 -13 ^o 59.1	322 ^o 04.0 -13 ^o 48.7	336 ^o 34.0 -13 ^o 38.2	351 ^o 04.1 -13 ^o 27.6	5 ^o 34.2 -13 ^o 17.0	20 ^o 04.4 -13 ^o 06.3	34 ^o 34.7 -12 ^o 55.5	49 ^o 05.1 -12 ^o 44.8	63 ^o 35.6 -12 ^o 33.9	78 ^o 06.2 -12 ^o 23.0	92 ^o 36.8 -12 ^o 12.1	+30.3	15.6
	Fr 26	310 ^o 25.1 -9 ^o 22.7	324 ^o 56.9 -9 ^o 11.1	339 ^o 28.7 -9 ^o 01.1	354 ^o 00.6 -8 ^o 47.8	8 ^o 32.6 -8 ^o 36.2	23 ^o 04.6 -8 ^o 24.4	37 ^o 36.7 -8 ^o 12.7	52 ^o 08.9 -8 ^o 00.9	66 ^o 41.1 -7 ^o 49.2	81 ^o 13.3 -7 ^o 37.3	95 ^o 45.7 -7 ^o 25.5	+32.1	15.4
	Sa 27	313 ^o 56.5 -4 ^o 25.8	328 ^o 29.6 -4 ^o 13.7	343 ^o 02.7 -4 ^o 01.6	357 ^o 35.9 -3 ^o 49.5	12 ^o 09.1 -3 ^o 37.4	26 ^o 42.4 -3 ^o 25.2	41 ^o 15.6 -3 ^o 13.1	55 ^o 48.9 -3 ^o 01.0	70 ^o 22.3 -2 ^o 48.9	84 ^o 55.7 -2 ^o 36.7	99 ^o 29.1 -2 ^o 24.6	+33.3	15.2
●	Su 28	317 ^o 53.5 0 ^o 37.0	332 ^o 27.3 0 ^o 49.0	347 ^o 01.2 1 ^o 01.1	1 ^o 35.0 1 ^o 13.1	16 ^o 08.9 1 ^o 25.1	30 ^o 42.7 1 ^o 37.1	45 ^o 16.6 1 ^o 49.1	59 ^o 50.5 2 ^o 01.0	74 ^o 24.4 2 ^o 13.0	88 ^o 58.3 2 ^o 24.9	103 ^o 32.2 2 ^o 36.8	+33.9	15.1
	Mo 29</													

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D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
We 1	270°43.0	285°43.1	300°43.2	315°43.3	330°43.3	345°43.4	0°43.5	15°43.6	30°43.6	45°43.7	60°43.8	75°43.8	+0.1
	15°06.1	15°06.9	15°07.6	15°08.4	15°09.1	15°09.9	15°10.6	15°11.4	15°12.1	15°12.9	15°13.6	15°14.4	+0.8
Th 2	270°44.7	285°44.8	300°44.9	315°45.0	330°45.0	345°45.1	0°45.2	15°45.2	30°45.3	45°45.4	60°45.4	75°45.5	+0.1
	15°24.1	15°24.9	15°25.6	15°26.3	15°27.1	15°27.8	15°28.6	15°29.3	15°30.1	15°30.8	15°31.5	15°32.3	+0.7
Fr 3	270°46.3	285°46.4	300°46.4	315°46.5	330°46.6	345°46.6	0°46.7	15°46.8	30°46.8	45°46.9	60°46.9	75°47.0	+0.1
	15°41.9	15°42.6	15°43.3	15°44.1	15°44.8	15°45.5	15°46.3	15°47.0	15°47.7	15°48.5	15°49.2	15°49.9	+0.7
Sa 4	270°47.8	285°47.8	300°47.9	315°47.9	330°48.0	345°48.0	0°48.1	15°48.1	30°48.2	45°48.3	60°48.3	75°48.4	+0.1
	15°59.4	16°00.1	16°00.8	16°01.5	16°02.3	16°03.0	16°03.7	16°04.4	16°05.1	16°05.9	16°06.6	16°07.3	+0.7
Su 5	270°49.0	285°49.1	300°49.1	315°49.2	330°49.2	345°49.3	0°49.3	15°49.4	30°49.4	45°49.5	60°49.5	75°49.6	+0.0
	16°16.6	16°17.3	16°18.0	16°18.7	16°19.4	16°20.1	16°20.9	16°21.6	16°22.3	16°23.0	16°23.7	16°24.4	+0.7
Mo 6	270°50.2	285°50.2	300°50.3	315°50.3	330°50.4	345°50.4	0°50.5	15°50.5	30°50.6	45°50.6	60°50.6	75°50.7	+0.0
	16°33.5	16°34.2	16°34.9	16°35.6	16°36.3	16°37.0	16°37.7	16°38.4	16°39.1	16°39.8	16°40.5	16°41.2	+0.7
Tu 7	270°51.2	285°51.3	300°51.3	315°51.3	330°51.4	345°51.4	0°51.5	15°51.5	30°51.5	45°51.6	60°51.6	75°51.6	+0.0
	16°50.2	16°50.9	16°51.6	16°52.3	16°53.0	16°53.7	16°54.4	16°55.0	16°55.7	16°56.4	16°57.1	16°57.8	+0.7
We 8	270°52.1	285°52.1	300°52.2	315°52.2	330°52.2	345°52.3	0°52.3	15°52.3	30°52.4	45°52.4	60°52.4	75°52.5	+0.0
	17°06.6	17°07.3	17°08.0	17°08.7	17°09.3	17°10.0	17°10.7	17°11.4	17°12.0	17°12.7	17°13.4	17°14.1	+0.7
Th 9	270°52.8	285°52.9	300°52.9	315°52.9	330°53.0	345°53.0	0°53.0	15°53.0	30°53.1	45°53.1	60°53.1	75°53.1	+0.0
	17°22.7	17°23.4	17°24.1	17°24.7	17°25.4	17°26.1	17°26.7	17°27.4	17°28.0	17°28.7	17°29.4	17°30.0	+0.7
Fr 10	270°53.4	285°53.5	300°53.5	315°53.5	330°53.5	345°53.6	0°53.6	15°53.6	30°53.6	45°53.6	60°53.6	75°53.7	+0.0
	17°38.6	17°39.2	17°39.9	17°40.5	17°41.2	17°41.8	17°42.5	17°43.1	17°43.8	17°44.4	17°45.1	17°45.7	+0.6
Sa 11	270°53.9	285°53.9	300°53.9	315°54.0	330°54.0	345°54.0	0°54.0	15°54.0	30°54.0	45°54.1	60°54.1	75°54.1	+0.0
	17°54.1	17°54.7	17°55.4	17°56.0	17°56.6	17°57.3	17°57.9	17°58.6	17°59.2	17°59.8	18°00.5	18°01.1	+0.6
Su 12	270°54.2	285°54.3	300°54.3	315°54.3	330°54.3	345°54.3	0°54.3	15°54.3	30°54.3	45°54.3	60°54.3	75°54.3	+0.0
	18°09.3	18°09.9	18°10.6	18°11.2	18°11.8	18°12.4	18°13.1	18°13.7	18°14.3	18°14.9	18°15.6	18°16.2	+0.6
Mo 13	270°54.4	285°54.4	300°54.4	315°54.4	330°54.5	345°54.5	0°54.5	15°54.5	30°54.5	45°54.5	60°54.5	75°54.5	+0.0
	18°24.2	18°24.8	18°25.5	18°26.1	18°26.7	18°27.3	18°27.9	18°28.5	18°29.1	18°29.7	18°30.3	18°31.0	+0.6
Tu 14	270°54.5	285°54.5	300°54.5	315°54.5	330°54.5	345°54.5	0°54.5	15°54.5	30°54.5	45°54.5	60°54.5	75°54.5	-0.0
	18°38.8	18°39.4	18°40.0	18°40.6	18°41.2	18°41.8	18°42.4	18°43.0	18°43.6	18°44.2	18°44.8	18°45.4	+0.6
We 15	270°54.4	285°54.4	300°54.4	315°54.4	330°54.4	345°54.4	0°54.4	15°54.3	30°54.3	45°54.3	60°54.3	75°54.3	-0.0
	18°53.1	18°53.7	18°54.3	18°54.9	18°55.5	18°56.1	18°56.6	18°57.2	18°57.8	18°58.4	18°59.0	18°59.6	+0.6
Th 16	270°54.2	285°54.2	300°54.2	315°54.1	330°54.1	345°54.1	0°54.1	15°54.1	30°54.1	45°54.1	60°54.0	75°54.0	-0.0
	19°07.1	19°07.7	19°08.2	19°08.8	19°09.4	19°10.0	19°10.5	19°11.1	19°11.7	19°12.2	19°12.8	19°13.4	+0.6
Fr 17	270°53.8	285°53.8	300°53.8	315°53.8	330°53.7	345°53.7	0°53.7	15°53.7	30°53.7	45°53.6	60°53.6	75°53.6	-0.0
	19°20.7	19°21.3	19°21.9	19°22.4	19°23.0	19°23.5	19°24.1	19°24.7	19°25.2	19°25.8	19°26.3	19°26.9	+0.6
Sa 18	270°53.3	285°53.3	300°53.3	315°53.2	330°53.2	345°53.2	0°53.2	15°53.1	30°53.1	45°53.1	60°53.1	75°53.0	-0.0
	19°34.1	19°34.6	19°35.1	19°35.7	19°36.2	19°36.8	19°37.3	19°37.9	19°38.4	19°39.0	19°39.5	19°40.0	+0.5
Su 19	270°52.7	285°52.6	300°52.6	315°52.6	330°52.5	345°52.5	0°52.5	15°52.5	30°52.4	45°52.4	60°52.4	75°52.3	-0.0
	19°47.0	19°47.6	19°48.1	19°48.6	19°49.2	19°49.7	19°50.2	19°50.8	19°51.3	19°51.8	19°52.4	19°52.9	+0.5
Mo 20	270°51.9	285°51.9	300°51.8	315°51.8	330°51.7	345°51.7	0°51.7	15°51.6	30°51.6	45°51.6	60°51.5	75°51.5	-0.0
	19°59.7	20°00.2	20°00.7	20°01.2	20°01.8	20°02.3	20°02.8	20°03.3	20°03.8	20°04.3	20°04.9	20°05.4	+0.5
Tu 21	270°51.0	285°50.9	300°50.9	315°50.8	330°50.8	345°50.8	0°50.7	15°50.7	30°50.6	45°50.6	60°50.5	75°50.5	-0.0
	20°12.0	20°12.5	20°13.0	20°13.5	20°14.0	20°14.5	20°15.0	20°15.5	20°16.0	20°16.5	20°17.0	20°17.5	+0.5
We 22	270°49.9	285°49.9	300°49.8	315°49.8	330°49.7	345°49.7	0°49.6	15°49.6	30°49.5	45°49.5	60°49.4	75°49.4	-0.0
	20°24.0	20°24.5	20°24.9	20°25.4	20°25.9	20°26.4	20°26.9	20°27.4	20°27.9	20°28.4	20°28.8	20°29.3	+0.5
Th 23	270°48.7	285°48.7	300°48.6	315°48.6	330°48.5	345°48.5	0°48.4	15°48.4	30°48.3	45°48.2	60°48.2	75°48.1	-0.1
	20°35.6	20°36.1	20°36.5	20°37.0	20°37.5	20°38.0	20°38.4	20°38.9	20°39.4	20°39.8	20°40.3	20°40.8	+0.5
Fr 24	270°47.4	285°47.3	300°47.3	315°47.2	330°47.2	345°47.1	0°47.1	15°47.0	30°46.9	45°46.9	60°46.8	75°46.8	-0.1
	20°46.8	20°47.3	20°47.8	20°48.2	20°48.7	20°49.1	20°49.6	20°50.1	20°50.5	20°51.0	20°51.4	20°51.9	+0.5
Sa 25	270°45.9	285°45.9	300°45.8	315°45.8	330°45.7	345°45.6	0°45.6	15°45.5	30°45.4	45°45.4	60°45.3	75°45.2	-0.1
	20°57.7	20°58.2	20°58.6	20°59.1	20°59.5	21°00.0	21°00.4	21°00.9	21°01.3	21°01.7	21°02.2	21°02.6	+0.4
Su 26	270°44.4	285°44.3	300°44.2	315°44.2	330°44.1	345°44.0	0°43.9	15°43.9	30°43.8	45°43.7	60°43.7	75°43.6	-0.1
	21°08.3	21°08.7	21°09.2	21°09.6	21°10.0	21°10.4	21°10.8	21°11.3	21°11.7	21°12.2	21°12.6	21°13.0	+0.4
Mo 27	270°42.7	285°42.6	300°42.5	315°42.4	330°42.4	345°42.3	0°42.2	15°42.1	30°42.1	45°42.0	60°41.9	75°41.8	-0.1
	21°18.5	21°18.9	21°19.3	21°19.7	21°20.1	21°20.5	21°20.9	21°21.4	21°21.8	21°22.2	21°22.6	21°23.0	+0.4
Tu 28	270°40.8	285°40.7	300°40.7	315°40.6	330°40.5	345°40.4	0°40.4	15°40.3	30°40.2	45°40.1	60°40.0	75°39.9	-0.1
	21°28.3	21°28.7	21°29.1	21°29.5	21°29.9	21°30.3	21°30.7	21°31.1	21°31.5	21°31.9	21°32.3	21°32.7	+0.4
We 29	270°38.9	285°38.8	300°38.7	315°38.6	330°38.5	345°38.5	0°38.4	15°38.3	30°38.2	45°38.1	60°38.0	75°37.9	-0.1
	21°37.7	21°38.1	21°38.5	21°38.9	21°39.3	21°39.6	21°40.0	21°40.4	21°40.8	21°41.2	21°41.5	21°41.9	+0.4
Th 30	270°36.8	285°36.7	300°36.6	315°36.6	330°36.5	345°36.4	0°36.3	15°36.2	30°36.1	45°36.0	60°35.9	75°35.8	-0.1
	21°46.8	21°47.1	21°47.5	21°47.9	21°48.3	21°48.6	21°49.0	21°49.4	21°49.8	21°50.1	20°50.4	21°50.8	+0.4
Fr 31	270°34.7	285°34.6	300°34.5	315°34.4	330°34.3	345°34.2	0°34.1	15°34.0	30°33.9	45°33.8	60°33.7	75°33.6	-0.1
	21°55.5	21°55.8	21°56.2	21°56.5	21°56.9	21°57.2	21°57.6	21°57.9	21°58.3	21°58.6	21°59.0	21°59.3	+0.3

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.8'

MOON

May 2030

	D	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	Δ'/h	SH
●	We 1	242°44.4 13°22.4	267°17.6 13°32.0	271°50.7 13°41.5	286°23.9 13°50.9	300°57.0 14°00.3	315°30.1 14°09.6	330°03.2 14°18.8	344°36.2 14°27.1	359°09.2 14°37.1	13°42.2 14°46.2	28°15.1 14°55.2	+33.1 +9.3	14.8 54.3
	Th 2	246°25.3 17°01.6	260°57.7 17°09.5	275°30.0 17°17.2	290°02.4 17°24.9	304°34.7 17°32.5	319°06.9 17°40.1	333°39.2 17°47.5	348°11.4 17°54.9	2°43.5 18°02.2	17°15.7 18°09.4	31°47.7 18°16.6	+32.2 +7.5	14.7 54.0
	Fr 3	249°44.9 19°53.5	264°16.5 19°59.3	278°48.6 20°05.0	293°19.5 20°10.5	307°50.9 20°16.0	322°22.3 20°21.4	336°53.7 20°26.7	351°25.0 20°32.0	5°56.4 20°37.1	20°27.6 20°42.1	34°58.9 20°47.0	+31.4 +5.4	14.7 53.9
	Sa 4	252°44.3 21°49.4	267°15.1 21°52.7	281°45.9 21°56.0	296°16.7 21°59.1	310°47.4 22°02.2	325°18.1 22°05.2	339°48.8 22°08.0	354°19.5 22°10.8	8°50.2 22°13.4	23°20.8 22°16.0	37°51.5 22°18.4	+30.7 +2.9	14.7 53.9
●	Su 5	255°28.9 22°42.4	269°59.3 22°43.2	284°29.7 22°43.8	299°00.1 22°44.4	313°30.4 22°44.8	328°00.8 22°45.1	342°31.2 22°45.3	357°01.5 22°45.5	11°31.9 22°45.5	26°02.2 22°45.4	40°32.5 22°45.2	+30.4 +0.3	14.7 54.0
	Mo 6	258°07.5 22°29.2	272°37.9 22°27.2	287°08.2 22°25.2	301°38.6 22°23.1	316°09.0 22°20.8	330°39.4 22°18.5	345°09.7 22°16.0	359°40.1 22°13.5	14°10.6 22°10.8	28°41.0 22°08.0	43°11.4 22°05.1	+30.4 -2.4	14.8 54.2
	Tu 7	260°49.4 21°09.5	275°20.0 21°04.9	289°50.7 21°00.3	304°21.4 20°55.6	318°52.1 20°50.7	333°22.8 20°45.8	347°53.5 20°40.8	5°24.3 20°35.6	16°55.1 20°30.4	31°25.9 20°25.1	45°56.7 20°19.6	+30.7 -5.0	14.9 54.5
	We 8	263°41.3 18°46.6	278°12.4 18°39.6	292°43.6 18°32.6	307°14.8 18°25.5	321°46.0 18°18.2	336°17.2 18°10.9	350°48.4 18°03.5	5°19.7 17°56.0	19°51.0 17°48.4	34°22.3 17°40.7	48°53.6 17°33.0	+31.2 -7.4	15.0 55.0
●	Th 9	266°45.6 15°26.3	281°17.2 15°17.2	295°48.8 15°08.0	310°20.5 14°58.8	324°52.1 14°49.4	339°23.8 14°40.0	353°55.5 14°30.5	8°27.2 14°21.0	22°58.9 14°11.3	37°30.6 14°01.6	52°02.3 13°51.8	+31.7 -9.5	15.2 55.7
	Fr 10	269°59.3 11°16.3	284°31.3 11°05.4	299°03.0 10°54.4	313°34.8 10°43.4	328°06.7 10°32.3	342°38.5 10°21.1	357°10.4 10°09.9	11°42.2 9°58.6	26°14.1 9°47.3	40°45.9 9°35.9	55°17.7 9°24.4	+31.8 -11.2	15.4 55.6
	Sa 11	273°14.4 6°25.9	287°46.1 6°13.5	302°17.7 6°01.2	316°49.7 5°48.8	331°21.0 5°36.3	345°52.6 5°23.9	0°24.4 5°11.3	14°55.7 4°58.7	29°27.3 4°46.1	43°58.8 4°33.5	58°30.3 4°20.8	+31.6 -12.5	15.6 55.7
	Su 12	276°19.1 1°06.2	290°50.0 0°53.0	305°21.0 0°39.8	319°51.8 0°26.0	334°22.7 0°13.3	348°53.5 0°00.0	3°24.2 -0°13.3	17°54.9 -0°26.6	32°25.6 -0°26.6	46°56.2 -0°53.3	61°26.2 -1°06.7	+30.8 -13.3	15.9 55.8
●	Mo 13	278°58.6 -0°28.1	293°28.3 -0°41.6	307°57.8 -0°55.0	322°27.3 -0°58.4	336°56.8 -0°51.8	351°26.1 -0°35.2	5°55.4 -0°48.6	20°24.7 -0°20.0	34°53.8 -0°15.3	49°22.9 -0°28.6	63°51.9 -0°42.0	+29.3 -13.4	16.2 55.9
	Tu 14	280°57.6 -0°58.3	295°25.3 -10°11.1	309°52.9 -10°23.9	324°20.5 -10°36.6	338°47.9 -10°49.3	353°15.3 -11°01.9	7°42.5 -11°14.4	22°09.7 -11°26.9	36°36.8 -11°58.1	51°03.8 -11°51.7	65°30.7 -12°04.0	+27.3 -12.6	16.3 56.0
	We 15	282°02.9 -15°00.3	296°28.3 -15°11.4	310°53.6 -15°22.4	325°18.8 -15°33.3	339°43.9 -15°44.1	354°08.9 -15°54.8	8°33.8 -16°05.4	22°58.6 -16°15.9	37°23.3 -16°26.4	51°48.0 -16°36.7	66°12.5 -16°46.9	+25.0 -10.7	16.6 56.0
	Th 16	283°09.5 -19°05.7	296°32.6 -19°13.9	310°55.3 -19°22.0	325°18.6 -19°30.0	339°41.5 -19°37.8	354°04.3 -19°45.5	8°27.0 -19°53.0	22°49.7 -20°00.4	37°12.3 -20°07.6	51°34.5 -20°14.7	65°57.2 -20°21.7	+22.8 -7.6	16.7 56.1
○	Fr 17	-21°26.7 -21°47.0	295°48.8 -21°51.3	310°09.9 -21°55.5	324°31.4 -21°59.6	338°52.9 -22°03.4	353°14.3 -22°07.1	7°35.8 -22°10.7	21°57.2 -22°14.0	36°18.6 -22°17.2	50°39.9 -22°20.2	65°01.3 -22°23.1	+21.4 -3.6	16.7 56.1
	Sa 18	-28°21.3 -22°44.6	294°42.7 -22°44.6	309°04.1 -22°44.1	323°25.6 -22°44.1	337°47.1 -22°43.4	352°08.7 -22°43.0	6°30.2 -22°42.1	20°51.9 -22°41.1	35°13.5 -22°39.9	49°35.2 -22°38.6	63°57.0 -22°37.0	+21.6 +0.8	16.6 56.1
	Su 19	279°30.1 -21°54.2	293°52.8 -21°50.1	308°15.7 -21°45.8	322°38.6 -21°41.4	337°01.6 -21°36.8	351°24.7 -21°32.0	5°47.9 -21°27.1	20°11.1 -21°22.1	34°34.5 -21°16.9	48°57.9 -21°11.6	63°21.4 -21°06.1	+23.1 +4.8	16.5 56.0
	Mo 20	279°26.0 -19°27.9	293°51.1 -19°20.3	308°16.4 -19°12.6	322°41.7 -19°04.8	337°07.2 -18°56.9	351°32.7 -18°48.9	5°58.4 -18°40.8	20°24.1 -18°32.6	34°50.0 -18°24.2	49°16.0 -18°15.8	63°42.0 -18°07.2	+25.6 +8.1	16.2 55.9
○	Tu 21	280°26.3 -15°47.7	294°54.1 -15°37.7	309°22.0 -15°27.7	323°50.0 -15°17.5	338°18.1 -15°07.3	352°46.3 -14°57.0	7°14.6 -14°46.7	21°43.0 -14°36.2	36°11.6 -14°25.8	50°40.2 -14°15.2	65°08.9 -14°04.6	+28.3 +10.3	16.0 55.8
	We 22	294°54.1 -15°37.7	309°22.0 -15°27.7	323°50.0 -15°17.5	338°18.1 -15°07.3	352°46.3 -14°57.0	7°14.6 -14°46.7	21°43.0 -14°36.2	36°11.6 -14°25.8	50°40.2 -14°15.2	65°08.9 -14°04.6	79°37.3 -13°53.9	+28.4 +10.6	16.0 55.8
	Th 23	297°01.5 -11°07.0	311°31.8 -10°55.5	326°02.2 -10°44.0	340°32.7 -10°32.4	355°03.2 -10°20.8	9°33.9 -10°09.1	24°04.6 -9°57.4	38°35.4 -9°45.7	53°06.3 -9°33.9	67°37.3 -9°22.1	82°08.3 -9°10.3	+30.7 +11.7	15.7 55.5
	Fr 24	300°02.6 -6°10.1	314°34.7 -5°57.9	329°06.9 -5°45.8	343°39.2 -5°33.6	358°11.5 -5°21.4	12°43.9 -5°09.2	27°16.3 -4°57.0	41°48.8 -4°44.7	56°21.3 -4°32.5	70°53.9 -4°20.3	85°26.6 -4°08.0	+32.4 -4.0	15.4 55.6
○	Sa 25	303°01.7 -1°04.4	318°15.0 -0°52.2	332°48.4 -0°40.0	347°21.8 -0°27.8	1°55.2 -0°15.7	16°28.7 -0°03.5	31°02.2 0°08.6	45°35.7 0°20.8	60°09.2 0°32.9	74°42.8 0°45.0	89°16.4 0°57.1	+33.5 +12.2	15.2 55.8
	Su 26	307°42.7 3°56.3	322°16.5 4°08.0	336°50.4 4°19.8	351°24.3 4°31.5	5°58.2 4°43.1	20°32.1 4°54.8	35°06.4 5°06.4	49°39.0 5°18.0	64°13.8 5°29.6	78°47.8 5°41.1	93°21.7 5°52.6	+33.9 +11.6	15.0 55.2
	Mo 27	311°50.3 8°40.7	326°24.1 8°51.6	340°58.0 9°02.4	355°31.8 9°13.2	10°05.6 9°24.0	24°39.4 9°34.7	39°13.2 9°45.4	53°47.0 9°56.0	68°20.8 10°06.6	82°54.5 10°17.1	97°28.3 10°27.6	+33.8 +10.7	14.9 54.7
	Tu 28	315°51.8 12°58.8	330°25.2 13°08.4	344°58.6 13°18.0	359°31.9 13°27.5	14°05.2 13°36.9	28°38.5 13°46.3	43°11.7 13°55.7	57°44.9 14°05.0	72°18.1 14°14.2	86°51.3 14°23.3	101°24.4 14°32.4	+33.3 +9.4	14.8 54.3
○	We 29	319°37.5 16°40.7	334°10.1 16°48.7	348°42.7 16°56.6	363°15.2 17°04.5	17°47.7 17°12.2	32°20.2 17°19.9	46°52.6 17°27.5	61°25.0 17°35.1	75°57.4 17°42.5	90°29.7 17°49.9	105°02.0 17°57.2	+32.4 +7.7	14.7 54.0
	Th 30	323°01.8 19°37.0	337°33.5 19°43.0	352°05.2 19°48.9	366°36.8 19°54.7	21°08.4 20°00.4	35°39.9 20°06.0	50°11.5 20°11.5	64°40.3 20°16.9	79°14.4 20°22.3	93°45.8 20°27.5	108°17.2 20°32.7	+31.5 +5.6	14.7 53.9
○	Fr 31	326°04.1 21°38.8	340°35.0 21°42.4	355°05.8 21°45.9	369°36.7 21°49.3	24°07.5 21°52.7	38°38.2 21°55.9	53°09.0 21°59.0	67°39.7 22°02.0	82°10.4 22°04.9	96°41.1 22°07.8	111°11.8 22°10.5	+30.8 +3.2	14.7 53.9

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameterRow 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 2 14h12 — FQ: 10 17h11 — FM: 17 11h19 — LQ: 24 04h57

SUN

June 2030

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Sa 1	276°32.4 22°03.8	285°32.3 22°04.1	300°32.2 22°04.4	315°32.1 22°04.8	330°32.0 22°05.1	345°31.9 22°05.4	6°31.8 22°05.8	15°31.7 22°06.1	30°31.6 22°06.4	45°31.5 22°06.8	60°31.4 22°07.1	75°31.3 22°07.4	-0.1 +0.3
Su 2	270°30.0 22°11.7	285°29.9 22°12.0	300°29.8 22°12.3	315°29.7 22°12.6	330°29.6 22°13.0	345°29.5 22°13.3	0°29.4 22°13.6	15°29.3 22°13.9	30°29.2 22°14.2	45°29.1 22°14.5	60°29.0 22°14.9	75°28.9 22°15.2	-0.1 +0.3
Mo 3	270°27.5 22°19.2	285°27.4 22°19.5	300°27.3 22°19.8	315°27.2 22°20.1	330°27.1 22°20.4	345°27.0 22°20.7	0°26.9 22°21.0	15°26.8 22°21.3	30°26.7 22°21.6	45°26.6 22°21.9	60°26.5 22°22.2	75°26.4 22°22.5	-0.1 +0.3
Tu 4	270°25.0 22°26.3	285°24.9 22°26.6	300°24.8 22°26.9	315°24.7 22°27.2	330°24.6 22°27.5	345°24.5 22°27.8	0°24.3 22°28.1	15°24.2 22°28.4	30°24.1 22°28.6	45°24.0 22°28.9	60°23.9 22°29.2	75°23.8 22°29.5	-0.1 +0.3
We 5	270°22.4 22°33.1	285°22.3 22°33.4	300°22.1 22°33.6	315°22.0 22°33.9	330°21.9 22°34.2	345°21.8 22°34.5	0°21.7 22°34.7	15°21.6 22°35.0	30°21.5 22°35.3	45°21.4 22°35.5	60°21.2 22°35.8	75°21.1 22°36.1	-0.1 +0.3
Th 6	270°19.6 22°39.4	285°19.5 22°39.7	300°19.4 22°40.0	315°19.3 22°40.2	330°19.2 22°40.5	345°19.1 22°40.7	0°19.0 22°41.0	15°18.8 22°41.2	30°18.7 22°41.5	45°18.6 22°41.7	60°18.5 22°42.0	75°18.4 22°42.2	-0.1 +0.3
Fr 7	270°16.9 22°45.4	285°16.7 22°45.6	300°16.6 22°45.9	315°16.5 22°46.1	330°16.4 22°46.4	345°16.3 22°46.6	0°16.2 22°46.8	15°16.0 22°47.1	30°15.9 22°47.3	45°15.8 22°47.5	60°15.7 22°47.8	75°15.6 22°48.0	-0.1 +0.2
Sa 8	270°14.0 22°51.0	285°13.9 22°51.2	300°13.8 22°51.4	315°13.7 22°51.6	330°13.5 22°51.8	345°13.4 22°52.1	0°13.3 22°52.3	15°13.2 22°52.5	30°13.1 22°52.7	45°12.9 22°52.9	60°12.8 22°53.1	75°12.7 22°53.4	-0.1 +0.2
Su 9	270°11.1 22°56.1	285°11.0 22°56.3	300°10.9 22°56.5	315°10.7 22°56.7	330°10.6 22°56.9	345°10.5 22°57.1	0°10.4 22°57.3	15°10.2 22°57.5	30°10.1 22°57.7	45°10.0 22°57.9	60°09.9 22°58.1	75°09.8 22°59.3	-0.1 +0.2
Mo 10	270°08.1 23°00.8	285°08.0 23°01.0	300°07.9 23°01.2	315°07.8 23°01.4	330°07.6 23°01.6	345°07.5 23°01.8	0°07.4 23°02.0	15°07.3 23°02.2	30°07.1 23°02.4	45°07.0 23°02.6	60°06.9 23°02.7	75°06.8 23°02.9	-0.1 +0.2
Tu 11	270°05.1 23°05.2	285°05.0 23°05.4	300°04.9 23°05.5	315°04.7 23°05.7	330°04.6 23°05.9	345°04.5 23°06.0	0°04.4 23°06.2	15°04.2 23°06.4	30°04.1 23°06.6	45°04.0 23°06.7	60°03.9 23°06.9	75°03.7 23°07.0	-0.1 +0.2
We 12	270°02.1 23°09.1	285°01.9 23°09.3	300°01.8 23°09.4	315°01.7 23°09.6	330°01.5 23°09.7	345°01.4 23°09.9	0°01.3 23°10.0	15°01.2 23°10.2	30°01.0 23°10.3	45°00.9 23°10.5	60°00.8 23°10.7	75°00.6 23°10.8	-0.1 +0.2
Th 13	269°59.0 23°12.7	284°58.8 23°12.8	299°58.7 23°12.9	314°58.6 23°13.1	329°58.4 23°13.2	344°58.3 23°13.3	359°58.2 23°13.5	14°58.0 23°13.6	29°57.9 23°13.7	44°57.8 23°13.9	59°57.6 23°14.0	74°57.5 23°14.1	-0.1 +0.1
Fr 14	269°55.8 23°15.8	284°55.7 23°15.9	299°55.6 23°16.0	314°55.4 23°16.1	329°55.3 23°16.3	344°55.2 23°16.4	359°55.0 23°16.5	14°54.9 23°16.6	29°54.8 23°16.7	44°54.7 23°16.8	59°54.5 23°17.0	74°54.4 23°17.1	-0.1 +0.1
Sa 15	269°52.7 23°18.5	284°52.5 23°18.6	299°52.4 23°18.7	314°52.3 23°18.8	329°52.1 23°18.9	344°52.0 23°19.0	359°51.9 23°19.1	14°51.7 23°19.2	29°51.6 23°19.3	44°51.5 23°19.4	59°51.3 23°19.5	74°51.2 23°19.6	-0.1 +0.1
Su 16	269°49.5 23°20.8	284°49.3 23°20.9	299°49.2 23°21.0	314°49.1 23°21.0	329°48.9 23°21.1	344°48.8 23°21.2	359°48.7 23°21.3	14°48.5 23°21.4	29°48.4 23°21.5	44°48.3 23°21.6	59°48.1 23°21.7	74°48.0 23°21.7	-0.1 +0.1
Mo 17	269°46.2 23°22.7	284°46.1 23°22.7	299°46.0 23°22.8	314°45.8 23°22.9	329°45.7 23°22.9	344°45.6 23°23.0	359°45.4 23°23.1	14°45.3 23°23.1	29°45.2 23°23.2	44°45.0 23°23.3	59°44.9 23°23.4	74°44.8 23°23.4	-0.1 +0.1
Tu 18	269°42.9 23°24.1	284°42.9 23°24.2	299°42.7 23°24.2	314°42.6 23°24.3	329°42.5 23°24.3	344°42.3 23°24.4	359°42.2 23°24.4	14°42.1 23°24.5	29°42.0 23°24.5	44°41.8 23°24.6	59°41.7 23°24.6	74°41.5 23°24.7	-0.1 +0.0
We 19	269°39.8 23°25.2	284°39.6 23°25.2	299°39.5 23°25.3	314°39.3 23°25.3	329°39.2 23°25.3	344°39.1 23°25.4	359°38.9 23°25.4	14°38.8 23°25.4	29°38.7 23°25.5	44°38.5 23°25.5	59°38.4 23°25.5	74°38.3 23°25.5	-0.1 +0.0
Th 20	269°36.5 23°25.8	284°36.4 23°25.9	299°36.2 23°25.9	314°36.1 23°25.9	329°36.0 23°25.9	344°35.8 23°25.9	359°35.7 23°25.9	14°35.6 23°26.0	29°35.4 23°26.0	44°35.3 23°26.0	59°35.1 23°26.0	74°35.0 23°26.0	-0.1 +0.0
Fr 21	269°33.2 23°26.1	284°33.1 23°26.1	299°33.0 23°26.1	314°32.8 23°26.1	329°32.7 23°26.1	344°32.6 23°26.1	359°32.4 23°26.1	14°32.3 23°26.1	29°32.2 23°26.1	44°32.0 23°26.1	59°31.9 23°26.1	74°31.7 23°26.1	-0.1 -0.0
Sa 22	269°30.0 23°25.9	284°29.9 23°25.9	299°29.7 23°25.9	314°29.6 23°25.8	329°29.4 23°25.8	344°29.3 23°25.8	359°29.2 23°25.8	14°29.0 23°25.8	29°28.9 23°25.8	44°28.8 23°25.7	59°28.6 23°25.7	74°28.5 23°25.7	-0.1 -0.0
Su 23	269°26.7 23°25.3	284°26.6 23°25.3	299°26.5 23°25.2	314°26.3 23°25.2	329°26.2 23°25.2	344°26.1 23°25.1	359°25.9 23°25.1	14°25.8 23°25.1	29°25.6 23°25.2	44°25.5 23°25.2	59°25.4 23°25.2	74°25.3 23°25.0	-0.1 -0.0
Mo 24	269°23.5 23°24.3	284°23.4 23°24.2	299°23.2 23°24.2	314°23.1 23°24.1	329°23.0 23°24.1	344°22.8 23°24.0	359°22.7 23°24.0	14°22.6 23°24.0	29°22.5 23°24.0	44°22.3 23°24.0	59°22.2 23°24.0	74°22.0 23°23.7	-0.1 -0.1
Tu 25	269°20.3 23°22.9	284°20.2 23°22.8	299°20.0 23°22.7	314°19.9 23°22.7	329°19.8 23°22.6	344°19.6 23°22.5	359°19.5 23°22.5	14°19.4 23°22.4	29°19.2 23°22.4	44°19.1 23°22.4	59°19.0 23°22.4	74°18.8 23°22.2	-0.1 -0.1
We 26	269°17.1 23°21.0	284°17.0 23°21.0	299°16.8 23°20.9	314°16.7 23°20.8	329°16.6 23°20.7	344°16.5 23°20.6	359°16.3 23°20.5	14°16.2 23°20.4	29°16.0 23°20.4	44°15.9 23°20.3	59°15.8 23°20.3	74°15.7 23°20.2	-0.1 -0.1
Th 27	269°14.0 23°18.8	284°13.8 23°18.7	299°13.7 23°18.6	314°13.6 23°18.5	329°13.4 23°18.4	344°13.3 23°18.3	359°13.2 23°18.2	14°13.1 23°18.1	29°12.9 23°18.1	44°12.8 23°18.0	59°12.7 23°17.9	74°12.5 23°17.7	-0.1 -0.1
Fr 28	269°10.9 23°16.1	284°10.7 23°16.0	299°10.6 23°15.9	314°10.5 23°15.8	329°10.3 23°15.7	344°10.2 23°15.5	359°10.0 23°15.4	14°10.0 23°15.3	29°09.8 23°15.3	44°09.7 23°15.2	59°09.6 23°15.0	74°09.4 23°14.8	-0.1 -0.1
Sa 29	269°07.8 23°13.1	284°07.7 23°13.0	299°07.5 23°12.8	314°07.4 23°12.7	329°07.3 23°12.5	344°07.2 23°12.4	359°07.0 23°12.3	14°06.9 23°12.2	29°06.8 23°12.2	44°06.7 23°12.1	59°06.5 23°11.8	74°06.4 23°11.5	-0.1 -0.1
Su 30	269°04.8 23°09.6	284°04.7 23°09.5	299°04.5 23°09.3	314°04.4 23°09.2	329°04.3 23°09.0	344°04.2 23°08.8	359°04.0 23°08.7	14°03.9 23°08.5	29°03.8 23°08.4	44°03.7 23°08.2	59°03.5 23°08.1	74°03.4 23°07.9	-0.1 -0.2

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

June 2030

	D	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	Δ°/h	SH
Sa 1	241 ⁰ 46.7 22 ⁰ 30.3	256 ⁰ 17.1 22 ⁰ 31.9	270 ⁰ 47.5 22 ⁰ 33.5	285 ⁰ 18.0 22 ⁰ 35.0	299 ⁰ 48.4 22 ⁰ 36.3	314 ⁰ 18.8 22 ⁰ 37.6	328 ⁰ 49.1 22 ⁰ 38.7	343 ⁰ 19.5 22 ⁰ 39.8	357 ⁰ 49.8 22 ⁰ 40.7	12 ⁰ 20.2 22 ⁰ 41.5	26 ⁰ 50.5 22 ⁰ 42.2	+30.4	14.7	
	244 ⁰ 24.4 22 ⁰ 40.1	258 ⁰ 54.7 22 ⁰ 39.4	273 ⁰ 24.9 22 ⁰ 38.0	287 ⁰ 55.2 22 ⁰ 36.8	302 ⁰ 25.4 22 ⁰ 35.5	316 ⁰ 55.6 22 ⁰ 34.1	331 ⁰ 25.9 22 ⁰ 32.5	345 ⁰ 56.1 22 ⁰ 30.5	3 ⁰ 26.4 22 ⁰ 29.9	14 ⁰ 56.7 22 ⁰ 27.3	29 ⁰ 26.9 22 ⁰ 25.3	+30.2	14.8	
Su 2	247 ⁰ 02.1 21 ⁰ 43.0	261 ⁰ 32.5 21 ⁰ 39.4	276 ⁰ 03.0 21 ⁰ 35.6	290 ⁰ 33.4 21 ⁰ 31.8	305 ⁰ 03.9 21 ⁰ 27.8	319 ⁰ 34.5 21 ⁰ 23.7	334 ⁰ 05.0 21 ⁰ 19.6	348 ⁰ 35.5 21 ⁰ 15.3	3 ⁰ 06.1 21 ⁰ 10.9	17 ⁰ 26.7 21 ⁰ 06.4	32 ⁰ 07.3 21 ⁰ 01.9	+30.5	14.8	
	249 ⁰ 49.1 19 ⁰ 41.3	264 ⁰ 20.1 19 ⁰ 35.2	278 ⁰ 51.1 19 ⁰ 29.0	293 ⁰ 22.1 19 ⁰ 22.6	307 ⁰ 53.2 19 ⁰ 16.2	322 ⁰ 24.2 19 ⁰ 09.7	336 ⁰ 55.3 19 ⁰ 03.1	351 ⁰ 26.5 18 ⁰ 56.4	5 ⁰ 57.6 18 ⁰ 49.6	20 ⁰ 28.8 18 ⁰ 42.7	35 ⁰ 00.0 18 ⁰ 35.8	+31.1	14.9	
Tu 4	252 ⁰ 51.3 16 ⁰ 40.8	267 ⁰ 22.9 16 ⁰ 32.4	281 ⁰ 54.6 16 ⁰ 24.0	296 ⁰ 26.3 16 ⁰ 15.5	310 ⁰ 58.0 16 ⁰ 07.0	325 ⁰ 29.7 15 ⁰ 58.3	340 ⁰ 01.4 15 ⁰ 49.6	354 ⁰ 33.2 15 ⁰ 40.7	9 ⁰ 05.0 15 ⁰ 31.9	23 ⁰ 36.8 15 ⁰ 22.9	38 ⁰ 08.7 15 ⁰ 13.9	+31.7	15.0	
	256 ⁰ 08.9 12 ⁰ 49.5	270 ⁰ 41.1 12 ⁰ 39.4	285 ⁰ 13.3 12 ⁰ 29.1	299 ⁰ 45.5 12 ⁰ 18.8	314 ⁰ 17.7 12 ⁰ 08.5	328 ⁰ 49.9 11 ⁰ 58.0	343 ⁰ 22.2 11 ⁰ 47.5	357 ⁰ 54.4 11 ⁰ 37.0	12 ⁰ 26.7 11 ⁰ 26.4	26 ⁰ 59.0 11 ⁰ 15.7	41 ⁰ 31.3 11 ⁰ 05.0	+32.2	15.2	
Th 6	259 ⁰ 36.7 8 ⁰ 17.3	274 ⁰ 09.0 8 ⁰ 05.7	288 ⁰ 41.4 7 ⁰ 54.0	303 ⁰ 13.8 7 ⁰ 42.3	317 ⁰ 46.2 7 ⁰ 30.6	332 ⁰ 18.6 7 ⁰ 18.8	346 ⁰ 51.0 7 ⁰ 07.0	1 ⁰ 23.4 6 ⁰ 55.1	15 ⁰ 55.7 6 ⁰ 43.2	30 ⁰ 28.1 6 ⁰ 31.2	45 ⁰ 00.5 6 ⁰ 19.2	+32.4	15.4	
	263 ⁰ 04.5 3 ⁰ 14.7	277 ⁰ 36.7 3 ⁰ 02.1	292 ⁰ 08.8 2 ⁰ 49.6	306 ⁰ 40.9 2 ⁰ 36.9	321 ⁰ 12.9 2 ⁰ 24.3	335 ⁰ 45.0 2 ⁰ 11.6	350 ⁰ 17.0 1 ⁰ 58.9	4 ⁰ 49.0 1 ⁰ 46.2	19 ⁰ 20.9 1 ⁰ 33.5	33 ⁰ 52.9 1 ⁰ 20.7	48 ⁰ 24.9 1 ⁰ 07.9	+32.0	15.6	
Sa 8	266 ⁰ 19.0 -2 ⁰ 05.8	280 ⁰ 50.2 -2 ⁰ 18.8	295 ⁰ 21.5 -2 ⁰ 31.8	309 ⁰ 52.6 -2 ⁰ 44.8	324 ⁰ 23.8 -2 ⁰ 57.8	338 ⁰ 54.9 -3 ⁰ 10.8	353 ⁰ 25.9 -3 ⁰ 23.8	7 ⁰ 56.9 -3 ⁰ 36.8	22 ⁰ 27.8 -3 ⁰ 49.8	36 ⁰ 58.7 -4 ⁰ 02.8	51 ⁰ 29.5 -4 ⁰ 15.8	+31.1	15.8	
	269 ⁰ 04.2 -7 ⁰ 29.5	283 ⁰ 33.9 -7 ⁰ 42.2	298 ⁰ 03.6 -7 ⁰ 55.0	312 ⁰ 33.3 -8 ⁰ 07.7	327 ⁰ 02.8 -8 ⁰ 20.4	341 ⁰ 32.3 -8 ⁰ 33.0	356 ⁰ 01.7 -8 ⁰ 45.6	10 ⁰ 31.0 -8 ⁰ 58.2	25 ⁰ 00.2 -9 ⁰ 10.8	39 ⁰ 29.4 -9 ⁰ 23.3	53 ⁰ 58.4 -9 ⁰ 35.8	+29.4	16.1	
Mo 10	271 ⁰ 04.2 -12 ⁰ 37.7	285 ⁰ 31.9 -12 ⁰ 49.9	299 ⁰ 59.4 -13 ⁰ 01.0	314 ⁰ 26.9 -13 ⁰ 12.5	328 ⁰ 54.3 -13 ⁰ 24.0	343 ⁰ 21.6 -13 ⁰ 35.5	357 ⁰ 48.7 -13 ⁰ 46.8	12 ⁰ 15.8 -13 ⁰ 58.1	26 ⁰ 42.8 -14 ⁰ 09.3	41 ⁰ 09.7 -14 ⁰ 20.5	55 ⁰ 36.5 -14 ⁰ 31.5	+27.2	16.3	
	272 ⁰ 06.5 -17 ⁰ 07.2	286 ⁰ 31.7 -17 ⁰ 16.8	300 ⁰ 56.8 -17 ⁰ 26.3	315 ⁰ 21.8 -17 ⁰ 35.7	329 ⁰ 46.7 -17 ⁰ 45.0	344 ⁰ 11.5 -17 ⁰ 54.2	358 ⁰ 36.2 -18 ⁰ 03.2	13 ⁰ 00.8 -18 ⁰ 12.2	27 ⁰ 25.3 -18 ⁰ 21.0	41 ⁰ 49.7 -18 ⁰ 29.7	56 ⁰ 14.1 -18 ⁰ 38.3	+24.8	16.5	
We 12	272 ⁰ 07.9 -20 ⁰ 31.7	286 ⁰ 30.8 -20 ⁰ 38.2	300 ⁰ 53.6 -20 ⁰ 44.5	315 ⁰ 16.3 -20 ⁰ 50.7	329 ⁰ 39.9 -20 ⁰ 56.7	344 ⁰ 01.6 -21 ⁰ 02.5	358 ⁰ 24.1 -21 ⁰ 08.2	12 ⁰ 46.6 -21 ⁰ 13.8	27 ⁰ 09.0 -21 ⁰ 19.2	41 ⁰ 31.3 -21 ⁰ 24.4	55 ⁰ 53.6 -21 ⁰ 29.5	+22.6	16.6	
	270 ⁰ 20.9 -22 ⁰ 26.2	285 ⁰ 42.0 -22 ⁰ 30.9	300 ⁰ 38.8 -22 ⁰ 33.0	314 ⁰ 25.3 -22 ⁰ 35.0	328 ⁰ 46.7 -22 ⁰ 36.7	343 ⁰ 08.1 -22 ⁰ 38.2	357 ⁰ 29.5 -22 ⁰ 39.7	11 ⁰ 50.8 -22 ⁰ 40.9	26 ⁰ 12.1 -22 ⁰ 41.9	40 ⁰ 33.5 -22 ⁰ 42.8	54 ⁰ 54.8 -22 ⁰ 42.8	+21.4	16.7	
Fr 14	270 ⁰ 15.3 -22 ⁰ 34.8	284 ⁰ 36.8 -22 ⁰ 32.9	298 ⁰ 58.4 -22 ⁰ 30.8	313 ⁰ 20.0 -22 ⁰ 28.5	327 ⁰ 41.6 -22 ⁰ 26.1	342 ⁰ 03.3 -22 ⁰ 23.5	356 ⁰ 25.0 -22 ⁰ 20.7	10 ⁰ 46.8 -22 ⁰ 17.8	25 ⁰ 08.6 -22 ⁰ 14.6	39 ⁰ 30.5 -22 ⁰ 11.1	53 ⁰ 52.4 -22 ⁰ 07.9	+21.7	16.6	
	269 ⁰ 29.0 -20 ⁰ 57.1	283 ⁰ 52.0 -20 ⁰ 51.2	298 ⁰ 15.1 -20 ⁰ 45.1	312 ⁰ 38.3 -20 ⁰ 38.8	327 ⁰ 01.6 -20 ⁰ 32.5	341 ⁰ 25.0 -20 ⁰ 25.9	355 ⁰ 48.5 -20 ⁰ 19.3	10 ⁰ 12.0 -20 ⁰ 12.5	24 ⁰ 35.7 -20 ⁰ 05.6	38 ⁰ 59.4 -19 ⁰ 58.5	53 ⁰ 23.4 -19 ⁰ 51.3	+23.4	16.5	
Su 16	269 ⁰ 32.8 -17 ⁰ 48.5	283 ⁰ 58.8 -17 ⁰ 39.4	298 ⁰ 23.8 -17 ⁰ 30.2	312 ⁰ 49.5 -17 ⁰ 20.9	327 ⁰ 15.2 -17 ⁰ 11.5	341 ⁰ 41.1 -17 ⁰ 02.0	356 ⁰ 07.1 -16 ⁰ 52.4	10 ⁰ 33.2 -16 ⁰ 42.7	24 ⁰ 59.4 -16 ⁰ 32.9	39 ⁰ 25.7 -16 ⁰ 23.1	53 ⁰ 52.1 -16 ⁰ 13.1	+25.9	16.3	
	270 ⁰ 40.8 -13 ⁰ 33.9	285 ⁰ 08.9 -13 ⁰ 32.7	299 ⁰ 37.1 -13 ⁰ 11.4	314 ⁰ 05.4 -13 ⁰ 00.1	328 ⁰ 33.7 -12 ⁰ 48.7	343 ⁰ 02.2 -12 ⁰ 37.3	357 ⁰ 30.8 -12 ⁰ 25.8	11 ⁰ 59.4 -12 ⁰ 14.3	26 ⁰ 28.2 -12 ⁰ 02.7	40 ⁰ 57.1 -11 ⁰ 51.1	55 ⁰ 26.0 -11 ⁰ 39.4	+28.5	16.0	
Tu 18	272 ⁰ 51.2 -8 ⁰ 39.2	287 ⁰ 21.5 -8 ⁰ 26.9	301 ⁰ 52.0 -8 ⁰ 14.6	316 ⁰ 22.5 -8 ⁰ 02.3	330 ⁰ 53.1 -7 ⁰ 49.9	345 ⁰ 23.7 -7 ⁰ 37.6	359 ⁰ 54.5 -7 ⁰ 25.2	14 ⁰ 25.3 -7 ⁰ 12.8	28 ⁰ 56.2 -7 ⁰ 00.3	43 ⁰ 27.2 -6 ⁰ 47.9	57 ⁰ 58.2 -6 ⁰ 35.4	+30.7	15.8	
	275 ⁰ 51.9 -9 ⁰ 27.3	290 ⁰ 23.9 -8 ⁰ 14.7	304 ⁰ 56.0 -8 ⁰ 02.1	319 ⁰ 28.2 -7 ⁰ 49.5	334 ⁰ 00.4 -7 ⁰ 37.0	348 ⁰ 32.7 -7 ⁰ 24.4	3 ⁰ 05.0 -7 ⁰ 11.9	17 ⁰ 37.4 -1 ⁰ 59.3	32 ⁰ 09.8 -1 ⁰ 46.8	46 ⁰ 42.3 -1 ⁰ 34.3	61 ⁰ 14.8 -1 ⁰ 21.7	+32.3	15.5	
Th 20	290 ⁰ 23.9 -9 ⁰ 14.7	304 ⁰ 56.0 -9 ⁰ 02.1	319 ⁰ 28.2 -8 ⁰ 49.5	334 ⁰ 00.4 -8 ⁰ 37.0	348 ⁰ 32.7 -8 ⁰ 24.4	3 ⁰ 05.0 -7 ⁰ 11.9	17 ⁰ 37.4 -1 ⁰ 59.3	32 ⁰ 09.8 -1 ⁰ 46.8	46 ⁰ 42.3 -1 ⁰ 34.3	61 ⁰ 14.8 -1 ⁰ 21.7	75 ⁰ 47.7 -1 ⁰ 09.2	+32.3	15.5	
	294 ⁰ 00.3 1 ⁰ 56.6	308 ⁰ 33.5 2 ⁰ 08.8	323 ⁰ 06.6 2 ⁰ 21.0	337 ⁰ 39.8 2 ⁰ 33.2	352 ⁰ 13.0 2 ⁰ 45.3	3 ⁰ 46.2 2 ⁰ 57.5	21 ⁰ 19.5 3 ⁰ 09.6	35 ⁰ 52.8 3 ⁰ 21.6	50 ⁰ 26.1 3 ⁰ 33.7	64 ⁰ 59.1 3 ⁰ 45.7	79 ⁰ 32.8 3 ⁰ 57.7	+33.2	15.3	
Sa 22	297 ⁰ 54.6 6 ⁰ 53.5	312 ⁰ 28.1 7 ⁰ 04.9	327 ⁰ 01.7 7 ⁰ 16.3	341 ⁰ 35.2 7 ⁰ 27.6	356 ⁰ 08.8 7 ⁰ 38.9	10 ⁰ 42.3 7 ⁰ 50.2	25 ⁰ 15.8 8 ⁰ 01.4	39 ⁰ 49.8 8 ⁰ 12.6	54 ⁰ 22.9 8 ⁰ 23.7	68 ⁰ 56.5 8 ⁰ 34.8	83 ⁰ 30.0 8 ⁰ 45.8	+33.0	15.1	
	301 ⁰ 52.2 11 ⁰ 25.4	316 ⁰ 25.6 11 ⁰ 35.6	330 ⁰ 59.0 11 ⁰ 45.8	345 ⁰ 32.4 11 ⁰ 55.9	0 ⁰ 05.7 12 ⁰ 05.9	14 ⁰ 39.1 12 ⁰ 15.9	29 ⁰ 12.4 12 ⁰ 25.9	43 ⁰ 45.7 12 ⁰ 35.7	58 ⁰ 18.9 12 ⁰ 45.6	72 ⁰ 52.2 12 ⁰ 55.3	87 ⁰ 25.4 13 ⁰ 05.0	+33.3	14.9	
Mo 24	305 ⁰ 41.2 15 ⁰ 23.0	320 ⁰ 14.1 15 ⁰ 31.6	334 ⁰ 46.9 15 ⁰ 40.2	349 ⁰ 19.7 15 ⁰ 48.7	3 ⁰ 52.4 15 ⁰ 57.2	18 ⁰ 25.2 16 ⁰ 05.6	32 ⁰ 57.9 16 ⁰ 13.9	47 ⁰ 30.5 16 ⁰ 22.1	62 ⁰ 03.2 16 ⁰ 30.3	76 ⁰ 35.8 16 ⁰ 38.4	91 ⁰ 08.4 16 ⁰ 46.4	+32.7	14.8	
	309 ⁰ 13.1 18 ⁰ 37.4	323 ⁰ 45.1 18 ⁰ 44.2	338 ⁰ 17.1 18 ⁰ 50.9	352 ⁰ 49.1 18 ⁰ 57.5	7 ⁰ 21.0 19 ⁰ 10.4	21 ⁰ 52.9 19 ⁰ 16.7	36 ⁰ 24.8 19 ⁰ 10.4	50 ⁰ 56.7 19 ⁰ 23.0	65 ⁰ 28.5 19 ⁰ 29.1	80 ⁰ 00.2 19 ⁰ 35.2	94 ⁰ 31.9 19 ⁰ 41.2	+31.9	14.7	
We 26	312 ⁰ 23.8 21 ⁰ 00.3	326 ⁰ 55.0 21 ⁰ 09.3	341 ⁰ 26.1 21 ⁰ 09.3	355 ⁰ 57.2 21 ⁰ 13.6	10 ⁰ 28.3 21 ⁰ 17.9	24 ⁰ 59.4 21 ⁰ 22.0	39 ⁰ 30.4 21 ⁰ 26.1	54 ⁰ 01.4 21 ⁰ 30.0	68 ⁰ 32.4 21 ⁰ 33.9	83 ⁰ 03.3 21 ⁰ 37.6	97 ⁰ 34.2 21 ⁰ 41.3	+31.0	14.7	
	315 ⁰ 14.6 22 ⁰ 24.0	329 ⁰ 45.1 22 ⁰ 26.1	344 ⁰ 15.5 22 ⁰ 28.0	358 ⁰ 46.8 22 ⁰ 29.8	13 ⁰ 16.4 22 ⁰ 33.1	27 ⁰ 46.8 22 ⁰ 33.1	42 ⁰ 17.2 22 ⁰ 34.6	56 ⁰ 47.6 22 ⁰ 36.0	71 ⁰ 18.0 22 ⁰ 37.5	85 ⁰ 48.3 22 ⁰ 38.5	100 ⁰ 18.6 22 ⁰ 39.6	+30.4	14.7	
Fr 28	317 ⁰ 51.9 22 ⁰ 43.0	332 ⁰ 22.0 22 ⁰ 42.3	346 ⁰ 52.1 22 ⁰ 41.6	1 ⁰ 22.3 22 ⁰ 40.7	15									

SUN

July 2030

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Mo 1	268°01.8	284°01.7	299°01.6	314°01.5	329°01.3	344°01.2	359°01.1	14°01.0	29°00.9	44°00.7	59°00.6	74°00.5	-0.1
	23°05.7	23°05.6	23°05.4	23°05.2	23°05.1	23°04.9	23°04.7	23°04.5	23°04.4	23°04.2	23°04.0	23°03.8	-0.2
Tu 2	268°58.9	283°58.8	298°58.7	313°58.6	328°58.5	343°58.3	358°58.2	13°58.1	28°58.0	43°57.9	58°57.8	73°57.6	-0.1
	23°01.5	23°01.3	23°01.1	23°00.9	23°00.7	23°00.5	23°00.3	23°00.1	22°59.9	22°59.8	22°59.6	22°59.4	-0.2
We 3	268°56.1	283°56.0	298°55.9	313°55.8	328°55.7	343°55.5	358°55.4	13°55.3	28°55.2	43°55.1	58°55.0	73°54.9	-0.1
	22°56.8	22°56.6	22°56.4	22°56.2	22°56.0	22°55.8	22°55.6	22°55.3	22°55.1	22°54.9	22°54.7	22°54.5	-0.2
Th 4	268°53.4	283°53.3	298°53.2	313°53.1	328°52.9	343°52.8	358°52.7	13°52.6	28°52.5	43°52.4	58°52.3	73°52.2	-0.1
	22°51.7	22°51.5	22°51.3	22°51.0	22°50.8	22°50.6	22°50.4	22°50.1	22°49.9	22°49.7	22°49.5	22°49.2	-0.2
Fr 5	268°50.7	283°50.6	298°50.5	313°50.4	328°50.3	343°50.2	358°50.1	13°50.0	28°49.9	43°49.8	58°49.7	73°49.5	-0.1
	22°46.2	22°46.0	22°45.8	22°45.5	22°45.3	22°45.0	22°44.8	22°44.6	22°44.3	22°44.1	22°43.8	22°43.6	-0.2
Sa 6	268°48.2	283°48.1	298°48.0	313°47.9	328°47.8	343°47.7	358°47.5	13°47.4	28°47.3	43°47.2	58°47.1	73°47.0	-0.1
	22°40.4	22°40.1	22°39.8	22°39.6	22°39.3	22°39.1	22°38.8	22°38.6	22°38.3	22°38.1	22°37.8	22°37.5	-0.3
Su 7	268°45.7	283°45.6	298°45.5	313°45.4	328°45.3	343°45.2	358°45.1	13°45.0	28°44.9	43°44.8	58°44.7	73°44.6	-0.1
	22°34.1	22°33.8	22°33.6	22°33.3	22°33.0	22°32.7	22°32.5	22°32.2	22°31.9	22°31.6	22°31.4	22°31.1	-0.3
Mo 8	268°43.3	283°43.2	298°43.1	313°43.0	328°43.0	343°42.9	358°42.8	13°42.7	28°42.6	43°42.5	58°42.4	73°42.3	-0.1
	22°27.4	22°27.2	22°26.9	22°26.6	22°26.3	22°26.0	22°25.7	22°25.4	22°25.1	22°24.8	22°24.5	22°24.3	-0.3
Tu 9	268°41.1	283°41.0	298°40.9	313°40.8	328°40.7	343°40.6	358°40.5	13°40.4	28°40.3	43°40.3	58°40.2	73°40.1	-0.1
	22°20.4	22°20.1	22°19.8	22°19.5	22°19.2	22°18.9	22°18.6	22°18.3	22°18.0	22°17.7	22°17.3	22°17.0	-0.3
We 10	268°38.9	283°38.8	298°38.7	313°38.7	328°38.6	343°38.5	358°38.4	13°38.3	28°38.2	43°38.1	58°38.1	73°38.0	-0.1
	22°13.0	22°12.7	22°12.3	22°12.0	22°11.7	22°11.4	22°11.1	22°10.7	22°10.4	22°10.2	22°09.8	22°09.4	-0.3
Th 11	268°36.9	283°36.8	298°36.7	313°36.6	328°36.6	343°36.5	358°36.4	13°36.3	28°36.2	43°36.1	58°36.1	73°36.0	-0.1
	22°05.2	22°04.8	22°04.5	22°04.2	22°03.8	22°03.5	22°03.1	22°02.8	22°02.5	22°02.1	22°01.8	22°01.5	-0.3
Fr 12	268°35.0	283°34.9	298°34.8	313°34.7	328°34.6	343°34.6	358°34.5	13°34.4	28°34.3	43°34.3	58°34.2	73°34.1	-0.1
	21°57.0	21°56.6	21°56.3	21°55.9	21°55.6	21°55.2	21°54.9	21°54.5	21°54.2	21°53.8	21°53.5	21°53.1	-0.4
Sa 13	268°33.2	283°33.1	298°33.0	313°32.9	328°32.9	343°32.8	358°32.7	13°32.6	28°32.4	43°32.3	58°32.2	73°32.1	-0.1
	21°48.4	21°48.0	21°47.7	21°47.3	21°47.0	21°46.6	21°46.2	21°45.8	21°45.5	21°45.1	21°44.7	21°44.4	-0.4
Su 14	268°31.5	283°31.4	298°31.3	313°31.3	328°31.2	343°31.1	358°31.1	13°31.0	28°30.9	43°30.8	58°30.8	73°30.7	-0.1
	21°39.5	21°39.1	21°38.7	21°38.3	21°38.0	21°37.6	21°37.2	21°36.8	21°36.4	21°36.0	21°35.7	21°35.3	-0.4
Mo 15	268°29.9	283°29.9	298°29.8	313°29.7	328°29.7	343°29.6	358°29.5	13°29.5	28°29.4	43°29.3	58°29.3	73°29.2	-0.1
	21°30.2	21°29.8	21°29.4	21°29.0	21°28.6	21°28.2	21°27.8	21°27.4	21°27.0	21°26.6	21°26.2	21°25.8	-0.4
Tu 16	268°28.5	283°28.4	298°28.4	313°28.3	328°28.3	343°28.2	358°28.1	13°28.1	28°28.0	43°27.9	58°27.9	73°27.9	-0.1
	21°20.5	21°20.1	21°19.7	21°19.3	21°18.9	21°18.5	21°18.0	21°17.6	21°17.2	21°16.8	21°16.4	21°16.0	-0.4
We 17	268°27.2	283°27.1	298°27.1	313°27.0	328°27.0	343°26.9	358°26.9	13°26.8	28°26.8	43°26.7	58°26.7	73°26.6	-0.1
	21°10.5	21°10.1	21°09.6	21°09.2	21°08.8	21°08.3	21°07.9	21°07.5	21°07.1	21°06.6	21°06.2	21°05.8	-0.4
Th 18	268°26.0	283°26.0	298°25.9	313°25.9	328°25.8	343°25.8	358°25.7	13°25.7	28°25.6	43°25.6	58°25.6	73°25.5	-0.0
	21°00.1	20°59.7	20°59.2	20°58.8	20°58.3	20°57.9	20°57.4	20°57.0	20°56.6	20°56.1	20°55.7	20°55.2	-0.4
Fr 19	268°25.0	283°24.9	298°24.9	313°24.8	328°24.8	343°24.8	358°24.7	13°24.7	28°24.6	43°24.6	58°24.6	73°24.5	-0.0
	20°49.4	20°48.9	20°48.4	20°48.0	20°47.5	20°47.1	20°46.6	20°46.1	20°45.5	20°44.9	20°44.3	20°43.7	-0.5
Sa 20	268°24.1	283°24.0	298°24.0	313°23.9	328°23.9	343°23.9	358°23.8	13°23.8	28°23.8	43°23.7	58°23.7	73°23.7	-0.0
	20°38.3	20°37.8	20°37.3	20°36.8	20°36.4	20°35.9	20°35.4	20°35.0	20°34.5	20°34.0	20°33.5	20°33.1	-0.5
Su 21	268°23.3	283°23.3	298°23.2	313°23.2	328°23.2	343°23.1	358°23.1	13°23.1	28°23.1	43°23.0	58°23.0	73°23.0	-0.0
	20°26.8	20°26.3	20°25.8	20°25.4	20°24.9	20°24.4	20°23.9	20°23.4	20°22.9	20°22.4	20°21.9	20°21.4	-0.5
Mo 22	268°22.6	283°22.6	298°22.6	313°22.6	328°22.6	343°22.5	358°22.5	13°22.5	28°22.5	43°22.4	58°22.4	73°22.4	-0.0
	20°15.0	20°14.5	20°14.0	20°13.5	20°13.0	20°12.5	20°12.0	20°11.5	20°11.0	20°10.5	20°10.0	20°09.5	-0.5
Tu 23	268°22.1	283°22.1	298°22.1	313°22.1	328°22.1	343°22.1	358°22.0	13°22.0	28°22.0	43°22.0	58°22.0	73°22.0	-0.0
	20°02.9	20°02.4	20°01.9	20°01.4	20°00.8	20°00.3	19°59.8	19°59.3	19°58.8	19°58.3	19°57.7	19°57.2	-0.5
We 24	268°21.8	283°21.8	298°21.8	313°21.8	328°21.7	343°21.7	358°21.7	13°21.7	28°21.7	43°21.7	58°21.7	73°21.7	-0.0
	19°50.4	19°49.9	19°49.4	19°48.8	19°48.3	19°47.8	19°47.3	19°46.7	19°46.2	19°45.7	19°45.1	19°44.6	-0.5
Th 25	268°21.6	283°21.6	298°21.6	313°21.6	328°21.6	343°21.6	358°21.5	13°21.5	28°21.5	43°21.5	58°21.5	73°21.5	-0.0
	19°37.6	19°37.1	19°36.5	19°36.0	19°35.5	19°34.9	19°34.4	19°33.8	19°33.3	19°32.7	19°32.2	19°31.7	-0.5
Fr 26	268°21.5	283°21.5	298°21.5	313°21.5	328°21.5	343°21.5	358°21.5	13°21.5	28°21.5	43°21.5	58°21.5	73°21.5	+0.0
	19°24.5	19°24.0	19°23.4	19°22.8	19°22.3	19°21.7	19°21.2	19°20.6	19°20.1	19°19.5	19°18.9	19°18.4	-0.6
Sa 27	268°21.6	283°21.6	298°21.6	313°21.6	328°21.6	343°21.6	358°21.6	13°21.6	28°21.7	43°21.7	58°21.7	73°21.7	+0.0
	19°11.1	19°10.5	19°09.9	19°09.4	19°08.8	19°08.2	19°07.7	19°07.1	19°06.5	19°05.9	19°05.4	19°04.8	-0.6
Su 28	268°21.8	283°21.8	298°21.8	313°21.9	328°21.9	343°21.9	358°21.9	13°21.9	28°21.9	43°21.9	58°22.0	73°22.0	+0.0
	18°57.3	18°56.7	18°56.1	18°55.6	18°55.0	18°54.4	18°53.8	18°53.2	18°52.6	18°52.1	18°51.5	18°50.9	-0.6
Mo 29	268°22.2	283°22.2	298°22.2	313°22.3	328°22.2	343°22.3	358°22.3	13°22.3	28°22.4	43°22.4	58°22.4	73°22.4	+0.0
	18°43.2	18°42.6	18°42.0	18°41.4	18°40.8	18°40.3	18°39.7	18°39.1	18°38.5	18°37.9	18°37.3	18°36.7	-0.6
Tu 30	268°22.7	283°22.7	298°22.8	313°22.8	328°22.8	343°22.8	358°22.9	13°22.9	28°22.9	43°23.0	58°23.0	73°23.0	+0.0
	18°28.8	18°28.2	18°27.6	18°27.0	18°26.4	18°25.8	18°25.2	18°24.6	18°24.0	18°23.4	18°22.8	18°22.2	-0.6
We 31	268°23.4	283°23.4	298°23.5	313°23.5	328°23.5	343°23.6	358°23.6	13°23.6	28°23.7	43°23.7	58°23.7	73°23.8	+0.0
	18°14.2	18°13.5	18°12.9	18°12.3	18°11.7	18°11.1	18°10.4	18°09.8	18°09.2	18°08.6	18°08.0	18°07.3	-0.6

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 15.7'

MOON

July 2030

D	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	Δ'/h SH
Mo 1	236°02.1	250°32.6	265°03.2	279°33.7	294°04.3	308°34.9	323°05.6	337°36.2	352°06.9	6°37.7	21°08.4	+30.6 14.9
	20°33.4	20°28.2	20°22.8	20°17.3	20°11.7	20°06.0	20°00.2	19°54.3	19°48.4	19°42.3	19°36.1	-5.7 54.7
Tu 2	238°52.5	253°33.7	267°54.9	282°26.1	296°57.3	311°28.6	325°59.9	340°31.2	355°02.5	9°33.9	24°05.3	+31.3 15.0
	17°52.4	17°44.8	17°37.0	17°29.2	17°21.3	17°13.4	17°05.3	16°57.2	16°48.9	16°40.6	16°32.2	-8.0 55.1
We 3	241°59.6	256°31.4	271°03.2	285°35.1	300°07.0	314°38.9	329°10.9	343°42.8	358°14.8	12°46.8	27°18.8	+31.9 15.1
	14°17.0	14°07.3	13°57.7	13°47.9	13°38.1	13°28.2	13°18.2	13°08.2	12°58.1	12°48.0	12°37.8	-9.9 55.5
Th 4	245°21.6	259°53.9	274°26.2	288°58.5	303°30.9	318°03.2	332°35.6	347°08.0	1°40.4	16°12.8	30°45.2	+32.4 15.3
	9°57.2	9°46.1	9°34.9	9°23.6	9°12.3	9°00.9	8°49.5	8°38.1	8°26.6	8°15.1	8°03.5	-11.4 56.0
Fr 5	248°51.7	263°24.2	277°56.6	292°29.0	307°01.4	321°33.9	336°06.3	350°38.6	5°11.0	19°43.4	34°15.8	+32.4 15.4
	5°04.7	4°52.5	4°40.3	4°28.0	4°15.7	4°03.4	3°51.1	3°38.7	3°26.3	3°13.8	3°01.4	-12.3 56.6
Sa 6	252°19.2	266°51.2	281°23.3	295°55.3	310°27.2	324°59.2	339°31.1	354°03.0	8°34.8	23°06.6	37°38.4	+31.9 15.6
	-0°07.8	-0°20.5	-0°33.3	-0°46.0	-0°58.8	-1°11.5	-1°24.3	-1°37.0	-1°49.8	-2°02.6	-2°15.4	-12.8 57.2
Su 7	255°30.1	270°01.2	284°32.3	299°03.2	313°34.2	328°05.0	342°35.8	357°06.6	11°37.3	26°07.9	40°38.5	+30.8 15.8
	-5°26.4	-5°39.1	-5°51.7	-6°04.3	-6°16.9	-6°29.5	-6°42.1	-6°54.6	-7°07.1	-7°19.6	-7°32.1	-12.6 57.9
Mo 8	258°09.5	272°39.0	287°08.5	301°37.8	316°07.1	330°36.3	345°05.4	359°34.5	14°03.4	28°32.3	43°01.1	+29.2 16.0
	-10°35.1	-10°47.0	-10°58.9	-11°10.7	-11°22.4	-11°34.1	-11°45.7	-11°57.3	-12°08.8	-12°20.3	-12°31.7	-11.7 58.6
Tu 9	260°03.1	274°30.8	288°57.9	303°25.1	317°52.3	332°19.4	346°46.3	1°13.2	15°40.0	30°06.7	44°33.4	+27.0 16.2
	-15°15.1	-15°25.4	-15°35.6	-15°45.7	-15°55.8	-16°05.7	-16°15.6	-16°25.4	-16°35.1	-16°44.7	-16°54.2	-9.9 59.3
We 10	261°01.6	275°26.8	289°51.8	304°16.8	318°41.7	333°06.5	347°31.2	1°55.9	16°20.4	30°44.9	45°09.3	+24.8 16.3
	-19°04.4	-19°12.2	-19°19.8	-19°27.4	-19°34.8	-19°42.1	-19°49.3	-19°56.3	-20°03.2	-20°10.0	-20°16.7	-7.2 59.8
Th 11	261°05.9	275°29.1	289°52.3	304°15.4	318°38.4	333°01.4	347°24.3	1°47.2	16°10.8	30°32.8	44°55.5	+23.0 16.4
	-21°40.0	-21°44.4	-21°48.6	-21°52.7	-21°56.6	-22°00.4	-22°04.0	-22°07.5	-22°10.3	-22°13.9	-22°16.9	-3.7 60.3
Fr 12	260°31.9	274°54.1	289°16.4	303°38.6	318°00.8	332°22.9	346°45.1	1°07.3	15°29.5	29°51.7	44°13.9	+22.2 16.5
	-22°42.2	-22°42.6	-22°42.8	-22°42.8	-22°42.7	-22°42.4	-22°41.9	-22°41.2	-22°40.4	-22°39.4	-22°38.3	+0.4 60.5
Sa 13	259°48.8	274°11.4	288°34.0	302°56.7	317°19.4	331°42.1	346°04.9	0°27.8	14°50.7	29°13.6	43°36.6	+22.8 16.5
	-22°01.1	-21°57.4	-21°53.4	-21°49.3	-21°45.1	-21°40.6	-21°36.1	-21°31.3	-21°26.5	-21°21.4	-21°16.2	+4.5 60.5
Su 14	259°29.6	273°53.7	288°17.9	302°42.2	317°06.6	331°31.0	345°55.5	0°20.1	14°44.8	29°09.6	43°34.5	+24.5 16.4
	-19°41.0	-19°33.5	-19°25.9	-19°18.2	-19°10.4	-19°02.4	-18°54.3	-18°46.1	-18°37.8	-18°29.3	-18°20.7	-8.0 60.2
Mo 15	259°58.4	274°24.7	288°51.3	303°17.7	317°44.3	332°11.0	346°37.8	1°04.7	15°31.7	29°58.8	44°25.9	+26.8 16.2
	-15°59.0	-15°48.8	-15°38.5	-15°28.0	-15°17.5	-15°07.0	-14°56.3	-14°45.5	-14°34.7	-14°23.8	-14°12.8	-10.6 60.9
Tu 16	261°24.5	275°53.1	290°21.8	304°50.6	319°19.5	333°48.4	348°17.4	2°46.6	17°15.8	31°45.1	46°14.4	+29.0 16.0
	-11°19.9	-11°08.0	-11°00.5	-10°55.9	-10°43.9	-10°31.7	-10°19.6	-10°07.3	-9°55.1	-9°42.8	-9°30.5	-9°18.1
We 17	263°44.0	278°14.6	292°45.6	307°15.9	321°46.6	336°17.4	350°48.3	5°19.2	19°50.2	34°21.3	48°52.4	+30.8 15.8
	-6°09.2	-5°56.4	-5°43.6	-5°30.8	-5°18.0	-5°05.2	-4°52.4	-4°39.6	-4°26.7	-4°13.9	-4°01.1	-12.8 57.9
Th 18	266°45.6	281°17.5	295°49.5	310°21.5	324°53.6	339°25.7	353°57.8	8°30.0	23°02.2	37°34.4	52°06.7	+32.1 15.6
	-0°48.8	-0°36.1	-0°23.3	-0°10.6	0°02.1	0°14.8	0°27.5	0°40.1	0°52.7	1°05.3	1°17.9	-12.7 57.0
Fr 19	270°14.7	284°47.4	299°20.2	313°52.9	328°25.7	342°58.5	357°31.4	12°04.2	26°37.0	41°09.9	55°42.8	+32.8 15.3
	4°23.5	4°35.6	4°47.7	4°59.8	5°11.8	5°23.7	5°35.7	5°47.6	5°59.4	6°11.2	6°23.0	+12.0 56.2
Sa 20	273°57.0	288°30.0	303°03.0	317°36.0	332°08.9	346°41.9	1°14.9	15°47.9	30°20.8	44°53.8	59°26.7	+33.0 15.1
	9°14.2	9°25.2	9°36.2	9°47.1	9°58.0	10°08.8	10°19.5	10°30.2	10°40.9	10°51.5	11°02.0	+10.8 55.4
Su 21	288°30.0	303°03.0	317°36.0	332°08.9	346°41.9	1°14.9	15°47.9	30°20.8	44°53.8	59°26.7	73°59.7	+33.0 15.1
	9°25.2	9°36.2	9°47.1	9°58.0	10°08.8	10°19.5	10°30.2	10°40.9	10°51.5	11°02.0	11°12.5	+10.7 55.4
Mo 22	292°12.6	306°45.3	321°18.1	335°50.8	350°23.5	4°56.2	19°28.8	34°01.5	48°34.1	63°06.1	77°39.3	+32.7 14.9
	13°42.2	13°51.7	14°01.1	14°10.4	14°19.7	14°28.9	14°38.0	14°47.0	14°56.0	15°05.0	15°13.8	+9.2 54.8
Tu 23	295°45.2	310°17.4	324°49.5	339°21.7	353°53.8	8°25.9	22°57.9	37°29.9	52°01.9	66°33.9	81°05.8	+32.1 14.8
	17°17.6	17°25.2	17°32.8	17°40.2	17°47.6	17°55.0	18°02.2	18°09.3	18°16.4	18°23.4	18°30.3	+7.3 54.4
We 24	299°01.4	313°32.8	328°04.3	342°35.7	357°07.0	11°38.4	26°09.7	40°41.0	55°12.2	69°43.5	84°14.7	+31.3 14.8
	20°03.4	20°08.9	20°14.3	20°19.6	20°24.8	20°29.9	20°35.0	20°39.9	20°44.8	20°49.5	20°54.2	+1.5 54.2
Th 25	301°59.3	316°30.0	331°00.8	345°31.5	0°02.1	14°32.8	29°03.4	43°34.1	58°04.7	72°35.2	87°05.8	+30.6 14.8
	21°52.4	21°55.5	21°58.5	22°01.4	22°04.2	22°06.8	22°09.4	22°11.9	22°14.3	22°16.6	22°18.7	+2.6 54.1
Fr 26	304°41.7	319°11.9	333°42.2	348°12.4	2°42.6	17°12.9	31°43.1	46°13.2	60°43.4	75°13.6	89°43.8	+30.2 14.8
	22°38.7	22°39.2	22°39.6	22°39.9	22°40.0	22°40.1	22°40.0	22°40.0	22°39.6	22°39.2	22°38.7	+0.0 54.2
Sa 27	307°15.5	321°45.6	336°15.7	350°45.8	5°15.9	19°46.0	34°16.2	48°46.3	63°16.4	77°46.5	92°16.7	+30.1 14.8
	22°18.6	22°16.4	22°14.0	22°11.6	22°09.1	22°06.5	22°03.7	22°00.9	21°57.9	21°54.8	21°51.7	-2.7 54.4
Su 28	309°49.8	324°20.1	338°50.4	353°20.7	7°51.1	22°21.5	36°51.8	51°22.2	65°52.6	80°23.1	94°53.5	+30.4 14.9
	20°51.4	20°46.5	20°41.6	20°36.5	20°31.4	20°26.1	20°20.7	20°15.3	20°09.7	20°04.1	19°58.3	-5.3 54.8
Mo 29	312°32.7	327°03.4	341°34.2	356°05.1	10°35.9	25°06.8	39°37.7	54°08.6	68°39.5	83°10.5	97°41.5	+30.9 15.1
	18°20.2	18°13.0	18°05.6	17°58.1	17°50.5	17°42.9	17°35.1	17°27.3	17°19.4	17°11.4	17°03.3	-7.7 55.2
Tu 30	315°29.0	330°00.4	344°31.7	359°03.1	13°34.5	28°06.0	42°37.5	57°08.9	71°40.4	86°12.0	100°43.5	+31.5 15.2
	14°51.9	14°42.5	14°33.0	14°23.5	14°13.8	14°04.2	13°54.4	13°44.5	13°34.6	13°24.7	13°14.6	-9.7 55.7
We 31	318°39.0	333°10.8	347°42.7	2°14.5	16°46.4	31°18.3	45°50.2	60°22.1	74°54.0	89°26.0	103°57.9	+31.9 15.3
	10°36.1	10°25.0	10°13.9	10°02.7	9°51.5	9°40.2	9°28.9	9°17.5	9°06.1	8°54.6	8°43.1	-11.3 56.2

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (= South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 8 11h01 — FM: 15 02h12 — LQ: 22 08h07 — NM: 30 11h11

SUN

August 2030

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Th 1	268°24.2 17°59.2	283°24.3 17°58.5	298°24.3 17°57.9	313°24.3 17°57.3	328°24.4 17°56.7	343°24.4 17°56.0	358°24.5 17°55.4	13°24.5 17°54.8	28°24.5 17°54.1	43°24.6 17°53.5	58°24.6 17°52.8	73°24.7 17°52.2	+0.0 -0.6
Fr 2	268°25.2 17°43.9	283°25.3 17°43.3	298°25.3 17°42.6	313°25.4 17°42.0	328°25.4 17°41.3	343°25.4 17°40.7	358°25.5 17°40.0	13°25.5 17°39.4	28°25.6 17°38.7	43°25.6 17°38.1	58°25.7 17°37.5	73°25.7 17°36.8	+0.0 -0.6
Sa 3	268°26.4 17°28.3	283°26.4 17°27.7	298°26.5 17°27.0	313°26.5 17°26.4	328°26.6 17°25.7	343°26.6 17°25.1	358°26.7 17°24.4	13°26.7 17°23.8	28°26.8 17°23.1	43°26.8 17°22.4	58°26.9 17°21.8	73°26.9 17°21.1	+0.1 -0.7
Su 4	268°27.7 17°12.5	283°27.7 17°11.8	298°27.8 17°11.2	313°27.8 17°10.5	328°27.9 17°09.8	343°27.9 17°09.2	358°28.0 17°08.5	13°28.1 17°07.8	28°28.1 17°07.2	43°28.2 17°06.5	58°28.2 17°05.8	73°28.3 17°05.1	+0.1 -0.7
Mo 5	268°29.1 16°56.4	283°29.2 16°55.7	298°29.2 16°55.0	313°29.3 16°54.3	328°29.4 16°53.7	343°29.4 16°53.0	358°29.5 16°52.3	13°29.6 16°51.6	28°29.6 16°50.9	43°29.7 16°50.3	58°29.8 16°49.6	73°29.8 16°48.9	+0.1 -0.7
Tu 6	268°30.7 16°40.0	283°30.8 16°39.3	298°30.8 16°38.6	313°30.9 16°37.9	328°31.0 16°37.2	343°31.1 16°36.5	358°31.1 16°35.8	13°31.2 16°35.2	28°31.3 16°34.5	43°31.3 16°33.8	58°31.4 16°33.1	73°31.5 16°32.4	+0.1 -0.7
We 7	268°32.5 16°23.3	283°32.5 16°22.6	298°32.6 16°21.9	313°32.7 16°21.2	328°32.8 16°20.5	343°32.8 16°19.8	358°32.9 16°19.1	13°33.0 16°18.3	28°33.1 16°17.7	43°33.2 16°17.0	58°33.2 16°16.3	73°33.3 16°15.6	+0.1 -0.7
Th 8	268°34.4 16°06.4	283°34.5 16°05.7	298°34.5 16°05.0	313°34.6 16°04.3	328°34.7 16°03.6	343°34.8 16°02.8	358°34.9 16°02.1	13°35.0 16°01.4	28°35.0 16°00.7	43°35.1 16°00.0	58°35.2 15°59.3	73°35.3 15°58.6	+0.1 -0.7
Fr 9	268°36.4 15°49.2	283°36.5 15°48.5	298°36.6 15°47.8	313°36.7 15°47.1	328°36.8 15°46.3	343°36.9 15°45.6	358°37.0 15°44.9	13°37.1 15°44.2	28°37.2 15°43.5	43°37.2 15°42.8	58°37.3 15°42.0	73°37.4 15°41.3	+0.1 -0.7
Sa 10	268°38.6 15°31.8	283°38.7 15°31.1	298°38.7 15°30.3	313°38.9 15°29.6	328°39.0 15°28.9	343°39.1 15°28.1	358°39.2 15°27.4	13°39.3 15°26.7	28°39.3 15°25.9	43°39.5 15°25.2	58°39.6 15°24.5	73°39.7 15°23.7	+0.1 -0.7
Su 11	268°41.0 15°14.1	283°41.1 15°13.4	298°41.2 15°12.6	313°41.3 15°11.9	328°41.4 15°11.1	343°41.5 15°10.4	358°41.6 15°09.7	13°41.7 15°08.9	28°41.8 15°08.2	43°41.9 15°07.4	58°42.0 15°06.7	73°42.1 15°05.9	+0.1 -0.7
Mo 12	268°43.5 14°56.2	283°43.6 14°55.4	298°43.7 14°54.7	313°43.8 14°53.9	328°43.9 14°53.2	343°44.0 14°52.4	358°44.2 14°51.7	13°44.3 14°50.9	28°44.3 14°50.2	43°44.5 14°49.4	58°44.6 14°48.7	73°44.7 14°47.9	+0.1 -0.8
Tu 13	268°46.2 14°38.0	283°46.3 14°37.3	298°46.4 14°36.5	313°46.5 14°35.8	328°46.6 14°35.0	343°46.7 14°34.2	358°46.8 14°33.5	13°46.8 14°32.7	28°46.9 14°31.9	43°47.2 14°31.2	58°47.3 14°30.4	73°47.4 14°29.6	+0.1 -0.8
We 14	268°48.9 14°19.6	283°49.1 14°18.9	298°49.2 14°18.1	313°49.3 14°17.3	328°49.4 14°16.6	343°49.5 14°15.8	358°49.6 14°15.0	13°49.8 14°14.2	28°49.9 14°13.5	43°50.0 14°12.7	58°50.1 14°11.9	73°50.2 14°11.1	+0.1 -0.8
Th 15	268°51.8 14°01.0	283°52.0 14°00.2	298°52.1 13°59.5	313°52.2 13°58.7	328°52.3 13°57.9	343°52.4 13°57.1	358°52.6 13°56.3	13°52.7 13°55.6	28°52.8 13°54.8	43°53.0 13°54.0	58°53.1 13°53.2	73°53.2 13°52.4	+0.1 -0.8
Fr 16	268°54.9 13°42.2	283°55.0 13°41.4	298°55.2 13°40.6	313°55.3 13°39.8	328°55.4 13°39.0	343°55.5 13°38.2	358°55.7 13°37.4	13°55.8 13°36.6	28°55.9 13°35.9	43°56.1 13°35.1	58°56.2 13°34.3	73°56.3 13°33.5	+0.1 -0.8
Sa 17	268°58.1 13°23.1	283°58.2 13°22.3	298°58.3 13°21.5	313°58.5 13°20.7	328°58.6 13°19.9	343°58.7 13°19.1	358°58.9 13°18.3	13°58.9 13°17.5	28°59.0 13°16.7	43°59.3 13°15.9	58°59.4 13°15.1	73°59.5 13°14.3	+0.1 -0.8
Su 18	269°01.4 13°03.9	284°01.5 13°03.0	299°01.6 13°02.2	314°01.8 13°01.4	329°01.9 13°00.6	344°02.1 12°59.8	359°02.2 12°59.0	14°02.4 12°58.2	29°02.5 12°57.4	44°02.6 12°56.6	59°02.8 12°55.8	74°02.9 12°54.9	+0.1 -0.8
Mo 19	269°04.8 12°44.4	284°04.9 12°43.6	299°05.1 12°42.7	314°05.2 12°41.9	329°05.4 12°41.1	344°05.5 12°40.3	359°05.7 12°39.5	14°05.8 12°38.8	29°06.0 12°37.8	44°06.1 12°36.7	59°06.2 12°35.6	74°06.4 12°34.8	+0.1 -0.8
Tu 20	269°08.3 12°24.7	284°08.5 12°23.9	299°08.6 12°23.0	314°08.8 12°22.2	329°08.9 12°21.4	344°09.1 12°20.6	359°09.2 12°19.7	14°09.4 12°18.9	29°09.5 12°18.1	44°09.7 12°17.3	59°09.8 12°16.4	74°10.0 12°15.6	+0.2 -0.8
We 21	269°12.0 12°04.8	284°12.1 12°04.0	299°12.3 12°03.1	314°12.4 12°02.3	329°12.6 12°01.5	344°12.8 12°00.6	359°12.9 11°59.8	14°13.1 11°59.0	29°13.2 11°58.1	44°13.4 11°57.3	59°13.5 11°56.5	74°13.7 11°55.6	+0.2 -0.8
Th 22	269°15.7 11°44.7	284°15.9 11°43.9	299°16.1 11°43.0	314°16.2 11°42.2	329°16.4 11°41.4	344°16.5 11°40.5	359°16.7 11°39.7	14°16.9 11°38.8	29°17.0 11°38.0	44°17.2 11°37.1	59°17.5 11°36.3	74°17.5 11°35.5	+0.2 -0.8
Fr 23	269°19.6 11°24.5	284°19.8 11°23.6	299°19.9 11°22.8	314°20.1 11°21.9	329°20.3 11°21.1	344°20.4 11°20.2	359°20.6 11°19.4	14°20.8 11°18.5	29°20.9 11°17.7	44°21.1 11°16.8	59°21.5 11°16.0	74°21.4 11°15.1	+0.2 -0.9
Sa 24	269°23.6 11°04.0	284°23.8 11°03.2	299°23.9 11°02.3	314°24.1 11°01.4	329°24.3 11°00.6	344°24.4 10°59.7	359°24.6 10°58.9	14°24.8 10°58.0	29°24.9 10°57.2	44°25.1 10°56.3	59°25.5 10°55.4	74°25.4 10°54.6	+0.2 -0.9
Su 25	269°27.7 10°43.4	284°27.8 10°42.5	299°28.0 10°41.7	314°28.2 10°40.8	329°28.4 10°39.9	344°28.5 10°39.1	359°28.7 10°38.2	14°28.9 10°37.3	29°29.1 10°36.5	44°29.2 10°35.6	59°29.4 10°34.8	74°29.6 10°33.9	+0.2 -0.9
Mo 26	269°31.8 10°22.6	284°32.0 10°21.7	299°32.2 10°20.9	314°32.4 10°20.0	329°32.6 10°19.1	344°32.7 10°18.2	359°32.9 10°17.4	14°33.1 10°16.5	29°33.3 10°15.6	44°33.4 10°14.8	59°33.6 10°13.9	74°33.8 10°13.0	+0.2 -0.9
Tu 27	269°36.1 10°01.6	284°36.3 10°00.8	299°36.5 9°59.9	314°36.7 9°59.0	329°36.8 9°58.1	344°37.0 9°57.3	359°37.2 9°56.4	14°37.4 9°55.5	29°37.7 9°54.6	44°37.8 9°53.7	59°37.9 9°52.9	74°38.1 9°52.0	+0.2 -0.9
We 28	269°40.5 9°40.5	284°40.7 9°39.6	299°40.9 9°38.8	314°41.0 9°37.9	329°41.2 9°37.0	344°41.4 9°36.1	359°41.6 9°35.2	14°41.6 9°34.3	29°42.0 9°33.5	44°42.5 9°32.6	59°42.7 9°31.7	74°42.5 9°30.8	+0.2 -0.9
Th 29	269°44.9 9°19.3	284°45.1 9°18.4	299°45.3 9°17.5	314°45.5 9°16.6	329°45.7 9°15.7	344°45.9 9°14.8	359°46.1 9°13.9	14°46.3 9°13.0	29°46.5 9°12.1	44°46.8 9°11.2	59°46.8 9°10.4	74°47.0 9°09.5	+0.2 -0.9
Fr 30	269°49.5 8°57.8	284°49.7 8°56.9	299°49.9 8°56.1	314°50.1 8°55.2	329°50.3 8°54.3	344°50.4 8°53.4	359°50.6 8°52.5	14°50.8 8°50.9	29°51.0 8°50.7	44°51.2 8°49.8	59°51.5 8°48.9	74°51.6 8°48.0	+0.2 -0.9
Sa 31	269°54.1 8°36.3	284°54.3 8°35.4	299°54.5 8°34.5	314°54.7 8°33.6	329°54.9 8°32.7	344°55.1 8°31.8	359°55.3 8°30.9	14°55.5 8°30.0	29°55.7 8°29.1	44°55.9 8°28.2	59°56.1 8°27.3	74°56.3 8°26.4	+0.2 -0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.8'

MOON

August 2030

	D	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	Δ'/h SH
O	Th 1	234 ⁰ 45.8 6 ⁵⁷ 2.2	249 ⁰ 17.8 6 ⁴⁵ 3.2	263 ⁰ 49.9 6 ³³ 3.2	278 ⁰ 21.9 6 ²¹ 2.2	292 ⁰ 53.9 6 ⁰⁹ 1.1	307 ⁰ 26.0 5 ⁵⁷ 0.0	321 ⁰ 58.0 5 ⁴⁴ 8.8	336 ⁰ 30.0 5 ³² 6.6	351 ⁰ 02.1 5 ²⁰ 4.4	5 ⁰ 34.1 5 ⁰⁸ 1.1	20 ⁰ 06.1 4 ⁵⁵ 8.8	+32.0 15.4 -12.1 56.6
	Fr 2	238 ⁰ 06.0 1 ⁴⁸ 2.2	252 ⁰ 37.9 1 ³⁵ 5.5	267 ⁰ 09.8 1 ²² 9.9	281 ⁰ 41.7 1 ¹⁰ 2.2	296 ⁰ 13.6 0 ⁵⁷ 4.4	310 ⁰ 45.5 0 ⁴⁴ 7.0	325 ⁰ 17.3 0 ³² 0.0	339 ⁰ 49.1 0 ¹⁹ 2.2	354 ⁰ 20.9 0 ⁰⁶ 4.4	8 ⁵² 7.7 -0 ⁰⁶ 3.3	23 ⁰ 24.5 -0 ¹⁹ 1.1	+31.8 15.6 -12.7 57.1
	Sa 3	241 ⁰ 18.0 -3 ³¹ 0.0	255 ⁰ 49.3 -3 ⁰⁴ 3.7	270 ⁰ 20.6 -3 ⁵⁶ 5.5	284 ⁰ 51.8 -4 ⁰⁹ 2.2	299 ⁰ 23.1 -4 ²¹ 9.9	313 ⁰ 54.3 -4 ³⁴ 6.6	328 ⁰ 25.4 -4 ⁴⁷ 3.3	342 ⁰ 56.5 -5 ⁰⁰ 0.0	357 ⁰ 27.6 -5 ¹² 7.7	11 ⁵⁸ 6.6 -5 ²⁵ 3.3	26 ⁰ 29.6 -5 ³⁷ 9.9	+31.2 15.7 -12.7 57.6
	Su 4	244 ⁰ 08.9 -8 ⁴⁴ 1.1	258 ⁰ 39.1 -8 ⁵⁶ 2.2	273 ⁰ 09.3 -9 ⁰⁸ 3.3	287 ⁰ 39.4 -9 ²⁰ 4.4	302 ⁰ 09.4 -9 ³² 4.4	316 ⁰ 39.4 -9 ⁴⁴ 4.4	331 ⁰ 09.3 -9 ⁵⁶ 4.4	345 ⁰ 39.2 -10 ⁰⁸ 3.3	0 ⁰ 09.0 -10 ²⁰ 3.3	14 ³⁸ 8.8 -10 ³¹ 9.9	29 ⁰ 08.5 -10 ⁴³ 7.7	+30.0 15.9 -12.0 58.1
	Mo 5	246 ⁰ 26.1 -13 ³³ 1.1	260 ⁰ 54.7 -13 ⁴³ 9.9	275 ⁰ 23.3 -13 ⁵⁴ 6.6	289 ⁰ 51.8 -14 ⁰⁵ 3.3	304 ⁰ 20.2 -14 ¹⁵ 9.9	318 ⁰ 48.5 -14 ²⁶ 4.4	333 ⁰ 16.8 -14 ³⁶ 8.8	347 ⁰ 45.0 -14 ⁴⁷ 1.1	2 ¹³ 1.1 -14 ⁵⁷ 4.4	16 ⁴¹ 2.2 -15 ⁰⁷ 6.6	31 ⁰ 09.2 -15 ¹⁷ 7.7	+28.3 16.0 -10.5 58.6
	Tu 6	247 ⁰ 59.7 -17 ³⁸ 6.6	262 ⁰ 26.5 -17 ⁴⁷ 2.2	276 ⁰ 53.2 -17 ⁵⁵ 7.7	291 ⁰ 19.8 -18 ⁰⁴ 1.1	305 ⁰ 46.3 -18 ¹² 4.4	320 ⁰ 12.8 -18 ²⁰ 6.6	334 ⁰ 39.2 -18 ²⁸ 7.7	349 ⁰ 05.5 -18 ³⁶ 7.7	3 ³¹ 7.7 -18 ⁴⁴ 8.8	17 ⁵⁷ 9.9 -18 ⁵² 4.4	32 ⁰ 24.0 -19 ⁰⁰ 0.0	+26.4 16.1 -8.1 59.0
	We 7	248 ⁰ 46.6 -20 ⁴⁰ 2.2	263 ⁰ 11.6 -20 ⁴⁵ 9.9	277 ⁰ 36.5 -20 ⁵¹ 4.4	292 ⁰ 01.4 -20 ⁵⁶ 8.8	306 ⁰ 26.1 -21 ⁰² 1.1	320 ⁰ 50.9 -21 ⁰⁷ 2.2	335 ⁰ 15.5 -21 ¹² 2.2	349 ⁰ 40.1 -21 ¹⁷ 1.1	4 ⁰⁴ 7.7 -21 ²¹ 8.8	18 ²⁹ 2.2 -21 ²⁶ 9.9	32 ⁰ 53.6 -21 ³⁰ 8.8	+24.7 16.2 -5.1 59.4
	Th 8	248 ⁰ 54.3 -22 ¹⁹ 8.8	263 ⁰ 18.0 -22 ²¹ 9.9	277 ⁰ 41.7 -22 ²³ 8.8	292 ⁰ 05.4 -22 ²⁵ 6.6	306 ⁰ 29.1 -22 ²⁷ 2.2	320 ⁰ 52.7 -22 ²⁸ 7.7	335 ⁰ 16.3 -22 ³⁰ 0.0	349 ⁰ 39.8 -22 ³¹ 1.1	4 ⁰³ 4.4 -22 ³² 3.3	18 ²⁶ 9.9 -22 ³³ 0.0	32 ⁰ 50.4 -22 ³³ 6.6	+23.6 16.3 -1.4 59.6
	Fr 9	248 ⁰ 42.0 -22 ²⁵ 1.1	263 ⁰ 05.4 -22 ²³ 2.2	277 ⁰ 28.9 -22 ²¹ 3.3	291 ⁰ 52.4 -22 ¹⁹ 1.1	306 ⁰ 15.3 -22 ¹⁶ 8.8	320 ⁰ 39.4 -22 ¹⁴ 4.4	335 ⁰ 02.9 -22 ¹¹ 8.8	349 ⁰ 26.5 -22 ⁰⁹ 0.0	3 ⁵¹ 3.3 -22 ⁰⁶ 1.1	18 ¹³ 6.6 -22 ⁰³ 1.1	32 ⁰ 37.3 -21 ⁵⁹ 8.8	+23.5 16.3 +2.5 59.7
	Sa 10	248 ⁰ 35.8 -20 ⁵³ 7.7	263 ⁰ 00.0 -20 ⁴⁸ 2.2	277 ⁰ 24.4 -20 ⁴² 4.4	291 ⁰ 48.7 -20 ³⁶ 6.6	306 ⁰ 13.1 -20 ³⁰ 6.6	320 ⁰ 37.6 -20 ²⁴ 5.5	335 ⁰ 02.1 -20 ¹⁸ 2.2	349 ⁰ 26.7 -20 ¹⁵ 3.3	3 ⁵¹ 3.3 -20 ⁰⁵ 3.3	18 ¹⁶ 0.0 -19 ⁵⁸ 8.8	32 ⁰ 40.7 -19 ⁵¹ 9.9	+24.5 16.3 +6.2 59.7
O	Su 11	248 ⁰ 59.9 -17 ⁵⁵ 1.1	263 ⁰ 25.7 -17 ⁴⁶ 3.3	277 ⁰ 51.6 -17 ³⁷ 5.5	292 ⁰ 17.6 -17 ²⁸ 5.5	306 ⁰ 43.7 -17 ¹⁹ 5.5	321 ⁰ 09.8 -17 ¹⁰ 3.3	335 ⁰ 36.0 -17 ⁰¹ 1.1	350 ⁰ 12.8 -16 ⁵¹ 2.2	4 ²⁸ 7.7 -16 ⁴² 2.2	18 ⁵⁵ 1.1 -16 ³² 7.7	33 ⁰ 21.6 -16 ²³ 0.0	+26.2 16.2 +9.2 59.4
	Mo 12	250 ⁰ 08.6 -13 ⁴⁷ 4.4	264 ⁰ 36.3 -13 ³⁶ 4.4	279 ⁰ 04.2 -13 ²⁵ 3.3	293 ⁰ 32.1 -13 ¹⁴ 1.1	308 ⁰ 00.0 -13 ⁰² 9.9	322 ⁰ 28.1 -12 ⁵¹ 6.6	336 ⁰ 56.2 -12 ⁴⁰ 4.4	351 ⁰ 24.4 -12 ²⁸ 7.7	5 ⁵² 7.7 -12 ¹⁷ 3.3	20 ²¹ 1.1 -12 ⁰⁵ 7.7	34 ⁰ 49.5 -11 ⁵⁴ 1.1	+28.1 16.1 +11.3 59.0
	Tu 13	252 ⁰ 04.5 -8 ⁵³ 6.6	266 ⁰ 34.1 -8 ⁴¹ 2.2	281 ⁰ 03.7 -8 ²⁸ 8.8	295 ⁰ 33.4 -8 ¹⁶ 3.3	310 ⁰ 03.2 -8 ⁰³ 9.9	324 ⁰ 33.0 -7 ⁵¹ 3.3	339 ⁰ 02.9 -7 ³⁸ 8.8	353 ⁰ 32.8 -7 ²⁶ 2.2	8 ⁰² 8.8 -7 ¹³ 6.6	22 ³² 9.9 -7 ⁰¹ 0.0	37 ⁰ 03.0 -6 ⁴⁸ 3.3	+29.8 15.9 -12.5 58.4
	We 14	254 ⁰ 41.6 -3 ³⁶ 5.5	269 ⁰ 12.6 -3 ²³ 7.7	283 ⁰ 43.7 -3 ¹⁰ 8.8	298 ⁰ 14.3 -2 ⁵⁸ 0.0	312 ⁰ 45.8 -2 ⁴⁵ 1.1	327 ⁰ 17.1 -2 ³² 2.2	341 ⁰ 48.3 -2 ¹⁹ 4.4	356 ⁰ 19.6 -2 ⁰⁶ 5.5	10 ⁵⁰ 9.9 -1 ⁵³ 6.6	25 ²² 2.2 -1 ⁴⁰ 8.8	39 ⁰ 53.6 -1 ²⁷ 9.9	+31.2 15.7 -12.9 57.6
	Th 15	257 ⁰ 48.9 1 ⁴³ 3.3	272 ⁰ 20.9 1 ⁵⁵ 9.9	286 ⁰ 52.9 2 ⁰⁸ 4.4	301 ⁰ 24.9 2 ²¹ 0.0	315 ⁰ 56.9 2 ³³ 5.5	330 ⁰ 28.9 2 ⁴⁶ 0.0	345 ⁰ 01.0 2 ⁵⁸ 5.5	359 ⁰ 33.1 3 ¹⁰ 9.9	14 ⁰⁵ 2.2 3 ²³ 3.3	28 ³⁷ 4.4 3 ³⁵ 7.7	43 ⁰ 09.6 3 ⁴⁸ 1.1	+32.1 15.5 -12.5 56.9
	Fr 16	261 ⁰ 14.1 6 ⁴⁸ 9.9	275 ⁰ 46.5 7 ⁰⁰ 7.7	290 ⁰ 15.8 7 ¹² 4.4	304 ⁰ 51.3 7 ²⁴ 0.0	319 ⁰ 23.5 7 ³⁵ 6.6	333 ⁰ 56.2 7 ⁴⁷ 1.1	348 ⁰ 28.7 7 ⁵⁸ 6.6	3 ⁰¹ 1.1 8 ¹⁰ 2.2	17 ³³ 6.6 8 ²¹ 5.5	32 ⁰⁶ 6.6 8 ³² 8.8	46 ⁰ 38.5 8 ⁴⁴ 1.1	+32.4 15.3 -11.5 56.1
	Sa 17	264 ⁰ 45.4 11 ²⁶ 9.9	279 ⁰ 17.8 11 ³⁷ 3.3	293 ⁰ 50.2 11 ⁴⁷ 6.6	308 ⁰ 22.6 11 ⁵⁷ 9.9	322 ⁰ 55.0 12 ⁰⁸ 1.1	337 ⁰ 27.4 12 ¹⁸ 2.2	351 ⁰ 59.8 12 ²⁸ 3.3	6 ³² 2.2 12 ³⁸ 3.3	21 ⁰⁴ 6.6 12 ⁴⁸ 2.2	35 ³⁶ 9.9 12 ⁵⁸ 1.1	50 ⁰ 09.3 13 ⁰⁷ 9.9	+32.4 15.1 +10.1 55.4
	Su 18	268 ⁰ 12.9 15 ²⁶ 4.4	282 ⁰ 45.0 15 ³⁵ 1.1	297 ⁰ 17.1 15 ⁴³ 7.7	311 ⁰ 49.2 15 ⁵² 1.1	326 ⁰ 21.2 16 ⁰⁰ 6.6	340 ⁰ 53.3 16 ⁰⁸ 9.9	355 ⁰ 25.3 16 ¹⁷ 2.2	9 ⁵⁷ 3.3 16 ²⁵ 3.3	24 ²⁹ 3.3 16 ³³ 4.4	39 ⁰¹ 3.3 16 ⁴¹ 5.5	53 ⁰ 33.2 16 ⁴⁹ 4.4	+32.0 15.0 +8.3 54.9
	Mo 19	271 ⁰ 29.7 18 ³⁸ 6.6	286 ⁰ 01.3 18 ⁴⁵ 2.2	300 ⁰ 32.5 18 ⁵¹ 7.7	315 ⁰ 04.4 18 ⁵⁸ 1.1	329 ⁰ 35.9 19 ⁰⁴ 4.4	344 ⁰ 07.4 19 ¹⁰ 6.6	358 ⁰ 38.9 19 ¹⁶ 8.8	13 ⁰¹ 0.0 19 ²² 8.8	27 ⁴¹ 8.8 19 ²⁸ 8.8	42 ¹³ 2.2 19 ³⁴ 7.7	56 ⁰ 44.6 19 ⁴⁰ 5.5	+31.5 14.9 +6.2 54.5
	Tu 20	286 ⁰ 01.3 18 ⁴⁵ 2.2	300 ⁰ 32.9 18 ⁵¹ 7.7	315 ⁰ 04.4 18 ⁵⁸ 1.1	329 ⁰ 35.9 19 ⁰⁴ 4.4	344 ⁰ 07.4 19 ¹⁰ 6.6	358 ⁰ 38.9 19 ¹⁶ 8.8	13 ¹⁰ 3.3 19 ²² 8.8	27 ⁴¹ 8.8 19 ²⁸ 8.8	42 ¹³ 2.2 19 ³⁴ 7.7	56 ⁰ 44.6 19 ⁴⁰ 5.5	71 ⁰ 15.9 19 ⁴⁶ 2.2	+31.5 14.9 +6.1 54.5
O	We 21	289 ⁰ 03.4 21 ⁰⁰ 3.3	303 ⁰ 34.4 21 ⁰⁴ 5.5	318 ⁰ 05.4 21 ⁰⁸ 5.5	332 ⁰ 36.3 21 ¹² 5.5	347 ⁰ 07.2 21 ¹⁶ 2.2	1 ³⁸ 1.1 21 ²⁰ 2.2	16 ⁰⁹ 0.0 21 ²³ 9.9	30 ³⁹ 9.9 21 ²⁷ 4.4	45 ¹⁰ 7.7 21 ³⁰ 9.9	59 ⁴¹ 7.7 21 ³⁴ 3.3	74 ⁰ 12.3 21 ³⁷ 6.6	+30.9 14.8 +3.7 54.2
	Th 22	291 ⁰ 52.0 22 ¹⁴ 7.7	306 ⁰ 22.5 22 ¹⁶ 3.3	320 ⁰ 53.0 22 ¹⁹ 3.3	335 ⁰ 23.5 22 ¹⁹ 3.3	349 ⁰ 54.0 22 ²⁰ 9.9	4 ²⁴ 4.4 22 ²¹ 9.9	18 ⁵⁴ 9.9 22 ²³ 0.0	33 ²⁵ 3.3 22 ²⁴ 9.9	47 ⁵⁵ 7.7 22 ²⁴ 9.9	62 ²⁶ 1.1 22 ²⁵ 8.8	76 ⁰ 56.5 22 ²⁶ 5.5	+30.5 14.8 +1.2 54.2
	Fr 23	294 ⁰ 31.4 22 ²⁴ 4.4	309 ⁰ 01.7 22 ²³ 4.4	323 ⁰ 31.9 22 ²² 3.3	338 ⁰ 02.2 22 ²¹ 1.1	352 ⁰ 32.5 22 ¹⁸ 4.4	7 ⁰² 7.7 22 ¹⁹ 8.8	21 ³³ 0.0 22 ¹⁶ 9.9	36 ⁰³ 0.0 22 ¹⁵ 2.2	50 ³³ 5.5 22 ¹³ 5.5	65 ⁰³ 7.7 22 ¹¹ 7.7	79 ⁰ 34.0 22 ⁰⁹ 7.7	+30.3 14.8 -1.5 54.4
	Sa 24	297 ⁰ 08.1 21 ⁰² 7.7	311 ⁰ 38.4 21 ²⁴ 2.2	326 ⁰ 08.7 21 ²⁰ 5.5	340 ⁰ 39.0 21 ¹⁶ 7.7	355 ⁰ 09.4 21 ¹² 7.7	9 ³⁹ 7.7 21 ⁰⁸ 7.7	24 ¹⁰ 1.1 21 ⁰⁴ 5.5	38 ⁴⁰ 4.4 21 ⁰⁰ 3.3	53 ¹⁰ 8.8 20 ⁵⁵ 9.9	67 ⁴¹ 2.2 20 ⁵¹ 4.4	82 ⁰ 11.6 20 ⁴⁶ 9.9	+30.3 14.9 -4.1 54.7
	Su 25	299 ⁰ 48.8 19 ²⁶ 4.4	314 ⁰ 19.4 19 ²⁰ 2.2	328 ⁰ 50.0 19 ¹⁴ 0.0	343 ⁰ 20.7 19 ⁰⁷ 6.6	357 ⁰ 51.3 19 ⁰¹ 1.1	12 ²¹ 9.9 18 ⁵⁴ 6.6	26 ⁵² 6.6 18 ⁴⁸ 0.0	41 ²³ 3.3 18 ⁴¹ 2.2	55 ⁵⁴ 0.0 18 ³⁴ 0.0	70 ²⁴ 7.7 18 ²⁷ 5.5	84 ⁰ 55.4 18 ²⁰ 5.5	+30.7 15.0 -6.6 55.1
	Mo 26	302 ⁰ 38.4 16 ²⁴ 3.3	317 ⁰ 09.4 16 ¹⁵ 8.8	331 ⁰ 04.3 16 ⁰⁷ 3.3	346 ⁰ 11.4 15 ⁵⁸ 7.7	0 ⁴² 4.4 15 ⁵⁰ 7.7	15 ¹³ 5.5 15 ⁴¹ 2.2	29 ⁴⁴ 6.6 15 ³² 3.3	44 ¹⁵ 7.7 15 ²³ 4.4	58 ⁴⁶ 8.8 15 ¹⁴ 4.4	73 ¹⁷ 9.9 15 ⁰⁵ 3.3	87 ⁰ 49.9 14 ⁵⁶ 1.1	+31.1 15.2 -8.8 55.7
	Tu 27	305 ⁰ 37.8 12 ²⁹ 2.2	320 ⁰ 09.8 12 ¹⁸ 7.7	334 ⁰ 04.6 12 ⁰⁸ 3.3	349 ⁰ 12.0 11 ⁵⁷ 8.8	3 ⁴³ 4.4 11 ⁴³ 4.4	18 ¹⁴ 8.8 11 ³⁶ 5.5	32 ⁴⁶ 2.2 11 ²⁵ 8.8	47 ¹⁷ 6.6 11 ¹⁵ 0.0	61 ⁴⁹ 0.0 11 ⁰⁴ 2.2	76 ²⁰ 0.0 10 ⁵³ 3.3	90 ⁰ 51.9 10 ⁴² 4.4	+31.4 15.4 -10.7 56.3
	We 28	308 ⁰ 44.4 7 ⁵¹ 1.1	323 ⁰ 15.9 7 ³⁹ 3.3	337 ⁰ 47.9 7 ²⁷ 4.4	352 ⁰ 19.0 7 ¹⁵ 4.4	0 ⁶ 50.0 7 ⁰³ 5.5	21 ²² 0.0 6 ⁵¹ 5.5	35 ⁵³ 6.6 6 ³⁹ 4.4	50525				

SUN

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D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ' /h
Su 1	269°58.8 8°14.6	284°59.0 8°13.7	299°59.2 8°12.8	314°59.4 8°11.9	329°59.6 8°11.0	344°59.8 8°10.1	0°00.0 8°09.1	15°00.2 8°08.2	30°00.4 8°07.3	45°00.8 8°06.4	60°00.8 8°05.5	75°01.0 8°04.6	+0.2 -0.9
Mo 2	270°03.6 7°52.8	285°03.8 7°51.9	300°04.0 7°50.9	315°04.2 7°50.0	330°04.4 7°49.1	345°04.6 7°48.2	0°04.8 7°47.3	15°05.0 7°46.4	30°05.2 7°44.5	45°05.4 7°43.6	60°05.6 7°42.7	75°05.8 7°41.7	+0.2 -0.9
Tu 3	270°08.5 7°30.8	285°08.7 7°29.9	300°08.9 7°29.0	315°09.1 7°28.1	330°09.3 7°27.1	345°09.5 7°26.2	0°09.7 7°25.3	15°09.9 7°24.4	30°10.1 7°23.5	45°10.3 7°22.5	60°10.5 7°21.6	75°10.7 7°20.7	+0.2 -0.9
We 4	270°13.4 7°08.7	285°13.6 7°07.8	300°13.8 7°06.9	315°14.0 7°06.0	330°14.2 7°05.1	345°14.4 7°04.1	0°14.6 7°03.2	15°14.9 7°02.3	30°15.1 7°01.4	45°15.3 7°00.4	60°15.5 6°59.5	75°15.7 6°58.6	+0.2 -0.9
Th 5	270°18.4 6°46.6	285°18.6 6°45.6	300°18.8 6°44.7	315°19.0 6°43.8	330°19.2 6°42.8	345°19.4 6°41.9	0°19.7 6°41.0	15°19.9 6°40.1	30°20.1 6°39.1	45°20.3 6°38.2	60°20.5 6°37.3	75°20.7 6°36.4	+0.2 -0.9
Fr 6	270°23.5 6°24.3	285°23.7 6°23.3	300°23.9 6°22.4	315°24.1 6°21.5	330°24.3 6°20.5	345°24.5 6°19.6	0°24.7 6°18.7	15°24.9 6°17.7	30°25.2 6°16.8	45°25.4 6°15.9	60°25.6 6°14.9	75°25.8 6°14.0	+0.2 -0.9
Sa 7	270°28.6 6°01.9	285°28.8 6°00.9	300°29.0 6°00.0	315°29.2 5°59.1	330°29.4 5°58.1	345°29.6 5°57.2	0°29.9 5°56.2	15°30.1 5°55.3	30°30.3 5°54.4	45°30.5 5°53.4	60°30.7 5°52.5	75°30.9 5°51.6	+0.2 -0.9
Su 8	270°33.7 5°39.4	285°33.9 5°38.4	300°34.2 5°37.5	315°34.4 5°36.5	330°34.6 5°35.6	345°34.8 5°34.7	0°35.0 5°33.7	15°35.2 5°32.8	30°35.5 5°31.8	45°35.7 5°30.9	60°35.9 5°30.0	75°36.1 5°29.0	+0.2 -0.9
Mo 9	270°38.9 5°16.8	285°39.2 5°15.8	300°39.4 5°14.9	315°39.6 5°13.9	330°39.8 5°13.0	345°40.0 5°12.1	0°40.3 5°11.1	15°40.5 5°10.2	30°40.7 5°09.2	45°40.9 5°08.3	60°41.1 5°07.3	75°41.3 5°06.4	+0.2 -0.9
Tu 10	270°44.2 4°54.1	285°44.4 4°53.2	300°44.6 4°52.2	315°44.9 4°51.3	330°45.1 4°50.3	345°45.3 4°49.4	0°45.5 4°48.4	15°45.7 4°47.5	30°46.0 4°46.5	45°46.2 4°45.6	60°46.4 4°44.6	75°46.6 4°43.7	+0.2 -0.9
We 11	270°49.5 4°31.3	285°49.7 4°30.4	300°49.9 4°29.4	315°50.1 4°28.5	330°50.4 4°27.5	345°50.6 4°26.6	0°50.8 4°25.6	15°51.0 4°24.7	30°51.3 4°23.7	45°51.5 4°22.8	60°51.7 4°21.8	75°51.9 4°20.9	+0.2 -1.0
Th 12	270°54.8 4°08.5	285°55.0 4°07.6	300°55.2 4°06.6	315°55.5 4°05.6	330°55.7 4°04.7	345°55.9 4°03.7	0°56.1 4°02.8	15°56.4 4°01.8	30°56.6 4°00.9	45°56.8 3°59.9	60°57.0 3°59.0	75°57.2 3°58.0	+0.2 -1.0
Fr 13	271°00.1 3°45.6	286°00.4 3°44.6	301°00.6 3°43.7	316°00.8 3°42.7	331°01.0 3°41.8	346°01.3 3°40.8	1°01.5 3°39.9	16°01.7 3°38.9	31°01.9 3°37.9	46°02.2 3°37.0	61°02.4 3°36.0	76°02.6 3°35.1	+0.2 -1.0
Sa 14	271°05.5 3°22.6	286°05.7 3°21.7	301°05.9 3°20.7	316°06.1 3°19.7	331°06.4 3°18.8	346°06.6 3°17.8	1°06.8 3°16.9	16°07.1 3°15.9	31°07.3 3°14.9	46°07.5 3°14.0	61°07.7 3°13.0	76°08.0 3°12.1	+0.2 -1.0
Su 15	271°10.9 2°59.6	286°11.1 2°58.6	301°11.3 2°57.6	316°11.5 2°56.7	331°11.8 2°55.7	346°12.0 2°54.8	1°12.2 2°53.8	16°12.4 2°52.8	31°12.7 2°51.9	46°13.0 2°50.9	61°13.1 2°50.0	76°13.3 2°49.0	+0.2 -1.0
Mo 16	271°16.2 2°36.5	286°16.5 2°35.5	301°16.7 2°34.5	316°16.9 2°33.6	331°17.1 2°32.6	346°17.4 2°31.7	1°17.6 2°30.7	16°17.8 2°29.7	31°18.0 2°28.8	46°18.3 2°27.8	61°18.5 2°26.8	76°18.7 2°25.9	+0.2 -1.0
Tu 17	271°21.6 2°13.3	286°21.9 2°12.4	301°22.1 2°11.4	316°22.3 2°10.4	331°22.5 2°09.5	346°22.7 2°08.5	1°23.0 2°07.5	16°23.2 2°06.6	31°23.4 2°05.6	46°23.6 2°04.6	61°23.9 2°03.7	76°24.1 2°02.7	+0.2 -1.0
We 18	271°27.0 1°50.1	286°27.2 1°49.1	301°27.4 1°48.2	316°27.7 1°47.2	331°27.9 1°46.2	346°28.1 1°45.3	1°28.3 1°44.3	16°28.6 1°43.3	31°28.8 1°42.4	46°29.0 1°41.4	61°29.2 1°40.4	76°29.5 1°39.5	+0.2 -1.0
Th 19	271°32.4 1°26.9	286°32.6 1°25.9	301°32.8 1°24.9	316°33.0 1°24.0	331°33.3 1°23.0	346°33.5 1°22.0	1°33.7 1°21.1	16°33.9 1°20.1	31°34.2 1°19.1	46°34.4 1°18.2	61°34.6 1°17.2	76°34.8 1°16.2	+0.2 -1.0
Fr 20	271°37.7 1°03.6	286°37.9 1°02.6	301°38.2 1°01.7	316°38.4 1°00.7	331°38.6 0°59.7	346°38.8 0°58.7	1°39.0 0°57.8	16°39.3 0°56.8	31°39.5 0°55.8	46°39.7 0°54.9	61°39.9 0°53.9	76°40.2 0°52.9	+0.2 -1.0
Sa 21	271°43.0 0°40.3	286°43.3 0°39.3	301°43.5 0°38.3	316°43.7 0°37.4	331°43.9 0°36.4	346°44.1 0°35.4	1°44.4 0°34.5	16°44.6 0°33.5	31°44.8 0°32.5	46°45.0 0°31.5	61°45.3 0°30.6	76°45.5 0°29.6	+0.2 -1.0
Su 22	271°48.3 0°17.0	286°48.6 0°16.0	301°48.8 0°15.0	316°49.0 0°14.0	331°49.2 0°13.1	346°49.4 0°12.1	1°49.7 0°11.1	16°49.9 0°10.2	31°50.1 0°09.2	46°50.3 0°08.2	61°50.5 0°07.2	76°50.8 0°06.3	+0.2 -1.0
Mo 23	271°53.6 -0°06.4	286°53.8 -0°07.4	301°54.1 -0°08.3	316°54.3 -0°09.3	331°54.5 -0°10.3	346°54.7 -0°11.3	1°54.9 -0°12.2	16°55.2 -0°13.2	31°55.4 -0°14.2	46°55.6 -0°15.1	61°55.8 -0°16.1	76°56.0 -0°17.1	+0.2 -1.0
Tu 24	271°58.9 -0°29.7	286°59.1 -0°30.7	301°59.3 -0°31.7	316°59.5 -0°32.7	331°59.7 -0°33.6	346°59.9 -0°34.6	2°00.2 -0°35.6	17°00.4 -0°36.6	32°00.6 -0°37.5	47°00.8 -0°38.5	62°01.0 -0°39.5	77°01.2 -0°40.5	+0.2 -1.0
We 25	272°04.1 -0°53.1	287°04.3 -0°54.1	302°04.5 -0°55.1	317°04.7 -0°56.0	332°04.9 -0°57.0	347°05.1 -0°58.0	2°05.3 -0°59.0	17°05.6 -0°59.9	32°05.8 -1°00.9	47°06.0 -1°01.9	62°06.2 -1°02.9	77°06.4 -1°03.8	+0.2 -1.0
Th 26	272°09.2 -1°16.5	287°09.4 -1°17.5	302°09.6 -1°18.4	317°09.9 -1°19.4	332°10.1 -1°20.4	347°10.3 -1°21.4	2°10.5 -1°22.3	17°10.7 -1°23.3	32°10.9 -1°24.3	47°11.1 -1°25.2	62°11.3 -1°26.2	77°11.6 -1°27.2	+0.2 -1.0
Fr 27	272°14.3 -1°39.8	287°14.5 -1°40.8	302°14.7 -1°41.8	317°15.0 -1°42.8	332°15.2 -1°43.7	347°15.4 -1°44.7	2°15.6 -1°45.7	17°15.8 -1°46.7	32°16.0 -1°47.6	47°16.2 -1°48.6	62°16.4 -1°49.6	77°16.6 -1°50.6	+0.2 -1.0
Sa 28	272°19.4 -2°03.2	287°19.6 -2°04.2	302°19.8 -2°05.1	317°20.0 -2°06.1	332°20.2 -2°07.1	347°20.4 -2°08.1	2°20.6 -2°09.0	17°20.8 -2°10.0	32°21.0 -2°11.0	47°21.3 -2°11.9	62°21.5 -2°12.9	77°21.7 -2°13.9	+0.2 -1.0
Su 29	272°24.4 -2°26.5	287°24.6 -2°27.5	302°24.8 -2°28.5	317°25.0 -2°29.4	332°25.2 -2°30.4	347°25.4 -2°31.4	2°25.6 -2°32.4	17°25.8 -2°33.3	32°26.0 -2°34.3	47°26.2 -2°35.3	62°26.4 -2°36.2	77°26.6 -2°37.2	+0.2 -1.0
Mo 30	272°29.3 -2°49.8	287°29.5 -2°50.8	302°29.7 -2°51.8	317°29.9 -2°52.8	332°30.1 -2°53.7	347°30.3 -2°54.7	2°30.5 -2°55.7	17°30.7 -2°56.6	32°30.9 -2°57.6	47°31.1 -2°58.6	62°31.3 -2°59.5	77°31.5 -3°00.5	+0.2 -1.0

Row 1: GHA (Greenwich Hour Angle), Δ' /h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ' /h = dec. change

Semi-diameter: 15.9'

MOON

September 2030

	D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ/h	SH
●	Su 1	247°12.5 -11°56.4	261°41.1 -12°07.8	276°09.7 -12°19.1	290°38.2 -12°30.4	305°06.7 -12°41.6	319°35.1 -12°52.7	334°03.4 -13°03.7	348°31.7 -13°14.7	2°59.9 -13°25.6	17°28.1 -13°36.4	31°56.2 -13°47.2	+28.4	16.0
	Mo 2	248°49.9 -16°18.5	263°17.0 -16°27.9	277°44.0 -16°37.1	292°10.9 -16°46.3	306°37.8 -16°55.4	321°04.6 -17°04.3	335°31.4 -17°13.2	349°58.0 -17°22.0	4°24.7 -17°30.6	18°51.2 -17°39.2	33°17.7 -17°47.6	+26.8	16.1
	Tu 3	249°47.8 -19°40.7	264°13.3 -19°47.2	278°38.8 -19°53.7	293°04.2 -20°00.0	307°29.6 -20°06.2	321°54.9 -20°12.3	336°20.2 -20°18.2	350°45.4 -20°24.0	5°10.6 -20°29.7	19°35.7 -20°35.2	34°00.8 -20°40.6	+25.3	16.1
	We 4	250°12.1 -21°45.2	264°36.6 -21°48.4	279°01.0 -21°51.4	293°25.4 -21°54.3	307°49.8 -21°57.0	322°14.2 -21°59.6	336°38.5 -22°02.0	351°02.8 -22°04.3	5°27.1 -22°06.5	19°51.4 -22°08.5	34°15.7 -22°10.3	+24.4	16.1
	Th 5	250°18.7 -22°20.2	264°42.9 -22°19.0	279°07.1 -22°19.0	293°31.3 -22°18.1	307°55.5 -22°17.1	322°19.8 -22°16.0	336°44.0 -22°14.7	351°08.3 -22°13.3	5°32.6 -22°11.7	19°56.9 -22°10.0	34°21.2 -22°08.1	+24.2	16.1
	Fr 6	250°29.4 -21°22.5	264°54.3 -21°18.3	279°19.1 -21°14.0	293°44.0 -21°09.6	308°09.0 -21°05.0	322°34.0 -21°00.2	336°59.1 -20°55.4	351°24.2 -20°50.4	5°49.3 -20°45.2	20°14.3 -20°40.0	34°39.8 -20°34.6	+25.0	16.1
	Sa 7	251°05.2 -18°58.5	265°31.3 -18°51.1	279°57.6 -18°43.6	294°23.9 -18°36.0	308°50.2 -18°28.3	323°16.6 -18°20.5	337°43.1 -18°12.5	352°09.7 -18°04.5	6°36.3 -17°56.3	21°03.0 -17°48.1	35°29.8 -17°39.7	+26.5	16.0
	Su 8	252°19.2 -15°22.5	266°47.1 -15°12.6	281°15.0 -15°02.6	295°43.0 -14°52.6	310°11.0 -14°42.2	324°39.1 -14°32.2	339°07.3 -14°22.0	353°35.6 -14°11.6	8°03.9 -14°01.2	22°32.3 -13°50.6	37°00.7 -13°40.0	+28.1	16.0
	Mo 9	254°15.3 -10°53.4	268°44.8 -10°41.1	283°14.3 -10°30.2	297°43.9 -10°18.5	312°13.5 -10°06.8	326°43.3 -9°55.0	341°13.0 -9°43.2	355°42.8 -9°31.3	10°12.7 -9°19.4	23°42.7 -9°07.5	39°12.7 -8°55.5	+29.7	15.8
	Tu 10	256°48.9 -5°51.7	271°19.7 -5°39.2	285°50.5 -5°26.7	300°21.4 -5°14.2	314°52.3 -5°01.7	329°23.3 -4°49.1	343°54.4 -4°36.6	358°25.4 -4°24.0	12°56.5 -4°11.5	27°27.7 -3°58.9	41°58.9 -3°46.3	+31.0	15.7
	We 11	259°50.8 -0°36.9	274°22.2 -0°24.3	288°54.3 -0°11.7	303°26.0 0°00.9	317°57.8 0°13.4	332°29.6 0°26.0	347°01.5 0°38.5	1°33.3 0°51.1	16°05.2 1°03.6	30°37.1 1°16.1	45°09.1 1°28.6	+31.8	15.5
	Th 12	263°10.1 4°33.1	277°42.3 4°45.2	292°14.5 4°57.2	306°46.7 5°09.2	321°18.9 5°21.2	335°51.1 5°33.1	350°23.3 5°45.0	3 [°] 55.6 5°56.9	19°27.8 6°08.7	34°00.0 6°20.5	48°32.2 6°32.3	+32.2	15.4
	Fr 13	266°36.0 9°23.0	281°08.3 9°34.0	295°40.3 9°44.9	310°12.7 9°55.8	324°45.0 10°06.6	339°17.2 10°17.4	353°49.4 10°28.1	8°21.9 10°38.7	19°25.8 10°49.3	37°26.0 10°59.8	51°58.9 11°10.3	+32.2	15.2
	Sa 14	269°59.6 13°39.7	284°31.6 13°49.2	299°03.6 13°58.5	313°35.5 14°07.8	328°07.5 14°17.0	342°39.4 14°26.1	357°11.3 14°35.2	11°43.2 14°44.2	26°15.1 14°53.1	40°47.0 15°01.9	55°18.8 15°10.7	+31.9	15.1
	Su 15	273°14.4 17°12.6	287°46.0 17°20.1	302°17.5 17°27.5	316°49.0 17°34.8	331°20.9 17°42.0	345°52.0 17°49.1	0°23.5 17°56.2	14°54.9 18°03.1	29°26.3 18°10.0	43°57.7 18°16.8	58°29.1 18°23.5	+31.5	14.9
	Mo 16	276°17.5 19°53.0	290°48.5 19°58.2	305°19.6 20°03.3	319°50.6 20°08.4	334°21.6 20°13.3	348°52.6 20°18.1	3 [°] 23.6 20°22.9	17°54.6 20°27.5	32°25.5 20°32.1	46°56.5 20°36.5	61°27.4 20°40.9	+31.0	14.8
	Tu 17	279°09.3 21°34.4	293°39.9 21°37.2	308°10.6 21°39.8	322°41.3 21°42.4	337°11.9 21°44.8	351°42.6 21°47.2	6°13.2 21°49.5	20°43.8 21°51.6	35°14.4 21°53.7	49°45.0 21°55.6	64°15.6 21°57.4	+30.6	14.8
	We 18	293°39.9 21°37.2	308°10.6 21°39.8	322°41.3 21°42.4	337°11.9 21°44.8	351°42.6 21°47.2	6°13.2 21°49.5	20°43.8 21°51.6	35°14.4 21°53.7	49°45.0 21°55.6	64°15.6 21°57.4	78°46.2 21°59.2	+30.6	14.8
	Th 19	296°24.0 22°12.9	310°54.5 22°13.0	325°25.0 22°12.9	339°55.5 22°12.8	354°26.0 22°12.6	8°56.5 22°12.3	23°27.0 22°11.8	37°57.4 22°11.3	52°27.9 22°10.6	66°58.4 22°09.9	81°28.9 22°09.0	+30.5	14.8
	Fr 20	299°06.5 21°43.7	313°37.1 21°41.2	328°07.6 21°38.6	342°38.2 21°35.9	357°08.8 21°33.1	11°39.4 21°30.1	26°09.9 21°27.1	40°40.5 21°24.0	55°11.2 21°20.8	69°41.8 21°17.4	84°12.4 21°14.0	+30.6	14.8
	Sa 21	301°53.1 20°10.5	316°23.9 20°05.5	330°54.7 20°00.4	345°25.5 19°55.2	359°56.4 19°45.9	14°27.2 19°44.5	28°58.1 19°39.0	43°29.0 19°33.4	57°59.9 19°27.7	72°30.8 19°21.9	87°01.7 19°16.0	+30.9	14.9
	Su 22	304°47.4 17°36.6	319°18.5 17°29.2	333°49.3 17°21.8	348°20.9 17°14.2	3 [°] 52.1 17°06.6	17°23.3 16°58.9	31°54.5 16°51.1	46°25.7 16°43.3	60°57.0 16°35.3	75°28.2 16°27.2	89°59.5 16°19.1	+31.2	15.1
	Mo 23	307°50.0 14°07.3	322°21.4 13°57.9	336°52.9 13°48.4	351°24.3 13°38.9	5°55.8 13°29.2	20°27.3 13°19.5	34°58.8 13°09.7	49°30.3 12°49.8	64°01.8 12°40.9	78°33.3 12°39.9	93°04.8 12°29.8	+31.5	15.3
	Tu 24	310°57.7 9°50.7	325°29.3 9°39.6	340°00.8 9°28.4	354°32.3 9°17.1	3°03.8 9°05.9	23°35.4 8°54.5	38°06.9 8°43.1	52°38.4 8°31.6	67°09.9 8°20.1	81°41.4 8°08.6	96°12.9 7°57.0	+31.5	15.5
	We 25	314°03.9 4°57.0	328°35.2 4°44.6	343°06.5 4°32.2	357°37.7 4°19.8	12°09.0 4°07.4	26°40.2 3°54.9	41°11.4 3°42.4	55°42.6 3°29.8	70°13.7 3°17.2	84°44.8 3°04.6	99°15.9 2°52.0	+31.2	15.7
	Th 26	316°59.2 -0°20.4	331°29.8 -0°33.4	346°00.4 -0°46.4	0°31.0 -0°59.3	15°01.5 -1°12.3	29°32.0 -1°25.3	44°02.5 -1°38.3	58°32.9 -1°51.3	73°03.2 -2°04.3	87°33.6 -2°17.4	102°03.9 -2°30.4	+30.5	15.9
	Fr 27	319°32.7 -5°44.7	334°02.2 -5°57.5	348°31.7 -6°10.3	3°01.1 -6°23.1	17°30.5 -6°35.9	31°59.8 -6°48.6	46°29.1 -7°01.3	60°58.3 -7°14.0	75°27.4 -7°26.7	89°56.5 -7°39.3	104°25.6 -7°51.9	+29.3	16.1
	Sa 28	321°33.8 -10°55.5	336°01.8 -11°07.3	350°29.8 -11°19.1	4°57.7 -11°30.8	19°25.5 -11°42.5	33°53.3 -11°54.1	48°21.0 -12°05.6	62°48.7 -12°17.1	77°16.2 -12°28.5	91°43.8 -12°39.8	106°11.2 -12°51.0	+27.7	16.2
	Su 29	322°54.7 -15°30.2	337°21.1 -15°40.1	351°47.4 -15°49.9	6°13.6 -15°59.6	20°39.8 -16°09.9	35°05.9 -16°18.7	49°31.9 -16°28.1	63°57.9 -16°37.4	78°23.8 -16°46.6	92°49.6 -16°55.7	107°15.4 -17°04.6	+26.1	16.3
	Mo 30	323°34.7 -19°05.5	337°59.5 -19°12.6	352°24.3 -19°19.5	6°49.0 -19°26.3	21°13.7 -19°33.0	35°38.4 -19°39.6	50°02.9 -19°46.0	64°27.5 -19°52.3	78°52.0 -19°58.4	93°16.4 -20°04.5	107°40.4 -20°10.4	+24.6	16.3

SUN

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D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Tu 1	257°34.0 -3°12.1	272°34.2 -3°13.1	287°34.4 -3°14.1	302°34.6 -3°15.1	317°34.8 -3°16.0	332°35.0 -3°17.0	347°35.2 -3°18.0	2°35.4 -3°18.9	17°35.6 -3°19.9	32°35.8 -3°20.9	47°36.0 -3°21.8	62°36.2 -3°22.8	+0.2 -1.0
We 2	257°38.8 -3°35.4	272°39.0 -3°36.4	287°39.2 -3°37.3	302°39.4 -3°38.3	317°39.6 -3°39.6	332°39.8 -3°40.2	347°40.0 -3°41.2	2°40.2 -3°42.2	17°40.4 -3°43.1	32°40.6 -3°44.1	47°40.8 -3°45.1	62°41.0 -3°46.0	+0.2 -1.0
Th 3	257°43.3 -3°58.6	272°43.7 -3°59.6	287°43.9 -4°00.5	302°44.1 -4°01.5	317°44.3 -4°02.5	332°44.5 -4°03.4	347°44.7 -4°04.4	2°44.9 -4°05.4	17°45.1 -4°06.3	32°45.3 -4°07.3	47°45.5 -4°08.2	62°45.7 -4°09.2	+0.2 -1.0
Fr 4	257°48.2 -4°21.7	272°48.4 -4°22.7	287°48.6 -4°23.7	302°48.8 -4°24.6	317°48.9 -4°25.6	332°49.1 -4°26.6	347°49.3 -4°27.5	2°49.5 -4°28.5	17°49.7 -4°29.5	32°49.9 -4°30.4	47°50.1 -4°31.4	62°50.3 -4°32.3	+0.2 -1.0
Sa 5	257°52.7 -4°44.8	272°52.9 -4°45.8	287°53.1 -4°46.8	302°53.3 -4°47.7	317°53.5 -4°48.7	332°53.7 -4°49.7	347°53.9 -4°50.6	2°54.1 -4°51.6	17°54.3 -4°52.5	32°54.4 -4°53.5	47°54.6 -4°54.5	62°54.8 -4°55.4	+0.2 -1.0
Su 6	257°57.2 -5°07.9	272°57.4 -5°08.8	287°57.6 -5°09.8	302°57.8 -5°10.8	317°58.0 -5°11.7	332°58.2 -5°12.7	347°58.3 -5°13.6	2°58.5 -5°14.6	17°58.7 -5°15.6	32°58.9 -5°16.5	47°59.1 -5°17.5	62°59.3 -5°18.4	+0.2 -1.0
Mo 7	258°01.6 -5°30.9	273°01.8 -5°31.8	288°02.0 -5°32.8	303°02.2 -5°33.7	318°02.4 -5°34.7	333°02.5 -5°35.6	348°02.7 -5°36.6	3°02.9 -5°37.5	18°03.1 -5°38.5	33°03.3 -5°39.5	48°03.4 -5°40.4	63°03.6 -5°41.4	+0.2 -1.0
Tu 8	258°05.9 -5°53.8	273°06.1 -5°54.7	288°06.3 -5°55.7	303°06.5 -5°56.6	318°06.6 -5°57.6	333°06.8 -5°58.5	348°07.0 -5°59.5	3°07.2 -6°00.4	18°07.3 -6°01.4	33°07.5 -6°02.3	48°07.7 -6°03.3	63°07.9 -6°04.2	+0.2 -0.9
We 9	258°10.1 -6°16.6	273°10.3 -6°17.5	288°10.5 -6°18.5	303°10.6 -6°19.4	318°10.8 -6°20.4	333°11.0 -6°21.3	348°11.1 -6°22.3	3°11.3 -6°23.2	18°11.5 -6°24.2	33°11.7 -6°25.1	48°11.9 -6°26.1	63°12.0 -6°27.0	+0.2 -0.9
Th 10	258°14.2 -6°39.3	273°14.4 -6°40.3	288°14.5 -6°41.2	303°14.7 -6°42.2	318°14.9 -6°43.1	333°15.0 -6°44.1	348°15.2 -6°45.0	3°15.4 -6°45.9	18°15.5 -6°46.9	33°15.7 -6°47.8	48°15.9 -6°48.8	63°16.0 -6°49.7	+0.2 -0.9
Fr 11	258°18.1 -7°02.0	273°18.3 -7°02.9	288°18.5 -7°03.9	303°18.7 -7°04.8	318°18.8 -7°05.7	333°19.0 -7°06.7	348°19.1 -7°07.6	3°19.3 -7°08.6	18°19.5 -7°09.5	33°19.6 -7°10.5	48°19.8 -7°11.4	63°19.9 -7°12.3	+0.2 -0.9
Sa 12	258°22.0 -7°24.5	273°22.2 -7°25.5	288°22.3 -7°26.4	303°22.5 -7°27.4	318°22.6 -7°28.3	333°22.8 -7°29.2	348°23.0 -7°30.2	3°23.1 -7°31.1	18°23.3 -7°32.0	33°23.4 -7°33.0	48°23.6 -7°33.9	63°23.7 -7°34.8	+0.2 -0.9
Su 13	258°25.7 -7°47.0	273°25.9 -7°47.9	288°26.0 -7°48.9	303°26.2 -7°49.8	318°26.3 -7°50.7	333°26.5 -7°51.7	348°26.6 -7°52.6	3°26.8 -7°53.5	18°26.9 -7°54.5	33°27.1 -7°55.4	48°27.1 -7°56.3	63°27.4 -7°57.3	+0.2 -0.9
Mo 14	258°29.3 -8°09.3	273°29.5 -8°10.3	288°29.6 -8°11.2	303°29.8 -8°12.1	318°29.9 -8°13.1	333°30.1 -8°14.0	348°30.2 -8°14.9	3°30.3 -8°15.8	18°30.5 -8°16.8	33°30.6 -8°17.7	48°30.8 -8°18.6	63°30.9 -8°19.6	+0.2 -0.9
Tu 15	258°32.8 -8°31.6	273°32.9 -8°32.5	288°33.1 -8°33.4	303°33.2 -8°34.4	318°33.3 -8°35.3	333°33.5 -8°36.2	348°33.6 -8°37.1	3°33.7 -8°38.1	18°33.9 -8°39.0	33°34.0 -8°39.9	48°34.2 -8°40.8	63°34.3 -8°41.7	+0.2 -0.9
We 16	258°36.1 -8°53.7	273°36.2 -8°54.6	288°36.3 -8°55.5	303°36.5 -8°56.5	318°36.6 -8°57.4	333°36.7 -8°58.3	348°36.9 -8°59.2	3°37.0 -9°00.1	18°37.1 -9°01.1	33°37.1 -9°02.0	48°37.4 -9°02.9	63°37.4 -9°03.8	+0.2 -0.9
Th 17	258°39.2 -9°15.7	273°39.4 -9°16.6	288°39.5 -9°17.5	303°39.6 -9°18.4	318°39.8 -9°19.4	333°39.9 -9°20.3	348°40.0 -9°21.2	3°40.1 -9°22.1	18°40.3 -9°23.0	33°40.4 -9°23.9	48°40.5 -9°24.8	63°40.6 -9°25.7	+0.2 -0.9
Fr 18	258°42.2 -9°37.6	273°42.4 -9°38.5	288°42.5 -9°39.4	303°42.6 -9°40.3	318°42.7 -9°41.2	333°42.9 -9°42.1	348°43.0 -9°43.0	3°43.1 -9°43.9	18°43.2 -9°44.8	33°43.3 -9°45.7	48°43.5 -9°46.6	63°43.6 -9°47.5	+0.2 -0.9
Sa 19	258°45.1 -9°59.3	273°45.2 -10°00.2	288°45.3 -10°01.1	303°45.4 -10°02.0	318°45.6 -10°02.9	333°45.7 -10°03.8	348°45.8 -10°04.7	3°45.9 -10°05.6	18°46.0 -10°06.5	33°46.1 -10°07.4	48°46.2 -10°08.3	63°46.4 -10°09.2	+0.2 -0.9
Su 20	258°47.8 -10°20.9	273°47.9 -10°21.8	288°48.0 -10°22.7	303°48.1 -10°23.6	318°48.2 -10°24.5	333°48.3 -10°25.4	348°48.4 -10°26.2	3°48.5 -10°27.1	18°48.6 -10°28.0	33°48.8 -10°28.9	48°48.9 -10°29.8	63°49.0 -10°30.7	+0.2 -0.9
Mo 21	258°50.3 -10°42.3	273°50.4 -10°43.2	288°50.5 -10°44.1	303°50.6 -10°45.0	318°50.7 -10°45.9	333°50.8 -10°46.8	348°50.9 -10°47.6	3°51.0 -10°48.5	18°51.1 -10°49.4	33°51.2 -10°50.3	48°51.3 -10°51.2	63°51.4 -10°52.1	+0.1 -0.9
Tu 22	258°52.7 -11°03.6	273°52.8 -11°04.5	288°52.9 -11°05.3	303°52.9 -11°06.2	318°53.0 -11°07.1	333°53.1 -11°08.0	348°53.2 -11°08.9	3°53.3 -11°09.8	18°53.4 -11°10.6	33°53.5 -11°11.5	48°53.6 -11°12.4	63°53.7 -11°13.3	+0.1 -0.9
We 23	258°54.8 -11°24.7	273°54.9 -11°25.6	288°55.0 -11°26.4	303°55.1 -11°27.3	318°55.2 -11°28.2	333°55.3 -11°29.1	348°55.4 -11°29.9	3°55.5 -11°30.8	18°55.5 -11°31.7	33°55.6 -11°32.6	48°55.7 -11°33.4	63°55.8 -11°34.3	+0.1 -0.9
Th 24	258°56.9 -11°45.6	273°56.9 -11°46.5	288°57.0 -11°47.4	303°57.1 -11°48.2	318°57.2 -11°49.1	333°57.3 -11°50.0	348°57.3 -11°50.8	3°57.4 -11°51.7	18°57.5 -11°52.6	33°57.6 -11°53.4	48°57.6 -11°54.3	63°57.7 -11°55.2	+0.1 -0.9
Fr 25	258°58.4 -12°06.4	273°58.8 -12°07.2	288°58.8 -12°08.0	303°58.9 -12°08.9	318°59.0 -12°09.8	333°59.0 -12°10.7	348°59.1 -12°11.5	3°59.2 -12°12.4	18°59.3 -12°13.3	33°59.3 -12°14.1	48°59.4 -12°15.0	63°59.5 -12°15.8	+0.1 -0.9
Sa 26	259°00.0 -12°27.0	274°00.4 -12°27.8	289°00.5 -12°28.7	304°00.5 -12°29.5	319°00.6 -12°30.4	334°00.6 -12°31.2	349°00.7 -12°32.1	4°00.8 -12°32.9	19°00.8 -12°33.8	34°00.9 -12°34.6	49°01.0 -12°35.5	64°01.0 -12°36.3	+0.1 -0.9
Su 27	259°01.8 -12°47.4	274°01.8 -12°48.2	289°01.9 -12°49.0	304°02.0 -12°49.9	319°02.0 -12°50.7	334°02.1 -12°51.6	349°02.1 -12°52.4	4°02.2 -12°53.2	19°02.2 -12°54.1	34°02.3 -12°54.9	49°02.3 -12°55.8	64°02.4 -12°56.6	+0.1 -0.8
Mo 28	259°03.1 -13°07.5	274°03.1 -13°08.4	289°03.2 -13°09.2	304°03.2 -13°10.0	319°03.3 -13°10.9	334°03.3 -13°11.7	349°03.3 -13°12.5	4°03.4 -13°13.4	19°03.4 -13°14.2	34°03.5 -13°15.0	49°03.5 -13°15.9	64°03.6 -13°16.7	+0.0 -0.8
Tu 29	259°04.2 -13°27.5	274°04.2 -13°28.3	289°04.2 -13°29.2	304°04.3 -13°30.0	319°04.3 -13°30.8	334°04.4 -13°31.6	349°04.4 -13°32.5	4°04.4 -13°33.3	19°04.5 -13°34.1	34°04.5 -13°34.9	49°04.6 -13°35.8	64°04.6 -13°36.6	+0.0 -0.8
We 30	259°05.1 -13°47.3	274°05.1 -13°48.1	289°05.1 -13°48.9	304°05.2 -13°49.7	319°05.2 -13°50.5	334°05.2 -13°51.4	349°05.2 -13°52.2	4°05.3 -13°53.0	19°05.3 -13°53.8	34°05.3 -13°54.6	49°05.4 -13°55.4	64°05.4 -13°56.3	+0.0 -0.8
Th 31	259°05.8 -14°06.8	274°05.8 -14°07.6	289°05.8 -14°08.4	304°05.8 -14°09.2	319°05.9 -14°10.1	334°05.9 -14°10.9	349°05.9 -14°11.7	4°05.9 -14°12.5	19°06.0 -14°13.3	34°06.0 -14°14.1	49°06.0 -14°14.9	64°06.0 -14°15.7	+0.0 -0.8

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ°/h = dec. change

Semi-diameter: 16.0'

MOON

October 2030

	D	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ /h	SH
●	Tu 1	251°42.8 -21°01.5	266°06.8 -21°05.8	280°30.7 -21°05.8	294°54.7 -21°14.0	309°18.6 -21°17.9	323°42.5 -21°25.2	338°06.4 -21°28.7	352°30.3 -21°35.1	6°54.1 -21°35.1	21°18.0 -21°35.1	35°41.8 -21°38.1	+23.9	16.3
	We 2	251°38.2 -22°04.9	266°02.0 -22°05.9	280°25.7 -22°05.9	294°49.6 -22°06.1	309°13.4 -22°06.2	323°37.2 -22°06.2	338°01.1 -22°06.0	352°24.9 -22°05.7	6°48.8 -22°05.2	21°12.7 -22°04.5	35°36.6 -22°03.7	+23.8	16.2
	Th 3	251°39.7 -21°34.1	266°04.2 -21°31.0	280°28.7 -21°27.7	294°53.4 -21°24.3	309°18.0 -21°20.7	323°42.8 -21°17.0	338°07.5 -21°13.2	352°32.4 -21°09.2	6°57.2 -21°05.1	21°22.2 -21°00.9	35°47.2 -20°56.5	+24.7	16.1
●	Fr 4	252°09.4 -19°35.4	266°35.4 -19°29.0	281°01.5 -19°22.5	295°27.7 -19°15.8	309°53.9 -19°09.1	324°20.2 -19°02.2	338°46.6 -18°55.3	353°13.0 -18°48.2	7°39.5 -18°41.0	22°06.1 -18°33.7	36°32.7 -18°26.3	+26.3	16.0
	Sa 5	253°21.4 -16°22.8	267°49.2 -16°13.9	282°17.1 -16°04.8	296°45.1 -15°55.6	311°13.2 -15°46.4	325°41.3 -15°37.0	340°09.5 -15°27.6	354°37.8 -15°18.1	9°06.1 -15°08.6	23°34.5 -14°58.9	38°03.0 -14°49.2	+28.2	15.9
	Su 6	255°18.7 -12°14.7	269°48.3 -12°03.8	284°18.0 -11°53.0	298°47.7 -11°42.0	313°17.5 -11°31.1	327°47.3 -11°20.0	342°17.2 -11°08.9	356°47.2 -10°57.8	11°17.2 -10°46.6	25°47.3 -10°35.4	40°17.4 -10°24.1	+29.9	15.8
●	Mo 7	257°56.2 -7°29.8	272°27.2 -7°17.9	286°58.3 -7°06.0	301°29.4 -6°54.0	316°00.5 -6°42.1	330°31.7 -6°30.1	345°02.9 -6°18.0	359°34.2 -6°06.0	14°05.5 -5°53.9	28°36.9 -5°41.8	43°08.3 -5°29.7	+31.2	15.6
	Tu 8	261°03.7 -2°26.3	275°35.7 -2°14.0	290°07.6 -2°01.7	304°39.7 -1°49.4	319°11.7 -1°37.1	333°43.8 -1°24.8	348°15.8 -1°12.5	2°48.0 -1°00.2	17°20.1 -0°48.0	31°52.3 -0°35.7	46°24.4 -0°23.4	+32.1	15.5
	We 9	264°29.3 -0°39.4	279°31.7 -0°15.5	293°34.1 -0°03.5	308°06.6 -0°15.5	322°39.0 -0°27.5	337°11.5 -0°39.5	351°44.0 -0°51.4	6°16.4 -0°40.3	26°48.9 -0°15.2	35°21.4 -0°27.1	49°53.9 -0°38.9	+32.5	15.3
○	Th 10	268°01.3 -9°32.4	282°33.8 -7°43.7	297°06.3 -7°54.9	311°38.7 -8°06.0	326°11.2 -8°17.2	340°43.6 -8°28.3	355°16.1 -8°39.3	9°48.5 -8°50.3	24°20.9 -8°01.9	38°53.3 -7°12.1	53°25.7 -9°23.0	+32.4	15.2
	Fr 11	271°30.2 -11°59.2	286°02.4 -12°09.1	300°34.6 -12°19.0	315°06.7 -12°28.8	329°38.9 -12°38.6	344°11.0 -12°48.3	358°43.1 -12°57.9	13°15.2 -13°07.5	27°47.2 -13°17.0	42°19.3 -13°26.4	56°51.4 -13°35.8	+32.1	15.1
	Sa 12	274°49.1 -15°47.7	289°20.8 -15°55.9	303°52.5 -16°04.0	318°24.1 -16°12.0	332°55.8 -16°20.0	347°27.4 -16°27.9	7°59.0 -16°35.7	16°30.5 -16°43.4	31°02.0 -16°51.0	45°33.6 -16°58.6	60°05.1 -17°06.0	+31.6	15.0
○	Su 13	277°54.9 -18°47.7	292°26.0 -18°53.8	306°57.2 -18°59.8	321°28.3 -19°05.7	335°59.4 -19°11.5	350°30.4 -19°17.2	5°01.5 -19°22.8	19°32.5 -19°28.3	34°03.6 -19°33.8	48°34.6 -19°39.1	63°05.8 -19°44.3	+31.1	14.9
	Mo 14	280°48.3 -20°51.3	295°19.0 -20°55.0	309°49.8 -20°58.6	324°20.5 -21°02.1	338°51.2 -21°05.5	353°21.9 -21°08.8	7°52.5 -21°12.0	22°23.2 -21°15.0	36°53.9 -21°18.0	51°24.5 -21°20.9	65°55.2 -21°23.7	+30.7	14.8
	Tu 15	283°34.0 -21°53.2	298°04.5 -21°54.3	312°35.5 -21°55.4	327°05.6 -21°56.3	341°36.2 -21°57.1	356°06.8 -21°57.9	10°37.3 -21°58.5	25°07.9 -21°59.0	39°32.6 -21°59.4	54°09.0 -21°59.8	68°39.6 -22°00.0	+30.6	14.7
●	We 16	286°18.7 -21°50.9	300°49.3 -21°49.5	315°20.0 -21°48.0	329°50.0 -21°46.3	344°21.4 -21°44.6	358°52.1 -21°42.8	13°22.8 -21°40.9	27°53.6 -21°38.8	42°24.3 -21°36.7	56°55.1 -21°34.5	71°25.8 -21°32.1	+30.7	14.8
	Th 17	300°49.3 -21°49.5	315°20.0 -21°48.0	329°50.0 -21°46.3	344°21.4 -21°44.6	358°52.1 -21°44.6	13°22.8 -21°40.9	27°53.6 -21°38.8	42°24.3 -21°36.7	56°55.1 -21°34.5	71°25.8 -21°32.1	85°56.6 -21°29.7	+30.7	14.8
	Fr 18	303°40.2 -20°41.3	318°11.2 -20°37.3	332°42.3 -20°33.2	347°13.3 -20°29.0	361°44.8 -20°24.7	16°15.5 -20°20.4	30°46.7 -20°15.9	45°17.8 -20°11.2	59°49.0 -20°06.6	74°20.2 -20°01.9	88°51.4 -19°57.0	+31.1	14.8
●	Sa 19	306°41.6 -18°33.1	321°13.2 -18°26.8	335°44.7 -18°20.4	350°16.2 -18°13.9	364°47.8 -18°07.4	19°19.4 -18°00.7	33°51.0 -17°54.0	48°22.6 -17°47.1	62°54.2 -17°40.2	77°25.9 -17°33.2	91°57.5 -17°26.1	+31.6	14.9
	Su 20	309°54.6 -15°30.0	324°26.5 -15°21.6	338°58.4 -15°13.2	353°30.4 -15°04.6	368°02.3 -14°56.0	8°02.3 -14°47.4	22°34.3 -14°38.6	37°06.3 -14°29.8	51°38.3 -14°20.9	65°10.3 -14°20.9	80°42.3 -14°11.9	+32.0	15.1
	Mo 21	313°15.6 -11°38.6	327°47.7 -11°28.5	342°19.9 -11°18.3	356°52.0 -11°08.0	371°24.1 -10°57.7	25°56.2 -10°47.3	40°28.4 -10°36.8	55°00.5 -10°26.3	69°32.6 -10°15.7	84°04.7 -10°05.0	98°36.8 -9°54.3	+32.1	15.3
●	Tu 22	316°37.6 -9°07.1	331°09.6 -6°55.6	345°41.5 -6°44.0	0°13.5 -6°32.3	14°45.4 -6°20.6	29°17.8 -6°08.9	43°49.1 -5°57.1	58°21.9 -5°45.2	72°52.8 -5°33.4	87°24.6 -5°21.4	101°56.4 -5°09.5	+31.9	15.5
	We 23	319°50.2 -2°05.7	334°21.3 -2°05.7	348°52.8 -2°03.4	3°24.1 -1°40.6	17°55.5 -1°28.1	32°26.5 -1°02.9	46°57.7 -0°50.2	61°28.8 -0°37.6	75°59.8 -0°24.9	90°30.9 -0°12.2	105°01.9 -0°00.5	+31.2	15.7
	Th 24	323°40.9 -3°12.6	337°11.1 -3°25.5	351°41.2 -3°38.3	6°11.3 -3°51.1	20°41.3 -4°04.0	35°11.2 -4°16.8	49°41.1 -4°29.7	64°11.0 -4°42.5	78°40.7 -4°55.3	93°10.4 -5°08.1	107°40.6 -5°20.9	+29.9	16.0
●	Fr 25	324°56.6 -8°30.4	339°25.1 -8°42.8	353°53.6 -8°55.1	8°21.9 -9°07.5	22°50.2 -9°07.5	37°18.5 -9°32.0	51°46.6 -9°44.2	66°14.7 -9°56.4	80°42.6 -10°08.5	95°10.6 -10°20.6	109°38.8 -10°32.6	+28.2	16.2
	Sa 26	326°26.0 -13°25.8	340°52.5 -13°36.8	355°19.0 -13°47.7	9°45.3 -13°58.6	24°11.6 -14°09.3	38°37.7 -14°20.0	53°03.8 -14°30.6	67°29.8 -14°41.1	81°55.8 -14°51.5	96°21.6 -15°01.9	110°47.4 -15°12.1	+26.1	16.4
	Su 27	327°04.0 -17°33.6	341°28.5 -17°42.1	355°52.9 -17°50.9	10°17.2 -17°58.9	24°41.5 -18°07.1	39°05.7 -18°15.2	53°29.8 -18°23.1	67°53.8 -18°30.9	82°17.8 -18°38.6	96°41.7 -18°46.2	111°05.6 -18°53.6	+24.2	16.5
●	Mo 28	326°56.2 -20°28.5	341°19.2 -20°33.7	355°42.1 -20°38.7	10°05.0 -20°43.6	24°27.8 -20°48.6	38°50.6 -20°52.9	53°13.4 -20°57.3	67°36.1 -21°01.6	81°58.8 -21°05.7	96°21.5 -21°09.7	110°44.2 -21°13.5	+22.8	16.5
	Tu 29	326°22.0 -21°51.4	340°44.5 -21°52.6	355°07.0 -21°53.7	9°29.5 -21°54.6	23°52.0 -21°56.0	38°14.5 -21°56.0	52°37.0 -21°56.4	66°59.6 -21°56.7	81°22.1 -21°56.8	95°44.7 -21°56.8	110°07.7 -21°56.6	+22.5	16.5
	We 30	325°50.6 -21°34.5	340°13.8 -21°31.8	354°33.1 -21°29.0	9°00.5 -21°26.0	23°23.9 -21°22.8	37°47.3 -21°19.5	52°10.9 -21°16.0	66°34.4 -21°12.4	80°58.1 -21°08.7	95°21.8 -21°04.8	109°45.6 -21°00.8	+23.5	16.4
●	Th 31	325°50.9 -19°43.9	340°15.9 -19°37.7	354°41.0 -19°31.4	9°06.1 -19°25.0	23°31.3 -19°18.4	37°56.7 -19°11.8	52°22.1 -19°05.0	66°47.6 -18°58.1	81°13.1 -18°51.1	95°38.8 -18°44.0	110°04.5 -18°36.7	+25.4	16.2
													+6.7	59.4

Row 1: GHA, Δ /h = GHA change - 14°, SH = semi-diameter
Row 2: Dec (- = South), Δ /h = dec. change, SH = horizontal parallax
Column = (UTC hour - day) mod 24
FQ: 4 03h56 — FM: 11 10h46 — LQ: 19 14h50 — NM: 26 20h17

SUN

November 2030

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Fr 1	259°06.3 -14°26.1	274°06.3 -14°26.9	289°06.3 -14°27.7	304°06.3 -14°28.5	319°06.3 -14°29.3	334°06.4 -14°30.1	349°06.4 -14°30.9	4°06.4 -14°31.7	15°06.4 -14°32.5	34°06.4 -14°33.3	45°06.4 -14°34.1	64°06.4 -14°34.9	+0.0 -0.8
Sa 2	259°06.6 -14°45.2	274°06.6 -15°04.6	289°06.6 -15°05.6	304°06.6 -15°06.4	319°06.6 -15°07.2	334°06.6 -15°08.0	349°06.6 -15°08.7	4°06.7 -15°09.5	15°06.7 -15°10.3	34°06.7 -15°11.1	45°06.7 -15°11.8	64°06.7 -15°12.6	+0.0 -0.8
Su 3	259°06.7 -15°04.1	274°06.7 -15°23.4	289°06.7 -15°24.2	304°06.7 -15°25.0	319°06.7 -15°25.7	334°06.7 -15°26.5	349°06.7 -15°27.3	4°06.7 -15°28.0	15°06.7 -15°28.8	34°06.7 -15°29.6	45°06.7 -15°30.3	64°06.7 -15°31.1	-0.0 -0.8
Mo 4	259°06.6 -15°22.7	274°06.6 -15°41.0	289°06.6 -15°41.8	304°06.6 -15°42.5	319°06.6 -15°43.3	334°06.6 -15°44.0	349°06.6 -15°44.8	4°06.6 -15°45.6	15°06.6 -15°46.3	34°06.6 -15°47.1	45°06.6 -15°47.8	64°06.6 -15°48.6	-0.0 -0.8
Tu 5	259°06.4 -15°41.0	274°06.4 -15°59.8	289°06.3 -16°00.6	304°06.3 -16°01.3	319°06.3 -16°02.1	334°06.3 -16°02.8	349°06.3 -16°03.6	4°06.3 -16°04.3	15°06.2 -16°05.1	34°06.2 -16°05.8	45°06.2 -16°06.6	64°06.2 -16°07.3	-0.0 -0.7
We 6	259°05.9 -16°16.9	274°05.9 -16°35.2	289°05.8 -16°35.9	304°05.8 -16°36.6	319°05.8 -16°37.4	334°05.8 -16°38.1	349°05.7 -16°38.8	4°05.7 -16°39.5	15°05.7 -16°40.2	34°05.7 -16°41.0	45°05.6 -16°41.7	64°05.6 -16°42.4	-0.0 -0.7
Th 7	259°05.2 -16°43.8	274°05.2 -16°52.4	289°05.1 -16°53.2	304°05.1 -16°53.9	319°05.1 -16°54.6	334°05.0 -16°55.3	349°05.0 -16°56.0	4°05.0 -16°56.7	15°04.9 -16°57.4	34°04.9 -16°58.1	45°04.9 -16°58.8	64°04.8 -16°59.5	-0.0 -0.7
Fr 8	259°04.3 -16°51.7	274°04.3 -16°52.4	289°04.2 -16°53.2	304°04.2 -16°53.9	319°04.2 -16°54.6	334°04.1 -16°55.3	349°04.1 -16°56.0	4°04.0 -16°56.7	15°04.0 -16°57.4	34°03.9 -16°58.1	45°03.9 -16°58.8	64°03.8 -16°59.5	-0.0 -0.7
Sa 9	259°03.2 -16°51.7	274°03.2 -16°52.4	289°03.1 -16°53.2	304°03.1 -16°53.9	319°03.0 -16°54.6	334°03.0 -16°55.3	349°02.9 -16°56.0	4°02.9 -16°56.7	15°02.8 -16°57.4	34°02.8 -16°58.1	45°02.7 -16°58.8	64°02.6 -16°59.5	-0.1 -0.7
Su 10	259°01.9 -17°08.7	274°01.9 -17°09.4	289°01.8 -17°10.1	304°01.7 -17°10.8	319°01.7 -17°11.5	334°01.6 -17°12.2	349°01.6 -17°12.9	4°01.5 -17°13.6	15°01.4 -17°14.3	34°01.4 -17°15.0	45°01.3 -17°15.7	64°01.2 -17°16.4	-0.1 -0.7
Mo 11	259°00.4 -17°25.4	274°00.3 -17°26.1	289°00.3 -17°26.8	304°00.3 -17°27.5	319°00.1 -17°28.1	334°00.0 -17°28.8	349°00.0 -17°29.5	3°59.9 -17°30.2	15°00.0 -17°30.9	33°59.8 -17°31.6	45°00.0 -17°32.3	63°59.6 -17°32.9	-0.1 -0.7
Tu 12	258°58.7 -17°41.8	273°58.6 -17°42.5	288°58.5 -17°43.1	303°58.4 -17°43.8	318°58.3 -17°44.5	333°58.3 -17°45.2	348°58.2 -17°45.9	3°58.1 -17°46.5	15°00.0 -17°47.2	33°57.9 -17°47.9	45°00.0 -17°48.6	63°57.8 -17°49.2	-0.1 -0.7
We 13	258°56.7 -17°57.9	273°56.6 -17°58.5	288°56.5 -17°59.2	303°56.4 -17°59.9	318°56.4 -18°00.5	333°56.3 -18°01.2	348°56.2 -18°01.8	3°56.1 -18°02.5	15°00.0 -18°03.2	33°55.9 -18°03.9	45°00.0 -18°04.6	63°55.7 -18°05.1	-0.1 -0.7
Th 14	258°54.8 -18°13.6	273°54.4 -18°14.3	288°54.0 -18°14.9	303°54.3 -18°15.6	318°54.2 -18°16.2	333°54.1 -18°16.9	348°54.0 -18°17.5	3°53.9 -18°18.2	15°00.0 -18°18.8	33°53.7 -18°19.5	45°00.0 -18°20.1	63°53.5 -18°20.8	-0.1 -0.6
Fr 15	258°52.2 -18°29.1	273°52.1 -18°29.7	288°52.0 -18°30.4	303°52.1 -18°31.0	318°51.7 -18°31.6	333°51.6 -18°32.3	348°51.5 -18°32.9	3°51.4 -18°33.6	15°00.0 -18°34.2	33°51.2 -18°34.9	45°00.0 -18°35.6	63°51.0 -18°36.1	-0.1 -0.6
Sa 16	258°49.6 -18°44.2	273°49.5 -18°44.9	288°49.3 -18°45.5	303°49.2 -18°46.1	318°49.1 -18°46.7	333°49.0 -18°47.3	348°48.9 -18°48.0	3°48.8 -18°48.6	15°00.0 -18°49.2	33°48.5 -18°49.9	45°00.0 -18°50.4	63°48.3 -18°51.1	-0.1 -0.6
Su 17	258°46.8 -18°59.6	273°46.6 -18°59.6	288°46.5 -19°00.3	303°46.4 -19°00.9	318°46.3 -19°01.5	333°46.2 -19°02.1	348°46.0 -19°02.7	3°45.9 -19°03.3	15°00.0 -19°03.9	33°45.7 -19°04.5	45°00.0 -19°05.1	63°45.4 -19°05.7	-0.1 -0.6
Mo 18	258°43.7 -19°13.5	273°43.6 -19°14.1	288°43.5 -19°14.7	303°43.4 -19°15.3	318°43.2 -19°15.9	333°43.1 -19°16.5	348°43.0 -19°17.1	3°42.8 -19°17.7	15°00.0 -19°18.2	33°42.6 -19°18.8	45°00.0 -19°19.4	63°42.3 -19°20.0	-0.1 -0.6
Tu 19	258°40.5 -19°27.6	273°40.4 -19°28.2	288°40.2 -19°28.8	303°40.1 -19°29.4	318°40.0 -19°29.9	333°39.8 -19°30.5	348°39.7 -19°31.1	3°39.5 -19°31.7	15°00.0 -19°32.2	33°39.2 -19°32.8	45°00.0 -19°33.4	63°39.0 -19°34.0	-0.1 -0.6
We 20	258°37.1 -19°41.4	273°36.9 -19°42.0	288°36.8 -19°42.5	303°36.6 -19°43.1	318°36.5 -19°43.6	333°36.3 -19°44.2	348°36.2 -19°44.8	3°36.0 -19°45.3	15°00.0 -19°45.9	33°35.7 -19°46.5	45°00.0 -19°47.0	63°35.4 -19°47.6	-0.2 -0.6
Th 21	258°33.4 -19°54.8	273°33.3 -19°55.3	288°33.1 -19°55.9	303°32.9 -19°56.4	318°32.8 -19°57.0	333°32.6 -19°57.5	348°32.5 -19°58.1	3°32.3 -19°58.6	15°00.0 -19°59.2	33°32.1 -19°59.7	45°00.0 -20°00.3	63°31.7 -20°00.8	-0.2 -0.5
Fr 22	258°29.6 -20°07.5	273°29.4 -20°08.4	288°29.2 -20°08.9	303°29.1 -20°09.4	318°28.9 -20°10.0	333°28.7 -20°10.5	348°28.6 -20°11.0	3°28.4 -20°11.6	15°00.0 -20°12.1	33°28.1 -20°12.6	45°00.0 -20°13.2	63°27.7 -20°13.7	-0.2 -0.5
Sa 23	258°25.8 -20°20.5	273°25.3 -20°21.0	288°25.1 -20°21.6	303°25.0 -20°22.1	318°24.8 -20°22.6	333°24.6 -20°23.1	348°24.4 -20°23.6	3°24.3 -20°24.2	15°00.0 -20°24.7	33°23.9 -20°25.2	45°00.0 -20°25.7	63°23.6 -20°26.2	-0.2 -0.5
Su 24	258°21.2 -20°32.8	273°21.1 -20°33.3	288°20.9 -20°33.8	303°20.7 -20°34.3	318°20.5 -20°34.8	333°20.3 -20°35.3	348°20.1 -20°35.8	3°20.0 -20°36.3	15°00.0 -20°36.8	33°19.6 -20°37.3	45°00.0 -20°37.8	63°19.2 -20°38.3	-0.2 -0.5
Mo 25	258°16.8 -20°45.2	273°16.6 -20°45.2	288°16.4 -20°45.7	303°16.2 -20°46.2	318°16.0 -20°46.7	333°15.8 -20°47.2	348°15.6 -20°47.7	3°15.5 -20°48.2	15°00.0 -20°48.6	33°15.3 -20°49.1	45°00.0 -20°49.6	63°14.7 -20°50.1	-0.2 -0.5
Tu 26	258°12.1 -20°56.3	273°11.9 -20°56.8	288°11.7 -20°57.2	303°11.6 -20°57.7	318°11.4 -20°58.2	333°11.2 -20°58.6	348°11.0 -20°59.1	3°10.8 -20°59.6	15°00.0 -21°00.1	33°10.4 -21°00.6	45°00.0 -21°01.1	63°10.0 -21°01.5	-0.2 -0.5
We 27	258°07.3 -21°07.4	273°07.1 -21°08.4	288°06.9 -21°08.8	303°06.7 -21°09.3	318°06.5 -21°09.8	333°06.3 -21°09.7	348°06.1 -21°10.2	3°05.9 -21°10.6	15°00.0 -21°11.1	33°05.5 -21°11.5	45°00.0 -21°12.0	63°05.0 -21°12.4	-0.2 -0.5
Th 28	258°02.3 -21°18.2	273°02.1 -21°18.6	288°01.9 -21°19.1	303°01.7 -21°19.5	318°01.5 -21°19.9	333°01.3 -21°20.4	348°01.0 -21°20.8	3°00.8 -21°21.3	15°00.0 -21°21.7	33°00.6 -21°22.1	45°00.0 -21°22.6	63°00.0 -21°23.0	-0.2 -0.4
Fr 29	257°57.1 -21°28.5	272°56.9 -21°29.0	287°56.7 -21°29.4	302°56.5 -21°29.8	317°56.3 -21°30.2	332°56.0 -21°30.6	347°55.8 -21°31.1	2°55.6 -21°31.5	15°00.0 -21°31.9	32°55.2 -21°32.3	45°00.0 -21°32.7	62°54.7 -21°33.1	-0.2 -0.4
Sa 30	257°51.8 -21°38.5	272°51.6 -21°38.9	287°51.3 -21°39.3	302°51.1 -21°39.7	317°50.9 -21°40.1	332°50.7 -21°40.5	347°50.4 -21°40.9	2°50.2 -21°41.3	15°00.0 -21°41.7	32°49.8 -21°42.1	45°00.0 -21°42.5	62°49.3 -21°42.9	-0.2 -0.4

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

November 2030

	D	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	Δ'/h	SH
O	Fr 1	240°00.3 -17°26.8	254°26.9 -17°18.5	268°53.2 -17°10.1	283°20.4 -17°01.6	297°47.3 -16°53.1	312°14.3 -16°44.4	326°41.4 -16°35.6	341°08.6 -16°26.8	355°35.8 -16°17.8	10°03.2 -16°08.8	24°30.6 -15°59.7	+27.0	16.1
	Sa 2	241°32.6 -13°33.5	256°01.5 -13°23.2	270°30.4 -13°12.8	284°59.3 -13°02.4	299°28.4 -12°51.9	313°57.5 -12°41.3	328°26.7 -12°30.7	342°56.0 -12°20.0	357°25.4 -12°09.3	11°54.8 -11°58.5	26°24.4 -11°47.7	+29.2	15.9
	Su 3	243°55.9 -8°47.9	258°26.5 -8°36.3	272°57.2 -8°24.7	287°28.0 -8°13.1	301°58.8 -8°01.4	316°29.7 -7°49.7	331°00.6 -7°38.0	345°31.6 -7°26.2	0°02.7 -7°14.5	14°33.8 -7°02.7	29°05.0 -6°51.7	+30.9	15.7
O	Mo 4	246°58.7 -4°03.4	261°30.6 -3°51.3	276°02.6 -3°39.3	290°34.6 -3°27.2	305°06.7 -3°15.1	319°38.8 -3°03.0	334°10.9 -2°50.9	348°43.1 -2°38.9	3°15.3 -2°26.8	17°47.6 -2°14.7	32°19.8 -2°02.6	+32.1	15.5
	Tu 5	250°27.3 0°58.3	264°59.9 1°10.3	279°32.6 1°22.3	294°05.3 1°34.2	308°38.1 1°46.2	323°10.8 1°58.1	337°43.6 2°10.0	352°16.3 2°21.9	6°49.1 2°33.7	21°21.9 2°45.6	35°54.7 2°57.4	+32.8	15.3
	We 6	254°07.7 5°51.7	268°40.6 6°03.1	283°13.4 6°14.4	297°46.3 6°25.8	312°19.2 6°37.0	326°52.1 6°48.3	341°24.9 6°59.5	355°57.8 7°10.7	10°30.7 7°21.8	25°03.5 7°32.9	39°36.4 7°43.9	+32.9	15.2
O	Th 7	257°47.8 10°24.3	272°20.5 10°34.6	286°53.1 10°44.8	301°25.7 10°55.0	315°58.4 11°05.2	330°30.9 11°15.3	345°03.5 11°25.3	359°36.1 11°35.3	14°08.6 11°45.2	28°41.1 11°55.0	43°13.6 12°04.9	+32.6	15.1
	Fr 8	261°18.4 17°41.5	275°50.6 17°05.4	290°22.7 17°55.1	304°54.8 18°01.8	319°26.8 18°08.4	333°58.9 18°14.9	348°30.9 18°21.3	3°02.9 18°27.7	17°34.8 18°33.9	32°06.7 18°40.1	46°38.6 18°46.2	+32.0	14.9
	Sa 9	264°34.1 17°41.5	279°05.6 17°05.4	293°37.9 17°55.1	308°08.5 18°01.8	322°39.9 18°08.4	337°11.3 18°14.9	351°42.6 18°21.3	6°14.0 18°27.7	20°45.3 18°33.9	35°16.6 18°40.1	49°47.8 18°46.2	+31.4	14.9
O	Su 10	267°34.0 20°06.3	282°04.9 20°10.9	296°35.8 20°15.4	311°06.7 20°19.8	325°37.5 20°24.1	340°08.3 20°28.3	354°39.2 20°32.4	9°10.0 20°36.6	23°40.7 20°44.0	38°11.5 20°44.0	52°42.3 20°47.9	+30.8	14.8
	Mo 11	270°22.0 21°31.8	284°52.6 21°33.9	299°23.1 21°35.9	313°53.7 21°37.8	328°24.3 21°39.6	342°54.8 21°41.3	357°25.3 21°42.9	11°55.9 21°44.4	26°26.4 21°45.8	40°57.0 21°47.1	55°27.5 21°48.3	+30.5	14.7
	Tu 12	273°05.7 21°54.0	287°36.3 21°53.5	302°06.9 21°53.0	316°37.5 21°52.3	331°08.1 21°51.6	345°38.7 21°50.7	0°09.3 21°49.7	14°39.9 21°48.7	29°10.6 21°47.5	43°41.3 21°46.3	58°11.9 21°44.9	+30.6	14.7
O	We 13	275°53.9 21°12.4	290°24.8 21°09.5	304°55.8 21°06.4	319°26.8 21°03.3	333°57.8 21°00.0	348°28.8 20°56.7	2°59.8 20°53.2	17°30.9 20°49.7	32°02.0 20°46.1	46°33.1 20°42.3	61°04.2 20°38.5	+31.0	14.7
	Th 14	278°54.1 19°30.0	293°25.6 19°24.7	307°57.2 19°19.3	322°28.8 19°13.9	337°00.4 19°08.3	351°32.0 19°02.7	6°03.7 18°56.9	20°35.3 18°51.1	35°07.1 18°45.2	49°38.8 18°39.2	64°10.5 18°33.1	+31.6	14.8
	Fr 15	283°10.1 16°52.1	296°42.2 16°44.7	311°14.4 16°37.2	325°46.6 16°29.7	340°18.9 16°22.1	354°51.1 16°14.4	9°23.4 16°06.6	23°55.7 15°58.8	38°28.0 15°50.9	53°00.4 15°42.9	67°32.8 15°34.8	+32.3	14.9
O	Sa 16	296°42.2 16°44.7	311°14.4 16°37.2	325°46.6 16°29.7	340°18.9 16°22.1	354°51.1 16°14.4	9°23.4 16°06.6	23°55.7 15°58.8	38°28.0 15°50.9	53°00.4 15°42.9	67°32.8 15°34.8	82°05.2 15°26.7	+32.3	14.9
	Su 17	300°13.4 13°16.3	314°46.1 13°07.1	329°18.8 12°57.8	343°51.5 12°48.4	358°24.2 12°39.9	12°56.9 12°29.5	27°29.7 12°20.0	42°02.4 12°10.4	56°35.2 12°00.7	71°08.8 11°51.0	85°40.7 11°41.2	+32.7	15.0
	Mo 18	303°53.2 9°07.5	318°26.2 8°56.8	332°58.9 8°46.1	347°31.7 8°35.3	362°04.6 8°24.5	16°37.4 8°13.6	31°10.2 8°02.7	45°43.1 7°51.7	60°15.9 7°40.7	74°48.7 7°29.6	89°21.5 7°18.5	+32.8	15.2
O	Tu 19	307°31.9 4°26.8	322°04.5 4°15.1	336°37.0 4°03.3	351°09.5 3°51.5	5°42.0 3°39.6	20°14.4 3°27.7	34°46.9 3°15.8	49°19.3 3°03.9	63°51.6 2°51.9	78°24.0 2°39.9	92°56.3 2°27.9	+32.4	15.4
	We 20	310°56.6 -0°35.5	325°28.3 -0°47.9	339°59.9 -1°00.2	354°31.5 -1°12.6	5°03.1 -1°25.1	23°34.6 -1°37.5	38°06.0 -1°49.9	52°37.4 -2°02.4	67°08.8 -2°14.8	81°40.0 -2°27.3	96°11.3 -2°39.7	+31.5	15.7
	Th 21	313°52.4 -5°46.7	328°22.7 -5°59.1	342°52.8 -6°11.5	357°22.9 -6°23.9	11°52.9 -6°36.2	26°22.8 -6°48.6	40°52.6 -7°00.9	55°22.4 -7°13.2	69°52.1 -7°25.5	84°21.7 -7°37.8	98°51.2 -7°50.0	+29.9	16.0
O	Fr 22	316°04.2 -10°49.9	330°32.4 -11°01.6	345°00.4 -11°13.2	359°28.4 -11°24.8	13°56.3 -11°36.3	28°24.1 -11°47.7	42°51.8 -11°59.1	57°19.4 -12°10.5	71°46.9 -12°21.8	86°14.3 -12°33.0	100°41.6 -12°44.2	+27.7	16.2
	Sa 23	317°19.4 -15°23.3	331°45.2 -15°33.3	346°10.8 -15°43.1	360°36.3 -15°52.9	15°01.8 -16°02.6	29°27.1 -16°12.2	43°52.3 -16°21.7	58°17.5 -16°31.0	72°42.5 -16°40.3	87°07.4 -16°48.2	101°32.3 -16°58.6	+25.3	16.5
	Su 24	317°33.7 -19°01.0	331°57.0 -19°08.2	346°20.3 -19°15.2	360°43.5 -19°22.1	15°06.7 -19°35.5	29°29.7 -19°42.0	43°52.7 -19°48.4	58°15.6 -19°54.6	72°38.4 -20°05.8	87°01.2 -20°16.6	101°23.8 -20°26.6	+23.0	16.6
O	Mo 25	316°56.5 -21°17.2	331°18.2 -21°20.6	345°40.0 -21°23.9	360°01.6 -21°27.0	14°23.3 -21°30.0	28°44.9 -21°32.8	43°06.5 -21°35.4	57°28.1 -21°37.9	71°49.6 -21°40.1	86°11.1 -21°42.3	100°32.6 -21°44.2	+21.6	16.7
	Tu 26	315°54.1 -21°53.3	330°15.5 -21°52.6	344°37.8 -21°51.6	358°58.6 -21°50.5	13°20.1 -21°49.3	27°41.7 -21°47.9	42°03.3 -21°46.3	56°24.9 -21°44.5	70°46.6 -21°42.6	85°08.3 -21°40.5	99°30.1 -21°38.3	+21.6	16.7
	We 27	315°02.4 -20°45.3	329°25.1 -20°40.5	343°47.8 -20°35.6	358°10.6 -20°30.5	12°33.5 -20°25.5	26°56.4 -20°19.9	41°19.5 -20°14.4	55°42.6 -20°09.8	70°05.8 -20°03.8	84°29.0 -19°57.1	98°52.4 -19°51.0	+23.0	16.6
O	Th 28	314°53.5 -18°04.6	329°18.3 -17°56.5	343°43.3 -17°48.4	358°08.3 -17°40.1	12°33.4 -17°31.7	26°58.6 -17°23.2	41°24.0 -17°14.6	55°49.4 -17°05.9	70°14.9 -16°57.1	84°40.5 -16°48.2	99°06.3 -16°39.2	+25.3	16.1
	Fr 29	315°44.2 -14°03.4	330°11.5 -13°52.6	344°38.9 -13°42.1	359°06.4 -13°30.2	13°34.0 -13°18.5	28°01.8 -13°08.1	42°29.6 -13°10.1	56°57.5 -12°59.4	71°25.5 -12°48.5	85°53.5 -12°37.7	100°21.7 -12°26.7	+27.8	16.1
	Sa 30	317°35.2 -9°36.4	332°04.8 -9°24.7	346°34.5 -9°13.0	361°04.2 -9°01.2	15°34.0 -8°49.0	30°03.9 -8°37.6	44°33.9 -8°25.7	59°03.9 -8°13.8	73°34.1 -8°01.9	88°04.2 -7°50.0	102°34.5 -7°38.0	+29.9	15.9

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameterRow 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 2 11h56 — FM: 10 03h30 — LQ: 18 08h32 — NM: 25 06h46

SUN

December 2030

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Su 1	272°46.1 -21°48.4	287°45.8 -21°48.8	302°45.6 -21°49.2	317°45.4 -21°49.6	332°45.1 -21°49.9	347°44.9 -21°50.3	2°44.7 -21°50.7	17°44.4 -21°51.1	32°44.2 -21°51.5	47°44.0 -21°51.8	62°43.7 -21°52.2	77°43.5 -21°52.6	-0.2 -0.4
Mo 2	272°40.4 -21°57.8	287°40.2 -21°57.9	302°39.9 -21°58.2	317°39.7 -21°58.6	332°39.4 -21°59.0	347°39.2 -21°59.3	2°39.0 -21°59.7	17°38.7 -22°00.1	32°38.5 -22°00.4	47°38.2 -22°00.8	62°38.0 -22°01.1	77°37.7 -22°01.5	-0.2 -0.4
Tu 3	272°34.6 -22°06.2	287°34.3 -22°06.5	302°34.1 -22°06.9	317°33.8 -22°07.2	332°33.6 -22°07.6	347°33.3 -22°07.9	2°38.1 -22°08.3	17°32.9 -22°08.6	32°32.6 -22°08.9	47°32.4 -22°09.2	62°32.1 -22°09.6	77°31.9 -22°10.0	-0.2 -0.3
We 4	272°28.6 -22°14.4	287°28.4 -22°14.7	302°28.1 -22°15.1	317°27.9 -22°15.4	332°27.6 -22°15.7	347°27.4 -22°16.1	2°27.1 -22°16.4	17°26.9 -22°16.7	32°26.6 -22°17.0	47°26.3 -22°17.4	62°26.1 -22°17.7	77°25.8 -22°18.0	-0.3 -0.3
Th 5	272°22.5 -22°22.2	287°22.3 -22°22.5	302°22.0 -22°22.8	317°21.7 -22°23.2	332°21.5 -22°23.5	347°21.2 -22°23.8	2°21.0 -22°24.1	17°20.7 -22°24.4	32°20.5 -22°24.7	47°20.2 -22°25.0	62°19.9 -22°25.3	77°19.7 -22°25.6	-0.3 -0.3
Fr 6	272°16.3 -22°29.6	287°16.0 -22°29.9	302°15.8 -22°30.2	317°15.5 -22°30.5	332°15.2 -22°30.8	347°15.0 -22°31.1	2°14.7 -22°31.4	17°14.4 -22°31.7	32°14.2 -22°31.9	47°13.9 -22°32.2	62°13.6 -22°32.5	77°13.4 -22°32.8	-0.3 -0.3
Sa 7	272°09.9 -22°36.5	287°09.6 -22°36.8	302°09.4 -22°37.1	317°09.1 -22°37.4	332°08.8 -22°37.6	347°08.6 -22°37.9	2°08.3 -22°38.2	17°08.0 -22°38.5	32°07.8 -22°38.7	47°07.5 -22°39.0	62°07.2 -22°39.3	77°07.0 -22°39.6	-0.3 -0.3
Su 8	272°03.4 -22°43.0	287°03.2 -22°43.3	302°02.9 -22°43.5	317°02.6 -22°43.8	332°02.3 -22°44.1	347°02.1 -22°44.3	2°01.8 -22°44.6	17°01.5 -22°44.8	32°01.2 -22°45.1	47°01.0 -22°45.3	62°00.7 -22°45.6	77°00.4 -22°45.8	-0.3 -0.3
Mo 9	271°56.8 -22°49.1	286°56.5 -22°49.3	301°56.3 -22°49.6	316°56.0 -22°49.8	331°55.7 -22°50.0	346°55.4 -22°50.3	1°55.2 -22°50.5	16°54.9 -22°50.8	31°54.6 -22°51.0	46°54.3 -22°51.2	61°54.0 -22°51.5	76°53.8 -22°51.7	-0.3 -0.2
Tu 10	271°50.1 -22°50.7	286°49.8 -22°50.9	301°49.5 -22°51.1	316°49.3 -22°51.2	331°49.0 -22°51.5	346°48.7 -22°51.8	1°48.4 -22°51.9	16°48.1 -22°52.1	31°47.8 -22°52.2	46°47.6 -22°52.4	61°47.3 -22°52.5	76°47.0 -22°52.7	-0.3 -0.2
We 11	271°43.3 -22°59.8	286°43.0 -22°59.9	301°42.7 -22°00.2	316°42.4 -22°00.4	331°42.1 -22°00.6	346°41.9 -22°00.8	1°41.6 -22°01.1	16°41.3 -22°01.2	31°41.0 -22°01.4	46°40.7 -22°01.6	61°40.4 -22°01.8	76°40.1 -22°02.0	-0.3 -0.2
Th 12	271°36.4 -23°04.5	286°36.1 -23°04.7	301°35.8 -23°04.9	316°35.5 -23°05.1	331°35.2 -23°05.3	346°34.9 -23°05.4	1°34.6 -23°05.7	16°34.3 -23°05.8	31°34.0 -23°06.0	46°33.8 -23°06.2	61°33.5 -23°06.3	76°33.2 -23°06.5	-0.3 -0.2
Fr 13	271°29.4 -23°08.8	286°29.1 -23°08.9	301°28.8 -23°09.1	316°28.5 -23°09.3	331°28.2 -23°09.4	346°27.9 -23°09.6	1°27.6 -23°09.8	16°27.3 -23°09.9	31°27.0 -23°10.1	46°26.7 -23°10.2	61°26.4 -23°10.4	76°26.1 -23°10.6	-0.3 -0.2
Sa 14	271°22.3 -23°12.0	286°22.0 -23°12.7	301°21.7 -23°12.8	316°21.4 -23°13.0	331°21.1 -23°13.1	346°20.8 -23°13.3	1°20.5 -23°13.4	16°20.2 -23°13.6	31°19.9 -23°13.7	46°19.6 -23°13.8	61°19.3 -23°14.0	76°19.0 -23°14.1	-0.3 -0.2
Su 15	271°15.9 -23°15.7	286°14.8 -23°16.0	301°14.5 -23°16.1	316°14.2 -23°16.2	331°13.9 -23°16.4	346°13.6 -23°16.5	1°13.3 -23°16.6	16°13.0 -23°16.7	31°12.7 -23°16.9	46°12.4 -23°17.0	61°12.1 -23°17.1	76°11.8 -23°17.2	-0.3 -0.1
Mo 16	271°07.9 -23°21.1	286°07.6 -23°21.2	301°07.3 -23°21.3	316°07.0 -23°21.4	331°06.7 -23°21.5	346°06.4 -23°21.5	1°06.1 -23°21.6	16°05.8 -23°21.7	31°05.5 -23°21.9	46°05.2 -23°21.9	61°04.9 -23°22.0	76°04.5 -23°22.0	-0.3 -0.1
Tu 17	271°00.6 -23°21.1	286°00.3 -23°21.2	301°00.0 -23°21.6	315°59.7 -23°21.4	330°59.4 -23°21.5	345°59.1 -23°21.5	0°58.8 -23°21.6	15°58.5 -23°21.7	30°58.1 -23°21.9	45°57.8 -23°21.9	60°57.5 -23°22.0	75°57.2 -23°22.0	-0.3 -0.1
We 18	270°53.2 -23°23.0	285°52.9 -23°23.1	300°52.6 -23°23.2	315°52.3 -23°23.2	330°52.0 -23°23.3	345°51.7 -23°23.4	0°51.4 -23°23.4	15°51.1 -23°23.5	30°50.8 -23°23.6	45°50.5 -23°23.6	60°50.2 -23°23.7	75°49.9 -23°23.7	-0.3 -0.1
Th 19	270°45.8 -23°24.5	285°45.5 -23°24.5	300°45.3 -23°24.6	315°44.9 -23°24.6	330°44.6 -23°24.7	345°44.3 -23°24.7	0°44.0 -23°24.8	15°43.7 -23°24.8	30°43.4 -23°24.9	45°43.1 -23°24.9	60°42.8 -23°24.9	75°42.4 -23°25.0	-0.3 -0.0
Fr 20	270°38.4 -23°25.5	285°38.1 -23°25.5	300°37.8 -23°25.5	315°37.5 -23°25.5	330°37.2 -23°25.6	345°36.9 -23°25.6	0°36.6 -23°25.6	15°36.2 -23°25.7	30°35.9 -23°25.7	45°35.6 -23°25.7	60°35.3 -23°25.7	75°35.0 -23°25.8	-0.3 -0.0
Sa 21	270°31.0 -23°26.0	285°30.6 -23°26.0	300°30.3 -23°26.0	315°30.0 -23°26.0	330°29.7 -23°26.0	345°29.4 -23°26.0	0°29.1 -23°26.0	15°28.8 -23°26.0	30°28.5 -23°26.0	45°28.2 -23°26.0	60°27.8 -23°26.0	75°27.5 -23°26.0	-0.3 -0.0
Su 22	270°23.5 -23°26.0	285°23.2 -23°26.0	300°22.9 -23°26.0	315°22.5 -23°26.0	330°22.2 -23°26.0	345°21.9 -23°26.0	0°21.6 -23°25.9	15°21.3 -23°25.9	30°21.0 -23°25.9	45°20.7 -23°25.9	60°20.4 -23°25.9	75°20.1 -23°25.9	-0.3 +0.0
Mo 23	270°16.0 -23°25.6	285°15.7 -23°25.5	300°15.4 -23°25.5	315°15.1 -23°25.5	330°14.8 -23°25.5	345°14.4 -23°25.4	0°14.1 -23°25.4	15°13.8 -23°25.4	30°13.5 -23°25.3	45°13.2 -23°25.3	60°12.9 -23°25.3	75°12.6 -23°25.2	-0.3 +0.0
Tu 24	270°08.5 -23°24.7	285°08.2 -23°24.6	300°07.9 -23°24.6	315°07.6 -23°24.5	330°07.3 -23°24.5	345°07.0 -23°24.4	0°06.6 -23°24.4	15°06.3 -23°24.3	30°06.0 -23°24.3	45°05.7 -23°24.2	60°05.4 -23°24.2	75°05.1 -23°24.1	-0.3 +0.1
We 25	270°01.0 -23°23.3	285°00.7 -23°23.2	300°00.4 -23°23.2	315°00.1 -23°23.1	329°59.8 -23°23.0	344°59.5 -23°23.0	344°59.5 -23°23.0	14°58.9 -23°22.8	29°58.6 -23°22.7	44°58.2 -23°22.7	59°57.9 -23°22.6	74°57.6 -23°22.5	-0.3 +0.1
Th 26	269°53.6 -23°21.5	284°53.3 -23°21.4	299°53.0 -23°21.3	314°52.7 -23°21.2	329°52.3 -23°21.1	344°52.0 -23°21.0	344°52.0 -23°21.0	14°51.4 -23°20.9	29°51.1 -23°20.7	44°50.8 -23°20.7	59°50.5 -23°20.6	74°50.2 -23°20.5	-0.3 +0.1
Fr 27	269°46.4 -23°19.1	284°45.9 -23°19.0	299°45.6 -23°18.9	314°45.2 -23°18.8	329°44.9 -23°18.7	344°44.6 -23°18.6	344°44.6 -23°18.5	14°44.3 -23°18.4	29°43.7 -23°18.3	44°43.4 -23°18.2	59°43.1 -23°18.0	74°42.8 -23°17.9	-0.3 +0.1
Sa 28	269°38.8 -23°16.4	284°38.5 -23°16.2	299°38.2 -23°16.1	314°37.9 -23°16.0	329°37.6 -23°15.9	344°37.3 -23°15.7	344°37.3 -23°15.6	14°36.6 -23°15.5	29°36.3 -23°15.3	44°36.0 -23°15.2	59°35.7 -23°15.1	74°35.4 -23°14.9	-0.3 +0.1
Su 29	269°31.5 -23°13.1	284°31.2 -23°13.0	299°30.8 -23°12.8	314°30.5 -23°12.7	329°30.2 -23°12.5	344°29.9 -23°12.4	344°29.9 -23°12.2	14°29.3 -23°12.1	29°29.0 -23°11.9	44°28.7 -23°11.8	59°28.4 -23°11.6	74°28.1 -23°11.5	-0.3 +0.1
Mo 30	269°24.2 -23°09.4	284°23.9 -23°09.2	299°23.6 -23°09.1	314°23.3 -23°08.9	329°23.0 -23°08.7	344°22.7 -23°08.6	344°22.7 -23°08.4	14°22.1 -23°08.2	29°21.8 -23°08.1	44°21.5 -23°07.9	59°21.2 -23°07.7	74°20.9 -23°07.6	-0.3 +0.2
Tu 31	269°17.0 -23°05.2	284°16.7 -23°05.1	299°16.4 -23°04.9	314°16.1 -23°04.7	329°15.8 -23°04.5	344°15.5 -23°04.3	344°15.5 -23°04.1	14°14.9 -23°03.9	29°14.6 -23°03.7	44°14.3 -23°03.4	59°14.0 -23°03.2	74°13.7 -23°03.0	-0.3 +0.2

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.3'

MOON

December 2030

	D	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	Δ'/h SH
●	Su 1	233 ⁰ 10.1 -5 ⁰ 49.3	247 ⁰ 41.0 -5 ⁰ 37.2	262 ¹ 12.0 -5 ⁰ 25.0	276 ⁰ 43.1 -5 ⁰ 12.8	291 ⁰ 14.2 -5 ⁰ 00.7	305 ⁰ 45.4 -4 ⁰ 48.5	320 ⁰ 16.6 -4 ⁰ 36.2	334 ⁰ 47.9 -4 ⁰ 24.0	349 ⁰ 19.3 -4 ⁰ 11.8	3 ⁰ 50.7 -3 ⁰ 59.6	18 ⁰ 22.2 -3 ⁰ 47.3	+31.2 15.7 -12.2 57.6
	Mo 2	236 ⁰ 19.0 -0 ⁰ 44.0	250 ⁰ 52.1 -0 ⁰ 31.4	265 ⁰ 24.3 -0 ⁰ 19.7	279 ⁰ 56.6 -0 ⁰ 07.5	294 ⁰ 28.9 0 ⁰ 04.9	309 ⁰ 01.2 0 ⁰ 16.7	323 ⁰ 33.6 0 ⁰ 28.8	338 ⁰ 06.0 0 ⁰ 40.9	352 ⁰ 38.4 0 ⁰ 53.0	7 ⁰ 19.0 1 ⁰ 05.0	21 ⁰ 43.3 1 ⁰ 17.1	+32.3 15.5 -12.1 56.7
	Tu 3	239 ⁰ 53.4 4 ⁰ 14.9	254 ⁰ 26.2 4 ⁰ 26.6	268 ⁰ 59.0 4 ⁰ 38.4	283 ⁰ 31.9 4 ⁰ 49.8	298 ⁰ 04.7 5 ⁰ 01.3	312 ⁰ 37.6 5 ⁰ 12.8	327 ⁰ 10.5 5 ⁰ 24.3	341 ⁰ 43.3 5 ⁰ 35.8	356 ⁰ 16.2 5 ⁰ 47.2	10 ⁰ 49.1 5 ⁰ 58.6	25 ⁰ 22.0 6 ⁰ 09.9	+32.9 15.3 +11.5 56.0
●	We 4	243 ⁰ 35.8 8 ⁰ 55.1	258 ⁰ 08.7 9 ⁰ 05.8	272 ⁰ 41.6 9 ⁰ 16.4	287 ⁰ 14.5 9 ⁰ 27.0	301 ⁰ 47.4 9 ⁰ 37.5	316 ⁰ 20.2 9 ⁰ 47.9	330 ⁰ 53.1 9 ⁰ 58.4	345 ⁰ 25.9 10 ⁰ 08.7	359 ⁰ 58.8 10 ⁰ 19.0	14 ⁰ 31.6 10 ⁰ 29.3	29 ⁰ 04.4 20 ⁰ 10.5	+32.9 15.1 +10.4 55.4
	Th 5	247 ⁰ 14.9 13 ⁰ 05.8	261 ⁰ 47.5 13 ⁰ 15.1	276 ⁰ 20.0 13 ⁰ 24.3	290 ⁰ 52.5 13 ⁰ 33.5	305 ⁰ 25.0 13 ⁰ 42.5	319 ⁰ 57.5 13 ⁰ 51.6	334 ⁰ 30.0 14 ⁰ 00.5	349 ⁰ 02.4 14 ⁰ 09.4	3 ⁰ 34.8 14 ⁰ 18.2	18 ⁰ 07.2 14 ⁰ 27.0	32 ⁰ 39.6 14 ⁰ 35.6	+32.5 15.0 +9.0 54.8
	Fr 6	250 ⁰ 42.0 16 ⁰ 37.3	265 ⁰ 14.0 16 ⁰ 44.8	279 ⁰ 45.9 16 ⁰ 52.2	294 ⁰ 17.8 16 ⁰ 59.6	308 ⁰ 49.7 17 ⁰ 06.9	323 ⁰ 21.6 17 ⁰ 14.1	337 ⁰ 53.4 17 ⁰ 21.2	352 ⁰ 25.2 17 ⁰ 28.2	6 ⁰ 56.9 17 ⁰ 35.2	21 ⁰ 28.7 17 ⁰ 42.0	36 ⁰ 00.4 17 ⁰ 48.8	+31.8 14.9 +7.2 54.5
○	Sa 7	253 ⁰ 52.9 19 ⁰ 20.5	268 ⁰ 24.2 19 ⁰ 25.9	282 ⁰ 55.4 19 ⁰ 31.2	297 ⁰ 26.7 19 ⁰ 36.5	311 ⁰ 57.9 19 ⁰ 41.6	326 ⁰ 29.1 19 ⁰ 46.6	341 ⁰ 00.2 19 ⁰ 51.6	355 ⁰ 31.4 19 ⁰ 56.5	10 ⁰ 02.5 20 ⁰ 01.2	24 ⁰ 33.6 20 ⁰ 05.9	39 ⁰ 04.6 20 ⁰ 10.5	+31.2 14.8 +5.0 54.2
	Su 8	256 ⁰ 48.2 21 ⁰ 07.7	271 ⁰ 19.0 21 ⁰ 10.8	285 ⁰ 49.7 21 ⁰ 16.6	300 ⁰ 20.4 21 ⁰ 16.6	314 ⁰ 51.1 21 ⁰ 19.3	329 ⁰ 21.8 21 ⁰ 21.9	343 ⁰ 52.5 21 ⁰ 24.5	358 ⁰ 23.2 21 ⁰ 26.9	12 ⁰ 53.9 21 ⁰ 29.3	27 ⁰ 24.5 21 ⁰ 31.5	41 ⁰ 55.1 21 ⁰ 33.6	+30.7 14.7 +2.6 54.0
	Mo 9	259 ⁰ 33.7 21 ⁰ 53.5	274 ⁰ 04.3 21 ⁰ 54.0	288 ⁰ 34.8 21 ⁰ 54.4	303 ⁰ 05.3 21 ⁰ 54.7	317 ⁰ 35.5 21 ⁰ 54.9	332 ⁰ 06.4 21 ⁰ 55.0	346 ⁰ 36.9 21 ⁰ 55.9	1 ⁰ 07.5 21 ⁰ 54.9	15 ⁰ 38.0 21 ⁰ 54.7	30 ⁰ 08.4 21 ⁰ 54.4	44 ⁰ 39.1 21 ⁰ 54.0	+30.5 14.7 +0.6 53.9
○	Tu 10	263 ⁰ 18.3 21 ⁰ 35.5	276 ⁰ 49.0 21 ⁰ 33.5	291 ⁰ 19.8 21 ⁰ 31.4	305 ⁰ 50.5 21 ⁰ 29.1	320 ⁰ 21.3 21 ⁰ 26.8	334 ⁰ 52.0 21 ⁰ 24.3	349 ⁰ 22.8 21 ⁰ 21.8	3 ⁰ 53.6 21 ⁰ 19.2	18 ⁰ 24.4 21 ⁰ 16.4	32 ⁰ 55.3 21 ⁰ 13.6	47 ⁰ 26.1 21 ⁰ 10.7	+30.8 14.7 -2.5 53.9
	We 11	265 ⁰ 11.5 20 ⁰ 15.1	279 ⁰ 42.8 20 ⁰ 10.6	294 ⁰ 14.0 20 ⁰ 06.1	308 ⁰ 45.3 20 ⁰ 01.4	323 ⁰ 16.6 19 ⁰ 56.7	337 ⁰ 47.9 19 ⁰ 51.9	352 ⁰ 19.3 19 ⁰ 47.0	6 ⁰ 50.6 19 ⁰ 42.0	21 ⁰ 22.0 19 ⁰ 36.9	35 ⁰ 53.5 19 ⁰ 31.7	50 ⁰ 24.9 19 ⁰ 26.4	+31.3 14.7 -4.9 54.0
	Th 12	268 ⁰ 20.4 17 ⁰ 56.9	282 ⁰ 52.3 17 ⁰ 50.3	297 ⁰ 24.3 17 ⁰ 43.6	311 ⁰ 56.3 17 ⁰ 36.8	326 ⁰ 28.3 17 ⁰ 29.9	341 ⁰ 00.3 17 ⁰ 22.9	355 ⁰ 32.4 17 ⁰ 15.9	10 ⁰ 04.5 17 ⁰ 08.8	24 ⁰ 36.7 17 ⁰ 01.6	39 ⁰ 08.9 16 ⁰ 54.3	53 ⁰ 41.1 16 ⁰ 47.0	+32.1 14.8 -7.0 54.2
●	Fr 13	271 ⁰ 47.5 14 ⁰ 48.1	286 ⁰ 20.1 14 ⁰ 39.6	300 ⁰ 52.8 14 ⁰ 31.0	315 ⁰ 25.5 14 ⁰ 22.4	329 ⁰ 58.2 14 ⁰ 13.7	344 ⁰ 31.0 14 ⁰ 05.0	359 ⁰ 03.8 13 ⁰ 56.1	18 ⁰ 36.6 13 ⁰ 47.3	28 ⁰ 09.4 13 ⁰ 38.3	42 ⁰ 42.2 13 ⁰ 29.3	57 ⁰ 15.1 13 ⁰ 20.2	+32.8 14.9 -8.8 54.5
	Sa 14	275 ⁰ 30.5 10 ⁰ 57.1	290 ⁰ 03.6 10 ⁰ 47.1	304 ⁰ 36.8 10 ⁰ 37.1	319 ⁰ 10.0 10 ⁰ 27.0	333 ⁰ 43.2 10 ⁰ 16.9	348 ⁰ 16.4 10 ⁰ 06.7	2 ⁰ 49.7 9 ⁰ 56.5	17 ⁰ 22.9 9 ⁰ 46.2	31 ⁰ 56.1 9 ⁰ 35.8	46 ⁰ 29.4 9 ⁰ 25.4	61 ⁰ 02.7 9 ⁰ 15.0	+33.2 15.0 -10.2 55.0
	Su 15	279 ⁰ 22.3 6 ⁰ 33.3	293 ⁰ 55.6 6 ⁰ 22.2	308 ⁰ 28.6 6 ⁰ 11.0	323 ⁰ 02.2 5 ⁰ 59.9	337 ⁰ 35.5 5 ⁰ 48.6	352 ⁰ 08.8 5 ⁰ 37.4	6 ⁰ 42.1 5 ⁰ 26.1	21 ⁰ 15.4 5 ⁰ 14.8	35 ⁰ 48.6 5 ⁰ 03.5	50 ⁰ 21.9 4 ⁰ 52.1	64 ⁰ 55.2 4 ⁰ 40.7	+33.3 15.2 -11.3 55.6
●	Mo 16	293 ⁰ 55.6 6 ⁰ 22.2	308 ⁰ 28.6 6 ⁰ 11.0	323 ⁰ 02.2 5 ⁰ 59.9	337 ⁰ 35.5 5 ⁰ 48.6	352 ⁰ 08.8 5 ⁰ 37.4	6 ⁰ 42.1 5 ⁰ 26.1	21 ⁰ 15.4 5 ⁰ 14.8	35 ⁰ 48.6 5 ⁰ 03.5	50 ⁰ 21.9 4 ⁰ 52.1	64 ⁰ 55.2 4 ⁰ 40.7	79 ⁰ 28.4 4 ⁰ 29.2	+33.3 15.2 -11.3 55.6
	Tu 17	297 ⁰ 45.1 1 ⁰ 34.4	312 ⁰ 18.0 1 ⁰ 22.6	326 ⁰ 50.9 1 ⁰ 10.7	341 ⁰ 23.8 0 ⁰ 58.0	355 ⁰ 56.7 0 ⁰ 46.9	10 ⁰ 29.5 0 ⁰ 35.0	25 ⁰ 02.3 0 ⁰ 23.1	39 ⁰ 35.0 0 ⁰ 11.2	54 ⁰ 07.8 -0 ⁰ 00.8	68 ⁰ 40.5 -0 ⁰ 12.7	83 ⁰ 13.1 -0 ⁰ 24.7	+32.8 15.4 -11.9 56.3
	We 18	301 ⁰ 18.3 -3 ⁰ 25.3	315 ⁰ 50.3 -3 ⁰ 37.4	330 ⁰ 22.2 -3 ⁰ 49.5	344 ⁰ 54.1 -4 ⁰ 01.5	359 ⁰ 25.9 -4 ⁰ 13.6	13 ⁰ 57.7 -4 ⁰ 25.7	28 ⁰ 29.4 -4 ⁰ 37.7	43 ⁰ 01.4 -4 ⁰ 49.7	57 ⁰ 32.6 -5 ⁰ 01.8	72 ⁰ 04.1 -5 ⁰ 13.8	86 ⁰ 35.6 -5 ⁰ 25.8	+31.7 15.6 -12.0 57.2
●	Th 19	304 ⁰ 19.8 -8 ⁰ 24.1	318 ⁰ 50.2 -8 ⁰ 35.9	333 ⁰ 20.5 -8 ⁰ 47.5	347 ⁰ 50.7 -8 ⁰ 59.2	362 ⁰ 00.9 -9 ⁰ 10.8	16 ⁰ 50.9 -9 ⁰ 22.4	31 ⁰ 20.9 -9 ⁰ 34.0	45 ⁰ 50.9 -9 ⁰ 45.5	60 ⁰ 20.6 -9 ⁰ 57.0	74 ⁰ 50.4 -10 ⁰ 08.5	89 ⁰ 20.0 -10 ⁰ 19.9	+30.0 15.8 -11.6 58.1
	Fr 20	306 ⁰ 34.1 -13 ⁰ 05.6	321 ⁰ 02.3 -13 ⁰ 16.2	335 ⁰ 30.4 -13 ⁰ 26.8	349 ⁰ 58.4 -13 ⁰ 37.3	4 ⁰ 26.3 -13 ⁰ 47.7	18 ⁰ 54.1 -13 ⁰ 58.1	33 ⁰ 21.8 -14 ⁰ 08.3	47 ⁰ 49.4 -14 ⁰ 18.6	62 ⁰ 16.9 -14 ⁰ 28.7	76 ⁰ 44.3 -14 ⁰ 38.8	91 ⁰ 11.6 -14 ⁰ 48.8	+27.8 16.1 -10.3 59.1
	Sa 21	307 ⁰ 48.8 -17 ⁰ 08.9	322 ⁰ 14.5 -17 ⁰ 17.5	336 ⁰ 40.0 -17 ⁰ 26.1	351 ⁰ 05.5 -17 ⁰ 34.5	5 ⁰ 30.8 -17 ⁰ 42.7	19 ⁰ 56.1 -17 ⁰ 50.9	34 ⁰ 21.2 -17 ⁰ 59.0	48 ⁰ 46.3 -18 ⁰ 07.7	63 ⁰ 11.2 -18 ⁰ 14.9	77 ⁰ 36.0 -18 ⁰ 22.6	92 ⁰ 00.6 -18 ⁰ 30.2	+25.2 16.4 -8.1 60.0
●	Su 22	308 ⁰ 00.3 -20 ⁰ 09.9	322 ⁰ 23.6 -20 ⁰ 15.5	336 ⁰ 46.7 -20 ⁰ 24.0	351 ⁰ 09.8 -20 ⁰ 26.3	5 ⁰ 32.8 -20 ⁰ 31.5	19 ⁰ 55.7 -20 ⁰ 36.5	34 ⁰ 18.5 -20 ⁰ 41.4	48 ⁰ 41.3 -20 ⁰ 46.1	63 ⁰ 04.0 -20 ⁰ 50.7	77 ⁰ 26.6 -20 ⁰ 55.1	91 ⁰ 49.1 -20 ⁰ 59.4	+22.9 16.6 -5.0 60.7
	Mo 23	307 ⁰ 19.8 -21 ⁰ 44.9	321 ⁰ 41.4 -21 ⁰ 46.9	336 ⁰ 03.0 -21 ⁰ 48.2	350 ⁰ 24.6 -21 ⁰ 49.6	4 ⁰ 46.1 -21 ⁰ 50.8	19 ⁰ 07.7 -21 ⁰ 51.9	33 ⁰ 29.1 -21 ⁰ 52.8	47 ⁰ 50.6 -21 ⁰ 53.5	62 ⁰ 12.0 -21 ⁰ 54.1	76 ⁰ 33.4 -21 ⁰ 54.5	90 ⁰ 54.8 -21 ⁰ 54.7	+21.5 16.7 -1.0 61.2
	Tu 24	306 ⁰ 15.0 -21 ⁰ 37.6	320 ⁰ 36.4 -21 ⁰ 35.2	334 ⁰ 57.9 -21 ⁰ 32.5	349 ⁰ 19.3 -21 ⁰ 29.7	3 ⁰ 40.8 -21 ⁰ 26.7	18 ⁰ 02.4 -21 ⁰ 23.5	32 ⁰ 23.9 -21 ⁰ 20.2	46 ⁰ 45.5 -21 ⁰ 16.7	61 ⁰ 07.1 -21 ⁰ 13.1	75 ⁰ 28.8 -21 ⁰ 09.3	89 ⁰ 50.5 -21 ⁰ 05.3	+21.5 16.7 +3.2 61.4
●	We 25	305 ⁰ 22.5 -19 ⁰ 46.9	319 ⁰ 45.1 -19 ⁰ 40.5	334 ⁰ 07.8 -19 ⁰ 33.9	348 ⁰ 30.6 -19 ⁰ 27.2	2 ⁰ 53.5 -19 ⁰ 20.3	17 ⁰ 16.4 -19 ⁰ 13.4	31 ⁰ 39.4 -19 ⁰ 06.2	46 ⁰ 02.5 -18 ⁰ 59.0	60 ⁰ 25.7 -18 ⁰ 51.6	74 ⁰ 49.0 -18 ⁰ 44.1	89 ⁰ 12.3 -18 ⁰ 36.4	+23.0 16.7 +7.1 61.1
	Th 26	305 ⁰ 13.2 -16 ⁰ 27.0	319 ⁰ 38.0 -16 ⁰ 17.5	334 ⁰ 02.9 -16 ⁰ 07.9	348 ⁰ 27.9 -15 ⁰ 58.2	2 ⁰ 53.0 -15 ⁰ 48.4	17 ⁰ 18.2 -15 ⁰ 38.4	31 ⁰ 43.5 -15 ⁰ 28.4	46 ⁰ 08.9 -15 ⁰ 18.3	60 ⁰ 34.4 -15 ⁰ 08.1	75 ⁰ 00.4 -14 ⁰ 57.9	89 ⁰ 25.7 -14 ⁰ 47.5	+25.2 16.5 +10.0 60.6
	Fr 27	306 ⁰ 02.7 -12 ⁰ 02.7	320 ⁰ 29.9 -11 ⁰ 51.2	334 ⁰ 57.2 -11 ⁰ 39.6	349 ⁰ 24.6 -11 ⁰ 28.0	3 ⁰ 52.2 -11 ⁰ 16.3	18 ⁰ 19.8 -11 ⁰ 04.5	32 ⁰ 47.5 -10 ⁰ 52.8	47 ⁰ 15.3 -10 ⁰ 40.9	61 ⁰ 43.1 -10 ⁰ 29.0	76 ⁰ 11.1 -10 ⁰ 17.1	90 ⁰ 39.2 -10 ⁰ 05.1	+27.7 16.3 -11.8 59.7
●	Sa 28	307 ⁰ 50.3 -7 ⁰ 01.1	322 ⁰ 19.7 -6 ⁰ 48.6	336 ⁰ 49.2 -6 ⁰ 36.1	351 ⁰ 18.7 -6 ⁰ 23.6	5 ⁰ 48.4 -6 ⁰ 11.0	20 ⁰ 18.1 -5 ⁰ 58.5	34 ⁰ 47.8 -5 ⁰ 45.9	49 ⁰ 17.6 -5 ⁰ 33.3	63 ⁰ 47.6 -5 ⁰ 20.7	78 ⁰ 17.5 -5 ⁰ 08.1	92 ⁰ 47.6 -4 ⁰ 55.5	+29.7 16.0 +12.6 58.8
	Su 29	310 ⁰ 25.8 -1 ⁰ 46.1	324 ⁰ 56.8 -1 ⁰ 33.5	339 ⁰ 27.9 -1 ⁰ 20.9	353 ⁰ 59.0 -1 ⁰ 08.3	8 ⁰ 30.2 -0 ⁰ 43.2	23 ⁰ 01.4 -0 ⁰ 30.7	37 ⁰ 32.6 -0 ⁰ 30.7	52 ⁰ 03.9 -0 ⁰ 18.2	66 ⁰ 35.3 -0 ⁰ 05.7	81 ⁰ 06.7 0 ⁰ 06.8	95 ⁰ 38.1 0 ⁰ 19.3	+

SUN

January 2031

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
We 1	269°09.8 -23°00.6	284°09.6 -23°00.4	299°09.3 -23°00.2	314°09.0 -23°00.0	329°08.7 -22°59.8	344°08.4 -22°59.6	359°08.1 -22°59.4	14°07.8 -22°59.2	29°07.5 -22°59.0	44°07.2 -22°58.7	59°06.9 -22°58.5	74°06.6 -22°58.3	-0.3 +0.2
Th 2	269°02.8 -22°55.5	284°02.5 -22°55.3	299°02.2 -22°55.1	314°01.9 -22°54.8	329°01.6 -22°54.6	344°01.3 -22°54.4	359°01.1 -22°54.2	14°00.8 -22°53.9	29°00.5 -22°53.7	44°00.2 -22°53.5	59°05.9 -22°53.3	73°59.6 -22°53.0	-0.3 +0.2
Fr 3	268°55.8 -22°50.0	283°55.6 -22°49.7	298°55.3 -22°49.5	313°55.0 -22°49.2	328°54.7 -22°49.0	343°54.4 -22°48.7	358°54.1 -22°48.5	13°53.8 -22°48.3	28°53.5 -22°48.0	43°53.3 -22°47.8	58°53.0 -22°47.5	73°52.7 -22°47.3	-0.3 +0.2
Sa 4	268°49.0 -22°44.0	283°48.7 -22°43.7	298°48.4 -22°43.4	313°48.1 -22°43.2	328°47.8 -22°42.9	343°47.6 -22°42.7	358°47.3 -22°42.4	13°47.0 -22°42.1	28°46.7 -22°41.9	43°46.4 -22°41.6	58°46.2 -22°41.3	73°45.9 -22°41.1	-0.3 +0.3
Su 5	268°42.2 -22°37.5	283°41.9 -22°37.2	298°41.7 -22°36.9	313°41.4 -22°36.7	328°41.1 -22°36.4	343°40.8 -22°36.1	358°40.6 -22°35.8	13°40.3 -22°35.5	28°40.0 -22°35.3	43°39.7 -22°35.0	58°39.4 -22°34.7	73°39.2 -22°34.4	-0.3 +0.3
Mo 6	268°35.6 -22°30.6	283°35.3 -22°30.3	298°35.0 -22°30.0	313°34.8 -22°29.7	328°34.5 -22°29.4	343°34.2 -22°29.1	358°33.9 -22°28.8	13°33.7 -22°28.5	28°33.4 -22°28.2	43°33.1 -22°27.9	58°32.8 -22°27.6	73°32.6 -22°27.3	-0.3 +0.3
Tu 7	268°29.0 -22°25.6	283°28.8 -22°25.1	298°28.5 -22°22.6	313°28.2 -22°22.2	328°28.0 -22°22.0	343°27.7 -22°21.7	358°27.4 -22°21.4	13°27.2 -22°21.0	28°26.9 -22°20.7	43°26.6 -22°20.4	58°26.4 -22°20.1	73°26.1 -22°19.7	-0.3 +0.3
We 8	268°22.6 -22°18.5	283°22.4 -22°15.1	298°22.1 -22°14.8	313°21.8 -22°14.5	328°21.6 -22°14.1	343°21.3 -22°13.8	358°21.1 -22°13.5	13°20.8 -22°13.1	28°20.5 -22°12.8	43°20.3 -22°12.4	58°20.0 -22°12.1	73°19.7 -22°11.8	-0.3 +0.3
Th 9	268°16.4 -22°07.3	283°16.1 -22°06.9	298°15.8 -22°06.5	313°15.6 -22°06.2	328°15.3 -22°05.8	343°15.1 -22°05.5	358°14.8 -22°05.1	13°14.6 -22°04.9	28°14.3 -22°04.4	43°14.0 -22°04.1	58°13.8 -22°03.7	73°13.5 -22°03.3	-0.3 +0.3
Fr 10	268°10.2 -21°58.8	283°10.0 -21°58.2	298°09.7 -21°57.9	313°09.5 -21°57.5	328°09.2 -21°57.1	343°09.0 -21°56.7	358°08.7 -21°56.4	13°08.4 -21°56.0	28°08.2 -21°55.6	43°07.9 -21°55.2	58°07.7 -21°54.9	73°07.4 -21°54.5	-0.3 +0.2
Sa 11	268°04.2 -21°49.5	283°04.0 -21°49.1	298°03.7 -21°48.7	313°03.5 -21°48.4	328°03.2 -21°48.0	343°03.0 -21°47.6	358°02.7 -21°47.2	12°56.8 -21°46.8	28°02.2 -21°46.4	43°02.0 -21°46.0	58°01.7 -21°45.6	73°01.5 -21°45.2	-0.2 +0.3
Su 12	267°58.3 -21°40.0	282°58.1 -21°39.6	297°57.9 -21°39.2	312°57.6 -21°38.8	327°57.4 -21°38.4	342°57.1 -21°38.0	357°56.9 -21°37.6	12°56.7 -21°37.2	27°56.4 -21°36.7	42°56.2 -21°36.3	57°55.9 -21°35.9	72°55.7 -21°35.5	-0.2 +0.4
Mo 13	267°52.6 -21°30.1	282°52.4 -21°29.7	297°52.2 -21°29.2	312°51.9 -21°28.8	327°51.7 -21°28.4	342°51.5 -21°28.0	357°51.2 -21°27.5	12°51.0 -21°27.1	27°50.8 -21°26.7	42°50.5 -21°26.2	57°50.3 -21°25.8	72°50.1 -21°25.4	-0.2 +0.4
Tu 14	267°47.1 -21°19.7	282°46.8 -21°19.3	297°46.6 -21°18.9	312°46.4 -21°18.4	327°46.2 -21°18.0	342°45.9 -21°17.5	357°45.7 -21°17.1	12°45.5 -21°16.6	27°45.3 -21°16.2	42°45.0 -21°15.7	57°44.8 -21°15.3	72°44.6 -21°14.9	-0.2 +0.4
We 15	267°41.7 -21°09.0	282°41.4 -21°08.5	297°41.2 -21°08.1	312°41.0 -21°07.6	327°40.8 -21°07.1	342°40.6 -21°06.7	357°40.3 -21°06.2	12°40.1 -21°05.8	27°39.9 -21°05.3	42°39.7 -21°04.8	57°39.5 -21°04.4	72°39.2 -21°03.9	-0.2 +0.5
Th 16	267°36.3 -20°57.8	282°36.2 -20°57.3	297°36.0 -20°56.9	312°35.8 -20°56.4	327°35.6 -20°55.9	342°35.4 -20°55.4	357°35.1 -20°55.0	12°34.9 -20°54.5	27°34.7 -20°54.0	42°34.5 -20°53.5	57°34.3 -20°53.0	72°34.1 -20°52.6	-0.2 +0.5
Fr 17	267°31.3 -20°46.2	282°31.1 -20°45.7	297°30.9 -20°45.3	312°30.7 -20°44.8	327°30.5 -20°44.3	342°30.3 -20°43.8	357°30.0 -20°43.3	12°29.9 -20°42.8	27°29.7 -20°42.3	42°29.5 -20°41.9	57°29.3 -20°41.3	72°29.1 -20°40.8	-0.2 +0.5
Sa 18	267°26.4 -20°34.3	282°26.2 -20°33.8	297°26.0 -20°33.3	312°25.8 -20°32.8	327°25.6 -20°32.2	342°25.4 -20°31.7	357°25.2 -20°31.2	12°25.0 -20°30.7	27°24.8 -20°30.2	42°24.6 -20°29.7	57°24.4 -20°29.2	72°24.2 -20°28.7	-0.2 +0.5
Su 19	267°21.7 -20°21.9	282°21.5 -20°21.4	297°21.3 -20°20.9	312°21.1 -20°19.8	327°20.9 -20°19.3	342°20.7 -20°18.8	357°20.5 -20°18.3	12°20.4 -20°18.2	27°20.2 -20°17.7	42°20.0 -20°17.2	57°19.8 -20°16.7	72°19.6 -20°16.1	-0.2 +0.5
Mo 20	267°17.1 -20°09.9	282°17.0 -20°08.6	297°16.8 -20°08.1	312°16.6 -20°07.6	327°16.4 -20°07.0	342°16.2 -20°06.5	357°16.0 -20°05.9	12°15.9 -20°05.4	27°15.7 -20°04.9	42°15.5 -20°04.4	57°15.3 -20°03.8	72°15.1 -20°03.2	-0.2 +0.5
Tu 21	267°12.8 -19°56.1	282°12.6 -19°55.5	297°12.4 -19°55.0	312°12.4 -19°54.4	327°12.1 -19°53.8	342°11.9 -19°53.3	357°11.7 -19°52.7	12°11.5 -19°52.2	27°11.4 -19°51.6	42°11.2 -19°51.0	57°11.0 -19°50.5	72°10.8 -19°49.9	-0.2 +0.6
We 22	267°08.6 -19°42.6	282°08.4 -19°42.0	297°08.2 -19°41.4	312°08.1 -19°40.9	327°07.9 -19°40.3	342°07.7 -19°39.7	357°07.6 -19°39.1	12°07.4 -19°38.6	27°07.2 -19°38.0	42°07.1 -19°37.4	57°06.9 -19°36.8	72°06.7 -19°36.3	-0.2 +0.6
Th 23	267°04.6 -19°28.7	282°04.4 -19°28.1	297°04.3 -19°27.5	312°04.1 -19°27.0	327°03.9 -19°26.4	342°03.8 -19°25.8	357°03.6 -19°25.2	12°03.5 -19°24.6	27°03.3 -19°24.0	42°03.1 -19°23.4	57°03.0 -19°22.8	72°02.8 -19°22.2	-0.2 +0.6
Fr 24	267°00.8 -19°14.5	282°00.6 -19°13.9	297°00.5 -19°13.3	312°00.3 -19°12.7	327°00.2 -19°12.1	342°00.0 -19°11.5	356°59.9 -19°10.9	11°59.7 -19°10.3	26°59.6 -19°09.7	41°59.4 -19°09.1	56°59.3 -19°08.5	71°59.1 -19°07.9	-0.2 +0.6
Sa 25	266°57.2 -18°59.9	281°57.0 -18°59.3	296°56.9 -18°58.7	311°56.8 -18°58.1	326°56.6 -18°57.5	341°56.5 -18°56.8	356°56.3 -18°56.2	11°56.2 -18°55.6	26°56.0 -18°55.0	41°55.9 -18°54.4	56°55.7 -18°53.8	71°55.6 -18°53.1	-0.1 +0.6
Su 26	266°53.8 -18°45.0	281°53.6 -18°44.4	296°53.5 -18°43.8	311°53.4 -18°43.1	326°53.2 -18°42.5	341°53.1 -18°41.9	356°53.0 -18°41.2	11°52.8 -18°40.6	26°52.7 -18°40.0	41°52.6 -18°39.3	56°52.4 -18°38.7	71°52.3 -18°38.1	-0.1 +0.6
Mo 27	266°50.6 -18°29.8	281°50.5 -18°29.1	296°50.3 -18°28.5	311°50.2 -18°27.8	326°50.1 -18°27.2	341°49.9 -18°26.5	356°49.8 -18°25.9	11°49.7 -18°25.2	26°49.6 -18°24.6	41°49.4 -18°23.9	56°49.3 -18°23.3	71°49.2 -18°22.6	-0.1 +0.6
Tu 28	266°47.6 -18°14.2	281°47.5 -18°13.5	296°47.4 -18°12.8	311°47.3 -18°12.2	326°47.1 -18°11.5	341°47.0 -18°10.9	356°46.9 -18°10.2	11°46.8 -18°09.5	26°46.6 -18°08.9	41°46.5 -18°08.2	56°46.4 -18°07.6	71°46.3 -18°06.9	-0.1 +0.7
We 29	266°44.8 -17°58.2	281°44.7 -17°57.6	296°44.6 -17°56.9	311°44.5 -17°56.2	326°44.4 -17°55.6	341°44.2 -17°54.9	356°44.1 -17°54.2	11°44.0 -17°53.5	26°43.9 -17°52.9	41°43.8 -17°52.2	56°43.7 -17°51.5	71°43.6 -17°50.8	-0.1 +0.7
Th 30	266°42.0 -17°42.2	281°42.1 -17°41.3	296°42.0 -17°40.6	311°41.9 -17°39.9	326°41.8 -17°39.3	341°41.7 -17°38.6	356°41.6 -17°37.9	11°41.5 -17°37.2	26°41.4 -17°36.5	41°41.3 -17°35.8	56°41.2 -17°35.1	71°41.1 -17°34.4	-0.1 +0.7
Fr 31	266°39.9 -17°25.4	281°39.8 -17°24.7	296°39.7 -17°24.0	311°39.6 -17°23.4	326°39.5 -17°22.7	341°39.4 -17°22.0	356°39.3 -17°21.3	11°39.2 -17°20.6	26°39.1 -17°19.9	41°39.0 -17°19.2	56°38.9 -17°18.5	71°38.8 -17°17.8	-0.1 +0.7

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 16.3'

MOON

January 2031

	D	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	Δ'/h	SH
We 1	233 [°] 17.7 11 [°] 32.6	247 [°] 50.1 11 [°] 42.5	262 [°] 22.6 11 [°] 52.4	276 [°] 55.0 12 [°] 02.2	291 [°] 27.4 12 [°] 12.0	305 [°] 59.8 12 [°] 21.7	320 [°] 32.2 12 [°] 31.3	335 [°] 04.6 12 [°] 40.8	349 [°] 37.0 12 [°] 50.3	4 [°] 09.4 12 [°] 59.8	18 [°] 41.7 13 [°] 09.1	+32.4	15.1	
	236 [°] 45.5 15 [°] 21.3	251 [°] 17.6 15 [°] 29.5	265 [°] 49.7 15 [°] 37.7	280 [°] 21.8 15 [°] 45.7	294 [°] 53.8 15 [°] 53.8	309 [°] 25.9 16 [°] 01.7	323 [°] 57.9 16 [°] 09.5	338 [°] 29.9 16 [°] 17.3	353 [°] 01.9 16 [°] 25.0	7 [°] 33.9 16 [°] 32.6	22 [°] 05.8 16 [°] 40.2	+32.0	14.9	
Fr 3	240 [°] 02.3 18 [°] 23.6	254 [°] 33.9 18 [°] 29.8	269 [°] 05.5 18 [°] 36.0	283 [°] 37.0 18 [°] 42.0	298 [°] 08.6 18 [°] 48.0	312 [°] 40.1 18 [°] 53.9	327 [°] 11.5 18 [°] 59.7	341 [°] 43.0 19 [°] 05.4	356 [°] 14.4 19 [°] 11.0	10 [°] 45.8 19 [°] 16.5	25 [°] 17.2 19 [°] 21.9	+31.5	14.8	
Sa 4	243 [°] 05.4 20 [°] 32.5	257 [°] 36.5 20 [°] 36.4	272 [°] 07.5 20 [°] 40.3	286 [°] 38.5 20 [°] 44.0	301 [°] 09.5 20 [°] 47.7	315 [°] 40.5 20 [°] 51.3	330 [°] 11.4 20 [°] 54.7	344 [°] 42.4 20 [°] 58.1	359 [°] 13.3 21 [°] 01.4	13 [°] 44.2 21 [°] 04.6	28 [°] 15.1 21 [°] 07.7	+31.0	14.7	
Su 5	245 [°] 56.6 21 [°] 42.1	260 [°] 27.3 21 [°] 43.6	274 [°] 58.0 21 [°] 45.0	289 [°] 28.7 21 [°] 46.3	303 [°] 59.3 21 [°] 47.4	318 [°] 29.9 21 [°] 48.5	333 [°] 00.6 21 [°] 49.5	347 [°] 31.2 21 [°] 50.4	2 [°] 01.8 21 [°] 51.2	16 [°] 32.5 21 [°] 51.9	31 [°] 03.1 21 [°] 52.5	+30.6	14.7	
Mo 6	248 [°] 42.1 21 [°] 49.0	263 [°] 12.7 21 [°] 47.9	277 [°] 43.4 21 [°] 46.8	292 [°] 14.0 21 [°] 45.5	306 [°] 44.6 21 [°] 44.2	321 [°] 15.3 21 [°] 42.7	335 [°] 45.9 21 [°] 41.2	350 [°] 16.6 21 [°] 39.5	4 [°] 47.2 21 [°] 37.8	19 [°] 17.9 21 [°] 35.9	33 [°] 48.6 21 [°] 33.9	+30.6	14.7	
Tu 7	251 [°] 30.3 20 [°] 52.6	266 [°] 01.2 20 [°] 49.1	280 [°] 32.2 20 [°] 45.5	295 [°] 03.1 20 [°] 41.7	309 [°] 34.1 20 [°] 37.9	324 [°] 05.1 20 [°] 34.0	338 [°] 36.1 20 [°] 30.0	353 [°] 07.1 20 [°] 25.9	7 [°] 38.1 20 [°] 21.7	22 [°] 09.2 20 [°] 17.4	36 [°] 40.3 20 [°] 13.0	+31.0	14.7	
We 8	254 [°] 29.4 18 [°] 56.0	269 [°] 00.9 18 [°] 50.2	283 [°] 32.4 18 [°] 44.2	298 [°] 03.9 18 [°] 38.2	312 [°] 35.9 18 [°] 32.1	327 [°] 07.1 18 [°] 25.9	341 [°] 38.7 18 [°] 19.7	356 [°] 10.3 18 [°] 13.3	10 [°] 42.0 18 [°] 06.9	25 [°] 13.7 18 [°] 00.3	39 [°] 45.4 17 [°] 53.7	+31.6	14.8	
Th 9	257 [°] 44.7 16 [°] 05.1	272 [°] 16.9 15 [°] 57.2	286 [°] 49.5 15 [°] 49.3	301 [°] 21.3 15 [°] 41.3	315 [°] 53.6 15 [°] 33.2	330 [°] 25.9 15 [°] 25.1	344 [°] 58.2 15 [°] 16.8	359 [°] 30.5 15 [°] 00.2	14 [°] 02.9 14 [°] 51.8	28 [°] 35.3 14 [°] 43.3	43 [°] 07.7 14 [°] 43.3	+32.3	14.9	
Fr 10	261 [°] 17.1 12 [°] 28.1	275 [°] 50.0 12 [°] 18.6	290 [°] 22.8 12 [°] 09.1	304 [°] 55.7 11 [°] 59.5	319 [°] 28.6 11 [°] 49.8	334 [°] 01.5 11 [°] 40.1	348 [°] 34.4 11 [°] 30.3	3 [°] 07.3 11 [°] 20.5	32 [°] 13.3 11 [°] 10.6	36 [°] 46.3 11 [°] 00.6	43 [°] 29.4 10 [°] 50.6	+32.9	14.9	
Sa 11	265 [°] 03.2 8 [°] 15.0	279 [°] 36.4 8 [°] 04.3	294 [°] 09.7 7 [°] 53.5	308 [°] 42.9 7 [°] 42.7	323 [°] 16.2 7 [°] 31.8	337 [°] 49.4 7 [°] 21.0	352 [°] 22.7 7 [°] 10.0	6 [°] 56.0 6 [°] 59.1	21 [°] 29.3 6 [°] 48.1	36 [°] 32.6 6 [°] 37.0	50 [°] 35.8 6 [°] 26.0	+33.3	15.1	
Su 12	268 [°] 55.3 3 [°] 36.3	283 [°] 28.5 3 [°] 24.8	298 [°] 01.8 3 [°] 13.2	312 [°] 35.0 3 [°] 01.7	327 [°] 08.3 2 [°] 50.1	341 [°] 41.5 2 [°] 38.5	356 [°] 14.7 2 [°] 26.8	10 [°] 47.9 2 [°] 15.2	25 [°] 21.1 2 [°] 03.5	39 [°] 54.3 1 [°] 51.8	54 [°] 27.4 1 [°] 40.1	+33.2	15.2	
Mo 13	272 [°] 42.5 -1 [°] 16.7	287 [°] 15.5 -1 [°] 28.6	301 [°] 48.1 -1 [°] 40.5	316 [°] 20.9 -1 [°] 52.3	330 [°] 53.6 -2 [°] 04.2	345 [°] 26.3 -2 [°] 16.0	359 [°] 58.9 -2 [°] 27.9	14 [°] 31.6 -2 [°] 39.7	29 [°] 04.1 -2 [°] 51.6	43 [°] 36.7 -3 [°] 03.4	58 [°] 09.2 -3 [°] 15.3	+32.7	15.4	
Tu 14	276 [°] 11.9 -6 [°] 11.9	290 [°] 43.7 -6 [°] 23.6	305 [°] 15.3 -6 [°] 35.2	319 [°] 47.3 -6 [°] 46.8	334 [°] 18.8 -6 [°] 58.4	348 [°] 50.4 -7 [°] 10.0	3 [°] 22.0 -7 [°] 21.6	17 [°] 53.4 -7 [°] 33.1	32 [°] 24.9 -7 [°] 44.6	46 [°] 56.2 -7 [°] 56.1	61 [°] 27.5 -8 [°] 07.5	+31.6	15.5	
We 15	290 [°] 43.7 -6 [°] 23.6	305 [°] 15.5 -6 [°] 35.2	319 [°] 47.3 -6 [°] 46.8	334 [°] 18.8 -6 [°] 58.4	348 [°] 50.4 -7 [°] 10.0	3 [°] 22.0 -7 [°] 21.6	17 [°] 53.4 -7 [°] 33.1	32 [°] 24.9 -7 [°] 44.6	46 [°] 56.2 -7 [°] 56.1	61 [°] 27.5 -8 [°] 07.5	75 [°] 58.8 -8 [°] 19.0	+31.5	15.5	
Th 16	293 [°] 39.6 -11 [°] 06.2	308 [°] 09.7 -11 [°] 17.0	322 [°] 39.8 -11 [°] 27.8	337 [°] 09.9 -11 [°] 38.5	351 [°] 39.7 -11 [°] 49.2	6 [°] 09.6 -11 [°] 59.8	20 [°] 39.4 -12 [°] 10.4	35 [°] 09.9 -12 [°] 20.9	49 [°] 38.7 -12 [°] 31.4	64 [°] 08.2 -12 [°] 41.8	78 [°] 37.7 -12 [°] 52.1	+29.8	15.8	
Fr 17	-15 [°] 19.9 -15 [°] 19.9	-15 [°] 29.2 -15 [°] 29.2	-15 [°] 38.4 -15 [°] 38.4	-15 [°] 47.5 -15 [°] 47.5	-15 [°] 56.5 -15 [°] 56.5	-16 [°] 05.5 -16 [°] 05.5	-16 [°] 14.4 -16 [°] 14.4	-16 [°] 23.2 -16 [°] 23.2	-16 [°] 31.9 -16 [°] 31.9	-16 [°] 40.5 -16 [°] 40.5	-16 [°] 49.0 -16 [°] 49.0	-8.9	58.6	
Sa 18	-29 [°] 04.2 -18 [°] 45.3	-31 [°] 10.3 -18 [°] 52.2	-32 [°] 55.7 -18 [°] 59.0	-34 [°] 02.1 -19 [°] 05.7	-35 [°] 58.9 -19 [°] 12.3	-37 [°] 53.8 -19 [°] 18.8	-39 [°] 58.9 -19 [°] 25.1	-41 [°] 58.9 -19 [°] 31.3	-43 [°] 58.9 -19 [°] 37.4	-45 [°] 58.9 -19 [°] 43.4	-47 [°] 58.9 -19 [°] 49.3	+25.4	16.2	
Su 19	-29 [°] 23.4 -21 [°] 01.5	-31 [°] 11.4 -21 [°] 05.3	-32 [°] 56.7 -21 [°] 08.8	-34 [°] 03.4 -21 [°] 12.3	-35 [°] 58.9 -21 [°] 15.6	-37 [°] 53.8 -21 [°] 18.7	-39 [°] 58.9 -21 [°] 24.9	-41 [°] 58.9 -21 [°] 31.1	-43 [°] 58.9 -21 [°] 37.4	-45 [°] 58.9 -21 [°] 43.4	-47 [°] 58.9 -21 [°] 49.3	+23.5	16.4	
Mo 20	-29 [°] 00.1 -21 [°] 49.8	-31 [°] 12.6 -21 [°] 49.7	-32 [°] 58.5 -21 [°] 49.4	-34 [°] 00.7 -21 [°] 49.0	-35 [°] 58.9 -21 [°] 48.4	-37 [°] 52.4 -21 [°] 47.7	-39 [°] 58.9 -21 [°] 46.8	-41 [°] 58.9 -21 [°] 45.1	-43 [°] 58.9 -21 [°] 43.4	-45 [°] 58.9 -21 [°] 41.1	-47 [°] 58.9 -21 [°] 38.8	+22.4	16.5	
Tu 21	-29 [°] 19.8 -20 [°] 59.2	-31 [°] 10.4 -20 [°] 55.1	-32 [°] 56.0 -20 [°] 50.8	-34 [°] 02.7 -20 [°] 46.4	-35 [°] 58.9 -20 [°] 41.9	-37 [°] 53.8 -20 [°] 37.2	-39 [°] 58.9 -20 [°] 32.3	-41 [°] 58.9 -20 [°] 27.3	-43 [°] 58.9 -20 [°] 22.1	-45 [°] 58.9 -20 [°] 16.8	-47 [°] 58.9 -20 [°] 11.3	+22.6	16.6	
We 22	-29 [°] 53.4 -18 [°] 32.0	-31 [°] 17.0 -18 [°] 24.2	-32 [°] 40.7 -18 [°] 16.4	-33 [°] 04.4 -18 [°] 08.4	-34 [°] 28.2 -18 [°] 00.3	-35 [°] 52.1 -17 [°] 52.1	-37 [°] 26.0 -17 [°] 43.7	-38 [°] 50.0 -17 [°] 35.2	-40 [°] 14.0 -17 [°] 26.6	-41 [°] 38.0 -17 [°] 17.9	-42 [°] 62.0 -17 [°] 09.1	+23.9	16.6	
Th 23	-29 [°] 05.0 -14 [°] 43.5	-31 [°] 30.5 -14 [°] 33.0	-32 [°] 56.1 -14 [°] 22.4	-34 [°] 01.7 -14 [°] 11.7	-35 [°] 26.7 -14 [°] 01.0	-36 [°] 51.3 -13 [°] 50.1	-38 [°] 26.9 -13 [°] 39.2	-39 [°] 58.9 -13 [°] 28.2	-41 [°] 31.1 -13 [°] 17.1	-42 [°] 57.2 -13 [°] 05.9	-44 [°] 18.0 -12 [°] 54.7	+25.8	16.5	
Fr 24	-29 [°] 06.2 -9 [°] 58.0	-31 [°] 33.7 -9 [°] 45.8	-32 [°] 01.3 -9 [°] 33.5	-32 [°] 48.9 -9 [°] 21.2	-33 [°] 54.6 -9 [°] 08.8	-35 [°] 06.4 -8 [°] 56.4	-36 [°] 23.2 -8 [°] 44.0	-37 [°] 40.0 -8 [°] 31.5	-38 [°] 56.8 -8 [°] 19.0	-40 [°] 16.4 -8 [°] 06.5	-41 [°] 44.5 -7 [°] 53.9	+27.8	16.3	
Sa 25	-29 [°] 55.5 -4 [°] 42.1	-31 [°] 24.8 -4 [°] 29.2	-32 [°] 54.4 -4 [°] 16.3	-34 [°] 22.3 -4 [°] 03.3	-35 [°] 56.3 -3 [°] 50.4	-37 [°] 25.5 -3 [°] 37.5	-38 [°] 55.0 -3 [°] 24.5	-40 [°] 21.7 -3 [°] 11.6	-41 [°] 51.3 -2 [°] 58.6	-43 [°] 21.3 -2 [°] 45.7	-44 [°] 51.9 -2 [°] 32.7	+29.5	16.1	
Su 26	-30 [°] 12.3 0 [°] 40.1	-31 [°] 55.4 0 [°] 52.9	-33 [°] 02.5 1 [°] 05.6	-34 [°] 55.7 1 [°] 18.3	-36 [°] 50.9 1 [°] 30.9	-38 [°] 55.7 1 [°] 43.5	-40 [°] 58.9 1 [°] 56.1	-42 [°] 58.9 2 [°] 08.7	-44 [°] 58.9 2 [°] 21.3	-46 [°] 58.9 2 [°] 33.8	-48 [°] 58.9 2 [°] 46.3	+30.8	15.8	
Mo 27	-30 [°] 18.7 5 [°] 49.2	-31 [°] 58.5 6 [°] 01.0	-33 [°] 03.1 6 [°] 12.8	-34 [°] 52.9 6 [°] 24.6	-36 [°] 53.3 6 [°] 36.3	-38 [°] 55.7 6 [°] 48.0	-40 [°] 58.9 6 [°] 59.6	-42 [°] 58.9 7 [°] 11.2	-44 [°] 58.9 7 [°] 22.7	-46 [°] 58.9 7 [°] 34.2	-48 [°] 58.9 7 [°] 45.6	+31.5	15.6	
Tu 28	-30 [°] 27.5 10 [°] 30.0	-32 [°] 51.9 10 [°] 40.5	-34 [°] 56.3 10 [°] 50.9	-36 [°] 57.0 11 [°] 01.3	-38 [°] 58.1 11 [°] 11.6	-40 [°] 59.2 11 [°] 21.8	-42 [°] 59.3 11 [°] 32.0	-44 [°] 59.4 11 [°] 42.1	-46 [°] 59.5 11 [°] 52.1	-48 [°] 59.6 12 [°] 02.0	-50 [°] 59.7 12 [°] 11.9	+31.7	15.3	
We 29	-31 [°] 39.7 14 [°] 31.7	-32 [°] 51.1 14 [°] 40.4	-34 [°] 56.3 14 [°] 49.0	-36 [°]										

SUN

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D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Sa 1	266°37.7 -17°08.6	281°37.6 -17°07.9	296°37.5 -17°07.2	311°37.4 -17°06.5	326°37.4 -17°05.7	341°37.3 -17°05.0	356°37.2 -17°04.3	11°37.1 -17°03.6	26°37.0 -17°02.9	41°36.9 -17°02.2	56°36.9 -17°01.5	71°36.8 -17°00.8	-0.1 +0.7
Su 2	266°35.7 -16°51.4	281°35.7 -16°50.7	296°35.6 -16°50.0	311°35.5 -16°49.3	326°35.4 -16°48.5	341°35.4 -16°47.8	356°35.3 -16°47.1	11°35.2 -16°46.4	26°35.1 -16°45.6	41°35.1 -16°44.9	56°35.0 -16°44.2	71°34.9 -16°43.5	-0.1 +0.7
Mo 3	266°34.0 -16°34.0	281°33.9 -16°33.2	296°33.9 -16°32.5	311°33.8 -16°31.8	326°33.7 -16°31.0	341°33.7 -16°30.3	356°33.6 -16°29.5	11°33.5 -16°28.8	26°33.5 -16°28.1	41°33.4 -16°27.3	56°33.3 -16°26.6	71°33.3 -16°25.9	-0.1 +0.7
Tu 4	266°32.5 -16°16.2	281°32.4 -16°15.5	296°32.3 -16°14.7	311°32.3 -16°14.0	326°32.2 -16°13.2	341°32.2 -16°12.5	356°32.1 -16°11.7	11°32.0 -16°11.0	26°32.0 -16°10.2	41°31.9 -16°09.5	56°31.9 -16°08.7	71°31.8 -16°08.0	-0.1 +0.7
We 5	266°31.1 -15°58.2	281°31.1 -15°57.4	296°31.0 -15°56.7	311°31.0 -15°55.9	326°30.9 -15°55.2	341°30.9 -15°54.4	356°30.8 -15°53.6	11°30.8 -15°52.9	26°30.7 -15°52.1	41°30.7 -15°51.4	56°30.6 -15°50.6	71°30.6 -15°49.8	-0.0 +0.8
Th 6	266°30.0 -15°39.9	281°29.9 -15°39.1	296°29.9 -15°38.3	311°29.9 -15°37.6	326°29.8 -15°36.8	341°29.8 -15°36.0	356°29.7 -15°35.3	11°29.7 -15°34.5	26°29.7 -15°33.7	41°29.6 -15°33.0	56°29.6 -15°32.2	71°29.5 -15°31.4	-0.0 +0.8
Fr 7	266°29.1 -15°21.3	281°29.0 -15°20.5	296°29.0 -15°19.8	311°29.0 -15°19.0	326°28.9 -15°18.2	341°28.9 -15°17.4	356°28.9 -15°16.6	11°28.8 -15°15.9	26°28.8 -15°15.1	41°28.8 -15°14.3	56°28.7 -15°13.5	71°28.7 -15°12.7	-0.0 +0.8
Sa 8	266°28.3 -15°02.5	281°28.3 -15°01.7	296°28.3 -15°00.9	311°28.2 -15°00.1	326°28.2 -14°59.3	341°28.2 -14°58.5	356°28.2 -14°57.7	11°28.1 -14°57.0	26°28.1 -14°56.2	41°28.1 -14°55.4	56°28.1 -14°54.6	71°28.1 -14°53.8	-0.0 +0.8
Su 9	266°27.8 -14°43.4	281°27.8 -14°42.6	296°27.8 -14°41.8	311°27.7 -14°41.0	326°27.7 -14°40.2	341°27.7 -14°39.4	356°27.7 -14°38.6	11°27.7 -14°37.8	26°27.7 -14°37.0	41°27.6 -14°36.2	56°27.6 -14°35.4	71°27.6 -14°34.6	-0.0 +0.8
Mo 10	266°27.5 -14°24.1	281°27.4 -14°23.3	296°27.4 -14°22.5	311°27.4 -14°21.6	326°27.4 -14°20.8	341°27.4 -14°20.0	356°27.4 -14°19.2	11°27.4 -14°18.4	26°27.4 -14°17.6	41°27.4 -14°16.8	56°27.4 -14°15.9	71°27.4 -14°15.1	-0.0 +0.8
Tu 11	266°27.3 -14°04.5	281°27.3 -14°03.7	296°27.3 -14°02.9	311°27.3 -14°02.0	326°27.3 -14°01.2	341°27.3 -14°00.4	356°27.3 -13°59.6	11°27.3 -13°58.7	26°27.3 -13°57.9	41°27.3 -13°57.1	56°27.3 -13°56.3	71°27.3 -13°55.5	-0.0 +0.8
We 12	266°27.3 -13°44.7	281°27.4 -13°43.9	296°27.4 -13°43.0	311°27.4 -13°42.2	326°27.4 -13°41.4	341°27.4 -13°40.5	356°27.4 -13°39.7	11°27.4 -13°38.9	26°27.4 -13°38.0	41°27.4 -13°37.2	56°27.4 -13°36.4	71°27.4 -13°35.5	+0.0 +0.8
Th 13	266°27.6 -13°24.7	281°27.6 -13°23.8	296°27.6 -13°23.0	311°27.6 -13°22.1	326°27.6 -13°21.3	341°27.6 -13°20.5	356°27.7 -13°19.6	11°27.7 -13°18.8	26°27.7 -13°17.9	41°27.7 -13°17.1	56°27.7 -13°16.2	71°27.7 -13°15.4	+0.0 +0.8
Fr 14	266°28.0 -13°04.4	281°28.0 -13°03.6	296°28.0 -13°02.7	311°28.0 -13°01.9	326°28.1 -13°01.0	341°28.1 -13°00.2	356°28.1 -12°59.3	11°28.1 -12°58.5	26°28.2 -12°57.6	41°28.2 -12°56.8	56°28.2 -12°55.9	71°28.2 -12°55.0	+0.0 +0.9
Sa 15	266°28.6 -12°43.9	281°28.6 -12°43.1	296°28.6 -12°42.2	311°28.7 -12°41.4	326°28.7 -12°40.5	341°28.7 -12°39.6	356°28.7 -12°38.8	11°28.6 -12°37.9	26°28.8 -12°37.1	41°28.8 -12°36.2	56°28.9 -12°35.3	71°28.9 -12°34.5	+0.0 +0.9
Su 16	266°29.3 -12°23.2	281°29.4 -12°22.4	296°29.4 -12°21.5	311°29.4 -12°20.6	326°29.5 -12°19.8	341°29.5 -12°18.9	356°29.6 -12°18.0	11°29.6 -12°17.2	26°29.6 -12°16.3	41°29.7 -12°15.4	56°29.7 -12°14.6	71°29.7 -12°13.7	+0.0 +0.9
Mo 17	266°30.3 -12°02.4	281°30.3 -12°01.5	296°30.3 -12°00.6	311°30.4 -11°59.7	326°30.4 -11°58.9	341°30.5 -11°58.0	356°30.5 -11°57.1	11°30.6 -11°56.2	26°30.6 -11°55.4	41°30.7 -11°54.5	56°30.7 -11°53.6	71°30.8 -11°52.7	+0.0 +0.9
Tu 18	266°31.4 -11°41.3	281°31.4 -11°40.4	296°31.5 -11°39.5	311°31.5 -11°38.6	326°31.6 -11°37.8	341°31.6 -11°36.9	356°31.7 -11°36.0	11°31.7 -11°35.1	26°31.8 -11°34.2	41°31.8 -11°33.3	56°31.9 -11°32.5	71°31.9 -11°31.6	+0.0 +0.9
We 19	266°32.7 -11°20.0	281°32.7 -11°19.1	296°32.8 -11°18.3	311°32.8 -11°17.4	326°32.9 -11°16.5	341°32.9 -11°15.6	356°33.0 -11°14.7	11°33.1 -11°13.8	26°33.1 -11°12.9	41°33.2 -11°12.0	56°33.2 -11°11.1	71°33.3 -11°10.2	+0.1 +0.9
Th 20	266°34.1 -10°58.6	281°34.2 -10°57.7	296°34.2 -10°56.8	311°34.3 -10°55.9	326°34.4 -10°55.0	341°34.4 -10°54.1	356°34.5 -10°53.2	11°34.6 -10°52.3	26°34.6 -10°51.4	41°34.7 -10°50.5	56°34.8 -10°49.6	71°34.8 -10°48.7	+0.1 +0.9
Fr 21	266°35.7 -10°37.0	281°35.8 -10°36.1	296°35.8 -10°35.2	311°35.9 -10°34.3	326°36.0 -10°33.4	341°36.1 -10°32.5	356°36.1 -10°31.6	11°36.2 -10°30.7	26°36.3 -10°29.7	41°36.4 -10°28.8	56°36.4 -10°27.9	71°36.5 -10°27.0	+0.1 +0.9
Sa 22	266°37.5 -9°53.3	281°37.5 -9°52.4	296°37.6 -9°51.5	311°37.7 -9°50.5	326°37.8 -9°49.6	341°37.9 -9°48.7	356°37.9 -9°47.8	11°38.0 -9°46.9	26°38.1 -9°45.9	41°38.2 -9°45.0	56°38.3 -9°44.1	71°38.3 -9°43.2	+0.1 +0.9
Su 23	266°39.4 -9°31.2	281°39.5 -9°30.3	296°39.6 -9°29.4	311°39.6 -9°28.4	326°39.7 -9°27.5	341°39.8 -9°26.6	356°39.9 -9°25.7	11°40.0 -9°24.7	26°40.1 -9°23.8	41°40.2 -9°22.9	56°40.2 -9°22.0	71°40.3 -9°21.0	+0.1 +0.9
Mo 24	266°41.5 -9°09.0	281°41.6 -9°08.1	296°41.7 -9°07.1	311°41.7 -9°06.2	326°41.8 -9°05.3	341°41.9 -9°04.3	356°42.0 -9°03.4	11°42.1 -9°02.5	26°42.2 -9°01.6	41°42.3 -9°00.6	56°42.4 -8°59.7	71°42.5 -8°58.8	+0.1 +0.9
Tu 25	266°43.7 -8°46.6	281°43.8 -8°45.7	296°43.9 -8°44.8	311°44.0 -8°43.8	326°44.1 -8°42.9	341°44.2 -8°42.0	356°44.3 -8°41.0	11°44.4 -8°40.1	26°44.5 -8°39.1	41°44.6 -8°38.2	56°44.7 -8°37.3	71°44.8 -8°36.3	+0.1 +0.9
We 26	266°44.6 -8°24.1	281°44.7 -8°23.2	296°44.8 -8°22.3	311°44.9 -8°21.3	326°45.0 -8°20.4	341°44.9 -8°19.4	356°45.0 -8°18.5	11°44.9 -8°17.6	26°45.5 -8°16.6	41°45.6 -8°15.7	56°45.7 -8°14.7	71°45.8 -8°13.8	+0.1 +0.9
Th 27	266°51.3 -8°01.5	281°51.4 -8°00.6	296°51.5 -7°59.6	311°51.6 -7°58.7	326°51.7 -7°57.8	341°51.8 -7°56.8	356°52.0 -7°55.9	11°52.1 -7°54.9	26°52.2 -7°53.0	41°52.3 -7°53.0	56°52.4 -7°52.1	71°52.5 -7°51.1	+0.1 +0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 16.2'

MOON

February 2031

	D	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	Δ°/h	SH
	Sa 1	247°04.8	261°35.6	276°06.4	290°37.1	305°07.9	319°38.6	334°09.4	348°40.1	3°10.8	17°41.5	32°12.2	+30.7	14.8
		21°14.3	21°16.7	21°19.1	21°21.3	21°23.4	21°25.5	21°27.4	21°29.2	21°31.0	21°32.6	21°34.1	+2.0	54.1
	Su 2	240°52.5	264°23.1	278°53.8	293°24.5	307°55.1	322°25.8	336°56.5	351°27.2	5°57.9	20°28.6	34°59.2	+30.7	14.7
		21°45.1	21°45.0	21°44.8	21°44.5	21°44.1	21°43.6	21°43.1	21°42.4	21°41.6	21°40.7	21°39.7	-0.5	54.0
	Mo 3	252°40.5	267°11.3	281°42.2	296°13.0	310°43.9	325°14.7	339°45.6	354°16.5	8°47.4	23°18.4	37°49.3	+30.9	14.7
		21°12.9	21°10.3	21°07.7	21°04.9	21°02.0	20°59.0	20°56.0	20°52.8	20°49.5	20°46.2	20°42.7	-3.0	54.1
	Tu 4	255°35.4	270°06.7	284°37.9	299°09.2	313°40.5	328°11.8	342°43.1	357°14.4	11°45.8	26°17.2	40°48.6	+31.3	14.8
		19°39.5	19°34.5	19°29.5	19°24.3	19°19.1	19°13.8	19°08.3	19°02.8	18°57.2	18°51.6	18°45.8	-5.4	54.2
	We 5	258°42.4	273°14.2	287°46.0	302°17.8	316°49.6	331°21.5	345°53.4	0°25.3	14°57.2	29°29.2	44°01.2	+31.9	14.9
		17°09.0	17°01.9	16°54.7	16°47.4	16°40.1	16°32.7	16°25.1	16°17.6	16°09.9	16°02.2	15°54.3	-7.5	54.5
	Th 6	262°03.5	276°35.8	291°08.2	305°40.5	320°12.9	334°45.3	349°17.8	3°50.2	18°22.7	32°55.2	47°27.7	+32.4	15.0
		13°48.4	13°39.5	13°30.5	13°21.4	13°12.3	13°03.1	12°53.8	12°44.5	12°35.1	12°25.6	12°16.1	-9.2	54.9
	Fr 7	265°37.1	280°09.9	294°42.6	309°15.4	323°48.2	338°20.9	352°53.7	7°26.5	21°59.4	36°32.2	51°05.0	+32.8	15.1
		9°46.7	9°36.3	9°25.9	9°15.4	9°04.9	8°54.3	8°43.7	8°33.0	8°22.3	8°11.6	8°00.8	-10.6	55.3
	Sa 8	269°18.1	283°51.0	298°23.8	312°56.7	327°29.6	342°02.5	356°35.3	11°08.2	25°41.1	40°13.9	54°46.8	+32.9	15.2
		5°14.4	5°03.0	4°51.6	4°40.2	4°28.8	4°17.3	4°05.8	3°54.3	3°42.7	3°31.1	3°19.5	-11.5	55.8
	Su 9	272°58.2	287°30.8	302°03.8	316°36.1	331°08.7	345°41.2	0°13.8	14°46.3	29°18.8	43°51.3	58°23.6	+32.6	15.3
		0°23.5	0°11.6	-0°00.2	-0°12.1	-0°24.0	-0°35.8	-0°47.2	-0°59.6	-1°11.5	-1°23.3	-1°35.2	-11.9	56.3
	Mo 10	276°27.1	290°59.0	305°30.9	320°02.8	334°34.7	349°06.5	3°38.2	18°10.0	32°41.6	47°13.3	61°44.9	+31.8	15.5
		-4°33.0	-4°44.7	-4°56.5	-5°08.2	-5°19.9	-5°31.6	-5°43.3	-5°55.0	-6°06.6	-6°18.3	-6°29.9	-11.7	56.8
	Tu 11	279°33.1	294°03.9	308°34.7	323°05.3	337°36.0	352°06.6	6°37.1	21°07.5	35°37.9	50°08.3	64°38.6	+30.5	15.6
		-9°20.4	-9°31.5	-9°42.6	-9°53.6	-10°04.6	-10°15.5	-10°26.4	-10°37.2	-10°48.0	-10°58.8	-11°09.4	-10.9	57.3
	We 12	283°05.1	296°34.3	311°03.5	325°32.6	340°01.6	354°30.5	8°59.4	23°28.2	37°57.0	52°25.6	66°54.2	+28.9	15.8
		-13°43.1	-13°52.9	-14°02.6	-14°12.2	-14°21.7	-14°31.2	-14°40.6	-14°49.9	-14°59.2	-15°08.3	-15°17.4	-9.4	57.8
	Th 13	296°34.3	311°03.5	325°32.6	340°01.6	354°30.5	8°59.4	23°28.2	37°57.0	52°25.6	66°54.2	81°22.7	+28.8	15.8
		-13°52.9	-14°02.6	-14°12.2	-14°21.7	-14°31.2	-14°40.6	-14°49.9	-14°59.2	-15°08.3	-15°17.4	-15°26.4	-9.4	57.9
	Fr 14	298°21.7	312°49.0	327°16.3	341°43.5	356°10.6	10°37.6	25°04.6	39°31.5	53°58.3	68°25.0	82°51.7	+27.0	15.9
		-17°31.4	-17°39.0	-17°46.5	-17°53.9	-18°01.2	-18°08.4	-18°15.5	-18°22.2	-18°29.3	-18°36.1	-18°42.8	-7.1	58.4
	Sa 15	299°23.3	313°48.9	328°14.4	342°39.8	357°05.2	11°30.5	25°55.8	40°21.0	54°46.1	69°11.2	83°36.2	+25.3	16.1
		-20°09.1	-20°13.9	-20°18.6	-20°23.1	-20°27.5	-20°31.8	-20°36.0	-20°40.0	-20°43.9	-20°47.7	-20°51.3	-4.2	58.9
	Su 16	299°45.6	314°09.9	328°34.1	342°58.3	357°22.5	11°46.6	26°10.7	40°34.8	54°58.9	69°22.9	83°46.9	+24.1	16.2
		-21°29.5	-21°30.9	-21°32.1	-21°33.3	-21°34.3	-21°35.1	-21°35.8	-21°36.3	-21°36.7	-21°37.0	-21°37.1	-0.8	59.4
	Mo 17	299°44.8	314°08.8	328°32.8	342°56.2	357°20.8	11°45.2	26°09.6	40°34.1	54°58.7	69°23.2	83°47.9	+24.4	16.4
		-21°20.9	-21°18.7	-21°16.3	-21°13.7	-21°11.0	-21°08.1	-21°05.1	-21°02.0	-20°58.7	-20°55.2	-20°51.7	+2.9	59.8
	Tu 18	299°43.5	314°07.8	328°32.1	342°56.4	357°20.8	11°45.2	26°09.6	40°34.1	54°58.7	69°23.2	83°47.9	+24.4	16.4
		-19°40.6	-19°34.6	-19°28.8	-19°22.7	-19°16.4	-19°10.0	-19°03.5	-18°56.9	-18°50.1	-18°43.2	-18°36.2	+6.5	60.0
	We 19	300°03.1	314°28.6	328°54.1	343°19.6	357°45.3	12°10.9	26°36.7	41°02.5	55°28.3	69°54.2	84°20.2	+25.7	16.4
		-16°36.0	-16°27.1	-16°18.1	-16°08.9	-15°59.7	-15°50.3	-15°40.9	-15°31.3	-15°21.7	-15°11.9	-15°02.1	+9.4	60.0
	Th 20	300°57.3	315°24.3	329°51.3	344°18.4	358°45.6	13°12.8	27°40.1	42°07.4	56°34.9	71°02.3	85°29.9	+27.3	16.3
		-12°23.8	-12°12.6	-12°01.4	-11°50.0	-11°38.6	-11°27.2	-11°15.6	-11°04.0	-10°52.4	-10°40.7	-10°28.9	+11.5	59.8
	Fr 21	302°29.9	316°58.4	331°26.9	345°55.5	0°24.1	14°52.8	29°21.5	43°50.3	58°19.1	72°48.0	87°16.9	+28.7	16.2
		-7°26.2	-7°13.7	-7°01.2	-6°48.6	-6°36.0	-6°23.4	-6°10.7	-5°58.0	-5°45.3	-5°32.6	-5°19.9	+12.6	59.4
	Sa 22	304°36.6	319°06.3	333°36.0	348°05.8	2°35.5	17°05.4	31°35.2	46°05.1	60°35.0	75°05.0	89°35.0	+28.9	16.0
		-2°07.1	-1°54.2	-1°41.3	-1°28.4	-1°15.5	-1°02.6	-0°49.8	-0°36.9	-0°24.1	-0°11.2	0°01.6	+12.9	58.7
	Su 23	307°08.8	321°39.2	336°09.7	350°40.3	5°10.8	19°41.4	34°11.9	48°42.6	63°13.2	77°43.8	92°14.5	+30.6	15.8
		3°11.5	3°24.0	3°36.4	3°48.8	4°01.2	4°13.5	4°25.7	4°38.0	4°50.2	5°02.3	5°14.5	+12.3	57.9
	Mo 24	309°56.3	324°27.2	338°58.1	353°29.0	7°59.9	22°30.8	37°01.7	51°32.7	66°03.6	80°34.5	95°05.5	+30.9	15.6
		8°10.7	8°22.1	8°33.3	8°44.6	8°55.7	9°06.8	9°17.9	9°28.9	9°39.8	9°50.7	10°01.5	+11.1	57.1
	Tu 25	312°50.1	327°21.1	341°52.0	356°23.0	10°54.0	25°25.0	39°55.9	54°26.9	68°57.8	83°28.8	97°59.8	+31.0	15.3
		12°35.5	12°45.2	12°54.8	13°04.3	13°13.8	13°23.2	13°32.5	13°41.8	13°51.0	14°00.1	14°09.1	+9.4	56.3
	We 26	315°43.5	330°14.3	344°45.2	359°16.0	13°46.9	28°17.7	42°48.5	57°19.4	71°50.2	86°21.0	100°51.8	+30.8	15.1
		16°14.4	16°22.1	16°29.7	16°37.2	16°44.6	16°52.0	16°59.2	17°06.4	17°13.4	17°20.4	17°27.3	+7.3	55.5
	Th 27	318°32.9	333°03.5	347°34.2	2°04.9	16°35.5	31°06.2	45°36.8	60°07.5	74°38.1	89°08.7	103°39.4	+30.7	15.0
		18°59.5	19°04.9	19°10.2	19°15.4	19°20.5	19°25.5	19°30.4	19°35.2	19°39.9	19°44.6	19°49.1	+5.0	54.9
	Fr 28	321°18.2	335°48.7	350°19.3	4°49.9	19°20.4	33°51.0	48°21.5	62°52.1	77°22.6	91°53.2	106°23.7	+30.6	14.9
		20°45.2	20°48.1	20°50.9	20°53.7	20°56.3	20°58.9	21°01.3	21°03.7	21°05.9	21°08.0	21°10.1	+2.5	54.5

Row 1: GHA, Δ°/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (= South), Δ°/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 7 12h46 — LQ: 14 22h49 — NM: 21 15h48

SUN

March 2031

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Sa 1	266°54.1 -7°38.8	281°54.2 -7°37.9	296°54.3 -7°36.9	311°54.4 -7°36.0	326°54.5 -7°35.0	341°54.7 -7°34.1	356°54.8 -7°33.1	11°54.9 -7°32.2	26°55.0 -7°31.2	41°55.1 -7°30.3	56°55.3 -7°29.3	71°55.4 -7°28.4	+0.1 +1.0
Su 2	266°57.0 -7°16.0	281°57.1 -7°15.0	296°57.2 -7°14.1	311°57.4 -7°13.1	326°57.5 -7°12.2	341°57.6 -7°11.2	356°57.7 -7°10.3	11°57.9 -7°09.3	26°58.0 -7°08.3	41°58.1 -7°07.4	56°58.3 -7°06.4	71°58.4 -7°05.5	+0.1 +1.0
Mo 3	267°00.1 -6°53.0	282°00.2 -6°52.1	297°00.3 -6°51.1	312°00.4 -6°50.2	327°00.6 -6°49.2	342°00.7 -6°48.3	357°00.8 -6°47.3	12°01.0 -6°46.3	27°01.1 -6°45.4	42°01.2 -6°44.4	57°01.4 -6°43.5	72°01.5 -6°42.5	+0.1 +1.0
Tu 4	267°03.2 -6°30.0	282°03.4 -6°29.1	297°03.5 -6°28.1	312°03.6 -6°27.1	327°03.8 -6°26.2	342°03.9 -6°25.2	357°04.0 -6°24.2	12°04.2 -6°23.3	27°04.3 -6°22.3	42°04.5 -6°21.4	57°04.6 -6°20.4	72°04.7 -6°19.4	+0.1 +1.0
We 5	267°06.5 -6°06.9	282°06.7 -6°05.9	297°06.8 -6°05.0	312°06.9 -6°04.0	327°07.1 -6°03.0	342°07.2 -6°02.1	357°07.4 -6°01.1	12°07.5 -6°00.1	27°07.7 -5°59.2	42°07.8 -5°58.2	57°07.9 -5°57.2	72°08.1 -5°56.3	+0.1 +1.0
Th 6	267°09.9 -5°43.7	282°10.1 -5°42.7	297°10.2 -5°41.8	312°10.4 -5°40.8	327°10.5 -5°39.8	342°10.7 -5°38.8	357°10.8 -5°37.9	12°11.0 -5°36.9	27°11.1 -5°35.9	42°11.2 -5°35.0	57°11.4 -5°34.0	72°11.5 -5°33.0	+0.1 +1.0
Fr 7	267°13.5 -5°20.4	282°13.6 -5°19.4	297°13.8 -5°18.5	312°13.9 -5°17.5	327°14.0 -5°16.5	342°14.2 -5°15.6	357°14.3 -5°14.6	12°14.5 -5°13.6	27°14.6 -5°12.6	42°14.8 -5°11.7	57°14.9 -5°10.7	72°15.1 -5°09.7	+0.1 +1.0
Sa 8	267°17.1 -4°57.1	282°17.2 -4°56.1	297°17.4 -4°55.1	312°17.5 -4°54.1	327°17.7 -4°53.2	342°17.8 -4°52.2	357°18.0 -4°51.2	12°18.1 -4°50.2	27°18.3 -4°49.3	42°18.5 -4°48.3	57°18.6 -4°47.3	72°18.8 -4°46.3	+0.2 +1.0
Su 9	267°20.8 -4°33.6	282°20.9 -4°32.7	297°21.1 -4°31.7	312°21.3 -4°30.7	327°21.4 -4°29.7	342°21.6 -4°28.8	357°21.7 -4°27.8	12°21.9 -4°26.8	27°22.0 -4°25.8	42°22.2 -4°24.9	57°22.4 -4°23.9	72°22.5 -4°22.9	+0.2 +1.0
Mo 10	267°24.6 -4°10.2	282°24.7 -4°09.2	297°24.9 -4°08.2	312°25.1 -4°07.2	327°25.2 -4°06.3	342°25.4 -4°05.3	357°25.5 -4°04.3	12°25.7 -4°03.3	27°25.9 -4°02.3	42°26.0 -4°01.4	57°26.2 -4°00.4	72°26.4 -3°59.4	+0.2 +1.0
Tu 11	267°28.5 -3°46.6	282°28.6 -3°45.7	297°28.8 -3°44.7	312°29.0 -3°43.7	327°29.1 -3°42.7	342°29.3 -3°41.7	357°29.5 -3°40.8	12°29.6 -3°39.8	27°29.8 -3°38.8	42°29.9 -3°37.8	57°30.1 -3°36.8	72°30.3 -3°35.8	+0.2 +1.0
We 12	267°32.4 -3°23.1	282°32.6 -3°22.1	297°32.8 -3°21.1	312°32.9 -3°20.1	327°33.1 -3°19.1	342°33.3 -3°18.2	357°33.4 -3°17.2	12°33.6 -3°16.2	27°33.8 -3°15.2	42°33.9 -3°14.2	57°34.1 -3°13.2	72°34.3 -3°12.3	+0.2 +1.0
Th 13	267°36.5 -2°59.5	282°36.6 -2°58.5	297°36.8 -2°57.5	312°37.0 -2°56.5	327°37.1 -2°55.5	342°37.3 -2°54.5	357°37.5 -2°53.5	12°37.7 -2°52.6	27°37.9 -2°51.6	42°38.0 -2°50.6	57°38.2 -2°49.6	72°38.3 -2°48.6	+0.2 +1.0
Fr 14	267°40.6 -2°35.8	282°40.7 -2°34.8	297°40.9 -2°33.8	312°41.1 -2°32.8	327°41.2 -2°31.9	342°41.4 -2°30.9	357°41.6 -2°29.9	12°41.8 -2°28.9	27°41.9 -2°27.9	42°42.1 -2°26.9	57°42.3 -2°25.9	72°42.5 -2°25.0	+0.2 +1.0
Sa 15	267°44.7 -2°12.1	282°44.9 -2°11.1	297°45.1 -2°10.2	312°45.2 -2°09.2	327°45.4 -2°08.2	342°45.6 -2°07.2	357°45.8 -2°06.2	12°45.9 -2°05.2	27°46.0 -2°04.2	42°46.3 -2°03.2	57°46.5 -2°02.3	72°46.6 -2°01.3	+0.2 +1.0
Su 16	267°48.9 -1°48.4	282°49.1 -1°47.4	297°49.3 -1°46.4	312°49.5 -1°45.5	327°49.6 -1°44.5	342°49.8 -1°43.5	357°50.0 -1°42.5	12°50.2 -1°41.5	27°50.4 -1°40.5	42°50.5 -1°39.5	57°50.7 -1°38.5	72°50.9 -1°37.6	+0.2 +1.0
Mo 17	267°53.2 -1°24.7	282°53.4 -1°23.7	297°53.6 -1°22.7	312°53.7 -1°21.7	327°53.9 -1°20.7	342°54.1 -1°19.8	357°54.3 -1°18.8	12°54.4 -1°17.8	27°54.6 -1°16.8	42°54.8 -1°15.8	57°55.0 -1°14.8	72°55.2 -1°13.8	+0.2 +1.0
Tu 18	267°57.5 -1°01.0	282°57.7 -1°00.0	297°57.9 -0°59.0	312°58.0 -0°58.0	327°58.2 -0°57.0	342°58.4 -0°56.0	357°58.6 -0°55.0	12°58.8 -0°54.1	27°58.9 -0°53.1	42°59.1 -0°52.1	57°59.3 -0°51.1	72°59.5 -0°50.1	+0.2 +1.0
We 19	268°01.9 -0°37.2	283°02.0 -0°36.3	298°02.2 -0°35.3	313°02.4 -0°34.3	328°02.6 -0°33.3	343°02.8 -0°32.3	358°02.9 -0°31.3	13°03.1 -0°30.3	28°03.3 -0°29.3	43°03.5 -0°28.3	58°03.7 -0°27.4	73°03.9 -0°26.4	+0.2 +1.0
Th 20	268°06.2 -0°13.5	283°06.4 -0°12.5	298°06.6 -0°11.5	313°06.8 -0°10.5	328°07.0 -0°09.6	343°07.1 -0°08.6	358°07.3 -0°07.6	13°07.5 -0°06.6	28°07.7 -0°05.6	43°07.9 -0°04.6	58°08.1 -0°03.6	73°08.3 -0°02.6	+0.2 +1.0
Fr 21	268°10.6 0°10.2	283°10.8 0°11.2	298°11.0 0°12.2	313°11.2 0°13.2	328°11.4 0°14.2	343°11.6 0°15.2	358°11.8 0°16.1	13°11.9 0°17.1	28°12.1 0°18.1	43°12.3 0°19.1	58°12.5 0°20.1	73°12.7 0°21.1	+0.2 +1.0
Sa 22	268°15.1 0°33.9	283°15.3 0°34.9	298°15.5 0°35.9	313°15.6 0°36.9	328°15.8 0°37.9	343°16.0 0°38.9	358°16.2 0°39.8	13°16.4 0°40.8	28°16.6 0°41.8	43°16.8 0°42.8	58°16.9 0°43.8	73°17.1 0°44.8	+0.2 +1.0
Su 23	268°19.5 0°57.6	283°19.7 0°58.6	298°19.9 0°59.6	313°20.1 1°00.6	328°20.3 1°01.5	343°20.5 1°02.5	358°20.7 1°03.5	13°20.6 1°04.5	28°20.8 1°05.5	43°21.0 1°06.5	58°21.2 1°07.5	73°21.4 1°08.4	+0.2 +1.0
Mo 24	268°24.2 1°21.3	283°24.2 1°22.2	298°24.4 1°23.2	313°24.6 1°24.2	328°24.8 1°25.2	343°25.0 1°26.2	358°25.1 1°27.2	13°25.3 1°28.1	28°25.5 1°29.1	43°25.7 1°30.1	58°25.9 1°31.1	73°26.1 1°32.1	+0.2 +1.0
Tu 25	268°28.5 1°44.9	283°28.7 1°45.9	298°28.9 1°46.8	313°29.1 1°47.8	328°29.3 1°48.8	343°29.4 1°49.8	358°29.6 1°50.8	13°29.8 1°51.8	28°30.0 1°52.7	43°30.3 1°53.7	58°30.4 1°54.7	73°30.6 1°55.7	+0.2 +1.0
We 26	268°33.0 2°08.5	283°33.2 2°09.4	298°33.4 2°10.4	313°33.6 2°11.4	328°33.8 2°12.4	343°34.0 2°13.4	358°34.1 2°14.3	13°34.3 2°15.3	28°34.6 2°16.3	43°34.7 2°17.3	58°34.9 2°18.3	73°35.1 2°19.2	+0.2 +1.0
Th 27	268°37.5 2°32.0	283°37.7 2°33.0	298°37.9 2°33.9	313°38.1 2°34.9	328°38.3 2°35.9	343°38.5 2°36.9	358°38.7 2°37.9	13°38.8 2°39.8	28°39.0 2°39.8	43°39.2 2°40.8	58°39.4 2°41.8	73°39.6 2°42.8	+0.2 +1.0
Fr 28	268°42.0 2°55.5	283°42.2 2°56.4	298°42.4 2°57.4	313°42.6 2°58.4	328°42.8 2°59.4	343°43.0 3°00.3	358°43.2 3°01.3	13°43.3 3°02.3	28°43.5 3°03.3	43°43.7 3°04.3	58°43.7 3°05.2	73°44.1 3°06.2	+0.2 +1.0
Sa 29	268°46.5 3°18.9	283°46.7 3°19.9	298°46.9 3°20.8	313°47.1 3°21.8	328°47.3 3°22.8	343°47.5 3°23.8	358°47.7 3°24.7	13°47.9 3°25.7	28°48.0 3°26.7	43°48.2 3°27.6	58°48.4 3°28.6	73°48.6 3°29.6	+0.2 +1.0
Su 30	268°51.0 3°42.2	283°51.2 3°43.2	298°51.4 3°44.2	313°51.6 3°45.2	328°51.8 3°46.1	343°52.0 3°47.1	358°52.2 3°48.1	13°52.3 3°49.0	28°52.5 3°50.0	43°52.7 3°51.0	58°52.9 3°51.9	73°53.1 3°52.9	+0.2 +1.0
Mo 31	268°55.5 4°05.5	283°55.7 4°06.5	298°55.9 4°07.5	313°56.1 4°08.4	328°56.3 4°09.4	343°56.5 4°10.4	358°56.6 4°11.3	13°56.8 4°12.3	28°57.0 4°13.3	43°57.2 4°14.2	58°57.4 4°15.2	73°57.6 4°16.2	+0.2 +1.0

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°
Row 2: Dec (Declination, – = South), Δ°/h = dec. change – 15°
Semi-diameter: 16.1'

MOON

March 2031

	D	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	Δ'/h SH	
●	Sa 1	236°58.8 21°23.9	251°29.3 21°24.9	265°59.9 21°25.9	280°30.5 21°26.7	295°01.1 21°27.4	309°31.7 21°28.1	324°02.3 21°28.6	338°32.9 21°29.0	353°03.5 21°29.3	7°34.1 21°29.6	22°04.7 21°29.7	+30.6 14.8 +0.6 54.3	
	Su 2	239°45.0 21°19.6	254°15.8 21°18.1	268°46.5 21°16.5	283°17.7 21°14.9	297°48.1 21°13.1	312°19.0 21°11.2	326°49.8 21°09.3	341°20.6 21°07.2	355°51.5 21°05.0	10°22.4 21°02.8	24°53.2 21°00.4	+30.8 14.8 -1.9 54.1	
	Mo 3	242°38.4 20°13.6	257°09.5 20°09.7	271°40.7 20°05.8	286°11.9 20°01.7	300°43.1 19°57.6	315°14.3 19°53.3	329°45.5 19°49.0	344°16.8 19°44.5	358°48.1 19°40.0	13°19.4 19°35.4	27°50.7 19°30.7	+31.2 14.8 -8.4 54.2	
●	Tu 4	245°42.8 18°09.5	260°14.4 18°03.4	274°46.0 17°57.2	289°17.7 17°50.9	303°49.4 17°44.6	318°21.1 17°38.1	332°52.9 17°31.6	347°24.6 17°25.0	1°56.4 17°18.3	16°28.2 17°11.5	31°00.0 17°04.7	+31.7 14.8 -6.5 54.4	
	We 5	248°59.5 15°12.6	263°31.6 15°04.5	278°03.7 14°56.3	292°35.9 14°48.1	307°08.0 14°39.8	321°40.2 14°31.4	336°12.4 14°23.0	350°44.6 14°14.5	5°16.9 14°05.9	19°49.1 13°57.3	34°21.4 13°48.6	+32.2 14.9 -8.4 54.8	
	Th 6	252°26.9 11°30.1	266°59.3 11°20.4	281°31.8 11°10.6	296°04.3 11°00.7	310°36.8 10°50.8	325°09.3 10°40.9	339°41.8 10°30.9	354°14.3 10°20.8	8°46.8 10°10.7	23°19.3 10°00.5	37°51.9 9°50.3	+32.5 15.1 -10.0 55.3	
●	Fr 7	256°00.2 7°11.1	270°32.8 7°00.1	285°05.3 6°49.1	299°37.9 6°38.0	314°10.4 6°26.9	328°43.0 6°15.8	343°15.5 6°04.6	357°48.1 5°53.4	12°20.6 5°42.2	26°53.1 5°30.9	41°25.6 5°19.6	+32.5 15.2 -11.1 55.9	
	Sa 8	259°32.2 -2°26.4	274°04.5 -2°14.6	288°36.8 -2°02.9	303°09.1 -1°51.1	317°41.3 -1°39.3	332°13.6 -1°27.5	346°45.8 -1°15.6	1°18.0 -1°03.8	15°50.2 0°51.9	30°22.4 0°40.0	44°54.5 0°28.1	+32.2 15.4 -11.8 56.4	
	Su 9	262°53.5 -3°31.1	277°25.2 -2°43.0	291°56.8 -2°55.0	306°28.4 -3°06.9	321°00.0 -3°18.9	335°31.6 -3°30.8	350°03.1 -3°42.8	4°34.6 -3°54.7	19°06.0 -4°06.6	33°37.4 -4°18.5	48°08.7 -4°30.4	+31.5 15.5 -11.9 57.0	
●	Mo 10	265°54.0 -7°26.4	280°24.6 -7°37.9	294°55.2 -7°49.4	309°25.7 -8°00.8	323°56.2 -8°12.3	338°26.7 -8°23.7	352°57.1 -8°35.0	7°27.4 -8°46.4	21°57.7 -9°06.6	36°27.9 -9°08.9	50°58.1 -9°20.1	+30.4 15.7 -11.4 57.5	
	Tu 11	268°23.9 -12°02.5	282°53.1 -12°12.8	297°22.3 -12°23.2	311°51.5 -12°33.4	326°20.5 -12°43.6	340°49.5 -12°53.8	355°18.4 -13°03.8	9°47.3 -13°13.9	24°16.1 -13°23.8	38°44.9 -13°33.7	53°13.6 -13°43.4	+29.0 15.8 -10.1 58.0	
	We 12	270°16.0 -16°01.0	284°43.7 -16°09.5	299°11.3 -16°17.9	313°38.8 -16°26.2	328°06.2 -16°34.5	342°33.6 -16°42.6	357°00.9 -16°50.6	11°28.2 -16°58.6	25°55.4 -17°06.4	40°22.5 -17°14.1	54°49.6 -17°21.8	+27.4 15.9 -8.1 58.4	
●	Th 13	271°28.3 -19°03.6	285°54.4 -19°09.4	300°20.5 -19°15.2	314°46.5 -19°20.9	329°12.5 -19°26.4	343°38.4 -19°31.8	358°04.2 -19°37.1	12°30.0 -19°42.3	26°55.7 -19°47.3	41°21.4 -19°52.3	55°47.1 -19°57.1	+25.9 16.0 -5.4 58.7	
	Fr 14	272°06.5 -20°53.6	286°31.5 -20°56.3	300°56.5 -20°58.9	315°21.4 -21°01.3	329°46.3 -21°03.6	344°11.2 -21°05.8	358°36.0 -21°07.8	13°00.8 -21°09.7	27°25.6 -21°11.4	41°50.4 -21°13.0	56°15.1 -21°14.5	+24.9 16.1 -2.1 59.0	
	Sa 15	286°31.5 -20°56.3	300°56.5 -20°58.9	315°21.4 -21°01.3	329°46.3 -21°03.6	344°11.2 -21°05.8	358°36.0 -21°07.8	13°00.8 -21°09.7	27°25.6 -21°11.4	41°50.4 -21°13.0	56°15.1 -21°14.5	70°39.9 -21°15.8	+24.8 16.1 -2.0 59.0	
●	Su 16	286°49.5 -21°18.9	301°13.7 -21°17.9	315°38.3 -21°16.9	330°02.9 -21°15.7	344°27.5 -21°14.3	358°52.1 -21°12.8	13°16.6 -21°11.2	27°41.2 -21°09.4	42°05.9 -21°07.5	56°30.5 -21°05.4	70°55.1 -21°03.2	+24.6 16.1 +1.6 59.2	
	Mo 17	287°06.8 -20°13.7	301°31.8 -20°09.9	315°56.8 -20°04.8	330°21.9 -20°00.1	344°47.0 -19°55.4	359°12.1 -19°50.4	13°37.2 -19°45.4	28°02.4 -19°40.2	42°27.6 -19°34.9	56°52.9 -19°29.5	71°18.2 -19°23.9	+25.1 16.2 +5.0 59.3	
	Tu 18	287°42.9 -17°46.0	302°09.0 -17°38.5	316°33.0 -17°30.9	331°01.2 -17°23.2	345°27.3 -17°15.4	359°53.6 -17°07.5	14°19.9 -16°59.5	28°46.2 -16°51.4	43°12.6 -16°43.2	57°39.0 -16°34.9	72°05.5 -16°26.4	+26.3 16.2 +8.0 59.2	
●	We 19	288°49.5 -14°08.5	303°16.9 -13°58.6	317°44.3 -13°48.6	332°11.8 -13°38.5	346°39.3 -13°28.4	361°15.4 -13°18.1	15°06.9 -13°07.8	15°34.5 -12°57.4	30°02.2 -12°47.0	44°30.0 -12°36.4	58°57.8 -12°25.8	+27.6 16.1 -10.3 59.1	
	Th 20	290°30.0 -9°39.0	304°58.7 -9°27.4	319°27.4 -9°15.8	333°56.2 -9°04.1	348°25.0 -8°52.4	363°09.5 -8°40.6	25°53.9 -8°28.8	17°22.8 -8°17.0	31°51.8 -8°05.1	46°20.8 -7°53.1	60°49.9 -7°41.1	+28.9 16.1 -11.8 58.9	
	Fr 21	292°40.7 -4°37.6	307°10.4 -4°25.2	321°40.2 -4°12.8	336°10.0 -4°00.3	350°39.0 -3°47.8	365°09.8 -3°35.3	5°09.9 -3°22.8	19°39.7 -3°10.3	34°09.6 -2°57.8	48°39.6 -2°45.3	63°09.9 -2°32.7	+29.9 16.0 -12.5 58.5	
●	Sa 22	295°13.5 0°35.3	309°44.0 0°47.8	324°14.4 1°00.3	338°44.9 1°12.7	353°15.4 1°25.2	368°15.4 1°37.6	7°45.9 1°50.0	22°16.5 1°50.0	36°47.0 2°14.7	51°17.6 2°14.7	65°48.2 2°27.1	80°18.8 2°39.4	+30.5 15.8 +12.5 58.0
	Su 23	297°59.1 5°40.8	312°29.9 5°52.6	327°00.7 6°04.4	341°31.4 6°16.1	356°02.2 6°27.8	370°33.0 6°39.4	10°33.0 6°51.0	25°03.8 6°51.0	39°34.5 7°02.6	54°05.3 7°14.1	68°36.1 7°25.5	83°06.9 7°37.0	+30.8 15.7 +11.6 57.4
	Mo 24	300°48.7 10°21.7	315°19.3 10°32.2	329°50.2 10°42.7	344°21.0 10°53.1	358°51.7 11°03.4	373°22.5 11°13.6	13°22.5 11°23.8	27°53.2 11°34.0	42°23.9 11°44.0	56°54.7 11°54.0	71°25.4 12°03.9	85°56.1 12°03.9	+30.7 15.5 +10.2 56.7
●	Tu 25	303°35.9 14°23.8	318°06.4 14°32.5	332°37.0 14°41.2	347°07.6 14°49.7	361°38.1 14°58.2	375°08.7 15°06.6	16°08.7 15°14.9	30°39.2 15°23.1	45°09.7 15°31.2	59°40.2 15°39.2	74°10.7 15°47.2	88°41.2 15°47.2	+30.5 15.3 +8.3 56.1
	We 26	306°17.6 17°36.0	320°47.9 17°42.5	335°18.3 17°48.9	349°48.6 17°55.3	364°18.9 18°01.5	378°49.3 18°07.6	18°49.3 18°13.7	33°19.6 18°19.6	47°49.9 18°25.5	62°20.2 18°31.3	76°50.5 18°31.3	91°20.8 18°36.9	+30.3 15.1 +6.1 55.4
	Th 27	308°54.5 19°50.2	323°24.8 19°54.3	337°55.0 19°58.3	352°25.2 20°02.2	366°55.4 20°09.7	381°25.7 20°19.7	21°25.7 20°13.3	35°55.9 20°16.8	50°26.1 20°16.8	64°56.3 20°20.2	79°26.6 20°23.2	93°56.8 20°26.6	+30.2 15.0 +3.6 54.9
●	Fr 28	311°30.6 21°02.2	326°00.9 21°03.7	340°31.2 21°05.2	355°01.5 21°06.5	369°31.9 21°07.8	384°02.2 21°08.9	24°02.2 21°10.0	38°32.6 21°10.0	53°02.9 21°10.9	67°33.3 21°11.8	82°03.7 21°12.5	96°34.1 21°13.2	+30.3 14.9 +1.5 54.5
	Sa 29	314°11.5 21°10.7	328°42.1 21°09.7	343°12.8 21°08.6	357°43.4 21°07.5	372°14.1 21°06.2	386°44.8 21°04.8	26°44.8 21°03.4	41°15.5 21°03.4	55°46.2 21°01.8	70°17.0 21°00.2	84°47.7 20°58.4	99°18.5 20°56.6	+30.7 14.8 -1.4 54.2
	Su 30	317°02.8 20°17.3	331°33.9 20°13.9	346°05.1 20°10.5	360°36.3 20°06.9	375°07.5 20°03.7	389°38.5 19°59.7	29°38.7 19°55.7	44°10.0 19°55.7	58°41.2 19°51.8	73°12.5 19°47.3	87°43.6 19°43.6	102°15.2 19°39.4	+31.2 14.8 -3.8 54.2
●	Mo 31	320°08.2 18°26.0	334°40.0 18°20.4	349°11.7 18°14.7	363°43.5 18°09.0	378°15.3 18°03.2	392°47.1 17°57.2	47°19.0 17°51.2	61°50.8 17°45.2	76°22.7 17°39.0	90°54.6 17°32.8	105°26.6 17°26.4	+31.8 14.8 -6.0 54.3	

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter
 Row 2: Dec (– = South), Δ'/h = dec. change, SH = horizontal parallax
 Column = (UTC hour – day) mod 24
 FQ: 1 04h02 — FM: 9 04h29 — LQ: 16 06h35 — NM: 23 03h49 — FQ: 31 00h32

SUN

April 2031

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Tu 1	269°00.0 4°28.7	284°00.2 4°29.7	299°00.4 4°30.7	314°00.5 4°31.6	329°00.7 4°32.6	344°00.9 4°33.6	359°01.1 4°34.5	14°01.3 4°35.5	29°01.3 4°36.4	44°01.7 4°37.4	59°01.8 4°38.4	74°02.0 4°39.3	+0.2 +1.0
We 2	269°04.4 4°51.9	284°04.6 4°52.8	299°04.8 4°53.8	314°05.0 4°54.7	329°05.2 4°55.7	344°05.4 4°56.7	359°05.5 4°57.6	14°05.7 4°58.6	29°05.9 4°59.5	44°06.1 5°00.5	59°06.3 5°01.5	74°06.5 5°02.4	+0.2 +1.0
Th 3	269°08.9 5°14.9	284°09.0 5°15.8	299°09.2 5°16.8	314°09.4 5°17.8	329°09.6 5°18.7	344°09.8 5°19.7	359°10.0 5°20.6	14°10.1 5°21.6	29°10.3 5°22.6	44°10.5 5°23.5	59°10.7 5°24.5	74°10.9 5°25.4	+0.2 +1.0
Fr 4	269°13.2 5°37.8	284°13.4 5°38.8	299°13.6 5°39.7	314°13.8 5°40.7	329°14.0 5°41.6	344°14.2 5°42.6	359°14.3 5°43.6	14°14.5 5°44.5	29°14.7 5°45.5	44°14.9 5°46.4	59°15.1 5°47.4	74°15.2 5°48.3	+0.2 +1.0
Sa 5	269°17.6 6°00.7	284°17.8 6°01.6	299°18.0 6°02.6	314°18.1 6°03.5	329°18.3 6°04.5	344°18.5 6°05.4	359°18.7 6°06.4	14°18.9 6°07.3	29°19.0 6°08.3	44°19.2 6°09.2	59°19.4 6°10.2	74°19.6 6°11.1	+0.2 +0.9
Su 6	269°21.9 6°23.4	284°22.1 6°24.4	299°22.3 6°25.3	314°22.4 6°26.3	329°22.6 6°27.2	344°22.8 6°28.1	359°23.0 6°29.1	14°23.2 6°30.0	29°23.3 6°31.0	44°23.5 6°31.9	59°23.7 6°32.9	74°23.9 6°33.8	+0.2 +0.9
Mo 7	269°26.2 6°46.0	284°26.3 6°47.0	299°26.5 6°47.9	314°26.7 6°48.9	329°26.9 6°49.8	344°27.0 6°50.7	359°27.2 6°51.7	14°27.4 6°52.6	29°27.6 6°53.6	44°27.7 6°54.5	59°27.9 6°55.4	74°28.1 6°56.4	+0.2 +0.9
Tu 8	269°30.4 7°08.6	284°30.5 7°09.5	299°30.7 7°10.4	314°30.9 7°11.4	329°31.1 7°12.3	344°31.2 7°13.2	359°31.4 7°14.2	14°31.6 7°15.1	29°31.8 7°16.0	44°31.9 7°17.0	59°32.1 7°17.9	74°32.3 7°18.8	+0.2 +0.9
We 9	269°34.5 7°31.0	284°34.7 7°31.9	299°34.9 7°32.8	314°35.0 7°33.7	329°35.2 7°34.7	344°35.4 7°35.6	359°35.5 7°36.5	14°35.7 7°37.5	29°35.9 7°38.4	44°36.1 7°39.3	59°36.2 7°40.2	74°36.4 7°41.2	+0.2 +0.9
Th 10	269°38.6 7°53.2	284°38.8 7°54.1	299°38.9 7°55.1	314°39.1 7°56.0	329°39.3 7°56.9	344°39.4 7°57.8	359°39.6 7°58.8	14°39.9 7°59.7	29°39.9 8°00.6	44°40.1 8°01.5	59°40.3 8°02.5	74°40.4 8°03.4	+0.2 +0.9
Fr 11	269°42.6 8°15.4	284°42.8 8°16.3	299°42.9 8°17.2	314°43.1 8°18.1	329°43.3 8°19.0	344°43.4 8°20.0	359°43.6 8°20.9	14°43.6 8°21.8	29°43.9 8°22.7	44°44.1 8°23.6	59°44.3 8°24.5	74°44.4 8°25.5	+0.2 +0.9
Sa 12	269°46.5 8°37.4	284°46.7 8°38.3	299°46.9 8°39.2	314°47.0 8°40.1	329°47.2 8°41.0	344°47.4 8°41.9	359°47.5 8°42.8	14°47.7 8°43.7	29°47.8 8°44.7	44°48.0 8°45.6	59°48.2 8°46.5	74°48.3 8°47.4	+0.2 +0.9
Su 13	269°50.4 8°59.2	284°50.6 9°00.1	299°50.7 9°01.0	314°50.9 9°01.9	329°51.0 9°02.8	344°51.2 9°03.7	359°51.4 9°04.7	14°51.5 9°05.6	29°51.7 9°06.5	44°51.8 9°07.4	59°52.0 9°08.3	74°52.1 9°09.2	+0.2 +0.9
Mo 14	269°54.2 9°20.9	284°54.3 9°21.8	299°54.5 9°22.7	314°54.6 9°23.6	329°54.8 9°24.5	344°55.0 9°25.4	359°55.1 9°26.3	14°55.3 9°27.2	29°55.5 9°28.1	44°55.6 9°29.0	59°55.7 9°29.9	74°55.9 9°30.8	+0.2 +0.9
Tu 15	269°57.9 9°42.5	284°58.0 9°43.4	299°58.2 9°44.3	314°58.3 9°45.2	329°58.5 9°46.1	344°58.6 9°46.9	359°58.8 9°47.8	14°58.9 9°48.7	29°59.0 9°49.6	44°59.2 9°50.5	59°59.4 9°51.4	74°59.5 9°52.3	+0.2 +0.9
We 16	270°01.5 10°03.9	285°01.6 10°04.8	300°01.7 10°05.6	315°01.9 10°06.5	330°02.0 10°07.4	345°02.2 10°08.3	0°02.3 10°09.2	15°02.5 10°10.1	30°02.6 10°11.0	45°02.8 10°11.9	60°02.9 10°12.7	75°03.1 10°13.6	+0.1 +0.9
Th 17	270°05.0 10°25.1	285°05.1 10°26.0	300°05.2 10°26.9	315°05.4 10°27.7	330°05.5 10°28.6	345°05.7 10°29.5	0°05.8 10°30.4	15°06.0 10°31.3	30°06.1 10°32.1	45°06.2 10°33.0	60°06.4 10°33.9	75°06.5 10°34.8	+0.1 +0.9
Fr 18	270°08.3 10°46.2	285°08.5 10°47.0	300°08.6 10°47.9	315°08.8 10°48.8	330°08.9 10°49.7	345°09.0 10°50.5	0°09.2 10°51.4	15°09.3 10°52.3	30°09.5 10°53.1	45°09.6 10°54.0	60°09.7 10°54.9	75°09.9 10°55.8	+0.1 +0.9
Sa 19	270°11.6 11°07.0	285°11.8 11°07.9	300°11.9 11°08.8	315°12.0 11°09.6	330°12.3 11°10.5	345°12.3 11°11.4	0°12.4 11°12.2	15°12.6 11°13.1	30°12.7 11°14.0	45°12.9 11°14.8	60°13.0 11°15.7	75°13.1 11°16.5	+0.1 +0.9
Su 20	270°14.8 11°27.7	285°15.0 11°28.6	300°15.1 11°29.5	315°15.2 11°30.3	330°15.4 11°31.2	345°15.5 11°32.0	0°15.6 11°32.9	15°15.7 11°33.7	30°15.9 11°34.6	45°16.0 11°35.5	60°16.1 11°36.3	75°16.3 11°37.2	+0.1 +0.9
Mo 21	270°17.9 11°48.2	285°18.0 11°49.1	300°18.2 11°49.9	315°18.3 11°50.8	330°18.6 11°51.6	345°18.5 11°52.5	0°18.7 11°53.3	15°18.8 11°54.2	30°18.9 11°55.0	45°19.0 11°55.9	60°19.2 11°56.7	75°19.3 11°57.6	+0.1 +0.8
Tu 22	270°20.9 12°08.6	285°21.0 12°09.4	300°21.1 12°10.2	315°21.3 12°11.1	330°21.4 12°11.9	345°21.5 12°12.8	0°21.6 12°13.6	15°21.7 12°14.4	30°21.9 12°15.3	45°22.0 12°16.1	60°22.2 12°17.0	75°22.2 12°17.8	+0.1 +0.8
We 23	270°23.8 12°28.7	285°23.9 12°29.5	300°24.0 12°30.3	315°24.1 12°31.2	330°24.2 12°32.8	345°24.3 12°32.8	0°24.5 12°33.7	15°24.6 12°34.5	30°24.7 12°35.3	45°24.8 12°36.2	60°24.9 12°37.0	75°25.0 12°37.8	+0.1 +0.8
Th 24	270°26.5 12°48.6	285°26.6 12°49.4	300°26.7 12°50.2	315°26.8 12°51.1	330°26.9 12°51.9	345°27.1 12°52.7	0°27.2 12°53.5	15°27.3 12°54.3	30°27.4 12°55.2	45°27.5 12°56.0	60°27.6 12°56.8	75°27.7 12°57.6	+0.1 +0.8
Fr 25	270°29.1 13°08.3	285°29.2 13°09.1	300°29.4 13°09.9	315°29.5 13°10.7	330°29.6 13°11.5	345°29.7 13°12.4	0°29.8 13°13.2	15°29.9 13°14.0	30°30.0 13°14.8	45°30.1 13°15.6	60°30.2 13°16.4	75°30.3 13°17.2	+0.1 +0.8
Sa 26	270°31.7 13°27.8	285°31.8 13°28.6	300°31.9 13°29.4	315°32.0 13°30.2	330°32.1 13°31.0	345°32.2 13°31.8	0°32.3 13°32.6	15°32.4 13°33.4	30°32.5 13°34.2	45°32.6 13°35.0	60°32.7 13°35.8	75°32.8 13°36.6	+0.1 +0.8
Su 27	270°34.0 13°47.0	285°34.1 13°47.8	300°34.2 13°48.6	315°34.3 13°49.4	330°34.4 13°50.2	345°34.5 13°51.0	0°34.6 13°51.8	15°34.7 13°52.6	30°34.8 13°53.4	45°34.9 13°54.2	60°35.0 13°55.0	75°35.1 13°55.8	+0.1 +0.8
Mo 28	270°36.3 14°06.0	285°36.4 14°06.8	300°36.5 14°07.6	315°36.6 14°08.4	330°36.7 14°09.2	345°36.8 14°10.0	0°36.9 14°10.8	15°37.0 14°11.6	30°37.1 14°12.3	45°37.1 14°13.1	60°37.2 14°13.9	75°37.3 14°14.7	+0.1 +0.8
Tu 29	270°38.5 14°24.8	285°38.6 14°25.6	300°38.7 14°26.4	315°38.7 14°27.2	330°38.8 14°27.9	345°38.9 14°28.7	0°39.0 14°29.5	15°39.1 14°30.3	30°39.2 14°31.1	45°39.3 14°31.8	60°39.3 14°32.6	75°39.4 14°33.4	+0.1 +0.8
We 30	270°40.5 14°43.4	285°40.6 14°44.2	300°40.7 14°44.9	315°40.7 14°45.7	330°40.8 14°46.5	345°40.9 14°47.2	0°41.0 14°48.0	15°41.1 14°48.8	30°41.2 14°49.5	45°41.2 14°50.3	60°41.3 14°51.1	75°41.4 14°51.8	+0.1 +0.8

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change – 15°
Row 2: Dec (Declination, – = South), Δ'/h = dec. change
Semi-diameter: 15.9'

MOON

April 2031

	D	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	Δ'/h SH
○	Tu 1	236°15.0 -0°26.0	250°47.2 16°18.9	265°19.7 16°11.7	279°51.6 16°04.4	294°23.8 15°57.1	308°56.0 15°49.7	323°28.3 15°42.2	338°00.6 15°34.7	352°32.9 15°27.0	7°05.2 15°19.4	21°37.5 15°11.6	+32.2 14.9 -7.4 54.5
	We 2	239°44.5 13°06.7	254°17.0 12°57.9	268°49.6 12°49.0	283°22.2 12°40.0	297°54.9 12°30.9	312°27.5 12°21.8	327°00.1 12°12.6	341°32.7 12°03.4	356°05.4 11°54.1	10°38.1 11°44.8	25°10.7 11°35.4	+32.6 15.0 -9.1 55.0
○	Th 3	243°21.3 9°07.5	257°54.1 8°57.2	272°26.8 8°46.8	286°59.5 8°36.5	301°32.2 8°26.0	316°04.9 8°15.6	330°37.6 8°05.0	345°10.4 7°54.5	359°43.1 7°43.8	14°15.1 7°33.2	28°48.4 7°22.5	+32.7 15.2 -10.5 55.6
	Fr 4	246°57.6 4°37.0	261°30.1 4°25.7	276°02.6 4°14.3	290°35.0 4°02.9	305°07.5 3°51.5	319°39.9 3°40.1	334°12.3 3°28.6	348°44.7 3°17.1	3°17.0 3°05.6	17°49.4 2°54.0	32°21.7 2°42.4	+32.4 15.3 -11.5 56.3
○	Sa 5	250°23.1 -0°13.9	264°55.0 -0°25.8	279°26.8 -0°37.7	293°58.5 -0°49.6	308°30.3 -1°01.5	323°02.0 -1°13.4	337°33.6 -1°25.3	352°05.3 -1°37.3	6°36.8 -1°49.2	21°08.4 -2°01.1	35°39.9 -2°13.1	+31.7 15.5 -11.9 57.0
	Su 6	253°26.9 -5°11.9	267°57.6 -5°23.8	282°28.3 -5°35.6	296°58.9 -5°47.4	311°29.5 -5°59.2	326°00.0 -6°11.0	340°30.5 -6°22.7	355°00.9 -6°34.5	9°31.2 -6°46.2	24°01.5 -6°57.9	38°31.8 -7°09.5	+30.5 15.7 -11.8 57.7
○	Mo 7	255°57.9 -10°00.6	270°27.2 -10°11.7	284°56.3 -10°22.7	299°25.4 -10°33.7	313°54.4 -10°44.7	328°23.4 -10°55.6	342°52.3 -11°06.4	357°21.1 -11°17.2	11°49.9 -11°27.9	26°18.5 -11°38.6	40°47.2 -11°49.2	+28.9 15.9 -10.9 58.4
	Tu 8	257°47.9 -14°20.7	272°15.3 -14°30.2	286°42.7 -14°39.6	301°10.1 -14°48.9	315°37.3 -14°58.2	330°04.5 -15°07.4	344°31.6 -15°16.5	358°58.7 -15°25.5	13°25.6 -15°34.8	27°52.5 -15°43.2	42°19.4 -15°51.9	+27.2 16.1 -9.1 58.9
○	We 9	258°53.7 -17°51.0	273°19.4 -17°58.1	287°45.1 -18°05.1	302°10.8 -18°12.0	316°36.3 -18°18.7	331°01.9 -18°25.4	345°27.3 -18°31.9	359°52.7 -18°38.4	14°18.1 -18°44.4	28°43.3 -18°50.7	43°08.6 -18°56.8	+25.5 16.2 -6.6 59.3
	Th 10	259°21.0 -20°12.0	273°45.5 -20°16.0	288°10.3 -20°19.8	302°34.6 -20°23.5	316°58.3 -20°27.1	331°23.1 -20°30.5	345°47.4 -20°33.8	360°11.7 -20°36.9	14°36.0 -20°39.9	29°00.2 -20°42.8	43°24.4 -20°45.5	+24.3 16.2 -3.3 59.5
○	Fr 11	259°25.5 -21°09.1	273°49.5 -21°09.5	288°13.5 -21°09.8	302°37.6 -21°09.9	317°01.6 -21°09.9	331°25.6 -21°09.7	345°49.6 -21°09.4	360°13.6 -21°09.0	14°37.7 -21°08.4	29°01.7 -21°07.6	43°25.8 -21°06.8	+24.0 16.2 +0.2 59.5
	Sa 12	259°29.3 -20°36.4	273°53.8 -20°33.3	288°18.3 -20°30.0	302°42.8 -20°26.6	317°07.4 -20°23.0	331°32.0 -20°19.3	345°56.7 -20°15.0	360°21.4 -20°11.5	14°46.1 -20°07.4	29°10.9 -20°03.2	43°35.7 -19°58.8	+24.6 16.2 +3.8 59.4
○	Su 13	259°54.2 -18°38.3	274°19.9 -18°31.9	289°45.6 -18°25.4	303°11.4 -18°18.9	317°37.2 -18°12.2	332°03.1 -18°05.4	346°29.1 -17°58.4	361°05.5 -17°51.4	15°21.2 -17°44.3	29°47.4 -17°37.0	44°13.6 -17°29.7	+25.9 16.1 +6.9 59.2
	Mo 14	274°19.9 -18°31.9	288°45.6 -18°25.4	303°11.4 -18°18.9	317°37.2 -18°12.2	332°03.1 -18°05.4	346°29.1 -17°58.4	361°05.5 -17°51.4	366°10.5 -17°44.3	15°21.2 -17°37.0	29°47.4 -17°29.7	44°13.6 -17°22.2	+26.0 16.1 +7.0 59.2
○	Tu 15	275°21.8 -15°18.3	289°49.4 -15°09.3	304°16.3 -15°00.2	318°44.0 -14°51.0	333°11.5 -14°41.7	347°39.1 -14°32.4	362°06.7 -14°22.9	367°16.4 -14°13.3	16°34.4 -14°03.8	31°02.2 -13°54.4	50°57.9 -13°44.4	+27.6 16.1 +9.4 58.9
	We 16	277°03.7 -11°09.8	291°32.5 -10°59.0	306°01.5 -10°48.1	320°30.4 -10°37.2	334°59.5 -10°26.3	349°28.6 -10°15.2	364°07.7 -10°04.1	369°17.8 -9°53.0	17°26.9 -9°41.8	32°56.1 -9°30.6	47°25.4 -9°19.3	+29.1 16.0 +1.1 58.5
○	Th 17	279°20.9 -8°25.5	293°51.0 -8°13.6	308°21.1 -8°01.7	322°51.3 -7°49.8	335°51.8 -7°37.9	351°51.8 -7°25.9	367°22.1 -7°13.9	382°52.4 -7°01.9	35°22.8 -6°49.9	49°53.2 -6°37.9	64°23.7 -6°25.8	+30.3 15.8 -12.0 58.1
	Fr 18	282°04.0 -1°23.6	296°34.9 -1°11.5	311°05.8 -0°59.3	325°36.8 -0°47.1	340°07.7 -0°34.9	354°38.7 -0°22.7	369°09.7 -0°10.6	383°40.8 0°01.6	38°11.8 0°13.8	52°42.9 0°25.9	67°13.9 0°38.0	+31.0 15.7 +12.2 57.7
○	Sa 19	285°01.7 3°38.3	299°32.9 3°50.1	314°04.2 4°02.0	328°35.4 4°13.7	343°06.7 4°25.5	357°38.0 4°37.2	372°09.2 4°49.0	386°40.5 5°00.6	41°11.8 5°12.3	55°43.1 5°23.9	70°14.3 5°35.5	+31.3 15.6 +11.7 57.2
	Su 20	288°03.2 8°24.3	302°34.4 8°35.2	317°05.6 8°46.1	331°36.8 8°56.9	346°08.0 9°07.0	360°39.2 9°18.3	375°10.3 9°29.0	389°41.5 9°39.5	44°12.6 9°50.1	58°43.8 10°00.6	73°14.9 10°11.0	+31.2 15.4 +10.7 56.7
○	Mo 21	291°00.2 12°40.0	305°31.2 12°49.4	320°02.0 12°58.7	334°32.9 13°08.0	349°03.8 13°17.2	363°34.6 13°26.3	378°05.5 13°35.3	392°36.3 13°44.3	47°07.1 13°53.2	61°37.1 14°02.0	76°08.6 14°10.8	+30.8 15.3 +9.1 56.1
	Tu 22	293°48.1 16°12.6	308°18.6 16°20.0	322°49.1 16°27.4	337°19.5 16°34.1	351°50.0 16°41.8	366°20.4 16°49.0	380°50.8 16°56.0	395°21.2 17°02.9	48°51.2 17°09.7	64°22.6 17°16.5	78°52.4 17°23.1	+30.4 15.2 +7.1 55.6
○	We 23	296°26.3 18°51.9	310°56.5 18°57.1	325°26.7 19°02.1	339°56.8 19°07.1	354°27.0 19°11.9	368°57.1 19°16.7	383°27.2 19°21.4	397°57.4 19°25.9	52°27.4 19°30.4	66°57.5 19°34.8	81°27.7 19°39.1	+30.1 15.0 +4.7 55.1
	Th 24	298°59.0 20°31.0	313°29.0 20°33.7	327°59.1 20°38.7	342°29.2 20°43.3	356°59.3 20°48.0	371°29.4 20°52.4	385°59.5 20°55.4	400°29.6 20°58.4	54°59.7 20°59.7	69°29.9 20°51.2	84°00.0 20°53.0	+30.1 14.9 +2.2 54.7
○	Fr 25	301°33.1 21°06.7	316°03.4 21°06.8	330°33.7 21°06.8	345°04.1 21°06.7	359°34.4 21°06.2	374°04.8 21°05.8	388°35.2 21°05.3	403°05.6 21°05.6	57°36.0 21°04.7	72°06.5 21°04.0	86°37.0 21°03.2	+30.4 14.8 -0.4 54.3
	Sa 26	304°16.6 20°39.3	318°47.5 20°36.9	333°18.3 20°34.5	347°49.2 20°31.9	362°20.2 20°29.3	376°51.1 20°26.5	391°22.1 20°23.7	405°53.1 20°20.7	60°24.1 20°17.7	74°55.1 20°14.6	89°26.2 20°11.4	+31.0 14.8 -2.8 54.2
○	Su 27	307°15.9 19°12.4	321°47.5 19°07.7	336°01.9 19°03.0	350°50.6 18°58.2	365°22.3 18°53.8	379°54.0 18°48.3	394°25.7 18°43.3	408°57.4 18°38.1	63°29.1 18°32.9	78°00.9 18°27.6	92°32.8 18°22.2	+31.7 14.8 -5.0 54.1
	Mo 28	310°33.6 16°51.6	325°05.9 16°44.9	339°38.2 16°38.2	354°10.4 16°31.4	368°42.5 16°24.9	383°15.3 16°17.6	397°47.7 16°10.5	412°25.7 16°03.4	66°52.6 15°56.3	81°25.1 15°49.0	95°57.6 15°41.7	+32.4 14.8 -7.0 54.3
○	Tu 29	314°08.2 13°43.8	328°41.1 13°35.4	343°14.0 13°26.9	357°46.9 13°18.4	372°19.8 13°09.9	386°52.8 13°01.2	401°25.7 12°52.5	415°58.7 12°43.8	70°31.7 12°34.9	85°04.7 12°26.1	99°37.7 12°17.1	+33.0 14.9 -8.7 54.6
	We 30	317°54.3 9°56.4	332°27.5 9°46.6	347°00.6 9°36.7	361°33.8 9°26.8	376°07.0 9°16.8	390°40.2 9°06.8	405°13.3 8°56.8	419°46.5 8°46.7	74°19.7 8°36.5	88°52.9 8°26.3	103°26.0 8°16.1	+33.2 15.0 -10.0 55.1

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 7 17h21 — LQ: 14 12h57 — NM: 21 16h57 — FQ: 29 19h19

SUN

May 2031

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Th 1	270°42.4 15°01.7	285°42.5 15°02.5	300°42.6 15°03.2	315°42.6 15°04.0	330°42.7 15°04.7	345°42.8 15°05.5	0°42.9 15°06.2	15°42.9 15°07.0	30°43.0 15°07.8	45°43.1 15°08.5	60°43.2 15°09.3	75°43.2 15°10.0	+0.1 +0.8
Fr 2	270°44.2 15°19.8	285°44.2 15°20.5	300°44.3 15°21.3	315°44.4 15°22.0	330°44.5 15°22.8	345°44.5 15°23.5	0°44.6 15°24.2	15°44.7 15°25.0	30°44.7 15°25.7	45°44.8 15°26.5	60°44.9 15°27.2	75°44.9 15°28.0	+0.1 +0.7
Sa 3	270°45.8 15°37.6	285°45.9 15°38.3	300°45.9 15°39.1	315°46.0 15°39.8	330°46.1 15°40.5	345°46.1 15°41.3	0°46.2 15°42.0	15°46.3 15°42.7	30°46.3 15°43.5	45°46.4 15°44.2	60°46.5 15°44.9	75°46.5 15°45.7	+0.1 +0.7
Su 4	270°47.3 15°55.1	285°47.4 15°55.9	300°47.4 15°56.6	315°47.5 15°57.3	330°47.6 15°58.0	345°47.6 15°58.7	0°47.7 15°59.5	15°47.7 16°00.2	30°47.8 16°00.9	45°47.8 16°01.6	60°47.9 16°02.4	75°48.0 16°03.1	+0.1 +0.7
Mo 5	270°48.7 16°12.4	285°48.7 16°13.1	300°48.8 16°13.8	315°48.8 16°14.6	330°48.9 16°15.3	345°49.0 16°16.0	0°49.0 16°16.7	15°49.1 16°17.4	30°49.1 16°18.1	45°49.2 16°18.8	60°49.2 16°19.5	75°49.3 16°20.2	+0.1 +0.7
Tu 6	270°49.9 16°29.4	285°50.0 16°30.1	300°50.0 16°30.8	315°50.1 16°31.5	330°50.1 16°32.2	345°50.2 16°32.9	0°50.2 16°33.6	15°50.3 16°34.3	30°50.3 16°35.0	45°50.3 16°35.7	60°50.4 16°36.4	75°50.4 16°37.1	+0.0 +0.7
We 7	270°51.0 16°46.2	285°51.1 16°46.9	300°51.1 16°47.5	315°51.1 16°48.2	330°51.2 16°48.9	345°51.2 16°49.6	0°51.3 16°50.3	15°51.3 16°51.0	30°51.3 16°51.7	45°51.4 16°52.4	60°51.4 16°53.1	75°51.5 16°53.7	+0.0 +0.7
Th 8	270°52.0 17°02.6	285°52.0 17°03.3	300°52.0 17°04.0	315°52.1 17°04.7	330°52.1 17°05.3	345°52.1 17°06.0	0°52.2 17°06.7	15°52.2 17°07.4	30°52.3 17°08.1	45°52.3 17°08.7	60°52.3 17°09.4	75°52.4 17°10.1	+0.0 +0.7
Fr 9	270°52.8 17°18.8	285°52.8 17°19.5	300°52.8 17°20.1	315°52.9 17°20.8	330°52.9 17°21.5	345°52.9 17°22.1	0°53.0 17°22.8	15°53.0 17°23.5	30°53.0 17°24.1	45°53.0 17°24.8	60°53.1 17°25.5	75°53.1 17°26.1	+0.0 +0.7
Sa 10	270°53.4 17°34.7	285°53.5 17°35.3	300°53.5 17°36.0	315°53.5 17°36.7	330°53.5 17°37.3	345°53.5 17°38.0	0°53.6 17°38.6	15°53.6 17°39.3	30°53.6 17°39.9	45°53.6 17°40.6	60°53.7 17°41.2	75°53.7 17°41.9	+0.0 +0.7
Su 11	270°54.0 17°50.3	285°54.0 17°50.9	300°54.0 17°51.6	315°54.0 17°52.2	330°54.0 17°52.9	345°54.0 17°53.5	0°54.1 17°54.1	15°54.1 17°54.8	30°54.1 17°55.4	45°54.1 17°56.1	60°54.1 17°56.7	75°54.1 17°57.3	+0.0 +0.6
Mo 12	270°54.3 18°05.6	285°54.3 18°06.2	300°54.3 18°06.8	315°54.3 18°07.5	330°54.4 18°08.1	345°54.4 18°08.7	0°54.4 18°09.4	15°54.4 18°10.0	30°54.4 18°10.6	45°54.4 18°11.2	60°54.4 18°11.9	75°54.4 18°12.5	+0.0 +0.6
Tu 13	270°54.5 18°20.6	285°54.5 18°21.2	300°54.6 18°21.8	315°54.6 18°22.4	330°54.6 18°23.0	345°54.6 18°23.7	0°54.6 18°24.3	15°54.6 18°24.9	30°54.6 18°25.5	45°54.6 18°26.1	60°54.6 18°26.7	75°54.6 18°27.3	+0.0 +0.6
We 14	270°54.6 18°35.3	285°54.6 18°35.9	300°54.6 18°36.5	315°54.6 18°37.1	330°54.6 18°37.7	345°54.6 18°38.3	0°54.6 18°38.9	15°54.6 18°39.5	30°54.6 18°40.1	45°54.6 18°40.7	60°54.6 18°41.3	75°54.6 18°41.9	-0.0 +0.6
Th 15	270°54.5 18°49.6	285°54.5 18°50.2	300°54.5 18°50.8	315°54.5 18°51.4	330°54.5 18°52.0	345°54.5 18°52.6	0°54.5 18°53.2	15°54.5 18°53.8	30°54.5 18°54.4	45°54.5 18°54.9	60°54.5 18°55.5	75°54.5 18°56.1	-0.0 +0.6
Fr 16	270°54.3 19°03.7	285°54.3 19°04.3	300°54.3 19°04.8	315°54.3 19°05.4	330°54.3 19°06.0	345°54.3 19°06.6	0°54.2 19°07.7	15°54.2 19°07.7	30°54.2 19°08.3	45°54.2 19°08.9	60°54.2 19°09.4	75°54.2 19°10.0	-0.0 +0.6
Sa 17	270°54.0 19°17.4	285°53.9 19°18.0	300°53.9 19°18.5	315°53.9 19°19.1	330°53.9 19°19.7	345°53.9 19°20.2	0°53.8 19°20.8	15°53.8 19°21.4	30°53.8 19°21.9	45°53.8 19°22.5	60°53.8 19°23.0	75°53.7 19°23.6	-0.0 +0.6
Su 18	270°53.4 19°30.8	285°53.4 19°31.4	300°53.4 19°31.9	315°53.4 19°32.5	330°53.3 19°33.0	345°53.3 19°33.6	0°53.3 19°34.1	15°53.3 19°34.7	30°53.2 19°35.2	45°53.2 19°35.8	60°53.2 19°36.3	75°53.2 19°36.9	-0.0 +0.5
Mo 19	270°52.8 19°43.9	285°52.8 19°44.4	300°52.7 19°45.0	315°52.7 19°45.5	330°52.7 19°46.0	345°52.6 19°46.6	0°52.6 19°47.1	15°52.6 19°47.6	30°52.5 19°48.2	45°52.5 19°48.7	60°52.5 19°49.2	75°52.4 19°49.8	-0.0 +0.5
Tu 20	270°52.0 19°56.6	285°52.0 19°57.1	300°51.9 19°57.7	315°51.9 19°58.2	330°51.9 19°58.7	345°51.8 19°59.2	0°51.8 19°59.8	15°51.7 20°00.3	30°51.7 20°00.8	45°51.7 20°01.3	60°51.6 20°01.8	75°51.6 20°02.3	-0.0 +0.5
We 21	270°51.1 20°09.0	285°51.0 20°09.5	300°51.0 20°10.0	315°51.0 20°10.5	330°50.9 20°11.1	345°50.9 20°11.6	0°50.8 20°12.1	15°50.8 20°12.6	30°50.7 20°13.1	45°50.7 20°13.6	60°50.7 20°14.1	75°50.6 20°14.6	-0.0 +0.5
Th 22	270°50.0 20°21.1	285°50.0 20°21.6	300°49.9 20°22.1	315°49.9 20°22.6	330°49.8 20°23.2	345°49.8 20°23.5	0°49.7 20°24.0	15°49.7 20°24.5	30°49.6 20°25.0	45°49.6 20°25.5	60°49.5 20°26.0	75°49.5 20°26.5	-0.0 +0.5
Fr 23	270°48.8 20°32.8	285°48.8 20°33.3	300°48.7 20°33.7	315°48.7 20°34.2	330°48.6 20°34.7	345°48.6 20°35.2	0°48.5 20°35.6	15°48.5 20°36.1	30°48.4 20°36.6	45°48.3 20°37.1	60°48.3 20°37.5	75°48.2 20°38.0	-0.1 +0.5
Sa 24	270°47.5 20°44.1	285°47.5 20°44.6	300°47.4 20°45.0	315°47.3 20°45.5	330°47.3 20°46.0	345°47.2 20°46.4	0°47.2 20°46.9	15°47.1 20°47.4	30°47.0 20°47.8	45°47.0 20°48.3	60°46.9 20°48.7	75°46.9 20°49.2	-0.1 +0.5
Su 25	270°46.1 20°55.1	285°46.0 20°55.6	300°45.9 20°56.0	315°45.9 20°56.5	330°45.8 20°56.9	345°45.8 20°57.4	0°45.7 20°57.8	15°45.6 20°58.2	30°45.6 20°58.7	45°45.5 20°59.1	60°45.4 20°59.6	75°45.4 21°00.0	-0.1 +0.4
Mo 26	270°44.5 21°05.7	285°44.4 21°06.2	300°44.4 21°06.6	315°44.3 21°07.0	330°44.2 21°07.5	345°44.2 21°07.9	0°44.1 21°08.8	15°44.0 21°09.8	30°44.0 21°09.9	45°43.9 21°09.6	60°43.8 21°10.1	75°43.8 21°10.5	-0.1 +0.4
Tu 27	270°42.8 21°16.0	285°42.8 21°16.6	300°42.7 21°16.8	315°42.6 21°17.3	330°42.5 21°17.7	345°42.5 21°18.1	0°42.4 21°18.5	15°42.3 21°18.9	30°42.2 21°19.3	45°42.2 21°19.8	60°42.1 21°20.2	75°42.0 21°20.6	-0.1 +0.4
We 28	270°41.0 21°25.9	285°41.0 21°26.3	300°40.9 21°26.7	315°40.8 21°27.1	330°40.7 21°27.5	345°40.6 21°27.9	0°40.6 21°28.3	15°40.5 21°28.7	30°40.4 21°29.1	45°40.3 21°29.5	60°40.3 21°29.9	75°40.2 21°30.3	-0.1 +0.4
Th 29	270°39.1 21°35.4	285°39.1 21°35.8	300°39.0 21°36.2	315°38.9 21°36.6	330°38.8 21°37.0	345°38.7 21°37.4	0°38.6 21°37.8	15°38.6 21°38.5	30°38.5 21°38.8	45°38.4 21°38.8	60°38.3 21°39.3	75°38.2 21°39.7	-0.1 +0.4
Fr 30	270°37.1 21°44.6	285°37.0 21°45.0	300°37.0 21°45.3	315°36.9 21°45.7	330°36.8 21°46.1	345°36.7 21°46.4	0°36.6 21°46.8	15°36.5 21°47.2	30°36.4 21°47.6	45°36.3 21°47.9	60°36.3 21°48.3	75°36.2 21°48.7	-0.1 +0.4
Sa 31	270°35.0 21°53.4	285°34.9 21°53.7	300°34.8 21°54.1	315°34.7 21°54.4	330°34.7 21°54.8	345°34.6 21°55.1	0°34.5 21°55.5	15°34.4 21°55.8	30°34.3 21°56.2	45°34.2 21°56.6	60°34.1 21°56.9	75°34.0 21°57.3	-0.1 +0.4

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 15.8'

MOON

May 2031

	D	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	Δ'/h SH
Th 1	234°24.4	248°57.5	263°30.6	278°03.7	292°36.8	307°09.9	321°43.0	336°16.0	350°49.1	5°22.1	19°55.1	+33.1	15.2
	6°42.0	6°31.3	6°20.6	6°09.8	5°59.1	5°48.2	5°37.4	5°26.5	5°15.5	5°04.6	4°53.6	-10.8	55.6
Fr 2	238°07.6	252°40.3	267°12.9	281°45.4	296°18.0	310°50.5	325°23.0	339°55.4	354°27.8	9°00.2	23°32.5	+32.5	15.4
	2°04.9	1°53.5	1°42.0	1°30.5	1°19.0	1°07.4	0°55.8	0°44.3	0°32.7	0°21.1	0°09.4	-11.6	56.4
Sa 3	241°32.5	256°04.1	270°35.5	285°07.2	299°38.7	314°10.1	328°41.4	343°12.8	357°44.0	12°15.2	26°46.3	+31.4	15.6
	-2°46.4	-2°58.2	-3°10.0	-3°21.8	-3°33.6	-3°45.3	-3°57.1	-4°08.9	-4°20.6	-4°32.4	-4°44.1	-11.8	57.2
Su 4	244°25.7	258°55.8	273°25.8	287°55.7	302°25.6	316°55.4	331°25.1	345°54.8	0°24.4	14°53.9	29°23.3	+29.8	15.8
	-7°38.8	-7°50.3	-8°01.7	-8°13.1	-8°24.5	-8°35.9	-8°47.2	-8°58.6	-9°09.8	-9°21.1	-9°32.3	-11.4	58.1
Mo 5	246°35.0	261°03.1	275°31.2	289°59.1	304°27.0	318°54.8	333°22.5	347°50.1	2°17.6	16°45.0	31°12.4	+27.7	16.1
	-12°14.9	-12°25.3	-12°35.7	-12°46.0	-12°56.2	-13°06.4	-13°16.5	-13°26.5	-13°36.5	-13°46.4	-13°56.2	-10.1	59.0
Tu 6	247°52.3	262°18.3	276°44.2	291°10.0	305°35.7	320°01.3	334°26.9	348°52.4	3°17.8	17°43.1	32°08.3	+25.6	16.3
	-16°15.8	-16°22.3	-16°30.7	-16°38.9	-16°47.1	-16°55.2	-17°03.1	-17°11.0	-17°18.7	-17°26.3	-17°33.9	-8.0	59.6
We 7	248°17.9	262°42.0	277°06.0	291°30.0	305°53.9	320°17.7	334°41.5	349°05.2	3°28.9	17°52.5	32°16.1	+23.8	16.4
	-19°12.7	-19°18.3	-19°23.8	-19°29.1	-19°34.3	-19°39.4	-19°44.3	-19°49.1	-19°53.8	-19°58.3	-20°02.7	-5.0	60.1
Th 8	248°04.5	262°27.5	276°50.4	291°13.3	305°36.2	319°59.1	334°22.0	348°44.9	3°07.7	17°30.6	31°53.4	+22.9	16.5
	-20°51.1	-20°53.1	-20°55.0	-20°56.7	-20°58.3	-20°59.8	-21°01.0	-21°02.2	-21°03.1	-21°04.0	-21°04.6	-1.4	60.4
Fr 9	247°52.3	261°59.4	276°22.4	290°45.4	305°08.5	319°31.6	333°54.7	348°17.9	2°41.1	17°04.3	31°27.6	+23.1	16.4
	-20°56.3	-20°54.5	-20°52.6	-20°50.5	-20°48.3	-20°45.9	-20°43.4	-20°40.7	-20°37.9	-20°34.9	-20°31.8	+2.4	60.3
Sa 10	247°52.3	261°64.6	276°10.8	290°35.0	304°59.3	319°23.7	333°48.1	348°12.6	2°37.7	17°01.8	31°26.5	+24.4	16.4
	-19°28.2	-19°22.8	-19°17.3	-19°11.7	-19°06.0	-19°00.2	-18°54.2	-18°48.1	-18°41.8	-18°35.5	-18°29.0	+5.9	60.0
Su 11	247°45.9	262°11.8	276°37.8	291°03.9	305°30.0	319°56.3	334°22.6	348°49.0	3°15.4	17°42.0	32°08.6	+26.3	16.2
	-16°38.1	-16°29.8	-16°21.5	-16°13.0	-16°04.5	-15°55.9	-15°47.1	-15°38.3	-15°29.4	-15°20.4	-15°11.3	+7.8	59.6
Mo 12	248°57.4	263°25.3	277°53.2	292°21.3	306°49.4	321°17.5	335°45.8	350°14.1	4°42.5	19°11.0	33°39.5	+28.2	16.1
	-12°45.1	-12°34.4	-12°24.4	-12°13.9	-12°03.4	-11°52.9	-11°42.2	-11°31.5	-11°20.8	-11°09.9	-10°59.1	-10.6	59.0
Tu 13	250°55.6	265°25.2	279°54.8	294°24.5	308°54.3	323°24.1	337°54.0	352°23.9	6°53.9	21°23.9	35°54.0	+29.8	15.9
	-8°10.4	-7°58.9	-7°47.3	-7°35.6	-7°24.0	-7°12.3	-7°00.6	-6°48.8	-6°37.1	-6°25.3	-6°13.4	-11.7	58.4
We 14	265°25.2	279°54.8	294°24.5	308°54.3	323°24.1	337°54.0	352°23.9	6°53.9	21°23.9	35°54.0	50°24.2	+29.9	15.9
	-7°58.9	-7°47.3	-7°35.6	-7°24.0	-7°12.3	-7°00.6	-6°48.8	-6°37.1	-6°25.3	-6°13.4	-6°01.6	-11.7	58.4
Th 15	268°02.0	282°32.8	297°03.7	311°34.6	326°05.6	340°36.6	355°07.7	9°38.7	24°09.8	38°41.0	53°12.1	+31.0	15.7
	-3°02.0	-2°50.0	-2°37.9	-2°25.8	-2°13.8	-2°01.7	-1°49.6	-1°37.6	-1°25.5	-1°13.5	-1°01.4	-12.1	57.7
Fr 16	271°02.7	285°34.2	300°05.7	314°37.3	329°08.3	343°40.5	358°12.1	12°43.7	27°15.3	41°47.0	56°18.6	+31.6	15.6
	1°58.3	2°10.2	2°22.0	2°33.9	2°45.7	2°57.4	3°09.2	3°20.9	3°32.6	3°44.3	3°56.0	+11.8	57.1
Sa 17	274°14.1	288°45.8	303°17.5	317°49.3	332°21.0	346°52.7	1°24.4	15°56.0	30°27.7	44°59.4	59°31.1	+31.7	15.4
	6°47.0	6°58.1	7°09.2	7°20.2	7°31.2	7°42.1	7°53.0	8°03.8	8°14.6	8°25.4	8°36.1	+10.9	56.5
Su 18	277°25.0	291°56.5	306°28.0	320°59.5	335°30.9	350°02.4	4°33.8	19°05.2	33°36.6	48°08.0	62°39.3	+31.4	15.3
	11°10.5	11°20.4	11°30.1	11°39.9	11°49.5	11°59.1	12°08.7	12°18.1	12°27.5	12°36.9	12°46.1	+9.6	56.6
Mo 19	280°27.4	294°58.5	309°29.5	324°00.6	338°31.5	353°02.4	7°33.4	22°04.3	36°35.2	51°06.1	65°37.0	+31.0	15.1
	14°56.9	15°05.0	15°13.1	15°21.0	15°28.9	15°36.7	15°44.5	15°52.1	15°59.7	16°07.2	16°14.6	+7.8	55.5
Tu 20	283°17.6	297°48.2	312°18.7	326°49.3	341°19.8	355°50.3	10°20.7	24°51.2	39°21.6	53°52.1	68°22.5	+30.5	15.0
	17°55.8	18°01.5	18°07.5	18°13.3	18°19.1	18°24.7	18°30.3	18°35.8	18°41.4	18°46.4	18°51.6	+5.6	55.0
We 21	285°57.2	300°27.4	314°57.6	329°27.8	343°58.0	358°28.2	12°58.4	27°28.6	41°58.8	56°29.0	70°59.2	+30.2	14.9
	19°58.0	20°01.7	20°05.2	20°08.7	20°12.0	20°15.3	20°18.4	20°21.5	20°24.4	20°27.3	20°30.0	+3.2	54.7
Th 22	288°32.0	303°02.2	317°32.4	332°02.6	346°32.9	1°03.1	15°33.4	30°03.6	44°33.9	59°04.2	73°34.5	+30.3	14.8
	20°59.0	21°00.2	21°01.2	21°02.1	21°02.9	21°03.6	21°04.3	21°04.8	21°05.2	21°05.5	21°05.7	+0.7	54.3
Fr 23	291°10.8	305°41.4	320°12.0	334°42.6	349°13.2	3°43.9	18°14.5	32°45.3	47°16.0	61°46.7	76°17.6	+30.7	14.8
	20°56.8	20°55.4	20°53.0	20°52.3	20°50.7	20°48.9	20°47.0	20°45.0	20°43.0	20°40.8	20°38.5	-1.8	54.1
Sa 24	294°02.5	308°33.7	323°04.9	337°36.2	352°07.6	6°38.9	21°10.3	35°41.7	50°13.2	64°44.7	79°16.2	+31.4	14.7
	19°53.3	19°49.6	19°45.7	19°41.8	19°37.8	19°33.7	19°29.5	19°25.2	19°20.9	19°16.4	19°11.9	-4.1	54.0
Su 25	297°13.0	311°45.0	326°17.1	340°49.2	355°21.4	9°53.6	24°25.8	38°58.0	53°30.3	68°02.7	82°35.0	+32.2	14.7
	17°53.7	17°47.9	17°42.0	17°35.9	17°29.9	17°23.7	17°17.4	17°11.1	17°04.7	16°58.3	16°52.7	-6.2	54.0
Mo 26	300°44.1	315°16.9	329°49.8	344°22.7	358°55.6	13°28.6	28°01.6	42°34.6	57°07.6	71°40.7	86°13.8	+33.0	14.8
	15°05.1	14°57.4	14°49.8	14°41.9	14°34.0	14°26.1	14°18.2	14°10.1	14°02.0	13°53.8	13°45.6	-7.9	54.2
Tu 27	304°32.8	319°06.3	333°39.7	348°13.2	2°46.7	17°20.2	31°53.7	46°27.7	61°00.7	75°34.3	90°07.8	+33.5	14.9
	11°35.2	11°26.1	11°16.9	11°07.7	2°46.7	17°20.2	31°53.7	46°27.7	61°00.7	75°34.3	90°07.8	+33.5	14.9
We 28	308°32.1	323°05.8	337°39.4	352°13.1	6°46.7	21°20.4	35°54.0	50°27.7	65°01.3	79°34.9	94°08.6	+33.6	15.0
	7°32.5	7°22.2	7°11.9	7°01.5	6°51.1	6°40.7	6°30.2	6°19.7	6°09.2	5°58.6	5°48.0	-10.4	55.0
Th 29	312°31.6	327°05.0	341°38.4	356°11.8	10°45.1	25°18.4	39°51.7	54°25.0	68°58.2	83°31.4	98°04.6	+33.3	15.2
	3°05.2	2°54.1	2°43.0	2°31.9	2°20.8	2°09.6	1°58.4	1°47.2	1°36.0	1°24.7	1°13.5	-11.2	55.6
Fr 30	316°18.4	330°51.0	345°23.6	359°56.1	14°28.8	29°01.0	43°33.4	58°05.8	72°38.0	87°10.3	101°42.4	+32.4	15.4
	-1°37.3	-1°48.8	-2°00.3	-2°11.7	-2°23.2	-2°34.7	-2°46.2	-2°57.7	-3°09.2	-3°20.7	-3°32.2	-11.5	56.5
Sa 31	319°38.3	334°09.5	348°40.7	3°11.8	17°42.8	32°13.7	46°44.6	61°15.4	75°46.1	90°16.8	104°47.4	+30.9	15.6
	-6°24.0	-6°35.4	-6°46.7	-6°58.1	-7°09.4	-7°20.7	-7°31.9	-7°43.2	-7°54.4	-8°05.6	-8°16.8	-11.3	57.4

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec = (±, South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 7 03h39 — LQ: 13 19h06 — NM: 21 07h17 — FQ: 29 11h19

SUN

June 2031

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Su 1	276°32.8 22°01.8	285°32.7 22°02.1	300°32.6 22°02.4	315°32.5 22°02.8	330°32.4 22°03.1	345°32.3 22°03.5	0°32.2 22°03.8	15°32.1 22°04.1	30°32.0 22°04.5	45°31.9 22°04.8	60°31.9 22°05.1	75°31.8 22°05.5	-0.1 +0.3
Mo 2	270°30.5 22°09.8	285°30.4 22°10.1	300°30.3 22°10.4	315°30.2 22°10.7	330°30.1 22°11.1	345°30.0 22°11.4	0°29.9 22°11.7	15°29.8 22°12.0	30°29.7 22°12.3	45°29.6 22°12.7	60°29.5 22°13.0	75°29.4 22°13.3	-0.1 +0.3
Tu 3	270°28.1 22°17.4	285°28.0 22°17.7	300°27.9 22°18.0	315°27.8 22°18.3	330°27.7 22°18.6	345°27.6 22°18.9	0°27.5 22°19.2	15°27.4 22°19.5	30°27.3 22°19.8	45°27.2 22°20.1	60°27.1 22°20.4	75°27.0 22°20.7	-0.1 +0.3
We 4	270°25.6 22°24.6	285°25.5 22°24.9	300°25.4 22°25.2	315°25.3 22°25.5	330°25.2 22°25.8	345°25.1 22°26.1	0°25.0 22°26.4	15°24.9 22°26.6	30°24.8 22°26.9	45°24.7 22°27.2	60°24.6 22°27.5	75°24.4 22°27.8	-0.1 +0.3
Th 5	270°23.0 22°31.4	285°22.9 22°31.7	300°22.8 22°32.0	315°22.7 22°32.3	330°22.6 22°32.6	345°22.5 22°32.8	0°22.4 22°33.1	15°22.3 22°33.4	30°22.2 22°33.6	45°22.1 22°33.9	60°21.9 22°34.2	75°21.8 22°34.5	-0.1 +0.3
Fr 6	270°20.4 22°37.9	285°20.3 22°38.2	300°20.2 22°38.4	315°20.1 22°38.7	330°19.9 22°38.9	345°19.8 22°39.2	0°19.7 22°39.4	15°19.6 22°39.7	30°19.5 22°40.0	45°19.4 22°40.2	60°19.3 22°40.5	75°19.2 22°40.7	-0.1 +0.3
Sa 7	270°17.7 22°43.9	285°17.5 22°44.2	300°17.4 22°44.4	315°17.3 22°44.7	330°17.2 22°44.9	345°17.1 22°45.2	0°17.0 22°45.4	15°16.9 22°45.6	30°16.7 22°45.9	45°16.6 22°46.1	60°16.5 22°46.3	75°16.4 22°46.6	-0.1 +0.2
Su 8	270°14.9 22°54.8	285°14.7 22°55.1	300°14.6 22°55.3	315°14.5 22°55.5	330°14.4 22°55.7	345°14.3 22°50.7	0°14.1 22°50.9	15°14.0 22°51.2	30°13.9 22°51.4	45°13.8 22°51.6	60°13.7 22°51.8	75°13.5 22°52.1	-0.1 +0.2
Mo 9	270°12.0 22°54.8	285°11.9 22°55.1	300°11.7 22°55.3	315°11.6 22°55.5	330°11.5 22°55.7	345°11.4 22°55.9	0°11.3 22°56.1	15°11.1 22°56.3	30°10.9 22°56.5	45°10.9 22°56.7	60°10.8 22°56.9	75°10.6 22°57.1	-0.1 +0.2
Tu 10	270°09.0 22°59.7	285°08.9 22°59.9	300°08.8 22°00.1	315°08.7 23°00.3	330°08.5 23°00.5	345°08.4 23°00.6	0°08.3 23°00.8	15°08.2 23°01.0	30°08.0 23°01.2	45°07.9 23°01.4	60°07.8 23°01.6	75°07.7 23°01.8	-0.1 +0.2
We 11	270°06.0 23°04.1	285°05.9 23°04.3	300°05.8 23°04.5	315°05.7 23°04.7	330°05.5 23°04.8	345°05.4 23°05.0	0°05.3 23°05.2	15°05.2 23°05.4	30°05.0 23°05.5	45°04.9 23°05.7	60°04.8 23°05.9	75°04.6 23°06.0	-0.1 +0.2
Th 12	270°03.0 23°08.2	285°02.8 23°08.3	300°02.7 23°08.5	315°02.6 23°08.6	330°02.5 23°08.9	345°02.3 23°09.0	0°02.2 23°09.1	15°02.1 23°09.3	30°01.9 23°09.4	45°01.8 23°09.6	60°01.7 23°09.7	75°01.6 23°09.9	-0.1 +0.2
Fr 13	269°59.9 23°11.8	284°59.7 23°11.9	299°59.6 23°12.1	314°59.5 23°12.2	329°59.3 23°12.4	344°59.2 23°12.5	359°59.1 23°12.6	14°58.9 23°12.8	29°58.8 23°12.9	44°58.7 23°13.0	59°58.6 23°13.2	74°58.4 23°13.3	-0.1 +0.1
Sa 14	269°56.7 23°15.0	284°56.6 23°15.1	299°56.4 23°15.3	314°56.3 23°15.4	329°56.2 23°15.5	344°56.0 23°15.6	359°55.9 23°15.7	14°55.8 23°15.9	29°55.6 23°16.0	44°55.5 23°16.1	59°55.4 23°16.2	74°55.2 23°16.3	-0.1 +0.1
Su 15	269°53.5 23°17.4	284°53.4 23°17.9	299°53.2 23°18.0	314°53.1 23°18.1	329°53.0 23°18.2	344°52.8 23°18.3	359°52.7 23°18.5	14°52.6 23°18.6	29°52.4 23°18.7	44°52.3 23°18.8	59°52.2 23°18.9	74°52.0 23°19.0	-0.1 +0.1
Mo 16	269°50.3 23°20.2	284°50.1 23°20.3	299°50.0 23°20.4	314°49.9 23°20.5	329°49.7 23°20.6	344°49.6 23°20.7	359°49.5 23°20.7	14°49.3 23°20.8	29°49.2 23°20.9	44°49.1 23°21.0	59°48.9 23°21.1	74°48.8 23°21.2	-0.1 +0.1
Tu 17	269°47.0 23°22.2	284°46.9 23°22.3	299°46.8 23°22.3	314°46.6 23°22.4	329°46.5 23°22.5	344°46.3 23°22.6	359°46.2 23°22.6	14°46.1 23°22.7	29°45.9 23°22.8	44°45.8 23°22.8	59°45.7 23°22.9	74°45.5 23°23.0	-0.1 +0.1
We 18	269°43.8 23°23.8	284°43.6 23°23.8	299°43.5 23°23.9	314°43.3 23°23.9	329°43.2 23°24.0	344°43.1 23°24.0	359°42.9 23°24.1	14°42.8 23°24.1	29°42.7 23°24.2	44°42.5 23°24.2	59°42.4 23°24.3	74°42.2 23°24.3	-0.1 +0.1
Th 19	269°40.5 23°24.9	284°40.3 23°25.0	299°40.2 23°25.0	314°40.1 23°25.0	329°39.9 23°25.1	344°39.8 23°25.1	359°39.6 23°25.1	14°39.5 23°25.2	29°39.4 23°25.2	44°39.2 23°25.2	59°39.1 23°25.3	74°39.0 23°25.3	-0.1 +0.0
Fr 20	269°37.2 23°25.7	284°37.0 23°25.7	299°36.9 23°25.7	314°36.8 23°25.7	329°36.6 23°25.7	344°36.5 23°25.8	359°36.3 23°25.8	14°36.2 23°25.8	29°36.1 23°25.8	44°35.9 23°25.8	59°35.8 23°25.9	74°35.7 23°25.9	-0.1 +0.0
Sa 21	269°33.9 23°26.0	284°33.7 23°26.0	299°33.6 23°26.0	314°33.5 23°26.0	329°33.3 23°26.0	344°33.2 23°26.0	359°33.1 23°26.0	14°32.9 23°26.0	29°32.8 23°26.0	44°32.6 23°26.0	59°32.5 23°26.0	74°32.4 23°26.0	-0.1 +0.0
Su 22	269°30.6 23°25.9	284°30.5 23°25.9	299°30.3 23°25.9	314°30.2 23°25.9	329°30.0 23°25.9	344°29.9 23°25.8	359°29.8 23°25.8	14°29.6 23°25.8	29°29.5 23°25.8	44°29.4 23°25.8	59°29.2 23°25.8	74°29.1 23°25.7	-0.1 -0.0
Mo 23	269°27.3 23°25.4	284°27.2 23°25.4	299°27.1 23°25.4	314°26.9 23°25.3	329°26.8 23°25.3	344°26.6 23°25.3	359°26.5 23°25.2	14°26.4 23°25.2	29°26.2 23°25.2	44°26.1 23°25.2	59°26.0 23°25.1	74°25.8 23°25.1	-0.1 -0.0
Tu 24	269°24.1 23°24.5	284°23.9 23°24.5	299°23.8 23°24.4	314°23.7 23°24.4	329°23.5 23°24.3	344°23.4 23°24.3	359°23.3 23°24.2	14°23.1 23°24.2	29°23.0 23°24.2	44°22.9 23°24.2	59°22.7 23°24.0	74°22.6 23°24.0	-0.1 -0.1
We 25	269°20.9 23°23.2	284°20.7 23°23.1	299°20.6 23°23.1	314°20.4 23°23.0	329°20.3 23°22.9	344°20.2 23°22.9	359°20.0 23°22.8	14°19.9 23°22.7	29°19.8 23°22.7	44°19.7 23°22.6	59°19.5 23°22.5	74°19.4 23°22.4	-0.1 -0.1
Th 26	269°17.7 23°21.5	284°17.5 23°21.4	299°17.4 23°21.3	314°17.3 23°21.2	329°17.1 23°21.1	344°17.0 23°21.0	359°16.9 23°21.0	14°16.7 23°20.9	29°16.6 23°20.8	44°16.5 23°20.7	59°16.3 23°20.6	74°16.2 23°20.5	-0.1 -0.1
Fr 27	269°14.5 23°19.3	284°14.4 23°19.2	299°14.3 23°19.1	314°14.1 23°19.0	329°14.0 23°18.9	344°13.9 23°18.8	359°13.7 23°18.7	14°13.6 23°18.6	29°13.5 23°18.5	44°13.3 23°18.4	59°13.2 23°18.3	74°13.1 23°18.2	-0.1 -0.1
Sa 28	269°11.4 23°16.8	284°11.3 23°16.7	299°11.2 23°16.5	314°11.0 23°16.4	329°10.9 23°16.3	344°10.8 23°16.2	359°10.6 23°16.1	14°10.5 23°15.9	29°10.4 23°15.8	44°10.3 23°15.7	59°10.1 23°15.6	74°10.0 23°15.5	-0.1 -0.1
Su 29	269°08.4 23°13.8	284°08.2 23°13.7	299°08.1 23°13.5	314°08.0 23°13.4	329°07.9 23°13.3	344°07.7 23°13.1	359°07.6 23°13.0	14°07.5 23°12.9	29°07.4 23°12.8	44°07.2 23°12.7	59°07.1 23°12.6	74°07.0 23°12.5	-0.1 -0.1
Mo 30	269°05.4 23°10.4	284°05.3 23°10.3	299°05.1 23°10.1	314°05.0 23°10.0	329°04.9 23°09.8	344°04.8 23°09.7	359°04.6 23°09.5	14°04.5 23°09.4	29°04.4 23°09.3	44°04.3 23°09.1	59°04.1 23°08.9	74°04.0 23°08.8	-0.1 -0.2

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

June 2031

	D	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	Δ/h	SH
Su 1	249°48.9 -10°07.0	264°18.6 -10°17.8	278°48.2 -10°28.6	293°17.7 -10°39.3	307°47.2 -10°50.1	322°16.5 -11°00.7	336°45.8 -11°11.3	351°15.0 -11°21.9	5°44.1 -11°32.4	20°13.1 -11°42.9	34°42.0 -11°53.3	+29.3	15.9	
	251°44.7 -14°22.8	266°12.1 -14°32.2	280°39.4 -14°41.5	295°06.6 -14°50.8	309°33.7 -15°00.0	324°00.8 -15°09.2	338°27.7 -15°18.2	352°54.5 -15°27.2	7°21.3 -15°36.1	21°47.9 -15°44.9	36°14.4 -15°53.6	+27.0	16.1	
Tu 3	252°40.8 -17°52.8	267°05.8 -17°59.9	281°30.7 -18°06.9	295°55.6 -18°13.8	310°20.3 -18°20.6	324°44.9 -18°27.3	339°09.5 -18°33.8	353°33.9 -18°40.3	7°58.3 -18°46.6	22°22.6 -18°52.7	36°46.8 -18°58.8	+24.6	16.4	
We 4	252°40.3 -20°13.9	267°03.3 -20°17.8	281°26.3 -20°21.6	295°49.1 -20°25.2	310°11.9 -20°28.7	324°34.7 -20°32.0	338°57.4 -20°35.1	353°20.1 -20°38.2	7°42.7 -20°41.0	22°05.2 -20°43.7	36°27.7 -20°46.3	+22.7	16.5	
Th 5	252°00.8 -21°06.2	266°22.8 -21°06.2	280°44.8 -21°06.1	295°06.8 -21°05.9	309°28.8 -21°05.4	323°50.7 -21°04.9	338°12.7 -21°04.1	352°34.7 -21°03.2	6°56.6 -21°02.2	21°18.6 -21°00.9	35°40.6 -20°59.6	+22.0	16.6	
Fr 6	251°12.3 -20°19.9	265°34.6 -20°16.0	279°57.0 -20°12.0	294°19.5 -20°07.8	308°41.9 -20°03.4	323°04.4 -19°59.0	337°27.0 -19°54.3	351°49.6 -19°49.5	6°12.3 -19°44.6	20°35.0 -19°39.6	34°57.8 -19°34.3	+22.5	16.6	
Sa 7	250°47.0 -17°59.7	265°10.8 -17°52.4	279°34.8 -17°44.9	293°58.7 -17°37.3	308°22.8 -17°29.6	322°47.0 -17°21.8	337°11.2 -17°13.8	351°35.5 -17°05.8	5°59.9 -16°57.6	20°24.4 -16°49.3	34°48.9 -16°40.9	+24.2	16.6	
Su 8	251°07.4 -14°22.9	265°33.4 -14°13.0	279°59.4 -14°02.9	294°25.5 -13°52.8	308°51.7 -13°42.7	323°18.0 -13°32.4	337°44.3 -13°22.1	352°10.8 -13°11.7	6°37.3 -13°01.2	21°03.9 -12°50.6	35°30.6 -12°40.4	+26.3	16.4	
Mo 9	252°21.3 -9°53.2	266°49.3 -9°41.7	281°17.4 -9°30.1	295°45.6 -9°18.5	310°13.8 -9°06.8	324°42.2 -8°55.1	339°16.0 -8°43.4	353°39.1 -8°31.6	8°07.6 -8°19.8	22°36.3 -8°07.9	37°05.3 -7°56.0	+28.4	16.2	
Tu 10	254°23.7 -4°54.8	268°53.4 -4°42.5	283°23.2 -4°30.3	297°53.1 -4°18.0	312°23.0 -4°05.8	326°53.0 -3°53.5	341°23.0 -3°41.3	355°53.1 -3°29.0	10°23.3 -3°16.7	24°53.5 -3°04.4	39°23.7 -2°52.1	+30.0	16.0	
We 11	257°02.8 0°11.5	271°33.7 0°23.7	286°04.7 0°35.8	300°35.7 0°48.0	315°06.8 1°00.1	329°37.8 1°12.2	344°08.9 1°24.2	358°40.0 1°36.3	13°11.2 1°48.3	27°42.4 2°00.3	42°13.6 2°12.3	+31.1	15.7	
Th 12	271°33.7 0°23.7	286°04.7 0°35.8	300°35.7 0°48.0	315°06.8 1°00.1	329°37.8 1°12.2	344°08.9 1°24.2	358°40.0 1°36.3	373°11.2 1°48.3	27°42.4 2°00.3	42°13.6 2°12.3	56°44.8 2°24.3	+31.1	15.7	
Fr 13	274°36.2 5°20.1	289°07.7 5°31.5	303°39.3 5°42.9	318°10.9 5°54.3	332°42.5 6°05.6	347°14.1 6°16.9	362°17.3 6°28.2	376°17.3 6°39.4	16°17.3 6°50.6	30°49.0 7°01.7	45°20.6 7°12.7	+31.6	15.5	
Sa 14	277°47.4 9°53.0	292°19.5 10°03.2	306°50.7 10°13.4	321°22.3 10°23.6	335°54.0 10°33.7	350°25.0 10°43.7	365°16.5 10°53.7	380°05.5 11°03.6	24°00.5 11°13.4	48°32.2 11°23.2	63°03.8 11°32.9	+31.6	15.3	
Su 15	280°56.6 15°50.9	295°28.0 13°59.6	309°59.4 14°08.2	324°30.8 14°16.7	339°02.2 14°25.1	353°33.6 14°33.5	368°04.9 14°41.7	383°07.5 14°49.9	22°36.2 14°58.1	37°07.5 15°06.1	51°38.8 15°14.1	+31.3	15.2	
Mo 16	283°57.1 17°04.2	298°28.1 17°10.9	312°59.1 17°17.5	327°30.0 17°24.0	342°01.0 17°30.4	356°31.9 17°36.7	371°02.8 17°43.0	386°05.3 17°49.2	25°33.7 17°55.2	40°04.5 18°01.2	54°35.4 18°07.1	+30.9	15.0	
Tu 17	286°46.7 19°24.6	301°17.3 19°29.9	315°47.9 19°33.4	330°18.4 19°37.6	344°49.0 19°41.7	359°19.5 19°45.8	374°08.1 19°49.7	389°15.5 19°53.6	28°20.6 19°57.3	42°51.1 20°01.0	57°21.6 20°04.5	+30.5	14.9	
We 18	289°28.4 20°46.1	303°58.8 20°48.1	318°29.1 20°49.9	333°59.5 20°51.7	347°29.9 20°53.4	362°00.3 20°55.0	376°30.7 20°56.5	391°01.1 20°57.8	31°01.1 20°59.1	45°31.4 21°00.3	60°01.8 21°01.4	+30.4	14.8	
Th 19	292°08.9 21°05.5	306°39.4 21°05.0	321°09.9 21°04.3	335°40.5 21°03.6	350°11.0 21°02.8	365°11.0 21°01.9	380°12.2 21°00.9	395°13.4 21°00.9	33°42.8 20°59.7	48°13.4 20°58.5	62°44.1 20°57.2	+30.6	14.7	
Fr 20	294°57.0 20°23.1	309°28.0 20°20.2	323°59.0 20°17.1	338°30.1 20°14.0	353°01.2 20°10.8	368°07.8 20°07.5	383°08.4 20°04.1	398°09.6 20°00.6	22°03.4 20°00.6	36°34.6 19°57.0	65°37.0 19°53.3	+31.1	14.7	
Sa 21	298°00.6 18°42.6	312°32.4 18°37.5	327°04.1 18°32.2	341°36.0 18°26.9	356°07.8 18°21.5	371°08.9 18°16.1	386°10.3 18°10.5	399°11.6 18°04.9	25°11.6 18°04.9	39°43.5 17°59.2	54°15.5 17°53.4	+31.9	14.7	
Su 22	301°24.3 16°10.4	315°56.9 16°03.3	330°29.5 15°56.2	345°02.1 15°49.0	359°34.8 15°41.8	374°07.5 15°34.4	389°08.4 15°27.0	404°09.3 15°19.6	28°40.3 15°12.1	43°13.0 15°04.5	57°45.9 14°56.8	+32.7	14.7	
Mo 23	305°08.2 12°54.6	319°41.5 12°45.9	334°14.9 12°37.3	348°48.3 12°28.5	363°21.7 12°19.8	377°55.1 12°10.9	392°28.5 12°02.0	407°02.0 11°53.1	47°02.0 11°44.1	61°35.5 11°35.1	76°09.0 11°26.0	+33.4	14.8	
Tu 24	309°08.1 9°03.9	323°41.9 8°54.0	338°15.7 8°44.2	352°49.6 8°34.3	367°23.4 8°24.3	382°00.3 8°14.3	397°07.3 8°04.3	412°08.1 7°54.3	21°57.3 7°44.2	36°31.2 7°34.0	51°05.1 7°23.8	+33.9	14.9	
We 25	313°15.9 4°47.3	327°49.8 4°36.6	342°23.7 4°26.0	356°57.6 4°15.2	371°31.6 4°04.5	386°05.5 3°53.7	401°09.4 3°42.9	416°13.2 3°32.1	55°13.2 3°21.2	69°47.1 3°10.4	84°21.0 2°59.5	+33.9	15.0	
Th 26	317°20.7 0°14.1	331°54.2 0°02.9	346°27.7 -0°08.2	361°01.2 -0°19.4	376°14.7 -0°30.5	391°08.1 -0°41.7	406°11.2 -0°52.9	421°14.1 -1°04.1	44°15.9 -1°15.3	59°14.9 -1°26.5	73°48.2 -1°37.7	+33.4	15.1	
Fr 27	321°09.3 -4°26.0	335°41.9 -4°37.1	350°14.4 -4°48.3	365°07.6 -4°59.5	380°10.9 -5°10.7	395°18.4 -5°21.8	410°24.2 -5°32.9	425°29.1 -5°44.1	48°24.2 -5°55.2	62°56.4 -6°06.3	77°28.7 -6°17.4	+32.4	15.4	
Sa 28	324°27.3 -9°01.2	338°58.4 -9°11.9	353°29.4 -9°22.6	368°00.3 -9°33.3	383°03.2 -9°43.9	398°06.1 -9°54.5	413°09.0 -10°05.1	428°11.9 -10°15.6	51°32.6 -10°26.1	66°03.3 -10°36.5	80°33.8 -10°46.9	+30.7	15.6	
Su 29	327°00.3 -13°17.4	341°29.3 -13°27.0	355°58.3 -13°36.5	370°27.1 -13°46.0	385°00.4 -13°55.4	399°24.4 -14°04.8	414°07.5 -14°14.1	429°10.4 -14°23.3	53°53.0 -14°32.4	68°21.4 -14°41.5	82°49.8 -14°50.5	+28.6	15.9	
Mo 30	328°36.9 -16°56.4	343°03.5 -17°04.0	357°29.9 -17°11.6	372°01.2 -17°19.2	386°26.2 -17°26.6	400°48.8 -17°33.9	415°14.9 -17°41.1	430°09.3 -17°48.2	55°14.9 -17°56.8	69°40.9 -18°05.2	84°32.8 -18°02.1	+26.1	16.1	

SUN

July 2031

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Tu 1	268°02.5	284°02.3	299°02.2	314°02.1	329°02.0	344°01.8	359°01.7	14°01.6	29°01.5	44°01.4	59°01.3	74°01.1	-0.1
	23°06.7	23°06.5	23°06.3	23°06.2	23°06.0	23°05.8	23°05.7	23°05.5	23°05.3	23°05.2	23°05.0	23°04.8	-0.2
We 2	268°59.6	283°59.5	298°59.4	313°59.2	328°59.1	343°59.0	358°58.9	13°58.8	28°58.7	43°58.5	58°58.4	73°58.3	-0.1
	23°02.5	23°02.3	23°02.1	23°01.9	23°01.8	23°01.6	23°01.4	23°01.2	23°01.0	23°00.8	23°00.6	23°00.4	-0.2
Th 3	268°56.8	283°56.7	298°56.6	313°56.5	328°56.3	343°56.2	358°56.1	13°56.0	28°55.9	43°55.8	58°55.7	73°55.6	-0.1
	22°57.9	22°57.7	22°57.5	22°57.3	22°57.1	22°56.9	22°56.7	22°56.5	22°56.3	22°56.1	22°55.9	22°55.7	-0.2
Fr 4	268°54.1	283°54.0	298°53.9	313°53.8	328°53.7	343°53.5	358°53.4	13°53.3	28°53.2	43°53.1	58°53.0	73°52.9	-0.1
	22°52.9	22°52.7	22°52.5	22°52.3	22°52.1	22°51.9	22°51.6	22°51.4	22°51.2	22°51.0	22°50.8	22°50.5	-0.2
Sa 5	268°51.5	283°51.4	298°51.3	313°51.1	328°51.0	343°50.9	358°50.8	13°50.7	28°50.6	43°50.5	58°50.4	73°50.3	-0.1
	22°47.6	22°47.3	22°47.1	22°46.9	22°46.6	22°46.4	22°46.2	22°45.9	22°45.7	22°45.5	22°45.2	22°45.0	-0.2
Su 6	268°48.9	283°48.8	298°48.7	313°48.6	328°48.5	343°48.4	358°48.3	13°48.2	28°48.1	43°48.0	58°47.9	73°47.8	-0.1
	22°41.8	22°41.5	22°41.3	22°41.0	22°40.8	22°40.5	22°40.3	22°40.0	22°39.8	22°39.5	22°39.3	22°39.0	-0.3
Mo 7	268°46.8	283°46.4	298°46.3	313°46.2	328°46.1	343°46.0	358°45.9	13°45.8	28°45.7	43°45.6	58°45.5	73°45.4	-0.1
	22°35.6	22°35.4	22°35.1	22°34.8	22°34.6	22°34.3	22°34.0	22°33.8	22°33.5	22°33.2	22°32.9	22°32.7	-0.3
Tu 8	268°44.1	283°44.0	298°43.9	313°43.8	328°43.7	343°43.6	358°43.5	13°43.4	28°43.3	43°43.2	58°43.1	73°43.0	-0.1
	22°29.1	22°28.8	22°28.5	22°28.2	22°27.9	22°27.7	22°27.4	22°27.1	22°26.8	22°26.5	22°26.2	22°25.9	-0.3
We 9	268°41.8	283°41.7	298°41.6	313°41.5	328°41.4	343°41.4	358°41.3	13°41.2	28°41.1	43°41.0	58°40.9	73°40.8	-0.1
	22°22.1	22°21.8	22°21.5	22°21.2	22°20.9	22°20.6	22°20.3	22°20.0	22°19.7	22°19.4	22°19.1	22°18.8	-0.3
Th 10	268°39.6	283°39.6	298°39.5	313°39.4	328°39.3	343°39.2	358°39.1	13°39.0	28°38.9	43°38.8	58°38.7	73°38.7	-0.1
	22°14.8	22°14.5	22°14.2	22°13.9	22°13.5	22°13.2	22°12.9	22°12.6	22°12.3	22°11.9	22°11.6	22°11.3	-0.3
Fr 11	268°37.6	283°37.5	298°37.4	313°37.3	328°37.2	343°37.2	358°37.1	13°37.0	28°36.9	43°36.8	58°36.7	73°36.7	-0.1
	22°07.1	22°06.8	22°06.4	22°06.1	22°05.8	22°05.4	22°05.1	22°04.8	22°04.4	22°04.1	22°03.8	22°03.4	-0.3
Sa 12	268°35.6	283°35.5	298°35.4	313°35.4	328°35.3	343°35.2	358°35.1	13°35.1	28°35.0	43°34.9	58°34.8	73°34.7	-0.1
	21°59.0	21°58.6	21°58.3	21°57.9	21°57.6	21°57.2	21°56.9	21°56.6	21°56.2	21°55.8	21°55.5	21°55.1	-0.3
Su 13	268°33.8	283°33.7	298°33.6	313°33.5	328°33.5	343°33.4	358°33.3	13°33.2	28°33.2	43°33.1	58°33.0	73°32.9	-0.1
	21°50.5	21°50.1	21°49.8	21°49.4	21°49.1	21°48.7	21°48.3	21°48.0	21°47.6	21°47.2	21°46.9	21°46.5	-0.4
Mo 14	268°32.0	283°31.9	298°31.9	313°31.8	328°31.7	343°31.7	358°31.6	13°31.5	28°31.5	43°31.4	58°31.3	73°31.2	-0.1
	21°41.7	21°41.3	21°40.9	21°40.5	21°40.1	21°39.8	21°39.4	21°39.0	21°38.6	21°38.2	21°37.9	21°37.5	-0.4
Tu 15	268°30.4	283°30.3	298°30.3	313°30.2	328°30.1	343°30.1	358°30.0	13°29.9	28°29.9	43°29.8	58°29.7	73°29.7	-0.1
	21°32.4	21°32.0	21°31.7	21°31.3	21°30.9	21°30.5	21°30.1	21°29.7	21°29.3	21°28.9	21°28.5	21°28.1	-0.4
We 16	268°28.9	283°28.8	298°28.8	313°28.7	328°28.6	343°28.6	358°28.5	13°28.5	28°28.4	43°28.3	58°28.3	73°28.2	-0.1
	21°22.8	21°22.4	21°22.0	21°21.6	21°21.2	21°20.8	21°20.4	21°20.0	21°19.6	21°19.2	21°18.7	21°18.3	-0.4
Th 17	268°27.5	283°27.5	298°27.4	313°27.3	328°27.2	343°27.2	358°27.2	13°27.1	28°27.1	43°27.0	58°27.0	73°26.9	-0.1
	21°12.9	21°12.5	21°12.0	21°11.6	21°11.2	21°10.8	21°10.4	21°09.9	21°09.5	21°09.1	21°08.6	21°08.2	-0.4
Fr 18	268°26.3	283°26.2	298°26.2	313°26.1	328°26.1	343°26.0	358°26.0	13°25.9	28°25.9	43°25.8	58°25.8	73°25.7	-0.0
	21°02.6	21°02.1	21°01.7	21°01.3	21°00.8	21°00.4	20°59.9	20°59.5	20°59.1	20°58.6	20°58.2	20°57.7	-0.4
Sa 19	268°25.1	283°25.1	298°25.1	313°25.0	328°25.0	343°24.9	358°24.9	13°24.8	28°24.8	43°24.8	58°24.7	73°24.7	-0.0
	20°51.9	20°51.5	20°51.0	20°50.6	20°50.1	20°49.6	20°49.2	20°48.7	20°48.3	20°47.8	20°47.4	20°46.9	-0.5
Su 20	268°24.2	283°24.1	298°24.1	313°24.1	328°24.0	343°24.0	358°24.0	13°23.9	28°23.9	43°23.8	58°23.8	73°23.8	-0.0
	20°40.9	20°40.4	20°40.0	20°39.5	20°39.0	20°38.6	20°38.1	20°37.6	20°37.1	20°36.7	20°36.2	20°35.7	-0.5
Mo 21	268°23.3	283°23.3	298°23.3	313°23.2	328°23.2	343°23.2	358°23.2	13°23.1	28°23.1	43°23.1	58°23.0	73°23.0	-0.0
	20°29.5	20°29.1	20°28.6	20°28.1	20°27.6	20°27.1	20°26.6	20°26.2	20°25.7	20°25.2	20°24.7	20°24.2	-0.5
Tu 22	268°22.6	283°22.6	298°22.6	313°22.6	328°22.5	343°22.5	358°22.5	13°22.5	28°22.4	43°22.3	58°22.2	73°22.2	-0.0
	20°17.8	20°17.3	20°16.8	20°16.3	20°15.8	20°15.3	20°14.8	20°14.3	20°13.8	20°13.3	20°12.8	20°12.3	-0.5
We 23	268°22.1	283°22.1	298°22.1	313°22.0	328°22.0	343°22.0	358°22.0	13°22.0	28°22.0	43°21.9	58°21.9	73°21.9	-0.0
	20°05.8	20°05.3	20°04.8	20°04.2	20°03.7	20°03.2	20°02.7	20°02.2	20°01.7	20°01.2	20°00.7	20°00.1	-0.5
Th 24	268°21.7	283°21.7	298°21.7	313°21.7	328°21.6	343°21.6	358°21.6	13°21.6	28°21.6	43°21.6	58°21.6	73°21.6	-0.0
	19°53.4	19°52.9	19°52.3	19°51.8	19°51.3	19°50.8	19°50.2	19°49.7	19°49.2	19°48.7	19°48.1	19°47.6	-0.5
Fr 25	268°21.5	283°21.4	298°21.4	313°21.4	328°21.4	343°21.4	358°21.4	13°21.4	28°21.4	43°21.4	58°21.4	73°21.4	-0.0
	19°40.7	19°40.1	19°39.6	19°39.1	19°38.5	19°38.0	19°37.4	19°36.9	19°36.4	19°35.8	19°35.3	19°34.7	-0.5
Sa 26	268°21.4	283°21.4	298°21.4	313°21.4	328°21.4	343°21.4	358°21.4	13°21.4	28°21.4	43°21.4	58°21.4	73°21.4	+0.0
	19°27.6	19°27.1	19°26.5	19°26.0	19°25.4	19°24.9	19°24.3	19°23.8	19°23.2	19°22.7	19°22.1	19°21.6	-0.6
Su 27	268°21.4	283°21.4	298°21.4	313°21.4	328°21.4	343°21.4	358°21.5	13°21.5	28°21.5	43°21.5	58°21.5	73°21.5	+0.0
	19°14.3	19°13.7	19°13.2	19°12.6	19°12.0	19°11.5	19°10.9	19°10.3	19°09.8	19°09.2	19°08.6	19°08.1	-0.6
Mo 28	268°21.6	283°21.6	298°21.7	313°21.7	328°21.7	343°21.7	358°21.7	13°21.7	28°21.7	43°21.7	58°21.8	73°21.8	+0.0
	19°00.6	19°00.0	18°59.4	18°58.9	18°58.3	18°57.7	18°57.1	18°56.6	18°56.0	18°55.4	18°54.8	18°54.2	-0.6
Tu 29	268°22.0	283°22.0	298°22.0	313°22.1	328°22.1	343°22.1	358°22.1	13°22.1	28°22.2	43°22.2	58°22.2	73°22.2	+0.0
	18°46.6	18°46.0	18°45.4	18°44.8	18°44.3	18°43.7	18°43.1	18°42.5	18°41.9	18°41.3	18°40.7	18°40.1	-0.6
We 30	268°22.5	283°22.6	298°22.6	313°22.6	328°22.6	343°22.7	358°22.7	13°22.7	28°22.7	43°22.7	58°22.8	73°22.8	+0.0
	18°32.3	18°31.7	18°31.1	18°30.5	18°29.9	18°29.3	18°28.7	18°28.1	18°27.5	18°26.9	18°26.3	18°25.7	-0.6
Th 31	268°23.2	283°23.2	298°23.3	313°23.3	328°23.3	343°23.4	358°23.4	13°23.4	28°23.5	43°23.5	58°23.5	73°23.6	+0.0
	18°17.7	18°17.1	18°16.5	18°15.9	18°15.3	18°14.6	18°14.0	18°13.4	18°12.8	18°12.2	18°11.6	18°10.9	-0.6

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

July 2031

	D	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	Δ'/h SH
O	Tu 1	242°45.4 -19°05.0	257°10.1 -19°10.7	271°34.8 -19°16.2	285°59.4 -19°21.6	300°23.9 -19°26.9	314°48.3 -19°32.1	329°12.6 -19°37.1	343°36.8 -19°42.0	358°00.9 -19°46.8	12°25.0 -19°51.4	26°49.0 -19°56.0	+24.4 16.3 -5.1 59.9
	We 2	240°39.5 -20°47.1	257°02.3 -20°51.5	271°25.1 -20°55.5	285°47.8 -20°59.5	300°10.4 -20°55.3	314°33.1 -20°56.9	328°55.6 -20°58.4	343°18.1 -20°59.8	357°40.6 -21°01.0	12°03.0 -21°02.0	26°25.3 -20°33.5	+22.6 16.5 -1.6 60.6
	Th 3	241°57.0 -20°57.2	256°18.9 -20°55.5	270°40.9 -20°53.7	285°02.0 -20°51.8	299°24.7 -20°49.6	313°46.7 -20°47.3	328°08.6 -20°44.9	342°30.5 -20°42.3	356°52.5 -20°39.5	11°14.4 -20°36.5	25°36.4 -20°33.5	+21.9 16.7 +2.4 61.2
O	Fr 4	241°08.2 -19°28.5	255°30.6 -19°22.9	269°53.0 -19°17.3	284°15.5 -19°11.4	298°38.0 -19°05.5	313°00.8 -18°59.3	327°23.2 -18°53.1	341°45.8 -18°46.7	356°08.5 -18°40.1	10°31.3 -18°33.4	24°54.1 -18°26.6	+22.6 16.7 +6.2 61.4
	Sa 5	240°44.0 -16°28.8	255°07.9 -16°20.0	269°31.8 -16°11.0	283°55.9 -16°02.0	298°20.0 -15°52.8	312°44.1 -15°43.6	327°08.4 -15°34.2	341°32.7 -15°24.7	355°57.2 -15°15.1	10°21.6 -15°05.4	24°46.2 -14°55.7	+24.2 16.7 +9.3 61.2
	Su 6	241°04.6 -12°18.2	255°30.5 -12°07.1	269°56.4 -11°55.9	284°22.5 -11°44.6	298°48.6 -11°33.3	313°14.8 -11°21.9	327°41.1 -11°10.4	342°07.5 -10°58.9	356°34.0 -10°47.8	11°00.5 -10°35.6	25°27.1 -10°23.9	+26.3 16.5 +11.4 60.7
O	Mo 7	242°15.8 -7°22.9	256°43.6 -7°10.5	271°11.6 -6°58.1	285°39.5 -6°45.7	300°07.6 -6°33.2	314°35.7 -6°20.7	329°03.9 -6°08.2	343°32.2 -5°55.7	358°00.6 -5°43.2	12°29.0 -5°30.6	26°57.4 -5°18.1	+28.2 16.3 +12.5 59.9
	Tu 8	244°12.0 -2°08.5	258°41.4 -1°55.9	273°10.9 -1°43.3	287°40.5 -1°30.6	302°10.1 -1°18.0	316°39.7 -1°05.4	331°09.4 -0°52.8	345°39.1 -0°40.2	0°08.9 -0°27.7	14°38.7 -0°15.1	29°08.6 -0°02.6	+29.7 16.1 +12.6 59.0
	We 9	246°01.7 3°02.8	261°12.2 3°14.9	275°42.8 3°27.0	290°13.3 3°39.1	304°43.9 3°51.1	319°14.5 4°03.1	333°45.2 4°15.1	348°15.9 4°27.0	2°46.6 4°38.9	17°17.3 4°50.7	31°48.0 5°02.5	+30.6 15.8 +10.2 58.0
O	Th 10	249°31.8 7°54.0	264°02.9 8°05.0	278°33.9 8°16.0	293°05.0 8°26.9	307°36.1 8°37.8	322°07.2 8°48.6	336°38.3 8°59.4	351°09.8 9°10.1	5°40.6 9°20.7	20°11.7 9°31.3	34°42.8 9°41.8	+31.1 15.6 +10.8 57.1
	Fr 11	253°30.4 12°11.9	267°01.6 12°21.4	281°32.7 12°30.8	296°03.9 12°40.1	310°35.1 12°49.4	325°06.2 12°58.6	339°37.4 13°07.7	354°08.6 13°16.7	8°39.7 13°25.7	23°10.9 13°34.6	37°42.0 13°43.4	+32.1 15.3 +9.2 56.2
	Sa 12	267°01.6 12°21.4	281°32.7 12°30.8	296°03.9 12°40.1	310°35.1 12°49.4	325°06.2 12°58.6	339°37.4 13°07.7	354°08.6 13°16.7	8°39.7 13°25.7	23°10.9 13°34.6	37°42.0 13°43.4	52°13.2 13°52.2	+31.2 15.3 +9.1 56.2
O	Su 13	269°59.4 15°54.0	284°30.6 16°01.5	299°01.4 16°08.9	313°32.4 16°16.2	328°03.4 16°23.4	342°34.3 16°30.6	357°05.3 16°37.6	11°36.3 16°44.6	26°07.2 16°51.5	40°38.1 16°58.3	55°09.0 17°05.0	+31.0 15.1 +7.1 55.4
	Mo 14	272°51.5 18°35.1	287°22.3 18°40.4	301°52.9 18°45.6	316°23.9 18°50.7	330°54.9 18°55.7	345°25.1 19°00.6	359°55.8 19°05.4	14°26.4 19°10.1	28°57.1 19°14.8	43°27.8 19°19.3	57°58.4 19°23.7	+30.7 15.0 +4.9 54.9
	Tu 15	275°37.3 20°18.9	290°07.9 20°21.8	304°38.4 20°24.6	319°09.0 20°27.3	333°39.5 20°29.9	348°10.0 20°32.4	362°10.0 20°34.8	17°11.1 20°37.1	31°41.6 20°39.3	46°12.1 20°41.4	60°42.7 20°43.5	+30.5 14.8 +2.5 54.4
O	We 16	278°20.7 21°01.8	292°51.3 21°02.2	307°21.9 21°02.6	321°52.5 21°02.8	336°23.0 21°03.0	350°53.6 21°03.0	365°24.3 21°02.9	19°54.9 21°02.8	34°25.5 21°02.5	48°56.1 21°02.1	63°26.8 21°01.7	+30.6 14.8 -0.0 54.1
	Th 17	281°08.2 20°43.2	295°39.0 20°41.2	310°09.9 20°39.0	324°40.9 20°36.9	339°11.8 20°34.6	353°42.8 20°32.2	368°13.8 20°29.7	22°44.8 20°27.1	37°15.8 20°24.5	51°46.8 20°21.7	66°17.9 20°18.8	+31.0 14.7 -2.4 53.9
	Fr 18	284°06.8 19°25.1	298°38.3 19°20.8	313°09.8 19°16.4	327°41.3 19°12.0	342°12.9 19°07.4	356°44.4 19°02.8	11°16.0 18°58.0	25°47.7 18°53.2	40°19.3 18°48.3	54°51.0 18°43.4	69°22.8 18°38.3	+31.6 14.7 -4.7 53.9
O	Sa 19	287°22.3 14°13.1	301°54.5 14°05.1	316°26.7 13°57.0	330°59.0 13°48.8	345°31.3 13°40.6	0°03.6 13°32.3	14°36.0 13°23.9	29°08.4 13°15.5	43°40.8 13°07.1	58°13.3 12°58.6	72°45.8 12°50.0	+32.4 14.7 -6.7 53.9
	Su 20	290°56.8 10°35.1	305°29.8 10°25.7	320°02.8 10°16.2	334°35.8 10°06.8	349°08.8 9°57.2	3°41.9 9°47.7	18°15.0 9°38.1	32°48.2 9°28.4	47°21.3 9°18.7	61°54.5 9°09.0	76°27.7 8°59.2	+33.1 14.7 -9.6 54.3
	Mo 21	294°48.8 10°35.1	309°22.4 10°25.7	323°56.0 10°16.2	338°29.6 10°06.8	353°03.2 9°57.2	7°36.9 9°47.7	22°10.5 9°38.1	36°44.2 9°28.4	51°17.9 9°18.7	65°51.7 9°09.0	80°25.4 8°59.2	+33.7 14.8 -9.6 54.3
O	Tu 22	298°52.9 6°28.0	313°26.8 6°17.6	328°00.8 6°07.2	342°34.8 5°56.8	357°08.6 5°46.6	11°42.5 5°35.9	26°16.5 5°25.4	40°50.4 5°14.9	55°24.3 5°04.3	69°58.3 4°53.8	84°32.2 4°43.2	+33.9 14.9 -10.5 54.6
	We 23	303°00.9 2°01.6	317°34.7 1°50.6	332°08.8 1°39.7	346°42.4 1°28.8	1°16.2 1°17.8	15°50.0 1°06.8	30°23.8 0°55.9	44°57.6 0°44.9	59°31.3 0°33.9	74°05.1 0°22.9	88°38.8 0°11.8	+33.8 15.0 -11.0 55.0
	Th 24	307°01.9 -2°34.0	321°35.2 -2°45.0	336°08.5 -2°56.1	350°41.8 -3°07.1	5°15.0 -3°29.2	19°48.2 -3°50.4	34°21.3 -4°03.3	48°54.5 -4°35.1	63°27.5 -4°02.3	78°00.6 -4°13.3	92°33.6 -4°24.3	+33.2 15.2 -11.0 55.6
O	Fr 25	310°43.6 -7°07.6	325°15.9 -7°18.4	339°48.1 -7°29.1	354°20.3 -7°39.8	8°52.4 -8°01.1	23°24.5 -8°11.7	37°56.5 -8°11.7	52°28.4 -8°22.3	67°00.3 -8°32.8	81°32.1 -8°43.4	96°03.9 -8°53.8	+32.0 15.3 -10.6 56.2
	Sa 26	313°52.9 -11°27.0	328°23.6 -11°36.8	342°54.3 -11°46.7	357°24.9 -11°56.4	11°55.4 -12°06.2	26°25.8 -12°15.8	40°56.1 -12°25.5	55°26.4 -12°35.1	69°56.6 -12°44.6	84°26.7 -12°54.0	98°56.8 -13°03.5	+30.4 15.5 -9.7 57.0
	Su 27	316°17.7 -15°17.2	330°46.4 -15°25.6	345°15.0 -15°33.9	359°43.6 -15°42.1	14°12.0 -15°50.3	28°40.4 -15°58.3	43°08.7 -16°06.3	57°36.9 -16°14.2	72°05.0 -16°22.0	86°33.0 -16°29.8	101°01.0 -16°37.4	+28.3 15.8 -8.0 57.9
O	Mo 28	317°49.3 -18°21.2	332°15.8 -18°27.4	346°42.2 -18°33.4	359°43.6 -18°39.3	15°34.8 -18°45.1	30°01.0 -18°50.8	44°27.1 -18°56.4	58°53.1 -19°01.9	73°19.0 -19°07.3	87°44.8 -19°12.5	102°10.5 -19°17.7	+26.1 16.0 -5.6 58.8
	Tu 29	318°26.9 -20°20.2	332°51.4 -20°23.4	347°15.8 -20°26.4	360°22.0 -20°29.3	16°04.4 -20°32.0	30°28.6 -20°34.6	44°52.8 -20°37.1	59°16.9 -20°39.1	73°40.9 -20°41.6	88°04.8 -20°43.7	102°28.7 -20°45.6	+24.2 16.3 -2.5 59.6
	We 30	318°20.8 -20°57.0	332°43.9 -20°56.6	347°07.0 -20°56.0	360°13.0 -20°55.2	15°53.1 -20°54.2	30°16.1 -20°53.3	44°39.1 -20°52.2	59°02.0 -20°50.8	73°24.9 -20°49.3	87°47.8 -20°47.7	102°10.7 -20°45.9	+23.0 16.5 +1.1 60.4
O	Th 31	317°52.6 -20°00.8	332°15.4 -19°56.6	346°38.2 -19°52.2	360°13.0 -19°47.7	15°23.8 -19°43.0	29°46.7 -19°38.2	44°09.5 -19°33.3	58°32.4 -19°28.2	72°55.3 -19°22.9	87°18.2 -19°17.5	101°41.2 -19°12.0	+22.9 16.6 +4.9 60.9

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 4 19h01 — LQ: 11 11h49 — NM: 19 13h40 — FQ: 27 10h34

SUN

August 2021

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Fr 1	268°24.0 18°02.8	283°24.1 18°02.2	298°24.1 18°01.6	313°24.2 18°00.9	328°24.2 18°00.3	343°24.2 17°59.7	358°24.3 17°59.1	13°24.3 17°58.4	28°24.4 17°57.8	43°24.4 17°57.2	58°24.4 17°56.5	73°24.5 17°55.9	+0.0 -0.6
Sa 2	268°25.0 17°47.6	283°25.1 17°47.0	298°25.1 17°46.4	313°25.2 17°45.7	328°25.2 17°45.1	343°25.3 17°44.4	358°25.3 17°43.8	13°25.4 17°43.2	28°25.4 17°42.5	43°25.5 17°41.9	58°25.5 17°41.2	73°25.5 17°40.6	+0.0 -0.6
Su 3	268°26.2 17°32.2	283°26.2 17°31.5	298°26.3 17°30.9	313°26.3 17°30.2	328°26.4 17°29.5	343°26.4 17°28.9	358°26.5 17°28.2	13°26.5 17°27.6	28°26.6 17°26.9	43°26.7 17°26.3	58°26.7 17°25.6	73°26.8 17°25.0	+0.1 -0.7
Mo 4	268°27.5 17°16.4	283°27.5 17°15.7	298°27.6 17°15.1	313°27.7 17°14.4	328°27.7 17°13.7	343°27.8 17°13.1	358°27.8 17°12.4	13°27.9 17°11.7	28°27.9 17°11.1	43°28.0 17°10.4	58°28.1 17°09.7	73°28.1 17°09.1	+0.1 -0.7
Tu 5	268°28.9 17°00.3	283°29.0 16°59.7	298°29.1 16°59.0	313°29.1 16°58.3	328°29.2 16°57.6	343°29.2 16°57.0	358°29.3 16°56.3	13°29.4 16°55.6	28°29.4 16°54.9	43°29.5 16°54.3	58°29.6 16°53.6	73°29.6 16°52.9	+0.1 -0.7
We 6	268°30.5 16°44.0	283°30.6 16°43.3	298°30.7 16°42.7	313°30.7 16°42.0	328°30.8 16°41.3	343°30.9 16°40.6	358°30.9 16°39.9	13°31.0 16°39.2	28°31.1 16°38.5	43°31.2 16°37.8	58°31.2 16°37.1	73°31.3 16°36.5	+0.1 -0.7
Th 7	268°32.3 16°27.4	283°32.3 16°26.7	298°32.4 16°26.0	313°32.5 16°25.3	328°32.6 16°24.6	343°32.6 16°23.9	358°32.7 16°23.2	13°32.8 16°22.5	28°32.9 16°21.8	43°33.0 16°21.1	58°33.0 16°20.4	73°33.1 16°19.7	+0.1 -0.7
Fr 8	268°34.1 16°10.6	283°34.2 16°09.9	298°34.3 16°09.2	313°34.4 16°08.5	328°34.5 16°07.7	343°34.6 16°07.0	358°34.6 16°06.3	13°34.7 16°05.6	28°34.8 16°04.9	43°34.9 16°04.2	58°35.0 16°03.5	73°35.1 16°02.8	+0.1 -0.7
Sa 9	268°36.2 15°53.5	283°36.3 15°52.7	298°36.3 15°52.0	313°36.4 15°51.3	328°36.5 15°50.6	343°36.6 15°49.9	358°36.7 15°49.1	13°36.8 15°48.4	28°36.9 15°47.7	43°37.0 15°47.0	58°37.1 15°46.3	73°37.1 15°45.5	+0.1 -0.7
Su 10	268°38.3 15°36.1	283°38.4 15°35.4	298°38.5 15°34.6	313°38.6 15°33.9	328°38.7 15°33.2	343°38.8 15°32.4	358°38.9 15°31.7	13°39.0 15°31.0	28°39.0 15°30.2	43°39.2 15°29.5	58°39.3 15°28.8	73°39.4 15°28.0	+0.1 -0.7
Mo 11	268°40.6 15°18.5	283°40.7 15°17.7	298°40.8 15°17.0	313°40.9 15°16.2	328°41.0 15°15.5	343°41.1 15°14.8	358°41.2 15°14.0	13°41.3 15°13.3	28°41.3 15°12.5	43°41.5 15°11.8	58°41.6 15°11.0	73°41.7 15°10.3	+0.1 -0.7
Tu 12	268°43.1 15°00.6	283°43.2 15°00.6	298°43.3 15°00.6	313°43.4 15°00.6	328°43.5 15°00.6	343°43.6 15°00.6	358°43.7 15°00.6	13°43.8 15°00.6	28°43.8 15°00.6	43°44.0 15°00.6	58°44.1 15°00.6	73°44.3 15°00.6	+0.1 -0.8
We 13	268°45.7 14°42.5	283°45.8 14°41.7	298°45.9 14°41.0	313°46.0 14°40.2	328°46.1 14°39.4	343°46.2 14°38.7	358°46.3 14°37.9	13°46.4 14°37.1	28°46.4 14°36.4	43°46.6 14°35.6	58°46.7 14°34.9	73°46.8 14°34.1	+0.1 -0.8
Th 14	268°48.4 14°24.1	283°48.5 14°23.4	298°48.6 14°22.6	313°48.7 14°21.8	328°48.8 14°21.0	343°49.0 14°20.3	358°49.1 14°19.5	13°49.2 14°18.7	28°49.3 14°18.0	43°49.4 14°17.2	58°49.5 14°16.4	73°49.7 14°15.6	+0.1 -0.8
Fr 15	268°51.2 14°05.6	283°51.3 14°04.8	298°51.5 14°04.0	313°51.6 14°03.2	328°51.7 14°02.4	343°51.8 14°01.7	358°52.0 14°00.9	13°52.1 14°00.1	28°52.2 13°59.3	43°52.3 13°58.5	58°52.5 13°57.7	73°52.6 13°57.0	+0.1 -0.8
Sa 16	268°54.2 13°46.8	283°54.3 13°46.0	298°54.5 13°45.2	313°54.6 13°44.4	328°54.7 13°43.6	343°54.8 13°42.8	358°55.0 13°42.0	13°55.1 13°41.2	28°55.2 13°40.4	43°55.3 13°39.6	58°55.5 13°38.9	73°55.6 13°38.1	+0.1 -0.8
Su 17	268°57.3 13°27.7	283°57.4 13°26.9	298°57.6 13°26.1	313°57.7 13°25.3	328°57.8 13°24.5	343°58.0 13°23.7	358°58.1 13°22.9	13°58.2 13°22.1	28°58.3 13°21.3	43°58.4 13°20.5	58°58.6 13°19.7	73°58.8 13°18.9	+0.1 -0.8
Mo 18	269°00.5 13°08.5	284°00.7 13°07.7	299°00.8 13°06.9	314°01.0 13°06.1	329°01.1 13°05.3	344°01.2 13°04.5	359°01.4 13°03.7	14°01.5 13°02.9	29°01.6 13°02.1	44°01.7 13°01.2	59°01.9 13°00.4	74°02.1 12°59.6	+0.1 -0.8
Tu 19	269°03.9 12°49.1	284°04.1 12°48.2	299°04.4 12°47.4	314°04.3 12°46.6	329°04.5 12°45.8	344°04.6 12°45.0	359°04.8 12°44.2	14°04.9 12°43.4	29°05.1 12°42.5	44°05.3 12°41.7	59°05.3 12°40.9	74°05.5 12°40.1	+0.1 -0.8
We 20	269°07.4 12°29.4	284°07.5 12°28.6	299°07.7 12°27.8	314°07.8 12°26.9	329°08.0 12°26.1	344°08.1 12°25.3	359°08.3 12°24.5	14°08.4 12°23.7	29°08.6 12°22.8	44°08.7 12°22.0	59°08.9 12°21.2	74°09.0 12°20.3	+0.1 -0.8
Th 21	269°11.0 12°09.6	284°11.2 12°08.7	299°11.3 12°07.9	314°11.5 12°07.1	329°11.6 12°06.3	344°11.8 12°05.4	359°11.9 12°04.6	14°12.1 12°03.8	29°12.4 12°02.9	44°12.5 12°02.1	59°12.5 12°01.3	74°12.7 12°00.4	+0.2 -0.8
Fr 22	269°14.7 11°49.5	284°14.9 11°48.7	299°15.0 11°47.9	314°15.2 11°47.0	329°15.4 11°46.2	344°15.5 11°45.4	359°15.7 11°44.5	14°15.8 11°43.7	29°16.0 11°42.8	44°16.1 11°42.0	59°16.3 11°41.1	74°16.5 11°40.3	+0.2 -0.8
Sa 23	269°18.6 11°29.3	284°18.7 11°28.5	299°18.9 11°27.6	314°19.1 11°26.8	329°19.2 11°25.9	344°19.4 11°25.1	359°19.5 11°24.3	14°19.7 11°23.4	29°19.9 11°22.6	44°20.0 11°21.7	59°20.0 11°20.9	74°20.4 11°20.0	+0.2 -0.8
Su 24	269°22.5 11°08.9	284°22.7 11°08.1	299°22.9 11°07.2	314°23.0 11°06.4	329°23.2 11°05.5	344°23.4 11°04.7	359°23.5 11°03.8	14°23.7 11°03.0	29°23.9 11°02.1	44°24.0 11°01.2	59°24.0 11°00.4	74°24.4 11°00.5	+0.2 -0.9
Mo 25	269°26.6 10°48.4	284°26.8 10°47.5	299°26.9 10°46.6	314°27.1 10°45.8	329°27.3 10°44.9	344°27.4 10°44.1	359°27.6 10°43.2	14°27.8 10°42.3	29°28.0 10°41.5	44°28.1 10°40.6	59°28.2 10°39.7	74°28.5 10°38.9	+0.2 -0.9
Tu 26	269°30.8 10°27.6	284°30.9 10°26.8	299°31.1 10°25.9	314°31.3 10°25.0	329°31.5 10°24.2	344°31.6 10°23.3	359°31.8 10°22.4	14°32.0 10°21.5	29°32.2 10°20.7	44°32.3 10°19.8	59°32.5 10°18.9	74°32.7 10°18.1	+0.2 -0.9
We 27	269°35.0 10°06.7	284°35.2 10°05.8	299°35.4 10°05.0	314°35.6 10°04.1	329°35.8 10°03.2	344°35.9 10°02.3	359°36.1 10°01.5	14°36.3 10°00.6	29°36.6 9°59.7	44°36.7 9°58.8	59°36.8 9°58.0	74°37.0 9°57.1	+0.2 -0.9
Th 28	269°39.4 9°45.7	284°39.6 9°44.8	299°39.8 9°43.9	314°40.0 9°43.0	329°40.1 9°42.1	344°40.3 9°41.3	359°40.5 9°40.4	14°40.7 9°39.5	29°40.9 9°38.0	44°41.1 9°37.7	59°41.3 9°36.8	74°41.4 9°36.0	+0.2 -0.9
Fr 29	269°43.9 9°24.4	284°44.1 9°23.6	299°44.3 9°22.7	314°44.4 9°21.8	329°44.6 9°20.9	344°44.8 9°20.0	359°45.0 9°19.1	14°45.2 9°18.2	29°45.4 9°17.3	44°45.6 9°16.5	59°45.8 9°15.6	74°46.0 9°14.7	+0.2 -0.9
Sa 30	269°48.4 9°03.1	284°48.6 9°02.2	299°48.8 9°01.3	314°49.0 9°00.4	329°49.2 8°59.5	344°49.4 8°58.6	359°49.6 8°57.7	14°49.9 8°56.8	29°50.0 8°55.0	44°50.2 8°55.0	59°50.4 8°54.1	74°50.6 8°53.2	+0.2 -0.9
Su 31	269°53.1 8°41.6	284°53.3 8°40.7	299°53.5 8°39.8	314°53.7 8°38.9	329°53.9 8°38.0	344°54.1 8°37.1	359°54.3 8°36.2	14°54.5 8°35.3	29°54.7 8°34.4	44°54.9 8°33.5	59°55.1 8°32.6	74°55.3 8°31.7	+0.2 -0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.8'

MOON

August 2031

	D	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	0h	Δ'/h SH
O	Fr 1	245°32.3 -18°08.8	259°55.6 -18°01.8	274°18.9 -17°54.6	288°42.3 -17°47.2	303°05.7 -17°39.8	317°29.2 -17°32.2	331°52.7 -17°24.5	346°16.3 -17°16.6	0°39.9 -17°08.6	15°03.6 -17°00.5	29°27.2 -16°52.3	+23.5 16.7 +7.7 61.1
	Sa 2	245°29.6 -14°35.2	259°54.3 -14°25.2	274°19.0 -14°15.1	288°43.7 -14°04.9	303°08.5 -13°54.6	317°33.4 -13°44.2	331°58.4 -13°33.7	346°23.4 -13°23.2	0°48.5 -13°13.7	15°13.7 -13°01.8	29°38.9 -12°51.0	+24.9 16.7 +10.4 61.1
	Su 3	246°05.2 -09°59.6	260°31.5 -9°47.7	274°57.9 -9°35.7	289°24.3 -9°23.6	303°50.6 -9°11.5	318°17.4 -8°59.4	332°44.0 -8°47.2	347°10.7 -8°34.9	1°37.5 -8°22.6	16°04.3 -8°10.3	30°31.2 -7°57.9	+26.6 16.6 +12.2 60.7
O	Mo 4	247°22.0 -4°48.3	261°49.8 -4°35.4	276°17.8 -4°22.6	290°45.7 -4°09.8	305°13.8 -3°56.9	319°41.9 -3°44.0	334°10.0 -3°31.1	348°38.2 -3°18.3	3°06.4 -3°05.4	17°34.7 -2°52.5	32°03.1 -2°39.6	+28.1 16.4 +12.9 60.1
	Tu 5	249°14.2 0°33.1	263°43.3 0°45.8	278°12.2 0°58.6	292°41.6 1°11.3	307°10.8 1°23.9	321°40.0 1°36.6	336°09.3 1°49.2	350°38.6 2°01.8	5°08.0 2°14.3	19°37.4 2°26.9	34°06.8 2°39.4	+29.3 16.1 +12.6 59.2
	We 6	251°32.0 5°42.4	266°01.9 5°54.2	280°31.8 6°06.0	295°01.8 6°17.8	309°31.7 6°29.5	324°01.7 6°41.1	338°31.7 6°52.8	353°01.7 7°04.3	7°31.8 7°15.8	22°01.9 7°27.2	36°31.9 7°38.6	+30.0 15.9 +11.6 58.2
O	Th 7	254°05.0 10°22.1	268°35.3 10°32.5	283°05.7 10°42.8	297°36.0 10°53.0	312°06.3 11°03.2	326°36.7 11°13.3	341°07.0 11°23.4	355°37.4 11°33.3	10°07.7 11°43.2	24°38.1 11°53.0	39°08.5 12°02.7	+30.3 15.6 +10.1 57.3
	Fr 8	256°44.6 14°19.5	271°15.0 14°28.0	285°45.4 14°36.4	300°15.8 14°44.7	314°46.6 14°52.9	329°16.7 15°01.1	343°47.1 15°09.1	358°17.5 15°17.1	12°47.9 15°25.0	27°18.4 15°32.8	41°48.8 15°40.5	+30.4 15.4 +8.1 56.3
	Sa 9	259°24.9 17°25.5	273°55.3 17°31.8	288°25.7 17°38.0	302°56.1 17°44.0	317°26.4 17°50.0	331°56.8 17°55.9	346°27.2 18°01.7	0°57.6 18°07.5	15°28.0 18°13.1	29°58.3 18°18.6	44°28.7 18°24.0	+30.4 15.1 +5.9 55.5
O	Su 10	273°55.3 17°31.8	288°25.7 17°38.0	302°56.1 17°44.0	317°26.4 17°50.0	331°56.8 17°55.9	346°27.2 18°01.7	0°57.6 18°07.5	15°28.0 18°13.1	29°58.3 18°18.6	44°28.7 18°24.0	58°59.1 18°29.4	+30.4 15.1 +5.5 55.5
	Mo 11	276°34.5 19°37.9	291°04.8 19°41.7	305°35.2 19°45.3	320°05.5 19°48.9	334°35.9 19°52.4	349°06.2 19°55.8	3°36.6 19°59.1	18°07.0 20°02.3	33°37.3 20°05.4	47°07.7 20°08.4	61°38.1 20°11.3	+30.4 15.0 +3.3 54.9
	Tu 12	279°14.2 20°43.0	293°44.7 20°44.3	308°15.2 20°45.5	322°45.6 20°46.6	337°16.1 20°47.6	351°46.6 20°48.5	6°17.1 20°49.4	20°47.6 20°50.1	35°18.2 20°50.7	49°48.7 20°51.2	64°19.2 20°51.7	+30.5 14.8 +0.9 54.4
O	We 13	281°59.0 20°46.3	296°29.8 20°45.1	311°00.6 20°43.9	325°31.4 20°42.6	340°02.2 20°41.2	354°33.0 20°39.6	9°03.9 20°38.0	23°34.8 20°36.3	38°05.7 20°34.5	52°36.6 20°32.6	67°07.5 20°30.6	+30.9 14.8 -1.6 54.1
	Th 14	284°54.1 19°49.6	299°25.4 19°46.1	313°56.7 19°42.6	328°28.1 19°38.9	342°59.2 19°35.2	357°30.8 19°32.5	12°02.2 19°27.4	26°33.7 19°23.4	41°05.1 19°19.4	55°36.6 19°15.2	70°08.1 19°10.9	+31.4 14.7 -3.9 54.0
	Fr 15	288°04.1 17°56.9	302°36.1 17°51.4	317°08.0 17°45.7	331°40.0 17°39.9	346°12.1 17°34.1	0°44.1 17°28.2	15°16.2 17°22.2	29°48.4 17°16.2	44°20.5 17°10.0	58°52.2 17°03.8	73°24.9 16°57.6	+32.1 14.7 -5.9 54.0
O	Sa 16	291°31.2 15°14.5	306°03.8 15°07.1	320°36.5 14°59.6	335°09.2 14°52.1	349°41.9 14°44.4	4°14.6 14°36.7	18°44.7 14°29.0	33°20.2 14°21.2	47°53.0 14°13.3	62°25.9 14°05.3	76°58.7 13°57.3	+32.8 14.8 -7.7 54.1
	Su 17	295°14.5 11°50.1	309°47.8 11°41.2	324°21.0 11°32.2	338°54.3 11°23.2	353°27.6 11°14.1	8°00.9 11°05.0	22°34.2 10°55.8	37°07.5 10°46.5	51°40.9 10°37.3	66°14.2 10°27.9	80°47.6 10°18.5	+33.3 14.8 -9.2 54.3
	Mo 18	299°10.2 7°52.6	313°43.8 7°42.6	328°17.4 7°32.5	342°51.0 7°22.3	357°24.6 7°12.2	11°58.3 7°02.0	26°31.9 6°51.8	41°05.5 6°41.5	55°39.2 6°31.2	70°12.9 6°20.9	84°46.5 6°10.5	+33.6 14.9 -10.2 54.6
O	Tu 19	303°11.6 -1°01.5	317°45.2 -1°12.5	332°18.9 -1°23.5	346°52.5 -1°34.6	361°26.2 -1°45.6	15°59.8 -1°56.6	30°33.4 -2°07.7	45°07.0 -2°18.7	59°40.6 -2°05.2	74°14.2 -2°01.9	88°47.8 -1°54.3	+33.6 15.0 -10.8 55.0
	We 20	307°09.9 -1°01.5	321°43.2 -1°12.5	336°16.5 -1°23.5	350°49.8 -1°34.6	5°23.1 -1°45.6	19°56.3 -1°56.6	34°29.5 -2°07.7	49°02.7 -2°18.7	63°35.9 -2°05.2	78°09.0 -2°01.9	92°42.2 -1°51.8	+33.2 15.1 -11.0 55.4
	Th 21	310°55.0 -5°35.9	325°27.5 -5°46.7	340°00.1 -5°57.5	354°32.6 -6°08.3	9°05.0 -6°19.1	23°37.4 -6°29.8	38°09.8 -6°40.5	52°42.1 -6°51.2	67°14.4 -7°01.9	81°46.7 -7°12.6	96°18.8 -7°23.2	+32.4 15.3 -10.7 55.9
O	Fr 22	314°15.9 -9°58.8	328°47.3 -10°08.9	343°18.6 -10°18.9	357°49.9 -10°28.9	12°21.1 -10°38.9	26°52.3 -10°48.8	41°23.4 -10°58.7	55°54.4 -11°08.5	70°25.4 -11°18.3	84°56.3 -11°28.0	99°27.5 -11°37.7	+31.1 15.4 -9.9 55.6
	Sa 23	317°02.3 -13°56.2	331°32.2 -14°05.0	346°01.9 -14°13.7	0°31.6 -14°22.3	15°01.2 -14°30.3	29°30.7 -14°39.3	44°00.2 -14°47.7	58°29.6 -15°04.3	72°58.9 -15°14.3	87°28.2 -15°25.5	101°57.3 -15°20.7	+29.5 15.6 -8.4 57.1
	Su 24	319°06.3 -17°12.8	333°34.3 -17°19.6	348°02.3 -17°26.3	2°30.1 -17°32.9	16°57.9 -17°39.4	31°25.6 -17°45.8	45°53.3 -17°52.1	60°20.8 -17°58.3	74°48.3 -18°04.5	89°15.8 -18°15.8	103°43.1 -18°16.4	+27.7 15.8 -6.4 57.8
O	Mo 25	320°24.9 -19°32.4	334°56.1 -19°36.6	349°17.3 -19°40.6	3°43.4 -19°44.6	18°09.5 -19°46.6	32°35.5 -19°52.1	47°01.4 -19°55.7	61°27.2 -20°02.5	75°53.0 -20°02.5	90°18.8 -20°03.9	104°44.4 -20°08.8	+26.0 15.9 -3.6 58.5
	Tu 26	321°03.0 -20°39.8	335°27.9 -20°41.6	349°52.7 -20°41.6	4°17.4 -20°42.4	18°42.1 -20°43.5	33°06.8 -20°43.5	47°31.5 -20°43.8	61°56.1 -20°44.0	76°20.7 -20°44.0	90°45.2 -20°43.9	105°09.7 -20°43.7	+24.7 16.1 -0.4 59.2
	We 27	321°14.2 -20°23.6	335°38.3 -20°21.1	350°02.4 -20°18.5	4°26.6 -20°15.7	18°50.7 -20°12.8	33°14.8 -20°09.8	47°38.9 -20°06.6	62°03.3 -20°03.3	76°27.1 -19°59.9	90°51.2 -19°56.3	105°15.4 -19°52.5	+24.1 16.3 +3.1 59.8
O	Th 28	321°17.8 -18°40.0	335°42.1 -18°34.0	350°06.4 -18°28.0	4°30.7 -18°21.8	18°55.1 -18°15.5	33°19.4 -18°09.1	47°43.8 -18°02.5	62°08.2 -17°55.8	76°32.7 -17°49.0	90°57.2 -17°42.0	105°21.7 -17°35.0	+24.4 16.4 +6.5 60.3
	Fr 29	321°33.4 -15°36.4	335°58.5 -15°25.7	350°23.6 -15°15.6	4°48.8 -15°07.5	19°14.0 -14°58.3	33°39.3 -14°50.1	48°04.6 -14°39.5	62°29.9 -14°29.9	76°55.3 -14°20.3	91°20.8 -14°10.5	105°46.2 -14°00.7	+25.3 16.5 +9.4 60.5
	Sa 30	322°14.3 -11°22.5	336°40.6 -11°11.3	351°06.9 -11°00.0	5°33.2 -10°48.7	19°59.6 -10°37.3	34°26.1 -10°25.9	48°52.6 -10°14.3	63°19.2 -10°02.8	77°45.8 -9°50.1	92°12.2 -9°39.4	106°39.1 -9°27.6	+26.5 16.5 +11.5 60.5
O	Su 31	323°25.4 -6°25.1	337°52.9 -6°12.6	352°20.4 -6°00.1	6°47.9 -5°47.5	21°15.5 -5°34.9	35°43.1 -5°22.3	50°10.8 -5°09.7	64°38.5 -4°57.0	79°06.3 -4°44.4	93°34.1 -4°31.6	108°01.9 -4°18.9	+27.7 16.4 +12.6 60.2

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 3 01h45 — LQ: 10 00h23 — NM: 18 04h32 — FQ: 25 18h39

SUN

September 2031

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Mo 1	260°57.8 8°19.9	284°58.0 8°19.0	299°58.2 8°18.1	314°58.4 8°17.2	329°58.6 8°16.3	344°58.8 8°15.4	359°59.0 8°14.5	14°59.2 8°13.6	29°59.4 8°12.7	44°59.6 8°11.8	59°59.8 8°10.9	75°00.0 8°10.0	+0.2 -0.9
Tu 2	270°02.6 7°58.1	285°02.8 7°57.3	300°03.0 7°56.3	315°03.2 7°55.4	330°03.4 7°54.5	345°03.6 7°53.6	0°03.8 7°52.7	15°04.0 7°51.8	30°04.3 7°50.9	45°04.5 7°49.9	60°04.7 7°49.0	75°04.9 7°48.1	+0.2 -0.9
We 3	270°07.5 7°36.2	285°07.7 7°35.3	300°07.9 7°34.4	315°08.1 7°33.5	330°08.3 7°32.6	345°08.5 7°31.7	0°08.7 7°30.7	15°08.9 7°29.8	30°09.1 7°28.9	45°09.4 7°28.0	60°09.6 7°27.1	75°09.8 7°26.2	+0.2 -0.9
Th 4	270°12.5 7°14.2	285°12.7 7°13.3	300°12.9 7°12.4	315°13.1 7°11.4	330°13.3 7°10.5	345°13.5 7°09.6	0°13.7 7°08.7	15°13.9 7°07.8	30°14.1 7°06.8	45°14.3 7°05.9	60°14.5 7°05.0	75°14.7 7°04.1	+0.2 -0.9
Fr 5	270°17.5 6°52.1	285°17.7 6°51.1	300°17.9 6°50.2	315°18.1 6°49.3	330°18.3 6°48.4	345°18.5 6°47.4	0°18.7 6°46.5	15°18.9 6°45.6	30°19.1 6°44.6	45°19.3 6°43.7	60°19.6 6°42.8	75°19.8 6°41.9	+0.2 -0.9
Sa 6	270°22.5 6°29.8	285°22.7 6°28.9	300°22.9 6°27.9	315°23.1 6°27.0	330°23.4 6°26.1	345°23.6 6°25.1	0°23.8 6°24.2	15°24.0 6°23.3	30°24.2 6°22.3	45°24.4 6°21.4	60°24.6 6°20.5	75°24.8 6°19.5	+0.2 -0.9
Su 7	270°27.6 6°07.4	285°27.8 6°06.5	300°28.0 6°05.5	315°28.3 6°04.6	330°28.5 6°03.7	345°28.7 6°02.7	0°28.9 6°01.8	15°29.1 6°00.9	30°29.3 5°59.9	45°29.5 5°59.0	60°29.8 5°58.1	75°30.0 5°57.1	+0.2 -0.9
Mo 8	270°32.8 5°44.9	285°33.0 5°44.0	300°33.2 5°43.1	315°33.4 5°42.1	330°33.6 5°41.2	345°33.8 5°40.2	0°34.1 5°39.3	15°34.3 5°38.4	30°34.5 5°37.4	45°34.7 5°36.5	60°34.9 5°35.5	75°35.1 5°34.6	+0.2 -0.9
Tu 9	270°37.9 5°22.4	285°38.2 5°21.4	300°38.4 5°20.5	315°38.6 5°19.5	330°38.8 5°18.6	345°39.0 5°17.6	0°39.3 5°16.7	15°39.5 5°15.8	30°39.7 5°14.8	45°39.9 5°13.9	60°40.1 5°12.9	75°40.3 5°12.0	+0.2 -0.9
We 10	270°43.2 4°59.7	285°43.4 4°58.8	300°43.6 4°57.8	315°43.8 4°56.9	330°44.0 4°55.9	345°44.3 4°55.0	0°44.5 4°54.0	15°44.7 4°53.1	30°44.9 4°52.1	45°45.1 4°51.2	60°45.4 4°50.2	75°45.6 4°49.3	+0.2 -0.9
Th 11	270°48.4 4°36.9	285°48.6 4°36.0	300°48.9 4°35.0	315°49.1 4°34.1	330°49.3 4°33.1	345°49.5 4°32.2	0°49.5 4°31.2	15°50.0 4°30.3	30°50.2 4°29.3	45°50.4 4°28.4	60°50.7 4°27.4	75°50.8 4°26.5	+0.2 -1.0
Fr 12	270°53.7 4°14.1	285°53.9 4°13.2	300°54.1 4°12.2	315°54.4 4°11.3	330°54.6 4°10.3	345°54.8 4°09.3	0°55.0 4°08.4	15°55.2 4°07.4	30°55.5 4°06.5	45°55.7 4°05.5	60°55.9 4°04.6	75°56.1 4°03.6	+0.2 -1.0
Sa 13	270°59.0 3°51.2	285°59.2 3°50.2	300°59.4 3°49.3	315°59.7 3°48.3	330°59.9 3°47.4	346°00.1 3°46.4	1°00.3 3°45.5	16°00.6 3°44.5	31°00.8 3°43.6	46°01.0 3°42.6	61°01.2 3°41.6	76°01.4 3°40.7	+0.2 -1.0
Su 14	271°04.3 3°28.2	286°04.5 3°27.3	301°04.8 3°26.3	316°05.0 3°25.4	331°05.2 3°24.4	346°05.4 3°23.4	1°05.7 3°22.5	16°05.9 3°21.5	31°06.1 3°20.6	46°06.3 3°19.6	61°06.5 3°18.6	76°06.8 3°17.7	+0.2 -1.0
Mo 15	271°09.7 3°05.2	286°09.9 3°04.2	301°10.1 3°03.3	316°10.3 3°02.3	331°10.5 3°01.3	346°10.8 3°00.4	1°10.1 2°59.4	16°11.2 2°58.5	31°11.4 2°57.5	46°11.7 2°56.5	61°11.9 2°55.6	76°12.1 2°54.6	+0.2 -1.0
Tu 16	271°15.0 2°42.1	286°15.2 2°41.1	301°15.4 2°40.2	316°15.7 2°39.2	331°15.9 2°38.2	346°16.1 2°37.3	1°16.3 2°36.3	16°16.6 2°35.3	31°16.8 2°34.4	46°17.0 2°33.4	61°17.2 2°32.4	76°17.4 2°31.5	+0.2 -1.0
We 17	271°20.3 2°18.9	286°20.6 2°18.0	301°20.8 2°17.0	316°21.0 2°16.0	331°21.2 2°15.1	346°21.5 2°14.1	1°21.7 2°13.1	16°21.9 2°12.2	31°22.1 2°11.2	46°22.3 2°10.2	61°22.6 2°09.3	76°22.8 2°08.3	+0.2 -1.0
Th 18	271°25.7 1°55.7	286°25.9 1°54.8	301°26.1 1°53.8	316°26.4 1°52.8	331°26.6 1°51.9	346°26.8 1°50.9	1°27.0 1°49.9	16°27.2 1°49.0	31°27.5 1°48.0	46°27.7 1°47.0	61°27.9 1°46.1	76°28.1 1°45.1	+0.2 -1.0
Fr 19	271°31.0 1°32.5	286°31.3 1°31.5	301°31.5 1°30.6	316°31.7 1°29.6	331°31.9 1°28.6	346°32.1 1°27.7	1°32.4 1°26.7	16°32.6 1°25.7	31°32.8 1°24.8	46°33.0 1°23.8	61°33.3 1°22.8	76°33.5 1°21.8	+0.2 -1.0
Sa 20	271°36.4 1°09.2	286°36.6 1°08.3	301°36.8 1°07.3	316°37.0 1°06.3	331°37.3 1°05.4	346°37.5 1°04.4	1°37.7 1°03.4	16°37.9 1°02.4	31°38.1 1°01.5	46°38.4 1°00.5	61°38.6 0°59.5	76°38.8 0°58.6	+0.2 -1.0
Su 21	271°41.7 0°45.9	286°41.9 0°45.0	301°42.1 0°44.0	316°42.4 0°43.0	331°42.6 0°42.1	346°42.8 0°41.1	1°43.0 0°40.1	16°43.2 0°39.1	31°43.5 0°38.2	46°43.7 0°37.2	61°43.9 0°36.2	76°44.1 0°35.3	+0.2 -1.0
Mo 22	271°47.0 0°22.6	286°47.2 0°21.6	301°47.4 0°20.7	316°47.7 0°19.7	331°47.9 0°18.7	346°48.1 0°17.8	1°48.3 0°16.8	16°48.5 0°15.8	31°48.8 0°14.8	46°49.0 0°13.9	61°49.2 0°12.9	76°49.4 0°11.9	+0.2 -1.0
Tu 23	271°52.3 -0°00.7	286°52.5 -0°01.7	301°52.7 -0°02.7	316°52.9 -0°03.6	331°53.2 -0°04.6	346°53.4 -0°05.6	1°53.6 -0°06.6	16°53.8 -0°07.5	31°54.0 -0°08.5	46°54.3 -0°09.5	61°54.5 -0°10.4	76°54.7 -0°11.4	+0.2 -1.0
We 24	271°57.5 -0°24.1	286°57.8 -0°25.0	301°58.0 -0°26.0	316°58.2 -0°27.0	331°58.4 -0°28.0	346°58.6 -0°28.9	1°58.9 -0°29.9	16°59.1 -0°30.9	31°59.3 -0°31.9	46°59.5 -0°32.8	61°59.7 -0°33.8	76°59.9 -0°34.8	+0.2 -1.0
Th 25	272°02.8 -0°47.4	287°03.0 -0°48.4	302°03.2 -0°49.4	317°03.4 -0°50.3	332°03.6 -0°51.3	347°03.9 -0°52.3	2°04.1 -0°53.3	17°04.3 -0°54.2	32°04.5 -0°55.2	47°04.7 -0°56.2	62°04.9 -0°57.2	77°05.2 -0°58.1	+0.2 -1.0
Fr 26	272°08.0 -1°10.8	287°08.2 -1°11.8	302°08.4 -1°12.7	317°08.6 -1°13.7	332°08.8 -1°14.7	347°09.0 -1°15.6	2°09.3 -1°16.6	17°09.5 -1°17.6	32°09.7 -1°18.6	47°09.9 -1°19.5	62°10.1 -1°20.5	77°10.3 -1°21.5	+0.2 -1.0
Sa 27	272°13.1 -1°34.1	287°13.3 -1°35.1	302°13.5 -1°36.1	317°13.8 -1°37.0	332°14.0 -1°38.0	347°14.2 -1°39.0	2°14.4 -1°40.0	17°14.6 -1°40.9	32°14.8 -1°41.9	47°15.0 -1°42.9	62°15.3 -1°43.9	77°15.5 -1°44.8	+0.2 -1.0
Su 28	272°18.2 -1°57.5	287°18.4 -1°58.4	302°18.6 -1°59.4	317°18.9 -2°00.4	332°19.1 -2°01.4	347°19.3 -2°02.3	2°19.5 -2°03.3	17°19.7 -2°04.3	32°19.9 -2°05.2	47°20.1 -2°06.2	62°20.3 -2°07.2	77°20.5 -2°08.2	+0.2 -1.0
Mo 29	272°23.3 -2°20.8	287°23.5 -2°21.8	302°23.7 -2°22.7	317°23.9 -2°23.7	332°24.1 -2°24.7	347°24.3 -2°25.6	2°24.5 -2°26.6	17°24.7 -2°27.6	32°25.0 -2°28.6	47°25.2 -2°29.5	62°25.4 -2°30.5	77°25.6 -2°31.5	+0.2 -1.0
Tu 30	272°28.3 -2°44.1	287°28.5 -2°45.1	302°28.7 -2°46.0	317°28.9 -2°47.0	332°29.1 -2°48.0	347°29.3 -2°48.9	2°29.5 -2°49.9	17°29.7 -2°50.9	32°29.9 -2°51.8	47°30.1 -2°52.8	62°30.3 -2°53.8	77°30.5 -2°54.8	+0.2 -1.0

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.9'

MOON

September 2031

	D	15h	16h	17h	18h	19h	20h	21h	22h	23h	0h	1h	Δ'/h SH
○	Mo 1	238 ⁰ 14.3 -2 ⁰ 23.8	262 ⁰ 42.5 -2 ⁰ 11.0	267 ⁰ 10.8 -1 ⁰ 58.1	281 ⁰ 39.1 -1 ⁰ 45.3	296 ⁰ 07.4 -1 ⁰ 32.4	310 ⁰ 35.8 -1 ⁰ 19.6	325 ⁰ 04.2 -1 ⁰ 06.8	339 ⁰ 32.7 -0 ⁰ 54.0	354 ⁰ 01.1 -0 ⁰ 41.1	8 ⁰ 29.6 -0 ⁰ 28.3	22 ⁰ 58.2 -0 ⁰ 15.5	+28.4 16.3 -12.8 59.9
	Tu 2	240 ⁰ 09.7 2 ⁰ 54.5	254 ⁰ 38.7 3 ⁰ 07.0	269 ⁰ 07.7 3 ⁰ 19.5	283 ⁰ 36.7 3 ⁰ 31.9	298 ⁰ 05.7 3 ⁰ 44.2	312 ⁰ 34.8 3 ⁰ 56.6	327 ⁰ 03.9 4 ⁰ 08.9	341 ⁰ 33.0 4 ⁰ 21.2	356 ⁰ 02.1 4 ⁰ 33.4	10 ⁰ 31.3 4 ⁰ 45.6	25 ⁰ 00.4 4 ⁰ 57.7	+29.1 16.1 -12.3 59.1
	We 3	242 ⁰ 01.9 7 ⁰ 54.2	256 ⁰ 49.3 8 ⁰ 05.6	271 ⁰ 18.2 8 ⁰ 16.8	285 ⁰ 48.1 8 ⁰ 28.1	300 ⁰ 17.6 8 ⁰ 39.2	314 ⁰ 47.0 8 ⁰ 50.3	329 ⁰ 16.5 9 ⁰ 01.3	343 ⁰ 46.0 9 ⁰ 12.3	358 ⁰ 15.5 9 ⁰ 23.2	12 ⁰ 44.9 9 ⁰ 34.1	27 ⁰ 14.4 9 ⁰ 44.8	+29.5 15.9 -11.1 58.3
○	Th 4	244 ⁰ 37.7 12 ⁰ 17.9	259 ⁰ 07.3 12 ⁰ 27.5	273 ⁰ 36.9 12 ⁰ 37.0	288 ⁰ 06.5 12 ⁰ 46.5	302 ⁰ 36.2 12 ⁰ 55.8	317 ⁰ 05.8 13 ⁰ 05.1	331 ⁰ 35.4 13 ⁰ 14.3	346 ⁰ 05.0 13 ⁰ 23.4	0 ⁰ 34.6 13 ⁰ 32.4	15 ⁰ 04.3 13 ⁰ 41.4	29 ⁰ 33.9 13 ⁰ 50.3	+29.6 15.6 -9.2 57.4
	Fr 5	246 ⁰ 58.6 15 ⁰ 52.7	261 ⁰ 28.3 16 ⁰ 00.1	275 ⁰ 57.9 16 ⁰ 07.5	290 ⁰ 27.6 16 ⁰ 14.7	304 ⁰ 57.3 16 ⁰ 21.9	319 ⁰ 26.9 16 ⁰ 29.0	333 ⁰ 56.6 16 ⁰ 36.0	348 ⁰ 26.3 16 ⁰ 42.8	2 ⁰ 56.0 16 ⁰ 49.6	17 ⁰ 25.7 16 ⁰ 56.3	31 ⁰ 55.4 17 ⁰ 02.9	+29.7 15.4 -7.0 56.5
	Sa 6	249 ⁰ 21.1 18 ⁰ 30.1	263 ⁰ 50.8 18 ⁰ 35.1	278 ⁰ 20.6 18 ⁰ 40.1	292 ⁰ 50.3 18 ⁰ 44.9	307 ⁰ 20.1 18 ⁰ 49.6	321 ⁰ 49.9 18 ⁰ 54.2	336 ⁰ 19.7 18 ⁰ 58.8	350 ⁰ 49.4 19 ⁰ 03.2	5 ⁰ 19.2 19 ⁰ 07.5	19 ⁰ 49.0 19 ⁰ 11.7	34 ⁰ 18.8 19 ⁰ 15.9	+29.8 15.2 -4.6 55.7
○	Su 7	251 ⁰ 47.0 20 ⁰ 05.5	266 ⁰ 17.0 20 ⁰ 08.0	280 ⁰ 47.0 20 ⁰ 10.4	295 ⁰ 17.0 20 ⁰ 12.7	309 ⁰ 47.0 20 ⁰ 14.9	324 ⁰ 17.0 20 ⁰ 17.0	338 ⁰ 47.0 20 ⁰ 19.0	353 ⁰ 17.0 20 ⁰ 20.9	7 ⁰ 47.1 20 ⁰ 22.7	22 ⁰ 17.2 20 ⁰ 24.3	36 ⁰ 47.3 20 ⁰ 25.9	+30.0 15.0 -2.0 55.0
	Mo 8	254 ⁰ 20.6 20 ⁰ 37.7	268 ⁰ 50.9 20 ⁰ 37.7	283 ⁰ 21.3 20 ⁰ 37.5	297 ⁰ 51.7 20 ⁰ 37.3	312 ⁰ 22.2 20 ⁰ 37.0	326 ⁰ 52.6 20 ⁰ 36.6	341 ⁰ 23.1 20 ⁰ 36.1	355 ⁰ 53.6 20 ⁰ 35.5	10 ⁰ 24.1 20 ⁰ 34.8	24 ⁰ 54.6 20 ⁰ 34.0	39 ⁰ 25.2 20 ⁰ 33.1	+30.5 14.9 -0.5 54.5
	Tu 9	268 ⁰ 50.9 20 ⁰ 37.7	283 ⁰ 21.3 20 ⁰ 37.5	297 ⁰ 51.7 20 ⁰ 37.3	312 ⁰ 22.2 20 ⁰ 37.0	326 ⁰ 52.6 20 ⁰ 36.6	341 ⁰ 23.1 20 ⁰ 36.1	355 ⁰ 53.6 20 ⁰ 35.5	10 ⁰ 24.1 20 ⁰ 34.8	24 ⁰ 54.6 20 ⁰ 34.0	39 ⁰ 25.2 20 ⁰ 33.1	53 ⁰ 55.8 20 ⁰ 32.1	+30.5 14.9 -0.6 54.5
○	We 10	271 ⁰ 37.5 20 ⁰ 05.8	286 ⁰ 08.4 20 ⁰ 10.3	300 ⁰ 39.5 20 ⁰ 00.7	315 ⁰ 10.5 19 ⁰ 58.0	329 ⁰ 41.0 19 ⁰ 55.3	344 ⁰ 12.6 19 ⁰ 52.4	358 ⁰ 43.8 19 ⁰ 49.4	13 ⁰ 14.9 19 ⁰ 46.4	27 ⁰ 46.0 19 ⁰ 43.2	42 ⁰ 17.3 19 ⁰ 40.0	56 ⁰ 48.5 19 ⁰ 36.7	+31.1 14.8 -2.9 54.2
	Th 11	274 ⁰ 40.4 18 ⁰ 36.5	289 ⁰ 12.0 18 ⁰ 31.8	303 ⁰ 43.8 18 ⁰ 27.0	318 ⁰ 15.5 18 ⁰ 22.2	332 ⁰ 47.3 18 ⁰ 17.2	347 ⁰ 19.1 18 ⁰ 12.2	1 ⁰ 50.9 18 ⁰ 01.9	16 ⁰ 22.8 19 ⁰ 17.0	30 ⁰ 54.7 19 ⁰ 11.7	45 ⁰ 26.6 17 ⁰ 51.3	59 ⁰ 58.5 17 ⁰ 45.9	+31.8 14.7 -5.1 54.1
	Fr 12	278 ⁰ 01.1 16 ⁰ 15.3	292 ⁰ 33.5 16 ⁰ 08.7	307 ⁰ 05.9 16 ⁰ 02.0	321 ⁰ 38.3 15 ⁰ 55.2	336 ⁰ 10.8 15 ⁰ 48.4	350 ⁰ 43.3 15 ⁰ 41.5	5 ⁰ 15.8 15 ⁰ 34.5	19 ⁰ 48.4 15 ⁰ 27.4	34 ⁰ 21.0 15 ⁰ 20.3	48 ⁰ 53.6 15 ⁰ 13.1	63 ⁰ 26.6 15 ⁰ 05.9	+32.5 14.8 -6.9 54.1
○	Sa 13	281 ⁰ 38.3 13 ⁰ 09.2	296 ⁰ 11.3 13 ⁰ 01.0	310 ⁰ 44.3 12 ⁰ 52.6	325 ⁰ 17.3 12 ⁰ 44.3	339 ⁰ 50.4 12 ⁰ 35.8	354 ⁰ 23.4 12 ⁰ 27.3	8 ⁰ 56.5 12 ⁰ 18.8	23 ⁰ 29.6 12 ⁰ 10.1	38 ⁰ 02.7 12 ⁰ 01.5	52 ⁰ 35.8 11 ⁰ 52.7	67 ⁰ 09.0 11 ⁰ 44.0	+33.1 14.8 -8.5 54.3
	Su 14	285 ⁰ 27.9 9 ⁰ 26.1	300 ⁰ 01.3 9 ⁰ 16.6	314 ⁰ 34.6 9 ⁰ 06.9	329 ⁰ 08.0 8 ⁰ 57.3	343 ⁰ 41.4 8 ⁰ 47.6	358 ⁰ 14.8 8 ⁰ 37.8	12 ⁰ 48.2 8 ⁰ 28.0	27 ⁰ 21.6 8 ⁰ 18.2	41 ⁰ 55.0 8 ⁰ 08.3	56 ⁰ 28.4 7 ⁰ 58.4	71 ⁰ 01.8 7 ⁰ 48.5	+33.4 14.9 -9.8 54.7
	Mo 15	289 ⁰ 23.4 5 ⁰ 14.9	303 ⁰ 56.8 5 ⁰ 04.4	318 ⁰ 30.2 4 ⁰ 53.9	333 ⁰ 03.3 4 ⁰ 43.3	347 ⁰ 37.1 4 ⁰ 32.7	2 ⁰ 10.5 4 ⁰ 22.1	16 ⁰ 43.9 4 ⁰ 11.5	31 ⁰ 17.3 4 ⁰ 00.8	45 ⁰ 50.7 3 ⁰ 50.1	60 ⁰ 24.1 3 ⁰ 39.4	74 ⁰ 57.4 3 ⁰ 27.8	+33.4 15.0 -10.6 55.1
●	Tu 16	293 ⁰ 16.5 0 ⁰ 45.6	307 ⁰ 49.6 0 ⁰ 34.6	322 ⁰ 22.8 0 ⁰ 23.6	336 ⁰ 55.9 0 ⁰ 12.5	351 ⁰ 28.9 0 ⁰ 01.5	6 ⁰ 02.0 -0 ⁰ 09.5	20 ⁰ 35.9 -0 ⁰ 20.5	35 ⁰ 08.1 -0 ⁰ 31.6	49 ⁰ 41.1 -0 ⁰ 42.6	64 ⁰ 14.0 -0 ⁰ 53.7	78 ⁰ 47.0 -1 ⁰ 04.7	+33.1 15.1 -11.0 55.5
	We 17	296 ⁰ 57.8 -3 ⁰ 50.4	311 ⁰ 30.3 -4 ⁰ 01.4	326 ⁰ 02.7 -4 ⁰ 12.4	340 ⁰ 35.1 -4 ⁰ 23.4	355 ⁰ 07.5 -4 ⁰ 34.4	9 ⁰ 39.8 -4 ⁰ 45.3	24 ⁰ 12.1 -4 ⁰ 56.3	38 ⁰ 44.3 -5 ⁰ 07.2	53 ⁰ 16.5 -5 ⁰ 18.1	67 ⁰ 48.7 -5 ⁰ 29.0	82 ⁰ 20.8 -5 ⁰ 39.8	+33.2 15.3 -10.9 56.0
	Th 18	300 ⁰ 17.6 -8 ⁰ 20.1	314 ⁰ 49.0 -8 ⁰ 30.6	329 ⁰ 20.3 -8 ⁰ 41.0	343 ⁰ 51.6 -8 ⁰ 51.4	358 ⁰ 22.2 -9 ⁰ 01.7	12 ⁰ 54.1 -9 ⁰ 12.0	27 ⁰ 25.3 -9 ⁰ 22.3	41 ⁰ 56.4 -9 ⁰ 32.5	56 ⁰ 27.4 -9 ⁰ 42.7	70 ⁰ 58.4 -9 ⁰ 52.9	85 ⁰ 29.4 -10 ⁰ 03.0	+31.2 15.4 -10.3 56.6
○	Fr 19	303 ⁰ 06.8 -12 ⁰ 28.8	317 ⁰ 36.8 -12 ⁰ 38.1	332 ⁰ 06.7 -12 ⁰ 47.4	346 ⁰ 36.6 -12 ⁰ 56.6	1 ⁰ 06.5 -13 ⁰ 05.7	15 ⁰ 36.3 -13 ⁰ 14.7	30 ⁰ 06.0 -13 ⁰ 23.7	44 ⁰ 35.7 -13 ⁰ 32.6	59 ⁰ 05.3 -13 ⁰ 41.5	73 ⁰ 34.8 -13 ⁰ 50.3	88 ⁰ 04.3 -13 ⁰ 59.0	+29.8 15.6 -9.0 57.1
	Sa 20	305 ⁰ 18.8 -16 ⁰ 00.9	319 ⁰ 47.2 -16 ⁰ 08.4	334 ⁰ 15.6 -16 ⁰ 15.8	348 ⁰ 43.9 -16 ⁰ 23.1	3 ⁰ 12.2 -16 ⁰ 30.3	17 ⁰ 40.4 -16 ⁰ 37.4	32 ⁰ 08.6 -16 ⁰ 44.5	46 ⁰ 36.6 -16 ⁰ 51.5	61 ⁰ 04.6 -16 ⁰ 58.3	75 ⁰ 32.6 -17 ⁰ 05.1	90 ⁰ 00.5 -17 ⁰ 11.8	+28.2 15.7 -7.1 57.6
	Su 21	306 ⁰ 51.6 -18 ⁰ 40.1	321 ⁰ 18.5 -18 ⁰ 45.1	335 ⁰ 45.4 -18 ⁰ 50.1	350 ⁰ 12.2 -18 ⁰ 54.9	4 ⁰ 39.0 -18 ⁰ 59.6	19 ⁰ 05.7 -19 ⁰ 04.3	33 ⁰ 32.3 -19 ⁰ 08.8	47 ⁰ 58.9 -19 ⁰ 13.1	62 ⁰ 25.5 -19 ⁰ 17.4	76 ⁰ 52.0 -19 ⁰ 21.6	91 ⁰ 18.5 -19 ⁰ 25.6	+26.7 15.8 -4.6 58.1
○	Mo 22	307 ⁰ 49.7 -20 ⁰ 11.9	322 ⁰ 15.4 -20 ⁰ 14.0	336 ⁰ 41.1 -20 ⁰ 16.0	351 ⁰ 06.8 -20 ⁰ 17.7	5 ⁰ 32.4 -20 ⁰ 18.2	19 ⁰ 58.0 -20 ⁰ 21.1	34 ⁰ 23.6 -20 ⁰ 22.6	48 ⁰ 49.9 -20 ⁰ 23.9	63 ⁰ 14.7 -20 ⁰ 25.1	77 ⁰ 40.1 -20 ⁰ 26.2	92 ⁰ 05.6 -20 ⁰ 27.2	+25.6 16.0 -1.5 58.5
	Tu 23	308 ⁰ 24.7 -20 ⁰ 25.6	322 ⁰ 49.8 -20 ⁰ 24.4	337 ⁰ 15.0 -20 ⁰ 23.1	351 ⁰ 40.1 -20 ⁰ 21.7	6 ⁰ 05.2 -20 ⁰ 18.4	20 ⁰ 30.3 -20 ⁰ 18.4	34 ⁰ 55.4 -20 ⁰ 16.6	49 ⁰ 20.5 -20 ⁰ 14.6	63 ⁰ 45.6 -20 ⁰ 12.5	78 ⁰ 10.7 -20 ⁰ 10.3	92 ⁰ 35.8 -20 ⁰ 07.9	+25.1 16.1 -1.8 58.9
	We 24	308 ⁰ 52.9 -19 ⁰ 16.7	323 ⁰ 18.1 -19 ⁰ 12.3	337 ⁰ 43.4 -19 ⁰ 07.7	352 ⁰ 08.6 -19 ⁰ 03.0	6 ⁰ 33.9 -18 ⁰ 58.2	20 ⁰ 59.2 -18 ⁰ 53.2	35 ⁰ 24.5 -18 ⁰ 48.1	49 ⁰ 49.9 -18 ⁰ 42.1	64 ⁰ 15.2 -18 ⁰ 37.6	78 ⁰ 40.6 -18 ⁰ 32.2	93 ⁰ 06.0 -18 ⁰ 26.6	+25.3 16.2 -5.0 59.3
○	Th 25	309 ⁰ 30.5 -16 ⁰ 48.7	323 ⁰ 56.4 -16 ⁰ 41.2	338 ⁰ 22.3 -16 ⁰ 23.7	352 ⁰ 48.3 -16 ⁰ 26.0	7 ⁰ 14.2 -16 ⁰ 18.3	21 ⁰ 40.3 -16 ⁰ 10.4	36 ⁰ 06.3 -16 ⁰ 02.4	50 ⁰ 32.4 -15 ⁰ 54.3	64 ⁰ 58.6 -15 ⁰ 46.1	79 ⁰ 24.7 -15 ⁰ 37.8	93 ⁰ 50.9 -15 ⁰ 29.5	+26.0 16.2 -7.9 59.6
	Fr 26	310 ⁰ 28.8 -13 ⁰ 12.1	324 ⁰ 55.7 -13 ⁰ 02.2	339 ⁰ 22.6 -12 ⁰ 52.3	353 ⁰ 49.5 -12 ⁰ 42.2	8 ⁰ 16.5 -12 ⁰ 32.1	22 ⁰ 43.5 -12 ⁰ 21.9	37 ⁰ 10.5 -12 ⁰ 11.6	51 ⁰ 37.6 -12 ⁰ 01.3	66 ⁰ 04.8 -11 ⁰ 50.9	80 ⁰ 31.9 -11 ⁰ 40.4	94 ⁰ 59.2 -11 ⁰ 29.8	+27.0 16.3 -10.2 59.7
	Sa 27	311 ⁰ 52.1 -8 ⁰ 43.4	326 ⁰ 20.0 -8 ⁰ 31.8	340 ⁰ 47.8 -8 ⁰ 20.2	355 ⁰ 15.7 -8 ⁰ 08.5	9 ⁰ 43.7 -7 ⁰ 56.8	24 ⁰ 11.7 -7 ⁰ 45.1	38 ⁰ 39.7 -7 ⁰ 33.3	53 ⁰ 07.7 -7 ⁰ 21.5	67 ⁰ 35.8 -7 ⁰ 09.6	82 ⁰ 03.9 -6 ⁰ 57.6	96 ⁰ 32.1 -6 ⁰ 45.7	+28.0 16.3 -11.8 59.7
○	Su 28	313 ⁰ 38.1 -3 ⁰ 42.4	328 ⁰ 06.7 -3 ⁰ 30.0	342 ⁰ 37.3 -3 ⁰ 16.6	357 ⁰ 04.0 -3 ⁰ 05.2	11 ⁰ 32.7 -2 ⁰ 52.7	26 ⁰ 01.5 -2 ⁰ 40.3	40 ⁰ 30.2 -2 ⁰ 27.8	54 ⁰ 59.0 -2 ⁰ 15.3	69 ⁰ 27.8 -2 ⁰ 02.8	83 ⁰ 56.6 -1 ⁰ 50.3	98 ⁰ 25.4 -1 ⁰ 37.8	+28.7 16.2 -12.5 59.5
	Mo 29	315 ⁰ 40.3 1 ⁰ 29.4	330 ⁰ 09.4 1 ⁰ 41.8	344 ⁰ 38.5 1 ⁰ 54.2	359 ⁰ 07.7 2 ⁰ 06.5	13 ⁰ 36.8 2 ⁰ 18.9	28 ⁰ 06.0 2 ⁰ 31.2	42 ⁰ 35.2 2 ⁰ 43.5	57 ⁰ 04.3 2 ⁰ 55.8	71 ⁰ 33.5 3 ⁰ 08.0	86 ⁰ 02.7 3 ⁰ 20.3	100 ⁰ 32.0 3 ⁰ 32.5	+29.2 16.1 -12.6 59.0

SUN

October 2031

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
We 1	257°33.0 -3°06.4	272°33.2 -3°07.4	287°33.4 -3°08.3	302°33.6 -3°09.3	317°33.8 -3°10.3	332°34.0 -3°11.2	347°34.2 -3°12.2	2°34.4 -3°13.2	17°34.6 -3°14.1	32°34.8 -3°15.1	47°35.0 -3°16.1	62°35.2 -3°17.0	+0.2 -1.0
Th 2	257°37.9 -3°29.6	272°38.1 -3°30.6	287°38.3 -3°31.6	302°38.5 -3°32.5	317°38.7 -3°33.5	332°38.9 -3°34.5	347°39.1 -3°35.4	2°39.3 -3°36.4	17°39.5 -3°37.4	32°39.7 -3°38.3	47°39.9 -3°39.3	62°40.1 -3°40.3	+0.2 -1.0
Fr 3	257°42.6 -3°52.8	272°42.8 -3°53.8	287°43.0 -3°54.8	302°43.2 -3°55.7	317°43.4 -3°56.7	332°43.6 -3°57.7	347°43.8 -3°58.6	2°44.0 -3°59.6	17°44.2 -4°00.6	32°44.4 -4°01.5	47°44.6 -4°02.5	62°44.8 -4°03.5	+0.2 -1.0
Sa 4	257°47.3 -4°16.0	272°47.5 -4°17.0	287°47.7 -4°17.9	302°47.9 -4°18.9	317°48.1 -4°19.8	332°48.3 -4°20.8	347°48.5 -4°21.8	2°48.7 -4°22.7	17°48.9 -4°23.7	32°49.1 -4°24.7	47°49.3 -4°25.6	62°49.5 -4°26.6	+0.2 -1.0
Su 5	257°52.0 -4°39.1	272°52.1 -4°40.1	287°52.3 -4°41.0	302°52.5 -4°42.0	317°52.7 -4°43.0	332°52.9 -4°43.9	347°53.1 -4°44.9	2°53.3 -4°45.8	17°53.5 -4°46.8	32°53.7 -4°47.8	47°53.8 -4°48.7	62°54.0 -4°49.7	+0.2 -1.0
Mo 6	257°56.5 -5°02.2	272°56.7 -5°03.1	287°56.8 -5°04.1	302°57.0 -5°05.0	317°57.2 -5°06.0	332°57.4 -5°07.0	347°57.6 -5°07.9	2°57.8 -5°08.9	17°58.0 -5°09.8	32°58.1 -5°10.8	47°58.3 -5°11.7	62°58.5 -5°12.7	+0.2 -1.0
Tu 7	258°00.9 -5°25.2	273°01.1 -5°26.1	288°01.2 -5°27.1	303°01.4 -5°28.0	318°01.6 -5°29.0	333°01.8 -5°29.9	348°02.0 -5°30.9	3°02.2 -5°31.8	18°02.3 -5°32.8	33°02.5 -5°33.8	48°02.7 -5°34.7	63°02.9 -5°35.7	+0.2 -1.0
We 8	258°05.2 -5°48.1	273°05.4 -5°49.0	288°05.6 -5°50.0	303°05.7 -5°50.9	318°05.9 -5°51.9	333°06.1 -5°52.8	348°06.3 -5°53.8	3°06.4 -5°54.8	18°06.6 -5°55.7	33°06.8 -5°56.7	48°07.0 -5°57.6	63°07.1 -5°58.6	+0.2 -1.0
Th 9	258°09.4 -6°10.9	273°09.6 -6°11.9	288°09.7 -6°12.8	303°09.9 -6°13.8	318°10.1 -6°14.7	333°10.3 -6°15.7	348°10.4 -6°16.7	3°10.6 -6°17.6	18°10.8 -6°18.5	33°10.9 -6°19.5	48°11.1 -6°20.4	63°11.3 -6°21.4	+0.2 -0.9
Fr 10	258°13.7 -6°33.7	273°13.7 -6°34.7	288°13.8 -6°35.6	303°14.0 -6°36.5	318°14.2 -6°37.5	333°14.3 -6°38.4	348°14.5 -6°39.4	3°14.7 -6°40.3	18°14.8 -6°41.3	33°15.0 -6°42.0	48°15.2 -6°43.1	63°15.3 -6°44.1	+0.2 -0.9
Sa 11	258°17.5 -6°56.4	273°17.6 -6°57.3	288°17.8 -6°58.3	303°17.9 -6°59.2	318°18.1 -7°00.2	333°18.3 -7°01.1	348°18.4 -7°02.0	3°18.6 -7°03.0	18°18.7 -7°03.9	33°18.9 -7°04.8	48°19.1 -7°05.8	63°19.2 -7°06.8	+0.2 -0.9
Su 12	258°21.3 -7°19.3	273°21.5 -7°19.9	288°21.6 -7°20.9	303°21.8 -7°21.8	318°21.9 -7°22.7	333°22.1 -7°23.7	348°22.2 -7°24.6	3°22.4 -7°25.6	18°22.5 -7°26.5	33°22.7 -7°27.4	48°22.9 -7°28.4	63°23.0 -7°29.3	+0.2 -0.9
Mo 13	258°25.0 -7°41.5	273°25.2 -7°42.4	288°25.3 -7°43.3	303°25.5 -7°44.3	318°25.6 -7°45.2	333°25.8 -7°46.2	348°25.9 -7°47.1	3°26.1 -7°48.0	18°26.2 -7°49.0	33°26.4 -7°49.9	48°26.5 -7°50.8	63°26.7 -7°51.8	+0.2 -0.9
Tu 14	258°28.6 -8°03.9	273°28.7 -8°04.8	288°28.9 -8°05.7	303°29.0 -8°06.7	318°29.2 -8°07.6	333°29.3 -8°08.5	348°29.5 -8°09.4	3°29.6 -8°10.4	18°29.8 -8°11.3	33°29.9 -8°12.2	48°30.0 -8°13.2	63°30.2 -8°14.1	+0.2 -0.9
We 15	258°32.3 -8°26.1	273°32.2 -8°27.1	288°32.3 -8°28.0	303°32.5 -8°28.9	318°32.6 -8°29.8	333°32.7 -8°30.8	348°32.9 -8°31.7	3°33.0 -8°32.6	18°33.2 -8°33.5	33°33.3 -8°34.5	48°33.4 -8°35.4	63°33.6 -8°36.3	+0.2 -0.9
Th 16	258°35.3 -8°48.3	273°35.5 -8°49.2	288°35.6 -8°50.1	303°35.7 -8°51.1	318°35.9 -8°52.0	333°36.0 -8°52.9	348°36.1 -8°53.8	3°36.3 -8°54.7	18°36.4 -8°55.7	33°36.5 -8°56.6	48°36.7 -8°57.5	63°36.8 -8°58.4	+0.2 -0.9
Fr 17	258°38.5 -9°10.3	273°38.6 -9°11.3	288°38.8 -9°12.2	303°38.9 -9°13.1	318°39.0 -9°14.0	333°39.1 -9°14.9	348°39.3 -9°15.8	3°39.4 -9°16.7	18°39.5 -9°17.7	33°39.6 -9°18.6	48°39.8 -9°19.5	63°39.9 -9°20.4	+0.2 -0.9
Sa 18	258°41.5 -9°32.2	273°41.6 -9°33.2	288°41.8 -9°34.1	303°41.9 -9°35.0	318°42.0 -9°35.9	333°42.1 -9°36.8	348°42.2 -9°37.7	3°42.4 -9°38.6	18°42.5 -9°39.5	33°42.6 -9°40.4	48°42.7 -9°41.3	63°42.8 -9°42.2	+0.2 -0.9
Su 19	258°44.4 -9°54.0	273°44.5 -9°54.9	288°44.6 -9°55.8	303°44.7 -9°56.7	318°44.8 -9°57.6	333°45.0 -9°58.5	348°45.1 -9°59.4	3°45.2 -10°00.3	18°45.3 -10°01.2	33°45.4 -10°02.1	48°45.5 -10°03.0	63°45.6 -10°03.9	+0.2 -0.9
Mo 20	258°47.1 -10°15.6	273°47.2 -10°16.5	288°47.3 -10°17.4	303°47.4 -10°18.3	318°47.5 -10°19.2	333°47.6 -10°20.1	348°47.7 -10°21.0	3°47.9 -10°21.9	18°48.0 -10°22.8	33°48.1 -10°23.7	48°48.2 -10°24.6	63°48.3 -10°25.5	+0.2 -0.9
Tu 21	258°49.6 -10°37.1	273°49.8 -10°38.0	288°49.9 -10°38.9	303°50.0 -10°39.8	318°50.1 -10°40.7	333°50.2 -10°41.5	348°50.3 -10°42.4	3°50.4 -10°43.3	18°50.5 -10°44.2	33°50.6 -10°45.1	48°50.7 -10°46.0	63°50.8 -10°46.9	+0.1 -0.9
We 22	258°52.0 -11°05.8	273°52.1 -11°05.9	288°52.2 -11°06.2	303°52.3 -11°07.1	318°52.4 -11°08.0	333°52.5 -11°08.8	348°52.6 -11°09.7	3°52.7 -11°10.6	18°52.8 -11°05.5	33°52.9 -11°06.4	48°53.0 -11°07.2	63°53.1 -11°08.1	+0.1 -0.9
Th 23	258°54.3 -11°19.5	273°54.4 -11°20.4	288°54.5 -11°21.3	303°54.5 -11°22.1	318°54.6 -11°23.1	333°54.7 -11°23.9	348°54.8 -11°24.8	3°54.9 -11°25.7	18°55.0 -11°26.6	33°55.1 -11°27.4	48°55.2 -11°28.3	63°55.2 -11°29.2	+0.1 -0.9
Fr 24	258°56.3 -11°40.5	273°56.4 -11°41.4	288°56.5 -11°42.3	303°56.6 -11°43.1	318°56.7 -11°44.0	333°56.8 -11°44.9	348°56.8 -11°45.7	3°56.9 -11°46.6	18°57.0 -11°47.5	33°57.1 -11°48.4	48°57.2 -11°49.2	63°57.2 -11°50.1	+0.1 -0.9
Sa 25	258°58.2 -12°01.3	273°58.3 -12°02.2	288°58.4 -12°03.0	303°58.5 -12°03.9	318°58.5 -12°04.8	333°58.6 -12°05.6	348°58.6 -12°06.5	3°58.8 -12°07.3	18°58.8 -12°08.2	33°58.9 -12°09.1	48°58.9 -12°09.9	63°58.9 -12°10.8	+0.1 -0.9
Su 26	259°00.0 -12°21.9	274°00.0 -12°22.8	289°00.1 -12°23.6	304°00.2 -12°24.5	319°00.2 -12°25.3	334°00.3 -12°26.2	349°00.4 -12°27.0	4°00.4 -12°27.9	19°00.5 -12°28.8	34°00.6 -12°29.6	49°00.6 -12°30.5	64°00.7 -12°31.3	+0.1 -0.9
Mo 27	259°01.5 -12°42.3	274°01.6 -12°43.2	289°01.6 -12°44.0	304°01.7 -12°44.9	319°01.8 -12°45.7	334°01.8 -12°46.6	349°01.9 -12°47.4	4°01.9 -12°48.3	19°02.0 -12°49.1	34°02.0 -12°49.9	49°02.1 -12°50.8	64°02.1 -12°51.6	+0.2 -0.8
Tu 28	259°02.9 -13°02.6	274°02.9 -13°03.4	289°03.0 -13°04.2	304°03.0 -13°05.1	319°03.1 -13°05.9	334°03.1 -13°06.7	349°03.2 -13°07.5	4°03.2 -13°08.4	19°03.3 -13°09.3	34°03.3 -13°10.1	49°03.4 -13°10.9	64°03.4 -13°11.8	+0.1 -0.8
We 29	259°04.1 -13°22.6	274°04.1 -13°23.4	289°04.1 -13°24.2	304°04.2 -13°25.1	319°04.2 -13°25.9	334°04.3 -13°26.7	349°04.3 -13°27.5	4°04.4 -13°28.4	19°04.4 -13°29.2	34°04.4 -13°30.0	49°04.5 -13°30.8	64°04.5 -13°31.7	+0.0 -0.8
Th 30	259°05.0 -13°42.4	274°05.1 -13°43.2	289°05.1 -13°44.0	304°05.2 -13°44.8	319°05.2 -13°45.7	334°05.2 -13°46.5	349°05.3 -13°47.3	4°05.3 -13°48.1	19°05.3 -13°48.9	34°05.4 -13°49.8	49°05.4 -13°50.6	64°05.4 -13°51.4	+0.0 -0.8
Fr 31	259°05.8 -14°02.0	274°05.9 -14°02.8	289°05.9 -14°03.6	304°05.9 -14°04.4	319°05.9 -14°05.2	334°06.0 -14°06.0	349°06.0 -14°06.8	4°06.0 -14°07.6	19°06.1 -14°08.5	34°06.1 -14°09.3	49°06.1 -14°10.1	64°06.1 -14°10.9	+0.0 -0.8

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ°/h = dec. change

Semi-diameter: 16.0'

MOON

October 2031

	D	16h	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	Δ /h	SH
●	We 1	247°37.2 10°13.0	262°06.5 10°23.1	276°35.8 10°33.9	291°05.1 10°44.2	305°34.4 10°54.4	320°03.7 11°04.6	334°33.0 11°14.7	349°02.2 11°24.7	3°31.5 11°34.7	18°00.8 11°44.6	32°30.0 11°54.4	+29.3	15.8
	Th 2	249°48.5 14°12.0	264°17.7 14°20.5	278°46.9 14°28.9	293°16.1 14°37.2	307°45.3 14°45.4	322°14.5 14°53.6	336°43.7 15°01.7	351°12.9 15°09.6	5°42.0 15°17.5	20°11.2 15°25.3	34°40.4 15°33.0	+29.2	15.6
	Fr 3	251°57.8 17°17.1	266°26.9 17°23.3	280°56.1 17°29.4	295°25.3 17°35.3	309°54.4 17°41.2	324°23.6 17°47.0	338°52.8 17°52.6	353°21.9 17°58.2	7°51.1 18°03.6	22°20.3 18°09.0	36°49.9 18°14.3	+29.2	15.4
●	Sa 4	254°08.1 19°20.8	268°37.4 19°24.4	283°06.7 19°27.9	297°36.0 19°31.3	312°05.4 19°34.6	326°34.8 19°37.8	341°04.1 19°40.9	355°33.5 19°43.9	10°02.9 19°46.8	24°32.3 19°49.5	39°01.8 19°52.2	+29.4	15.2
	Su 5	256°25.4 20°19.8	270°55.1 20°20.8	285°24.9 20°21.7	299°54.7 20°22.5	314°24.5 20°23.2	328°54.3 20°23.8	343°24.1 20°24.3	357°54.0 20°24.7	12°23.9 20°25.0	26°53.9 20°25.2	41°23.8 20°25.3	+29.8	15.0
	Mo 6	258°56.5 20°14.8	273°26.9 20°13.3	287°57.3 20°11.7	302°27.8 20°10.1	316°58.3 20°08.3	331°28.8 20°06.4	345°59.4 20°04.5	0°30.0 20°02.4	15°00.7 20°00.3	29°31.3 19°58.0	44°02.0 19°55.7	+30.6	14.9
○	Tu 7	261°46.7 19°09.8	276°17.9 19°06.1	290°49.2 19°02.2	305°20.6 18°58.3	319°51.9 18°54.3	334°23.3 18°50.2	348°54.7 18°46.0	3°26.2 18°41.7	17°57.7 18°37.3	32°29.2 18°32.9	47°00.8 18°28.4	+31.4	14.8
	We 8	276°17.9 19°06.1	290°49.2 19°02.2	305°20.6 18°58.3	319°51.9 18°54.3	334°23.3 18°50.2	348°54.7 18°46.0	3°26.2 18°41.7	17°57.7 18°37.3	32°29.2 18°32.9	47°00.8 18°28.4	61°32.4 18°23.7	+31.4	14.8
	Th 9	279°30.6 17°05.1	294°02.7 16°59.2	308°34.9 16°53.3	323°07.1 16°47.2	337°39.4 16°37.1	352°11.7 16°25.0	6°44.0 16°28.8	21°16.3 16°26.5	35°48.7 16°16.1	50°21.1 16°09.6	64°53.5 16°03.1	+32.3	14.8
○	Fr 10	283°03.5 14°17.3	297°36.3 14°09.7	312°09.2 14°02.0	326°42.2 13°54.3	341°15.1 13°46.6	355°48.1 13°38.7	10°21.1 13°30.8	24°54.1 13°22.9	39°27.2 13°14.9	54°00.2 13°06.8	68°33.3 12°58.7	+33.0	14.8
	Sa 11	286°51.9 10°50.2	301°25.2 10°41.2	315°58.6 10°32.2	330°32.0 10°23.1	345°05.4 10°13.9	359°38.8 10°04.8	14°12.2 9°55.9	28°46.6 9°46.2	43°19.1 9°36.9	57°52.5 9°27.5	72°26.0 9°18.1	+33.4	14.9
	Su 12	290°48.4 6°51.8	305°21.9 6°41.7	319°55.4 6°31.6	334°28.9 6°21.5	349°02.3 6°11.3	3°35.9 6°01.1	18°09.4 5°50.9	32°42.9 5°40.6	47°16.4 5°30.3	61°49.9 5°19.9	76°23.8 5°09.6	+33.5	15.0
○	Mo 13	294°43.9 2°30.8	309°17.2 2°20.0	323°50.4 2°09.2	338°23.6 1°58.4	352°56.8 1°47.6	7°30.0 1°36.7	22°03.1 1°25.8	36°36.3 1°15.0	51°09.4 1°04.1	65°42.4 0°53.1	80°15.8 0°42.2	+33.2	15.1
	Tu 14	298°27.9 -0°02.8	313°00.4 -2°13.9	327°33.3 -2°24.9	342°05.5 -2°36.0	356°37.9 -2°47.0	11°10.3 -2°58.1	25°42.7 -3°09.1	40°15.0 -3°20.1	54°47.3 -3°31.1	69°19.6 -3°42.2	83°51.8 -3°53.2	+32.4	15.3
	We 15	301°49.5 -6°37.0	316°21.0 -6°47.8	330°52.4 -6°58.5	345°23.7 -7°09.3	359°55.0 -7°20.0	14°26.2 -7°30.7	28°57.4 -7°41.3	43°28.6 -7°51.9	57°59.6 -8°02.5	72°30.6 -8°13.1	87°01.6 -8°23.7	+31.2	15.5
●	Th 16	304°38.8 -10°57.2	319°08.8 -11°07.1	333°38.7 -11°17.0	348°08.6 -11°26.8	2°38.4 -11°36.6	17°08.1 -11°46.2	31°37.8 -11°55.8	46°07.4 -12°05.4	60°36.9 -12°14.9	75°06.4 -12°24.3	89°35.7 -12°33.7	+29.7	15.6
	Fr 17	306°48.5 -14°46.8	321°16.9 -14°55.1	335°45.1 -15°03.3	350°13.3 -15°11.5	4°41.4 -15°19.5	19°09.4 -15°27.5	33°37.4 -15°35.4	48°05.3 -15°43.4	62°33.1 -15°50.9	77°00.9 -15°58.5	91°28.6 -16°06.1	+28.0	15.8
	Sa 18	308°16.4 -17°47.9	322°43.1 -17°53.9	337°09.7 -17°59.8	351°36.3 -18°05.5	6°02.8 -18°11.2	20°29.2 -18°16.7	34°55.6 -18°22.2	49°22.0 -18°27.5	63°48.3 -18°32.7	78°14.5 -18°37.9	92°56.2 -18°42.9	+26.4	15.9
○	Su 19	309°07.6 -19°43.6	323°33.1 -19°46.7	337°58.5 -19°49.7	352°50.4 -19°52.5	7°15.2 -19°55.2	21°14.6 -19°57.7	35°39.8 -20°00.2	50°05.1 -20°02.5	64°30.3 -20°04.7	78°55.5 -20°06.7	93°20.7 -20°08.6	+25.3	16.0
	Mo 20	309°35.7 -20°21.6	324°00.6 -20°21.4	338°25.5 -20°21.0	352°50.4 -20°20.6	7°55.3 -20°20.0	21°40.1 -20°19.2	36°05.0 -20°18.4	50°29.9 -20°17.3	64°54.8 -20°16.2	79°46.4 -20°14.9	93°44.8 -20°13.5	+24.9	16.1
	Tu 21	309°59.3 -19°36.5	324°24.4 -19°33.0	338°49.6 -19°29.4	353°14.8 -19°25.6	7°40.0 -19°21.7	22°05.2 -19°17.7	36°30.4 -19°13.5	50°55.7 -19°09.3	65°21.0 -19°04.9	79°46.4 -19°00.3	94°11.8 -18°55.7	+25.2	16.1
○	We 22	310°36.8 -17°31.6	325°02.8 -17°23.1	339°28.8 -17°18.5	353°54.9 -17°11.7	8°21.0 -17°04.9	22°47.2 -16°57.9	37°13.4 -16°50.9	51°39.7 -16°43.7	66°06.0 -16°36.4	80°32.4 -16°29.9	94°58.8 -16°21.5	+26.2	16.1
	Th 23	311°40.6 -14°17.6	326°07.8 -14°08.6	340°35.0 -13°59.5	355°02.3 -13°50.4	9°29.6 -13°41.1	23°57.0 -13°31.8	38°24.4 -13°22.4	52°51.9 -13°12.9	67°19.4 -13°03.4	81°47.0 -12°53.7	96°14.8 -12°44.0	+27.4	16.1
	Fr 24	313°14.6 -10°10.0	327°42.9 -9°59.2	342°11.3 -9°48.4	356°39.8 -9°37.5	11°08.3 -9°26.5	25°36.8 -9°15.6	40°05.4 -9°04.5	54°34.0 -8°53.4	69°02.6 -8°42.3	83°31.3 -8°31.1	98°00.0 -8°19.9	+28.5	16.1
○	Sa 25	315°15.3 -5°26.6	329°44.6 -5°14.8	344°13.9 -5°03.0	358°43.2 -4°51.1	13°12.6 -4°39.2	27°42.0 -4°27.3	42°11.4 -4°15.4	56°40.9 -4°03.4	71°10.3 -3°51.4	85°39.8 -3°39.5	100°09.3 -3°27.4	+29.4	16.6
	Su 26	317°34.6 -0°26.2	332°04.4 -0°14.1	346°34.2 -0°02.0	1°04.1 0°10.1	15°33.9 0°22.2	30°03.8 0°34.3	44°33.7 0°46.4	59°03.6 0°58.5	73°33.4 1°05.5	88°03.4 1°22.6	102°33.3 1°34.6	+29.9	16.0
	Mo 27	320°02.5 4°33.0	334°32.5 4°44.6	349°02.4 4°56.3	3°32.4 5°07.9	18°02.3 5°19.5	32°32.3 5°31.1	47°02.2 5°42.6	61°32.2 5°54.1	76°02.1 6°05.5	90°32.1 6°16.9	105°02.0 6°28.3	+30.0	15.9
○	Tu 28	322°30.0 9°13.2	336°59.8 9°23.8	351°29.6 9°34.3	5°59.3 9°44.8	20°29.1 9°55.2	34°58.6 10°05.6	49°28.6 10°15.9	63°58.3 10°26.1	78°28.0 10°36.2	92°57.7 10°46.3	107°27.4 10°56.4	+29.7	15.7
	We 29	324°50.9 13°18.6	339°20.3 13°27.4	353°49.3 13°36.8	8°19.2 13°45.0	22°48.6 13°53.6	37°18.2 14°02.0	51°47.4 14°10.7	66°16.8 14°19.1	80°46.1 14°27.4	95°15.5 14°35.6	109°44.8 14°43.8	+29.4	15.6
	Th 30	327°03.3 16°35.3	341°32.4 16°42.0	356°01.5 16°48.6	10°30.7 16°55.2	24°59.8 17°01.6	39°28.9 17°07.9	53°58.0 17°14.1	68°27.1 17°20.3	82°56.2 17°26.2	97°25.3 17°32.2	111°54.4 17°38.0	+29.1	15.4
○	Fr 31	329°10.2 18°53.5	343°39.2 18°57.7	358°08.3 19°01.8	12°37.4 19°05.8	27°06.4 19°09.7	41°35.5 19°13.5	56°04.6 19°17.1	70°33.7 19°20.7	85°02.8 19°24.2	99°31.9 19°27.6	114°01.0 19°30.9	+29.1	15.2
													+3.7	55.9

Row 1: GHA, Δ /h = GHA change - 14°, SH = semi-diameter
 Row 2: Dec (– = South), Δ /h = dec. change, SH = horizontal parallax
 Column = (UTC hour – day) mod 24
 LQ: 8 10h50 — NM: 16 08h20 — FQ: 23 07h36 — FM: 30 07h32

SUN

November 2031

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Sa 1	259°06.4 -14°21.3	274°06.5 -14°22.1	289°06.5 -14°22.9	304°06.5 -14°23.7	319°06.5 -14°24.6	334°06.5 -14°25.4	349°06.5 -14°26.2	4°06.6 -14°27.0	15°06.6 -14°27.7	34°06.6 -14°28.5	45°06.6 -14°29.3	64°06.6 -14°30.1	+0.0 -0.8
Su 2	259°06.8 -14°40.8	274°06.8 -14°41.3	289°06.9 -14°42.1	304°06.9 -14°42.9	319°06.9 -14°43.6	334°06.9 -14°44.4	349°06.9 -14°45.2	4°06.9 -14°46.0	15°06.9 -14°46.8	34°06.9 -14°47.6	45°06.9 -14°48.4	64°06.9 -14°49.2	+0.0 -0.8
Mo 3	259°07.0 -14°59.4	274°07.0 -15°00.2	289°07.0 -15°00.9	304°07.0 -15°01.7	319°07.0 -15°02.5	334°07.0 -15°03.3	349°07.0 -15°04.1	4°07.0 -15°04.9	15°07.0 -15°05.6	34°07.0 -15°06.4	45°07.0 -15°07.2	64°07.0 -15°08.0	+0.0 -0.8
Tu 4	259°07.0 -15°18.0	274°07.0 -15°18.8	289°07.0 -15°19.6	304°07.0 -15°20.4	319°07.0 -15°21.1	334°07.0 -15°21.9	349°07.0 -15°22.7	4°07.0 -15°23.4	15°07.0 -15°24.2	34°06.9 -15°25.0	45°06.9 -15°25.7	64°06.9 -15°26.5	-0.0 -0.8
We 5	259°06.8 -15°36.5	274°06.8 -15°37.2	289°06.8 -15°38.0	304°06.7 -15°38.7	319°06.7 -15°39.5	334°06.7 -15°40.3	349°06.7 -15°41.0	4°06.7 -15°41.8	15°06.7 -15°42.5	34°06.6 -15°43.3	45°06.6 -15°44.0	64°06.6 -15°44.8	-0.0 -0.8
Th 6	259°06.3 -15°54.6	274°06.3 -15°55.4	289°06.3 -15°56.1	304°06.3 -15°56.9	319°06.3 -15°57.6	334°06.2 -15°58.4	349°06.2 -15°59.1	4°06.2 -15°59.9	15°06.2 -16°00.6	34°06.1 -16°01.3	45°06.1 -16°02.1	64°06.1 -16°02.8	-0.0 -0.7
Fr 7	259°05.7 -16°12.5	274°05.7 -16°13.2	289°05.6 -16°14.0	304°05.6 -16°14.7	319°05.6 -16°15.5	334°05.5 -16°16.2	349°05.5 -16°16.9	4°05.5 -16°17.7	15°05.4 -16°18.4	34°05.4 -16°19.1	45°05.4 -16°19.9	64°05.3 -16°20.6	-0.0 -0.7
Sa 8	259°04.8 -16°30.1	274°04.8 -16°30.8	289°04.8 -16°31.6	304°04.7 -16°32.3	319°04.7 -16°33.0	334°04.6 -16°33.8	349°04.6 -16°34.5	4°04.5 -16°35.2	15°04.5 -16°35.9	34°04.5 -16°36.7	45°04.4 -16°37.4	64°04.4 -16°38.1	-0.0 -0.7
Su 9	259°03.8 -16°47.5	274°03.7 -16°48.2	289°03.7 -16°48.9	304°03.6 -16°49.6	319°03.6 -16°50.3	334°03.5 -16°51.0	349°03.5 -16°51.8	4°03.4 -16°52.5	15°03.4 -16°53.2	34°03.3 -16°53.9	45°03.2 -16°54.6	64°03.2 -16°55.3	-0.1 -0.7
Mo 10	259°02.5 -17°04.5	274°02.4 -17°05.2	289°02.3 -17°05.9	304°02.3 -17°06.6	319°02.2 -17°07.3	334°02.2 -17°08.0	349°02.1 -17°08.7	4°02.0 -17°09.4	15°02.0 -17°10.1	34°01.9 -17°10.8	45°01.9 -17°11.5	64°01.8 -17°12.2	-0.1 -0.7
Tu 11	259°01.0 -17°21.3	274°00.9 -17°22.0	289°00.8 -17°22.7	304°00.8 -17°23.4	319°00.7 -17°24.1	334°00.6 -17°24.7	349°00.5 -17°25.4	4°00.5 -17°26.1	15°00.4 -17°26.8	34°00.3 -17°27.5	45°00.3 -17°28.2	64°00.2 -17°28.9	-0.1 -0.7
We 12	258°59.2 -17°37.8	273°59.2 -17°38.4	288°59.1 -17°39.1	303°59.0 -17°39.8	318°58.9 -17°40.5	333°58.8 -17°41.2	348°58.8 -17°41.8	3°58.7 -17°42.5	15°58.6 -17°43.2	33°58.5 -17°43.9	45°58.4 -17°44.6	63°58.4 -17°45.2	-0.1 -0.7
Th 13	258°57.3 -17°53.9	273°57.2 -17°54.6	288°57.1 -17°55.3	303°57.0 -17°55.9	318°56.9 -17°56.6	333°56.9 -17°57.3	348°56.8 -17°57.9	3°56.7 -17°58.6	15°56.6 -17°59.2	33°56.5 -17°59.9	45°56.4 -18°00.6	63°56.3 -18°01.2	-0.1 -0.7
Fr 14	258°55.1 -18°09.8	273°55.0 -18°10.4	288°54.9 -18°11.1	303°54.9 -18°11.7	318°54.8 -18°12.4	333°54.7 -18°13.0	348°54.6 -18°13.7	3°54.5 -18°14.3	15°54.4 -18°15.0	33°54.3 -18°15.6	45°54.2 -18°16.3	63°54.1 -18°16.9	-0.1 -0.7
Sa 15	258°52.8 -18°25.3	273°52.7 -18°26.0	288°52.6 -18°26.6	303°52.5 -18°27.2	318°52.4 -18°27.9	333°52.2 -18°28.5	348°52.1 -18°29.2	3°52.0 -18°29.8	15°51.9 -18°30.4	33°51.8 -18°31.1	45°51.7 -18°31.7	63°51.6 -18°32.3	-0.1 -0.6
Su 16	258°50.2 -18°40.5	273°50.1 -18°41.2	288°50.0 -18°41.8	303°49.9 -18°42.4	318°49.7 -18°43.0	333°49.6 -18°43.7	348°49.5 -18°44.4	3°49.4 -18°44.9	15°49.3 -18°45.5	33°49.2 -18°46.1	45°49.1 -18°46.8	63°48.9 -18°47.4	-0.1 -0.6
Mo 17	258°47.4 -18°55.4	273°47.3 -18°56.0	288°47.2 -18°56.6	303°47.0 -18°57.3	318°46.9 -18°57.9	333°46.8 -18°58.5	348°46.7 -18°59.1	3°46.5 -18°59.7	15°46.4 -19°00.3	33°46.3 -19°00.9	45°46.2 -19°01.5	63°46.1 -19°02.1	-0.1 -0.6
Tu 18	258°44.2 -19°10.6	273°44.3 -19°10.6	288°44.1 -19°11.2	303°44.0 -19°11.8	318°43.9 -19°12.4	333°43.8 -19°13.0	348°43.6 -19°13.6	3°43.5 -19°14.1	15°43.4 -19°14.7	33°43.2 -19°15.3	45°43.1 -19°15.9	63°43.0 -19°16.5	-0.1 -0.6
We 19	258°41.2 -19°24.2	273°41.1 -19°24.8	288°40.9 -19°25.3	303°40.8 -19°25.9	318°40.7 -19°26.5	333°40.5 -19°27.1	348°40.4 -19°27.7	3°40.2 -19°28.3	15°40.1 -19°28.8	33°40.0 -19°29.4	45°39.8 -19°30.0	63°39.7 -19°30.6	-0.1 -0.6
Th 20	258°37.8 -19°38.6	273°37.7 -19°38.6	288°37.5 -19°39.2	303°37.4 -19°39.7	318°37.2 -19°40.3	333°37.1 -19°40.9	348°36.9 -19°41.4	3°36.8 -19°42.0	15°36.6 -19°42.6	33°36.5 -19°43.1	45°36.3 -19°43.7	63°36.2 -19°44.3	-0.1 -0.6
Fr 21	258°34.2 -19°52.1	273°34.1 -19°52.1	288°33.9 -19°52.6	303°33.7 -19°53.2	318°33.6 -19°53.7	333°33.4 -19°54.3	348°33.3 -19°54.8	3°33.1 -19°55.4	15°33.0 -19°55.9	33°32.8 -19°56.5	45°32.7 -19°57.0	63°32.5 -19°57.6	-0.2 -0.6
Sa 22	258°30.4 -20°04.7	273°30.3 -20°05.2	288°30.1 -20°05.7	303°29.9 -20°06.3	318°29.8 -20°06.8	333°29.6 -20°07.4	348°29.4 -20°07.9	3°29.3 -20°08.4	15°29.1 -20°09.0	33°28.9 -20°09.5	45°28.8 -20°10.0	63°28.6 -20°10.6	-0.2 -0.5
Su 23	258°26.4 -20°17.4	273°26.3 -20°18.0	288°26.1 -20°18.5	303°25.9 -20°19.0	318°25.7 -20°19.5	333°25.6 -20°20.0	348°25.4 -20°20.6	3°25.2 -20°21.1	15°25.1 -20°21.6	33°24.9 -20°22.1	45°24.7 -20°22.6	63°24.5 -20°23.2	-0.2 -0.5
Mo 24	258°22.2 -20°29.8	273°22.1 -20°30.3	288°21.9 -20°30.8	303°21.7 -20°31.3	318°21.5 -20°31.9	333°21.4 -20°32.4	348°21.2 -20°32.9	3°21.0 -20°33.4	15°20.8 -20°33.9	33°20.6 -20°34.4	45°20.5 -20°34.9	63°20.3 -20°35.4	-0.2 -0.5
Tu 25	258°17.9 -20°41.8	273°17.7 -20°42.3	288°17.5 -20°42.8	303°17.3 -20°43.3	318°17.1 -20°43.8	333°16.9 -20°44.3	348°16.8 -20°44.8	3°16.6 -20°45.3	15°16.4 -20°45.8	33°16.2 -20°46.2	45°16.0 -20°46.7	63°15.8 -20°47.2	-0.2 -0.5
We 26	258°13.3 -20°53.5	273°13.1 -20°53.9	288°12.9 -20°54.4	303°12.7 -20°54.9	318°12.6 -20°55.4	333°12.4 -20°55.8	348°12.2 -20°56.3	3°12.0 -20°56.8	15°11.8 -20°57.3	33°11.6 -20°57.7	45°11.4 -20°58.2	63°11.2 -20°58.7	-0.2 -0.5
Th 27	258°08.6 -21°04.7	273°08.4 -21°05.2	288°08.2 -21°05.6	303°08.0 -21°06.1	318°07.8 -21°06.5	333°07.6 -21°07.0	348°07.4 -21°07.5	3°07.2 -21°07.9	15°07.0 -21°08.4	33°06.8 -21°08.9	45°06.6 -21°09.3	63°06.4 -21°09.7	-0.2 -0.5
Fr 28	258°03.7 -21°15.8	273°03.5 -21°16.0	288°03.3 -21°16.4	303°03.1 -21°16.9	318°02.8 -21°17.3	333°02.6 -21°17.8	348°02.4 -21°18.2	3°02.2 -21°18.6	15°02.0 -21°19.1	33°01.8 -21°19.5	45°01.6 -21°19.9	63°01.4 -21°20.4	-0.2 -0.4
Sa 29	257°58.6 -21°26.6	272°58.4 -21°26.8	287°58.2 -21°26.8	302°57.9 -21°27.3	317°57.7 -21°27.7	332°57.5 -21°28.1	347°57.3 -21°28.5	2°57.1 -21°29.0	15°56.8 -21°29.4	32°56.6 -21°29.8	45°56.4 -21°30.2	62°56.2 -21°30.6	-0.2 -0.4
Su 30	257°53.3 -21°36.0	272°53.1 -21°36.4	287°52.9 -21°36.8	302°52.6 -21°37.3	317°52.4 -21°37.7	332°52.2 -21°38.1	347°52.0 -21°38.5	2°51.8 -21°38.9	15°51.5 -21°39.3	32°51.3 -21°39.7	45°51.1 -21°40.1	62°50.8 -21°40.5	-0.2 -0.4

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

November 2031

	D	16h	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	Δ/h	SH
Sa 1	229°54.2	244°23.4	258°52.6	273°21.8	287°51.1	302°20.3	316°49.6	331°18.9	345°48.2	0°17.6	14°46.9	+29.3	15.1	
	19°53.2	19°55.6	19°57.8	19°59.9	20°01.9	20°03.8	20°05.6	20°07.3	20°08.9	20°10.4	20°11.7	+1.9	55.5	
Su 2	232°09.9	246°39.6	261°09.4	275°39.2	290°09.0	304°38.9	319°08.8	333°38.7	348°08.6	2°38.6	17°08.6	+29.9	15.0	
	20°20.0	20°19.7	20°19.3	20°18.9	20°18.3	20°17.6	20°16.8	20°16.0	20°15.0	20°13.9	20°12.8	-0.7	54.9	
Mo 3	234°42.9	249°13.5	263°44.1	278°14.8	292°45.5	307°16.2	321°47.0	336°17.4	350°48.6	5°19.5	19°50.5	+30.8	14.9	
	19°43.6	19°40.9	19°38.1	19°35.2	19°32.2	19°29.2	19°26.0	19°22.8	19°19.4	19°16.0	19°12.5	-3.1	54.5	
Tu 4	237°39.3	252°10.9	266°42.5	281°14.1	295°45.8	310°17.6	324°49.4	339°21.2	353°53.1	8°25.0	22°56.9	+31.8	14.8	
	18°09.6	18°04.7	17°59.8	17°54.8	17°49.7	17°44.5	17°39.3	17°33.9	17°28.5	17°23.0	17°17.5	-5.2	54.2	
We 5	241°00.7	255°33.2	270°05.8	284°38.4	299°11.1	313°43.8	328°16.5	342°49.3	357°22.1	11°54.9	26°27.8	+32.7	14.8	
	15°45.4	15°38.7	15°31.9	15°25.1	15°18.2	15°11.2	15°04.2	14°57.1	14°50.0	14°42.7	14°35.5	-7.0	54.2	
Th 6	244°44.3	259°17.6	273°51.0	288°24.4	302°57.7	317°31.2	332°04.6	346°38.1	1°11.6	15°45.1	30°18.6	+33.4	14.8	
	12°39.1	12°30.8	12°22.6	12°14.3	12°05.9	11°57.5	11°49.0	11°40.4	11°31.9	11°23.2	11°14.5	-8.5	54.2	
Fr 7	248°43.5	263°17.2	277°51.0	292°24.8	306°58.6	321°32.4	336°06.2	350°40.0	5°13.8	19°47.6	34°21.5	+33.8	14.9	
	8°58.7	8°49.3	8°39.8	8°30.3	8°20.8	8°11.2	8°01.6	7°51.9	7°42.2	7°32.5	7°22.8	-9.6	54.5	
Sa 8	263°17.2	277°51.0	292°24.8	306°58.6	321°32.4	336°06.2	350°40.0	5°13.8	19°47.6	34°21.5	48°55.3	+33.8	14.9	
	8°49.3	8°39.8	8°30.3	8°20.8	8°11.2	8°01.6	7°51.9	7°42.2	7°32.5	7°22.8	7°13.0	-9.6	54.5	
Su 9	267°22.5	281°56.3	296°30.0	311°03.8	325°37.3	340°11.2	354°44.9	9°18.6	23°52.3	38°26.0	52°59.6	+33.7	15.0	
	4°41.9	4°31.6	4°21.2	4°10.9	4°00.5	3°50.1	3°39.6	3°29.1	3°18.7	3°08.1	2°57.6	-10.4	55.0	
Mo 10	271°21.9	285°55.2	300°28.4	315°01.7	329°34.8	344°08.0	358°41.1	13°14.2	27°47.3	42°20.3	56°53.2	+33.1	15.2	
	0°17.2	0°06.4	-0°04.4	-0°15.3	-0°26.1	-0°37.0	-0°47.9	-0°58.7	-1°09.6	-1°20.5	-1°31.4	-10.9	55.6	
Tu 11	275°02.9	289°35.2	304°07.2	318°39.6	333°11.1	347°43.8	362°15.8	376°47.8	31°19.7	45°51.5	60°23.3	+32.0	15.4	
	-4°15.1	-4°26.0	-4°36.9	-4°47.7	-4°58.6	-5°09.4	-5°20.3	-5°31.1	-5°41.9	-5°52.7	-6°03.5	-10.8	56.4	
We 12	278°12.9	292°43.7	307°14.4	321°45.0	336°15.6	350°46.1	365°16.5	379°46.9	34°17.2	48°47.4	63°17.6	+30.5	15.6	
	-8°42.9	-8°53.4	-9°03.7	-9°14.1	-9°24.4	-9°34.7	-9°44.9	-9°55.2	-10°05.3	-10°15.5	-10°25.6	-10.3	57.2	
Th 13	280°40.6	295°09.5	309°38.3	324°07.1	338°35.7	353°04.3	367°32.8	381°59.1	22°01.2	36°29.6	50°57.8	+28.5	15.8	
	-12°51.2	-13°00.5	-13°09.7	-13°18.9	-13°27.9	-13°37.0	-13°45.9	-13°54.8	-14°03.6	-14°12.4	-14°21.1	-9.0	58.0	
Fr 14	282°19.0	296°45.9	311°12.7	325°39.4	340°06.3	354°32.6	369°19.1	383°51.9	23°25.5	37°51.9	52°18.3	+26.5	16.0	
	-16°21.7	-16°29.1	-16°36.4	-16°43.5	-16°50.6	-16°57.6	-17°04.5	-17°11.2	-17°17.9	-17°24.5	-17°31.0	-6.9	58.7	
Sa 15	283°08.7	297°33.8	311°58.8	326°23.8	340°48.7	355°13.6	369°38.4	383°59.1	24°03.2	38°27.9	52°52.5	67°17.1	+24.8	16.2
	-18°54.9	-18°59.5	-19°04.1	-19°08.5	-19°12.8	-19°16.9	-19°21.0	-19°24.9	-19°28.7	-19°32.4	-19°35.9	-4.1	59.3	
Su 16	283°21.0	297°45.0	312°08.9	326°32.9	340°56.8	355°20.7	370°44.6	24°08.4	38°32.3	52°56.1	67°19.9	+23.9	16.3	
	-20°12.9	-20°14.3	-20°15.5	-20°16.6	-20°17.6	-20°18.4	-20°19.1	-20°19.6	-20°20.0	-20°20.3	-20°20.4	-0.7	59.7	
Mo 17	283°16.8	297°40.7	312°04.6	326°28.4	340°52.3	355°16.3	370°40.2	24°04.2	38°28.2	52°52.2	67°16.2	+23.9	16.3	
	-20°05.0	-20°02.9	-20°00.6	-19°58.2	-19°55.6	-19°52.9	-19°50.0	-19°47.0	-19°43.9	-19°40.7	-19°37.3	+2.8	59.8	
Tu 18	283°21.1	297°45.8	312°10.5	326°35.3	341°00.1	355°25.0	370°49.9	24°14.8	38°39.9	53°04.9	67°30.1	+24.9	16.3	
	-18°30.5	-18°25.0	-18°19.4	-18°13.7	-18°07.9	-18°01.9	-17°55.8	-17°49.6	-17°43.7	-17°36.8	-17°30.3	+6.0	59.8	
We 19	283°54.1	298°20.2	312°46.4	327°12.6	341°38.9	356°05.2	371°51.2	24°58.1	39°24.7	53°51.3	68°18.0	+26.4	16.3	
	-15°39.0	-15°30.7	-15°22.2	-15°14.0	-15°05.4	-14°56.8	-14°48.1	-14°39.3	-14°30.4	-14°21.5	-14°12.4	+8.7	59.6	
Th 20	285°05.8	299°33.5	314°01.2	328°29.0	342°56.9	357°24.8	372°52.8	26°20.9	40°49.0	55°17.2	69°45.4	+28.0	16.2	
	-11°47.2	-11°37.0	-11°26.6	-11°16.3	-11°05.8	-10°55.3	-10°44.8	-10°34.2	-10°23.5	-10°12.8	-10°02.0	+10.5	59.3	
Fr 21	286°55.5	301°24.5	315°53.7	330°22.8	344°52.1	359°21.3	374°50.6	28°20.0	42°49.4	57°18.8	71°48.3	+29.3	16.0	
	-7°14.8	-7°03.3	-6°51.8	-6°40.3	-6°28.8	-6°17.2	-6°05.6	-5°53.9	-5°42.3	-5°30.6	-5°18.8	+11.6	58.8	
Sa 22	289°15.1	303°45.2	318°15.3	332°45.4	347°15.5	362°15.7	377°15.8	16°15.8	30°46.1	45°16.3	59°46.5	74°16.8	+30.2	15.9
	-2°21.2	-2°09.2	-1°57.3	-1°45.4	-1°33.4	-1°21.5	-1°09.6	-0°57.6	-0°45.7	-0°33.8	-0°21.8	+11.9	58.4	
Su 23	291°53.2	306°23.7	320°54.3	335°24.8	349°55.4	364°26.0	379°56.5	33°27.1	47°57.7	62°28.3	76°58.9	+30.6	15.8	
	2°35.8	2°47.5	2°59.2	3°10.9	3°22.5	3°34.1	3°45.7	3°57.3	4°08.9	4°20.4	4°31.8	+11.6	57.9	
Mo 24	294°37.8	309°08.3	323°38.9	338°09.4	352°40.0	367°10.5	382°41.1	36°11.6	50°42.1	65°12.6	79°43.1	+30.5	15.6	
	7°19.9	7°30.8	7°41.7	7°52.5	8°03.2	8°13.9	8°24.6	8°35.2	8°45.7	8°56.2	9°06.7	+10.7	57.4	
Tu 25	297°18.8	311°49.1	326°19.4	340°49.6	355°19.8	370°50.0	385°20.2	38°50.3	53°20.5	67°50.6	82°20.7	+30.2	15.5	
	11°36.6	11°46.1	11°55.5	12°04.9	12°14.2	12°23.4	12°32.6	12°41.7	12°50.7	12°59.6	13°08.5	+29.2	56.9	
We 26	299°50.2	314°20.0	328°49.8	343°19.6	357°49.3	372°19.1	387°48.8	41°18.5	55°48.2	70°17.8	84°47.5	+29.7	15.4	
	15°12.5	15°20.1	15°27.7	15°35.1	15°42.5	15°49.8	15°57.0	16°04.1	16°11.1	16°18.1	16°24.9	+7.2	56.4	
Th 27	302°10.5	316°40.0	331°09.4	345°38.8	360°28.3	375°37.6	390°06.9	43°36.3	58°05.7	72°35.0	87°04.4	+29.4	15.2	
	17°56.6	18°02.0	18°07.3	18°12.4	18°17.5	18°22.5	18°27.3	18°32.1	18°36.8	18°41.3	18°45.8	+4.9	55.9	
Fr 28	304°24.1	318°53.4	333°22.8	347°52.1	362°21.4	377°50.7	392°40.1	45°49.4	60°18.8	74°48.1	89°17.5	+29.3	15.1	
	19°40.8	19°43.6	19°46.4	19°49.0	19°51.5	19°54.0	19°56.3	19°58.5	20°00.6	20°02.6	20°04.6	+2.4	55.4	
Sa 29	306°39.5	321°09.1	335°38.7	350°08.3	365°07.4	380°07.1	395°07.7	48°07.1	62°36.9	77°06.6	91°36.4	+29.7	15.0	
	20°20.8	20°21.1	20°21.2	20°21.3	20°21.2	20°21.1	20°20.8	20°20.5	20°20.0	20°19.4	20°18.8	-0.2	54.9	
Su 30	309°06.9	323°37.1	338°07.5	352°37.8	367°08.2	382°18.3	397°09.1	50°39.6	65°10.1	79°40.7	94°11.3	+30.4	14.9	
	19°57.1	19°54.9	19°52.5	19°50.1	19°47.6	19°45.0	19°42.3	19°39.5	19°36.7	19°33.7	19°30.6	-2.6	54.5	

SUN

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D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Mo 1	272°47.7 -21°46.0	287°47.4 -21°46.4	302°47.2 -21°46.8	317°47.0 -21°47.2	332°46.7 -21°47.6	347°46.5 -21°48.0	362°46.3 -21°48.4	377°46.0 -21°48.8	392°45.8 -21°49.2	407°45.6 -21°49.5	422°45.3 -21°49.9	437°45.1 -21°50.3	-0.2 -0.4
Tu 2	272°42.0 -21°55.2	287°41.8 -21°55.6	302°41.6 -21°56.0	317°41.3 -21°56.4	332°41.1 -21°56.7	347°40.9 -21°57.1	362°40.6 -21°57.5	377°40.4 -21°57.8	392°40.1 -21°58.2	407°39.9 -21°58.6	422°39.7 -21°59.0	437°39.4 -21°59.3	-0.2 -0.4
We 3	272°36.3 -22°04.0	287°36.0 -22°04.4	302°35.8 -22°04.7	317°35.5 -22°05.1	332°35.3 -22°05.4	347°35.1 -22°05.8	362°34.8 -22°06.1	377°34.6 -22°06.5	392°34.3 -22°06.8	407°34.1 -22°07.2	422°33.8 -22°07.5	437°33.6 -22°07.9	-0.2 -0.4
Th 4	272°30.4 -22°12.4	287°30.1 -22°12.7	302°29.9 -22°13.0	317°29.6 -22°13.4	332°29.4 -22°13.7	347°29.1 -22°14.0	362°28.9 -22°14.4	377°28.6 -22°14.7	392°28.3 -22°15.1	407°28.1 -22°15.4	422°27.8 -22°15.7	437°27.6 -22°16.0	-0.3 -0.3
Fr 5	272°24.3 -22°20.3	287°24.0 -22°20.6	302°23.8 -22°20.9	317°23.5 -22°21.2	332°23.3 -22°21.6	347°23.0 -22°21.9	362°22.7 -22°22.2	377°22.5 -22°22.5	392°22.2 -22°22.8	407°22.0 -22°23.1	422°21.7 -22°23.5	437°21.5 -22°23.8	-0.3 -0.3
Sa 6	272°18.1 -22°27.8	287°17.8 -22°28.1	302°17.5 -22°28.4	317°17.3 -22°28.7	332°17.0 -22°29.0	347°16.8 -22°29.3	362°16.5 -22°29.6	377°16.2 -22°29.9	392°16.0 -22°30.2	407°15.7 -22°30.5	422°15.4 -22°30.8	437°15.2 -22°31.1	-0.3 -0.3
Su 7	272°11.7 -22°34.8	287°11.4 -22°35.1	302°11.2 -22°35.4	317°10.9 -22°35.7	332°10.6 -22°35.9	347°10.4 -22°36.2	362°10.1 -22°36.5	377°09.8 -22°36.8	392°09.6 -22°37.1	407°09.3 -22°37.3	422°09.0 -22°37.6	437°08.8 -22°37.9	-0.3 -0.3
Mo 8	272°05.2 -22°41.4	287°05.0 -22°41.7	302°04.7 -22°42.0	317°04.4 -22°42.2	332°04.1 -22°42.5	347°03.9 -22°42.7	362°03.6 -22°43.0	377°03.3 -22°43.3	392°03.0 -22°43.5	407°02.8 -22°43.8	422°02.5 -22°44.0	437°02.2 -22°44.3	-0.3 -0.3
Tu 9	271°58.6 -22°47.6	286°58.3 -22°47.8	301°58.1 -22°48.1	316°57.8 -22°48.3	331°57.5 -22°48.6	346°57.2 -22°48.8	361°56.9 -22°49.1	376°56.7 -22°49.3	391°56.4 -22°49.5	406°56.1 -22°49.8	421°55.8 -22°50.1	436°55.5 -22°50.3	-0.3 -0.2
We 10	271°51.9 -22°58.6	286°51.6 -22°58.8	301°51.3 -22°59.0	316°51.0 -22°59.2	331°50.8 -22°59.4	346°50.5 -22°59.6	361°50.2 -22°59.8	376°49.9 -22°59.9	391°49.6 -22°59.9	406°49.3 -22°59.9	421°49.1 -22°59.9	436°48.8 -22°59.9	-0.3 -0.2
Th 11	271°45.1 -22°58.1	286°44.8 -22°58.8	301°44.5 -22°59.0	316°44.2 -22°59.2	331°43.9 -22°59.4	346°43.6 -22°59.6	361°43.3 -22°59.8	376°43.0 -22°59.9	391°42.8 -22°59.9	406°42.5 -22°59.9	421°42.2 -22°59.9	436°41.9 -22°59.9	-0.3 -0.2
Fr 12	271°38.1 -23°03.4	286°37.8 -23°03.6	301°37.5 -23°03.7	316°37.2 -23°03.9	331°36.9 -23°04.1	346°36.7 -23°04.3	361°36.4 -23°04.5	376°36.1 -23°04.7	391°35.8 -23°04.9	406°35.5 -23°05.0	421°35.2 -23°05.1	436°34.9 -23°05.4	-0.3 -0.2
Sa 13	271°31.1 -23°07.7	286°30.8 -23°07.9	301°30.5 -23°08.1	316°30.2 -23°08.2	331°29.9 -23°08.4	346°29.6 -23°08.6	361°29.3 -23°08.7	376°29.0 -23°08.9	391°28.7 -23°09.1	406°28.4 -23°09.1	421°28.1 -23°09.4	436°27.8 -23°09.6	-0.3 -0.2
Su 14	271°24.0 -23°11.6	286°23.7 -23°11.8	301°23.4 -23°11.9	316°23.1 -23°12.1	331°22.8 -23°12.2	346°22.5 -23°12.4	361°22.2 -23°12.5	376°21.9 -23°12.7	391°21.6 -23°12.8	406°21.3 -23°12.9	421°21.0 -23°13.1	436°20.7 -23°13.2	-0.3 -0.1
Mo 15	271°16.8 -23°15.2	286°16.5 -23°15.2	301°16.2 -23°15.3	316°15.9 -23°15.4	331°15.6 -23°15.6	346°15.3 -23°15.7	361°15.0 -23°15.8	376°14.7 -23°15.9	391°14.4 -23°16.1	406°14.1 -23°16.2	421°13.8 -23°16.3	436°13.5 -23°16.5	-0.3 -0.1
Tu 16	271°09.5 -23°18.0	286°09.2 -23°18.1	301°08.9 -23°18.2	316°08.6 -23°18.4	331°08.3 -23°18.6	346°08.0 -23°18.7	361°07.7 -23°18.8	376°07.4 -23°18.9	391°07.1 -23°19.0	406°06.8 -23°19.1	421°06.5 -23°19.1	436°06.2 -23°19.2	-0.3 -0.1
We 17	271°02.2 -23°20.8	286°01.9 -23°20.6	301°01.6 -23°20.7	316°01.3 -23°20.8	331°01.0 -23°21.0	346°00.7 -23°21.1	361°00.4 -23°21.1	376°00.1 -23°21.2	391°00.0 -23°21.2	406°00.0 -23°21.3	421°00.0 -23°21.4	436°00.0 -23°21.5	-0.3 -0.1
Th 18	270°54.8 -23°22.5	285°54.5 -23°22.6	300°54.2 -23°22.7	315°53.9 -23°22.8	330°53.6 -23°22.8	345°53.3 -23°22.9	360°53.0 -23°23.0	375°52.7 -23°23.0	390°52.4 -23°23.1	405°52.1 -23°23.2	420°51.8 -23°23.2	435°51.5 -23°23.3	-0.3 -0.1
Fr 19	270°47.4 -23°24.1	285°47.1 -23°24.2	300°46.8 -23°24.2	315°46.5 -23°24.3	330°46.2 -23°24.3	345°45.9 -23°24.4	360°45.6 -23°24.4	375°45.3 -23°24.4	390°45.0 -23°24.5	405°44.7 -23°24.6	420°44.4 -23°24.6	435°44.0 -23°24.7	-0.3 -0.1
Sa 20	270°40.0 -23°25.2	285°39.7 -23°25.2	300°39.4 -23°25.3	315°39.1 -23°25.3	330°38.8 -23°25.3	345°38.5 -23°25.4	360°38.2 -23°25.4	375°37.9 -23°25.4	390°37.5 -23°25.5	405°37.2 -23°25.5	420°36.9 -23°25.5	435°36.6 -23°25.5	-0.3 -0.0
Su 21	270°32.6 -23°25.8	285°32.3 -23°25.8	300°32.0 -23°25.9	315°31.6 -23°25.9	330°31.3 -23°25.9	345°31.0 -23°25.9	360°30.7 -23°25.9	375°30.4 -23°25.9	390°30.1 -23°25.9	405°29.8 -23°25.9	420°29.5 -23°25.9	435°29.2 -23°26.0	-0.3 -0.0
Mo 22	270°25.2 -23°26.0	285°24.8 -23°26.0	300°24.5 -23°26.0	315°24.2 -23°26.0	330°23.9 -23°26.0	345°23.6 -23°26.1	360°23.3 -23°26.1	375°23.0 -23°26.1	390°22.6 -23°26.1	405°22.3 -23°26.1	420°22.0 -23°26.1	435°21.7 -23°26.1	-0.3 +0.0
Tu 23	270°17.7 -23°25.2	285°17.4 -23°25.6	300°17.0 -23°25.6	315°16.7 -23°25.6	330°16.4 -23°25.6	345°16.1 -23°25.5	360°15.8 -23°25.5	375°15.5 -23°25.5	390°15.2 -23°25.5	405°14.9 -23°25.5	420°14.6 -23°25.4	435°14.3 -23°25.4	-0.3 +0.0
We 24	270°10.2 -23°24.9	285°09.9 -23°24.8	300°09.6 -23°24.8	315°09.3 -23°24.8	330°09.0 -23°24.7	345°08.7 -23°24.7	360°08.4 -23°24.6	375°08.1 -23°24.6	390°07.7 -23°24.5	405°07.4 -23°24.5	420°07.1 -23°24.4	435°06.8 -23°24.4	-0.3 +0.0
Th 25	270°02.8 -23°23.6	285°02.5 -23°23.6	300°02.2 -23°23.5	315°01.9 -23°23.4	330°01.5 -23°23.4	345°01.2 -23°23.4	360°00.9 -23°23.2	375°00.6 -23°23.2	390°00.3 -23°23.1	405°00.0 -23°23.0	420°00.0 -23°23.0	435°00.0 -23°22.9	-0.3 +0.1
Fr 26	269°55.4 -23°21.8	284°55.1 -23°21.7	299°54.7 -23°21.7	314°54.4 -23°21.6	329°54.1 -23°21.5	344°53.8 -23°21.5	359°53.5 -23°21.4	374°53.2 -23°21.2	389°52.9 -23°21.2	404°52.6 -23°21.1	419°52.3 -23°21.1	434°52.0 -23°21.0	-0.3 +0.1
Sa 27	269°48.0 -23°19.7	284°47.7 -23°19.6	299°47.4 -23°19.5	314°47.1 -23°19.4	329°46.8 -23°19.3	344°46.4 -23°19.2	359°46.1 -23°19.1	374°45.8 -23°19.0	389°45.5 -23°18.9	404°45.2 -23°18.8	419°44.9 -23°18.7	434°44.6 -23°18.5	-0.3 +0.1
Su 28	269°40.0 -23°17.0	284°40.3 -23°16.9	299°40.0 -23°16.8	314°39.7 -23°16.6	329°39.4 -23°16.4	344°39.1 -23°16.3	359°38.8 -23°16.2	374°38.5 -23°16.1	389°38.2 -23°15.9	404°37.9 -23°15.8	419°37.6 -23°15.7	434°37.3 -23°15.7	-0.3 +0.1
Mo 29	269°33.0 -23°13.9	284°33.0 -23°13.8	299°32.7 -23°13.6	314°32.4 -23°13.5	329°32.1 -23°13.4	344°31.8 -23°13.2	359°31.5 -23°13.1	374°31.2 -23°12.9	389°30.9 -23°12.8	404°30.6 -23°12.6	419°30.3 -23°12.5	434°30.0 -23°12.3	-0.3 +0.1
Tu 30	269°26.2 -23°10.8	284°25.8 -23°10.2	299°25.5 -23°10.0	314°25.2 -23°09.8	329°24.9 -23°09.7	344°24.6 -23°09.5	359°24.3 -23°09.4	374°24.0 -23°09.2	389°23.7 -23°09.0	404°23.4 -23°08.8	419°23.1 -23°08.7	434°22.8 -23°08.5	-0.3 +0.2
We 31	269°18.9 -23°06.3	284°18.6 -23°06.1	299°18.3 -23°05.9	314°18.0 -23°05.7	329°17.7 -23°05.5	344°17.4 -23°05.4	359°17.1 -23°05.0	374°16.8 -23°04.8	389°16.5 -23°04.6	404°16.2 -23°04.4	419°15.9 -23°04.3	434°15.6 -23°04.3	-0.3 +0.2

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

December 2031

	D	16h	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	Δ'/h	SH
O	Mo 1	224°48.4 18°59.0	239°19.4 18°55.1	253°50.5 18°51.0	268°21.6 18°46.9	282°52.7 18°42.7	297°23.8 18°38.4	311°55.0 18°34.0	326°26.3 18°29.6	340°57.6 18°25.0	355°28.9 18°20.4	10°00.3 18°15.7	+31.2	14.8
	Tu 2	227°55.9 16°55.7	242°28.0 16°49.7	257°00.1 16°43.7	271°32.2 16°37.6	286°04.4 16°31.5	300°36.6 16°25.2	315°08.9 16°18.9	329°41.2 16°12.6	344°13.5 16°06.1	358°45.9 15°59.6	13°18.3 15°53.1	+32.2	14.8
	We 3	231°29.4 14°06.8	246°02.4 13°59.2	260°35.5 13°51.6	275°08.6 13°43.9	289°41.8 13°36.1	304°14.9 13°28.3	318°48.2 13°20.4	333°21.4 13°12.5	347°54.7 13°04.6	2°28.0 12°56.5	17°01.4 12°48.5	+33.2	14.7
O	Th 4	235°25.1 10°41.2	249°58.9 10°32.4	264°32.7 10°23.5	279°06.5 10°14.5	293°40.4 10°05.5	308°14.3 9°56.5	322°48.2 9°47.4	337°22.1 9°38.3	351°56.0 9°29.1	6°30.0 9°19.9	21°04.0 9°10.7	+33.9	14.8
	Fr 5	239°35.4 6°47.7	254°09.5 6°37.9	268°43.7 6°28.0	283°17.9 6°18.1	297°52.1 6°08.2	312°26.3 5°58.3	327°00.5 5°48.4	341°34.7 5°38.4	356°08.9 5°28.4	10°43.1 5°18.3	25°17.3 5°08.2	+34.2	14.8
	Sa 6	243°49.7 2°34.4	258°23.8 2°23.9	272°57.9 2°13.5	287°31.9 2°03.0	302°06.0 1°52.5	316°40.0 1°42.1	331°14.0 1°31.5	345°48.0 1°21.0	0°22.0 1°10.5	14°55.9 0°59.9	29°29.9 0°49.4	+34.0	15.0
O	Su 7	247°55.7 -1°50.2	262°29.1 -2°00.9	277°02.6 -2°11.6	291°36.0 -2°22.3	306°09.3 -2°33.0	320°42.6 -2°43.7	335°15.9 -2°54.4	349°49.2 -3°05.1	4°22.4 -3°15.8	18°55.5 -3°26.5	33°28.6 -3°37.2	+33.3	15.1
	Mo 8	262°29.1 -2°00.9	277°02.6 -2°11.6	291°36.0 -2°22.3	306°09.3 -2°33.0	320°42.6 -2°43.7	335°15.9 -2°54.4	349°49.2 -3°05.1	4°22.4 -3°15.8	18°55.5 -3°26.5	33°28.6 -3°37.2	48°01.7 -3°47.9	+33.3	15.1
	Tu 9	266°11.7 -6°27.2	280°44.0 -6°37.7	295°16.1 -6°48.2	309°48.3 -6°58.7	324°20.3 -7°09.1	338°52.3 -7°19.6	353°24.2 -7°30.0	7°56.1 -7°40.4	22°29.7 -7°50.8	36°59.6 -8°01.1	51°31.3 -8°11.5	+32.0	15.4
O	We 10	269°17.7 -10°42.9	283°48.2 -10°32.0	298°18.6 -10°22.5	312°48.9 -10°12.2	327°19.2 -10°11.9	341°49.3 -10°01.1	356°19.4 -10°41.1	10°49.4 -11°50.7	25°19.3 -12°00.2	39°49.2 -12°09.6	54°18.9 -12°19.0	+30.1	15.6
	Th 11	271°34.6 -14°33.1	286°03.0 -14°41.5	300°31.2 -14°49.9	314°59.3 -14°58.2	329°27.4 -15°06.4	343°55.4 -15°14.5	358°23.2 -15°22.6	12°51.0 -15°30.6	27°18.7 -15°38.5	41°46.3 -15°46.3	56°13.8 -15°54.0	+27.9	15.9
	Fr 12	275°55.2 -17°39.3	287°21.2 -17°45.6	301°47.2 -17°51.7	316°13.0 -17°57.8	330°57.1 -18°03.7	345°04.5 -18°09.5	359°30.1 -18°15.2	13°55.6 -18°20.8	28°21.0 -18°26.3	42°46.4 -18°31.7	57°11.6 -18°36.9	+25.6	16.1
O	Sa 13	273°21.2 -19°41.4	287°45.3 -19°44.4	302°09.3 -19°47.8	316°33.2 -19°50.8	330°57.1 -19°53.7	345°20.9 -19°56.4	359°44.6 -19°59.0	14°08.3 -20°01.5	28°32.0 -20°03.8	42°55.6 -20°06.0	57°19.1 -20°08.0	+23.8	16.3
	Su 14	273°07.1 -20°21.5	287°30.0 -20°21.2	301°52.9 -20°20.8	316°15.5 -20°20.2	330°57.1 -20°19.5	345°01.6 -20°18.6	359°24.4 -20°17.6	13°47.3 -20°16.5	28°10.1 -20°15.1	42°32.9 -20°13.7	56°55.7 -20°12.1	+22.9	16.5
	Mo 15	272°38.4 -19°30.2	287°01.4 -19°26.2	301°24.4 -19°22.1	315°47.2 -19°17.9	330°10.5 -19°13.5	344°33.5 -19°09.0	358°56.6 -19°04.3	13°19.8 -18°59.5	27°43.0 -18°54.6	42°06.2 -18°49.5	56°29.4 -18°44.3	+23.1	16.6
O	Tu 16	272°23.8 -17°10.3	286°47.8 -17°03.1	301°11.9 -16°55.7	315°36.1 -16°48.2	330°00.3 -16°40.4	344°24.6 -16°32.8	358°49.0 -16°25.0	13°13.4 -16°17.9	27°37.9 -16°09.0	42°02.4 -16°00.8	56°27.1 -15°52.5	+24.3	16.6
	We 17	273°44.6 -13°36.4	287°10.3 -13°26.6	301°36.2 -13°16.8	316°02.0 -13°06.8	330°28.0 -12°56.7	344°54.0 -12°46.6	359°20.1 -12°36.4	13°46.3 -12°26.2	28°12.6 -12°15.8	42°38.9 -12°05.4	57°05.3 -11°54.9	+26.1	16.5
	Th 18	273°49.7 -9°10.3	288°17.7 -8°58.9	302°44.8 -8°47.4	317°12.5 -8°35.9	331°40.2 -8°24.4	346°08.0 -8°12.8	0°35.9 -8°01.2	15°03.8 -7°49.6	29°31.8 -7°37.9	43°59.8 -7°26.2	58°27.9 -7°14.4	+27.8	16.3
O	Fr 19	275°36.5 -4°15.2	290°05.5 -4°03.1	304°34.6 -3°51.0	319°03.7 -3°38.9	333°32.9 -3°26.7	348°02.1 -3°14.6	0°21.3 -3°02.5	17°00.7 -2°50.3	31°30.0 -2°38.2	45°59.4 -2°26.0	60°28.8 -2°13.9	+29.2	16.1
	Sa 20	277°55.1 0°47.6	292°25.2 0°59.6	306°55.5 1°11.6	321°25.3 1°23.6	335°55.5 1°35.5	350°25.6 1°47.4	4°55.8 1°59.3	19°26.0 2°11.2	33°56.2 2°23.1	48°26.4 2°34.9	62°56.7 2°46.7	+30.2	15.9
	Su 21	280°33.1 5°40.1	295°03.6 5°51.4	309°34.2 6°02.6	324°04.7 6°13.8	338°35.3 6°24.9	353°05.9 6°36.0	7°36.5 6°47.1	22°07.1 6°58.1	36°37.7 7°09.1	51°08.3 7°20.0	65°38.9 7°30.8	+30.6	15.7
O	Mo 22	283°18.2 10°07.6	297°48.8 10°17.6	312°19.5 10°27.5	326°50.1 10°37.4	341°20.6 10°47.2	355°51.2 10°56.9	10°21.8 11°06.6	24°52.4 11°16.2	39°23.0 11°25.8	53°53.5 11°35.3	68°24.1 11°44.7	+30.6	15.5
	Tu 23	286°01.1 13°57.6	300°31.5 14°05.9	315°01.9 14°14.1	329°32.2 14°22.2	344°02.6 14°30.2	358°32.9 14°38.2	13°03.2 14°46.1	27°33.5 14°53.9	42°03.8 15°01.6	56°34.0 15°09.2	71°04.3 15°16.8	+30.3	15.4
	We 24	288°36.4 17°00.0	303°06.4 17°06.2	317°36.4 17°12.3	332°06.4 17°18.3	346°36.4 17°24.2	1°06.4 17°30.0	13°36.4 17°35.7	30°06.3 17°41.4	44°36.3 17°46.9	59°06.2 17°52.4	73°36.1 17°57.7	+30.0	15.2
O	Th 25	291°03.6 19°06.6	305°33.4 19°10.4	320°03.2 19°14.2	334°33.0 19°17.8	349°02.7 19°21.3	3°32.5 19°24.7	18°02.2 19°28.1	32°32.0 19°31.3	47°01.7 19°34.4	61°31.4 19°37.4	76°01.2 19°40.4	+29.8	15.1
	Fr 26	293°27.5 20°12.2	307°57.2 20°13.5	322°27.0 20°15.8	336°56.8 20°15.8	351°26.7 20°16.9	5°56.5 20°17.8	20°26.3 20°18.6	34°56.2 20°19.3	48°26.0 20°19.9	63°55.9 20°20.4	78°25.8 20°20.8	+29.8	15.0
	Sa 27	295°55.9 20°14.9	310°26.1 20°13.8	324°56.3 20°12.5	339°26.5 20°11.1	353°56.7 20°09.6	8°27.0 20°08.1	22°57.3 20°06.4	37°27.6 20°04.6	51°57.9 20°02.8	66°28.9 20°00.8	80°58.3 19°58.8	+30.3	14.9
O	Su 28	298°38.2 19°16.9	313°09.1 19°13.4	327°40.0 19°09.8	342°10.9 19°06.1	356°41.9 19°02.3	11°13.0 18°58.4	25°44.0 18°54.5	40°15.1 18°50.5	54°46.3 18°46.3	69°17.5 18°42.1	83°48.7 18°37.8	+31.0	14.8
	Mo 29	301°41.4 17°23.6	316°13.3 17°18.0	330°45.2 17°12.3	345°17.1 17°06.6	359°49.1 17°00.8	14°21.0 16°54.9	28°53.0 16°49.0	43°25.1 16°43.0	57°57.2 16°36.9	72°29.4 16°30.7	87°01.6 16°24.5	+32.0	14.7
	Tu 30	305°09.2 14°02.8	319°42.0 14°35.5	334°14.8 14°28.2	348°47.7 14°20.8	3°20.7 14°13.3	17°53.6 14°05.8	32°26.6 13°58.2	46°59.7 13°50.5	61°39.2 13°42.8	76°05.8 13°35.1	90°39.0 13°27.3	+33.0	14.7
O	We 31	309°00.2 11°23.8	323°33.9 11°15.1	338°07.6 11°06.5	352°41.3 10°57.8	7°15.1 10°49.0	21°48.8 10°40.2	36°22.7 10°31.3	50°56.5 10°22.4	65°30.3 10°13.5	80°04.2 10°04.5	94°38.1 9°55.5	+33.8	14.7

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameterRow 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 7 03h19 — NM: 14 09h05 — FQ: 21 00h00 — FM: 28 17h33

SUN

January 2032

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Th 1	269°11.7 -23°01.7	284°11.4 -23°01.6	299°11.1 -23°01.4	314°10.8 -23°01.2	329°10.6 -23°01.0	344°10.3 -23°00.7	359°10.0 -23°00.5	14°09.7 -23°00.3	29°09.4 -23°00.1	44°09.1 -22°59.9	59°08.8 -22°59.7	74°08.5 -22°59.5	-0.3 +0.2
Fr 2	269°04.7 -22°56.8	284°04.4 -22°56.6	299°04.1 -22°56.3	314°03.8 -22°56.1	329°03.5 -22°55.9	344°03.2 -22°55.7	359°02.9 -22°55.5	14°02.6 -22°55.2	29°02.3 -22°55.0	44°02.0 -22°54.8	59°01.8 -22°54.6	74°01.5 -22°54.3	-0.3 +0.2
Sa 3	268°57.7 -22°51.3	283°57.4 -22°51.1	298°57.1 -22°50.9	313°56.8 -22°50.6	328°56.5 -22°50.4	343°56.3 -22°50.1	358°56.0 -22°49.7	13°55.7 -22°49.7	28°55.4 -22°49.2	43°55.1 -22°48.9	58°54.8 -22°48.7	73°54.5 -22°48.7	-0.3 +0.2
Su 4	268°50.8 -22°45.4	283°50.5 -22°45.2	298°50.2 -22°44.9	313°50.0 -22°44.7	328°49.7 -22°44.4	343°49.4 -22°44.2	358°49.1 -22°43.9	13°48.8 -22°43.6	28°48.5 -22°43.4	43°48.2 -22°43.1	58°48.0 -22°42.8	73°47.7 -22°42.6	-0.3 +0.3
Mo 5	268°44.0 -22°39.1	283°43.7 -22°38.8	298°43.4 -22°38.5	313°43.2 -22°38.3	328°42.9 -22°38.0	343°42.6 -22°37.7	358°42.3 -22°37.4	13°42.0 -22°37.2	28°41.8 -22°36.9	43°41.5 -22°36.6	58°41.2 -22°36.3	73°40.9 -22°36.0	-0.3 +0.3
Tu 6	268°37.3 -22°32.3	283°37.0 -22°32.0	298°36.8 -22°31.7	313°36.5 -22°31.4	328°36.2 -22°31.1	343°35.9 -22°30.8	358°35.7 -22°30.5	13°35.4 -22°30.2	28°35.1 -22°29.9	43°34.8 -22°29.6	58°34.6 -22°29.3	73°34.3 -22°29.0	-0.3 +0.3
We 7	268°30.7 -22°25.0	283°30.5 -22°24.7	298°30.2 -22°24.4	313°29.9 -22°24.2	328°29.6 -22°23.8	343°29.4 -22°23.5	358°29.1 -22°23.2	13°28.8 -22°22.9	28°28.6 -22°22.5	43°28.3 -22°22.2	58°28.0 -22°21.9	73°27.7 -22°21.6	-0.3 +0.3
Th 8	268°24.2 -22°17.4	283°24.0 -22°17.0	298°23.7 -22°16.7	313°23.4 -22°16.4	328°23.2 -22°16.0	343°22.9 -22°15.7	358°22.6 -22°15.4	13°22.4 -22°15.0	28°22.1 -22°14.7	43°21.9 -22°14.4	58°21.6 -22°14.0	73°21.3 -22°13.7	-0.3 +0.3
Fr 9	268°17.9 -22°09.2	283°17.6 -22°08.9	298°17.4 -22°08.5	313°17.1 -22°08.2	328°16.8 -22°07.8	343°16.6 -22°07.5	358°16.3 -22°07.1	13°16.1 -22°06.9	28°15.8 -22°06.6	43°15.5 -22°06.1	58°15.3 -22°05.7	73°15.0 -22°05.4	-0.3 +0.2
Sa 10	268°11.7 -22°00.7	283°11.4 -22°00.3	298°11.2 -22°00.1	313°10.9 -22°00.0	328°10.6 -22°00.0	343°10.4 -21°58.8	358°10.1 -21°58.1	13°09.8 -21°58.1	28°09.6 -21°57.7	43°09.4 -21°57.4	58°09.1 -21°57.0	73°08.9 -21°56.6	-0.3 +0.2
Su 11	268°05.6 -21°51.7	283°05.3 -21°51.3	298°05.1 -21°50.9	313°04.8 -21°50.5	328°04.6 -21°50.1	343°04.3 -21°49.8	358°04.1 -21°49.4	13°03.8 -21°49.0	28°03.6 -21°48.6	43°03.3 -21°48.2	58°03.1 -21°47.8	73°02.8 -21°47.4	-0.2 +0.4
Mo 12	267°59.6 -21°42.3	282°59.4 -21°41.9	297°59.1 -21°41.5	312°58.9 -21°41.1	327°58.7 -21°40.7	342°58.4 -21°40.3	357°58.2 -21°39.9	12°57.9 -21°39.4	27°57.7 -21°39.0	42°57.4 -21°38.6	57°57.2 -21°38.2	72°57.0 -21°37.8	-0.2 +0.4
Tu 13	267°53.8 -21°32.4	282°53.6 -21°32.0	297°53.4 -21°31.6	312°53.1 -21°31.2	327°52.9 -21°30.8	342°52.6 -21°30.3	357°52.4 -21°29.9	12°52.2 -21°29.5	27°51.9 -21°29.1	42°51.7 -21°28.6	57°51.5 -21°28.2	72°51.2 -21°27.8	-0.2 +0.4
We 14	267°48.2 -21°22.2	282°48.0 -21°21.7	297°47.7 -21°21.3	312°47.5 -21°20.9	327°47.3 -21°20.4	342°47.0 -21°20.0	357°46.8 -21°19.6	12°46.6 -21°19.1	27°46.6 -21°18.7	42°46.1 -21°18.2	57°45.9 -21°17.8	72°45.7 -21°17.3	-0.2 +0.4
Th 15	267°42.7 -21°11.5	282°42.5 -21°11.1	297°42.3 -21°10.6	312°42.0 -21°10.2	327°41.8 -21°09.7	342°41.6 -21°09.2	357°41.4 -21°08.8	12°41.1 -21°08.3	27°40.9 -21°07.9	42°40.7 -21°07.4	57°40.5 -21°07.0	72°40.3 -21°06.5	-0.2 +0.5
Fr 16	267°37.3 -21°00.4	282°37.2 -21°00.0	297°37.0 -20°59.5	312°36.7 -20°59.0	327°36.5 -20°58.6	342°36.3 -20°58.1	357°36.1 -20°57.5	12°35.9 -20°57.1	27°35.7 -20°56.7	42°35.5 -20°56.2	57°35.2 -20°55.7	72°35.0 -20°55.2	-0.2 +0.5
Sa 17	267°32.3 -20°49.0	282°32.1 -20°48.5	297°31.8 -20°48.0	312°31.6 -20°47.5	327°31.4 -20°47.0	342°31.2 -20°46.5	357°31.0 -20°46.0	12°30.8 -20°45.5	27°30.6 -20°45.1	42°30.4 -20°44.6	57°30.2 -20°44.1	72°30.0 -20°43.6	-0.2 +0.5
Su 18	267°27.3 -20°37.7	282°27.1 -20°36.6	297°26.9 -20°36.1	312°26.7 -20°35.6	327°26.5 -20°35.1	342°26.3 -20°34.6	357°26.1 -20°34.1	12°25.9 -20°33.6	27°25.7 -20°33.1	42°25.5 -20°32.6	57°25.3 -20°32.0	72°25.1 -20°31.5	-0.2 +0.5
Mo 19	267°22.5 -20°24.9	282°22.3 -20°24.3	297°22.1 -20°23.8	312°21.9 -20°23.3	327°21.8 -20°22.8	342°21.6 -20°22.3	357°21.4 -20°21.7	12°21.2 -20°21.2	27°21.0 -20°20.7	42°20.8 -20°20.2	57°20.6 -20°19.6	72°20.4 -20°19.1	-0.2 +0.5
Tu 20	267°17.9 -20°12.2	282°17.8 -20°11.7	297°17.6 -20°11.1	312°17.4 -20°10.6	327°17.2 -20°10.8	342°17.0 -20°09.5	357°16.8 -20°09.0	12°16.6 -20°08.5	27°16.5 -20°07.9	42°16.3 -20°07.4	57°16.1 -20°06.8	72°15.9 -20°06.3	-0.2 +0.5
We 21	267°13.6 -19°59.2	282°13.4 -19°58.6	297°13.2 -19°58.1	312°13.0 -19°57.5	327°12.8 -19°57.0	342°12.7 -19°56.4	357°12.5 -19°55.9	12°12.3 -19°54.8	27°12.1 -19°54.3	42°12.0 -19°53.8	57°11.8 -19°53.3	72°11.6 -19°53.1	-0.2 +0.6
Th 22	267°09.3 -19°45.8	282°09.2 -19°45.2	297°09.0 -19°44.7	312°08.8 -19°44.1	327°08.7 -19°43.5	342°08.5 -19°43.0	357°08.3 -19°42.4	12°08.2 -19°41.8	27°08.0 -19°41.3	42°07.8 -19°40.7	57°07.7 -19°40.1	72°07.5 -19°39.5	-0.2 +0.6
Fr 23	267°05.3 -19°32.0	282°05.2 -19°31.5	297°05.0 -19°30.9	312°04.9 -19°30.3	327°04.7 -19°29.7	342°04.5 -19°29.1	357°04.4 -19°28.5	12°04.2 -19°28.0	27°04.0 -19°27.4	42°03.9 -19°26.8	57°03.7 -19°26.2	72°03.6 -19°25.6	-0.2 +0.6
Sa 24	267°01.5 -19°17.9	282°01.4 -19°17.3	297°01.2 -19°16.7	312°01.1 -19°16.1	327°00.9 -19°15.5	342°00.8 -19°14.9	357°00.6 -19°14.3	12°00.5 -19°13.7	27°00.3 -19°13.1	42°00.1 -19°12.5	57°00.0 -19°11.9	71°59.8 -19°11.3	-0.2 +0.6
Su 25	266°57.9 -19°03.4	281°57.8 -19°02.8	296°57.6 -19°02.2	311°57.5 -19°01.6	326°57.3 -19°01.0	341°57.2 -19°00.4	356°57.0 -18°59.8	11°56.9 -18°59.2	26°56.8 -18°58.5	41°56.6 -18°57.9	56°56.5 -18°57.3	71°56.3 -18°56.7	-0.1 +0.6
Mo 26	266°54.5 -18°48.6	281°54.4 -18°48.0	296°54.2 -18°47.4	311°54.1 -18°46.7	326°54.0 -18°46.1	341°53.8 -18°45.5	356°53.7 -18°44.9	11°53.5 -18°44.2	26°53.4 -18°43.6	41°53.3 -18°43.0	56°53.1 -18°42.3	71°53.0 -18°41.7	-0.1 +0.6
Tu 27	266°51.3 -18°33.5	281°51.2 -18°32.8	296°51.0 -18°32.2	311°50.9 -18°31.5	326°50.8 -18°30.9	341°50.6 -18°30.3	356°50.5 -18°29.6	11°50.4 -18°29.0	26°50.3 -18°28.3	41°50.1 -18°27.7	56°50.0 -18°27.0	71°49.9 -18°26.4	-0.1 +0.6
We 28	266°48.3 -18°18.0	281°48.2 -18°17.3	296°48.0 -18°16.6	311°47.9 -18°16.0	326°47.8 -18°15.3	341°47.7 -18°14.7	356°47.6 -18°14.0	11°47.4 -18°13.4	26°47.3 -18°12.7	41°47.2 -18°12.1	56°47.1 -18°11.4	71°47.0 -18°10.7	-0.1 +0.7
Th 29	266°45.5 -18°02.1	281°45.4 -18°01.4	296°45.2 -18°00.8	311°45.1 -18°00.1	326°45.0 -17°59.4	341°44.9 -17°58.8	356°44.8 -17°58.1	11°44.7 -17°57.4	26°44.6 -17°56.8	41°44.5 -17°56.1	56°44.4 -17°55.4	71°44.2 -17°54.7	-0.1 +0.7
Fr 30	266°42.9 -17°46.0	281°42.8 -17°45.3	296°42.7 -17°44.6	311°42.6 -17°43.9	326°42.4 -17°43.2	341°42.3 -17°42.6	356°42.2 -17°41.9	11°42.1 -17°41.2	26°42.0 -17°40.5	41°41.9 -17°39.8	56°41.8 -17°39.1	71°41.7 -17°38.4	-0.1 +0.7
Sa 31	266°40.5 -17°29.3	281°40.4 -17°28.8	296°40.3 -17°28.1	311°40.2 -17°27.4	326°40.1 -17°26.7	341°40.0 -17°26.0	356°39.9 -17°25.3	11°39.8 -17°24.6	26°39.7 -17°23.9	41°39.6 -17°23.2	56°39.5 -17°22.5	71°39.4 -17°21.8	-0.1 +0.7

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 16.3'

MOON

January 2032

	D	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	3h	Δ' /h SH
●	Th 1	225°44.4 8°32.6	240°18.5 8°23.2	254°52.2 8°13.8	269°26.8 8°04.3	284°01.0 7°54.8	298°35.2 7°45.3	313°09.4 7°35.7	327°43.7 7°26.1	342°17.9 7°16.5	356°52.2 7°06.9	11°26.5 6°57.2	+34.2 14.7 -9.5 54.0
	Fr 2	230°01.9 4°28.6	244°36.3 4°18.5	259°10.7 4°08.4	273°45.1 3°58.3	288°19.5 3°48.1	302°53.9 3°38.0	317°28.3 3°27.8	332°02.7 3°17.6	346°37.1 3°07.3	1°11.6 2°57.1	15°46.0 2°46.8	+34.4 14.8 -10.2 54.3
	Sa 3	234°20.9 0°11.4	248°55.2 0°01.0	263°29.4 -0°09.5	278°03.6 -0°19.3	292°37.8 -0°30.4	307°11.9 -0°40.9	321°46.0 -0°51.3	336°20.2 -1°01.8	350°54.2 -1°12.3	5°28.3 -1°22.7	20°02.3 -1°33.2	+34.1 14.9 -10.5 54.7
	Su 4	238°29.4 -4°10.1	253°03.0 -4°20.6	267°36.5 -4°31.0	282°09.9 -4°41.4	296°43.3 -4°51.8	311°16.7 -5°02.1	325°50.0 -5°12.5	340°23.3 -5°22.8	354°56.5 -5°33.2	9°29.7 -5°43.5	24°02.9 -5°53.8	+33.3 15.1 -10.4 55.3
	Mo 5	242°13.9 -8°26.2	256°46.2 -8°36.2	271°18.4 -8°46.1	285°50.6 -8°56.0	300°22.7 -9°05.9	314°54.7 -9°15.8	329°26.7 -9°25.6	343°58.6 -9°35.4	358°30.5 -9°45.2	13°02.2 -9°54.9	27°33.9 -10°04.6	+32.0 15.3 -9.8 56.0
	Tu 6	245°20.9 -12°25.2	259°51.4 -12°34.2	274°21.8 -12°43.1	288°52.2 -12°52.0	303°22.5 -13°00.9	317°52.6 -13°09.7	332°22.7 -13°18.4	346°52.8 -13°27.1	1°22.7 -13°35.8	15°52.6 -13°44.3	30°22.3 -13°52.8	+30.1 15.5 -8.8 56.9
	We 7	259°51.4 -12°34.2	274°21.8 -12°43.1	288°52.2 -12°52.0	303°22.5 -13°00.9	317°52.6 -13°09.7	332°22.7 -13°18.4	346°52.8 -13°27.1	1°22.7 -13°35.8	15°52.6 -13°44.3	30°22.3 -13°52.8	44°52.0 -14°01.3	+30.1 15.5 -8.7 57.0
	Th 8	262°06.6 -16°00.0	276°34.9 -16°07.4	291°03.1 -16°14.6	305°31.1 -16°21.8	319°59.1 -16°28.9	334°27.0 -16°35.9	348°54.8 -16°42.8	3°22.4 -16°49.6	17°50.0 -16°56.4	32°17.6 -17°03.0	46°45.0 -17°09.6	+27.8 15.8 -7.0 58.0
	Fr 9	263°01.5 -18°36.4	277°51.2 -18°41.4	292°46.9 -18°46.2	306°42.7 -18°50.9	321°08.3 -18°55.6	335°34.0 -19°00.1	349°59.5 -19°04.5	4°24.9 -19°08.8	18°52.6 -19°12.9	33°15.5 -19°17.0	47°40.7 -19°20.9	+25.6 16.1 -4.5 59.0
	Sa 10	263°49.0 -20°04.6	278°13.0 -20°06.4	292°37.0 -20°08.2	307°00.8 -20°09.8	321°24.6 -20°11.2	335°48.3 -20°12.5	350°12.0 -20°13.7	4°35.6 -20°14.7	18°59.2 -20°15.8	33°22.7 -20°16.4	47°46.2 -20°17.0	+23.7 16.3 -1.2 59.9
●	Su 11	263°32.9 -20°08.6	277°55.7 -20°06.6	292°18.6 -20°05.0	306°41.4 -20°02.9	321°04.2 -20°00.8	335°26.9 -19°58.4	349°49.7 -19°55.9	4°12.4 -19°53.3	18°35.1 -19°50.5	32°57.9 -19°47.6	47°20.6 -19°44.5	+22.8 16.6 +2.4 60.7
	Mo 12	263°01.5 -18°40.8	277°24.3 -18°35.4	291°47.1 -18°29.8	306°10.0 -18°24.1	320°32.9 -18°17.3	334°55.8 -18°12.3	349°18.8 -18°06.2	3°41.7 -18°00.0	18°54.8 -17°53.6	32°27.8 -17°47.1	46°50.9 -17°40.5	+22.9 16.7 +6.0 61.2
	Tu 13	262°42.1 -15°45.7	277°05.9 -15°37.1	291°29.7 -15°28.4	305°53.6 -15°19.6	320°17.6 -15°10.6	334°41.6 -15°01.6	349°05.7 -14°52.4	3°29.8 -14°43.2	18°53.0 -14°33.8	32°18.3 -14°24.3	46°42.6 -14°14.8	+21.4 16.7 +9.1 61.3
	We 14	262°54.9 -11°40.4	277°20.3 -11°29.4	291°45.7 -11°18.4	306°11.2 -11°07.3	320°36.7 -10°56.1	335°02.3 -10°44.9	349°28.0 -10°33.6	3°53.8 -10°22.3	18°19.6 -10°10.8	32°45.5 -9°59.4	47°11.4 -9°47.8	+25.6 16.7 +11.3 61.1
	Th 15	263°48.5 -6°48.9	278°15.5 -6°36.7	292°42.5 -6°24.4	307°09.6 -6°12.1	321°36.8 -5°59.8	336°04.0 -5°47.4	350°31.3 -5°35.0	4°58.7 -5°22.6	19°26.1 -5°10.2	33°53.5 -4°57.8	48°21.1 -4°45.3	+27.3 16.5 +12.4 60.6
	Fr 16	265°20.4 -1°37.4	279°48.8 -1°24.8	294°17.2 -1°12.3	308°45.7 -0°59.8	323°14.2 -0°47.3	337°42.7 -0°34.8	352°11.3 -0°22.3	6°40.0 -0°09.8	21°08.6 -0°02.7	35°37.4 0°15.1	50°06.1 0°27.5	+28.6 16.3 +12.5 59.8
	Sa 17	267°02.0 3°31.0	281°51.4 3°43.0	296°20.7 3°55.0	310°50.1 4°06.9	325°19.5 4°18.8	339°48.9 4°30.6	354°18.4 4°42.4	8°07.9 4°54.2	23°17.4 5°05.9	37°40.7 5°17.5	52°16.5 5°29.2	+29.5 16.0 +11.8 58.9
	Su 18	269°42.4 8°17.5	284°12.2 8°28.3	298°44.1 8°39.0	313°12.0 8°49.6	327°41.9 9°00.2	342°11.8 9°10.8	356°41.7 9°21.3	11°11.6 9°31.7	25°41.6 9°42.0	40°11.5 9°52.3	54°41.5 10°02.5	+29.9 15.8 +10.5 57.9
	Mo 19	272°11.5 12°27.5	286°41.6 12°36.6	301°11.6 12°45.6	315°41.7 12°54.5	330°11.7 13°03.4	344°41.7 13°12.2	359°11.8 13°20.9	13°41.8 13°29.5	28°11.8 13°38.0	42°41.9 13°46.5	57°11.9 13°54.8	+30.0 15.5 +8.7 57.0
○	Tu 20	274°42.3 15°50.5	289°12.3 15°57.5	303°42.3 16°04.4	318°12.3 16°11.3	332°42.3 16°18.0	347°12.3 16°24.7	1°42.3 16°31.3	16°12.2 16°37.8	30°42.2 16°44.2	45°12.2 16°50.5	59°42.2 16°56.7	+30.0 15.3 +6.6 56.2
	We 21	277°11.4 18°18.7	291°41.3 18°23.4	306°11.3 18°28.1	320°41.2 18°32.6	335°11.1 18°37.0	349°41.0 18°41.3	4°11.0 18°45.6	18°40.9 18°49.7	33°10.8 18°53.7	47°40.7 18°57.7	62°10.7 19°01.5	+29.9 15.1 +4.3 55.5
	Th 22	279°39.8 19°47.3	294°09.8 19°49.6	308°39.8 19°51.8	323°09.8 19°53.8	337°39.8 19°55.8	352°09.8 19°57.7	6°39.8 19°59.9	21°09.8 20°01.1	35°39.9 20°02.7	50°09.9 20°04.2	64°40.0 20°05.5	+30.0 15.0 +1.8 54.9
	Fr 23	282°12.2 20°14.3	296°42.5 20°14.1	311°12.8 20°13.8	325°43.1 20°13.4	340°13.3 20°12.9	354°43.7 20°12.3	9°14.1 20°11.6	23°44.4 20°10.8	38°14.8 20°10.0	52°45.2 20°09.0	67°15.7 20°07.9	+30.3 14.9 -0.6 54.5
	Sa 24	284°55.0 15°49.6	299°25.8 15°42.6	313°56.6 15°35.9	328°27.5 15°29.2	342°58.4 15°22.4	357°29.4 15°15.6	12°00.3 15°08.7	26°31.3 15°01.7	41°02.3 14°54.7	55°33.4 14°47.6	70°04.5 14°40.5	+30.9 14.8 -6.9 53.9
	Su 25	287°54.4 18°10.0	302°26.0 18°05.3	316°57.6 18°00.5	331°29.3 17°55.6	346°01.0 17°50.7	0°32.7 17°45.6	15°04.5 17°40.5	29°36.3 17°35.3	44°08.1 17°38.1	58°40.0 17°24.7	73°11.9 17°19.3	+31.7 14.7 -5.1 54.0
	Mo 26	291°14.6 15°49.1	305°47.1 15°42.6	320°19.6 15°35.9	334°52.1 15°29.2	349°24.7 15°22.4	3°57.3 15°15.6	18°29.9 15°08.7	33°02.6 15°01.7	47°35.3 14°54.7	62°08.1 14°47.6	76°40.0 14°40.5	+32.6 14.7 -6.9 53.9
	Tu 27	294°56.4 12°46.0	309°29.7 12°37.9	324°03.0 12°29.8	338°36.4 12°21.6	353°09.8 12°13.4	7°43.2 12°05.1	22°16.6 11°56.8	36°50.1 11°48.1	51°23.6 11°40.0	65°57.1 11°31.5	80°30.7 11°22.9	+33.4 14.7 -8.3 53.9
	We 28	298°57.0 9°09.9	313°31.0 9°00.5	328°04.9 8°51.3	342°38.9 8°42.0	357°12.9 8°32.7	11°46.9 8°23.4	26°21.0 8°14.0	40°55.0 8°04.6	55°29.1 7°55.1	70°03.2 7°45.6	84°37.3 7°40.7	+34.0 14.7 -9.4 54.0
	Th 29	303°10.6 5°09.8	317°44.9 4°59.9	332°19.3 4°49.9	346°53.6 4°39.9	1°27.9 4°29.9	16°02.2 4°19.9	30°36.6 4°09.8	45°10.9 3°59.7	59°45.2 3°45.2	74°19.6 3°39.5	88°53.9 3°29.4	+34.3 14.8 -10.0 54.1
○	Fr 30	307°29.0 0°55.8	322°03.3 0°45.5	336°37.6 0°35.1	351°11.9 0°24.8	5°46.2 0°14.5	20°20.4 0°04.1	34°54.7 -0°06.2	49°28.9 -0°16.6	64°03.1 -0°26.9	78°37.3 -0°37.3	93°11.5 -0°47.7	+34.3 14.8 -10.3 54.4
	Sa 31	322°03.3 0°45.5	336°37.6 0°35.1	351°11.9 0°24.8	5°46.2 0°14.5	20°20.4 0°04.1	34°54.7 -0°06.2	49°28.9 -0°16.6	64°03.1 -0°26.9	78°37.3 -0°37.3	93°11.5 -0°47.7	107°45.7 -0°58.0	+34.2 14.8 -10.4 54.4

Row 1: GHA, Δ' /h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (— = South), Δ' /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 5 22h04 — NM: 12 20h06 — FQ: 19 12h14 — FM: 27 12h52

SUN

February 2032

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Su 1	266°38.3	281°38.2	296°38.1	311°38.0	326°37.9	341°37.8	356°37.7	11°37.6	26°37.6	41°37.5	56°37.4	71°37.3	-0.1
	-17°12.7	-17°12.0	-17°11.3	-17°10.6	-17°09.9	-17°09.2	-17°08.4	-17°07.7	-17°07.0	-17°06.3	-17°05.6	-17°04.9	+0.7
Mo 2	266°36.2	281°36.2	296°36.1	311°36.0	326°35.9	341°35.9	356°35.8	11°35.7	26°35.6	41°35.5	56°35.5	71°35.4	-0.1
	-16°55.6	-16°54.9	-16°54.2	-16°53.4	-16°52.7	-16°52.0	-16°51.3	-16°50.6	-16°49.8	-16°49.1	-16°48.4	-16°47.7	+0.7
Tu 3	266°34.2	281°34.4	296°34.3	311°34.2	326°34.2	341°34.1	356°34.0	11°34.0	26°33.9	41°33.8	56°33.8	71°33.7	-0.1
	-16°38.2	-16°37.5	-16°36.7	-16°36.0	-16°35.3	-16°34.5	-16°33.8	-16°33.1	-16°32.3	-16°31.6	-16°30.8	-16°30.1	+0.7
We 4	266°32.8	281°32.8	296°32.7	311°32.7	326°32.6	341°32.5	356°32.5	11°32.4	26°32.3	41°32.3	56°32.2	71°32.2	-0.1
	-16°20.5	-16°19.8	-16°19.0	-16°18.3	-16°17.5	-16°16.8	-16°16.1	-16°15.3	-16°14.6	-16°13.8	-16°13.1	-16°12.3	+0.7
Th 5	266°31.4	281°31.4	296°31.3	311°31.3	326°31.2	341°31.2	356°31.1	11°31.1	26°31.0	41°31.0	56°30.9	71°30.9	-0.1
	-16°02.6	-16°01.8	-16°01.0	-16°00.3	-15°59.5	-15°58.8	-15°58.0	-15°57.3	-15°56.5	-15°55.7	-15°55.0	-15°54.2	+0.8
Fr 6	266°30.2	281°30.2	296°30.1	311°30.1	326°30.0	341°30.0	356°29.9	11°29.9	26°29.9	41°29.8	56°29.8	71°29.7	-0.0
	-15°07.0	-15°06.2	-15°05.4	-15°04.6	-15°03.9	-15°03.1	-15°02.3	-15°01.5	-15°00.7	-14°59.9	-14°59.1	-14°58.3	+0.8
Sa 7	266°29.2	281°29.2	296°29.1	311°29.1	326°29.1	341°29.0	356°29.0	11°28.9	26°28.9	41°28.9	56°28.8	71°28.8	-0.0
	-15°25.8	-15°25.0	-15°24.2	-15°23.5	-15°22.7	-15°21.9	-15°21.1	-15°20.3	-15°19.6	-15°18.8	-15°18.0	-15°17.2	+0.8
Su 8	266°28.2	281°28.2	296°28.3	311°28.3	326°28.3	341°28.2	356°28.2	11°28.2	26°28.2	41°28.1	56°28.1	71°28.1	-0.0
	-15°07.0	-15°06.2	-15°05.4	-15°04.6	-15°03.9	-15°03.1	-15°02.3	-15°01.5	-15°00.7	-14°59.9	-14°59.1	-14°58.3	+0.8
Mo 9	266°27.8	281°27.7	296°27.7	311°27.7	326°27.7	341°27.7	356°27.6	11°27.6	26°27.6	41°27.6	56°27.6	71°27.5	-0.0
	-14°48.0	-14°47.2	-14°46.4	-14°45.6	-14°44.8	-14°44.0	-14°43.2	-14°42.4	-14°41.6	-14°40.8	-14°40.0	-14°39.2	+0.8
Tu 10	266°27.3	281°27.3	296°27.3	311°27.3	326°27.3	341°27.3	356°27.3	11°27.2	26°27.2	41°27.2	56°27.2	71°27.2	-0.0
	-14°28.7	-14°27.9	-14°27.1	-14°26.3	-14°25.4	-14°24.6	-14°23.8	-14°23.0	-14°22.2	-14°21.4	-14°20.6	-14°19.8	+0.8
We 11	266°27.1	281°27.1	296°27.1	311°27.1	326°27.1	341°27.1	356°27.1	11°27.1	26°27.1	41°27.1	56°27.1	71°27.1	-0.0
	-14°09.2	-14°08.3	-14°07.5	-14°06.7	-14°05.9	-14°05.1	-14°04.2	-14°03.4	-14°02.6	-14°01.8	-14°00.9	-14°00.1	+0.8
Th 12	266°27.0	281°27.1	296°27.1	311°27.1	326°27.1	341°27.1	356°27.1	11°27.1	26°27.1	41°27.1	56°27.1	71°27.1	+0.0
	-13°49.4	-13°48.6	-13°47.7	-13°46.9	-13°46.1	-13°45.2	-13°44.4	-13°43.6	-13°42.8	-13°41.9	-13°41.1	-13°40.3	+0.8
Fr 13	266°27.2	281°27.2	296°27.2	311°27.2	326°27.2	341°27.2	356°27.2	11°27.3	26°27.3	41°27.3	56°27.3	71°27.3	+0.0
	-13°29.4	-13°28.6	-13°27.7	-13°26.9	-13°26.0	-13°25.2	-13°24.4	-13°23.5	-13°22.7	-13°21.8	-13°21.0	-13°20.2	+0.8
Sa 14	266°27.5	281°27.5	296°27.6	311°27.6	326°27.6	341°27.6	356°27.6	11°27.7	26°27.7	41°27.7	56°27.7	71°27.7	+0.0
	-12°09.2	-12°08.3	-13°07.5	-13°06.6	-13°05.8	-13°05.0	-13°04.1	-13°03.3	-13°02.4	-13°01.6	-13°00.7	-12°59.9	+0.8
Su 15	266°28.1	281°28.1	296°28.1	311°28.1	326°28.2	341°28.2	356°28.2	11°28.2	26°28.3	41°28.3	56°28.3	71°28.4	+0.0
	-12°48.8	-12°47.9	-12°47.1	-12°46.2	-12°45.3	-12°44.5	-12°43.6	-12°42.8	-12°41.9	-12°41.1	-12°40.2	-12°39.3	+0.9
Mo 16	266°28.8	281°28.8	296°28.8	311°28.9	326°28.9	341°28.9	356°29.0	11°29.0	26°29.0	41°29.1	56°29.1	71°29.2	+0.0
	-12°28.7	-12°27.3	-12°26.4	-12°25.5	-12°24.7	-12°23.8	-12°22.9	-12°22.1	-12°21.2	-12°20.3	-12°19.5	-12°18.6	+0.9
Tu 17	266°29.7	281°29.7	296°29.7	311°29.8	326°29.8	341°29.9	356°29.9	11°30.0	26°30.0	41°30.0	56°30.1	71°30.1	+0.0
	-12°07.3	-12°06.4	-12°05.6	-12°04.7	-12°03.8	-12°02.9	-12°02.1	-12°01.2	-12°00.3	-11°59.4	-11°58.6	-11°57.7	+0.9
We 18	266°30.7	281°30.8	296°30.8	311°30.9	326°30.9	341°31.0	356°31.0	11°31.1	26°31.1	41°31.2	56°31.2	71°31.3	+0.1
	-11°46.3	-11°45.4	-11°44.5	-11°43.6	-11°42.8	-11°41.9	-11°41.0	-11°40.1	-11°39.2	-11°38.4	-11°37.5	-11°36.6	+0.9
Th 19	266°32.0	281°32.0	296°32.1	311°32.2	326°32.2	341°32.3	356°32.3	11°32.4	26°32.4	41°32.5	56°32.6	71°32.6	+0.1
	-11°25.1	-11°24.2	-11°23.3	-11°22.4	-11°21.5	-11°20.6	-11°19.8	-11°18.9	-11°18.0	-11°17.1	-11°16.2	-11°15.3	+0.9
Fr 20	266°33.4	281°33.5	296°33.5	311°33.6	326°33.7	341°33.7	356°33.8	11°33.9	26°33.9	41°34.0	56°34.1	71°34.1	+0.1
	-11°03.7	-11°02.8	-11°01.9	-11°01.0	-11°00.1	-10°59.2	-10°58.3	-10°57.4	-10°56.5	-10°55.6	-10°54.7	-10°53.8	+0.9
Sa 21	266°35.1	281°35.1	296°35.1	311°35.2	326°35.3	341°35.4	356°35.4	11°35.5	26°35.6	41°35.6	56°35.7	71°35.8	+0.1
	-10°42.1	-10°41.2	-10°40.3	-10°39.4	-10°38.5	-10°37.6	-10°36.7	-10°35.8	-10°34.9	-10°34.0	-10°33.1	-10°32.2	+0.9
Su 22	266°36.8	281°36.8	296°36.9	311°37.0	326°37.1	341°37.2	356°37.3	11°37.3	26°37.4	41°37.5	56°37.5	71°37.6	+0.1
	-10°20.4	-10°19.5	-10°18.6	-10°17.7	-10°16.8	-10°15.9	-10°15.0	-10°14.1	-10°13.1	-10°12.2	-10°11.3	-10°10.4	+0.9
Mo 23	266°38.7	281°38.8	296°38.9	311°38.9	326°39.0	341°39.1	356°39.2	11°39.3	26°39.4	41°39.5	56°39.5	71°39.6	+0.1
	-9°58.5	-9°57.6	-9°56.7	-9°55.8	-9°54.9	-9°54.0	-9°53.1	-9°52.1	-9°51.2	-9°50.3	-9°49.4	-9°48.5	+0.9
Tu 24	266°40.8	281°40.9	296°40.9	311°41.0	326°41.1	341°41.2	356°41.3	11°41.4	26°41.5	41°41.6	56°41.7	71°41.8	+0.1
	-9°36.5	-9°35.6	-9°34.7	-9°33.8	-9°32.8	-9°31.9	-9°31.0	-9°30.1	-9°29.1	-9°28.2	-9°27.3	-9°26.4	+0.9
We 25	266°43.0	281°43.1	296°43.2	311°43.3	326°43.4	341°43.5	356°43.6	11°43.7	26°43.8	41°43.9	56°44.0	71°44.1	+0.1
	-9°14.3	-9°13.4	-9°12.5	-9°11.6	-9°10.6	-9°09.7	-9°08.8	-9°07.8	-9°06.9	-9°06.0	-9°05.1	-9°04.1	+0.9
Th 26	266°45.4	281°45.5	296°45.6	311°45.7	326°45.8	341°45.9	356°46.0	11°46.1	26°46.2	41°46.3	56°46.4	71°46.5	+0.1
	-8°52.0	-8°51.1	-8°50.2	-8°49.2	-8°48.3	-8°47.4	-8°46.4	-8°45.5	-8°44.6	-8°43.6	-8°42.7	-8°41.8	+0.9
Fr 27	266°47.9	281°48.0	296°48.1	311°48.2	326°48.3	341°48.4	356°48.5	11°48.7	26°48.8	41°48.9	56°49.0	71°49.1	+0.1
	-8°29.6	-8°28.6	-8°27.7	-8°26.8	-8°25.8	-8°24.9	-8°24.0	-8°23.0	-8°22.1	-8°21.1	-8°20.2	-8°19.3	+0.9
Sa 28	266°50.5	281°50.7	296°50.8	311°50.9	326°51.0	341°51.1	356°51.2	11°51.3	26°51.5	41°51.6	56°51.7	71°51.8	+0.1
	-8°07.0	-8°06.1	-8°05.1	-8°04.2	-8°03.2	-8°02.3	-8°01.4	-8°00.4	-7°59.5	-7°58.5	-7°57.6	-7°56.6	+0.9
Su 29	266°53.3	281°53.5	296°53.6	311°53.7	326°53.8	341°53.9	356°54.1	11°54.2	26°54.3	41°54.4	56°54.5	71°54.7	+0.1
	-7°44.3	-7°43.4	-7°42.4	-7°41.5	-7°40.5	-7°39.6	-7°38.6	-7°37.7	-7°36.7	-7°35.8	-7°34.8	-7°33.9	+0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 16.2'

MOON

February 2032

	D	18h	19h	20h	21h	22h	23h	0h	1h	2h	3h	4h	Δ°/h	SH
Su 1	228 [◦] 20.1 -6 [◦] 36.4	242 [◦] 53.4 -6 [◦] 46.4	257 [◦] 26.5 -6 [◦] 56.4	271 [◦] 59.8 -7 [◦] 06.3	286 [◦] 32.8 -7 [◦] 16.3	301 [◦] 05.8 -7 [◦] 26.2	315 [◦] 38.8 -7 [◦] 36.1	330 [◦] 11.8 -7 [◦] 46.0	344 [◦] 44.7 -7 [◦] 55.8	359 [◦] 17.5 -8 [◦] 05.6	13 [◦] 50.3 -8 [◦] 15.4	+33.0	15.1 -9.9	55.2
	231 [◦] 56.4 -10 [◦] 38.3	246 [◦] 28.4 -10 [◦] 47.5	261 [◦] 00.3 -10 [◦] 56.7	275 [◦] 32.1 -11 [◦] 05.9	290 [◦] 03.9 -11 [◦] 15.0	304 [◦] 35.6 -11 [◦] 24.0	319 [◦] 07.2 -11 [◦] 33.1	333 [◦] 38.8 -11 [◦] 42.0	348 [◦] 10.3 -11 [◦] 51.0	362 [◦] 41.8 -12 [◦] 00.7	17 [◦] 13.2 -12 [◦] 08.7	+31.7	15.2 -9.0	55.9
Mo 2	234 [◦] 56.0 -14 [◦] 14.7	249 [◦] 26.2 -14 [◦] 22.6	263 [◦] 56.2 -14 [◦] 30.5	278 [◦] 26.6 -14 [◦] 38.3	292 [◦] 56.6 -14 [◦] 46.0	307 [◦] 26.6 -14 [◦] 53.7	321 [◦] 56.5 -15 [◦] 01.3	336 [◦] 26.3 -15 [◦] 08.8	350 [◦] 56.1 -15 [◦] 16.3	365 [◦] 25.7 -15 [◦] 23.7	19 [◦] 55.3 -15 [◦] 31.0	+29.9	15.5 -7.6	56.7
	237 [◦] 09.7 -17 [◦] 11.6	251 [◦] 38.0 -17 [◦] 17.7	266 [◦] 06.2 -17 [◦] 23.6	280 [◦] 34.4 -17 [◦] 29.5	295 [◦] 02.5 -17 [◦] 35.3	309 [◦] 30.5 -17 [◦] 41.0	323 [◦] 58.4 -17 [◦] 46.5	338 [◦] 26.2 -17 [◦] 52.0	352 [◦] 53.9 -17 [◦] 57.4	367 [◦] 21.6 -18 [◦] 02.7	21 [◦] 49.2 -18 [◦] 08.0	+27.9	15.7 -5.6	57.5
We 4	238 [◦] 33.4 -19 [◦] 13.7	252 [◦] 59.7 -19 [◦] 17.3	267 [◦] 26.0 -19 [◦] 20.7	281 [◦] 52.2 -19 [◦] 24.0	296 [◦] 18.3 -19 [◦] 27.1	310 [◦] 44.3 -19 [◦] 30.2	325 [◦] 10.3 -19 [◦] 33.1	339 [◦] 36.2 -19 [◦] 36.0	354 [◦] 02.0 -19 [◦] 38.7	368 [◦] 27.7 -19 [◦] 41.2	22 [◦] 53.4 -19 [◦] 43.7	+26.0	16.0 -3.0	58.3
	252 [◦] 59.7 -19 [◦] 17.3	267 [◦] 26.0 -19 [◦] 20.7	281 [◦] 52.2 -19 [◦] 24.0	296 [◦] 18.3 -19 [◦] 27.1	310 [◦] 44.3 -19 [◦] 30.2	325 [◦] 10.3 -19 [◦] 33.1	339 [◦] 36.2 -19 [◦] 36.0	354 [◦] 02.0 -19 [◦] 38.7	368 [◦] 27.7 -19 [◦] 41.2	382 [◦] 53.4 -19 [◦] 43.7	37 [◦] 19.0 -19 [◦] 46.1	+25.9	16.0 -2.9	58.5
Fr 6	253 [◦] 35.5 -20 [◦] 06.0	268 [◦] 00.1 -20 [◦] 06.3	282 [◦] 24.7 -20 [◦] 06.4	296 [◦] 49.2 -20 [◦] 06.5	311 [◦] 13.7 -20 [◦] 06.6	325 [◦] 38.1 -20 [◦] 06.1	340 [◦] 02.5 -20 [◦] 05.7	354 [◦] 26.9 -20 [◦] 05.2	368 [◦] 51.1 -20 [◦] 04.5	383 [◦] 15.4 -20 [◦] 03.7	37 [◦] 39.6 -20 [◦] 02.8	+24.4	16.2 +0.3	59.5
	253 [◦] 38.7 -19 [◦] 32.0	268 [◦] 02.4 -19 [◦] 28.5	282 [◦] 26.1 -19 [◦] 25.5	296 [◦] 49.8 -19 [◦] 22.0	311 [◦] 13.5 -19 [◦] 18.4	325 [◦] 37.1 -19 [◦] 14.7	340 [◦] 00.8 -19 [◦] 10.8	354 [◦] 24.4 -19 [◦] 07.6	368 [◦] 48.0 -19 [◦] 02.6	383 [◦] 11.7 -18 [◦] 58.3	37 [◦] 35.3 -18 [◦] 53.9	+23.7	16.5 +3.8	60.3
Su 8	253 [◦] 29.7 -17 [◦] 31.0	267 [◦] 53.4 -17 [◦] 24.4	282 [◦] 27.1 -17 [◦] 17.6	296 [◦] 40.8 -17 [◦] 10.8	311 [◦] 07.3 -17 [◦] 03.8	325 [◦] 28.3 -16 [◦] 56.7	339 [◦] 52.1 -16 [◦] 49.4	354 [◦] 15.9 -16 [◦] 42.1	368 [◦] 39.7 -16 [◦] 34.6	383 [◦] 03.6 -16 [◦] 27.0	37 [◦] 27.5 -16 [◦] 19.2	+23.8	16.6 +7.2	61.0
	253 [◦] 29.4 -14 [◦] 09.3	267 [◦] 53.8 -13 [◦] 59.8	282 [◦] 27.1 -13 [◦] 50.1	296 [◦] 42.7 -13 [◦] 40.4	311 [◦] 07.3 -13 [◦] 30.6	325 [◦] 31.9 -13 [◦] 20.6	339 [◦] 56.5 -13 [◦] 10.6	354 [◦] 21.1 -12 [◦] 50.3	368 [◦] 45.8 -12 [◦] 40.6	383 [◦] 10.6 -12 [◦] 30.9	37 [◦] 35.4 -12 [◦] 29.6	+24.6	16.7 +10.6	61.3
Tu 10	253 [◦] 52.8 -9 [◦] 43.9	268 [◦] 18.3 -9 [◦] 32.3	282 [◦] 43.9 -9 [◦] 20.6	297 [◦] 09.6 -9 [◦] 08.9	311 [◦] 35.2 -8 [◦] 57.1	326 [◦] 01.0 -8 [◦] 45.2	340 [◦] 26.8 -8 [◦] 33.3	354 [◦] 52.6 -8 [◦] 21.4	369 [◦] 18.5 -8 [◦] 09.4	384 [◦] 44.4 -7 [◦] 57.3	38 [◦] 10.4 -7 [◦] 45.2	+25.8	16.7 +11.9	61.3
	254 [◦] 45.7 -4 [◦] 38.8	269 [◦] 12.5 -4 [◦] 26.1	283 [◦] 39.2 -4 [◦] 13.5	298 [◦] 06.1 -4 [◦] 00.8	312 [◦] 32.9 -3 [◦] 48.1	326 [◦] 59.8 -3 [◦] 35.3	341 [◦] 26.8 -3 [◦] 22.6	355 [◦] 53.8 -3 [◦] 09.8	370 [◦] 20.8 -2 [◦] 57.1	385 [◦] 47.9 -2 [◦] 44.3	39 [◦] 15.0 -2 [◦] 31.5	+26.9	16.6 +17.2	61.9
Th 12	256 [◦] 06.4 0 [◦] 39.8	270 [◦] 34.1 0 [◦] 52.4	285 [◦] 01.9 1 [◦] 05.1	299 [◦] 29.7 1 [◦] 17.7	313 [◦] 57.5 1 [◦] 30.3	328 [◦] 25.3 1 [◦] 42.9	342 [◦] 53.2 1 [◦] 55.4	357 [◦] 21.1 2 [◦] 08.0	371 [◦] 49.1 2 [◦] 20.5	386 [◦] 17.1 2 [◦] 32.9	40 [◦] 45.1 2 [◦] 45.4	+27.9	16.4 +12.6	62.0
	Sa 14	257 [◦] 48.4 5 [◦] 47.4	272 [◦] 16.8 5 [◦] 59.2	286 [◦] 45.3 6 [◦] 10.9	301 [◦] 13.7 6 [◦] 22.6	315 [◦] 42.2 6 [◦] 34.2	330 [◦] 10.7 6 [◦] 45.8	344 [◦] 39.2 6 [◦] 57.3	359 [◦] 07.8 7 [◦] 08.8	373 [◦] 36.8 7 [◦] 20.2	388 [◦] 04.9 7 [◦] 31.5	42 [◦] 33.5 7 [◦] 42.8	+28.5	16.2 +11.5
Su 15	259 [◦] 44.4 10 [◦] 24.2	274 [◦] 13.2 10 [◦] 34.4	288 [◦] 42.1 10 [◦] 44.5	303 [◦] 10.9 10 [◦] 54.6	317 [◦] 39.9 11 [◦] 04.5	332 [◦] 08.7 11 [◦] 14.4	346 [◦] 37.6 11 [◦] 24.3	360 [◦] 06.5 11 [◦] 34.0	374 [◦] 35.5 11 [◦] 43.7	389 [◦] 04.3 11 [◦] 53.3	44 [◦] 33.3 12 [◦] 02.8	+28.9	15.9 +9.9	63.8
	261 [◦] 48.4 14 [◦] 15.3	276 [◦] 17.5 14 [◦] 23.8	290 [◦] 46.6 14 [◦] 31.5	305 [◦] 15.7 14 [◦] 39.4	319 [◦] 44.5 14 [◦] 47.3	334 [◦] 13.9 14 [◦] 55.1	348 [◦] 43.0 15 [◦] 02.8	362 [◦] 12.1 15 [◦] 10.4	376 [◦] 41.9 15 [◦] 17.9	390 [◦] 21.3 15 [◦] 25.3	46 [◦] 39.5 15 [◦] 32.6	+29.1	15.6 +7.7	64.7
Mo 16	263 [◦] 57.6 17 [◦] 10.9	278 [◦] 26.8 17 [◦] 16.7	292 [◦] 56.1 17 [◦] 22.4	307 [◦] 25.4 17 [◦] 28.0	321 [◦] 54.3 17 [◦] 33.4	336 [◦] 24.0 17 [◦] 38.8	350 [◦] 53.3 17 [◦] 44.1	365 [◦] 22.6 17 [◦] 49.3	379 [◦] 51.9 17 [◦] 54.4	393 [◦] 21.3 17 [◦] 59.4	48 [◦] 50.6 18 [◦] 04.3	+29.3	15.4 +5.3	65.6
	266 [◦] 12.1 19 [◦] 05.5	280 [◦] 41.7 19 [◦] 08.8	295 [◦] 11.2 19 [◦] 12.0	309 [◦] 40.8 19 [◦] 15.0	324 [◦] 10.4 19 [◦] 18.0	338 [◦] 39.9 19 [◦] 20.9	353 [◦] 09.6 19 [◦] 23.6	367 [◦] 39.9 19 [◦] 26.3	382 [◦] 08.9 19 [◦] 28.9	396 [◦] 38.5 19 [◦] 31.3	51 [◦] 08.1 19 [◦] 33.7	+29.6	15.2 +2.8	66.5
We 18	268 [◦] 35.3 19 [◦] 57.2	283 [◦] 05.3 19 [◦] 57.9	297 [◦] 35.3 19 [◦] 58.6	312 [◦] 05.3 19 [◦] 59.1	326 [◦] 35.4 19 [◦] 59.6	341 [◦] 05.4 20 [◦] 00.0	355 [◦] 35.5 20 [◦] 00.3	370 [◦] 05.6 20 [◦] 00.4	384 [◦] 35.7 20 [◦] 00.5	398 [◦] 05.9 20 [◦] 00.5	53 [◦] 36.1 20 [◦] 00.4	+30.1	15.0 +0.3	67.4
	271 [◦] 11.8 19 [◦] 47.1	285 [◦] 42.4 19 [◦] 45.4	300 [◦] 13.1 19 [◦] 43.7	314 [◦] 43.7 19 [◦] 41.9	329 [◦] 14.4 19 [◦] 39.9	343 [◦] 45.1 19 [◦] 37.9	358 [◦] 15.9 19 [◦] 35.8	372 [◦] 46.7 19 [◦] 33.6	387 [◦] 17.5 19 [◦] 31.4	401 [◦] 48.3 19 [◦] 29.0	56 [◦] 19.2 19 [◦] 26.5	+30.7	14.8 -2.1	68.3
Fr 20	274 [◦] 06.1 18 [◦] 39.0	288 [◦] 37.5 18 [◦] 35.2	303 [◦] 08.9 18 [◦] 31.2	317 [◦] 40.3 18 [◦] 27.2	332 [◦] 11.8 18 [◦] 23.1	346 [◦] 43.3 18 [◦] 18.9	360 [◦] 14.9 18 [◦] 14.7	374 [◦] 46.3 18 [◦] 10.3	389 [◦] 18.1 18 [◦] 05.9	403 [◦] 49.8 18 [◦] 01.4	59 [◦] 21.5 17 [◦] 56.8	+31.5	14.8 -4.2	69.2
	277 [◦] 20.9 16 [◦] 38.7	291 [◦] 53.1 16 [◦] 33.0	306 [◦] 25.4 16 [◦] 27.1	320 [◦] 57.6 16 [◦] 21.1	335 [◦] 30.0 16 [◦] 15.1	350 [◦] 02.3 16 [◦] 09.0	364 [◦] 34.7 16 [◦] 02.9	378 [◦] 47.2 15 [◦] 56.7	392 [◦] 59.9 15 [◦] 50.4	407 [◦] 12.4 15 [◦] 44.0	62 [◦] 44.7 15 [◦] 37.6	+32.4	14.7 -6.1	70.1
Su 22	280 [◦] 56.4 13 [◦] 53.5	295 [◦] 29.4 13 [◦] 46.1	310 [◦] 02.4 13 [◦] 38.6	324 [◦] 35.5 13 [◦] 31.0	339 [◦] 08.6 13 [◦] 23.4	353 [◦] 41.8 13 [◦] 15.8	368 [◦] 14.9 13 [◦] 08.1	382 [◦] 42.8 13 [◦] 00.3	396 [◦] 51.3 12 [◦] 52.5	411 [◦] 04.6 12 [◦] 44.6	51 [◦] 54.6 12 [◦] 36.6	+33.2	14.7 -7.7	71.0
	284 [◦] 50.0 10 [◦] 31.5	299 [◦] 23.6 10 [◦] 22.8	313 [◦] 57.3 10 [◦] 14.0	328 [◦] 31.0 10 [◦] 05.2	343 [◦] 04.7 9 [◦] 56.3	357 [◦] 38.5 9 [◦] 47.4	372 [◦] 12.2 9 [◦] 38.5	386 [◦] 46.0 9 [◦] 29.5	401 [◦] 19.8 9 [◦] 20.5	415 [◦] 53.6 9 [◦] 11.5	55 [◦] 53.6 9 [◦] 02.4	+33.7	14.7 -8.9	71.9
Tu 24	288 [◦] 56.7 6 [◦] 41.6	303 [◦] 30.7 6 [◦] 31.9	318 [◦] 04.8 6 [◦] 22.2	332 [◦] 38.9 6 [◦] 12.5	347 [◦] 12.9 6 [◦] 02.8	361 [◦] 02.8 5 [◦] 53.0	375 [◦] 14.9 5 [◦] 43.3	389 [◦] 26.5 5 [◦] 33.4	403 [◦] 38.2 5 [◦] 23.6	417 [◦] 50.3 5 [◦] 13.7	74 [◦] 37.5 5 [◦] 03.9	+34.1	14.8 -8.5	72.8
	293 [◦] 09.5 2 [◦] 33.1	307 [◦] 43.6 2 [◦] 22.9	322 [◦] 17.7 2 [◦] 12.7	336 [◦] 51.8 2 [◦] 02.5	351 [◦] 25.9 1 [◦] 52.1	365 [◦] 00.0 1 [◦] 42.0	379 [◦] 13.1 1 [◦] 31.8	393 [◦] 26.1 1 [◦] 21.5	407					

SUN

March 2032

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Mo 1	266°56.3 -7°21.5	281°56.4 -7°20.6	296°56.5 -7°19.6	311°56.6 -7°18.7	326°56.7 -7°17.7	341°56.9 -7°16.8	356°57.0 -7°15.8	11°57.1 -7°14.8	26°57.2 -7°13.9	41°57.4 -7°12.9	56°57.5 -7°12.0	71°57.6 -7°11.0	+0.1 +1.0
Tu 2	266°59.3 -6°58.6	281°59.4 -6°57.7	296°59.5 -6°56.7	311°59.7 -6°55.7	326°59.8 -6°54.8	341°59.9 -6°53.8	357°00.1 -6°52.9	12°00.2 -6°51.9	27°00.3 -6°50.9	42°00.5 -6°50.0	57°00.6 -6°49.0	72°00.7 -6°48.1	+0.1 +1.0
We 3	267°02.4 -6°35.6	282°02.6 -6°34.6	297°02.7 -6°33.7	312°02.8 -6°32.7	327°03.0 -6°31.8	342°03.1 -6°30.8	357°03.2 -6°29.8	12°03.4 -6°28.9	27°03.5 -6°27.9	42°03.6 -6°26.9	57°03.8 -6°26.0	72°03.9 -6°25.0	+0.1 +1.0
Th 4	267°05.7 -6°12.5	282°05.8 -6°11.5	297°06.0 -6°10.6	312°06.1 -6°09.6	327°06.3 -6°08.6	342°06.4 -6°07.7	357°06.5 -6°06.7	12°06.7 -6°05.7	27°06.8 -6°04.8	42°06.9 -6°03.8	57°07.1 -6°02.8	72°07.2 -6°01.9	+0.1 +1.0
Fr 5	267°09.1 -5°49.3	282°09.2 -5°48.3	297°09.4 -5°47.4	312°09.5 -5°46.4	327°09.6 -5°45.4	342°09.8 -5°44.5	357°09.9 -5°43.5	12°10.1 -5°42.5	27°10.2 -5°41.6	42°10.4 -5°40.6	57°10.5 -5°39.6	72°10.6 -5°38.6	+0.1 +1.0
Sa 6	267°12.5 -5°26.0	282°12.7 -5°25.1	297°12.8 -5°24.1	312°13.0 -5°23.1	327°13.1 -5°22.1	342°13.3 -5°21.2	357°13.4 -5°20.2	12°13.6 -5°19.2	27°13.7 -5°18.3	42°13.9 -5°17.3	57°14.0 -5°16.3	72°14.2 -5°15.3	+0.1 +1.0
Su 7	267°16.1 -5°02.7	282°16.2 -5°01.7	297°16.4 -5°00.7	312°16.5 -4°59.8	327°16.7 -4°58.8	342°16.8 -4°57.8	357°17.0 -4°56.8	12°17.2 -4°55.9	27°17.3 -4°54.9	42°17.5 -4°53.9	57°17.6 -4°52.9	72°17.8 -4°52.0	+0.2 +1.0
Mo 8	267°19.7 -4°39.3	282°19.9 -4°38.3	297°20.1 -4°37.3	312°20.2 -4°36.3	327°20.4 -4°35.4	342°20.5 -4°34.4	357°20.7 -4°33.4	12°20.8 -4°32.6	27°21.0 -4°31.4	42°21.1 -4°30.5	57°21.3 -4°29.5	72°21.5 -4°28.5	+0.2 +1.0
Tu 9	267°23.5 -4°15.8	282°23.6 -4°14.8	297°23.8 -4°13.8	312°24.0 -4°12.8	327°24.1 -4°11.9	342°24.3 -4°10.9	357°24.4 -4°09.9	12°24.6 -4°08.9	27°24.9 -4°07.9	42°24.9 -4°07.0	57°25.1 -4°06.0	72°25.2 -4°05.0	+0.2 +1.0
We 10	267°27.3 -3°52.3	282°27.5 -3°51.3	297°27.6 -3°50.3	312°27.8 -3°49.3	327°28.0 -3°48.3	342°28.1 -3°47.3	357°28.3 -3°46.4	12°28.4 -3°45.4	27°28.6 -3°44.4	42°28.8 -3°43.4	57°28.9 -3°42.4	72°29.1 -3°41.5	+0.2 +1.0
Th 11	267°31.2 -3°28.7	282°31.4 -3°27.7	297°31.5 -3°26.7	312°31.7 -3°25.7	327°31.9 -3°24.7	342°32.0 -3°23.8	357°32.2 -3°22.8	12°32.4 -3°21.8	27°32.5 -3°20.8	42°32.7 -3°19.8	57°32.9 -3°18.8	72°33.0 -3°17.9	+0.2 +1.0
Fr 12	267°35.2 -3°05.1	282°35.4 -3°04.1	297°35.5 -3°03.1	312°35.7 -3°02.1	327°35.9 -3°01.1	342°36.0 -3°00.1	357°36.2 -2°59.2	12°36.4 -2°58.2	27°36.5 -2°57.2	42°36.7 -2°56.2	57°36.9 -2°55.2	72°37.0 -2°54.2	+0.2 +1.0
Sa 13	267°39.2 -2°41.4	282°39.4 -2°40.4	297°39.6 -2°39.4	312°39.8 -2°38.5	327°39.9 -2°37.5	342°40.1 -2°36.5	357°40.3 -2°35.5	12°40.4 -2°34.5	27°40.6 -2°33.5	42°40.8 -2°32.5	57°40.9 -2°31.5	72°41.1 -2°30.6	+0.2 +1.0
Su 14	267°43.4 -2°17.7	282°43.5 -2°16.7	297°43.7 -2°15.8	312°43.9 -2°14.8	327°44.2 -2°13.8	342°44.2 -2°12.8	357°44.4 -2°11.8	12°44.6 -2°10.8	27°44.7 -2°09.8	42°44.9 -2°08.8	57°45.1 -2°07.9	72°45.3 -2°06.9	+0.2 +1.0
Mo 15	267°47.5 -1°54.0	282°47.7 -1°53.0	297°47.9 -1°52.1	312°48.1 -1°51.1	327°48.2 -1°50.1	342°48.4 -1°49.1	357°48.6 -1°48.1	12°48.8 -1°47.1	27°48.9 -1°46.1	42°49.1 -1°45.1	57°49.3 -1°44.1	72°49.5 -1°43.2	+0.2 +1.0
Tu 16	267°51.8 -1°30.3	282°51.9 -1°29.3	297°52.1 -1°28.3	312°52.3 -1°27.3	327°52.5 -1°26.4	342°52.7 -1°25.4	357°52.8 -1°24.4	12°53.0 -1°23.4	27°53.2 -1°22.4	42°53.4 -1°21.4	57°53.6 -1°20.4	72°53.7 -1°19.4	+0.2 +1.0
We 17	267°55.1 -1°06.6	282°55.2 -1°05.6	297°55.4 -1°04.6	312°55.6 -1°03.6	327°55.8 -1°02.6	342°57.0 -1°01.6	357°57.1 -1°00.7	12°57.3 -0°59.7	27°57.5 -0°58.7	42°57.7 -0°57.7	57°57.9 -0°56.7	72°58.0 -0°55.7	+0.2 +1.0
Th 18	268°00.4 -0°42.9	283°00.6 -0°41.9	298°00.8 -0°40.9	313°01.0 -0°39.9	328°01.2 -0°38.9	343°01.3 -0°37.9	358°01.5 -0°36.9	13°01.7 -0°35.9	28°01.9 -0°35.0	43°02.0 -0°34.0	58°02.2 -0°33.0	73°02.4 -0°32.0	+0.2 +1.0
Fr 19	268°04.8 -0°19.1	283°05.0 -0°18.2	298°05.2 -0°17.2	313°05.3 -0°16.2	328°05.5 -0°15.2	343°05.7 -0°14.2	358°05.9 -0°13.2	13°06.1 -0°12.2	28°06.3 -0°11.2	43°06.4 -0°10.2	58°06.6 -0°09.3	73°06.8 -0°08.3	+0.2 +1.0
Sa 20	268°09.2 0°04.6	283°09.4 0°05.6	298°09.6 0°06.5	313°09.8 0°07.5	328°10.0 0°08.5	343°10.1 0°09.5	358°10.3 0°10.5	13°10.5 0°11.5	28°10.7 0°12.5	43°10.9 0°13.5	58°11.1 0°14.5	73°11.3 0°15.4	+0.2 +1.0
Su 21	268°13.7 0°28.3	283°13.9 0°29.3	298°14.0 0°30.2	313°14.2 0°31.2	328°14.4 0°32.2	343°14.6 0°33.2	358°14.8 0°34.2	13°15.0 0°35.2	28°15.2 0°36.2	43°15.4 0°37.2	58°15.5 0°38.1	73°15.7 0°39.1	+0.2 +1.0
Mo 22	268°18.2 0°51.9	283°18.3 0°52.9	298°18.5 0°53.9	313°18.7 0°54.9	328°18.9 0°55.9	343°19.1 0°56.9	358°19.3 0°57.9	13°19.5 0°58.8	28°19.7 0°59.8	43°19.8 1°00.8	58°20.0 1°01.8	73°20.2 1°02.8	+0.2 +1.0
Tu 23	268°22.7 1°15.6	283°22.9 1°16.6	298°23.0 1°17.6	313°23.2 1°18.5	328°23.4 1°19.5	343°23.6 1°20.5	358°23.8 1°21.5	13°24.0 1°22.5	28°24.2 1°23.5	43°24.4 1°24.5	58°24.6 1°25.4	73°24.7 1°26.4	+0.2 +1.0
We 24	268°27.2 1°39.2	283°27.4 1°40.2	298°27.6 1°41.2	313°27.8 1°42.2	328°28.0 1°43.1	343°28.1 1°44.1	358°28.3 1°45.1	13°28.5 1°46.1	28°28.7 1°47.1	43°28.9 1°48.1	58°29.1 1°49.0	73°29.3 1°50.0	+0.2 +1.0
Th 25	268°31.7 2°02.8	283°31.9 2°03.8	298°32.1 2°04.7	313°32.3 2°05.7	328°32.5 2°06.7	343°32.7 2°07.7	358°32.9 2°08.7	13°33.1 2°09.6	28°33.3 2°10.6	43°33.4 2°11.6	58°33.6 2°12.6	73°33.8 2°13.6	+0.2 +1.0
Fr 26	268°36.3 2°26.3	283°36.5 2°27.3	298°36.7 2°28.3	313°36.9 2°29.2	328°37.0 2°30.2	343°37.2 2°31.2	358°37.4 2°32.2	13°37.6 2°33.2	28°37.8 2°34.1	43°38.0 2°35.1	58°38.2 2°36.1	73°38.4 2°37.1	+0.2 +1.0
Sa 27	268°40.8 2°49.8	283°41.0 2°50.8	298°41.2 2°51.7	313°41.4 2°52.7	328°41.6 2°53.7	343°41.8 2°54.7	358°42.0 2°55.7	13°42.2 2°56.6	28°42.4 2°57.6	43°42.5 2°58.6	58°42.7 2°59.6	73°42.9 3°00.5	+0.2 +1.0
Su 28	268°45.4 3°13.2	283°45.6 3°14.2	298°45.7 3°15.2	313°45.9 3°16.1	328°46.1 3°17.1	343°46.3 3°18.1	358°46.5 3°19.1	13°46.7 3°20.6	28°46.9 3°21.0	43°47.1 3°22.0	58°47.3 3°23.0	73°47.4 3°23.9	+0.2 +1.0
Mo 29	268°49.9 3°36.6	283°50.1 3°37.5	298°50.3 3°38.5	313°50.5 3°39.5	328°50.7 3°40.5	343°50.8 3°41.4	358°51.0 3°42.4	13°51.2 3°43.4	28°51.4 3°44.4	43°51.6 3°45.3	58°51.8 3°46.3	73°52.0 3°47.3	+0.2 +1.0
Tu 30	268°54.4 3°59.9	283°54.6 4°00.8	298°54.8 4°01.8	313°55.0 4°02.8	328°55.2 4°03.7	343°55.3 4°04.7	358°55.5 4°05.7	13°55.7 4°06.7	28°55.9 4°07.6	43°56.3 4°08.6	58°56.6 4°09.6	73°56.5 4°10.5	+0.2 +1.0
We 31	268°58.9 4°23.1	283°59.1 4°24.1	298°59.3 4°25.0	313°59.5 4°26.0	328°59.6 4°27.0	343°59.8 4°27.9	359°00.0 4°28.9	14°00.0 4°29.9	29°00.0 4°30.8	44°00.0 4°31.8	59°00.8 4°32.7	74°00.9 4°33.7	+0.2 +1.0

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ°/h = dec. change

Semi-diameter: 16.1'

MOON

March 2032

	D	18h	19h	20h	21h	22h	23h	0h	1h	2h	3h	4h	Δ'/h SH
●	Mo 1	235°28.6 -12°58.0	249°59.6 -13°06.3	264°30.9 -13°14.5	279°01.6 -13°22.7	293°32.4 -13°30.8	308°03.2 -13°38.8	322°34.0 -13°46.8	337°04.7 -13°54.7	351°35.3 -14°02.6	6°05.9 -14°10.4	20°36.4 -14°18.1	-30.8 15.3 -8.0 56.1
	Tu 2	238°06.5 -16°05.7	252°35.9 -16°12.2	267°05.4 -16°18.7	281°34.7 -16°25.1	296°04.0 -16°31.5	310°33.3 -16°37.7	325°02.4 -16°43.9	339°31.5 -16°50.0	354°00.6 -16°56.0	8°29.5 -17°01.9	22°58.4 -17°07.7	-29.2 15.5 -6.2 56.7
●	We 3	240°04.2 -18°24.2	254°32.1 -18°28.5	268°59.9 -18°32.7	283°27.6 -18°36.9	297°55.3 -18°40.9	312°23.0 -18°44.8	326°50.5 -18°48.6	341°18.0 -18°52.4	355°45.5 -18°56.0	10°12.8 -18°59.5	24°40.2 -19°02.9	-27.6 15.7 -3.9 57.4
	Th 4	241°23.2 -19°40.5	255°49.6 -19°42.0	270°16.0 -19°43.5	284°42.4 -19°44.9	299°08.6 -19°46.1	313°34.9 -19°47.2	328°01.1 -19°48.2	342°27.2 -19°49.1	356°53.4 -19°49.8	11°19.4 -19°50.4	25°45.4 -19°50.9	-26.2 15.9 -1.1 58.2
●	Fr 5	242°11.1 -19°40.5	256°36.5 -19°42.0	271°02.0 -19°43.5	285°27.3 -19°44.9	299°52.7 -19°46.1	314°18.0 -19°47.2	328°43.4 -19°48.2	343°08.7 -19°49.1	357°33.9 -19°49.8	11°59.2 -19°50.4	26°24.4 -19°50.9	-25.3 16.1 -1.1 58.9
	Sa 6	256°36.5 -19°43.5	271°02.0 -19°44.0	285°27.3 -19°44.9	299°52.7 -19°45.4	314°18.0 -19°46.1	328°43.4 -19°45.4	343°08.7 -19°45.4	357°33.9 -19°45.4	11°59.2 -19°45.4	26°24.4 -19°45.4	40°49.6 -19°45.4	-25.3 16.1 -1.1 58.9
●	Su 7	257°06.2 -18°22.4	271°31.2 -18°17.6	285°56.2 -18°12.6	300°21.3 -18°07.5	314°46.3 -18°02.3	329°11.4 -17°56.9	343°36.4 -17°51.4	358°01.5 -17°45.8	12°26.5 -17°40.1	26°51.5 -17°34.3	41°16.6 -17°28.3	-25.0 16.3 -5.4 59.7
	Mo 8	257°33.6 -15°44.5	271°58.8 -15°36.6	286°24.1 -15°28.6	300°49.4 -15°20.6	315°14.7 -15°12.4	329°40.0 -15°04.2	344°05.3 -14°55.8	358°30.7 -14°47.3	12°56.1 -14°38.7	27°21.5 -14°30.0	41°46.9 -14°21.2	-25.3 16.4 -8.3 60.3
●	Tu 9	258°11.2 -11°57.6	272°37.1 -11°47.3	287°02.9 -11°36.9	301°28.8 -11°26.4	315°54.8 -11°15.9	330°20.7 -11°05.3	344°46.6 -10°54.6	359°12.6 -10°43.8	13°38.7 -10°33.0	28°04.7 -10°22.0	42°30.8 -10°11.1	-26.0 16.6 -1.0 76.0
	We 10	259°05.7 -7°18.6	273°32.2 -7°06.6	287°58.8 -6°54.6	302°25.4 -6°42.6	316°52.0 -6°30.5	331°18.7 -6°18.4	345°45.4 -6°06.2	0°12.1 -5°54.0	14°38.9 -5°41.8	29°05.6 -5°29.5	43°32.4 -5°17.2	-26.7 16.6 -1.2 60.8
●	Th 11	260°17.5 -2°09.6	274°44.7 -1°57.0	289°11.9 -1°44.3	303°39.9 -1°31.7	318°06.4 -1°19.0	332°33.6 -1°06.4	347°00.9 -0°53.7	1°28.3 -0°41.1	15°55.6 -0°28.4	30°22.9 -0°15.8	44°50.3 -0°03.1	-27.3 16.5 -1.2 60.7
	Fr 12	261°43.0 3°04.9	276°10.6 3°17.3	290°38.3 3°29.6	305°05.9 3°41.9	319°33.6 3°54.2	334°01.3 4°06.4	348°29.0 4°18.6	2°56.7 4°30.8	17°24.4 4°42.9	31°52.2 4°54.9	46°19.9 5°07.0	-27.7 16.4 -1.2 60.2
●	Sa 13	263°17.2 8°01.7	277°45.0 8°12.9	292°12.9 8°24.0	306°40.8 8°35.1	321°08.7 8°46.1	335°36.6 8°57.0	350°04.6 9°07.9	4°32.5 9°18.7	19°00.4 9°25.9	33°28.3 9°40.1	47°56.3 9°50.7	-27.9 16.2 -1.0 59.4
	Su 14	264°56.0 12°20.6	279°24.0 12°30.0	293°52.0 12°39.3	308°20.0 12°48.4	322°48.1 12°57.5	337°16.1 13°06.5	351°44.2 13°15.4	6°12.2 13°24.2	20°40.3 13°33.0	35°08.3 13°41.6	49°36.4 13°50.1	-28.0 16.0 -9.0 58.5
●	Mo 15	266°38.3 15°47.0	281°06.4 15°54.4	295°34.6 16°00.9	310°02.8 16°07.7	324°31.1 16°14.4	338°59.3 16°21.0	353°27.5 16°27.5	7°55.8 16°33.9	22°24.0 16°40.2	36°52.3 16°46.4	51°20.6 16°52.5	-28.2 15.7 -6.6 57.6
	Tu 16	268°26.4 18°11.5	282°54.9 18°15.9	297°23.4 18°20.2	311°51.9 18°24.4	326°20.5 18°28.5	340°49.1 18°32.5	355°17.7 18°36.4	9°46.3 18°40.2	24°15.0 18°43.9	38°46.4 18°47.4	53°12.3 18°50.9	-28.6 15.4 -3.9 56.6
●	We 17	270°25.3 19°30.2	284°54.4 19°32.0	299°23.5 19°33.7	313°52.6 19°35.2	328°21.8 19°36.7	342°51.0 19°38.1	357°20.2 19°39.3	11°49.4 19°40.5	26°17.8 19°41.5	40°48.0 19°42.5	55°17.3 19°43.3	-29.2 15.2 -1.3 55.8
	Th 18	272°41.3 19°43.9	287°11.2 19°43.2	301°41.1 19°42.3	316°11.0 19°41.4	330°41.0 19°40.4	345°11.0 19°39.2	359°41.1 19°38.0	14°11.2 19°36.7	28°41.3 19°35.2	43°11.5 19°33.7	57°41.7 19°32.1	-30.0 15.0 -1.2 55.1
●	Fr 19	275°19.5 18°56.8	289°50.3 18°53.8	304°21.2 18°50.6	318°52.1 18°47.4	333°23.1 18°44.1	347°54.1 18°40.7	2°25.1 18°37.2	16°56.2 18°33.6	31°27.3 18°29.9	45°58.5 18°26.2	60°29.7 18°22.3	-31.0 14.9 -3.5 54.5
	Sa 20	278°22.6 17°15.2	292°54.4 17°10.7	307°26.3 17°04.9	321°58.2 16°59.7	336°30.2 16°54.4	351°02.2 16°49.0	5°34.2 16°43.5	20°06.3 16°38.0	34°38.4 16°32.4	49°10.5 16°26.7	63°42.7 16°20.9	-32.0 14.8 -5.4 54.2
●	Su 21	281°50.0 14°46.5	296°22.7 14°39.7	310°55.5 14°32.8	325°28.3 14°25.9	340°01.0 14°18.9	354°34.1 14°11.8	9°07.0 14°04.7	23°40.0 13°57.5	38°13.0 13°50.3	52°46.0 13°43.0	67°19.0 13°35.6	-32.9 14.7 -7.1 54.0
	Mo 22	285°38.1 11°38.7	300°11.6 11°30.7	314°45.1 11°22.2	329°18.6 11°13.9	343°52.2 11°05.5	358°25.8 10°57.1	12°59.4 10°48.7	27°33.0 10°40.2	42°06.6 10°31.6	56°40.3 10°23.1	71°13.9 10°14.4	-33.6 14.7 -8.4 54.0
●	Tu 23	289°41.1 8°00.0	304°15.0 7°50.7	318°48.9 7°41.4	333°22.8 7°32.1	347°56.8 7°22.7	2°30.8 7°13.3	17°04.7 7°03.8	31°38.7 6°54.4	46°12.7 6°44.8	60°46.7 6°35.3	75°20.7 6°25.7	-34.0 14.8 -9.4 54.2
	We 24	293°51.0 3°59.0	308°25.0 3°49.0	322°59.0 3°39.0	337°33.0 3°29.0	352°07.0 3°18.9	6°41.0 3°08.9	21°15.0 2°58.8	35°49.0 2°48.7	50°23.0 2°38.6	64°57.0 2°28.5	79°31.0 2°18.4	-34.0 14.8 -10.1 54.4
●	Th 25	297°59.0 -0°15.1	312°32.8 -0°25.4	327°06.5 -0°35.7	341°40.2 -0°46.0	356°13.9 -0°56.3	10°47.6 -1°06.6	25°21.3 -1°17.0	39°54.9 -1°27.3	54°28.5 -1°37.6	69°02.1 -1°47.9	83°35.7 -1°58.2	-33.7 14.9 -10.3 54.8
	Fr 26	301°55.9 -4°32.1	316°29.0 -4°42.3	331°02.1 -4°52.5	345°35.1 -5°02.7	0°18.1 -5°12.8	14°41.1 -5°22.9	29°14.0 -5°33.0	43°46.9 -5°43.1	58°19.8 -5°53.2	72°52.6 -6°03.2	87°25.4 -6°13.3	-33.0 15.1 -10.1 55.2
●	Sa 27	305°32.3 -8°40.7	320°04.4 -8°50.3	334°36.4 -8°59.8	349°08.5 -9°09.3	3°40.4 -9°18.8	18°12.4 -9°28.3	32°44.2 -9°37.7	47°16.0 -9°47.0	61°47.8 -9°56.4	76°19.5 -10°05.7	90°51.2 -10°14.9	-31.9 15.2 -9.4 55.7
	Su 28	308°40.1 -12°28.0	323°10.9 -12°36.5	337°41.7 -12°44.9	352°12.4 -12°53.2	6°43.0 -13°01.5	21°13.6 -13°09.7	35°44.2 -13°17.9	50°14.6 -13°26.0	64°45.1 -13°34.0	79°15.4 -13°42.0	93°45.8 -13°49.9	-30.6 15.3 -8.2 56.2
●	Mo 29	311°13.4 -15°40.4	325°42.8 -15°47.2	340°12.1 -15°53.8	354°00.5 -16°00.5	9°10.6 -16°07.0	23°39.8 -16°13.4	38°08.8 -16°19.8	52°37.9 -16°26.1	67°06.8 -16°32.3	81°35.7 -16°38.4	96°04.6 -16°44.4	-29.1 15.5 -6.6 56.7
	Tu 30	325°42.8 -15°47.2	340°12.1 -15°53.8	354°00.5 -16°00.5	9°10.6 -16°07.0	23°39.8 -16°13.4	38°08.8 -16°19.8	52°37.9 -16°26.1	67°06.8 -16°32.3	81°35.7 -16°38.4	96°04.6 -16°44.4	110°33.4 -16°50.4	-29.1 15.5 -6.6 56.7
●	We 31	327°38.6 -18°08.4	342°06.5 -18°12.9	356°34.4 -18°17.2	11°02.2 -18°21.4	25°30.0 -18°25.6	39°57.7 -18°29.6	54°25.3 -18°33.5	68°52.9 -18°37.3	83°20.5 -18°41.1	97°48.0 -18°44.7	112°15.5 -18°48.2	-27.7 15.6 -4.0 57.3

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter
Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax
Column = (UTC hour - day) mod 24
LQ: 5 01h47 — NM: 11 16h24 — FQ: 18 20h56 — FM: 27 00h46

SUN

April 2032

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Th 1	269°03.4 4°46.2	284°03.5 4°47.2	299°03.7 4°48.2	314°03.9 4°49.1	329°04.1 4°50.1	344°04.3 4°51.1	359°04.5 4°52.0	14°04.7 4°53.0	29°04.8 4°53.9	44°05.0 4°54.9	59°05.2 4°55.9	74°05.4 4°56.8	+0.2 +1.0
Fr 2	269°07.8 5°09.3	284°08.0 5°10.3	299°08.1 5°11.2	314°08.3 5°12.2	329°08.5 5°13.1	344°08.7 5°14.1	359°08.9 5°15.1	14°09.1 5°16.0	29°09.2 5°17.0	44°09.4 5°17.9	59°09.6 5°18.9	74°09.8 5°19.8	+0.2 +1.0
Sa 3	269°12.2 5°32.3	284°12.4 5°33.2	299°12.5 5°34.2	314°12.7 5°35.1	329°12.9 5°36.1	344°13.1 5°37.0	359°13.3 5°38.0	14°13.4 5°39.0	29°13.6 5°39.9	44°13.8 5°40.9	59°14.0 5°41.8	74°14.2 5°42.8	+0.2 +1.0
Su 4	269°16.5 5°55.2	284°16.7 5°56.1	299°16.9 5°57.1	314°17.1 5°58.0	329°17.2 5°59.0	344°17.4 5°59.9	359°17.6 6°00.9	14°17.8 6°01.8	29°17.9 6°02.8	44°18.1 6°03.7	59°18.3 6°04.7	74°18.5 6°05.6	+0.2 +1.0
Mo 5	269°20.8 6°17.9	284°21.0 6°18.9	299°21.2 6°19.8	314°21.3 6°20.8	329°21.5 6°21.7	344°21.7 6°22.7	359°21.9 6°23.6	14°22.0 6°24.5	29°22.2 6°25.5	44°22.4 6°26.4	59°22.6 6°27.4	74°22.8 6°28.3	+0.2 +0.9
Tu 6	269°25.0 6°40.6	284°25.2 6°41.5	299°25.4 6°42.5	314°25.6 6°43.4	329°25.7 6°44.4	344°25.9 6°45.3	359°26.1 6°46.2	14°26.3 6°47.2	29°26.4 6°48.1	44°26.6 6°49.1	59°26.8 6°50.0	74°27.0 6°50.9	+0.2 +0.9
We 7	269°29.2 7°03.1	284°29.4 7°04.1	299°29.6 7°05.0	314°29.7 7°06.0	329°29.9 7°06.9	344°30.1 7°07.8	359°30.3 7°08.8	14°30.4 7°09.7	29°30.6 7°10.6	44°30.8 7°11.6	59°31.0 7°12.5	74°31.1 7°13.4	+0.2 +0.9
Th 8	269°33.3 7°25.6	284°33.5 7°26.5	299°33.7 7°27.4	314°33.9 7°28.4	329°34.0 7°29.3	344°34.2 7°30.3	359°34.4 7°31.2	14°34.5 7°32.1	29°34.7 7°33.0	44°34.9 7°34.0	59°35.0 7°34.9	74°35.2 7°35.8	+0.2 +0.9
Fr 9	269°37.4 7°47.9	284°37.6 7°48.8	299°37.7 7°49.7	314°37.9 7°50.7	329°38.1 7°51.6	344°38.2 7°52.5	359°38.4 7°53.4	14°38.6 7°54.4	29°38.7 7°55.3	44°38.9 7°56.2	59°39.1 7°57.1	74°39.2 7°58.1	+0.2 +0.9
Sa 10	269°41.4 8°10.1	284°41.6 8°11.0	299°41.7 8°11.9	314°41.9 8°12.8	329°42.1 8°13.7	344°42.2 8°14.7	359°42.4 8°15.6	14°42.5 8°16.5	29°42.7 8°17.4	44°42.9 8°18.3	59°43.0 8°19.3	74°43.2 8°20.2	+0.2 +0.9
Su 11	269°45.3 8°32.1	284°45.5 8°33.0	299°45.6 8°33.9	314°45.8 8°34.9	329°46.0 8°35.8	344°46.1 8°36.7	359°46.3 8°37.6	14°46.4 8°38.5	29°46.6 8°39.4	44°46.8 8°40.3	59°46.9 8°41.2	74°47.1 8°42.2	+0.2 +0.9
Mo 12	269°49.2 8°54.0	284°49.3 8°54.9	299°49.5 8°55.8	314°49.6 8°56.7	329°49.8 8°57.6	344°49.9 8°58.5	359°50.1 8°59.5	14°50.3 9°00.4	29°50.4 9°01.3	44°50.6 9°02.2	59°50.7 9°03.1	74°50.9 9°04.0	+0.2 +0.9
Tu 13	269°52.9 9°15.8	284°53.1 9°16.7	299°53.2 9°17.6	314°53.4 9°18.5	329°53.6 9°19.4	344°53.7 9°20.3	359°53.9 9°21.2	14°54.0 9°22.1	29°54.2 9°23.0	44°54.3 9°23.9	59°54.5 9°24.8	74°54.6 9°25.7	+0.2 +0.9
We 14	269°56.6 9°37.3	284°56.8 9°38.2	299°56.9 9°39.1	314°57.1 9°40.0	329°57.2 9°40.9	344°57.4 9°41.8	359°57.5 9°42.7	14°57.7 9°43.6	29°57.8 9°44.5	44°58.0 9°45.4	59°58.1 9°46.3	74°58.3 9°47.2	+0.2 +0.9
Th 15	270°00.2 9°58.8	285°00.4 9°59.7	300°00.5 10°00.6	315°00.7 10°01.4	330°00.9 10°02.3	345°01.0 10°03.2	15°01.1 10°04.1	15°01.3 10°05.0	30°01.4 10°05.9	45°01.6 10°06.8	60°01.7 10°07.7	75°01.9 10°08.5	+0.1 +0.9
Fr 16	270°03.8 10°20.0	285°03.9 10°20.9	300°04.0 10°21.8	315°04.2 10°22.7	330°04.3 10°23.6	345°04.5 10°24.5	15°04.6 10°25.3	15°04.8 10°26.2	30°04.9 10°27.1	45°05.0 10°28.0	60°05.1 10°28.9	75°05.3 10°29.7	+0.1 +0.9
Sa 17	270°07.2 10°41.1	285°07.3 10°42.0	300°07.5 10°42.9	315°07.6 10°43.8	330°07.7 10°44.6	345°07.9 10°45.5	15°08.0 10°46.4	15°08.2 10°47.3	30°08.3 10°48.1	45°08.4 10°49.0	60°08.6 10°49.9	75°08.7 10°50.7	+0.1 +0.9
Su 18	270°10.5 11°02.1	285°10.7 11°02.9	300°10.8 11°03.8	315°10.9 11°04.7	330°11.1 11°05.5	345°11.2 11°06.4	15°11.3 11°07.3	15°11.5 11°08.1	30°11.6 11°09.0	45°11.8 11°09.9	60°11.9 11°10.8	75°12.0 11°11.6	+0.1 +0.9
Mo 19	270°13.8 11°22.8	285°13.9 11°23.6	300°14.0 11°24.5	315°14.2 11°25.4	330°14.3 11°26.2	345°14.4 11°27.1	15°14.6 11°27.9	15°14.7 11°28.8	30°14.8 11°29.7	45°15.0 11°30.5	60°15.1 11°31.4	75°15.2 11°32.2	+0.1 +0.9
Tu 20	270°16.9 11°43.3	285°17.0 11°44.2	300°17.2 11°45.0	315°17.3 11°45.9	330°17.4 11°46.7	345°17.6 11°47.6	15°17.7 11°48.4	15°17.8 11°49.3	30°17.9 11°50.1	45°18.1 11°51.0	60°18.2 11°51.8	75°18.3 11°52.7	+0.1 +0.8
We 21	270°19.9 12°03.7	285°20.1 12°04.5	300°20.2 12°05.4	315°20.3 12°06.2	330°20.4 12°07.1	345°20.6 12°07.9	15°20.7 12°08.7	15°20.8 12°09.6	30°20.9 12°10.4	45°21.1 12°11.3	60°21.2 12°12.1	75°21.3 12°12.9	+0.1 +0.8
Th 22	270°22.9 12°23.8	285°23.0 12°24.7	300°23.1 12°25.5	315°23.2 12°26.3	330°23.4 12°27.2	345°23.5 12°28.0	15°23.6 12°28.8	15°23.7 12°29.7	30°23.8 12°30.5	45°23.9 12°31.3	60°24.1 12°32.2	75°24.2 12°33.0	+0.1 +0.8
Fr 23	270°25.7 12°43.8	285°25.8 12°44.6	300°25.9 12°45.4	315°26.0 12°46.3	330°26.2 12°47.1	345°26.3 12°47.9	15°26.4 12°48.7	15°26.5 12°49.6	30°26.6 12°50.4	45°26.7 12°51.2	60°26.8 12°52.0	75°27.0 12°52.8	+0.1 +0.8
Sa 24	270°28.4 13°03.5	285°28.5 13°04.3	300°28.6 13°05.1	315°28.7 13°06.0	330°28.8 13°06.8	345°28.9 13°07.6	15°29.1 13°08.4	15°29.2 13°09.2	30°29.3 13°10.0	45°29.4 13°10.9	60°29.5 13°11.7	75°29.6 13°12.5	+0.1 +0.8
Su 25	270°31.0 13°23.0	285°31.1 13°23.8	300°31.2 13°24.7	315°31.3 13°25.5	330°31.4 13°26.3	345°31.5 13°27.1	15°31.6 13°27.9	15°31.7 13°28.7	30°31.8 13°29.5	45°31.9 13°30.3	60°32.0 13°31.1	75°32.1 13°31.9	+0.1 +0.8
Mo 26	270°33.5 13°42.3	285°33.6 13°43.1	300°33.7 13°43.9	315°33.8 13°44.7	330°33.9 13°45.5	345°34.0 13°46.3	15°34.0 13°47.1	15°34.1 13°47.9	30°34.2 13°48.7	45°34.3 13°49.5	60°34.4 13°50.3	75°34.5 13°51.1	+0.1 +0.8
Tu 27	270°35.8 14°01.4	285°35.9 14°02.2	300°36.0 14°03.0	315°36.1 14°03.8	330°36.2 14°04.6	345°36.3 14°05.4	15°36.4 14°06.1	15°36.5 14°06.9	30°36.6 14°07.7	45°36.7 14°08.5	60°36.7 14°09.3	75°36.8 14°10.1	+0.1 +0.8
We 28	270°38.0 14°20.3	285°38.1 14°21.0	300°38.2 14°21.8	315°38.3 14°22.6	330°38.4 14°23.4	345°38.4 14°24.2	15°38.5 14°24.9	15°38.6 14°25.7	30°38.7 14°26.5	45°38.8 14°27.3	60°38.9 14°28.0	75°39.0 14°28.8	+0.1 +0.8
Th 29	270°40.1 14°38.9	285°40.2 14°39.6	300°40.2 14°40.4	315°40.3 14°41.2	330°40.4 14°41.9	345°40.5 14°42.7	15°40.6 14°43.5	15°40.7 14°44.3	30°40.8 14°45.0	45°40.8 14°45.8	60°40.9 14°46.6	75°41.0 14°47.3	+0.1 +0.8
Fr 30	270°42.0 14°57.2	285°42.1 14°58.0	300°42.2 14°58.8	315°42.3 14°59.5	330°42.3 15°00.3	345°42.4 15°01.0	15°42.5 15°01.8	15°42.6 15°02.5	30°42.6 15°03.3	45°42.7 15°04.1	60°42.8 15°04.8	75°42.9 15°05.6	+0.1 +0.8

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 15.9'

MOON

April 2032

	D	19h	20h	21h	22h	23h	0h	1h	2h	3h	4h	5h	Δ' /h SH
O	Th 1	228°59.2 -19°40.7	243°25.5 -19°40.3	257°51.7 -19°39.8	272°17.9 -19°39.1	286°44.1 -19°38.3	301°10.3 -19°36.4	315°36.4 -19°36.4	330°02.6 -19°35.3	344°28.7 -19°34.0	358°54.8 -19°32.6	13°20.9 -19°31.1	+26.2 15.9 +1.0 58.2
	Fr 2	229°51.2 -18°53.8	244°17.2 -18°50.4	258°43.2 -18°46.8	273°09.2 -18°43.1	287°35.1 -18°39.3	302°01.1 -18°35.4	316°27.1 -18°31.3	330°53.1 -18°27.1	345°19.1 -18°22.8	359°45.2 -18°18.4	14°11.2 -18°13.9	+26.0 16.0 +4.0 58.7
	Sa 3	230°42.7 -16°52.0	245°08.9 -16°45.6	259°35.9 -16°39.1	274°01.4 -16°32.5	288°27.7 -16°25.8	302°54.0 -16°19.0	317°20.3 -16°12.1	331°46.6 -16°05.1	346°13.0 -15°50.8	360°39.3 -15°43.5	15°05.7 -15°43.5	+26.3 16.1 +6.9 59.2
	Su 4	231°44.3 -13°41.7	246°11.1 -13°32.8	260°37.8 -13°23.8	275°04.7 -13°14.8	289°31.5 -13°05.6	303°58.4 -12°56.4	318°25.3 -12°47.1	332°52.2 -12°37.7	347°19.1 -12°28.2	1°46.1 -12°18.6	16°13.1 -12°09.0	+26.9 16.3 +9.4 59.6
	Mo 5	246°11.1 -13°32.8	260°37.8 -13°23.8	275°04.7 -13°14.8	289°31.5 -13°05.6	303°58.4 -12°56.4	318°25.3 -12°47.1	332°52.2 -12°37.7	347°19.1 -12°28.2	1°46.1 -12°18.6	16°13.1 -12°09.0	30°40.1 -11°59.3	+26.9 16.3 +9.4 59.6
	Tu 6	247°28.3 -9°24.6	261°55.7 -9°13.7	276°23.8 -9°02.8	290°50.6 -8°51.9	305°18.1 -8°40.8	319°45.6 -8°29.7	334°13.1 -8°18.6	348°40.6 -8°07.4	3°08.2 -7°56.2	17°35.8 -7°44.9	32°03.4 -7°33.5	+27.5 16.3 +11.1 59.9
	We 7	248°59.8 -4°38.1	263°27.7 -4°26.1	277°55.6 -4°14.1	292°23.5 -4°02.1	306°51.4 -3°50.0	321°19.4 -3°37.9	335°47.3 -3°25.8	350°15.3 -3°13.7	4°43.3 -3°01.5	19°11.3 -2°49.4	33°39.3 -2°37.2	+28.0 16.4 +12.1 60.0
	Th 8	250°40.5 0°26.7	265°08.6 0°38.9	279°36.8 0°51.2	294°04.9 1°03.5	308°33.0 1°15.7	323°01.2 1°27.9	337°29.3 1°40.2	351°57.5 1°52.4	6°25.6 2°04.7	20°53.8 2°16.8	35°21.9 2°28.9	+28.1 16.3 +12.2 59.9
	Fr 9	252°24.0 5°28.3	266°52.1 5°40.0	281°20.2 5°51.7	295°48.3 6°03.6	310°16.4 6°14.9	324°44.5 6°26.4	339°12.5 6°37.9	353°40.6 6°49.4	8°08.6 7°00.8	22°36.8 7°12.1	37°04.8 7°23.4	+28.2 16.2 +11.5 59.5
	Sa 10	254°04.7 10°06.0	268°32.6 10°16.3	283°00.5 10°26.6	297°28.4 10°36.8	311°56.3 10°46.9	326°24.2 10°56.9	340°52.1 11°06.9	355°20.0 11°16.8	9°47.8 11°26.6	24°15.7 11°36.4	38°43.5 11°46.1	+27.9 16.1 +10.0 59.0
O	Su 11	255°40.3 14°01.1	270°08.1 14°09.4	284°35.8 14°17.7	299°03.5 14°25.8	313°31.2 14°33.8	327°59.0 14°41.7	342°26.7 14°49.6	356°54.4 14°57.3	11°22.1 15°04.9	25°49.8 15°12.5	40°17.5 15°19.9	+27.7 15.9 +7.9 58.3
	Mo 12	257°13.2 16°59.6	271°40.9 17°05.4	285°08.7 17°11.1	300°36.4 17°16.7	315°04.2 17°22.2	329°31.9 17°27.6	343°59.7 17°32.9	358°27.5 17°38.1	12°55.3 17°43.1	27°23.1 17°48.1	41°50.9 17°53.0	+27.8 15.7 +5.3 57.5
	Tu 13	258°49.9 18°52.7	273°18.0 18°55.8	287°46.1 18°58.9	302°14.2 19°01.7	316°42.3 19°04.5	331°10.5 19°07.2	345°38.7 19°09.8	360°06.9 19°12.2	14°35.1 19°14.6	29°03.4 19°16.8	43°31.7 19°18.9	+28.2 15.4 +2.6 56.6
	We 14	260°39.7 19°38.0	275°08.5 19°38.4	289°37.3 19°38.7	304°06.2 19°38.9	318°35.1 19°39.0	333°04.1 19°39.0	347°33.0 19°38.9	362°02.1 19°38.7	16°31.1 19°38.4	31°00.2 19°38.0	45°29.4 19°37.5	+29.0 15.2 -0.1 55.9
	Th 15	262°51.6 19°17.8	277°21.4 19°15.7	291°51.3 19°13.6	306°21.2 19°11.3	320°51.2 19°08.9	335°21.2 19°06.5	349°51.3 19°03.9	364°21.4 19°01.3	18°51.6 18°58.5	33°21.8 18°55.7	47°52.0 18°52.8	+30.0 15.0 -2.5 55.2
	Fr 16	265°31.6 17°58.6	280°02.6 17°54.3	294°33.7 17°49.9	309°04.8 17°45.5	323°36.0 17°41.0	338°07.2 17°36.4	352°38.5 17°31.7	367°09.8 17°26.9	21°41.1 17°22.1	36°12.5 17°17.2	50°44.8 17°12.2	+31.2 14.9 -4.6 54.7
	Sa 17	268°41.3 15°48.5	283°13.5 15°42.4	297°45.7 15°36.2	312°18.0 15°29.9	326°50.3 15°23.6	341°22.7 15°17.1	355°55.1 15°10.7	370°27.5 15°04.2	25°00.0 14°57.6	39°32.5 14°50.9	54°05.1 14°44.2	+32.4 14.8 -6.4 54.3
	Su 18	272°18.1 12°56.3	286°51.2 12°48.6	301°24.4 12°40.9	315°57.6 12°33.2	330°30.9 12°25.4	345°04.2 12°17.5	359°37.5 12°09.6	374°10.7 12°01.7	28°44.2 11°53.7	43°17.6 11°45.6	57°51.0 11°37.5	+33.3 14.8 -7.9 54.1
	Mo 19	276°15.5 9°30.5	290°49.4 9°21.7	305°23.2 9°12.8	319°57.0 9°04.0	334°30.9 8°55.0	349°04.8 8°46.1	363°38.7 8°37.1	378°12.6 8°28.0	32°46.5 8°18.9	47°20.5 8°09.8	61°54.4 8°00.7	+33.9 14.8 -9.0 54.2
	Tu 20	280°25.1 5°39.5	294°59.2 5°29.8	309°33.3 5°20.1	324°07.4 5°10.4	338°41.5 5°00.7	353°15.6 4°50.9	367°49.7 4°41.2	382°22.3 4°31.4	36°57.8 4°21.5	51°31.9 4°11.7	66°06.0 4°01.8	+34.1 14.8 -9.8 54.4
O	We 21	284°36.6 1°31.5	299°10.5 1°21.3	313°44.4 1°11.2	328°18.4 1°01.0	342°52.3 0°50.8	357°26.1 0°40.6	372°00.0 0°30.4	386°33.9 0°20.2	41°07.7 0°10.0	55°41.5 -0°00.3	70°15.3 -0°10.5	+33.9 14.9 -10.2 54.7
	Th 22	288°39.2 -2°44.5	303°12.5 -2°54.7	317°45.9 -3°05.0	332°19.2 -3°15.3	346°52.4 -3°25.5	361°25.7 -3°35.7	376°00.0 -3°46.0	390°32.0 -3°56.2	45°05.1 -4°06.4	59°38.2 -4°16.6	74°11.3 -4°26.8	+33.2 15.0 -10.2 55.2
	Fr 23	292°22.1 -6°58.0	306°54.4 -7°07.9	321°26.7 -7°17.7	335°59.0 -7°27.7	350°31.2 -7°37.6	365°03.4 -7°47.4	379°35.2 -7°57.2	393°07.6 -8°07.0	48°39.6 -8°16.7	63°11.5 -8°26.4	77°43.5 -8°36.1	+32.1 15.2 -9.8 55.7
	Sa 24	295°35.4 -10°57.0	310°06.4 -11°06.1	324°37.4 -11°15.1	339°08.3 -11°24.0	353°39.1 -11°33.0	368°09.9 -11°41.8	382°40.6 -11°50.7	397°11.2 -11°59.4	51°41.8 -12°08.1	66°12.3 -12°16.8	80°42.7 -12°25.4	+30.7 15.4 -8.8 56.3
	Su 25	298°11.9 -14°27.3	312°41.3 -14°34.9	327°10.7 -14°42.5	341°40.0 -14°49.9	356°09.2 -14°57.3	370°38.4 -15°04.6	385°07.5 -15°11.9	399°36.5 -15°19.0	54°05.5 -15°26.1	68°34.4 -15°33.1	83°03.2 -15°40.0	+29.1 15.5 -7.3 56.9
	Mo 26	300°08.3 -17°13.7	314°36.2 -17°19.2	329°04.0 -17°24.7	343°31.7 -17°30.0	357°59.4 -17°35.2	372°27.0 -17°40.4	387°06.9 -17°45.4	401°22.1 -17°50.3	55°49.5 -17°55.2	70°16.9 -17°59.9	84°44.2 -18°04.5	+26.7 15.7 -5.1 57.5
	Tu 27	301°28.2 -19°01.3	315°54.7 -19°04.4	330°21.3 -19°07.0	344°47.7 -19°09.6	359°14.2 -19°12.2	373°40.6 -19°14.6	388°06.9 -19°17.0	402°33.3 -19°19.2	56°59.5 -19°21.2	71°25.8 -19°23.2	85°52.0 -19°25.1	+26.4 15.8 -2.4 58.0
	We 28	302°21.9 -19°38.2	316°47.7 -19°38.2	331°13.5 -19°37.7	345°39.3 -19°37.7	360°05.1 -19°37.2	374°30.6 -19°36.6	388°56.6 -19°35.9	403°22.3 -19°35.1	57°48.0 -19°34.1	72°13.8 -19°33.0	86°39.5 -19°31.8	+25.8 15.9 +0.8 58.4
	Th 29	316°47.7 -19°38.2	331°13.5 -19°38.2	345°39.3 -19°37.7	360°05.1 -19°37.2	374°30.6 -19°36.6	388°56.6 -19°35.9	403°22.3 -19°35.1	417°48.1 -19°34.1	57°48.0 -19°33.0	72°13.8 -19°31.8	86°39.5 -19°30.4	+25.7 15.9 +0.8 58.4
	Fr 30	317°30.8 -18°55.5	331°56.6 -18°52.2	346°22.3 -18°48.8	361°04.8 -18°45.2	375°13.9 -18°41.6	389°39.7 -18°37.8	403°05.6 -18°33.9	417°31.4 -18°29.8	58°31.4 -18°25.7	73°57.3 -18°21.4	87°23.1 -18°17.0	+25.8 16.0 +3.9 58.8

Row 1: GHA, Δ' /h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ' /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 3 10h10 — NM: 10 02h39 — FQ: 17 15h24 — FM: 25 15h09

SUN

May 2032

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Sa 1	270°43.8	285°43.9	300°44.0	315°44.0	330°44.1	345°44.2	0°44.3	15°44.3	30°44.4	45°44.5	60°44.5	75°44.6	+0.1
	15°15.4	15°16.1	15°16.9	15°17.6	15°18.4	15°19.1	15°19.9	15°20.6	15°21.3	15°22.1	15°22.8	15°23.6	+0.7
Su 2	270°45.5	285°45.6	300°45.6	315°45.7	330°45.8	345°45.8	0°45.9	15°46.0	30°46.0	45°46.1	60°46.2	75°46.2	+0.1
	15°33.2	15°34.0	15°34.7	15°35.4	15°36.2	15°36.9	15°37.7	15°38.4	15°39.1	15°39.9	15°40.6	15°41.3	+0.7
Mo 3	270°47.0	285°47.1	300°47.1	315°47.2	330°47.3	345°47.3	0°47.4	15°47.4	30°47.5	45°47.6	60°47.6	75°47.7	+0.1
	15°50.8	15°51.6	15°52.3	15°53.0	15°53.8	15°54.5	15°55.2	15°55.9	15°56.7	15°57.4	15°58.1	15°58.8	+0.7
Tu 4	270°48.4	285°48.5	300°48.5	315°48.6	330°48.6	345°48.7	0°48.7	15°48.8	30°48.8	45°48.9	60°48.9	75°49.0	+0.1
	16°08.2	16°08.9	16°09.6	16°10.3	16°11.1	16°11.8	16°12.5	16°13.2	16°13.9	16°14.6	16°15.4	16°16.1	+0.7
We 5	270°49.6	285°49.7	300°49.7	315°49.8	330°49.8	345°49.9	0°49.9	15°50.0	30°50.0	45°50.1	60°50.1	75°50.2	+0.0
	16°25.3	16°26.0	16°26.7	16°27.4	16°28.1	16°28.8	16°29.5	16°30.2	16°30.9	16°31.6	16°32.3	16°33.0	+0.7
Th 6	270°50.7	285°50.8	300°50.8	315°50.9	330°50.9	345°50.9	0°51.0	15°51.0	30°51.1	45°51.1	60°51.1	75°51.2	+0.0
	16°42.1	16°42.8	16°43.5	16°44.2	16°44.9	16°45.6	16°46.3	16°46.9	16°47.6	16°48.3	16°49.0	16°49.7	+0.7
Fr 7	270°51.7	285°51.7	300°51.8	315°51.8	330°51.8	345°51.9	0°51.9	15°51.9	30°52.0	45°52.0	60°52.0	75°52.1	+0.0
	17°04.9	17°05.6	17°06.2	17°06.9	17°07.6	17°08.2	17°08.9	17°09.6	17°10.2	17°10.9	17°11.6	17°12.2	+0.7
Sa 8	270°52.5	285°52.5	300°52.5	315°52.6	330°52.6	345°52.6	0°52.7	15°52.7	30°52.7	45°52.7	60°52.8	75°52.8	+0.0
	17°14.9	17°15.6	17°16.2	17°16.9	17°17.6	17°18.2	17°18.9	17°19.6	17°20.2	17°20.9	17°21.6	17°22.2	+0.7
Su 9	270°53.1	285°53.2	300°53.2	315°53.2	330°53.2	345°53.3	0°53.3	15°53.3	30°53.3	45°53.4	60°53.4	75°53.4	+0.0
	17°30.8	17°31.5	17°32.2	17°32.8	17°33.5	17°34.1	17°34.8	17°35.4	17°36.1	17°36.8	17°37.4	17°38.1	+0.7
Mo 10	270°53.7	285°53.7	300°53.7	315°53.7	330°53.7	345°53.7	0°53.8	15°53.8	30°53.8	45°53.8	60°53.8	75°53.8	+0.0
	17°46.5	17°47.2	17°47.8	17°48.5	17°49.1	17°49.7	17°50.4	17°51.0	17°51.7	17°52.3	17°53.0	17°53.6	+0.6
Tu 11	270°54.0	285°54.0	300°54.1	315°54.1	330°54.1	345°54.1	0°54.1	15°54.1	30°54.1	45°54.1	60°54.1	75°54.2	+0.0
	18°01.9	18°02.5	18°03.2	18°03.8	18°04.4	18°05.1	18°05.7	18°06.3	18°06.9	18°07.6	18°08.2	18°08.8	+0.6
We 12	270°54.3	285°54.3	300°54.3	315°54.3	330°54.3	345°54.3	0°54.3	15°54.3	30°54.3	45°54.3	60°54.3	75°54.3	+0.0
	18°17.0	18°17.6	18°18.2	18°18.8	18°19.4	18°20.1	18°20.7	18°21.3	18°21.9	18°22.5	18°23.1	18°23.8	+0.6
Th 13	270°54.4	285°54.4	300°54.4	315°54.4	330°54.4	345°54.4	0°54.4	15°54.4	30°54.4	45°54.4	60°54.4	75°54.3	-0.0
	18°31.7	18°32.3	18°32.9	18°33.5	18°34.1	18°34.8	18°35.4	18°36.0	18°36.6	18°37.2	18°37.8	18°38.4	+0.6
Fr 14	270°54.3	285°54.3	300°54.3	315°54.3	330°54.3	345°54.3	0°54.3	15°54.3	30°54.3	45°54.3	60°54.3	75°54.2	-0.0
	18°46.2	18°46.8	18°47.4	18°47.9	18°48.5	18°49.1	18°49.7	18°50.3	18°50.9	18°51.5	18°52.1	18°52.7	+0.6
Sa 15	270°54.1	285°54.1	300°54.1	315°54.1	330°54.1	345°54.1	0°54.1	15°54.0	30°54.0	45°54.0	60°54.0	75°54.0	-0.0
	19°00.3	19°00.9	19°01.5	19°02.0	19°02.6	19°03.2	19°03.8	19°04.4	19°04.9	19°05.5	19°06.1	19°06.7	+0.6
Su 16	270°53.8	285°53.8	300°53.8	315°53.7	330°53.7	345°53.7	0°53.7	15°53.7	30°53.7	45°53.6	60°53.6	75°53.6	-0.0
	19°14.1	19°14.7	19°15.2	19°15.8	19°16.4	19°16.9	19°17.5	19°18.1	19°18.6	19°19.2	19°19.8	19°20.3	+0.6
Mo 17	270°53.3	285°53.3	300°53.3	315°53.3	330°53.2	345°53.2	0°53.2	15°53.2	30°53.2	45°53.1	60°53.1	75°53.1	-0.0
	19°27.6	19°28.1	19°28.7	19°29.2	19°29.8	19°30.4	19°30.9	19°31.5	19°32.0	19°32.6	19°33.1	19°33.7	+0.6
Tu 18	270°52.7	285°52.7	300°52.7	315°52.7	330°52.6	345°52.6	0°52.6	15°52.5	30°52.5	45°52.5	60°52.5	75°52.4	-0.0
	19°40.7	19°41.3	19°41.8	19°42.4	19°42.9	19°43.4	19°44.0	19°44.5	19°45.0	19°45.6	19°46.1	19°46.6	+0.5
We 19	270°50.2	285°50.2	300°50.2	315°50.1	330°50.1	345°50.1	0°50.1	15°50.0	30°50.0	45°50.0	60°50.0	75°50.0	-0.0
	19°53.5	19°54.1	19°54.6	19°55.1	19°55.6	19°56.2	19°56.7	19°57.2	19°57.7	19°58.3	19°58.8	19°59.3	+0.5
Th 20	270°51.2	285°51.1	300°51.1	315°51.1	330°51.0	345°51.0	0°50.9	15°50.9	30°50.9	45°50.8	60°50.8	75°50.7	-0.0
	20°06.0	20°06.5	20°07.0	20°07.6	20°08.1	20°08.6	20°09.1	20°09.6	20°10.1	20°10.6	20°11.1	20°11.6	+0.5
Fr 21	270°50.2	285°50.1	300°50.1	315°50.0	330°50.0	345°50.0	0°49.9	15°49.9	30°49.8	45°49.8	60°49.7	75°49.7	-0.0
	20°18.1	20°18.6	20°19.1	20°19.6	20°20.1	20°20.6	20°21.1	20°21.6	20°22.1	20°22.6	20°23.1	20°23.6	+0.5
Sa 22	270°49.1	285°49.0	300°49.0	315°48.9	330°48.9	345°48.8	0°48.8	15°48.7	30°48.7	45°48.6	60°48.6	75°48.5	-0.1
	20°29.9	20°30.4	20°30.9	20°31.4	20°31.9	20°32.3	20°32.8	20°33.3	20°33.8	20°34.3	20°34.7	20°35.2	+0.5
Su 23	270°47.8	285°47.8	300°47.7	315°47.7	330°47.6	345°47.6	0°47.5	15°47.4	30°47.4	45°47.3	60°47.3	75°47.2	-0.1
	20°41.4	20°41.8	20°42.3	20°42.8	20°43.2	20°43.7	20°44.2	20°44.6	20°45.1	20°45.6	20°46.0	20°46.5	+0.5
Mo 24	270°46.5	285°46.4	300°46.3	315°46.3	330°46.2	345°46.2	0°46.1	15°46.0	30°46.0	45°45.9	60°45.9	75°45.8	-0.1
	20°52.4	20°52.9	20°53.3	20°53.8	20°54.2	20°54.7	20°55.1	20°55.6	20°56.0	20°56.5	20°56.9	20°57.4	+0.5
Tu 25	270°45.0	285°44.9	300°44.8	315°44.8	330°44.7	345°44.6	0°44.6	15°44.5	30°44.5	45°44.4	60°44.3	75°44.3	-0.1
	21°03.1	21°03.6	21°04.0	21°04.5	21°04.9	21°05.3	21°05.8	21°06.2	21°06.6	21°07.1	21°07.5	21°07.9	+0.4
We 26	270°43.4	285°43.3	300°43.2	315°43.2	330°43.1	345°43.0	0°42.9	15°42.9	30°42.8	45°42.7	60°42.7	75°42.6	-0.1
	21°13.5	21°13.9	21°14.3	21°14.8	21°15.2	21°15.6	21°16.0	21°16.4	21°16.9	21°17.3	21°17.7	21°18.1	+0.4
Th 27	270°41.6	285°41.6	300°41.5	315°41.4	330°41.3	345°41.3	0°41.2	15°41.1	30°41.0	45°41.0	60°40.9	75°40.8	-0.1
	21°23.5	21°23.9	21°24.3	21°24.7	21°25.1	21°25.5	21°25.9	21°26.3	21°26.7	21°27.1	21°27.5	21°27.9	+0.4
Fr 28	270°39.8	285°39.7	300°39.6	315°39.5	330°39.5	345°39.4	0°39.3	15°39.2	30°39.1	45°39.1	60°39.0	75°38.9	-0.1
	21°33.1	21°33.5	21°33.9	21°34.3	21°34.7	21°35.1	21°35.4	21°35.8	21°36.2	21°36.6	21°37.0	21°37.4	+0.4
Sa 29	270°37.8	285°37.7	300°37.7	315°37.6	330°37.5	345°37.4	0°37.3	15°37.2	30°37.1	45°37.1	60°37.0	75°36.9	-0.1
	21°42.3	21°42.7	21°43.1	21°43.5	21°43.8	21°44.2	21°44.6	21°45.0	21°45.3	21°45.7	21°46.1	21°46.4	+0.4
Su 30	270°35.7	285°35.7	300°35.6	315°35.5	330°35.4	345°35.3	0°35.2	15°35.1	30°35.0	45°34.9	60°34.8	75°34.8	-0.1
	21°51.2	21°51.6	21°51.9	21°52.3	21°52.6	21°53.0	21°53.3	21°53.7	21°54.0	21°54.4	21°54.8	21°55.1	+0.4
Mo 31	270°33.6	285°33.5	300°33.4	315°33.3	330°33.2	345°33.1	0°33.0	15°32.9	30°32.8	45°32.7	60°32.6	75°32.5	-0.1
	21°59.7	22°00.0	22°00.4	22°00.7	22°01.1	22°01.4	22°01.7	22°02.1	22°02.4	22°02.8	22°03.1	22°03.4	+0.3

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.8'

MOON

May 2032

	D	20h	21h	22h	23h	0h	1h	2h	3h	4h	5h	6h	Δ'/h SH
O	Sa 1	232°45.5 -14°42.4	247°12.5 -14°34.3	261°39.4 -14°26.1	276°06.4 -14°17.9	290°33.5 -14°09.5	305°00.6 -14°01.1	319°27.7 -13°52.5	333°54.9 -13°43.9	348°22.1 -13°35.2	2°49.3 -13°26.4	17°16.6 -13°17.6	+27.1 16.1 +8.5 59.1
	Su 2	234°10.1 -10°55.3	248°38.0 -10°45.2	263°05.8 -10°35.1	277°33.8 -10°24.9	292°01.7 -10°14.7	306°29.7 -10°04.4	320°57.7 -9°54.0	335°25.8 -9°43.6	349°53.9 -9°33.1	4°22.0 -9°22.0	18°50.1 -9°12.0	+28.0 16.2 +10.3 59.3
	Mo 3	235°55.9 -6°27.0	250°24.5 -6°15.7	264°53.1 -6°04.3	279°21.8 -5°52.9	293°50.5 -5°41.4	308°19.2 -5°30.0	322°47.9 -5°18.5	337°16.6 -5°06.9	351°45.3 -4°55.3	6°14.1 -4°43.7	20°42.9 -4°32.1	+28.7 16.2 +11.5 59.3
O	Tu 4	250°24.5 -6°15.7	264°53.1 -6°04.3	279°21.8 -5°52.9	293°50.5 -5°41.4	308°19.2 -5°30.0	322°47.9 -5°18.5	337°16.6 -5°06.9	351°45.3 -4°55.3	6°14.1 -4°43.7	20°42.9 -4°32.1	35°11.7 -4°20.5	+28.7 16.2 +11.5 59.3
	We 5	252°25.7 -1°23.4	266°54.7 -1°11.5	281°23.8 -0°59.6	295°52.8 -0°47.7	310°21.9 -0°35.8	324°50.9 -0°23.9	339°20.0 -0°11.9	353°49.1 0°00.0	8°18.1 0°11.9	22°47.2 0°23.8	37°16.3 0°35.7	+29.1 16.1 +11.9 59.2
	Th 6	254°32.5 3°33.1	269°01.6 3°44.7	283°30.6 3°56.4	297°59.7 4°08.0	312°28.7 4°19.6	326°57.8 4°31.2	341°26.8 4°42.8	355°55.8 4°54.3	10°24.8 5°05.8	24°53.8 5°17.2	39°22.8 5°28.7	+29.0 16.1 +11.6 59.0
O	Fr 7	256°36.2 8°15.2	271°04.9 8°25.9	285°33.7 8°36.6	300°02.4 8°47.2	314°31.2 8°57.8	328°59.9 9°08.3	343°28.6 9°18.8	357°57.3 9°29.2	12°25.9 9°39.5	26°54.6 9°49.8	41°23.2 10°00.0	+28.7 16.0 +10.5 58.6
	Sa 8	258°30.4 12°15.2	272°58.8 12°34.3	287°27.1 12°43.4	301°55.4 12°52.3	316°23.7 13°01.2	330°51.9 13°10.0	345°20.2 13°18.7	359°48.4 13°27.3	14°16.6 13°35.8	28°44.8 13°44.3	43°13.0 13°52.7	+28.3 15.9 +8.7 58.2
	Su 9	260°13.8 15°50.5	274°41.8 15°54.4	289°09.7 16°01.3	303°37.7 16°08.0	318°05.6 16°14.6	332°33.5 16°21.1	347°01.4 16°27.5	361°37.3 16°33.0	15°57.2 16°40.1	30°25.0 16°46.1	44°52.9 16°52.2	+27.9 15.7 +6.5 57.6
O	Mo 10	261°50.6 18°10.1	276°18.4 18°14.4	290°46.3 18°18.6	305°14.1 18°22.8	319°42.6 18°26.8	334°09.9 18°30.7	348°37.3 18°34.5	363°05.7 18°38.2	17°33.5 18°41.8	32°40.1 18°45.3	46°29.3 18°48.6	+27.9 15.5 +3.9 57.0
	Tu 11	263°29.8 19°26.0	277°58.0 19°27.6	292°26.2 19°29.1	306°54.4 19°30.5	321°22.7 19°31.8	335°50.9 19°33.0	350°19.3 19°34.1	364°47.6 19°35.1	19°16.0 19°35.9	33°44.3 19°36.7	48°12.8 19°37.3	+28.3 15.4 +1.1 56.3
	We 12	265°23.1 19°34.3	279°52.1 19°33.3	294°21.1 19°32.2	308°50.1 19°30.9	323°19.1 19°29.6	337°48.4 19°28.2	352°17.6 19°26.6	366°46.8 19°25.0	21°16.1 19°23.3	35°45.4 19°21.4	50°14.8 19°19.5	+29.2 15.2 -1.5 55.6
O	Th 13	267°40.8 18°39.2	282°10.5 18°35.8	296°41.1 18°32.3	311°11.3 18°28.7	325°41.6 18°25.0	340°11.9 18°21.2	354°42.3 18°17.3	369°12.7 18°13.4	23°43.1 18°09.4	38°13.7 18°05.2	52°44.3 18°01.0	+30.3 15.0 -3.8 55.1
	Fr 14	270°29.1 16°48.4	285°00.5 16°42.9	299°31.9 16°37.4	314°03.4 16°31.8	328°35.0 16°26.1	343°06.6 16°20.3	357°38.2 16°14.5	372°12.9 16°08.6	26°41.7 16°02.7	41°17.1 15°56.6	55°45.3 15°50.5	+31.6 14.9 -5.8 54.6
	Sa 15	273°48.8 14°11.3	288°21.4 14°04.2	302°54.4 13°57.0	317°26.4 13°49.8	331°56.7 13°42.5	346°32.2 13°35.1	361°05.0 13°27.7	376°11.0 13°20.3	28°30.0 13°12.8	44°43.7 13°05.2	59°16.7 12°57.6	+32.8 14.8 -7.4 54.3
O	Su 16	277°35.8 10°57.0	292°09.4 10°49.1	306°42.9 10°40.7	321°16.5 10°32.2	335°50.2 10°23.7	350°23.8 10°15.1	365°07.5 10°06.5	379°51.9 9°57.9	34°05.0 9°49.2	48°38.8 9°40.5	63°12.6 9°31.7	+33.7 14.8 -8.6 54.2
	Mo 17	281°42.2 7°16.0	296°16.4 7°06.7	310°55.3 6°57.3	325°24.6 6°47.9	339°58.8 6°38.5	354°33.0 6°29.1	369°07.2 6°19.6	383°14.2 6°10.1	36°52.9 6°00.6	52°49.8 5°51.1	67°24.0 5°41.5	+34.2 14.8 -9.4 54.2
	Tu 18	285°57.8 3°15.2	300°32.0 3°02.0	315°06.3 2°55.3	329°40.5 2°45.3	344°14.8 2°35.4	358°49.0 2°25.4	373°23.2 2°15.4	387°57.4 2°05.4	42°31.6 1°55.3	57°05.8 1°45.3	71°40.0 1°35.2	+34.2 14.9 -10.0 54.3
O	We 19	290°10.8 -0°56.8	304°44.6 -1°06.9	319°18.5 -1°17.1	333°52.4 -1°27.3	348°26.2 -1°37.5	3°00.0 -1°47.7	17°33.7 -1°57.9	32°07.4 -2°08.1	46°41.1 -2°18.3	61°14.8 -2°28.5	75°48.5 -2°38.7	+33.8 15.0 -10.2 54.9
	Th 20	294°08.8 -5°10.8	308°41.8 -5°20.9	323°14.8 -5°31.0	337°47.7 -5°41.0	352°20.6 -5°51.0	6°53.5 -6°01.0	21°26.3 -6°11.0	35°59.1 -6°21.0	50°31.8 -6°31.0	65°04.8 -6°40.9	79°37.0 -6°50.8	+32.8 15.1 -10.0 55.5
	Fr 21	297°39.6 -9°16.6	312°11.4 -9°26.1	326°43.0 -9°35.6	341°14.6 -9°45.0	355°46.1 -9°54.4	10°17.6 -10°03.7	24°49.0 -10°13.0	39°20.3 -10°22.3	53°51.6 -10°31.5	68°22.8 -10°40.7	82°53.9 -10°49.9	+31.4 15.3 -9.3 56.1
O	Sa 22	300°32.7 -13°01.4	315°02.7 -13°09.8	329°32.6 -13°18.1	344°02.5 -13°26.3	358°32.3 -13°34.3	13°02.0 -13°42.6	27°31.7 -13°50.6	42°01.3 -13°58.6	56°30.8 -14°06.5	71°00.2 -14°14.4	85°29.9 -14°22.2	+29.7 15.5 -8.1 56.9
	Su 23	302°40.7 -16°10.1	317°08.9 -16°16.7	331°37.0 -16°23.2	346°05.0 -16°29.6	360°32.9 -16°35.9	15°00.7 -16°42.1	29°28.5 -16°48.2	43°56.2 -16°54.3	58°23.9 -17°00.2	72°51.4 -17°06.1	87°18.9 -17°11.8	+27.8 15.7 -6.2 57.6
	Mo 24	304°03.0 -18°26.3	318°29.4 -18°30.4	332°55.8 -18°34.4	347°22.0 -18°38.3	361°48.3 -18°45.8	16°14.5 -18°52.8	30°40.6 -18°59.3	45°06.6 -19°05.8	59°32.7 -19°12.8	73°58.6 -19°19.5	88°24.5 -19°26.4	+26.1 15.9 -3.6 58.3
O	Tu 25	304°47.3 -19°34.5	319°12.5 -19°35.7	333°37.6 -19°36.7	348°02.8 -19°37.6	362°27.9 -19°38.4	16°52.9 -19°39.0	31°18.0 -19°39.5	45°43.0 -19°39.9	60°08.0 -19°40.1	74°32.9 -19°40.3	88°57.9 -19°40.2	+25.1 16.1 -0.6 58.9
	We 26	305°10.1 -19°24.5	319°34.9 -19°22.4	333°59.6 -19°20.2	348°24.4 -19°17.8	362°49.2 -19°15.3	17°13.9 -19°12.7	31°38.7 -19°10.0	46°03.5 -19°07.1	60°28.3 -19°04.1	74°53.1 -19°01.0	89°17.9 -18°57.8	+24.8 16.2 -2.7 59.3
	Th 27	305°32.3 -17°53.8	319°57.4 -17°48.6	334°22.6 -17°43.2	348°47.8 -17°37.7	363°13.1 -17°32.1	17°38.3 -17°26.4	32°03.7 -17°14.7	46°29.0 -17°08.6	60°54.4 -17°02.4	75°19.8 -16°56.2	89°45.3 -16°49.8	+25.3 16.2 +5.9 59.5
O	Fr 28	319°57.4 -17°48.6	334°22.6 -17°43.2	348°47.8 -17°37.7	363°13.1 -17°32.1	362°49.2 -17°20.6	17°38.3 -17°08.6	32°03.7 -17°14.7	46°29.0 -17°08.6	60°54.4 -17°02.4	75°19.8 -16°56.2	89°45.3 -16°49.8	+25.3 16.2 +5.9 59.5
	Sa 29	320°38.3 -15°01.2	335°04.5 -14°53.2	349°30.8 -14°45.1	363°57.1 -14°36.9	378°23.4 -14°20.1	32°49.8 -14°11.6	47°16.3 -14°03.0	61°42.7 -13°54.4	76°09.3 -13°45.6	90°35.9 -13°36.8	105°00.2 -13°26.8	+26.4 16.2 +8.5 59.6
	Su 30	321°48.0 -11°14.7	336°15.4 -11°04.6	350°42.9 -10°54.5	365°10.4 -10°44.3	379°37.9 -10°34.3	34°05.6 -10°23.8	48°33.2 -10°13.4	63°00.9 -10°03.0	77°28.7 -9°52.5	91°56.6 -9°42.0	106°24.3 -9°31.4	+27.6 16.2 +10.3 59.5
O	Mo 31	323°27.3 -6°46.9	337°55.8 -6°35.6	352°24.4 -6°24.3	366°53.0 -6°12.9	381°21.6 -6°01.5	35°50.3 -5°50.1	50°19.0 -5°38.6	64°47.8 -5°27.1	79°16.5 -5°15.6	93°45.3 -5°04.1	108°14.2 -4°52.5	+28.7 16.2 +11.4 59.3

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (— = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 2 16h01 — NM: 9 13h35 — FQ: 17 09h43 — FM: 25 02h37 — LQ: 31 20h51

SUN

June 2032

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Tu 1	270°31.3 22°07.8	285°31.2 22°08.1	300°31.1 22°08.4	315°31.0 22°08.8	330°30.9 22°09.1	345°30.8 22°09.4	0°30.7 22°09.8	15°30.6 22°10.1	30°30.5 22°10.2	45°30.4 22°10.7	60°30.3 22°11.0	75°30.2 22°11.4	-0.1 +0.3
We 2	270°28.9 22°15.5	285°28.8 22°15.8	300°28.7 22°16.1	315°28.6 22°16.4	330°28.5 22°16.8	345°28.4 22°17.1	0°28.3 22°17.4	15°28.2 22°17.7	30°28.1 22°18.0	45°27.9 22°18.2	60°27.8 22°18.3	75°27.7 22°18.6	-0.1 +0.3
Th 3	270°26.4 22°22.8	285°26.3 22°23.1	300°26.2 22°23.4	315°26.1 22°23.7	330°26.0 22°24.0	345°25.8 22°24.3	0°25.7 22°24.6	15°25.6 22°24.9	30°25.5 22°25.2	45°25.4 22°25.5	60°25.3 22°25.8	75°25.2 22°26.1	-0.1 +0.3
Fr 4	270°23.8 22°29.8	285°23.7 22°30.0	300°23.6 22°30.3	315°23.5 22°30.6	330°23.4 22°30.9	345°23.2 22°31.2	0°23.1 22°31.4	15°23.0 22°31.7	30°22.9 22°32.0	45°22.8 22°32.3	60°22.7 22°32.5	75°22.6 22°32.8	-0.1 +0.3
Sa 5	270°21.1 22°36.3	285°21.0 22°36.6	300°20.9 22°36.8	315°20.8 22°37.1	330°20.7 22°37.4	345°20.6 22°37.6	0°20.4 22°37.9	15°20.3 22°38.1	30°20.2 22°38.4	45°20.1 22°38.7	60°20.0 22°38.9	75°19.9 22°39.2	-0.1 +0.3
Su 6	270°18.4 22°42.5	285°18.3 22°42.7	300°18.1 22°42.9	315°18.0 22°43.2	330°17.9 22°43.4	345°17.8 22°43.7	0°17.7 22°43.9	15°17.5 22°44.2	30°17.4 22°44.4	45°17.3 22°44.7	60°17.2 22°44.9	75°17.1 22°45.1	-0.1 +0.2
Mo 7	270°15.5 22°48.2	285°15.4 22°48.4	300°15.3 22°48.7	315°15.2 22°48.9	330°15.1 22°49.1	345°14.9 22°49.3	0°14.8 22°49.6	15°14.7 22°49.8	30°14.6 22°50.0	45°14.5 22°50.2	60°14.3 22°50.5	75°14.2 22°50.7	-0.1 +0.2
Tu 8	270°12.6 22°53.5	285°12.5 22°53.8	300°12.4 22°54.0	315°12.3 22°54.2	330°12.2 22°54.4	345°12.0 22°54.6	0°11.9 22°54.8	15°11.8 22°55.0	30°11.7 22°55.2	45°11.5 22°55.4	60°11.4 22°55.7	75°11.3 22°55.9	-0.1 +0.2
We 9	270°09.7 22°58.5	285°09.6 22°58.7	300°09.4 22°58.9	315°09.3 22°59.1	330°09.2 22°59.3	345°09.1 22°59.5	0°08.9 22°59.7	15°08.8 22°59.9	30°08.7 23°00.0	45°08.6 23°00.2	60°08.4 23°00.4	75°08.3 23°00.6	-0.1 +0.2
Th 10	270°06.7 23°03.0	285°06.5 23°03.2	300°06.4 23°03.4	315°06.3 23°03.6	330°06.2 23°03.7	345°06.0 23°03.9	0°05.9 23°04.1	15°05.8 23°04.3	30°05.6 23°04.5	45°05.5 23°04.6	60°05.4 23°04.8	75°05.3 23°05.0	-0.1 +0.2
Fr 11	270°03.6 23°07.2	285°03.5 23°07.3	300°03.3 23°07.5	315°03.2 23°07.7	330°03.1 23°07.8	345°02.9 23°08.0	0°02.8 23°08.1	15°02.7 23°08.3	30°02.6 23°08.4	45°02.4 23°08.6	60°02.3 23°08.9	75°02.2 23°09.2	-0.1 +0.2
Sa 12	270°00.5 23°10.9	285°00.3 23°11.0	300°00.2 23°11.2	315°00.1 23°11.3	330°00.0 23°11.5	344°59.8 23°11.6	359°59.7 23°11.8	14°59.6 23°11.9	29°59.6 23°12.0	44°59.4 23°12.2	59°59.2 23°12.3	74°59.0 23°12.5	-0.1 +0.1
Su 13	269°57.3 23°14.2	284°57.2 23°14.3	299°57.1 23°14.5	314°56.9 23°14.6	329°56.8 23°14.7	344°56.7 23°14.8	359°56.5 23°15.0	14°56.4 23°15.1	29°56.3 23°15.2	44°56.1 23°15.3	59°56.0 23°15.5	74°55.9 23°15.6	-0.1 +0.1
Mo 14	269°54.1 23°17.1	284°54.0 23°17.2	299°53.9 23°17.3	314°53.7 23°17.5	329°53.6 23°17.6	344°53.5 23°17.7	359°53.3 23°17.8	14°53.2 23°17.9	29°53.1 23°18.0	44°52.9 23°18.1	59°52.8 23°18.2	74°52.7 23°18.3	-0.1 +0.1
Tu 15	269°50.9 23°19.6	284°50.8 23°19.7	299°50.7 23°19.8	314°50.5 23°19.9	329°50.4 23°20.0	344°50.3 23°20.1	359°50.1 23°20.2	14°50.0 23°20.3	29°49.9 23°20.4	44°49.7 23°20.5	59°49.6 23°20.6	74°49.5 23°20.7	-0.1 +0.1
We 16	269°47.7 23°21.7	284°47.6 23°21.8	299°47.4 23°21.9	314°47.3 23°21.9	329°47.2 23°22.0	344°47.0 23°22.1	359°46.9 23°22.2	14°46.8 23°22.2	29°46.6 23°22.3	44°46.5 23°22.4	59°46.4 23°22.4	74°46.2 23°22.5	-0.1 +0.1
Th 17	269°44.5 23°23.4	284°44.3 23°23.4	299°44.2 23°23.5	314°44.1 23°23.6	329°44.0 23°23.6	344°43.8 23°23.7	359°43.6 23°23.7	14°43.5 23°23.8	29°43.4 23°23.8	44°43.2 23°23.9	59°43.1 23°23.9	74°43.0 23°24.0	-0.1 +0.1
Fr 18	269°41.2 23°24.6	284°41.1 23°24.7	299°40.9 23°24.7	314°40.8 23°24.8	329°40.7 23°24.8	344°40.5 23°24.8	359°40.4 23°24.9	14°40.3 23°24.9	29°40.2 23°25.0	44°40.0 23°25.0	59°39.9 23°25.0	74°39.7 23°25.1	-0.1 +0.0
Sa 19	269°38.0 23°25.5	284°37.8 23°25.5	299°37.7 23°25.5	314°37.6 23°25.6	329°37.4 23°25.6	344°37.3 23°25.6	359°37.1 23°25.6	14°37.0 23°25.6	29°36.9 23°25.7	44°36.7 23°25.7	59°36.6 23°25.7	74°36.5 23°25.7	-0.1 +0.0
Su 20	269°34.7 23°25.9	284°34.6 23°25.9	299°34.4 23°25.9	314°34.3 23°25.9	329°34.2 23°25.9	344°34.0 23°26.0	359°33.9 23°26.0	14°33.8 23°26.0	29°33.6 23°26.0	44°33.5 23°26.0	59°33.4 23°26.0	74°33.2 23°26.0	-0.1 +0.0
Mo 21	269°31.5 23°25.9	284°31.3 23°25.9	299°31.2 23°25.9	314°31.1 23°25.9	329°30.9 23°25.9	344°30.8 23°25.9	359°30.7 23°25.9	14°30.5 23°25.9	29°30.4 23°25.9	44°30.3 23°25.8	59°30.3 23°25.8	74°30.0 23°25.8	-0.1 -0.0
Tu 22	269°28.2 23°25.5	284°28.1 23°25.5	299°28.0 23°25.5	314°27.8 23°25.5	329°27.7 23°25.4	344°27.6 23°25.4	359°27.4 23°25.4	14°27.3 23°25.4	29°27.2 23°25.3	44°27.0 23°25.3	59°26.9 23°25.3	74°26.8 23°25.2	-0.1 -0.0
We 23	269°25.0 23°24.7	284°24.9 23°24.7	299°24.8 23°24.7	314°24.6 23°24.6	329°24.5 23°24.5	344°24.4 23°24.5	359°24.2 23°24.5	14°24.2 23°24.4	29°24.0 23°24.4	44°23.8 23°24.4	59°23.7 23°24.3	74°23.6 23°24.2	-0.1 -0.0
Th 24	269°21.8 23°23.5	284°21.7 23°23.5	299°21.6 23°23.4	314°21.4 23°23.3	329°21.3 23°23.3	344°21.2 23°23.2	359°21.0 23°23.2	14°20.9 23°23.1	29°20.8 23°23.1	44°20.7 23°23.0	59°20.5 23°22.9	74°20.4 23°22.8	-0.1 -0.1
Fr 25	269°18.7 23°21.9	284°18.6 23°21.8	299°18.4 23°21.7	314°18.3 23°21.7	329°18.2 23°21.6	344°18.0 23°21.5	359°17.9 23°21.4	14°17.8 23°21.3	29°17.6 23°21.2	44°17.5 23°21.1	59°17.4 23°21.1	74°17.2 23°21.0	-0.1 -0.1
Sa 26	269°15.6 23°19.9	284°15.4 23°19.8	299°15.3 23°19.7	314°15.2 23°19.6	329°15.0 23°19.5	344°14.9 23°19.4	359°14.8 23°19.3	14°14.6 23°19.2	29°14.4 23°19.1	44°14.3 23°18.9	59°14.2 23°18.9	74°14.1 23°18.8	-0.1 -0.1
Su 27	269°12.5 23°17.4	284°12.3 23°17.2	299°12.2 23°17.2	314°12.1 23°17.1	329°12.0 23°17.0	344°11.8 23°16.8	359°11.7 23°16.7	14°11.6 23°16.6	29°11.4 23°16.5	44°11.3 23°16.2	59°11.2 23°16.2	74°11.1 23°16.1	-0.1 -0.1
Mo 28	269°09.4 23°14.5	284°09.3 23°14.4	299°09.2 23°14.3	314°09.0 23°14.2	329°08.8 23°14.0	344°08.8 23°13.9	359°08.7 23°13.8	14°08.5 23°13.6	29°08.4 23°13.5	44°08.3 23°13.2	59°08.2 23°13.2	74°08.0 23°13.1	-0.1 -0.1
Tu 29	269°06.4 23°11.3	284°06.3 23°11.1	299°06.2 23°11.0	314°06.0 23°10.8	329°05.9 23°10.7	344°05.8 23°10.5	359°05.7 23°10.4	14°05.5 23°10.2	29°05.4 23°10.1	44°05.3 23°09.9	59°05.2 23°09.8	74°05.1 23°09.6	-0.1 -0.1
We 30	269°03.5 23°07.6	284°03.3 23°07.4	299°03.2 23°07.3	314°03.1 23°07.1	329°03.0 23°07.0	344°02.9 23°06.8	359°02.7 23°06.6	14°02.6 23°06.5	29°02.5 23°06.3	44°02.4 23°06.1	59°02.2 23°06.0	74°02.1 23°05.8	-0.1 -0.2

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

June 2032

	D	21h	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	Δ'/h SH
●	Tu 1	226°20.0 1°35.2	240°49.5 1°46.9	255°19.1 1°58.6	269°48.6 2°10.3	284°18.2 2°21.9	298°47.8 2°33.6	313°17.4 2°45.2	327°47.0 2°56.8	342°16.6 3°08.4	356°46.2 3°19.9	11°15.8 3°31.5	+29.6 16.0 +11.6 58.7
	We 2	228°39.8 6°20.9	243°09.4 6°31.9	257°38.9 6°42.9	272°08.5 6°53.8	286°38.0 7°04.7	301°07.6 7°15.5	315°37.1 7°26.3	330°06.6 7°37.1	344°36.1 7°47.8	359°05.6 7°58.4	13°35.1 8°09.1	+29.5 15.9 +10.8 58.3
	Th 3	243°09.4 6°31.9	257°38.9 6°42.9	272°08.5 6°53.8	286°38.0 7°04.7	301°07.6 7°15.5	315°37.1 7°26.3	330°06.6 7°37.1	344°36.1 7°47.8	359°05.6 7°58.4	13°35.1 8°09.1	28°04.6 8°19.6	+29.5 15.9 +10.8 58.3
●	Fr 4	245°25.1 10°51.3	259°54.3 11°01.0	274°23.6 11°10.5	288°52.8 11°20.0	303°22.0 11°29.5	317°51.1 11°38.8	332°20.3 11°48.1	346°49.4 11°57.3	1°18.5 12°06.5	15°47.6 12°15.6	30°16.7 12°24.6	+29.2 15.8 +9.3 57.8
	Sa 5	247°30.7 14°30.5	261°59.5 14°38.3	276°28.2 14°45.9	290°57.0 14°53.5	305°25.7 15°01.0	319°54.4 15°08.4	334°23.1 15°15.7	348°51.8 15°22.9	3°20.4 15°30.0	17°49.1 15°37.1	32°17.7 15°44.0	+28.7 15.6 +7.4 57.4
	Su 6	249°25.3 10°51.3	263°53.7 11°01.0	278°22.1 11°10.5	292°50.5 11°20.0	307°18.9 11°29.5	321°47.2 11°38.8	336°15.6 11°48.1	350°43.9 11°57.3	5°12.3 12°06.5	19°40.6 12°15.6	34°09.0 12°24.6	+28.4 15.5 +9.3 57.8
●	Mo 7	251°13.8 17°17.1	265°42.2 17°22.5	280°10.5 17°27.8	294°38.9 17°33.1	309°07.2 17°38.2	323°35.6 17°43.2	338°04.0 17°48.1	352°32.4 17°52.9	7°00.8 17°57.7	21°29.2 18°02.3	35°57.6 18°06.8	+28.4 15.4 +5.0 56.8
	Tu 8	253°05.9 19°02.0	267°34.7 19°04.9	282°03.4 19°07.6	296°32.2 19°10.2	311°01.0 19°12.7	325°29.8 19°15.1	339°58.7 19°17.4	354°27.5 19°19.6	8°56.5 19°21.7	23°25.4 19°23.7	37°54.4 19°25.6	+28.8 15.2 +2.4 56.3
	We 9	255°13.1 19°14.7	269°42.6 19°12.4	284°11.2 19°09.9	298°41.2 19°07.4	313°11.5 19°04.8	327°41.2 19°02.0	342°11.0 18°59.2	356°40.8 18°56.3	11°10.7 18°53.3	25°40.5 18°50.2	40°10.5 18°47.6	+29.7 15.1 +2.8 55.2
●	Th 10	257°45.0 17°48.6	272°15.7 17°44.0	286°46.4 17°39.4	301°17.2 17°34.6	315°48.1 17°29.8	330°18.9 17°24.9	344°49.9 17°19.9	359°20.8 17°14.9	13°51.9 17°09.7	28°23.0 17°04.5	42°54.1 16°59.2	+30.9 14.9 -4.9 54.8
	Fr 11	260°47.0 15°31.2	275°19.0 15°24.7	289°50.9 15°18.2	304°23.0 15°11.7	318°55.0 15°05.1	333°27.1 14°58.4	347°59.3 14°51.6	2°31.5 14°44.8	17°03.8 14°38.0	31°36.1 14°31.0	46°08.4 14°24.0	+32.1 14.8 -6.7 54.4
	Sa 12	264°19.1 12°32.4	278°52.2 12°24.5	293°25.3 12°16.6	307°58.4 12°08.6	322°31.6 12°00.6	337°04.8 11°52.5	351°38.1 11°44.4	6°11.4 11°36.2	20°44.7 11°28.0	35°18.1 11°19.8	49°51.5 11°11.5	+33.2 14.8 -8.1 54.2
●	Su 13	268°16.5 9°02.1	282°50.4 8°53.2	297°24.4 8°44.2	311°58.4 8°35.2	326°32.3 8°26.1	341°06.4 8°17.1	355°40.4 8°08.0	10°14.5 7°58.8	24°48.6 7°49.7	39°22.7 7°40.5	53°56.8 7°31.3	+34.0 14.8 -9.1 54.1
	Mo 14	272°30.9 5°09.6	287°05.3 5°00.0	301°39.7 4°50.3	316°14.1 4°40.6	330°48.5 4°30.9	345°22.9 4°21.2	359°57.3 4°11.5	14°31.7 4°01.7	29°06.2 3°51.9	43°40.6 3°42.1	58°15.0 3°32.3	+34.4 14.8 -9.7 54.2
	Tu 15	276°51.5 1°03.5	291°25.9 0°53.4	306°00.2 0°43.4	320°34.6 0°33.4	335°09.0 0°23.4	349°43.3 0°13.3	4°17.6 0°03.3	18°51.9 -0°06.8	33°26.2 -0°16.8	48°00.5 -0°26.9	62°34.8 -0°37.0	+34.3 14.8 -10.0 54.4
●	We 16	281°06.1 -3°08.0	295°40.0 -3°18.1	310°13.9 -3°28.1	324°47.7 -3°38.2	339°21.5 -3°48.2	353°55.2 -3°58.2	8°28.9 -4°08.2	23°02.6 -4°18.2	37°36.3 -4°28.2	52°09.9 -4°38.2	66°43.7 -4°48.2	+33.7 15.0 -10.0 54.9
	Th 17	285°01.9 -7°15.9	299°34.8 -7°25.6	314°07.6 -7°35.3	328°40.3 -7°45.0	343°13.0 -7°54.6	357°45.7 -8°04.2	12°18.3 -8°13.8	26°50.8 -8°23.3	41°28.3 -8°32.8	55°55.7 -8°42.3	70°28.1 -8°51.8	+32.6 15.1 -9.6 55.5
	Fr 18	288°26.1 -11°09.8	302°57.4 -11°18.7	317°28.7 -11°27.5	331°59.9 -11°36.3	346°31.0 -11°45.1	1°02.1 -11°53.8	15°33.1 -12°02.5	30°04.0 -12°11.1	44°34.8 -12°19.6	59°05.6 -12°28.2	73°36.3 -12°36.6	+31.0 15.3 -8.7 56.2
●	Sa 19	291°07.4 -14°36.8	305°36.8 -14°44.3	320°06.2 -14°51.8	334°50.5 -14°59.2	349°04.7 -15°06.5	3°33.8 -15°13.7	18°02.8 -15°20.9	32°31.6 -15°28.0	46°06.6 -15°35.0	61°29.4 -15°41.9	75°58.1 -15°48.8	+29.1 15.6 -7.2 57.1
	Su 20	292°58.8 -17°21.7	307°26.2 -17°27.7	321°53.5 -17°32.6	336°20.7 -17°37.9	350°47.9 -17°43.3	5°14.9 -17°48.2	19°41.9 -17°53.2	34°08.8 -17°58.1	48°35.7 -18°02.9	63°02.4 -18°07.6	77°29.1 -18°12.2	+27.0 15.8 -5.0 58.0
	Mo 21	294°00.5 -19°07.9	308°26.1 -19°10.7	322°51.5 -19°13.4	337°17.0 -19°15.9	351°42.3 -19°18.4	6°07.6 -19°20.7	20°32.8 -19°22.9	34°58.0 -19°25.0	49°23.1 -19°26.9	63°48.2 -19°28.7	78°13.2 -19°30.4	+25.3 16.0 -2.3 58.8
○	Tu 22	294°22.7 -19°40.7	308°47.0 -19°39.9	323°11.3 -19°39.3	337°35.6 -19°38.0	351°59.8 -19°37.9	6°24.0 -19°36.9	20°48.2 -19°35.9	35°12.4 -19°34.7	49°36.5 -19°33.3	64°00.6 -19°31.8	78°24.7 -19°30.2	+24.2 16.2 +1.0 59.6
	We 23	294°24.8 -18°49.7	308°48.8 -18°45.9	323°12.8 -18°42.0	337°36.9 -18°38.0	352°00.9 -18°33.8	6°24.9 -18°29.5	20°49.0 -18°25.1	35°13.0 -18°20.5	49°37.1 -18°15.8	64°01.2 -18°11.0	78°25.3 -18°06.0	+24.0 16.4 +4.4 60.1
	Th 24	294°30.1 -16°36.7	308°54.6 -16°29.8	323°19.3 -16°22.8	337°43.9 -16°15.7	352°08.6 -16°08.4	6°33.3 -16°01.0	20°58.1 -15°53.6	35°22.9 -15°46.0	49°47.8 -15°38.3	64°12.7 -15°30.5	78°37.6 -15°22.6	+24.8 16.5 +7.4 60.4
○	Fr 25	294°57.6 -13°12.1	309°23.4 -13°02.7	323°49.2 -12°53.2	338°15.0 -12°43.6	352°40.9 -12°33.9	7°06.9 -12°24.2	21°32.9 -12°14.3	35°58.9 -12°04.4	50°25.1 -11°54.4	64°51.2 -11°44.4	79°17.5 -11°34.2	+26.0 16.5 +9.6 60.4
	Sa 26	295°57.4 -8°54.3	310°24.5 -8°43.2	324°51.6 -8°32.1	339°18.8 -8°20.9	353°46.0 -8°09.6	8°13.3 -7°58.3	22°40.7 -7°47.0	37°08.1 -7°35.6	51°35.5 -7°24.1	66°03.0 -7°12.7	80°30.6 -7°01.2	+27.3 16.4 +11.3 60.1
	Su 27	310°24.5 -8°43.2	324°51.6 -8°32.1	339°18.8 -8°20.9	353°46.0 -8°09.6	8°13.3 -7°58.3	22°40.7 -7°47.0	37°08.1 -7°35.6	51°35.5 -7°24.1	66°03.0 -7°12.7	80°30.6 -7°01.2	94°58.2 -6°49.6	+27.4 16.4 +11.4 60.1
○	Mo 28	311°57.6 -3°53.2	326°25.9 -3°41.2	340°54.2 -3°29.3	355°22.6 -3°17.3	9°51.0 -3°05.4	24°19.5 -2°53.7	38°48.0 -2°41.4	53°16.5 -2°29.4	67°45.1 -2°17.4	82°13.7 -2°05.4	96°42.3 -1°53.4	+28.5 16.3 +12.0 59.7
	Tu 29	313°55.5 1°06.1	328°24.6 1°18.0	342°53.7 1°29.9	357°22.9 1°41.7	11°52.0 1°53.5	26°21.2 2°05.4	40°50.4 2°17.1	55°19.6 2°28.9	69°48.9 2°40.6	84°18.4 2°52.3	98°47.4 3°04.0	+29.2 16.1 +11.8 59.1
	We 30	316°08.0 5°55.5	330°37.5 6°06.6	345°07.0 6°17.7	359°36.4 6°28.8	14°05.9 6°39.8	28°35.4 6°50.7	43°04.9 7°01.6	57°34.3 7°12.5	72°03.8 7°23.3	86°33.3 7°34.0	101°02.8 7°44.7	+29.5 15.9 +10.9 58.5

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 8 01h32 — FQ: 16 02h59 — FM: 23 11h32 — LQ: 30 02h11

SUN

July 2032

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Th 1	268°00.6	284°00.4	299°00.3	314°00.2	329°00.1	344°00.0	358°59.9	13°59.7	28°59.6	43°59.5	58°59.4	73°59.3	-0.1
	23°03.5	23°03.3	23°03.2	23°03.0	23°02.8	23°02.6	23°02.4	23°02.3	23°02.1	23°01.9	23°01.7	23°01.5	-0.2
Fr 2	268°57.7	283°57.6	298°57.5	313°57.4	328°57.3	343°57.2	358°57.0	13°56.9	28°56.8	43°56.7	58°56.6	73°56.5	-0.1
	22°59.0	22°58.8	22°58.6	22°58.5	22°58.3	22°58.1	22°57.9	22°57.7	22°57.5	22°57.3	22°57.1	22°56.9	-0.2
Sa 3	268°55.0	283°54.9	298°54.7	313°54.6	328°54.5	343°54.4	358°54.3	13°54.2	28°54.1	43°54.0	58°53.8	73°53.7	-0.1
	22°54.2	22°53.9	22°53.7	22°53.5	22°53.3	22°53.1	22°52.9	22°52.7	22°52.4	22°52.2	22°52.0	22°51.8	-0.2
Su 4	268°52.3	283°52.2	298°52.1	313°51.9	328°51.8	343°51.7	358°51.6	13°51.5	28°51.4	43°51.3	58°51.2	73°51.1	-0.1
	22°48.9	22°48.6	22°48.4	22°48.2	22°48.0	22°47.7	22°47.5	22°47.3	22°47.0	22°46.8	22°46.6	22°46.3	-0.2
Mo 5	268°49.7	283°49.6	298°49.5	313°49.3	328°49.2	343°49.1	358°49.0	13°48.9	28°48.8	43°48.7	58°48.6	73°48.5	-0.1
	22°43.2	22°42.9	22°42.7	22°42.5	22°42.2	22°42.0	22°41.7	22°41.5	22°41.2	22°41.0	22°40.7	22°40.5	-0.2
Tu 6	268°47.1	283°47.0	298°46.9	313°46.8	328°46.7	343°46.6	358°46.5	13°46.4	28°46.3	43°46.2	58°46.1	73°46.0	-0.1
	22°37.1	22°36.9	22°36.6	22°36.3	22°36.1	22°35.8	22°35.5	22°35.3	22°35.0	22°34.7	22°34.5	22°34.2	-0.3
We 7	268°44.7	283°44.6	298°44.5	313°44.4	328°44.3	343°44.2	358°44.1	13°44.0	28°43.9	43°43.8	58°43.7	73°43.6	-0.1
	22°30.6	22°30.4	22°30.1	22°29.8	22°29.5	22°29.3	22°29.0	22°28.7	22°28.4	22°28.1	22°27.8	22°27.6	-0.3
Th 8	268°42.4	283°42.3	298°42.2	313°42.1	328°42.0	343°41.9	358°41.8	13°41.7	28°41.6	43°41.5	58°41.4	73°41.3	-0.1
	22°23.8	22°23.5	22°23.2	22°22.9	22°22.6	22°22.3	22°22.0	22°21.7	22°21.4	22°21.1	22°20.8	22°20.5	-0.3
Fr 9	268°40.1	283°40.1	298°40.0	313°39.9	328°39.8	343°39.7	358°39.6	13°39.5	28°39.4	43°39.3	58°39.2	73°39.2	-0.1
	22°16.6	22°16.2	22°15.9	22°15.6	22°15.3	22°15.0	22°14.7	22°14.4	22°14.1	22°13.7	22°13.4	22°13.1	-0.3
Sa 10	268°38.0	283°37.9	298°37.8	313°37.8	328°37.7	343°37.6	358°37.5	13°37.4	28°37.3	43°37.3	58°37.2	73°37.1	-0.1
	22°08.9	22°08.6	22°08.3	22°07.9	22°07.6	22°07.3	22°07.0	22°06.6	22°06.3	22°06.0	22°05.6	22°05.3	-0.3
Su 11	268°36.0	283°35.9	298°35.8	313°35.8	328°35.7	343°35.6	358°35.5	13°35.4	28°35.3	43°35.3	58°35.2	73°35.1	-0.1
	22°00.9	22°00.6	22°00.2	21°59.9	21°59.6	21°59.2	21°58.9	21°58.5	21°58.2	21°57.8	21°57.5	21°57.1	-0.3
Mo 12	268°34.1	283°34.0	298°34.0	313°33.9	328°33.8	343°33.7	358°33.7	13°33.6	28°33.5	43°33.4	58°33.4	73°33.3	-0.1
	21°52.5	21°52.2	21°51.8	21°51.5	21°51.1	21°50.7	21°50.4	21°50.0	21°49.7	21°49.3	21°48.9	21°48.6	-0.4
Tu 13	268°32.3	283°32.3	298°32.2	313°32.1	328°32.1	343°32.0	358°31.9	13°31.8	28°31.8	43°31.7	58°31.6	73°31.6	-0.1
	21°43.8	21°43.4	21°43.0	21°42.7	21°42.3	21°41.9	21°41.5	21°41.2	21°40.8	21°40.4	21°40.0	21°39.6	-0.4
We 14	268°30.7	283°30.6	298°30.6	313°30.5	328°30.4	343°30.4	358°30.3	13°30.2	28°30.2	43°30.1	58°30.0	73°30.0	-0.1
	21°34.7	21°34.3	21°33.9	21°33.5	21°33.1	21°32.7	21°32.3	21°31.9	21°31.5	21°31.1	21°30.7	21°30.4	-0.4
Th 15	268°29.2	283°29.1	298°29.0	313°28.9	328°28.9	343°28.9	358°28.8	13°28.8	28°28.7	43°28.6	58°28.6	73°28.5	-0.1
	21°25.2	21°24.8	21°24.4	21°24.0	21°23.5	21°23.1	21°22.7	21°22.3	21°21.9	21°21.5	21°21.1	21°20.7	-0.4
Fr 16	268°27.8	283°27.7	298°27.7	313°27.6	328°27.6	343°27.5	358°27.5	13°27.4	28°27.3	43°27.3	58°27.2	73°27.2	-0.1
	21°15.3	21°14.9	21°14.5	21°14.0	21°13.6	21°13.2	21°12.8	21°12.4	21°11.9	21°11.5	21°11.1	21°10.7	-0.4
Sa 17	268°26.5	283°26.5	298°26.4	313°26.4	328°26.3	343°26.3	358°26.2	13°26.2	28°26.1	43°26.1	58°26.0	73°26.0	-0.0
	21°05.1	21°04.7	21°04.2	21°03.8	21°03.4	21°02.9	21°02.5	21°02.0	21°01.6	21°01.2	21°00.7	21°00.3	-0.4
Su 18	268°25.4	283°25.4	298°25.3	313°25.3	328°25.2	343°25.2	358°25.2	13°25.1	28°25.1	43°25.0	58°25.0	73°25.0	-0.0
	20°54.5	20°54.1	20°53.6	20°53.2	20°52.7	20°52.3	20°51.8	20°51.4	20°50.9	20°50.5	20°50.0	20°49.6	-0.5
Mo 19	268°24.4	283°24.4	298°24.4	313°24.3	328°24.3	343°24.3	358°24.2	13°24.2	28°24.2	43°24.1	58°24.1	73°24.0	-0.0
	20°43.6	20°43.1	20°42.7	20°42.2	20°41.7	20°41.3	20°40.8	20°40.4	20°39.9	20°39.4	20°38.9	20°38.5	-0.5
Tu 20	268°23.6	283°23.6	298°23.6	313°23.5	328°23.5	343°23.5	358°23.4	13°23.4	28°23.4	43°23.3	58°23.3	73°23.3	-0.0
	20°32.3	20°31.8	20°31.4	20°30.9	20°30.4	20°29.9	20°29.4	20°29.0	20°28.5	20°28.0	20°27.5	20°27.0	-0.5
We 21	268°22.9	283°22.9	298°22.9	313°22.9	328°22.8	343°22.8	358°22.8	13°22.8	28°22.7	43°22.7	58°22.7	73°22.7	-0.0
	20°20.7	20°20.2	20°19.7	20°19.2	20°18.7	20°18.2	20°17.7	20°17.3	20°16.8	20°16.3	20°15.8	20°15.3	-0.5
Th 22	268°22.4	283°22.4	298°22.4	313°22.3	328°22.3	343°22.3	358°22.3	13°22.3	28°22.3	43°22.2	58°22.2	73°22.2	-0.0
	19°08.7	20°08.2	20°07.7	20°07.2	20°06.7	20°06.2	20°05.7	20°05.2	20°04.7	20°04.2	20°03.7	20°03.2	-0.5
Fr 23	268°22.0	283°22.0	298°22.0	313°22.0	328°21.9	343°21.9	358°21.9	13°21.9	28°21.9	43°21.9	58°21.9	73°21.9	-0.0
	19°56.5	19°55.9	19°55.4	19°54.9	19°54.4	19°53.9	19°53.3	19°52.8	19°52.3	19°51.8	19°51.3	19°50.7	-0.5
Sa 24	268°21.7	283°21.7	298°21.7	313°21.7	328°21.7	343°21.7	358°21.7	13°21.7	28°21.7	43°21.7	58°21.7	73°21.7	-0.0
	19°43.8	19°43.3	19°42.8	19°42.2	19°41.7	19°41.2	19°40.6	19°40.1	19°39.5	19°39.0	19°38.5	19°37.9	-0.5
Su 25	268°21.6	283°21.6	298°21.6	313°21.6	328°21.6	343°21.6	358°21.6	13°21.6	28°21.6	43°21.6	58°21.6	73°21.6	+0.0
	19°30.9	19°30.3	19°29.8	19°29.2	19°28.7	19°28.1	19°27.6	19°27.0	19°26.5	19°25.9	19°25.4	19°24.8	-0.5
Mo 26	268°21.7	283°21.7	298°21.7	313°21.7	328°21.7	343°21.7	358°21.7	13°21.7	28°21.7	43°21.7	58°21.7	73°21.8	+0.0
	19°17.6	19°17.0	19°16.5	19°15.9	19°15.4	19°14.8	19°14.2	19°13.7	19°13.1	19°12.5	19°12.0	19°11.4	-0.6
Tu 27	268°21.9	283°21.9	298°21.9	313°21.9	328°21.9	343°21.9	358°21.9	13°22.0	28°22.0	43°22.0	58°22.0	73°22.0	+0.0
	19°04.0	19°03.4	19°02.9	19°02.3	19°01.7	19°01.1	19°00.6	19°00.0	18°59.4	18°58.8	18°58.2	18°57.7	-0.6
We 28	268°22.2	283°22.2	298°22.2	313°22.3	328°22.3	343°22.3	358°22.3	13°22.3	28°22.4	43°22.4	58°22.4	73°22.4	+0.0
	18°50.1	18°49.5	18°48.9	18°48.3	18°47.7	18°47.1	18°46.6	18°46.0	18°45.4	18°44.8	18°44.2	18°43.6	-0.6
Th 29	268°22.7	283°22.7	298°22.7	313°22.8	328°22.8	343°22.8	358°22.8	13°22.9	28°22.9	43°22.9	58°22.9	73°23.0	+0.0
	18°35.9	18°35.3	18°34.7	18°34.1	18°33.5	18°32.9	18°32.3	18°31.7	18°31.1	18°30.4	18°29.8	18°29.2	-0.6
Fr 30	268°23.3	283°23.3	298°23.3	313°23.4	328°23.4	343°23.5	358°23.5	13°23.5	28°23.6	43°23.6	58°23.6	73°23.7	+0.0
	18°21.3	18°20.7	18°20.1	18°19.5	18°18.9	18°18.3	18°17.7	18°17.0	18°16.4	18°15.8	18°15.2	18°14.6	-0.6
Sa 31	268°24.1	283°24.1	298°24.2	313°24.2	328°24.2	343°24.3	358°24.3	13°24.3	28°24.4	43°24.4	58°24.5	73°24.5	+0.0
	18°06.5	18°05.9	18°05.2	18°04.6	18°04.0	18°03.4	18°02.7	18°02.1	18°01.5	18°00.9	18°00.2	17°59.6	-0.6

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 15.7'

MOON

July 2032

	D	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	Δ'/h SH
Th 1	233°43.1	248°12.3	262°41.6	277°10.9	291°40.1	306°09.3	320°38.6	335°07.8	349°37.0	4°06.1	18°35.3	+29.2 15.6	
	13°12.6	13°21.0	13°29.4	13°37.6	13°45.8	13°53.9	14°01.9	14°09.9	14°17.7	14°25.5	14°33.2	+8.1 57.4	
Fr 2	248°12.3	262°41.6	277°10.9	291°40.1	306°09.3	320°38.6	335°07.8	349°37.0	4°06.1	18°35.3	33°04.5	+29.2 15.6	
	13°21.0	13°29.4	13°37.6	13°45.8	13°53.9	14°01.9	14°09.9	14°17.7	14°25.5	14°33.2	14°40.8	+8.0 57.3	
Sa 3	250°20.6	264°49.5	279°18.5	293°47.5	308°16.4	322°45.4	337°14.3	351°43.3	6°12.2	20°41.1	35°10.0	+28.9 15.5	
	16°24.3	16°30.5	16°36.5	16°42.5	16°48.4	16°54.2	16°59.9	17°05.5	17°11.1	17°16.5	17°21.8	+5.8 56.7	
Su 4	252°22.9	266°51.8	281°20.6	295°49.4	310°18.3	324°47.1	339°15.9	353°44.8	8°13.6	22°42.5	37°11.3	+28.8 15.3	
	18°29.8	18°33.5	18°37.2	18°40.7	18°44.1	18°47.4	18°50.7	18°53.8	18°56.8	18°59.7	19°02.5	+3.3 56.2	
Mo 5	254°24.9	268°53.9	283°22.9	297°52.0	312°21.0	326°50.1	341°19.1	355°48.2	10°17.3	24°46.5	39°15.6	+29.1 15.2	
	19°32.3	19°33.5	19°34.5	19°35.5	19°36.3	19°37.1	19°37.7	19°38.3	19°38.7	19°39.1	19°39.3	+0.7 55.6	
Tu 6	256°35.5	271°05.0	285°34.6	300°04.2	314°33.8	329°03.5	343°33.2	358°02.9	12°32.6	27°02.4	41°32.2	+29.7 15.0	
	19°30.7	19°29.4	19°27.9	19°26.3	19°24.7	19°22.9	19°21.0	19°19.1	19°17.1	19°14.9	19°12.7	-1.8 55.2	
We 7	259°03.9	273°34.3	288°04.8	302°35.3	317°05.8	331°36.4	346°07.1	0°37.7	15°08.4	29°39.2	44°10.0	+30.6 14.9	
	18°28.1	18°24.4	18°20.6	18°16.7	18°12.8	18°08.7	18°04.6	18°00.4	17°56.1	17°51.7	17°47.3	-4.1 54.8	
Th 8	261°57.3	276°28.8	291°00.4	305°32.0	320°03.6	334°35.3	349°07.0	3°38.8	18°10.7	32°42.5	47°14.4	+31.7 14.8	
	16°30.9	16°25.3	16°19.5	16°13.6	16°07.7	16°01.8	15°55.7	15°49.6	15°43.4	15°37.1	15°30.8	-6.0 54.4	
Fr 9	265°18.6	279°51.2	294°23.9	308°56.6	323°29.3	338°02.1	352°35.5	7°07.8	21°40.7	36°13.7	50°46.7	+32.8 14.8	
	13°48.4	13°41.0	13°33.7	13°26.3	13°18.8	13°11.2	13°03.7	12°56.0	12°48.3	12°40.6	12°32.8	-7.6 54.2	
Sa 10	269°06.2	283°39.8	298°13.4	312°47.1	327°20.7	341°54.5	356°28.2	11°02.0	25°35.8	40°09.6	54°43.5	+33.7 14.7	
	10°30.2	10°21.7	10°13.1	10°04.5	9°55.9	9°47.2	9°38.5	9°29.7	9°20.9	9°12.1	9°03.2	-8.7 54.0	
Su 11	273°14.7	287°48.9	302°23.2	316°57.5	331°31.8	346°06.2	0°40.5	15°14.9	29°49.3	44°23.7	58°58.1	+34.3 14.7	
	6°46.4	6°37.0	6°27.6	6°18.2	6°08.8	5°59.3	5°49.9	5°40.4	5°30.8	5°21.3	5°11.7	-9.5 54.0	
Mo 12	277°35.6	292°10.2	306°44.7	321°19.3	335°53.9	350°28.4	5°03.0	19°37.6	34°12.1	48°46.7	63°21.2	+34.6 14.7	
	2°46.2	2°36.3	2°26.5	2°16.6	2°06.8	1°56.9	1°47.0	1°37.2	1°27.3	1°17.4	1°07.5	-9.9 54.1	
Tu 13	281°58.7	296°33.1	311°07.5	325°41.8	340°16.2	354°50.5	9°24.8	23°59.1	38°33.4	53°07.6	67°41.9	+34.3 14.8	
	-1°21.7	-1°31.6	-1°41.6	-1°51.5	-2°01.4	-2°11.4	-2°21.3	-2°31.2	-2°41.2	-2°51.1	-3°01.0	-9.9 54.3	
We 14	286°12.1	300°45.9	315°07.6	329°53.3	344°26.9	359°00.6	13°34.1	28°07.7	42°41.2	57°14.6	71°48.0	+33.6 14.9	
	-5°28.4	-5°38.2	-5°47.9	-5°57.6	-6°07.2	-6°16.9	-6°26.5	-6°36.1	-6°45.7	-6°55.3	-7°04.8	-9.6 54.8	
Th 15	290°03.6	304°36.2	319°08.8	333°41.3	348°13.8	362°46.2	17°18.5	31°50.8	46°23.1	60°55.2	75°27.3	+32.4 15.1	
	-9°25.0	-9°34.1	-9°43.1	-9°52.2	-10°01.2	-10°10.2	-10°19.1	-10°28.0	-10°36.8	-10°45.6	-10°54.4	-8.9 55.4	
Fr 16	293°21.1	307°52.1	322°23.1	336°54.0	351°24.8	5°55.6	20°26.2	34°56.8	49°27.4	63°57.8	78°28.2	+30.7 15.3	
	-13°00.7	-13°08.7	-13°16.7	-13°24.6	-13°32.4	-13°40.2	-13°48.0	-13°55.7	-14°03.3	-14°10.9	-14°18.4	-7.8 56.2	
Sa 17	295°54.4	310°23.5	324°52.5	339°22.1	353°50.3	8°19.1	22°47.8	37°16.4	51°44.9	66°13.4	80°41.7	+28.7 15.6	
	-16°02.9	-16°09.3	-16°15.6	-16°21.9	-16°28.0	-16°34.1	-16°40.1	-16°46.0	-16°51.8	-16°57.6	-17°03.2	-6.0 57.1	
Su 18	297°37.5	312°04.5	326°31.5	340°58.4	355°25.3	9°52.0	24°18.7	38°45.3	53°11.9	67°38.3	82°04.7	+26.7 15.8	
	-18°17.1	-18°21.2	-18°25.2	-18°29.2	-18°33.0	-18°36.7	-18°40.4	-18°43.9	-18°47.3	-18°50.6	-18°53.7	-3.7 58.1	
Mo 19	298°31.9	312°57.2	327°22.2	341°47.6	356°12.7	10°37.7	23°02.7	39°27.7	53°52.6	68°17.4	82°42.2	+25.0 16.1	
	-19°27.6	-19°28.9	-19°30.0	-19°31.1	-19°32.0	-19°32.8	-19°33.5	-19°34.0	-19°34.4	-19°34.7	-19°34.8	-0.7 59.0	
Tu 20	298°48.6	313°12.7	327°36.8	342°00.9	356°25.0	10°49.0	25°13.0	39°37.0	54°01.0	68°24.9	82°48.8	+24.0 16.3	
	-19°21.2	-19°19.2	-19°17.1	-19°14.9	-19°12.5	-19°09.9	-19°07.3	-19°04.5	-19°01.6	-18°58.5	-18°55.3	+2.6 59.9	
We 21	298°46.8	313°10.6	327°34.5	341°58.3	356°22.2	10°46.1	25°10.0	39°33.9	53°57.9	68°21.8	82°45.8	+23.9 16.5	
	-17°51.1	-17°45.7	-17°40.3	-17°34.7	-17°29.0	-17°23.1	-17°17.1	-17°11.0	-17°04.8	-16°58.4	-16°51.9	+5.9 60.6	
Th 22	298°48.1	313°12.5	327°36.9	342°01.4	356°25.9	10°50.4	25°15.0	39°39.6	54°04.2	68°28.9	82°53.7	+24.6 16.6	
	-15°00.3	-14°51.9	-14°43.5	-14°34.9	-14°26.3	-14°17.5	-14°08.6	-13°59.6	-13°50.6	-13°41.4	-13°32.1	+8.8 61.0	
Fr 23	299°09.8	313°35.3	328°00.8	342°26.3	356°51.9	11°17.5	25°43.2	40°08.9	54°34.7	69°00.5	83°26.4	+25.7 16.7	
	-11°02.4	-10°51.8	-10°41.1	-10°30.3	-10°19.4	-10°08.5	-9°57.6	-9°46.5	-9°35.4	-9°24.3	-9°13.0	-10.9 61.1	
Sa 24	300°00.3	314°26.9	328°53.6	343°20.3	357°47.1	12°13.9	26°40.8	41°07.7	55°34.6	70°01.6	84°28.6	+26.8 16.6	
	-6°18.6	-6°06.6	-5°54.6	-5°42.6	-5°30.5	-5°18.4	-5°06.3	-4°54.2	-4°42.0	-4°29.9	-4°17.7	+12.1 60.8	
Su 25	301°19.0	315°46.6	330°14.3	344°42.1	359°09.8	13°37.6	28°05.4	42°33.3	57°01.2	71°29.1	85°57.1	+27.8 16.4	
	-1°13.2	-1°00.9	-0°48.6	-0°36.3	-0°24.0	-0°11.7	0°00.6	0°12.9	0°25.1	0°37.4	0°49.6	+12.3 60.3	
Mo 26	315°46.6	330°14.3	344°42.1	359°09.8	13°37.6	28°05.4	42°33.3	57°01.2	71°29.1	85°57.1	100°25.1	+27.8 16.4	
	-1°00.9	-0°48.6	-0°36.3	-0°24.0	-0°11.7	0°00.6	0°12.9	0°25.1	0°37.4	0°49.6	1°01.8	+12.3 60.3	
Tu 27	317°28.1	331°56.4	346°24.9	0°53.3	15°01.7	29°50.2	44°18.7	58°47.2	73°15.7	87°44.3	102°12.8	+28.5 16.2	
	4°02.0	4°13.8	4°25.5	4°37.2	4°48.8	5°00.5	5°12.0	5°23.5	5°35.0	5°46.4	5°57.8	+11.6 59.5	
We 28	319°22.8	333°51.5	348°20.3	0°49.0	17°17.8	31°46.6	46°15.4	60°44.2	75°13.2	89°41.1	104°10.6	+28.8 16.0	
	8°42.2	8°52.7	9°03.2	9°13.5	9°23.8	9°34.1	9°44.2	9°54.4	10°04.4	10°14.4	10°24.3	+12.6 58.7	
Th 29	321°23.2	335°52.1	350°20.9	0°49.8	19°18.6	33°47.5	48°16.4	62°45.2	77°14.1	91°43.1	106°11.8	+28.9 15.8	
	12°43.9	12°52.6	13°01.2	13°09.7	13°18.1	13°26.5	13°34.8	13°42.9	13°51.0	13°59.1	14°07.0	+8.3 57.8	
Fr 30	323°24.8	337°53.6	352°22.5	6°51.4	21°20.2	35°49.1	50°18.0	64°46.8	79°15.7	93°44.6	108°13.4	+28.9 15.5	
	15°55.2	16°01.7	16°08.1	16°14.4	16°20.6	16°26.7	16°32.7	16°38.6	16°44.4	16°50.2	16°55.8	+6.1 57.0	
Sa 31	325°26.9	339°55.8	354°24.7	8°53.7	23°22.6	37°51.6	52°20.6	66°49.5	81°18.5	95°47.5	110°16.5	+29.0 15.3	
	18°08.3	18°12.4	18°16.3	18°20.2	18°23.9	18°27.5	18°31.1	18°34.5	18°37.8	18°41.1	18°44.2	+3.6 56.3	

SUN

August 2022

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Su 1	268°25.0 17°51.4	283°25.1 17°50.7	298°25.1 17°50.1	313°25.1 17°49.5	328°25.2 17°48.8	343°25.2 17°48.2	358°25.3 17°47.5	373°25.3 17°46.9	388°25.4 17°46.3	403°25.4 17°45.6	418°25.4 17°45.0	433°25.5 17°44.3	+0.0 -0.6
Mo 2	268°26.1 17°35.9	283°26.1 17°35.3	298°26.2 17°34.7	313°26.2 17°34.0	328°26.3 17°33.4	343°26.3 17°32.7	358°26.4 17°32.0	373°26.4 17°31.4	388°26.5 17°30.7	403°26.5 17°30.1	418°26.6 17°29.4	433°26.6 17°28.8	+0.0 -0.7
Tu 3	268°27.3 17°20.2	283°27.4 17°19.6	298°27.4 17°18.9	313°27.5 17°18.3	328°27.5 17°17.6	343°27.6 17°16.9	358°27.6 17°16.3	373°27.6 17°15.6	388°27.7 17°14.9	403°27.8 17°14.3	418°27.9 17°13.6	433°27.9 17°12.9	+0.1 -0.7
We 4	268°28.7 17°04.3	283°28.7 17°03.6	298°28.8 17°02.9	313°28.8 17°02.2	328°28.9 17°01.6	343°29.0 17°00.9	358°29.0 17°00.2	373°29.1 16°59.5	388°29.2 16°58.9	403°29.2 16°58.2	418°29.3 16°57.5	433°29.3 16°56.8	+0.1 -0.7
Th 5	268°30.2 16°48.0	283°30.2 16°47.3	298°30.3 16°46.6	313°30.4 16°45.9	328°30.4 16°45.3	343°30.5 16°44.6	358°30.6 16°43.9	373°30.7 16°43.2	388°30.7 16°42.5	403°30.8 16°41.8	418°30.9 16°41.1	433°30.9 16°40.4	+0.1 -0.7
Fr 6	268°31.8 16°31.5	283°31.9 16°30.8	298°32.0 16°30.1	313°32.1 16°29.4	328°32.1 16°28.7	343°32.2 16°28.0	358°32.3 16°27.3	373°32.4 16°26.6	388°32.4 16°25.9	403°32.5 16°25.2	418°32.6 16°24.5	433°32.7 16°23.8	+0.1 -0.7
Sa 7	268°33.7 16°14.7	283°33.7 16°13.9	298°33.8 16°13.2	313°33.9 16°12.5	328°34.0 16°11.8	343°34.1 16°11.1	358°34.1 16°10.4	373°34.2 16°09.7	388°34.3 16°09.0	403°34.4 16°08.3	418°34.5 16°07.6	433°34.5 16°06.9	+0.1 -0.7
Su 8	268°35.6 15°57.6	283°35.7 15°56.9	298°35.8 15°56.2	313°35.9 15°55.4	328°36.0 15°54.7	343°36.0 15°54.0	358°36.1 15°53.3	373°36.2 15°52.6	388°36.3 15°51.8	403°36.3 15°51.1	418°36.5 15°50.4	433°36.6 15°49.7	+0.1 -0.7
Mo 9	268°37.7 15°40.3	283°37.8 15°39.5	298°37.9 15°38.8	313°38.0 15°38.1	328°38.1 15°37.4	343°38.2 15°36.6	358°38.3 15°35.9	373°38.4 15°35.2	388°38.5 15°34.4	403°38.6 15°33.7	418°38.7 15°33.0	433°38.7 15°32.3	+0.1 -0.7
Tu 10	268°40.0 15°22.7	283°40.1 15°22.0	298°40.2 15°21.2	313°40.3 15°20.5	328°40.4 15°19.8	343°40.5 15°19.0	358°40.6 15°18.3	373°40.6 15°17.5	388°40.7 15°16.8	403°40.8 15°16.1	418°40.9 15°15.3	433°41.0 15°14.6	+0.1 -0.7
We 11	268°42.4 15°04.9	283°42.5 15°04.2	298°42.6 15°03.4	313°42.7 15°02.7	328°42.8 15°01.9	343°42.9 15°01.2	358°43.0 15°00.4	373°43.1 14°59.7	388°43.2 14°58.9	403°43.3 14°58.2	418°43.4 14°57.4	433°43.5 14°56.7	+0.1 -0.7
Th 12	268°44.9 14°46.8	283°45.0 14°46.1	298°45.1 14°45.3	313°45.3 14°44.6	328°45.4 14°43.8	343°45.5 14°43.1	358°45.6 14°42.3	373°45.7 14°41.5	388°45.8 14°40.8	403°45.9 14°40.0	418°46.0 14°39.3	433°46.1 14°38.5	+0.1 -0.8
Fr 13	268°47.6 14°28.6	283°47.7 14°27.8	298°47.8 14°27.0	313°48.0 14°26.3	328°48.1 14°25.5	343°48.2 14°24.7	358°48.3 14°24.0	373°48.4 14°23.2	388°48.5 14°22.4	403°48.7 14°21.6	418°48.8 14°20.9	433°48.9 14°20.1	+0.1 -0.8
Sa 14	268°50.4 14°10.1	283°50.6 14°09.3	298°50.7 14°08.5	313°50.8 14°07.7	328°50.9 14°06.9	343°51.0 14°06.2	358°51.2 14°05.4	373°51.3 14°04.6	388°51.4 14°03.8	403°51.6 14°03.0	418°51.7 14°02.3	433°51.8 14°01.5	+0.1 -0.8
Su 15	268°53.4 13°51.3	283°53.5 13°50.5	298°53.7 13°49.7	313°53.8 13°49.0	328°53.9 13°48.2	343°54.0 13°47.4	358°54.2 13°46.6	373°54.3 13°45.8	388°54.4 13°45.0	403°54.6 13°44.2	418°54.7 13°43.4	433°54.8 13°42.7	+0.1 -0.8
Mo 16	268°56.5 13°32.4	283°56.6 13°31.6	298°56.8 13°30.8	313°56.9 13°30.0	328°57.0 13°29.2	343°57.2 13°28.4	358°57.3 13°27.6	373°57.4 13°26.8	388°57.5 13°26.0	403°57.7 13°25.2	418°57.8 13°24.4	433°57.9 13°23.6	+0.1 -0.8
Tu 17	268°59.7 13°13.2	283°59.9 13°12.4	299°00.0 13°11.6	314°00.2 13°10.8	329°00.3 13°10.0	344°00.4 13°09.2	359°00.6 13°08.4	374°00.7 13°07.6	389°00.8 13°06.8	404°01.0 13°05.9	419°01.1 13°05.1	434°01.3 13°04.3	+0.1 -0.8
We 18	269°03.1 12°53.8	284°03.3 12°53.0	299°03.4 12°52.2	314°03.5 12°51.4	329°03.7 12°50.6	344°03.8 12°49.7	359°04.0 12°48.9	374°04.2 12°48.1	389°04.4 12°47.3	404°04.6 12°46.5	419°04.8 12°45.7	434°05.0 12°44.9	+0.1 -0.8
Th 19	269°06.6 12°34.2	284°06.7 12°33.4	299°06.9 12°32.6	314°07.0 12°31.8	329°07.2 12°30.9	344°07.3 12°29.9	359°07.5 12°29.3	374°07.6 12°28.5	389°07.8 12°27.7	404°08.0 12°26.8	419°08.2 12°26.0	434°08.4 12°25.2	+0.1 -0.8
Fr 20	269°10.2 12°14.5	284°10.4 12°13.6	299°10.5 12°12.8	314°10.7 12°12.0	329°10.8 12°11.1	344°11.0 12°10.3	359°11.1 12°09.5	374°11.3 12°08.6	389°11.5 12°07.8	404°11.7 12°07.0	419°11.9 12°06.2	434°12.1 12°05.3	+0.2 -0.8
Sa 21	269°13.9 11°54.5	284°14.1 11°53.6	299°14.3 11°52.8	314°14.4 11°52.0	329°14.6 11°51.1	344°14.7 11°50.3	359°14.9 11°49.5	374°15.1 11°48.6	389°15.3 11°47.8	404°15.6 11°46.9	419°15.8 11°46.1	434°16.0 11°45.3	+0.2 -0.8
Su 22	269°17.8 11°34.3	284°18.0 11°33.5	299°18.1 11°32.6	314°18.3 11°31.8	329°18.4 11°30.9	344°18.6 11°30.1	359°18.8 11°29.3	374°18.9 11°28.4	389°19.1 11°27.6	404°19.4 11°26.7	419°19.7 11°25.9	434°19.9 11°25.0	+0.2 -0.8
Mo 23	269°21.8 11°14.0	284°21.9 11°13.1	299°22.1 11°12.3	314°22.3 11°11.4	329°22.4 11°10.6	344°22.6 11°09.7	359°22.8 11°08.9	374°22.9 11°08.1	389°23.1 11°07.2	404°23.3 11°06.3	419°23.5 11°05.4	434°23.7 11°04.6	+0.2 -0.9
Tu 24	269°25.8 10°53.5	284°26.0 10°52.6	299°26.2 10°51.7	314°26.3 10°50.9	329°26.5 10°50.0	344°26.7 10°49.2	359°26.8 10°48.3	374°27.0 10°47.4	389°27.2 10°46.6	404°27.4 10°45.7	419°27.6 10°44.9	434°27.7 10°44.0	+0.2 -0.9
We 25	269°30.0 10°32.8	284°30.2 10°31.9	299°30.3 10°31.0	314°30.5 10°30.2	329°30.7 10°29.3	344°30.9 10°28.4	359°31.0 10°27.6	374°31.2 10°26.7	389°31.4 10°25.8	404°31.6 10°25.0	419°31.7 10°24.1	434°31.9 10°23.2	+0.2 -0.9
Th 26	269°34.2 10°11.9	284°34.4 10°11.0	299°34.6 10°10.1	314°34.8 10°09.3	329°35.0 10°08.4	344°35.1 10°07.5	359°35.3 10°06.7	374°35.5 10°05.8	389°35.7 10°04.9	404°35.9 10°04.0	419°36.0 10°03.2	434°36.2 10°02.3	+0.2 -0.9
Fr 27	269°38.6 9°50.9	284°38.8 9°50.0	299°39.0 9°49.1	314°39.1 9°48.2	329°39.3 9°47.3	344°39.5 9°46.5	359°39.7 9°45.6	374°39.9 9°44.7	389°40.1 9°43.8	404°40.3 9°42.9	419°40.5 9°42.1	434°40.6 9°41.2	+0.2 -0.9
Sa 28	269°43.0 9°29.7	284°43.2 9°28.8	299°43.4 9°27.9	314°43.6 9°27.0	329°43.8 9°26.1	344°44.0 9°25.2	359°44.1 9°24.3	374°44.3 9°23.5	389°44.5 9°22.6	404°44.7 9°21.7	419°44.9 9°20.8	434°45.1 9°19.9	+0.2 -0.9
Su 29	269°47.5 9°08.3	284°47.7 9°07.5	299°47.9 9°06.6	314°47.8 9°05.7	329°48.1 9°04.8	344°48.5 9°03.9	359°48.7 9°03.0	374°48.9 9°02.1	389°49.1 9°01.2	404°49.3 9°00.3	419°49.5 8°59.4	434°49.6 8°58.5	+0.2 -0.9
Mo 30	269°52.1 8°46.9	284°52.3 8°46.0	299°52.5 8°45.1	314°52.7 8°44.2	329°52.9 8°43.3	344°53.1 8°42.4	359°53.3 8°41.5	374°53.5 8°40.6	389°53.7 8°39.7	404°53.9 8°38.8	419°54.1 8°37.9	434°54.3 8°37.0	+0.2 -0.9
Tu 31	269°56.8 8°25.2	284°57.0 8°24.3	299°57.2 8°23.4	314°57.4 8°22.5	329°57.6 8°21.6	344°57.8 8°20.7	359°58.0 8°19.8	374°58.2 8°18.9	389°58.4 8°18.0	404°58.6 8°17.1	419°58.8 8°16.2	434°59.0 8°15.3	+0.2 -0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.8'

MOON

August 2032

	D	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	Δ'/h SH
●	Su 1	240°38.0	255°07.1	269°36.7	284°05.4	298°34.5	313°03.7	327°32.9	342°02.1	356°31.3	11°00.6	25°29.8	+29.2 15.2
		19°07.8	19°09.9	19°11.9	19°13.8	19°15.6	19°17.3	19°18.9	19°20.8	19°21.8	19°23.1	19°24.3	+1.7 55.8
●	Mo 2	242°51.1	257°20.7	271°50.3	286°19.9	300°49.6	315°19.3	329°49.0	344°18.8	358°48.6	13°18.4	27°48.2	+29.7 15.1
		19°30.2	19°29.8	19°29.3	19°28.7	19°28.1	19°27.3	19°26.4	19°25.4	19°24.3	19°23.1	19°21.8	-0.8 55.2
●	Tu 3	245°19.6	259°49.9	274°20.3	288°50.7	303°21.2	317°51.7	332°22.2	346°52.8	1°23.4	15°54.1	30°24.7	+30.5 14.9
		18°51.5	18°48.7	18°45.8	18°42.9	18°39.9	18°36.8	18°33.6	18°30.3	18°26.9	18°23.4	18°19.9	-3.2 54.8
●	We 4	248°09.6	262°40.9	277°12.3	291°43.7	306°15.1	320°46.6	335°18.1	349°49.6	4°21.2	18°52.9	33°24.5	+31.5 14.8
		17°16.6	17°11.8	17°06.8	17°01.8	16°56.7	16°51.6	16°46.3	16°41.0	16°35.6	16°30.2	16°24.7	-5.2 54.4
●	Th 5	251°24.6	265°56.9	280°29.3	295°01.7	309°34.1	324°06.6	338°39.1	353°11.7	7°44.3	22°16.9	36°49.6	+32.5 14.8
		14°53.3	14°46.7	14°40.0	14°33.3	14°26.5	14°19.6	14°12.7	14°05.7	13°58.7	13°51.6	13°44.4	-6.9 54.1
●	Fr 6	255°04.3	269°37.6	284°10.9	298°44.2	313°17.6	327°51.0	342°24.4	356°57.9	11°31.4	26°04.9	40°38.5	+33.4 14.7
		11°50.6	11°42.6	11°34.6	11°26.5	11°18.3	11°10.2	11°01.9	10°53.7	10°45.3	10°37.0	10°28.6	-8.2 54.0
●	Sa 7	259°05.4	273°39.4	288°13.4	302°47.4	317°21.5	331°55.6	346°29.7	1°03.9	15°38.0	30°12.2	44°46.4	+34.1 14.7
		8°18.0	8°09.0	8°00.0	7°50.9	7°41.8	7°32.7	7°23.6	7°14.4	7°05.2	6°56.0	6°46.8	-9.1 53.9
●	Su 8	263°21.5	277°56.0	292°30.4	307°04.9	321°39.4	336°13.9	350°48.4	5°22.9	19°57.4	34°31.9	49°06.4	+34.5 14.7
		4°25.1	4°15.5	4°05.9	3°56.3	3°46.6	3°37.0	3°27.3	3°17.6	3°07.9	2°58.2	2°48.4	-9.7 53.9
●	Mo 9	267°44.6	282°19.1	296°53.6	311°28.2	326°02.7	340°37.2	355°11.7	9°46.2	24°20.7	38°55.1	53°29.6	+34.5 14.7
		0°21.4	0°11.5	0°01.7	-0°08.2	-0°18.0	-0°27.9	-0°37.7	-0°47.6	-0°57.5	-1°07.3	-1°17.2	-9.9 54.0
●	Tu 10	273°04.9	286°39.1	301°13.3	315°47.4	330°21.6	344°55.7	359°29.8	14°03.8	28°37.9	43°11.9	57°45.9	+34.1 14.8
		-3°44.2	-3°53.9	-4°03.7	-4°13.4	-4°23.1	-4°32.7	-4°42.4	-4°52.0	-5°01.7	-5°11.3	-5°20.9	-9.7 54.3
●	We 11	276°11.9	290°45.4	305°18.8	319°52.2	334°25.5	348°58.8	3°32.1	18°05.3	32°38.5	47°11.6	61°44.7	+33.3 14.9
		-7°42.4	-7°51.6	-8°00.8	-8°10.0	-8°19.2	-8°28.3	-8°37.4	-8°46.5	-8°55.5	-9°04.5	-9°13.4	-9.1 54.7
●	Th 12	279°55.1	294°27.4	308°59.7	323°31.8	338°04.0	352°36.0	7°08.0	21°40.0	36°11.9	50°43.7	65°15.5	+32.0 15.1
		-11°23.5	-11°31.8	-11°40.1	-11°48.3	-11°56.5	-12°04.7	-12°12.8	-12°20.9	-12°28.9	-12°36.8	-12°44.7	-8.1 55.3
●	Fr 13	283°04.5	297°35.2	312°05.9	326°36.5	341°07.1	355°37.6	10°08.0	24°38.3	39°08.6	53°38.8	68°08.9	+30.4 15.3
		-14°36.6	-14°43.6	-14°50.5	-14°57.4	-15°04.1	-15°10.9	-15°17.5	-15°24.1	-15°30.6	-15°37.0	-15°43.4	-6.7 56.0
●	Sa 14	285°32.5	300°01.2	314°30.1	328°59.0	343°27.7	357°56.4	12°25.0	26°53.5	41°22.0	55°50.4	70°18.7	+28.6 15.5
		-17°09.7	-17°14.8	-17°19.8	-17°24.8	-17°29.6	-17°34.4	-17°39.0	-17°43.6	-17°48.9	-17°52.5	-17°56.8	-4.7 56.8
●	Su 15	287°15.0	301°42.2	316°09.3	330°36.3	345°03.3	359°30.2	13°57.1	28°23.9	42°50.6	57°17.3	71°43.9	+26.9 15.8
		-18°49.5	-18°52.2	-18°54.8	-18°57.3	-18°59.6	-19°01.9	-19°04.1	-19°06.1	-19°08.0	-19°09.8	-19°11.5	-2.2 57.8
●	Mo 16	288°15.7	302°41.4	317°07.1	331°32.6	345°58.2	0°23.7	14°49.1	29°14.5	43°39.8	58°05.2	72°30.4	+25.5 16.0
		-19°23.0	-19°22.8	-19°22.5	-19°22.1	-19°21.5	-19°20.8	-19°20.0	-19°19.1	-19°18.0	-19°16.8	-19°15.5	-0.8 58.8
●	Tu 17	288°45.0	303°09.7	317°34.4	331°59.1	346°23.8	0°48.4	15°13.1	29°37.1	44°02.2	58°26.8	72°51.4	+24.6 16.3
		-18°40.2	-18°36.8	-18°33.3	-18°29.7	-18°25.9	-18°22.0	-18°18.0	-18°13.8	-18°09.5	-18°05.1	-18°00.5	+4.0 59.7
●	We 18	288°58.7	303°23.2	317°47.6	332°12.1	346°36.6	1°01.1	15°25.6	29°50.1	44°14.6	58°39.1	73°03.6	+24.5 16.5
		-16°37.1	-16°30.6	-16°23.9	-16°17.1	-16°10.2	-16°03.1	-15°56.0	-15°48.7	-15°41.3	-15°33.8	-15°26.2	+7.1 60.6
●	Th 19	289°13.5	303°38.3	318°03.2	332°28.0	346°52.9	1°17.8	15°42.8	30°07.4	44°32.7	58°57.7	73°22.8	+24.9 16.7
		-13°18.8	-13°09.5	-13°00.1	-12°50.6	-12°40.9	-12°31.2	-12°21.4	-12°11.6	-12°01.6	-11°51.5	-11°41.4	+9.7 61.1
●	Fr 20	289°42.0	304°07.5	318°33.0	332°58.6	347°24.2	1°49.9	16°15.6	30°41.3	45°07.1	59°32.8	73°58.6	+25.7 16.7
		-8°59.7	-8°48.4	-8°37.0	-8°25.5	-8°14.0	-8°02.4	-7°50.8	-7°39.1	-7°27.4	-7°15.6	-7°03.7	+11.6 61.4
●	Sa 21	290°29.7	304°56.0	319°22.3	333°48.7	348°15.1	2°41.5	17°08.0	31°34.5	46°01.0	60°27.6	74°54.1	+26.4 16.7
		-4°01.5	-3°49.1	-3°36.7	-3°24.3	-3°11.8	-2°59.4	-2°46.9	-2°34.4	-2°21.9	-2°09.4	-1°56.9	+12.5 61.2
●	Su 22	291°36.0	306°02.9	320°29.9	334°57.0	349°24.0	3°51.1	18°18.2	32°45.3	47°12.4	61°39.9	76°06.8	+27.1 16.6
		1°10.6	1°23.0	1°35.4	1°47.8	2°00.1	2°12.4	2°24.7	2°37.0	2°49.3	3°01.5	3°13.7	+12.3 60.8
●	Mo 23	292°56.5	307°23.9	321°51.4	336°18.9	350°46.3	5°13.8	19°41.3	34°08.9	48°36.4	63°04.4	77°31.5	+27.5 16.4
		6°11.9	6°23.4	6°34.9	6°46.3	6°57.6	7°08.9	7°20.1	7°31.3	7°42.4	7°53.5	8°04.5	+11.3 60.0
●	Tu 24	294°26.2	308°53.9	323°21.7	337°49.4	352°17.2	6°44.9	21°12.7	35°40.5	50°08.3	64°36.0	79°03.8	+27.8 16.1
		10°41.2	10°51.1	11°00.9	11°10.6	11°20.2	11°29.8	11°39.2	11°48.6	11°57.9	12°07.1	12°16.3	+9.5 59.1
●	We 25	308°53.9	323°21.7	337°49.4	352°17.2	6°44.9	21°12.7	35°40.5	50°08.3	64°36.0	79°03.8	93°31.7	+27.8 16.1
		10°51.1	11°00.9	11°10.6	11°20.2	11°29.8	11°39.2	11°48.6	11°57.9	12°07.1	12°16.3	12°25.3	+9.4 59.1
●	Th 26	310°29.8	324°57.7	339°25.7	353°53.6	8°21.6	22°49.6	37°17.6	51°45.6	66°13.6	80°41.6	95°09.6	+28.0 15.8
		14°30.3	14°37.9	14°45.4	14°52.8	15°00.1	15°07.3	15°14.4	15°21.4	15°28.3	15°35.1	15°41.9	+7.2 58.1
●	Fr 27	312°11.4	326°39.6	341°07.9	355°36.1	10°04.4	24°32.7	39°01.0	53°29.3	67°57.6	82°25.9	96°54.3	+28.3 15.6
		17°10.5	17°15.6	17°20.6	17°25.5	17°30.3	17°35.0	17°39.6	17°44.0	17°48.4	17°52.7	17°56.8	+4.6 57.1
●	Sa 28	314°02.0	328°30.7	342°59.4	357°28.1	11°56.6	26°25.6	40°54.4	55°23.3	69°52.1	84°21.0	98°49.9	+28.8 15.3
		18°46.7	18°49.2	18°51.5	18°53.8	18°56.0	18°58.1	19°00.0	19°01.9	19°03.7	19°05.3	19°06.9	+2.0 56.3
●	Su 29	316°06.8	330°36.2	345°05.6	359°35.1	14°04.5	28°34.0	43°03.6	57°33.2	72°02.8	86°32.4	101°02.1	+29.5 15.1
		19°18.0	19°17.9	19°17.8	19°17.5	19°17.1	19°16.7	19°16.1	19°15.5	19°14.7	19°13.9	19°12.9	-0.5 55.5
●	Mo 30	318°31.7	333°01.9	347°32.2	2°02.6	16°33.0	31°03.4	45°33.9	60°04.4	74°35.0	89°05.6	103°36.2	+30.5 15.0
		18°47.4	18°45.0	18°42.5	18°39.9	18°37.2	18°34.4	18°31.5	18°28.5	18°25.5	18°22.3	18°19.1	-2.8 54.9
●	Tu 31	321°20.7	335°52.0	350°23.3	4°54.7	19°26.1	33°57.6	48°29.1	63°00.6	77°32.2	92°03.9	106°35.5	+31.5 14.9
		17°20.7	17°16.2	17°11.6	17°06.9	17°02.1	16°57.3	16°52.4	16°47.4	16°42.3	16°37.2	16°32.0	-4.9 54.5

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 6 05h11 — FQ: 14 07h51 — FM: 21 01h46 — LQ: 27 19h33

SUN

September 2032

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ' /h
We 1	270°01.6 8°03.5	285°01.8 8°02.6	300°02.0 8°01.6	315°02.2 8°00.7	330°02.4 7°59.8	345°02.6 7°58.9	0°02.8 7°58.0	15°03.0 7°57.1	30°03.2 7°55.3	45°03.4 7°53.5	60°03.6 7°54.4	75°03.8 7°53.5	+0.2 -0.9
Th 2	270°06.4 7°41.6	285°06.6 7°40.7	300°06.8 7°39.7	315°07.0 7°38.8	330°07.2 7°37.9	345°07.4 7°37.0	0°07.6 7°36.1	15°07.8 7°35.2	30°08.0 7°33.3	45°08.2 7°32.4	60°08.4 7°31.5	75°08.6 7°31.5	+0.2 -0.9
Fr 3	270°11.3 7°19.6	285°11.5 7°18.6	300°11.7 7°17.7	315°11.9 7°16.8	330°12.1 7°15.9	345°12.3 7°15.0	0°12.5 7°14.0	15°12.7 7°13.1	30°12.9 7°12.2	45°13.1 7°11.3	60°13.3 7°10.4	75°13.5 7°09.4	+0.2 -0.9
Sa 4	270°16.2 6°57.4	285°16.4 6°56.5	300°16.6 6°55.6	315°16.8 6°54.7	330°17.1 6°53.7	345°17.3 6°52.8	0°17.5 6°51.9	15°17.7 6°50.9	30°17.9 6°50.0	45°18.1 6°49.1	60°18.3 6°48.2	75°18.5 6°47.2	+0.2 -0.9
Su 5	270°21.2 6°35.2	285°21.4 6°34.2	300°21.6 6°33.3	315°21.9 6°32.4	330°22.1 6°31.5	345°22.3 6°30.5	0°22.5 6°29.6	15°22.7 6°28.7	30°22.9 6°27.7	45°23.1 6°26.8	60°23.3 6°25.9	75°23.5 6°24.9	+0.2 -0.9
Mo 6	270°26.3 6°12.8	285°26.5 6°11.9	300°26.7 6°11.0	315°26.9 6°10.0	330°27.1 6°09.1	345°27.4 6°08.2	0°27.6 6°07.2	15°27.8 6°06.3	30°28.0 6°05.3	45°28.2 6°04.4	60°28.4 6°03.5	75°28.6 6°02.5	+0.2 -0.9
Tu 7	270°31.4 5°50.4	285°31.6 5°49.4	300°31.8 5°48.5	315°32.0 5°47.5	330°32.3 5°46.6	345°32.5 5°45.7	0°32.7 5°44.7	15°32.9 5°43.8	30°33.1 5°42.9	45°33.3 5°41.9	60°33.5 5°41.0	75°33.8 5°40.0	+0.2 -0.9
We 8	270°36.6 5°27.8	285°36.8 5°26.9	300°37.0 5°25.9	315°37.2 5°25.0	330°37.4 5°24.0	345°37.6 5°23.1	0°37.9 5°22.2	15°38.1 5°21.2	30°38.3 5°20.3	45°38.5 5°19.3	60°38.7 5°18.4	75°38.9 5°17.4	+0.2 -0.9
Th 9	270°41.8 5°05.2	285°42.0 5°04.2	300°42.2 5°03.3	315°42.4 5°02.3	330°42.6 5°01.4	345°42.9 5°00.4	0°43.1 4°59.5	15°43.3 4°58.5	30°43.5 4°57.6	45°43.7 4°56.6	60°43.9 4°55.7	75°44.2 4°54.8	+0.2 -0.9
Fr 10	270°47.0 4°42.4	285°47.2 4°41.5	300°47.4 4°40.5	315°47.7 4°39.6	330°47.9 4°38.6	345°48.1 4°37.7	0°48.3 4°36.7	15°48.5 4°35.8	30°48.8 4°34.8	45°49.0 4°33.9	60°49.2 4°32.9	75°49.4 4°32.0	+0.2 -0.9
Sa 11	270°52.3 4°19.6	285°52.5 4°18.7	300°52.7 4°17.7	315°52.9 4°16.8	330°53.2 4°15.8	345°53.4 4°14.9	0°53.6 4°13.9	15°53.8 4°13.0	30°54.0 4°12.0	45°54.3 4°11.1	60°54.5 4°10.1	75°54.7 4°09.1	+0.2 -1.0
Su 12	270°57.6 3°56.7	285°57.8 3°55.8	300°58.0 3°54.8	315°58.2 3°53.9	330°58.5 3°52.9	345°58.7 3°52.0	0°58.9 3°51.0	15°59.1 3°50.1	30°59.4 3°49.1	45°59.6 3°48.1	60°59.8 3°47.2	75°60.0 3°46.2	+0.2 -1.0
Mo 13	271°02.9 3°33.8	286°03.1 3°32.8	301°03.4 3°31.9	316°03.6 3°30.9	331°03.8 3°30.0	346°04.0 3°29.0	1°04.3 3°28.0	16°04.5 3°27.1	31°04.7 3°26.1	46°04.9 3°25.2	61°05.1 3°24.2	76°05.4 3°23.2	+0.2 -1.0
Tu 14	271°08.3 3°10.8	286°08.5 3°09.8	301°08.7 3°08.9	316°08.9 3°07.9	331°09.2 3°06.9	346°09.4 3°06.0	1°09.6 3°05.0	16°09.8 3°04.0	31°10.1 3°03.1	46°10.3 3°02.1	61°10.5 3°01.2	76°10.7 3°00.2	+0.2 -1.0
We 15	271°13.6 2°47.7	286°13.9 2°46.7	301°14.1 2°45.8	316°14.3 2°44.8	331°14.5 2°43.9	346°14.8 2°42.9	1°15.0 2°40.1	16°15.2 2°41.0	31°15.4 2°40.0	46°15.7 2°39.0	61°15.9 2°38.1	76°16.1 2°37.1	+0.2 -1.0
Th 16	271°19.0 2°24.6	286°19.2 2°23.6	301°19.5 2°22.6	316°19.7 2°21.7	331°19.9 2°20.7	346°20.1 2°19.8	1°20.4 2°18.8	16°20.6 2°17.8	31°20.8 2°16.9	46°21.0 2°15.9	61°21.3 2°14.9	76°21.5 2°14.0	+0.2 -1.0
Fr 17	271°24.4 2°01.4	286°24.6 2°00.4	301°24.8 1°59.5	316°25.1 1°58.5	331°25.3 1°57.5	346°25.5 1°56.6	1°25.7 1°55.6	16°26.0 1°54.6	31°26.2 1°53.7	46°26.6 1°52.7	61°26.8 1°51.7	76°26.9 1°50.8	+0.2 -1.0
Sa 18	271°29.8 1°38.2	286°30.0 1°37.2	301°30.2 1°36.3	316°30.5 1°35.3	331°30.7 1°34.3	346°30.9 1°33.4	1°31.1 1°32.4	16°31.4 1°31.4	31°31.6 1°30.4	46°31.8 1°29.5	61°32.0 1°28.5	76°32.3 1°27.5	+0.2 -1.0
Su 19	271°35.2 1°14.9	286°35.4 1°14.0	301°35.6 1°13.0	316°35.8 1°12.0	331°36.1 1°11.1	346°36.3 1°10.1	1°36.5 1°09.1	16°36.7 1°08.2	31°37.0 1°07.2	46°37.3 1°06.2	61°37.4 1°05.2	76°37.6 1°04.3	+0.2 -1.0
Mo 20	271°40.5 0°51.7	286°40.7 0°50.7	301°41.0 0°49.7	316°41.2 0°48.8	331°41.4 0°47.8	346°41.6 0°46.8	1°41.9 0°45.8	16°42.1 0°44.9	31°42.3 0°43.9	46°42.5 0°42.9	61°42.8 0°42.0	76°43.0 0°41.0	+0.2 -1.0
Tu 21	271°45.9 0°28.4	286°46.1 0°27.4	301°46.3 0°26.4	316°46.5 0°25.4	331°46.8 0°24.5	346°47.0 0°23.5	1°47.2 0°22.5	16°47.4 0°21.6	31°47.7 0°20.6	46°47.9 0°19.6	61°48.1 0°18.6	76°48.3 0°17.7	+0.2 -1.0
We 22	271°51.2 0°05.0	286°51.4 0°04.1	301°51.6 0°03.1	316°51.9 0°02.1	331°52.1 0°01.1	346°52.3 0°00.2	1°52.5 -0°00.8	16°52.7 -0°01.8	31°53.0 -0°02.7	46°53.2 -0°03.7	61°53.4 -0°04.7	76°53.6 -0°05.7	+0.2 -1.0
Th 23	271°56.5 -0°18.3	286°56.7 -0°19.3	301°56.9 -0°20.3	316°57.1 -0°21.2	331°57.4 -0°22.2	346°57.6 -0°23.2	1°57.8 -0°24.1	16°58.0 -0°25.1	31°58.2 -0°26.1	46°58.4 -0°27.1	61°58.7 -0°28.1	76°58.9 -0°29.0	+0.2 -1.0
Fr 24	272°01.7 -0°41.7	287°01.9 -0°42.6	302°02.2 -0°43.6	317°02.4 -0°44.6	332°02.6 -0°45.6	347°02.8 -0°46.5	2°03.0 -0°47.5	17°03.2 -0°48.5	32°03.5 -0°49.4	47°03.7 -0°50.4	62°03.9 -0°51.4	77°04.1 -0°52.4	+0.2 -1.0
Sa 25	272°06.9 -1°05.0	287°07.1 -1°06.0	302°07.4 -1°07.0	317°07.6 -1°07.9	332°07.8 -1°08.9	347°08.0 -1°09.9	2°08.2 -1°10.9	17°08.4 -1°11.8	32°08.7 -1°12.8	47°08.9 -1°13.8	62°09.1 -1°14.8	77°09.3 -1°15.7	+0.2 -1.0
Su 26	272°12.1 -1°28.4	287°12.3 -1°29.3	302°12.5 -1°30.3	317°12.7 -1°31.3	332°12.9 -1°32.3	347°13.2 -1°33.2	2°13.4 -1°34.2	17°13.6 -1°35.2	32°13.8 -1°36.2	47°14.0 -1°37.1	62°14.2 -1°38.1	77°14.4 -1°39.1	+0.2 -1.0
Mo 27	272°17.2 -1°51.7	287°17.4 -1°52.7	302°17.6 -1°53.7	317°17.8 -1°54.6	332°18.0 -1°55.6	347°18.2 -1°56.6	2°18.5 -1°57.6	17°18.7 -1°58.5	32°18.9 -1°59.5	47°19.1 -2°00.5	62°19.3 -2°01.4	77°19.5 -2°02.4	+0.2 -1.0
Tu 28	272°22.2 -2°15.1	287°22.4 -2°16.0	302°22.6 -2°17.0	317°22.9 -2°18.0	332°23.1 -2°19.9	347°23.3 -2°20.9	2°23.5 -2°20.9	17°23.7 -2°21.9	32°23.9 -2°22.8	47°24.1 -2°23.8	62°24.3 -2°24.8	77°24.5 -2°25.7	+0.2 -1.0
We 29	272°27.2 -2°38.4	287°27.4 -2°39.3	302°27.6 -2°40.3	317°27.8 -2°41.3	332°28.0 -2°42.3	347°28.2 -2°43.2	2°28.4 -2°44.2	17°28.7 -2°45.2	32°28.9 -2°46.1	47°29.1 -2°47.1	62°29.3 -2°48.1	77°29.5 -2°49.1	+0.2 -1.0
Th 30	272°32.1 -3°01.7	287°32.3 -3°02.6	302°32.5 -3°03.6	317°32.7 -3°04.6	332°32.9 -3°05.5	347°33.1 -3°06.5	2°33.3 -3°07.5	17°33.5 -3°08.5	32°33.7 -3°09.4	47°33.9 -3°10.4	62°34.1 -3°11.4	77°34.4 -3°12.3	+0.2 -1.0

Row 1: GHA (Greenwich Hour Angle), Δ' /h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ' /h = dec. change

Semi-diameter: 15.9'

MOON

September 2032

D	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	Δ'/h SH
We 1	237°22.4 15°41.9	251°54.5 15°36.0	266°26.6 15°30.0	280°58.8 15°23.9	295°31.0 15°17.8	310°03.3 15°11.7	324°35.5 15°05.4	339°07.9 14°59.1	353°40.2 14°52.7	8°12.6 14°46.3	22°45.1 14°39.8	+32.3 14.8 -6.2 54.2
	240°56.1 12°55.3	255°29.1 12°47.9	270°02.2 12°40.4	284°35.3 12°32.9	299°08.4 12°25.3	313°41.6 12°17.7	328°14.8 12°10.0	342°48.0 12°02.3	357°21.3 11°54.5	11°54.6 11°46.7	26°27.9 11°38.8	+33.2 14.7 -7.6 54.0
Fr 3	244°51.3 9°35.4	259°25.1 9°26.8	273°58.2 9°18.2	288°32.7 9°09.6	303°06.6 9°00.9	317°40.5 8°52.2	332°14.4 8°43.5	346°48.3 8°34.7	1°22.2 8°25.9	15°56.2 8°17.1	30°30.2 8°08.2	+33.9 14.7 -8.7 53.9
Sa 4	249°02.3 5°51.4	263°36.5 5°42.1	278°10.8 5°32.7	292°45.1 5°23.3	307°19.4 5°13.9	321°53.7 5°04.5	336°28.0 4°55.1	351°02.4 4°45.6	5°36.7 4°36.1	20°11.1 4°26.6	34°45.4 4°17.1	+34.3 14.7 -9.4 53.9
Su 5	253°21.6 1°52.5	267°56.0 1°42.8	282°30.5 1°33.0	297°04.9 1°23.3	311°39.3 1°13.5	326°13.8 1°03.8	340°48.2 0°54.0	355°22.6 0°44.2	9°57.0 0°34.5	24°31.4 0°24.7	39°05.8 0°14.9	+34.4 14.7 -9.8 54.0
Mo 6	257°41.0 -2°11.9	272°15.2 -2°21.7	286°49.4 -2°31.4	301°23.7 -2°41.2	315°57.9 -2°50.9	330°32.0 -3°00.6	345°06.2 -3°10.3	359°40.4 -3°20.0	14°14.5 -3°29.7	28°48.6 -3°39.4	43°22.7 -3°49.1	+34.2 14.8 -9.7 54.2
Tu 7	261°51.4 -6°12.3	276°25.1 -6°21.7	290°58.8 -6°31.0	305°32.4 -6°40.4	320°06.0 -6°49.7	334°39.6 -6°59.0	349°13.2 -7°08.3	3°46.7 -7°17.5	18°20.2 -7°26.7	32°53.6 -7°35.9	47°27.0 -7°45.1	+33.6 14.9 -9.3 54.5
We 8	265°43.9 -9°58.6	280°16.7 -10°07.3	294°49.5 -10°15.8	309°22.2 -10°24.4	323°54.9 -10°32.9	338°27.5 -10°41.3	353°00.1 -10°49.7	7°32.7 -10°58.1	22°05.2 -11°06.4	36°37.6 -11°14.7	51°10.0 -11°22.9	+32.6 15.0 -8.4 54.9
Th 9	269°10.3 -13°20.4	283°41.9 -13°27.8	298°13.4 -13°35.2	312°44.9 -13°42.5	327°16.4 -13°49.7	341°47.8 -13°56.9	356°19.1 -14°04.0	10°50.4 -14°11.0	25°21.6 -14°18.0	39°52.8 -14°24.9	54°23.9 -14°31.8	+31.4 15.1 -7.1 55.4
Fr 10	272°03.8 -16°06.5	286°34.0 -16°12.2	301°04.1 -16°17.8	315°34.2 -16°23.4	330°04.2 -16°28.9	344°34.2 -16°34.3	359°04.1 -16°39.7	13°33.9 -16°45.0	28°03.7 -16°50.1	42°33.4 -16°55.2	57°03.1 -17°00.3	+29.9 15.3 -5.4 56.0
Sa 11	274°20.9 -18°05.1	288°49.6 -18°08.7	303°56.8 -18°12.2	318°27.7 -18°15.6	332°15.4 -18°19.0	346°43.9 -18°22.2	361°12.3 -18°25.3	15°40.7 -18°28.3	30°09.0 -18°31.2	44°37.2 -18°34.1	59°05.4 -18°36.8	+28.5 15.5 -3.2 56.7
Su 12	276°02.1 -19°05.2	290°29.5 -19°06.3	304°56.8 -19°07.6	319°24.1 -19°08.0	333°51.3 -19°08.7	348°18.5 -19°09.4	363°18.5 -19°10.9	17°12.7 -19°12.0	31°39.7 -19°10.5	46°06.7 -19°10.6	60°33.7 -19°10.7	+27.2 15.7 -0.5 57.5
Mo 13	277°13.3 -18°57.4	291°39.6 -18°55.5	306°06.0 -18°53.6	320°32.2 -18°51.5	334°58.5 -18°49.3	349°24.7 -18°47.0	364°09.4 -18°44.6	3°50.9 -18°42.1	18°17.1 -18°39.4	32°43.3 -18°36.6	47°09.4 -18°33.7	+26.1 15.9 -2.4 58.4
Tu 14	278°04.4 -17°35.8	292°30.2 -17°31.0	306°56.6 -17°26.1	321°21.7 -17°21.0	335°47.5 -17°15.9	350°13.3 -17°10.6	365°00.1 -17°05.2	4°39.0 -16°59.7	19°04.7 -16°54.0	33°30.4 -16°48.3	47°56.2 -16°42.4	+25.7 16.2 -5.3 59.3
We 15	278°47.1 -15°00.9	293°12.8 -14°53.3	307°38.5 -14°45.5	322°04.2 -14°37.7	336°29.9 -14°29.7	350°55.6 -14°21.6	365°21.3 -14°13.5	5°21.3 -14°05.2	19°47.0 -13°56.8	34°12.8 -13°48.4	48°38.5 -13°39.8	+25.7 16.4 -1.8 60.1
Th 16	279°31.4 -11°20.0	293°57.3 -11°09.9	308°23.3 -10°59.8	322°49.2 -10°49.6	337°15.1 -10°39.9	351°41.1 -10°29.0	367°07.0 -10°18.6	6°07.0 -10°08.1	20°33.0 -9°57.5	34°59.0 -9°46.9	49°25.0 -9°36.2	+26.0 16.6 -1.0 60.7
Fr 17	280°23.0 -6°47.7	294°49.3 -6°36.0	309°15.5 -6°24.3	323°41.8 -6°12.5	338°08.1 -6°00.7	352°34.4 -5°48.8	368°07.0 -5°36.9	7°00.7 -5°24.9	21°27.0 -5°12.9	35°53.4 -5°00.9	50°19.7 -4°48.8	+26.3 16.7 -1.1 61.1
Sa 18	281°22.9 -1°44.7	295°49.5 -1°32.3	310°16.0 -1°19.8	324°42.6 -1°07.4	339°09.1 -0°54.9	353°35.7 -0°42.5	369°02.3 -0°30.0	8°02.3 -0°17.6	22°28.9 -0°05.1	36°55.5 0°07.3	51°22.1 0°19.8	+26.6 16.7 -1.2 61.2
Su 19	282°28.7 3°24.9	296°55.4 3°37.1	311°22.1 3°49.2	325°48.8 4°01.3	340°15.6 4°13.4	354°42.3 4°25.4	369°09.0 4°37.4	9°09.0 4°49.4	23°35.7 4°49.4	38°02.5 5°01.3	52°29.2 5°13.2	+26.7 16.6 -5.2 60.9
Mo 20	283°37.1 8°16.7	298°03.9 8°27.6	312°30.7 8°38.5	326°57.4 8°49.4	341°24.2 9°00.2	355°50.9 9°10.9	370°17.7 9°21.5	10°17.7 9°32.1	24°44.5 9°42.6	39°11.2 9°53.0	53°38.0 10°03.4	+26.8 16.4 -10.7 60.3
Tu 21	284°46.5 12°29.1	299°13.3 12°38.1	313°40.1 12°47.0	328°06.9 12°55.9	342°33.7 13°04.6	357°00.6 13°13.3	372°27.4 13°21.9	25°54.2 13°30.3	40°21.0 13°38.7	54°47.0 13°47.9	69°14.7 13°55.2	+26.8 16.2 -8.6 59.4
We 22	285°58.4 15°45.9	300°25.4 15°52.5	314°52.4 15°58.9	329°19.4 16°05.3	343°46.4 16°11.5	358°13.5 16°17.7	373°40.5 16°23.7	27°07.6 16°29.6	41°34.7 16°35.4	56°01.8 16°41.1	70°28.9 16°46.7	+27.1 15.9 -6.1 58.4
Th 23	287°18.1 17°57.5	301°45.6 18°01.3	316°03.1 18°05.1	330°40.1 18°08.7	345°08.1 18°12.2	359°35.7 18°15.6	374°03.3 18°18.9	28°30.9 18°22.0	42°58.5 18°25.1	57°26.5 18°30.9	71°53.9 18°30.9	+27.6 15.7 -3.3 57.4
Fr 24	301°45.6 18°01.3	316°13.1 18°05.1	330°40.6 18°08.7	345°08.1 18°12.2	359°35.7 18°15.6	374°03.3 18°18.9	380°30.9 18°22.0	42°58.5 18°25.1	57°26.5 18°28.1	71°53.9 18°30.9	86°21.7 18°33.7	+27.6 15.7 -3.2 57.4
Sa 25	303°21.7 19°01.7	317°50.0 19°02.7	332°18.3 19°03.6	346°46.7 19°04.4	361°15.1 19°05.6	376°43.5 19°06.6	391°12.0 19°06.1	44°40.6 19°06.5	59°09.1 19°06.8	73°37.7 19°06.9	88°06.4 19°07.0	+28.5 15.4 -0.5 56.5
Su 26	305°21.5 18°55.9	319°50.9 18°54.3	334°20.3 18°52.7	348°49.7 18°51.0	363°19.3 18°49.4	378°48.8 18°47.3	393°18.4 18°45.2	46°48.1 18°43.2	61°17.8 18°41.0	75°47.6 18°38.7	90°17.4 18°36.3	+29.6 15.2 -2.0 55.6
Mo 27	307°50.4 17°50.1	322°21.0 17°46.3	336°51.7 17°42.5	351°22.4 17°38.5	366°53.1 17°34.5	381°23.9 17°30.4	396°54.8 17°26.2	49°25.5 17°22.0	63°56.6 17°17.7	78°27.6 17°13.2	92°58.8 17°08.8	+30.8 15.0 -4.1 55.0
Tu 28	310°50.3 15°52.5	325°22.1 15°46.8	339°53.8 15°41.1	354°25.9 15°35.3	369°58.5 15°29.5	384°29.8 15°23.5	398°01.9 15°17.6	52°34.0 15°11.5	67°06.0 15°05.4	81°38.3 14°59.2	96°10.5 14°53.0	+32.0 14.9 -6.0 54.5
We 29	314°19.1 13°12.1	328°52.0 13°04.9	343°24.9 12°57.6	357°57.9 12°50.4	372°30.9 12°43.0	386°03.9 12°35.6	399°07.0 12°28.2	56°10.1 12°20.7	70°43.2 12°13.1	85°16.4 12°05.5	99°49.6 11°57.9	+33.1 14.8 -7.4 54.2
Th 30	318°11.8 9°57.7	332°45.5 9°49.4	347°19.2 9°41.0	362°53.0 9°32.6	377°26.8 9°24.1	391°00.6 9°15.6	403°34.4 9°07.0	60°08.3 8°58.5	74°42.2 8°49.8	89°16.1 8°41.2	103°50.0 8°32.5	+33.8 14.7 -8.5 54.0

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 4 20h56 — FQ: 12 18h49 — FM: 19 09h30 — LQ: 26 09h12

SUN

October 2032

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Fr 1	257°36.8 -3°24.0	272°37.0 -3°24.9	287°37.2 -3°25.9	302°37.4 -3°26.9	317°37.6 -3°27.8	332°37.8 -3°28.8	347°38.0 -3°29.8	2°38.2 -3°30.7	17°38.4 -3°31.7	32°38.6 -3°32.7	47°38.8 -3°33.6	62°39.0 -3°34.6	+0.2 -1.0
Sa 2	257°41.5 -3°47.2	272°41.7 -3°48.1	287°41.9 -3°49.1	302°42.1 -3°50.1	317°42.3 -3°51.0	332°42.5 -3°52.0	347°42.7 -3°53.0	2°42.9 -3°53.9	17°43.1 -3°54.9	32°43.3 -3°55.9	47°43.5 -3°56.8	62°43.7 -3°57.8	+0.2 -1.0
Su 3	257°46.2 -4°10.4	272°46.4 -4°11.3	287°46.6 -4°12.3	302°46.8 -4°13.3	317°47.0 -4°14.2	332°47.2 -4°15.2	347°47.4 -4°16.2	2°47.6 -4°17.1	17°47.8 -4°18.1	32°47.9 -4°19.0	47°48.1 -4°20.0	62°48.3 -4°21.0	+0.2 -1.0
Mo 4	257°50.8 -4°33.5	272°51.0 -4°34.5	287°51.2 -4°35.4	302°51.4 -4°36.4	317°51.6 -4°37.3	332°51.8 -4°38.3	347°51.9 -4°39.3	2°52.1 -4°40.2	17°52.3 -4°41.2	32°52.5 -4°42.2	47°52.7 -4°43.1	62°52.9 -4°44.1	+0.2 -1.0
Tu 5	257°55.3 -4°56.6	272°55.5 -4°57.5	287°55.7 -4°58.5	302°55.9 -4°59.5	317°56.1 -5°00.4	332°56.2 -5°01.4	347°56.4 -5°02.3	2°56.6 -5°03.3	17°56.8 -5°04.3	32°57.0 -5°05.2	47°57.2 -5°06.2	62°57.3 -5°07.1	+0.2 -1.0
We 6	257°59.7 -5°19.6	272°59.9 -5°20.5	288°00.1 -5°21.5	303°00.3 -5°22.5	318°00.5 -5°23.4	333°00.6 -5°24.4	348°00.8 -5°25.3	3°01.0 -5°26.3	18°01.2 -5°27.2	33°01.4 -5°28.2	48°01.5 -5°29.2	63°01.7 -5°30.1	+0.2 -1.0
Th 7	258°04.0 -5°42.5	273°04.2 -5°43.5	288°04.4 -5°44.4	303°04.6 -5°45.4	318°04.7 -5°46.4	333°04.9 -5°47.3	348°05.1 -5°48.3	3°05.3 -5°49.2	18°05.5 -5°50.2	33°05.6 -5°51.1	48°05.8 -5°52.1	63°06.0 -5°53.0	+0.2 -1.0
Fr 8	258°08.3 -5°42.5	273°08.4 -5°43.5	288°08.6 -6°07.3	303°08.8 -6°08.3	318°08.9 -6°09.2	333°09.1 -6°10.2	348°09.3 -6°11.1	3°09.5 -6°12.1	18°09.6 -6°13.0	33°09.8 -6°14.0	48°10.0 -6°14.9	63°10.1 -6°15.9	+0.2 -1.0
Sa 9	258°12.4 -6°28.2	273°12.5 -6°29.1	288°12.7 -6°30.1	303°12.9 -6°31.0	318°13.0 -6°32.0	333°13.2 -6°32.9	348°13.4 -6°33.9	3°13.5 -6°34.8	18°13.7 -6°35.8	33°13.9 -6°36.7	48°14.0 -6°37.7	63°14.2 -6°38.6	+0.2 -0.9
Su 10	258°16.4 -6°50.9	273°16.5 -6°51.8	288°16.7 -6°52.8	303°16.8 -6°53.7	318°17.0 -6°54.7	333°17.2 -6°55.6	348°17.3 -6°56.5	3°17.5 -6°57.5	18°17.7 -6°58.5	33°17.8 -6°59.4	48°18.0 -7°00.3	63°18.1 -7°01.3	+0.2 -0.9
Mo 11	258°20.2 -7°13.5	273°20.4 -7°14.5	288°20.5 -7°15.4	303°20.7 -7°16.3	318°20.9 -7°17.3	333°21.0 -7°18.2	348°21.2 -7°19.2	3°21.3 -7°20.1	18°21.5 -7°21.0	33°21.7 -7°22.0	48°21.8 -7°22.9	63°22.0 -7°23.8	+0.2 -0.9
Tu 12	258°24.0 -7°36.6	273°24.1 -7°37.0	288°24.3 -7°37.9	303°24.5 -7°38.8	318°24.6 -7°39.8	333°24.8 -7°40.7	348°24.9 -7°41.6	3°25.1 -7°42.6	18°25.2 -7°43.5	33°25.4 -7°44.4	48°25.5 -7°45.3	63°25.7 -7°46.3	+0.2 -0.9
We 13	258°27.6 -7°58.4	273°27.8 -7°59.4	288°27.9 -8°00.3	303°28.1 -8°01.2	318°28.2 -8°02.2	333°28.4 -8°03.1	348°28.5 -8°04.0	3°28.7 -8°05.0	18°28.8 -8°05.9	33°28.9 -8°06.8	48°29.1 -8°07.7	63°29.3 -8°08.7	+0.1 -0.9
Th 14	258°31.1 -8°20.7	273°31.3 -8°21.7	288°31.4 -8°22.6	303°31.6 -8°23.5	318°31.7 -8°24.4	333°31.9 -8°25.4	348°32.0 -8°26.3	3°32.1 -8°27.2	18°32.3 -8°28.1	33°32.4 -8°29.1	48°32.6 -8°30.0	63°32.7 -8°30.9	+0.1 -0.9
Fr 15	258°34.8 -8°42.9	273°34.7 -8°43.8	288°34.8 -8°44.8	303°34.9 -8°45.7	318°35.1 -8°46.6	333°35.2 -8°47.5	348°35.3 -8°48.4	3°35.5 -8°49.4	18°35.6 -8°50.3	33°35.7 -8°51.2	48°35.9 -8°52.1	63°36.0 -8°53.0	+0.1 -0.9
Sa 16	258°37.8 -9°05.0	273°37.9 -9°05.9	288°38.0 -9°06.8	303°38.1 -9°07.7	318°38.3 -9°08.6	333°38.4 -9°09.5	348°38.5 -9°10.5	3°38.7 -9°11.4	18°38.8 -9°12.3	33°38.9 -9°13.2	48°39.1 -9°14.1	63°39.2 -9°15.0	+0.1 -0.9
Su 17	258°40.8 -9°26.9	273°41.0 -9°27.8	288°41.1 -9°28.7	303°41.2 -9°29.6	318°41.3 -9°30.5	333°41.5 -9°31.4	348°41.6 -9°32.3	3°41.7 -9°33.3	18°41.8 -9°34.2	33°42.0 -9°35.1	48°42.2 -9°36.0	63°42.2 -9°36.9	+0.1 -0.9
Mo 18	258°43.8 -9°48.7	273°43.9 -9°49.6	288°44.0 -9°50.5	303°44.2 -9°51.4	318°44.3 -9°52.3	333°44.4 -9°53.2	348°44.5 -9°54.1	3°44.6 -9°55.0	18°44.7 -9°55.9	33°44.9 -9°56.8	48°45.0 -9°57.7	63°45.1 -9°58.6	+0.1 -0.9
Tu 19	258°46.6 -10°10.3	273°46.7 -10°11.2	288°46.8 -10°12.1	303°46.9 -10°13.0	318°47.0 -10°13.9	333°47.1 -10°14.8	348°47.3 -10°15.7	3°47.4 -10°16.6	18°47.5 -10°17.5	33°47.6 -10°18.4	48°47.7 -10°19.3	63°47.8 -10°20.2	+0.1 -0.9
We 20	258°49.2 -10°31.8	273°49.3 -10°32.7	288°49.4 -10°33.6	303°49.5 -10°34.5	318°49.6 -10°35.4	333°49.7 -10°36.3	348°49.9 -10°37.2	3°50.0 -10°38.0	18°50.1 -10°38.9	33°50.2 -10°39.8	48°50.3 -10°40.7	63°50.4 -10°41.6	+0.1 -0.9
Th 21	258°51.7 -10°53.1	273°51.8 -10°54.0	288°51.9 -10°54.9	303°52.0 -10°55.8	318°52.1 -10°56.7	333°52.2 -10°57.6	348°52.3 -10°58.5	3°52.4 -10°59.3	18°52.5 -11°00.2	33°52.6 -11°01.1	48°52.7 -11°02.0	63°52.8 -11°02.9	+0.1 -0.9
Fr 22	258°54.0 -11°14.3	273°54.1 -11°15.2	288°54.2 -11°16.1	303°54.3 -11°17.0	318°54.4 -11°17.8	333°54.4 -11°18.7	348°54.5 -11°19.6	3°54.6 -11°20.5	18°54.7 -11°21.3	33°54.8 -11°22.2	48°54.9 -11°23.1	63°55.0 -11°24.0	+0.1 -0.9
Sa 23	258°56.8 -11°35.3	273°56.2 -11°36.2	288°56.3 -11°37.1	303°56.4 -11°38.0	318°56.4 -11°38.8	333°56.5 -11°39.7	348°56.6 -11°40.6	3°56.7 -11°41.4	18°56.8 -11°42.3	33°56.9 -11°43.2	48°56.9 -11°44.0	63°56.9 -11°44.9	+0.1 -0.9
Su 24	258°58.8 -11°56.2	273°58.1 -11°57.0	288°58.2 -11°57.9	303°58.3 -11°58.8	318°58.4 -11°59.6	333°58.4 -12°00.5	348°58.5 -12°01.4	3°58.6 -12°02.2	18°58.7 -12°03.1	33°58.7 -12°03.9	48°58.8 -12°04.8	63°58.9 -12°05.7	+0.1 -0.9
Mo 25	258°59.8 -12°16.8	273°59.9 -12°17.7	289°00.0 -12°18.5	304°00.0 -12°19.4	319°00.1 -12°20.3	334°00.2 -12°21.1	349°00.2 -12°22.0	4°00.3 -12°22.8	18°00.4 -12°23.7	34°00.4 -12°24.5	49°00.5 -12°25.4	64°00.6 -12°26.2	+0.1 -0.9
Tu 26	259°01.4 -12°37.3	274°01.5 -12°38.0	289°01.5 -12°39.0	304°01.6 -12°39.8	319°01.6 -12°40.7	334°01.7 -12°41.5	349°01.8 -12°42.4	4°01.8 -12°43.2	18°01.9 -12°44.1	34°01.9 -12°44.9	49°02.0 -12°45.7	64°02.1 -12°46.6	+0.1 -0.8
We 27	259°02.8 -12°57.7	274°02.8 -12°58.4	289°02.9 -12°59.3	304°03.0 -13°00.1	319°03.0 -13°00.9	334°03.1 -13°01.8	349°03.1 -13°02.6	4°03.2 -13°03.5	18°03.2 -13°04.3	34°03.3 -13°05.1	49°03.3 -13°06.0	64°03.4 -13°06.8	+0.1 -0.8
Th 28	259°04.0 -13°17.6	274°04.0 -13°18.5	289°04.1 -13°19.3	304°04.1 -13°20.1	319°04.2 -13°21.0	334°04.2 -13°21.8	349°04.3 -13°22.6	4°04.3 -13°23.5	18°04.4 -13°24.3	34°04.4 -13°25.1	49°04.4 -13°26.0	64°04.4 -13°26.8	+0.0 -0.8
Fr 29	259°05.0 -13°37.5	274°05.0 -13°38.3	289°05.1 -13°39.2	304°05.1 -13°40.0	319°05.1 -13°40.8	334°05.2 -13°41.6	349°05.2 -13°42.4	4°05.3 -13°43.3	18°05.3 -13°44.1	34°05.3 -13°44.9	49°05.4 -13°45.7	64°05.4 -13°46.6	+0.0 -0.8
Sa 30	259°05.8 -13°57.2	274°05.8 -13°58.8	289°05.9 -13°58.8	304°05.9 -14°00.4	319°05.9 -14°00.4	334°05.9 -14°01.2	349°06.0 -14°02.0	4°06.0 -14°02.9	18°06.0 -14°03.7	34°06.1 -14°04.5	49°06.1 -14°05.3	64°06.1 -14°06.1	+0.0 -0.8
Su 31	259°06.4 -14°16.6	274°06.4 -14°17.4	289°06.5 -14°18.2	304°06.5 -14°19.0	319°06.5 -14°19.8	334°06.5 -14°20.6	349°06.5 -14°21.4	4°06.6 -14°22.2	18°06.6 -14°23.0	34°06.6 -14°23.8	49°06.6 -14°24.6	64°06.6 -14°25.4	+0.0 -0.8

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.0'

MOON

October 2032

	D	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	Δ'/h SH
●	Fr 1	234 [°] 56.3 7°12.8	249 [°] 30.4 7°03.8	264 [°] 04.8 6°54.7	278 [°] 38.7 6°45.7	293 [°] 12.9 6°36.6	307 [°] 47.0 6°27.4	322 [°] 21.2 6°18.3	336 [°] 55.4 6°09.1	351 [°] 29.7 5°59.9	6°03.9 5°50.7	20°38.1 5°41.4	+34.2 14.7 -9.1 54.0
	Sa 2	239 [°] 12.8 3°20.1	253 [°] 47.2 3°10.5	268 [°] 21.5 3°00.9	282 [°] 55.9 2°51.3	297 [°] 30.9 2°41.7	312 [°] 04.6 2°32.1	326 [°] 39.9 2°22.5	341 [°] 13.3 2°12.8	355 [°] 47.7 2°03.1	10°22.0 1°53.5	24°56.4 1°43.8	+34.4 14.7 -9.6 54.0
●	Su 3	245 [°] 30.8 -0°42.3	258 [°] 05.1 -0°52.0	272 [°] 39.3 -1°01.8	287 [°] 13.6 -1°11.6	301 [°] 47.6 -1°21.3	316 [°] 21.8 -1°31.1	330 [°] 56.0 -1°40.8	345 [°] 30.1 -1°50.6	0°04.2 -2°00.3	14°38.3 -2°10.1	29°12.4 -2°19.8	+34.2 14.8 -9.5 54.2
	Mo 4	247 [°] 41.2 -4°44.9	262 [°] 14.9 -4°54.5	276 [°] 48.6 -5°04.0	291 [°] 22.3 -5°13.6	305 [°] 55.9 -5°23.1	320 [°] 29.6 -5°32.6	335 [°] 03.2 -5°42.1	349 [°] 36.7 -5°51.5	4°10.2 -6°01.0	18°43.7 -6°10.4	33°17.2 -6°19.8	+33.6 14.9 -9.5 54.5
●	Tu 5	251 [°] 35.2 -8°37.7	266 [°] 08.1 -8°46.7	280 [°] 40.9 -8°55.6	295 [°] 13.8 -9°04.5	309 [°] 46.5 -9°13.3	324 [°] 19.3 -9°22.1	338 [°] 52.0 -9°30.9	353 [°] 24.7 -9°39.7	7°57.3 -9°48.4	22°29.9 -9°57.0	37°02.4 -10°05.6	+32.7 15.0 -8.8 54.8
	We 6	255 [°] 05.1 -12°09.7	269 [°] 36.9 -12°17.6	284 [°] 08.7 -12°25.4	298 [°] 40.4 -12°33.2	313 [°] 12.0 -12°40.9	327 [°] 43.6 -12°48.6	342 [°] 15.2 -12°56.2	356 [°] 46.7 -13°03.8	11°18.2 -13°11.3	25°49.6 -13°18.7	40°21.0 -13°26.1	+31.6 15.1 -7.6 55.2
●	Th 7	258 [°] 05.3 -15°09.3	272 [°] 35.9 -15°15.7	287 [°] 06.4 -15°21.9	301 [°] 36.8 -15°28.1	316 [°] 07.2 -15°34.3	330 [°] 37.5 -15°40.3	345 [°] 07.8 -15°46.3	359 [°] 38.0 -15°52.2	14°08.2 -15°58.0	28°38.4 -16°03.8	43°08.4 -16°09.5	+30.3 15.2 -6.0 55.7
	Fr 8	260 [°] 33.4 -18°45.1	275 [°] 02.6 -18°47.0	289 [°] 31.9 -18°48.8	304 [°] 01.0 -18°50.6	318 [°] 30.1 -18°52.2	332 [°] 59.2 -18°53.7	347 [°] 28.2 -18°55.1	1°57.2 -18°56.4	16°26.1 -18°54.9	30°55.0 -18°58.7	45°23.8 -18°59.7	+29.0 15.3 -1.5 56.8
●	Sa 9	262 [°] 30.9 -18°45.1	276 [°] 59.0 -18°47.0	291 [°] 27.1 -18°48.8	305 [°] 55.1 -18°50.6	320 [°] 23.2 -18°52.2	334 [°] 51.1 -18°53.7	349 [°] 19.1 -18°55.1	1°37.0 -18°56.4	18°14.9 -18°58.7	32°42.7 -18°58.7	47°10.5 -18°59.7	+28.0 15.5 -1.5 56.8
	Su 10	264 [°] 03.7 -19°01.4	278 [°] 31.0 -19°00.7	292 [°] 58.3 -18°59.8	307 [°] 25.6 -18°58.8	321 [°] 52.8 -18°57.7	336 [°] 20.1 -18°56.5	350 [°] 47.3 -18°55.2	5°14.5 -18°53.8	19°41.6 -18°52.2	34°08.8 -18°50.5	48°35.9 -18°48.8	+27.2 15.7 -1.3 57.5
●	Mo 11	265 [°] 21.1 -18°08.7	279 [°] 48.0 -18°05.1	294 [°] 14.9 -18°01.4	308 [°] 41.8 -17°57.6	323 [°] 08.7 -17°53.7	337 [°] 35.6 -17°49.7	352 [°] 02.4 -17°45.6	6°29.3 -17°41.3	20°56.2 -17°37.0	35°23.1 -17°32.5	49°49.9 -17°28.0	+26.9 15.9 -4.1 58.1
	Tu 12	266 [°] 32.8 -16°06.4	280 [°] 59.7 -16°00.1	295 [°] 26.6 -15°53.7	309 [°] 53.5 -15°47.2	324 [°] 20.4 -15°40.6	338 [°] 47.3 -15°33.9	353 [°] 14.2 -15°27.1	7°41.1 -15°20.2	22°08.0 -15°13.2	36°34.9 -15°06.1	51°01.8 -14°58.9	+26.9 16.0 -6.7 58.8
●	We 13	267 [°] 46.7 -12°59.5	282 [°] 13.8 -12°50.9	296 [°] 40.9 -12°42.1	311 [°] 08.0 -12°33.2	325 [°] 35.1 -12°24.3	340 [°] 02.2 -12°15.2	354 [°] 29.3 -12°06.1	8°56.4 -11°56.9	23°23.6 -11°47.7	37°50.7 -11°38.3	52°17.9 -11°28.9	+27.1 16.2 -9.1 59.5
	Th 14	269 [°] 06.4 -8°58.4	283 [°] 33.7 -8°47.8	298 [°] 01.0 -8°37.2	312 [°] 28.3 -8°26.5	326 [°] 55.6 -8°15.8	341 [°] 23.0 -8°04.9	355 [°] 50.3 -7°54.1	10°17.7 -7°43.1	24°45.0 -7°32.2	39°12.4 -7°21.1	53°39.8 -7°10.0	+27.3 16.4 -10.8 60.0
●	Fr 15	270 [°] 30.8 -4°18.2	284 [°] 58.2 -4°06.4	299 [°] 25.6 -3°54.6	313 [°] 53.1 -3°42.8	328 [°] 20.4 -3°30.9	342 [°] 47.9 -3°19.0	357 [°] 15.3 -3°07.1	11°42.8 -2°55.2	26°10.2 -2°43.3	40°37.6 -2°31.3	55°05.0 -2°19.3	+27.4 16.5 -11.9 60.4
	Sa 16	271 [°] 55.7 0°42.1	286 [°] 23.1 0°54.2	300 [°] 50.4 1°06.3	315 [°] 17.7 1°18.5	329 [°] 45.0 1°30.6	344 [°] 12.3 1°42.7	358 [°] 39.6 1°54.7	13°06.9 2°06.8	27°34.1 2°18.9	42°01.4 2°30.9	56°28.6 2°43.0	+27.3 16.5 -12.1 60.5
●	Su 17	273 [°] 15.8 5°40.6	287 [°] 42.8 5°52.2	302 [°] 09.9 6°03.7	316 [°] 36.9 6°15.2	331 [°] 03.9 6°26.7	345 [°] 30.8 6°38.1	359 [°] 57.8 6°49.5	14°24.7 7°00.8	28°51.7 7°12.0	43°18.6 7°23.3	57°45.6 7°34.4	+27.0 16.5 -11.4 60.4
	Mo 18	274 [°] 27.1 10°14.9	288 [°] 53.7 10°25.1	303 [°] 20.4 10°35.1	317 [°] 47.0 10°45.2	332 [°] 13.6 10°55.1	346 [°] 40.2 11°05.0	1°06.8 11°14.8	15°33.3 11°24.5	29°59.9 11°34.1	44°26.4 11°43.7	58°53.0 11°53.1	+26.6 16.4 -9.8 60.0
●	Tu 19	275 [°] 29.6 14°04.5	289 [°] 55.9 14°12.6	304 [°] 22.3 14°20.5	318 [°] 48.7 14°28.3	333 [°] 15.0 14°36.0	347 [°] 41.4 14°43.6	2°07.7 14°51.1	16°34.1 14°58.6	31°00.4 15°05.9	45°26.8 15°13.1	59°53.1 15°20.2	+26.4 16.2 -7.6 59.3
	We 20	276 [°] 28.6 16°53.9	290 [°] 55.6 16°59.2	305 [°] 21.5 17°04.5	319 [°] 47.9 17°09.6	334 [°] 14.4 17°14.6	348 [°] 40.8 17°19.6	3°07.3 17°24.4	17°33.8 17°29.0	32°00.3 17°33.6	46°26.8 17°38.1	60°53.4 17°42.4	+26.5 15.9 -4.9 58.5
●	Th 21	277 [°] 34.3 18°33.9	292 [°] 01.2 18°36.4	306 [°] 28.2 18°38.8	320 [°] 55.2 18°41.1	335 [°] 22.2 18°43.2	349 [°] 49.3 18°45.3	4°16.4 18°47.2	18°43.5 18°49.0	33°10.7 18°50.8	47°37.9 18°52.4	62°05.1 18°53.9	+27.1 15.7 -2.0 57.6
	Fr 22	278 [°] 58.7 19°02.9	293 [°] 26.7 19°02.6	307 [°] 54.6 19°02.2	322 [°] 27.7 19°01.8	336 [°] 50.7 19°01.2	351 [°] 18.9 19°00.5	5°47.9 18°59.7	20°15.3 18°58.8	34°43.6 18°57.8	49°11.9 18°56.7	63°40.3 18°55.5	+28.2 15.5 -0.7 56.7
●	Sa 23	280 [°] 52.6 18°25.5	295 [°] 21.8 18°22.7	309 [°] 51.2 18°19.8	324 [°] 20.6 18°16.9	338 [°] 50.0 18°13.8	353 [°] 19.5 18°10.7	7°49.1 18°07.5	22°18.7 18°04.2	36°48.3 18°00.8	51°18.1 17°57.3	65°47.9 17°53.7	+29.5 15.2 -3.2 55.8
	Su 24	295 [°] 21.8 18°22.7	309 [°] 51.2 18°19.8	324 [°] 20.6 18°16.9	338 [°] 50.0 18°13.8	353 [°] 19.5 18°10.7	7°49.1 18°07.5	22°18.7 18°04.2	36°48.3 18°00.8	51°18.1 17°57.3	65°47.9 17°53.7	80°17.7 17°50.0	+29.6 15.2 -3.3 55.8
●	Mo 25	297 [°] 52.6 14°20.1	312 [°] 23.4 14°13.5	326 [°] 54.2 14°06.8	341 [°] 25.1 14°00.0	355 [°] 56.1 13°53.2	10°27.1 13°46.3	24°58.2 13°39.4	39°29.3 13°32.4	54°00.5 13°25.4	68°31.8 13°18.3	83°03.1 13°11.1	+31.1 15.0 -6.9 54.6
	Tu 26	300 [°] 59.2 14°20.1	315 [°] 31.3 14°13.5	330 [°] 03.3 14°06.8	344 [°] 35.8 14°00.0	359 [°] 08.1 13°53.2	13°40.5 13°46.3	28°12.9 13°39.4	42°45.3 13°32.4	57°17.8 13°25.4	71°50.4 13°18.3	86°23.0 13°11.1	+32.4 14.9 -6.9 54.6
●	We 27	304 [°] 37.2 11°17.8	319 [°] 10.5 11°09.9	333 [°] 43.8 11°01.9	348 [°] 17.1 10°53.9	2°50.5 10°45.8	17°23.9 10°37.7	31 [°] 57.4 10°29.5	46°30.9 10°21.3	61°04.4 10°13.1	75°37.4 10°04.8	90°11.5 9°56.5	+33.4 14.8 -8.1 54.3
	Th 28	308 [°] 38.9 7°47.5	323 [°] 12.9 7°38.6	337 [°] 46.6 7°29.7	352 [°] 21.0 7°20.8	6°55.1 7°11.8	21°29.2 7°02.8	36°03.3 6°53.8	50°37.3 6°44.8	65°11.6 6°35.7	79°45.8 6°26.6	94°20.0 6°17.5	+34.1 14.8 -9.0 54.1
●	Fr 29	312 [°] 54.5 3°57.8	327 [°] 28.8 3°48.3	342 [°] 03.2 3°38.9	356 [°] 37.6 3°29.4	11°10.2 3°19.8	25°46.3 3°10.3	40°20.7 3°00.7	54°55.1 2°51.2	69°29.9 2°41.6	84°03.9 2°32.0	98°38.3 2°22.4	+34.4 14.8 -9.5 54.1
	Sa 30	317 [°] 13.5 -0°02.8	331 [°] 47.7 -0°12.6	346 [°] 22.0 -0°22.3	0°56.3 -0°32.1	15°30.5 -0°41.8	30°04.7 -0°51.5	44°38.9 -1°01.3	59°13.1 -1°11.0	73°47.3 -1°20.8	88°21.3 -1°30.5	102°55.6 -1°40.3	+34.2 14.8 -9.7 54.3
●	Su 31	321 [°] 25.1 -4°05.8	335 [°] 58.9 -4°15.5	350 [°] 32.6 -4°25.1	5°06.4 -4°34.7	19°40.0 -4°44.3	34°13.7 -4°53.9	48°47.3 -5°03.5	63°20.9 -5°13.0	77°54.4 -5°22.6	92°28.0 -5°32.1	107°01.4 -5°41.6	+33.6 14.9 -9.6 54.6

Row 1: GHA, Δ'/h = GHA change – 14°, SH = semi-diameter
Row 2: Dec (– = South), Δ'/h = dec. change, SH = horizontal parallax
Column = (UTC hour – day) mod 24
NM: 4 13h26 — FQ: 12 03h47 — FM: 18 18h58 — LQ: 26 02h28

SUN

November 2032

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ' /h
Mo 1	259°06.8 -14°35.8	274°06.8 -14°36.6	289°06.8 -14°37.4	304°06.9 -14°38.2	319°06.9 -14°39.0	334°06.9 -14°39.8	349°06.9 -14°40.6	4°06.9 -14°41.4	15°06.9 -14°42.1	34°06.9 -14°42.9	45°06.9 -14°43.7	64°06.9 -14°44.5	+0.0 -0.8
Tu 2	259°07.0 -14°54.8	274°07.0 -14°55.6	289°07.0 -14°56.3	304°07.0 -14°57.1	319°07.0 -14°57.9	334°07.0 -14°58.7	349°07.0 -14°59.5	4°07.0 -15°00.3	15°07.0 -15°01.0	34°07.0 -15°01.8	45°07.0 -15°02.6	64°07.0 -15°03.4	+0.0 -0.8
We 3	259°07.0 -15°13.5	274°07.0 -15°14.3	289°07.0 -15°15.0	304°07.0 -15°15.8	319°07.0 -15°16.6	334°07.0 -15°17.4	349°07.0 -15°18.1	4°07.0 -15°18.9	15°07.0 -15°19.7	34°07.0 -15°20.5	45°07.0 -15°21.2	64°07.0 -15°22.0	-0.0 -0.8
Th 4	259°06.8 -15°32.0	274°06.8 -15°32.7	289°06.8 -15°33.5	304°06.8 -15°34.3	319°06.8 -15°35.0	334°06.8 -15°35.8	349°06.7 -15°36.5	4°06.7 -15°37.3	15°06.7 -15°38.1	34°06.7 -15°38.8	45°06.7 -15°39.6	64°06.7 -15°40.4	-0.0 -0.8
Fr 5	259°06.4 -15°50.2	274°06.4 -15°50.9	289°06.4 -15°51.7	304°06.3 -15°52.4	319°06.3 -15°53.2	334°06.3 -15°54.0	349°06.3 -15°54.7	4°06.3 -15°55.5	15°06.2 -15°56.2	34°06.2 -15°57.0	45°06.2 -15°57.7	64°06.2 -15°58.5	-0.0 -0.8
Sa 6	259°05.8 -16°08.1	274°05.8 -16°08.9	289°05.7 -16°09.6	304°05.7 -16°10.4	319°05.7 -16°11.1	334°05.6 -16°11.9	349°05.6 -16°12.6	4°05.6 -16°13.3	15°05.5 -16°14.1	34°05.5 -16°14.8	45°05.5 -16°15.5	64°05.4 -16°16.3	-0.0 -0.7
Su 7	259°05.0 -16°25.8	274°04.9 -16°26.6	289°04.9 -16°27.3	304°04.9 -16°28.0	319°04.8 -16°28.8	334°04.8 -16°29.5	349°04.7 -16°30.2	4°04.7 -16°30.9	15°04.6 -16°31.7	34°04.6 -16°32.4	45°04.6 -16°33.1	64°04.5 -16°33.8	-0.0 -0.7
Mo 8	259°03.9 -16°43.2	274°03.9 -16°44.0	289°03.8 -16°44.7	304°03.8 -16°45.4	319°03.7 -16°46.1	334°03.7 -16°46.8	349°03.7 -16°47.6	4°03.6 -16°48.3	15°03.6 -16°49.0	34°03.5 -16°49.7	45°03.5 -16°50.4	64°03.4 -16°51.1	-0.0 -0.7
Tu 9	259°02.7 -17°00.4	274°02.6 -17°01.1	289°02.6 -17°01.8	304°02.5 -17°02.5	319°02.5 -17°03.2	334°02.4 -17°03.9	349°02.4 -17°04.6	4°02.3 -17°05.3	15°02.2 -17°06.0	34°02.2 -17°06.7	45°02.1 -17°07.4	64°02.1 -17°08.1	-0.1 -0.7
We 10	259°01.3 -17°17.2	274°01.2 -17°17.9	289°01.1 -17°18.6	304°01.1 -17°19.3	319°01.0 -17°20.0	334°00.9 -17°20.7	349°00.9 -17°21.4	4°00.8 -17°22.1	15°00.7 -17°22.8	34°00.7 -17°23.5	45°00.6 -17°24.1	64°00.5 -17°24.8	-0.1 -0.7
Th 11	258°59.6 -17°33.8	273°59.5 -17°34.4	288°59.5 -17°35.1	303°59.4 -17°35.8	318°59.3 -17°36.5	333°59.2 -17°37.2	348°59.2 -17°37.8	3°59.1 -17°38.5	15°59.0 -17°39.2	33°58.9 -17°39.9	45°58.9 -17°40.6	63°58.8 -17°41.2	-0.1 -0.7
Fr 12	258°57.8 -17°50.7	273°57.7 -17°50.7	288°57.6 -17°51.3	303°57.5 -17°52.0	318°57.4 -17°52.7	333°57.3 -17°53.3	348°57.3 -17°54.7	3°57.2 -17°55.4	15°57.1 -17°55.3	33°57.0 -17°56.0	45°56.9 -17°56.7	63°56.8 -17°57.3	-0.1 -0.7
Sa 13	258°55.7 -18°05.9	273°55.6 -18°06.6	288°55.5 -18°07.2	303°55.4 -18°07.9	318°55.3 -18°08.5	333°55.2 -18°09.2	348°55.1 -18°09.8	3°55.0 -18°10.5	15°55.0 -18°11.2	33°54.9 -18°11.8	45°54.8 -18°12.5	63°54.7 -18°13.1	-0.1 -0.7
Su 14	258°53.4 -18°21.5	273°53.3 -18°22.2	288°53.2 -18°22.8	303°53.1 -18°23.5	318°53.0 -18°24.1	333°52.9 -18°24.8	348°52.8 -18°25.4	3°52.7 -18°26.2	15°52.6 -18°26.7	33°52.5 -18°27.3	45°52.4 -18°27.9	63°52.3 -18°28.6	-0.1 -0.6
Mo 15	258°50.9 -18°36.8	273°50.8 -18°37.4	288°50.7 -18°38.1	303°50.6 -18°38.7	318°50.5 -18°39.3	333°50.4 -18°40.0	348°50.3 -18°40.6	3°50.2 -18°41.2	15°50.1 -18°41.8	33°50.0 -18°42.5	45°49.8 -18°43.1	63°49.7 -18°43.7	-0.1 -0.6
Tu 16	258°48.3 -18°51.8	273°48.1 -18°52.4	288°48.0 -18°53.0	303°47.9 -18°53.6	318°47.8 -18°54.2	333°47.7 -18°54.8	348°47.5 -18°55.5	3°47.4 -18°56.7	15°47.3 -18°56.7	33°47.2 -18°57.3	45°47.1 -18°57.9	63°47.0 -18°58.5	-0.1 -0.6
We 17	258°45.4 -19°06.4	273°45.2 -19°07.0	288°45.1 -19°07.6	303°45.0 -19°08.2	318°44.9 -19°08.8	333°44.7 -19°09.4	348°44.6 -19°10.0	3°44.5 -19°10.6	15°44.3 -19°11.2	33°44.2 -19°11.8	45°44.1 -19°12.4	63°44.0 -19°13.0	-0.1 -0.6
Th 18	258°42.3 -19°20.7	273°42.1 -19°21.3	288°42.0 -19°21.9	303°41.9 -19°22.4	318°41.7 -19°23.0	333°41.6 -19°23.6	348°41.4 -19°24.2	3°41.3 -19°24.8	15°41.2 -19°25.4	33°41.0 -19°25.9	45°40.9 -19°26.5	63°40.8 -19°27.1	-0.1 -0.6
Fr 19	258°38.9 -19°34.6	273°38.8 -19°35.2	288°38.7 -19°35.8	303°38.5 -19°36.3	318°38.4 -19°36.9	333°38.2 -19°37.5	348°38.1 -19°38.0	3°37.9 -19°38.6	15°37.8 -19°39.2	33°37.6 -19°39.7	45°37.5 -19°40.3	63°37.4 -19°40.9	-0.1 -0.6
Sa 20	258°35.4 -19°48.2	273°35.3 -19°48.8	288°35.1 -19°49.3	303°35.0 -19°49.9	318°34.8 -19°50.4	333°34.7 -19°51.0	348°34.5 -19°51.5	3°34.4 -19°52.1	15°34.2 -19°52.6	33°34.1 -19°53.2	45°33.9 -19°53.7	63°33.7 -19°54.3	-0.2 -0.6
Su 21	258°31.7 -20°01.4	273°31.5 -20°02.0	288°31.4 -20°02.5	303°31.2 -20°03.0	318°31.1 -20°03.6	333°30.9 -20°04.1	348°30.7 -20°04.7	3°30.6 -20°05.7	15°30.4 -20°05.7	33°30.3 -20°06.3	45°30.1 -20°06.8	63°29.9 -20°07.4	-0.2 -0.5
Mo 22	258°27.8 -20°14.3	273°27.6 -20°14.8	288°27.4 -20°15.3	303°27.3 -20°15.9	318°27.1 -20°16.4	333°26.9 -20°16.9	348°26.8 -20°17.4	3°26.6 -20°18.0	15°26.4 -20°18.5	33°26.3 -20°19.0	45°26.1 -20°19.5	63°25.9 -20°20.0	-0.2 -0.5
Tu 23	258°23.6 -20°26.8	273°23.5 -20°27.3	288°23.3 -20°27.8	303°23.1 -20°28.3	318°22.9 -20°28.8	333°22.8 -20°29.3	348°22.6 -20°29.8	3°22.4 -20°30.3	15°22.2 -20°30.8	33°22.1 -20°31.3	45°21.9 -20°31.8	63°21.7 -20°32.4	-0.2 -0.5
We 24	258°19.3 -20°38.9	273°19.1 -20°39.4	288°19.0 -20°39.9	303°18.8 -20°40.4	318°18.6 -20°40.8	333°18.4 -20°41.3	348°18.2 -20°41.8	3°18.0 -20°42.3	15°17.8 -20°42.8	33°17.7 -20°43.3	45°17.5 -20°43.8	63°17.3 -20°44.3	-0.2 -0.5
Th 25	258°15.6 -20°50.8	273°14.6 -20°51.1	288°14.4 -20°51.6	303°14.2 -20°52.0	318°14.0 -20°52.5	333°13.8 -20°53.0	348°13.6 -20°53.5	3°13.4 -20°53.9	15°13.3 -20°54.4	33°13.1 -20°54.9	45°12.9 -20°55.4	63°12.7 -20°55.8	-0.2 -0.5
Fr 26	258°10.1 -21°01.9	273°09.9 -21°02.4	288°09.7 -21°02.9	303°09.5 -21°03.3	318°09.3 -21°03.8	333°09.1 -21°04.2	348°08.9 -21°04.7	3°08.7 -21°05.2	15°08.5 -21°05.6	33°08.3 -21°06.1	45°08.1 -21°06.5	63°07.9 -21°07.0	-0.2 -0.5
Sa 27	258°05.2 -21°12.9	273°05.0 -21°13.3	288°04.8 -21°13.8	303°04.6 -21°14.2	318°04.4 -21°14.7	333°04.1 -21°15.1	348°03.9 -21°15.5	3°03.7 -21°16.0	15°03.5 -21°16.4	33°03.3 -21°16.9	45°03.1 -21°17.3	63°02.9 -21°17.8	-0.2 -0.4
Su 28	258°00.1 -21°23.4	272°59.9 -21°24.3	287°59.7 -21°24.7	303°59.5 -21°25.1	317°59.2 -21°25.6	332°59.0 -21°26.0	347°58.8 -21°26.5	2°58.6 -21°26.9	15°58.4 -21°27.3	32°58.2 -21°27.7	45°57.9 -21°28.1	62°57.7 -21°28.6	-0.2 -0.4
Mo 29	257°54.9 -21°33.6	272°54.6 -21°34.0	287°54.4 -21°34.4	303°54.2 -21°34.8	317°54.0 -21°35.2	332°53.7 -21°35.6	347°53.5 -21°36.0	2°53.3 -21°36.4	15°53.1 -21°36.8	32°52.8 -21°37.3	45°52.6 -21°37.7	62°52.4 -21°38.1	-0.2 -0.4
Tu 30	257°49.4 -21°43.3	272°49.2 -21°43.7	287°49.0 -21°44.1	303°48.7 -21°44.5	317°48.5 -21°44.9	332°48.3 -21°45.3	347°48.0 -21°45.7	2°47.8 -21°46.0	15°47.6 -21°46.4	32°47.6 -21°46.8	45°47.1 -21°47.2	62°46.9 -21°47.6	-0.2 -0.4

Row 1: GHA (Greenwich Hour Angle), Δ' /h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ' /h = dec. change

Semi-diameter: 16.2'

MOON

November 2032

	D	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Δ'/h SH
Mo 1	238 ⁰ 01.2 -7°06.2	252 ⁰ 34.3 -7°15.5	267 ⁰ 07.4 -7°24.8	281 ⁰ 40.4 -7°34.1	296 ⁰ 13.4 -7°43.3	310 ⁰ 46.4 -8°01.6	325 ⁰ 19.3 -8°10.7	339 ⁰ 52.2 -8°19.8	354 ⁰ 25.0 -8°29.9	8°57.8 -8°38.0	23°30.5 -8°58.0	+32.9 15.0 -9.2 54.9	
	241 ⁰ 36.0 -10°49.3	256 ⁰ 08.0 -10°57.7	270 ⁰ 39.9 -11°06.1	285 ⁰ 11.8 -11°14.5	299 ⁰ 43.6 -11°22.8	314 ⁰ 15.4 -11°31.0	328 ⁰ 47.1 -11°39.3	343 ⁰ 18.8 -11°47.4	357 ⁰ 50.4 -11°55.5	12°22.0 -12°03.6	26°53.5 -12°11.6	+31.7 15.1 -8.2 55.4	
We 3	244 ⁰ 39.5 -14°05.1	259 ⁰ 10.1 -14°12.1	273 ⁰ 40.6 -14°19.2	288 ⁰ 11.2 -14°26.1	302 ⁰ 41.6 -14°33.0	317 ⁰ 12.0 -14°39.8	331 ⁰ 42.3 -14°46.6	346 ⁰ 12.6 -14°53.2	0°42.8 -14°59.9	15°13.0 -15°06.4	29°43.1 -15°12.9	+30.4 15.2 -8.8 55.9	
Th 4	247 ⁰ 08.1 -16°40.7	261 ⁰ 37.3 -16°45.9	276 ⁰ 06.5 -16°51.1	290 ⁰ 35.6 -16°56.1	305 ⁰ 04.7 -17°01.0	319 ⁰ 33.7 -17°05.9	334 ⁰ 02.6 -17°10.7	348 ⁰ 31.5 -17°15.4	3°00.4 -17°20.0	17°29.2 -17°24.5	31°58.0 -17°28.9	+29.0 15.4 -4.8 56.4	
Fr 5	249 ⁰ 03.6 -18°23.8	263 ⁰ 31.6 -18°26.7	277 ⁰ 59.5 -18°29.4	292 ⁰ 27.5 -18°32.1	306 ⁰ 55.4 -18°34.7	321 ⁰ 23.2 -18°37.1	335 ⁰ 51.0 -18°39.5	350 ⁰ 18.8 -18°41.7	4°46.6 -18°43.9	19°14.3 -18°45.9	33°41.9 -18°47.9	+27.8 15.5 -2.4 56.9	
Sa 6	250 ⁰ 33.1 -19°03.9	265 ⁰ 00.3 -19°04.1	279 ⁰ 27.5 -19°04.2	293 ⁰ 54.7 -19°04.2	308 ⁰ 21.8 -19°04.0	322 ⁰ 48.9 -19°03.8	337 ⁰ 16.0 -19°03.4	351 ⁰ 43.1 -19°02.9	6°10.2 -19°02.3	20°37.2 -19°01.6	35°04.2 -19°00.8	+27.1 15.6 +0.3 57.4	
Su 7	251 ⁰ 48.4 -18°35.0	266 ⁰ 15.3 -18°32.3	280 ⁰ 42.2 -18°29.6	295 ⁰ 09.1 -18°26.7	309 ⁰ 36.0 -18°23.8	324 ⁰ 02.9 -18°20.7	338 ⁰ 29.8 -18°17.5	352 ⁰ 56.7 -18°14.2	7°23.6 -18°10.8	21°50.5 -18°07.3	36°17.4 -18°03.7	+26.9 15.8 +3.1 57.8	
Mo 8	253 ⁰ 02.1 -16°56.2	267 ⁰ 29.2 -16°50.8	281 ⁰ 56.3 -16°45.3	296 ⁰ 23.4 -16°39.8	310 ⁰ 50.5 -16°34.1	325 ⁰ 17.6 -16°28.4	339 ⁰ 44.8 -16°22.5	354 ⁰ 11.9 -16°16.5	8°39.1 -16°10.5	23°06.3 -16°04.3	37°33.6 -15°58.0	+27.1 15.9 +5.8 58.3	
Tu 9	254 ⁰ 24.3 -14°12.5	268 ⁰ 51.8 -14°04.8	283 ⁰ 19.4 -13°56.9	297 ⁰ 47.0 -13°49.0	312 ⁰ 14.6 -13°41.0	326 ⁰ 42.3 -13°32.8	341 ⁰ 09.9 -13°24.7	355 ⁰ 37.6 -13°16.4	10°05.3 -13°08.7	24°33.0 -12°59.6	39°00.8 -12°51.0	+27.7 16.0 -8.2 58.7	
We 10	255 ⁰ 59.7 -10°34.0	270 ⁰ 27.8 -10°24.3	284 ⁰ 55.9 -10°14.6	299 ⁰ 24.0 -10°04.7	313 ⁰ 52.2 -9°54.8	328 ⁰ 20.3 -9°44.9	342 ⁰ 48.5 -9°34.9	357 ⁰ 16.7 -9°24.8	11°44.9 -9°14.7	26°13.2 -9°04.5	40°41.4 -8°54.2	+28.2 16.1 +10.0 59.1	
Th 11	257 ⁰ 47.1 -6°14.2	272 ⁰ 15.6 -6°03.1	286 ⁰ 44.1 -5°52.0	301 ⁰ 12.6 -5°40.9	315 ⁰ 41.1 -5°29.8	330 ⁰ 09.6 -5°18.6	344 ⁰ 38.1 -5°07.4	359 ⁰ 06.6 -4°56.1	13°35.2 -4°44.8	28°03.3 -4°33.5	42°32.2 -4°22.1	+28.5 16.2 +11.2 59.4	
Fr 12	259 ⁰ 40.7 -1°29.0	274 ⁰ 09.3 -1°17.3	288 ⁰ 37.8 -1°05.6	303 ⁰ 06.4 -0°53.9	317 ⁰ 34.9 -0°42.2	332 ⁰ 03.5 -0°30.5	346 ⁰ 32.0 -0°18.7	1°00.5 -0°07.0	15°29.1 0°04.7	29°57.6 0°16.5	44°26.1 0°28.2	+28.5 16.2 +11.7 59.6	
Sa 13	261 ⁰ 32.3 3°23.6	276 ⁰ 00.6 3°35.2	290 ⁰ 28.9 3°46.7	304 ⁰ 57.1 3°58.3	319 ⁰ 25.4 4°09.8	333 ⁰ 53.6 4°21.3	348 ⁰ 21.8 4°32.7	2°50.0 4°44.2	17°18.2 4°55.6	31°46.3 5°07.0	46°14.4 5°18.4	+28.2 16.3 +11.5 59.6	
Su 14	263 ⁰ 13.7 8°04.3	277 ⁰ 41.4 8°15.0	292 ⁰ 09.3 8°25.6	306 ⁰ 36.9 8°36.2	321 ⁰ 04.5 8°46.8	335 ⁰ 32.2 8°57.2	349 ⁰ 59.8 9°07.7	4°27.4 9°18.1	18°55.0 9°28.4	33°23.6 9°38.6	47°50.1 9°48.8	+27.6 16.2 +10.5 59.5	
Mo 15	264 ⁰ 39.7 12°13.7	279 ⁰ 06.6 12°22.8	293 ⁰ 33.8 12°31.8	308 ⁰ 01.0 12°40.7	322 ⁰ 28.0 12°49.5	336 ⁰ 55.0 12°58.2	351 ⁰ 22.0 13°06.9	5°48.9 13°15.4	20°15.9 13°23.9	34°42.8 13°32.3	49°09.7 13°40.6	+27.0 16.1 +8.7 59.2	
Tu 16	265 ⁰ 50.6 15°34.1	280 ⁰ 17.7 15°40.9	294 ⁰ 43.8 15°47.6	309 ⁰ 10.3 15°54.1	323 ⁰ 36.9 16°00.6	338 ⁰ 03.4 16°07.0	352 ⁰ 30.0 16°13.3	6°56.5 16°19.4	21°23.0 16°25.5	35°49.5 16°31.4	50°16.0 16°37.3	+26.5 16.0 +6.3 58.7	
We 17	266 ⁰ 53.0 17°51.7	281 ⁰ 19.5 17°55.7	295 ⁰ 46.0 17°59.7	310 ⁰ 12.5 18°03.5	324 ⁰ 39.0 18°07.3	339 ⁰ 05.6 18°10.9	353 ⁰ 32.1 18°14.4	7°58.6 18°17.7	22°25.2 18°21.0	36°51.7 18°24.1	51°18.3 18°27.2	+26.5 15.8 +3.6 58.1	
Th 18	267 ⁰ 59.5 18°58.9	282 ⁰ 26.5 19°00.1	296 ⁰ 53.5 19°01.1	311 ⁰ 20.5 19°02.1	325 ⁰ 47.5 19°03.0	340 ⁰ 14.6 19°03.7	354 ⁰ 41.7 19°04.3	9°08.9 19°04.8	23°36.1 19°05.2	38°03.3 19°05.5	52°30.5 19°05.7	+27.1 15.6 +0.7 57.4	
Fr 19	269 ⁰ 24.7 18°55.3	283 ⁰ 52.6 18°53.7	298 ⁰ 20.7 18°52.1	312 ⁰ 48.8 18°50.3	327 ⁰ 16.9 18°48.5	341 ⁰ 45.1 18°46.5	356 ⁰ 13.3 18°44.4	10°41.6 18°42.3	25°10.0 18°40.0	39°38.4 18°37.7	54°06.9 18°35.2	+28.2 15.4 -2.0 56.6	
Sa 20	271 ⁰ 20.7 17°46.8	285 ⁰ 50.1 17°42.9	300 ⁰ 19.6 17°38.8	314 ⁰ 49.1 17°34.7	329 ⁰ 18.7 17°30.5	343 ⁰ 48.4 17°26.2	358 ⁰ 18.1 17°21.8	12°47.8 17°17.4	27°17.7 17°12.8	41°47.6 17°08.2	56°17.5 17°03.5	+29.7 15.2 -4.3 55.8	
Su 21	273 ⁰ 54.4 15°43.5	288 ⁰ 25.3 15°37.5	302 ⁰ 56.3 15°31.5	317 ⁰ 27.4 15°25.5	331 ⁰ 58.5 15°19.4	346 ⁰ 29.7 15°13.2	361 ⁰ 01.5 15°06.9	15°52.3 15°00.6	30°03.6 14°54.2	44°35.1 14°47.8	59°06.5 14°41.3	+31.2 15.1 -6.2 55.2	
Mo 22	277 ⁰ 05.6 12°56.5	291 ⁰ 38.0 12°49.0	306 ⁰ 10.4 12°41.6	320 ⁰ 42.9 12°34.0	335 ⁰ 15.4 12°26.5	349 ⁰ 48.0 12°18.8	4°20.6 12°11.2	18°53.3 12°03.4	33°26.0 11°55.7	47°58.8 11°47.8	62°31.6 11°40.0	+32.6 14.9 -7.7 54.4	
Tu 23	291 ⁰ 38.0 12°54.9	306 ⁰ 10.4 12°41.6	320 ⁰ 42.9 12°34.0	335 ⁰ 15.4 12°26.5	349 ⁰ 48.0 12°18.8	4°20.6 12°11.2	18°53.3 12°03.4	33°26.0 11°55.7	47°58.8 11°47.8	62°31.6 11°40.0	77°04.5 11°32.1	+32.7 14.9 -7.7 54.4	
We 24	295 ⁰ 22.7 9°28.4	309 ⁰ 56.3 9°19.8	324 ⁰ 29.8 9°11.2	339 ⁰ 03.4 9°02.6	353 ⁰ 37.1 8°54.0	8°10.8 8°45.3	22°44.5 8°36.5	37°18.2 8°27.8	51°52.0 8°19.0	66°25.8 8°10.2	80°59.9 8°01.3	+33.7 14.8 -8.7 54.3	
Th 25	299 ⁰ 30.4 -2°13.9	314 ⁰ 04.6 -2°03.3	328 ⁰ 38.8 -2°33.3	343 ⁰ 13.2 -2°43.0	357 ⁰ 47.4 -2°52.7	5°08.1 -3°02.4	12°21.7 -3°12.0	26°56.1 -3°21.7	41°30.4 -3°31.3	56°04.4 -3°41.0	70°39.1 -3°50.6	+34.3 14.8 -9.7 54.4	
Fr 26	303 ⁰ 50.0 1°48.5	318 ⁰ 24.4 1°38.9	332 ⁰ 58.9 1°29.2	347 ⁰ 33.3 1°19.5	3 ⁰ 27.8 1°09.9	16°42.3 0°50.5	31°16.7 0°50.5	45°51.2 0°40.8	60°25.6 0°31.1	75°00.0 0°21.4	89°34.5 0°11.7	+34.5 14.8 -9.7 54.2	
Sa 27	308 ⁰ 09.4 -2°13.9	322 ⁰ 43.6 -2°03.3	337 ⁰ 17.8 -2°33.3	351 ⁰ 52.0 -2°43.0	6°26.1 -2°52.7	21°00.3 -3°02.4	35°34.4 -3°12.0	50°08.4 -3°21.7	64°42.5 -3°31.3	79°16.5 -3°41.0	93°50.5 -3°50.6	+34.1 14.8 -9.7 54.4	
Su 28	312 ⁰ 16.7 -6°13.5	326 ⁰ 50.2 -6°22.9	341 ⁰ 23.3 -6°32.3	355 ⁰ 57.0 -6°41.7	10°30.4 -6°51.0	25°03.7 -7°00.3	39°37.0 -7°09.6	54°10.2 -7°18.9	68°43.4 -7°28.1	83°16.5 -7°37.3	97°49.6 -7°46.5	+33.3 15.0 -9.3 54.8	
Mo 29	316 ⁰ 00.4 -10°00.9	330 ⁰ 32.7 -10°09.6	345 ⁰ 05.0 -10°18.2	359 ⁰ 37.2 -10°26.8	14°09.3 -10°35.4	28°41.4 -10°43.9	43°13.4 -10°52.4	57°45.4 -11°00.9	72°17.3 -11°09.3	86°49.2 -11°17.6	101°21.0 -11°26.0	+32.1 15.1 -8.5 55.3	
Tu 30	319 ⁰ 10.7 -13°24.8	333 ⁰ 41.6 -13°32.3	348 ⁰ 12.1 -13°39.7	2°43.0 -13°47.1	17°13.6 -13°54.4	31°44.2 -14°01.7	46°14.7 -14°08.9	60°45.1 -14°16.0	75°15.5 -14°23.1	89°45.8 -14°30.0	104°16.0 -14°37.0	+30.5 15.3 -7.2 56.0	

SUN

December 2032

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
We 1	272°43.6 -21°53.0	287°43.3 -21°53.4	302°43.1 -21°53.7	317°42.9 -21°54.1	332°42.6 -21°54.5	347°42.4 -21°54.9	3°42.2 -21°55.2	17°41.9 -21°55.6	32°41.7 -21°56.0	47°41.4 -21°56.4	62°41.2 -21°56.7	77°41.0 -21°57.1	-0.2 -0.4
Th 2	272°37.8 -22°01.9	287°37.6 -22°02.2	302°37.3 -22°02.6	317°37.1 -22°02.9	332°36.8 -22°03.3	347°36.6 -22°03.7	2°36.3 -22°04.0	17°36.1 -22°04.4	32°35.9 -22°04.7	47°35.6 -22°05.1	62°35.4 -22°05.4	77°35.1 -22°05.8	-0.2 -0.4
Fr 3	272°31.9 -22°10.3	287°31.6 -22°10.7	302°31.4 -22°11.0	317°31.1 -22°11.3	332°30.9 -22°11.7	347°30.6 -22°12.0	2°30.4 -22°12.4	17°30.1 -22°12.7	32°29.9 -22°13.0	47°29.6 -22°13.4	62°29.4 -22°13.7	77°29.1 -22°14.0	-0.3 -0.3
Sa 4	272°25.8 -22°18.3	287°25.6 -22°18.7	302°25.3 -22°19.0	317°25.1 -22°19.3	332°24.8 -22°19.6	347°24.5 -22°20.0	2°24.3 -22°20.3	17°24.0 -22°20.6	32°23.8 -22°20.9	47°23.5 -22°21.2	62°23.3 -22°21.5	77°23.0 -22°21.9	-0.3 -0.3
Su 5	272°19.6 -22°25.9	287°19.4 -22°26.2	302°19.1 -22°26.5	317°18.8 -22°26.8	332°18.6 -22°27.2	347°18.3 -22°27.5	2°18.0 -22°27.8	17°17.8 -22°28.1	32°17.5 -22°28.4	47°17.3 -22°28.7	62°17.0 -22°29.0	77°16.7 -22°29.3	-0.3 -0.3
Mo 6	272°13.3 -22°33.1	287°13.0 -22°33.4	302°12.7 -22°33.7	317°12.5 -22°34.0	332°12.2 -22°34.2	347°11.9 -22°34.5	2°11.7 -22°34.8	17°11.4 -22°35.1	32°11.1 -22°35.4	47°10.9 -22°35.7	62°10.6 -22°35.9	77°10.3 -22°36.2	-0.3 -0.3
Tu 7	272°06.8 -22°39.8	287°06.5 -22°40.1	302°06.3 -22°40.3	317°06.0 -22°40.6	332°05.7 -22°40.9	347°05.4 -22°41.1	2°05.2 -22°41.4	17°04.9 -22°41.7	32°04.6 -22°41.9	47°04.4 -22°42.2	62°04.1 -22°42.5	77°03.8 -22°42.7	-0.3 -0.3
We 8	272°00.2 -22°46.1	287°00.0 -22°46.3	302°59.7 -22°46.6	316°59.4 -22°46.8	331°59.1 -22°47.1	346°58.8 -22°47.1	1°58.6 -22°47.6	16°58.3 -22°47.8	31°58.0 -22°48.1	46°57.7 -22°48.3	61°57.5 -22°48.5	76°57.2 -22°48.8	-0.3 -0.2
Th 9	271°53.5 -22°53.5	286°53.3 -22°52.1	301°53.0 -22°52.4	316°52.7 -22°52.6	331°52.4 -22°52.8	346°52.1 -22°53.1	1°51.8 -22°53.3	16°51.6 -22°53.5	31°51.3 -22°53.7	46°51.0 -22°54.0	61°50.7 -22°54.2	76°50.4 -22°54.4	-0.3 -0.2
Fr 10	271°46.7 -22°57.3	286°46.5 -22°57.5	301°46.2 -22°57.7	316°45.9 -22°57.9	331°45.6 -22°58.1	346°45.3 -22°58.3	1°45.0 -22°58.5	16°44.7 -22°58.8	31°44.5 -22°59.0	46°44.2 -22°59.2	61°43.9 -22°59.5	76°43.6 -22°59.6	-0.3 -0.2
Sa 11	271°39.9 -23°02.2	286°39.6 -23°02.4	301°39.3 -23°02.6	316°39.0 -23°02.8	331°38.7 -23°03.0	346°38.4 -23°03.2	1°38.1 -23°03.3	16°37.8 -23°03.5	31°37.5 -23°03.7	46°37.3 -23°03.9	61°37.0 -23°04.1	76°36.7 -23°04.3	-0.3 -0.2
Su 12	271°32.9 -23°06.7	286°32.6 -23°06.8	301°32.3 -23°07.0	316°32.0 -23°07.2	331°31.7 -23°07.4	346°31.4 -23°07.5	1°31.1 -23°07.7	16°30.8 -23°07.9	31°30.5 -23°08.0	46°30.3 -23°08.2	61°30.0 -23°08.4	76°29.7 -23°08.6	-0.3 -0.2
Mo 13	271°25.8 -23°10.7	286°25.5 -23°10.8	301°25.2 -23°11.0	316°24.9 -23°11.1	331°24.7 -23°11.3	346°24.4 -23°11.4	1°24.1 -23°11.6	16°23.8 -23°11.7	31°23.5 -23°11.9	46°23.2 -23°12.0	61°22.9 -23°12.2	76°22.6 -23°12.3	-0.3 -0.2
Tu 14	271°18.7 -23°14.2	286°18.4 -23°14.3	301°18.1 -23°14.5	316°17.8 -23°14.8	331°17.5 -23°14.9	346°17.2 -23°15.0	1°16.9 -23°15.2	16°16.6 -23°15.3	31°16.3 -23°15.4	46°16.0 -23°15.5	61°15.7 -23°15.7	76°15.4 -23°15.7	-0.3 -0.3
We 15	271°11.5 -23°17.3	286°11.2 -23°17.4	301°10.9 -23°17.5	316°10.6 -23°17.6	331°10.3 -23°17.8	346°10.0 -23°17.9	1°09.7 -23°18.0	16°09.4 -23°18.1	31°09.1 -23°18.2	46°08.8 -23°18.3	61°08.5 -23°18.4	76°08.2 -23°18.5	-0.3 -0.3
Th 16	271°04.3 -23°19.9	286°04.0 -23°20.0	301°03.7 -23°20.1	316°03.4 -23°20.2	331°03.1 -23°20.3	346°02.8 -23°20.4	1°02.5 -23°20.5	16°02.1 -23°20.6	31°01.8 -23°20.7	46°01.5 -23°20.8	61°01.2 -23°20.9	76°00.9 -23°20.9	-0.3 -0.3
Fr 17	270°57.0 -23°22.1	285°56.7 -23°22.1	300°56.4 -23°22.2	315°56.1 -23°22.3	330°55.7 -23°22.4	345°55.4 -23°22.4	0°55.1 -23°22.5	15°54.8 -23°22.6	30°54.5 -23°22.7	45°54.2 -23°22.7	60°53.9 -23°22.8	75°53.6 -23°22.9	-0.3 -0.1
Sa 18	270°49.6 -23°23.7	285°49.3 -23°23.8	300°49.0 -23°23.9	315°48.7 -23°23.9	330°48.4 -23°24.0	345°48.1 -23°24.0	0°47.8 -23°24.1	15°47.5 -23°24.1	30°47.2 -23°24.2	45°46.9 -23°24.2	60°46.6 -23°24.3	75°46.2 -23°24.4	-0.3 -0.1
Su 19	270°42.2 -23°25.0	285°41.9 -23°25.0	300°41.6 -23°25.0	315°41.3 -23°25.1	330°41.0 -23°25.1	345°40.7 -23°25.1	0°40.4 -23°25.2	15°40.1 -23°25.2	30°39.8 -23°25.3	45°39.5 -23°25.3	60°39.2 -23°25.3	75°38.8 -23°25.4	-0.3 -0.0
Mo 20	270°34.8 -23°25.7	285°34.5 -23°25.7	300°34.2 -23°25.7	315°33.9 -23°25.8	330°33.6 -23°25.8	345°33.3 -23°25.8	0°33.0 -23°25.8	15°32.7 -23°25.8	30°32.4 -23°25.8	45°32.0 -23°25.9	60°31.7 -23°25.9	75°31.4 -23°25.9	-0.0 -0.0
Tu 21	270°27.2 -23°26.0	285°27.1 -23°26.0	300°26.8 -23°26.0	315°26.5 -23°26.0	330°26.2 -23°26.0	345°25.8 -23°26.0	0°25.5 -23°26.0	15°25.2 -23°26.0	30°24.9 -23°26.0	45°24.6 -23°25.9	60°24.3 -23°25.9	75°24.0 -23°25.9	-0.3 +0.0
We 22	270°20.0 -23°25.8	285°19.6 -23°25.8	300°19.3 -23°25.7	315°19.0 -23°25.7	330°18.7 -23°25.7	345°18.4 -23°25.7	0°18.1 -23°25.6	15°17.8 -23°25.6	30°17.5 -23°25.6	45°17.2 -23°25.6	60°16.8 -23°25.5	75°16.5 -23°25.5	+0.0 +0.0
Th 23	270°12.5 -23°25.1	285°12.2 -23°25.1	300°11.9 -23°25.0	315°11.6 -23°25.0	330°11.3 -23°24.9	345°10.9 -23°24.9	0°10.6 -23°24.9	15°10.3 -23°24.8	30°10.0 -23°24.8	45°09.7 -23°24.7	60°09.4 -23°24.7	75°09.1 -23°24.6	-0.3 +0.0
Fr 24	270°05.1 -23°24.0	285°04.7 -23°23.9	300°04.4 -23°23.8	315°04.1 -23°23.8	330°03.6 -23°23.7	345°03.3 -23°23.7	0°03.2 -23°23.6	15°02.9 -23°23.5	30°02.6 -23°23.5	45°02.3 -23°23.4	60°02.0 -23°23.3	75°01.6 -23°23.3	-0.3 +0.1
Sa 25	269°57.6 -23°22.3	284°57.3 -23°22.3	299°57.0 -23°22.1	314°56.7 -23°22.0	329°56.4 -23°22.0	344°56.1 -23°22.0	359°55.8 -23°21.9	14°55.4 -23°21.8	29°55.1 -23°21.7	44°54.8 -23°21.6	59°54.3 -23°21.5	74°54.2 -23°21.5	-0.3 +0.1
Su 26	269°50.2 -23°20.3	284°49.9 -23°20.2	299°49.6 -23°20.1	314°49.3 -23°20.0	329°49.0 -23°19.9	344°48.7 -23°19.8	359°48.3 -23°19.8	14°48.8 -23°19.6	29°47.7 -23°19.5	44°47.4 -23°19.4	59°47.1 -23°19.3	74°46.8 -23°19.2	-0.3 +0.1
Mo 27	269°42.8 -23°17.8	284°42.5 -23°17.6	299°42.2 -23°17.5	314°41.9 -23°17.4	329°41.6 -23°17.2	344°41.3 -23°17.1	359°41.0 -23°17.0	14°40.7 -23°16.9	29°40.4 -23°16.8	44°40.0 -23°16.6	59°39.7 -23°16.5	74°39.4 -23°16.4	-0.3 +0.1
Tu 28	269°35.5 -23°14.7	284°35.1 -23°14.6	299°34.8 -23°14.4	314°34.5 -23°14.3	329°34.2 -23°14.2	344°33.9 -23°14.0	359°33.6 -23°13.7	14°33.3 -23°13.6	29°33.0 -23°13.5	44°32.7 -23°13.4	59°32.4 -23°13.3	74°32.1 -23°13.2	-0.3 +0.1
We 29	269°28.2 -23°11.2	284°27.8 -23°11.1	299°27.5 -23°10.9	314°27.2 -23°10.7	329°26.9 -23°10.6	344°26.6 -23°10.4	359°26.3 -23°10.3	14°26.0 -23°10.1	29°25.7 -23°10.0	44°25.4 -23°09.8	59°25.1 -23°09.6	74°24.8 -23°09.5	-0.3 +0.2
Th 30	269°20.9 -23°07.3	284°20.6 -23°07.1	299°20.3 -23°06.9	314°20.0 -23°06.7	329°19.7 -23°06.6	344°19.4 -23°06.4	359°19.1 -23°06.2	14°18.8 -23°06.0	29°18.5 -23°05.8	44°18.2 -23°05.7	59°17.9 -23°05.5	74°17.6 -23°05.3	-0.3 +0.2
Fr 31	269°13.7 -23°02.9	284°13.4 -23°02.7	299°13.1 -23°02.5	314°12.8 -23°02.3	329°12.5 -23°02.1	344°12.2 -23°01.9	359°11.7 -23°01.5	14°11.6 -23°01.3	29°11.3 -23°01.1	44°11.0 -23°00.9	59°10.7 -23°00.7	74°10.4 -23°00.7	-0.3 +0.2

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.3'

MOON

December 2032

	D	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	Δ /h	SH
●	We 1	249 ^o 14.7 -15 ^o 42.5	263 ^o 44.2 -15 ^o 48.6	278 ^o 13.6 -15 ^o 54.7	292 ^o 43.0 -16 ^o 00.7	307 ^o 12.3 -16 ^o 06.6	321 ^o 41.5 -16 ^o 12.4	336 ^o 10.7 -16 ^o 18.2	350 ^o 39.8 -16 ^o 23.9	365 ^o 08.9 -16 ^o 29.4	379 ^o 37.9 -16 ^o 35.0	34 ^o 06.8 -16 ^o 40.4	+29.2	15.4 -5.8
	Th 2	251 ^o 13.0 -17 ^o 51.1	265 ^o 40.0 -17 ^o 55.1	280 ^o 08.8 -17 ^o 59.0	294 ^o 36.6 -18 ^o 02.8	309 ^o 04.4 -18 ^o 06.4	323 ^o 32.1 -18 ^o 10.0	337 ^o 59.8 -18 ^o 13.5	352 ^o 27.3 -18 ^o 16.8	365 ^o 54.9 -18 ^o 20.1	21 ^o 22.4 -18 ^o 23.9	35 ^o 49.8 -18 ^o 26.4	+27.7	15.6 -3.5
	Fr 3	252 ^o 35.7 -18 ^o 59.5	267 ^o 02.4 -19 ^o 00.8	281 ^o 29.0 -19 ^o 02.0	295 ^o 55.7 -19 ^o 03.1	310 ^o 22.3 -19 ^o 04.1	324 ^o 48.9 -19 ^o 04.9	339 ^o 15.4 -19 ^o 05.7	353 ^o 41.6 -19 ^o 06.9	368 ^o 08.4 -19 ^o 06.9	22 ^o 34.8 -19 ^o 07.3	37 ^o 01.2 -19 ^o 07.6	+26.6	15.7 -0.8
●	Sa 4	253 ^o 34.6 -18 ^o 57.8	268 ^o 00.7 -18 ^o 56.2	282 ^o 26.8 -18 ^o 54.5	296 ^o 52.9 -18 ^o 52.6	311 ^o 19.0 -18 ^o 50.7	325 ^o 45.0 -18 ^o 48.6	340 ^o 11.1 -18 ^o 46.4	354 ^o 37.1 -18 ^o 44.1	369 ^o 03.2 -18 ^o 41.7	23 ^o 29.2 -18 ^o 39.1	37 ^o 55.2 -18 ^o 36.4	+26.1	15.9 +2.1
	Su 5	254 ^o 26.3 -17 ^o 42.5	268 ^o 52.5 -17 ^o 37.9	283 ^o 18.6 -17 ^o 33.3	297 ^o 44.8 -17 ^o 28.6	312 ^o 11.0 -17 ^o 23.7	326 ^o 37.2 -17 ^o 18.7	341 ^o 03.5 -17 ^o 13.7	355 ^o 29.7 -17 ^o 08.5	369 ^o 56.0 -17 ^o 03.2	24 ^o 22.3 -16 ^o 57.8	38 ^o 48.6 -16 ^o 52.3	+26.2	16.0 +5.0
	Mo 6	255 ^o 26.4 -15 ^o 17.2	269 ^o 53.2 -15 ^o 10.0	284 ^o 20.0 -15 ^o 02.8	298 ^o 46.8 -14 ^o 55.5	313 ^o 13.6 -14 ^o 48.0	327 ^o 40.5 -14 ^o 40.5	342 ^o 07.4 -14 ^o 32.9	356 ^o 34.4 -14 ^o 25.2	370 ^o 01.3 -14 ^o 17.4	25 ^o 28.3 -14 ^o 09.6	39 ^o 55.4 -14 ^o 01.6	+26.9	16.1 +7.6
●	Tu 7	256 ^o 45.3 -11 ^o 52.3	271 ^o 12.9 -11 ^o 43.0	285 ^o 40.5 -11 ^o 33.7	300 ^o 08.2 -11 ^o 24.3	314 ^o 35.9 -11 ^o 14.9	329 ^o 03.7 -11 ^o 05.4	343 ^o 31.5 -10 ^o 55.8	357 ^o 59.3 -10 ^o 46.1	372 ^o 27.1 -10 ^o 36.4	26 ^o 55.0 -10 ^o 26.6	41 ^o 22.9 -10 ^o 16.8	+27.8	16.1 +9.5
	We 8	258 ^o 25.7 -7 ^o 42.5	272 ^o 54.1 -7 ^o 31.8	287 ^o 22.5 -7 ^o 21.1	301 ^o 51.0 -7 ^o 10.3	316 ^o 19.5 -6 ^o 59.5	330 ^o 48.1 -6 ^o 48.6	345 ^o 16.6 -6 ^o 37.7	359 ^o 45.2 -6 ^o 26.8	374 ^o 13.8 -6 ^o 15.8	28 ^o 42.5 -6 ^o 04.8	43 ^o 11.1 -5 ^o 53.8	+28.5	16.1 +10.9
	Th 9	260 ^o 23.6 -9 ^o 04.8	274 ^o 52.2 -2 ^o 53.4	289 ^o 21.5 -2 ^o 41.9	303 ^o 50.5 -2 ^o 30.4	318 ^o 19.5 -2 ^o 19.0	332 ^o 48.5 -2 ^o 07.5	347 ^o 17.6 -1 ^o 56.0	361 ^o 46.6 -1 ^o 44.4	376 ^o 15.7 -1 ^o 32.9	30 ^o 44.7 -1 ^o 21.4	45 ^o 13.8 -1 ^o 09.9	+29.0	16.1 +11.5
●	Fr 10	262 ^o 30.5 1 ^o 43.2	276 ^o 59.7 1 ^o 54.7	291 ^o 28.8 2 ^o 06.2	305 ^o 57.9 2 ^o 17.7	320 ^o 27.0 2 ^o 29.1	334 ^o 56.1 2 ^o 40.5	349 ^o 25.2 2 ^o 51.9	363 ^o 54.3 3 ^o 03.3	378 ^o 23.4 3 ^o 14.7	32 ^o 52.5 3 ^o 25.9	47 ^o 21.6 3 ^o 37.4	+29.1	16.1 +11.4
	Sa 11	264 ^o 36.6 6 ^o 24.2	279 ^o 05.5 6 ^o 35.0	293 ^o 34.3 6 ^o 45.8	308 ^o 03.2 6 ^o 56.6	322 ^o 32.0 7 ^o 07.3	337 ^o 00.8 7 ^o 18.0	351 ^o 29.6 7 ^o 28.7	365 ^o 58.4 7 ^o 39.3	380 ^o 27.2 7 ^o 49.8	34 ^o 55.9 8 ^o 00.3	49 ^o 24.6 8 ^o 10.8	+28.8	16.0 +10.7
	Su 12	266 ^o 32.7 10 ^o 41.1	281 ^o 01.1 10 ^o 50.6	295 ^o 29.4 11 ^o 00.1	309 ^o 57.7 11 ^o 09.5	324 ^o 26.7 11 ^o 18.9	338 ^o 54.2 11 ^o 28.1	353 ^o 22.4 11 ^o 37.3	367 ^o 50.6 11 ^o 46.5	382 ^o 18.8 11 ^o 55.5	36 ^o 46.8 12 ^o 04.5	51 ^o 15.1 12 ^o 13.5	+28.2	16.0 +9.2
●	Mo 13	268 ^o 13.7 14 ^o 17.9	282 ^o 41.4 14 ^o 25.5	297 ^o 09.1 14 ^o 33.0	311 ^o 36.8 14 ^o 40.5	326 ^o 04.4 14 ^o 47.9	340 ^o 32.0 14 ^o 55.1	354 ^o 59.6 15 ^o 02.3	369 ^o 27.2 15 ^o 09.4	383 ^o 54.7 15 ^o 16.4	38 ^o 22.2 15 ^o 23.3	52 ^o 49.7 15 ^o 30.1	+27.6	15.9 +7.2
	Tu 14	269 ^o 40.0 17 ^o 00.6	284 ^o 07.2 17 ^o 05.8	298 ^o 34.4 17 ^o 10.9	313 ^o 01.6 17 ^o 15.9	327 ^o 28.8 17 ^o 20.8	341 ^o 56.0 17 ^o 25.6	356 ^o 23.1 17 ^o 30.3	370 ^o 50.3 17 ^o 34.9	385 ^o 17.9 17 ^o 39.4	39 ^o 44.6 17 ^o 43.8	54 ^o 11.7 17 ^o 48.0	+27.2	15.8 +4.7
	We 15	270 ^o 58.6 18 ^o 38.9	285 ^o 25.7 18 ^o 41.5	299 ^o 52.9 18 ^o 43.9	314 ^o 20.0 18 ^o 46.1	328 ^o 47.2 18 ^o 48.3	343 ^o 14.3 18 ^o 50.4	357 ^o 41.6 18 ^o 52.3	372 ^o 08.8 18 ^o 54.2	386 ^o 36.0 18 ^o 55.9	41 ^o 03.2 18 ^o 57.5	55 ^o 30.5 18 ^o 59.0	+27.2	15.6 +2.0
○	Th 16	272 ^o 21.7 19 ^o 08.3	286 ^o 49.3 19 ^o 08.0	301 ^o 17.3 19 ^o 07.6	315 ^o 44.7 19 ^o 07.1	330 ^o 12.4 19 ^o 06.5	344 ^o 40.3 19 ^o 05.9	359 ^o 07.9 19 ^o 05.0	373 ^o 35.7 19 ^o 04.1	387 ^o 08.3 19 ^o 03.1	42 ^o 31.5 19 ^o 02.0	56 ^o 59.4 19 ^o 00.8	+27.8	15.5 -0.8
	Fr 17	274 ^o 03.4 18 ^o 30.0	288 ^o 32.0 18 ^o 27.1	303 ^o 00.7 18 ^o 24.2	317 ^o 29.4 18 ^o 21.1	331 ^o 58.2 18 ^o 18.0	346 ^o 27.0 18 ^o 14.7	360 ^o 55.9 18 ^o 11.4	375 ^o 24.8 18 ^o 08.0	389 ^o 53.8 18 ^o 04.5	44 ^o 22.8 18 ^o 00.9	58 ^o 51.9 17 ^o 57.2	+28.9	15.3 -3.3
	Sa 18	276 ^o 14.8 16 ^o 51.1	290 ^o 44.2 16 ^o 46.0	305 ^o 14.9 16 ^o 40.8	319 ^o 45.0 16 ^o 35.6	334 ^o 15.3 16 ^o 30.3	348 ^o 45.3 16 ^o 24.9	363 ^o 15.7 16 ^o 19.4	377 ^o 45.9 16 ^o 13.9	391 ^o 16.3 16 ^o 08.3	46 ^o 46.8 16 ^o 02.6	61 ^o 17.3 15 ^o 56.8	+30.2	15.2 -5.4
●	Su 19	279 ^o 01.9 14 ^o 22.0	293 ^o 33.3 14 ^o 15.2	308 ^o 04.8 14 ^o 08.3	322 ^o 36.4 14 ^o 01.3	337 ^o 08.0 13 ^o 54.3	351 ^o 39.6 13 ^o 47.2	365 ^o 11.4 13 ^o 40.0	379 ^o 44.1 13 ^o 32.9	393 ^o 47.5 13 ^o 25.6	49 ^o 46.8 13 ^o 18.3	64 ^o 18.8 13 ^o 10.9	+31.7	15.0 -7.1
	Mo 20	282 ^o 24.1 11 ^o 14.4	296 ^o 56.9 11 ^o 06.3	311 ^o 29.7 10 ^o 58.1	326 ^o 02.6 10 ^o 49.9	340 ^o 35.4 10 ^o 41.6	355 ^o 08.4 10 ^o 33.3	369 ^o 41.4 10 ^o 25.0	383 ^o 47.5 10 ^o 16.6	397 ^o 47.5 10 ^o 08.2	53 ^o 20.6 9 ^o 59.7	67 ^o 53.8 9 ^o 51.2	+33.0	14.9 -8.3
	Tu 21	286 ^o 16.0 7 ^o 39.6	300 ^o 49.8 7 ^o 30.6	315 ^o 23.6 7 ^o 21.6	329 ^o 57.4 7 ^o 12.5	344 ^o 31.3 7 ^o 03.4	359 ^o 05.2 6 ^o 54.3	373 ^o 39.1 6 ^o 45.2	387 ^o 13.1 6 ^o 36.0	401 ^o 47.1 6 ^o 26.8	57 ^o 21.1 6 ^o 17.6	71 ^o 55.1 6 ^o 08.4	+33.9	14.8 -9.1
●	We 22	300 ^o 49.8 3 ^o 30.6	315 ^o 23.6 3 ^o 21.6	329 ^o 57.4 3 ^o 19.1	344 ^o 31.3 3 ^o 09.5	359 ^o 05.2 3 ^o 00.0	373 ^o 39.1 2 ^o 50.4	387 ^o 13.1 2 ^o 40.8	401 ^o 47.1 2 ^o 31.3	416 ^o 13.1 2 ^o 21.7	57 ^o 21.1 2 ^o 12.1	71 ^o 55.1 2 ^o 02.5	+33.9	14.8 -9.6
	Th 23	305 ^o 02.9 3 ^o 38.1	319 ^o 37.3 3 ^o 28.6	334 ^o 11.7 3 ^o 19.1	348 ^o 46.2 3 ^o 09.5	363 ^o 20.6 3 ^o 00.0	377 ^o 55.0 2 ^o 50.4	392 ^o 29.5 2 ^o 40.8	406 ^o 58.5 2 ^o 31.3	421 ^o 38.4 2 ^o 21.7	76 ^o 12.9 2 ^o 12.1	90 ^o 47.4 1 ^o 52.5	+34.5	14.8 -9.4
	Fr 24	309 ^o 25.2 -0 ^o 22.3	323 ^o 59.7 -0 ^o 32.0	338 ^o 34.2 -0 ^o 41.7	353 ^o 08.7 -0 ^o 51.3	367 ^o 43.2 -1 ^o 01.0	381 ^o 17.7 -1 ^o 10.7	395 ^o 52.1 -1 ^o 20.3	409 ^o 26.0 -1 ^o 30.6	423 ^o 47.5 -1 ^o 39.6	80 ^o 35.5 -1 ^o 49.3	95 ^o 09.5 -1 ^o 58.9	+34.5	14.8 -9.7
○	Sa 25	313 ^o 44.4 -1 ^o 42.7	328 ^o 18.6 -4 ^o 32.1	342 ^o 52.7 -4 ^o 41.6	357 ^o 26.7 -4 ^o 51.1	371 ^o 00.8 -5 ^o 00.5	385 ^o 34.8 -5 ^o 10.0	400 ^o 08.8 -5 ^o 19.4	414 ^o 28.8 -5 ^o 28.8	428 ^o 42.8 -5 ^o 38.2	76 ^o 16.7 -5 ^o 47.5	84 ^o 50.6 -5 ^o 56.9	+34.0	14.8 +5.4
	Su 26	317 ^o 48.2 -8 ^o 14.5	332 ^o 21.5 -8 ^o 23.4	346 ^o 54.7 -8 ^o 32.4	361 ^o 27.9 -8 ^o 41.3	375 ^o 57.0 -8 ^o 50.2	390 ^o 34.1 -8 ^o 59.0	405 ^o 07.1 -9 ^o 07.8	419 ^o 24.1 -9 ^o 16.6	433 ^o 51.0 -9 ^o 25.4	88 ^o 45.9 -9 ^o 34.1	103 ^o 18.7 -9 ^o 42.8	+33.1	15.0 -8.8
	Mo 27	321 ^o 24.7 -11 ^o 48.5	335 ^o 56.7 -11 ^o 56.5	350 ^o 28.5 -12 ^o 04.5	364 ^o 00.4 -12 ^o 12.4	378 ^o 12.4 -12 ^o 20.3	392 ^o 24.3 -12 ^o 28.0	406 ^o 35.4 -12 ^o 36.0	420 ^o 46.3 -12 ^o 43.7	434 ^o 57.8 -12 ^o 51.4	92 ^o 10.0 -12 ^o 59.1	106 ^o 41.3 -13 ^o 06.7	+31.7	15.1 -7.8
●	Tu 28	324 ^o 23.8 -14 ^o 53.6	338 ^o 54.1 -15 ^o 00.2	353 ^o 24.3 -15 ^o 06.8	367 ^o 54.5 -15 ^o 13.3	381 ^o								

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D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Sa 1	269°06.6	284°06.3	299°06.0	314°05.7	329°05.4	344°05.1	359°04.8	14°04.5	29°04.2	44°03.9	59°03.6	74°03.3	-0.3
	-22°58.0	-22°57.8	-22°57.6	-22°57.3	-22°57.1	-22°56.9	-22°56.7	-22°56.5	-22°56.3	-22°56.0	-22°55.8	-22°55.6	+0.2
Su 2	268°59.5	283°59.3	298°59.0	313°58.7	328°58.4	343°58.1	358°57.8	13°57.5	28°57.2	43°56.9	58°56.6	73°56.3	-0.3
	-22°52.7	-22°52.4	-22°52.2	-22°52.0	-22°51.7	-22°51.5	-22°51.3	-22°51.0	-22°50.8	-22°50.5	-22°50.3	-22°50.1	+0.2
Mo 3	268°52.6	283°52.3	298°52.0	313°51.7	328°51.4	343°51.2	358°50.9	13°50.6	28°50.3	43°50.0	58°49.7	73°49.4	-0.3
	-22°46.9	-22°46.6	-22°46.4	-22°46.1	-22°45.9	-22°45.6	-22°45.4	-22°45.1	-22°44.8	-22°44.6	-22°44.3	-22°44.1	+0.3
Tu 4	268°45.7	283°45.5	298°45.2	313°44.9	328°44.6	343°44.3	358°44.1	13°43.8	28°43.5	43°43.2	58°42.9	73°42.6	-0.3
	-22°40.6	-22°40.4	-22°40.1	-22°39.8	-22°39.6	-22°39.3	-22°39.0	-22°38.7	-22°38.5	-22°38.2	-22°37.9	-22°37.6	+0.3
We 5	268°39.0	283°38.7	298°38.5	313°38.2	328°37.9	343°37.6	358°37.3	13°37.1	28°36.8	43°36.5	58°36.2	73°36.0	-0.3
	-22°34.0	-22°33.7	-22°33.4	-22°33.1	-22°32.8	-22°32.5	-22°32.2	-22°31.9	-22°31.6	-22°31.3	-22°31.0	-22°30.7	+0.3
Th 6	268°32.4	283°32.1	298°31.8	313°31.6	328°31.3	343°31.0	358°30.7	13°30.5	28°30.2	43°29.9	58°29.7	73°29.4	-0.3
	-22°26.8	-22°26.5	-22°26.2	-22°25.9	-22°25.6	-22°25.3	-22°25.0	-22°24.7	-22°24.3	-22°24.0	-22°23.7	-22°23.4	+0.3
Fr 7	268°25.9	283°25.6	298°25.3	313°25.1	328°24.8	343°24.5	358°24.3	13°24.0	28°23.7	43°23.5	58°23.2	73°22.9	-0.3
	-22°19.2	-22°18.9	-22°18.6	-22°18.3	-22°17.9	-22°17.6	-22°17.3	-22°17.0	-22°16.6	-22°16.3	-22°16.0	-22°15.6	+0.3
Sa 8	268°19.5	283°19.2	298°19.0	313°18.7	328°18.5	343°18.2	358°17.9	13°17.7	28°17.4	43°17.2	58°16.9	73°16.6	-0.3
	-22°13.2	-22°10.9	-22°10.5	-22°10.2	-22°09.9	-22°09.5	-22°09.2	-22°08.8	-22°08.5	-22°08.1	-22°07.8	-22°07.4	+0.3
Su 9	268°13.2	283°13.0	298°12.8	313°12.5	328°12.3	343°12.0	358°11.7	13°11.5	28°11.2	43°11.0	58°10.7	73°10.5	-0.3
	-22°02.8	-22°02.4	-22°02.1	-22°01.7	-22°01.3	-22°01.0	-22°00.6	-22°00.2	-21°59.9	-21°59.5	-21°59.1	-21°58.8	+0.3
Mo 10	268°07.2	283°06.9	298°06.7	313°06.4	328°06.2	343°05.9	358°05.7	13°05.4	28°05.2	43°04.9	58°04.7	73°04.4	-0.2
	-21°53.9	-21°53.5	-21°53.2	-21°52.8	-21°52.4	-21°52.0	-21°51.6	-21°51.2	-21°50.9	-21°50.5	-21°50.1	-21°49.7	+0.4
Tu 11	268°01.2	283°01.0	298°00.8	313°00.5	328°00.3	343°00.0	357°59.8	12°59.5	27°59.3	42°59.1	57°58.8	72°58.6	-0.2
	-21°44.6	-21°44.2	-21°43.8	-21°43.4	-21°43.0	-21°42.6	-21°42.2	-21°41.8	-21°41.4	-21°41.0	-21°40.6	-21°40.2	+0.4
We 12	267°55.5	282°55.2	297°55.0	312°54.7	327°54.5	342°54.3	357°54.0	12°53.8	27°53.6	42°53.3	57°53.1	72°52.8	-0.2
	-21°34.9	-21°34.5	-21°34.1	-21°33.6	-21°33.2	-21°32.8	-21°32.4	-21°32.0	-21°31.6	-21°31.2	-21°30.7	-21°30.3	-0.2
Th 13	267°49.8	282°49.6	297°49.4	312°49.1	327°48.9	342°48.7	357°48.4	12°48.2	27°48.0	42°47.7	57°47.5	72°47.3	-0.2
	-21°24.7	-21°24.3	-21°23.9	-21°23.4	-21°23.0	-21°22.6	-21°22.1	-21°21.7	-21°21.3	-21°20.8	-21°20.4	-21°20.0	+0.4
Fr 14	267°44.3	282°44.1	297°43.9	312°43.7	327°43.4	342°43.2	357°43.0	12°42.8	27°42.6	42°42.3	57°42.1	72°41.9	-0.2
	-21°14.2	-21°13.7	-21°13.3	-21°12.8	-21°12.4	-21°11.9	-21°11.5	-21°11.0	-21°10.6	-21°10.1	-21°09.7	-21°09.2	+0.5
Sa 15	267°39.0	282°38.8	297°38.6	312°38.4	327°38.2	342°38.0	357°37.7	12°37.5	27°37.3	42°37.1	57°36.9	72°36.7	-0.2
	-21°03.2	-21°02.8	-21°02.3	-21°01.8	-21°01.4	-21°00.9	-21°00.4	-21°00.0	-20°59.5	-20°59.0	-20°58.5	-20°58.1	+0.5
Su 16	267°33.9	282°33.7	297°33.5	312°33.3	327°33.1	342°32.8	357°32.6	12°32.4	27°32.2	42°32.0	57°31.8	72°31.6	-0.2
	-20°51.9	-20°51.4	-20°50.9	-20°50.4	-20°49.9	-20°49.4	-20°49.0	-20°48.5	-20°48.0	-20°47.5	-20°47.0	-20°46.5	+0.5
Mo 17	267°28.9	282°28.7	297°28.5	312°28.3	327°28.1	342°27.9	357°27.7	12°27.5	27°27.3	42°27.1	57°26.9	72°26.7	-0.2
	-20°40.1	-20°39.6	-20°39.1	-20°38.6	-20°38.1	-20°37.6	-20°37.1	-20°36.6	-20°36.1	-20°35.6	-20°35.1	-20°34.6	+0.5
Tu 18	267°24.1	282°23.9	297°23.8	312°23.6	327°23.4	342°23.2	357°23.0	12°22.8	27°22.6	42°22.4	57°22.2	72°22.0	-0.2
	-20°27.9	-20°27.4	-20°26.9	-20°26.4	-20°25.9	-20°25.4	-20°24.8	-20°24.3	-20°23.8	-20°23.3	-20°22.8	-20°22.2	+0.5
We 19	267°19.5	282°19.3	297°19.2	312°19.0	327°18.8	342°18.6	357°18.4	12°18.2	27°18.0	42°17.8	57°17.7	72°17.5	-0.2
	-20°15.4	-20°14.9	-20°14.3	-20°13.8	-20°13.3	-20°12.7	-20°12.2	-20°11.7	-20°11.1	-20°10.6	-20°10.1	-20°09.5	+0.5
Th 20	267°15.1	282°14.9	297°14.7	312°14.6	327°14.4	342°14.2	357°14.0	12°13.8	27°13.7	42°13.5	57°13.3	72°13.1	-0.2
	-20°02.5	-20°01.9	-20°01.4	-20°00.8	-20°00.3	-19°59.7	-19°59.2	-19°58.6	-19°58.1	-19°57.5	-19°57.0	-19°56.4	+0.6
Fr 21	267°10.9	282°10.7	297°10.5	312°10.3	327°10.2	342°10.0	357°09.8	12°09.6	27°09.5	42°09.3	57°09.1	72°09.0	-0.2
	-19°49.2	-19°48.6	-19°48.1	-19°47.5	-19°46.9	-19°46.4	-19°45.8	-19°45.2	-19°44.7	-19°44.1	-19°43.5	-19°43.0	+0.6
Sa 22	267°06.8	282°06.6	297°06.5	312°06.3	327°06.1	342°06.0	357°05.8	12°05.6	27°05.5	42°05.3	57°05.2	72°05.0	-0.2
	-19°35.5	-19°34.9	-19°34.3	-19°33.8	-19°33.2	-19°32.6	-19°32.0	-19°31.4	-19°30.9	-19°30.3	-19°29.7	-19°29.1	+0.6
Su 23	267°02.9	282°02.8	297°02.6	312°02.5	327°02.3	342°02.1	357°02.0	12°01.8	27°01.7	42°01.5	57°01.4	72°01.2	-0.2
	-19°07.1	-19°06.5	-19°05.9	-19°05.3	-19°04.6	-19°04.0	-19°03.4	-19°02.8	-19°02.2	-19°01.6	-19°01.0	-19°00.4	+0.6
Mo 24	266°59.2	281°59.1	296°58.9	311°58.8	326°58.6	341°58.5	356°58.4	11°58.2	26°58.1	41°57.9	56°57.8	71°57.6	-0.1
	-18°52.3	-18°51.7	-18°51.1	-18°50.5	-18°49.8	-18°49.2	-18°48.6	-18°48.0	-18°47.3	-18°46.7	-18°46.1	-18°45.5	+0.6
Tu 25	266°52.5	281°52.3	296°52.2	311°52.1	326°51.9	341°51.8	356°51.7	11°51.5	26°51.4	41°51.3	56°51.1	71°51.0	-0.1
	-18°37.2	-18°36.6	-18°36.0	-18°35.3	-18°34.7	-18°34.0	-18°33.4	-18°32.8	-18°32.1	-18°31.5	-18°30.8	-18°30.2	+0.6
Th 27	266°49.4	281°49.2	296°49.1	311°49.0	326°48.9	341°48.7	356°48.6	11°48.5	26°48.4	41°48.3	56°48.1	71°48.0	-0.1
	-18°21.8	-18°21.2	-18°20.5	-18°19.9	-18°19.2	-18°18.5	-18°17.9	-18°17.2	-18°16.6	-18°15.9	-18°15.3	-18°14.6	+0.7
Fr 28	266°46.5	281°46.3	296°46.2	311°46.1	326°46.0	341°45.9	356°45.8	11°45.7	26°45.5	41°45.4	56°45.3	71°45.2	-0.1
	-18°06.0	-18°05.4	-18°04.7	-18°04.0	-18°03.4	-18°02.7	-18°02.0	-18°01.4	-18°00.7	-18°00.0	-17°59.4	-17°58.7	+0.7
Sa 29	266°43.8	281°43.7	296°43.5	311°43.4	326°43.3	341°43.2	356°43.1	11°43.0	26°42.9	41°42.8	56°42.7	71°42.6	-0.1
	-17°49.9	-17°49.3	-17°48.6	-17°47.9	-17°47.2	-17°46.6	-17°45.9	-17°45.2	-17°44.5	-17°43.8	-17°43.2	-17°42.5	+0.7
Su 30	266°41.3	281°41.2	296°41.1	311°41.0	326°40.9	341°40.8	356°40.7	11°40.6	26°40.5	41°40.4	56°40.3	71°40.2	-0.1
	-17°33.5	-17°32.9	-17°32.2	-17°31.5	-17°30.8	-17°30.1	-17°29.4	-17°28.7	-17°28.0	-17°27.3	-17°26.6	-17°25.9	+0.7
Mo 31	266°39.0	281°38.9	296°38.8	311°38.7	326°38.6	341°38.5	356°38.4	11°38.3	26°38.2	41°38.2	56°38.1	71°38.0	-0.1
	-17°16.8	-17°16.1	-17°15.4	-17°14.7	-17°14.0	-17°13.3	-17°12.6	-17°11.9	-17°11.2	-17°10.5	-17°09.8	-17°09.1	+0.7

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 16.3'

MOON

January 2033

	D	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	Δ' /h SH
●	Sa 1	243°09.5 -18°30.1	267°34.8 -18°27.0	272°00.0 -18°23.8	286°25.3 -18°20.5	300°50.5 -18°17.0	315°15.8 -18°13.5	329°41.0 -18°09.8	344°06.2 -18°06.0	358°31.4 -18°02.0	12°56.7 -17°58.0	27°21.9 -17°53.8	+25.2 16.1 +3.6 59.1
	Su 2	243°41.1 -16°36.9	258°06.4 -16°30.8	272°31.8 -16°24.7	286°57.3 -16°18.4	301°22.7 -16°12.0	315°48.2 -15°58.9	330°13.6 -15°55.9	344°39.2 -15°52.2	359°04.7 -15°48.5	13°30.2 -15°38.5	27°55.8 -15°31.5	+25.5 16.3 +6.5 59.6
	Mo 3	244°23.1 -13°34.0	258°49.2 -13°25.5	273°15.3 -13°16.8	287°41.5 -13°08.0	302°07.7 -12°59.2	316°33.9 -12°50.2	331°00.2 -12°41.2	345°26.5 -12°32.1	359°52.8 -12°23.0	14°19.2 -12°13.7	28°45.6 -12°04.4	+26.2 16.3 +9.0 59.9
●	Tu 4	245°26.6 -9°35.7	259°53.7 -9°25.3	274°20.8 -9°14.8	288°47.9 -9°04.3	303°15.1 -8°53.7	317°42.3 -8°43.0	332°09.5 -8°32.3	346°36.8 -8°21.6	1°04.1 -8°10.8	15°31.5 -7°59.9	29°58.9 -7°49.0	+27.2 16.3 +10.7 59.9
	We 5	246°54.2 -5°00.8	261°22.1 -4°49.3	275°50.1 -4°37.8	290°18.2 -4°26.3	304°46.2 -4°14.8	319°14.3 -4°03.2	333°42.4 -3°51.6	348°10.5 -3°40.0	2°38.7 -3°28.4	17°06.9 -3°16.8	31°35.1 -3°05.2	+28.1 16.3 +11.6 59.6
	Th 6	248°41.5 -0°09.6	263°10.1 0°02.1	277°38.7 0°13.8	292°07.3 0°25.5	306°36.0 0°37.1	321°04.6 0°48.8	335°33.3 1°00.5	350°02.0 1°12.1	4°30.7 1°23.8	18°59.4 1°35.4	33°28.1 1°47.0	+28.7 16.2 +11.7 59.5
●	Fr 7	250°40.3 4°38.3	265°09.1 4°49.5	279°38.0 5°00.7	294°06.9 5°11.8	308°35.7 5°22.9	323°04.6 5°33.9	337°33.4 5°45.0	352°02.3 5°55.9	6°31.2 6°06.9	21°00.0 6°17.7	35°28.9 6°28.6	+28.9 16.1 +11.0 59.1
	Sa 8	252°41.3 9°05.5	267°10.1 9°15.5	281°38.8 9°25.4	296°07.6 9°35.4	310°36.3 9°45.2	325°05.0 9°55.0	339°33.3 10°04.7	354°02.5 10°14.4	8°31.2 10°24.0	22°59.9 10°33.5	37°28.5 10°43.0	+28.7 16.0 +9.8 58.6
	Su 9	254°37.0 12°56.4	269°05.4 13°04.7	283°33.9 13°12.9	298°02.3 13°21.1	312°30.7 13°29.1	326°59.1 13°37.1	341°27.5 13°45.0	355°55.8 13°52.8	10°24.1 14°00.5	24°52.6 14°08.1	39°20.8 14°15.7	+28.4 15.8 +7.9 58.1
●	Mo 10	256°23.6 15°58.4	270°51.7 16°04.5	285°19.8 16°10.5	299°47.9 16°16.4	314°15.9 16°22.2	328°43.9 16°27.9	343°11.9 16°33.6	357°40.0 16°39.9	12°08.0 16°44.5	26°35.9 16°49.8	41°03.9 16°55.1	+28.0 15.7 +5.7 57.5
	Tu 11	258°02.8 18°01.4	272°30.6 18°05.0	286°58.5 18°08.5	301°26.4 18°11.9	315°54.3 18°15.2	330°22.2 18°18.4	344°50.1 18°21.4	359°18.0 18°25.3	13°45.8 18°27.9	28°13.7 18°30.0	42°41.6 18°32.7	+27.9 15.5 +3.1 57.0
	We 12	259°41.0 18°59.7	274°09.1 19°00.6	288°37.2 19°01.5	303°05.2 19°02.2	317°33.3 19°02.8	332°01.5 19°03.4	346°29.6 19°03.8	360°57.8 19°04.1	15°25.9 19°04.3	29°54.1 19°04.4	44°22.4 19°04.4	+28.1 15.4 +0.5 56.5
●	Th 13	261°28.7 18°51.9	275°57.4 18°50.3	290°26.1 18°48.5	304°54.8 18°46.7	319°23.8 18°44.7	333°52.4 18°42.7	348°21.2 18°40.6	362°50.1 18°38.3	17°19.0 18°36.0	31°47.9 18°33.5	46°16.9 18°31.0	+28.8 15.3 -2.1 56.0
	Fr 14	263°36.5 17°41.8	278°06.1 17°37.8	292°35.8 17°33.7	307°05.6 17°29.5	321°45.3 17°25.3	336°05.2 17°20.9	350°35.1 17°16.5	365°05.0 17°12.0	19°35.0 17°07.4	34°05.0 17°02.7	48°35.1 16°57.9	+29.9 15.1 -4.4 55.5
	Sa 15	266°12.2 15°37.1	280°43.0 15°31.1	295°14.0 15°25.0	309°44.9 15°18.9	324°16.4 15°12.7	338°47.0 15°06.4	353°18.2 15°00.1	367°49.0 14°53.7	22°20.6 14°47.2	36°51.6 14°40.7	51°23.2 14°34.1	+31.1 15.0 -6.3 55.1
●	Su 16	269°19.1 12°47.9	283°51.3 12°40.4	298°23.4 12°32.8	312°55.7 12°25.2	327°07.7 12°17.5	342°00.2 12°09.8	356°32.6 12°02.0	371°05.0 11°54.1	25°37.7 11°46.3	40°10.0 11°38.3	54°42.5 11°30.4	+32.3 14.9 -7.8 54.7
	Mo 17	272°55.9 9°25.6	287°29.1 9°17.0	302°02.4 9°08.4	316°35.7 8°59.7	331°09.0 8°50.9	345°42.4 8°42.2	360°15.8 8°33.4	374°40.0 8°24.6	29°22.7 8°15.7	43°56.2 8°06.8	58°29.8 7°57.9	+33.4 14.8 -8.8 54.4
	Tu 18	276°56.9 5°41.1	291°30.9 5°31.8	306°05.0 5°22.5	320°39.1 5°13.2	335°13.3 5°03.8	349°47.3 4°54.5	364°21.4 4°45.1	378°55.6 4°35.7	33°29.8 4°26.2	48°04.0 4°16.8	62°38.3 4°07.4	+34.1 14.8 -9.4 54.1
●	We 19	281°13.8 144.4	295°48.3 1°34.8	310°22.7 1°25.2	324°57.2 1°15.6	339°31.7 1°06.0	354°06.2 0°56.4	368°40.7 0°46.8	382°15.2 0°37.2	37°49.8 0°27.6	52°24.3 0°18.0	66°58.8 0°08.3	+34.5 14.7 -9.6 54.0
	Th 20	285°36.6 -2°15.5	300°11.0 -2°25.0	314°45.5 -2°34.5	329°20.0 -2°44.1	343°54.4 -2°53.6	358°28.9 -3°03.1	373°03.3 -3°12.6	387°37.7 -3°22.0	42°12.1 -3°31.5	56°46.5 -3°41.0	71°20.9 -3°50.4	+34.4 14.8 -9.5 54.1
	Fr 21	300°11.0 -2°25.0	314°45.5 -2°34.5	329°20.0 -2°44.1	343°54.4 -2°53.6	358°28.9 -3°03.1	373°03.3 -3°12.6	387°37.7 -3°22.0	42°12.1 -3°31.5	56°46.5 -3°41.0	71°20.9 -3°50.4	85°55.2 -3°59.8	+34.4 14.8 -9.5 54.1
●	Sa 22	304°28.2 -16°19.2	319°02.2 -16°28.3	333°36.2 -16°37.4	348°10.2 -16°46.5	362°44.1 -16°55.5	377°18.0 -17°04.6	391°51.9 -17°13.6	406°25.7 -17°22.6	60°59.5 -17°31.5	75°33.2 -17°40.5	90°07.0 -17°49.4	+33.9 14.8 -9.0 54.3
	Su 23	308°28.4 -9°59.2	323°01.5 -10°07.5	337°34.6 -10°15.9	352°07.6 -10°24.2	366°40.6 -10°32.0	381°13.5 -10°40.7	395°46.3 -10°48.9	410°19.2 -10°57.0	64°51.9 -11°05.1	79°24.6 -11°13.2	93°57.3 -11°21.2	+32.9 14.9 -8.2 54.8
	Mo 24	312°00.8 -13°15.8	326°32.6 -13°23.0	341°04.3 -13°30.2	355°36.0 -13°37.3	370°07.6 -13°44.4	384°39.1 -13°51.4	399°10.6 -13°58.3	413°42.0 -14°05.2	68°13.3 -14°12.1	82°44.6 -14°18.8	97°15.8 -14°25.6	+31.5 15.1 -7.0 55.4
●	Tu 25	314°56.2 -15°58.4	329°26.3 -16°04.1	343°56.4 -16°09.6	358°26.4 -16°15.1	372°56.4 -16°20.5	387°26.2 -16°25.9	401°56.0 -16°31.1	416°25.8 -16°36.1	70°55.4 -16°41.4	85°25.0 -16°46.4	99°54.5 -16°51.4	+29.8 15.3 -5.3 56.1
	We 26	317°08.8 -17°55.2	331°37.2 -17°58.8	346°05.6 -18°02.2	360°33.8 -18°05.6	375°02.0 -18°12.0	389°30.1 -18°18.5	403°58.2 -18°25.1	418°26.2 -18°31.8	72°54.1 -18°38.0	87°21.9 -18°45.2	101°49.7 -18°52.3	+28.1 15.5 -3.1 57.0
	Th 27	318°38.7 -18°53.7	333°05.5 -18°54.7	347°32.2 -18°55.5	361°58.9 -18°56.2	376°25.5 -18°56.9	390°52.1 -18°57.4	405°18.6 -18°58.8	419°45.0 -18°59.0	74°11.4 -18°58.2	88°37.8 -18°58.2	103°04.1 -18°58.2	+26.5 15.8 -0.4 58.0
●	Fr 28	319°33.0 -18°42.8	333°58.6 -18°42.8	348°24.2 -18°38.7	362°49.7 -18°36.5	377°15.2 -18°34.1	391°40.7 -18°31.7	406°06.1 -18°29.0	420°13.6 -18°26.3	74°56.9 -18°23.5	89°22.3 -18°20.5	103°47.4 -18°17.4	+25.5 16.1 +2.5 58.9
	Sa 29	320°05.3 -17°16.2	334°30.4 -17°16.2	348°55.4 -17°16.0	363°20.5 -17°00.7	377°45.5 -16°55.5	391°10.6 -16°49.8	405°35.6 -16°44.1	419°00.6 -16°38.4	75°25.7 -16°32.5	89°50.7 -16°26.5	104°15.8 -16°20.4	+25.0 16.3 +5.6 59.7
	Su 30	320°32.1 -14°35.1	334°57.3 -14°27.2	349°22.5 -14°19.3	363°47.7 -14°11.2	378°13.0 -14°03.0	392°38.2 -13°54.7	407°03.5 -13°46.3	421°28.8 -13°37.8	75°54.1 -13°29.2	90°19.4 -13°20.6	104°44.8 -13°11.8	+25.3 16.2 +8.3 60.4
●	Mo 31	321°07.9 -10°49.6	335°33.7 -10°39.4	349°59.5 -10°29.2	364°25.3 -10°18.9	378°51.1 -10°08.6	393°17.0 -9°58.2	407°42.9 -9°47.7	421°08.9 -9°37.1	76°34.8 -9°26.5	91°00.8 -9°15.8	105°26.8 -9°05.1	+25.9 16.6 +10.5 60.8

Row 1: GHA, Δ' /h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (— = South), Δ' /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 1 10h17 — FQ: 8 03h34 — FM: 15 13h07 — LQ: 23 17h45 — NM: 30 21h59

SUN

February 2033

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Tu 1	266°36.9 -16°59.8	281°36.8 -16°59.1	296°36.7 -16°58.4	311°36.6 -16°57.6	326°36.6 -16°56.9	341°36.5 -16°56.2	356°36.4 -16°55.5	11°36.3 -16°54.8	26°36.2 -16°54.1	41°36.1 -16°53.3	56°36.1 -16°52.6	71°36.0 -16°51.9	-0.1 +0.7
We 2	266°35.0 -16°42.5	281°34.9 -16°41.7	296°34.8 -16°41.0	311°34.8 -16°40.3	326°34.7 -16°39.6	341°34.6 -16°38.8	356°34.6 -16°38.1	11°34.5 -16°37.4	26°34.4 -16°36.6	41°34.3 -16°35.9	56°34.3 -16°35.2	71°34.2 -16°34.4	-0.1 +0.7
Th 3	266°33.3 -16°24.9	281°33.3 -16°24.1	296°33.2 -16°23.4	311°33.1 -16°22.6	326°33.1 -16°21.9	341°33.0 -16°21.2	356°32.9 -16°20.4	11°32.9 -16°19.7	26°32.8 -16°18.9	41°32.7 -16°18.2	56°32.7 -16°17.4	71°32.6 -16°16.7	-0.1 +0.7
Fr 4	266°31.8 -16°07.0	281°31.8 -16°06.2	296°31.7 -16°05.5	311°31.7 -16°04.7	326°31.6 -16°03.9	341°31.6 -16°03.2	356°31.5 -16°02.4	11°31.5 -16°01.7	26°31.4 -16°00.9	41°31.3 -16°00.2	56°31.3 -15°59.4	71°31.2 -15°58.7	-0.1 +0.8
Sa 5	266°30.6 -15°48.8	281°30.5 -15°48.0	296°30.5 -15°47.3	311°30.4 -15°46.5	326°30.4 -15°45.7	341°30.3 -15°45.0	356°30.3 -15°44.2	11°30.3 -15°43.4	26°30.2 -15°42.7	41°30.2 -15°41.9	56°30.1 -15°41.1	71°30.1 -15°40.4	-0.0 +0.8
Su 6	266°29.5 -15°30.3	281°29.5 -15°29.6	296°29.4 -15°28.8	311°29.4 -15°27.2	326°29.4 -15°27.2	341°29.3 -15°26.5	356°29.3 -15°25.7	11°29.3 -15°24.9	26°29.2 -15°24.1	41°29.2 -15°23.4	56°29.1 -15°22.6	71°29.1 -15°21.8	-0.0 +0.8
Mo 7	266°28.7 -15°11.6	281°28.6 -15°10.8	296°28.6 -15°10.1	311°28.6 -15°09.3	326°28.5 -15°08.5	341°28.5 -15°07.7	356°28.5 -15°06.9	11°28.5 -15°06.1	26°28.4 -15°05.3	41°28.4 -15°04.5	56°28.4 -14°55.4	71°28.3 -14°54.7	-0.0 +0.8
Tu 8	266°28.0 -14°52.7	281°28.0 -14°51.9	296°28.0 -14°51.1	311°28.0 -14°50.3	326°27.9 -14°49.5	341°27.9 -14°48.7	356°27.9 -14°47.9	11°27.9 -14°47.1	26°27.8 -14°46.3	41°27.8 -14°45.5	56°27.8 -14°44.7	71°27.8 -14°43.9	-0.0 +0.8
We 9	266°27.6 -14°33.4	281°27.6 -14°32.6	296°27.5 -14°31.8	311°27.5 -14°31.0	326°27.5 -14°30.2	341°27.5 -14°29.4	356°27.5 -14°28.6	11°27.5 -14°27.8	26°27.5 -14°27.0	41°27.5 -14°26.2	56°27.5 -14°25.4	71°27.4 -14°24.6	-0.0 +0.8
Th 10	266°27.3 -14°14.0	281°27.3 -14°13.2	296°27.3 -14°12.4	311°27.3 -14°11.5	326°27.3 -14°10.7	341°27.3 -14°09.9	356°27.3 -14°09.1	11°27.3 -14°08.3	26°27.3 -14°07.5	41°27.3 -14°06.8	56°27.3 -14°05.8	71°27.3 -14°05.0	-0.0 +0.8
Fr 11	266°27.3 -13°54.8	281°27.3 -13°53.5	296°27.3 -13°52.6	311°27.3 -13°51.8	326°27.3 -13°51.0	341°27.3 -13°50.2	356°27.3 -13°49.3	11°27.3 -13°48.5	26°27.3 -13°47.7	41°27.3 -13°46.9	56°27.3 -13°46.0	71°27.3 -13°45.2	-0.0 +0.8
Sa 12	266°27.4 -13°34.4	281°27.4 -13°33.5	296°27.4 -13°32.7	311°27.4 -13°31.9	326°27.5 -13°31.0	341°27.5 -13°30.2	356°27.5 -13°29.4	11°27.5 -13°28.6	26°27.5 -13°27.7	41°27.5 -13°26.9	56°27.5 -13°26.0	71°27.5 -13°25.2	+0.0 +0.8
Su 13	266°27.7 -13°14.2	281°27.8 -13°13.4	296°27.8 -13°12.5	311°27.8 -13°11.7	326°27.8 -13°10.9	341°27.8 -13°10.0	356°27.9 -13°09.2	11°27.9 -13°08.3	26°27.9 -13°07.5	41°27.9 -13°06.6	56°27.9 -13°05.8	71°28.0 -13°04.9	+0.0 +0.8
Mo 14	266°28.3 -12°53.9	281°28.3 -12°53.0	296°28.3 -12°52.2	311°28.3 -12°51.3	326°28.4 -12°50.5	341°28.4 -12°49.6	356°28.4 -12°48.7	11°28.4 -12°47.9	26°28.4 -12°47.0	41°28.5 -12°46.2	56°28.5 -12°45.3	71°28.6 -12°44.5	+0.0 +0.9
Tu 15	266°29.0 -12°33.3	281°29.0 -12°32.4	296°29.0 -12°31.6	311°29.1 -12°30.7	326°29.1 -12°29.9	341°29.1 -12°29.0	356°29.2 -12°28.1	11°29.2 -12°27.3	26°29.2 -12°26.4	41°29.3 -12°25.5	56°29.3 -12°24.7	71°29.3 -12°23.8	+0.0 +0.9
We 16	266°29.8 -12°12.5	281°29.9 -12°11.7	296°29.9 -12°10.9	311°30.0 -12°09.9	326°30.0 -12°09.0	341°30.0 -12°08.2	356°30.1 -12°07.3	11°30.1 -12°06.4	26°30.2 -12°05.6	41°30.2 -12°04.7	56°30.3 -12°03.8	71°30.3 -12°02.9	+0.0 +0.9
Th 17	266°30.9 -11°51.6	281°30.9 -11°50.7	296°31.0 -11°49.8	311°31.0 -11°48.9	326°31.1 -11°48.0	341°31.1 -11°47.2	356°31.2 -11°46.3	11°31.2 -11°45.4	26°31.2 -11°44.5	41°31.3 -11°43.7	56°31.3 -11°42.8	71°31.4 -11°41.9	+0.0 +0.9
Fr 18	266°32.1 -11°30.4	281°32.2 -11°29.5	296°32.2 -11°28.6	311°32.3 -11°27.7	326°32.3 -11°26.9	341°32.4 -11°26.0	356°32.4 -11°25.1	11°32.5 -11°24.2	26°32.6 -11°23.3	41°32.6 -11°22.4	56°32.7 -11°21.5	71°32.7 -11°20.6	+0.1 +0.9
Sa 19	266°33.5 -11°09.1	281°33.6 -11°08.2	296°33.6 -11°07.3	311°33.7 -11°06.4	326°33.8 -11°05.5	341°33.8 -11°04.6	356°33.9 -11°03.7	11°33.9 -11°02.8	26°34.0 -11°01.9	41°34.1 -11°01.0	56°34.1 -11°00.1	71°34.2 -10°59.2	+0.1 +0.9
Su 20	266°35.1 -10°47.6	281°35.1 -10°46.7	296°35.2 -10°45.8	311°35.3 -10°44.9	326°35.3 -10°44.0	341°35.4 -10°43.0	356°35.5 -10°42.1	11°35.5 -10°41.2	26°35.6 -10°40.3	41°35.7 -10°39.4	56°35.8 -10°38.5	71°35.8 -10°37.6	+0.1 +0.9
Mo 21	266°36.8 -10°25.9	281°36.8 -10°25.0	296°36.9 -10°24.1	311°37.0 -10°23.1	326°37.1 -10°22.2	341°37.1 -10°21.3	356°37.2 -10°20.4	11°37.3 -10°19.5	26°37.4 -10°18.6	41°37.5 -10°17.7	56°37.5 -10°16.8	71°37.6 -10°15.9	+0.1 +0.9
Tu 22	266°38.6 -10°04.0	281°38.7 -10°03.1	296°38.8 -10°02.2	311°38.9 -10°01.3	326°39.0 -10°00.4	341°39.0 -9°59.5	356°39.1 -9°58.5	11°39.2 -9°57.6	26°39.3 -9°56.7	41°39.4 -9°55.8	56°39.5 -9°54.9	71°39.5 -9°54.0	+0.1 +0.9
We 23	266°40.7 -9°42.0	281°40.7 -9°41.1	296°40.8 -9°40.2	311°40.9 -9°39.3	326°41.0 -9°38.4	341°41.1 -9°37.4	356°41.2 -9°36.5	11°41.3 -9°35.6	26°41.4 -9°34.7	41°41.5 -9°33.7	56°41.5 -9°32.8	71°41.6 -9°31.9	+0.1 +0.9
Th 24	266°42.8 -9°19.9	281°42.9 -9°19.8	296°43.0 -9°18.0	311°43.1 -9°17.1	326°43.2 -9°16.2	341°43.3 -9°15.2	356°43.4 -9°14.3	11°43.5 -9°13.4	26°43.6 -9°12.5	41°43.7 -9°11.5	56°43.8 -9°10.6	71°43.9 -9°09.7	+0.1 +0.9
Fr 25	266°45.1 -8°57.6	281°45.2 -8°56.6	296°45.3 -8°55.7	311°45.4 -8°54.8	326°45.5 -8°53.9	341°45.6 -8°52.9	356°45.7 -8°52.0	11°45.8 -8°51.1	26°45.9 -8°50.1	41°46.0 -8°49.2	56°46.1 -8°48.3	71°46.2 -8°47.3	+0.1 +0.9
Sa 26	266°47.6 -8°35.2	281°47.7 -8°34.2	296°47.8 -8°33.3	311°47.9 -8°32.3	326°48.0 -8°31.4	341°48.1 -8°30.5	356°48.2 -8°29.5	11°48.3 -8°28.6	26°48.4 -8°27.6	41°48.5 -8°26.7	56°48.6 -8°25.8	71°48.7 -8°24.8	+0.1 +0.9
Su 27	266°50.2 -8°12.6	281°50.3 -8°11.7	296°50.4 -8°10.7	311°50.5 -8°09.8	326°50.6 -8°08.8	341°50.7 -8°07.9	356°50.8 -8°06.9	11°50.9 -8°06.0	26°51.0 -8°05.1	41°51.2 -8°04.1	56°51.3 -8°03.2	71°51.4 -8°02.2	+0.1 +0.9
Mo 28	266°52.9 -7°49.9	281°53.0 -7°49.0	296°53.1 -7°48.0	311°53.2 -7°47.1	326°53.3 -7°46.1	341°53.5 -7°45.2	356°53.6 -7°44.2	11°53.7 -7°43.3	26°53.8 -7°42.3	41°53.9 -7°41.4	56°54.0 -7°40.4	71°54.2 -7°39.5	+0.1 +0.9

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

February 2033

	D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	Δ'/h SH
C	Tu 1	249 ⁰ 48.8 -7 ⁰ 14.4	264 ⁰ 15.2 -7 ⁰ 03.1	278 ⁰ 41.5 -6 ⁰ 51.7	293 ⁰ 08.0 -6 ⁰ 40.2	307 ⁰ 34.4 -6 ⁰ 28.8	322 ⁰ 00.9 -6 ⁰ 17.2	336 ⁰ 27.4 -6 ⁰ 05.7	350 ⁰ 54.0 -5 ⁰ 54.1	5 ⁰ 20.6 -5 ⁰ 42.5	19 ⁰ 47.2 -5 ⁰ 30.8	34 ⁰ 13.8 -5 ⁰ 19.1	+26.5 16.6 +11.5 60.8
	We 2	250 ⁰ 56.8 -2 ⁰ 20.6	265 ⁰ 23.9 -2 ⁰ 08.6	279 ⁰ 51.0 -1 ⁰ 56.6	294 ⁰ 18.1 -1 ⁰ 44.5	308 ⁰ 45.2 -1 ⁰ 32.5	323 ⁰ 12.4 -1 ⁰ 20.4	337 ⁰ 39.6 -1 ⁰ 08.4	352 ⁰ 06.9 -0 ⁰ 56.3	6 ⁰ 34.1 -0 ⁰ 44.3	21 ⁰ 01.4 -0 ⁰ 32.2	35 ⁰ 28.7 -0 ⁰ 20.2	+27.2 16.5 +12.1 60.6
	Th 3	252 ⁰ 20.5 2 ⁰ 39.1	266 ⁰ 48.1 2 ⁰ 50.9	281 ⁰ 15.7 3 ⁰ 02.6	295 ⁰ 43.3 3 ⁰ 14.4	310 ⁰ 11.0 3 ⁰ 26.1	324 ⁰ 38.6 3 ⁰ 37.8	339 ⁰ 06.3 3 ⁰ 49.4	353 ⁰ 34.0 4 ⁰ 01.0	8 ⁰ 01.7 4 ⁰ 12.6	22 ⁰ 29.4 4 ⁰ 24.1	36 ⁰ 57.1 4 ⁰ 35.6	+27.7 16.4 +11.7 60.2
	Fr 4	253 ⁰ 54.1 7 ⁰ 23.0	268 ⁰ 21.9 7 ⁰ 33.7	282 ⁰ 49.8 7 ⁰ 44.4	297 ⁰ 17.7 7 ⁰ 55.0	311 ⁰ 45.6 8 ⁰ 05.6	326 ⁰ 13.4 8 ⁰ 16.2	340 ⁰ 41.3 8 ⁰ 26.6	355 ⁰ 09.2 8 ⁰ 37.0	9 ⁰ 37.1 8 ⁰ 47.4	24 ⁰ 05.0 8 ⁰ 57.6	38 ⁰ 32.9 9 ⁰ 07.8	+27.9 16.2 +10.5 59.5
	Sa 5	255 ⁰ 31.6 11 ⁰ 32.7	269 ⁰ 59.5 11 ⁰ 41.7	284 ⁰ 27.4 11 ⁰ 50.7	298 ⁰ 55.3 11 ⁰ 59.6	313 ⁰ 23.2 12 ⁰ 08.5	327 ⁰ 51.2 12 ⁰ 17.2	342 ⁰ 19.1 12 ⁰ 25.9	356 ⁰ 47.0 12 ⁰ 34.4	11 ⁰ 14.9 12 ⁰ 42.9	25 ⁰ 42.8 12 ⁰ 51.3	40 ⁰ 10.7 12 ⁰ 59.7	+27.9 16.0 +8.7 58.8
	Su 6	257 ⁰ 09.3 14 ⁰ 54.0	271 ⁰ 37.2 15 ⁰ 00.9	286 ⁰ 05.1 15 ⁰ 07.7	300 ⁰ 33.0 15 ⁰ 14.4	315 ⁰ 00.9 15 ⁰ 21.0	329 ⁰ 28.8 15 ⁰ 27.5	343 ⁰ 56.7 15 ⁰ 33.9	358 ⁰ 24.6 15 ⁰ 40.3	12 ⁰ 52.5 15 ⁰ 46.5	27 ⁰ 20.4 15 ⁰ 52.6	41 ⁰ 48.3 15 ⁰ 58.6	+27.9 15.8 +6.5 58.0
	Mo 7	258 ⁰ 47.3 17 ⁰ 17.1	273 ⁰ 15.2 17 ⁰ 21.5	287 ⁰ 43.2 17 ⁰ 25.8	302 ⁰ 11.2 17 ⁰ 30.0	316 ⁰ 39.2 17 ⁰ 34.2	331 ⁰ 07.2 17 ⁰ 38.2	345 ⁰ 35.2 17 ⁰ 42.1	0 ⁰ 03.2 17 ⁰ 45.9	14 ⁰ 31.2 17 ⁰ 49.6	28 ⁰ 59.2 17 ⁰ 53.2	43 ⁰ 27.3 17 ⁰ 56.6	+28.0 15.6 +4.0 57.2
	Tu 8	260 ⁰ 29.4 18 ⁰ 36.4	274 ⁰ 57.7 18 ⁰ 38.2	289 ⁰ 26.0 18 ⁰ 40.0	303 ⁰ 54.3 18 ⁰ 41.6	318 ⁰ 22.6 18 ⁰ 43.1	332 ⁰ 50.9 18 ⁰ 44.5	347 ⁰ 19.3 18 ⁰ 45.8	1 ⁰ 47.7 18 ⁰ 47.0	16 ⁰ 16.1 18 ⁰ 48.1	30 ⁰ 44.5 18 ⁰ 49.0	45 ⁰ 13.0 18 ⁰ 49.9	+28.4 15.4 +1.3 56.6
	We 9	262 ⁰ 22.6 18 ⁰ 50.9	276 ⁰ 51.5 18 ⁰ 50.1	291 ⁰ 20.4 18 ⁰ 49.3	305 ⁰ 49.3 18 ⁰ 48.3	320 ⁰ 18.3 18 ⁰ 47.3	334 ⁰ 47.3 18 ⁰ 46.1	349 ⁰ 16.3 18 ⁰ 44.9	3 ⁰ 45.3 18 ⁰ 43.6	18 ⁰ 14.4 18 ⁰ 42.1	32 ⁰ 43.6 18 ⁰ 40.6	47 ⁰ 12.7 18 ⁰ 39.0	+29.0 15.3 -1.2 55.9
	Th 10	264 ⁰ 34.4 18 ⁰ 03.3	279 ⁰ 04.2 18 ⁰ 00.2	293 ⁰ 33.9 17 ⁰ 56.9	308 ⁰ 03.8 17 ⁰ 53.7	322 ⁰ 33.7 17 ⁰ 50.3	337 ⁰ 03.6 17 ⁰ 46.8	351 ⁰ 33.5 17 ⁰ 43.3	6 ⁰ 03.2 17 ⁰ 39.6	20 ⁰ 33.6 17 ⁰ 35.9	35 ⁰ 03.6 17 ⁰ 32.1	49 ⁰ 33.8 17 ⁰ 28.2	+29.9 15.1 -3.5 55.4
O	Fr 11	267 ⁰ 10.8 16 ⁰ 19.9	281 ⁰ 41.7 16 ⁰ 14.7	296 ⁰ 12.5 16 ⁰ 09.5	310 ⁰ 43.5 16 ⁰ 04.1	325 ⁰ 14.4 15 ⁰ 58.7	339 ⁰ 45.4 15 ⁰ 53.3	354 ⁰ 16.5 15 ⁰ 47.7	8 ⁰ 47.6 15 ⁰ 42.1	23 ⁰ 18.7 15 ⁰ 36.4	37 ⁰ 49.9 15 ⁰ 30.7	52 ⁰ 21.1 15 ⁰ 24.8	+31.0 15.0 -5.5 55.0
	Sa 12	270 ⁰ 15.0 13 ⁰ 49.4	284 ⁰ 46.9 13 ⁰ 42.6	299 ⁰ 18.9 13 ⁰ 35.6	313 ⁰ 50.9 13 ⁰ 28.7	328 ⁰ 23.0 13 ⁰ 21.6	342 ⁰ 55.1 13 ⁰ 14.5	357 ⁰ 27.3 13 ⁰ 07.4	11 ⁰ 59.2 13 ⁰ 00.2	26 ⁰ 31.7 12 ⁰ 52.9	41 ⁰ 04.0 12 ⁰ 45.6	55 ⁰ 36.2 12 ⁰ 38.3	+32.1 14.9 -7.1 54.6
	Su 13	273 ⁰ 46.1 10 ⁰ 41.8	288 ⁰ 19.1 10 ⁰ 33.3	302 ⁰ 52.1 10 ⁰ 25.5	317 ⁰ 25.1 10 ⁰ 17.3	331 ⁰ 58.2 10 ⁰ 09.0	346 ⁰ 31.3 10 ⁰ 00.7	1 ⁰ 04.4 9 ⁰ 52.4	15 ⁰ 37.6 9 ⁰ 44.0	30 ⁰ 10.8 9 ⁰ 35.6	44 ⁰ 44.1 9 ⁰ 27.2	59 ⁰ 17.4 9 ⁰ 18.7	+33.1 14.8 -8.3 54.3
	Mo 14	277 ⁰ 40.4 7 ⁰ 07.4	292 ⁰ 14.2 6 ⁰ 58.5	306 ⁰ 48.0 6 ⁰ 49.5	321 ⁰ 21.8 6 ⁰ 40.4	335 ⁰ 55.7 6 ⁰ 31.4	350 ⁰ 29.5 6 ⁰ 22.3	5 ⁰ 03.5 6 ⁰ 13.2	19 ⁰ 37.4 6 ⁰ 04.0	34 ⁰ 11.3 5 ⁰ 54.9	48 ⁰ 45.3 5 ⁰ 45.7	63 ⁰ 19.3 5 ⁰ 36.5	+33.9 14.8 -9.1 54.1
	Tu 15	281 ⁰ 51.6 3 ⁰ 16.5	296 ⁰ 25.9 3 ⁰ 07.1	311 ⁰ 00.2 2 ⁰ 57.6	325 ⁰ 34.5 2 ⁰ 48.2	340 ⁰ 08.9 2 ⁰ 38.7	354 ⁰ 43.2 2 ⁰ 29.2	9 ⁰ 17.5 2 ⁰ 19.7	23 ⁰ 51.9 2 ⁰ 10.2	38 ⁰ 26.3 2 ⁰ 00.7	53 ⁰ 00.7 1 ⁰ 51.2	67 ⁰ 35.1 1 ⁰ 41.7	+34.3 14.7 -9.5 54.0
	We 16	286 ⁰ 11.7 -0 ⁰ 41.3	300 ⁰ 46.2 -0 ⁰ 50.8	315 ⁰ 20.6 -1 ⁰ 00.3	329 ⁰ 55.1 -1 ⁰ 09.8	344 ⁰ 29.5 -1 ⁰ 19.3	359 ⁰ 04.0 -1 ⁰ 28.8	13 ⁰ 38.5 -1 ⁰ 38.3	28 ⁰ 12.9 -1 ⁰ 47.8	42 ⁰ 47.4 -1 ⁰ 57.3	57 ⁰ 21.8 -2 ⁰ 06.8	71 ⁰ 56.2 -2 ⁰ 16.3	+34.5 14.7 -9.5 53.9
	Th 17	290 ⁰ 31.7 -4 ⁰ 36.8	305 ⁰ 06.0 -4 ⁰ 46.0	319 ⁰ 40.2 -4 ⁰ 55.2	334 ⁰ 14.5 -5 ⁰ 04.5	348 ⁰ 48.7 -5 ⁰ 13.6	3 ⁰ 22.9 -5 ⁰ 22.8	17 ⁰ 57.1 -5 ⁰ 32.0	32 ⁰ 31.2 -5 ⁰ 41.1	47 ⁰ 05.4 -5 ⁰ 50.2	61 ⁰ 39.5 -5 ⁰ 59.3	76 ⁰ 13.6 -6 ⁰ 08.3	+34.2 14.7 -9.2 54.0
	Fr 18	294 ⁰ 42.3 -8 ⁰ 21.1	309 ⁰ 16.0 -8 ⁰ 29.7	323 ⁰ 49.6 -8 ⁰ 38.3	338 ⁰ 23.3 -8 ⁰ 46.8	352 ⁰ 56.9 -8 ⁰ 55.3	7 ⁰ 30.4 -9 ⁰ 03.8	22 ⁰ 04.0 -9 ⁰ 12.3	36 ⁰ 37.5 -9 ⁰ 20.7	51 ⁰ 10.9 -9 ⁰ 29.0	65 ⁰ 44.4 -9 ⁰ 37.4	80 ⁰ 17.8 -9 ⁰ 45.7	+33.5 14.8 -8.5 54.3
	Sa 19	309 ⁰ 16.0 -8 ⁰ 29.7	323 ⁰ 49.6 -8 ⁰ 38.3	338 ⁰ 23.3 -8 ⁰ 46.8	352 ⁰ 56.9 -8 ⁰ 55.3	7 ⁰ 30.4 -9 ⁰ 03.8	22 ⁰ 04.0 -9 ⁰ 12.3	36 ⁰ 37.5 -9 ⁰ 20.7	51 ⁰ 10.9 -9 ⁰ 29.0	65 ⁰ 44.4 -9 ⁰ 37.4	80 ⁰ 17.8 -9 ⁰ 45.7	94 ⁰ 51.8 -9 ⁰ 53.9	+33.5 14.8 -8.4 54.3
	Su 20	313 ⁰ 06.8 -11 ⁰ 52.9	327 ⁰ 39.6 -12 ⁰ 00.5	342 ⁰ 12.2 -12 ⁰ 08.0	356 ⁰ 44.8 -12 ⁰ 15.5	11 ⁰ 17.4 -12 ⁰ 22.9	25 ⁰ 50.0 -12 ⁰ 30.2	40 ⁰ 22.4 -12 ⁰ 37.6	54 ⁰ 54.9 -12 ⁰ 44.8	69 ⁰ 27.3 -12 ⁰ 52.1	83 ⁰ 59.6 -12 ⁰ 59.2	98 ⁰ 31.9 -13 ⁰ 06.3	+32.5 14.9 -7.3 54.7
Q	Mo 21	316 ⁰ 30.2 -14 ⁰ 46.2	331 ⁰ 01.7 -14 ⁰ 52.4	345 ⁰ 33.1 -14 ⁰ 58.5	0 ⁰ 04.4 -15 ⁰ 04.5	14 ⁰ 35.7 -15 ⁰ 10.5	29 ⁰ 06.9 -15 ⁰ 16.4	43 ⁰ 38.1 -15 ⁰ 22.2	58 ⁰ 09.2 -15 ⁰ 28.0	72 ⁰ 40.3 -15 ⁰ 33.7	87 ⁰ 11.3 -15 ⁰ 39.3	101 ⁰ 42.3 -15 ⁰ 44.9	+31.2 15.1 -5.9 55.2
	Tu 22	319 ⁰ 19.6 -16 ⁰ 59.5	333 ⁰ 49.6 -17 ⁰ 03.9	348 ⁰ 19.5 -17 ⁰ 08.2	2 ⁰ 49.4 -17 ⁰ 12.4	17 ⁰ 19.2 -17 ⁰ 16.5	31 ⁰ 49.0 -17 ⁰ 20.5	46 ⁰ 18.7 -17 ⁰ 24.4	60 ⁰ 48.3 -17 ⁰ 28.3	75 ⁰ 17.9 -17 ⁰ 32.1	89 ⁰ 47.5 -17 ⁰ 35.7	104 ⁰ 16.9 -17 ⁰ 39.3	+29.7 15.2 -4.0 55.9
	We 23	321 ⁰ 31.8 -18 ⁰ 22.4	336 ⁰ 00.3 -18 ⁰ 24.5	350 ⁰ 28.7 -18 ⁰ 26.6	4 ⁰ 57.2 -18 ⁰ 28.5	19 ⁰ 25.5 -18 ⁰ 30.3	33 ⁰ 53.8 -18 ⁰ 32.0	48 ⁰ 22.0 -18 ⁰ 33.6	62 ⁰ 50.2 -18 ⁰ 35.2	77 ⁰ 18.3 -18 ⁰ 36.6	91 ⁰ 46.4 -18 ⁰ 37.9	106 ⁰ 14.4 -18 ⁰ 39.1	+28.3 15.5 -1.7 56.8
	Th 24	323 ⁰ 08.3 -18 ⁰ 44.7	337 ⁰ 35.5 -18 ⁰ 44.2	352 ⁰ 02.6 -18 ⁰ 43.6	6 ⁰ 29.7 -18 ⁰ 42.8	20 ⁰ 56.8 -18 ⁰ 42.0	35 ⁰ 23.8 -18 ⁰ 41.1	49 ⁰ 50.8 -18 ⁰ 40.0	64 ⁰ 17.7 -18 ⁰ 38.9	78 ⁰ 44.6 -18 ⁰ 37.6	93 ⁰ 11.4 -18 ⁰ 36.2	107 ⁰ 38.2 -18 ⁰ 34.7	+27.0 15.7 +1.0 57.7
	Fr 25	324 ⁰ 15.7 -17 ⁰ 58.3	338 ⁰ 41.9 -17 ⁰ 54.9	353 ⁰ 08.1 -17 ⁰ 51.4	7 ⁰ 34.2 -17 ⁰ 47.8	22 ⁰ 00.4 -17 ⁰ 44.1	36 ⁰ 26.5 -17 ⁰ 40.3	50 ⁰ 52.6 -17 ⁰ 36.4	65 ⁰ 18.7 -17 ⁰ 32.3	79 ⁰ 44.7 -17 ⁰ 28.1	94 ⁰ 10.7 -17 ⁰ 23.8	108 ⁰ 36.7 -17 ⁰ 19.4	+26.1 16.0 +3.9 58.7
	Sa 26	325 ⁰ 04.3 -15 ⁰ 59.5	339 ⁰ 30.0 -15 ⁰ 53.3	353 ⁰ 55.7 -15 ⁰ 46.9	8 ⁰ 21.4 -15 ⁰ 40.5	22 ⁰ 47.1 -15 ⁰ 33.9	37 ⁰ 12.8 -15 ⁰ 27.2	51 ⁰ 38.5 -15 ⁰ 20.4	66 ⁰ 04.1 -15 ⁰ 13.5	80 ⁰ 29.8 -15 ⁰ 06.5	94 ⁰ 55.4 -14 ⁰ 59.4	109 ⁰ 21.1 -14 ⁰ 52.2	+25.7 16.3 +6.7 59.7
	Su 27	325 ⁰ 45.6 -12 ⁰ 51.5	340 ⁰ 11.3 -12 ⁰ 42.6	354 ⁰ 36.9 -12 ⁰ 46.3	9 ⁰ 02.6 -12 ⁰ 44.7	23 ⁰ 28.2 -12 ⁰ 44.7	37 ⁰ 53.9 -12 ⁰ 45.5	52 ⁰ 19.5 -12 ⁰ 46.1	66 ⁰ 45.2 -11 ⁰ 47.6	81 ⁰ 19.0 -11 ⁰ 38.2	95 ⁰ 36.6 -11 ⁰ 28.6	110 ⁰ 02.3 -11 ⁰ 19.0	+25.7 16.5 +3.9 60.5
	Mo 28	326 ⁰ 28.8 -8 ⁰ 44.9	340 ⁰ 54.7 -8 ⁰ 34.0	355 ⁰ 20.5 -8 ⁰ 23.1	9 ⁰ 46.4 -8 ⁰ 12.1	24 ⁰ 12.3 -8 ⁰ 01.1	38 ⁰ 38.2 -7 ⁰ 50.0	53 ⁰ 04.1 -7 ⁰ 38.8	67 ⁰ 30.0 -7 ⁰ 27.6	81 ⁰ 56.0 -7 ⁰ 16.4	96 ⁰ 21.9 -7 ⁰ 05.0	110 ⁰ 47.9 -6 ⁰ 53.7	+25.9 16.7 +11.1 61.1

SUN

March 2033

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Tu 1	266°55.7 -7°27.1	281°55.8 -7°26.2	296°56.0 -7°25.2	311°56.1 -7°24.3	326°56.2 -7°23.3	341°56.3 -7°22.4	356°56.4 -7°21.4	11°56.6 -7°20.5	26°56.7 -7°19.5	41°56.8 -7°18.6	56°56.9 -7°17.6	71°57.1 -7°16.7	+0.1 +1.0
We 2	266°58.7 -7°04.2	281°58.8 -7°03.3	296°58.9 -7°02.3	311°59.1 -7°01.4	326°59.2 -7°00.4	341°59.3 -6°59.5	356°59.4 -6°58.5	11°59.5 -6°57.5	26°59.7 -6°56.6	41°59.8 -6°55.6	57°00.0 -6°54.7	72°00.1 -6°53.7	+0.1 +1.0
Th 3	267°01.8 -6°41.2	282°01.9 -6°40.3	297°02.0 -6°39.3	312°02.2 -6°38.4	327°02.3 -6°37.4	342°02.4 -6°36.4	357°02.6 -6°35.5	12°02.7 -6°34.5	27°02.7 -6°33.6	42°03.0 -6°32.6	57°03.1 -6°31.6	72°03.2 -6°30.7	+0.1 +1.0
Fr 4	267°05.0 -6°18.2	282°05.1 -6°17.2	297°05.2 -6°16.2	312°05.4 -6°15.3	327°05.5 -6°14.3	342°05.7 -6°13.3	357°05.8 -6°12.4	12°05.9 -6°11.4	27°06.1 -6°10.4	42°06.2 -6°09.5	57°06.3 -6°08.5	72°06.5 -6°07.5	+0.1 +1.0
Sa 5	267°08.3 -5°55.0	282°08.4 -5°54.0	297°08.6 -5°53.0	312°08.7 -5°52.1	327°08.9 -5°51.1	342°09.0 -5°50.1	357°09.1 -5°49.2	12°09.3 -5°48.2	27°09.4 -5°47.2	42°09.6 -5°46.3	57°09.7 -5°45.3	72°09.9 -5°44.3	+0.1 +1.0
Su 6	267°11.7 -5°31.7	282°11.9 -5°30.8	297°12.0 -5°29.8	312°12.2 -5°28.8	327°12.3 -5°27.8	342°12.5 -5°26.9	357°12.6 -5°25.9	12°12.7 -5°24.9	27°12.9 -5°24.0	42°13.0 -5°23.0	57°13.2 -5°22.0	72°13.3 -5°21.0	+0.1 +1.0
Mo 7	267°15.3 -5°08.4	282°15.4 -5°07.4	297°15.6 -5°06.5	312°15.7 -5°05.5	327°15.9 -5°04.5	342°16.0 -5°03.5	357°16.2 -5°02.6	12°16.3 -5°01.6	27°16.5 -5°00.6	42°16.6 -4°59.6	57°16.8 -4°58.7	72°16.9 -4°57.7	+0.2 +1.0
Tu 8	267°18.9 -4°45.0	282°19.1 -4°44.0	297°19.2 -4°43.1	312°19.4 -4°42.1	327°19.5 -4°41.1	342°19.7 -4°40.1	357°19.8 -4°39.1	12°20.0 -4°38.2	27°20.1 -4°37.2	42°20.3 -4°36.2	57°20.4 -4°35.2	72°20.6 -4°34.3	+0.2 +1.0
We 9	267°22.6 -4°21.6	282°22.8 -4°20.6	297°23.0 -4°19.6	312°23.1 -4°18.6	327°23.3 -4°17.6	342°23.4 -4°16.7	357°23.6 -4°15.7	12°23.7 -4°14.7	27°23.9 -4°13.7	42°24.1 -4°12.7	57°24.2 -4°11.8	72°24.4 -4°10.8	+0.2 +1.0
Th 10	267°26.5 -3°58.0	282°26.6 -3°57.1	297°26.8 -3°56.1	312°27.0 -3°55.1	327°27.1 -3°54.1	342°27.3 -3°53.1	357°27.4 -3°52.2	12°27.6 -3°51.2	27°27.8 -3°50.2	42°27.9 -3°49.2	57°28.1 -3°48.2	72°28.2 -3°47.3	+0.2 +1.0
Fr 11	267°30.4 -3°34.5	282°30.5 -3°33.5	297°30.7 -3°32.5	312°30.9 -3°31.5	327°31.0 -3°30.6	342°31.2 -3°29.6	357°31.4 -3°28.6	12°31.5 -3°27.6	27°31.7 -3°26.6	42°31.9 -3°25.6	57°32.0 -3°24.7	72°32.2 -3°23.7	+0.2 +1.0
Sa 12	267°34.4 -3°10.9	282°34.5 -3°09.9	297°34.7 -3°08.9	312°34.9 -3°07.9	327°35.0 -3°07.0	342°35.2 -3°06.0	357°35.4 -3°05.0	12°35.6 -3°04.0	27°35.7 -3°03.0	42°35.9 -3°02.0	57°36.1 -3°01.1	72°36.2 -3°00.1	+0.2 +1.0
Su 13	267°38.4 -2°47.3	282°38.6 -2°46.3	297°38.8 -2°45.3	312°39.0 -2°44.3	327°39.1 -2°43.3	342°39.3 -2°42.3	357°39.5 -2°41.4	12°39.6 -2°40.4	27°39.8 -2°39.4	42°40.0 -2°38.4	57°40.2 -2°37.4	72°40.3 -2°36.4	+0.2 +1.0
Mo 14	267°42.6 -2°23.6	282°42.8 -2°22.6	297°42.9 -2°21.6	312°43.1 -2°20.6	327°43.3 -2°19.7	342°43.4 -2°18.7	357°43.6 -2°17.7	12°43.8 -2°16.7	27°44.0 -2°15.7	42°44.2 -2°14.7	57°44.3 -2°13.7	72°44.5 -2°12.8	+0.2 +1.0
Tu 15	267°46.8 -1°59.9	282°47.0 -1°58.9	297°47.1 -1°57.9	312°47.3 -1°57.0	327°47.5 -1°56.0	342°47.7 -1°55.0	357°47.8 -1°54.0	12°48.0 -1°53.0	27°48.2 -1°52.0	42°48.4 -1°51.0	57°48.5 -1°50.0	72°48.7 -1°49.1	+0.2 +1.0
We 16	267°51.0 -1°36.2	282°51.2 -1°35.2	297°51.4 -1°34.2	312°51.6 -1°33.3	327°51.8 -1°32.3	342°51.9 -1°31.3	357°52.1 -1°30.3	12°52.3 -1°29.3	27°52.5 -1°28.3	42°52.6 -1°27.3	57°52.8 -1°26.3	72°53.0 -1°25.4	+0.2 +1.0
Th 17	267°55.3 -1°12.5	282°55.5 -1°11.5	297°55.7 -1°10.5	312°55.9 -1°09.5	327°56.1 -1°08.6	342°56.2 -1°07.6	357°56.4 -1°06.6	12°56.6 -1°05.6	27°56.8 -1°04.6	42°57.0 -1°03.6	57°57.2 -1°02.6	72°57.4 -1°01.6	+0.2 +1.0
Fr 18	267°59.7 -0°48.8	282°59.9 -0°47.8	298°00.1 -0°46.8	313°00.2 -0°45.8	328°00.4 -0°44.8	343°00.6 -0°43.8	358°00.8 -0°42.9	13°01.0 -0°41.9	28°01.2 -0°40.9	43°01.3 -0°39.9	58°01.5 -0°38.9	73°01.7 -0°37.9	+0.2 +1.0
Sa 19	268°04.1 -0°25.1	283°04.3 -0°24.1	298°04.5 -0°23.1	313°04.6 -0°22.1	328°04.8 -0°21.1	343°05.0 -0°20.1	358°05.2 -0°19.1	13°05.4 -0°18.2	28°05.6 -0°17.2	43°05.7 -0°16.2	58°05.9 -0°15.2	73°06.1 -0°14.2	+0.2 +1.0
Su 20	268°08.5 -0°01.4	283°08.7 -0°00.4	298°08.9 0°00.6	313°09.1 0°01.6	328°09.3 0°02.6	343°09.4 0°03.6	358°09.6 0°04.6	13°09.8 0°05.6	28°10.0 0°06.5	43°10.4 0°07.5	58°10.6 0°08.5	73°10.6 0°09.5	+0.2 +1.0
Mo 21	268°13.0 0°22.3	283°13.2 0°23.3	298°13.3 0°24.3	313°13.5 0°25.3	328°13.7 0°26.3	343°13.9 0°27.3	358°14.1 0°28.3	13°14.3 0°29.3	28°14.5 0°30.2	43°14.7 0°31.2	58°14.8 0°32.2	73°15.0 0°33.2	+0.2 +1.0
Tu 22	268°17.5 0°46.0	283°17.6 0°47.0	298°17.8 0°48.0	313°18.0 0°49.0	328°18.2 0°50.0	343°18.4 0°51.0	358°18.6 0°51.9	13°18.8 0°52.9	28°19.0 0°53.9	43°19.1 0°54.9	58°19.3 0°55.9	73°19.5 0°56.9	+0.2 +1.0
We 23	268°21.9 1°09.7	283°22.1 1°10.7	298°22.3 1°11.7	313°22.5 1°12.6	328°22.7 1°13.6	343°22.9 1°14.6	358°23.1 1°15.6	13°23.3 1°16.6	28°23.5 1°17.6	43°23.6 1°18.6	58°23.8 1°19.5	73°24.0 1°20.5	+0.2 +1.0
Th 24	268°26.5 1°33.3	283°26.6 1°34.3	298°26.8 1°35.3	313°27.0 1°36.3	328°27.2 1°37.3	343°27.4 1°38.2	358°27.6 1°39.2	13°27.6 1°40.2	28°28.0 1°41.2	43°28.1 1°42.2	58°28.3 1°43.2	73°28.5 1°44.1	+0.2 +1.0
Fr 25	268°31.0 1°56.9	283°31.2 1°57.9	298°31.3 1°58.9	313°31.5 1°59.9	328°31.7 2°00.8	343°31.9 2°01.8	358°32.1 2°02.8	13°32.3 2°03.8	28°32.5 2°04.8	43°32.7 2°05.8	58°32.8 2°06.7	73°33.0 2°07.7	+0.2 +1.0
Sa 26	268°35.5 2°20.5	283°35.7 2°21.4	298°35.9 2°22.4	313°36.0 2°23.4	328°36.2 2°24.4	343°36.4 2°25.4	358°36.6 2°26.3	13°36.8 2°27.3	28°37.0 2°28.3	43°37.2 2°29.3	58°37.4 2°30.3	73°37.5 2°31.2	+0.2 +1.0
Su 27	268°40.0 2°44.0	283°40.2 2°45.0	298°40.4 2°45.9	313°40.6 2°46.9	328°40.8 2°47.9	343°40.9 2°48.9	358°41.1 2°49.8	13°41.3 2°50.8	28°41.5 2°51.8	43°41.7 2°52.8	58°41.9 2°53.8	73°42.1 2°54.7	+0.2 +1.0
Mo 28	268°44.5 3°07.4	283°44.7 3°08.4	298°44.9 3°09.4	313°45.1 3°10.4	328°45.2 3°11.3	343°45.4 3°12.3	358°45.6 3°13.3	13°45.8 3°14.3	28°46.0 3°15.2	43°46.2 3°16.2	58°46.4 3°17.2	73°46.5 3°18.2	+0.2 +1.0
Tu 29	268°49.0 3°30.8	283°49.2 3°31.8	298°49.4 3°32.8	313°49.5 3°33.7	328°49.7 3°34.7	343°49.9 3°35.7	358°50.1 3°36.7	13°50.3 3°37.6	28°50.5 3°38.6	43°50.7 3°39.6	58°50.8 3°40.5	73°51.0 3°41.5	+0.2 +1.0
We 30	268°53.4 3°54.1	283°53.6 3°55.1	298°53.8 3°56.1	313°54.0 3°57.1	328°54.2 3°58.0	343°54.4 3°59.0	358°54.6 4°00.0	13°54.8 4°00.9	28°54.9 4°01.9	43°55.1 4°02.9	58°55.3 4°03.8	73°55.5 4°04.8	+0.2 +1.0
Th 31	268°57.9 4°17.4	283°58.1 4°18.4	298°58.3 4°19.3	313°58.5 4°20.3	328°58.6 4°21.3	343°58.8 4°22.2	358°59.0 4°23.2	13°59.2 4°24.1	28°59.5 4°25.1	43°59.6 4°26.1	58°59.8 4°27.1	73°59.9 4°28.0	+0.2 +1.0

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ°/h = dec. change

Semi-diameter: 16.1'

MOON

March 2033

	D	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	Δ'/h	SH
Tu 1	240°42.1 -5°09.2	255°08.1 -4°57.4	269°34.2 -4°45.5	284°00.3 -4°33.6	298°26.5 -4°21.7	312°52.6 -3°57.8	327°18.7 -3°45.8	341°44.9 -3°33.8	356°11.0 -3°21.7	10°37.2 -3°09.6	25°03.4 -2°50.1	+26.1	16.7	
	241°37.5 -0°06.7	256°03.8 0°05.6	270°30.2 0°17.8	284°56.6 0°30.0	299°22.9 0°42.2	313°49.3 0°54.4	328°15.7 1°06.6	342°42.1 1°18.8	357°08.5 1°31.0	11°34.9 1°43.2	26°01.4 1°55.3	+26.4	16.7	
Th 3	242°38.4 4°54.4	257°04.9 5°06.1	271°31.4 5°17.7	285°58.0 5°29.3	300°24.5 5°40.8	314°51.0 5°52.3	329°17.5 6°03.8	343°44.1 6°15.2	358°10.6 6°26.5	12°37.2 6°37.8	27°03.7 6°49.1	+26.5	16.6	
Fr 4	243°42.2 9°30.5	258°08.8 9°40.7	272°35.4 9°50.9	287°02.0 10°01.0	301°28.5 10°11.0	315°55.1 10°20.9	330°21.7 10°30.8	344°48.3 10°40.5	359°14.9 10°50.2	13°41.6 10°59.8	28°08.2 11°09.4	+26.6	16.4	
Sa 5	244°47.7 13°22.0	259°14.4 13°30.1	273°41.1 13°38.1	288°07.8 13°46.0	302°34.5 13°53.8	317°01.2 14°01.6	331°27.9 14°09.2	345°54.6 14°16.7	0°21.3 14°24.2	14°48.1 14°31.5	29°14.8 14°38.7	+26.7	16.2	
Su 6	245°57.1 16°14.9	260°24.0 16°20.5	274°51.0 16°26.0	289°17.9 16°31.3	303°44.9 16°36.6	318°11.9 16°41.7	332°38.9 16°46.7	347°05.9 16°51.7	0°32.9 16°56.5	16°00.0 17°01.2	30°27.0 17°05.8	+27.0	15.9	
Mo 7	247°15.6 18°01.8	261°43.1 18°04.7	276°10.5 18°07.4	290°38.0 18°10.0	305°05.5 18°12.6	319°33.1 18°15.0	334°00.7 18°17.3	348°28.3 18°19.5	2°55.9 18°21.6	17°23.6 18°23.6	31°51.2 18°25.5	+27.6	15.7	
Tu 8	248°50.7 18°41.0	263°18.9 18°41.2	277°47.2 18°41.2	292°15.6 18°41.2	306°43.9 18°41.1	321°12.3 18°40.9	335°40.8 18°40.6	350°09.3 18°40.1	4°37.8 18°39.6	19°06.4 18°39.0	33°35.0 18°38.3	+28.4	15.4	
We 9	250°49.5 18°15.6	265°18.8 18°13.3	279°48.2 18°11.0	294°17.6 18°08.5	308°47.1 18°06.0	323°16.6 18°03.3	337°46.1 18°00.6	352°15.1 17°57.8	6°45.4 17°45.4	21°15.1 17°51.9	35°44.9 17°48.8	+29.5	15.2	
Th 10	253°17.0 16°52.4	267°47.6 16°47.9	282°18.2 16°43.4	296°48.8 16°38.9	311°19.5 16°34.2	325°50.2 16°29.5	340°21.0 16°24.7	354°51.8 16°19.8	9°22.7 16°14.9	23°53.6 16°09.8	38°24.6 16°04.9	+30.8	15.0	
Fr 11	256°15.1 14°39.8	270°46.8 14°33.6	285°18.6 14°27.3	299°50.4 14°21.0	314°22.3 14°14.6	328°54.2 14°08.2	343°26.2 14°01.7	357°58.2 13°55.1	12°30.3 13°48.5	27°02.4 13°41.8	41°34.5 13°35.1	+31.9	14.9	
Sa 12	259°41.8 11°47.4	274°14.6 11°39.9	288°47.5 11°32.2	303°20.4 11°24.5	317°53.3 11°16.8	332°26.2 11°09.1	346°59.2 11°01.2	361°32.3 10°53.4	13°05.4 10°45.5	30°38.5 10°37.5	45°11.6 10°29.5	+33.0	14.8	
Su 13	263°32.7 8°25.0	278°06.3 8°16.4	292°40.6 8°07.8	307°13.7 7°59.2	321°47.4 7°50.5	336°21.2 7°41.8	350°54.9 7°33.0	5°28.8 7°24.3	20°02.8 7°15.5	34°36.4 7°06.6	49°10.3 6°57.8	+33.8	14.7	
Mo 14	267°41.4 4°42.1	282°15.2 4°32.9	296°49.4 4°23.7	311°23.6 4°14.4	325°57.6 4°05.2	340°32.1 3°55.9	355°06.4 3°46.6	9°40.7 3°37.3	24°15.0 3°28.0	38°49.3 3°18.7	53°23.6 3°09.3	+34.3	14.7	
Tu 15	271°59.2 0°48.1	286°33.6 0°38.7	301°08.0 0°29.2	315°42.4 0°19.7	330°16.4 0°10.3	344°51.2 0°00.8	359°25.7 -0°08.6	14°00.1 -0°18.1	28°34.5 -0°27.6	43°08.9 -0°37.0	57°43.3 -0°46.5	+34.4	14.7	
We 16	276°18.8 -3°07.7	290°53.1 -3°17.0	305°27.4 -3°26.3	320°01.6 -3°35.7	334°35.9 -3°45.0	349°10.2 -3°54.2	3 [°] 44.4 -4°03.5	18°18.6 -4°12.8	32°52.8 -4°22.0	47°27.0 -4°31.2	62°01.2 -4°40.4	+34.2	14.7	
Th 17	280°31.6 -6°56.0	295°05.4 -7°04.9	309°39.2 -7°13.7	324°13.0 -7°22.5	338°46.8 -7°31.3	353°20.6 -7°40.0	7°54.3 -7°57.4	22°28.0 -8°06.0	37°01.7 -8°14.6	51°35.3 -8°23.2	66°08.9 -8°32.2	+33.7	14.8	
Fr 18	284°29.6 -10°27.6	299°02.7 -10°35.5	313°35.7 -10°43.5	328°08.8 -10°51.4	342°41.8 -10°59.2	357°14.7 -11°07.0	11°47.7 -11°14.8	26°20.6 -11°22.5	40°53.4 -11°30.1	55°26.2 -11°37.8	69°59.0 -11°45.3	+32.9	14.8	
Sa 19	288°05.8 -13°32.7	302°37.9 -13°39.4	317°10.0 -13°46.1	331°42.0 -13°52.7	346°14.0 -13°59.2	0°46.0 -14°05.7	15°17.9 -14°12.1	29°49.7 -14°18.5	44°21.5 -14°24.8	58°53.3 -14°31.0	73°25.0 -14°37.2	+31.9	14.9	
Su 20	291°15.1 -16°01.7	305°46.1 -16°06.8	320°17.0 -16°11.8	334°47.9 -16°16.7	349°18.7 -16°21.6	3 [°] 49.5 -16°26.4	18°20.2 -16°31.1	32°50.9 -16°35.7	47°21.5 -16°40.2	61°52.1 -16°44.7	76°22.6 -16°49.1	+30.7	15.0	
Mo 21	305°46.1 -16°06.8	320°17.0 -16°11.8	334°47.9 -16°16.7	349°18.7 -16°21.6	3 [°] 49.5 -16°26.4	18°20.2 -16°31.1	32°50.9 -16°35.7	47°21.5 -16°40.2	61°52.1 -16°44.7	76°22.6 -16°49.1	90°53.1 -16°53.4	+30.7	15.1	
Tu 22	308°24.6 -17°48.2	322°54.3 -17°51.1	337°23.9 -17°54.0	351°53.6 -17°56.8	6°23.1 -17°59.5	20°52.7 -18°02.1	35°22.2 -18°04.6	50°21.1 -18°07.0	64°21.6 -18°09.4	78°50.4 -18°11.6	93°19.7 -18°13.8	+29.5	15.2	
We 23	310°34.0 -18°34.6	325°02.6 -18°35.2	339°31.2 -18°35.7	353°59.7 -18°36.1	8°28.2 -18°36.6	22°56.7 -18°36.6	37°25.1 -18°36.7	51°53.5 -18°36.7	66°21.8 -18°36.6	80°50.1 -18°36.4	95°18.4 -18°36.1	+28.4	15.4	
Th 24	312°18.4 -18°18.8	326°46.1 -18°16.8	341°13.9 -18°14.7	355°41.6 -18°12.5	10°09.2 -18°10.2	24°36.8 -18°07.8	39°04.4 -18°05.2	53°32.0 -18°02.6	67°59.6 -17°59.9	82°27.1 -17°57.0	96°54.6 -17°54.0	+27.6	15.7	
Fr 25	313°44.4 -16°56.6	328°11.6 -16°51.9	342°38.7 -16°47.1	357°05.9 -16°42.2	11°33.0 -16°37.2	26°00.1 -16°32.1	40°27.1 -16°26.9	54°54.2 -16°21.6	69°21.3 -16°16.1	83°48.3 -16°10.6	98°15.3 -16°05.5	+27.1	15.9	
Sa 26	314°59.3 -14°28.0	329°26.2 -14°20.7	343°53.0 -14°13.3	358°19.8 -14°05.8	12°46.7 -13°58.3	27°13.5 -13°50.6	41°40.3 -13°42.9	56°07.1 -13°35.0	70°33.9 -13°27.1	85°00.7 -13°19.0	99°27.5 -13°10.9	+26.8	16.2	
Su 27	316°08.9 -10°58.2	330°35.6 -10°48.6	345°02.3 -10°39.0	359°29.1 -10°29.4	13°55.8 -10°19.9	28°25.2 -10°09.8	42°49.2 -9°59.9	57°15.9 -9°49.9	71°42.6 -9°39.8	86°09.3 -9°29.7	100°36.0 -9°19.5	+26.7	16.4	
Mo 28	317°16.0 -6°38.6	331°42.7 -6°27.5	346°09.3 -6°16.2	0°35.9 -6°04.9	15°02.6 -5°53.6	29°29.2 -5°42.2	43°55.8 -5°30.8	58°22.4 -5°19.3	72°49.0 -5°07.8	87°15.6 -4°56.2	101°42.2 -4°44.6	+26.6	16.6	
Tu 29	318°20.3 -1°46.7	332°46.8 -1°34.6	347°13.3 -1°22.5	1°39.8 -1°10.5	16°06.2 -0°58.4	30°32.7 -0°46.3	44°59.1 -0°34.1	59°25.5 -0°22.0	73°51.5 -0°09.9	88°18.3 0°02.2	102°44.7 0°14.4	+26.4	16.7	
We 30	319°19.3 3°15.8	333°45.5 3°27.7	348°11.7 3°39.7	1°27.3 3°51.6	17°04.0 4°03.5	31°30.1 4°15.4	45°56.3 4°27.2	60°22.4 4°39.0	74°48.5 4°50.8	89°14.6 5°02.5	103°40.7 5°14.2	+26.1	16.7	
Th 31	320°10.3 8°04.3	334°36.1 8°15.3	349°02.0 8°26.1	3°27.8 8°36.9	17°53.7 8°47.6	32°19.5 8°58.3	46°45.3 9°08.9	61°11.1 9°19.4	75°36.8 9°29.9	90°02.6 9°40.2	104°28.3 9°50.5	+25.8	16.6	

SUN

April 2033

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Fr 1	269°02.3 4°40.6	284°02.5 4°41.5	299°02.7 4°42.5	314°02.9 4°43.5	329°03.1 4°44.2	344°03.3 4°45.4	359°03.4 4°46.4	14°03.6 4°47.3	29°03.8 4°48.3	44°04.0 4°49.2	59°04.2 4°50.2	74°04.4 4°51.2	+0.2 +1.0
Sa 2	269°06.7 5°03.7	284°06.9 5°04.6	299°07.1 5°05.6	314°07.3 5°06.5	329°07.5 5°07.5	344°07.6 5°08.5	359°07.8 5°09.4	14°08.0 5°10.4	29°08.2 5°11.3	44°08.4 5°12.3	59°08.6 5°13.3	74°08.7 5°14.2	+0.2 +1.0
Su 3	269°11.1 5°26.7	284°11.3 5°27.6	299°11.5 5°28.6	314°11.6 5°29.5	329°11.8 5°30.5	344°12.0 5°31.4	359°12.2 5°32.4	14°12.4 5°33.4	29°12.6 5°34.3	44°12.7 5°35.3	59°12.9 5°36.2	74°13.1 5°37.2	+0.2 +1.0
Mo 4	269°15.4 5°49.6	284°15.6 5°50.5	299°15.8 5°51.5	314°16.0 5°52.4	329°16.2 5°53.4	344°16.3 5°54.3	359°16.5 5°55.3	14°16.7 5°56.2	29°16.9 5°57.2	44°17.1 5°58.1	59°17.2 5°59.1	74°17.4 6°00.0	+0.2 +1.0
Tu 5	269°19.7 6°12.4	284°19.9 6°13.3	299°20.1 6°14.3	314°20.3 6°15.2	329°20.5 6°16.2	344°20.6 6°17.1	359°20.8 6°18.0	14°21.0 6°19.0	29°21.2 6°19.9	44°21.3 6°20.9	59°21.5 6°21.8	74°21.7 6°22.8	+0.2 +0.9
We 6	269°24.0 6°35.1	284°24.2 6°36.0	299°24.3 6°36.9	314°24.5 6°37.9	329°24.7 6°38.8	344°24.9 6°39.8	359°25.1 6°40.7	14°25.2 6°41.7	29°25.4 6°42.6	44°25.6 6°43.5	59°25.8 6°44.5	74°25.9 6°45.4	+0.2 +0.9
Th 7	269°28.2 6°57.6	284°28.4 6°58.6	299°28.6 6°59.5	314°28.7 7°00.4	329°28.9 7°01.4	344°29.1 7°02.3	359°29.2 7°03.3	14°29.4 7°04.2	29°29.6 7°05.1	44°29.8 7°06.1	59°29.9 7°07.0	74°30.1 7°07.9	+0.2 +0.9
Fr 8	269°32.4 7°20.1	284°32.5 7°21.0	299°32.7 7°22.0	314°32.9 7°22.9	329°33.0 7°23.8	344°33.2 7°24.8	359°33.4 7°25.7	14°33.6 7°26.6	29°33.7 7°27.5	44°33.9 7°28.5	59°34.1 7°29.4	74°34.2 7°30.3	+0.2 +0.9
Sa 9	269°36.5 7°42.4	284°36.6 7°43.3	299°36.8 7°44.3	314°37.0 7°45.2	329°37.1 7°46.1	344°37.3 7°47.1	359°37.5 7°48.0	14°37.6 7°48.9	29°37.8 7°49.8	44°38.0 7°50.8	59°38.2 7°51.7	74°38.3 7°52.6	+0.2 +0.9
Su 10	269°40.5 8°04.6	284°40.7 8°05.5	299°40.8 8°06.5	314°41.0 8°07.4	329°41.2 8°08.3	344°41.3 8°09.2	359°41.5 8°10.2	14°41.7 8°11.1	29°41.8 8°12.0	44°42.0 8°12.9	59°42.2 8°13.8	74°42.3 8°14.8	+0.2 +0.9
Mo 11	269°44.5 8°26.7	284°44.6 8°27.6	299°44.8 8°28.5	314°45.0 8°29.4	329°45.1 8°30.4	344°45.3 8°31.3	359°45.5 8°32.2	14°45.6 8°33.1	29°45.8 8°34.0	44°45.9 8°34.9	59°46.1 8°35.8	74°46.3 8°36.8	+0.2 +0.9
Tu 12	269°48.4 8°48.6	284°48.5 8°49.5	299°48.7 8°50.4	314°48.9 8°51.3	329°49.0 8°52.2	344°49.2 8°53.2	359°49.3 8°54.1	14°49.5 8°55.0	29°49.7 8°55.9	44°49.8 8°56.8	59°50.0 8°57.7	74°50.1 8°58.6	+0.2 +0.9
We 13	269°52.2 9°10.4	284°52.4 9°11.3	299°52.5 9°12.2	314°52.7 9°13.1	329°52.8 9°14.0	344°53.0 9°14.9	359°53.1 9°15.8	14°53.3 9°16.7	29°53.5 9°17.6	44°53.6 9°18.5	59°53.8 9°19.4	74°53.9 9°20.3	+0.2 +0.9
Th 14	269°56.9 9°32.0	284°56.1 9°32.9	299°56.3 9°33.8	314°56.4 9°34.7	329°56.6 9°35.6	344°56.7 9°36.5	359°56.9 9°37.4	14°56.9 9°38.3	29°57.2 9°39.2	44°57.3 9°40.1	59°57.5 9°41.0	74°57.6 9°41.9	+0.2 +0.9
Fr 15	269°55.9 9°53.5	284°59.8 9°54.4	299°59.9 9°55.2	315°00.1 9°56.1	330°00.0 9°57.0	345°00.4 9°57.9	359°56.9 9°58.8	15°00.7 9°59.7	30°00.8 10°00.6	45°01.0 10°01.5	60°01.1 10°02.4	75°01.3 10°03.3	+0.1 +0.9
Sa 16	270°03.2 10°14.8	285°03.3 10°15.7	300°03.5 10°16.5	315°03.6 10°17.4	330°03.8 10°18.3	345°03.9 10°19.2	359°03.9 10°20.1	15°04.1 10°20.9	30°04.3 10°21.8	45°04.5 10°22.7	60°04.6 10°23.6	75°04.8 10°24.5	+0.1 +0.9
Su 17	270°06.7 10°35.9	285°06.8 10°36.8	300°06.9 10°37.7	315°07.1 10°38.5	330°07.2 10°39.4	345°07.4 10°40.3	359°07.4 10°41.2	15°07.6 10°42.0	30°07.8 10°42.9	45°07.9 10°43.8	60°08.1 10°44.7	75°08.2 10°45.5	+0.1 +0.9
Mo 18	270°10.0 10°56.9	285°10.2 10°57.7	300°10.3 10°58.6	315°10.4 10°59.5	330°10.6 11°00.3	345°10.7 11°01.2	359°10.7 11°02.1	15°11.0 11°02.9	30°11.3 11°03.8	45°11.3 11°04.7	60°11.4 11°05.5	75°11.5 11°06.4	+0.1 +0.9
Tu 19	270°13.3 11°17.6	285°13.4 11°18.5	300°13.6 11°19.4	315°13.7 11°20.2	330°13.8 11°21.1	345°14.0 11°21.9	359°14.1 11°22.8	15°14.2 11°23.7	30°14.4 11°24.5	45°14.5 11°25.4	60°14.6 11°26.2	75°14.8 11°27.1	+0.1 +0.9
We 20	270°16.5 11°38.2	285°16.6 11°39.1	300°16.7 11°39.9	315°16.9 11°40.8	330°17.0 11°41.6	345°17.1 11°42.5	359°17.1 11°43.3	15°17.2 11°44.2	30°17.5 11°45.0	45°17.6 11°45.9	60°17.8 11°46.7	75°17.9 11°47.6	+0.1 +0.9
Th 21	270°19.5 11°58.6	285°19.7 11°59.5	300°19.8 12°00.3	315°19.9 12°01.2	330°20.0 12°02.0	345°20.2 12°02.9	359°20.2 12°03.7	15°20.3 12°04.5	30°20.5 12°05.4	45°20.6 12°06.2	60°20.7 12°07.1	75°20.9 12°07.9	+0.1 +0.8
Fr 22	270°22.5 12°38.8	285°22.6 12°39.7	300°22.7 12°40.5	315°22.8 12°41.3	330°22.9 13°01.9	345°23.1 13°02.7	359°23.1 13°03.5	15°23.3 13°04.4	30°23.4 13°05.2	45°23.5 13°06.0	60°23.7 13°06.8	75°23.8 13°07.6	+0.1 +0.8
Sa 23	270°25.3 12°58.6	285°25.4 12°59.5	300°25.5 13°00.3	315°25.6 13°01.1	330°25.8 13°01.9	345°25.9 13°02.7	359°25.9 13°03.5	15°26.1 13°04.4	30°26.2 13°05.2	45°26.3 13°06.0	60°26.4 13°06.8	75°26.5 13°07.6	+0.1 +0.8
Su 24	270°28.0 13°18.2	285°28.1 13°19.0	300°28.2 13°19.8	315°28.3 13°20.6	330°28.4 13°21.5	345°28.5 13°22.3	359°28.5 13°23.1	15°28.8 13°24.7	30°28.9 13°25.5	45°29.0 13°26.3	60°29.1 13°27.1	75°29.2 13°27.1	+0.1 +0.8
Mo 25	270°30.6 13°37.6	285°30.7 13°38.4	300°30.8 13°39.2	315°30.9 13°40.0	330°31.0 13°40.8	345°31.1 13°41.6	359°31.1 13°42.4	15°31.3 13°43.2	30°31.4 13°44.0	45°31.5 13°44.8	60°31.6 13°45.6	75°31.7 13°46.4	+0.1 +0.8
Tu 26	270°33.0 13°56.7	285°33.1 13°57.5	300°33.2 13°58.3	315°33.3 13°59.1	330°33.4 13°59.9	345°33.5 14°00.7	359°33.5 14°01.5	15°33.7 14°02.3	30°33.8 14°03.1	45°33.9 14°03.8	60°34.0 14°04.6	75°34.1 14°05.4	+0.1 +0.8
We 27	270°37.5 14°15.6	285°37.6 14°16.4	300°37.7 14°17.2	315°37.8 14°18.0	330°37.9 14°18.8	345°38.0 14°19.5	359°38.1 14°20.3	15°36.0 14°21.1	30°36.3 14°21.9	45°36.2 14°22.7	60°36.3 14°23.4	75°36.4 14°24.2	+0.1 +0.8
Th 28	270°39.6 14°34.3	285°39.7 14°35.1	300°39.8 14°35.9	315°39.9 14°36.6	330°39.9 14°37.4	345°40.0 14°38.2	359°40.0 14°38.9	15°40.2 14°39.7	30°40.3 14°40.5	45°40.4 14°41.3	60°40.4 14°42.0	75°40.5 14°42.8	+0.1 +0.8
Fr 29	270°41.5 14°52.7	285°41.6 14°53.5	300°41.7 14°54.3	315°41.8 14°55.0	330°41.9 14°55.8	345°41.9 14°56.6	359°41.9 14°57.3	15°42.3 14°58.1	30°42.2 14°58.8	45°42.2 14°59.6	60°42.3 15°00.4	75°42.4 15°01.1	+0.1 +0.8

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ'/h = dec. change

Semi-diameter: 15.9'

MOON

April 2033

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	Δ /h SH
Fr 1	248 ⁰ 45.3 11 ⁰ 29.4	263 ⁰ 10.9 11 ⁰ 48.2	277 ⁰ 36.6 11 ⁰ 48.2	292 ⁰ 02.2 11 ⁰ 57.4	306 ⁰ 27.8 12 ⁰ 06.6	320 ⁰ 53.4 12 ⁰ 15.7	335 ⁰ 19.0 12 ⁰ 24.7	349 ⁰ 44.6 12 ⁰ 42.2	4 ⁰ 10.2 12 ⁰ 51.1	18 ⁰ 35.8 12 ⁰ 59.7	33 ⁰ 01.4 12 ⁰ 59.7	+25.6 16.5 +9.0 60.5
Sa 2	140 ⁰ 25.1 14 ⁰ 57.0	263 ⁰ 50.7 15 ⁰ 04.0	278 ⁰ 16.3 15 ⁰ 10.9	292 ⁰ 41.9 15 ⁰ 17.6	307 ⁰ 07.5 15 ⁰ 24.3	321 ⁰ 33.1 15 ⁰ 30.9	335 ⁰ 58.7 15 ⁰ 37.3	350 ⁰ 24.4 15 ⁰ 43.6	4 ⁰ 50.0 15 ⁰ 49.8	19 ⁰ 15.7 15 ⁰ 56.0	33 ⁰ 41.3 16 ⁰ 01.9	+25.6 16.3 +6.5 59.7
Su 3	250 ⁰ 08.3 17 ⁰ 18.2	264 ⁰ 34.2 17 ⁰ 22.4	279 ⁰ 00.2 17 ⁰ 26.4	293 ⁰ 26.2 17 ⁰ 30.4	307 ⁰ 52.2 17 ⁰ 34.2	322 ⁰ 18.3 17 ⁰ 37.9	336 ⁰ 44.4 17 ⁰ 41.5	351 ⁰ 10.5 17 ⁰ 44.9	5 ⁰ 36.7 17 ⁰ 51.5	20 ⁰ 02.8 17 ⁰ 51.5	34 ⁰ 29.0 17 ⁰ 54.6	+26.1 16.0 +3.6 58.7
Mo 4	251 ⁰ 06.3 18 ⁰ 27.5	265 ⁰ 33.1 18 ⁰ 28.7	280 ⁰ 00.0 18 ⁰ 29.9	294 ⁰ 26.8 18 ⁰ 30.9	308 ⁰ 53.8 18 ⁰ 31.9	323 ⁰ 20.8 18 ⁰ 32.7	337 ⁰ 47.8 18 ⁰ 33.4	352 ⁰ 14.8 18 ⁰ 34.0	6 ⁰ 42.0 18 ⁰ 34.5	21 ⁰ 09.1 18 ⁰ 34.9	35 ⁰ 36.3 18 ⁰ 35.2	+27.0 15.7 +0.8 57.7
Tu 5	252 ⁰ 30.6 18 ⁰ 26.4	266 ⁰ 58.7 18 ⁰ 25.0	281 ⁰ 26.8 18 ⁰ 23.4	295 ⁰ 55.0 18 ⁰ 21.8	310 ⁰ 23.2 18 ⁰ 20.1	324 ⁰ 51.5 18 ⁰ 18.3	339 ⁰ 19.8 18 ⁰ 16.4	353 ⁰ 48.2 18 ⁰ 14.3	8 ⁰ 16.6 18 ⁰ 12.2	22 ⁰ 45.1 18 ⁰ 10.0	37 ⁰ 13.7 18 ⁰ 07.7	+28.3 15.5 -1.9 56.8
We 6	254 ⁰ 29.4 17 ⁰ 22.2	268 ⁰ 59.0 17 ⁰ 18.2	283 ⁰ 28.6 17 ⁰ 14.4	297 ⁰ 58.2 17 ⁰ 10.5	312 ⁰ 27.9 17 ⁰ 06.4	326 ⁰ 57.7 17 ⁰ 02.3	341 ⁰ 27.5 16 ⁰ 58.2	355 ⁰ 57.4 16 ⁰ 53.9	10 ⁰ 27.4 16 ⁰ 49.6	24 ⁰ 57.4 16 ⁰ 45.1	39 ⁰ 27.5 16 ⁰ 40.6	+29.8 15.2 -4.1 55.9
Th 7	257 ⁰ 05.9 15 ⁰ 24.1	271 ⁰ 36.9 15 ⁰ 18.4	286 ⁰ 08.0 15 ⁰ 12.7	300 ⁰ 39.1 15 ⁰ 06.9	315 ⁰ 10.3 15 ⁰ 01.0	329 ⁰ 41.6 14 ⁰ 55.0	344 ⁰ 12.9 14 ⁰ 49.0	358 ⁰ 44.3 14 ⁰ 42.9	13 ⁰ 15.7 14 ⁰ 36.8	27 ⁰ 47.2 14 ⁰ 30.6	42 ⁰ 18.7 14 ⁰ 24.3	+31.3 15.1 -6.0 55.2
Fr 8	260 ⁰ 18.1 12 ⁰ 43.4	274 ⁰ 50.4 12 ⁰ 36.2	289 ⁰ 22.8 12 ⁰ 29.0	303 ⁰ 55.3 12 ⁰ 21.7	318 ⁰ 27.8 12 ⁰ 14.4	333 ⁰ 00.4 12 ⁰ 07.0	347 ⁰ 33.0 11 ⁰ 59.6	361 ⁰ 57.4 11 ⁰ 52.1	16 ⁰ 38.3 11 ⁰ 44.6	31 ⁰ 11.0 11 ⁰ 37.0	45 ⁰ 43.8 11 ⁰ 29.4	+32.6 14.9 -7.4 54.6
Sa 9	264 ⁰ 00.4 9 ⁰ 30.1	278 ⁰ 33.8 9 ⁰ 21.9	293 ⁰ 07.2 9 ⁰ 13.5	307 ⁰ 40.7 9 ⁰ 05.2	322 ⁰ 14.2 8 ⁰ 56.8	336 ⁰ 47.8 8 ⁰ 48.4	351 ⁰ 21.4 8 ⁰ 40.0	5 ⁰ 55.0 8 ⁰ 31.5	20 ⁰ 28.6 8 ⁰ 23.0	35 ⁰ 02.3 8 ⁰ 14.5	49 ⁰ 36.6 8 ⁰ 05.9	+33.6 14.8 -8.4 54.3
Su 10	268 ⁰ 04.8 5 ⁰ 54.0	282 ⁰ 38.9 5 ⁰ 45.0	297 ⁰ 13.0 5 ⁰ 35.9	311 ⁰ 47.1 5 ⁰ 26.9	326 ⁰ 21.3 5 ⁰ 17.9	340 ⁰ 55.5 5 ⁰ 08.8	355 ⁰ 29.7 4 ⁰ 59.7	10 ⁰ 30.5 4 ⁰ 50.6	24 ⁰ 38.1 4 ⁰ 41.4	39 ⁰ 12.4 4 ⁰ 32.3	53 ⁰ 46.6 4 ⁰ 23.1	+34.2 14.7 -9.1 54.0
Mo 11	272 ⁰ 22.2 2 ⁰ 03.9	286 ⁰ 56.4 1 ⁰ 54.5	301 ⁰ 30.8 1 ⁰ 45.1	316 ⁰ 05.3 1 ⁰ 35.7	330 ⁰ 39.3 1 ⁰ 26.3	345 ⁰ 14.2 1 ⁰ 16.9	359 ⁰ 48.6 1 ⁰ 07.5	14 ⁰ 23.0 0 ⁰ 58.1	28 ⁰ 57.5 0 ⁰ 48.7	43 ⁰ 31.9 0 ⁰ 39.3	58 ⁰ 06.4 0 ⁰ 29.9	+34.4 14.7 -9.4 53.9
Tu 12	276 ⁰ 42.6 -1 ⁰ 51.4	291 ⁰ 16.9 -2 ⁰ 00.8	305 ⁰ 51.3 -2 ⁰ 10.2	320 ⁰ 25.6 -2 ⁰ 19.6	335 ⁰ 00.0 -2 ⁰ 28.9	349 ⁰ 34.3 -2 ⁰ 38.3	4 ⁰ 08.6 -2 ⁰ 47.7	18 ⁰ 42.9 -2 ⁰ 57.0	33 ⁰ 17.2 -3 ⁰ 06.3	27 ⁰ 47.1 -3 ⁰ 15.7	62 ⁰ 25.7 -3 ⁰ 25.0	+34.3 14.7 -9.4 54.0
We 13	280 ⁰ 57.3 -5 ⁰ 42.9	325 ⁰ 31.3 -5 ⁰ 52.0	310 ⁰ 05.2 -6 ⁰ 01.0	324 ⁰ 39.1 -6 ⁰ 10.0	339 ⁰ 12.9 -6 ⁰ 19.4	353 ⁰ 46.8 -6 ⁰ 28.0	8 ⁰ 20.6 -6 ⁰ 36.9	22 ⁰ 54.4 -6 ⁰ 45.8	37 ⁰ 28.2 -6 ⁰ 54.7	52 ⁰ 01.9 -7 ⁰ 03.6	66 ⁰ 35.5 -7 ⁰ 12.4	+33.8 14.8 -9.0 54.1
Th 14	284 ⁰ 57.8 -9 ⁰ 21.4	299 ⁰ 31.0 -9 ⁰ 29.9	314 ⁰ 04.2 -9 ⁰ 38.0	328 ⁰ 37.3 -9 ⁰ 46.2	343 ⁰ 10.3 -9 ⁰ 54.5	357 ⁰ 43.5 -10 ⁰ 02.6	12 ⁰ 16.5 -10 ⁰ 10.8	26 ⁰ 49.5 -10 ⁰ 26.9	41 ⁰ 22.5 -10 ⁰ 33.8	55 ⁰ 55.4 -10 ⁰ 44.9	70 ⁰ 28.4 -10 ⁰ 42.9	+33.1 14.8 -8.2 54.3
Fr 15	288 ⁰ 37.0 -12 ⁰ 36.8	303 ⁰ 09.3 -12 ⁰ 44.0	317 ⁰ 41.5 -12 ⁰ 51.2	332 ⁰ 13.6 -12 ⁰ 58.3	346 ⁰ 45.6 -13 ⁰ 05.3	361 ⁰ 17.8 -13 ⁰ 12.3	15 ⁰ 49.9 -13 ⁰ 19.2	30 ⁰ 21.9 -13 ⁰ 26.6	44 ⁰ 58.2 -13 ⁰ 32.8	59 ⁰ 25.7 -13 ⁰ 39.9	73 ⁰ 57.6 -13 ⁰ 46.3	+32.1 14.9 -6.9 54.6
Sa 16	291 ⁰ 50.3 -15 ⁰ 19.0	306 ⁰ 21.4 -15 ⁰ 24.7	320 ⁰ 52.5 -15 ⁰ 30.3	335 ⁰ 23.6 -15 ⁰ 35.8	349 ⁰ 54.6 -15 ⁰ 41.2	4 ⁰ 25.6 -15 ⁰ 46.6	18 ⁰ 56.5 -15 ⁰ 51.9	33 ⁰ 27.4 -15 ⁰ 57.1	47 ⁰ 58.2 -16 ⁰ 02.2	62 ⁰ 29.0 -16 ⁰ 07.3	76 ⁰ 59.8 -16 ⁰ 12.3	+31.0 15.0 -5.5 55.0
Su 17	294 ⁰ 35.8 -17 ⁰ 17.9	309 ⁰ 05.8 -17 ⁰ 21.6	323 ⁰ 35.9 -17 ⁰ 25.2	338 ⁰ 05.8 -17 ⁰ 28.8	352 ⁰ 35.8 -17 ⁰ 32.2	7 ⁰ 05.7 -17 ⁰ 35.6	21 ⁰ 35.5 -17 ⁰ 38.9	36 ⁰ 05.3 -17 ⁰ 42.1	50 ⁰ 35.1 -17 ⁰ 45.2	65 ⁰ 04.8 -17 ⁰ 48.2	79 ⁰ 34.5 -17 ⁰ 51.2	+29.9 15.1 -3.3 55.5
Mo 18	296 ⁰ 55.4 -18 ⁰ 24.2	311 ⁰ 24.5 -18 ⁰ 25.7	325 ⁰ 53.6 -18 ⁰ 27.0	340 ⁰ 22.6 -18 ⁰ 28.3	354 ⁰ 51.6 -18 ⁰ 29.4	9 ⁰ 20.6 -18 ⁰ 30.5	23 ⁰ 49.6 -18 ⁰ 31.5	38 ⁰ 18.5 -18 ⁰ 32.4	52 ⁰ 47.4 -18 ⁰ 33.1	67 ⁰ 16.2 -18 ⁰ 34.4	81 ⁰ 45.0 -18 ⁰ 34.8	+29.0 15.3 -1.0 56.0
Tu 19	311 ⁰ 24.5 -18 ⁰ 25.7	325 ⁰ 53.6 -18 ⁰ 27.0	340 ⁰ 22.6 -18 ⁰ 28.3	354 ⁰ 51.6 -18 ⁰ 29.4	9 ⁰ 20.6 -18 ⁰ 30.5	23 ⁰ 49.6 -18 ⁰ 31.5	38 ⁰ 18.5 -18 ⁰ 32.4	52 ⁰ 47.4 -18 ⁰ 33.1	67 ⁰ 16.2 -18 ⁰ 34.4	81 ⁰ 45.0 -18 ⁰ 34.8	96 ⁰ 13.8 -18 ⁰ 34.8	+28.9 15.3 -0.9 56.0
We 20	313 ⁰ 22.7 -18 ⁰ 29.9	327 ⁰ 51.1 -18 ⁰ 28.8	342 ⁰ 19.5 -18 ⁰ 27.6	356 ⁰ 47.8 -18 ⁰ 26.2	11 ⁰ 16.2 -18 ⁰ 24.8	25 ⁰ 44.5 -18 ⁰ 23.2	40 ⁰ 12.8 -18 ⁰ 21.6	54 ⁰ 41.1 -18 ⁰ 19.8	69 ⁰ 09.3 -18 ⁰ 18.0	83 ⁰ 37.6 -18 ⁰ 16.0	98 ⁰ 05.8 -18 ⁰ 13.9	+28.3 15.5 +1.6 56.7
Th 21	315 ⁰ 07.7 -17 ⁰ 30.6	329 ⁰ 35.7 -17 ⁰ 26.9	344 ⁰ 03.8 -17 ⁰ 23.1	358 ⁰ 31.8 -17 ⁰ 19.2	12 ⁰ 59.8 -17 ⁰ 15.1	27 ⁰ 27.8 -17 ⁰ 11.0	41 ⁰ 55.8 -17 ⁰ 06.8	56 ⁰ 23.8 -17 ⁰ 02.5	70 ⁰ 51.8 -16 ⁰ 58.0	85 ⁰ 19.7 -16 ⁰ 53.5	99 ⁰ 47.7 -16 ⁰ 48.9	+28.0 15.6 +4.2 57.3
Fr 22	316 ⁰ 46.8 -15 ⁰ 27.6	331 ⁰ 14.7 -15 ⁰ 21.5	345 ⁰ 42.7 -15 ⁰ 15.2	0 ⁰ 10.6 -15 ⁰ 08.8	14 ⁰ 38.5 -15 ⁰ 02.3	29 ⁰ 06.4 -14 ⁰ 55.7	43 ⁰ 34.3 -14 ⁰ 49.1	58 ⁰ 02.3 -14 ⁰ 42.3	72 ⁰ 30.2 -14 ⁰ 35.5	86 ⁰ 58.1 -14 ⁰ 28.5	101 ⁰ 26.6 -14 ⁰ 21.5	+27.9 15.8 +6.6 58.1
Sa 23	318 ⁰ 24.9 -12 ⁰ 25.4	332 ⁰ 52.9 -12 ⁰ 17.0	347 ⁰ 20.8 -12 ⁰ 08.5	1 ⁰ 48.7 -11 ⁰ 59.9	16 ⁰ 16.7 -11 ⁰ 51.3	30 ⁰ 44.6 -11 ⁰ 42.5	45 ⁰ 12.6 -11 ⁰ 33.7	59 ⁰ 40.5 -11 ⁰ 24.8	74 ⁰ 08.4 -11 ⁰ 15.9	88 ⁰ 36.4 -11 ⁰ 06.8	103 ⁰ 04.3 -10 ⁰ 57.7	+27.9 16.0 +8.8 58.8
Su 24	326 ⁰ 03.3 -8 ⁰ 32.5	334 ⁰ 31.2 -8 ⁰ 22.3	348 ⁰ 59.1 -8 ⁰ 12.0	3 ⁰ 27.0 -7 ⁰ 01.7	17 ⁰ 54.9 -7 ⁰ 51.3	32 ⁰ 22.8 -7 ⁰ 40.9	46 ⁰ 50.7 -7 ⁰ 30.4	61 ⁰ 18.6 -7 ⁰ 19.9	75 ⁰ 46.5 -7 ⁰ 09.2	90 ⁰ 14.3 -6 ⁰ 58.6	104 ⁰ 42.2 -6 ⁰ 47.9	+27.9 16.2 +10.5 59.6
Mo 25	321 ⁰ 39.2 -4 ⁰ 01.7	336 ⁰ 06.9 -3 ⁰ 50.4	350 ⁰ 34.6 -3 ⁰ 38.9	5 ⁰ 02.3 -3 ⁰ 27.5	19 ⁰ 30.0 -3 ⁰ 16.0	33 ⁰ 57.7 -3 ⁰ 04.5	48 ⁰ 25.3 -2 ⁰ 52.9	62 ⁰ 53.0 -2 ⁰ 41.4	77 ⁰ 20.6 -2 ⁰ 29.8	91 ⁰ 48.2 -2 ⁰ 18.1	106 ⁰ 15.8 -2 ⁰ 06.5	+27.7 16.4 +11.5 60.2
Tu 26	323 ⁰ 07.4 0 ⁰ 50.0	337 ⁰ 34.7 1 ⁰ 01.8	352 ⁰ 01.9 1 ⁰ 13.6	6 ⁰ 29.1 1 ⁰ 25.5	20 ⁰ 56.3 1 ⁰ 37.3	35 ⁰ 23.5 1 ⁰ 49.1	49 ⁰ 50.7 2 ⁰ 00.9	64 ⁰ 17.8 2 ⁰ 12.7	78 ⁰ 44.9 2 ⁰ 24.5	93 ⁰ 12.0 2 ⁰ 36.3	107 ⁰ 39.3 2 ⁰ 48.1	+27.2 16.5 +11.8 60.6
We 27	324 ⁰ 21.7 5 ⁰ 42.3	338 ⁰ 48.3 5 ⁰ 53.7	353 ⁰ 14.9 6 ⁰ 05.0	7 ⁰ 41.4 6 ⁰ 16.3	22 ⁰ 08.0 6 ⁰ 27.6	36 ⁰ 34.4 6 ⁰ 38.9	51 ⁰ 00.9 6 ⁰ 50.1	65 ⁰ 97.2 7 ⁰ 01.2	79 ⁰ 53.7 7 ⁰ 12.3	94 ⁰ 20.1 7 ⁰ 23.4	108 ⁰ 46.5 7 ⁰ 34.4	+26.5 16.6 +11.2 60.7
Th 28	325 ⁰ 18.0 10 ⁰ 12.7	339 ⁰ 43.9 10 ⁰ 22.8	354 ⁰ 09.7 10 ⁰ 32.8	8 ⁰ 35.5 10 ⁰ 42.7	23 ⁰ 01.3 10 ⁰ 52.5	37 ⁰ 27.1 11 ⁰ 02.2	51 ⁰ 52.8 11 ⁰ 11.9	66 ⁰ 18.5 11 ⁰ 21.5	80 ⁰ 44.2 11 ⁰ 31.0	95 ⁰ 09.4 11 ⁰ 40.4	109 ⁰ 35.4 11 ⁰ 49.8	+25.7 16.5 +9.7 60.6
Fr 29	325 ⁰ 57.1 13 ⁰ 59.4	340 ⁰ 22.3 14 ⁰ 07.3	354 ⁰ 47.6 14 ⁰ 15.1	9 ⁰ 12.9 14 ⁰ 22.8	23 ⁰ 38.1 14 ⁰ 30.1	38 ⁰ 03.3 14 ⁰ 37.8	52 ⁰ 28.5 14 ⁰ 45.2	66 ⁰ 53.7 14 ⁰ 59.6	81 ⁰ 18.9 15 ⁰ 06.7	95 ⁰ 44.1 15 ⁰ 16.7	110 ⁰ 09.3 15 ⁰ 13.6	+25.2 16.4 +7.4 60.2
Sa 30	326 ⁰ 26.2 16 ⁰ 44.4	340 ⁰ 51.3 16 ⁰ 49.6	355 ⁰ 16.4 16 ⁰ 54.6	9 ⁰ 41.6 16 ⁰ 59.5	24 ⁰ 06.7 17 ⁰ 04.3	38 ⁰ 31.9 17 ⁰ 08.9	52 ⁰ 57.1 17 ⁰ 13.5	67 ⁰ 22.3 17 ⁰ 17.9	81 ⁰ 47.5 17 ⁰ 22.2	96<		

SUN

May 2033

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Su 1	270°43.3	285°43.4	300°43.5	315°43.6	330°43.6	345°43.7	0°43.8	15°43.8	30°43.9	45°44.0	60°44.1	75°44.1	+0.1
	15°10.9	15°11.7	15°12.4	15°13.2	15°13.9	15°14.7	15°15.4	15°16.2	15°16.9	15°17.7	15°18.4	15°19.2	+0.8
Mo 2	270°45.0	285°45.1	300°45.2	315°45.2	330°45.3	345°45.3	0°45.4	15°45.5	30°45.5	45°45.6	60°45.7	75°45.7	+0.1
	15°28.9	15°29.6	15°30.4	15°31.1	15°31.8	15°32.6	15°33.3	15°34.1	15°34.8	15°35.5	15°36.3	15°37.0	+0.7
Tu 3	270°46.6	285°46.6	300°46.7	315°46.7	330°46.8	345°46.9	0°46.9	15°47.0	30°47.0	45°47.1	60°47.2	75°47.2	+0.1
	15°46.6	15°47.3	15°48.0	15°48.8	15°49.5	15°50.2	15°50.9	15°51.7	15°52.4	15°53.1	15°53.9	15°54.6	+0.7
We 4	270°48.0	285°48.0	300°48.1	315°48.1	330°48.2	345°48.2	0°48.3	15°48.3	30°48.4	45°48.5	60°48.5	75°48.6	+0.1
	16°04.0	16°04.7	16°05.4	16°06.1	16°06.9	16°07.6	16°08.3	16°09.0	16°09.7	16°10.4	16°11.2	16°11.9	+0.7
Th 5	270°49.2	285°49.3	300°49.3	315°49.4	330°49.4	345°49.5	0°49.5	15°49.6	30°49.6	45°49.7	60°49.7	75°49.8	+0.0
	16°21.1	16°21.8	16°22.6	16°23.3	16°24.0	16°24.7	16°25.4	16°26.1	16°26.8	16°27.5	16°28.2	16°28.9	+0.7
Fr 6	270°50.4	285°50.4	300°50.5	315°50.5	330°50.5	345°50.6	0°50.6	15°50.7	30°50.7	45°50.8	60°50.8	75°50.8	+0.0
	16°38.0	16°38.7	16°39.4	16°40.1	16°40.8	16°41.5	16°42.2	16°42.9	16°43.6	16°44.3	16°45.0	16°45.7	+0.7
Sa 7	270°51.4	285°51.4	300°51.4	315°51.5	330°51.5	345°51.6	0°51.6	15°51.6	30°51.7	45°51.7	60°51.7	75°51.8	+0.0
	16°54.6	16°55.3	16°56.0	16°56.7	16°57.4	16°58.0	16°58.7	16°59.4	17°00.1	17°00.8	17°01.4	17°02.1	+0.7
Su 8	270°52.2	285°52.3	300°52.3	315°52.3	330°52.4	345°52.4	0°52.4	15°52.4	30°52.5	45°52.5	60°52.5	75°52.6	+0.0
	17°10.9	17°11.6	17°12.3	17°13.0	17°13.6	17°14.3	17°15.0	17°15.6	17°16.3	17°17.0	17°17.6	17°18.3	+0.7
Mo 9	270°52.9	285°53.0	300°53.0	315°53.0	330°53.1	345°53.1	0°53.1	15°53.1	30°53.2	45°53.2	60°53.2	75°53.2	+0.0
	17°27.0	17°27.6	17°28.3	17°28.9	17°29.6	17°30.3	17°30.9	17°31.6	17°32.2	17°32.9	17°33.6	17°34.2	+0.7
Tu 10	270°53.5	285°53.6	300°53.6	315°53.6	330°53.6	345°53.6	0°53.7	15°53.7	30°53.7	45°53.7	60°53.7	75°53.8	+0.0
	17°42.7	17°43.3	17°44.0	17°44.6	17°45.3	17°45.9	17°46.6	17°47.2	17°47.9	17°48.5	17°49.2	17°49.8	+0.6
We 11	270°54.0	285°54.0	300°54.0	315°54.0	330°54.0	345°54.0	0°54.1	15°54.1	30°54.1	45°54.1	60°54.1	75°54.1	+0.0
	17°58.1	17°58.8	17°59.4	18°00.0	18°00.7	18°01.3	18°02.0	18°02.6	18°03.2	18°03.9	18°04.5	18°05.1	+0.6
Th 12	270°54.3	285°54.3	300°54.3	315°54.3	330°54.3	345°54.3	0°54.3	15°54.3	30°54.3	45°54.4	60°54.4	75°54.4	+0.0
	18°13.3	18°13.9	18°14.5	18°15.1	18°15.8	18°16.4	18°17.0	18°17.6	18°18.3	18°18.9	18°19.5	18°20.1	+0.6
Fr 13	270°54.4	285°54.4	300°54.4	315°54.5	330°54.5	345°54.5	0°54.5	15°54.5	30°54.5	45°54.5	60°54.5	75°54.5	+0.0
	18°28.1	18°28.7	18°29.3	18°29.9	18°30.5	18°31.2	18°31.8	18°32.4	18°33.0	18°33.6	18°34.2	18°34.8	+0.6
Sa 14	270°54.5	285°54.5	300°54.5	315°54.5	330°54.5	345°54.4	0°54.4	15°54.4	30°54.4	45°54.4	60°54.4	75°54.4	-0.0
	18°42.6	18°43.2	18°43.8	18°44.4	18°45.0	18°45.6	18°46.2	18°46.8	18°47.4	18°48.0	18°48.6	18°49.2	+0.6
Su 15	270°54.3	285°54.3	300°54.3	315°54.3	330°54.3	345°54.3	0°54.3	15°54.3	30°54.3	45°54.3	60°54.3	75°54.2	-0.0
	18°56.8	18°57.4	18°58.0	18°58.6	18°59.2	18°59.7	19°00.3	19°00.9	19°01.5	19°02.1	19°02.7	19°03.2	+0.6
Mo 16	270°54.1	285°54.1	300°54.0	315°54.0	330°54.0	345°54.0	0°54.0	15°54.0	30°54.0	45°53.9	60°53.9	75°53.9	-0.0
	19°10.7	19°11.3	19°11.9	19°12.4	19°13.0	19°13.6	19°14.1	19°14.7	19°15.3	19°15.8	19°16.4	19°17.0	+0.6
Tu 17	270°53.7	285°53.7	300°53.6	315°53.6	330°53.6	345°53.6	0°53.6	15°53.5	30°53.5	45°53.5	60°53.5	75°53.4	-0.0
	19°24.3	19°24.8	19°25.4	19°25.9	19°26.5	19°27.1	19°27.6	19°28.2	19°28.7	19°29.3	19°29.8	19°30.4	+0.6
We 18	270°53.1	285°53.1	300°53.1	315°53.0	330°53.0	345°53.0	0°53.0	15°52.9	30°52.9	45°52.9	60°52.9	75°52.8	-0.0
	19°37.5	19°38.0	19°38.6	19°39.1	19°39.7	19°40.2	19°40.8	19°41.3	19°41.8	19°42.4	19°42.9	19°43.4	+0.5
Th 19	270°52.4	285°52.4	300°52.4	315°52.3	330°52.3	345°52.3	0°52.2	15°52.2	30°52.2	45°52.1	60°52.1	75°52.1	-0.0
	19°50.4	19°50.9	19°51.4	19°52.0	19°52.5	19°53.0	19°53.6	19°54.1	19°54.6	19°55.1	19°55.7	19°56.2	+0.5
Fr 20	270°51.6	285°51.6	300°51.5	315°51.5	330°51.5	345°51.4	0°51.4	15°51.3	30°51.3	45°51.3	60°51.2	75°51.2	-0.0
	20°02.9	20°03.5	20°04.0	20°04.5	20°05.0	20°05.5	20°06.0	20°06.5	20°07.1	20°07.6	20°08.1	20°08.6	+0.5
Sa 21	270°50.6	285°50.6	300°50.6	315°50.5	330°50.5	345°50.4	0°50.4	15°50.3	30°50.3	45°50.2	60°50.2	75°50.2	-0.0
	20°15.2	20°15.7	20°16.2	20°16.7	20°17.2	20°17.7	20°18.2	20°18.7	20°19.2	20°19.7	20°20.1	20°20.6	+0.5
Su 22	270°49.5	285°49.5	300°49.4	315°49.4	330°49.3	345°49.3	0°49.2	15°49.2	30°49.1	45°49.1	60°49.0	75°49.0	-0.1
	20°27.0	20°27.5	20°28.0	20°28.5	20°29.0	20°29.5	20°29.9	20°30.4	20°30.9	20°31.4	20°31.9	20°32.4	+0.5
Mo 23	270°48.3	285°48.2	300°48.2	315°48.1	330°48.1	345°48.0	0°48.0	15°47.9	30°47.9	45°47.8	60°47.7	75°47.7	-0.1
	20°38.5	20°39.0	20°39.5	20°40.0	20°40.4	20°40.9	20°41.4	20°41.8	20°42.3	20°42.8	20°43.2	20°43.7	+0.5
Tu 24	270°46.9	285°46.9	300°46.8	315°46.7	330°46.7	345°46.6	0°46.6	15°46.5	30°46.4	45°46.4	60°46.3	75°46.3	-0.1
	20°49.7	20°50.2	20°50.6	20°51.1	20°51.5	20°52.0	20°52.4	20°52.9	20°53.4	20°53.8	20°54.3	20°54.7	+0.5
We 25	270°45.4	285°45.4	300°45.3	315°45.2	330°45.2	345°45.1	0°45.0	15°45.0	30°44.9	45°44.8	60°44.8	75°44.7	-0.1
	21°00.5	21°01.0	21°01.4	21°01.8	21°02.2	21°02.7	21°03.2	21°03.6	21°04.1	21°04.5	21°04.9	21°05.3	+0.4
Th 26	270°43.8	285°43.7	300°43.7	315°43.6	330°43.5	345°43.4	0°43.4	15°43.3	30°43.2	45°43.2	60°43.1	75°43.0	-0.1
	21°11.0	21°11.4	21°11.8	21°12.2	21°12.7	21°13.1	21°13.5	21°13.9	21°14.4	21°14.8	21°15.2	21°15.6	+0.4
Fr 27	270°42.0	285°42.0	300°41.9	315°41.8	330°41.7	345°41.7	0°41.6	15°41.5	30°41.4	45°41.4	60°41.3	75°41.2	-0.1
	21°21.0	21°21.5	21°21.9	21°22.3	21°22.7	21°23.1	21°23.5	21°23.9	21°24.3	21°24.7	21°25.1	21°25.5	+0.4
Sa 28	270°40.2	285°40.1	300°40.0	315°39.9	330°39.9	345°39.8	0°39.7	15°39.6	30°39.5	45°39.4	60°39.4	75°39.3	-0.1
	21°30.7	21°31.1	21°31.5	21°31.9	21°32.3	21°32.7	21°33.1	21°33.5	21°33.9	21°34.3	21°34.7	21°35.1	+0.4
Su 29	270°38.2	285°38.1	300°38.0	315°37.9	330°37.9	345°37.8	0°37.7	15°37.6	30°37.5	45°37.4	60°37.3	75°37.2	-0.1
	21°40.1	21°40.5	21°40.8	21°41.2	21°41.6	21°42.0	21°42.4	21°42.7	21°43.1	21°43.5	21°43.9	21°44.2	+0.4
Mo 30	270°36.1	285°36.0	300°35.9	315°35.8	330°35.7	345°35.7	0°35.6	15°35.5	30°35.4	45°35.3	60°35.2	75°35.1	-0.1
	21°49.1	21°49.4	21°49.8	21°50.1	21°50.5	21°50.9	21°51.2	21°51.6	21°51.9	21°52.3	21°52.7	21°53.0	+0.4
Tu 31	270°33.9	285°33.8	300°33.7	315°33.6	330°33.5	345°33.4	0°33.3	15°33.2	30°33.2	45°33.1	60°33.0	75°32.9	-0.1
	21°57.6	21°58.0	21°58.3	21°58.7	21°59.0	21°59.4	21°59.7	22°00.1	22°00.4	22°00.7	22°01.1	22°01.4	+0.3

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.8'

MOON

May 2033

	D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	Δ'/h SH
Su 1	240°25.8 18°01.6	254°51.2 18°04.5	269°16.7 18°07.2	283°42.2 18°09.8	298°07.7 18°12.3	312°33.3 18°14.7	326°58.8 18°17.0	341°24.5 18°19.1	355°50.1 18°21.1	10°15.8 18°23.0	24°41.5 18°24.8	+25.6 16.0 +2.3 58.8	
	241°12.1 18°37.2	255°38.5 18°37.1	270°04.9 18°36.9	284°31.4 18°36.5	298°58.0 18°36.1	313°24.6 18°35.5	327°51.3 18°34.9	342°18.0 18°34.1	356°44.8 18°33.2	11°11.6 18°32.2	25°38.5 18°31.1	+26.6 15.8 -0.6 57.9	
Tu 3	242°29.1 18°01.7	256°57.0 17°58.9	271°24.9 17°56.1	285°52.9 17°53.1	300°21.0 17°50.0	314°49.1 17°46.9	329°17.3 17°43.6	343°45.6 17°40.3	358°14.0 17°36.8	12°42.4 17°33.3	27°10.9 17°29.7	+28.2 15.5 -3.2 57.0	
We 4	244°26.4 16°24.7	258°55.9 16°19.7	273°25.6 16°14.7	287°55.3 16°09.5	302°25.1 16°04.3	316°55.0 15°59.0	331°24.9 15°53.6	345°54.9 15°48.2	0°25.0 15°42.7	14°55.1 15°37.1	29°25.3 15°31.4	+29.9 15.3 -5.3 56.1	
Th 5	247°06.4 13°58.3	261°37.6 13°51.6	276°08.9 13°44.8	290°40.3 13°38.0	305°11.7 13°31.1	319°43.2 13°24.2	334°14.8 13°17.2	348°46.4 13°10.1	3°18.1 13°03.0	17°49.8 12°55.8	32°21.6 12°48.6	+31.5 15.1 -7.0 55.4	
Fr 6	250°25.3 10°54.6	264°57.9 10°46.6	279°30.7 10°38.6	294°03.4 10°30.5	308°36.2 10°22.4	323°09.1 10°14.3	337°42.0 10°06.2	352°14.9 9°57.9	6°47.9 9°49.7	21°21.0 9°41.4	35°54.0 9°33.1	+32.9 14.9 -8.1 54.8	
Sa 7	254°15.1 7°24.5	268°48.8 7°15.7	283°22.6 7°06.8	297°56.3 6°58.0	312°30.1 6°49.1	327°03.9 6°40.2	341°37.8 6°31.3	356°11.7 6°22.3	10°45.6 6°13.3	25°19.5 6°04.3	39°53.5 5°55.3	+33.8 14.8 -8.9 54.4	
Su 8	258°25.7 3°37.7	273°00.0 3°28.4	287°34.3 3°19.1	302°08.6 3°09.8	316°43.0 3°00.5	331°17.3 2°51.2	345°51.7 2°41.8	0°26.0 2°32.5	15°00.4 2°23.1	29°34.8 2°13.7	44°09.2 2°04.3	+34.4 14.8 -9.3 54.1	
Mo 9	262°45.8 -0°17.0	277°20.3 -0°26.5	291°54.7 -0°35.9	306°29.2 -0°45.4	321°03.6 -0°54.8	335°38.0 -1°04.2	350°12.5 -1°13.7	4°46.9 -1°23.1	19°21.3 -1°32.5	33°55.7 -1°41.9	48°30.1 -1°51.3	+34.4 14.7 -9.4 54.1	
Tu 10	267°04.5 -4°11.5	281°38.7 -4°20.8	296°12.8 -4°30.0	310°47.0 -4°39.2	325°21.1 -4°48.4	339°55.2 -4°57.6	354°29.2 -5°06.8	9°03.3 -5°16.0	23°37.3 -5°25.1	38°11.3 -5°34.2	52°45.3 -5°43.3	+34.1 14.8 -9.2 54.1	
We 11	271°11.4 -9°57.0	285°44.9 -8°05.7	300°18.4 -8°14.4	314°51.8 -8°23.1	329°25.2 -8°31.7	343°58.6 -8°40.3	358°31.9 -8°48.8	13°05.2 -8°57.3	27°38.5 -9°05.8	42°11.7 -9°14.3	56°44.8 -9°22.7	+33.3 14.8 -8.6 54.4	
Th 12	274°57.6 -11°24.2	289°30.1 -11°31.9	304°02.6 -11°39.7	318°35.0 -11°47.3	333°07.4 -11°54.9	347°39.7 -12°02.5	0°12.0 -12°10.0	16°44.3 -12°17.5	31°16.5 -12°24.9	45°48.6 -12°32.3	60°20.7 -12°39.6	+32.3 14.9 -7.5 54.7	
Fr 13	278°16.5 -14°22.6	292°47.8 -14°29.0	307°19.1 -14°35.3	321°50.3 -14°41.6	336°21.5 -14°47.8	350°52.6 -14°53.9	5°23.7 -14°59.9	19°54.7 -15°05.9	34°25.7 -15°11.9	48°56.6 -15°17.7	63°27.5 -15°23.5	+31.1 15.0 -6.1 55.1	
Sa 14	281°04.8 -16°41.4	295°34.9 -16°46.6	310°04.9 -16°50.5	324°34.9 -16°54.9	339°04.9 -16°59.2	353°34.8 -17°03.5	8°04.6 -17°07.6	22°34.6 -17°11.7	37°04.2 -17°15.7	51°34.0 -17°19.6	66°03.6 -17°23.5	+29.9 15.1 -4.2 55.5	
Su 15	283°23.7 -18°10.1	297°52.8 -18°12.5	312°50.7 -18°14.8	326°50.7 -18°17.0	341°19.6 -18°19.1	355°48.5 -18°21.1	10°17.3 -18°23.0	24°46.1 -18°24.8	39°14.9 -18°26.6	53°43.6 -18°28.1	68°12.3 -18°29.6	+28.9 15.3 -1.9 56.0	
Mo 16	286°19.4 -18°40.1	299°47.6 -18°40.0	314°15.9 -18°39.8	328°44.1 -18°39.5	343°12.3 -18°39.1	357°40.5 -18°38.6	12°08.6 -18°37.9	26°36.8 -18°37.2	41°04.9 -18°36.4	55°33.0 -18°35.4	70°01.1 -18°34.4	+28.2 15.4 +0.6 56.6	
Tu 17	287°01.0 -18°06.2	301°29.0 -18°03.5	315°56.9 -18°00.7	330°24.8 -17°57.8	344°52.7 -17°54.7	359°20.6 -17°51.6	13°48.5 -17°48.4	28°16.4 -17°45.0	42°44.4 -17°41.6	57°12.3 -17°38.1	71°40.2 -17°34.4	+27.9 15.6 +3.2 57.1	
We 18	288°39.1 -16°27.7	303°07.1 -16°22.4	317°35.0 -16°17.1	332°03.0 -16°11.7	346°31.0 -16°06.1	0°59.0 -16°00.5	15°27.1 -15°54.8	29°55.1 -15°49.8	44°23.1 -15°43.0	58°51.2 -15°37.0	73°19.2 -15°30.9	+28.0 15.7 +5.7 57.6	
Th 19	303°07.1 -16°22.4	317°35.0 -16°17.1	332°03.0 -16°11.7	346°31.0 -16°06.1	0°59.0 -16°00.5	15°27.1 -15°54.8	29°55.1 -15°49.8	44°23.1 -15°43.0	58°51.2 -15°37.0	73°19.2 -15°30.9	87°47.3 -15°24.7	+28.0 15.7 +5.8 57.6	
Fr 20	304°49.8 -13°41.1	319°18.1 -13°33.5	333°46.8 -13°25.9	348°14.7 -13°18.1	2°43.0 -13°10.2	17°11.3 -13°02.3	31°39.7 -12°54.3	46°08.0 -12°46.2	60°36.4 -12°38.1	75°04.4 -12°29.8	89°33.2 -12°21.5	+28.3 15.9 +8.0 58.2	
Sa 21	306°40.6 -10°08.1	321°09.2 -9°58.7	335°37.8 -9°49.2	350°06.4 -9°39.6	4°35.1 -9°30.0	19°03.7 -9°20.3	33°32.3 -9°10.6	48°01.0 -9°00.8	62°29.6 -8°50.9	76°58.8 -8°41.0	91°27.0 -8°31.0	+28.6 16.0 +9.7 58.7	
Su 22	308°37.6 -5°55.3	323°06.4 -5°44.5	337°35.1 -5°33.7	352°03.8 -5°22.9	6°32.6 -5°12.1	21°01.3 -5°01.2	35°30.0 -4°50.2	49°58.8 -4°39.3	64°27.5 -4°28.3	78°56.2 -4°17.2	93°24.9 -4°06.2	+28.7 16.1 +10.9 59.2	
Mo 23	310°34.8 -1°17.2	325°03.4 -1°05.7	339°31.9 -0°54.3	354°00.5 -0°42.9	8°29.0 -0°31.4	22°57.5 -0°19.9	37°26.0 -0°08.5	51°54.5 0°03.0	66°23.5 0°14.5	80°51.4 0°26.0	95°19.4 0°37.5	+28.5 16.2 +11.5 59.6	
Tu 24	312°23.7 3°29.4	326°51.7 3°40.8	341°19.8 3°52.1	355°47.8 4°03.5	10°15.7 4°14.8	24°43.7 4°26.1	39°11.6 4°37.4	53°39.5 4°48.6	68°07.4 4°59.8	82°35.2 5°11.0	97°03.0 5°22.2	+27.9 16.3 +11.6 59.3	
We 25	313°56.0 8°05.6	328°23.3 8°16.1	342°50.5 8°26.6	357°17.7 8°37.1	11°44.8 8°47.5	26°11.9 8°57.8	40°39.0 9°08.1	55°06.0 9°18.3	69°33.0 9°28.5	84°00.0 9°38.6	98°26.9 9°48.7	+27.1 16.3 +10.3 59.9	
Th 26	315°06.4 12°11.5	329°32.8 12°20.4	343°59.1 12°29.3	358°25.3 12°38.1	12°51.6 12°46.8	27°17.8 12°55.4	41°44.0 13°03.9	56°10.1 13°12.3	70°36.2 13°20.7	85°02.3 13°28.9	99°28.3 13°37.1	+26.2 16.3 +8.6 59.9	
Fr 27	315°55.4 15°28.2	330°21.1 15°34.8	344°46.6 15°41.3	359°12.2 15°47.7	13°37.7 15°54.0	28°03.3 16°00.2	42°28.8 16°06.2	56°54.4 16°12.2	71°19.7 16°18.1	85°45.2 16°23.8	100°10.6 16°29.4	+25.5 16.2 +6.1 59.5	
Sa 28	316°31.2 17°40.2	330°56.6 17°40.2	345°22.0 17°42.7	359°47.3 17°51.2	14°12.7 17°54.7	28°38.1 17°58.0	43°03.4 18°01.2	57°28.8 18°04.2	71°54.2 18°07.2	86°19.6 18°10.0	100°45.1 18°12.7	+25.4 16.1 +3.2 59.0	
Su 29	317°08.8 18°38.9	331°34.6 18°39.7	346°00.4 18°40.4	0°26.2 18°40.9	14°52.1 18°41.7	29°18.0 18°41.8	43°44.0 18°41.8	58°10.0 18°41.9	72°36.0 18°41.9	87°02.1 18°41.7	101°28.2 18°41.5	+25.9 15.9 +0.3 58.3	
Mo 30	318°05.6 18°23.7	332°32.5 18°21.7	346°59.5 18°19.5	1°26.5 18°17.2	15°53.6 18°14.8	30°20.7 18°12.3	44°47.9 18°09.8	59°15.2 18°07.1	73°42.5 18°04.3	88°09.9 18°01.4	102°37.3 17°58.4	+27.2 15.7 -2.5 57.5	
Tu 31	319°36.7 17°01.7	334°05.2 16°57.2	348°33.7 16°52.6	3°02.4 16°47.9	17°31.1 16°43.1	31°59.8 16°38.2	46°28.7 16°33.3	60°57.6 16°28.3	75°26.6 16°23.2	89°55.6 16°18.0	104°24.7 16°12.7	+28.8 15.5 -4.9 56.7	

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 6 06h45 — FM: 14 10h42 — LQ: 21 18h29 — NM: 28 11h36

SUN

June 2033

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
We 1	270°31.6 22°05.8	285°31.5 22°06.2	300°31.4 22°06.5	315°31.3 22°06.8	330°31.2 22°07.2	345°31.1 22°07.5	6°31.0 22°07.8	15°30.9 22°08.1	30°30.8 22°08.5	45°30.7 22°08.8	60°30.6 22°09.1	75°30.5 22°09.5	-0.1 +0.3
Th 2	270°29.2 22°13.6	285°29.1 22°14.0	300°29.0 22°14.3	315°28.9 22°14.6	330°28.8 22°14.9	345°28.7 22°15.2	6°28.6 22°15.5	15°28.5 22°15.8	30°28.4 22°16.2	45°28.3 22°16.5	60°28.2 22°16.8	75°28.1 22°17.1	-0.1 +0.3
Fr 3	270°26.8 22°21.1	285°26.6 22°21.4	300°26.5 22°21.7	315°26.4 22°22.0	330°26.3 22°22.3	345°26.2 22°22.6	6°26.1 22°22.9	15°26.0 22°23.2	30°25.9 22°23.7	45°25.8 22°24.2	60°25.7 22°24.0	75°25.6 22°24.3	-0.1 +0.3
Sa 4	270°24.2 22°28.1	285°24.1 22°28.4	300°24.0 22°28.7	315°23.9 22°28.9	330°23.8 22°29.2	345°23.6 22°29.5	6°23.5 22°29.8	15°23.4 22°30.1	30°23.3 22°30.3	45°23.2 22°30.6	60°23.1 22°30.9	75°23.0 22°31.2	-0.1 +0.3
Su 5	270°21.6 22°34.7	285°21.4 22°35.0	300°21.3 22°35.3	315°21.2 22°35.5	330°21.1 22°35.8	345°21.0 22°36.1	6°20.9 22°36.3	15°20.8 22°36.6	30°20.7 22°36.9	45°20.5 22°37.1	60°20.4 22°37.4	75°20.3 22°37.6	-0.1 +0.3
Mo 6	270°18.8 22°41.0	285°18.7 22°41.2	300°18.6 22°41.5	315°18.5 22°41.7	330°18.4 22°42.0	345°18.3 22°42.2	6°18.1 22°42.5	15°18.0 22°42.7	30°17.9 22°43.0	45°17.8 22°43.2	60°17.7 22°43.5	75°17.6 22°43.7	-0.1 +0.2
Tu 7	270°16.1 22°46.8	285°15.9 22°47.1	300°15.8 22°47.3	315°15.7 22°47.5	330°15.6 22°47.8	345°15.5 22°48.0	6°15.3 22°48.2	15°15.2 22°48.4	30°15.1 22°48.7	45°15.0 22°48.9	60°14.9 22°49.1	75°14.8 22°49.4	-0.1 +0.2
We 8	270°13.2 22°52.3	285°13.1 22°52.5	300°13.0 22°52.7	315°12.8 22°52.9	330°12.7 22°53.1	345°12.6 22°53.3	6°12.5 22°53.6	15°12.4 22°53.8	30°12.4 22°54.0	45°12.1 22°54.2	60°12.0 22°54.4	75°11.9 22°54.6	-0.1 +0.2
Th 9	270°10.3 22°57.3	285°10.2 22°57.5	300°10.0 22°57.7	315°09.9 22°57.9	330°09.8 22°58.1	345°09.7 22°58.3	6°09.6 22°58.5	15°09.4 22°58.7	30°09.3 22°58.9	45°09.2 22°59.1	60°09.1 22°59.3	75°08.9 22°59.5	-0.1 +0.2
Fr 10	270°07.3 23°01.9	285°07.2 23°02.1	300°07.1 23°02.3	315°07.0 23°02.5	330°06.8 23°02.7	345°06.7 23°02.9	6°06.6 23°03.0	15°06.5 23°03.2	30°06.3 23°03.4	45°06.2 23°03.6	60°06.1 23°03.8	75°05.9 23°03.9	-0.1 +0.2
Sa 11	270°04.3 23°06.2	285°04.2 23°06.3	300°04.1 23°06.5	315°03.9 23°06.7	330°03.8 23°06.8	345°03.7 23°07.0	6°03.5 23°07.2	15°03.4 23°07.3	30°03.3 23°07.5	45°03.2 23°07.7	60°03.0 23°07.8	75°02.9 23°08.0	-0.1 +0.2
Su 12	270°01.2 23°10.0	285°01.1 23°10.3	300°01.0 23°10.3	315°00.9 23°10.4	330°00.7 23°10.6	345°00.6 23°10.7	6°00.5 23°10.9	15°00.3 23°11.1	30°00.2 23°11.2	45°00.1 23°11.3	60°00.0 23°11.5	74°59.8 23°11.6	-0.1 +0.1
Mo 13	269°58.1 23°13.4	284°58.0 23°13.5	299°57.9 23°13.7	314°57.7 23°13.8	329°57.6 23°13.9	344°57.5 23°14.1	359°57.4 23°14.2	14°57.2 23°14.3	29°57.1 23°14.5	44°57.0 23°14.6	59°56.8 23°14.7	74°56.7 23°14.8	-0.1 +0.1
Tu 14	269°55.0 23°16.4	284°54.9 23°16.5	299°54.7 23°16.7	314°54.6 23°16.8	329°54.5 23°16.9	344°54.3 23°17.0	359°54.2 23°17.1	14°54.1 23°17.2	29°53.9 23°17.3	44°53.8 23°17.4	59°53.7 23°17.6	74°53.5 23°17.7	-0.1 +0.1
We 15	269°51.8 23°19.0	284°51.7 23°19.1	299°51.5 23°19.2	314°51.4 23°19.3	329°51.3 23°19.4	344°51.1 23°19.5	359°51.0 23°19.6	14°50.9 23°19.7	29°50.7 23°19.8	44°50.6 23°19.9	59°50.5 23°20.0	74°50.3 23°20.1	-0.1 +0.1
Th 16	269°48.6 23°21.2	284°48.5 23°21.3	299°48.3 23°21.4	314°48.2 23°21.4	329°48.1 23°21.5	344°47.9 23°21.6	359°47.8 23°21.7	14°47.7 23°21.7	29°47.5 23°21.8	44°47.4 23°21.9	59°47.3 23°22.0	74°47.1 23°22.1	-0.1 +0.1
Fr 17	269°45.4 23°23.0	284°45.2 23°23.0	299°45.1 23°23.1	314°45.0 23°23.2	329°44.8 23°23.2	344°44.7 23°23.3	359°44.6 23°23.4	14°44.4 23°23.4	29°44.3 23°23.5	44°44.2 23°23.5	59°44.0 23°23.6	74°43.9 23°23.6	-0.1 +0.1
Sa 18	269°42.1 23°24.3	284°42.0 23°24.4	299°41.9 23°24.4	314°41.7 23°24.5	329°41.6 23°24.5	344°41.4 23°24.6	359°41.3 23°24.6	14°41.2 23°24.7	29°41.0 23°24.7	44°40.9 23°24.7	59°40.8 23°24.8	74°40.6 23°24.8	-0.1 +0.0
Su 19	269°38.9 23°25.3	284°38.7 23°25.3	299°38.6 23°25.3	314°38.5 23°25.4	329°38.3 23°25.4	344°38.2 23°25.4	359°38.0 23°25.5	14°37.9 23°25.5	29°37.8 23°25.5	44°37.6 23°25.5	59°37.5 23°25.6	74°37.4 23°25.6	-0.1 +0.0
Mo 20	269°35.6 23°25.8	284°35.5 23°25.8	299°35.3 23°25.8	314°35.2 23°25.8	329°35.0 23°25.9	344°34.9 23°25.9	359°34.8 23°25.9	14°34.6 23°25.9	29°34.5 23°25.9	44°34.4 23°25.9	59°34.2 23°25.9	74°34.1 23°25.9	-0.1 +0.0
Tu 21	269°32.3 23°25.9	284°32.2 23°25.9	299°32.1 23°25.9	314°31.9 23°25.9	329°31.8 23°25.9	344°31.6 23°25.9	359°31.5 23°25.9	14°31.4 23°25.9	29°31.2 23°25.9	44°31.1 23°25.9	59°31.0 23°25.9	74°30.8 23°25.8	-0.1 -0.0
We 22	269°29.1 23°25.6	284°28.9 23°25.6	299°28.8 23°25.6	314°28.6 23°25.6	329°28.5 23°25.5	344°28.4 23°25.5	359°28.2 23°25.5	14°28.2 23°25.5	29°28.0 23°25.5	44°27.8 23°25.4	59°27.7 23°25.4	74°27.6 23°25.4	-0.1 -0.0
Th 23	269°25.8 23°24.9	284°25.7 23°24.9	299°25.5 23°24.8	314°25.4 23°24.8	329°25.3 23°24.8	344°25.1 23°24.7	359°25.0 23°24.7	14°24.8 23°24.7	29°24.6 23°24.7	44°24.2 23°24.6	59°24.4 23°24.6	74°24.3 23°24.5	-0.1 -0.0
Fr 24	269°22.6 23°23.8	284°22.4 23°23.8	299°22.3 23°23.7	314°22.2 23°23.6	329°22.0 23°23.6	344°21.9 23°23.5	359°21.7 23°23.5	14°21.6 23°23.4	29°21.5 23°23.3	44°21.3 23°23.3	59°21.2 23°23.2	74°21.1 23°23.2	-0.1 -0.1
Sa 25	269°19.3 23°22.3	284°19.2 23°22.2	299°19.1 23°22.1	314°18.9 23°22.1	329°18.8 23°22.0	344°18.7 23°21.9	359°18.5 23°21.8	14°18.4 23°21.7	29°18.3 23°21.7	44°18.3 23°21.6	59°18.1 23°21.5	74°17.9 23°21.4	-0.1 -0.1
Su 26	269°16.2 23°20.3	284°16.0 23°20.2	299°15.9 23°20.1	314°15.8 23°20.1	329°15.6 23°20.0	344°15.5 23°19.9	359°15.4 23°19.8	14°15.2 23°19.7	29°15.1 23°19.7	44°15.0 23°19.6	59°14.8 23°19.5	74°14.7 23°19.3	-0.1 -0.1
Mo 27	269°13.0 23°18.0	284°12.9 23°17.9	299°12.7 23°17.8	314°12.6 23°17.7	329°12.5 23°17.5	344°12.4 23°17.4	359°12.2 23°17.3	14°12.1 23°17.2	29°12.0 23°17.1	44°11.8 23°17.0	59°11.7 23°16.9	74°11.6 23°16.8	-0.1 -0.1
Tu 28	269°09.9 23°15.2	284°09.8 23°15.1	299°09.6 23°15.0	314°09.5 23°14.8	329°09.4 23°14.7	344°09.3 23°14.6	359°09.1 23°14.5	14°09.0 23°14.3	29°08.8 23°14.2	44°08.8 23°14.1	59°08.6 23°13.9	74°08.5 23°13.8	-0.1 -0.1
We 29	269°06.9 23°12.0	284°06.7 23°11.9	299°06.6 23°11.8	314°06.5 23°11.6	329°06.3 23°11.5	344°06.2 23°11.3	359°06.1 23°11.2	14°06.0 23°11.0	29°05.8 23°10.9	44°05.7 23°10.8	59°05.6 23°10.6	74°05.5 23°10.5	-0.1 -0.1
Th 30	269°03.9 23°08.5	284°03.7 23°08.3	299°03.6 23°08.2	314°03.5 23°08.0	329°03.4 23°07.8	344°03.2 23°07.7	359°03.1 23°07.5	14°03.0 23°07.3	29°02.9 23°07.2	44°02.8 23°07.0	59°02.6 23°06.9	74°02.5 23°06.7	-0.1 -0.2

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

June 2033

	D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ'/h	SH
We 1	234°49.9 15°21.7	249°19.8 15°15.7	263°49.6 15°09.6	278°19.6 15°03.4	292°49.6 14°57.2	307°19.7 14°50.9	321°49.9 14°44.5	336°20.1 14°38.0	350°50.4 14°31.5	5°20.8 14°24.9	19°51.2 14°18.3	+30.1	15.3	
	237°35.8 12°31.5	252°07.3 12°23.9	266°38.8 12°16.3	281°10.4 12°08.6	295°42.1 12°00.9	310°13.8 11°53.2	324°45.6 11°45.4	339°17.5 11°37.5	353°49.4 11°29.6	8°21.3 11°21.7	22°53.3 11°13.7	+31.8	15.1	
Fr 3	241°00.2 9°09.1	255°33.1 9°00.5	270°06.0 8°51.8	284°39.0 8°43.2	299°12.0 8°34.5	313°45.0 8°25.8	328°18.1 8°17.0	342°51.2 8°08.2	357°24.4 7°59.4	11°57.6 7°50.6	26°30.9 7°41.7	+33.1	15.0	
Sa 4	244°54.4 5°25.9	259°28.3 5°16.7	274°02.1 5°07.5	288°36.0 4°58.2	303°10.0 4°48.9	317°43.9 4°39.7	332°17.9 4°30.4	346°51.9 4°21.1	1°25.9 4°11.7	15°59.9 4°02.4	30°34.0 3°53.1	+34.0	14.8	
Su 5	249°07.4 1°31.7	263°41.7 1°22.2	278°16.0 1°12.8	292°50.4 1°03.3	307°24.8 0°53.8	321°59.1 0°44.3	336°33.5 0°34.8	351°07.9 0°25.3	5°42.3 0°15.9	20°16.7 0°06.4	34°51.1 -0°03.1	+34.4	14.8	
Mo 6	253°27.1 -2°25.0	268°01.4 -2°34.4	282°35.8 -2°43.8	297°10.1 -2°53.2	311°44.4 -3°02.5	326°18.7 -3°11.9	340°53.1 -3°21.2	355°27.3 -3°30.6	10°01.6 -3°39.9	24°35.9 -3°49.2	39°10.1 -3°58.5	+34.3	14.8	
Tu 7	257°41.6 -6°16.0	272°15.5 -6°25.0	286°49.4 -6°34.0	301°23.3 -6°43.0	315°57.1 -6°51.9	330°30.9 -7°00.8	345°04.7 -7°09.7	359°38.4 -7°18.6	14°12.2 -7°27.4	28°45.8 -7°36.2	43°19.5 -7°45.0	+33.8	14.8	
We 8	261°40.0 -9°53.0	276°13.0 -10°01.2	290°46.0 -10°09.4	305°19.0 -10°17.6	319°51.9 -10°25.8	334°24.8 -10°33.9	348°57.6 -10°41.9	3 ⁰ 30.4 -10°49.9	18°03.2 -10°57.9	32°35.9 -11°05.8	47°08.5 -11°13.7	+32.9	14.9	
Th 9	265°12.6 -13°06.4	279°44.5 -13°13.5	294°16.3 -13°20.5	308°48.0 -13°27.5	323°19.7 -13°34.5	337°51.4 -13°41.3	352°23.0 -13°48.1	6°54.5 -14°01.6	21°26.0 -14°08.3	35°57.4 -14°18.3	50°28.8 -14°24.8	+31.6	15.0	
Fr 10	268°12.9 -15°45.7	282°43.4 -15°51.2	297°13.8 -15°56.7	311°44.2 -16°02.0	326°14.5 -16°07.3	340°44.8 -16°12.5	355°15.0 -16°17.6	9°45.1 -16°22.7	24°15.2 -16°27.7	38°45.3 -16°32.6	53°15.3 -16°37.4	+30.2	15.1	
Sa 11	270°38.6 -17°39.7	285°07.7 -17°43.2	299°36.8 -17°46.6	314°05.8 -17°49.8	328°34.8 -17°53.0	343°03.7 -17°56.1	357°32.6 -17°59.1	12°01.5 -18°02.0	26°30.2 -18°04.9	40°59.0 -18°07.6	57°11.7 -18°10.2	+28.9	15.3	
Su 12	272°32.9 -18°37.8	287°01.0 -18°38.9	301°29.0 -18°39.8	315°56.9 -18°40.6	330°24.9 -18°41.3	344°52.7 -18°42.0	359°20.6 -18°42.5	13°48.4 -18°43.2	28°16.2 -18°43.6	42°44.0 -18°43.4	57°11.7 -18°43.5	+27.9	15.5	
Mo 13	274°04.9 -18°32.0	288°32.3 -18°30.3	302°59.6 -18°28.6	317°27.0 -18°26.7	331°54.3 -18°24.8	346°21.7 -18°22.7	0°49.0 -18°20.5	15°16.3 -18°18.2	29°43.6 -18°15.9	44°10.9 -18°13.3	58°38.1 -18°10.7	+27.3	15.6	
Tu 14	275°26.9 -17°18.7	289°54.2 -17°14.4	304°21.4 -17°09.9	318°48.7 -17°05.4	333°16.0 -17°00.8	347°43.3 -16°56.0	2°10.6 -16°51.2	16°37.9 -16°46.3	31°05.2 -16°51.2	45°32.5 -16°56.1	59°59.8 -16°30.8	+27.3	15.8	
We 15	276°51.5 -15°00.4	291°19.0 -14°53.6	305°46.6 -14°46.7	320°14.2 -14°39.8	334°41.9 -14°32.7	349°09.5 -14°25.5	3 ⁰ 37.2 -14°18.3	18°04.9 -14°11.0	32°32.6 -14°03.6	47°00.3 -13°56.1	61°28.1 -13°48.5	+27.7	15.9	
Th 16	277°21.2 -11°45.1	292°55.2 -11°36.3	307°23.4 -11°27.4	323°43.2 -11°18.4	338°11.1 -11°09.4	353°47.9 -11°00.2	5°16.1 -10°51.1	19°44.4 -10°41.3	34°12.7 -10°32.5	48°14.0 -10°23.1	63°09.3 -10°13.7	+28.2	16.0	
Fr 17	280°16.5 -7°45.2	294°45.1 -7°34.9	309°13.8 -7°24.5	323°42.5 -7°14.1	338°11.1 -7°03.7	353°39.8 -6°53.2	7°08.6 -6°42.6	21°37.3 -6°32.1	36°06.0 -6°21.4	50°34.8 -6°10.8	65°03.6 -6°00.1	+28.7	16.1	
Sa 18	294°45.1 -7°34.9	309°13.8 -7°24.5	323°42.5 -7°14.1	338°11.1 -7°03.7	353°39.8 -6°53.2	7°08.6 -6°42.6	21°37.3 -6°32.1	36°06.0 -6°21.4	50°34.8 -6°10.8	65°03.6 -6°00.1	79°32.4 -5°49.4	+28.7	16.1	
Su 19	296°45.4 -3°04.6	311°14.3 -2°53.5	325°43.3 -2°42.3	340°12.2 -2°31.1	354°41.2 -2°19.9	9°10.1 -2°08.6	23°39.1 -1°57.3	38°08.0 -1°46.0	52°36.9 -1°34.8	67°05.9 -1°23.5	81°34.8 -1°12.2	+28.9	16.1	
Mo 20	298°48.6 1°37.9	313°17.4 1°49.2	327°46.3 2°00.5	342°15.1 2°11.8	356°43.9 2°23.1	11°12.7 2°34.4	25°41.5 2°45.6	40°10.3 2°56.9	54°39.0 3°08.1	69°07.8 3°19.3	83°36.5 3°30.5	+28.8	16.2	
Tu 21	300°45.3 6°15.4	315°13.7 6°26.2	329°42.7 6°36.9	344°10.4 6°47.6	358°38.7 6°58.2	13°07.0 7°08.8	27°35.3 7°19.3	42°03.3 7°29.8	56°31.8 7°40.3	71°00.0 7°50.7	85°28.2 8°01.1	+28.3	16.2	
We 22	302°27.1 10°30.4	316°54.8 10°39.9	331°22.4 10°49.3	345°50.0 10°58.7	0°17.6 11°07.9	14°45.1 11°17.2	29°12.6 11°26.3	43°40.1 11°35.4	58°07.6 11°44.1	72°35.0 11°53.3	87°02.4 12°02.2	+27.5	16.1	
Th 23	303°49.1 16°05.7	318°16.0 14°13.3	332°42.8 14°20.7	347°09.6 14°28.1	1°36.4 14°35.4	16°03.1 14°42.6	30°29.8 14°49.7	44°56.5 14°56.7	59°23.2 15°03.6	73°49.8 15°10.4	88°16.4 15°17.2	+26.7	16.1	
Fr 24	304°52.5 16°45.9	319°18.8 16°51.0	333°45.0 16°56.0	348°11.2 17°00.9	2°37.4 17°05.6	17°03.6 17°10.3	31°29.7 17°14.8	45°55.9 17°19.3	60°22.0 17°23.6	74°48.2 17°27.8	89°14.3 17°31.9	+26.2	16.0	
Sa 25	305°45.6 18°19.7	320°11.7 18°22.0	334°37.8 18°24.2	349°03.9 18°26.2	3°30.1 18°28.1	17°56.2 18°29.9	32°22.3 18°31.6	46°48.5 18°33.2	61°14.7 18°34.6	75°40.8 18°36.0	90°07.0 18°37.2	+26.1	15.9	
Su 26	306°42.6 18°41.7	321°09.2 18°41.1	335°35.8 18°40.4	350°02.4 18°39.6	4°29.1 18°38.6	18°55.9 18°37.5	33°22.6 18°36.4	47°49.4 18°35.1	62°16.3 18°33.7	76°43.1 18°32.2	91°10.1 18°30.6	+26.7	15.7	
Mo 27	307°59.3 17°53.7	322°27.0 17°50.4	336°54.7 17°47.0	351°22.5 17°43.5	5°50.4 17°40.0	20°18.3 17°36.3	34°46.2 17°32.5	49°14.2 17°28.7	63°42.3 17°24.7	78°10.4 17°20.6	92°38.6 17°16.5	+27.9	15.6	
Tu 28	309°48.7 16°03.7	324°17.8 15°58.2	338°47.1 15°52.5	353°16.4 15°46.9	7°45.7 15°41.1	22°15.1 15°35.3	36°44.6 15°29.3	51°14.2 15°23.4	65°43.8 15°17.3	80°13.5 15°11.2	94°43.2 15°04.9	+29.5	15.4	
We 29	312°17.1 13°23.7	326°47.9 13°16.5	341°18.7 13°09.2	355°49.6 13°01.8	10°20.5 12°54.9	24°51.5 12°46.9	39°22.6 12°39.4	53°53.7 12°31.8	68°24.9 12°24.2	82°56.2 12°16.5	97°27.5 12°08.7	+31.0	15.2	
Th 30	315°24.2 10°07.1	329°56.4 9°58.6	344°28.7 9°50.1	359°01.0 9°41.6	13°33.4 9°33.1	28°05.8 9°24.5	42°38.3 9°15.8	57°10.8 9°07.2	71°43.4 8°58.5	86°16.4 8°49.8	100°48.7 8°41.0	+32.5	15.0	

SUN

July 2033

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Fr 1	268°00.9	284°00.8	299°00.7	314°00.6	329°00.4	344°00.3	359°00.2	14°00.1	29°00.0	43°59.8	58°59.7	73°59.6	-0.1
	23°04.5	23°04.3	23°04.1	23°04.0	23°03.8	23°03.6	23°03.4	23°03.3	23°03.1	23°02.9	23°02.7	23°02.5	-0.2
Sa 2	268°58.1	283°58.0	298°57.8	313°57.7	328°57.6	343°57.5	358°57.4	13°57.3	28°57.1	43°57.0	58°56.9	73°56.8	-0.1
	23°00.1	22°59.9	22°59.7	22°59.5	22°59.3	22°59.1	22°58.9	22°58.7	22°58.6	22°58.4	22°58.2	22°58.0	-0.2
Su 3	268°55.3	283°55.2	298°55.1	313°54.9	328°54.8	343°54.7	358°54.6	13°54.5	28°54.4	43°54.3	58°54.2	73°54.0	-0.1
	22°55.3	22°55.1	22°54.9	22°54.7	22°54.5	22°54.3	22°54.1	22°53.8	22°53.6	22°53.4	22°53.2	22°53.0	-0.2
Mo 4	268°52.6	283°52.5	298°52.4	313°52.3	328°52.1	343°52.0	358°51.9	13°51.8	28°51.7	43°51.6	58°51.5	73°51.4	-0.1
	22°50.1	22°49.9	22°49.7	22°49.5	22°49.2	22°49.0	22°48.8	22°48.5	22°48.3	22°48.1	22°47.9	22°47.6	-0.2
Tu 5	268°50.0	283°49.9	298°49.8	313°49.7	328°49.5	343°49.4	358°49.3	13°49.2	28°49.1	43°49.0	58°48.9	73°48.8	-0.1
	22°44.6	22°44.3	22°44.1	22°43.8	22°43.6	22°43.3	22°43.1	22°42.9	22°42.6	22°42.4	22°42.1	22°41.9	-0.2
We 6	268°47.5	283°47.3	298°47.2	313°47.1	328°47.0	343°46.9	358°46.8	13°46.7	28°46.6	43°46.5	58°46.4	73°46.3	-0.1
	22°38.6	22°38.3	22°38.1	22°37.8	22°37.5	22°37.3	22°37.0	22°36.8	22°36.5	22°36.2	22°36.0	22°35.7	-0.3
Th 7	268°45.0	283°44.9	298°44.8	313°44.7	328°44.6	343°44.5	358°44.4	13°44.3	28°44.2	43°44.1	58°44.0	73°43.9	-0.1
	22°32.2	22°31.9	22°31.7	22°31.4	22°31.1	22°30.8	22°30.6	22°30.3	22°30.0	22°29.7	22°29.4	22°29.2	-0.3
Fr 8	268°42.7	283°42.6	298°42.5	313°42.4	328°42.3	343°42.2	358°42.1	13°42.0	28°41.9	43°41.8	58°41.7	73°41.7	-0.1
	22°25.5	22°25.2	22°24.9	22°24.6	22°24.3	22°24.0	22°23.7	22°23.4	22°23.1	22°22.8	22°22.5	22°22.2	-0.3
Sa 9	268°40.5	283°40.4	298°40.3	313°40.2	328°40.1	343°40.0	358°39.9	13°39.9	28°39.8	43°39.7	58°39.6	73°39.5	-0.1
	22°18.3	22°18.0	22°17.7	22°17.4	22°17.1	22°16.8	22°16.5	22°16.2	22°15.8	22°15.5	22°15.2	22°14.9	-0.3
Su 10	268°38.4	283°38.3	298°38.2	313°38.1	328°38.0	343°37.9	358°37.9	13°37.8	28°37.7	43°37.6	58°37.5	73°37.4	-0.1
	22°10.8	22°10.5	22°10.3	22°09.8	22°09.5	22°09.2	22°08.8	22°08.5	22°08.2	22°07.9	22°07.5	22°07.2	-0.3
Mo 11	268°36.4	283°36.3	298°36.2	313°36.1	328°36.0	343°36.0	358°35.9	13°35.8	28°35.7	43°35.6	58°35.5	73°35.5	-0.1
	22°02.9	22°02.5	22°02.2	22°01.9	22°01.5	22°01.2	22°00.8	22°00.5	22°00.2	22°59.8	22°59.5	22°59.1	-0.3
Tu 12	268°34.5	283°34.4	298°34.3	313°34.2	328°34.2	343°34.1	358°34.0	13°33.9	28°33.8	43°33.8	58°33.7	73°33.7	-0.1
	21°54.6	21°54.2	21°53.9	21°53.5	21°53.2	21°52.8	21°52.5	21°52.1	21°51.7	21°51.4	21°51.0	21°50.7	-0.4
We 13	268°32.7	283°32.6	298°32.6	313°32.5	328°32.4	343°32.4	358°32.3	13°32.2	28°32.1	43°32.1	58°32.0	73°31.9	-0.1
	21°45.9	21°45.6	21°45.2	21°44.8	21°44.4	21°44.1	21°43.7	21°43.3	21°43.0	21°42.6	21°42.2	21°41.8	-0.4
Th 14	268°31.1	283°31.0	298°30.9	313°30.9	328°30.8	343°30.7	358°30.7	13°30.6	28°30.5	43°30.5	58°30.4	73°30.3	-0.1
	21°36.9	21°36.5	21°36.1	21°35.7	21°35.3	21°35.0	21°34.6	21°34.2	21°33.8	21°33.4	21°33.0	21°32.6	-0.4
Fr 15	268°29.5	283°29.5	298°29.4	313°29.3	328°29.3	343°29.2	358°29.2	13°29.1	28°29.0	43°29.0	58°28.9	73°28.9	-0.1
	21°27.5	21°27.1	21°26.7	21°26.3	21°25.9	21°25.5	21°25.1	21°24.7	21°24.3	21°23.9	21°23.5	21°23.1	-0.4
Sa 16	268°28.1	283°28.1	298°28.0	313°28.0	328°27.9	343°27.8	358°27.8	13°27.7	28°27.7	43°27.6	58°27.6	73°27.5	-0.1
	21°17.7	21°17.3	21°16.9	21°16.5	21°16.1	21°15.6	21°15.2	21°14.8	21°14.4	21°14.0	21°13.5	21°13.1	-0.4
Su 17	268°26.8	283°26.8	298°26.7	313°26.7	328°26.6	343°26.6	358°26.5	13°26.5	28°26.4	43°26.4	58°26.3	73°26.3	-0.0
	21°07.6	21°07.2	21°06.7	21°06.3	21°05.9	21°05.4	21°05.0	21°04.6	21°04.2	21°03.7	21°03.3	21°02.8	-0.4
Mo 18	268°25.7	283°25.6	298°25.6	313°25.6	328°25.5	343°25.5	358°25.4	13°25.4	28°25.3	43°25.3	58°25.3	73°25.2	-0.0
	20°57.1	20°56.6	20°56.2	20°55.8	20°55.3	20°54.9	20°54.4	20°54.0	20°53.5	20°53.1	20°52.6	20°52.2	-0.4
Tu 19	268°24.7	283°24.6	298°24.6	313°24.6	328°24.5	343°24.5	358°24.4	13°24.4	28°24.4	43°24.3	58°24.3	73°24.2	-0.0
	20°46.2	20°45.8	20°45.3	20°44.9	20°44.4	20°43.9	20°43.5	20°43.0	20°42.6	20°42.1	20°41.6	20°41.2	-0.5
We 20	268°23.8	283°23.8	298°23.7	313°23.7	328°23.6	343°23.6	358°23.6	13°23.6	28°23.5	43°23.5	58°23.5	73°23.4	-0.0
	20°35.1	20°34.6	20°34.1	20°33.6	20°33.2	20°32.7	20°32.2	20°31.7	20°31.2	20°30.8	20°30.3	20°29.8	-0.5
Th 21	268°23.0	283°23.0	298°23.0	313°22.9	328°22.9	343°22.9	358°22.9	13°22.8	28°22.8	43°22.8	58°22.8	73°22.7	-0.0
	20°23.5	20°23.0	20°22.5	20°22.0	20°21.6	20°21.1	20°20.6	20°20.2	20°19.6	20°19.1	20°18.6	20°18.1	-0.5
Fr 22	268°22.4	283°22.4	298°22.4	313°22.3	328°22.3	343°22.3	358°22.3	13°22.3	28°22.2	43°22.2	58°22.2	73°22.2	-0.0
	20°11.6	20°11.1	20°10.6	20°10.1	20°09.6	20°09.1	20°08.6	20°08.1	20°07.6	20°07.1	20°06.6	20°06.1	-0.5
Sa 23	268°21.9	283°21.9	298°21.9	313°21.9	328°21.9	343°21.9	358°21.8	13°21.8	28°21.8	43°21.8	58°21.8	73°21.8	-0.0
	19°59.4	19°58.9	19°58.4	19°57.9	19°57.3	19°56.8	19°56.3	19°55.8	19°55.3	19°54.7	19°54.2	19°53.7	-0.5
Su 24	268°21.6	283°21.6	298°21.6	313°21.6	328°21.6	343°21.6	358°21.5	13°21.5	28°21.5	43°21.5	58°21.5	73°21.5	-0.0
	19°46.8	19°46.3	19°45.8	19°45.3	19°44.7	19°44.2	19°43.7	19°43.1	19°42.6	19°42.1	19°41.5	19°41.0	-0.5
Mo 25	268°21.4	283°21.4	298°21.4	313°21.4	328°21.4	343°21.4	358°21.4	13°21.4	28°21.4	43°21.4	58°21.4	73°21.4	-0.0
	19°34.0	19°33.4	19°32.9	19°32.3	19°31.8	19°31.2	19°30.7	19°30.1	19°29.6	19°29.0	19°28.5	19°27.9	-0.5
Tu 26	268°21.4	283°21.4	298°21.4	313°21.4	328°21.4	343°21.4	358°21.4	13°21.4	28°21.4	43°21.4	58°21.4	73°21.4	+0.0
	19°20.8	19°20.2	19°19.6	19°19.1	19°18.5	19°18.0	19°17.4	19°16.8	19°16.3	19°15.7	19°15.2	19°14.6	-0.6
We 27	268°21.5	283°21.5	298°21.5	313°21.5	328°21.5	343°21.5	358°21.5	13°21.6	28°21.6	43°21.6	58°21.6	73°21.6	+0.0
	19°07.2	19°06.7	19°06.1	19°05.5	19°04.9	19°04.4	19°03.8	19°03.2	19°02.6	19°02.1	19°01.5	19°00.9	-0.6
Th 28	268°21.8	283°21.8	298°21.8	313°21.8	328°21.8	343°21.8	358°21.8	13°21.9	28°21.9	43°21.9	58°21.9	73°21.9	+0.0
	18°53.4	18°52.8	18°52.2	18°51.6	18°51.0	18°50.5	18°49.9	18°49.3	18°48.7	18°48.1	18°47.5	18°46.9	-0.6
Fr 29	268°22.2	283°22.2	298°22.2	313°22.2	328°22.2	343°22.3	358°22.3	13°22.3	28°22.3	43°22.4	58°22.4	73°22.4	+0.0
	18°39.2	18°38.6	18°38.0	18°37.4	18°36.8	18°36.2	18°35.6	18°35.0	18°34.4	18°33.8	18°33.2	18°32.6	-0.6
Sa 30	268°22.7	283°22.8	298°22.8	313°22.8	328°22.9	343°22.9	358°22.9	13°22.9	28°23.0	43°23.0	58°23.0	73°23.1	+0.0
	18°24.8	18°24.2	18°23.5	18°22.9	18°22.3	18°21.7	18°21.1	18°20.5	18°19.8	18°19.3	18°18.7	18°18.0	-0.6
Su 31	268°23.5	283°23.5	298°23.5	313°23.5	328°23.6	343°23.6	358°23.7	13°23.7	28°23.7	43°23.8	58°23.8	73°23.9	+0.0
	18°10.0	18°09.4	18°08.8	18°08.1	18°07.5	18°06.9	18°06.3	18°05.6	18°05.0	18°04.4	18°03.8	18°03.1	-0.6

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 15.7'

MOON
July 2033

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	$\Delta V/H$ SH
Fr 1	231°44.9 7°20.9	246°18.0 7°11.8	260°51.1 7°02.8	275°94.4 6°53.7	289°57.6 6°44.6	304°30.9 6°35.5	319°04.2 6°26.3	333°37.6 6°17.1	348°11.0 6°08.0	24°44.7 5°58.7	17°17.9 5°49.5	+33.3 -9.154.8
Sa 2	235°43.8 3°29.2	250°17.7 3°19.8	264°51.7 3°10.3	279°95.7 3°00.9	293°59.7 2°51.4	308°33.8 2°41.9	323°07.8 2°32.4	337°41.9 2°22.9	352°16.0 2°13.4	6°50.2 2°03.9	21°24.3 1°54.4	+34.1 -9.554.4
Su 3	239°58.1 -0°28.2	254°32.4 -0°37.7	269°06.7 -0°47.2	283°41.1 -0°56.7	298°15.4 -1°06.2	312°49.7 -1°15.7	327°24.1 -1°25.1	341°58.4 -1°34.6	356°32.8 -1°44.0	11°07.1 -1°53.5	25°41.5 -2°02.9	+34.3 -9.554.2
Mo 4	244°16.0 -4°23.0	258°50.2 -4°32.2	273°24.5 -4°41.4	287°58.5 -4°50.6	302°32.8 -4°59.8	317°07.0 -5°08.9	331°41.2 -5°18.0	346°15.2 -5°27.1	360°29.9 -5°36.2	15°23.5 -5°45.3	29°57.6 -5°54.3	+34.2 -9.154.2
Tu 5	248°25.9 -8°06.9	262°59.6 -8°15.5	277°33.2 -8°24.1	292°06.2 -8°32.7	306°40.9 -8°41.2	321°14.0 -8°49.7	335°47.5 -8°58.1	350°20.9 -9°06.6	364°49.4 -9°14.9	19°27.8 -9°23.3	34°01.1 -9°31.6	+33.5 -8.554.4
We 6	252°16.8 -11°31.7	266°49.5 -11°39.3	281°22.1 -11°47.0	295°54.1 -11°54.5	310°27.4 -12°02.0	324°59.8 -12°09.5	339°32.2 -12°16.9	354°04.6 -12°24.3	368°37.7 -12°31.7	8°37.0 -12°38.9	37°41.6 -12°46.2	+32.5 -7.554.7
Th 7	255°31.9 -14°28.0	270°10.5 -14°34.3	284°41.0 -14°46.7	299°13.1 -14°56.1	313°44.3 -15°2.9	328°15.5 -15°48.9	342°46.6 -15°04.9	357°17.7 -15°10.8	371°48.2 -15°16.7	26°19.6 -15°22.5	40°50.5 -15°28.2	+31.1 -6.055.2
Fr 8	258°26.5 -16°45.4	272°56.4 -16°50.0	287°26.3 -16°54.4	301°56.1 -16°58.8	316°25.8 -17°03.1	330°55.5 -17°07.3	345°25.1 -17°11.4	359°54.7 -17°15.4	374°24.2 -17°19.4	28°53.6 -17°23.3	43°23.0 -17°27.1	+29.7 -4.255.9
Sa 9	260°37.1 -18°13.0	275°05.6 -18°15.3	289°34.0 -18°17.6	304°02.4 -18°19.7	318°30.7 -18°21.7	332°59.0 -18°23.6	347°27.3 -18°25.5	361°55.5 -18°27.2	376°23.6 -18°28.2	30°51.7 -18°30.3	45°47.9 -18°31.7	+28.3 -1.956.6
Su 10	262°45.0 -18°45.0	276°42.4 -18°40.3	291°09.7 -18°39.9	305°37.0 -18°39.4	320°04.3 -18°38.8	334°35.8 -18°37.3	348°58.7 -18°36.4	363°25.9 -18°35.4	377°53.0 -18°34.2	32°20.1 -18°32.4	46°47.2 -18°33.0	+27.2 -0.857.3
Mo 11	263°00.8 -18°30.0	277°57.1 -18°27.7	292°23.8 -18°25.4	306°50.5 -18°21.3	321°17.2 -18°17.9	335°44.9 -18°14.4	350°10.5 -18°10.8	364°37.2 -18°07.1	378°33.8 -18°03.8	33°30.5 -18°01.4	47°57.1 -17°58.4	+26.7 -3.558.0
Tu 12	264°36.5 -16°11.8	278°05.1 -16°06.0	292°38.9 -16°00.1	307°56.4 -15°54.2	322°23.1 -15°48.1	336°49.8 -15°41.9	351°16.5 -15°35.7	365°43.2 -15°29.9	379°29.8 -15°22.8	34°36.6 -15°16.3	49°03.3 -15°09.6	+26.7 -6.258.7
We 13	265°34.3 -13°18.3	280°13.3 -13°02.2	294°40.3 -13°01.9	309°07.4 -12°53.6	323°34.4 -12°45.2	338°01.5 -12°36.8	352°28.7 -12°28.2	366°55.8 -12°19.6	381°23.0 -12°10.7	35°50.1 -12°02.1	50°17.3 -11°53.2	+27.1 -8.555.9
Th 14	267°30.8 -9°31.6	281°35.9 -9°21.6	296°03.5 -9°11.6	310°31.1 -9°01.5	324°58.8 -8°51.4	339°26.5 -8°41.2	353°54.2 -8°30.9	368°21.9 -8°20.6	382°49.7 -8°10.3	37°17.5 -8°01.3	51°45.3 -7°49.4	+27.7 -10.259.4
Fr 15	268°44.9 -5°07.4	283°13.0 -4°56.3	297°41.2 -4°45.2	312°09.3 -4°34.1	326°37.5 -4°22.9	341°05.7 -4°11.7	355°33.9 -4°00.5	369°57.1 -3°49.2	384°58.7 -3°38.0	53°07.2 -3°26.7	78°17.9 -3°15.4	+28.2 -11.259.9
Sa 16	270°37.2 -0°24.2	285°01.1 -0°12.7	299°29.6 -0°01.3	313°58.1 0°10.2	328°26.5 0°21.7	342°55.0 0°33.1	357°23.5 0°44.5	371°52.0 0°56.0	386°58.7 1°07.4	82°10.5 1°18.8	107°17.9 1°30.2	+28.5 -11.459.5
Su 17	272°24.7 4°19.3	286°53.2 4°30.4	301°21.7 4°41.5	315°50.1 4°52.5	330°18.5 5°03.5	344°47.0 5°14.5	359°15.4 5°25.4	373°43.8 5°36.3	388°12.2 5°47.1	122°40.6 5°57.9	147°08.7 6°08.7	+28.4 -10.959.4
Mo 18	286°53.2 4°30.4	301°21.7 4°41.5	315°50.1 4°52.5	330°18.5 5°03.5	344°47.0 5°14.5	359°15.4 5°25.4	373°43.8 5°36.3	388°12.2 5°47.1	402°40.6 5°57.9	57°08.9 6°08.7	71°37.7 6°19.5	+28.4 -10.959.4
Tu 19	288°41.2 8°55.0	303°09.3 9°05.0	317°37.3 9°14.9	332°05.5 9°24.7	346°33.6 9°34.5	360°11.7 9°44.2	374°05.9 9°53.0	387°57.9 10°03.5	401°53.0 10°13.0	58°53.7 10°22.5	73°21.7 10°31.9	+28.0 -9.759.1
We 20	290°16.8 12°44.5	304°46.2 12°52.7	319°13.8 13°00.8	333°41.4 13°08.9	348°09.9 13°16.9	362°36.5 13°24.8	376°04.0 13°32.6	389°31.5 13°40.4	402°59.0 13°48.0	60°26.4 13°55.6	74°03.9 14°03.1	+27.5 -7.958.0
Th 21	291°44.0 15°44.4	306°10.1 15°50.4	320°37.1 15°56.3	335°04.3 16°02.1	349°31.4 16°07.7	363°58.4 16°13.8	378°25.5 16°18.8	392°52.5 16°24.2	406°19.5 16°29.5	61°46.5 16°34.7	76°13.5 16°39.8	+27.1 -5.558.8
Fr 22	292°57.3 17°43.6	307°24.1 17°47.0	321°51.0 17°50.3	336°17.9 17°53.4	350°44.7 17°56.5	364°11.6 17°59.5	378°38.4 18°03.5	392°05.3 18°07.7	405°12.2 18°10.2	62°59.0 18°12.6	77°25.9 18°12.6	+26.9 -2.957.8
Sa 23	294°10.1 18°35.4	308°37.1 18°36.1	323°04.2 18°36.6	337°31.3 18°37.0	351°58.4 18°37.3	365°25.5 18°37.5	380°52.6 18°37.6	395°19.8 18°37.4	409°47.0 18°37.2	64°14.2 18°37.2	78°41.4 18°36.8	+27.1 -0.157.4
Su 24	295°33.5 18°18.7	310°01.2 18°16.7	324°29.0 18°14.5	338°56.8 18°12.3	353°24.6 18°09.9	367°52.5 18°07.5	382°20.4 18°04.9	396°48.4 18°02.3	410°16.4 17°59.5	65°44.5 17°56.7	80°12.6 17°53.7	+27.9 -2.556.9
Mo 25	297°15.9 16°58.1	311°48.3 16°53.6	326°17.2 16°49.1	340°46.2 16°44.5	355°15.2 16°39.8	369°44.2 16°30.1	384°22.4 16°25.2	398°42.5 16°20.1	412°17.1 16°15.0	67°40.1 16°10.8	82°10.3 16°09.8	+29.1 -4.856.4
Tu 26	299°36.7 14°42.4	314°06.9 14°36.0	328°37.2 14°29.5	343°07.5 14°23.0	357°37.8 14°16.4	372°08.3 14°09.7	386°38.4 14°03.0	401°09.3 13°56.2	415°39.9 13°49.3	70°10.5 13°42.4	84°41.2 13°35.4	+30.5 -6.755.8
We 27	301°28.4 11°43.6	317°00.0 11°35.7	331°31.6 11°27.8	346°03.6 11°19.8	359°35.0 11°11.8	373°06.8 11°03.7	386°38.4 10°55.6	400°10.5 10°47.5	413°14.5 10°39.3	73°14.4 10°31.1	87°46.4 10°22.8	+31.8 -8.155.3
Th 28	305°52.6 8°14.1	320°25.3 8°05.2	334°58.2 7°56.3	349°31.0 7°47.4	363°03.9 7°38.5	376°29.5 7°29.5	389°08.8 7°20.6	401°42.8 7°11.5	413°15.2 7°02.5	76°49.0 6°53.4	91°22.1 6°44.4	+33.0 -9.054.9
Fr 29	309°43.3 4°25.8	324°16.9 4°16.4	338°50.6 4°07.0	353°24.3 3°57.6	367°58.1 3°48.2	381°22.3 3°38.8	394°07.9 3°29.4	406°51.9 3°19.9	418°42.5 3°10.5	80°47.2 3°01.1	95°21.1 2°51.6	+33.8 -9.454.5
Sa 30	313°51.9 0°29.3	328°26.1 0°19.8	343°00.3 0°10.3	357°34.3 0°00.9	371°08.5 -0°08.6	384°42.9 -0°18.1	397°17.1 -0°27.6	409°45.1 -0°37.0	421°12.5 -0°46.5	84°59.9 -0°55.9	99°34.2 -1°05.4	+34.2 -9.554.2
Su 31	318°08.5 -3°25.8	332°42.7 -3°35.1	347°17.0 -3°44.3	361°51.3 -3°53.6	376°25.5 -4°02.8	390°59.8 -4°12.0	405°34.0 -4°21.1	419°08.3 -4°30.3	432°14.5 -4°39.4	89°16.2 -4°48.5	103°50.0 -4°57.6	+34.3 -9.254.1

Row 1: GHA, Δ'/h = GHA change $- 14^\circ$, SH = semi-diameter

Row 2: Dec ($- =$ South), $\Delta'/h =$ dec. change, SH = horizontal parallax

$$\text{Column} = (\text{UTC hour} - \text{day}) \bmod 24$$

FQ: 4 17h12 — FM: 12 09h28 — LQ: 19 04h07 — NM: 26 08h12

SUN

August 2033

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Mo 1	268°24.3 17°55.0	283°24.4 17°54.3	298°24.4 17°53.7	313°24.5 17°53.0	328°24.5 17°52.4	343°24.6 17°51.8	358°24.6 17°51.1	13°24.6 17°50.5	28°24.7 17°49.9	43°24.7 17°49.2	58°24.8 17°48.6	73°24.8 17°48.0	+0.0 -0.6
Tu 2	268°25.4 17°39.6	283°25.4 17°39.0	298°25.5 17°38.3	313°25.5 17°37.7	328°25.6 17°37.0	343°25.6 17°36.4	358°25.7 17°35.7	13°25.7 17°35.1	28°25.8 17°34.4	43°25.8 17°33.8	58°25.9 17°33.1	73°25.9 17°32.5	+0.0 -0.6
We 3	268°26.6 17°24.0	283°26.6 17°23.3	298°26.7 17°22.7	313°26.7 17°22.0	328°26.8 17°21.3	343°26.8 17°20.7	358°26.9 17°20.0	13°27.0 17°19.4	28°27.0 17°18.7	43°27.1 17°18.0	58°27.1 17°17.4	73°27.2 17°16.7	+0.1 -0.7
Th 4	268°27.9 17°08.1	283°28.0 17°07.4	298°28.0 17°06.7	313°28.1 17°06.0	328°28.2 17°05.4	343°28.2 17°04.7	358°28.3 17°04.0	13°28.4 17°03.4	28°28.4 17°02.7	43°28.5 17°02.0	58°28.5 17°01.3	73°28.6 17°00.7	+0.1 -0.7
Fr 5	268°29.4 16°51.9	283°29.5 16°51.2	298°29.6 16°50.5	313°29.6 16°49.8	328°29.7 16°49.1	343°29.8 16°48.5	358°29.8 16°47.8	13°29.9 16°47.1	28°30.0 16°46.4	43°30.0 16°45.7	58°30.1 16°45.0	73°30.2 16°44.4	+0.1 -0.7
Sa 6	268°31.1 16°35.4	283°31.2 16°34.7	298°31.2 16°34.0	313°31.3 16°33.3	328°31.4 16°32.6	343°31.5 16°31.9	358°31.5 16°31.2	13°31.6 16°30.6	28°31.7 16°29.9	43°31.7 16°29.2	58°31.8 16°28.5	73°31.9 16°27.8	+0.1 -0.7
Su 7	268°32.9 16°18.7	283°33.0 16°18.0	298°33.1 16°17.3	313°33.1 16°16.6	328°33.2 16°15.9	343°33.3 16°15.2	358°33.4 16°14.5	13°33.5 16°13.7	28°33.5 16°13.0	43°33.6 16°12.3	58°33.7 16°11.9	73°33.8 16°10.9	+0.1 -0.7
Mo 8	268°34.9 16°01.7	283°34.9 16°01.0	298°35.0 16°00.3	313°35.1 15°59.5	328°35.2 15°58.8	343°35.3 15°58.1	358°35.4 15°57.4	13°35.5 15°56.7	28°35.5 15°56.0	43°35.6 15°55.2	58°35.7 15°54.5	73°35.8 15°53.3	+0.1 -0.7
Tu 9	268°37.0 15°44.4	283°37.0 15°43.7	298°37.2 15°43.0	313°37.2 15°42.3	328°37.3 15°41.5	343°37.4 15°40.8	358°37.5 15°40.1	13°37.6 15°39.4	28°37.7 15°38.6	43°37.7 15°37.9	58°37.8 15°37.2	73°38.0 15°36.5	+0.1 -0.7
We 10	268°39.2 15°26.9	283°39.3 15°26.2	298°39.4 15°25.5	313°39.5 15°24.7	328°39.6 15°24.0	343°39.7 15°23.3	358°39.8 15°22.5	13°39.9 15°21.8	28°40.0 15°21.1	43°40.0 15°20.3	58°40.2 15°19.6	73°40.3 15°18.8	+0.1 -0.7
Th 11	268°41.6 15°09.2	283°41.7 15°08.5	298°41.8 15°07.7	313°41.9 15°07.0	328°42.0 15°06.2	343°42.1 15°05.5	358°42.2 15°04.7	13°42.4 15°04.0	28°42.5 15°03.2	43°42.6 15°02.5	58°42.7 15°01.7	73°42.8 15°01.0	+0.1 -0.7
Fr 12	268°44.2 14°51.2	283°44.3 14°50.5	298°44.4 14°49.7	313°44.5 14°48.9	328°44.6 14°48.2	343°44.7 14°47.4	358°44.8 14°46.7	13°44.9 14°45.9	28°45.0 14°45.2	43°45.0 14°44.4	58°45.2 14°43.6	73°45.4 14°42.9	+0.1 -0.8
Sa 13	268°46.8 14°33.0	283°47.0 14°32.2	298°47.1 14°31.5	313°47.2 14°30.7	328°47.3 14°29.9	343°47.4 14°29.2	358°47.5 14°28.4	13°47.7 14°27.6	28°47.8 14°26.9	43°47.9 14°26.1	58°48.0 14°25.3	73°48.1 14°24.6	+0.1 -0.8
Su 14	268°49.7 14°14.5	283°49.8 14°13.8	298°49.9 14°13.0	313°50.0 14°12.2	328°50.1 14°11.4	343°50.3 14°10.7	358°50.4 14°09.9	13°50.5 14°09.1	28°50.6 14°08.3	43°50.6 14°07.6	58°50.9 14°06.8	73°51.0 14°06.0	+0.1 -0.8
Mo 15	268°52.6 13°55.8	283°52.7 13°55.1	298°52.8 13°54.3	313°53.0 13°53.5	328°53.1 13°52.7	343°53.2 13°51.9	358°53.4 13°51.1	13°53.5 13°50.4	28°53.6 13°49.6	43°53.7 13°48.8	58°53.9 13°48.0	73°54.0 13°47.2	+0.1 -0.8
Tu 16	268°55.7 13°36.9	283°55.8 13°36.1	298°55.9 13°35.4	313°56.1 13°34.6	328°56.2 13°33.8	343°56.3 13°33.0	358°56.5 13°32.2	13°56.6 13°31.4	28°56.7 13°30.6	43°56.9 13°29.8	58°57.0 13°29.0	73°57.1 13°28.2	+0.1 -0.8
We 17	268°58.9 13°17.8	283°59.0 13°17.0	298°59.1 13°16.2	313°59.3 13°15.4	328°59.4 13°14.6	343°59.5 13°13.8	358°59.7 13°13.0	13°59.8 13°12.2	28°59.9 13°11.3	43°60.0 13°10.6	59°00.1 13°09.8	74°00.0 13°09.0	+0.1 -0.8
Th 18	269°02.2 12°58.5	284°02.3 12°57.7	299°02.5 12°56.9	314°02.6 12°56.0	329°02.7 12°55.2	344°02.9 12°54.4	359°03.0 12°53.6	14°03.2 12°52.8	29°03.3 12°52.0	44°03.5 12°51.2	59°03.6 12°50.4	74°03.7 12°49.5	+0.1 -0.8
Fr 19	269°05.6 12°38.9	284°05.8 12°38.1	299°05.9 12°37.3	314°06.1 12°36.5	329°06.2 12°35.7	344°06.3 12°34.8	359°06.5 12°34.0	14°06.6 12°33.2	29°06.8 12°32.4	44°06.9 12°31.6	59°07.1 12°30.7	74°07.2 12°29.9	+0.1 -0.8
Sa 20	269°09.2 12°19.2	284°09.3 12°18.4	299°09.5 12°17.5	314°09.6 12°16.7	329°09.8 12°15.9	344°09.9 12°15.1	359°10.1 12°14.2	14°10.2 12°13.4	29°10.4 12°12.6	44°10.7 12°11.7	59°10.9 12°10.9	74°10.8 12°10.1	+0.2 -0.8
Su 21	269°12.8 11°59.3	284°13.0 11°58.4	299°13.1 11°57.6	314°13.3 11°56.7	329°13.5 11°55.9	344°13.6 11°55.1	359°13.8 11°54.2	14°13.9 11°53.4	29°14.1 11°52.6	44°14.4 11°51.7	59°14.7 11°50.9	74°14.5 11°50.1	+0.2 -0.8
Mo 22	269°16.6 11°39.1	284°16.8 11°38.0	299°16.9 11°37.4	314°17.1 11°36.6	329°17.2 11°35.8	344°17.4 11°34.9	359°17.6 11°34.1	14°17.7 11°33.2	29°17.9 11°32.4	44°18.1 11°31.5	59°18.2 11°30.7	74°18.4 11°29.8	+0.2 -0.8
Tu 23	269°20.5 11°18.8	284°20.7 11°18.0	299°20.8 11°17.1	314°21.0 11°16.3	329°21.2 11°15.4	344°21.3 11°14.6	359°21.5 11°13.7	14°21.6 11°12.9	29°21.8 11°12.0	44°22.0 11°11.1	59°22.1 11°10.3	74°22.3 11°09.4	+0.2 -0.9
We 24	269°24.5 10°58.3	284°24.7 10°57.5	299°24.8 10°56.6	314°25.0 10°55.7	329°25.2 10°54.9	344°25.3 10°54.0	359°25.5 10°53.2	14°25.7 10°52.3	29°25.8 10°51.5	44°26.0 10°50.6	59°26.2 10°49.7	74°26.4 10°48.9	+0.2 -0.9
Th 25	269°28.6 10°37.7	284°28.8 10°36.8	299°28.9 10°35.9	314°29.1 10°35.1	329°29.3 10°34.2	344°29.5 10°33.3	359°29.6 10°32.5	14°29.8 10°31.6	29°30.0 10°30.7	44°30.1 10°29.9	59°30.3 10°29.0	74°30.5 10°28.1	+0.2 -0.9
Fr 26	269°32.8 10°16.8	284°33.0 10°16.0	299°33.1 10°15.1	314°33.3 10°14.2	329°33.5 10°13.3	344°33.7 10°12.5	359°33.9 10°11.6	14°34.0 10°10.7	29°34.2 10°09.8	44°34.4 10°09.0	59°34.7 10°08.1	74°34.7 10°07.2	+0.2 -0.9
Sa 27	269°37.1 9°55.8	284°37.3 9°54.9	299°37.4 9°54.1	314°37.6 9°53.2	329°37.8 9°52.3	344°38.0 9°51.4	359°38.2 9°50.6	14°38.4 9°49.7	29°38.7 9°48.8	44°38.7 9°47.9	59°38.9 9°47.0	74°39.1 9°46.2	+0.2 -0.9
Su 28	269°41.5 9°34.7	284°41.7 9°33.8	299°41.8 9°32.9	314°42.0 9°32.0	329°42.2 9°31.1	344°42.4 9°30.2	359°42.6 9°29.4	14°42.8 9°28.5	29°43.0 9°27.6	44°43.1 9°26.7	59°43.3 9°25.8	74°43.5 9°24.9	+0.2 -0.9
Mo 29	269°46.0 9°13.4	284°46.1 9°12.5	299°46.3 9°11.6	314°46.5 9°10.7	329°46.8 9°09.8	344°46.9 9°08.9	359°47.1 9°08.0	14°47.3 9°07.1	29°47.5 9°06.2	44°47.7 9°05.3	59°47.9 9°04.4	74°48.0 9°03.6	+0.2 -0.9
Tu 30	269°50.5 8°51.9	284°50.7 8°50.1	299°50.9 8°50.1	314°51.1 8°49.2	329°51.3 8°48.3	344°51.5 8°47.4	359°51.7 8°46.5	14°51.9 8°45.6	29°52.1 8°44.7	44°52.3 8°43.8	59°52.5 8°42.9	74°52.7 8°42.0	+0.2 -0.9
We 31	269°55.2 8°30.3	284°55.4 8°29.4	299°55.6 8°28.5	314°55.8 8°27.6	329°56.0 8°26.7	344°56.2 8°25.8	359°56.4 8°24.9	14°56.6 8°24.0	29°56.8 8°23.1	44°57.0 8°22.2	59°57.2 8°21.3	74°57.4 8°20.4	+0.2 -0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 15.8'

MOON

August 2033

	D	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h	SH
Mo 1	234 ⁰ 58.3 -6 ⁰ 18.5	249 ⁰ 32.3 -6 ⁰ 27.3	264 ⁰ 06.4 -6 ⁰ 36.2	278 ⁰ 40.4 -6 ⁰ 45.0	293 ⁰ 14.4 -6 ⁰ 53.8	307 ⁰ 48.4 -7 ⁰ 02.5	322 ⁰ 22.4 -7 ⁰ 11.3	336 ⁰ 56.3 -7 ⁰ 20.0	351 ⁰ 30.3 -7 ⁰ 28.6	36 ⁰ 04.2 -7 ⁰ 37.3	20 ⁰ 38.1 -7 ⁰ 45.9	+34.0	14.8	
	239 ⁰ 03.2 -9 ⁰ 51.0	253 ⁰ 36.6 -9 ⁰ 59.1	268 ⁰ 10.0 -10 ⁰ 07.1	282 ⁰ 43.4 -10 ⁰ 15.1	297 ⁰ 16.7 -10 ⁰ 23.0	311 ⁰ 50.0 -10 ⁰ 30.9	326 ⁰ 23.3 -10 ⁰ 38.8	340 ⁰ 56.5 -10 ⁰ 46.6	355 ⁰ 29.7 -10 ⁰ 54.3	10 ⁰ 02.8 -11 ⁰ 02.1	24 ⁰ 35.9 -11 ⁰ 09.7	+33.3	14.8	
Tu 2	242 ⁰ 47.6 -12 ⁰ 59.3	257 ⁰ 20.0 -13 ⁰ 06.2	271 ⁰ 52.4 -13 ⁰ 13.1	286 ⁰ 24.7 -13 ⁰ 19.9	300 ⁰ 57.0 -13 ⁰ 26.6	315 ⁰ 29.2 -13 ⁰ 33.3	330 ⁰ 01.4 -13 ⁰ 39.9	344 ⁰ 33.6 -13 ⁰ 46.5	359 ⁰ 05.7 -13 ⁰ 53.0	13 ⁰ 37.7 -13 ⁰ 59.4	28 ⁰ 09.7 -14 ⁰ 05.8	+32.2	14.9	
We 3	246 ⁰ 03.2 -14 ⁰ 03.3	260 ⁰ 34.3 -15 ⁰ 39.7	275 ⁰ 05.4 -15 ⁰ 45.0	289 ⁰ 36.4 -15 ⁰ 50.2	304 ⁰ 07.4 -15 ⁰ 55.4	318 ⁰ 38.3 -16 ⁰ 00.5	333 ⁰ 09.1 -16 ⁰ 05.5	347 ⁰ 39.9 -16 ⁰ 10.5	362 ⁰ 10.6 -16 ⁰ 15.3	16 ⁰ 41.3 -16 ⁰ 20.1	31 ⁰ 11.9 -16 ⁰ 24.9	+30.9	15.1	
Th 4	248 ⁰ 44.4 -15 ⁰ 34.3	263 ⁰ 14.1 -15 ⁰ 39.7	277 ⁰ 43.7 -15 ⁰ 45.0	292 ⁰ 13.3 -15 ⁰ 50.2	306 ⁰ 42.8 -15 ⁰ 55.4	321 ⁰ 12.3 -16 ⁰ 00.5	335 ⁰ 41.7 -16 ⁰ 05.5	350 ⁰ 11.0 -16 ⁰ 10.5	364 ⁰ 40.3 -16 ⁰ 15.3	19 ⁰ 09.6 -17 ⁰ 54.2	33 ⁰ 38.8 -17 ⁰ 56.8	+29.4	15.3	
Fr 5	250 ⁰ 49.9 -17 ⁰ 26.3	265 ⁰ 18.3 -17 ⁰ 29.8	279 ⁰ 46.5 -17 ⁰ 33.1	294 ⁰ 14.7 -17 ⁰ 36.4	308 ⁰ 42.9 -17 ⁰ 39.6	323 ⁰ 11.0 -17 ⁰ 42.7	337 ⁰ 39.1 -17 ⁰ 45.7	352 ⁰ 07.1 -17 ⁰ 48.6	366 ⁰ 35.1 -17 ⁰ 51.4	21 ⁰ 03.0 -17 ⁰ 54.2	35 ⁰ 30.9 -18 ⁰ 01.9	+28.1	15.3	
Sa 6	252 ⁰ 24.0 -18 ⁰ 25.2	266 ⁰ 51.2 -18 ⁰ 26.3	281 ⁰ 18.4 -18 ⁰ 27.4	295 ⁰ 45.5 -18 ⁰ 28.3	310 ⁰ 12.6 -18 ⁰ 29.9	324 ⁰ 39.7 -18 ⁰ 29.8	339 ⁰ 06.7 -18 ⁰ 30.4	353 ⁰ 33.8 -18 ⁰ 30.9	367 ⁰ 00.7 -18 ⁰ 31.3	22 ⁰ 27.7 -18 ⁰ 31.6	36 ⁰ 54.6 -18 ⁰ 31.8	+27.1	15.7	
Su 7	253 ⁰ 35.4 -17 ⁰ 10.8	268 ⁰ 02.0 -17 ⁰ 06.5	282 ⁰ 28.5 -17 ⁰ 02.1	296 ⁰ 55.1 -16 ⁰ 52.9	311 ⁰ 21.6 -16 ⁰ 52.9	325 ⁰ 48.1 -16 ⁰ 48.2	340 ⁰ 14.6 -16 ⁰ 43.3	354 ⁰ 41.0 -16 ⁰ 38.4	369 ⁰ 07.5 -16 ⁰ 33.3	23 ⁰ 33.9 -16 ⁰ 28.2	38 ⁰ 00.4 -16 ⁰ 22.9	+26.5	16.0	
Mo 8	254 ⁰ 36.2 -14 ⁰ 50.9	269 ⁰ 02.2 -14 ⁰ 44.0	283 ⁰ 29.0 -14 ⁰ 36.9	297 ⁰ 55.3 -14 ⁰ 29.8	312 ⁰ 21.7 -14 ⁰ 22.5	326 ⁰ 48.1 -14 ⁰ 15.1	341 ⁰ 14.5 -14 ⁰ 07.7	355 ⁰ 40.9 -14 ⁰ 00.2	369 ⁰ 07.3 -13 ⁰ 52.5	24 ⁰ 33.7 -13 ⁰ 44.8	39 ⁰ 00.1 -13 ⁰ 36.9	+26.4	16.2	
Tu 9	255 ⁰ 37.3 -11 ⁰ 28.8	270 ⁰ 03.8 -11 ⁰ 19.5	284 ⁰ 30.4 -11 ⁰ 10.2	298 ⁰ 57.0 -11 ⁰ 00.9	313 ⁰ 23.6 -10 ⁰ 51.4	327 ⁰ 50.3 -10 ⁰ 41.9	342 ⁰ 16.9 -10 ⁰ 32.3	356 ⁰ 43.5 -10 ⁰ 22.6	370 ⁰ 10.2 -10 ⁰ 12.9	25 ⁰ 36.9 -10 ⁰ 03.1	40 ⁰ 03.6 -9 ⁰ 53.2	+26.6	16.3	
We 10	256 ⁰ 45.9 -7 ⁰ 17.4	271 ⁰ 12.8 -7 ⁰ 06.6	285 ⁰ 39.8 -6 ⁰ 55.7	300 ⁰ 06.7 -6 ⁰ 44.7	314 ⁰ 33.7 -6 ⁰ 33.8	329 ⁰ 00.7 -6 ⁰ 22.8	343 ⁰ 27.8 -6 ⁰ 11.7	357 ⁰ 54.8 -6 ⁰ 00.6	372 ⁰ 21.9 -5 ⁰ 49.5	26 ⁰ 48.9 -5 ⁰ 38.3	41 ⁰ 16.0 -5 ⁰ 27.0	+27.0	16.4	
Th 11	258 ⁰ 03.9 -9 ⁰ 35.2	272 ⁰ 31.2 -9 ⁰ 23.5	286 ⁰ 58.5 -9 ⁰ 11.9	301 ⁰ 25.8 -9 ⁰ 00.2	315 ⁰ 53.2 -1 ⁰ 48.5	330 ⁰ 20.5 -1 ⁰ 36.9	344 ⁰ 47.9 -1 ⁰ 25.2	359 ⁰ 15.2 -1 ⁰ 13.5	373 ⁰ 42.6 -1 ⁰ 01.8	28 ⁰ 10.0 -0 ⁰ 50.0	42 ⁰ 37.4 -0 ⁰ 38.3	+27.3	16.5	
Fr 12	259 ⁰ 29.0 2 ⁰ 16.8	273 ⁰ 56.5 2 ⁰ 28.4	288 ⁰ 24.0 2 ⁰ 40.0	302 ⁰ 51.4 2 ⁰ 51.5	317 ⁰ 18.9 3 ⁰ 03.0	331 ⁰ 46.4 3 ⁰ 14.5	346 ⁰ 13.9 3 ⁰ 26.0	361 ⁰ 41.4 3 ⁰ 37.4	375 ⁰ 08.9 3 ⁰ 48.8	29 ⁰ 36.4 4 ⁰ 00.2	44 ⁰ 03.9 4 ⁰ 11.5	+27.5	16.4	
Sa 13	260 ⁰ 56.1 6 ⁰ 57.3	275 ⁰ 33.6 7 ⁰ 08.0	289 ⁰ 51.0 7 ⁰ 18.7	304 ⁰ 18.5 7 ⁰ 29.3	318 ⁰ 45.9 7 ⁰ 39.8	333 ⁰ 13.3 7 ⁰ 50.3	347 ⁰ 40.8 8 ⁰ 00.7	362 ⁰ 08.2 8 ⁰ 11.1	376 ⁰ 35.6 8 ⁰ 21.4	31 ⁰ 03.0 8 ⁰ 31.7	45 ⁰ 30.4 8 ⁰ 41.9	+27.4	16.3	
Su 14	262 ⁰ 20.5 11 ⁰ 07.0	276 ⁰ 47.8 11 ⁰ 16.1	291 ⁰ 15.0 11 ⁰ 25.1	305 ⁰ 42.3 11 ⁰ 34.1	320 ⁰ 09.5 11 ⁰ 43.0	334 ⁰ 36.8 11 ⁰ 51.8	349 ⁰ 04.0 12 ⁰ 00.5	363 ⁰ 31.2 12 ⁰ 09.1	378 ⁰ 58.4 12 ⁰ 17.7	32 ⁰ 25.6 12 ⁰ 26.1	46 ⁰ 52.8 12 ⁰ 34.5	+27.2	16.2	
Mo 15	263 ⁰ 39.6 14 ⁰ 29.8	278 ⁰ 06.7 14 ⁰ 36.8	292 ⁰ 33.7 14 ⁰ 43.7	307 ⁰ 00.8 14 ⁰ 50.4	321 ⁰ 27.8 14 ⁰ 57.1	335 ⁰ 54.9 15 ⁰ 03.7	350 ⁰ 21.9 15 ⁰ 10.2	364 ⁰ 48.9 15 ⁰ 16.5	379 ⁰ 15.9 15 ⁰ 22.8	33 ⁰ 43.0 15 ⁰ 29.0	48 ⁰ 10.0 15 ⁰ 35.1	+27.0	16.0	
Tu 16	278 ⁰ 06.7 14 ⁰ 36.8	292 ⁰ 33.7 14 ⁰ 43.7	307 ⁰ 00.8 14 ⁰ 50.4	321 ⁰ 27.8 14 ⁰ 57.1	335 ⁰ 54.9 15 ⁰ 03.7	350 ⁰ 21.9 15 ⁰ 10.2	364 ⁰ 48.9 15 ⁰ 16.5	379 ⁰ 15.9 15 ⁰ 22.8	383 ⁰ 43.0 15 ⁰ 29.0	40 ⁰ 10.0 15 ⁰ 35.1	50 ⁰ 37.0 15 ⁰ 41.9	+27.0	16.0	
We 17	279 ⁰ 22.0 16 ⁰ 58.5	293 ⁰ 49.0 17 ⁰ 02.8	308 ⁰ 16.0 17 ⁰ 07.1	322 ⁰ 43.0 17 ⁰ 11.2	337 ⁰ 10.0 17 ⁰ 15.2	351 ⁰ 37.1 17 ⁰ 19.1	366 ⁰ 04.1 17 ⁰ 22.9	380 ⁰ 31.1 17 ⁰ 26.6	394 ⁰ 58.2 17 ⁰ 30.1	49 ⁰ 25.2 17 ⁰ 33.6	63 ⁰ 52.3 17 ⁰ 37.0	+27.0	15.8	
Th 18	280 ⁰ 39.6 18 ⁰ 14.5	295 ⁰ 06.9 18 ⁰ 16.1	309 ⁰ 34.1 18 ⁰ 17.6	324 ⁰ 01.5 18 ⁰ 19.0	338 ⁰ 28.8 18 ⁰ 20.3	352 ⁰ 56.1 18 ⁰ 21.5	367 ⁰ 23.5 18 ⁰ 22.6	381 ⁰ 50.9 18 ⁰ 23.6	396 ⁰ 18.3 18 ⁰ 24.5	50 ⁰ 45.7 18 ⁰ 25.2	65 ⁰ 13.2 18 ⁰ 25.9	+27.4	15.7	
Fr 19	282 ⁰ 08.3 18 ⁰ 23.1	296 ⁰ 36.3 18 ⁰ 22.0	311 ⁰ 04.2 18 ⁰ 20.9	325 ⁰ 32.2 18 ⁰ 19.7	340 ⁰ 00.2 18 ⁰ 18.3	354 ⁰ 28.3 18 ⁰ 16.9	368 ⁰ 56.4 18 ⁰ 15.4	383 ⁰ 24.5 18 ⁰ 13.7	397 ⁰ 52.7 18 ⁰ 12.0	52 ⁰ 20.9 18 ⁰ 10.2	66 ⁰ 49.1 18 ⁰ 08.2	+28.1	15.5	
Sa 20	283 ⁰ 57.5 17 ⁰ 27.6	298 ⁰ 26.4 17 ⁰ 24.1	312 ⁰ 55.4 17 ⁰ 20.6	327 ⁰ 24.4 17 ⁰ 16.9	341 ⁰ 53.4 17 ⁰ 13.2	356 ⁰ 22.5 17 ⁰ 09.4	370 ⁰ 51.7 17 ⁰ 05.5	385 ⁰ 20.8 17 ⁰ 01.5	399 ⁰ 50.1 16 ⁰ 57.4	54 ⁰ 19.3 16 ⁰ 53.2	68 ⁰ 48.7 16 ⁰ 49.0	+29.1	15.3	
Su 21	286 ⁰ 14.3 15 ⁰ 35.3	300 ⁰ 44.4 15 ⁰ 29.8	315 ⁰ 14.6 15 ⁰ 24.2	329 ⁰ 44.8 15 ⁰ 18.5	344 ⁰ 15.1 15 ⁰ 12.7	358 ⁰ 45.4 15 ⁰ 06.9	373 ⁰ 15.7 15 ⁰ 10.1	387 ⁰ 46.2 14 ⁰ 55.0	402 ⁰ 16.0 14 ⁰ 49.0	56 ⁰ 47.6 14 ⁰ 42.8	71 ⁰ 17.7 14 ⁰ 36.7	+30.3	15.2	
Mo 22	289 ⁰ 02.0 12 ⁰ 56.2	303 ⁰ 33.4 12 ⁰ 49.0	318 ⁰ 04.8 12 ⁰ 41.8	332 ⁰ 36.2 12 ⁰ 34.5	347 ⁰ 07.7 12 ⁰ 27.1	361 ⁰ 33.2 12 ⁰ 19.7	375 ⁰ 39.3 12 ⁰ 12.3	390 ⁰ 42.5 12 ⁰ 04.8	404 ⁰ 45.4 11 ⁰ 57.2	59 ⁰ 45.9 11 ⁰ 49.6	74 ⁰ 17.7 11 ⁰ 41.9	+31.6	15.1	
Tu 23	292 ⁰ 19.8 9 ⁰ 41.5	306 ⁰ 52.2 9 ⁰ 33.2	321 ⁰ 24.8 9 ⁰ 24.8	335 ⁰ 57.3 9 ⁰ 16.3	350 ⁰ 29.9 9 ⁰ 07.9	364 ⁰ 59.3 8 ⁰ 59.3	379 ⁰ 35.3 8 ⁰ 50.8	393 ⁰ 48.0 8 ⁰ 42.2	408 ⁰ 40.8 8 ⁰ 33.6	63 ⁰ 13.6 8 ⁰ 25.0	77 ⁰ 46.4 8 ⁰ 16.3	+32.7	15.0	
We 24	296 ⁰ 03.3 6 ⁰ 02.8	310 ⁰ 36.7 5 ⁰ 33.7	325 ⁰ 10.1 5 ⁰ 44.5	339 ⁰ 43.5 5 ⁰ 35.4	354 ⁰ 17.0 5 ⁰ 26.3	368 ⁰ 50.5 5 ⁰ 17.1	383 ⁰ 24.1 5 ⁰ 07.9	397 ⁰ 57.4 4 ⁰ 58.7	412 ⁰ 31.2 4 ⁰ 49.5	67 ⁰ 04.8 4 ⁰ 40.2	81 ⁰ 38.5 4 ⁰ 31.0	+33.5	14.9	
Fr 26	300 ⁰ 05.9 2 ⁰ 10.8	314 ⁰ 39.9 2 ⁰ 01.4	329 ⁰ 13.9 1 ⁰ 52.0	343 ⁰ 47.9 1 ⁰ 42.6	358 ⁰ 21.9 1 ⁰ 33.2	372 ⁰ 56.0 1 ⁰ 23.7	387 ⁰ 30.1 1 ⁰ 14.3	401 ⁰ 42.0 1 ⁰ 04.9	416 ⁰ 05.1 0 ⁰ 55.5	71 ⁰ 12.3 0 ⁰ 46.0	85 ⁰ 46.5 0 ⁰ 36.6	+34.1	14.8	
Sa 27	304 ⁰ 19.4 -1 ⁰ 44.2	318 ⁰ 53.7 -1 ⁰ 53.6	333 ⁰ 27.9 -2 ⁰ 02.9	348 ⁰ 02.2 -2 ⁰ 12.2	362 ⁰ 34.6 -2 ⁰ 21.5	376 ⁰ 10.7 -2 ⁰ 30.8	390 ⁰ 44.9 -2 ⁰ 40.1	404 ⁰ 19.2 -2 ⁰ 49.3	418 ⁰ 53.4 -2 ⁰ 58.6	75 ⁰ 27.7 -3 ⁰ 07.8	90 ⁰ 01.9 -3 ⁰ 17.0	+34.3	14.7	
Su 28	308 ⁰ 35.1 -5 ⁰ 33.1	323 ⁰ 09.2 -5 ⁰ 42.0	337 ⁰ 43.4 -5 ⁰ 50.9	352 ⁰ 17.5 -5 ⁰ 59.7	366 ⁰ 51.6 -6 ⁰ 08.6	381 ⁰ 25.7 -6 ⁰ 17.4	395 ⁰ 59.8 -6 ⁰ 26.1	410 ⁰ 33.8 -6 ⁰ 34.9	425 ⁰ 07.9 -6 ⁰ 43.6	79 ⁰ 41.9 -6 ⁰ 52.3	94 ⁰ 15.9 -7 ⁰ 01.0	+34.1	14.7	

SUN

September 2033

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Th 1	269°59.9 8°08.6	285°00.1 8°07.7	300°00.3 8°06.8	315°00.5 8°05.9	330°00.7 8°05.0	345°00.9 8°04.1	0°01.1 8°03.2	15°01.3 8°02.2	30°01.5 8°01.4	45°01.7 8°00.4	60°01.9 7°59.5	75°02.1 7°58.6	+0.2 -0.9
Fr 2	270°04.7 7°46.7	285°05.0 7°45.8	300°05.2 7°44.9	315°05.4 7°44.0	330°05.6 7°43.1	345°05.8 7°42.2	0°06.0 7°41.3	15°06.2 7°40.3	30°06.4 7°39.4	45°06.6 7°38.5	60°06.8 7°37.6	75°07.0 7°36.7	+0.2 -0.9
Sa 3	270°09.6 7°24.8	285°09.8 7°23.8	300°10.0 7°22.9	315°10.3 7°22.0	330°10.5 7°21.1	345°10.7 7°20.2	0°10.9 7°19.3	15°11.1 7°18.3	30°11.3 7°17.4	45°11.5 7°16.5	60°11.7 7°15.6	75°11.9 7°14.7	+0.2 -0.9
Su 4	270°14.6 7°02.7	285°14.8 7°01.7	300°15.0 7°00.8	315°15.2 6°59.9	330°15.4 6°59.0	345°15.6 6°58.1	0°15.8 6°57.1	15°16.1 6°56.2	30°16.3 6°55.3	45°16.5 6°54.4	60°16.7 6°53.4	75°16.9 6°52.5	+0.2 -0.9
Mo 5	270°19.6 6°40.5	285°19.8 6°39.5	300°20.0 6°38.6	315°20.3 6°37.7	330°20.5 6°36.7	345°20.7 6°35.8	0°20.9 6°34.9	15°21.1 6°34.0	30°21.3 6°33.0	45°21.5 6°32.1	60°21.7 6°31.2	75°21.9 6°30.2	+0.2 -0.9
Tu 6	270°24.7 6°18.1	285°24.9 6°17.2	300°25.1 6°16.3	315°25.3 6°15.3	330°25.6 6°14.4	345°25.8 6°13.5	0°26.0 6°12.5	15°26.2 6°11.6	30°26.4 6°10.7	45°26.6 6°09.7	60°26.8 6°08.8	75°27.1 6°07.9	+0.2 -0.9
We 7	270°29.8 5°55.7	285°30.1 5°54.8	300°30.3 5°53.8	315°30.5 5°52.9	330°30.7 5°52.0	345°30.9 5°51.0	0°31.1 5°50.1	15°31.3 5°49.2	30°31.6 5°48.2	45°31.8 5°47.3	60°32.0 5°46.3	75°32.2 5°45.4	+0.2 -0.9
Th 8	270°35.0 5°33.2	285°35.2 5°32.3	300°35.5 5°31.3	315°35.7 5°30.4	330°35.9 5°29.4	345°36.1 5°28.5	0°36.3 5°27.6	15°36.5 5°26.6	30°36.8 5°25.7	45°37.0 5°24.7	60°37.2 5°23.8	75°37.4 5°22.8	+0.2 -0.9
Fr 9	270°40.3 5°10.6	285°40.5 5°09.6	300°40.7 5°08.7	315°40.9 5°07.8	330°41.1 5°06.8	345°41.3 5°05.9	0°41.6 5°04.9	15°41.8 5°04.0	30°42.0 5°03.0	45°42.2 5°02.1	60°42.4 5°01.1	75°42.7 5°00.2	+0.2 -0.9
Sa 10	270°45.5 4°47.9	285°45.7 4°46.9	300°46.0 4°46.0	315°46.2 4°45.0	330°46.4 4°44.1	345°46.6 4°43.1	0°46.8 4°42.2	15°47.1 4°41.2	30°47.3 4°40.3	45°47.5 4°39.4	60°47.8 4°38.4	75°47.9 4°37.5	+0.2 -0.9
Su 11	270°50.8 4°25.1	285°51.0 4°24.2	300°51.3 4°23.2	315°51.5 4°22.3	330°51.7 4°21.3	345°51.9 4°20.3	0°52.1 4°19.4	15°52.4 4°18.4	30°52.6 4°17.5	45°52.8 4°16.5	60°53.0 4°15.6	75°53.3 4°14.6	+0.2 -1.0
Mo 12	270°56.1 4°02.2	285°56.4 4°01.3	300°56.6 4°00.3	315°56.8 3°59.4	330°57.0 3°58.4	345°57.2 3°57.5	0°57.5 3°56.5	15°57.7 3°55.6	30°57.9 3°54.6	45°58.1 3°53.7	60°58.4 3°52.7	75°58.6 3°51.7	+0.2 -1.0
Tu 13	271°01.5 3°39.3	286°01.7 3°38.4	301°01.9 3°37.4	316°02.1 3°36.4	331°02.4 3°35.5	346°02.6 3°34.5	1°02.8 3°33.6	16°03.0 3°32.6	31°03.3 3°31.7	46°03.5 3°30.7	61°03.7 3°29.7	76°03.9 3°28.8	+0.2 -1.0
We 14	271°06.8 3°16.3	286°07.1 3°15.4	301°07.3 3°14.4	316°07.5 3°13.4	331°07.7 3°12.5	346°07.9 3°11.5	1°08.2 3°10.6	16°08.4 3°09.6	31°08.6 3°08.6	46°08.8 3°07.7	61°09.1 3°06.7	76°09.3 3°05.7	+0.2 -1.0
Th 15	271°12.3 2°53.2	286°12.4 2°52.3	301°12.6 2°51.3	316°12.9 2°50.4	331°13.1 2°49.4	346°13.3 2°48.4	1°13.5 2°47.5	16°13.8 2°46.5	31°14.0 2°45.5	46°14.2 2°44.6	61°14.4 2°43.6	76°14.7 2°42.7	+0.2 -1.0
Fr 16	271°17.6 2°30.1	286°17.8 2°29.2	301°18.0 2°28.2	316°18.3 2°27.2	331°18.5 2°26.3	346°18.7 2°25.3	1°18.9 2°24.3	16°19.1 2°23.4	31°19.3 2°22.4	46°19.6 2°21.4	61°19.8 2°20.5	76°20.0 2°19.5	+0.2 -1.0
Sa 17	271°22.9 2°07.0	286°23.1 2°06.0	301°23.4 2°05.0	316°23.8 2°04.1	331°24.0 2°03.1	346°24.2 2°02.1	1°24.3 2°01.2	16°24.5 2°00.2	31°24.7 1°59.2	46°24.9 1°58.3	61°25.2 1°57.3	76°25.4 1°56.3	+0.2 -1.0
Su 18	271°28.3 1°43.7	286°28.5 1°42.8	301°28.7 1°41.8	316°28.9 1°40.8	331°29.2 1°39.9	346°29.4 1°38.9	1°29.6 1°37.9	16°29.8 1°37.0	31°30.1 1°36.0	46°30.3 1°35.0	61°30.5 1°34.1	76°30.7 1°33.1	+0.2 -1.0
Mo 19	271°33.6 1°20.5	286°33.8 1°19.5	301°34.1 1°18.6	316°34.3 1°17.6	331°34.5 1°16.6	346°34.7 1°15.6	1°35.0 1°14.7	16°35.2 1°13.7	31°35.4 1°12.7	46°35.8 1°11.8	61°35.8 1°10.8	76°36.1 1°09.8	+0.2 -1.0
Tu 20	271°38.9 0°57.2	286°39.2 0°56.2	301°39.4 0°55.3	316°39.6 0°54.3	331°39.8 0°53.3	346°40.1 0°52.4	1°40.3 0°51.4	16°40.5 0°50.4	31°40.7 0°49.4	46°40.9 0°48.5	61°41.2 0°47.5	76°41.4 0°46.5	+0.2 -1.0
We 21	271°44.3 0°33.9	286°44.5 0°32.9	301°44.7 0°32.0	316°44.9 0°31.0	331°45.1 0°30.0	346°45.4 0°29.0	1°45.6 0°28.1	16°45.8 0°27.1	31°46.0 0°26.1	46°46.2 0°25.1	61°46.5 0°24.2	76°46.7 0°23.2	+0.2 -1.0
Th 22	271°49.5 0°10.6	286°49.8 0°09.6	301°50.0 0°08.6	316°50.2 0°07.6	331°50.4 0°06.7	346°50.6 0°05.7	1°50.9 0°04.7	16°51.1 0°03.8	31°51.3 0°02.8	46°51.5 0°01.8	61°51.7 0°00.8	76°52.0 -0°00.1	+0.2 -1.0
Fr 23	271°54.8 -0°12.8	286°55.0 -0°13.8	301°55.2 -0°14.7	316°55.5 -0°15.7	331°55.7 -0°16.7	346°55.9 -0°17.7	1°56.1 -0°18.6	16°56.3 -0°19.6	31°56.5 -0°20.6	46°56.8 -0°21.5	61°57.0 -0°22.5	76°57.2 -0°23.5	+0.2 -1.0
Sa 24	272°00.0 -0°36.1	287°00.2 -0°37.1	302°00.5 -0°38.1	317°00.7 -0°39.1	332°00.9 -0°40.0	347°01.1 -0°41.0	2°01.3 -0°42.0	17°01.5 -0°43.0	32°01.8 -0°43.9	47°02.0 -0°44.9	62°02.2 -0°45.9	77°02.4 -0°46.9	+0.2 -1.0
Su 25	272°05.2 -0°59.5	287°05.4 -0°05.5	302°05.6 -0°01.5	317°05.9 -0°02.4	332°06.1 -0°03.4	347°06.3 -0°04.4	2°06.5 -0°05.4	17°06.7 -0°06.3	32°06.9 -0°07.3	47°07.1 -0°08.3	62°07.4 -0°09.2	77°07.6 -0°10.2	+0.2 -1.0
Mo 26	272°10.4 -1°22.9	287°10.6 -1°23.8	302°10.8 -1°24.8	317°11.0 -1°25.8	332°11.2 -1°26.8	347°11.4 -1°27.7	2°11.6 -1°28.7	17°11.8 -1°29.7	32°12.1 -1°30.7	47°12.3 -1°31.6	62°12.5 -1°32.6	77°12.7 -1°33.6	+0.2 -1.0
Tu 27	272°15.4 -1°46.2	287°15.7 -1°47.2	302°15.9 -1°48.2	317°16.1 -1°49.1	332°16.3 -1°50.1	347°16.5 -1°51.1	2°16.7 -1°52.1	17°16.9 -1°53.0	32°17.1 -1°54.0	47°17.3 -1°55.0	62°17.6 -1°56.0	77°17.8 -1°56.9	+0.2 -1.0
We 28	272°20.5 -2°09.6	287°20.7 -2°10.5	302°20.9 -2°11.5	317°21.1 -2°12.5	332°21.3 -2°13.5	347°21.5 -2°14.4	2°21.7 -2°15.4	17°22.0 -2°16.4	32°22.2 -2°17.3	47°22.4 -2°18.3	62°22.6 -2°19.3	77°22.8 -2°20.3	+0.2 -1.0
Th 29	272°25.5 -2°32.9	287°25.7 -2°33.8	302°25.9 -2°34.8	317°26.1 -2°35.8	332°26.3 -2°36.8	347°26.5 -2°37.7	2°26.7 -2°38.7	17°26.9 -2°39.7	32°27.1 -2°40.7	47°27.3 -2°41.6	62°27.6 -2°42.6	77°27.8 -2°43.6	+0.2 -1.0
Fr 30	272°30.4 -2°56.2	287°30.6 -2°57.2	303°30.8 -2°58.1	317°31.0 -2°59.1	332°31.2 -3°00.1	347°31.4 -3°01.0	2°31.6 -3°02.0	17°31.8 -3°03.0	32°32.1 -3°03.9	47°32.3 -3°04.9	62°32.5 -3°05.9	77°32.7 -3°06.9	+0.2 -1.0

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.9'

MOON

September 2023

	D	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	Δ'/h SH
●	Th 1	236°06.1 -16°31.9	260°37.0 -16°36.2	265°07.9 -16°40.4	279°38.8 -16°44.5	294°09.6 -16°48.5	308°40.4 -16°52.5	323°11.1 -17°00.1	337°41.8 -17°03.9	352°12.4 -17°07.5	6°43.0 -17°11.1	21°13.5 -17°11.1	+30.7 15.0 -3.9 55.1
	Fr 2	238°45.3 -17°54.5	253°15.0 -17°56.7	267°44.7 -17°58.8	282°14.3 -18°00.9	296°43.9 -18°02.8	311°13.4 -18°04.7	325°42.9 -18°06.4	340°12.3 -18°08.1	354°41.7 -18°09.6	9°11.0 -18°11.1	23°40.3 -18°12.5	+29.5 15.2 -1.8 55.8
	Sa 3	240°54.0 -18°21.8	255°22.6 -18°21.4	269°51.1 -18°21.4	284°19.5 -18°21.0	298°48.0 -18°20.6	313°16.3 -18°20.0	327°44.7 -18°19.3	342°13.0 -18°18.6	356°41.3 -18°17.7	11°09.5 -18°16.7	25°37.7 -18°15.6	+28.4 15.4 +0.6 56.6
	Su 4	242°36.0 -17°46.9	257°03.6 -17°44.2	271°31.2 -17°41.3	285°58.7 -17°38.3	300°26.2 -17°35.2	314°53.7 -17°32.1	329°21.2 -17°28.8	343°48.6 -17°25.4	358°16.0 -17°21.9	12°43.4 -17°18.2	27°10.7 -17°14.5	+27.5 15.7 +3.2 57.6
○	Mo 5	243°58.1 -16°05.9	258°25.1 -16°00.5	272°52.0 -15°55.0	287°19.0 -15°49.3	301°45.9 -15°43.8	316°12.8 -15°37.8	330°39.7 -15°31.8	345°06.6 -15°25.8	359°33.5 -15°19.6	14°00.4 -15°13.4	28°27.2 -15°07.0	+26.9 16.0 +5.9 58.6
	Tu 6	245°08.4 -13°19.8	259°35.1 -13°11.9	274°01.8 -13°03.9	288°28.4 -12°55.8	302°55.1 -12°47.6	317°21.8 -12°39.3	331°48.4 -12°30.9	346°15.0 -12°22.5	0°41.7 -12°15.9	15°08.3 -12°05.3	29°34.9 -11°56.6	+26.6 16.2 +8.3 59.5
	We 7	246°13.9 -9°35.8	260°40.5 -9°25.8	275°07.1 -9°15.8	289°33.7 -9°05.6	304°00.2 -8°55.4	318°26.8 -8°45.2	332°53.4 -8°34.9	347°20.0 -8°24.5	1°46.6 -8°14.0	16°13.1 -8°03.5	30°39.7 -7°52.9	+26.6 16.4 +10.3 60.3
	Th 8	247°18.4 -5°07.7	261°44.9 -4°56.3	276°11.5 -4°44.9	290°38.1 -4°33.4	305°04.7 -4°21.9	319°31.2 -4°10.4	333°57.8 -3°58.8	348°24.4 -3°47.2	2°50.9 -3°35.6	17°17.5 -3°23.9	31°44.1 -3°12.3	+26.6 16.6 +11.5 60.9
●	Fr 9	248°22.3 -0°14.8	262°48.8 -0°02.9	277°15.3 -0°09.0	291°41.8 0°21.0	306°08.3 0°32.9	320°34.8 0°44.8	335°01.3 0°56.7	349°27.8 1°08.6	3°54.3 1°20.5	18°20.6 1°32.4	32°47.0 1°44.2	+26.5 16.7 +11.9 61.1
	Sa 10	249°23.7 4°40.0	263°50.0 4°51.5	278°16.4 5°02.9	292°42.7 5°14.4	307°09.1 5°25.7	321°35.4 5°37.1	336°01.8 5°48.4	350°28.1 5°59.6	4°54.4 6°10.8	19°20.7 6°22.0	33°47.0 6°33.1	+26.3 16.6 +11.3 61.0
	Su 11	250°20.4 9°13.3	264°46.5 9°23.4	279°12.7 9°33.6	293°38.1 9°43.6	308°05.0 9°53.6	322°31.1 10°03.4	336°57.2 10°13.3	351°23.3 10°23.0	5°49.4 10°32.7	20°15.5 10°42.3	34°41.6 10°51.8	+26.1 16.5 +9.9 60.5
	Mo 12	251°12.2 13°04.3	265°38.2 13°12.4	280°04.2 13°20.5	294°30.2 13°28.4	308°56.2 13°36.2	323°22.2 13°44.0	337°48.2 13°51.6	352°14.2 13°59.1	6°40.2 14°06.4	21°06.2 14°13.9	35°32.2 14°21.2	+26.0 16.3 +7.7 59.9
○	Tu 13	252°02.5 15°57.4	266°28.6 16°02.9	280°54.6 16°08.4	295°20.7 16°13.7	309°46.6 16°19.0	324°12.9 16°24.1	338°39.1 16°29.1	353°05.1 16°34.0	7°31.4 16°38.8	21°57.5 16°43.5	36°23.7 16°48.1	+26.1 16.1 +5.1 59.1
	We 14	252°58.5 17°43.2	267°25.0 17°46.0	281°51.5 17°48.6	296°18.1 17°51.2	310°44.6 17°53.4	325°11.2 17°55.9	339°57.9 17°58.1	354°04.5 18°00.2	8°31.2 18°02.2	22°57.9 18°04.1	37°24.7 18°05.9	+26.6 15.9 +2.3 58.2
	Th 15	254°09.9 18°19.1	268°37.2 18°19.1	283°04.6 18°19.0	297°32.0 18°18.8	311°59.4 18°18.5	326°26.9 18°18.0	340°54.4 18°17.5	355°21.9 18°16.9	9°49.6 18°16.2	24°17.2 18°15.3	38°44.9 18°14.4	+27.5 15.6 -0.5 57.4
	Fr 16	268°37.2 18°19.1	283°04.6 18°19.0	297°32.0 18°18.8	311°59.4 18°18.5	326°26.9 18°18.0	340°54.4 18°17.5	355°21.9 18°16.9	9°49.6 18°16.2	24°17.2 18°15.3	24°17.2 18°14.4	38°44.9 18°13.3	+27.5 15.6 -0.6 57.3
●	Sa 17	270°14.4 17°45.6	284°42.9 17°43.0	299°11.5 17°40.3	313°40.1 17°37.5	328°08.8 17°34.6	342°37.5 17°31.6	357°06.2 17°28.5	11°35.1 17°25.3	26°03.9 17°22.0	40°32.9 17°18.6	55°01.8 17°15.2	+28.7 15.4 -3.0 56.6
	Su 18	272°23.0 16°13.1	286°52.8 16°08.3	301°22.7 16°03.4	315°52.7 15°58.4	330°22.7 15°53.4	344°52.7 15°48.3	359°22.8 15°43.1	13°53.0 15°37.9	28°23.2 15°32.5	42°53.5 15°27.1	57°23.8 15°21.6	+30.1 15.2 -5.1 55.9
	Mo 19	275°05.2 13°51.2	289°36.4 13°44.6	304°07.6 13°38.0	318°38.9 13°31.4	333°10.2 13°24.6	347°41.6 13°17.9	2°13.0 13°11.0	16°44.5 13°04.1	31°16.0 12°57.1	45°47.6 12°50.1	60°19.2 12°43.1	+31.4 15.1 -6.8 55.3
	Tu 20	278°19.2 10°50.8	292°51.5 10°42.9	307°23.9 10°35.0	321°56.4 10°27.1	336°28.8 10°19.1	351°01.4 10°11.0	5°33.9 10°03.0	20°06.5 9°54.9	34°39.2 9°46.7	49°11.9 9°38.5	63°44.6 9°30.3	+32.5 15.0 -8.1 54.8
●	We 21	281°59.9 7°22.7	296°33.2 7°13.9	311°06.6 7°05.1	325°39.9 6°56.3	340°13.3 6°47.5	354°46.7 6°38.6	9°20.2 6°29.7	23°53.6 6°20.8	38°27.2 6°11.9	53°00.2 6°03.0	67°34.2 5°54.0	+33.4 14.9 -8.9 54.5
	Th 22	286°00.6 3°37.2	300°34.5 3°30.2	315°08.4 3°18.7	329°42.4 3°09.4	344°16.4 3°00.2	358°50.4 2°50.9	13°24.4 2°41.6	27°58.4 2°28.3	42°32.5 2°23.0	57°06.5 2°13.7	71°40.6 2°04.4	+34.0 14.8 -9.3 54.2
	Fr 23	290°13.1 -0°15.7	304°47.3 -0°25.0	319°21.5 -0°34.4	333°55.8 -0°43.7	348°30.0 -0°53.0	3°04.3 -1°02.3	17°38.5 -1°11.6	32°12.8 -1°20.9	46°47.0 -1°30.2	61°21.3 -1°39.5	75°55.5 -1°48.8	+34.2 14.7 -9.3 54.0
	Sa 24	294°29.2 -4°06.6	309°03.4 -4°15.6	323°37.6 -4°24.7	338°11.8 -4°33.7	352°45.9 -4°42.7	7°20.1 -4°51.7	21°54.3 -5°00.6	36°28.4 -5°09.6	51°02.6 -5°18.5	65°36.7 -5°27.4	80°10.8 -5°36.3	+34.2 14.7 -9.0 53.9
●	Su 25	298°40.9 -7°46.3	313°14.8 -7°54.7	327°48.6 -8°03.1	342°22.4 -8°11.5	356°56.3 -8°11.5	11°30.0 -8°28.1	26°03.8 -8°36.4	40°37.6 -8°44.6	55°11.3 -8°52.8	69°45.0 -9°00.9	84°18.7 -9°09.1	+33.8 14.7 -8.3 53.9
	Mo 26	302°40.9 -11°06.0	317°14.2 -11°13.5	331°47.4 -11°20.9	346°20.6 -11°28.2	0°53.8 -11°35.5	15°26.9 -11°42.8	30°00.0 -11°50.0	44°33.1 -11°57.2	59°06.2 -12°04.3	73°39.2 -12°11.4	88°12.2 -12°18.4	+33.1 14.7 -7.2 54.0
	Tu 27	306°23.0 -13°57.1	320°55.4 -14°03.2	335°27.8 -14°09.3	350°00.2 -14°15.3	4°32.5 -14°21.1	19°04.8 -14°27.1	33°37.1 -14°33.0	48°09.3 -14°38.0	62°41.5 -14°44.4	77°13.7 -14°50.0	91°45.8 -14°55.6	+32.3 14.8 -5.9 54.2
	We 28	309°42.7 -16°11.1	324°14.4 -16°15.6	338°45.7 -16°20.0	353°17.1 -16°24.3	7°48.4 -16°28.6	22°19.8 -16°32.7	36°51.1 -16°36.8	51°22.3 -16°40.8	65°53.5 -16°44.8	80°24.7 -16°48.7	94°55.8 -16°52.5	+31.3 14.9 -4.1 54.6
●	Th 29	312°37.9 -17°40.0	327°08.4 -17°42.5	341°33.8 -17°44.9	356°09.2 -17°47.2	10°39.6 -17°49.5	25°09.9 -17°51.7	39°40.2 -17°55.7	54°10.5 -17°57.7	68°40.7 -17°57.6	83°10.0 -17°59.5	97°41.0 -18°01.2	+30.3 15.0 -2.1 55.0
	Fr 30	315°08.7 -18°16.4	329°38.3 -18°16.7	344°07.8 -18°16.9	358°37.3 -18°17.0	13°06.8 -18°17.0	27°36.2 -18°16.9	42°05.6 -18°16.7	56°34.9 -18°16.4	71°04.3 -18°16.1	85°33.6 -18°15.6	100°02.8 -18°15.0	+29.4 15.2 +0.1 55.8

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 2 02h23 — FM: 9 02h20 — LQ: 15 17h33 — NM: 23 13h39

SUN

October 2033

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Sa 1	257°35.1 -3°18.5	272°35.3 -3°19.4	287°35.5 -3°20.4	302°35.7 -3°21.4	317°35.9 -3°22.4	332°36.1 -3°23.3	347°36.3 -3°24.3	2°36.5 -3°25.3	17°36.7 -3°26.2	32°36.9 -3°27.2	47°37.1 -3°28.2	62°37.3 -3°29.1	+0.2 -1.0
Su 2	257°39.9 -3°41.7	272°40.1 -3°42.7	287°40.3 -3°43.6	302°40.5 -3°44.6	317°40.7 -3°45.6	332°40.9 -3°46.5	347°41.1 -3°47.5	2°41.3 -3°48.5	17°41.5 -3°49.4	32°41.7 -3°50.4	47°41.9 -3°51.4	62°42.1 -3°52.3	+0.2 -1.0
Mo 3	257°44.6 -4°04.9	272°44.8 -4°05.9	287°45.0 -4°06.8	302°45.2 -4°07.8	317°45.4 -4°08.7	332°45.6 -4°09.7	347°45.8 -4°10.7	2°46.0 -4°11.6	17°46.2 -4°12.6	32°46.4 -4°13.6	47°46.6 -4°14.5	62°46.8 -4°15.5	+0.2 -1.0
Tu 4	257°49.3 -4°28.0	272°49.5 -4°29.0	287°49.7 -4°29.9	302°49.8 -4°30.9	317°50.0 -4°31.9	332°50.2 -4°32.8	347°50.4 -4°33.8	2°50.6 -4°34.8	17°50.8 -4°35.7	32°51.0 -4°36.7	47°51.2 -4°37.6	62°51.4 -4°38.6	+0.2 -1.0
We 5	257°53.8 -4°51.1	272°54.0 -4°52.1	287°54.2 -4°53.0	302°54.4 -4°54.0	317°54.6 -4°54.9	332°54.8 -4°55.9	347°55.0 -4°56.9	2°55.1 -4°57.8	17°55.3 -4°58.8	32°55.5 -4°59.7	47°55.7 -5°00.7	62°55.9 -5°01.7	+0.2 -1.0
Th 6	257°58.3 -5°14.1	272°58.5 -5°15.1	287°58.7 -5°16.0	302°58.9 -5°17.0	317°59.0 -5°17.9	332°59.2 -5°18.9	347°59.4 -5°19.9	2°59.6 -5°20.8	17°59.8 -5°21.8	33°00.0 -5°22.7	48°00.1 -5°23.7	63°00.3 -5°24.6	+0.2 -1.0
Fr 7	258°02.7 -5°37.1	273°02.9 -5°38.0	288°03.0 -5°39.0	303°03.2 -5°39.9	318°03.4 -5°40.9	333°03.6 -5°41.8	348°03.8 -5°42.8	3°03.9 -5°43.7	18°04.1 -5°44.7	33°04.3 -5°45.7	48°04.5 -5°46.6	63°04.7 -5°47.6	+0.2 -1.0
Sa 8	258°07.0 -5°59.9	273°07.1 -6°00.9	288°07.3 -6°01.8	303°07.5 -6°02.8	318°07.7 -6°03.8	333°07.8 -6°04.7	348°08.0 -6°05.7	3°08.2 -6°06.6	18°08.4 -6°07.6	33°08.5 -6°08.5	48°08.7 -6°09.5	63°08.9 -6°10.4	+0.2 -0.9
Su 9	258°11.1 -6°22.7	127°31.1 -6°23.7	288°11.5 -6°24.6	303°11.7 -6°25.6	318°11.8 -6°26.5	333°12.0 -6°27.5	348°12.2 -6°28.4	3°12.3 -6°29.4	18°12.5 -6°30.3	33°12.7 -6°31.3	48°12.8 -6°32.2	63°13.0 -6°33.2	+0.2 -0.9
Mo 10	258°15.2 -6°45.5	273°15.4 -6°46.4	288°15.5 -6°47.4	303°15.7 -6°48.3	318°15.9 -6°49.2	333°16.0 -6°50.2	348°16.2 -6°51.1	3°16.4 -6°52.1	18°16.5 -6°53.0	33°16.7 -6°54.0	48°16.8 -6°54.9	63°17.0 -6°55.8	+0.2 -0.9
Tu 11	258°19.1 -7°08.1	127°31.9 -7°09.0	288°19.5 -7°10.0	303°19.6 -7°10.9	318°19.8 -7°11.8	333°19.9 -7°12.8	348°20.1 -7°13.7	3°20.3 -7°14.7	18°20.4 -7°15.6	33°20.6 -7°16.5	48°20.7 -7°17.5	63°20.9 -7°18.4	+0.2 -0.9
We 12	258°22.9 -7°30.6	273°23.1 -7°31.6	288°23.3 -7°32.5	303°23.4 -7°33.4	318°23.6 -7°34.4	333°23.7 -7°35.3	348°23.9 -7°36.2	3°24.0 -7°37.2	18°24.2 -7°38.1	33°24.3 -7°39.0	48°24.5 -7°40.0	63°24.6 -7°40.9	+0.2 -0.9
Th 13	258°26.6 -7°53.0	273°26.8 -7°54.0	288°26.9 -7°54.9	303°27.1 -7°55.8	318°27.2 -7°56.8	333°27.4 -7°57.7	348°27.5 -7°58.6	3°27.7 -7°59.6	18°27.8 -8°00.5	33°28.0 -8°01.4	48°28.1 -8°02.4	63°28.3 -8°03.3	+0.1 -0.9
Fr 14	258°30.2 -8°15.4	273°30.3 -8°16.3	288°30.5 -8°17.2	303°30.6 -8°18.2	318°30.7 -8°19.1	333°30.9 -8°20.0	348°31.0 -8°20.9	3°31.2 -8°21.9	18°31.3 -8°22.8	33°31.5 -8°23.7	48°31.6 -8°24.6	63°31.7 -8°25.6	+0.1 -0.9
Sa 15	258°33.8 -8°37.6	273°33.7 -8°38.5	288°33.8 -8°39.4	303°34.0 -8°40.3	318°34.1 -8°41.3	333°34.3 -8°42.2	348°34.4 -8°43.1	3°34.5 -8°44.0	18°34.7 -8°45.0	33°34.8 -8°45.9	48°34.9 -8°46.8	63°35.1 -8°47.7	+0.1 -0.9
Su 16	258°36.8 -8°59.7	273°37.0 -9°00.6	288°37.1 -9°01.5	303°37.2 -9°02.4	318°37.4 -9°03.3	333°37.5 -9°04.2	348°37.6 -9°05.2	3°37.7 -9°06.1	18°37.9 -9°07.0	33°38.0 -9°07.9	48°38.1 -9°08.8	63°38.3 -9°09.7	+0.1 -0.9
Mo 17	258°39.9 -9°21.6	273°40.1 -9°22.5	288°40.2 -9°23.4	303°40.3 -9°24.4	318°40.4 -9°25.3	333°40.6 -9°26.2	348°40.7 -9°27.1	3°40.8 -9°28.0	18°40.9 -9°28.9	33°41.9 -9°29.8	48°41.2 -9°30.7	63°41.3 -9°31.6	+0.1 -0.9
Tu 18	258°42.9 -9°43.4	273°43.0 -9°44.4	288°43.1 -9°45.3	303°43.2 -9°46.2	318°43.4 -9°47.1	333°43.5 -9°48.0	348°43.6 -9°48.9	3°43.7 -9°49.8	18°43.8 -9°50.7	33°43.9 -9°51.6	48°44.1 -9°52.5	63°44.2 -9°53.4	+0.1 -0.9
We 19	258°45.7 -10°05.1	273°45.8 -10°06.0	288°45.9 -10°06.9	303°46.0 -10°07.8	318°46.1 -10°08.7	333°46.2 -10°09.6	348°46.4 -10°10.5	3°46.5 -10°11.4	18°46.6 -10°12.3	33°46.7 -10°13.2	48°46.8 -10°14.1	63°46.9 -10°15.0	+0.1 -0.9
Th 20	258°48.3 -10°26.7	273°48.4 -10°27.6	288°48.5 -10°28.5	303°48.6 -10°29.4	318°48.7 -10°30.3	333°48.8 -10°31.1	348°48.9 -10°32.0	3°49.1 -10°32.9	18°49.2 -10°33.8	33°49.3 -10°34.7	48°49.4 -10°35.6	63°49.5 -10°36.5	+0.1 -0.9
Fr 21	258°50.8 -10°48.1	273°50.9 -10°48.9	288°51.0 -10°49.8	303°51.1 -10°50.7	318°51.2 -10°51.6	333°51.3 -10°52.5	348°51.4 -10°53.4	3°51.5 -10°54.3	18°51.6 -10°55.2	33°51.7 -10°56.0	48°51.8 -10°56.9	63°51.9 -10°57.8	+0.1 -0.9
Sa 22	258°53.1 -11°09.3	127°53.2 -11°10.2	288°53.3 -11°11.0	303°53.4 -11°11.9	318°53.5 -11°12.8	333°53.5 -11°13.7	348°53.6 -11°14.6	3°53.7 -11°15.4	18°53.8 -11°16.3	33°53.9 -11°17.2	48°54.0 -11°18.1	63°54.1 -11°19.0	+0.1 -0.9
Su 23	258°55.2 -11°30.3	273°55.3 -11°31.2	288°55.3 -11°32.1	303°55.5 -11°33.0	318°55.6 -11°33.8	333°55.6 -11°34.7	348°55.7 -11°35.6	3°55.8 -11°36.5	18°55.9 -11°37.3	33°56.0 -11°38.2	48°56.1 -11°39.1	63°56.1 -11°39.9	+0.1 -0.9
Mo 24	258°57.2 -11°51.2	273°57.3 -11°52.1	288°57.3 -11°53.0	303°57.4 -11°53.8	318°57.5 -11°54.7	333°57.6 -11°55.6	348°57.6 -11°56.4	3°57.7 -11°57.3	18°57.8 -11°58.2	33°57.9 -11°59.0	48°57.9 -11°59.9	63°58.0 -12°00.7	+0.1 -0.9
Tu 25	258°59.0 -12°11.9	273°59.0 -12°12.8	288°59.1 -12°13.7	303°59.2 -12°14.5	318°59.2 -12°15.4	333°59.3 -12°16.2	348°59.4 -12°17.1	3°59.4 -12°17.9	18°59.5 -12°18.8	33°59.6 -12°19.7	48°59.6 -12°20.6	63°59.7 -12°21.4	+0.1 -0.9
We 26	259°00.6 -12°32.5	274°00.6 -12°33.3	289°00.7 -12°34.2	304°00.8 -12°35.0	319°00.8 -12°35.9	334°00.9 -12°36.7	349°00.9 -12°37.6	4°01.0 -12°38.4	19°01.1 -12°39.3	34°01.1 -12°40.1	49°01.2 -12°40.9	64°01.2 -12°41.8	+0.1 -0.8
Th 27	259°02.8 -12°52.0	274°02.0 -12°53.0	289°02.1 -12°54.5	304°02.2 -12°55.3	319°02.2 -12°56.1	334°02.3 -12°57.0	349°02.3 -12°57.8	4°02.4 -12°58.7	19°02.4 -12°59.5	34°02.5 -13°00.3	49°02.5 -13°01.2	64°02.6 -13°02.0	+0.1 -0.8
Fr 28	259°03.2 -13°12.9	274°03.3 -13°13.7	289°03.3 -13°14.6	304°03.4 -13°15.4	319°03.4 -13°16.2	334°03.5 -13°17.1	349°03.5 -13°17.9	4°03.6 -13°18.7	19°03.6 -13°19.6	34°03.6 -13°20.4	49°03.7 -13°21.2	64°03.7 -13°22.1	+0.0 -0.8
Sa 29	259°04.3 -13°32.8	274°04.3 -13°33.6	289°04.4 -13°34.5	304°04.4 -13°35.3	319°04.4 -13°36.1	334°04.5 -13°36.9	349°04.5 -13°37.8	4°04.6 -13°38.6	19°04.6 -13°39.4	34°04.6 -13°40.2	49°04.7 -13°41.1	64°04.7 -13°41.9	+0.0 -0.8
Su 30	259°05.0 -13°52.5	127°05.2 -13°53.3	289°05.2 -13°54.2	304°05.2 -13°55.0	319°05.3 -13°55.8	334°05.3 -13°56.6	349°05.3 -13°57.4	4°05.4 -13°58.2	19°05.4 -13°59.0	34°05.4 -14°00.7	49°05.5 -14°01.5	64°05.5 -14°01.5	+0.0 -0.8
Mo 31	259°05.8 -14°12.0	274°05.8 -14°12.8	289°05.9 -14°13.6	304°05.9 -14°14.4	319°05.9 -14°15.2	334°05.9 -14°16.0	349°06.0 -14°16.8	4°06.0 -14°17.6	19°06.0 -14°18.4	34°06.0 -14°19.2	49°06.0 -14°20.0	64°06.1 -14°20.9	+0.0 -0.8

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.0'

MOON

October 2033

	D	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	Δ/h	SH
●	Sa 1	244 ⁰ 53.7 -18°04.0	259 ⁰ 22.7 -18°02.3	273 ⁰ 51.6 -18°00.6	288 ⁰ 20.4 -17°58.8	302 ⁰ 49.3 -17°56.8	317 ⁰ 18.1 -17°54.8	331 ⁰ 46.9 -17°52.6	346 ⁰ 15.6 -17°50.4	3 ⁰ 44.3 -17°48.1	15 ⁰ 13.1 -17°45.6	29 ⁰ 41.7 -17°43.1	+28.8	15.4
	Su 2	246 ⁰ 49.0 -16°53.2	261 ⁰ 17.3 -16°49.0	275 ⁰ 45.6 -16°44.8	290 ⁰ 13.8 -16°40.5	304 ⁰ 42.1 -16°36.0	319 ⁰ 10.3 -16°31.5	333 ⁰ 38.5 -16°26.9	348 ⁰ 06.7 -16°22.2	2 ⁰ 34.9 -16°17.3	17 ⁰ 03.0 -16°12.4	31 ⁰ 31.1 -16°07.4	+28.2	15.6
	Mo 3	248 ⁰ 30.9 -14°40.4	262 ⁰ 58.8 -14°33.8	277 ⁰ 26.7 -14°27.1	291 ⁰ 54.5 -14°20.4	306 ⁰ 22.3 -14°13.5	320 ⁰ 50.1 -14°06.6	335 ⁰ 17.9 -13°59.5	349 ⁰ 45.7 -13°52.4	4 ⁰ 13.4 -13°45.2	18 ⁰ 41.2 -13°37.8	33 ⁰ 08.8 -13°30.4	+27.8	15.9
●	Tu 4	250 ⁰ 03.3 -11°28.8	264 ⁰ 30.9 -11°20.0	278 ⁰ 58.4 -11°11.2	293 ⁰ 25.9 -11°02.2	307 ⁰ 53.4 -10°53.2	322 ⁰ 20.8 -10°44.1	336 ⁰ 48.3 -10°34.9	351 ⁰ 15.8 -10°25.7	5 ⁰ 43.2 -10°16.3	20 ⁰ 10.6 -10°06.9	34 ⁰ 38.0 -9°57.5	+27.5	16.2
	We 5	251 ⁰ 27.7 -7°26.9	265 ⁰ 54.9 -7°16.4	280 ⁰ 22.1 -7°05.8	294 ⁰ 49.2 -6°55.1	309 ⁰ 16.4 -6°44.4	323 ⁰ 43.5 -6°33.6	338 ⁰ 10.6 -6°22.8	352 ⁰ 37.8 -6°11.9	7 ⁰ 04.9 -6°01.0	21 ⁰ 31.9 -5°50.0	35 ⁰ 59.0 -5°38.9	+27.1	16.4
	Th 6	252 ⁰ 42.9 -2°48.5	267 ⁰ 09.7 -2°36.8	281 ⁰ 36.4 -2°25.1	296 ⁰ 03.2 -2°13.5	310 ⁰ 29.9 -2°01.7	324 ⁰ 56.6 -1°50.0	339 ⁰ 23.3 -1°38.2	353 ⁰ 49.9 -1°26.4	8 ⁰ 16.6 -1°14.6	22 ⁰ 43.2 -1°02.8	37 ⁰ 09.8 -0°51.0	+26.7	16.6
●	Fr 7	253 ⁰ 46.0 2°07.3	268 ⁰ 12.2 2°19.2	282 ⁰ 38.5 2°31.0	297 ⁰ 04.6 2°42.9	311 ⁰ 30.8 2°54.7	325 ⁰ 56.9 3°06.5	340 ⁰ 23.0 3°18.4	354 ⁰ 49.1 3°30.1	9 ⁰ 15.2 3°41.9	23 ⁰ 41.2 3°53.6	38 ⁰ 07.2 4°05.4	+26.1	16.7
	Sa 8	254 ⁰ 34.2 6°57.2	268 ⁰ 59.8 7°08.4	283 ⁰ 25.3 7°19.5	297 ⁰ 50.9 7°30.5	312 ⁰ 16.4 7°41.5	326 ⁰ 41.9 7°52.4	341 ⁰ 07.3 8°03.2	355 ⁰ 32.8 8°14.0	9 ⁰ 58.2 8°24.8	24 ⁰ 23.6 8°35.5	38 ⁰ 49.0 8°46.1	+25.5	16.7
	Su 9	255 ⁰ 06.9 11°17.0	269 ⁰ 31.9 11°26.5	283 ⁰ 56.9 11°35.8	298 ⁰ 21.9 11°45.1	312 ⁰ 46.9 11°54.3	327 ⁰ 11.8 12°03.4	341 ⁰ 36.8 12°12.4	356 ⁰ 01.7 12°21.3	10 ⁰ 26.6 12°30.6	24 ⁰ 51.5 12°38.8	39 ⁰ 16.4 12°47.4	+25.0	16.6
●	Mo 10	255 ⁰ 28.4 14°44.9	269 ⁰ 53.2 14°51.9	284 ⁰ 17.9 14°58.8	298 ⁰ 42.7 15°05.5	313 ⁰ 07.4 15°12.2	327 ⁰ 32.2 15°18.8	341 ⁰ 56.9 15°25.2	356 ⁰ 21.7 15°31.5	10 ⁰ 46.5 15°37.7	25 ⁰ 11.2 15°43.8	39 ⁰ 36.0 15°49.8	+24.8	16.5
	Tu 11	255 ⁰ 48.9 17°05.4	270 ⁰ 13.9 17°09.5	284 ⁰ 38.8 17°13.5	299 ⁰ 03.9 17°17.4	313 ⁰ 28.9 17°21.1	327 ⁰ 54.0 17°24.7	342 ⁰ 19.1 17°28.2	356 ⁰ 44.2 17°31.5	11 ⁰ 09.4 17°34.8	25 ⁰ 34.6 17°37.9	39 ⁰ 59.8 17°40.9	+25.1	16.2
	We 12	256 ⁰ 22.1 18°11.6	270 ⁰ 47.9 18°12.7	285 ⁰ 13.7 18°13.7	299 ⁰ 39.6 18°14.5	314 ⁰ 05.6 18°15.3	328 ⁰ 31.6 18°15.9	342 ⁰ 57.6 18°16.8	357 ⁰ 23.7 18°17.1	11 ⁰ 49.8 18°17.8	26 ⁰ 16.0 18°17.2	40 ⁰ 42.2 18°17.3	+26.0	16.0
●	Th 13	257 ⁰ 22.3 18°04.7	271 ⁰ 49.4 18°03.0	286 ⁰ 16.6 18°01.2	300 ⁰ 43.8 17°59.3	315 ⁰ 11.1 17°57.3	329 ⁰ 38.5 17°55.2	344 ⁰ 06.0 17°53.0	358 ⁰ 33.5 17°50.7	13 ⁰ 54.5 17°48.2	27 ⁰ 28.6 17°45.7	41 ⁰ 56.3 17°43.1	+27.4	15.7
	Fr 14	258 ⁰ 59.6 16°52.5	273 ⁰ 28.3 16°48.4	287 ⁰ 57.1 16°44.2	302 ⁰ 26.0 16°40.0	316 ⁰ 54.9 16°35.6	331 ⁰ 24.0 16°31.2	345 ⁰ 53.0 16°26.7	360 ⁰ 22.2 16°22.1	14 ⁰ 51.4 16°17.4	29 ⁰ 20.7 16°12.6	43 ⁰ 50.0 16°07.8	+29.0	15.5
	Sa 15	273 ⁰ 28.3 16°48.4	287 ⁰ 57.1 16°44.2	302 ⁰ 26.0 16°40.0	316 ⁰ 54.9 16°35.6	331 ⁰ 24.0 16°31.2	345 ⁰ 53.0 16°26.7	360 ⁰ 22.2 16°22.1	379 ⁰ 00.0 16°17.4	29 ⁰ 20.7 16°12.6	43 ⁰ 50.0 16°07.8	58 ⁰ 19.4 16°02.8	+29.1	15.4
●	Su 16	275 ⁰ 48.6 14°40.0	290 ⁰ 19.0 14°33.9	304 ⁰ 49.5 14°27.8	319 ⁰ 20.1 14°21.6	333 ⁰ 50.8 14°15.3	348 ⁰ 21.5 14°09.0	363 ⁰ 52.3 14°02.6	379 ⁰ 23.1 13°56.1	31 ⁰ 54.6 13°49.6	46 ⁰ 24.9 13°43.0	60 ⁰ 56.0 13°36.3	+30.7	15.2
	Mo 17	278 ⁰ 48.2 11°49.9	293 ⁰ 20.0 11°42.4	307 ⁰ 52.1 11°34.8	322 ⁰ 24.2 11°27.2	336 ⁰ 56.2 11°19.6	351 ⁰ 28.4 11°11.9	366 ⁰ 00.6 11°04.1	381 ⁰ 32.8 10°56.4	33 ⁰ 05.1 10°48.5	49 ⁰ 37.4 10°40.7	64 ⁰ 09.8 10°32.7	+32.2	15.0
	Tu 18	282 ⁰ 21.1 8°29.5	296 ⁰ 64.2 8°21.0	311 ⁰ 27.3 8°12.4	326 ⁰ 00.4 8°03.9	340 ⁰ 33.6 7°55.3	355 ⁰ 06.9 7°46.7	370 ⁰ 40.2 7°38.0	386 ⁰ 46.8 7°29.4	24 ⁰ 13.5 7°20.7	38 ⁰ 46.2 7°11.9	53 ⁰ 20.2 7°03.2	+33.3	14.9
●	We 19	286 ⁰ 18.5 4°49.2	300 ⁰ 52.4 4°40.1	315 ⁰ 26.3 4°31.0	330 ⁰ 00.2 4°21.9	344 ⁰ 34.2 4°12.8	359 ⁰ 08.1 4°03.6	374 ⁰ 12.1 3°54.5	389 ⁰ 13.4 3°45.3	28 ⁰ 16.1 3°36.1	42 ⁰ 50.2 3°26.9	57 ⁰ 24.2 3°16.9	+34.0	14.8
	Th 20	290 ⁰ 31.0 0°58.6	305 ⁰ 05.3 0°49.3	319 ⁰ 39.6 0°40.0	334 ⁰ 13.9 0°30.7	348 ⁰ 48.2 0°21.4	363 ⁰ 22.5 0°12.1	378 ⁰ 56.8 0°02.8	393 ⁰ 11.4 -0°06.5	32 ⁰ 31.1 -0°15.8	51 ⁰ 23.2 -0°25.2	65 ⁰ 57.5 -0°34.5	+34.3	14.7
	Fr 21	294 ⁰ 49.0 -2°53.2	309 ⁰ 23.3 -3°02.4	323 ⁰ 57.6 -3°11.6	338 ⁰ 31.9 -3°20.7	353 ⁰ 06.2 -3°29.9	367 ⁰ 40.5 -3°39.0	382 ⁰ 14.7 -3°48.1	397 ⁰ 14.7 -3°57.2	22 ⁰ 14.7 -4°06.3	51 ⁰ 23.2 -4°15.3	65 ⁰ 57.5 -4°24.4	+34.3	14.7
●	Sa 22	299 ⁰ 03.5 -6°37.5	313 ⁰ 37.5 -6°46.2	328 ⁰ 11.5 -6°54.9	342 ⁰ 45.4 -7°03.5	357 ⁰ 19.4 -7°12.1	372 ⁰ 53.0 -7°20.7	387 ⁰ 27.2 -7°29.2	402 ⁰ 01.1 -7°37.8	55 ⁰ 34.9 -7°46.3	70 ⁰ 08.7 -7°54.7	84 ⁰ 42.6 -8°03.1	+33.9	14.7
	Su 23	303 ⁰ 06.7 -10°05.3	317 ⁰ 40.1 -10°13.2	332 ⁰ 13.5 -10°21.0	346 ⁰ 46.9 -10°28.7	361 ⁰ 20.2 -10°36.6	376 ⁰ 53.5 -10°44.1	391 ⁰ 26.7 -10°51.7	406 ⁰ 59.9 -11°06.9	59 ⁰ 33.1 -11°14.3	74 ⁰ 06.3 -11°21.8	88 ⁰ 39.4 -11°28.8	+33.3	14.7
	Mo 24	306 ⁰ 52.5 -13°07.5	321 ⁰ 25.1 -13°14.2	335 ⁰ 57.7 -13°20.7	350 ⁰ 30.2 -13°27.2	365 ⁰ 02.7 -13°33.7	380 ⁰ 35.2 -13°40.4	395 ⁰ 07.6 -13°46.4	410 ⁰ 40.9 -13°52.7	425 ⁰ 13.1 -13°59.0	59 ⁰ 33.1 -14°05.1	74 ⁰ 06.3 -14°11.2	+32.4	14.8
●	Tu 25	310 ⁰ 17.0 -15°35.1	324 ⁰ 48.7 -15°40.2	339 ⁰ 20.3 -15°45.2	353 ⁰ 52.0 -15°50.1	368 ⁰ 23.6 -15°55.0	383 ⁰ 56.1 -15°59.7	398 ⁰ 28.6 -16°04.4	413 ⁰ 01.1 -16°09.1	66 ⁰ 29.6 -16°13.6	81 ⁰ 01.0 -16°18.1	95 ⁰ 32.4 -16°22.5	+31.5	14.4
	We 26	313 ⁰ 18.8 -17°19.6	327 ⁰ 49.6 -17°22.8	342 ⁰ 20.4 -17°25.9	356 ⁰ 51.2 -17°28.9	371 ⁰ 21.9 -17°31.9	386 ⁰ 52.6 -17°34.7	401 ⁰ 23.2 -17°37.4	416 ⁰ 53.9 -17°40.1	69 ⁰ 24.7 -17°42.7	83 ⁰ 55.0 -17°45.2	98 ⁰ 25.5 -17°47.6	+30.7	14.9
	Th 27	315 ⁰ 59.8 -18°13.6	330 ⁰ 29.8 -18°14.6	344 ⁰ 59.9 -18°15.6	359 ⁰ 29.9 -18°16.4	374 ⁰ 59.8 -18°17.2	389 ⁰ 29.8 -18°18.3	404 ⁰ 59.7 -18°18.4	420 ⁰ 59.7 -18°18.9	71 ⁰ 59.5 -18°19.3	86 ⁰ 29.3 -18°19.6	100 ⁰ 59.2 -18°19.8	+29.9	15.1
●	Fr 28	318 ⁰ 23.9 -18°11.6	332 ⁰ 53.4 -18°10.3	347 ⁰ 22.9 -18°09.0	362 ⁰ 52.3 -18°07.5	378 ⁰ 21.8 -18°05.9	393 ⁰ 51.2 -18°04.2	409 ⁰ 20.6 -18°02.5	424 ⁰ 50.6 -18°00.6	74 ⁰ 19.3 -17°58.6	88 ⁰ 48.7 -17°56.6	103 ⁰ 18.7 -17°54.4	+29.4	15.2
	Sa 29	320 ⁰ 36.5 -17°10.8	335 ⁰ 05.6 -17°07.1	349 ⁰ 34.3 -17°03.3	364 ⁰ 03.9 -16°59.5	379 ⁰ 33.0 -16°55.5	394 ⁰ 02.1 -16°51.6	409 ⁰ 31.2 -16°47.3	424 ⁰ 00.2 -16°43.1	76 ⁰ 29.3 -16°38.8	90 ⁰ 58.4 -16°34.3	105 ⁰ 27.4 -16°29.8	+29.1	15.4
	Su 30	322 ⁰ 42.3 -17°11.0	337 ⁰ 11.2 -15°05.1	351 ⁰ 40.2 -14°59.0	366 ⁰ 09.1 -14°52.8	381 ⁰ 38.0 -14°46.6	396 ⁰ 06.9 -14°40.3	411 ⁰ 35.8 -14°33.9	426 ⁰ 04.4 -14°27.4	78 ⁰ 33.6 -14°20.8	93 ⁰ 02.5 -14°14.1	107 ⁰ 31.4 -14°07.3	+28.9	15.6
●	Mo 31	324 ⁰ 43.9 -12°15.8	339 ⁰ 12.7 -12°07.7	353 ⁰ 41.5 -11°59.6	368 ⁰ 10.2 -11°51.4	383 ⁰ 38.0 -11°43.0	398 ⁰ 07.8 -11°34.7	413 ⁰ 36.5 -11°26.2	428 ⁰ 04.9 -11°17.7	80 ⁰ 34.0 -11°09.0	95 ⁰ 02.7 -11°00.4	109 ⁰ 31.4 -10°51.6	+28.7	15.9

SUN

November 2033

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Tu 1	259°06.3 -14°31.3	274°06.3 -14°32.0	289°06.3 -14°32.8	304°06.4 -14°33.6	319°06.4 -14°34.4	334°06.4 -14°35.2	349°06.4 -14°36.0	4°06.4 -14°36.8	15°06.4 -14°37.6	34°06.4 -14°38.4	45°06.4 -14°39.2	64°06.5 -14°40.0	+0.0 -0.8
We 2	259°06.6 -14°50.3	274°06.6 -14°51.1	289°06.6 -14°51.8	304°06.6 -14°52.6	319°06.6 -14°53.4	334°06.6 -14°54.2	349°06.6 -14°55.0	4°06.6 -14°55.8	15°06.6 -14°56.6	34°06.6 -14°57.3	45°06.7 -14°58.1	64°06.7 -14°58.9	+0.0 -0.8
Th 3	259°06.7 -15°09.0	274°06.7 -15°09.8	289°06.7 -15°10.6	304°06.7 -15°11.4	319°06.7 -15°12.1	334°06.7 -15°12.9	349°06.7 -15°13.7	4°06.7 -15°14.5	15°06.7 -15°15.2	34°06.7 -15°16.0	45°06.7 -15°16.8	64°06.7 -15°17.6	-0.0 -0.8
Fr 4	259°06.6 -15°27.6	274°06.6 -15°28.3	289°06.6 -15°29.1	304°06.5 -15°29.9	319°06.5 -15°30.6	334°06.5 -15°31.4	349°06.5 -15°32.2	4°06.5 -15°32.9	15°06.5 -15°33.7	34°06.5 -15°34.4	45°06.5 -15°35.2	64°06.5 -15°36.0	-0.0 -0.8
Sa 5	259°06.3 -15°45.8	274°06.2 -15°46.6	289°06.2 -15°47.3	304°06.2 -15°48.1	319°06.2 -15°48.9	334°06.2 -15°49.6	349°06.2 -15°50.4	4°06.1 -15°51.1	15°06.1 -15°51.9	34°06.1 -15°52.6	45°06.1 -15°53.4	64°06.1 -15°54.1	-0.0 -0.8
Su 6	259°05.7 -16°03.8	274°05.7 -16°04.6	289°05.7 -16°05.3	304°05.7 -16°06.1	319°05.6 -16°06.8	334°05.6 -16°07.6	349°05.6 -16°08.3	4°05.6 -16°09.0	15°05.5 -16°09.8	34°05.5 -16°10.5	45°05.5 -16°11.3	64°05.4 -16°12.0	-0.0 -0.7
Mo 7	259°05.0 -16°21.6	274°05.0 -16°22.3	289°05.0 -16°23.1	304°04.9 -16°23.8	319°04.9 -16°24.5	334°04.8 -16°25.3	349°04.8 -16°26.0	4°04.8 -16°26.7	15°04.7 -16°27.4	34°04.7 -16°28.2	45°04.7 -16°28.9	64°04.6 -16°29.6	-0.0 -0.7
Tu 8	259°04.1 -16°39.1	274°04.0 -16°39.8	289°04.0 -16°40.5	304°04.0 -16°41.2	319°03.9 -16°41.9	334°03.9 -16°42.7	349°03.8 -16°43.4	4°03.8 -16°44.1	15°03.7 -16°44.8	34°03.7 -16°45.5	45°03.6 -16°46.3	64°03.6 -16°47.0	-0.0 -0.7
We 9	259°02.9 -16°56.2	274°02.9 -16°57.0	289°02.8 -16°57.7	304°02.8 -16°58.4	319°02.7 -16°59.1	334°02.7 -16°59.8	349°02.6 -17°00.5	4°02.6 -17°01.2	15°02.5 -17°01.9	34°02.4 -17°02.6	45°02.4 -17°03.3	64°02.3 -17°04.0	-0.1 -0.7
Th 10	259°01.6 -17°13.1	274°01.5 -17°13.8	289°01.4 -17°14.5	304°01.4 -17°15.2	319°01.3 -17°15.9	334°01.3 -17°16.6	349°01.2 -17°17.3	4°01.1 -17°18.0	15°01.1 -17°18.7	34°01.0 -17°19.4	45°01.0 -17°20.1	64°00.9 -17°20.8	-0.1 -0.7
Fr 11	259°00.0 -17°29.8	273°59.9 -17°30.4	288°59.9 -17°31.1	303°59.8 -17°31.8	318°59.7 -17°32.5	333°59.6 -17°33.2	348°59.6 -17°33.9	3°59.5 -17°34.5	15°59.4 -17°35.2	33°59.3 -17°35.9	45°59.3 -17°36.6	63°59.2 -17°37.3	-0.1 -0.7
Sa 12	258°58.2 -17°46.1	273°58.1 -17°46.7	288°58.0 -17°47.4	303°58.0 -17°48.1	318°57.9 -17°48.7	333°57.8 -17°49.4	348°57.7 -17°50.1	3°57.6 -17°50.8	15°57.6 -17°51.4	33°57.5 -17°52.1	45°57.4 -17°52.8	63°57.3 -17°53.4	-0.1 -0.7
Su 13	258°56.2 -18°02.1	273°56.1 -18°02.7	288°56.0 -18°03.4	303°55.9 -18°04.0	318°55.8 -18°04.7	333°55.7 -18°05.4	348°55.6 -18°06.0	3°55.6 -18°06.7	15°55.5 -18°07.3	33°55.4 -18°08.0	45°55.3 -18°08.6	63°55.2 -18°09.3	-0.1 -0.7
Mo 14	258°54.0 -18°17.7	273°53.9 -18°18.4	288°53.8 -18°19.1	303°53.7 -18°19.7	318°53.6 -18°20.3	333°53.5 -18°21.0	348°53.4 -18°21.6	3°53.3 -18°22.3	15°53.2 -18°22.9	33°53.1 -18°23.5	45°53.0 -18°24.2	63°52.9 -18°24.8	-0.1 -0.6
Tu 15	258°51.5 -18°33.1	273°51.4 -18°33.7	288°51.3 -18°34.4	303°51.2 -18°35.0	318°51.1 -18°35.6	333°51.0 -18°36.3	348°50.9 -18°36.9	3°50.8 -18°37.5	15°50.6 -18°38.2	33°50.5 -18°38.8	45°50.4 -18°39.4	63°50.3 -18°40.0	-0.1 -0.6
We 16	258°48.9 -18°48.2	273°48.7 -18°48.8	288°48.6 -18°49.4	303°48.5 -18°50.0	318°48.4 -18°50.6	333°48.3 -18°51.1	348°48.2 -18°51.9	3°48.0 -18°52.5	15°47.9 -18°53.1	33°47.8 -18°53.7	45°47.8 -18°54.3	63°47.6 -18°54.9	-0.1 -0.6
Th 17	258°46.0 -19°02.9	273°45.9 -19°03.5	288°45.7 -19°04.1	303°45.6 -19°04.7	318°45.5 -19°05.3	333°45.3 -19°05.9	348°45.2 -19°06.5	3°45.1 -19°07.1	15°45.0 -19°07.7	33°44.8 -19°08.3	45°44.7 -19°08.9	63°44.6 -19°09.5	-0.1 -0.6
Fr 18	258°42.9 -19°17.2	273°42.8 -19°17.8	288°42.6 -19°18.4	303°42.5 -19°19.0	318°42.4 -19°19.6	333°42.2 -19°20.2	348°42.1 -19°20.8	3°41.9 -19°21.4	15°41.8 -19°21.9	33°41.7 -19°22.5	45°41.5 -19°23.1	63°41.4 -19°23.7	-0.1 -0.6
Sa 19	258°39.6 -19°31.3	273°39.5 -19°31.8	288°39.3 -19°32.4	303°39.2 -19°33.0	318°39.0 -19°33.6	333°38.9 -19°34.1	348°38.7 -19°34.7	3°38.6 -19°35.3	15°38.4 -19°35.8	33°38.3 -19°36.4	45°38.2 -19°37.0	63°38.0 -19°37.6	-0.1 -0.6
Su 20	258°36.1 -19°44.9	273°35.9 -19°45.5	288°35.8 -19°46.0	303°35.6 -19°46.6	318°35.5 -19°47.2	333°35.3 -19°47.7	348°35.2 -19°48.3	3°35.0 -19°48.9	15°34.9 -19°50.4	33°34.7 -19°50.5	45°34.6 -19°50.5	63°34.4 -19°51.1	-0.2 -0.6
Mo 21	258°32.4 -19°58.2	273°32.2 -19°58.8	288°32.1 -19°59.3	303°31.9 -20°00.0	318°31.7 -20°00.4	333°31.6 -20°01.0	348°31.4 -20°01.5	3°31.3 -20°02.0	15°31.1 -20°02.6	33°30.9 -20°03.1	45°30.8 -20°03.7	63°30.6 -20°04.2	-0.2 -0.5
Tu 22	258°28.5 -20°11.2	273°28.3 -20°11.7	288°28.1 -20°12.2	303°28.0 -20°12.8	318°27.8 -20°13.3	333°27.6 -20°13.8	348°27.5 -20°14.4	3°27.3 -20°14.9	15°27.1 -20°15.4	33°27.0 -20°15.9	45°26.8 -20°16.5	63°26.6 -20°17.0	-0.2 -0.5
We 23	258°24.4 -20°23.8	273°24.2 -20°24.3	288°24.0 -20°24.8	303°23.8 -20°25.3	318°23.7 -20°25.8	333°23.5 -20°26.3	348°23.3 -20°26.8	3°23.1 -20°27.4	15°23.0 -20°27.9	33°22.8 -20°28.4	45°22.6 -20°28.9	63°22.4 -20°29.4	-0.2 -0.5
Th 24	258°20.0 -20°36.0	273°19.9 -20°36.5	288°19.7 -20°37.0	303°19.5 -20°37.5	318°19.3 -20°38.0	333°19.1 -20°38.5	348°19.0 -20°39.0	3°18.8 -20°39.4	15°18.6 -20°39.9	33°18.4 -20°40.4	45°18.2 -20°40.9	63°18.0 -20°41.4	-0.2 -0.5
Fr 25	258°15.6 -20°47.8	273°15.4 -20°48.3	288°15.2 -20°48.8	303°15.0 -20°49.2	318°14.8 -20°49.7	333°14.6 -20°50.2	348°14.4 -20°50.7	3°14.2 -20°51.2	15°14.0 -20°51.6	33°13.8 -20°52.1	45°13.7 -20°52.6	63°13.5 -20°53.1	-0.2 -0.5
Sa 26	258°10.9 -20°59.2	273°10.7 -20°59.7	288°10.5 -21°00.2	303°10.3 -21°00.6	318°10.1 -21°01.1	333°09.9 -21°01.5	348°09.7 -21°02.0	3°09.5 -21°02.5	15°09.3 -21°02.9	33°09.1 -21°03.4	45°08.9 -21°03.9	63°08.7 -21°04.3	-0.2 -0.5
Su 27	258°06.0 -21°10.8	273°05.8 -21°11.2	288°05.6 -21°11.7	303°05.4 -21°12.1	318°05.2 -21°12.5	333°05.0 -21°12.9	348°04.8 -21°13.4	3°04.6 -21°13.8	15°04.4 -21°14.3	33°04.2 -21°14.8	45°04.0 -21°15.3	63°03.8 -21°15.7	-0.2 -0.4
Mo 28	258°01.0 -21°20.9	273°00.8 -21°21.3	288°00.6 -21°21.8	303°00.4 -21°22.2	318°00.2 -21°22.6	332°59.9 -21°23.1	347°59.7 -21°23.5	2°59.5 -21°23.9	15°59.3 -21°24.4	32°59.1 -21°24.8	45°58.9 -21°25.2	62°58.7 -21°25.6	-0.2 -0.4
Tu 29	257°55.8 -21°31.1	272°55.6 -21°31.6	287°55.4 -21°32.0	302°55.2 -21°32.4	317°54.9 -21°32.8	332°54.7 -21°33.2	347°54.5 -21°33.6	2°54.3 -21°34.0	15°54.1 -21°34.5	32°53.8 -21°34.9	45°53.6 -21°35.3	62°53.4 -21°35.7	-0.2 -0.4
We 30	257°50.5 -21°41.0	272°50.2 -21°41.8	287°50.0 -21°42.1	302°49.8 -21°42.4	317°49.5 -21°42.6	332°49.3 -21°43.0	347°49.1 -21°43.4	2°48.9 -21°43.8	15°48.6 -21°44.1	32°48.5 -21°44.5	45°48.2 -21°44.9	62°47.9 -21°45.3	-0.2 -0.4

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

November 2033

	D	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	Δ'/h SH
O	Tu 1	239 ⁰ 49.3 -9 ⁰ 29.6	254 ⁰ 18.0 -9 ⁰ 20.1	268 ⁰ 46.6 -9 ⁰ 10.6	283 ⁰ 15.1 -9 ⁰ 01.0	297 ⁰ 43.7 -8 ⁰ 51.4	312 ⁰ 12.3 -8 ⁰ 41.7	326 ⁰ 40.8 -8 ⁰ 31.9	341 ⁰ 09.4 -8 ⁰ 22.1	355 ⁰ 37.9 -8 ⁰ 12.2	10 ⁰ 06.4 -8 ⁰ 02.2	24 ⁰ 34.9 -7 ⁰ 52.2	+28.6 16.0 +9.7 58.8
	We 2	241 ⁰ 40.2 -5 ⁰ 15.6	256 ⁰ 08.5 -5 ⁰ 04.8	270 ⁰ 36.6 -4 ⁰ 53.9	285 ⁰ 04.8 -4 ⁰ 43.0	299 ⁰ 32.9 -4 ⁰ 32.0	314 ⁰ 01.1 -4 ⁰ 21.0	328 ⁰ 29.2 -4 ⁰ 10.0	342 ⁰ 57.2 -3 ⁰ 58.9	357 ⁰ 25.3 -3 ⁰ 47.8	11 ⁰ 53.3 -3 ⁰ 36.6	26 ⁰ 21.3 -3 ⁰ 25.5	+28.1 16.3 +11.0 59.7
	Th 3	243 ⁰ 18.0 -0 ⁰ 34.4	257 ⁰ 45.6 -0 ⁰ 22.8	272 ⁰ 13.3 -0 ⁰ 11.3	286 ⁰ 04.6 0 ⁰ 00.3	301 ⁰ 08.0 0 ⁰ 12.0	315 ⁰ 35.4 0 ⁰ 23.6	330 ⁰ 02.8 0 ⁰ 35.2	344 ⁰ 30.1 0 ⁰ 46.8	358 ⁰ 57.4 0 ⁰ 58.5	13 ⁰ 24.7 1 ⁰ 10.1	27 ⁰ 51.9 1 ⁰ 21.8	+27.4 16.5 +11.6 60.4
O	Fr 4	244 ⁰ 35.9 4 ⁰ 15.9	259 ⁰ 02.5 4 ⁰ 27.4	273 ⁰ 29.1 4 ⁰ 38.9	287 ⁰ 55.6 4 ⁰ 50.3	302 ⁰ 22.1 5 ⁰ 01.8	316 ⁰ 48.6 5 ⁰ 13.2	331 ⁰ 15.0 5 ⁰ 24.6	345 ⁰ 41.3 5 ⁰ 35.9	0 ⁰ 07.7 5 ⁰ 47.2	14 ⁰ 33.9 5 ⁰ 58.5	29 ⁰ 00.2 6 ⁰ 09.8	+26.4 16.6 +11.4 60.9
	Sa 5	245 ⁰ 28.5 8 ⁰ 53.5	259 ⁰ 54.0 9 ⁰ 04.0	274 ⁰ 19.5 9 ⁰ 14.5	288 ⁰ 45.0 9 ⁰ 24.9	303 ⁰ 10.4 9 ⁰ 35.2	317 ⁰ 35.8 9 ⁰ 45.5	332 ⁰ 01.1 9 ⁰ 55.7	346 ⁰ 26.4 10 ⁰ 05.8	0 ⁰ 51.7 10 ⁰ 15.9	15 ⁰ 16.9 10 ⁰ 25.8	29 ⁰ 42.0 10 ⁰ 35.8	+25.4 16.7 +10.2 61.2
	Su 6	245 ⁰ 54.9 12 ⁰ 55.0	260 ⁰ 19.5 13 ⁰ 03.6	274 ⁰ 44.0 13 ⁰ 12.1	289 ⁰ 08.6 13 ⁰ 20.5	303 ⁰ 33.0 13 ⁰ 28.8	317 ⁰ 57.5 13 ⁰ 37.0	332 ⁰ 21.9 13 ⁰ 45.1	346 ⁰ 46.3 13 ⁰ 53.1	1 ⁰ 10.7 14 ⁰ 01.0	15 ⁰ 35.0 14 ⁰ 08.8	29 ⁰ 59.3 14 ⁰ 16.5	+24.4 16.6 +8.2 61.0
O	Mo 7	246 ⁰ 01.7 15 ⁰ 58.8	260 ⁰ 35.7 16 ⁰ 04.7	274 ⁰ 49.8 16 ⁰ 10.5	289 ⁰ 13.8 16 ⁰ 16.2	303 ⁰ 37.8 16 ⁰ 21.7	318 ⁰ 01.8 16 ⁰ 27.2	332 ⁰ 25.8 16 ⁰ 32.5	346 ⁰ 49.9 16 ⁰ 37.7	1 ⁰ 13.9 16 ⁰ 42.7	15 ⁰ 37.9 16 ⁰ 47.7	30 ⁰ 01.9 16 ⁰ 52.5	+24.0 16.5 +5.4 60.6
	Tu 8	246 ⁰ 03.3 17 ⁰ 49.8	260 ⁰ 27.5 17 ⁰ 52.6	274 ⁰ 51.7 17 ⁰ 55.3	289 ⁰ 16.0 17 ⁰ 57.8	303 ⁰ 40.3 18 ⁰ 00.2	318 ⁰ 04.7 18 ⁰ 02.5	332 ⁰ 29.0 18 ⁰ 04.7	346 ⁰ 53.4 18 ⁰ 06.7	1 ⁰ 17.8 18 ⁰ 08.7	15 ⁰ 42.3 18 ⁰ 10.5	30 ⁰ 06.8 18 ⁰ 12.1	+24.3 16.3 +2.2 59.8
	We 9	246 ⁰ 19.1 18 ⁰ 22.1	260 ⁰ 44.3 18 ⁰ 21.8	275 ⁰ 09.6 18 ⁰ 21.4	289 ⁰ 34.9 18 ⁰ 20.8	304 ⁰ 00.3 18 ⁰ 20.2	318 ⁰ 25.7 18 ⁰ 19.4	332 ⁰ 51.2 18 ⁰ 15.5	347 ⁰ 16.7 18 ⁰ 17.5	1 ⁰ 42.3 18 ⁰ 16.3	16 ⁰ 08.0 18 ⁰ 15.1	30 ⁰ 33.7 18 ⁰ 13.7	+25.5 16.1 -8.8 58.9
O	Th 10	247 ⁰ 07.5 17 ⁰ 39.9	261 ⁰ 34.3 17 ⁰ 36.8	276 ⁰ 01.2 17 ⁰ 33.5	290 ⁰ 28.2 17 ⁰ 30.2	304 ⁰ 55.2 17 ⁰ 26.8	319 ⁰ 22.3 17 ⁰ 23.3	333 ⁰ 49.5 17 ⁰ 19.7	348 ⁰ 16.8 17 ⁰ 16.0	2 ⁰ 44.1 17 ⁰ 12.2	17 ⁰ 11.5 17 ⁰ 08.3	31 ⁰ 39.0 17 ⁰ 04.3	+27.1 15.8 -3.6 57.9
	Fr 11	248 ⁰ 40.5 15 ⁰ 53.8	263 ⁰ 09.2 15 ⁰ 48.4	277 ⁰ 38.0 15 ⁰ 43.0	292 ⁰ 06.9 15 ⁰ 37.4	306 ⁰ 35.8 15 ⁰ 31.8	321 ⁰ 04.8 15 ⁰ 26.1	335 ⁰ 33.9 15 ⁰ 20.4	350 ⁰ 03.1 15 ⁰ 14.5	4 ⁰ 32.4 15 ⁰ 08.6	19 ⁰ 01.7 15 ⁰ 02.6	33 ⁰ 31.1 14 ⁰ 56.6	+29.1 15.5 -5.7 56.9
	Sa 12	251 ⁰ 01.2 13 ⁰ 17.8	265 ⁰ 31.8 13 ⁰ 10.7	280 ⁰ 02.5 13 ⁰ 03.6	294 ⁰ 33.2 12 ⁰ 56.4	309 ⁰ 04.0 12 ⁰ 49.2	323 ⁰ 34.9 12 ⁰ 41.9	338 ⁰ 05.8 12 ⁰ 34.5	352 ⁰ 36.8 12 ⁰ 27.1	7 ⁰ 07.9 12 ⁰ 19.6	21 ⁰ 39.0 12 ⁰ 12.1	36 ⁰ 10.2 12 ⁰ 04.6	+30.9 15.3 -7.3 56.1
O	Su 13	254 ⁰ 05.8 10 ⁰ 05.8	268 ⁰ 38.0 9 ⁰ 57.5	283 ⁰ 10.3 9 ⁰ 49.2	297 ⁰ 42.6 9 ⁰ 40.9	312 ⁰ 14.9 9 ⁰ 32.5	326 ⁰ 47.3 9 ⁰ 24.2	341 ⁰ 19.8 9 ⁰ 15.7	355 ⁰ 52.3 9 ⁰ 07.3	10 ⁰ 24.8 8 ⁰ 58.8	24 ⁰ 57.5 8 ⁰ 50.2	39 ⁰ 30.1 8 ⁰ 41.7	+32.4 15.1 -8.4 55.3
	Mo 14	268 ⁰ 38.0 9 ⁰ 57.5	283 ⁰ 10.3 9 ⁰ 49.2	297 ⁰ 42.6 9 ⁰ 40.9	312 ⁰ 14.9 9 ⁰ 32.5	326 ⁰ 47.3 9 ⁰ 24.2	341 ⁰ 19.8 9 ⁰ 15.7	355 ⁰ 52.3 9 ⁰ 07.3	10 ⁰ 24.8 8 ⁰ 58.8	24 ⁰ 57.5 8 ⁰ 50.2	39 ⁰ 30.1 8 ⁰ 41.7	54 ⁰ 02.8 8 ⁰ 33.1	+32.5 15.1 -8.4 55.3
	Tu 15	272 ⁰ 19.0 6 ⁰ 21.0	286 ⁰ 52.4 6 ⁰ 12.0	301 ⁰ 25.5 6 ⁰ 03.0	315 ⁰ 59.3 5 ⁰ 54.0	330 ⁰ 32.9 5 ⁰ 44.9	345 ⁰ 06.4 5 ⁰ 35.8	359 ⁰ 04.0 5 ⁰ 26.7	14 ⁰ 13.8 5 ⁰ 17.6	28 ⁰ 47.3 5 ⁰ 08.5	43 ⁰ 21.0 4 ⁰ 59.4	57 ⁰ 54.7 4 ⁰ 50.2	+33.6 14.9 -9.1 54.7
O	We 16	276 ⁰ 23.7 2 ⁰ 31.5	290 ⁰ 57.9 2 ⁰ 22.2	305 ⁰ 32.0 2 ⁰ 12.9	320 ⁰ 06.2 2 ⁰ 03.5	334 ⁰ 40.3 1 ⁰ 54.2	349 ⁰ 14.5 1 ⁰ 44.9	3 ⁰ 48.7 1 ⁰ 35.5	18 ⁰ 23.0 1 ⁰ 26.2	32 ⁰ 57.2 1 ⁰ 16.8	47 ⁰ 31.4 1 ⁰ 07.5	62 ⁰ 05.7 0 ⁰ 58.1	+34.2 14.8 -9.3 54.3
	Th 17	280 ⁰ 40.7 -1 ⁰ 22.0	295 ⁰ 15.1 -1 ⁰ 31.3	309 ⁰ 49.5 -1 ⁰ 40.5	324 ⁰ 23.8 -1 ⁰ 49.8	338 ⁰ 58.2 -1 ⁰ 59.1	353 ⁰ 32.6 -2 ⁰ 08.4	8 ⁰ 07.0 -2 ⁰ 17.6	22 ⁰ 41.3 -2 ⁰ 26.9	37 ⁰ 15.7 -2 ⁰ 36.1	51 ⁰ 56.0 -2 ⁰ 45.4	66 ⁰ 24.4 -2 ⁰ 54.6	+34.4 14.7 -9.3 54.1
	Fr 18	284 ⁰ 58.8 -5 ⁰ 11.0	299 ⁰ 33.8 -5 ⁰ 20.0	314 ⁰ 07.2 -5 ⁰ 28.9	328 ⁰ 04.1 -5 ⁰ 37.8	343 ⁰ 15.4 -5 ⁰ 46.7	357 ⁰ 49.7 -5 ⁰ 55.6	12 ⁰ 23.8 -6 ⁰ 04.4	26 ⁰ 57.9 -6 ⁰ 13.2	41 ⁰ 32.0 -6 ⁰ 22.0	56 ⁰ 06.1 -6 ⁰ 30.8	70 ⁰ 40.1 -6 ⁰ 39.6	+34.1 14.7 -8.9 54.0
O	Sa 19	289 ⁰ 08.1 -8 ⁰ 47.4	303 ⁰ 41.8 -8 ⁰ 55.6	318 ⁰ 15.4 -9 ⁰ 03.9	332 ⁰ 49.0 -9 ⁰ 12.1	347 ⁰ 22.6 -9 ⁰ 20.2	1 ⁰ 56.2 -9 ⁰ 28.3	16 ⁰ 29.7 -9 ⁰ 36.4	31 ⁰ 03.2 -9 ⁰ 44.5	45 ⁰ 36.6 -9 ⁰ 52.5	60 ⁰ 10.1 -10 ⁰ 00.5	74 ⁰ 43.5 -10 ⁰ 08.4	+33.5 14.7 -8.1 54.0
	Su 20	293 ⁰ 00.4 -12 ⁰ 02.2	307 ⁰ 33.2 -12 ⁰ 09.9	322 ⁰ 06.0 -12 ⁰ 16.6	336 ⁰ 38.8 -12 ⁰ 23.7	351 ⁰ 11.5 -12 ⁰ 30.8	5 ⁰ 44.2 -12 ⁰ 37.8	20 ⁰ 16.8 -12 ⁰ 44.8	34 ⁰ 49.5 -12 ⁰ 51.1	49 ⁰ 22.0 -12 ⁰ 58.5	63 ⁰ 54.6 -13 ⁰ 05.3	78 ⁰ 27.1 -13 ⁰ 12.1	+32.7 14.8 -7.0 54.2
	Mo 21	296 ⁰ 29.8 -14 ⁰ 46.3	311 ⁰ 01.6 -14 ⁰ 52.1	325 ⁰ 33.4 -14 ⁰ 57.9	340 ⁰ 05.2 -15 ⁰ 03.5	354 ⁰ 37.0 -15 ⁰ 09.1	9 ⁰ 08.6 -15 ⁰ 14.7	23 ⁰ 40.3 -15 ⁰ 20.1	38 ⁰ 11.9 -15 ⁰ 25.5	52 ⁰ 43.5 -15 ⁰ 39.9	67 ⁰ 15.0 -15 ⁰ 46.1	81 ⁰ 46.5 -15 ⁰ 41.8	+31.7 14.8 -5.5 54.5
O	Tu 22	299 ⁰ 34.0 -16 ⁰ 50.4	314 ⁰ 04.8 -16 ⁰ 54.4	328 ⁰ 35.7 -16 ⁰ 58.4	343 ⁰ 06.4 -17 ⁰ 02.2	357 ⁰ 37.2 -17 ⁰ 06.0	12 ⁰ 07.9 -17 ⁰ 09.7	26 ⁰ 38.5 -17 ⁰ 13.3	41 ⁰ 09.2 -17 ⁰ 16.8	55 ⁰ 39.8 -17 ⁰ 20.3	70 ⁰ 10.3 -17 ⁰ 23.6	84 ⁰ 40.8 -17 ⁰ 26.9	+30.7 14.9 -3.6 54.8
	We 23	302 ⁰ 14.5 -18 ⁰ 05.9	316 ⁰ 44.5 -18 ⁰ 07.9	331 ⁰ 14.4 -18 ⁰ 09.6	345 ⁰ 44.4 -18 ⁰ 11.3	0 ⁰ 14.3 -18 ⁰ 13.3	14 ⁰ 44.2 -18 ⁰ 14.5	29 ⁰ 14.0 -18 ⁰ 16.0	43 ⁰ 43.8 -18 ⁰ 17.3	58 ⁰ 13.6 -18 ⁰ 18.6	72 ⁰ 43.4 -18 ⁰ 19.8	87 ⁰ 13.1 -18 ⁰ 20.8	+29.9 15.0 -1.5 55.2
	Th 24	304 ⁰ 36.5 -18 ⁰ 25.9	319 ⁰ 05.9 -18 ⁰ 25.5	333 ⁰ 35.3 -18 ⁰ 25.0	348 ⁰ 04.6 -18 ⁰ 24.4	2 ⁰ 34.0 -18 ⁰ 23.7	17 ⁰ 03.3 -18 ⁰ 22.9	31 ⁰ 32.6 -18 ⁰ 22.0	46 ⁰ 01.9 -18 ⁰ 21.0	60 ⁰ 31.2 -18 ⁰ 19.9	75 ⁰ 00.5 -18 ⁰ 18.7	89 ⁰ 29.8 -18 ⁰ 17.5	+29.3 15.2 +0.8 55.6
O	Fr 25	306 ⁰ 47.6 -17 ⁰ 46.8	321 ⁰ 16.7 -17 ⁰ 43.9	335 ⁰ 45.8 -17 ⁰ 41.0	350 ⁰ 15.0 -17 ⁰ 38.0	4 ⁰ 44.1 -17 ⁰ 34.9	19 ⁰ 13.2 -17 ⁰ 31.7	33 ⁰ 42.3 -17 ⁰ 28.5	48 ⁰ 11.4 -17 ⁰ 25.1	62 ⁰ 40.6 -17 ⁰ 21.6	77 ⁰ 09.7 -17 ⁰ 18.0	91 ⁰ 38.8 -17 ⁰ 14.4	+29.1 15.3 +3.2 56.1
	Sa 26	308 ⁰ 55.6 -16 ⁰ 08.2	323 ⁰ 24.7 -16 ⁰ 03.1	337 ⁰ 53.9 -15 ⁰ 57.9	352 ⁰ 23.0 -15 ⁰ 52.6	6 ⁰ 52.2 -15 ⁰ 47.2	21 ⁰ 21.4 -15 ⁰ 41.7	35 ⁰ 50.5 -15 ⁰ 36.1	50 ⁰ 19.7 -15 ⁰ 30.4	64 ⁰ 48.9 -15 ⁰ 24.7	79 ⁰ 18.1 -15 ⁰ 18.8	93 ⁰ 43.7 -15 ⁰ 12.9	+29.2 15.5 +5.5 56.7
	Su 27	311 ⁰ 06.0 -13 ⁰ 34.0	325 ⁰ 35.3 -13 ⁰ 26.7	340 ⁰ 04.6 -13 ⁰ 19.4	354 ⁰ 34.0 -13 ⁰ 12.0	9 ⁰ 03.3 -13 ⁰ 04.5	23 ⁰ 32.6 -12 ⁰ 57.0	38 ⁰ 02.0 -12 ⁰ 49.3	52 ⁰ 31.3 -12 ⁰ 41.6	67 ⁰ 00.7 -12 ⁰ 33.9	81 ⁰ 30.0 -12 ⁰ 26.0	95 ⁰ 59.4 -12 ⁰ 18.1	+29.3 15.6 +7.6 57.3
O	Mo 28	313 ⁰ 20.4 -10 ⁰ 10.8	327 ⁰ 49.9 -10 ⁰ 01.8	342 ⁰ 19.3 -9 ⁰ 52.7	356 ⁰ 48.7 -9 ⁰ 43.6	11 ⁰ 18.2 -9 ⁰ 34.4	25 ⁰ 47.6 -9 ⁰ 25.2	40 ⁰ 17.1 -9 ⁰ 15.8	54 ⁰ 46.5 -9 ⁰ 06.5	69 ⁰ 15.9 -8 ⁰ 57.0	83 ⁰ 45.4 -8 ⁰ 47.5	98 ⁰ 14.8 -8 ⁰ 38.0	+29.4 15.8 +9.3 57.9
	Tu 29	315 ⁰ 35.9 -6 ⁰ 08.6	330 ⁰ 05.3 -5 ⁰ 58.2	344 ⁰ 34.3 -5 ⁰ 47.9	359 ⁰ 04.0 -5 ⁰ 37.4	13 ⁰ 33.3 -5 ⁰ 27.0	28 ⁰ 02.6 -5 ⁰ 16.5	42 ⁰ 31.9 -5 ⁰ 05.9	57 ⁰ 01.2 -4 ⁰ 55.3	71 ⁰ 30.5 -4 ⁰ 44.7	85 ⁰ 59.8 -4 ⁰ 34.1	100 ⁰ 29.0 -4 ⁰ 23.4	+29.3 16.0 +10.

SUN

December 2033

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Th 1	272°44.7 -21°50.8	287°44.5 -21°51.1	302°44.2 -21°51.5	317°44.0 -21°51.9	332°43.8 -21°52.3	347°43.5 -21°52.7	3°43.3 -21°53.0	17°43.1 -21°53.4	33°42.8 -21°53.8	47°42.6 -21°54.2	62°42.4 -21°54.6	77°42.1 -21°54.9	-0.2 -0.4
Fr 2	272°39.9 -21°59.7	287°38.8 -22°00.1	302°38.5 -22°00.5	317°38.3 -22°00.8	332°38.1 -22°01.2	347°37.8 -22°01.6	2°37.6 -22°01.9	17°37.3 -22°02.3	32°37.1 -22°02.6	47°36.8 -22°03.0	62°36.6 -22°03.4	77°36.4 -22°03.7	-0.2 -0.4
Sa 3	272°33.2 -22°08.3	287°32.9 -22°08.6	302°32.7 -22°09.0	317°32.4 -22°09.3	332°32.2 -22°09.7	347°31.9 -22°10.0	2°31.7 -22°10.4	17°31.5 -22°10.7	32°31.2 -22°11.0	47°31.0 -22°11.4	62°30.7 -22°11.7	77°30.5 -22°12.1	-0.2 -0.3
Su 4	272°27.2 -22°16.4	287°27.0 -22°16.7	302°26.7 -22°17.1	317°26.4 -22°17.4	332°26.2 -22°17.7	347°25.9 -22°18.1	2°25.7 -22°18.4	17°25.4 -22°18.7	32°25.2 -22°19.0	47°24.9 -22°19.4	62°24.7 -22°19.7	77°24.4 -22°20.0	-0.3 -0.3
Mo 5	272°21.1 -22°24.1	287°20.8 -22°24.4	302°20.6 -22°24.7	317°20.3 -22°25.0	332°20.1 -22°25.4	347°19.8 -22°25.7	2°19.5 -22°26.0	17°19.3 -22°26.3	32°19.0 -22°26.6	47°18.8 -22°26.9	62°18.5 -22°27.2	77°18.2 -22°27.5	-0.3 -0.3
Tu 6	272°14.8 -22°31.4	287°14.6 -22°31.7	302°14.3 -22°32.0	317°14.0 -22°32.2	332°13.8 -22°32.5	347°13.5 -22°32.8	2°13.2 -22°33.1	17°13.0 -22°33.4	32°12.7 -22°33.7	47°12.5 -22°34.0	62°12.2 -22°34.3	77°11.9 -22°34.5	-0.3 -0.3
We 7	272°08.4 -22°38.2	287°08.2 -22°38.5	302°07.9 -22°38.7	317°07.6 -22°39.0	332°07.4 -22°39.3	347°07.1 -22°39.6	2°06.8 -22°39.8	17°06.6 -22°40.1	32°06.3 -22°40.4	47°06.0 -22°40.6	62°05.7 -22°40.9	77°05.5 -22°41.2	-0.3 -0.3
Th 8	272°01.9 -22°44.6	287°01.7 -22°44.8	302°01.4 -22°45.1	317°01.1 -22°45.3	332°00.8 -22°45.6	347°00.6 -22°45.8	2°00.3 -22°46.1	17°00.0 -22°46.3	32°59.7 -22°46.6	46°59.5 -22°46.8	61°59.2 -22°47.1	76°58.9 -22°47.3	-0.3 -0.3
Fr 9	271°55.3 -22°50.5	286°55.0 -22°50.7	301°54.8 -22°51.0	316°54.5 -22°51.2	331°54.2 -22°51.4	346°53.9 -22°51.7	1°53.6 -22°51.9	16°53.4 -22°52.1	31°53.1 -22°52.4	46°52.8 -22°52.6	61°52.5 -22°52.8	76°52.2 -22°53.1	-0.3 -0.2
Sa 10	271°48.6 -22°56.0	286°48.3 -22°56.2	301°48.0 -22°56.4	316°47.7 -22°56.6	331°47.4 -22°56.8	346°47.2 -22°57.1	1°46.9 -22°57.3	16°46.6 -22°57.5	31°46.3 -22°57.7	46°46.0 -22°57.9	61°45.7 -22°58.1	76°45.4 -22°58.3	-0.3 -0.2
Su 11	271°41.7 -23°01.0	286°41.4 -23°01.2	301°41.2 -23°01.4	316°40.9 -23°01.6	331°40.6 -23°01.8	346°40.3 -23°02.0	1°40.0 -23°02.2	16°39.7 -23°02.4	31°39.4 -23°02.6	46°39.1 -23°02.8	61°38.8 -23°03.0	76°38.6 -23°03.2	-0.3 -0.2
Mo 12	271°34.8 -23°05.6	286°34.5 -23°05.8	301°34.2 -23°05.9	316°33.9 -23°06.1	331°33.6 -23°06.3	346°33.3 -23°06.5	1°33.3 -23°06.7	16°32.7 -23°06.8	31°32.5 -23°07.0	46°32.2 -23°07.2	61°31.9 -23°07.3	76°31.6 -23°07.5	-0.3 -0.2
Tu 13	271°27.8 -23°09.7	286°27.5 -23°09.9	301°27.2 -23°10.0	316°26.9 -23°10.2	331°26.6 -23°10.3	346°26.3 -23°10.5	1°26.0 -23°10.7	16°25.7 -23°10.8	31°25.4 -23°11.0	46°25.1 -23°11.1	61°24.8 -23°11.3	76°24.5 -23°11.6	-0.3 -0.2
We 14	271°20.6 -23°13.8	286°20.3 -23°13.5	301°20.0 -23°13.6	316°19.7 -23°13.8	331°19.4 -23°13.9	346°19.1 -23°14.1	1°18.7 -23°14.2	16°18.5 -23°14.3	31°18.2 -23°14.5	46°17.9 -23°14.6	61°17.6 -23°14.7	76°17.3 -23°14.9	-0.3 -0.1
Th 15	271°13.4 -23°16.5	286°13.1 -23°16.7	301°12.8 -23°16.8	316°12.5 -23°16.9	331°12.2 -23°17.0	346°11.9 -23°17.1	1°11.6 -23°17.3	16°11.3 -23°17.4	31°11.0 -23°17.5	46°10.7 -23°17.6	61°10.4 -23°17.7	76°10.1 -23°17.8	-0.3 -0.1
Fr 16	271°06.2 -23°19.3	286°05.9 -23°19.4	301°05.6 -23°19.5	316°05.3 -23°19.6	331°05.0 -23°19.7	346°04.7 -23°19.8	1°04.4 -23°19.9	16°04.4 -23°20.0	31°03.7 -23°20.1	46°03.4 -23°20.2	61°03.1 -23°20.3	76°02.8 -23°20.4	-0.3 -0.1
Sa 17	270°58.9 -23°21.5	285°58.6 -23°21.6	300°58.2 -23°21.7	315°57.9 -23°21.8	330°57.6 -23°21.9	345°57.3 -23°21.9	0°57.0 -23°22.0	15°56.7 -23°22.1	30°56.4 -23°22.2	45°56.1 -23°22.3	60°55.8 -23°22.3	75°55.5 -23°22.4	-0.3 -0.1
Su 18	270°51.5 -23°23.3	285°51.2 -23°23.4	300°50.9 -23°23.5	315°50.6 -23°23.5	330°50.3 -23°23.6	345°50.0 -23°23.6	0°49.6 -23°23.7	15°49.3 -23°23.8	30°49.0 -23°23.8	45°48.7 -23°23.9	60°48.4 -23°23.9	75°48.1 -23°24.0	-0.3 -0.1
Mo 19	270°44.1 -23°24.7	285°43.8 -23°24.7	300°43.5 -23°24.7	315°43.2 -23°24.8	330°42.8 -23°24.8	345°42.5 -23°24.9	0°42.2 -23°24.9	15°41.9 -23°24.9	30°41.6 -23°25.0	45°41.3 -23°25.0	60°41.0 -23°25.1	75°40.7 -23°25.1	-0.3 -0.0
Tu 20	270°36.6 -23°25.5	285°36.3 -23°25.5	300°36.0 -23°25.6	315°35.7 -23°25.6	330°35.4 -23°25.6	345°35.1 -23°25.6	0°34.8 -23°25.6	15°34.5 -23°25.7	30°34.2 -23°25.7	45°33.8 -23°25.7	60°33.5 -23°25.7	75°33.2 -23°25.7	-0.3 -0.0
We 21	270°29.2 -23°25.9	285°28.9 -23°25.9	300°28.6 -23°25.9	315°28.2 -23°25.9	330°27.9 -23°25.9	345°27.6 -23°25.9	0°27.3 -23°25.9	15°27.0 -23°25.9	30°26.7 -23°25.9	45°26.4 -23°25.9	60°26.1 -23°25.9	75°25.8 -23°25.9	-0.3 -0.0
Th 22	270°21.7 -23°25.8	285°21.4 -23°25.8	300°21.1 -23°25.8	315°20.8 -23°25.8	330°20.5 -23°25.7	345°20.1 -23°25.7	0°19.8 -23°25.7	15°19.5 -23°25.7	30°19.2 -23°25.7	45°18.9 -23°25.7	60°18.6 -23°25.6	75°18.3 -23°25.6	-0.3 +0.0
Fr 23	270°14.2 -23°25.8	285°13.9 -23°25.2	300°13.6 -23°25.2	315°13.3 -23°25.2	330°13.0 -23°25.1	345°12.7 -23°25.1	0°12.4 -23°25.0	15°12.0 -23°25.0	30°11.7 -23°25.0	45°11.4 -23°24.9	60°11.1 -23°24.9	75°10.8 -23°24.8	-0.3 +0.0
Sa 24	270°06.8 -23°24.2	285°06.4 -23°24.2	300°06.1 -23°24.1	315°05.8 -23°24.1	330°05.5 -23°24.0	345°05.2 -23°24.0	0°04.9 -23°23.9	15°04.6 -23°23.8	30°04.3 -23°23.8	45°04.0 -23°23.7	60°03.6 -23°23.7	75°03.3 -23°23.6	-0.3 +0.1
Su 25	269°59.3 -23°22.7	284°59.0 -23°22.7	299°58.7 -23°22.6	314°58.4 -23°22.5	329°58.1 -23°22.4	344°57.8 -23°22.4	359°57.4 -23°22.2	14°57.1 -23°22.2	29°56.8 -23°22.1	44°56.5 -23°22.1	59°56.2 -23°22.1	74°55.9 -23°21.9	-0.3 +0.1
Mo 26	269°51.9 -23°20.8	284°51.6 -23°20.7	299°51.3 -23°20.6	314°50.9 -23°20.5	329°50.6 -23°20.4	344°50.3 -23°20.3	359°50.0 -23°20.2	14°49.7 -23°20.0	29°49.4 -23°20.0	44°49.1 -23°19.9	59°48.8 -23°19.8	74°48.5 -23°19.7	-0.3 +0.1
Tu 27	269°44.5 -23°18.3	284°44.2 -23°18.2	299°43.9 -23°18.1	314°43.6 -23°18.0	329°43.3 -23°17.9	344°42.9 -23°17.8	359°42.6 -23°17.7	14°42.3 -23°17.5	29°42.0 -23°17.4	44°41.7 -23°17.3	59°41.4 -23°17.2	74°41.1 -23°17.1	-0.3 +0.1
We 28	269°37.1 -23°15.4	284°36.8 -23°15.3	299°36.5 -23°15.2	314°36.2 -23°15.0	329°35.9 -23°14.9	344°35.6 -23°14.8	359°35.3 -23°14.8	14°35.0 -23°14.5	29°34.7 -23°14.4	44°34.4 -23°14.2	59°34.1 -23°14.1	74°33.8 -23°14.0	-0.3 +0.1
Th 29	269°29.8 -23°12.1	284°29.5 -23°11.9	299°29.2 -23°11.8	314°28.9 -23°11.6	329°28.6 -23°11.5	344°28.3 -23°11.3	359°28.0 -23°11.2	14°27.7 -23°11.0	29°27.4 -23°10.9	44°27.1 -23°10.7	59°26.8 -23°10.5	74°26.5 -23°10.4	-0.3 +0.2
Fr 30	269°22.2 -23°08.2	284°22.3 -23°08.1	299°22.0 -23°07.9	314°21.7 -23°07.7	329°21.4 -23°07.6	344°21.1 -23°07.4	359°20.8 -23°07.2	14°20.5 -23°07.0	29°20.2 -23°06.9	44°19.9 -23°06.7	59°19.6 -23°06.5	74°19.3 -23°06.3	-0.3 +0.2
Sa 31	269°15.4 -23°04.0	284°15.1 -23°03.8	299°14.8 -23°03.6	314°14.5 -23°03.4	329°14.2 -23°03.2	344°14.0 -23°03.0	359°13.7 -23°02.8	14°13.4 -23°02.6	29°13.1 -23°02.4	44°12.8 -23°02.2	59°12.5 -23°02.0	74°12.2 -23°01.8	-0.3 +0.2

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

December 2033

	D	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	Δ /h	SH	
	Th 1	247°19.6 2°05.1	261°48.0 2°16.4	276°16.3 2°27.7	290°44.6 2°39.0	305°12.8 2°50.2	319°41.0 3°01.5	334°09.2 3°12.7	348°37.3 3°23.9	3°05.4 3°35.2	17°33.5 3°46.4	32°01.5 3°57.6	+28.2	16.3	
	Fr 2	248°56.4 6°03.0	263°23.7 6°53.7	277°50.9 7°04.5	293°18.1 7°15.2	306°45.3 7°25.9	321°12.4 7°36.6	335°39.5 7°47.2	350°06.5 7°57.7	4°33.4 8°08.2	19°00.3 8°18.7	33°27.2 8°29.1	+27.1	16.4	
	Sa 3	250°03.9 10°58.9	264°29.9 11°08.4	278°55.9 11°17.8	293°21.9 11°27.1	307°47.7 11°36.4	322°13.6 11°45.6	336°39.4 11°54.7	351°05.1 12°03.8	5°30.8 12°12.7	19°56.4 12°21.6	34°22.2 12°30.4	+25.8	16.5	
	Su 4	250°40.3 14°32.1	265°05.2 14°39.4	279°30.1 14°46.7	293°54.9 14°53.8	308°19.6 15°00.9	322°44.3 15°07.8	337°09.0 15°14.7	351°33.7 15°21.4	5°58.3 15°28.0	20°22.9 15°34.5	34°47.4 15°40.9	+24.7	16.5	
	Mo 5	250°52.6 17°03.4	265°16.7 17°08.0	279°40.9 17°12.4	294°05.1 17°16.7	308°29.2 17°20.9	322°53.4 17°25.0	337°17.5 17°28.9	351°41.6 17°32.7	6°05.7 17°36.4	20°29.9 17°40.0	34°54.0 17°43.4	+24.1	16.4	
	Tu 6	250°56.4 18°19.9	265°20.7 18°21.3	279°45.0 18°22.6	294°09.3 18°23.7	308°33.7 18°24.7	322°58.0 18°25.6	337°22.4 18°26.4	351°46.9 18°27.1	6°11.3 18°27.6	20°35.8 18°28.0	35°00.3 18°28.2	+24.4	16.3	
	We 7	251°13.2 18°17.5	265°38.4 18°15.8	280°03.7 18°14.0	294°29.1 18°12.0	308°54.5 18°10.0	323°19.9 18°07.9	337°45.5 18°05.6	352°11.0 18°03.2	6°36.7 18°00.7	21°02.4 17°58.1	35°28.2 17°55.4	+25.5	16.1	
	Th 8	252°02.8 17°01.9	266°29.7 16°57.5	280°56.6 16°53.0	295°23.6 16°48.4	309°50.7 16°43.8	324°17.9 16°39.0	338°45.2 16°34.1	353°12.5 16°29.2	7°39.9 16°24.1	22°07.4 16°19.0	36°35.0 16°13.8	+27.2	15.8	
	Fr 9	253°37.8 14°45.7	268°06.7 14°39.2	282°33.6 14°32.6	297°04.5 14°26.0	311°33.9 14°19.3	326°02.7 14°12.5	340°32.0 14°05.6	355°01.2 13°58.7	9°30.6 13°51.8	24°00.1 13°44.7	38°29.6 13°37.6	+29.2	15.6	
	Sa 10	256°01.6 11°44.2	270°32.3 11°36.3	285°03.1 11°28.2	299°33.9 11°20.2	314°04.8 11°12.0	328°35.8 11°03.9	343°06.9 10°55.7	357°38.0 10°47.4	12°09.2 10°39.1	26°40.5 10°30.8	41°11.8 10°22.4	+31.0	15.3	
	Su 11	259°09.3 8°12.6	273°41.6 8°03.7	288°14.0 7°54.7	302°46.4 7°45.8	317°18.4 7°36.8	331°51.4 7°27.8	346°24.0 7°18.7	360°56.6 7°09.7	15°29.3 7°00.6	30°02.2 6°51.5	44°34.8 6°42.4	+32.5	15.1	
	Mo 12	262°51.7 4°23.5	277°25.2 4°14.1	291°58.6 4°04.7	306°32.2 3°55.3	321°05.7 3°45.9	335°39.3 3°36.5	350°12.9 3°27.1	364°19.3 3°17.7	4°46.6 3°08.2	19°20.3 2°58.8	33°54.0 2°49.4	+48°27.7	+33.6	15.0
	Tu 13	277°25.2 4°14.1	291°58.6 4°04.7	306°32.2 3°55.3	321°05.7 3°45.9	335°39.3 3°36.5	350°12.9 3°27.1	364°19.3 3°17.7	379°20.3 3°08.2	4°46.6 2°58.8	19°20.3 2°49.4	33°54.0 2°49.4	+48°27.7	+33.6	15.0
	We 14	281°31.0 0°18.0	296°05.1 0°08.6	310°39.3 -0°00.9	325°13.4 -0°10.3	339°47.6 -0°19.7	354°21.8 -0°29.2	368°55.9 -0°38.6	383°17.9 -0°48.0	8°55.9 -0°57.4	23°30.1 -1°06.8	38°04.5 -1°16.2	+67°12.8	+34.2	14.8
	Th 15	283°46.8 -3°35.7	300°21.1 -3°44.9	314°55.9 -3°54.1	329°29.6 -4°03.3	344°03.9 -4°12.4	358°38.1 -4°21.5	373°12.4 -4°30.6	387°46.0 -4°39.7	42°20.8 -4°48.8	56°55.1 -4°57.8	71°29.3 -5°06.8	+34.2	14.8	
	Fr 16	290°00.8 -7°19.3	304°34.8 -7°27.9	319°08.7 -7°36.5	333°42.6 -7°45.0	348°16.5 -7°53.5	362°50.4 -8°02.0	377°24.2 -8°10.5	391°58.1 -8°18.9	46°31.4 -8°27.3	61°05.7 -8°35.7	75°39.4 -8°44.0	+33.9	14.8	
	Sa 17	294°02.2 -10°44.6	308°35.5 -10°52.2	323°08.7 -11°00.0	337°41.9 -11°07.6	352°15.1 -11°15.2	366°48.2 -11°22.7	381°21.3 -11°30.2	395°54.4 -11°37.7	50°27.3 -11°45.1	65°00.3 -11°52.4	79°33.2 -11°59.7	+33.1	14.8	
	Su 18	297°42.4 -13°42.2	312°14.7 -13°49.7	326°46.9 -13°56.1	341°19.1 -14°02.5	355°51.2 -14°08.8	370°23.3 -14°15.0	384°55.4 -14°21.2	399°27.4 -14°27.3	53°59.4 -14°33.3	68°31.3 -14°39.3	83°03.1 -14°45.2	+32.1	14.9	
	Mo 19	300°55.7 -16°06.1	315°26.8 -16°10.9	329°57.9 -16°15.7	344°28.9 -16°20.4	358°59.9 -16°25.0	373°30.9 -16°29.6	387°01.8 -16°34.0	401°28.6 -16°38.4	42°32.6 -16°42.7	57°03.4 -16°47.0	71°34.2 -16°51.1	+30.9	15.0	
	Tu 20	303°40.4 -17°43.8	318°10.4 -17°46.7	332°40.4 -17°49.4	347°10.3 -17°52.1	361°40.2 -17°54.7	376°10.1 -17°57.2	390°39.9 -17°59.6	405°09.7 -18°01.9	50°39.4 -18°04.1	64°20.0 -18°06.3	78°38.8 -18°08.3	+29.8	15.1	
	We 21	305°59.7 -18°27.9	320°28.8 -18°28.5	334°57.9 -18°29.0	349°27.0 -18°29.3	363°56.0 -18°29.6	378°25.1 -18°29.7	392°54.1 -18°29.8	407°23.1 -18°29.8	61°52.0 -18°29.6	75°39.4 -18°29.4	89°27.7 -18°29.1	+29.0	15.2	
	Th 22	308°01.1 -18°12.3	322°29.7 -18°10.4	336°58.3 -18°08.4	351°26.9 -18°06.3	365°55.5 -18°04.1	380°24.1 -18°01.8	394°52.6 -17°59.4	409°21.2 -17°56.9	63°49.8 -17°54.3	78°18.3 -17°51.6	92°46.9 -17°48.7	+28.6	15.4	
	Fr 23	309°54.6 -16°54.8	324°23.2 -16°50.5	338°51.7 -16°46.0	353°20.2 -16°41.5	367°48.8 -16°36.8	381°17.3 -16°32.0	395°45.9 -16°27.2	409°14.4 -16°22.3	65°43.0 -16°17.2	80°11.5 -16°12.1	94°40.8 -16°06.9	+28.5	15.5	
	Sa 24	311°49.9 -14°37.9	326°18.7 -14°31.3	340°47.4 -14°24.6	355°16.2 -14°17.8	369°45.0 -14°10.9	383°13.8 -14°03.9	396°42.6 -13°56.9	410°11.5 -13°49.8	67°40.3 -13°42.6	82°09.2 -13°35.3	96°38.7 -13°27.9	+28.8	15.6	
	Su 25	313°53.1 -10°17.6	328°22.2 -10°14.3	342°51.4 -10°01.6	357°20.5 -9°58.8	371°49.7 -9°46.2	385°18.9 -9°33.5	400°48.1 -9°20.7	415°17.3 -9°07.4	55°17.3 -8°54.9	69°46.5 -8°42.1	84°15.7 -8°28.3	+29.2	15.8	
	Mo 26	316°05.3 -7°37.2	330°34.7 -7°27.2	345°04.2 -7°17.2	359°33.6 -7°07.2	373°03.1 -6°57.1	386°32.5 -6°47.0	400°02.0 -6°36.8	413°31.5 -6°26.6	57°31.5 -6°16.4	72°01.0 -6°06.1	86°30.5 -5°55.8	+29.5	15.9	
	Tu 27	318°22.6 -3°16.9	332°52.1 -3°06.1	347°21.6 -2°55.3	361°51.1 -2°44.4	375°20.6 -2°33.6	388°50.0 -2°22.7	402°19.1 -2°11.8	415°49.9 -2°00.8	59°49.0 -1°49.9	74°18.5 -1°38.9	88°47.9 -1°28.0	+29.5	16.0	
	We 28	320°37.4 -1°17.6	335°06.6 -1°08.7	349°35.8 -1°00.9	363°05.0 -0°50.8	376°18.4 -0°41.5	389°31.8 -0°32.2	402°44.7 -0°23.9	415°57.6 -0°15.4	62°01.4 -0°04.9	76°30.5 -0°05.9	90°59.5 -0°00.0	+105°28.5	+29.1	16.1
	Th 29	322°40.1 5°50.5	337°08.6 6°01.6	351°37.1 6°11.8	365°05.6 6°22.3	378°18.4 6°32.9	391°31.8 6°43.4	404°44.7 6°53.9	417°57.6 7°04.3	63°59.9 7°14.7	78°27.2 7°25.1	92°55.5 7°35.4	+107°23.7	+28.4	16.2
	Fr 30	324°21.5 10°04.7	338°49.0 10°14.3	353°16.5 10°23.7	367°48.9 10°33.2	381°18.4 10°42.5	394°31.8 10°51.8	407°44.7 11°01.1	420°57.6 11°10.2	51°05.9 11°19.3	65°33.3 11°28.3	79°54.4 11°37.2	+27.3	16.2	
	Sa 31	325°35.7 13°42.6	340°02.1 13°50.3	354°28.5 13°57.9	368°54.7 14°05.5	382°21.0 14°12.9	395°47.2 14°20.3	408°13.4 14°27.5	420°38.4 14°34.7	66°39.5 14°41.8	81°05.6 14°48.8	95°31.6 14°55.7	+26.2	16.2	
	Sa 31												+7.3	59.5	

Row 1: GHA, Δ /h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 6 07h22 — LQ: 13 15h28 — NM: 21 18h46 — FQ: 29 00h20

SUN

January 2034

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Su 1	269°08.3	284°08.1	299°07.8	314°07.5	329°07.2	344°06.9	359°06.6	14°06.3	29°06.0	44°05.7	59°05.4	74°05.1	-0.3
	-22°59.2	-22°59.0	-22°58.8	-22°58.6	-22°58.4	-22°58.2	-22°57.9	-22°57.7	-22°57.5	-22°57.3	-22°57.1	-22°56.9	+0.2
Mo 2	269°01.3	284°01.1	299°00.8	314°00.5	329°00.2	343°59.9	358°59.6	13°59.3	28°59.0	43°58.7	58°58.4	73°58.2	-0.3
	-22°54.0	-22°53.8	-22°53.5	-22°53.3	-22°53.1	-22°52.8	-22°52.6	-22°52.4	-22°52.2	-22°51.9	-22°51.7	-22°51.4	+0.2
Tu 3	268°54.4	283°54.1	298°53.9	313°53.6	328°53.3	343°53.0	358°52.7	13°52.4	28°52.1	43°51.9	58°51.6	73°51.3	-0.3
	-22°48.3	-22°48.1	-22°47.8	-22°47.6	-22°47.3	-22°47.1	-22°46.8	-22°46.6	-22°46.3	-22°46.1	-22°45.8	-22°45.6	+0.3
We 4	268°47.6	283°47.3	298°47.0	313°46.8	328°46.5	343°46.2	358°45.9	13°45.6	28°45.4	43°45.1	58°44.8	73°44.5	-0.3
	-22°42.2	-22°41.9	-22°41.7	-22°41.4	-22°41.1	-22°40.9	-22°40.6	-22°40.3	-22°40.1	-22°39.8	-22°39.5	-22°39.2	+0.3
Th 5	268°40.9	283°40.6	298°40.3	313°40.1	328°39.8	343°39.5	358°39.2	13°39.0	28°38.7	43°38.4	58°38.1	73°37.9	-0.3
	-22°35.6	-22°35.3	-22°35.1	-22°34.8	-22°34.5	-22°34.2	-22°33.9	-22°33.6	-22°33.3	-22°33.1	-22°32.8	-22°32.5	+0.3
Fr 6	268°34.3	283°34.0	298°33.7	313°33.5	328°33.2	343°32.9	358°32.7	13°32.4	28°32.1	43°31.8	58°31.6	73°31.3	-0.3
	-22°28.6	-22°28.3	-22°28.0	-22°27.7	-22°27.4	-22°27.1	-22°26.8	-22°26.5	-22°26.2	-22°25.9	-22°25.6	-22°25.3	+0.3
Sa 7	268°27.8	283°27.5	298°27.3	313°27.0	328°26.7	343°26.5	358°26.2	13°25.9	28°25.7	43°25.4	58°25.1	73°24.9	-0.3
	-22°21.2	-22°20.8	-22°20.5	-22°20.2	-22°19.9	-22°19.5	-22°19.2	-22°18.9	-22°18.6	-22°18.3	-22°17.9	-22°17.6	+0.3
Su 8	268°21.4	283°21.2	298°20.9	313°20.6	328°20.4	343°20.1	358°19.8	13°19.6	28°19.3	43°19.1	58°18.8	73°18.5	-0.3
	-22°13.8	-22°12.9	-22°12.2	-22°11.6	-22°11.0	-22°10.4	-22°9.8	-22°10.9	-22°10.5	-22°10.2	-22°9.8	-22°9.5	+0.3
Mo 9	268°15.2	283°14.9	298°14.7	313°14.4	328°14.1	343°13.9	358°13.6	13°13.4	28°13.1	43°12.9	58°12.6	73°12.4	-0.3
	-22°04.9	-22°04.6	-22°04.2	-22°03.8	-22°03.5	-22°03.1	-22°02.8	-22°02.4	-22°02.0	-22°01.7	-22°01.3	-22°00.9	+0.3
Tu 10	268°09.1	283°08.8	298°08.6	313°08.3	328°08.1	343°07.8	358°07.6	13°07.3	28°07.1	43°06.8	58°06.6	73°06.3	-0.3
	-21°56.1	-21°55.8	-21°55.4	-21°55.0	-21°54.6	-21°54.3	-21°53.9	-21°53.5	-21°53.1	-21°52.7	-21°52.4	-21°52.0	+0.3
We 11	268°03.1	283°02.8	298°02.6	313°02.3	328°02.1	343°01.9	358°01.6	13°01.4	28°01.1	43°00.9	58°00.6	73°00.4	-0.2
	-21°46.6	-21°46.6	-21°46.2	-21°45.8	-21°45.4	-21°45.0	-21°44.6	-21°44.2	-21°43.8	-21°43.4	-21°43.0	-21°42.6	+0.3
Th 12	267°57.3	282°57.0	297°56.8	312°56.5	327°56.3	342°56.1	357°55.8	12°55.6	27°55.3	42°55.1	57°54.9	72°54.6	-0.2
	-21°37.3	-21°36.9	-21°36.5	-21°36.1	-21°35.7	-21°35.3	-21°34.8	-21°34.4	-21°34.0	-21°33.6	-21°33.2	-21°32.8	+0.4
Fr 13	267°51.6	282°51.3	297°51.1	312°50.9	327°50.6	342°50.4	357°50.2	12°49.9	27°49.7	42°49.5	57°49.2	72°49.0	-0.2
	-21°27.3	-21°26.9	-21°26.4	-21°26.0	-21°25.6	-21°25.1	-21°24.7	-21°24.3	-21°23.8	-21°23.4	-21°23.0	-21°22.5	+0.4
Sa 14	267°46.0	282°45.8	297°45.6	312°45.4	327°45.1	342°44.9	357°44.7	12°44.4	27°44.2	42°44.0	57°43.8	72°43.5	-0.2
	-21°16.8	-21°16.4	-21°15.9	-21°15.5	-21°15.0	-21°14.6	-21°14.1	-21°13.7	-21°13.2	-21°12.8	-21°12.3	-21°11.9	+0.4
Su 15	267°40.4	282°40.4	297°40.2	312°40.0	327°39.8	342°39.6	357°39.3	12°39.1	27°38.9	42°38.7	57°38.5	72°38.2	-0.2
	-21°06.0	-21°05.5	-21°05.0	-21°04.6	-21°04.1	-21°03.6	-21°03.2	-21°02.7	-21°02.2	-21°01.8	-21°01.3	-21°00.8	+0.5
Mo 16	267°35.4	282°35.2	297°35.0	312°34.8	327°34.6	342°34.4	357°34.2	12°34.0	27°33.7	42°33.5	57°33.3	72°33.1	-0.2
	-20°54.7	-20°54.2	-20°53.7	-20°53.2	-20°52.8	-20°52.3	-20°51.8	-20°51.3	-20°50.8	-20°50.3	-20°49.9	-20°49.4	+0.5
Tu 17	267°30.4	282°30.2	297°30.0	312°29.8	327°29.6	342°29.4	357°29.2	12°29.0	27°28.8	42°28.6	57°28.3	72°28.1	-0.2
	-20°43.0	-20°42.5	-20°42.0	-20°41.5	-20°41.0	-20°40.5	-20°40.0	-20°39.5	-20°39.0	-20°38.5	-20°38.0	-20°37.5	+0.5
We 18	267°25.5	282°25.3	297°25.1	312°24.9	327°24.7	342°24.5	357°24.3	12°24.1	27°23.9	42°23.7	57°23.6	72°23.4	-0.2
	-20°30.9	-20°30.4	-20°29.9	-20°29.4	-20°28.9	-20°28.4	-20°27.9	-20°27.3	-20°26.8	-20°26.3	-20°25.8	-20°25.3	+0.5
Th 19	267°20.8	282°20.6	297°20.5	312°20.3	327°20.1	342°19.9	357°19.7	12°19.5	27°19.3	42°19.1	57°18.9	72°18.7	-0.2
	-20°18.5	-20°18.0	-20°17.4	-20°16.9	-20°16.4	-20°15.8	-20°15.3	-20°14.8	-20°14.3	-20°13.7	-20°13.2	-20°12.7	+0.5
Fr 20	267°16.3	282°16.1	297°16.0	312°15.8	327°15.6	342°15.4	357°15.2	12°15.0	27°14.9	42°14.7	57°14.5	72°14.3	-0.2
	-20°05.7	-20°05.1	-20°04.6	-20°04.0	-20°03.5	-20°02.9	-20°02.4	-20°01.8	-20°01.3	-20°00.7	-20°00.2	-19°59.6	+0.5
Sa 21	267°12.0	282°11.8	297°11.6	312°11.5	327°11.3	342°11.1	357°10.9	12°10.8	27°10.6	42°10.4	57°10.3	72°10.1	-0.2
	-19°52.4	-19°51.9	-19°51.3	-19°50.8	-19°50.2	-19°49.6	-19°49.1	-19°48.5	-19°48.0	-19°47.4	-19°46.8	-19°46.3	+0.6
Su 22	267°07.9	282°07.7	297°07.5	312°07.4	327°07.2	342°07.0	357°06.9	12°06.7	27°06.5	42°06.4	57°06.2	72°06.0	-0.2
	-19°24.9	-19°24.3	-19°23.7	-19°23.1	-19°22.6	-19°22.0	-19°21.4	-19°20.8	-19°20.2	-19°19.6	-19°19.0	-19°18.4	+0.6
Mo 23	267°03.9	282°03.8	297°03.6	312°03.4	327°03.3	342°03.1	357°03.0	12°02.8	27°02.7	42°02.5	57°02.3	72°02.2	-0.2
	-19°10.6	-19°10.0	-19°09.4	-19°08.8	-19°08.2	-19°07.6	-19°07.0	-19°06.4	-19°05.8	-19°05.1	-19°04.5	-19°03.9	+0.6
Tu 24	266°56.6	281°56.5	296°56.4	311°56.2	326°56.1	341°55.9	356°55.8	11°55.6	26°55.5	41°55.4	56°55.2	71°55.1	-0.1
	-18°55.9	-18°55.3	-18°54.7	-18°54.1	-18°53.5	-18°52.9	-18°52.2	-18°51.6	-18°51.0	-18°50.4	-18°49.7	-18°49.1	+0.6
We 25	266°53.3	281°53.2	296°53.0	311°52.9	326°52.8	341°52.6	356°52.5	11°52.4	26°52.2	41°52.1	56°52.0	71°51.8	-0.1
	-18°40.9	-18°40.3	-18°39.7	-18°39.0	-18°38.4	-18°37.8	-18°37.1	-18°36.5	-18°35.9	-18°35.2	-18°34.6	-18°34.0	+0.6
Th 26	266°50.2	281°50.0	296°49.9	311°49.8	326°49.7	341°49.5	356°49.4	11°49.3	26°49.2	41°49.1	56°48.9	71°48.8	-0.1
	-18°25.6	-18°25.0	-18°24.3	-18°23.7	-18°23.0	-18°22.4	-18°21.7	-18°21.1	-18°20.4	-18°19.8	-18°19.1	-18°18.5	+0.6
Fr 27	266°47.2	281°47.1	296°47.0	311°46.9	326°46.8	341°46.7	356°46.6	11°46.4	26°46.3	41°46.2	56°46.1	71°46.0	-0.1
	-18°09.9	-18°09.3	-18°08.6	-18°07.9	-18°07.3	-18°06.6	-18°06.0	-18°05.3	-18°04.6	-18°04.0	-18°03.3	-18°02.6	+0.7
Sa 28	266°44.5	281°44.4	296°44.3	311°44.2	326°44.1	341°44.0	356°43.9	11°43.8	26°43.7	41°43.6	56°43.5	71°43.4	-0.1
	-17°53.9	-17°53.3	-17°52.6	-17°51.9	-17°51.2	-17°50.6	-17°49.9	-17°49.2	-17°48.5	-17°47.8	-17°47.1	-17°46.5	+0.7
Su 29	266°42.0	281°41.9	296°41.8	311°41.7	326°41.6	341°41.5	356°41.4	11°41.3	26°41.2	41°41.1	56°41.0	71°40.9	-0.1
	-17°37.6	-17°36.9	-17°36.2	-17°35.5	-17°34.9	-17°34.2	-17°33.5	-17°32.8	-17°32.1	-17°31.4	-17°30.7	-17°30.0	+0.7
Mo 30	266°39.7	281°39.6	296°39.5	311°39.4	326°39.4	341°39.3	356°39.2	11°39.1	26°39.0	41°38.9	56°38.8	71°38.7	-0.1
	-17°21.0	-17°20.3	-17°19.6	-17°18.9	-17°18.2	-17°17.5	-17°16.8	-17°16.1	-17°15.4	-17°14.7	-17°14.0	-17°13.3	+0.7
Tu 31													

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 16.3'

MOON

January 2034

	D	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	Δ'/h SH
O	Su 1	239°49.9 15°53.3	254°15.5 15°59.2	268°41.1 16°05.0	283°06.6 16°10.7	297°32.2 16°16.2	311°57.7 16°21.7	326°23.1 16°27.1	340°48.5 16°32.3	355°13.9 16°37.5	9°39.3 16°42.5	24°04.7 16°47.4	+25.5 16.2 +5.4 59.5
	Mo 2	240°22.1 17°47.6	254°47.2 17°50.7	269°12.2 17°53.7	283°37.2 17°56.5	298°02.2 18°01.8	312°27.2 18°04.3	326°52.2 18°04.3	341°17.2 18°06.7	355°42.2 18°08.9	10°07.2 18°11.0	24°32.2 18°13.0	+25.0 16.2 +2.5 59.3
	Tu 3	240°47.8 18°28.3	255°12.9 18°28.3	269°38.1 18°28.3	284°03.3 18°28.1	298°28.5 18°27.7	312°53.8 18°27.3	327°19.0 18°26.7	341°44.3 18°26.1	356°09.7 18°25.3	10°35.0 18°24.3	25°00.4 18°23.3	+25.3 16.1 -0.5 58.9
O	We 4	241°25.8 17°53.8	255°51.8 17°50.9	270°17.9 17°47.9	284°44.0 17°44.9	299°10.2 17°41.7	313°36.5 17°38.4	328°02.8 17°34.9	342°29.1 17°31.4	356°55.5 17°27.4	11°22.0 17°24.1	25°48.5 17°20.2	+26.3 15.9 -3.4 58.3
	Th 5	242°33.6 16°10.9	257°01.1 16°05.5	271°28.7 16°00.1	285°56.4 15°54.5	300°24.1 15°48.9	314°51.9 15°43.2	329°19.7 15°37.4	343°47.6 15°31.5	358°15.6 15°25.5	12°43.7 15°19.5	27°11.8 15°13.3	+27.8 15.7 -5.8 57.7
	Fr 6	244°22.3 13°32.3	258°51.6 13°25.0	273°20.9 13°17.7	287°50.3 13°10.3	302°19.8 13°02.8	316°49.3 12°55.3	331°18.9 12°47.7	345°48.6 12°40.0	0°18.4 12°32.3	14°48.2 12°24.5	29°18.1 12°16.7	+29.6 15.5 -7.6 56.9
O	Sa 7	246°54.7 10°13.3	261°25.6 10°04.7	275°56.7 9°56.1	290°27.7 9°47.5	304°58.9 9°38.4	319°30.1 9°30.0	334°01.4 9°21.3	348°32.7 9°12.4	3°04.1 9°03.6	17°35.6 8°54.7	32°07.1 8°45.8	+31.2 15.3 -8.8 56.2
	Su 8	250°06.6 6°28.9	264°39.0 6°19.6	279°11.4 6°10.2	293°43.9 6°00.9	308°16.8 5°51.5	322°49.0 5°42.1	337°21.6 5°32.7	351°54.3 5°23.3	6°27.0 5°13.9	20°59.8 5°04.4	35°32.6 4°54.9	+32.6 15.1 -9.4 55.5
	Mo 9	253°49.4 2°32.0	268°22.8 2°22.4	282°56.2 2°12.8	297°29.7 2°03.2	312°03.7 1°53.7	326°36.7 1°44.1	341°10.3 1°34.5	355°43.9 1°24.9	10°17.5 1°15.4	24°51.1 1°05.8	39°24.8 0°56.2	+33.5 15.0 -9.6 54.9
O	Tu 10	257°52.2 -1°26.6	272°26.2 -1°36.0	287°00.2 -1°45.5	301°34.1 -1°54.9	316°08.1 -2°04.3	330°42.2 -2°13.7	345°16.2 -2°23.1	359°50.2 -2°32.4	14°24.2 -2°41.8	28°58.3 -2°51.1	43°32.3 -3°00.4	+34.0 14.9 -9.4 54.5
	We 11	262°03.4 -5°17.8	276°37.4 -5°26.8	291°11.5 -5°35.8	305°45.5 -5°44.7	320°19.6 -5°53.6	334°53.6 -6°02.5	349°27.6 -6°11.4	0°16.1 -6°20.2	18°35.6 -6°29.0	33°09.6 -6°37.8	47°43.6 -6°46.5	+34.0 14.8 -8.9 54.2
	Th 12	276°37.4 -5°26.8	291°11.5 -5°35.8	305°45.5 -5°44.7	320°19.6 -5°53.6	334°53.6 -6°02.5	349°27.6 -6°11.4	0°16.1 -6°20.2	18°35.6 -6°29.0	33°09.6 -6°37.8	47°43.6 -6°46.5	62°17.6 -6°55.2	+34.0 14.8 -8.8 54.2
O	Fr 13	280°45.2 -9°02.1	295°18.9 -9°10.2	309°52.3 -9°18.4	324°26.2 -9°26.5	338°59.8 -9°34.6	353°33.4 -9°42.6	0°06.9 -9°50.6	22°40.5 -9°58.5	37°14.0 -10°06.4	51°47.5 -10°14.3	66°20.9 -10°22.1	+33.6 14.8 -8.0 54.2
	Sa 14	284°39.0 -12°14.1	299°12.0 -12°21.2	313°44.9 -12°28.2	328°17.7 -12°35.2	342°50.5 -12°42.1	357°23.3 -12°49.0	11°56.1 -12°55.8	26°28.8 -13°02.6	41°00.4 -13°09.3	55°34.1 -13°16.0	70°06.7 -13°22.6	+32.8 14.8 -6.9 54.3
	Su 15	288°10.4 -14°54.8	302°42.3 -15°00.5	317°14.1 -15°06.1	331°45.9 -15°11.6	346°17.7 -15°17.1	0°49.1 -15°22.5	15°21.1 -15°27.8	29°52.7 -15°33.1	44°24.3 -15°38.3	58°55.8 -15°43.4	73°27.3 -15°48.5	+31.7 14.9 -5.4 54.6
O	Mo 16	291°13.6 -16°55.7	305°44.3 -16°59.6	320°15.0 -17°03.4	334°45.6 -17°07.1	349°16.2 -17°10.7	3°46.7 -17°14.3	17°32.4 -17°17.8	32°47.6 -17°21.2	47°17.9 -17°24.5	61°48.3 -17°27.7	76°18.5 -17°30.9	+30.5 15.0 -3.5 55.1
	Tu 17	293°47.1 -18°07.8	308°16.7 -18°09.6	322°46.2 -18°11.2	337°15.7 -18°12.8	351°45.1 -18°14.3	6°14.5 -18°15.7	20°43.8 -18°16.9	35°13.1 -18°18.1	49°42.4 -18°19.3	64°11.6 -18°20.3	78°40.8 -18°21.2	+29.4 15.2 -1.3 55.7
	We 18	295°54.1 -18°23.3	310°22.7 -18°22.6	324°51.3 -18°21.9	339°19.9 -18°21.0	353°48.4 -18°20.1	8°16.9 -18°19.0	22°45.4 -18°17.9	37°13.9 -18°16.6	51°42.3 -18°15.3	66°10.7 -18°13.8	80°39.1 -18°12.3	+28.5 15.4 +1.1 56.3
O	Th 19	297°42.2 -17°36.7	312°10.3 -17°33.5	326°38.3 -17°30.2	341°06.4 -17°26.8	355°34.4 -17°23.4	10°02.4 -17°19.8	24°30.4 -17°16.1	38°58.4 -17°12.3	53°26.4 -17°08.4	67°54.4 -17°04.4	82°22.4 -17°00.3	+28.0 15.5 +3.6 57.0
	Fr 20	299°21.5 -15°47.0	313°49.5 -15°41.3	328°17.4 -15°35.5	342°45.3 -15°29.7	357°13.3 -15°23.7	11°41.2 -15°17.7	26°09.2 -15°11.5	40°37.1 -15°05.3	55°05.1 -14°59.0	69°33.1 -14°52.6	84°01.0 -14°46.1	+28.0 15.7 +6.1 57.6
	Sa 21	301°01.7 -12°58.1	315°29.9 -12°50.1	329°58.0 -12°42.3	344°26.2 -12°34.3	358°54.3 -12°26.2	13°22.5 -12°18.0	27°50.7 -12°09.8	42°18.9 -12°01.4	56°47.1 -11°53.0	71°15.4 -11°44.6	85°43.6 -11°36.0	+28.2 15.9 +8.2 58.2
O	Su 22	302°49.1 -9°19.7	317°17.5 -9°10.1	331°06.0 -9°00.4	346°14.5 -8°50.7	0°43.1 -8°41.1	15°11.6 -8°31.1	29°40.1 -8°21.3	44°08.7 -8°11.4	58°37.3 -8°01.4	73°05.9 -7°51.9	87°34.5 -7°41.3	+28.5 16.0 +9.8 58.6
	Mo 23	304°44.9 -5°05.1	319°13.7 -4°54.4	333°42.3 -4°43.6	348°11.2 -4°32.9	2°40.0 -4°22.1	17°08.9 -4°11.3	31°37.7 -4°00.4	46°06.5 -3°49.5	60°35.3 -3°38.3	75°04.2 -3°27.7	89°33.0 -3°16.7	+28.8 16.1 +10.8 59.0
	Tu 24	306°45.9 -4°30.7	321°14.7 -0°19.5	335°03.6 -0°08.4	350°12.5 0°02.8	4°41.3 0°13.9	19°10.2 0°25.1	33°39.0 0°36.2	48°07.8 0°47.4	62°36.7 0°58.5	77°05.5 1°09.7	91°34.5 1°20.8	+28.8 16.1 +11.2 59.1
O	We 25	308°45.4 4°06.3	323°14.1 4°17.2	337°42.7 4°28.0	352°11.3 4°38.9	6°39.9 4°49.7	21°08.5 5°00.4	35°37.0 5°11.2	50°05.5 5°21.9	64°34.1 5°32.6	79°02.4 5°43.2	93°31.1 5°53.8	+28.6 16.1 +10.8 59.2
	Th 26	310°35.7 8°28.3	325°03.8 8°38.2	339°31.9 8°48.1	353°59.9 8°57.9	8°28.0 9°07.0	22°56.0 9°17.4	37°24.0 9°27.0	51°51.9 9°36.6	66°19.8 9°46.1	80°47.7 9°55.6	95°15.6 10°05.0	+28.0 16.1 +9.7 59.2
	Fr 27	312°10.0 12°18.4	326°37.4 12°26.7	341°04.8 12°34.9	355°32.1 12°43.1	9°59.4 12°51.2	24°26.7 12°59.2	38°53.9 13°07.1	53°21.1 13°15.0	67°48.3 13°22.7	82°15.4 13°30.4	96°42.5 13°38.0	+27.2 16.1 +8.0 59.1
O	Sa 28	313°25.6 15°21.3	327°52.2 15°27.6	342°18.8 15°33.5	356°45.4 15°39.4	11°12.0 15°45.0	25°38.5 15°51.0	40°05.0 15°56.6	54°31.5 16°02.2	68°57.0 16°08.0	83°24.4 16°13.0	97°50.9 16°18.2	+26.5 16.1 +5.7 58.9
	Su 29	314°24.9 17°24.1	328°51.0 17°27.7	343°17.2 17°31.1	357°43.3 17°34.4	12°09.4 17°37.6	26°35.5 17°40.7	41°01.6 17°43.7	55°27.7 17°46.5	69°53.8 17°49.3	84°19.8 17°51.9	98°45.9 17°54.4	+26.1 16.0 +3.0 58.6
	Mo 30	315°17.0 18°18.5	329°43.1 18°19.2	344°09.2 18°19.8	358°35.3 18°20.2	13°01.5 18°20.6	27°27.6 18°20.8	41°53.8 18°20.9	56°20.0 18°20.9	70°46.2 18°20.8	85°12.2 18°20.6	99°38.7 18°20.3	+26.2 15.9 +0.2 58.3
O	Tu 31	316°15.1 18°01.8	330°41.8 17°59.6	345°08.5 17°57.4	359°35.2 17°55.1	14°02.0 17°52.6	28°28.8 17°50.1	42°55.6 17°47.4	57°22.5 17°44.7	71°49.4 17°41.8	86°16.3 17°38.9	100°43.3 17°35.8	+26.8 15.8 -2.6 57.9

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter
Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax
Column = (UTC hour - day) mod 24
FM: 4 19h47 — LQ: 12 13h17 — NM: 20 10h01 — FQ: 27 08h32

SUN

February 2024

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
We 1	266°37.6 -17°04.0	281°37.5 -17°03.3	296°37.5 -17°02.6	311°37.4 -17°01.9	326°37.3 -17°01.2	341°37.2 -17°00.5	356°37.1 -16°59.8	11°37.1 -16°59.0	26°37.0 -16°58.3	41°36.9 -16°57.6	56°36.8 -16°56.9	71°36.7 -16°56.2	-0.1 +0.7
Th 2	266°35.7 -16°46.8	281°35.7 -16°46.1	296°35.6 -16°45.3	311°35.5 -16°44.6	326°35.4 -16°43.9	341°35.4 -16°43.2	356°35.3 -16°42.4	11°35.2 -16°41.7	26°35.2 -16°41.0	41°35.1 -16°40.3	56°35.0 -16°39.5	71°34.9 -16°38.8	-0.1 +0.7
Fr 3	266°34.1 -16°29.3	281°34.0 -16°28.5	296°33.9 -16°27.8	311°33.9 -16°27.1	326°33.8 -16°26.3	341°33.7 -16°25.6	356°33.7 -16°24.8	11°33.6 -16°24.1	26°33.5 -16°23.4	41°33.5 -16°22.6	56°33.4 -16°21.9	71°33.4 -16°21.1	-0.1 +0.7
Sa 4	266°32.6 -16°11.4	281°32.5 -16°10.7	296°32.5 -16°10.0	311°32.4 -16°09.2	326°32.3 -16°08.5	341°32.3 -16°07.7	356°32.2 -16°07.0	11°32.2 -16°06.2	26°32.1 -16°05.4	41°32.1 -16°04.7	56°32.0 -16°03.9	71°32.0 -16°03.2	-0.1 +0.8
Su 5	266°31.3 -15°53.3	281°31.2 -15°52.6	296°31.2 -15°51.8	311°31.3 -15°51.1	326°31.1 -15°50.3	341°31.1 -15°49.5	356°31.0 -15°48.8	11°31.0 -15°48.0	26°30.9 -15°47.3	41°30.9 -15°46.5	56°30.8 -15°45.7	71°30.8 -15°45.0	-0.0 +0.8
Mo 6	266°30.2 -15°35.0	281°30.2 -15°34.2	296°30.1 -15°33.4	311°30.1 -15°32.7	326°30.1 -15°31.9	341°30.0 -15°31.1	356°30.0 -15°30.3	11°29.9 -15°29.6	26°29.9 -15°28.8	41°29.9 -15°28.0	56°29.8 -15°27.2	71°29.8 -15°26.5	-0.0 +0.8
Tu 7	266°29.3 -15°16.3	281°29.3 -15°15.6	296°29.3 -15°14.8	311°29.2 -15°14.0	326°29.2 -15°13.2	341°29.2 -15°12.4	356°29.1 -15°11.6	11°29.1 -15°10.9	26°29.1 -15°10.1	41°29.1 -15°09.3	56°29.0 -15°08.5	71°29.0 -15°07.7	-0.0 +0.8
We 8	266°28.7 -14°57.4	281°28.6 -14°56.6	296°28.6 -14°55.9	311°28.6 -14°55.1	326°28.6 -14°54.3	341°28.5 -14°53.5	356°28.5 -14°52.7	11°28.5 -14°51.9	26°28.5 -14°51.1	41°28.4 -14°50.3	56°28.4 -14°49.5	71°28.4 -14°48.7	-0.0 +0.8
Th 9	266°28.2 -14°38.3	281°28.1 -14°37.5	296°28.1 -14°36.7	311°28.1 -14°35.9	326°28.1 -14°35.1	341°28.1 -14°34.3	356°28.1 -14°33.5	11°28.1 -14°32.7	26°28.0 -14°31.8	41°28.0 -14°31.0	56°28.0 -14°30.2	71°28.0 -14°29.4	-0.0 +0.8
Fr 10	266°27.9 -14°18.9	281°27.8 -14°18.1	296°27.8 -14°17.3	311°27.8 -14°16.4	326°27.8 -14°15.6	341°27.8 -14°14.8	356°27.8 -14°14.0	11°27.8 -14°13.2	26°27.8 -14°12.4	41°27.8 -14°11.5	56°27.8 -14°10.7	71°27.8 -14°09.9	-0.0 +0.8
Sa 11	266°27.7 -13°59.2	281°27.7 -13°58.4	296°27.7 -13°57.6	311°27.7 -13°56.8	326°27.7 -13°55.9	341°27.7 -13°55.1	356°27.7 -13°54.3	11°27.7 -13°53.5	26°27.7 -13°52.6	41°27.7 -13°51.8	56°27.7 -13°51.0	71°27.8 -13°50.2	+0.0 +0.8
Su 12	266°27.8 -13°39.4	281°27.8 -13°38.5	296°27.8 -13°37.7	311°27.8 -13°36.9	326°27.9 -13°36.0	341°27.9 -13°35.2	356°27.9 -13°34.4	11°27.9 -13°33.5	26°27.9 -13°32.7	41°27.9 -13°31.9	56°27.9 -13°31.0	71°27.9 -13°30.2	+0.0 +0.8
Mo 13	266°28.1 -13°19.3	281°28.1 -13°18.4	296°28.1 -13°17.6	311°28.1 -13°16.7	326°28.1 -13°15.9	341°28.2 -13°15.1	356°28.2 -13°14.2	11°28.2 -13°13.4	26°28.2 -13°12.5	41°28.2 -13°11.7	56°28.2 -13°10.8	71°28.3 -13°10.0	+0.0 +0.8
Tu 14	266°28.5 -12°59.0	281°28.5 -12°58.1	296°28.6 -12°57.3	311°28.6 -12°56.4	326°28.6 -12°55.5	341°28.6 -12°54.7	356°28.7 -12°53.8	11°28.7 -12°53.0	26°28.7 -12°52.1	41°28.7 -12°51.3	56°28.8 -12°50.4	71°28.8 -12°49.6	+0.0 +0.9
We 15	266°29.1 -12°38.4	281°29.2 -12°37.6	296°29.2 -12°36.7	311°29.2 -12°35.8	326°29.3 -12°35.0	341°29.3 -12°34.1	356°29.3 -12°33.3	11°29.4 -12°32.4	26°29.4 -12°31.5	41°29.4 -12°30.7	56°29.4 -12°29.8	71°29.5 -12°29.0	+0.0 +0.9
Th 16	266°29.9 -12°17.7	281°30.0 -12°16.8	296°30.0 -12°16.0	311°30.0 -12°15.1	326°30.0 -12°14.2	341°30.1 -12°13.4	356°30.2 -12°12.5	11°30.2 -12°11.6	26°30.2 -12°10.7	41°30.3 -12°09.9	56°30.3 -12°09.0	71°30.4 -12°08.1	+0.0 +0.9
Fr 17	266°30.9 -11°56.8	281°30.9 -11°55.9	296°31.0 -11°55.0	311°31.0 -11°54.1	326°31.1 -11°53.3	341°31.1 -11°52.4	356°31.2 -11°51.5	11°31.2 -11°50.6	26°31.3 -11°49.7	41°31.3 -11°48.9	56°31.4 -11°48.0	71°31.4 -11°47.1	+0.0 +0.9
Sa 18	266°32.0 -11°35.6	281°32.1 -11°34.8	296°32.1 -11°33.9	311°32.2 -11°33.0	326°32.3 -11°32.1	341°32.3 -11°31.2	356°32.4 -11°30.3	11°32.4 -11°29.4	26°32.5 -11°28.6	41°32.5 -11°27.7	56°32.6 -11°26.8	71°32.6 -11°25.9	+0.1 +0.9
Su 19	266°33.4 -11°14.3	281°33.4 -11°13.4	296°33.5 -11°12.6	311°33.5 -11°11.7	326°33.6 -11°10.8	341°33.7 -11°09.9	356°33.7 -11°09.0	11°33.8 -11°08.1	26°33.8 -11°07.2	41°33.9 -11°06.3	56°34.0 -11°05.4	71°34.0 -11°04.5	+0.0 +0.9
Mo 20	266°34.8 -10°52.9	281°34.9 -10°52.0	296°35.0 -10°51.1	311°35.0 -10°50.2	326°35.1 -10°49.3	341°35.2 -10°48.4	356°35.2 -10°47.5	11°35.3 -10°46.6	26°35.4 -10°45.7	41°35.4 -10°44.8	56°35.5 -10°43.9	71°35.6 -10°43.0	+0.1 +0.9
Tu 21	266°36.5 -10°31.2	281°36.6 -10°30.3	296°36.6 -10°29.4	311°36.7 -10°28.5	326°36.8 -10°27.6	341°36.8 -10°26.7	356°36.8 -10°25.9	11°37.0 -10°24.9	26°37.1 -10°24.0	41°37.1 -10°23.1	56°37.2 -10°22.1	71°37.3 -10°21.2	+0.1 +0.9
We 22	266°38.3 -9°09.4	281°38.4 -9°08.5	296°38.4 -9°07.6	311°38.5 -9°06.7	326°38.6 -9°05.8	341°38.7 -9°04.8	356°38.8 -9°03.9	11°38.8 -9°03.0	26°38.9 -9°02.1	41°39.0 -9°01.2	56°39.1 -9°00.3	71°39.2 -8°59.4	+0.1 +0.9
Th 23	266°40.3 -8°47.4	281°40.3 -8°46.5	296°40.4 -8°45.6	311°40.5 -8°44.7	326°40.6 -8°43.8	341°40.7 -8°42.8	356°40.8 -8°41.9	11°40.9 -8°41.0	26°40.9 -8°40.1	41°41.0 -8°39.2	56°41.1 -8°38.2	71°41.2 -8°37.3	+0.1 +0.9
Fr 24	266°42.4 -8°25.3	281°42.5 -8°24.4	296°42.6 -8°23.5	311°42.7 -8°22.6	326°42.7 -8°21.6	341°42.8 -8°20.7	356°42.9 -8°19.8	11°43.0 -8°18.8	26°43.1 -8°17.9	41°43.2 -8°17.0	56°43.3 -8°16.1	71°43.4 -8°15.1	+0.1 +0.9
Sa 25	266°44.7 -8°03.1	281°44.8 -8°02.1	296°44.9 -8°01.2	311°45.0 -8°00.3	326°45.1 -8°59.3	341°45.1 -8°58.4	356°45.2 -8°57.5	11°45.3 -8°56.6	26°45.4 -8°55.6	41°45.5 -8°54.7	56°45.6 -8°53.8	71°45.8 -8°52.8	+0.1 +0.9
Su 26	266°47.7 -8°40.7	281°47.2 -8°39.7	296°47.3 -8°38.8	311°47.4 -8°37.9	326°47.5 -8°36.9	341°47.6 -8°36.0	356°47.7 -8°35.1	11°47.8 -8°34.1	26°47.9 -8°33.2	41°48.0 -8°32.3	56°48.1 -8°31.3	71°48.2 -8°30.4	+0.1 +0.9
Mo 27	266°49.7 -8°18.2	281°49.8 -8°17.2	296°49.9 -8°16.3	311°50.0 -8°15.3	326°50.1 -8°14.4	341°50.2 -8°13.5	356°50.3 -8°12.5	11°50.4 -8°11.6	26°50.5 -8°10.6	41°50.7 -8°09.7	56°50.8 -8°08.8	71°50.9 -8°07.8	+0.1 +0.9
Tu 28	266°52.2 -7°55.5	281°52.5 -7°54.6	296°52.6 -7°53.6	311°52.7 -7°52.7	326°52.8 -7°51.7	341°52.9 -7°50.8	356°53.1 -7°49.9	11°53.2 -7°48.9	26°53.3 -7°48.0	41°53.4 -7°47.0	56°53.5 -7°46.1	71°53.6 -7°45.1	+0.1 +0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 16.2'

MOON

February 2034

	D	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	0h	Δ'/h SH
○	We 1	245 [°] 15.6 16 [°] 59.5	259 [°] 43.1 16 [°] 55.3	274 [°] 10.6 16 [°] 51.1	288 [°] 38.2 16 [°] 46.7	303 [°] 05.8 16 [°] 42.7	317 [°] 33.5 16 [°] 37.7	332 [°] 01.2 16 [°] 33.0	346 [°] 29.0 16 [°] 28.3	360 [°] 56.8 16 [°] 23.5	15 [°] 24.7 16 [°] 18.6	29 [°] 52.6 16 [°] 13.6	+27.7 15.7 -4.6 57.5
	Th 2	246 [°] 58.1 14 [°] 48.2	261 [°] 26.9 14 [°] 41.9	275 [°] 55.8 14 [°] 35.4	290 [°] 24.7 14 [°] 29.0	304 [°] 53.7 14 [°] 22.4	319 [°] 22.8 14 [°] 15.8	333 [°] 51.9 14 [°] 09.1	348 [°] 21.1 14 [°] 02.3	2 [°] 50.3 13 [°] 55.5	17 [°] 19.6 13 [°] 48.5	31 [°] 48.9 13 [°] 41.6	+29.1 15.5 -6.7 57.0
	Fr 3	249 [°] 16.1 11 [°] 49.2	263 [°] 46.4 11 [°] 41.3	278 [°] 16.7 11 [°] 33.3	293 [°] 47.1 11 [°] 25.2	307 [°] 17.5 11 [°] 17.7	321 [°] 48.0 11 [°] 09.0	336 [°] 18.6 11 [°] 00.8	350 [°] 49.2 10 [°] 52.5	5 [°] 19.9 10 [°] 44.2	19 [°] 50.6 10 [°] 35.9	34 [°] 21.4 10 [°] 27.5	+30.5 15.4 -8.2 56.4
	Sa 4	252 [°] 09.8 8 [°] 16.8	266 [°] 41.4 8 [°] 07.8	281 [°] 13.1 7 [°] 58.7	295 [°] 44.8 7 [°] 49.7	310 [°] 16.6 7 [°] 40.6	324 [°] 48.4 7 [°] 31.5	339 [°] 20.3 7 [°] 22.3	353 [°] 52.2 7 [°] 13.2	8 [°] 24.2 7 [°] 04.0	22 [°] 56.2 6 [°] 54.8	37 [°] 28.3 6 [°] 45.5	+31.9 15.2 -9.1 55.8
○	Su 5	255 [°] 34.5 4 [°] 24.6	270 [°] 07.3 4 [°] 15.1	284 [°] 40.0 4 [°] 05.6	299 [°] 12.8 3 [°] 56.0	313 [°] 45.7 3 [°] 46.5	328 [°] 18.6 3 [°] 36.9	342 [°] 51.5 3 [°] 27.4	357 [°] 24.4 3 [°] 17.8	11 [°] 57.4 3 [°] 08.2	26 [°] 30.4 2 [°] 58.6	41 [°] 03.5 2 [°] 49.0	+32.9 15.1 -9.6 55.3
	Mo 6	259 [°] 22.7 0 [°] 25.1	273 [°] 56.1 0 [°] 15.5	288 [°] 29.6 0 [°] 06.0	303 [°] 03.2 -0 [°] 03.6	317 [°] 36.7 -0 [°] 13.1	332 [°] 10.3 -0 [°] 22.7	346 [°] 43.9 -0 [°] 32.2	360 [°] 17.5 -0 [°] 41.8	15 [°] 51.1 -0 [°] 51.3	30 [°] 24.7 -1 [°] 00.8	44 [°] 58.4 -1 [°] 10.3	+33.6 14.9 -9.5 54.4
	Tu 7	263 [°] 24.8 -3 [°] 31.0	277 [°] 58.6 -3 [°] 40.3	292 [°] 32.5 -3 [°] 49.5	307 [°] 06.3 -3 [°] 58.7	321 [°] 40.2 -4 [°] 07.9	336 [°] 14.0 -4 [°] 17.0	350 [°] 47.9 -4 [°] 26.2	5 [°] 21.8 -4 [°] 35.3	16 [°] 55.6 -4 [°] 44.4	34 [°] 29.5 -4 [°] 53.4	49 [°] 03.4 -5 [°] 02.5	+33.9 14.8 -9.1 54.4
	We 8	267 [°] 31.0 -7 [°] 14.8	282 [°] 04.8 -7 [°] 23.3	296 [°] 38.6 -7 [°] 31.9	311 [°] 12.4 -7 [°] 40.4	325 [°] 46.2 -7 [°] 48.9	340 [°] 19.9 -7 [°] 57.3	354 [°] 53.7 -8 [°] 05.7	9 [°] 27.4 -8 [°] 14.1	24 [°] 01.1 -8 [°] 22.4	38 [°] 34.8 -8 [°] 30.7	53 [°] 08.5 -8 [°] 39.0	+33.7 14.8 -8.4 54.2
○	Th 9	271 [°] 31.7 -10 [°] 38.0	286 [°] 05.1 -10 [°] 45.6	300 [°] 38.4 -10 [°] 53.2	315 [°] 11.8 -11 [°] 00.7	329 [°] 45.1 -11 [°] 08.1	344 [°] 18.4 -11 [°] 15.5	358 [°] 51.6 -11 [°] 22.9	13 [°] 24.8 -11 [°] 30.2	27 [°] 58.1 -11 [°] 37.5	57 [°] 04.4 -11 [°] 44.7	71 [°] 37.5 -11 [°] 51.9	+33.3 14.8 -7.4 54.2
	Fr 10	286 [°] 05.1 -10 [°] 45.6	300 [°] 38.4 -10 [°] 53.2	315 [°] 11.8 -11 [°] 00.7	329 [°] 45.1 -11 [°] 08.1	344 [°] 18.4 -11 [°] 15.5	358 [°] 51.6 -11 [°] 22.9	13 [°] 24.8 -11 [°] 30.2	27 [°] 58.1 -11 [°] 37.5	57 [°] 04.4 -11 [°] 44.7	71 [°] 37.5 -11 [°] 51.9	84 [°] 58.4 -12 [°] 00.8	+33.2 14.8 -7.3 54.2
	Sa 11	289 [°] 50.6 -13 [°] 39.5	304 [°] 23.2 -13 [°] 45.8	318 [°] 55.8 -13 [°] 52.0	333 [°] 28.4 -13 [°] 58.1	348 [°] 00.9 -14 [°] 04.2	362 [°] 33.3 -14 [°] 10.2	376 [°] 08.1 -14 [°] 16.2	389 [°] 33.3 -14 [°] 22.1	402 [°] 03.3 -14 [°] 27.9	425 [°] 15.1 -14 [°] 33.7	448 [°] 14.8 -14 [°] 39.4	+32.4 14.8 -6.0 54.3
	Su 12	293 [°] 14.4 -15 [°] 57.3	307 [°] 46.1 -16 [°] 02.0	322 [°] 17.6 -16 [°] 06.6	336 [°] 49.2 -16 [°] 11.1	351 [°] 20.7 -16 [°] 15.5	365 [°] 52.1 -16 [°] 19.9	379 [°] 23.5 -16 [°] 24.2	392 [°] 48.6 -16 [°] 28.4	405 [°] 23.2 -16 [°] 32.6	418 [°] 53.7 -16 [°] 36.6	431 [°] 14.9 -16 [°] 40.6	+31.4 14.9 -4.3 54.4
●	Mo 13	296 [°] 12.0 -17 [°] 31.3	310 [°] 42.5 -17 [°] 34.1	325 [°] 15.3 -17 [°] 36.7	339 [°] 48.4 -17 [°] 39.3	354 [°] 13.8 -17 [°] 41.8	368 [°] 44.2 -17 [°] 44.5	382 [°] 14.5 -17 [°] 46.5	395 [°] 44.7 -17 [°] 48.5	408 [°] 14.9 -17 [°] 50.9	421 [°] 14.9 -17 [°] 52.9	434 [°] 15.1 -17 [°] 54.9	+30.3 15.0 -2.4 55.2
	Tu 14	298 [°] 42.1 -18 [°] 13.8	313 [°] 11.6 -18 [°] 14.4	327 [°] 41.0 -18 [°] 14.8	342 [°] 10.4 -18 [°] 15.1	356 [°] 39.7 -18 [°] 15.5	370 [°] 09.2 -18 [°] 15.6	384 [°] 38.3 -18 [°] 15.6	398 [°] 07.5 -18 [°] 15.5	411 [°] 36.3 -18 [°] 15.4	425 [°] 05.1 -18 [°] 15.2	438 [°] 35.0 -18 [°] 14.9	+29.3 15.2 -0.1 55.8
	We 15	300 [°] 47.6 -17 [°] 58.3	315 [°] 16.2 -17 [°] 56.4	329 [°] 44.7 -17 [°] 54.4	344 [°] 13.3 -17 [°] 52.3	358 [°] 41.8 -17 [°] 50.1	372 [°] 10.2 -17 [°] 47.8	385 [°] 38.7 -17 [°] 45.4	398 [°] 07.5 -17 [°] 42.7	411 [°] 36.3 -17 [°] 40.3	424 [°] 05.1 -17 [°] 37.5	437 [°] 32.2 -17 [°] 34.7	+28.5 15.4 -2.4 56.6
	Th 16	302 [°] 34.5 -16 [°] 40.5	317 [°] 02.5 -16 [°] 36.1	331 [°] 30.5 -16 [°] 31.6	345 [°] 58.5 -16 [°] 27.0	360 [°] 26.4 -16 [°] 22.3	374 [°] 54.4 -16 [°] 17.5	388 [°] 29.3 -16 [°] 12.5	401 [°] 54.5 -16 [°] 07.5	415 [°] 29.3 -16 [°] 02.4	428 [°] 46.0 -15 [°] 57.2	441 [°] 13.9 -15 [°] 51.9	+27.9 15.7 -4.9 57.5
●	Fr 17	304 [°] 10.7 -14 [°] 20.7	318 [°] 38.5 -14 [°] 13.8	333 [°] 06.2 -14 [°] 06.9	347 [°] 33.9 -13 [°] 59.9	361 [°] 01.6 -13 [°] 52.8	375 [°] 28.1 -13 [°] 45.6	389 [°] 53.0 -13 [°] 38.3	403 [°] 28.1 -13 [°] 30.9	416 [°] 52.5 -13 [°] 23.5	430 [°] 27.0 -13 [°] 15.9	443 [°] 02.4 -13 [°] 08.3	+27.7 15.9 +7.2 58.3
	Sa 18	305 [°] 43.3 -11 [°] 03.9	320 [°] 11.0 -10 [°] 54.9	334 [°] 38.7 -10 [°] 45.9	349 [°] 06.5 -10 [°] 36.9	363 [°] 34.2 -10 [°] 27.7	378 [°] 01.9 -10 [°] 18.5	392 [°] 29.6 -10 [°] 09.2	406 [°] 57.3 -9 [°] 59.9	421 [°] 25.0 -9 [°] 50.5	435 [°] 52.8 -9 [°] 41.1	450 [°] 20.5 -9 [°] 31.4	+27.2 16.1 +9.2 59.0
	Su 19	307 [°] 16.8 -7 [°] 01.0	321 [°] 44.6 -6 [°] 50.5	336 [°] 12.4 -6 [°] 40.0	350 [°] 40.1 -6 [°] 29.4	365 [°] 07.9 -6 [°] 18.8	379 [°] 35.7 -6 [°] 08.2	393 [°] 03.5 -5 [°] 57.5	406 [°] 31.3 -5 [°] 46.7	419 [°] 59.1 -5 [°] 36.0	433 [°] 26.9 -5 [°] 25.1	446 [°] 54.7 -5 [°] 14.3	+27.8 16.2 +10.7 59.6
	Mo 20	308 [°] 51.8 -2 [°] 27.7	323 [°] 19.6 -2 [°] 16.4	337 [°] 47.4 -2 [°] 05.1	352 [°] 15.2 -1 [°] 53.7	366 [°] 43.0 -1 [°] 42.4	380 [°] 10.8 -1 [°] 31.0	393 [°] 38.6 -1 [°] 19.6	406 [°] 06.4 -1 [°] 08.3	418 [°] 34.2 -0 [°] 56.9	430 [°] 02.0 -0 [°] 45.5	442 [°] 29.8 -0 [°] 34.1	+27.8 16.3 +11.4 59.9
○	Tu 21	310 [°] 25.8 2 [°] 17.0	324 [°] 53.5 2 [°] 28.3	339 [°] 21.2 2 [°] 39.6	353 [°] 48.9 2 [°] 50.9	367 [°] 16.5 3 [°] 02.2	380 [°] 44.1 3 [°] 13.5	393 [°] 11.8 3 [°] 24.7	405 [°] 39.1 3 [°] 35.9	417 [°] 11.8 3 [°] 47.1	428 [°] 34.6 3 [°] 58.3	439 [°] 02.2 4 [°] 09.5	+27.6 16.4 +11.3 60.0
	We 22	311 [°] 54.5 6 [°] 52.7	326 [°] 21.8 7 [°] 03.3	340 [°] 49.2 7 [°] 13.8	355 [°] 16.5 7 [°] 24.2	369 [°] 43.8 7 [°] 34.6	383 [°] 11.2 7 [°] 45.0	395 [°] 38.6 7 [°] 55.3	407 [°] 05.6 8 [°] 05.6	419 [°] 33.0 8 [°] 15.8	430 [°] 02.0 8 [°] 25.9	441 [°] 46.4 8 [°] 36.0	+27.3 16.3 +10.3 59.9
	Th 23	313 [°] 13.6 10 [°] 59.9	327 [°] 40.6 11 [°] 09.0	342 [°] 07.5 11 [°] 17.9	356 [°] 34.4 11 [°] 26.8	370 [°] 01.3 11 [°] 35.6	383 [°] 28.1 11 [°] 44.4	395 [°] 55.0 11 [°] 53.0	408 [°] 21.8 12 [°] 01.6	420 [°] 48.6 12 [°] 10.1	432 [°] 15.4 12 [°] 18.5	443 [°] 42.2 12 [°] 26.9	+26.9 16.3 +8.7 59.6
	Fr 24	314 [°] 21.8 14 [°] 21.5	328 [°] 48.3 14 [°] 28.4	343 [°] 14.8 14 [°] 35.2	357 [°] 41.3 14 [°] 42.0	371 [°] 07.8 14 [°] 48.6	384 [°] 34.2 14 [°] 55.1	397 [°] 00.7 15 [°] 01.5	409 [°] 27.1 15 [°] 07.9	421 [°] 53.6 15 [°] 14.1	433 [°] 20.2 15 [°] 20.2	444 [°] 46.4 15 [°] 26.3	+26.5 16.1 +6.5 59.2
○	Sa 25	315 [°] 27.2 16 [°] 44.3	329 [°] 47.8 16 [°] 48.6	344 [°] 14.1 16 [°] 52.9	358 [°] 40.4 16 [°] 57.0	372 [°] 07.1 17 [°] 01.0	385 [°] 33.0 17 [°] 05.0	398 [°] 59.3 17 [°] 08.8	411 [°] 59.3 17 [°] 12.5	424 [°] 51.9 17 [°] 16.1	437 [°] 51.9 17 [°] 19.5	450 [°] 45.1 17 [°] 22.9	+26.3 16.0 +3.9 58.7
	Su 26	316 [°] 19.9 18 [°] 00.0	330 [°] 46.3 18 [°] 01.6	345 [°] 12.8 18 [°] 03.1	359 [°] 39.3 18 [°] 04.4	373 [°] 05.7 18 [°] 05.7	386 [°] 32.3 18 [°] 06.8	399 [°] 58.8 18 [°] 07.8	413 [°] 25.3 18 [°] 08.6	425 [°] 51.9 18 [°] 09.6	438 [°] 18.5 18 [°] 10.2	450 [°] 45.1 18 [°] 10.8	+26.5 15.9 +1.1 58.2
	Mo 27	317 [°] 27.2 18 [°] 06.2	331 [°] 54.2 18 [°] 05.1	346 [°] 21.3 18 [°] 03.8	360 [°] 48.4 18 [°] 02.4	374 [°] 15.5 18 [°] 00.9	387 [°] 42.7 17 [°] 59.3	400 [°] 09.9 17 [°] 57.6	412 [°] 58.7 17 [°] 55.8	425 [°] 04.9 17 [°] 53.9	437 [°] 31.7 17 [°] 51.9	449 [°] 59.1 17 [°] 49.7	+27.2 15.7 -1.7 57.6
	Tu 28	318 [°] 54.2 17 [°] 05.9	333 [°] 22.2 17 [°] 02.2	347 [°] 50.2 16 [°] 58.4	362 [°] 18.3 16 [°] 54.5	375 [°] 46.5 16 [°] 50.5	388 [°] 14.7 16 [°] 46.4	400 [°] 43.0 16 [°] 42.3	412 [°] 11.2 16 [°] 38.0	424 [°] 39.6 16 [°] 33.7	436 [°] 08.0 16 [°] 29.2	448 [°] 36.4 16 [°] 24.7	+28.2 15.6 -4.1 57.1

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 3 10h04 — LQ: 11 11h09 — NM: 18 23h10 — FQ: 25 16h34

SUN

March 2024

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
We 1	266°55.2 -7°32.8	281°55.3 -7°31.8	296°55.4 -7°30.9	311°55.6 -7°29.9	326°55.7 -7°29.0	341°55.8 -7°28.0	356°55.9 -7°27.1	11°56.1 -7°26.1	26°56.2 -7°25.2	41°56.3 -7°24.2	56°56.4 -7°23.3	71°56.6 -7°22.3	+0.1 +1.0
Th 2	266°58.2 -7°09.9	281°58.3 -7°09.0	296°58.4 -7°08.0	311°58.6 -7°07.1	326°58.7 -7°06.7	341°58.8 -7°05.2	356°58.9 -7°04.2	11°59.1 -7°03.2	26°59.2 -7°02.3	41°59.3 -7°01.3	56°59.5 -6°59.4	71°59.6 -6°58.4	+0.1 +1.0
Fr 3	267°01.3 -6°47.0	282°01.4 -6°46.0	297°01.5 -6°45.1	312°01.7 -6°44.1	327°01.8 -6°43.1	342°01.9 -6°42.2	357°02.1 -6°41.2	12°02.2 -6°40.3	27°02.3 -6°39.3	42°02.5 -6°38.3	57°02.6 -6°37.4	72°02.7 -6°36.4	+0.1 +1.0
Sa 4	267°04.5 -6°23.9	282°04.6 -6°23.0	297°04.8 -6°22.0	312°04.9 -6°21.0	327°05.0 -6°20.1	342°05.2 -6°19.1	357°05.3 -6°18.1	12°05.5 -6°17.2	27°05.6 -6°16.2	42°05.7 -6°15.2	57°05.9 -6°14.3	72°06.0 -6°13.3	+0.1 +1.0
Su 5	267°07.8 -6°00.8	282°08.0 -5°59.8	297°08.1 -5°58.8	312°08.3 -5°57.9	327°08.4 -5°56.9	342°08.5 -5°55.9	357°08.7 -5°55.0	12°08.8 -5°54.0	27°09.0 -5°53.0	42°09.1 -5°52.1	57°09.2 -5°51.1	72°09.4 -5°50.1	+0.1 +1.0
Mo 6	267°11.3 -5°37.6	282°11.4 -5°36.6	297°11.6 -5°35.6	312°11.7 -5°34.6	327°11.8 -5°33.7	342°12.0 -5°32.7	357°12.1 -5°31.7	12°12.3 -5°30.8	27°12.4 -5°29.8	42°12.6 -5°28.8	57°12.7 -5°27.9	72°12.9 -5°26.9	+0.1 +1.0
Tu 7	267°14.8 -5°14.2	282°15.0 -5°13.3	297°15.1 -5°12.3	312°15.3 -5°11.3	327°15.4 -5°10.4	342°15.6 -5°09.4	357°15.7 -5°08.4	12°15.9 -5°07.4	27°16.0 -5°06.5	42°16.2 -5°05.5	57°16.3 -5°04.5	72°16.5 -5°03.5	+0.2 +1.0
We 8	267°18.4 -4°50.9	282°18.6 -4°49.9	297°18.7 -4°48.9	312°18.9 -4°48.0	327°19.1 -4°47.0	342°19.2 -4°46.0	357°19.4 -4°45.0	12°19.5 -4°44.0	27°19.7 -4°43.1	42°19.8 -4°42.1	57°20.0 -4°41.1	72°20.1 -4°40.1	+0.2 +1.0
Th 9	267°22.2 -4°27.4	282°22.3 -4°26.5	297°22.5 -4°25.5	312°22.6 -4°24.5	327°22.8 -4°23.8	342°23.0 -4°22.6	357°23.1 -4°21.6	12°23.3 -4°20.6	27°23.4 -4°19.6	42°23.6 -4°18.6	57°23.7 -4°17.7	72°23.9 -4°16.7	+0.2 +1.0
Fr 10	267°26.0 -4°03.9	282°26.1 -4°03.0	297°26.3 -4°02.0	312°26.5 -4°01.0	327°26.6 -4°00.6	342°26.8 -3°59.0	357°26.9 -3°58.1	12°27.1 -3°57.1	27°27.2 -3°56.1	42°27.4 -3°55.1	57°27.6 -3°54.1	72°27.7 -3°53.1	+0.2 +1.0
Sa 11	267°29.9 -3°40.4	282°30.0 -3°39.4	297°30.2 -3°38.4	312°30.4 -3°37.5	327°30.5 -3°36.5	342°30.7 -3°35.5	357°30.8 -3°34.5	12°31.0 -3°33.5	27°31.1 -3°32.5	42°31.2 -3°31.6	57°31.5 -3°30.6	72°31.7 -3°29.6	+0.2 +1.0
Su 12	267°33.8 -3°16.8	282°34.0 -3°15.8	297°34.2 -3°14.8	312°34.3 -3°13.9	327°34.5 -3°12.9	342°34.7 -3°11.9	357°34.8 -3°10.9	12°35.0 -3°09.9	27°35.2 -3°08.9	42°35.3 -3°08.0	57°35.5 -3°07.0	72°35.7 -3°06.0	+0.2 +1.0
Mo 13	267°37.9 -2°53.2	282°38.0 -2°52.2	297°38.2 -2°51.2	312°38.4 -2°50.2	327°38.5 -2°49.2	342°38.7 -2°48.3	357°38.9 -2°47.3	12°39.1 -2°46.3	27°39.2 -2°45.3	42°39.4 -2°44.3	57°39.6 -2°43.3	72°39.7 -2°42.3	+0.2 +1.0
Tu 14	267°42.0 -2°29.5	282°42.1 -2°28.5	297°42.3 -2°27.5	312°42.5 -2°26.6	327°42.6 -2°25.6	342°42.8 -2°24.6	357°43.0 -2°23.6	12°43.2 -2°22.6	27°43.3 -2°21.6	42°43.5 -2°20.6	57°43.7 -2°19.7	72°43.9 -2°18.7	+0.2 +1.0
We 15	267°46.1 -2°05.8	282°46.3 -2°04.8	297°46.5 -2°03.9	312°46.6 -2°02.9	327°46.8 -2°01.9	342°47.0 -2°00.9	357°47.2 -1°59.9	12°47.3 -1°58.9	27°47.4 -1°57.9	42°47.5 -1°56.9	57°47.7 -1°56.0	72°47.9 -1°55.0	+0.2 +1.0
Th 16	267°50.3 -1°42.1	282°50.5 -1°41.1	297°50.7 -1°40.1	312°50.9 -1°39.2	327°51.0 -1°38.2	342°51.2 -1°37.2	357°51.4 -1°36.2	12°51.6 -1°35.2	27°51.7 -1°34.2	42°51.9 -1°33.2	57°52.1 -1°32.2	72°52.3 -1°31.2	+0.2 +1.0
Fr 17	267°54.6 -1°18.4	282°54.8 -1°17.4	297°54.9 -1°16.4	312°55.1 -1°15.4	327°55.3 -1°14.4	342°55.5 -1°13.5	357°55.7 -1°12.5	12°55.8 -1°11.5	27°56.0 -1°10.5	42°56.2 -1°09.5	57°56.4 -1°08.5	72°56.5 -1°07.5	+0.2 +1.0
Sa 18	267°58.9 -0°54.7	282°59.1 -0°53.7	297°59.2 -0°52.7	312°59.4 -0°51.7	327°59.6 -0°50.7	342°59.8 -0°49.7	358°00.0 -0°48.7	13°00.1 -0°47.7	28°00.3 -0°46.8	43°00.5 -0°45.8	58°00.7 -0°44.8	73°00.9 -0°43.8	+0.2 +1.0
Su 19	268°03.2 -0°30.9	283°03.4 -0°29.9	298°03.6 -0°29.0	313°03.8 -0°28.0	328°03.9 -0°27.0	343°04.1 -0°26.0	358°04.3 -0°25.0	13°04.5 -0°24.0	28°04.7 -0°23.0	43°04.9 -0°22.0	58°05.0 -0°21.0	73°05.2 -0°20.1	+0.2 +1.0
Mo 20	268°07.6 -0°07.2	283°07.8 -0°06.2	298°08.0 -0°05.2	313°08.1 -0°04.2	328°08.3 -0°03.3	343°08.5 -0°02.3	358°08.7 -0°01.3	13°08.9 -0°00.3	28°09.1 0°00.7	43°09.2 0°01.7	58°09.4 0°02.7	73°09.6 0°03.7	+0.2 +1.0
Tu 21	268°12.0 0°16.5	283°12.2 0°17.5	298°12.4 0°18.5	313°12.6 0°19.5	328°12.7 0°20.5	343°12.9 0°21.4	358°13.1 0°22.4	13°13.3 0°23.4	28°13.5 0°24.4	43°13.7 0°25.4	58°13.9 0°26.4	73°14.0 0°27.4	+0.2 +1.0
We 22	268°16.4 0°40.2	283°16.6 0°41.2	298°16.8 0°42.2	313°17.0 0°43.2	328°17.2 0°44.2	343°17.4 0°45.1	358°17.6 0°46.1	13°17.7 0°47.1	28°17.9 0°48.1	43°18.1 0°49.1	58°18.3 0°50.1	73°18.5 0°51.1	+0.2 +1.0
Th 23	268°20.9 1°03.9	283°21.1 1°04.9	298°21.3 1°05.9	313°21.5 1°06.8	328°21.7 1°07.8	343°21.8 1°08.8	358°22.0 1°09.8	13°22.2 1°10.8	28°22.2 1°11.8	43°22.6 1°12.8	58°22.8 1°13.7	73°23.0 1°14.7	+0.2 +1.0
Fr 24	268°25.4 1°27.5	283°25.6 1°28.5	298°25.8 1°29.5	313°26.0 1°30.5	328°26.1 1°31.5	343°26.3 1°32.5	358°26.5 1°33.4	13°26.7 1°34.4	28°26.9 1°35.4	43°27.1 1°36.4	58°27.3 1°37.4	73°27.4 1°38.4	+0.2 +1.0
Sa 25	268°29.9 1°51.1	283°30.1 1°52.1	298°30.3 1°53.1	313°30.4 1°54.1	328°30.6 1°55.1	343°30.8 1°56.0	358°31.0 1°57.0	13°31.2 1°58.0	28°31.4 1°59.0	43°31.6 2°00.0	58°31.8 2°01.0	73°32.0 2°01.9	+0.2 +1.0
Su 26	268°34.4 2°14.7	283°34.6 2°15.7	298°34.8 2°16.7	313°35.0 2°17.6	328°35.1 2°18.6	343°35.3 2°19.6	358°35.5 2°20.6	13°35.7 2°21.6	28°35.9 2°22.5	43°36.1 2°23.5	58°36.3 2°24.5	73°36.5 2°25.5	+0.2 +1.0
Mo 27	268°38.9 2°38.2	283°39.1 2°39.2	298°39.3 2°40.2	313°39.5 2°41.2	328°39.7 2°42.1	343°39.9 2°43.1	358°40.0 2°44.1	13°40.0 2°45.1	28°40.2 2°46.0	43°40.4 2°47.0	58°40.6 2°48.0	73°41.0 2°49.0	+0.2 +1.0
Tu 28	268°43.4 3°01.7	283°43.6 3°02.7	298°43.8 3°03.6	313°44.0 3°04.6	328°44.2 3°05.6	343°44.4 3°06.6	358°44.6 3°07.5	13°44.4 3°08.5	28°44.4 3°09.5	43°44.9 3°10.5	58°45.3 3°11.4	73°45.5 3°12.4	+0.2 +1.0
We 29	268°47.9 3°25.1	283°48.1 3°26.1	298°48.3 3°27.0	313°48.5 3°28.0	328°48.7 3°29.0	343°48.9 3°29.9	358°49.1 3°30.9	13°49.1 3°31.9	28°49.4 3°32.9	43°49.6 3°33.8	58°49.9 3°34.8	73°50.0 3°35.8	+0.2 +1.0
Th 30	268°52.4 3°48.4	283°52.6 3°49.4	298°52.8 3°50.4	313°53.0 3°51.3	328°53.2 3°52.3	343°53.4 3°53.3	358°53.6 3°54.2	13°53.8 3°55.2	28°53.9 3°56.2	43°54.1 3°57.1	58°54.3 3°58.1	73°54.5 3°59.1	+0.2 +1.0
Fr 31	268°56.9 4°11.7	283°57.1 4°12.6	298°57.3 4°13.6	313°57.5 4°14.6	328°57.7 4°15.5	343°57.9 4°16.5	358°58.1 4°17.5	13°58.2 4°18.4	28°58.4 4°19.4	43°58.6 4°20.4	58°58.8 4°21.3	73°59.0 4°22.3	+0.2 +1.0

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ'/h = dec. change

Semi-diameter: 16.1'

MOON

March 2024

	D	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Δ'/h SH
O	We 1	248°23.6 15°34.8	262°52.6 15°29.3	277°21.2 15°23.8	291°50.7 15°18.2	306°19.9 15°12.5	320°49.1 15°06.7	335°18.3 15°00.8	349°47.6 14°54.9	364°17.0 14°48.9	378°46.4 14°42.9	393°15.8 14°36.7	+29.2 15.5 -5.8 56.7
	Th 2	250°43.9 12°56.2	265°14.2 12°49.0	279°44.6 12°41.7	294°15.0 12°34.3	308°45.4 12°27.0	323°15.9 12°19.5	337°46.4 12°12.0	352°17.0 12°04.4	367°47.7 11°56.8	382°18.4 11°49.1	397°49.1 11°41.4	+30.5 15.3 -7.5 56.2
	Fr 3	253°36.2 9°39.5	268°07.7 9°31.0	282°39.7 9°22.5	297°10.8 9°13.9	311°42.5 9°05.3	326°14.2 8°56.7	340°45.9 8°48.0	355°17.7 8°39.3	370°49.5 8°30.5	385°24.1 8°21.8	399°53.3 8°13.0	+31.7 15.2 -7.8 55.7
	Sa 4	256°56.7 5°57.4	271°29.2 5°48.1	286°01.8 5°38.9	300°34.4 5°29.6	315°07.0 5°20.3	329°39.7 5°11.0	344°12.4 5°01.7	358°45.1 4°52.3	373°17.9 4°43.0	387°50.7 4°33.6	402°23.5 4°24.2	+32.7 15.1 -9.3 55.2
O	Su 5	260°39.3 2°02.1	275°12.6 1°52.5	289°45.9 1°43.0	304°19.2 1°33.5	318°52.5 1°24.0	333°25.8 1°14.4	347°59.2 1°04.9	362°32.6 0°55.4	377°06.0 0°45.8	391°39.4 0°36.3	406°12.9 0°26.8	+33.4 15.0 -9.5 54.8
	Mo 6	264°36.4 2°02.1	279°10.1 1°52.5	293°43.8 1°43.0	308°17.5 1°33.5	322°51.2 1°24.0	337°24.9 1°14.4	351°58.6 1°04.9	366°32.3 0°55.4	381°06.0 0°45.8	395°39.7 0°36.3	410°13.5 0°26.8	+33.7 14.9 -9.3 54.5
	Tu 7	268°39.8 -1°55.2	283°13.6 -2°04.6	297°47.0 -2°13.9	312°21.1 -2°23.3	326°54.8 -2°32.6	341°28.5 -2°42.0	356°02.3 -2°51.3	370°36.0 -3°00.6	385°09.7 -3°09.8	399°43.4 -3°19.1	414°17.1 -3°28.3	+33.7 14.8 -9.3 54.2
	We 8	272°41.4 -9°16.1	287°15.0 -9°24.1	301°48.5 -9°32.1	316°22.0 -9°40.0	330°55.4 -9°47.9	345°28.9 -9°55.7	360°02.3 -10°03.5	374°35.8 -10°11.2	389°09.2 -10°18.9	403°42.5 -10°26.6	418°15.9 -10°34.2	+33.4 14.7 -7.8 54.1
O	Th 9	276°33.9 -12°22.9	291°07.0 -12°29.4	305°40.0 -12°36.1	320°12.9 -12°42.8	334°45.9 -12°49.5	349°18.8 -12°56.1	363°51.7 -13°02.6	378°24.4 -13°09.1	392°57.5 -13°15.5	407°30.2 -13°21.9	422°03.2 -13°28.2	+32.9 14.7 -6.6 54.1
	Fr 10	280°11.1 -14°55.8	294°43.4 -15°01.1	309°15.7 -15°06.4	323°47.9 -15°11.6	338°20.1 -15°16.8	352°52.3 -15°21.8	367°24.4 -15°26.8	381°56.5 -15°31.8	396°28.6 -15°36.6	410°00.6 -15°41.5	424°32.6 -15°46.2	+32.2 14.8 -5.0 54.2
	Sa 11	294°43.4 -15°01.1	309°15.7 -15°06.4	323°47.9 -15°11.6	338°20.1 -15°16.8	352°52.3 -15°21.8	367°24.4 -15°26.8	381°56.5 -15°31.8	396°28.6 -15°36.6	410°00.6 -15°41.5	424°32.6 -15°46.2	438°57.9 -15°50.9	+32.1 14.8 -5.0 54.2
	Su 12	297°59.9 -16°52.3	312°31.4 -16°55.8	327°02.7 -16°59.2	341°34.1 -17°02.5	356°05.2 -17°05.8	370°36.6 -17°09.0	385°07.9 -17°12.1	399°39.0 -17°15.2	414°10.2 -17°18.1	428°41.3 -17°21.0	443°12.4 -17°23.8	+31.2 14.9 -3.2 54.6
O	Mo 13	300°54.3 -17°56.0	315°24.8 -17°57.1	329°55.3 -17°58.8	344°25.8 -18°00.1	358°56.2 -18°01.3	373°26.5 -18°02.5	387°57.9 -18°03.5	402°27.2 -18°04.5	416°57.4 -18°05.3	431°27.7 -18°06.3	446°00.8 -18°07.2	+30.4 15.0 -1.1 55.1
	Tu 14	303°26.9 -18°06.2	317°56.5 -18°05.5	332°26.3 -18°04.6	346°55.8 -18°03.6	361°25.4 -18°02.6	375°54.9 -18°01.4	390°24.5 -18°00.2	404°54.0 -17°58.9	419°23.4 -17°57.4	433°52.9 -17°55.9	448°22.3 -17°54.3	+29.5 15.2 +1.2 55.8
	We 15	305°40.1 -17°18.6	320°09.1 -17°15.4	334°38.1 -17°12.1	349°07.0 -17°08.8	363°35.9 -17°05.4	378°04.8 -17°01.8	392°33.7 -16°58.2	406°02.5 -16°54.5	420°31.3 -16°50.6	434°00.6 -16°46.7	447°29.9 -16°42.7	+28.9 15.4 +3.6 56.6
	Th 16	307°38.1 -15°30.8	322°06.6 -15°25.3	336°35.0 -15°19.6	351°03.5 -15°13.9	365°31.9 -15°08.1	379°59.3 -15°02.1	394°26.7 -14°56.1	408°54.0 -14°50.0	423°21.4 -14°43.8	437°46.7 -14°37.5	451°31.1 -14°31.1	+28.4 15.7 +6.0 57.5
O	Fr 17	309°25.0 -12°44.5	323°53.3 -12°36.7	338°21.2 -12°28.9	352°49.3 -12°20.9	367°17.3 -12°12.8	381°45.4 -12°04.7	396°13.4 -11°56.5	410°41.2 -11°48.2	425°09.5 -11°39.8	439°34.4 -11°31.4	454°05.4 -11°22.8	+28.0 15.9 +8.2 58.5
	Sa 18	312°03.7 -9°05.8	326°31.5 -8°56.1	340°59.3 -8°46.3	355°27.0 -8°36.5	370°04.8 -8°26.6	384°32.5 -8°16.6	398°59.3 -8°06.6	413°34.6 -7°56.5	428°06.5 -7°46.4	442°31.3 -7°36.2	457°04.4 -7°25.9	+27.7 16.2 +10.0 59.4
	Su 19	312°34.7 -4°45.9	327°02.1 -4°34.8	341°29.6 -4°23.7	356°05.7 -4°12.6	370°36.6 -4°01.5	385°07.9 -3°50.3	399°39.0 -3°39.1	414°10.2 -3°27.8	428°41.3 -3°16.6	443°12.4 -3°05.2	457°04.4 -2°53.9	+27.4 16.4 +11.6 60.1
	Mo 20	313°56.4 -0°01.3	328°23.4 0°10.3	342°50.4 0°21.9	357°17.4 0°33.5	371°44.1 0°45.2	386°11.3 0°56.8	400°38.3 1°08.4	415°05.5 1°20.0	429°32.2 1°31.6	444°00.8 1°43.3	458°25.8 1°54.9	+26.9 16.5 +11.6 60.6
O	Tu 21	315°05.8 -4°47.2	329°32.3 4°58.5	343°58.8 5°09.7	358°25.2 5°21.0	372°51.6 5°32.2	387°18.0 5°43.3	401°44.4 5°54.5	416°11.7 6°05.6	430°37.0 6°16.6	445°03.2 6°27.6	459°29.6 6°38.6	+26.4 16.6 +11.1 60.8
	We 22	316°00.7 9°16.9	330°26.6 9°27.0	344°52.5 9°37.0	359°18.3 9°47.0	373°44.2 9°56.8	388°10.0 10°06.6	402°35.7 10°16.4	417°01.5 10°26.0	431°17.2 10°35.6	445°02.2 10°45.2	459°29.6 10°54.6	+25.8 16.6 +9.8 60.7
	Th 23	316°41.7 13°06.2	331°07.1 13°14.3	345°32.4 13°22.2	359°57.8 13°30.1	374°23.2 13°37.9	389°48.5 13°45.6	404°13.8 13°53.1	418°59.9 14°00.6	433°35.2 14°08.0	448°00.8 14°15.3	462°29.6 14°22.4	+25.3 16.5 +7.6 60.3
	Fr 24	317°13.7 15°57.4	331°38.9 16°02.9	346°04.1 16°08.2	360°29.3 16°13.4	375°04.6 16°18.6	389°30.0 16°23.6	404°05.0 16°28.4	418°35.0 16°33.2	433°05.5 16°37.9	447°36.0 16°42.4	462°06.8 16°46.9	+25.2 16.3 +4.9 59.7
O	Sa 25	317°46.6 17°39.3	332°12.1 17°41.9	346°37.7 17°44.3	361°03.2 17°46.7	375°28.8 17°48.9	390°04.4 17°51.0	404°20.1 17°52.9	418°45.7 17°54.8	433°11.4 17°56.5	447°37.1 17°58.1	462°02.9 17°59.6	+25.6 16.1 +2.0 59.0
	Su 26	318°33.2 18°08.3	332°59.5 18°08.0	347°25.8 18°07.5	362°01.3 18°07.0	376°18.7 18°06.3	390°45.2 18°05.5	405°11.7 18°04.6	419°38.3 18°03.7	434°05.0 18°02.5	448°31.6 18°01.3	463°08.4 18°00.0	+26.5 15.9 -0.8 58.2
	Mo 27	319°45.3 17°27.6	334°12.8 17°24.6	348°40.4 17°21.5	363°08.1 17°18.4	377°35.5 17°15.1	391°02.9 17°11.7	405°31.4 17°08.3	419°59.3 17°04.7	434°27.3 17°01.1	449°00.8 16°57.3	463°53.3 16°53.5	+27.8 15.7 -3.4 57.4
	Tu 28	321°31.2 15°45.4	336°00.2 15°40.2	350°29.3 15°34.9	365°04.4 15°29.6	379°27.6 15°24.1	393°56.8 15°18.6	408°26.1 15°13.0	422°55.5 15°07.3	437°24.2 15°01.6	451°54.4 14°55.7	466°23.9 14°49.8	+29.3 15.5 -5.6 56.6
O	We 29	323°53.9 13°13.0	338°24.3 13°06.1	352°54.0 12°59.0	367°25.4 12°52.0	381°46.8 12°44.8	396°18.0 12°37.6	410°57.4 12°30.3	425°28.0 12°23.0	439°59.1 12°15.7	454°30.0 12°08.2	469°00.9 12°00.7	+30.7 15.3 -7.2 56.1
	Th 30	326°51.2 10°02.6	341°23.0 9°54.3	355°54.8 9°46.0	370°26.6 9°37.7	384°58.5 9°29.4	399°30.4 9°20.4	414°02.4 9°12.5	428°34.4 9°04.0	442°06.5 8°55.5	459°38.6 8°47.0	474°10.7 8°38.4	+32.0 15.1 -8.4 55.5
	Fr 31	330°17.7 6°26.0	344°50.5 6°16.9	359°23.3 6°07.8	373°56.1 5°58.8	388°29.0 5°49.6	403°01.9 5°40.6	417°34.8 5°31.4	431°07.7 5°22.2	445°40.7 5°13.0	460°13.8 5°03.8	474°46.8 4°54.6	+32.9 15.0 -9.1 55.1

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (— = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 5 02h10 — LQ: 13 06h44 — NM: 20 10h14 — FQ: 27 01h18

SUN

April 2034

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Sa 1	269°01.4 4°34.9	284°01.6 4°35.8	299°01.8 4°36.8	314°02.0 4°37.8	329°02.2 4°38.7	344°02.3 4°39.7	359°02.5 4°40.6	14°02.7 4°41.6	29°02.9 4°42.6	44°03.1 4°43.5	59°03.3 4°44.5	74°03.5 4°45.5	+0.2 +1.0
Su 2	269°05.9 4°58.0	284°06.0 4°58.9	299°06.2 4°59.9	314°06.4 5°00.8	329°06.6 5°01.8	344°06.8 5°02.8	359°07.0 5°03.7	14°07.1 5°04.7	29°07.3 5°05.6	44°07.5 5°06.6	59°07.7 5°07.6	74°07.9 5°08.5	+0.2 +1.0
Mo 3	269°10.3 5°20.0	284°10.5 5°21.9	299°10.6 5°22.9	314°10.8 5°23.8	329°11.0 5°24.8	344°11.2 5°25.8	359°11.4 5°26.7	14°11.6 5°27.7	29°11.7 5°28.6	44°11.9 5°29.6	59°12.1 5°30.5	74°12.3 5°31.5	+0.2 +1.0
Tu 4	269°14.6 5°43.9	284°14.8 5°44.8	299°15.0 5°45.8	314°15.2 5°46.7	329°15.4 5°47.7	344°15.6 5°48.7	359°15.7 5°49.6	14°15.9 5°50.6	29°16.1 5°51.5	44°16.3 5°52.5	59°16.5 5°53.4	74°16.6 5°54.4	+0.2 +1.0
We 5	269°19.0 6°06.7	284°19.2 6°07.7	299°19.3 6°08.6	314°19.5 6°09.6	329°19.7 6°10.5	344°19.9 6°11.4	359°20.1 6°12.4	14°20.2 6°13.3	29°20.4 6°14.3	44°20.6 6°15.2	59°20.8 6°16.2	74°21.0 6°17.1	+0.2 +0.9
Th 6	269°23.3 6°29.4	284°23.5 6°30.4	299°23.6 6°31.3	314°23.8 6°32.2	329°24.0 6°33.2	344°24.2 6°34.1	359°24.3 6°35.1	14°24.5 6°36.0	29°24.7 6°37.0	44°24.9 6°37.9	59°25.0 6°38.8	74°25.2 6°39.8	+0.2 +0.9
Fr 7	269°27.5 6°52.0	284°27.7 6°53.9	299°27.9 6°54.8	314°28.0 6°55.8	329°28.2 6°56.7	344°28.4 6°57.7	359°28.6 6°58.6	14°28.7 6°59.5	29°28.9 7°00.5	44°29.1 7°01.4	59°29.3 7°02.3	74°29.4 7°03.4	+0.2 +0.9
Sa 8	269°31.7 7°14.5	284°31.9 7°15.4	299°32.0 7°16.4	314°32.2 7°17.3	329°32.4 7°18.2	344°32.5 7°19.2	359°32.7 7°20.1	14°32.9 7°21.0	29°33.1 7°22.0	44°33.2 7°22.9	59°33.4 7°23.8	74°33.6 7°24.8	+0.2 +0.9
Su 9	269°35.8 7°36.9	284°36.0 7°37.8	299°36.1 7°38.7	314°36.3 7°39.7	329°36.5 7°40.6	344°36.6 7°41.5	359°36.8 7°42.4	14°37.0 7°43.4	29°37.2 7°44.3	44°37.3 7°45.2	59°37.5 7°46.1	74°37.7 7°47.1	+0.2 +0.9
Mo 10	269°39.8 7°59.1	284°40.0 8°00.0	299°40.2 8°01.0	314°40.3 8°01.9	329°40.5 8°02.8	344°40.7 8°03.7	359°40.8 8°04.6	14°41.0 8°05.6	29°41.2 8°06.5	44°41.3 8°07.4	59°41.5 8°08.3	74°41.7 8°09.3	+0.2 +0.9
Tu 11	269°43.8 8°21.2	284°44.0 8°22.1	299°44.2 8°23.0	314°44.3 8°24.0	329°44.5 8°24.9	344°44.6 8°25.8	359°44.8 8°26.7	14°45.0 8°27.6	29°45.1 8°28.5	44°45.3 8°29.5	59°45.5 8°30.4	74°45.6 8°31.3	+0.2 +0.9
We 12	269°47.7 8°43.2	284°47.9 8°44.1	299°48.0 8°45.0	314°48.2 8°45.9	329°48.4 8°46.8	344°48.5 8°47.7	359°48.7 8°48.6	14°48.8 8°49.6	29°49.0 8°50.5	44°49.2 8°51.4	59°49.3 8°52.3	74°49.5 8°53.2	+0.2 +0.9
Th 13	269°51.5 9°05.0	284°51.7 9°05.9	299°51.8 9°06.8	314°52.0 9°07.7	329°52.2 9°08.6	344°52.3 9°09.5	359°52.5 9°10.4	14°52.6 9°11.3	29°52.8 9°12.2	44°52.9 9°13.1	59°53.1 9°14.0	74°53.3 9°14.9	+0.2 +0.9
Fr 14	269°55.3 9°26.7	284°55.4 9°27.6	299°55.6 9°28.5	314°55.7 9°29.4	329°55.9 9°30.3	344°56.0 9°31.2	359°56.2 9°32.1	14°56.3 9°33.0	29°56.5 9°33.9	44°56.6 9°34.7	59°56.8 9°35.6	74°56.9 9°36.5	+0.2 +0.9
Sa 15	269°58.9 9°48.2	284°59.1 9°49.1	299°59.2 9°50.0	314°59.4 9°50.9	329°59.6 9°51.7	344°59.7 9°52.6	359°59.8 9°53.5	15°00.0 9°54.4	30°00.0 9°55.3	44°59.2 9°56.2	60°00.4 9°57.1	75°00.5 9°58.0	+0.1 +0.9
Su 16	270°02.5 10°09.5	285°02.6 10°10.4	300°02.7 10°11.3	315°02.9 10°12.2	330°03.0 10°13.1	345°03.2 10°14.0	0°03.3 10°14.8	15°03.5 10°15.7	30°03.6 10°16.6	45°03.8 10°17.5	60°03.9 10°18.4	75°04.1 10°19.3	+0.1 +0.9
Mo 17	270°05.9 10°30.7	285°06.0 10°31.6	300°06.2 10°32.5	315°06.3 10°33.4	330°06.5 10°34.2	345°06.6 10°35.1	0°06.8 10°36.0	15°06.9 10°36.9	30°07.0 10°37.7	45°07.2 10°38.6	60°07.3 10°39.5	75°07.5 10°40.4	+0.1 +0.9
Tu 18	270°09.3 10°51.7	285°09.3 10°52.6	300°09.5 10°53.5	315°09.7 10°54.3	330°09.8 10°55.2	345°10.0 10°56.1	0°10.1 10°57.0	15°10.2 10°57.8	30°10.4 10°58.7	45°10.5 10°59.6	60°10.6 11°00.4	75°10.8 11°01.3	+0.1 +0.9
We 19	270°12.5 11°12.6	285°12.7 11°13.4	300°12.8 11°14.3	315°12.9 11°15.2	330°13.1 11°16.0	345°13.2 11°16.9	0°13.3 11°17.7	15°13.5 11°18.6	30°13.7 11°19.5	45°13.7 11°20.3	60°13.8 11°21.2	75°14.0 11°22.0	+0.1 +0.9
Th 20	270°15.7 11°33.2	285°15.8 11°34.1	300°15.9 11°34.9	315°16.1 11°35.8	330°16.2 11°36.6	345°16.3 11°37.5	0°16.4 11°38.3	15°16.6 11°39.2	30°16.7 11°40.0	45°16.8 11°40.9	60°17.0 11°41.8	75°17.1 11°42.6	+0.1 +0.9
Fr 21	270°18.7 11°53.7	285°18.8 11°54.5	300°19.0 11°55.4	315°19.1 11°56.2	330°19.2 11°57.1	345°19.3 11°57.9	0°19.5 11°58.8	15°19.6 11°59.6	30°19.7 12°00.4	45°19.8 12°01.3	60°19.9 12°02.2	75°19.1 12°03.0	+0.1 +0.8
Sa 22	270°21.7 12°13.9	285°21.8 12°14.8	300°21.9 12°15.6	315°22.0 12°16.4	330°22.1 12°17.3	345°22.3 12°18.1	0°22.4 12°19.0	15°22.5 12°19.8	30°22.6 12°20.6	45°22.7 12°21.5	60°22.9 12°22.3	75°23.0 12°23.1	+0.1 +0.8
Su 23	270°24.5 12°34.0	285°24.6 12°34.8	300°24.7 12°35.6	315°24.8 12°36.5	330°25.0 12°37.3	345°25.1 12°38.1	0°25.2 12°39.0	15°25.3 12°39.8	30°25.4 12°40.6	45°25.5 12°41.5	60°25.7 12°42.3	75°25.8 12°43.1	+0.1 +0.8
Mo 24	270°27.2 13°13.5	285°27.3 13°14.3	300°27.4 13°15.1	315°27.6 13°15.9	330°27.7 13°16.7	345°27.8 13°17.5	0°27.9 13°18.4	15°28.0 13°19.2	30°28.1 13°20.0	45°28.2 13°20.8	60°28.3 13°21.6	75°28.4 13°22.4	+0.1 +0.8
Tu 25	270°29.8 13°32.9	285°29.9 13°33.7	300°30.0 13°34.5	315°30.2 13°35.3	330°30.3 13°36.1	345°30.4 13°36.9	0°30.5 13°37.7	15°30.6 13°38.5	30°30.7 13°39.3	45°30.8 13°40.1	60°30.9 13°40.9	75°31.0 13°41.7	+0.1 +0.8
We 26	270°32.3 13°52.1	285°32.4 13°52.9	300°32.5 13°53.7	315°32.6 13°54.5	330°32.7 13°55.3	345°32.8 13°56.1	0°32.9 13°56.9	15°33.0 13°57.6	30°33.1 13°58.4	45°33.2 13°59.2	60°33.3 14°00.0	75°33.4 14°00.8	+0.1 +0.8
Th 27	270°34.7 13°11.1	285°34.8 13°11.8	300°34.9 13°12.6	315°35.0 13°13.4	330°35.1 14°14.2	345°35.2 14°15.0	0°35.3 14°15.8	15°35.4 14°16.5	30°35.5 14°17.3	45°35.6 14°18.1	60°35.7 14°18.9	75°35.8 14°19.7	+0.1 +0.8
Fr 28	270°37.0 14°29.8	285°37.1 14°30.6	300°37.1 14°31.3	315°37.2 14°32.1	330°37.3 14°32.9	345°37.4 14°33.7	0°37.5 14°34.4	15°37.6 14°35.2	30°37.7 14°36.0	45°37.8 14°36.7	60°37.9 14°37.5	75°38.0 14°38.3	+0.1 +0.8
Sa 29	270°39.1 14°48.3	285°39.2 14°49.0	300°39.3 14°49.8	315°39.3 14°50.6	330°39.4 14°51.3	345°39.5 14°52.1	0°39.6 14°52.9	15°39.7 14°53.6	30°39.8 14°54.4	45°39.9 14°55.1	60°39.9 14°55.9	75°40.0 14°56.7	+0.1 +0.8
Su 30	270°41.1 14°48.3	285°41.2 14°49.0	300°41.3 14°49.8	315°41.3 14°50.6	330°41.4 14°51.3	345°41.5 14°52.1	0°41.6 14°52.9	15°41.7 14°53.6	30°41.7 14°54.4	45°41.8 14°55.1	60°41.9 14°55.9	75°42.0 14°56.7	+0.1 +0.8

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.9'

MOON

April 2034

	D	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	0h	Δ'/h SH
○	Sa 1	246°45.5 3°30.9	261°18.8 3°21.5	275°52.1 3°12.1	290°25.5 3°02.8	304°58.9 2°53.4	319°32.3 2°44.0	334°05.7 2°34.6	348°39.2 2°25.2	3°12.6 2°15.8	17°46.1 2°06.3	32°19.6 1°56.9	+33.4 14.9 -9.4 54.8
	Su 2	250°44.2 -0°24.6	265°17.9 -0°34.0	279°51.7 -0°43.4	294°25.4 -0°52.8	308°59.2 -1°02.2	323°33.0 -1°11.6	338°06.8 -1°21.0	352°40.6 -1°30.7	7°14.4 -1°49.0	21°48.2 -1°49.0	36°22.0 -1°58.4	+33.8 14.8 -9.4 54.4
	Mo 3	254°49.6 -4°16.7	269°23.3 -4°25.8	283°57.3 -4°34.8	298°31.2 -4°43.9	313°05.0 -4°52.9	327°38.8 -5°01.9	342°12.7 -5°10.8	356°46.5 -5°19.8	11°20.3 -5°20.7	25°54.1 -5°37.6	40°27.9 -5°46.4	+33.8 14.8 -9.0 54.2
○	Tu 4	258°54.0 -7°55.9	273°27.7 -8°04.3	288°01.3 -8°12.6	302°34.9 -8°21.0	317°08.5 -8°29.2	331°42.1 -8°37.4	346°15.7 -8°45.6	360°49.3 -8°53.8	15°22.8 -9°01.0	29°56.4 -9°10.0	44°29.9 -9°18.0	+33.6 14.7 -8.2 54.0
	We 5	262°50.5 -11°13.4	277°23.7 -11°20.8	291°56.9 -11°28.0	306°30.1 -11°35.3	321°03.2 -11°42.4	335°36.3 -11°49.6	350°09.4 -11°56.7	364°42.5 -12°03.7	19°15.6 -12°10.7	33°48.6 -12°17.6	48°21.6 -12°24.4	+33.1 14.7 -7.1 53.9
	Th 6	266°33.8 -14°00.8	281°06.4 -14°06.8	295°39.0 -14°12.7	310°11.5 -14°18.5	324°44.0 -14°24.3	339°16.5 -14°30.0	353°49.0 -14°35.6	368°21.4 -14°41.2	22°53.8 -14°46.8	37°26.2 -14°52.2	51°58.6 -14°57.6	+32.5 14.7 -5.7 54.0
○	Fr 7	270°00.5 -16°10.4	284°32.4 -16°14.7	299°04.2 -16°18.9	313°36.1 -16°23.1	328°07.9 -16°27.2	342°39.6 -16°31.2	357°11.4 -16°35.1	371°43.1 -16°39.9	26°14.8 -16°42.7	40°46.5 -16°46.5	55°18.3 -16°50.1	+31.8 14.8 -4.0 54.2
	Sa 8	273°09.2 -17°00.7	287°40.3 -17°37.7	302°11.5 -17°40.0	316°42.6 -17°42.2	331°13.7 -17°44.4	345°44.8 -17°46.4	360°15.8 -17°48.4	374°46.8 -17°50.3	29°17.8 -17°52.1	43°48.8 -17°53.8	58°19.7 -17°55.5	+31.1 14.9 -2.0 54.5
	Su 9	276°35.7 -18°09.9	290°31.2 -18°10.2	305°01.7 -18°10.3	319°32.2 -18°10.4	334°02.6 -18°10.4	348°33.1 -18°10.4	363°03.5 -18°10.9	377°33.9 -18°09.9	32°04.2 -18°09.6	46°34.6 -18°09.1	61°04.9 -18°08.6	+30.4 15.0 -0.1 54.9
○	Mo 10	290°31.2 -18°10.2	305°01.7 -18°10.3	319°32.2 -18°10.4	334°02.6 -18°10.4	348°33.1 -18°10.4	363°03.5 -18°10.9	377°33.9 -18°09.9	391°43.1 -18°09.6	26°14.8 -18°09.1	40°46.5 -18°08.6	55°18.3 -18°08.0	+30.4 15.0 -0.2 55.0
	Tu 11	293°07.2 -17°47.9	307°37.2 -17°45.9	322°07.2 -17°43.7	336°37.1 -17°41.5	351°07.0 -17°39.1	365°37.0 -17°36.7	380°06.8 -17°34.2	394°36.7 -17°31.6	49°06.6 -17°28.9	63°36.4 -17°26.1	78°06.2 -17°23.2	+29.9 15.2 -2.5 55.6
	We 12	295°31.6 -16°28.9	310°01.1 -16°24.9	324°30.7 -16°20.1	339°00.2 -16°15.6	353°29.8 -16°11.0	367°59.3 -16°06.3	382°28.8 -16°01.5	396°58.3 -15°56.6	51°27.7 -15°51.6	65°57.2 -15°46.5	80°26.6 -15°41.4	+29.5 15.4 -4.8 56.4
○	Th 13	297°46.6 -14°13.5	312°15.9 -14°06.9	326°45.1 -14°00.3	341°14.3 -13°53.5	355°43.5 -13°46.7	370°12.7 -13°39.8	384°42.1 -13°32.9	399°11.0 -13°25.8	53°40.0 -13°18.7	68°09.2 -13°11.4	82°38.3 -13°04.1	+29.2 15.6 -6.9 57.3
	Fr 14	299°53.2 -11°04.9	314°22.1 -10°56.4	328°51.0 -10°47.6	343°19.8 -10°39.0	357°48.6 -10°30.3	372°17.4 -10°21.4	386°46.2 -10°12.5	401°15.0 -10°03.5	55°43.8 -9°54.4	70°12.5 -9°45.3	84°41.2 -9°36.1	+28.8 15.9 -8.9 58.3
	Sa 15	301°49.8 -7°10.4	316°18.8 -7°00.2	330°46.6 -6°50.0	345°14.9 -6°39.6	359°43.3 -6°29.3	374°11.6 -6°18.9	388°39.9 -6°08.4	403°08.1 -5°57.9	57°36.4 -5°47.3	72°04.6 -5°36.7	86°32.8 -5°26.1	+28.3 16.2 -10.4 59.3
○	Su 16	303°32.4 -4°41.2	318°00.2 -4°29.9	332°27.9 -4°18.6	346°55.5 -4°07.3	361°23.2 -3°56.0	375°50.8 -3°44.6	390°18.4 -3°33.2	404°44.5 -3°21.7	59°13.5 -3°10.3	73°40.9 -3°05.8	88°08.4 -3°04.7	+27.6 16.4 -11.4 60.2
	Mo 17	304°55.8 2°06.3	319°22.6 2°17.9	333°49.3 2°29.5	348°16.2 2°41.1	362°43.0 2°52.7	377°09.7 3°04.3	391°36.3 3°15.8	405°03.0 3°27.4	60°29.5 3°38.9	74°56.1 3°50.5	89°22.6 4°02.0	+26.7 16.6 -11.6 60.8
	Tu 18	305°55.0 6°51.5	320°20.8 7°02.5	334°46.5 7°13.5	349°12.3 7°24.4	363°38.0 7°35.3	378°03.6 7°46.2	392°29.2 7°56.9	406°54.4 8°07.7	61°20.3 8°18.4	75°45.3 8°29.0	90°11.2 8°39.6	+25.6 16.7 -10.8 61.2
○	We 19	306°27.9 11°10.6	320°52.7 11°20.1	335°17.5 11°29.5	349°42.2 11°38.8	364°06.9 11°48.0	378°31.6 11°57.2	392°56.2 12°06.3	47°20.8 12°15.2	61°45.3 12°24.2	76°09.9 12°32.9	90°34.3 12°41.7	+24.6 16.7 +9.1 61.3
	Th 20	306°38.4 14°40.6	321°02.5 14°47.7	335°26.6 14°54.7	349°50.7 15°01.5	364°14.7 15°08.3	378°38.7 15°14.9	393°02.7 15°21.5	47°26.7 15°27.9	61°50.7 15°34.2	76°14.7 15°40.4	90°38.8 15°46.5	+24.0 16.6 +6.6 60.9
	Fr 21	306°37.7 17°03.2	321°01.7 17°07.3	335°25.7 17°11.3	349°49.7 17°15.2	364°13.7 17°18.9	378°37.7 17°22.6	393°01.7 17°26.1	47°25.7 17°29.4	61°49.8 17°32.7	76°13.9 17°35.8	90°38.6 17°38.8	+24.0 16.5 +3.6 60.3
○	Sa 22	306°42.8 18°08.6	321°07.4 18°09.6	335°32.1 18°10.4	349°56.7 18°11.1	364°21.5 18°11.1	378°46.2 18°12.2	393°11.0 18°12.6	47°35.9 18°12.8	62°00.8 18°12.9	76°25.7 18°12.9	90°50.7 18°12.8	+24.8 16.2 +0.4 59.5
	Su 23	307°12.2 17°56.7	321°38.1 17°54.7	336°04.0 17°52.6	350°30.1 17°50.4	365°22.2 17°48.1	380°22.3 17°45.7	395°48.5 17°43.1	48°14.8 17°40.5	62°41.2 17°37.8	77°07.6 17°34.9	91°34.2 17°31.9	+26.2 16.0 -2.5 58.6
	Mo 24	308°19.9 16°35.6	322°47.5 16°31.1	337°15.3 16°26.5	351°43.0 16°21.8	366°10.9 16°17.2	381°07.9 16°12.1	396°06.8 16°07.2	49°34.9 16°02.1	64°03.0 15°57.0	78°31.2 15°51.8	92°59.5 15°46.5	+28.0 15.7 -4.9 57.6
○	Tu 25	310°12.7 14°17.8	324°42.2 14°11.3	339°11.7 14°04.7	353°41.3 13°58.1	368°11.0 13°51.4	382°40.7 13°44.6	397°10.5 13°37.8	51°40.4 13°30.9	66°10.3 13°24.0	80°40.4 13°17.0	95°10.4 13°09.9	+29.8 15.5 -8.6 56.7
	We 26	312°49.7 11°17.2	327°20.8 11°09.3	341°52.0 11°01.3	356°23.2 10°53.3	370°54.5 10°45.3	385°25.9 10°37.2	399°57.3 10°29.0	54°28.8 10°20.9	69°00.3 10°12.6	83°31.9 10°04.4	98°03.5 9°56.1	+31.4 15.3 -8.1 56.0
	Th 27	316°04.5 7°47.2	330°36.9 7°38.4	345°09.4 7°29.5	359°42.0 7°20.6	374°14.6 7°11.7	388°47.2 7°02.8	403°19.9 6°53.8	57°52.2 6°44.8	72°25.4 6°35.8	86°58.2 6°26.7	101°31.0 6°17.7	+32.7 15.1 -9.0 55.3
○	Fr 28	319°47.9 3°59.6	334°21.3 3°50.2	348°54.7 3°40.9	363°28.1 3°31.6	378°01.6 3°22.2	392°35.1 3°12.7	407°08.6 3°03.5	61°42.2 2°54.1	76°15.7 2°45.7	90°49.9 2°35.3	105°22.9 2°25.9	+33.5 14.9 -9.4 54.8
	Sa 29	323°49.5 0°04.7	338°23.4 -0°04.7	352°57.3 -0°14.2	367°31.2 -0°23.6	381°05.2 -0°33.0	395°38.9 -0°42.3	410°13.1 -0°51.7	65°47.0 -1°01.1	80°21.0 -1°10.5	94°55.0 -1°19.8	109°29.0 -1°29.2	+33.9 14.8 -9.4 54.4
	Su 30	327°59.2 -3°48.0	342°33.2 -3°57.2	357°07.2 -4°06.3	371°41.2 -4°15.4	385°15.2 -4°24.5	40°49.3 -4°33.5	55°23.3 -4°42.6	69°57.3 -4°51.6	84°31.2 -5°00.6	99°05.2 -5°09.6	113°39.2 -5°18.5	+34.0 14.8 -9.0 54.1

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter
Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax
Column = (UTC hour - day) mod 24
FM: 3 19h18 — LQ: 11 22h45 — NM: 18 19h25 — FQ: 25 11h34

SUN

May 2034

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Mo 1	270°43.0	285°43.0	300°43.1	315°43.2	330°43.3	345°43.3	0°43.4	15°43.5	30°43.6	45°43.6	60°43.7	75°43.8	+0.1
	15°06.5	15°07.3	15°08.0	15°08.8	15°09.5	15°10.3	15°11.0	15°11.8	15°12.5	15°13.3	15°14.0	15°14.8	+0.8
Tu 2	270°44.7	285°44.8	300°44.8	315°44.9	330°45.0	345°45.0	0°45.1	15°45.2	30°45.3	45°45.3	60°45.4	75°45.5	+0.1
	15°24.5	15°25.3	15°26.0	15°26.7	15°27.5	15°28.2	15°29.0	15°29.7	15°30.5	15°31.2	15°31.9	15°32.7	+0.7
We 3	270°46.3	285°46.4	300°46.4	315°46.5	330°46.6	345°46.6	0°46.7	15°46.8	30°46.8	45°46.9	60°46.9	75°47.0	+0.1
	15°42.2	15°43.0	15°43.7	15°44.4	15°45.2	15°45.9	15°46.6	15°47.4	15°48.1	15°48.8	15°49.6	15°50.3	+0.7
Th 4	270°47.8	285°47.8	300°47.9	315°47.9	330°48.0	345°48.1	0°48.1	15°48.2	30°48.2	45°48.3	60°48.3	75°48.4	+0.1
	15°59.7	16°00.4	16°01.2	16°01.9	16°02.6	16°03.3	16°04.1	16°04.8	16°05.5	16°06.2	16°06.9	16°07.6	+0.7
Fr 5	270°49.1	285°49.2	300°49.2	315°49.3	330°49.3	345°49.4	0°49.4	15°49.5	30°49.5	45°49.6	60°49.6	75°49.7	+0.1
	16°16.9	16°17.6	16°18.4	16°19.1	16°19.8	16°20.5	16°21.2	16°21.9	16°22.6	16°23.3	16°24.0	16°24.7	+0.7
Sa 6	270°50.3	285°50.3	300°50.4	315°50.4	330°50.5	345°50.5	0°50.6	15°50.6	30°50.7	45°50.7	60°50.7	75°50.8	+0.0
	16°33.9	16°34.6	16°35.3	16°36.0	16°36.7	16°37.4	16°38.1	16°38.8	16°39.5	16°40.2	16°40.9	16°41.5	+0.7
Su 7	270°51.3	285°51.4	300°51.4	315°51.5	330°51.5	345°51.5	0°51.6	15°51.6	30°51.7	45°51.7	60°51.7	75°51.8	+0.0
	16°50.5	16°51.2	16°51.9	16°52.6	16°53.3	16°54.0	16°54.7	16°55.4	16°56.0	16°56.7	16°57.4	16°58.1	+0.7
Mo 8	270°52.2	285°52.3	300°52.3	315°52.3	330°52.4	345°52.4	0°52.4	15°52.5	30°52.5	45°52.5	60°52.6	75°52.6	+0.0
	17°06.9	17°07.6	17°08.3	17°09.0	17°09.6	17°10.3	17°11.0	17°11.7	17°12.3	17°13.0	17°13.7	17°14.3	+0.7
Tu 9	270°53.0	285°53.0	300°53.0	315°53.1	330°53.1	345°53.1	0°53.2	15°53.2	30°53.2	45°53.2	60°53.3	75°53.3	+0.0
	17°23.0	17°23.7	17°24.4	17°25.0	17°25.7	17°26.3	17°27.0	17°27.7	17°28.3	17°29.0	17°29.7	17°30.3	+0.7
We 10	270°53.6	285°53.6	300°53.6	315°53.7	330°53.7	345°53.7	0°53.7	15°53.7	30°53.8	45°53.8	60°53.8	75°53.8	+0.0
	17°38.8	17°39.5	17°40.1	17°40.8	17°41.4	17°42.1	17°42.7	17°43.4	17°44.0	17°44.7	17°45.3	17°46.0	+0.6
Th 11	270°54.1	285°54.1	300°54.1	315°54.1	330°54.1	345°54.1	0°54.1	15°54.2	30°54.2	45°54.2	60°54.2	75°54.2	+0.0
	17°54.4	17°55.0	17°55.6	17°56.3	17°56.9	17°57.5	17°58.2	17°58.8	17°59.5	18°00.1	18°00.7	18°01.4	+0.6
Fr 12	270°54.4	285°54.4	300°54.4	315°54.4	330°54.4	345°54.4	0°54.4	15°54.4	30°54.4	45°54.4	60°54.4	75°54.5	+0.0
	18°09.6	18°10.2	18°10.8	18°11.4	18°12.1	18°12.7	18°13.3	18°13.9	18°14.6	18°15.2	18°15.8	18°16.4	+0.6
Sa 13	270°54.5	285°54.5	300°54.5	315°54.5	330°54.5	345°54.5	0°54.5	15°54.6	30°54.6	45°54.6	60°54.6	75°54.6	+0.0
	18°24.5	18°25.1	18°25.7	18°26.3	18°26.9	18°27.5	18°28.2	18°28.8	18°29.4	18°30.0	18°30.6	18°31.2	+0.6
Su 14	270°54.5	285°54.5	300°54.5	315°54.5	330°54.5	345°54.5	0°54.5	15°54.5	30°54.5	45°54.5	60°54.5	75°54.5	-0.0
	18°39.1	18°39.7	18°40.3	18°40.9	18°41.5	18°42.1	18°42.7	18°43.3	18°43.9	18°44.5	18°45.1	18°45.7	+0.6
Mo 15	270°54.4	285°54.4	300°54.4	315°54.4	330°54.4	345°54.4	0°54.4	15°54.3	30°54.3	45°54.3	60°54.3	75°54.3	-0.0
	18°53.4	18°54.0	18°54.5	18°55.1	18°55.7	18°56.3	18°56.9	18°57.5	18°58.1	18°58.6	18°59.2	18°59.8	+0.6
Tu 16	270°54.1	285°54.1	300°54.1	315°54.1	330°54.1	345°54.1	0°54.0	15°54.0	30°54.0	45°54.0	60°54.0	75°54.0	-0.0
	19°07.3	19°07.9	19°08.5	19°09.1	19°09.6	19°10.2	19°10.8	19°11.3	19°11.9	19°12.5	19°13.1	19°13.6	+0.6
We 17	270°53.7	285°53.7	300°53.7	315°53.7	330°53.6	345°53.6	0°53.6	15°53.6	30°53.5	45°53.5	60°53.5	75°53.5	-0.0
	19°21.0	19°21.5	19°22.1	19°22.7	19°23.2	19°23.8	19°24.3	19°24.9	19°25.5	19°26.0	19°26.6	19°27.1	+0.6
Th 18	270°53.2	285°53.1	300°53.1	315°53.1	330°53.1	345°53.0	0°53.0	15°53.0	30°52.9	45°52.9	60°52.9	75°52.9	-0.0
	19°34.3	19°34.8	19°35.4	19°35.9	19°36.5	19°37.0	19°37.6	19°38.1	19°38.7	19°39.2	19°39.7	19°40.3	+0.5
Fr 19	270°52.5	285°52.4	300°52.4	315°52.4	330°52.3	345°52.3	0°52.3	15°52.2	30°52.2	45°52.2	60°52.1	75°52.1	-0.0
	19°47.3	19°47.8	19°48.3	19°48.9	19°49.4	19°49.9	19°50.5	19°51.0	19°51.5	19°52.1	19°52.6	19°53.1	+0.5
Sa 20	270°51.6	285°51.6	300°51.6	315°51.5	330°51.5	345°51.4	0°51.4	15°51.4	30°51.3	45°51.3	60°51.2	75°51.2	-0.0
	19°59.9	20°00.4	20°01.0	20°01.5	20°02.0	20°02.5	20°03.0	20°03.5	20°04.1	20°04.6	20°05.1	20°05.6	+0.5
Su 21	270°50.7	285°50.6	300°50.6	315°50.5	330°50.5	345°50.5	0°50.4	15°50.4	30°50.3	45°50.3	60°50.2	75°50.2	-0.0
	20°12.2	20°12.7	20°13.2	20°13.7	20°14.2	20°14.7	20°15.3	20°15.8	20°16.3	20°16.8	20°17.3	20°17.8	+0.5
Mo 22	270°49.6	285°49.5	300°49.5	315°49.4	330°49.4	345°49.3	0°49.3	15°49.2	30°49.2	45°49.1	60°49.1	75°49.0	-0.0
	20°24.2	20°24.7	20°25.2	20°25.7	20°26.1	20°26.6	20°27.1	20°27.6	20°28.1	20°28.6	20°29.1	20°29.6	+0.5
Tu 23	270°48.4	285°48.3	300°48.2	315°48.2	330°48.1	345°48.1	0°48.0	15°48.0	30°47.9	45°47.9	60°47.8	75°47.8	-0.1
	20°35.8	20°36.3	20°36.7	20°37.2	20°37.7	20°38.2	20°38.6	20°39.1	20°39.6	20°40.1	20°40.5	20°41.0	+0.5
We 24	270°47.0	285°47.0	300°46.9	315°46.8	330°46.8	345°46.7	0°46.7	15°46.6	30°46.5	45°46.5	60°46.4	75°46.4	-0.1
	20°47.0	20°47.5	20°48.0	20°48.4	20°48.9	20°49.3	20°49.8	20°50.3	20°50.7	20°51.2	20°51.6	20°52.1	+0.5
Th 25	270°45.6	285°45.5	300°45.4	315°45.4	330°45.3	345°45.2	0°45.2	15°45.1	30°45.0	45°45.0	60°44.9	75°44.8	-0.1
	20°57.9	20°58.4	20°58.8	20°59.3	20°59.7	21°00.2	21°00.6	21°01.1	21°01.5	21°01.9	21°02.4	21°02.8	+0.4
Fr 26	270°44.0	285°43.9	300°43.8	315°43.8	330°43.7	345°43.6	0°43.6	15°43.5	30°43.4	45°43.3	60°43.3	75°43.2	-0.1
	21°08.5	21°08.9	21°09.3	21°09.8	21°10.2	21°10.6	21°11.1	21°11.5	21°11.9	21°12.3	21°12.8	21°13.2	+0.4
Sa 27	270°42.3	285°42.2	300°42.1	315°42.1	330°42.0	345°41.9	0°41.8	15°41.8	30°41.7	45°41.6	60°41.5	75°41.5	-0.1
	21°18.6	21°19.1	21°19.5	21°19.9	21°20.3	21°20.7	21°21.1	21°21.5	21°21.9	21°22.4	21°22.8	21°23.2	+0.4
Su 28	270°40.5	285°40.4	300°40.3	315°40.2	330°40.2	345°40.1	0°40.0	15°39.9	30°39.8	45°39.8	60°39.7	75°39.6	-0.1
	21°28.4	21°28.8	21°29.2	21°29.6	21°30.0	21°30.4	21°30.8	21°31.2	21°31.6	21°32.0	21°32.4	21°32.8	+0.4
Mo 29	270°38.5	285°38.5	300°38.4	315°38.3	330°38.2	345°38.1	0°38.1	15°38.0	30°37.9	45°37.8	60°37.7	75°37.6	-0.1
	21°37.9	21°38.2	21°38.6	21°39.0	21°39.4	21°39.8	21°40.2	21°40.5	21°40.9	21°41.3	21°41.7	21°42.1	+0.4
Tu 30	270°36.5	285°36.4	300°36.3	315°36.3	330°36.2	345°36.1	0°36.0	15°35.9	30°35.8	45°35.7	60°35.6	75°35.6	-0.1
	21°46.9	21°47.3	21°47.6	21°48.0	21°48.4	21°48.7	21°49.1	21°49.5	21°49.8	21°50.2	21°50.6	21°50.9	+0.4
We 31	270°34.4	285°34.3	300°34.2	315°34.1	330°34.0	345°33.9	0°33.8	15°33.8	30°33.7	45°33.6	60°33.5	75°33.4	-0.1
	21°55.6	21°55.9	21°56.3	21°56.6	21°57.0	21°57.3	21°57.7	21°58.0	21°58.4	21°58.7	21°59.1	21°59.4	+0.3

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.8'

MOON

May 2034

	D	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	0h	Δ'/h SH
O	Mo 1	244°44.6 -6°37.9	259°18.5 -6°46.6	273°52.8 -6°55.3	288°26.2 -7°03.9	303°00.1 -7°12.5	317°33.9 -7°21.1	332°07.7 -7°29.6	346°41.5 -7°38.1	1°15.3 -7°46.6	15°49.1 -7°55.0	30°22.8 -8°03.4	+33.8 14.7 -8.6 54.0
	Tu 2	248°47.0 -10°05.1	263°02.4 -10°12.9	277°53.8 -10°20.7	292°27.2 -10°28.4	307°00.6 -10°36.7	321°34.0 -10°43.7	336°07.3 -10°51.3	350°40.6 -11°06.3	5°13.9 -11°13.7	19°47.2 -11°21.1	34°20.4 -11°21.1	+33.3 14.7 -7.6 53.9
	We 3	252°35.9 -13°05.9	267°08.7 -13°12.5	281°41.5 -13°19.0	296°14.3 -13°25.4	310°47.0 -13°31.8	325°19.7 -13°38.2	339°52.4 -13°44.4	354°25.0 -13°50.7	8°57.7 -13°56.8	23°30.2 -14°02.9	38°02.8 -14°09.0	+32.7 14.7 -6.3 53.9
	Th 4	256°07.7 -15°31.9	270°39.7 -15°36.9	285°11.8 -15°41.9	299°43.8 -15°46.7	314°15.8 -15°51.5	328°47.8 -15°56.3	343°19.7 -16°00.9	357°51.6 -16°05.5	12°23.5 -16°10.0	26°55.4 -16°14.5	41°27.2 -16°18.8	+32.0 14.7 -4.7 54.0
●	Fr 5	259°21.1 -17°15.5	273°52.5 -17°18.7	288°23.8 -17°21.7	302°55.2 -17°24.7	317°26.4 -17°27.7	331°57.7 -17°30.5	346°29.0 -17°33.3	1°00.2 -17°36.0	15°31.4 -17°38.6	30°02.5 -17°41.1	44°33.7 -17°43.5	+31.3 14.8 -2.8 54.2
	Sa 6	262°18.0 -18°10.2	276°48.8 -18°11.3	291°19.5 -18°12.3	305°50.3 -18°13.2	320°21.0 -18°14.1	334°51.7 -18°14.8	349°22.4 -18°15.5	3°53.0 -18°16.1	18°23.7 -18°16.6	32°54.3 -18°17.0	47°24.9 -18°17.3	+30.7 14.9 -0.7 54.6
	Su 7	265°02.1 -18°11.5	279°32.4 -18°10.4	294°02.8 -18°09.3	308°33.1 -18°08.0	323°03.5 -18°06.6	337°33.8 -18°05.2	352°04.1 -18°03.6	6°34.4 -18°02.0	21°04.7 -18°00.3	35°35.0 -17°58.5	50°05.2 -17°56.6	+30.3 15.0 +1.5 55.0
	Mo 8	267°38.1 -17°17.3	282°08.3 -17°14.0	296°38.4 -17°10.6	311°08.5 -17°07.1	325°38.7 -17°03.5	340°08.8 -16°59.8	354°38.9 -16°56.0	9°09.0 -16°52.1	23°39.1 -16°48.2	38°09.2 -16°44.2	52°39.3 -16°40.0	+30.1 15.1 +3.7 55.5
●	Tu 9	270°10.1 -15°27.9	284°40.2 -15°22.4	299°10.2 -15°16.8	313°40.2 -15°11.1	328°10.2 -15°05.4	342°40.2 -14°59.6	357°10.2 -14°53.7	11°40.3 -14°47.7	26°10.3 -14°41.6	40°40.3 -14°35.5	55°10.3 -14°29.2	+30.0 15.3 +5.9 56.2
	We 10	284°40.2 -15°22.4	299°10.2 -15°16.8	313°40.2 -15°11.1	328°10.2 -15°05.4	342°40.2 -14°59.6	357°10.2 -14°53.7	11°40.3 -14°47.7	26°10.3 -14°41.6	40°40.3 -14°35.5	55°10.3 -14°29.2	69°40.3 -14°22.9	+30.0 15.3 +5.9 56.3
	Th 11	287°09.7 -12°38.8	301°39.6 -12°31.2	316°09.5 -12°23.6	330°39.4 -12°15.9	345°09.3 -12°08.1	359°39.2 -12°00.2	14°09.1 -11°52.3	28°39.0 -11°44.3	43°08.9 -11°36.3	57°38.8 -11°28.1	72°08.6 -11°19.9	+29.9 15.6 +7.9 57.1
	Fr 12	289°35.3 -9°08.8	304°05.3 -8°59.6	318°34.7 -8°50.3	333°04.4 -8°40.9	347°34.0 -8°31.5	362°03.6 -8°22.0	16°33.2 -8°12.4	31°02.8 -8°02.6	45°32.4 -7°53.2	60°02.0 -7°43.5	74°31.5 -7°33.7	+29.6 15.8 +9.5 57.9
●	Sa 13	291°52.3 -5°01.1	306°21.5 -4°50.6	320°50.6 -4°40.0	335°19.8 -4°29.4	349°48.5 -4°18.7	364°18.1 -4°08.0	18°47.0 -3°57.3	33°16.1 -3°46.5	47°45.1 -3°35.7	62°14.1 -3°24.9	76°43.0 -3°14.0	+29.1 16.1 -10.7 58.9
	Su 14	293°53.0 -0°27.5	308°21.4 -0°16.3	322°49.7 -0°05.0	337°18.0 0°06.3	351°46.8 0°17.6	36°14.5 0°29.0	20°42.6 0°40.3	35°10.8 0°51.6	49°38.8 1°03.0	64°06.9 1°14.4	78°34.6 1°25.7	+28.2 16.3 +11.3 59.8
	Mo 15	295°29.0 4°16.1	309°56.2 4°27.4	324°24.3 4°38.7	338°50.4 4°49.9	353°17.6 5°01.2	7°44.5 5°12.4	22°11.4 5°23.6	36°38.3 5°34.7	51°05.1 5°45.9	65°31.1 5°57.0	79°58.6 6°08.1	+27.0 16.5 +11.6 60.5
	Tu 16	296°32.6 8°49.9	310°58.4 9°00.4	325°24.4 9°10.7	339°49.9 9°21.1	354°15.5 9°31.3	8°41.1 9°41.5	23°06.6 9°51.7	37°32.1 10°01.8	51°57.5 10°11.8	66°22.9 10°21.7	80°48.1 10°31.6	+25.5 16.6 +10.2 61.0
●	We 17	297°00.9 12°51.1	311°25.3 12°59.7	325°49.7 13°08.2	340°14.1 13°16.7	354°38.0 13°25.0	9°02.6 13°33.3	23°26.8 13°41.5	37°50.9 13°49.5	52°15.0 13°57.5	66°39.1 14°05.4	81°03.1 14°13.2	+24.2 16.7 +8.2 61.2
	Th 18	296°58.8 15°56.8	311°22.3 16°02.8	325°45.7 16°08.7	340°09.1 16°14.4	354°32.5 16°20.5	8°55.9 16°25.6	23°19.2 16°31.0	37°42.6 16°36.2	52°05.9 16°41.4	66°29.2 16°46.4	80°52.5 16°51.3	+23.4 16.7 +5.6 61.1
	Fr 19	296°41.0 17°49.3	311°04.3 17°52.1	325°27.3 17°54.8	339°50.8 17°57.3	354°14.1 17°59.7	8°37.4 18°02.0	23°00.8 18°04.2	37°24.1 18°06.2	51°47.5 18°08.1	66°10.9 18°09.9	80°34.3 18°11.5	+23.3 16.5 +2.2 60.6
	Sa 20	296°29.5 18°20.1	310°53.6 18°19.6	325°17.6 18°19.0	339°41.7 18°18.3	354°05.9 18°17.5	8°30.1 18°16.5	22°54.4 18°15.4	37°18.7 18°14.2	51°43.0 18°12.8	66°07.5 18°11.4	80°32.0 18°09.8	+24.2 16.3 -1.0 59.9
●	Su 21	296°47.1 17°31.8	311°12.6 17°28.3	325°38.3 17°24.8	340°04.0 17°21.1	354°29.8 17°17.4	8°55.7 17°13.5	23°21.6 17°09.5	37°47.6 17°05.4	52°13.7 17°01.3	66°39.9 16°57.0	81°06.1 16°52.6	+25.9 16.1 -3.9 58.9
	Mo 22	297°49.7 15°35.6	312°17.3 15°29.8	326°44.9 15°23.9	341°12.6 15°17.9	355°40.4 15°11.8	10°08.3 15°05.6	24°36.3 14°59.4	39°04.4 14°53.1	53°32.5 14°46.5	68°00.7 14°40.2	82°29.7 14°33.6	+27.9 15.8 -6.2 57.9
	Tu 23	299°43.5 12°47.4	314°13.1 12°39.8	328°42.8 12°32.1	343°12.5 12°24.4	357°42.3 12°16.7	12°12.2 12°08.9	26°42.2 12°01.0	41°12.3 11°53.1	55°42.4 11°45.2	70°12.6 11°37.1	84°42.9 11°29.1	+29.9 15.5 -7.8 57.0
	We 24	302°25.6 9°23.0	316°56.9 9°14.3	331°28.4 9°05.5	345°59.9 8°56.7	0°31.4 8°47.9	15°03.1 8°39.1	29°34.7 8°30.2	44°06.5 8°21.3	58°38.3 8°12.3	73°10.2 8°03.4	87°42.1 7°54.4	+31.7 15.3 -8.9 56.1
●	Th 25	305°47.2 5°36.7	320°20.0 5°27.4	334°52.8 5°18.0	349°25.6 5°08.6	3°58.4 4°59.3	18°31.4 4°49.9	33°04.3 4°40.5	47°37.3 4°31.1	62°10.3 4°21.6	76°43.4 4°12.2	91°16.7 4°02.5	+32.9 15.1 -9.4 55.4
	Fr 26	309°37.1 1°40.3	324°10.8 1°30.8	338°44.4 1°21.2	353°18.1 1°11.7	7°51.7 0°52.2	22°25.5 0°52.7	36°59.2 0°43.2	51°32.9 0°33.9	66°06.7 0°24.2	80°40.5 0°14.7	95°14.3 0°05.2	+33.7 14.9 -9.5 54.8
	Sa 27	313°43.3 -2°16.4	328°17.3 -2°25.7	342°50.3 -2°35.0	357°25.3 -2°44.3	11°59.4 -2°53.6	26°33.4 -3°02.9	41°07.4 -3°12.2	55°41.5 -3°21.5	70°15.5 -3°30.7	84°49.6 -3°39.9	99°23.6 -3°49.1	+34.0 14.8 -9.3 54.3
	Su 28	317°54.2 -6°04.5	332°28.1 -6°13.4	347°00.2 -6°22.1	1°36.1 -6°31.0	16°10.1 -6°39.7	30°44.0 -6°48.4	45°17.9 -6°57.1	59°51.9 -7°05.8	74°25.8 -7°14.4	88°59.7 -7°23.0	103°33.6 -7°31.6	+33.9 14.7 -8.7 54.1
●	Mo 29	321°59.8 -9°36.0	336°33.4 -9°44.0	351°07.0 -9°52.0	0°540.6 -9°59.9	20°144.1 -10°07.8	34°477.9 -10°15.6	49°211.1 -10°23.4	63°541.5 -10°31.1	78°288.0 -10°38.5	93°014.4 -10°46.5	107°348.8 -10°54.1	+33.5 14.7 -7.8 54.0
	Tu 30	325°52.3 -12°42.6	340°25.2 -12°49.4	354°58.1 -12°56.2	0°310.0 -13°02.9	24°030.8 -13°09.6	38°366.7 -13°16.2	53°009.4 -13°22.8	67°422.2 -13°29.3	82°144.7 -13°35.7	96°477.4 -13°42.1	111°202.2 -13°48.4	+32.8 14.7 -6.6 54.0
	We 31	329°26.2 -15°16.0	343°58.3 -15°21.3	358°30.4 -15°26.6	13°02.4 -15°31.8	27°34.5 -15°36.9	42°06.5 -15°42.0	56°38.4 -15°46.9	71°10.3 -15°51.9	85°42.2 -15°56.7	100°14.1 -16°01.5	114°45.9 -16°06.2	+32.0 14.7 -5.0 54.1

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 3 12h15 — LQ: 11 10h56 — NM: 18 03h12 — FQ: 24 23h57

SUN

June 2034

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Th 1	276°32.2 22°03.9	285°32.1 22°04.2	300°32.0 22°04.5	315°31.9 22°04.9	330°31.8 22°05.2	345°31.7 22°05.5	0°31.6 22°05.9	15°31.5 22°06.2	30°31.445°31.3 22°06.522°06.9	45°31.3 22°06.9	60°31.2 22°07.2	75°31.1 22°07.5	-0.1 +0.3
Fr 2	276°29.8 22°11.8	285°29.7 22°12.1	300°29.6 22°12.4	315°29.5 22°12.7	330°29.4 22°13.0	345°29.3 22°13.4	0°29.2 22°13.7	15°29.1 22°14.0	30°29.045°28.9 22°14.322°14.6	45°28.9 22°14.6	60°28.8 22°14.9	75°28.7 22°15.3	-0.1 +0.3
Sa 3	276°27.4 22°19.3	285°27.3 22°19.6	300°27.2 22°19.9	315°27.1 22°20.2	330°27.0 22°20.5	345°26.9 22°20.8	0°26.8 22°21.1	15°26.7 22°21.4	30°26.645°26.5 22°21.722°22.0	45°26.5 22°22.0	60°26.4 22°22.3	75°26.3 22°22.6	-0.1 +0.3
Su 4	276°24.9 22°26.4	285°24.8 22°26.7	300°24.7 22°27.0	315°24.6 22°27.3	330°24.5 22°27.6	345°24.4 22°27.8	0°24.3 22°28.1	15°24.1 22°28.4	30°24.045°23.9 22°28.722°29.0	45°23.9 22°29.0	60°23.8 22°29.3	75°23.7 22°29.5	-0.1 +0.3
Mo 5	276°22.3 22°33.1	285°22.2 22°33.4	300°22.1 22°33.7	315°22.0 22°34.0	330°21.9 22°34.2	345°21.7 22°34.5	0°21.6 22°34.8	15°21.5 22°35.0	30°21.445°21.3 22°35.322°35.6	45°21.3 22°35.6	60°21.2 22°35.8	75°21.1 22°36.1	-0.1 +0.3
Tu 6	276°19.6 22°39.5	285°19.5 22°39.7	300°19.4 22°40.0	315°19.3 22°40.2	330°19.2 22°40.5	345°19.0 22°40.7	0°18.9 22°41.0	15°18.8 22°41.2	30°18.745°18.6 22°41.522°41.7	45°18.6 22°41.7	60°18.5 22°42.0	75°18.4 22°42.2	-0.1 +0.3
We 7	276°16.8 22°45.4	285°16.7 22°45.7	300°16.6 22°45.9	315°16.5 22°46.1	330°16.4 22°46.4	345°16.3 22°46.6	0°16.1 22°46.8	15°16.0 22°47.1	30°15.945°15.8 22°47.322°47.5	45°15.8 22°47.5	60°15.7 22°47.8	75°15.6 22°48.0	-0.1 +0.2
Th 8	276°14.0 22°51.0	285°13.9 22°51.2	300°13.8 22°51.5	315°13.6 22°51.6	330°13.5 22°51.8	345°13.4 22°52.1	0°13.3 22°52.3	15°13.2 22°52.5	30°13.045°12.9 22°52.722°52.9	45°12.9 22°52.9	60°12.8 22°53.1	75°12.7 22°53.4	-0.1 +0.2
Fr 9	276°11.1 22°56.1	285°11.0 22°56.3	300°10.9 22°56.5	315°10.7 22°56.7	330°10.6 22°56.9	345°10.5 22°57.1	0°10.4 22°57.3	15°10.2 22°57.5	30°10.145°10.0 22°57.722°57.9	45°10.0 22°57.9	60°09.9 22°58.1	75°09.7 22°58.3	-0.1 +0.2
Sa 10	276°08.1 23°00.8	285°08.0 23°01.0	300°07.9 23°01.2	315°07.7 23°01.4	330°07.6 23°01.6	345°07.5 23°01.8	0°07.4 23°01.9	15°07.2 23°02.1	30°07.145°07.0 23°02.323°02.5	45°07.0 23°02.5	60°06.9 23°02.7	75°06.7 23°02.9	-0.1 +0.2
Su 11	276°05.1 23°05.2	285°05.0 23°05.3	300°04.8 23°05.5	315°04.7 23°05.7	330°04.6 23°05.8	345°04.4 23°06.0	0°04.3 23°06.2	15°04.2 23°06.3	30°04.145°03.9 23°06.523°06.7	45°03.9 23°06.7	60°03.8 23°06.8	75°03.7 23°07.0	-0.1 +0.2
Mo 12	276°02.0 23°09.1	285°01.9 23°09.2	300°01.7 23°09.4	315°01.6 23°09.5	330°01.5 23°09.7	345°01.3 23°09.8	0°01.2 23°10.0	15°01.1 23°10.2	30°01.045°00.8 23°10.323°10.4	45°00.8 23°10.4	60°00.7 23°10.6	75°00.6 23°10.7	-0.1 +0.2
Tu 13	269°58.9 23°12.6	284°58.7 23°12.7	299°58.6 23°12.9	314°58.5 23°13.0	329°58.3 23°13.1	344°58.2 23°13.3	359°58.1 23°13.4	14°57.9 23°13.5	29°57.844°57.7 23°13.723°13.8	44°57.7 23°13.8	59°57.5 23°13.9	74°57.4 23°14.1	-0.1 +0.1
We 14	269°55.7 23°15.7	284°55.5 23°15.8	299°55.4 23°15.9	314°55.3 23°16.1	329°55.1 23°16.2	344°55.0 23°16.3	359°54.9 23°16.4	14°54.7 23°16.5	29°54.644°54.5 23°16.823°16.8	44°54.5 23°16.8	59°54.3 23°16.9	74°54.2 23°17.0	-0.1 +0.1
Th 15	269°52.5 23°18.4	284°52.3 23°18.5	299°52.2 23°18.6	314°52.1 23°18.7	329°51.9 23°18.8	344°51.8 23°18.9	359°51.6 23°19.0	14°51.5 23°19.1	29°51.444°51.2 23°19.223°19.3	44°51.2 23°19.3	59°51.1 23°19.4	74°51.0 23°19.5	-0.1 +0.1
Fr 16	269°49.2 23°20.7	284°49.1 23°20.8	299°48.9 23°20.9	314°48.8 23°20.9	329°48.7 23°21.0	344°48.5 23°21.1	359°48.4 23°21.2	14°48.3 23°21.3	29°48.244°48.1 23°21.423°21.4	44°48.1 23°21.4	59°47.8 23°21.5	74°47.7 23°21.6	-0.1 +0.1
Sa 17	269°45.9 23°22.6	284°45.8 23°22.6	299°45.7 23°22.7	314°45.5 23°22.8	329°45.4 23°22.8	344°45.3 23°22.9	359°45.1 23°23.0	14°45.0 23°23.0	29°44.844°44.7 23°23.123°23.2	44°44.7 23°23.2	59°44.6 23°23.2	74°44.4 23°23.3	-0.1 +0.1
Su 18	269°42.7 23°24.0	284°42.5 23°24.1	299°42.5 23°24.1	314°42.2 23°24.2	329°42.1 23°24.2	344°42.0 23°24.3	359°41.8 23°24.3	14°41.7 23°24.4	29°41.644°41.5 23°24.423°24.5	44°41.5 23°24.5	59°41.3 23°24.5	74°41.1 23°24.5	-0.1 +0.0
Mo 19	269°39.4 23°25.1	284°39.2 23°25.1	299°39.1 23°25.1	314°38.9 23°25.2	329°38.8 23°25.2	344°38.7 23°25.2	359°38.5 23°25.3	14°38.4 23°25.3	29°38.344°38.2 23°25.323°25.4	44°38.2 23°25.4	59°38.0 23°25.4	74°37.9 23°25.4	-0.1 +0.0
Tu 20	269°36.1 23°25.7	284°35.9 23°25.7	299°35.8 23°25.7	314°35.7 23°25.7	329°35.5 23°25.8	344°35.4 23°25.8	359°35.2 23°25.8	14°35.1 23°25.8	29°35.044°34.8 23°25.823°25.8	44°34.8 23°25.8	59°34.7 23°25.8	74°34.6 23°25.9	-0.1 +0.0
We 21	269°32.8 23°25.9	284°32.6 23°25.9	299°32.5 23°25.9	314°32.4 23°25.9	329°32.2 23°25.9	344°32.1 23°25.9	359°32.0 23°25.9	14°31.8 23°25.9	29°31.744°31.6 23°25.923°25.9	44°31.6 23°25.9	59°31.4 23°25.9	74°31.3 23°25.9	-0.1 -0.0
Th 22	269°29.5 23°25.7	284°29.4 23°25.7	299°29.2 23°25.7	314°29.1 23°25.7	329°29.0 23°25.7	344°28.8 23°25.6	359°28.7 23°25.6	14°28.6 23°25.6	29°28.544°28.3 23°25.623°25.6	44°28.3 23°25.6	59°28.2 23°25.5	74°28.0 23°25.5	-0.1 -0.0
Fr 23	269°26.3 23°25.1	284°26.1 23°25.1	299°26.0 23°25.1	314°25.9 23°25.0	329°25.7 23°25.0	344°25.6 23°24.9	359°25.4 23°24.9	14°25.3 23°24.9	29°25.244°25.0 23°24.923°24.8	44°25.0 23°24.8	59°24.9 23°24.8	74°24.7 23°24.7	-0.1 -0.0
Sa 24	269°23.0 23°24.1	284°22.9 23°24.1	299°22.8 23°24.0	314°22.6 23°23.9	329°22.5 23°23.8	344°22.4 23°23.8	359°22.2 23°23.8	14°22.2 23°23.7	29°22.044°21.8 23°23.723°23.6	44°21.8 23°23.6	59°21.7 23°23.6	74°21.6 23°23.5	-0.1 -0.1
Su 25	269°19.8 23°22.7	284°19.7 23°22.6	299°19.6 23°22.5	314°19.4 23°22.5	329°19.3 23°22.4	344°19.2 23°22.3	359°19.0 23°22.3	14°18.9 23°22.2	29°18.844°18.6 23°22.223°22.2	44°18.6 23°22.2	59°18.5 23°22.2	74°18.4 23°21.9	-0.1 -0.1
Mo 26	269°16.7 23°20.8	284°16.5 23°20.7	299°16.4 23°20.7	314°16.3 23°20.6	329°16.1 23°20.5	344°16.0 23°20.4	359°15.9 23°20.3	14°15.8 23°20.2	29°15.644°15.5 23°20.223°20.0	44°15.5 23°20.0	59°15.4 23°19.9	74°15.2 23°19.9	-0.1 -0.1
Tu 27	269°13.5 23°18.6	284°13.4 23°18.5	299°13.3 23°18.4	314°13.2 23°18.3	329°13.0 23°18.2	344°12.9 23°18.1	359°12.8 23°18.0	14°12.6 23°17.8	29°12.544°12.4 23°17.823°17.7	44°12.4 23°17.7	59°12.3 23°17.6	74°12.1 23°17.5	-0.1 -0.1
We 28	269°10.5 23°15.9	284°10.3 23°15.8	299°10.2 23°15.7	314°10.1 23°15.6	329°10.0 23°15.4	344°09.8 23°15.3	359°09.7 23°15.2	14°09.6 23°15.1	29°09.644°09.3 23°14.923°14.8	44°09.3 23°14.8	59°09.2 23°14.7	74°09.1 23°14.6	-0.1 -0.1
Th 29	269°07.5 23°12.9	284°07.3 23°12.7	299°07.2 23°12.6	314°07.1 23°12.4	329°07.0 23°12.3	344°06.8 23°12.2	359°06.7 23°12.0	14°06.6 23°11.9	29°06.544°06.3 23°11.723°11.6	44°06.3 23°11.6	59°06.2 23°11.5	74°06.1 23°11.3	-0.1 -0.1
Fr 30	269°04.5 23°09.4	284°04.4 23°09.2	299°04.2 23°09.1	314°04.1 23°08.9	329°04.0 23°08.8	344°03.9 23°08.6	359°03.8 23°08.4	14°03.6 23°08.3	29°03.544°03.4 23°08.223°08.0	44°03.4 23°08.0	59°03.3 23°07.8	74°03.1 23°07.6	-0.1 -0.2

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

June 2034

	D	15h	16h	17h	18h	19h	20h	21h	22h	23h	0h	1h	Δ /h SH
Th 1	245°30.9 -16°45.4	260°02.4 -16°49.3	274°33.9 -16°53.2	289°05.3 -16°57.1	303°36.7 -17°00.8	318°08.1 -17°04.5	332°39.4 -17°08.1	347°10.7 -17°11.6	1°42.0 -17°15.1	16°13.3 -17°18.4	30°44.5 -17°21.7	+31.4 14.8 -3.6 54.2	
	248°29.4 -18°01.2	263°00.1 -18°03.2	277°30.9 -18°05.1	292°01.6 -18°06.9	306°32.3 -18°08.6	321°03.0 -18°10.2	335°33.6 -18°11.8	350°04.3 -18°13.2	4°34.9 -18°14.6	19°05.5 -18°15.9	33°36.6 -18°17.1	+30.7 14.9 -1.6 54.5	
Sa 3	251°12.1 -18°24.4	265°42.4 -18°24.2	280°12.6 -18°23.9	294°42.9 -18°23.5	309°13.1 -18°23.0	323°43.3 -18°22.4	338°13.5 -18°21.7	352°43.7 -18°21.0	7°13.9 -18°20.1	21°44.1 -18°19.2	36°14.2 -18°18.1	+30.2 15.0 +0.6 54.9	
Su 4	253°45.5 -17°51.7	268°15.5 -17°49.2	282°45.6 -17°46.6	297°15.6 -17°43.9	311°45.6 -17°41.2	326°15.7 -17°38.3	340°45.7 -17°35.4	355°15.7 -17°32.4	9°45.7 -17°29.2	24°15.7 -17°26.0	38°45.7 -17°22.7	+30.0 15.1 +2.9 55.3	
Mo 5	256°16.1 -16°22.7	270°46.1 -16°18.0	285°16.2 -16°13.2	299°46.2 -16°08.4	314°16.3 -16°03.4	328°46.4 -15°58.4	343°16.4 -15°53.3	357°46.5 -15°48.1	12°16.6 -15°42.8	26°46.7 -15°37.4	41°16.7 -15°32.0	+30.1 15.2 +5.1 55.8	
Tu 6	258°48.7 -14°00.5	273°18.9 -13°53.8	287°49.1 -13°47.0	302°19.2 -13°40.1	316°49.4 -13°33.2	331°19.6 -13°26.1	345°49.8 -13°19.0	0°20.1 -13°11.9	14°50.3 -13°04.6	29°20.5 -12°57.3	43°50.7 -12°49.9	+30.2 15.4 +7.1 56.4	
We 7	261°24.6 -10°50.8	275°54.9 -10°42.4	290°25.2 -10°33.9	304°55.5 -10°25.3	319°25.7 -10°16.6	333°56.0 -10°07.9	348°26.3 -9°59.1	2°56.6 -9°50.3	17°26.9 -9°41.1	31°57.1 -9°32.5	46°27.4 -9°23.5	+30.3 15.6 +8.7 57.0	
Th 8	264°01.1 -7°01.9	278°31.3 -6°52.1	293°01.5 -6°42.2	307°31.6 -6°32.3	322°01.8 -6°22.3	336°31.9 -6°12.3	351°02.1 -6°02.3	5°32.2 -5°52.2	20°02.3 -5°42.1	34°32.4 -5°31.9	49°02.5 -5°21.7	+30.1 15.7 +10.0 57.8	
Fr 9	278°31.3 -6°52.1	293°01.5 -6°42.2	307°31.6 -6°32.3	322°01.8 -6°22.3	336°31.9 -6°12.3	351°02.1 -6°02.3	5°32.2 -5°52.2	20°02.3 -5°42.1	34°32.4 -5°31.9	49°02.5 -5°21.7	63°32.6 -5°11.4	+30.1 15.8 +10.1 57.8	
Sa 10	281°01.4 -2°33.5	295°31.1 -2°22.7	310°00.9 -2°12.0	324°30.6 -2°01.2	339°00.2 -1°50.3	353°29.9 -1°39.5	7°59.5 -1°28.6	22°29.1 -1°17.7	36°58.6 -1°06.8	51°28.1 -0°55.9	65°57.6 -0°44.9	+29.6 16.0 +10.9 58.5	
Su 11	283°15.9 2°00.5	297°44.8 2°11.6	312°13.7 2°22.7	326°42.5 2°33.7	341°11.3 2°44.8	355°40.0 2°55.9	10°08.7 3°06.9	24°37.3 3°18.0	39°05.9 3°29.0	53°34.5 3°40.0	68°03.0 3°51.0	+28.7 16.2 +11.1 59.3	
Mo 12	285°04.5 6°34.2	299°32.2 6°44.9	313°59.8 6°55.6	328°27.3 7°06.2	342°54.8 7°16.8	357°22.3 7°27.4	11°49.7 7°37.9	26°17.0 7°48.3	40°44.3 7°58.8	55°11.5 8°09.2	69°38.6 8°19.5	+27.4 16.3 +10.5 59.9	
Tu 13	286°18.6 10°48.9	300°44.7 10°58.4	315°10.8 11°07.8	329°36.9 11°17.2	344°02.9 11°26.5	358°28.8 11°35.7	12°54.7 11°44.9	27°20.4 11°54.0	41°46.2 12°03.0	56°11.9 12°11.9	70°37.5 12°20.8	+25.9 16.5 +9.2 60.4	
We 14	286°54.5 14°23.6	301°19.2 14°31.1	315°43.9 14°38.4	330°08.3 14°45.7	344°31.3 14°52.8	358°57.4 14°59.9	13°21.8 15°06.9	27°46.2 15°13.7	42°10.5 15°20.5	56°34.8 15°27.1	70°59.1 15°33.6	+24.4 16.6 +7.0 60.7	
Th 15	286°57.6 16°58.0	301°21.2 17°02.7	315°44.8 17°07.3	330°08.3 17°11.7	344°31.9 17°16.0	358°55.4 17°20.2	13°18.9 17°24.2	27°42.4 17°28.2	42°05.8 17°32.0	56°29.3 17°35.6	70°52.7 17°39.2	+23.5 16.6 +4.1 60.7	
Fr 16	286°43.2 18°16.7	301°06.6 18°18.2	315°30.0 18°19.5	330°03.2 18°20.7	344°16.8 18°21.7	358°40.2 18°22.6	13°03.7 18°23.4	27°27.2 18°24.1	41°50.7 18°24.6	56°14.2 18°25.0	70°37.7 18°25.2	+23.4 16.5 +0.8 60.4	
Sa 17	286°34.6 18°13.4	300°58.8 18°11.6	315°22.9 18°09.7	329°47.2 18°07.6	344°11.4 18°05.5	358°35.8 18°03.2	13°00.2 18°00.7	27°24.6 17°56.2	41°49.1 17°55.5	56°13.6 17°52.7	70°38.3 17°49.8	+24.4 16.3 -2.4 59.8	
Su 18	286°55.2 16°52.7	301°20.9 16°48.0	315°46.7 16°43.2	330°12.5 16°38.3	344°38.5 16°33.3	359°04.4 16°28.3	13°30.5 16°23.1	27°56.7 16°17.8	42°22.9 16°12.4	56°49.9 16°07.0	71°15.6 16°01.4	+26.0 16.1 -5.1 59.0	
Mo 19	288°01.1 14°27.5	302°28.8 14°20.6	316°56.6 14°13.6	331°24.5 14°06.5	345°52.4 13°59.4	0°20.4 13°52.2	14°48.5 13°44.9	29°16.7 13°37.6	43°45.0 13°30.2	58°13.4 13°22.7	72°41.8 13°15.2	+28.1 15.8 -7.2 58.1	
Tu 20	289°58.0 11°15.0	304°27.8 11°06.6	318°57.5 10°58.1	333°27.4 10°49.6	347°57.4 10°41.0	2°27.4 10°32.4	16°57.5 10°23.7	31°27.6 10°15.0	45°57.9 10°06.3	60°28.2 9°57.5	74°58.6 9°48.7	+30.1 15.6 -8.6 57.1	
We 21	292°42.6 7°32.3	307°14.0 7°23.0	321°45.5 7°13.7	336°17.1 7°04.3	350°48.7 6°54.9	5°20.4 6°45.5	19°52.2 6°36.1	34°24.0 6°26.6	48°55.9 6°17.2	63°27.8 6°07.7	77°59.8 5°58.2	+31.7 15.3 -9.4 56.3	
Th 22	296°05.5 9°34.1	310°38.2 9°24.5	325°11.0 9°14.8	339°43.9 9°05.1	354°16.7 2°55.4	8°49.7 2°45.7	23°22.6 2°36.0	37°55.6 2°26.4	52°28.6 2°16.7	67°01.7 2°07.0	81°34.8 1°57.3	+32.9 15.1 -9.7 55.5	
Fr 23	299°55.0 -0°27.6	314°28.6 -0°37.2	329°02.1 -0°46.8	343°35.7 -0°56.4	358°09.4 -1°06.0	12°43.0 -1°15.5	27°16.7 -1°25.1	41°50.3 -1°34.6	56°24.0 -1°44.1	70°57.7 -1°53.6	85°31.5 -2°03.1	+33.7 15.0 -9.6 54.9	
Sa 24	303°58.7 -4°23.3	318°32.6 -4°32.5	333°06.5 -4°41.7	347°40.4 -4°50.8	2°14.3 -4°59.9	16°48.2 -5°09.0	31°22.0 -5°18.0	45°55.9 -5°27.1	60°29.8 -5°36.1	75°03.7 -5°45.1	89°37.6 -5°54.0	+33.9 14.8 -9.1 54.4	
Su 25	308°05.0 -8°04.6	322°38.8 -8°13.1	337°12.5 -8°21.5	351°46.2 -8°29.9	6°19.9 -8°38.2	20°53.6 -8°46.5	35°27.3 -8°54.8	50°01.0 -9°03.0	64°34.6 -9°11.2	79°08.2 -9°19.3	93°41.8 -9°27.4	+33.7 14.8 -8.3 54.2	
Mo 26	312°03.5 -11°23.9	326°36.8 -11°31.3	341°10.0 -11°38.6	355°43.2 -11°45.9	10°16.4 -11°53.2	24°49.6 -12°00.4	39°22.7 -12°07.5	53°55.8 -12°14.6	68°28.8 -12°21.7	83°01.9 -12°28.7	97°34.9 -12°35.6	+33.1 14.7 -7.2 54.1	
Tu 27	315°46.3 -14°13.2	330°18.8 -14°19.3	344°51.2 -14°25.3	359°23.7 -14°31.2	13°56.1 -14°37.0	28°28.4 -14°42.8	43°00.7 -14°48.6	57°33.0 -14°54.2	72°05.3 -14°59.8	86°37.5 -15°05.4	101°09.7 -15°10.9	+32.3 14.8 -5.8 54.1	
We 28	319°08.2 -16°24.9	333°39.8 -16°29.3	348°11.3 -16°33.6	2°42.9 -16°37.8	17°14.4 -16°41.9	31°45.8 -16°46.0	46°17.3 -16°50.0	60°48.7 -16°53.9	75°20.0 -16°57.8	89°51.3 -17°01.5	104°22.6 -17°05.2	+31.4 14.8 -4.0 54.3	
Th 29	322°07.8 -17°51.1	336°38.5 -17°53.5	351°09.3 -17°55.9	5°39.9 -17°58.1	20°10.6 -18°00.2	34°41.2 -18°02.3	49°11.8 -18°04.3	63°42.4 -18°06.2	78°12.9 -18°08.0	92°43.4 -18°09.7	107°13.0 -18°11.4	+30.6 14.9 -2.0 54.6	
Fr 30	324°47.8 -18°25.3	339°17.9 -18°25.5	353°47.9 -18°25.7	8°18.0 -18°25.9	22°48.0 -18°25.6	37°18.0 -18°25.5	51°47.9 -18°25.2	66°17.9 -18°24.9	80°47.8 -18°24.5	95°17.7 -18°23.9	109°47.6 -18°23.3	+30.0 15.0 +0.2 55.0	

SUN

July 2024

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Sa 1	268°01.6	284°01.5	299°01.3	314°01.2	329°01.1	344°01.0	359°00.9	14°00.7	29°00.6	44°00.5	59°00.4	74°00.3	-0.1
	23°05.5	23°05.3	23°05.2	23°05.0	23°04.8	23°04.6	23°04.5	23°04.3	23°04.2	23°03.9	23°03.8	23°03.6	-0.2
Su 2	268°58.7	283°58.6	298°58.5	313°58.4	328°58.3	343°58.2	358°58.0	13°57.9	28°57.8	43°57.7	58°57.6	73°57.5	-0.1
	23°01.2	23°01.0	23°00.8	23°00.6	23°00.5	23°00.3	23°00.1	22°59.9	22°59.7	22°59.5	22°59.3	22°59.1	-0.2
Mo 3	268°56.0	283°55.9	298°55.7	313°55.6	328°55.5	343°55.4	358°55.3	13°55.2	28°55.1	43°55.0	58°54.8	73°54.7	-0.1
	22°56.5	22°56.3	22°56.1	22°55.9	22°55.7	22°55.5	22°55.3	22°55.1	22°54.9	22°54.7	22°54.4	22°54.2	-0.2
Tu 4	268°53.3	283°53.2	298°53.1	313°52.9	328°52.8	343°52.7	358°52.6	13°52.5	28°52.4	43°52.3	58°52.2	73°52.1	-0.1
	22°51.4	22°51.2	22°51.0	22°50.8	22°50.5	22°50.3	22°50.1	22°49.9	22°49.6	22°49.4	22°49.2	22°49.0	-0.2
We 5	268°50.7	283°50.6	298°50.5	313°50.3	328°50.2	343°50.1	358°50.0	13°49.9	28°49.8	43°49.7	58°49.6	73°49.5	-0.1
	22°45.9	22°45.7	22°45.5	22°45.2	22°45.0	22°44.8	22°44.5	22°44.3	22°44.0	22°43.8	22°43.5	22°43.3	-0.2
Th 6	268°48.1	283°48.0	298°47.9	313°47.8	328°47.7	343°47.6	358°47.5	13°47.4	28°47.3	43°47.2	58°47.1	73°47.0	-0.1
	22°40.1	22°39.8	22°39.6	22°39.3	22°39.0	22°38.8	22°38.5	22°38.3	22°38.0	22°37.8	22°37.5	22°37.2	-0.3
Fr 7	268°45.7	283°45.6	298°45.5	313°45.4	328°45.3	343°45.2	358°45.1	13°45.0	28°44.9	43°44.8	58°44.7	73°44.6	-0.1
	22°33.8	22°33.5	22°33.3	22°33.0	22°32.7	22°32.4	22°32.2	22°31.9	22°31.6	22°31.3	22°31.1	22°30.8	-0.3
Sa 8	268°43.3	283°43.2	298°43.1	313°43.0	328°42.9	343°42.9	358°42.8	13°42.7	28°42.6	43°42.5	58°42.4	73°42.3	-0.1
	22°27.1	22°26.8	22°26.6	22°26.3	22°26.0	22°25.7	22°25.4	22°25.1	22°24.8	22°24.5	22°24.2	22°23.9	-0.3
Su 9	268°41.1	283°41.0	298°40.9	313°40.8	328°40.7	343°40.6	358°40.5	13°40.4	28°40.3	43°40.2	58°40.1	73°40.0	-0.1
	22°20.1	22°19.8	22°19.5	22°19.2	22°18.9	22°18.6	22°18.2	22°17.9	22°17.6	22°17.3	22°17.0	22°16.7	-0.3
Mo 10	268°38.9	283°38.8	298°38.7	313°38.6	328°38.5	343°38.5	358°38.4	13°38.3	28°38.2	43°38.1	58°38.0	73°37.9	-0.1
	22°12.6	22°12.3	22°12.0	22°11.7	22°11.4	22°11.0	22°10.7	22°10.4	22°10.1	22°09.7	22°09.4	22°09.1	-0.3
Tu 11	268°36.8	283°36.8	298°36.7	313°36.6	328°36.5	343°36.4	358°36.3	13°36.3	28°36.2	43°36.1	58°36.0	73°35.9	-0.1
	22°04.8	22°04.5	22°04.1	22°03.8	22°03.5	22°03.1	22°02.8	22°02.5	22°02.2	22°01.8	22°01.4	22°01.0	-0.3
We 12	268°34.9	283°34.8	298°34.7	313°34.7	328°34.6	343°34.5	358°34.4	13°34.3	28°34.3	43°34.2	58°34.1	73°34.0	-0.1
	21°56.6	21°56.3	21°55.9	21°55.6	21°55.2	21°54.8	21°54.5	21°54.1	21°53.8	21°53.4	21°53.1	21°52.7	-0.4
Th 13	268°33.0	283°33.0	298°32.9	313°32.8	328°32.6	343°32.7	358°32.6	13°32.5	28°32.5	43°32.4	58°32.3	73°32.2	-0.1
	21°48.0	21°47.7	21°47.3	21°46.9	21°46.6	21°46.2	21°45.8	21°45.5	21°45.1	21°44.7	21°44.3	21°44.0	-0.4
Fr 14	268°31.3	283°31.3	298°31.2	313°31.1	328°31.0	343°31.0	358°30.9	13°30.8	28°30.8	43°30.7	58°30.6	73°30.6	-0.1
	21°39.1	21°38.7	21°38.3	21°37.9	21°37.5	21°37.2	21°36.8	21°36.4	21°36.0	21°35.6	21°35.2	21°34.8	-0.4
Sa 15	268°29.7	283°29.7	298°29.6	313°29.5	328°29.5	343°29.4	358°29.3	13°29.3	28°29.2	43°29.1	58°29.1	73°29.0	-0.1
	21°29.8	21°29.4	21°29.0	21°28.6	21°28.2	21°27.8	21°27.4	21°27.0	21°26.6	21°26.2	21°25.8	21°25.4	-0.4
Su 16	268°28.2	283°28.2	298°28.1	313°28.1	328°28.0	343°28.0	358°27.9	13°27.8	28°27.8	43°27.7	58°27.7	73°27.6	-0.1
	21°20.1	21°19.7	21°19.2	21°18.8	21°18.4	21°18.0	21°17.6	21°17.2	21°16.8	21°16.3	21°15.9	21°15.5	-0.4
Mo 17	268°26.9	283°26.8	298°26.8	313°26.7	328°26.7	343°26.6	358°26.6	13°26.5	28°26.5	43°26.4	58°26.4	73°26.3	-0.1
	21°10.0	21°09.6	21°09.2	21°08.7	21°08.3	21°07.9	21°07.5	21°07.0	21°06.6	21°06.2	21°05.7	21°05.3	-0.4
Tu 18	268°25.7	283°25.6	298°25.6	313°25.5	328°25.5	343°25.4	358°25.4	13°25.4	28°25.4	43°25.3	58°25.2	73°25.2	-0.0
	20°59.6	20°59.2	20°58.7	20°58.3	20°57.8	20°57.4	20°57.0	20°56.5	20°56.0	20°55.6	20°55.2	20°54.7	-0.4
We 19	268°24.6	283°24.6	298°24.5	313°24.5	328°24.4	343°24.4	358°24.4	13°24.3	28°24.3	43°24.2	58°24.2	73°24.2	-0.0
	20°48.9	20°48.4	20°47.9	20°47.5	20°47.0	20°46.6	20°46.1	20°45.7	20°45.2	20°44.7	20°44.3	20°43.8	-0.5
Th 20	268°23.7	283°23.6	298°23.6	313°23.6	328°23.5	343°23.5	358°23.5	13°23.4	28°23.4	43°23.4	58°23.3	73°23.3	-0.0
	20°37.7	20°37.3	20°36.8	20°36.3	20°35.9	20°35.4	20°34.9	20°34.4	20°34.0	20°33.5	20°33.0	20°32.5	-0.5
Fr 21	268°22.9	283°22.9	298°22.8	313°22.8	328°22.8	343°22.7	358°22.7	13°22.7	28°22.7	43°22.6	58°22.6	73°22.6	-0.0
	20°26.3	20°25.8	20°25.3	20°24.8	20°24.3	20°23.8	20°23.3	20°22.9	20°22.4	20°22.0	20°21.4	20°20.9	-0.5
Sa 22	268°22.2	283°22.2	298°22.2	313°22.2	328°22.1	343°22.1	358°22.1	13°22.1	28°22.1	43°22.0	58°22.0	73°22.0	-0.0
	20°14.5	20°14.0	20°13.5	20°13.0	20°12.5	20°12.0	20°11.5	20°11.0	20°10.5	20°10.0	20°09.5	20°09.0	-0.5
Su 23	268°21.7	283°21.7	298°21.7	313°21.7	328°21.7	343°21.7	358°21.6	13°21.6	28°21.6	43°21.6	58°21.6	73°21.6	-0.0
	20°02.4	20°01.8	20°01.3	20°00.8	20°00.3	19°59.8	19°59.3	19°58.8	19°58.2	19°57.7	19°57.1	19°56.6	-0.5
Mo 24	268°21.4	283°21.4	298°21.4	313°21.4	328°21.4	343°21.3	358°21.3	13°21.3	28°21.3	43°21.3	58°21.3	73°21.3	-0.0
	19°49.9	19°49.4	19°48.8	19°48.3	19°47.8	19°47.2	19°46.7	19°46.2	19°45.7	19°45.1	19°44.6	19°44.1	-0.5
Tu 25	268°21.2	283°21.2	298°21.2	313°21.2	328°21.2	343°21.2	358°21.2	13°21.2	28°21.2	43°21.2	58°21.2	73°21.2	-0.0
	19°37.1	19°36.5	19°36.0	19°35.5	19°34.9	19°34.4	19°33.8	19°33.3	19°32.7	19°32.2	19°31.7	19°31.1	-0.5
We 26	268°21.2	283°21.2	298°21.2	313°21.2	328°21.2	343°21.2	358°21.2	13°21.2	28°21.2	43°21.2	58°21.2	73°21.2	+0.0
	19°24.0	19°23.4	19°22.9	19°22.3	19°21.7	19°21.2	19°20.6	19°20.1	19°19.5	19°19.0	19°18.4	19°17.8	-0.6
Th 27	268°21.3	283°21.3	298°21.3	313°21.3	328°21.3	343°21.3	358°21.3	13°21.3	28°21.3	43°21.3	58°21.3	73°21.3	+0.0
	19°10.5	19°10.0	19°09.4	19°08.8	19°08.2	19°07.7	19°07.1	19°06.5	19°06.0	19°05.4	19°04.8	19°04.3	-0.6
Fr 28	268°21.5	283°21.6	298°21.6	313°21.6	328°21.6	343°21.6	358°21.6	13°21.7	28°21.7	43°21.7	58°21.7	73°21.7	+0.0
	18°56.8	18°56.2	18°55.6	18°55.0	18°54.4	18°53.9	18°53.3	18°52.7	18°52.1	18°51.5	18°50.9	18°50.3	-0.6
Sa 29	268°22.0	283°22.0	298°22.0	313°22.0	328°22.1	343°22.1	358°22.1	13°22.1	28°22.1	43°22.2	58°22.2	73°22.2	+0.0
	18°42.7	18°42.1	18°41.5	18°40.9	18°40.3	18°39.7	18°39.1	18°38.5	18°37.9	18°37.3	18°36.7	18°36.1	-0.6
Su 30	268°22.5	283°22.6	298°22.6	313°22.6	328°22.7	343°22.7	358°22.7	13°22.7	28°22.8	43°22.8	58°22.8	73°22.9	+0.0
	18°28.3	18°27.7	18°27.1	18°26.5	18°25.9	18°25.3	18°24.7	18°24.1	18°23.4	18°22.8	18°22.2	18°21.6	-0.6
Mo 31	268°23.3	283°23.3	298°23.3	313°23.3	328°23.4	343°23.4	358°23.5	13°23.5	28°23.5	43°23.6	58°23.6	73°23.7	+0.0
	18°13.6	18°13.0	18°12.4	18°11.8	18°11.2	18°10.5	18°09.9	18°09.3	18°08.7	18°08.0	18°07.4	18°06.8	-0.6

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

July 2024

	D	15h	16h	17h	18h	19h	20h	21h	22h	23h	0h	1h	Δ'/h SH
O	Sa 1	240°16.0 -18°13.6	264°45.7 -18°12.1	269°15.5 -18°10.5	283°45.2 -18°08.7	298°14.9 -18°06.9	312°44.6 -18°05.0	327°14.3 -18°03.0	341°44.0 -18°00.9	356°13.7 -17°58.7	10°43.4 -17°56.4	25°13.0 -17°54.0	+29.7 15.1 +2.055.4
	Su 2	242°37.4 -17°07.3	257°07.0 -17°03.5	271°36.6 -16°59.5	286°06.2 -16°55.5	300°35.9 -16°51.4	315°05.5 -16°47.2	329°35.1 -16°42.9	344°04.7 -16°38.5	358°34.3 -16°34.0	13°03.9 -16°29.5	27°33.6 -16°24.8	+29.6 15.2 +4.355.8
	Mo 3	244°58.7 -15°04.7	259°28.4 -14°58.7	273°58.1 -14°52.6	288°27.5 -14°46.5	302°57.2 -14°40.2	317°27.4 -14°33.9	331°57.2 -14°27.5	346°27.0 -14°21.0	0°56.8 -14°14.4	15°26.6 -14°07.7	29°56.4 -14°01.0	+29.8 15.4 +6.456.3
	Tu 4	247°24.8 -12°11.2	261°54.8 -12°03.3	276°24.8 -11°55.3	290°54.8 -11°47.3	305°24.8 -11°39.2	319°54.8 -11°31.1	334°24.9 -11°22.8	348°54.9 -11°14.6	3°24.9 -11°06.2	17°55.0 -10°57.8	32°25.1 -10°49.3	+30.0 15.5 +8.256.9
O	We 5	249°56.9 -8°35.1	264°27.1 -8°25.8	278°57.3 -8°16.3	293°27.5 -8°06.9	307°57.7 -7°57.3	322°27.9 -7°47.8	336°58.0 -7°38.1	351°28.2 -7°28.5	5°58.4 -7°18.8	20°28.6 -7°09.0	34°58.8 -6°59.2	+30.2 15.7 +9.657.4
	Th 6	252°31.7 -4°27.5	267°01.8 -4°17.1	281°32.0 -4°06.7	296°02.1 -3°56.2	310°32.2 -3°45.8	325°02.4 -3°35.3	339°32.5 -3°24.7	354°02.6 -3°14.2	8°32.7 -3°03.6	23°02.7 -2°53.0	37°32.8 -2°42.4	+30.1 15.8 +10.557.9
	Fr 7	255°02.0 -0°01.0	269°31.8 0°09.8	284°01.5 0°20.7	298°31.3 0°31.6	313°01.0 0°42.4	327°30.7 0°53.3	342°00.4 1°04.2	356°30.0 1°15.1	10°59.6 1°25.9	25°29.2 1°36.8	39°58.8 1°47.7	+29.7 15.9 +10.958.5
	Sa 8	257°18.5 4°29.9	271°47.5 4°40.6	286°16.5 4°51.3	300°45.4 5°02.0	315°14.3 5°12.6	329°43.2 5°23.3	344°12.0 5°33.9	358°40.8 5°44.4	13°09.6 5°55.0	27°38.3 6°05.5	42°06.9 6°16.0	+28.8 16.1 +10.659.0
O	Su 9	271°47.5 4°40.6	286°16.5 4°51.3	300°45.4 5°02.0	315°14.3 5°12.6	329°43.2 5°23.3	344°12.0 5°33.9	358°40.8 5°44.4	13°09.6 5°55.0	27°38.3 6°05.5	42°06.9 6°16.0	56°35.5 6°26.4	+28.8 16.1 +10.659.0
	Mo 10	273°39.1 8°59.1	288°07.0 9°08.9	302°34.8 9°18.7	317°02.5 9°28.4	331°30.2 9°38.1	345°57.8 9°47.8	0°25.4 9°57.3	14°52.9 10°06.9	29°20.4 10°16.3	43°47.8 10°25.7	58°15.2 10°35.1	+27.6 16.2 +9.659.4
	Tu 11	274°59.1 12°47.5	289°25.5 12°55.8	303°52.0 13°04.0	318°18.3 13°12.1	332°44.7 13°20.1	347°10.9 13°28.0	1°37.1 13°35.9	16°03.3 13°43.6	30°29.4 13°51.3	44°55.4 13°58.9	59°21.4 14°06.4	+26.2 16.3 +7.959.7
	We 12	275°45.0 15°47.8	290°10.2 15°53.8	304°35.4 15°59.7	319°00.5 16°05.4	333°25.3 16°11.1	347°50.5 16°16.6	2°15.5 16°22.0	16°40.4 16°27.3	31°05.3 16°32.6	45°30.2 16°37.7	59°55.0 16°42.6	+25.0 16.3 +5.559.9
O	Th 13	276°03.2 17°43.5	290°27.5 17°46.6	304°51.8 17°49.6	319°16.1 17°52.5	333°40.4 17°55.2	348°04.6 17°57.8	0°28.9 18°00.3	16°53.1 18°02.6	31°17.3 18°04.9	45°41.5 18°07.0	60°05.7 18°09.0	+24.3 16.3 +2.559.9
	Fr 14	276°08.5 22°23.5	290°32.8 18°23.4	304°57.2 18°23.3	319°21.3 18°23.0	333°45.6 18°22.5	348°09.9 18°22.0	2°34.2 18°21.3	16°58.5 18°20.5	31°22.9 18°19.5	45°47.3 18°18.5	60°34.3 18°17.3	+24.3 16.3 -0.659.7
	Sa 15	276°22.0 17°44.9	290°47.0 17°41.8	305°12.0 17°38.6	319°37.1 17°35.2	334°02.3 17°31.8	348°27.5 17°28.2	2°52.7 17°24.5	17°18.0 17°20.7	31°43.4 17°16.8	46°08.8 17°12.8	60°34.3 17°08.7	+25.2 16.2 -3.659.3
	Su 16	277°03.5 15°54.3	291°30.0 15°48.4	305°56.3 15°42.7	320°23.6 15°36.8	334°40.8 15°30.8	349°16.6 15°24.7	3°43.4 15°18.5	18°10.3 15°12.2	32°37.2 15°05.8	47°04.3 14°59.3	61°31.4 14°52.8	+26.8 16.0 -6.258.6
O	Mo 17	278°26.6 13°05.3	292°54.9 12°57.6	307°23.2 12°49.8	321°51.6 12°41.9	336°20.1 12°34.0	350°48.7 12°26.0	5°17.3 12°18.0	19°46.1 12°09.9	34°14.8 12°01.7	48°43.7 11°53.5	63°12.6 11°45.2	+28.6 15.8 -8.057.9
	Tu 18	280°35.3 9°35.0	295°05.4 9°26.0	309°35.5 9°16.9	324°05.7 9°07.8	338°36.0 8°58.6	353°06.3 8°49.5	7°36.7 8°40.3	22°07.2 8°31.0	36°37.7 8°21.7	51°08.3 8°12.4	65°39.0 8°03.1	+30.4 15.6 -9.257.1
	We 19	283°26.1 5°40.1	297°57.7 5°30.5	312°29.3 5°20.7	327°01.0 5°11.0	341°32.8 5°01.2	356°04.6 4°51.5	10°36.5 4°41.8	25°08.4 4°32.0	39°40.3 4°22.2	54°12.3 4°12.4	68°44.4 4°02.6	+31.8 15.3 -9.756.3
	Th 20	286°50.5 1°35.3	301°23.2 1°25.5	315°55.9 1°15.6	330°28.7 1°05.8	345°01.6 0°56.0	359°34.4 0°46.2	14°07.3 0°36.4	28°40.2 0°26.6	43°13.2 0°16.9	57°46.2 0°07.1	72°19.2 -0°02.7	+32.9 15.1 -9.855.5
O	Fr 21	290°37.5 -2°27.5	305°10.9 -2°37.0	319°44.3 -2°46.6	334°17.8 -2°56.0	348°51.2 -3°05.5	3°24.7 -3°15.0	17°58.1 -3°24.4	32°31.6 -3°33.8	47°05.1 -3°43.2	61°38.6 -3°52.5	76°12.2 -4°01.9	+33.5 15.0 -9.454.9
	Sa 22	294°35.9 -6°18.7	309°09.5 -6°07.6	323°43.1 -6°36.4	338°16.7 -6°45.2	352°50.3 -6°54.0	7°23.9 -7°02.8	21°57.5 -7°11.5	36°31.1 -7°20.2	51°04.7 -7°28.8	65°38.3 -7°37.4	80°11.9 -7°46.0	+33.6 14.9 -8.754.5
	Su 23	298°34.6 -9°50.0	313°08.0 -9°58.0	327°41.4 -10°05.9	342°14.8 -10°13.7	356°48.2 -10°21.3	11°21.5 -10°29.3	25°54.9 -10°37.0	40°28.2 -10°44.6	55°01.5 -10°52.3	69°34.8 -10°59.8	84°08.0 -11°07.4	+33.3 14.8 -7.754.2
	Mo 24	302°24.2 -12°54.2	316°57.1 -13°00.9	331°29.9 -13°07.5	346°02.7 -13°14.1	0°35.5 -13°20.6	15°08.3 -13°27.1	29°41.0 -13°33.5	44°13.7 -13°39.9	58°46.4 -13°46.2	73°19.1 -13°52.4	87°51.7 -13°58.6	+32.8 14.4 -6.454.2
O	Tu 25	305°57.1 -15°23.8	320°29.2 -15°29.0	335°01.3 -15°34.1	349°33.3 -15°39.1	4°05.3 -15°44.1	18°37.3 -15°49.0	33°09.2 -15°53.8	47°41.1 -15°58.6	62°12.9 -16°03.3	76°44.8 -16°07.9	91°16.5 -16°12.4	+31.9 14.8 -4.954.3
	We 26	309°08.9 -17°11.7	323°40.1 -17°15.1	338°11.3 -17°18.3	352°42.4 -17°21.5	7°13.5 -17°24.6	21°44.6 -17°27.7	36°15.6 -17°30.6	50°46.6 -17°33.5	65°17.6 -17°36.3	79°48.5 -17°39.0	94°19.4 -17°41.6	+31.0 14.9 -3.054.5
	Th 27	311°58.6 -18°10.9	326°28.9 -18°12.1	340°59.2 -18°13.3	355°29.5 -18°14.4	9°59.8 -18°15.8	24°30.0 -18°16.3	39°00.2 -18°17.1	53°30.2 -18°17.8	68°00.5 -18°18.5	82°30.2 -18°19.0	97°00.7 -18°19.5	+30.2 15.0 -0.954.9
	Fr 28	314°28.9 -18°15.4	328°58.6 -18°14.4	343°28.3 -18°13.3	357°57.9 -18°12.1	12°27.6 -18°10.8	26°57.2 -18°09.4	41°26.8 -18°08.0	55°56.3 -18°06.4	70°25.9 -18°04.7	84°55.4 -18°02.9	99°24.9 -18°01.1	+29.6 15.1 +1.455.5
O	Sa 29	316°46.0 -17°21.9	331°15.3 -17°18.5	345°44.6 -17°15.1	0°13.9 -17°11.5	14°43.2 -17°07.9	29°12.5 -17°04.2	43°41.7 -17°00.3	58°11.0 -16°56.4	72°40.3 -16°52.4	87°09.5 -16°48.3	101°38.8 -16°44.1	+29.3 15.3 +3.856.0
	Su 30	318°57.2 -15°30.2	333°26.4 -15°24.6	347°55.6 -15°17.8	2°24.9 -15°13.3	16°54.1 -15°07.1	31°23.3 -15°01.2	45°52.6 -14°55.1	60°21.8 -14°42.7	74°51.1 -14°36.4	89°20.3 -14°30.4	103°49.6 -14°23.0	+29.2 15.4 +6.056.6
	Mo 31	321°09.0 -12°44.3	335°38.4 -12°36.6	350°07.8 -12°28.9	4°37.1 -12°21.1	19°06.5 -12°13.2	33°35.9 -12°05.3	48°05.3 -11°57.2	62°34.6 -11°49.2	77°04.1 -11°41.0	91°33.5 -11°32.8	106°02.9 -11°24.5	+29.4 15.6 +8.057.2

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (— = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FM: 1 17h44 — LQ: 9 01h59 — NM: 15 18h15 — FQ: 23 07h05 — FM: 31 05h54

SUN

August 2034

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Tu 1	268°24.1 17°58.6	283°24.2 17°58.0	298°24.2 17°57.4	313°24.3 17°56.8	328°24.3 17°56.1	343°24.3 17°55.5	358°24.4 17°54.9	13°24.4 17°54.2	28°24.5 17°53.6	43°24.5 17°53.0	58°24.6 17°52.3	73°24.6 17°51.7	+0.0 -0.6
We 2	268°25.2 17°43.4	283°25.2 17°42.7	298°25.3 17°42.1	313°25.3 17°41.4	328°25.4 17°40.8	343°25.4 17°40.2	358°25.5 17°39.5	13°25.5 17°38.9	28°25.6 17°38.2	43°25.6 17°37.6	58°25.7 17°36.9	73°25.7 17°36.3	+0.0 -0.6
Th 3	268°26.4 17°27.8	283°26.4 17°27.2	298°26.5 17°26.5	313°26.5 17°25.9	328°26.6 17°25.2	343°26.6 17°24.5	358°26.7 17°23.9	13°26.7 17°23.2	28°26.8 17°22.6	43°26.8 17°21.9	58°26.9 17°21.3	73°26.9 17°20.6	+0.1 -0.7
Fr 4	268°27.7 17°12.0	283°27.7 17°11.3	298°27.8 17°10.6	313°27.9 17°10.0	328°27.9 17°09.3	343°28.0 17°08.6	358°28.0 17°08.0	13°28.1 17°07.3	28°28.2 17°06.6	43°28.2 17°06.0	58°28.3 17°05.3	73°28.3 17°04.6	+0.1 -0.7
Sa 5	268°29.2 16°55.8	283°29.2 16°55.2	298°29.3 16°54.5	313°29.4 16°53.8	328°29.4 16°53.1	343°29.5 16°52.5	358°29.6 16°51.8	13°29.6 16°51.1	28°29.7 16°50.4	43°29.8 16°49.7	58°29.8 16°49.0	73°29.9 16°48.4	+0.1 -0.7
Su 6	268°30.8 16°39.5	283°30.9 16°38.8	298°30.9 16°38.1	313°31.0 16°37.4	328°31.1 16°36.7	343°31.1 16°36.0	358°31.2 16°35.3	13°31.3 16°34.6	28°31.4 16°33.9	43°31.4 16°33.2	58°31.5 16°32.5	73°31.6 16°31.8	+0.1 -0.7
Mo 7	268°32.5 16°22.8	283°32.6 16°22.1	298°32.7 16°21.4	313°32.8 16°20.7	328°32.9 16°20.0	343°32.9 16°19.3	358°33.0 16°18.6	13°33.1 16°17.9	28°33.2 16°17.2	43°33.2 16°16.5	58°33.3 16°15.8	73°33.4 16°15.1	+0.1 -0.7
Tu 8	268°34.5 16°05.8	283°34.5 16°05.1	298°34.6 16°04.4	313°34.7 16°03.7	328°34.8 16°03.0	343°34.9 16°02.3	358°35.0 16°01.6	13°35.0 16°00.9	28°35.1 16°00.1	43°35.2 15°59.4	58°35.3 15°58.7	73°35.4 15°58.0	+0.1 -0.7
We 9	268°36.5 15°48.7	283°36.6 15°47.9	298°36.7 15°47.2	313°36.8 15°46.5	328°36.9 15°45.8	343°36.9 15°45.0	358°37.0 15°44.3	13°37.1 15°43.6	28°37.2 15°42.9	43°37.3 15°42.1	58°37.4 15°41.4	73°37.5 15°40.7	+0.1 -0.7
Th 10	268°38.7 15°31.2	283°38.8 15°30.5	298°38.9 15°29.7	313°39.0 15°29.0	328°39.1 15°28.3	343°39.2 15°27.5	358°39.3 15°26.8	13°39.4 15°26.1	28°39.5 15°25.3	43°39.5 15°24.6	58°39.6 15°23.9	73°39.7 15°23.1	+0.1 -0.7
Fr 11	268°41.0 15°13.5	283°41.1 15°12.8	298°41.2 15°12.0	313°41.3 15°11.3	328°41.4 15°10.5	343°41.5 15°09.8	358°41.6 15°09.1	13°41.7 15°08.3	28°41.8 15°07.6	43°41.9 15°06.8	58°42.0 15°06.1	73°42.1 15°05.3	+0.1 -0.7
Sa 12	268°43.5 14°55.6	283°43.6 14°54.8	298°43.7 14°54.1	313°43.8 14°53.3	328°43.9 14°52.6	343°44.0 14°51.8	358°44.1 14°51.1	13°44.2 14°50.3	28°44.3 14°49.5	43°44.3 14°48.8	58°44.5 14°48.0	73°44.7 14°47.3	+0.1 -0.8
Su 13	268°46.1 14°37.4	283°46.2 14°36.6	298°46.3 14°35.9	313°46.4 14°35.1	328°46.5 14°34.3	343°46.6 14°33.6	358°46.8 14°32.8	13°46.9 14°32.1	28°47.0 14°31.3	43°47.0 14°30.5	58°47.2 14°29.8	73°47.3 14°29.0	+0.1 -0.8
Mo 14	268°48.8 14°19.0	283°48.9 14°18.2	298°49.1 14°17.4	313°49.2 14°16.7	328°49.3 14°15.9	343°49.4 14°15.1	358°49.5 14°14.4	13°49.6 14°13.6	28°49.8 14°12.8	43°49.8 14°12.0	58°50.0 14°11.3	73°50.1 14°10.5	+0.1 -0.8
Tu 15	268°51.7 14°00.4	283°51.8 13°59.6	298°51.9 13°58.8	313°52.1 13°58.0	328°52.2 13°57.2	343°52.3 13°56.4	358°52.4 13°55.7	13°52.6 13°54.9	28°52.7 13°54.1	43°52.8 13°53.3	58°52.9 13°52.5	73°53.1 13°51.7	+0.1 -0.8
We 16	268°54.7 13°41.5	283°54.8 13°40.7	298°55.0 13°39.9	313°55.1 13°39.1	328°55.2 13°38.3	343°55.3 13°37.5	358°55.5 13°36.7	13°55.6 13°36.0	28°55.7 13°35.2	43°55.9 13°34.4	58°56.0 13°33.6	73°56.1 13°32.8	+0.1 -0.8
Th 17	268°57.8 13°22.4	283°58.0 13°21.6	298°58.1 13°20.8	313°58.2 13°20.0	328°58.4 13°19.2	343°58.5 13°18.4	358°58.6 13°17.6	13°58.8 13°16.8	28°59.0 13°16.0	43°59.1 13°15.2	58°59.2 13°14.4	73°59.3 13°13.6	+0.1 -0.8
Fr 18	269°01.1 13°03.1	284°01.3 13°02.3	299°01.4 13°01.5	314°01.5 13°00.7	329°01.6 12°59.9	344°01.8 12°59.1	359°02.0 12°58.3	14°02.1 12°57.5	29°02.2 12°56.7	44°02.4 12°55.9	59°02.5 12°55.0	74°02.7 12°54.2	+0.1 -0.8
Sa 19	269°04.5 12°43.6	284°04.7 12°42.8	299°04.8 12°42.0	314°04.9 12°41.2	329°05.1 12°40.4	344°05.2 12°39.6	359°05.4 12°38.7	14°05.5 12°37.9	29°05.7 12°37.1	44°05.8 12°36.3	59°06.0 12°35.5	74°06.1 12°34.6	+0.1 -0.8
Su 20	269°08.0 12°23.9	284°08.2 12°23.1	299°08.3 12°22.3	314°08.5 12°21.5	329°08.6 12°20.6	344°08.8 12°19.8	359°08.9 12°19.0	14°08.9 12°18.2	29°09.1 12°17.3	44°09.2 12°16.5	59°09.5 12°15.7	74°09.7 12°14.9	+0.2 -0.8
Mo 21	269°11.7 12°04.1	284°11.8 12°03.2	299°12.0 12°02.4	314°12.2 12°01.6	329°12.3 12°00.7	344°12.5 11°59.9	359°12.6 11°59.1	14°12.8 11°58.2	29°12.9 11°57.4	44°13.1 11°56.6	59°13.2 11°55.7	74°13.4 11°54.9	+0.2 -0.8
Tu 22	269°15.5 11°44.0	284°15.6 11°43.1	299°15.8 11°42.3	314°15.9 11°41.5	329°16.1 11°40.1	344°16.3 11°39.8	359°16.4 11°38.9	14°16.6 11°38.1	29°16.8 11°37.3	44°16.9 11°36.4	59°17.1 11°35.6	74°17.2 11°34.7	+0.2 -0.8
We 23	269°19.3 11°23.7	284°19.5 11°22.9	299°19.7 11°22.0	314°19.8 11°21.2	329°20.0 11°20.3	344°20.2 11°19.5	359°20.3 11°18.6	14°20.5 11°17.8	29°20.7 11°16.9	44°20.9 11°16.1	59°21.0 11°15.2	74°21.2 11°14.4	+0.2 -0.8
Th 24	269°23.3 11°03.3	284°23.5 11°02.4	299°23.7 11°01.6	314°23.8 11°00.7	329°24.0 11°00.0	344°24.2 10°59.0	359°24.4 10°58.1	14°24.5 10°57.3	29°24.7 10°56.4	44°24.9 10°55.6	59°25.0 10°54.7	74°25.2 10°53.9	+0.2 -0.9
Fr 25	269°27.4 10°42.7	284°27.6 10°41.8	299°27.8 10°40.9	314°28.0 10°40.1	329°28.1 10°39.2	344°28.3 10°38.4	359°28.5 10°37.5	14°28.7 10°36.6	29°28.8 10°35.8	44°29.0 10°34.9	59°29.2 10°34.0	74°29.4 10°33.2	+0.2 -0.9
Sa 26	269°31.7 10°21.9	284°31.8 10°21.0	299°32.0 10°20.1	314°32.2 10°19.3	329°32.4 10°18.4	344°32.5 10°17.5	359°32.7 10°16.7	14°32.9 10°15.8	29°33.1 10°14.9	44°33.3 10°14.1	59°33.4 10°13.2	74°33.6 10°12.3	+0.2 -0.9
Su 27	269°36.0 10°00.9	284°36.2 10°00.1	299°36.3 9°59.2	314°36.5 9°58.3	329°36.7 9°57.4	344°36.9 9°56.6	359°37.1 9°55.7	14°37.2 9°54.8	29°37.4 9°53.9	44°37.6 9°53.0	59°37.8 9°52.2	74°38.0 9°51.3	+0.2 -0.9
Mo 28	269°40.4 9°39.8	284°40.6 9°39.0	299°40.8 9°38.1	314°40.9 9°37.2	329°41.1 9°36.3	344°41.3 9°35.4	359°41.5 9°34.5	14°41.7 9°33.7	29°41.9 9°32.8	44°42.1 9°31.9	59°42.2 9°31.0	74°42.4 9°30.1	+0.2 -0.9
Tu 29	269°44.9 9°18.6	284°45.1 9°17.7	299°45.3 9°16.8	314°45.5 9°15.9	329°45.6 9°15.0	344°45.8 9°14.1	359°46.0 9°13.2	14°46.2 9°12.4	29°46.4 9°11.5	44°46.6 9°10.6	59°46.8 9°09.7	74°47.0 9°08.8	+0.2 -0.9
We 30	269°49.5 8°57.2	284°49.7 8°56.3	299°49.9 8°55.4	314°50.1 8°54.5	329°50.2 8°53.6	344°50.4 8°52.7	359°50.6 8°51.8	14°50.8 8°50.9	29°51.0 8°50.1	44°51.2 8°49.1	59°51.4 8°48.2	74°51.6 8°47.3	+0.2 -0.9
Th 31	269°54.1 8°35.6	284°54.3 8°34.7	299°54.5 8°33.8	314°54.7 8°32.9	329°54.9 8°32.0	344°55.1 8°31.1	359°55.3 8°30.2	14°55.5 8°29.3	29°55.7 8°28.4	44°55.9 8°27.5	59°56.1 8°26.6	74°56.3 8°25.7	+0.2 -0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.8'

MOON

August 2034

	D	16h	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	Δ'/h SH
O	Tu 1	236 ⁰ 28.0 -10 ⁰ 06.8	250 ⁰ 57.5 -9 ⁰ 57.9	265 ⁰ 27.9 -9 ⁰ 48.9	279 ⁰ 56.5 -9 ⁰ 39.8	294 ⁰ 26.1 -9 ⁰ 30.7	308 ⁰ 55.6 -9 ⁰ 21.5	323 ⁰ 25.1 -9 ⁰ 12.3	337 ⁰ 54.7 -8 ⁰ 53.0	352 ⁰ 24.2 -8 ⁰ 54.7	6 ⁰ 53.8 -8 ⁰ 44.3	21 ⁰ 23.3 -8 ⁰ 34.8	+29.5 15.7 +9.2 57.6
	We 2	238 ⁰ 47.3 -6 ⁰ 07.3	253 ⁰ 17.0 -5 ⁰ 57.2	267 ⁰ 46.6 -5 ⁰ 46.9	282 ⁰ 16.2 -5 ⁰ 36.7	296 ⁰ 45.9 -5 ⁰ 26.4	311 ⁰ 15.5 -5 ⁰ 16.1	325 ⁰ 45.1 -5 ⁰ 05.7	340 ⁰ 14.8 -4 ⁰ 55.3	354 ⁰ 44.4 -4 ⁰ 44.9	9 ⁰ 14.0 -4 ⁰ 34.5	23 ⁰ 43.6 -4 ⁰ 24.0	+29.6 15.8 +10.3 58.1
	Th 3	241 ⁰ 07.7 -1 ⁰ 43.8	255 ⁰ 37.2 -1 ⁰ 32.9	270 ⁰ 06.8 -1 ⁰ 22.1	284 ⁰ 36.3 -1 ⁰ 11.2	299 ⁰ 05.8 -1 ⁰ 00.4	313 ⁰ 35.3 -0 ⁰ 49.5	328 ⁰ 04.8 -0 ⁰ 38.6	342 ⁰ 34.3 -0 ⁰ 27.7	357 ⁰ 03.8 -0 ⁰ 16.8	11 ⁰ 33.3 -0 ⁰ 05.9	26 ⁰ 02.7 0 ⁰ 05.0	+29.5 16.0 +10.9 58.5
O	Fr 4	243 ⁰ 22.6 2 ⁰ 48.5	257 ⁰ 51.8 2 ⁰ 59.4	272 ⁰ 20.9 3 ⁰ 10.2	286 ⁰ 50.0 3 ⁰ 21.0	301 ⁰ 19.1 3 ⁰ 31.8	315 ⁰ 48.2 3 ⁰ 42.6	330 ⁰ 17.3 3 ⁰ 53.4	344 ⁰ 46.3 4 ⁰ 04.1	359 ⁰ 15.3 4 ⁰ 14.8	13 ⁰ 44.3 4 ⁰ 25.6	28 ⁰ 13.3 4 ⁰ 36.2	+29.1 16.0 +10.8 58.8
	Sa 5	245 ⁰ 24.1 7 ⁰ 15.1	259 ⁰ 52.6 7 ⁰ 23.3	274 ⁰ 21.0 7 ⁰ 33.4	288 ⁰ 49.4 7 ⁰ 43.5	303 ⁰ 17.8 7 ⁰ 53.6	317 ⁰ 46.1 8 ⁰ 03.6	332 ⁰ 14.4 8 ⁰ 13.6	346 ⁰ 42.7 8 ⁰ 23.5	1 ⁰ 10.9 8 ⁰ 33.4	15 ⁰ 39.1 8 ⁰ 43.2	30 ⁰ 07.3 8 ⁰ 53.0	+28.3 16.1 +10.0 59.1
	Su 6	247 ⁰ 04.8 11 ⁰ 13.0	261 ⁰ 32.3 11 ⁰ 21.9	275 ⁰ 59.8 11 ⁰ 30.6	290 ⁰ 27.2 11 ⁰ 39.3	304 ⁰ 54.6 11 ⁰ 48.0	319 ⁰ 22.0 11 ⁰ 56.5	333 ⁰ 49.3 12 ⁰ 05.0	348 ⁰ 16.6 12 ⁰ 13.5	2 ⁰ 43.8 12 ⁰ 21.8	17 ⁰ 11.0 12 ⁰ 30.1	31 ⁰ 38.1 12 ⁰ 38.3	+27.3 16.1 +8.5 59.2
O	Mo 7	248 ⁰ 20.2 14 ⁰ 31.6	262 ⁰ 46.7 14 ⁰ 38.4	277 ⁰ 13.1 14 ⁰ 45.2	291 ⁰ 39.5 14 ⁰ 51.9	306 ⁰ 05.8 14 ⁰ 58.5	320 ⁰ 32.2 15 ⁰ 04.9	334 ⁰ 58.5 15 ⁰ 11.3	349 ⁰ 24.7 15 ⁰ 17.6	3 ⁰ 50.9 15 ⁰ 23.8	18 ⁰ 17.1 15 ⁰ 29.9	32 ⁰ 43.2 15 ⁰ 35.9	+26.3 16.2 +6.4 59.3
	Tu 8	262 ⁰ 46.7 14 ⁰ 38.4	277 ⁰ 13.1 14 ⁰ 45.2	291 ⁰ 39.5 14 ⁰ 51.9	306 ⁰ 05.8 14 ⁰ 58.5	320 ⁰ 32.2 15 ⁰ 04.9	334 ⁰ 58.5 15 ⁰ 11.3	349 ⁰ 24.7 15 ⁰ 17.6	3 ⁰ 50.9 15 ⁰ 23.8	18 ⁰ 17.1 15 ⁰ 29.9	32 ⁰ 43.2 15 ⁰ 35.9	47 ⁰ 09.3 15 ⁰ 41.8	+26.3 16.2 +6.3 59.3
	We 9	263 ⁰ 36.8 16 ⁰ 58.0	278 ⁰ 02.2 17 ⁰ 02.2	292 ⁰ 27.3 17 ⁰ 06.3	306 ⁰ 53.5 17 ⁰ 10.3	321 ⁰ 51.7 17 ⁰ 14.2	335 ⁰ 44.5 17 ⁰ 17.9	350 ⁰ 09.9 17 ⁰ 21.6	4 ⁰ 35.4 17 ⁰ 25.1	19 ⁰ 00.8 17 ⁰ 28.6	33 ⁰ 26.2 17 ⁰ 31.9	47 ⁰ 51.6 17 ⁰ 35.1	+25.5 16.2 +3.7 59.2
O	Th 10	264 ⁰ 10.8 18 ⁰ 09.0	278 ⁰ 36.1 18 ⁰ 10.4	293 ⁰ 01.3 18 ⁰ 11.6	307 ⁰ 26.5 18 ⁰ 12.6	321 ⁰ 51.7 18 ⁰ 13.6	336 ⁰ 16.9 18 ⁰ 14.4	350 ⁰ 42.1 18 ⁰ 15.1	5 ⁰ 07.4 18 ⁰ 15.2	19 ⁰ 32.6 18 ⁰ 16.2	33 ⁰ 57.8 18 ⁰ 16.6	48 ⁰ 23.0 18 ⁰ 16.8	+25.2 16.1 +0.8 59.1
	Fr 11	264 ⁰ 43.1 18 ⁰ 06.0	279 ⁰ 08.6 18 ⁰ 04.4	293 ⁰ 34.2 18 ⁰ 02.6	307 ⁰ 59.7 18 ⁰ 00.7	322 ⁰ 25.3 17 ⁰ 58.7	336 ⁰ 50.9 17 ⁰ 56.6	351 ⁰ 16.5 17 ⁰ 54.3	5 ⁰ 42.7 17 ⁰ 52.0	20 ⁰ 07.8 17 ⁰ 49.5	34 ⁰ 33.6 17 ⁰ 46.9	48 ⁰ 59.3 17 ⁰ 44.2	+25.6 16.0 -2.2 58.8
	Sa 12	265 ⁰ 30.3 16 ⁰ 50.7	279 ⁰ 56.4 16 ⁰ 46.3	294 ⁰ 23.1 16 ⁰ 41.7	308 ⁰ 49.6 16 ⁰ 37.1	323 ⁰ 16.2 16 ⁰ 32.4	337 ⁰ 42.8 16 ⁰ 27.6	352 ⁰ 09.4 16 ⁰ 22.7	6 ⁰ 36.1 16 ⁰ 17.7	21 ⁰ 02.9 16 ⁰ 12.6	35 ⁰ 29.7 16 ⁰ 07.3	49 ⁰ 56.6 16 ⁰ 02.0	+26.6 15.9 -4.9 58.4
O	Su 13	266 ⁰ 46.2 14 ⁰ 31.7	281 ⁰ 14.0 14 ⁰ 25.0	295 ⁰ 41.8 14 ⁰ 18.2	310 ⁰ 09.7 14 ⁰ 11.4	324 ⁰ 37.6 14 ⁰ 04.4	339 ⁰ 05.6 13 ⁰ 57.4	353 ⁰ 33.7 13 ⁰ 50.4	8 ⁰ 01.9 13 ⁰ 43.2	22 ⁰ 30.1 13 ⁰ 36.0	36 ⁰ 58.3 13 ⁰ 28.7	51 ⁰ 26.6 13 ⁰ 21.3	+28.0 15.8 -7.0 57.9
	Mo 14	268 ⁰ 38.9 11 ⁰ 22.8	283 ⁰ 08.0 11 ⁰ 14.5	297 ⁰ 37.3 11 ⁰ 06.0	312 ⁰ 07.0 10 ⁰ 57.0	326 ⁰ 36.5 10 ⁰ 49.0	341 ⁰ 06.0 10 ⁰ 40.5	355 ⁰ 35.6 10 ⁰ 31.8	10 ⁰ 05.3 10 ⁰ 23.2	24 ⁰ 35.0 10 ⁰ 14.4	39 ⁰ 04.8 10 ⁰ 05.7	53 ⁰ 34.7 9 ⁰ 56.9	+29.6 15.6 -8.6 57.3
	Tu 15	271 ⁰ 09.4 7 ⁰ 39.9	285 ⁰ 40.0 7 ⁰ 30.5	300 ⁰ 11.0 7 ⁰ 21.1	314 ⁰ 41.9 7 ⁰ 11.6	329 ⁰ 12.8 7 ⁰ 02.1	343 ⁰ 43.8 6 ⁰ 52.6	358 ⁰ 14.8 6 ⁰ 43.1	12 ⁰ 45.9 6 ⁰ 33.5	27 ⁰ 17.0 6 ⁰ 24.0	41 ⁰ 48.2 6 ⁰ 14.4	56 ⁰ 19.4 6 ⁰ 04.7	+31.0 15.4 -9.5 56.7
O	We 16	274 ⁰ 13.6 3 ⁰ 38.5	288 ⁰ 45.5 3 ⁰ 28.6	303 ⁰ 17.5 3 ⁰ 18.8	317 ⁰ 49.6 3 ⁰ 08.9	332 ⁰ 21.7 2 ⁰ 59.1	346 ⁰ 53.8 2 ⁰ 49.2	1 ⁰ 25.9 2 ⁰ 39.4	15 ⁰ 58.1 2 ⁰ 29.5	30 ⁰ 30.4 2 ⁰ 19.6	45 ⁰ 02.4 2 ⁰ 09.8	59 ⁰ 34.9 1 ⁰ 59.9	+32.1 15.3 -9.9 56.0
	Th 17	277 ⁰ 43.5 -0 ⁰ 27.6	292 ⁰ 16.3 -0 ⁰ 37.4	306 ⁰ 49.1 -0 ⁰ 47.2	321 ⁰ 22.0 -0 ⁰ 56.9	335 ⁰ 54.9 -1 ⁰ 06.6	350 ⁰ 27.8 -1 ⁰ 16.4	5 ⁰ 00.7 -1 ⁰ 26.1	19 ⁰ 33.6 -1 ⁰ 35.7	34 ⁰ 06.6 -1 ⁰ 45.4	46 ⁰ 38.9 -1 ⁰ 55.1	63 ⁰ 12.6 -2 ⁰ 04.7	+32.9 15.1 -9.7 55.4
	Fr 18	281 ⁰ 29.9 -4 ⁰ 26.8	296 ⁰ 03.1 -4 ⁰ 36.1	310 ⁰ 36.4 -4 ⁰ 45.3	325 ⁰ 09.7 -4 ⁰ 54.6	339 ⁰ 43.0 -5 ⁰ 03.7	354 ⁰ 16.3 -5 ⁰ 12.9	8 ⁰ 49.6 -5 ⁰ 22.1	23 ⁰ 22.9 -5 ⁰ 31.2	37 ⁰ 56.2 -5 ⁰ 40.0	52 ⁰ 29.5 -5 ⁰ 49.3	67 ⁰ 02.9 -5 ⁰ 58.3	+33.3 15.0 -9.2 54.9
O	Sa 19	285 ⁰ 23.1 -8 ⁰ 09.4	299 ⁰ 56.4 -8 ⁰ 17.8	314 ⁰ 29.8 -8 ⁰ 26.2	329 ⁰ 03.1 -8 ⁰ 34.6	343 ⁰ 36.4 -8 ⁰ 42.9	358 ⁰ 09.7 -8 ⁰ 51.2	12 ⁰ 43.0 -8 ⁰ 59.4	27 ⁰ 16.3 -9 ⁰ 07.6	41 ⁰ 49.6 -9 ⁰ 15.8	56 ⁰ 22.9 -9 ⁰ 23.9	70 ⁰ 56.2 -9 ⁰ 31.9	+33.3 14.9 -8.3 54.5
	Su 20	289 ⁰ 14.1 -11 ⁰ 27.3	303 ⁰ 47.1 -11 ⁰ 34.6	318 ⁰ 20.2 -11 ⁰ 41.8	332 ⁰ 53.2 -11 ⁰ 49.0	347 ⁰ 26.3 -11 ⁰ 56.2	1 ⁰ 59.3 -12 ⁰ 03.3	16 ⁰ 32.3 -12 ⁰ 10.3	31 ⁰ 05.2 -12 ⁰ 17.3	45 ⁰ 38.2 -12 ⁰ 24.2	60 ⁰ 11.1 -12 ⁰ 31.1	74 ⁰ 44.0 -12 ⁰ 37.9	+33.0 14.8 -7.1 54.2
	Mo 21	292 ⁰ 55.0 -14 ⁰ 13.2	307 ⁰ 27.5 -14 ⁰ 19.1	322 ⁰ 00.0 -14 ⁰ 24.9	336 ⁰ 32.5 -14 ⁰ 30.7	351 ⁰ 05.0 -14 ⁰ 36.4	5 ⁰ 37.4 -14 ⁰ 42.0	20 ⁰ 09.8 -14 ⁰ 47.5	34 ⁰ 42.2 -14 ⁰ 53.0	49 ⁰ 14.5 -14 ⁰ 58.5	63 ⁰ 46.9 -15 ⁰ 03.8	78 ⁰ 19.1 -15 ⁰ 09.1	+32.4 14.8 -5.6 54.2
O	Tu 22	296 ⁰ 19.9 -16 ⁰ 20.4	310 ⁰ 51.8 -16 ⁰ 24.6	325 ⁰ 23.5 -16 ⁰ 28.7	339 ⁰ 55.3 -16 ⁰ 32.8	354 ⁰ 27.0 -16 ⁰ 36.0	8 ⁰ 58.7 -16 ⁰ 40.6	23 ⁰ 30.3 -16 ⁰ 44.5	38 ⁰ 01.9 -16 ⁰ 48.2	52 ⁰ 33.5 -16 ⁰ 51.9	67 ⁰ 05.1 -16 ⁰ 55.9	81 ⁰ 36.6 -16 ⁰ 59.0	+31.7 14.8 -3.9 54.3
	We 23	299 ⁰ 25.5 -17 ⁰ 42.4	313 ⁰ 56.5 -17 ⁰ 44.7	328 ⁰ 27.5 -17 ⁰ 46.8	342 ⁰ 58.4 -17 ⁰ 48.9	357 ⁰ 29.3 -17 ⁰ 52.8	12 ⁰ 00.2 -17 ⁰ 54.7	26 ⁰ 31.0 -17 ⁰ 56.4	41 ⁰ 01.8 -17 ⁰ 58.1	55 ⁰ 32.6 -17 ⁰ 58.1	70 ⁰ 03.4 -17 ⁰ 59.7	84 ⁰ 34.1 -18 ⁰ 01.2	+30.9 14.9 -1.9 54.6
	Th 24	302 ⁰ 11.2 -18 ⁰ 13.3	316 ⁰ 41.4 -18 ⁰ 13.4	331 ⁰ 11.7 -18 ⁰ 13.4	345 ⁰ 41.8 -18 ⁰ 13.3	0 ⁰ 12.0 -18 ⁰ 12.9	14 ⁰ 42.1 -18 ⁰ 12.5	29 ⁰ 12.2 -18 ⁰ 12.5	43 ⁰ 42.3 -18 ⁰ 12.1	58 ⁰ 12.4 -18 ⁰ 11.6	72 ⁰ 42.4 -18 ⁰ 11.0	87 ⁰ 12.4 -18 ⁰ 10.2	+30.1 15.0 +0.3 55.1
O	Fr 25	304 ⁰ 39.5 -17 ⁰ 48.5	319 ⁰ 09.1 -17 ⁰ 46.3	333 ⁰ 38.8 -17 ⁰ 44.0	348 ⁰ 08.3 -17 ⁰ 41.6	2 ⁰ 37.9 -17 ⁰ 36.6	17 ⁰ 07.5 -17 ⁰ 33.9	31 ⁰ 37.0 -17 ⁰ 31.1	46 ⁰ 06.5 -17 ⁰ 28.3	60 ⁰ 36.0 -17 ⁰ 28.3	75 ⁰ 05.5 -17 ⁰ 25.4	89 ⁰ 35.0 -17 ⁰ 22.3	+29.5 15.2 +2.6 55.8
	Sa 26	306 ⁰ 55.1 -16 ⁰ 25.6	321 ⁰ 24.3 -16 ⁰ 21.1	335 ⁰ 53.6 -16 ⁰ 16.5	350 ⁰ 22.8 -16 ⁰ 11.8	4 ⁰ 52.0 -16 ⁰ 07.1	19 ⁰ 21.2 -15 ⁰ 02.1	33 ⁰ 50.4 -15 ⁰ 57.1	48 ⁰ 19.5 -15 ⁰ 52.0	62 ⁰ 48.7 -15 ⁰ 46.9	77 ⁰ 17.9 -15 ⁰ 41.6	91 ⁰ 47.0 -15 ⁰ 36.3	+29.2 15.4 +4.9 56.5
	Su 27	309 ⁰ 03.4 -14 ⁰ 05.6	323 ⁰ 32.4 -13 ⁰ 58.9	338 ⁰ 01.5 -13 ⁰ 52.0	352 ⁰ 30.5 -13 ⁰ 45.2	6 ⁰ 59.5 -13 ⁰ 31.1	21 ⁰ 28.6 -13 ⁰ 16.7	35 ⁰ 57.6 -13 ⁰ 04.0	50 ⁰ 26.6 -13 ⁰ 16.7	64 ⁰ 55.6 -13 ⁰ 09.4	79 ⁰ 24.6 -13 ⁰ 02.0	93 ⁰ 53.7 -12 ⁰ 54.6	+29.0 15.6 +7.1 57.2
O	Mo 28	311 ⁰ 08.6 -10 ⁰ 53.4	325 ⁰ 37.6 -10 ⁰ 44.8	340 ⁰ 06.6 -10 ⁰ 35.6	354 ⁰ 35.6 -10 ⁰ 27.3	9 ⁰ 04.5 -10 ⁰ 18.5	23 ⁰ 33.5 -10 ⁰ 09.5	38 ⁰ 02.5 -10 ⁰ 00.5	52 ⁰ 31.5 -9 ⁰ 51.5	67 ⁰ 00.4 -9 ⁰ 42.4	81 ⁰ 29.4 -9 ⁰ 33.2	95 ⁰ 58.4 -9 ⁰ 24.0	+29.0 15.8 +9.0 57.9
	Tu 29	313 ⁰ 12.7 -6 ⁰ 58.5	327 ⁰ 41.6 -6 ⁰ 48.4	342 ⁰ 10.6 -6 ⁰ 38.3	356 ⁰ 39.5 -6 ⁰ 28.1	11 ⁰ 08.4 -6 ⁰ 17.8	25 ⁰ 37.3 -6 ⁰ 07.5	40 ⁰ 06.2 -5 ⁰ 57.2	54 ⁰ 35.1 -5 ⁰ 46.8	69 ⁰ 04.1 -5 ⁰ 36.4	83 ⁰ 32.1 -5 ⁰ 25.9	98 ⁰ 01.8 -5 ⁰ 15.5	+28.9 16.0

SUN

September 2024

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ' /h
Fr 1	269°58.9 8°13.9	284°59.1 8°13.0	1299°59.3 8°12.1	314°59.5 8°11.2	320°59.7 8°10.3	344°59.9 8°09.4	0°00.1 8°08.5	15°00.3 8°07.6	30°00.5 8°06.7	45°00.7 8°05.8	60°00.9 8°04.9	75°01.1 8°04.0	+0.2 -0.9
Sa 2	270°03.7 7°52.1	285°03.9 7°51.2	930°04.1 7°50.3	315°04.3 7°49.4	330°04.5 7°48.5	345°04.7 7°47.6	0°04.9 7°46.7	15°05.1 7°45.7	30°05.3 7°44.8	45°05.5 7°43.9	60°05.7 7°43.0	75°05.9 7°42.1	+0.2 -0.9
Su 3	270°08.6 7°30.2	285°08.8 7°29.3	830°09.0 7°28.0	315°09.2 7°27.4	330°09.4 7°26.5	345°09.6 7°25.6	0°09.8 7°24.7	15°10.0 7°23.8	30°10.2 7°22.8	45°10.4 7°21.9	60°10.6 7°21.0	75°10.9 7°20.1	+0.2 -0.9
Mo 4	270°13.5 7°08.1	285°13.7 7°07.2	330°14.0 7°06.3	315°14.2 7°05.3	330°14.4 7°04.4	345°14.6 7°03.5	0°14.8 7°02.6	15°15.0 7°01.6	30°15.2 7°00.7	45°15.4 6°59.8	60°15.6 6°58.9	75°15.8 6°58.0	+0.2 -0.9
Tu 5	270°18.5 6°45.9	285°18.8 6°45.0	330°19.0 6°44.1	315°19.2 6°43.1	330°19.4 6°42.2	345°19.6 6°41.3	0°19.8 6°40.4	15°20.0 6°39.4	30°20.2 6°38.5	45°20.4 6°37.6	60°20.6 6°36.6	75°20.9 6°35.7	+0.2 -0.9
We 6	270°23.6 6°23.6	285°23.8 6°22.7	330°24.0 6°21.8	315°24.2 6°20.8	330°24.4 6°19.9	345°24.7 6°19.0	0°24.9 6°18.0	15°25.1 6°17.1	30°25.3 6°16.2	45°25.5 6°15.2	60°25.7 6°14.3	75°25.9 6°13.4	+0.2 -0.9
Th 7	270°28.7 6°01.2	285°28.9 6°00.3	930°29.1 5°59.3	315°29.3 5°58.4	330°29.6 5°57.5	345°29.8 5°56.5	0°30.0 5°55.6	15°30.2 5°54.7	30°30.4 5°53.7	45°30.6 5°52.8	60°30.8 5°51.9	75°31.1 5°50.9	+0.2 -0.9
Fr 8	270°33.8 5°38.7	285°34.1 5°37.8	330°34.3 5°36.8	315°34.5 5°35.9	330°34.7 5°35.0	345°34.9 5°34.0	0°35.1 5°33.1	15°35.4 5°32.1	30°35.6 5°31.2	45°35.8 5°30.2	60°36.0 5°29.3	75°36.2 5°28.4	+0.2 -0.9
Sa 9	270°39.0 5°16.1	285°39.2 5°15.2	330°39.5 5°14.2	315°39.7 5°13.3	330°39.9 5°12.3	345°40.1 5°11.4	0°40.3 5°10.4	15°40.5 5°09.5	30°40.8 5°08.6	45°41.0 5°07.6	60°41.2 5°06.7	75°41.4 5°05.7	+0.2 -0.9
Su 10	270°44.2 4°53.4	285°44.5 4°52.5	330°44.7 4°51.5	315°44.9 4°50.6	330°45.1 4°49.6	345°45.3 4°48.7	0°45.6 4°47.7	15°45.8 4°46.8	30°46.0 4°45.8	45°46.2 4°44.9	60°46.4 4°43.9	75°46.6 4°43.0	+0.2 -0.9
Mo 11	270°49.5 4°30.6	285°49.7 4°29.7	330°49.9 4°28.7	315°50.1 4°27.8	330°50.4 4°26.8	345°50.6 4°25.9	0°50.8 4°24.9	15°51.0 4°24.0	30°51.2 4°23.0	45°51.4 4°22.1	60°51.6 4°21.1	75°51.9 4°20.2	+0.2 -1.0
Tu 12	270°54.8 4°07.8	285°55.0 4°06.8	330°55.2 4°05.9	315°55.4 4°04.9	330°55.6 4°04.0	345°55.9 4°03.0	0°56.1 4°02.1	15°56.3 4°01.1	30°56.5 4°00.2	45°56.8 3°59.2	60°57.0 3°58.2	75°57.2 3°57.3	+0.2 -1.0
We 13	271°00.1 3°44.9	286°00.3 3°43.9	331°00.5 3°43.0	316°00.7 3°42.0	331°01.0 3°41.3	346°01.2 3°40.1	1°01.4 3°39.1	16°01.6 3°38.2	31°01.8 3°37.2	46°02.1 3°36.2	61°02.3 3°35.3	76°02.5 3°34.3	+0.2 -1.0
Th 14	271°05.4 3°21.9	286°05.6 3°20.9	331°05.8 3°20.0	316°06.0 3°19.0	331°06.3 3°18.0	346°06.5 3°17.1	1°06.7 3°16.1	16°06.9 3°15.2	31°07.2 3°14.2	46°07.4 3°13.2	61°07.6 3°12.3	76°07.8 3°11.3	+0.2 -1.0
Fr 15	271°10.7 2°58.8	286°10.9 2°57.9	331°11.2 2°56.9	316°11.4 2°55.9	331°11.6 2°55.0	346°11.8 2°54.0	1°12.1 2°53.0	16°12.3 2°52.1	31°12.5 2°51.1	46°12.7 2°50.2	61°12.9 2°49.2	76°13.2 2°48.2	+0.2 -1.0
Sa 16	271°16.1 2°35.7	286°16.3 2°34.7	331°16.5 2°33.8	316°16.7 2°32.8	331°17.0 2°31.9	346°17.2 2°30.9	1°17.4 2°29.9	16°17.6 2°29.0	31°17.8 2°28.0	46°18.1 2°27.0	61°18.3 2°26.1	76°18.5 2°25.1	+0.2 -1.0
Su 17	271°21.4 2°12.5	286°21.6 2°11.6	331°21.9 2°10.6	316°22.1 2°09.7	331°22.3 2°08.7	346°22.5 2°07.7	1°22.8 2°06.8	16°23.0 2°05.8	31°23.2 2°04.8	46°23.6 2°03.9	61°23.6 2°02.9	76°23.9 2°01.9	+0.2 -1.0
Mo 18	271°26.8 1°49.3	286°27.0 1°48.4	331°27.2 1°47.4	316°27.4 1°46.4	331°27.7 1°45.5	346°27.9 1°44.5	1°28.1 1°43.5	16°28.3 1°42.6	31°28.6 1°41.6	46°28.8 1°40.6	61°28.9 1°39.7	76°29.2 1°38.7	+0.2 -1.0
Tu 19	271°32.1 1°26.1	286°32.3 1°25.1	331°32.6 1°24.2	316°32.8 1°23.2	331°33.0 1°22.2	346°33.2 1°21.3	1°33.5 1°20.3	16°33.7 1°19.3	31°33.9 1°18.3	46°34.1 1°17.4	61°34.4 1°16.4	76°34.6 1°15.4	+0.2 -1.0
We 20	271°37.5 1°02.8	286°37.7 1°01.9	331°37.9 1°00.9	316°38.1 0°59.9	331°38.4 0°58.9	346°38.6 0°58.0	1°38.8 0°57.0	16°39.0 0°56.0	31°39.2 0°55.1	46°39.5 0°54.1	61°39.7 0°53.1	76°39.9 0°52.2	+0.2 -1.0
Th 21	271°42.8 0°39.8	286°43.0 0°38.6	331°43.2 0°37.6	316°43.5 0°36.6	331°43.7 0°35.6	346°43.9 0°34.7	1°44.1 0°33.7	16°44.4 0°32.7	31°44.6 0°31.8	46°44.8 0°30.8	61°45.0 0°29.8	76°45.2 0°28.8	+0.2 -1.0
Fr 22	271°48.1 0°16.2	286°48.3 0°15.2	331°48.6 0°14.3	316°48.8 0°13.3	331°49.0 0°12.3	346°49.2 0°11.3	1°49.4 0°10.4	16°49.7 0°09.4	31°49.9 0°08.4	46°50.1 0°07.5	61°50.3 0°06.5	76°50.5 0°05.5	+0.2 -1.0
Sa 23	271°53.4 -0°07.1	286°53.6 -0°08.1	331°53.8 -0°09.1	316°54.1 -0°10.0	331°54.3 -0°11.0	346°54.5 -0°12.0	1°54.7 -0°13.0	16°54.9 -0°13.9	31°55.2 -0°14.9	46°55.4 -0°15.9	61°55.6 -0°16.9	76°55.8 -0°17.8	+0.2 -1.0
Su 24	271°58.7 -0°30.5	286°58.9 -0°31.5	331°59.1 -0°32.4	316°59.3 -0°33.4	331°59.6 -0°34.4	346°59.8 -0°35.3	2°00.0 -0°36.3	17°00.2 -0°37.3	32°00.4 -0°38.3	47°00.6 -0°39.2	62°00.9 -0°40.2	77°01.1 -0°41.2	+0.2 -1.0
Mo 25	272°03.9 -0°53.8	287°04.1 -0°54.8	332°04.3 -0°55.8	317°04.6 -0°56.7	332°04.8 -0°57.7	347°05.0 -0°58.7	2°05.2 -0°59.7	17°05.4 -1°00.6	32°05.6 -1°01.6	47°05.9 -1°02.6	62°06.1 -1°03.6	77°06.3 -1°04.5	+0.2 -1.0
Tu 26	272°09.1 -1°17.2	287°09.3 -1°18.2	332°09.5 -1°19.1	317°09.7 -1°20.1	332°10.0 -1°21.1	347°10.2 -1°22.0	2°10.4 -1°23.0	17°10.6 -1°24.0	32°10.8 -1°25.0	47°11.0 -1°25.9	62°11.3 -1°26.9	77°11.5 -1°27.9	+0.2 -1.0
We 27	272°14.3 -1°40.5	287°14.5 -1°41.5	332°14.7 -1°42.5	317°14.9 -1°43.4	332°15.1 -1°44.4	347°15.3 -1°45.4	2°15.5 -1°46.4	17°15.7 -1°47.3	32°16.0 -1°48.3	47°16.2 -1°49.3	62°16.4 -1°50.2	77°16.6 -1°51.2	+0.2 -1.0
Th 28	272°19.4 -2°03.9	287°19.6 -2°04.8	332°19.8 -2°05.8	317°20.0 -2°06.8	332°20.2 -2°07.7	347°20.4 -2°08.7	2°20.6 -2°09.7	17°20.8 -2°10.7	32°21.0 -2°11.6	47°21.2 -2°12.6	62°21.5 -2°13.6	77°21.7 -2°14.5	+0.2 -1.0
Fr 29	272°24.4 -2°27.2	287°24.6 -2°28.1	332°24.8 -2°29.1	317°25.0 -2°30.1	332°25.2 -2°31.1	347°25.4 -2°32.0	2°25.6 -2°33.0	17°25.9 -2°34.0	32°26.1 -2°34.9	47°26.3 -2°35.9	62°26.5 -2°36.9	77°26.7 -2°37.8	+0.2 -1.0
Sa 30	272°29.4 -2°50.5	287°29.6 -2°51.4	332°29.8 -2°52.4	317°30.0 -2°53.4	332°30.2 -2°54.3	347°30.4 -2°55.3	2°30.6 -2°56.3	17°30.8 -2°57.2	32°31.0 -2°58.2	47°31.2 -2°59.2	62°31.4 -3°00.2	77°31.6 -3°01.1	+0.2 -1.0

Row 1: GHA (Greenwich Hour Angle), Δ' /h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ' /h = dec. change

Semi-diameter: 15.9'

MOON

September 2023

D	17h	18h	19h	20h	21h	22h	23h	0h	1h	2h	3h	Δ'/h SH
Fr 1	235 ⁰⁰ 06.1 5 ³¹ 3.3	246 ⁰⁰ 34.1 5 ⁴² 0.0	261 ⁰⁰ 02.1 5 ⁵² 7.7	275 ⁰⁰ 30.0 6 ⁰³ 3.0	289 ⁰⁰ 58.0 6 ¹³ 9.9	304 ⁰⁰ 25.8 6 ²⁴ 5.5	318 ⁰⁰ 53.7 6 ³⁵ 0.0	333 ⁰⁰ 21.6 6 ⁴⁵ 5.5	347 ⁰⁰ 49.4 6 ⁵⁶ 0.0	2 ⁰⁰ 17.1 7 ⁰⁶ 4.4	16 ⁰⁰ 44.9 7 ¹⁶ 8.8	+27.9 16.2 +10.6 59.5
Sa 2	239 ⁰⁰ 37.8 9 ⁴⁶ 4.4	248 ⁰⁰ 05.1 9 ⁵⁵ 9.9	262 ⁰⁰ 32.4 10 ⁰⁵ 4.4	276 ⁰⁰ 59.6 10 ¹⁴ 8.8	291 ⁰⁰ 26.8 10 ²⁴ 3.3	305 ⁰⁰ 54.0 10 ³³ 4.4	320 ⁰⁰ 21.1 10 ⁴² 6.6	334 ⁰⁰ 48.2 10 ⁵¹ 7.7	349 ⁰⁰ 15.3 11 ⁰⁰ 8.8	3 ⁰⁰ 42.3 11 ⁰⁹ 8.8	18 ⁰⁰ 09.4 11 ¹⁸ 7.7	+27.2 16.2 +9.2 59.6
Su 3	234 ⁰⁰ 50.9 13 ⁰¹ 3.1	249 ⁰⁰ 17.5 13 ¹⁰ 3.3	263 ⁰⁰ 44.0 13 ¹⁹ 3.3	278 ⁰⁰ 10.5 13 ²⁸ 3.3	292 ⁰⁰ 36.9 13 ³⁷ 3.3	307 ⁰⁰ 03.3 14 ⁰⁰ 8.8	321 ⁰⁰ 29.7 14 ⁰⁸ 0.0	335 ⁰⁰ 56.1 14 ¹⁵ 1.1	350 ⁰⁰ 22.4 14 ²² 4.4	4 ⁰⁰ 48.8 14 ²⁹ 1.1	19 ⁰⁰ 15.1 14 ³⁵ 9.9	+26.4 16.2 +7.3 59.5
Mo 4	235 ⁰⁰ 46.5 16 ⁰⁰ 6.7	250 ⁰⁰ 12.4 16 ¹¹ 9.9	264 ⁰⁰ 38.3 16 ²⁰ 1.0	279 ⁰⁰ 04.2 16 ²² 0.0	293 ⁰⁰ 30.1 16 ²⁶ 9.9	307 ⁰⁰ 56.0 16 ³¹ 7.7	322 ⁰⁰ 21.8 16 ³⁶ 4.4	336 ⁰⁰ 47.6 16 ⁴¹ 0.0	351 ⁰⁰ 13.5 16 ⁴⁵ 5.5	5 ⁰⁰ 39.3 16 ⁴⁹ 9.9	20 ⁰⁰ 05.0 16 ⁵⁴ 1.1	+25.9 16.1 +4.7 59.2
Tu 5	236 ⁰⁰ 30.8 17 ⁰⁰ 4.4	250 ⁰⁰ 56.5 17 ⁰⁶ 9.9	265 ⁰⁰ 22.1 17 ¹⁵ 9.9	279 ⁰⁰ 47.8 17 ²⁴ 9.9	294 ⁰⁰ 13.5 17 ³³ 6.6	308 ⁰⁰ 39.2 17 ⁴² 5.5	323 ⁰⁰ 04.9 17 ⁵¹ 4.4	337 ⁰⁰ 30.6 17 ⁵⁹ 1.1	351 ⁰⁰ 56.3 18 ⁰⁰ 8.8	6 ⁰⁰ 22.0 18 ⁰² 3.3	20 ⁰⁰ 47.7 18 ⁰⁸ 7.7	+25.7 16.1 +1.9 58.9
We 6	237 ⁰⁰ 14.8 18 ¹⁰ 10.7	251 ⁰⁰ 40.7 18 ¹⁰ 3.3	266 ⁰⁰ 06.7 18 ⁰⁹ 7.7	280 ⁰⁰ 32.7 18 ⁰⁹ 0.0	294 ⁰⁰ 58.7 18 ⁰⁸ 2.2	309 ⁰⁰ 24.7 18 ⁰⁷ 3.3	323 ⁰⁰ 50.8 18 ⁰⁶ 3.3	338 ⁰⁰ 16.9 18 ⁰⁵ 2.2	352 ⁰⁰ 43.0 18 ⁰³ 9.9	7 ⁰⁰ 09.1 18 ⁰² 5.5	21 ⁰⁰ 35.3 18 ⁰¹ 1.1	+26.0 16.0 -1.0 58.5
Th 7	251 ⁰⁰ 40.7 18 ¹⁰ 10.3	266 ⁰⁰ 06.7 18 ⁰⁹ 7.7	280 ⁰⁰ 32.7 18 ⁰⁹ 0.0	294 ⁰⁰ 58.7 18 ⁰⁸ 2.2	309 ⁰⁰ 24.7 18 ⁰⁷ 3.3	323 ⁰⁰ 50.8 18 ⁰⁶ 3.3	338 ⁰⁰ 16.9 18 ⁰⁵ 2.2	352 ⁰⁰ 43.0 18 ⁰³ 9.9	7 ⁰⁰ 09.1 18 ⁰² 5.5	21 ⁰⁰ 35.3 18 ⁰¹ 1.1	36 ⁰⁰ 01.5 17 ⁵⁹ 5.5	+26.1 16.0 -1.1 58.5
Fr 8	252 ⁰⁰ 38.4 17 ⁰² 2.5	267 ⁰⁰ 05.1 17 ¹⁹ 2.2	281 ⁰⁰ 31.9 17 ¹⁵ 8.8	295 ⁰⁰ 58.8 17 ¹² 3.3	310 ⁰⁰ 25.6 17 ⁰⁸ 7.7	324 ⁰⁰ 52.6 17 ⁰⁴ 9.9	339 ⁰⁰ 19.9 17 ⁰¹ 1.1	353 ⁰⁰ 46.6 16 ⁵⁷ 2.2	8 ⁰⁰ 13.6 16 ⁵³ 8.8	22 ⁰⁰ 40.7 16 ⁴⁹ 4.4	37 ⁰⁰ 07.9 16 ⁴⁴ 8.8	+26.9 15.8 -3.8 58.1
Sa 9	254 ⁰⁰ 00.8 15 ³⁰ 1.1	268 ⁰⁰ 28.8 15 ²⁴ 4.4	282 ⁰⁰ 56.8 15 ¹⁸ 7.7	297 ⁰⁰ 24.8 15 ¹² 8.8	311 ⁰⁰ 52.9 15 ⁰⁶ 9.9	326 ⁰⁰ 21.0 15 ⁰⁰ 8.8	340 ⁰⁰ 49.2 14 ⁵⁴ 7.7	355 ⁰⁰ 17.5 14 ⁴⁸ 5.5	9 ⁰⁰ 45.8 14 ⁴² 2.2	24 ⁰⁰ 14.1 14 ³⁵ 9.9	38 ⁰⁰ 42.5 14 ²⁹ 5.5	+28.2 15.7 -6.1 57.6
Su 10	255 ⁰⁰ 55.2 14 ⁴⁴ 1.1	270 ⁰⁰ 24.5 12 ³⁶ 6.6	284 ⁰⁰ 53.8 12 ²⁸ 9.9	299 ⁰⁰ 23.2 12 ²¹ 3.3	313 ⁰⁰ 52.6 12 ¹³ 5.5	328 ⁰⁰ 22.1 12 ⁰⁵ 7.7	342 ⁰⁰ 51.7 11 ⁵⁷ 8.8	357 ⁰⁰ 21.3 11 ⁴⁹ 9.9	11 ⁰⁰ 50.9 11 ⁴³ 8.8	26 ⁰⁰ 20.6 11 ³³ 8.8	40 ⁰⁰ 50.4 11 ²⁵ 7.7	+29.5 15.6 -7.8 57.1
Mo 11	258 ⁰⁰ 23.0 9 ¹⁸ 1.1	272 ⁰⁰ 53.6 9 ⁰⁹ 3.3	287 ⁰⁰ 24.2 9 ⁰⁰ 3.3	301 ⁰⁰ 54.9 8 ⁵¹ 4.4	316 ⁰⁰ 25.7 8 ⁴² 4.4	330 ⁰⁰ 56.4 8 ³³ 4.4	345 ⁰⁰ 27.3 8 ²⁴ 3.3	359 ⁰⁰ 58.1 8 ¹⁵ 2.2	11 ⁰⁰ 49.9 8 ⁰⁶ 1.1	29 ⁰⁰ 00.0 7 ⁵⁶ 9.9	43 ⁰⁰ 31.0 7 ⁴⁷ 7.7	+30.8 15.4 -9.0 56.6
Tu 12	261 ⁰⁰ 21.4 5 ²⁶ 4.4	275 ⁰⁰ 53.1 5 ¹⁶ 8.8	290 ⁰⁰ 24.9 5 ⁰⁷ 2.2	304 ⁰⁰ 56.6 4 ⁵⁷ 6.6	319 ⁰⁰ 28.5 4 ⁴⁷ 9.9	334 ⁰⁰ 00.3 4 ³⁸ 3.3	348 ⁰⁰ 32.2 4 ²⁸ 6.6	3 ⁰⁰ 41.1 4 ¹⁸ 9.9	17 ⁰⁰ 36.1 4 ⁰⁹ 2.2	32 ⁰⁰ 08.1 3 ⁵⁹ 4.4	46 ⁰⁰ 40.1 3 ⁴⁹ 7.7	+31.9 15.3 -9.7 56.0
We 13	264 ⁰⁰ 44.4 1 ²² 9.9	279 ⁰⁰ 16.9 1 ¹³ 1.1	293 ⁰⁰ 49.8 1 ⁰³ 3.3	308 ⁰⁰ 22.0 0 ⁵³ 5.5	322 ⁰⁰ 54.6 0 ⁴³ 7.7	337 ⁰⁰ 27.2 0 ³³ 9.9	351 ⁰⁰ 59.9 0 ²⁴ 1.1	6 ⁰⁰ 32.5 0 ¹⁴ 3.3	21 ⁰⁰ 05.2 0 ⁰⁴ 5.5	35 ⁰⁰ 38.0 -0 ⁰⁵ 2.2	50 ⁰⁰ 17.0 -0 ¹⁵ 0.0	+32.6 15.1 -9.8 55.5
Th 14	268 ⁰⁰ 24.1 -0 ⁴⁰ 0.0	282 ⁰⁰ 57.2 -2 ⁰⁹ 4.4	297 ⁰⁰ 30.2 -2 ⁵⁹ 1.1	312 ⁰⁰ 03.3 -3 ⁰⁸ 6.6	326 ⁰⁰ 36.3 -3 ¹⁸ 1.1	341 ⁰⁰ 09.4 -3 ²⁷ 5.5	355 ⁰⁰ 42.5 -3 ³⁷ 0.0	10 ⁰⁰ 15.6 -3 ⁴⁶ 4.4	24 ⁰⁰ 48.7 -3 ⁵⁵ 8.8	39 ⁰⁰ 21.8 -4 ⁰⁵ 1.1	53 ⁰⁰ 55.0 -4 ¹⁴ 5.5	+33.1 15.0 -9.5 55.0
Fr 15	277 ⁰⁰ 12.7 -6 ³¹ 3.3	286 ⁰⁰ 45.9 -6 ⁴⁰ 2.2	301 ⁰⁰ 19.2 -6 ⁴⁹ 0.0	315 ⁰⁰ 52.4 -6 ⁵⁷ 8.8	330 ⁰⁰ 25.6 -7 ⁰⁶ 6.6	344 ⁰⁰ 58.8 -7 ¹⁵ 3.3	359 ⁰⁰ 58.8 -7 ²⁴ 0.0	14 ⁰⁰ 05.2 -7 ³² 7.7	28 ⁰⁰ 38.4 -7 ⁴¹ 3.3	43 ⁰⁰ 11.7 -7 ⁴⁹ 9.9	57 ⁰⁰ 44.9 -7 ⁵⁸ 4.4	+33.2 14.9 -8.7 54.6
Sa 16	276 ⁰⁰ 02.4 -10 ⁰¹ 6.6	290 ⁰⁰ 35.5 -10 ⁰⁹ 4.4	305 ⁰⁰ 08.6 -10 ¹⁷ 2.2	319 ⁰⁰ 41.7 -10 ²⁵ 0.0	334 ⁰⁰ 14.8 -10 ³² 7.7	348 ⁰⁰ 47.9 -10 ⁴⁰ 4.4	3 ⁰⁰ 20.9 -10 ⁴⁸ 0.0	17 ⁰⁰ 54.0 -10 ⁵⁵ 5.5	32 ⁰⁰ 27.0 -11 ⁰³ 1.1	47 ⁰⁰ 00.0 -11 ¹⁰ 5.5	61 ⁰⁰ 33.1 -11 ¹⁷ 9.9	+33.1 14.8 -7.6 54.3
Su 17	279 ⁰⁰ 46.5 -13 ⁰² 6.6	294 ⁰⁰ 19.3 -13 ⁰⁹ 2.2	308 ⁰⁰ 52.0 -13 ¹⁵ 6.6	323 ⁰⁰ 24.7 -13 ²² 0.0	337 ⁰⁰ 57.4 -13 ²⁸ 4.4	352 ⁰⁰ 30.1 -13 ³⁴ 7.7	7 ⁰⁰ 02.8 -13 ⁴⁰ 9.9	21 ⁰⁰ 35.5 -13 ⁴⁷ 1.1	36 ⁰⁰ 08.1 -13 ⁵³ 2.2	50 ⁰⁰ 40.7 -13 ⁵⁹ 9.9	65 ⁰⁰ 13.3 -14 ⁰⁵ 2.2	+32.7 14.8 -6.3 54.1
Mo 18	283 ⁰⁰ 19.7 -15 ²⁷ 3.3	297 ⁰⁰ 51.9 -15 ³² 3.3	312 ⁰⁰ 24.1 -15 ³⁷ 1.1	326 ⁰⁰ 56.3 -15 ⁴¹ 9.9	341 ⁰⁰ 28.5 -15 ⁴⁶ 9.9	356 ⁰⁰ 00.6 -15 ⁵¹ 3.3	10 ⁰⁰ 32.8 -15 ⁵⁵ 9.9	25 ⁰⁰ 04.9 -16 ⁰⁰ 5.5	39 ⁰⁰ 36.9 -16 ⁰⁹ 3.3	54 ⁰⁰ 09.0 -16 ⁰⁹ 3.3	68 ⁰⁰ 41.0 -16 ¹³ 6.6	+32.1 14.8 -4.6 54.1
Tu 19	286 ⁰⁰ 38.4 -17 ⁰⁹ 4.4	301 ⁰⁰ 10.1 -17 ¹² 5.5	315 ⁰⁰ 41.6 -17 ¹⁵ 6.6	330 ⁰⁰ 13.2 -17 ¹⁸ 8.8	344 ⁰⁰ 44.8 -17 ²¹ 4.4	359 ⁰⁰ 16.3 -17 ²⁴ 2.2	13 ⁰⁰ 47.8 -17 ²⁶ 9.9	28 ⁰⁰ 19.3 -17 ²⁹ 6.6	42 ⁰⁰ 50.7 -17 ³² 1.1	57 ⁰⁰ 22.1 -17 ³⁴ 6.6	71 ⁰⁰ 53.5 -17 ³⁷ 0.0	+31.5 14.8 -2.8 54.2
We 20	289 ⁰⁰ 41.3 -18 ⁰³ 4.4	304 ⁰⁰ 12.3 -18 ⁰⁴ 5.5	318 ⁰⁰ 43.3 -18 ⁰⁵ 5.5	333 ⁰⁰ 14.2 -18 ⁰⁶ 4.4	347 ⁰⁰ 45.1 -18 ⁰⁷ 2.2	2 ⁰⁰ 16.0 -18 ⁰⁸ 0.0	16 ⁰⁰ 46.9 -18 ⁰⁸ 7.7	31 ⁰⁰ 17.7 -18 ⁰⁹ 2.2	45 ⁰⁰ 48.6 -18 ⁰⁹ 7.7	60 ⁰⁰ 19.4 -18 ¹⁰ 2.2	74 ⁰⁰ 50.4 -18 ¹⁰ 5.5	+30.9 14.9 -0.7 54.6
Th 21	292 ⁰⁰ 28.9 -18 ⁰⁴ 8.8	306 ⁰⁰ 59.3 -18 ⁰³ 8.8	321 ⁰⁰ 29.7 -18 ⁰² 6.6	336 ⁰⁰ 00.1 -18 ⁰¹ 3.3	350 ⁰⁰ 30.5 -17 ⁵⁸ 5.5	5 ⁰⁰ 00.8 -17 ⁵⁷ 0.0	19 ⁰⁰ 31.1 -17 ⁵⁵ 4.4	34 ⁰⁰ 01.4 -17 ⁵³ 7.7	48 ⁰⁰ 31.6 -17 ⁵¹ 3.3	63 ⁰⁰ 01.9 -17 ⁵¹ 9.9	77 ⁰⁰ 32.1 -17 ⁵⁰ 0.0	+30.3 15.0 +1.5 55.1
Fr 22	295 ⁰⁰ 03.3 -17 ¹⁰ 9.9	309 ⁰⁰ 33.3 -17 ⁰⁷ 5.5	324 ⁰⁰ 03.2 -17 ⁰⁴ 1.1	338 ⁰⁰ 33.1 -17 ⁰⁰ 6.6	353 ⁰⁰ 03.0 -16 ⁵⁷ 0.0	7 ⁰⁰ 32.8 -16 ⁵³ 3.3	22 ⁰⁰ 02.7 -16 ⁴⁹ 5.5	36 ⁰⁰ 32.5 -16 ⁴⁵ 8.8	51 ⁰⁰ 02.4 -16 ⁴¹ 7.7	65 ⁰⁰ 32.2 -16 ³⁷ 6.6	80 ⁰⁰ 02.8 -16 ³³ 5.5	+29.9 15.2 +3.7 55.5
Sa 23	297 ⁰⁰ 27.2 -15 ²⁰ 6.6	311 ⁰⁰ 56.8 -15 ¹⁵ 0.0	326 ⁰⁰ 26.3 -15 ⁰⁹ 4.4	340 ⁰⁰ 55.9 -15 ⁰³ 6.6	355 ⁰⁰ 25.4 -14 ⁵⁷ 8.8	9 ⁰⁰ 54.9 -14 ⁵¹ 9.9	24 ⁰⁰ 24.5 -14 ⁴⁵ 9.9	38 ⁰⁰ 54.0 -14 ³⁹ 8.8	53 ⁰⁰ 23.4 -14 ³³ 6.6	67 ⁰⁰ 52.9 -14 ²⁷ 4.4	82 ⁰⁰ 22.4 -14 ²¹ 0.0	+29.5 15.4 +6.0 56.6
Su 24	299 ⁰⁰ 42.9 -12 ³⁶ 0.0	314 ⁰⁰ 12.2 -12 ²⁸ 4.4	328 ⁰⁰ 41.4 -12 ²⁰ 6.6	343 ⁰⁰ 10.7 -12 ¹² 8.8	357 ⁰⁰ 39.9 -12 ⁰⁵ 0.0	12 ⁰⁰ 09.1 -11 ⁵⁷ 0.0	26 ⁰⁰ 38.3 -11 ⁴⁹ 0.0	41 ⁰⁰ 07.5 -11 ⁴⁰ 9.9	55 ⁰⁰ 36.7 -11 ³² 7.7	70 ⁰⁰ 05.9 -11 ²⁴ 4.4	84 ⁰⁰ 35.9 -11 ¹⁶ 1.1	+29.2 15.7 +8.0 57.5
Mo 25	301 ⁰⁰ 51.1 -9 ⁰² 8.8	316 ⁰⁰ 20.0 -8 ⁵³ 3.3	330 ⁰⁰ 49.0 -8 ⁴³ 9.9	345 ⁰⁰ 17.9 -8 ³⁴ 8.8	359 ⁰⁰ 46.8 -8 ²⁴ 7.7	14 ⁰⁰ 15.7 -8 ¹⁵ 1.1	28 ⁰⁰ 44.6 -8 ⁰⁵ 5.5	43 ⁰⁰ 13.5 -7 ⁵⁵ 6.6	57 ⁰⁰ 42.4 -7 ⁴⁵ 7.7	72 ⁰⁰ 11.2 -7 ³⁵ 8.8	86 ⁰⁰ 40.0 -7 ²⁵ 9.9	+28.9 15.9 +9.7 58.4
Tu 26	303 ⁰⁰ 50.5 -4 ⁵⁰ 7.7	318 ⁰⁰ 19.0 -4 ⁴⁰ 0.0	332 ⁰⁰ 47.5 -4 ²⁹ 2.2	347 ⁰⁰ 16.0 -4 ¹⁸ 4.4	1 ⁰⁰ 44.5 -4 ⁰⁷ 9.9	16 ⁰⁰ 13.0 -3 ⁵⁶ 8.8	30 ⁰⁰ 41.5 -3 ⁴⁵ 9.9	45 ⁰⁰ 09.9 -3 ³⁴ 9.9	59 ⁰⁰ 38.3 -3 ²⁴ 0.0	74 ⁰⁰ 06.7 -3 ¹³ 0.0	88 ⁰⁰ 35.0 -3 ⁰² 0.0	+28.5 16.1 +10.9 59.2
We 27	305 ⁰⁰ 37.6 -0 ¹³ 9.9	320 ⁰⁰ 05.6 -0 ⁰² 6.6	334 ⁰⁰ 33.6 0 ⁰⁸ 7.7	349 ⁰⁰ 01.5 0 ²⁰ 1.1	3 ⁰⁰ 29.4 0 ³¹ 5.5	17 ⁰⁰ 57.2 0 ⁴² 8.8	32 ⁰⁰ 25.1 0 ⁵⁴ 2.2	46 ⁰⁰ 52.1 1 ⁰⁵ 6.6	61 ⁰⁰ 20.6 1 ¹⁶ 9.9	75 ⁰⁰ 48.4 1 ²⁸ 3.3	90 ⁰⁰ 16.1 1 ³⁹ 7.7	+27.8 16.3 +11.4 59.9
Th 28	307 ⁰⁰ 08.2 4 ⁰⁹ 2.2	321 ⁰⁰ 35.4 4 ⁰⁷ 5.5	336 ⁰⁰ 02.6 4 ⁵¹ 5.5	350 ⁰⁰ 29.7 5 ⁰² 6.6	4 ⁰⁰ 56.9 5 ¹³ 7.7	19 ⁰⁰ 23.9 5 ²⁴ 7.7	33 ⁰⁰ 51.0 5 ³⁵ 7.7	48 ⁰⁰ 18.0 5 ⁴⁶ 7.7	62 ⁰⁰ 45.0 5 ⁵⁷ 7.7	77 ⁰⁰ 11.9 6 ⁰⁸ 6.6	91 ⁰⁰ 38.8 6 ¹⁹ 5.5	+27.1 16.4 +11.0 60.3
Fr 29	308 ⁰⁰ 18.3 8 ⁵⁷ 7.7	322 ⁰⁰ 44.7 9 ⁰⁷ 8.8	337 ⁰⁰ 11.9 9 ¹⁷ 9.9	351 ⁰⁰ 37.3 9 ²⁷ 9.9	6 ⁰⁰ 35.3 9 ³⁷ 9.9	20 ⁰⁰ 29.8 9 ⁴⁷ 7.7	34 ⁰⁰ 55.9 9 ⁵⁷ 5.5	49 ⁰⁰ 22.1 10 ⁰⁷ 3.3	63 ⁰⁰ 48.2 10 ¹⁷ 0.0	78 ⁰⁰ 14.2 10 ²⁶ 6.6	92 ⁰⁰ 40.3 10 ³⁶ 1.1	+26.2 16.5 +9.9 60

SUN

October 2024

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ' / h
Su 1	257°34.1 -3°12.8	272°34.3 -3°13.7	287°34.5 -3°14.7	302°34.7 -3°15.7	317°34.9 -3°16.6	332°35.1 -3°17.6	347°35.3 -3°18.6	2°35.5 -3°19.5	17°35.7 -3°20.5	32°35.9 -3°21.5	47°36.1 -3°22.4	62°36.3 -3°23.4	+0.2 -1.0
Mo 2	257°38.9 -3°36.0	272°39.1 -3°37.0	287°39.3 -3°37.9	302°39.5 -3°38.9	317°39.7 -3°39.9	332°39.9 -3°40.8	347°40.1 -3°41.8	2°40.3 -3°42.8	17°40.5 -3°43.7	32°40.7 -3°44.7	47°40.9 -3°45.7	62°41.1 -3°46.6	+0.2 -1.0
Tu 3	257°43.7 -3°59.2	272°43.9 -4°00.1	287°44.1 -4°01.1	302°44.3 -4°02.1	317°44.4 -4°03.0	332°44.6 -4°04.0	347°44.8 -4°05.0	2°45.0 -4°05.9	17°45.2 -4°06.9	32°45.4 -4°07.9	47°45.6 -4°08.8	62°45.8 -4°09.8	+0.2 -1.0
We 4	257°48.3 -4°22.3	272°48.5 -4°23.3	287°48.7 -4°24.3	302°48.9 -4°25.2	317°49.1 -4°26.2	332°49.3 -4°27.1	347°49.5 -4°28.1	2°49.7 -4°29.1	17°49.9 -4°30.0	32°50.1 -4°31.0	47°50.2 -4°32.0	62°50.4 -4°32.9	+0.2 -1.0
Th 5	257°52.9 -4°45.4	272°53.1 -4°46.4	287°53.3 -4°47.3	302°53.5 -4°48.3	317°53.7 -4°49.3	332°53.8 -4°50.2	347°54.0 -4°51.2	2°54.2 -4°52.1	17°54.4 -4°53.1	32°54.6 -4°54.1	47°54.8 -4°55.0	62°55.0 -4°56.0	+0.2 -1.0
Fr 6	257°57.4 -5°08.5	272°57.6 -5°09.4	287°57.7 -5°10.4	302°57.9 -5°11.3	317°58.1 -5°12.3	332°58.3 -5°13.3	347°58.5 -5°14.2	2°58.7 -5°15.2	17°58.9 -5°16.1	32°59.0 -5°17.1	47°59.2 -5°18.0	62°59.4 -5°19.0	+0.2 -1.0
Sa 7	258°01.8 -5°31.4	273°01.9 -5°32.4	288°02.1 -5°33.3	303°02.3 -5°34.3	318°02.5 -5°35.3	333°02.7 -5°36.2	348°02.8 -5°37.2	3°03.0 -5°38.1	18°03.2 -5°39.1	33°03.4 -5°40.0	48°03.5 -5°41.0	63°03.7 -5°41.9	+0.2 -1.0
Su 8	258°06.0 -5°54.3	273°06.2 -5°55.3	288°06.4 -5°56.2	303°06.6 -5°57.2	318°06.7 -5°58.2	333°06.9 -5°59.1	348°07.1 -6°00.1	3°07.2 -6°01.0	18°07.4 -6°02.0	33°07.6 -6°02.9	48°07.8 -6°03.9	63°07.9 -6°04.8	+0.2 -1.0
Mo 9	258°10.2 -6°17.2	273°10.4 -6°18.1	288°10.5 -6°19.1	303°10.7 -6°20.0	318°10.9 -6°21.0	333°11.0 -6°21.9	348°11.2 -6°22.9	3°11.4 -6°23.8	18°11.5 -6°24.8	33°11.7 -6°25.7	48°11.9 -6°26.7	63°12.1 -6°27.6	+0.2 -0.9
Tu 10	258°14.2 -6°39.9	273°14.4 -6°40.9	288°14.6 -6°41.8	303°14.7 -6°42.8	318°14.9 -6°43.7	333°15.1 -6°44.7	348°15.2 -6°45.6	3°15.4 -6°46.5	18°15.5 -6°47.5	33°15.7 -6°48.4	48°15.9 -6°49.4	63°16.0 -6°50.3	+0.2 -0.9
We 11	258°18.1 -7°02.6	273°18.3 -7°03.5	288°18.5 -7°04.5	303°18.6 -7°05.4	318°18.8 -7°06.3	333°19.0 -7°07.3	348°19.1 -7°08.2	3°19.3 -7°09.2	18°19.4 -7°10.1	33°19.6 -7°11.1	48°19.8 -7°12.0	63°19.9 -7°12.9	+0.2 -0.9
Th 12	258°22.0 -7°25.1	273°22.1 -7°26.1	288°22.3 -7°27.0	303°22.4 -7°28.0	318°22.6 -7°28.9	333°22.7 -7°29.8	348°22.9 -7°30.8	3°23.0 -7°31.7	18°23.2 -7°32.6	33°23.3 -7°33.6	48°23.5 -7°34.5	63°23.7 -7°35.5	+0.2 -0.9
Fr 13	258°25.6 -7°47.6	273°25.8 -7°48.5	288°25.9 -7°49.5	303°26.1 -7°50.4	318°26.2 -7°51.3	333°26.4 -7°52.3	348°26.5 -7°53.2	3°26.7 -7°54.1	18°26.8 -7°55.1	33°27.0 -7°56.0	48°27.1 -7°56.9	63°27.3 -7°57.9	+0.3 -0.9
Sa 14	258°29.2 -8°10.0	273°29.3 -8°10.9	288°29.5 -8°11.8	303°29.6 -8°12.8	318°29.8 -8°13.7	333°29.9 -8°14.6	348°30.0 -8°15.5	3°30.2 -8°16.5	18°30.3 -8°17.4	33°30.5 -8°18.3	48°30.6 -8°19.2	63°30.8 -8°20.2	+0.3 -0.9
Su 15	258°32.6 -8°32.2	273°32.7 -8°33.1	288°32.9 -8°34.1	303°33.0 -8°35.0	318°33.1 -8°35.9	333°33.3 -8°36.8	348°33.4 -8°37.8	3°33.6 -8°38.7	18°33.7 -8°39.6	33°33.8 -8°40.5	48°34.0 -8°41.4	63°34.1 -8°42.4	+0.3 -0.9
Mo 16	258°35.9 -8°54.3	273°36.0 -8°55.3	288°36.1 -8°56.2	303°36.3 -8°57.1	318°36.4 -8°58.0	333°36.5 -8°58.9	348°36.7 -8°59.8	3°36.8 -9°00.8	18°36.9 -9°01.7	33°37.1 -9°02.6	48°37.2 -9°03.5	63°37.3 -9°04.4	+0.3 -0.9
Tu 17	258°39.9 -9°16.3	273°39.1 -9°17.2	288°39.3 -9°18.2	303°39.4 -9°19.1	318°39.5 -9°20.0	333°39.6 -9°20.9	348°39.8 -9°21.8	3°39.9 -9°22.7	18°40.0 -9°23.6	33°40.2 -9°24.5	48°40.3 -9°25.5	63°40.4 -9°26.4	+0.4 -0.9
We 18	258°42.6 -9°38.2	273°42.1 -9°39.1	288°42.2 -9°40.0	303°42.4 -9°40.9	318°42.5 -9°41.8	333°42.6 -9°42.7	348°42.7 -9°43.6	3°42.8 -9°44.5	18°43.0 -9°45.4	33°43.1 -9°46.3	48°43.2 -9°47.3	63°43.3 -9°48.2	+0.3 -0.9
Th 19	258°44.8 -9°59.9	273°44.9 -10°00.8	288°45.1 -10°01.7	303°45.2 -10°02.6	318°45.3 -10°03.5	333°45.4 -10°04.4	348°45.5 -10°05.3	3°45.6 -10°06.2	18°45.7 -10°07.1	33°45.9 -10°08.0	48°45.9 -10°08.9	63°45.9 -10°09.8	+0.4 -0.9
Fr 20	258°47.5 -10°21.5	273°47.6 -10°22.4	288°47.7 -10°23.3	303°47.8 -10°24.2	318°48.0 -10°25.1	333°48.1 -10°26.0	348°48.2 -10°26.9	3°48.3 -10°27.7	18°48.4 -10°28.6	33°48.5 -10°29.5	48°48.6 -10°30.4	63°48.7 -10°31.3	+0.4 -0.9
Sa 21	258°50.0 -10°42.9	273°50.2 -10°43.8	288°50.3 -10°44.7	303°50.4 -10°45.6	318°50.5 -10°46.5	333°50.6 -10°47.3	348°50.7 -10°48.2	3°50.8 -10°49.1	18°50.9 -10°50.9	33°51.0 -10°51.8	48°51.1 -10°52.8	63°51.2 -10°53.7	+0.4 -0.9
Su 22	258°52.4 -11°04.2	273°52.5 -11°05.0	288°52.6 -11°05.9	303°52.7 -11°06.8	318°52.8 -11°07.7	333°52.9 -11°08.6	348°53.0 -11°09.5	3°53.1 -11°10.3	18°53.2 -11°11.2	33°53.3 -11°12.1	48°53.4 -11°13.0	63°53.5 -11°13.8	+0.4 -0.9
Mo 23	258°54.6 -11°25.3	273°54.7 -11°26.1	288°54.8 -11°27.0	303°54.9 -11°27.9	318°55.0 -11°28.8	333°55.1 -11°29.6	348°55.2 -11°30.5	3°55.2 -11°31.4	18°55.3 -11°32.2	33°55.4 -11°33.1	48°55.5 -11°34.0	63°55.6 -11°34.9	+0.4 -0.9
Tu 24	258°56.7 -11°46.2	273°56.7 -11°47.0	288°56.8 -11°47.9	303°56.9 -11°48.8	318°57.0 -11°49.6	333°57.1 -11°50.5	348°57.2 -11°51.4	3°57.2 -11°52.2	18°57.3 -11°53.1	33°57.4 -11°54.0	48°57.5 -11°54.8	63°57.5 -11°55.7	+0.4 -0.9
We 25	258°58.5 -12°06.9	273°58.6 -12°07.8	288°58.7 -12°08.6	303°58.8 -12°09.5	318°58.8 -12°10.4	333°58.9 -12°11.2	348°58.9 -12°12.1	3°59.0 -12°12.9	18°59.1 -12°13.8	33°59.2 -12°14.6	48°59.3 -12°15.5	63°59.3 -12°16.4	+0.4 -0.9
Th 26	259°00.0 -12°27.5	274°00.3 -12°28.3	289°00.4 -12°29.2	304°00.4 -12°30.0	319°00.5 -12°30.9	334°00.6 -12°31.7	349°00.6 -12°32.6	4°00.7 -12°33.4	19°00.7 -12°34.3	34°00.8 -12°35.1	49°00.9 -12°36.0	64°00.9 -12°36.8	+0.4 -0.9
Fr 27	259°01.7 -12°47.7	274°01.8 -12°48.7	289°01.8 -12°49.5	304°01.9 -12°50.4	319°02.0 -12°51.2	334°02.0 -12°52.0	349°02.1 -12°52.9	4°02.1 -12°53.7	19°02.2 -12°54.6	34°02.3 -12°55.4	49°02.3 -12°56.3	64°02.4 -12°57.1	+0.4 -0.8
Sa 28	259°03.1 -13°08.0	274°03.1 -13°08.8	289°03.2 -13°09.7	304°03.2 -13°10.5	319°03.3 -13°11.3	334°03.3 -13°12.2	349°03.4 -13°13.0	4°03.4 -13°13.8	19°03.5 -13°14.7	34°03.5 -13°15.5	49°03.6 -13°16.3	64°03.6 -13°17.2	+0.0 -0.8
Su 29	259°04.2 -13°27.9	274°04.2 -13°28.8	289°04.3 -13°29.6	304°04.3 -13°30.4	319°04.4 -13°31.2	334°04.4 -13°32.1	349°04.4 -13°32.9	4°04.5 -13°33.7	19°04.5 -13°34.5	34°04.6 -13°35.4	49°04.6 -13°36.2	64°04.6 -13°37.0	+0.0 -0.8
Mo 30	259°05.5 -13°47.7	274°05.2 -13°48.5	289°05.2 -13°49.3	304°05.2 -13°50.1	319°05.3 -13°51.0	334°05.3 -13°51.8	349°05.3 -13°52.6	4°05.4 -13°53.4	19°05.4 -13°54.2	34°05.4 -13°55.0	49°05.5 -13°55.9	64°05.5 -13°56.7	+0.0 -0.8
Tu 31	259°05.9 -14°07.2	274°05.9 -14°08.0	289°05.9 -14°08.8	304°05.9 -14°09.6	319°06.0 -14°10.5	334°06.0 -14°11.3	349°06.0 -14°12.1	4°06.0 -14°12.9	19°06.1 -14°13.7	34°06.1 -14°14.5	49°06.1 -14°15.3	64°06.1 -14°16.1	+0.0 -0.8

Row 1: GHA (Greenwich Hour Angle), Δ' / h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ' / h = dec. change
Semi-diameter: 16.0'

MOON

October 2034

	D	18h	19h	20h	21h	22h	23h	0h	1h	2h	3h	4h	Δ'/h	SH
O	Su 1	237°58.2 15°17.5	251°58.2 15°23.8	266°23.2 15°30.0	280°48.4 15°36.1	295°13.4 15°42.1	309°38.4 15°48.0	324°03.4 15°53.7	338°28.4 15°59.4	352°53.4 16°04.9	7°18.4 16°10.3	21°43.3 16°15.6	+25.0 +5.8	16.4 60.1
	Mo 2	237°57.2 17°21.4	252°22.2 17°24.8	266°47.1 17°28.1	281°12.0 17°31.3	295°37.0 17°34.4	310°01.9 17°37.4	324°26.9 17°40.2	338°51.9 17°42.9	353°16.9 17°45.5	7°41.9 17°48.0	22°06.9 17°50.4	+25.0 +2.9	16.2 59.6
	Tu 3	238°24.4 18°11.3	252°49.8 18°11.7	267°15.2 18°12.0	281°40.6 18°12.2	296°06.0 18°12.2	310°31.5 18°12.2	324°57.0 18°12.1	339°22.6 18°11.8	353°48.2 18°11.4	8°13.8 18°10.9	22°39.5 18°10.3	+25.5 -0.1	16.1 59.0
●	We 4	239°09.3 17°47.2	253°35.6 17°44.8	268°02.0 17°42.3	282°28.5 17°39.6	296°55.0 17°36.9	311°21.5 17°34.0	325°48.1 17°31.1	340°14.8 17°28.0	354°41.5 17°24.8	9°08.2 17°21.6	23°35.0 17°18.2	+26.6 -2.9	15.9 58.3
	Th 5	240°23.8 16°15.8	254°51.5 16°10.9	269°19.3 16°05.9	283°47.1 16°00.8	298°15.0 15°55.6	312°42.9 15°50.3	327°11.0 15°45.0	341°39.0 15°39.5	356°07.1 15°34.0	10°35.3 15°28.4	25°03.6 15°22.7	+28.0 -5.3	15.7 57.7
	Fr 6	254°51.5 16°15.8	269°19.3 16°10.9	283°47.1 16°05.9	298°15.0 15°55.6	312°42.9 15°50.3	327°11.0 15°45.0	341°39.0 15°39.5	356°07.1 15°34.0	10°35.3 15°28.4	25°03.6 15°22.7	39°31.9 15°16.9	+28.0 -5.4	15.7 57.7
●	Sa 7	256°43.7 13°41.1	271°12.9 13°34.1	285°42.2 13°27.1	300°11.6 13°19.9	314°41.1 13°12.8	329°10.6 13°05.5	343°40.1 12°58.2	358°09.7 12°50.9	12°39.4 12°43.5	27°09.1 12°36.0	41°38.9 12°28.4	+29.5 -7.3	15.6 57.0
	Su 8	259°12.3 6°46.7	273°43.0 6°37.4	288°13.7 6°28.1	302°44.5 6°18.8	317°15.3 6°10.4	331°46.1 6°00.0	346°17.0 5°50.6	0°48.0 5°41.2	15°19.0 5°31.7	29°50.0 5°22.3	44°21.2 5°12.8	+30.9 -9.4	15.4 55.9
	Mo 9	262°13.2 6°46.7	276°45.0 6°37.4	291°16.9 6°28.1	305°48.7 6°18.8	320°20.7 6°09.4	334°52.6 6°00.0	349°24.6 5°50.6	3°56.7 5°41.2	18°28.7 5°31.7	33°00.9 5°22.3	47°33.0 5°12.8	+32.0 -9.4	15.2 55.9
●	Tu 10	265°39.1 2°48.6	280°11.7 2°38.9	294°44.4 2°29.2	309°17.1 2°19.5	323°49.8 2°09.8	338°22.6 2°00.1	352°55.3 1°50.4	7°28.1 1°40.7	22°00.9 1°30.9	36°33.8 1°21.2	51°06.6 1°11.5	+32.8 -9.7	15.1 55.4
	We 11	269°21.7 -1°13.9	283°54.8 -1°23.5	298°28.8 -1°33.2	313°01.2 -1°42.8	327°34.3 -1°52.4	342°07.5 -2°01.9	356°40.7 -2°11.5	11°13.9 -2°21.1	25°47.1 -2°30.6	40°20.3 -2°40.1	54°53.6 -2°49.6	+33.2 -9.6	15.0 55.0
	Th 12	273°12.7 -5°09.8	287°46.0 -5°18.9	302°19.4 -5°28.1	316°52.7 -5°37.2	331°26.0 -5°46.2	345°59.3 -5°55.3	0°32.6 -6°04.3	15°05.9 -6°13.3	29°39.2 -6°22.2	44°12.5 -6°31.1	58°45.8 -6°40.0	+33.3 -9.0	14.9 54.6
●	Fr 13	277°04.7 -8°49.0	291°37.9 -8°57.3	306°11.1 -9°05.6	320°44.3 -9°13.8	335°17.4 -9°21.9	349°50.6 -9°30.1	4°23.7 -9°38.1	18°56.9 -9°46.2	33°30.0 -9°54.2	48°03.1 -10°02.1	62°36.3 -10°10.0	+33.2 -8.1	14.8 54.3
	Sa 14	280°51.3 -12°02.6	295°24.2 -12°09.6	309°57.1 -12°16.7	324°29.9 -12°23.7	339°02.5 -12°30.6	353°35.6 -12°37.4	8°08.4 -12°44.3	22°41.2 -12°51.0	40°47.2 -12°57.7	51°46.7 -13°04.3	66°19.5 -13°10.9	+32.8 -6.8	14.7 54.4
	Su 15	284°28.3 -14°42.3	299°00.7 -14°47.9	313°33.1 -14°53.4	328°05.5 -14°58.9	342°37.9 -15°04.3	357°10.3 -15°09.6	11°42.6 -15°14.8	26°14.9 -15°20.0	40°47.2 -15°25.1	55°19.5 -15°30.2	69°51.7 -15°35.2	+32.3 -5.3	14.7 54.0
●	Mo 16	287°53.1 -16°41.4	302°25.0 -16°45.2	316°56.9 -16°49.0	331°28.8 -16°52.6	346°00.7 -16°56.3	0°32.6 -16°59.8	15°04.4 -17°03.2	29°36.2 -17°06.6	44°08.0 -17°09.9	58°39.7 -17°13.1	73°11.5 -17°16.3	+31.8 -3.5	14.7 54.0
	Tu 17	-1°01.5 -17°54.0	305°36.8 -17°55.9	320°08.2 -17°57.7	334°39.6 -17°59.4	349°11.0 -18°01.1	3°42.4 -18°02.6	18°13.8 -18°04.1	32°45.1 -18°05.5	47°16.4 -18°06.8	61°47.7 -18°08.0	76°19.0 -18°09.1	+31.4 -1.5	14.8 54.1
	We 18	294°06.3 -18°16.1	308°37.3 -18°15.8	323°08.3 -18°15.5	337°39.4 -18°15.1	352°10.4 -18°14.7	6°41.3 -18°14.7	21°12.3 -18°13.5	35°43.2 -18°12.7	50°14.2 -18°11.9	64°45.1 -18°11.0	79°16.0 -18°10.0	+31.0 +0.6	14.9 54.5
●	Th 19	296°58.1 -17°44.8	311°28.8 -17°42.4	325°59.6 -17°39.9	340°30.2 -17°37.4	355°00.9 -17°34.7	9°31.6 -17°32.0	24°02.3 -17°29.2	38°32.9 -17°26.3	53°03.6 -17°23.3	67°34.2 -17°20.3	82°04.8 -17°17.1	+30.7 +2.8	15.0 55.5
	Fr 20	299°43.0 -16°19.4	314°13.5 -16°14.9	328°43.9 -16°10.2	343°14.4 -16°05.5	357°44.8 -16°00.7	12°15.2 -15°55.9	26°45.7 -15°50.9	41°16.1 -15°45.9	55°46.5 -15°40.8	70°16.9 -15°35.5	84°47.3 -15°30.3	+30.4 +4.9	15.2 56.5
	Sa 21	303°21.9 -14°01.0	316°52.1 -13°54.4	331°22.4 -13°47.8	345°52.6 -13°41.0	0°22.8 -13°34.2	14°52.9 -13°27.3	29°23.1 -13°20.3	43°53.3 -13°13.2	58°23.4 -13°06.1	72°53.6 -12°58.9	87°23.7 -12°51.6	+30.2 +6.9	15.4 56.5
●	Su 22	304°54.0 -10°53.3	319°23.9 -10°44.8	333°53.8 -10°36.3	348°23.7 -10°27.7	2°53.5 -10°19.0	17°23.4 -10°10.3	31°53.2 -10°01.5	46°23.0 -9°52.6	60°52.8 -9°43.7	75°22.6 -9°34.7	89°52.3 -9°25.6	+29.8 +8.8	15.7 57.4
	Mo 23	307°16.0 -7°02.5	321°45.4 -6°52.5	336°14.8 -6°42.4	350°44.2 -6°32.3	5°13.5 -6°22.4	19°42.8 -6°11.9	34°12.1 -6°01.7	48°41.3 -5°51.4	63°10.5 -5°41.0	77°39.9 -5°30.6	92°08.8 -5°20.2	+29.3 +10.5	15.8 58.4
	Tu 24	309°22.5 -2°38.6	323°51.2 -2°27.7	338°19.8 -2°16.5	352°48.4 -2°05.4	7°16.9 -1°54.2	21°45.4 -1°43.1	36°13.9 -1°31.9	50°42.3 -1°20.7	65°10.7 -1°09.4	79°39.0 -0°58.2	94°07.3 -0°46.9	+28.5 +11.2	16.2 59.4
●	We 25	311°06.7 2°03.9	325°34.3 2°15.3	340°01.9 2°26.7	354°29.4 2°38.2	8°56.9 2°49.6	23°24.3 3°01.0	37°51.7 3°12.4	52°19.0 3°23.8	66°46.2 3°35.2	81°13.5 3°46.6	95°40.6 3°58.0	+27.4 +11.6	16.4 60.2
	Th 26	312°22.1 6°46.1	326°48.4 6°57.1	341°07.4 7°08.0	355°41.0 7°18.9	10°07.2 7°29.8	24°33.3 7°40.6	38°59.4 7°51.4	53°25.4 8°02.1	67°51.4 8°12.8	82°17.3 8°23.4	96°43.2 8°34.0	+26.1 +10.8	16.6 60.9
	Fr 27	313°05.0 11°05.6	327°30.0 11°15.2	341°55.0 11°24.7	356°20.0 11°34.1	10°44.9 11°43.4	25°09.7 11°52.7	39°34.7 12°01.8	53°59.9 12°10.9	68°24.0 12°19.9	82°48.8 12°28.9	97°13.3 12°37.7	+24.8 +9.2	16.7 61.1
●	Sa 28	313°17.6 14°38.9	327°41.6 14°46.2	342°05.6 14°53.4	356°29.5 15°00.4	10°53.4 15°07.3	25°17.3 15°14.2	39°41.1 15°20.9	54°04.9 15°27.5	68°28.7 15°34.0	82°52.5 15°40.4	97°16.2 15°46.6	+23.9 +8.6	16.7 61.1
	Su 29	313°10.4 17°06.2	327°33.9 17°10.5	341°57.5 17°14.6	356°21.0 17°18.7	10°44.5 17°22.6	25°08.0 17°26.4	39°31.6 17°30.1	53°55.1 17°33.6	68°18.7 17°37.0	82°44.2 17°40.3	97°05.8 17°43.5	+23.5 +3.7	16.6 60.7
	Mo 30	327°33.9 17°10.5	341°57.5 17°14.6	356°21.0 17°18.7	10°44.5 17°22.6	25°08.0 17°26.4	39°31.6 17°30.1	53°55.1 17°33.6	68°18.7 17°37.0	82°44.2 17°40.3	97°05.8 17°43.5	111°29.4 17°46.5	+23.5 +3.6	16.5 60.7
●	Tu 31	327°25.1 18°16.2	341°49.0 18°17.1	356°12.9 18°17.9	10°36.9 18°18.6	25°01.0 18°19.2	39°25.0 18°19.6	53°49.1 18°19.9	68°13.3 18°20.0	82°37.4 18°20.1	97°01.7 18°20.0	111°25.9 18°19.8	+24.1 +0.4	16.4 60.0

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 4 18h04 — NM: 12 07h32 — FQ: 20 12h03 — FM: 27 12h42

SUN

November 2034

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
We 1	259°06.4 -14°26.8	274°06.4 -14°27.3	289°06.4 -14°28.1	304°06.5 -14°28.9	319°06.5 -14°29.7	334°06.5 -14°30.5	349°06.5 -14°31.3	4°06.5 -14°32.1	15°06.5 -14°32.9	34°06.6 -14°33.7	45°06.6 -14°34.5	64°06.6 -14°35.3	+0.0 -0.8
Th 2	259°06.7 -14°45.7	274°06.8 -14°46.4	289°06.8 -14°47.2	304°06.8 -14°48.0	319°06.8 -14°48.7	334°06.8 -14°49.5	349°06.8 -14°50.3	4°06.8 -14°51.1	15°06.8 -14°51.9	34°06.8 -14°52.7	45°06.8 -14°53.5	64°06.8 -14°54.3	+0.0 -0.8
Fr 3	259°06.9 -15°04.4	274°06.9 -15°05.2	289°06.9 -15°06.0	304°06.9 -15°06.8	319°06.9 -15°07.5	334°06.9 -15°08.3	349°06.9 -15°09.1	4°06.9 -15°09.9	15°06.9 -15°10.7	34°06.9 -15°11.4	45°06.9 -15°12.2	64°06.9 -15°13.0	-0.0 -0.8
Sa 4	259°06.8 -15°23.0	274°06.8 -15°23.8	289°06.8 -15°24.6	304°06.8 -15°25.3	319°06.8 -15°26.1	334°06.8 -15°26.9	349°06.7 -15°27.6	4°06.7 -15°28.4	15°06.7 -15°29.2	34°06.7 -15°29.9	45°06.7 -15°30.7	64°06.7 -15°31.5	-0.0 -0.8
Su 5	259°06.5 -15°41.4	274°06.5 -15°42.1	289°06.5 -15°42.9	304°06.5 -15°43.6	319°06.4 -15°44.4	334°06.4 -15°45.1	349°06.4 -15°45.9	4°06.4 -15°46.7	15°06.4 -15°47.4	34°06.3 -15°48.2	45°06.3 -15°48.9	64°06.3 -15°49.7	-0.0 -0.8
Mo 6	259°06.0 -15°59.4	274°06.0 -16°00.2	289°06.0 -16°00.9	304°05.9 -16°01.7	319°05.9 -16°02.4	334°05.9 -16°03.2	349°05.8 -16°03.9	4°05.8 -16°04.7	15°05.8 -16°05.4	34°05.8 -16°06.2	45°05.7 -16°06.9	64°05.7 -16°07.6	-0.0 -0.7
Tu 7	259°05.3 -16°17.3	274°05.3 -16°18.0	289°05.2 -16°18.7	304°05.2 -16°19.5	319°05.1 -16°20.2	334°05.1 -16°20.9	349°05.1 -16°21.7	4°05.0 -16°22.4	15°05.0 -16°23.1	34°05.0 -16°23.9	45°04.9 -16°24.6	64°04.9 -16°25.3	-0.0 -0.7
We 8	259°04.4 -16°35.1	274°04.3 -16°35.5	289°04.3 -16°36.2	304°04.2 -16°37.0	319°04.2 -16°37.7	334°04.1 -16°38.4	349°04.1 -16°39.1	4°04.1 -16°39.9	15°04.0 -16°40.6	34°04.0 -16°41.3	45°03.9 -16°42.0	64°03.9 -16°42.7	-0.0 -0.7
Th 9	259°03.2 -16°52.1	274°03.2 -16°52.8	289°03.1 -16°53.5	304°03.1 -16°54.2	319°03.0 -16°54.9	334°03.0 -16°55.6	349°02.9 -16°56.3	4°02.8 -16°57.0	15°02.8 -16°57.8	34°02.7 -16°58.5	45°02.7 -16°59.2	64°02.6 -16°59.9	-0.1 -0.7
Fr 10	259°01.9 -17°09.0	274°01.8 -17°09.7	289°01.7 -17°10.4	304°01.7 -17°11.1	319°01.6 -17°11.8	334°01.6 -17°12.5	349°01.5 -17°13.2	4°01.4 -17°13.9	15°01.4 -17°14.6	34°01.3 -17°15.3	45°01.2 -17°16.0	64°01.2 -17°16.7	-0.1 -0.7
Sa 11	259°00.3 -17°25.7	274°00.2 -17°26.4	289°00.2 -17°27.1	304°00.1 -17°27.8	319°00.0 -17°28.5	333°59.9 -17°29.2	348°59.9 -17°30.5	3°59.8 -17°31.2	15°59.7 -17°31.9	33°59.7 -17°32.6	45°59.6 -17°33.2	63°59.5 -17°33.3	-0.1 -0.7
Su 12	258°58.5 -17°42.1	273°58.4 -17°42.8	288°58.4 -17°43.5	303°58.3 -17°44.1	318°58.2 -17°44.8	333°58.1 -17°45.5	348°58.0 -17°46.2	3°58.0 -17°46.8	15°57.9 -17°47.5	33°57.8 -17°48.2	45°57.7 -17°48.9	63°57.6 -17°49.5	-0.1 -0.7
Mo 13	258°56.5 -17°58.2	273°56.4 -17°58.9	288°56.4 -17°59.5	303°56.3 -18°00.2	318°56.2 -18°00.8	333°56.1 -18°01.5	348°56.0 -18°02.2	3°55.9 -18°02.8	15°55.8 -18°03.5	33°55.7 -18°04.1	45°55.6 -18°04.8	63°55.6 -18°05.5	-0.1 -0.7
Tu 14	258°54.3 -18°14.0	273°54.2 -18°14.6	288°54.1 -18°15.3	303°54.0 -18°15.9	318°53.9 -18°16.6	333°53.8 -18°17.2	348°53.8 -18°17.9	3°53.7 -18°18.5	15°53.6 -18°19.2	33°53.5 -18°19.8	45°53.4 -18°20.4	63°53.3 -18°21.1	-0.1 -0.6
We 15	258°51.9 -18°29.4	273°51.8 -18°30.1	288°51.7 -18°30.7	303°51.6 -18°31.3	318°51.5 -18°32.0	333°51.4 -18°32.6	348°51.3 -18°33.2	3°51.2 -18°33.9	15°51.1 -18°34.5	33°51.0 -18°35.1	45°50.9 -18°35.8	63°50.8 -18°36.4	-0.1 -0.6
Th 16	258°49.3 -18°44.5	273°49.2 -18°45.2	288°49.1 -18°45.8	303°49.0 -18°46.4	318°48.9 -18°47.0	333°48.7 -18°47.7	348°48.6 -18°48.4	3°48.5 -18°49.5	15°48.4 -18°50.5	33°48.3 -18°50.7	45°48.2 -18°51.4	63°48.0 -18°51.4	-0.1 -0.6
Fr 17	258°46.5 -18°59.3	273°46.4 -18°59.9	288°46.2 -19°00.6	303°46.1 -19°01.2	318°46.0 -19°01.8	333°45.9 -19°02.4	348°45.7 -19°03.0	3°45.6 -19°03.6	15°45.5 -19°04.2	33°45.4 -19°04.8	45°45.2 -19°05.4	63°45.1 -19°06.0	-0.1 -0.6
Sa 18	258°43.5 -19°13.8	273°43.3 -19°14.4	288°43.2 -19°15.0	303°43.1 -19°15.6	318°42.9 -19°16.2	333°42.8 -19°16.8	348°42.7 -19°17.3	3°42.5 -19°17.9	15°42.4 -19°18.5	33°42.3 -19°19.1	45°42.1 -19°19.7	63°42.0 -19°20.3	-0.1 -0.6
Su 19	258°40.2 -19°27.9	273°40.1 -19°28.5	288°39.9 -19°29.1	303°39.8 -19°29.6	318°39.7 -19°30.2	333°39.5 -19°30.8	348°39.4 -19°31.4	3°39.2 -19°31.9	15°39.1 -19°32.5	33°39.0 -19°33.1	45°38.8 -19°33.7	63°38.7 -19°34.2	-0.1 -0.6
Mo 20	258°36.8 -19°41.6	273°36.7 -19°42.2	288°36.5 -19°42.8	303°36.4 -19°43.3	318°36.2 -19°43.9	333°36.1 -19°44.5	348°35.9 -19°45.0	3°35.8 -19°45.6	15°35.6 -19°46.2	33°35.4 -19°46.7	45°35.3 -19°47.3	63°35.2 -19°47.8	-0.1 -0.6
Tu 21	258°33.2 -19°55.0	273°33.0 -19°55.6	288°32.9 -19°56.1	303°32.7 -19°56.7	318°32.5 -19°57.2	333°32.4 -19°57.8	348°32.2 -19°58.3	3°32.1 -19°58.9	15°31.9 -19°59.4	33°31.8 -20°00.0	45°31.6 -20°00.5	63°31.4 -20°01.1	-0.2 -0.5
We 22	258°29.3 -20°08.1	273°29.2 -20°08.6	288°29.0 -20°09.1	303°28.9 -20°09.7	318°28.7 -20°10.2	333°28.5 -20°10.8	348°28.4 -20°11.3	3°28.2 -20°11.8	15°28.0 -20°12.3	33°27.9 -20°12.9	45°27.7 -20°13.4	63°27.5 -20°13.9	-0.2 -0.5
Th 23	258°25.3 -20°20.7	273°25.2 -20°21.3	288°25.0 -20°21.8	303°24.8 -20°22.3	318°24.6 -20°22.8	333°24.5 -20°23.3	348°24.3 -20°23.8	3°24.1 -20°24.4	15°23.9 -20°24.9	33°23.8 -20°25.4	45°23.6 -20°25.9	63°23.4 -20°26.4	-0.2 -0.5
Fr 24	258°21.1 -20°33.0	273°20.9 -20°33.5	288°20.8 -20°34.0	303°20.6 -20°34.5	318°20.4 -20°35.0	333°20.2 -20°35.5	348°20.0 -20°36.0	3°19.9 -20°36.5	15°19.7 -20°37.0	33°19.5 -20°37.5	45°19.3 -20°38.0	63°19.1 -20°38.5	-0.2 -0.5
Sa 25	258°16.7 -20°44.9	273°16.5 -20°45.4	288°16.3 -20°45.9	303°16.2 -20°46.4	318°16.0 -20°46.9	333°15.8 -20°47.4	348°15.6 -20°47.9	3°15.4 -20°48.3	15°15.2 -20°48.8	33°15.0 -20°49.3	45°14.8 -20°49.8	63°14.6 -20°50.3	-0.2 -0.5
Su 26	258°12.1 -20°56.5	273°11.9 -20°56.9	288°11.7 -20°57.4	303°11.5 -20°57.9	318°11.4 -20°58.3	333°11.2 -20°58.8	348°11.0 -20°59.3	3°10.8 -20°59.8	15°10.6 -21°00.2	33°10.4 -21°00.7	45°10.2 -21°01.1	63°10.0 -21°01.6	-0.2 -0.5
Mo 27	258°07.4 -21°07.6	273°07.2 -21°08.0	288°07.0 -21°08.5	303°06.8 -21°08.9	318°06.6 -21°09.4	333°06.3 -21°09.9	348°06.1 -21°10.3	3°05.9 -21°10.8	15°05.7 -21°11.2	33°05.5 -21°11.7	45°05.3 -21°12.1	63°05.1 -21°12.6	-0.2 -0.5
Tu 28	258°02.4 -21°18.3	273°02.2 -21°18.8	288°02.0 -21°19.2	303°01.8 -21°19.6	318°01.6 -21°20.1	333°01.4 -21°20.5	348°01.1 -21°20.9	3°00.9 -21°21.4	15°00.7 -21°21.8	33°00.5 -21°22.2	45°00.3 -21°22.7	63°00.1 -21°23.1	-0.2 -0.4
We 29	257°57.3 -21°27.8	272°57.1 -21°28.5	287°56.8 -21°29.5	302°56.6 -21°29.9	317°56.4 -21°30.3	332°56.2 -21°30.8	347°56.0 -21°31.2	2°55.7 -21°31.6	15°55.5 -21°32.0	32°55.3 -21°32.4	47°55.1 -21°32.8	62°54.9 -21°33.2	-0.2 -0.4
Th 30	257°52.0 -21°38.6	272°51.7 -21°39.1	287°51.5 -21°39.4	302°51.3 -21°39.8	317°51.1 -21°40.2	332°50.8 -21°40.6	347°50.6 -21°41.0	2°50.4 -21°41.4	15°50.2 -21°41.8	32°49.9 -21°42.2	47°49.7 -21°42.6	62°49.5 -21°43.0	-0.2 -0.4

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

November 2034

	D	19h	20h	21h	22h	23h	0h	1h	2h	3h	4h	5h	Δ'/h SH
O	We 1	227°17.5 17°05.6	241°43.8 17°01.5	256°10.1 16°50.7	270°36.6 16°52.9	285°03.1 16°48.5	299°29.7 16°43.9	313°56.3 16°39.3	328°23.1 16°34.6	342°49.9 16°29.8	357°16.8 16°24.8	11°43.7 16°19.8	+26.6 -4.6
	Th 2	228°37.0 14°54.2	243°05.2 14°47.8	257°33.4 14°41.4	272°01.7 14°34.8	286°30.1 14°28.2	300°58.6 14°21.6	315°27.1 14°14.8	329°55.7 14°08.0	344°24.4 14°01.1	358°53.2 13°54.2	13°22.0 13°47.2	+28.5 -6.7
	Fr 3	230°43.0 11°54.2	245°13.0 8°46.2	259°43.0 8°02.6	274°13.1 11°30.1	288°44.3 11°22.0	303°13.5 11°13.8	317°43.8 11°05.1	332°14.1 10°57.2	346°44.5 10°48.0	1°15.0 10°40.5	15°45.6 10°32.1	+30.3 -8.2
	Sa 4	233°30.9 8°20.7	248°02.4 8°11.7	262°33.9 8°02.6	277°05.5 7°53.5	291°37.1 7°44.4	306°08.8 7°35.2	320°40.5 7°26.0	335°12.3 7°16.8	349°44.1 7°07.6	4°16.0 6°58.3	18°47.9 6°49.0	+31.7 -9.2
	Su 5	248°02.4 8°11.7	262°33.9 8°02.6	277°05.5 7°53.5	291°37.1 7°44.4	306°08.8 7°35.2	320°40.5 7°26.0	335°12.3 7°16.8	349°44.1 7°07.6	4°16.0 6°58.3	18°47.9 6°49.0	33°19.8 6°39.7	+31.8 -9.2
●	Mo 6	251°24.5 4°17.6	265°57.1 4°08.0	280°29.8 3°58.4	295°02.5 3°48.8	309°35.2 3°39.2	324°07.9 3°29.6	338°40.7 3°19.9	353°13.5 3°10.3	7°46.4 3°00.6	22°19.3 2°50.9	36°52.2 2°41.2	+32.8 -9.6
	Tu 7	255°08.9 0°15.9	269°42.2 0°06.2	284°15.5 -0°03.5	298°48.8 -0°13.1	313°22.2 -0°22.8	327°55.5 -0°32.5	342°28.9 -0°42.1	357°02.3 -0°51.7	11°35.7 -1°01.4	26°09.1 -1°11.0	40°42.5 -1°20.6	+33.4 -9.7
	We 8	259°05.2 -7°29.7	273°38.7 -7°38.4	288°12.3 -7°47.0	302°45.8 -7°55.6	317°19.4 -8°04.2	331°53.0 -8°12.8	346°26.5 -8°21.2	1°00.1 -8°29.7	15°33.7 -8°38.1	30°07.2 -8°54.9	44°40.8 -8°54.9	+33.6 -8.5
	Th 9	263°03.8 -7°29.7	277°37.3 -7°38.4	292°10.8 -7°47.0	306°44.3 -7°55.6	321°17.7 -8°04.2	335°51.1 -8°12.8	350°24.6 -8°21.2	4°58.0 -8°29.7	19°31.4 -8°38.1	34°04.8 -8°54.9	48°38.2 -8°54.9	+33.4 -8.5
	Fr 10	266°57.3 -10°54.9	281°30.4 -11°02.5	296°03.5 -11°10.1	310°36.6 -11°17.6	325°09.7 -11°25.1	339°42.8 -11°32.6	354°15.8 -11°40.0	8°48.9 -11°47.3	23°21.9 -11°54.6	37°54.9 -12°01.8	52°27.9 -12°09.9	+33.1 -7.4
●	Sa 11	270°40.0 -13°50.0	285°12.6 -13°56.3	299°45.3 -14°02.8	314°17.8 -14°08.7	328°50.4 -14°14.7	343°23.0 -14°20.8	357°55.5 -14°26.7	12°28.0 -14°32.6	27°00.5 -14°38.1	41°32.9 -14°44.2	56°05.4 -14°49.9	+32.5 -6.0
	Su 12	274°09.3 -16°07.4	288°41.3 -16°12.0	303°13.4 -16°16.5	317°45.4 -16°21.0	332°17.5 -16°25.4	346°49.4 -16°29.7	1°21.4 -16°33.9	15°53.4 -16°38.1	30°25.3 -16°42.2	44°57.2 -16°46.2	59°29.1 -16°50.2	+32.0 -4.3
	Mo 13	277°25.0 -17°40.2	291°56.6 -17°42.9	306°28.2 -17°45.5	320°59.7 -17°48.1	335°31.3 -17°50.5	350°02.8 -17°52.9	4°34.3 -17°55.2	19°05.7 -17°57.4	33°37.2 -17°59.6	48°08.6 -18°01.7	62°40.1 -18°03.6	+31.5 -2.3
	Tu 14	280°29.8 -18°23.4	295°01.0 -18°24.0	309°32.2 -18°24.6	324°03.4 -18°25.1	338°34.6 -18°25.8	353°05.8 -18°26.6	7°37.0 -18°26.1	22°08.1 -18°26.1	36°39.2 -18°26.2	51°10.4 -18°26.2	65°41.5 -18°26.0	+31.2 -0.3
	We 15	283°27.5 -18°14.0	297°58.6 -18°12.5	312°29.6 -18°10.9	327°00.6 -18°09.2	341°31.6 -18°07.5	356°02.6 -18°05.7	10°33.6 -18°03.7	25°04.6 -18°01.7	39°35.6 -17°59.6	54°06.6 -17°57.5	68°37.6 -17°55.2	+31.0 -1.9
O	Th 16	286°22.3 -17°11.1	300°53.3 -17°07.5	315°24.3 -17°03.8	329°55.2 -17°00.0	344°26.2 -16°56.2	358°57.2 -16°52.2	13°28.2 -16°48.2	27°59.2 -16°44.1	42°30.1 -16°39.9	57°01.1 -16°35.6	71°31.2 -16°31.3	+31.0 -0.4
	Fr 17	289°16.8 -15°16.3	303°47.8 -15°10.6	318°18.8 -15°04.9	332°49.8 -14°59.1	347°20.8 -14°53.3	1°51.8 -14°47.3	16°22.8 -14°41.3	30°53.8 -14°35.2	45°24.7 -14°29.0	59°55.7 -14°22.8	74°26.7 -14°16.5	+31.0 -6.5
	Sa 18	292°11.2 -12°32.8	306°42.2 -12°25.3	321°13.1 -12°17.8	335°44.0 -12°10.2	350°15.0 -12°02.5	4°45.9 -11°54.7	19°16.8 -11°46.9	33°47.7 -11°39.0	48°18.6 -11°31.1	62°49.5 -11°23.0	77°20.4 -11°14.9	+30.9 -7.8
	Su 19	295°02.4 -9°06.1	309°33.1 -8°57.0	324°03.8 -8°47.9	338°34.5 -8°38.7	353°05.1 -8°29.4	7°35.7 -8°20.1	22°06.4 -8°10.8	36°37.0 -8°01.4	51°07.6 -7°51.9	65°38.1 -7°42.4	80°08.7 -7°32.8	+30.6 -9.3
	Mo 20	297°44.1 -5°03.5	312°14.3 -4°53.2	326°44.4 -4°42.8	341°15.4 -4°32.4	355°44.6 -4°22.0	10°14.6 -4°11.5	24°44.6 -4°01.0	39°14.6 -3°50.5	53°44.5 -3°39.9	68°14.4 -3°29.3	82°44.3 -3°18.6	+30.0 -10.5
O	Tu 21	300°07.7 -0°35.3	314°36.9 -0°24.3	329°06.1 -0°13.2	343°35.2 -0°02.1	358°04.3 0°09.1	12°33.3 0°20.2	27°02.3 0°31.4	41°31.2 0°42.6	56°00.1 0°53.7	70°29.0 1°04.9	84°57.7 1°16.1	+29.0 +11.2
	We 22	302°03.0 4°04.6	316°30.8 4°15.8	330°58.7 4°26.9	345°26.4 4°38.1	359°54.1 4°49.3	5°09.1 5°00.4	28°49.3 5°11.5	43°16.8 5°11.5	57°44.3 5°33.7	72°11.7 5°44.8	86°39.9 5°55.9	+27.6 +11.1
	Th 23	303°20.7 8°37.9	317°46.9 8°48.4	332°13.1 8°58.9	346°39.2 9°09.3	1°05.2 9°19.6	15°31.2 9°29.9	29°57.0 9°40.2	44°22.9 9°50.4	58°48.6 10°00.5	73°14.3 10°10.6	87°39.9 10°20.6	+25.9 +10.3
	Fr 24	303°55.6 15°54.8	318°20.1 16°01.1	332°44.6 16°07.3	347°09.0 16°13.3	1°33.3 16°19.3	15°57.5 16°25.1	30°21.7 16°30.7	44°45.9 16°36.3	59°09.9 16°41.7	73°33.9 16°47.0	87°57.9 16°52.2	+24.2 +5.7
	Sa 25	303°50.6 15°54.8	318°13.7 16°01.1	332°36.8 16°07.3	346°59.8 16°13.3	1°22.9 16°19.3	15°45.8 16°25.1	30°08.7 16°30.7	44°31.6 16°36.3	58°54.5 16°41.7	73°17.3 16°47.0	87°40.1 16°52.2	+22.9 +5.7
O	Su 26	303°19.5 17°54.2	317°42.1 17°57.2	332°04.6 18°00.1	346°27.1 18°02.9	0°49.9 18°05.6	15°12.2 18°08.1	29°34.7 18°10.4	43°57.2 18°12.7	58°19.8 18°14.8	72°42.3 18°16.7	87°04.9 18°18.5	+22.5 +2.4
	Mo 27	302°46.1 18°29.1	317°09.0 18°28.7	331°32.1 18°28.2	345°55.2 18°27.5	0°18.3 18°26.7	14°41.4 18°25.8	29°04.4 18°24.7	43°27.9 18°23.5	57°51.2 18°22.2	72°14.6 18°20.8	86°38.0 18°19.2	+23.2 -1.0
	Tu 28	302°36.6 17°40.2	317°01.0 17°36.6	331°25.5 17°32.9	345°50.1 17°29.1	0°14.8 17°25.2	14°39.5 17°21.2	29°04.4 17°17.0	43°29.3 17°12.8	57°54.2 17°08.4	72°19.3 17°03.9	86°44.4 16°59.4	+24.8 -4.1
	We 29	317°01.0 17°36.6	331°25.5 17°32.9	345°50.1 17°29.1	0°14.8 17°25.2	14°39.5 17°21.2	29°04.4 17°17.0	43°29.3 17°12.8	57°54.2 17°08.4	72°19.3 17°03.9	86°44.4 16°59.4	101°09.6 16°54.7	+24.9 -4.2
	Th 30	317°37.9 15°32.4	332°04.5 15°26.2	346°31.1 15°19.8	0°57.9 15°13.4	15°24.7 15°06.9	29°51.6 15°00.4	44°18.6 14°53.7	58°45.7 14°47.0	73°12.9 14°40.2	87°40.2 14°33.3	102°07.6 14°26.3	+27.0 -6.6

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 3 03h27 — NM: 11 01h16 — FQ: 19 04h01 — FM: 25 03h32

SUN

December 2034

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Fr 1	272°46.3 -21°48.8	287°46.0 -21°48.9	302°45.8 -21°49.2	317°45.6 -21°49.6	332°45.3 -21°50.0	347°45.1 -21°50.4	2°44.9 -21°50.8	17°44.6 -21°51.2	32°44.4 -21°51.5	47°44.2 -21°51.9	62°43.9 -21°52.3	77°43.7 -21°52.7	-0.2 -0.4
Sa 2	272°40.6 -21°57.6	287°40.4 -21°57.9	302°40.1 -21°58.3	317°39.9 -21°58.7	332°39.6 -21°59.4	347°39.4 -21°59.4	2°39.2 -21°59.8	17°38.9 -22°00.1	32°38.7 -22°00.5	47°38.4 -22°00.8	62°38.2 -22°01.2	77°38.0 -22°01.6	-0.2 -0.4
Su 3	272°34.8 -22°06.2	287°34.5 -22°06.6	302°34.3 -22°06.9	317°34.1 -22°07.3	332°33.8 -22°07.6	347°33.6 -22°08.0	2°33.3 -22°08.3	17°33.1 -22°08.7	32°32.8 -22°09.0	47°32.6 -22°09.3	62°32.3 -22°09.7	77°32.1 -22°10.0	-0.2 -0.3
Mo 4	272°28.8 -22°14.4	287°28.6 -22°14.8	302°28.3 -22°15.1	317°28.1 -22°15.4	332°27.8 -22°15.8	347°27.6 -22°16.1	2°27.3 -22°16.4	17°27.0 -22°16.8	32°26.8 -22°17.1	47°26.5 -22°17.4	62°26.3 -22°17.7	77°26.0 -22°18.1	-0.3 -0.3
Tu 5	272°22.7 -22°22.2	287°22.4 -22°22.6	302°22.2 -22°22.9	317°21.9 -22°23.2	332°21.7 -22°23.5	347°21.4 -22°23.8	2°21.1 -22°24.1	17°20.9 -22°24.4	32°20.6 -22°24.7	47°20.4 -22°25.1	62°20.1 -22°25.4	77°19.8 -22°25.7	-0.3 -0.4
We 6	272°16.4 -22°29.5	287°16.2 -22°29.9	302°15.9 -22°30.2	317°15.6 -22°30.5	332°15.4 -22°30.8	347°15.1 -22°31.1	2°14.9 -22°31.4	17°14.6 -22°31.7	32°14.3 -22°32.0	47°14.1 -22°32.3	62°13.8 -22°32.5	77°13.5 -22°32.8	-0.3 -0.3
Th 7	272°10.0 -22°36.5	287°09.8 -22°36.8	302°09.5 -22°37.1	317°09.2 -22°37.4	332°09.0 -22°37.6	347°08.7 -22°37.9	2°08.4 -22°38.2	17°08.2 -22°38.5	32°07.9 -22°38.7	47°07.6 -22°39.0	62°07.3 -22°39.3	77°07.1 -22°39.6	-0.3 -0.3
Fr 8	272°03.5 -22°43.0	287°03.2 -22°43.3	302°03.0 -22°43.5	317°02.7 -22°43.8	332°02.4 -22°44.1	347°02.1 -22°44.3	2°01.9 -22°44.6	17°01.6 -22°44.8	32°01.3 -22°45.1	47°01.0 -22°45.3	62°00.8 -22°45.6	77°00.5 -22°45.8	-0.3 -0.3
Sa 9	271°56.9 -22°49.1	286°56.6 -22°49.3	301°56.3 -22°49.6	316°56.0 -22°49.8	331°55.8 -22°50.0	346°55.5 -22°50.3	1°55.2 -22°50.5	16°54.9 -22°51.0	31°54.6 -22°51.2	46°54.4 -22°51.4	61°54.1 -22°51.5	76°53.8 -22°51.7	-0.3 -0.2
Su 10	271°50.7 -22°54.7	286°49.8 -22°54.9	301°49.6 -22°55.1	316°49.3 -22°55.3	331°49.0 -22°55.5	346°48.7 -22°55.8	1°48.4 -22°56.2	16°48.1 -22°56.2	31°47.8 -22°56.4	46°47.7 -22°56.6	61°47.3 -22°56.9	76°47.0 -22°57.1	-0.3 -0.2
Mo 11	271°43.3 -22°59.8	286°43.0 -22°59.8	301°42.7 -22°59.8	316°42.4 -22°59.8	331°42.1 -22°59.8	346°41.8 -22°59.8	1°41.5 -22°59.8	16°41.2 -22°59.8	31°41.0 -22°59.8	46°40.7 -22°59.8	61°40.4 -22°59.8	76°40.1 -22°59.8	-0.3 -0.2
Tu 12	271°36.3 -22°54.9	286°36.0 -22°54.7	301°35.7 -22°54.9	316°35.4 -22°54.9	331°35.1 -22°54.9	346°34.8 -22°54.9	1°34.6 -22°54.9	16°34.3 -22°54.9	31°34.0 -22°54.9	46°33.7 -22°54.9	61°33.4 -22°54.9	76°33.1 -22°54.9	-0.3 -0.2
We 13	271°29.3 -23°08.7	286°29.0 -23°08.9	301°28.7 -23°09.1	316°28.4 -23°09.2	331°28.1 -23°09.4	346°27.8 -23°09.5	1°27.5 -23°09.7	16°27.2 -23°09.9	31°26.9 -23°10.0	46°26.6 -23°10.0	61°26.3 -23°10.0	76°26.0 -23°10.0	-0.3 -0.2
Th 14	271°22.2 -23°12.9	286°21.8 -23°12.6	301°21.5 -23°12.8	316°21.2 -23°12.9	331°20.9 -23°13.1	346°20.6 -23°13.2	1°20.3 -23°13.3	16°20.0 -23°13.5	31°19.7 -23°13.6	46°19.4 -23°13.8	61°19.2 -23°13.9	76°18.9 -23°14.1	-0.3 -0.1
Fr 15	271°14.9 -23°15.8	286°14.6 -23°15.9	301°14.3 -23°16.1	316°14.0 -23°16.2	331°13.7 -23°16.3	346°13.4 -23°16.4	1°13.1 -23°16.5	16°12.8 -23°16.7	31°12.5 -23°16.8	46°12.2 -23°16.9	61°11.9 -23°17.0	76°11.6 -23°17.2	-0.3 -0.1
Sa 16	271°07.7 -23°18.6	286°07.4 -23°18.8	301°07.1 -23°18.9	316°06.8 -23°19.0	331°06.5 -23°19.1	346°06.2 -23°19.2	1°06.9 -23°19.3	16°05.6 -23°19.4	31°05.3 -23°19.5	46°05.0 -23°19.6	61°04.7 -23°19.7	76°04.4 -23°19.8	-0.3 -0.1
Su 17	271°00.4 -23°21.0	286°00.1 -23°21.1	300°59.8 -23°21.2	315°59.5 -23°21.3	330°59.2 -23°21.4	345°58.9 -23°21.5	0°58.6 -23°21.6	15°58.3 -23°21.6	30°57.9 -23°21.7	45°57.6 -23°21.8	60°57.3 -23°21.9	75°57.0 -23°22.0	-0.3 -0.1
Mo 18	270°53.0 -23°22.9	285°52.7 -23°23.0	300°52.4 -23°23.1	315°52.1 -23°23.1	330°51.8 -23°23.2	345°51.5 -23°23.3	0°51.2 -23°23.3	15°50.9 -23°23.4	30°50.6 -23°23.5	45°50.3 -23°23.6	60°50.0 -23°23.6	75°49.7 -23°23.7	-0.3 -0.1
Tu 19	270°45.7 -23°24.4	285°45.4 -23°24.4	300°45.1 -23°24.5	315°44.7 -23°24.5	330°44.4 -23°24.6	345°44.1 -23°24.6	0°43.8 -23°24.7	15°43.5 -23°24.7	30°43.2 -23°24.7	45°42.9 -23°24.8	60°42.6 -23°24.8	75°42.3 -23°24.9	-0.3 -0.0
We 20	270°38.3 -23°25.3	285°38.0 -23°25.4	300°37.6 -23°25.4	315°37.3 -23°25.4	330°37.0 -23°25.5	345°36.7 -23°25.5	0°36.4 -23°25.5	15°36.1 -23°25.5	30°35.8 -23°25.6	45°35.5 -23°25.6	60°35.2 -23°25.6	75°34.9 -23°25.6	-0.3 -0.0
Th 21	270°30.8 -23°25.8	285°30.5 -23°25.9	300°30.2 -23°25.9	315°29.9 -23°25.9	330°29.6 -23°25.9	345°29.3 -23°25.9	0°29.0 -23°25.9	15°28.7 -23°25.9	30°28.4 -23°25.9	45°28.1 -23°25.9	60°27.7 -23°25.9	75°27.4 -23°25.9	-0.3 -0.0
Fr 22	270°23.4 -23°25.9	285°23.1 -23°25.9	300°22.8 -23°25.9	315°22.5 -23°25.8	330°22.2 -23°25.8	345°21.9 -23°25.8	0°21.5 -23°25.8	15°21.2 -23°25.8	30°20.9 -23°25.8	45°20.6 -23°25.8	60°20.3 -23°25.8	75°20.0 -23°25.7	-0.3 +0.0
Sa 23	270°16.0 -23°25.4	285°15.7 -23°25.4	300°15.4 -23°25.4	315°15.0 -23°25.3	330°14.7 -23°25.3	345°14.4 -23°25.3	0°14.1 -23°25.3	15°13.8 -23°25.2	30°13.5 -23°25.2	45°13.2 -23°25.2	60°12.9 -23°25.1	75°12.6 -23°25.1	-0.3 +0.0
Su 24	270°08.5 -23°24.5	285°08.2 -23°24.5	300°07.9 -23°24.4	315°07.6 -23°24.4	330°07.3 -23°24.3	345°07.0 -23°24.3	0°06.7 -23°24.2	15°06.4 -23°24.2	30°06.1 -23°24.1	45°05.8 -23°24.1	60°05.5 -23°24.0	75°05.1 -23°24.0	-0.3 +0.1
Mo 25	270°01.1 -23°23.1	285°00.8 -23°23.1	300°00.5 -23°23.0	315°00.2 -23°22.9	330°59.9 -23°22.9	344°59.6 -23°22.8	344°59.6 -23°22.7	14°59.0 -23°22.7	29°58.7 -23°22.6	44°58.4 -23°22.5	59°58.0 -23°22.4	74°57.7 -23°22.4	-0.3 +0.1
Tu 26	269°53.7 -23°21.3	284°53.4 -23°21.2	299°53.1 -23°21.1	314°52.8 -23°21.0	329°52.5 -23°20.9	344°52.2 -23°20.9	344°52.2 -23°20.9	14°51.6 -23°20.7	29°51.3 -23°20.6	44°51.0 -23°20.6	59°50.7 -23°20.6	74°50.4 -23°20.3	-0.3 +0.1
We 27	269°46.4 -23°19.0	284°46.1 -23°18.9	299°45.8 -23°18.7	314°45.5 -23°18.5	329°45.1 -23°18.5	344°44.8 -23°18.4	344°44.8 -23°18.3	14°44.2 -23°18.2	29°43.9 -23°18.1	44°43.6 -23°18.0	59°43.3 -23°17.9	74°43.0 -23°17.8	-0.3 +0.1
Th 28	269°39.9 -23°16.2	284°38.7 -23°16.1	299°38.4 -23°15.9	314°38.1 -23°15.8	329°37.8 -23°15.7	344°37.5 -23°15.6	344°37.5 -23°15.6	14°36.9 -23°15.3	29°36.6 -23°15.2	44°36.3 -23°15.2	59°36.0 -23°15.0	74°35.7 -23°14.8	-0.3 +0.1
Fr 29	269°31.8 -23°12.9	284°31.5 -23°12.8	299°31.1 -23°12.6	314°30.8 -23°12.5	329°30.5 -23°12.4	344°30.2 -23°12.2	344°30.2 -23°12.1	14°29.6 -23°11.9	29°29.3 -23°11.8	44°29.0 -23°11.6	59°28.7 -23°11.4	74°28.4 -23°11.3	-0.3 +0.1
Sa 30	269°24.5 -23°09.2	284°24.2 -23°09.1	299°23.9 -23°08.9	314°23.6 -23°08.7	329°23.3 -23°08.6	344°23.0 -23°08.4	344°23.0 -23°08.2	14°22.4 -23°08.0	29°22.1 -23°07.9	44°21.8 -23°07.7	59°21.5 -23°07.5	74°21.2 -23°07.4	-0.3 +0.2
Su 31	269°17.3 -23°05.0	284°17.0 -23°04.9	299°16.7 -23°04.7	314°16.4 -23°04.5	329°16.1 -23°04.3	344°15.8 -23°04.1	344°15.8 -23°03.9	14°15.2 -23°03.7	29°14.9 -23°03.5	44°14.7 -23°03.4	59°14.4 -23°03.2	74°14.1 -23°03.0	-0.3 +0.2

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

December 2034

	D	20h	21h	22h	23h	0h	1h	2h	3h	4h	5h	6h	Δ'/h SH
●	Fr 1	234°28.0 9°51.6	248°58.3 9°42.6	263°28.6 9°33.6	277°58.9 9°24.6	292°29.4 9°15.5	306°59.9 8°57.3	321°30.5 8°57.3	336°01.1 8°48.1	350°31.8 8°38.9	5°02.6 8°29.7	19°33.5 8°20.4	+30.5 15.6 -9.1 57.1
	Sa 2	237°23.8 5°58.4	251°55.6 5°48.7	266°27.5 5°39.1	280°59.4 5°29.4	295°31.4 5°19.7	310°03.4 5°10.0	324°35.5 5°00.3	339°07.6 4°50.6	353°39.8 4°40.9	8°12.0 4°31.1	22°44.3 4°21.4	+32.1 15.3 -9.7 56.2
	Su 3	240°53.5 1°54.4	255°26.5 1°44.6	269°59.4 1°34.8	284°32.4 1°24.9	299°05.4 1°15.1	313°38.5 1°05.3	328°11.6 0°55.5	342°44.7 0°45.7	357°17.8 0°35.9	11°51.0 0°26.1	26°24.2 0°16.4	+33.1 15.1 -9.8 55.4
●	Mo 4	255°26.5 1°44.6	269°59.4 1°34.8	284°32.4 1°24.9	299°05.4 1°15.1	313°38.5 1°05.3	328°11.6 0°55.5	342°44.7 0°45.7	357°17.8 0°35.9	11°51.0 0°26.1	26°24.2 0°16.4	40°57.4 0°06.6	+33.1 15.1 -9.8 55.4
	Tu 5	259°18.3 -2°18.7	273°51.9 -2°28.3	288°25.4 -2°37.9	302°59.0 -2°47.4	317°32.6 -2°57.0	332°06.2 -3°06.5	346°39.8 -3°15.9	1°13.4 -3°25.4	15°47.0 -3°34.9	30°20.6 -3°44.3	44°54.2 -3°53.7	+33.6 14.9 -9.5 54.8
	We 6	263°19.3 -6°11.8	277°53.0 -6°20.8	292°26.6 -6°29.8	307°00.3 -6°38.7	321°34.0 -6°47.6	336°07.6 -6°56.5	350°41.3 -7°05.3	5°14.9 -7°14.1	16°48.6 -7°22.8	34°22.2 -7°31.6	48°55.8 -7°40.3	+33.7 14.8 -8.8 54.4
●	Th 7	267°19.0 -9°46.2	281°52.5 -9°54.3	296°25.9 -10°02.3	310°59.3 -10°10.3	325°32.7 -10°18.2	340°06.1 -10°26.1	354°39.4 -10°33.9	9°12.8 -10°41.8	23°46.1 -10°49.5	38°19.4 -10°57.2	52°52.7 -11°04.9	+33.4 14.7 -7.9 54.1
	Fr 8	271°09.5 -12°53.8	285°42.5 -13°00.6	300°15.4 -13°07.4	314°48.3 -13°14.1	329°21.1 -13°20.7	343°54.0 -13°27.4	358°26.8 -13°33.9	12°59.6 -13°40.4	27°32.4 -13°46.8	42°05.1 -13°53.2	56°37.8 -13°59.5	+32.8 14.7 -6.6 53.9
	Sa 9	274°45.6 -15°26.7	289°17.9 -15°32.0	303°50.1 -15°37.2	318°22.4 -15°42.4	332°54.6 -15°47.5	347°26.8 -15°57.4	1°59.9 -16°02.3	16°31.1 -16°07.1	31°03.3 -16°11.9	45°35.4 -16°16.4	60°07.4 -16°21.0	+32.2 14.7 -5.0 53.9
●	Su 10	278°05.4 -17°17.7	292°37.1 -17°21.2	307°08.7 -17°24.6	321°40.3 -17°27.9	336°11.9 -17°31.1	350°43.5 -17°34.3	5°15.0 -17°37.8	19°46.6 -17°40.4	34°18.1 -17°43.3	48°49.6 -17°48.9	63°21.0 -17°54.1	+31.6 14.7 -3.1 53.9
	Mo 11	281°10.7 -18°20.5	295°41.8 -18°22.0	310°13.0 -18°23.8	324°44.1 -18°24.6	339°15.2 -18°25.8	353°46.3 -18°26.9	8°17.4 -18°27.9	22°48.5 -18°28.9	37°19.6 -18°29.7	51°50.6 -18°30.5	66°21.7 -18°31.1	+31.1 14.7 -1.1 54.1
	Tu 12	284°06.0 -18°30.9	298°36.9 -18°30.2	313°07.8 -18°29.4	327°38.6 -18°28.5	342°09.5 -18°27.6	356°40.4 -18°26.5	11°11.2 -18°25.4	25°42.1 -18°24.1	40°13.0 -18°22.8	54°43.8 -18°21.4	69°14.7 -18°19.9	+30.9 14.8 +1.1 54.3
●	We 13	286°57.4 -17°47.2	301°28.2 -17°44.3	315°59.1 -17°41.3	330°30.0 -17°38.3	345°00.8 -17°35.2	359°31.7 -17°31.9	14°02.6 -17°28.6	28°33.5 -17°25.3	43°04.4 -17°21.8	57°35.3 -17°18.3	72°06.2 -17°14.6	+30.9 14.9 +3.3 54.6
	Th 14	289°50.5 -16°10.3	304°21.5 -16°05.3	318°52.5 -16°00.3	333°23.5 -15°55.2	347°54.6 -15°50.1	362°25.6 -15°44.8	16°56.7 -15°39.9	31°27.7 -15°34.1	45°58.8 -15°28.6	60°29.9 -15°23.0	75°01.0 -15°17.4	+31.1 15.0 +5.3 55.0
	Fr 15	292°48.4 -13°44.0	307°19.6 -13°37.2	321°50.9 -13°30.3	336°22.1 -13°23.4	350°53.1 -13°16.4	5°24.6 -13°09.3	19°55.9 -13°02.1	34°27.2 -12°54.9	48°58.4 -12°47.6	63°29.7 -12°40.3	78°01.7 -12°32.9	+31.3 15.1 +7.1 55.5
●	Sa 16	295°50.9 -10°34.1	310°22.3 -10°25.7	324°53.6 -10°17.2	339°25.0 -10°08.7	353°56.3 -10°00.1	8°27.2 -9°51.5	22°59.0 -9°42.8	37°30.4 -9°34.1	52°01.7 -9°25.3	66°33.1 -9°16.5	81°04.4 -9°07.6	+31.3 15.3 +8.7 56.2
	Su 17	298°53.8 -6°48.2	313°25.0 -6°38.5	327°56.2 -6°28.8	342°27.4 -6°19.0	356°58.6 -6°09.3	11°29.8 -5°59.4	26°00.9 -5°49.6	40°32.1 -5°39.6	55°03.2 -5°29.7	69°34.3 -5°19.7	84°05.4 -5°09.7	+31.2 15.5 +9.8 56.9
	Mo 18	301°49.3 -2°35.4	316°20.0 -2°24.8	330°50.0 -2°14.3	345°21.3 -2°03.7	359°52.0 -1°53.1	14°22.6 -1°42.5	28°53.1 -1°31.9	43°23.7 -1°21.2	57°54.2 -1°10.5	72°24.7 -0°59.8	86°55.1 -0°49.1	+30.6 15.7 +10.6 57.7
●	Tu 19	304°26.9 1°53.1	318°56.7 2°04.0	333°26.6 2°14.9	347°56.1 2°25.8	362°27.5 2°36.7	16°55.3 2°47.6	31°24.8 2°58.5	45°54.3 3°09.3	60°23.7 3°20.2	74°53.0 3°31.1	89°22.4 3°41.9	+29.5 16.0 +10.9 58.6
	We 20	306°35.1 6°23.5	321°03.4 6°34.1	335°31.7 6°44.7	350°00.0 6°55.2	4°28.1 7°05.8	18°56.2 7°16.3	33°24.2 7°26.8	47°52.2 7°37.2	62°20.1 7°47.6	76°47.9 7°58.0	91°15.6 8°08.3	+28.1 16.2 +10.5 59.5
	Th 21	308°03.2 10°38.3	322°29.8 10°47.8	336°56.3 10°57.4	351°22.7 11°06.8	5°49.1 11°16.3	20°15.3 11°25.6	34°41.5 11°34.9	49°07.7 11°44.1	63°33.7 11°53.2	77°59.7 12°02.3	92°25.6 12°11.3	+26.2 16.4 +9.3 60.2
●	Fr 22	308°45.1 14°17.0	323°09.8 14°24.7	337°34.4 14°32.3	351°59.0 14°39.8	6°23.5 14°47.7	20°47.9 14°54.5	35°12.3 15°01.7	49°36.6 15°08.8	63°00.8 15°15.8	78°25.0 15°22.7	92°49.1 15°29.5	+24.4 16.6 +7.3 60.8
	Sa 23	308°43.4 16°58.1	323°06.5 17°03.0	337°29.7 17°07.9	351°52.8 17°12.6	6°15.8 17°15.2	20°38.8 17°21.6	35°01.8 17°26.0	49°24.7 17°30.2	63°47.6 17°34.2	78°10.5 17°38.2	92°33.3 17°42.0	+23.0 16.7 +4.4 61.1
	Su 24	308°12.6 18°23.0	322°35.1 18°24.7	336°57.6 18°26.2	351°20.1 18°27.5	5°42.6 18°28.7	20°05.0 18°29.8	34°27.5 18°30.8	48°50.0 18°31.6	63°12.5 18°32.2	77°35.0 18°32.7	91°57.5 18°33.1	+22.5 16.7 +1.0 61.1
●	Mo 25	307°37.7 18°22.2	322°00.6 18°20.4	336°23.6 18°18.5	350°46.6 18°16.4	5°09.6 18°14.2	19°32.7 18°11.8	33°55.9 18°09.3	48°19.1 18°06.7	62°42.3 18°04.0	77°05.6 18°01.1	91°28.9 17°58.1	+23.1 16.6 -2.4 60.7
	Tu 26	307°26.4 16°58.3	321°50.8 16°53.4	336°15.2 16°48.3	350°39.7 16°43.2	5°04.3 16°37.9	19°29.0 16°32.5	33°53.7 16°27.1	48°18.6 16°21.5	62°43.5 16°15.8	77°08.5 16°10.0	91°33.5 16°04.1	+24.7 16.4 -5.4 60.1
	We 27	307°59.6 14°24.5	322°26.0 14°17.1	336°52.6 14°09.7	351°19.2 14°02.2	5°45.9 13°54.6	20°12.6 13°47.9	34°39.5 13°39.3	49°06.5 13°31.5	63°33.5 13°23.6	78°00.6 13°15.6	92°27.8 13°07.6	+26.8 16.1 -7.7 59.2
●	Th 28	322°26.0 14°17.1	336°52.6 14°09.7	351°19.2 14°02.2	5°45.9 13°54.6	20°12.6 13°47.9	34°39.5 13°39.3	49°06.5 13°31.5	63°33.5 13°23.6	78°00.6 13°15.6	92°27.8 13°07.6	106°55.1 12°59.6	+26.9 16.1 -7.8 59.1
	Fr 29	323°55.2 10°51.0	338°23.8 10°42.0	352°52.6 10°33.0	7°21.4 10°23.9	21°50.4 10°14.8	36°19.4 10°05.6	50°48.5 9°56.4	65°17.7 9°47.1	79°46.9 9°37.8	94°16.2 9°28.5	108°45.6 9°19.1	+29.1 15.9 -9.2 58.1
	Sa 30	326°15.9 6°54.6	340°46.4 6°44.8	355°17.1 6°34.9	9°47.7 6°25.1	24°18.6 6°15.2	38°49.5 6°05.3	53°20.4 5°55.3	67°51.4 5°45.4	82°22.4 5°35.4	96°63.5 5°25.5	111°24.7 5°15.5	+30.9 15.6 -9.9 57.1
●	Su 31	329°19.0 2°44.8	343°51.0 2°34.8	358°23.1 2°24.7	12°55.3 2°14.6	27°27.4 2°04.6	41°59.7 1°54.5	56°31.9 1°44.4	71°04.2 1°34.4	85°36.6 1°24.3	100°09.0 1°14.3	114°41.4 1°04.3	+32.2 15.3 -10.1 56.2

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter
Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax
Column = (UTC hour - day) mod 24
LQ: 2 16h46 — NM: 10 20h14 — FQ: 18 17h44 — FM: 25 08h54

SUN

January 2035

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Mo 1	269°10.2 -23°00.4	284°09.9 -23°00.2	299°09.6 -23°00.0	314°09.3 -22°59.8	329°09.0 -22°59.6	344°08.7 -22°59.4	359°08.4 -22°59.2	14°08.1 -22°59.0	29°07.9 -22°58.7	44°07.6 -22°58.5	59°07.3 -22°58.3	74°07.0 -22°58.1	-0.3 +0.2
Tu 2	269°03.2 -22°55.3	284°02.9 -22°55.1	299°02.6 -22°54.8	314°02.3 -22°54.6	329°02.0 -22°54.4	344°01.7 -22°54.2	359°01.4 -22°53.9	14°01.1 -22°53.7	29°00.8 -22°53.5	44°00.5 -22°53.3	59°00.3 -22°53.0	74°00.0 -22°52.8	-0.3 +0.2
We 3	268°56.2 -22°49.7	283°55.9 -22°49.5	298°55.6 -22°49.2	313°55.3 -22°49.0	328°55.0 -22°48.8	343°54.8 -22°48.5	358°54.5 -22°48.3	13°54.2 -22°48.0	28°53.9 -22°47.8	43°53.6 -22°47.5	58°53.3 -22°47.3	73°53.0 -22°47.0	-0.3 +0.2
Th 4	268°49.3 -22°43.7	283°49.0 -22°43.5	298°48.8 -22°43.2	313°48.5 -22°42.9	328°48.2 -22°42.7	343°47.9 -22°42.4	358°47.6 -22°42.1	13°47.3 -22°41.9	28°47.1 -22°41.6	43°46.8 -22°41.3	58°46.5 -22°41.1	73°46.2 -22°40.8	-0.3 +0.3
Fr 5	268°42.5 -22°37.2	283°42.3 -22°37.0	298°42.0 -22°36.7	313°41.7 -22°36.4	328°41.4 -22°36.1	343°41.1 -22°35.8	358°40.9 -22°35.6	13°40.6 -22°35.3	28°40.3 -22°35.0	43°40.0 -22°34.7	58°39.7 -22°34.4	73°39.5 -22°34.1	-0.3 +0.3
Sa 6	268°35.9 -22°30.3	283°35.6 -22°30.0	298°35.3 -22°29.7	313°35.0 -22°29.4	328°34.8 -22°29.1	343°34.5 -22°28.8	358°34.2 -22°28.5	13°33.9 -22°28.2	28°33.7 -22°27.9	43°33.4 -22°27.6	58°33.1 -22°27.3	73°32.8 -22°27.0	-0.3 +0.3
Su 7	268°29.3 -22°23.0	283°29.0 -22°22.7	298°28.8 -22°22.3	313°28.5 -22°22.0	328°28.2 -22°21.7	343°27.9 -22°21.4	358°27.7 -22°21.1	13°27.4 -22°20.7	28°27.1 -22°20.4	43°26.9 -22°20.1	58°26.6 -22°19.8	73°26.3 -22°19.5	-0.3 +0.3
Mo 8	268°22.9 -22°15.2	283°22.6 -22°14.8	298°22.3 -22°14.5	313°22.1 -22°14.2	328°21.8 -22°13.8	343°21.5 -22°13.5	358°21.3 -22°13.2	13°21.0 -22°12.8	28°20.7 -22°12.5	43°20.5 -22°12.1	58°20.2 -22°11.8	73°19.9 -22°11.5	-0.3 +0.3
Tu 9	268°16.5 -22°06.9	283°16.3 -22°06.6	298°16.0 -22°06.2	313°15.8 -22°05.9	328°15.5 -22°05.5	343°15.2 -22°05.2	358°15.0 -22°04.8	13°14.7 -22°04.4	28°14.5 -22°04.1	43°14.2 -22°03.7	58°13.9 -22°03.4	73°13.7 -22°03.0	-0.3 +0.4
We 10	268°10.3 -21°58.3	283°10.1 -21°57.9	298°09.8 -21°57.5	313°09.6 -21°57.2	328°09.3 -21°56.8	343°09.1 -21°56.4	358°08.8 -21°56.0	13°08.6 -21°55.7	28°08.3 -21°55.3	43°08.1 -21°54.9	58°07.8 -21°54.5	73°07.6 -21°54.2	-0.3 +0.2
Th 11	268°04.3 -21°49.2	283°04.1 -21°48.8	298°03.8 -21°48.4	313°03.6 -21°48.0	328°03.3 -21°47.6	343°03.1 -21°47.2	358°02.8 -21°46.8	13°02.6 -21°46.4	28°02.3 -21°46.0	43°02.1 -21°45.7	58°01.8 -21°45.3	73°01.6 -21°44.9	-0.2 +0.4
Fr 12	267°58.4 -21°39.7	282°58.2 -21°39.2	297°57.9 -21°38.8	312°57.7 -21°38.4	327°57.4 -21°38.0	342°57.1 -21°37.6	357°56.9 -21°37.2	12°56.7 -21°36.8	27°56.5 -21°36.4	42°56.2 -21°36.0	57°56.0 -21°35.6	72°55.8 -21°35.1	-0.2 +0.4
Sa 13	267°52.7 -21°29.7	282°52.4 -21°29.3	297°52.3 -21°28.9	312°52.0 -21°28.4	327°51.7 -21°28.0	342°51.5 -21°27.6	357°51.2 -21°27.2	12°51.0 -21°26.7	27°50.8 -21°26.3	42°50.5 -21°25.9	57°50.3 -21°25.4	72°50.1 -21°25.0	-0.2 +0.4
Su 14	267°47.1 -21°19.4	282°46.8 -21°18.9	297°46.6 -21°18.5	312°46.4 -21°18.0	327°46.2 -21°17.6	342°45.9 -21°17.1	357°45.7 -21°16.7	12°45.5 -21°16.3	27°45.2 -21°15.8	42°45.0 -21°15.4	57°44.8 -21°14.9	72°44.6 -21°14.5	-0.2 +0.4
Mo 15	267°41.7 -21°08.6	282°41.4 -21°08.1	297°41.2 -21°07.7	312°41.0 -21°07.2	327°40.8 -21°06.8	342°40.5 -21°06.3	357°40.3 -21°05.8	12°40.1 -21°05.4	27°39.9 -21°04.9	42°39.7 -21°04.4	57°39.4 -21°04.0	72°39.2 -21°03.5	-0.2 +0.5
Tu 16	267°36.4 -20°57.4	282°36.2 -20°56.9	297°36.0 -20°56.5	312°35.8 -20°56.0	327°35.6 -20°55.5	342°35.3 -20°55.0	357°35.1 -20°54.6	12°34.9 -20°54.1	27°34.7 -20°53.6	42°34.5 -20°53.1	57°34.3 -20°52.6	72°34.1 -20°52.2	-0.2 +0.5
We 17	267°31.3 -20°45.8	282°31.1 -20°45.4	297°30.9 -20°44.9	312°30.7 -20°44.4	327°30.5 -20°43.9	342°30.3 -20°43.4	357°30.1 -20°42.9	12°29.9 -20°42.4	27°29.7 -20°41.9	42°29.5 -20°41.4	57°29.3 -20°40.9	72°29.1 -20°40.4	-0.2 +0.5
Th 18	267°26.4 -20°33.9	282°26.2 -20°33.4	297°26.0 -20°32.9	312°25.9 -20°32.4	327°25.7 -20°31.8	342°25.5 -20°31.3	357°25.3 -20°30.8	12°25.1 -20°30.3	27°24.9 -20°29.8	42°24.7 -20°29.3	57°24.5 -20°28.8	72°24.3 -20°28.3	-0.2 +0.5
Fr 19	267°21.7 -20°21.5	282°21.6 -20°21.0	297°21.4 -20°20.5	312°21.2 -20°20.0	327°21.0 -20°19.4	342°20.8 -20°18.9	357°20.6 -20°18.4	12°20.4 -20°17.8	27°20.2 -20°17.3	42°20.0 -20°16.8	57°19.8 -20°16.3	72°19.6 -20°15.7	-0.2 +0.5
Sa 20	267°17.2 -20°08.9	282°17.0 -20°08.2	297°16.9 -20°07.7	312°16.7 -20°07.2	327°16.5 -20°06.6	342°16.3 -20°06.1	357°16.1 -20°05.5	12°15.9 -20°05.0	27°15.8 -20°04.5	42°15.6 -20°03.9	57°15.4 -20°03.4	72°15.2 -20°02.8	-0.2 +0.5
Su 21	267°12.9 -19°55.7	282°12.7 -19°55.1	297°12.5 -19°54.6	312°12.4 -19°54.0	327°12.2 -19°53.4	342°12.0 -19°52.9	357°11.8 -19°52.3	12°11.7 -19°51.8	27°11.5 -19°51.2	42°11.3 -19°50.7	57°11.2 -19°50.1	72°11.0 -19°49.5	-0.2 +0.6
Mo 22	267°08.8 -19°42.2	282°08.6 -19°41.6	297°08.4 -19°41.0	312°08.3 -19°40.5	327°08.1 -19°39.9	342°07.9 -19°39.3	357°07.8 -19°38.8	12°07.6 -19°38.2	27°07.4 -19°37.6	42°07.3 -19°37.0	57°07.1 -19°36.5	72°06.9 -19°35.9	-0.2 +0.6
Tu 23	267°04.8 -19°28.3	282°04.7 -19°27.7	297°04.5 -19°27.2	312°04.3 -19°26.6	327°04.2 -19°26.0	342°04.0 -19°25.4	357°03.9 -19°24.8	12°03.7 -19°24.2	27°03.5 -19°23.6	42°03.4 -19°23.0	57°03.2 -19°22.5	72°03.1 -19°21.9	-0.2 +0.6
We 24	267°01.1 -19°14.1	282°00.9 -19°13.5	297°00.8 -19°12.9	312°00.6 -19°12.3	327°00.5 -19°11.7	342°00.3 -19°11.1	357°00.2 -19°10.5	12°00.0 -19°09.9	26°59.9 -19°09.3	41°59.7 -19°08.7	56°59.6 -19°08.1	71°59.4 -19°07.5	-0.2 +0.6
Th 25	266°57.5 -18°59.6	281°57.4 -18°58.9	296°57.2 -18°58.3	311°57.1 -18°57.7	326°56.9 -18°57.1	341°56.8 -18°56.5	356°56.7 -18°55.9	11°56.5 -18°55.2	26°56.4 -18°54.6	41°56.2 -18°54.0	56°56.1 -18°53.4	71°56.0 -18°52.8	-0.1 +0.6
Fr 26	266°54.2 -18°44.6	281°54.0 -18°44.0	296°53.9 -18°43.4	311°53.8 -18°42.7	326°53.6 -18°42.1	341°53.5 -18°41.5	356°53.4 -18°40.9	11°53.2 -18°40.2	26°53.1 -18°39.6	41°53.0 -18°39.0	56°52.8 -18°38.3	71°52.7 -18°37.7	-0.1 +0.6
Sa 27	266°51.0 -18°29.4	281°50.9 -18°28.7	296°50.8 -18°28.1	311°50.6 -18°27.4	326°50.5 -18°26.8	341°50.4 -18°26.2	356°50.2 -18°25.5	11°50.1 -18°24.9	26°50.0 -18°24.2	41°49.9 -18°23.6	56°49.8 -18°22.9	71°49.6 -18°22.3	-0.1 +0.6
Su 28	266°48.0 -18°13.8	281°47.9 -18°13.1	296°47.8 -18°12.5	311°47.7 -18°11.8	326°47.6 -18°11.2	341°47.5 -18°10.5	356°47.3 -18°09.8	11°47.2 -18°09.2	26°47.1 -18°08.5	41°47.0 -18°07.9	56°46.9 -18°07.2	71°46.8 -18°06.5	-0.1 +0.7
Mo 29	266°45.3 -17°57.9	281°45.2 -17°57.2	296°45.1 -17°56.5	311°45.0 -17°55.9	326°44.8 -17°55.2	341°44.7 -17°54.5	356°44.6 -17°53.8	11°44.5 -17°53.2	26°44.4 -17°52.5	41°44.3 -17°51.8	56°44.2 -17°51.1	71°44.1 -17°50.5	-0.1 +0.7
Tu 30	266°42.7 -17°41.6	281°42.6 -17°40.9	296°42.5 -17°40.3	311°42.4 -17°39.6	326°42.3 -17°38.9	341°42.2 -17°38.2	356°42.1 -17°37.5	11°42.0 -17°36.8	26°41.9 -17°36.1	41°41.8 -17°35.4	56°41.7 -17°34.8	71°41.6 -17°34.1	-0.1 +0.7
We 31	266°40.4 -17°25.1	281°40.3 -17°24.4	296°40.2 -17°23.7	311°40.1 -17°23.0	326°40.0 -17°22.3	341°39.9 -17°21.6	356°39.8 -17°20.9	11°39.7 -17°20.2	26°39.6 -17°19.5	41°39.5 -17°18.8	56°39.4 -17°18.1	71°39.3 -17°17.4	-0.1 +0.7

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 16.3'

MOON

January 2035

	D	21h	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	Δ'/h SH
O	Mo 1	234 ⁰ 49.4 -4 ⁰ 18.9	249 ⁰ 22.8 -4 ⁰ 28.3	263 ⁰ 56.1 -4 ⁰ 37.7	278 ⁰ 29.5 -4 ⁰ 47.1	293 ⁰ 02.9 -4 ⁰ 56.5	307 ⁰ 36.3 -5 ⁰ 05.8	322 ⁰ 09.7 -5 ⁰ 15.1	336 ⁰ 43.1 -5 ⁰ 24.4	351 ⁰ 16.5 -5 ⁰ 33.6	5 ⁰ 49.9 -5 ⁰ 42.8	20 ⁰ 23.4 -5 ⁰ 52.0	+33.4 15.0 -9.3 54.9
	Tu 2	238 ⁰ 45.3 -8 ⁰ 05.4	253 ⁰ 18.8 -8 ⁰ 14.0	267 ⁰ 52.3 -8 ⁰ 22.6	282 ⁰ 25.7 -8 ⁰ 31.1	296 ⁰ 59.2 -8 ⁰ 39.6	311 ⁰ 32.6 -8 ⁰ 48.0	326 ⁰ 06.0 -9 ⁰ 04.8	340 ⁰ 39.5 -9 ⁰ 13.1	355 ⁰ 12.9 -9 ⁰ 21.4	9 ⁰ 46.3 -9 ⁰ 21.4	24 ⁰ 19.7 -9 ⁰ 29.6	+33.4 14.8 -8.4 54.4
	We 3	253 ⁰ 18.8 -8 ⁰ 14.0	267 ⁰ 52.3 -8 ⁰ 22.6	282 ⁰ 25.7 -8 ⁰ 31.1	296 ⁰ 59.2 -8 ⁰ 39.6	311 ⁰ 32.6 -8 ⁰ 48.0	326 ⁰ 06.0 -9 ⁰ 04.8	340 ⁰ 39.5 -9 ⁰ 13.1	355 ⁰ 12.9 -9 ⁰ 21.4	9 ⁰ 46.3 -9 ⁰ 21.4	24 ⁰ 19.7 -9 ⁰ 29.6	38 ⁰ 53.1 -9 ⁰ 37.8	+33.4 14.8 -8.4 54.4
●	Th 4	257 ⁰ 12.6 -11 ⁰ 35.0	271 ⁰ 45.8 -11 ⁰ 42.4	286 ⁰ 19.0 -11 ⁰ 49.8	300 ⁰ 52.1 -11 ⁰ 57.1	315 ⁰ 25.3 -12 ⁰ 04.4	329 ⁰ 58.4 -12 ⁰ 11.6	344 ⁰ 31.5 -12 ⁰ 18.8	359 ⁰ 04.5 -12 ⁰ 25.9	13 ⁰ 37.6 -12 ⁰ 32.9	28 ⁰ 10.6 -12 ⁰ 39.9	42 ⁰ 43.6 -12 ⁰ 46.8	+33.1 14.8 -7.2 54.1
	Fr 5	260 ⁰ 56.1 -14 ⁰ 24.0	275 ⁰ 28.8 -14 ⁰ 30.0	290 ⁰ 01.4 -14 ⁰ 36.0	304 ⁰ 34.0 -14 ⁰ 41.8	319 ⁰ 06.6 -14 ⁰ 47.7	333 ⁰ 39.1 -14 ⁰ 53.4	348 ⁰ 11.6 -14 ⁰ 59.1	2 ⁰ 44.1 -15 ⁰ 04.7	17 ⁰ 16.6 -15 ⁰ 10.2	31 ⁰ 49.0 -15 ⁰ 15.7	46 ⁰ 21.4 -15 ⁰ 21.1	+32.5 14.7 -5.7 54.0
	Sa 6	264 ⁰ 24.2 -16 ⁰ 34.2	278 ⁰ 56.2 -16 ⁰ 38.5	293 ⁰ 28.1 -16 ⁰ 42.7	308 ⁰ 00.0 -16 ⁰ 46.8	322 ⁰ 31.9 -16 ⁰ 50.9	337 ⁰ 03.8 -16 ⁰ 54.9	351 ⁰ 35.6 -16 ⁰ 58.9	6 ⁰ 07.4 -17 ⁰ 02.7	20 ⁰ 39.2 -17 ⁰ 06.5	35 ⁰ 10.9 -17 ⁰ 10.2	49 ⁰ 42.7 -17 ⁰ 13.8	+31.8 14.7 -4.0 54.0
●	Su 7	267 ⁰ 35.3 -17 ⁰ 58.8	282 ⁰ 06.6 -18 ⁰ 01.2	296 ⁰ 37.9 -18 ⁰ 03.5	311 ⁰ 09.2 -18 ⁰ 05.7	325 ⁰ 40.4 -18 ⁰ 07.8	340 ⁰ 11.7 -18 ⁰ 09.8	354 ⁰ 42.8 -18 ⁰ 11.8	9 ⁰ 14.0 -18 ⁰ 13.6	23 ⁰ 45.2 -18 ⁰ 15.4	38 ⁰ 16.3 -18 ⁰ 17.1	52 ⁰ 47.4 -18 ⁰ 18.7	+31.2 14.8 -2.0 54.1
	Mo 8	270 ⁰ 31.7 -18 ⁰ 32.6	285 ⁰ 02.5 -18 ⁰ 32.9	299 ⁰ 33.3 -18 ⁰ 33.0	314 ⁰ 04.1 -18 ⁰ 33.1	328 ⁰ 34.8 -18 ⁰ 33.0	343 ⁰ 05.6 -18 ⁰ 32.9	357 ⁰ 36.3 -18 ⁰ 32.7	12 ⁰ 07.1 -18 ⁰ 32.4	26 ⁰ 37.8 -18 ⁰ 32.1	41 ⁰ 08.5 -18 ⁰ 31.0	55 ⁰ 39.2 -18 ⁰ 31.0	+30.7 14.8 -0.2 54.3
	Tu 9	273 ⁰ 18.5 -18 ⁰ 12.1	287 ⁰ 49.0 -18 ⁰ 10.1	302 ⁰ 19.6 -18 ⁰ 08.1	316 ⁰ 50.2 -18 ⁰ 05.9	331 ⁰ 20.7 -18 ⁰ 03.7	345 ⁰ 51.3 -18 ⁰ 01.4	0 ⁰ 21.8 -17 ⁰ 58.6	14 ⁰ 52.4 -17 ⁰ 56.4	29 ⁰ 22.9 -17 ⁰ 53.9	43 ⁰ 53.5 -17 ⁰ 51.2	58 ⁰ 24.0 -17 ⁰ 48.4	+30.6 14.9 -2.4 54.7
●	We 10	276 ⁰ 02.3 -16 ⁰ 56.6	290 ⁰ 32.9 -16 ⁰ 52.4	305 ⁰ 03.5 -16 ⁰ 48.2	319 ⁰ 34.1 -16 ⁰ 43.9	334 ⁰ 04.7 -16 ⁰ 39.5	348 ⁰ 35.3 -16 ⁰ 35.1	3 ⁰ 05.9 -16 ⁰ 30.5	17 ⁰ 36.6 -16 ⁰ 25.9	32 ⁰ 07.2 -16 ⁰ 21.1	46 ⁰ 37.8 -16 ⁰ 16.3	61 ⁰ 08.5 -16 ⁰ 11.5	+30.6 15.0 -4.5 55.0
	Th 11	278 ⁰ 49.3 -14 ⁰ 48.6	293 ⁰ 20.1 -14 ⁰ 42.5	307 ⁰ 50.9 -14 ⁰ 36.3	322 ⁰ 21.7 -14 ⁰ 30.0	336 ⁰ 52.5 -14 ⁰ 23.6	351 ⁰ 23.4 -14 ⁰ 17.2	5 ⁰ 54.2 -14 ⁰ 10.7	20 ⁰ 25.1 -14 ⁰ 04.1	34 ⁰ 56.0 -13 ⁰ 57.5	49 ⁰ 26.9 -13 ⁰ 50.2	63 ⁰ 57.8 -13 ⁰ 43.9	+30.9 15.1 -6.5 55.5
	Fr 12	281 ⁰ 42.6 -11 ⁰ 53.8	296 ⁰ 13.7 -11 ⁰ 45.9	310 ⁰ 44.8 -11 ⁰ 38.0	325 ⁰ 15.9 -11 ⁰ 30.0	339 ⁰ 47.0 -11 ⁰ 22.0	354 ⁰ 18.1 -11 ⁰ 13.9	8 ⁰ 49.2 -11 ⁰ 05.7	23 ⁰ 20.4 -10 ⁰ 57.5	37 ⁰ 51.5 -10 ⁰ 49.2	52 ⁰ 22.7 -10 ⁰ 40.9	66 ⁰ 53.8 -10 ⁰ 32.5	+31.1 15.3 -8.1 55.9
●	Sa 13	284 ⁰ 42.0 -8 ⁰ 20.1	299 ⁰ 13.3 -8 ⁰ 10.9	313 ⁰ 44.5 -8 ⁰ 01.6	328 ⁰ 15.8 -7 ⁰ 52.3	342 ⁰ 47.0 -7 ⁰ 42.9	357 ⁰ 18.3 -7 ⁰ 33.5	11 ⁰ 49.6 -7 ⁰ 24.1	26 ⁰ 20.8 -7 ⁰ 14.6	40 ⁰ 52.1 -7 ⁰ 05.1	55 ⁰ 23.4 -6 ⁰ 55.5	69 ⁰ 54.6 -6 ⁰ 45.9	+31.3 15.4 -9.4 56.5
	Su 14	287 ⁰ 43.1 -4 ⁰ 17.3	302 ⁰ 14.3 -4 ⁰ 07.2	316 ⁰ 45.4 -3 ⁰ 57.0	331 ⁰ 16.6 -3 ⁰ 46.8	345 ⁰ 47.7 -3 ⁰ 36.6	360 ⁰ 42.9 -3 ⁰ 26.3	0 ⁰ 18.9 -3 ⁰ 16.0	14 ⁰ 50.0 -3 ⁰ 05.7	29 ⁰ 21.1 -2 ⁰ 55.3	43 ⁰ 52.2 -2 ⁰ 45.0	58 ⁰ 23.3 -2 ⁰ 34.6	+31.1 15.6 -10.3 57.0
	Mo 15	290 ⁰ 38.1 0 ⁰ 03.1	305 ⁰ 08.8 0 ⁰ 13.7	319 ⁰ 39.5 0 ⁰ 24.4	334 ⁰ 10.2 0 ⁰ 35.0	348 ⁰ 40.6 0 ⁰ 45.6	3 ⁰ 11.5 0 ⁰ 56.2	8 ⁰ 11.4 1 ⁰ 06.9	32 ⁰ 12.6 1 ⁰ 17.5	46 ⁰ 43.2 1 ⁰ 28.2	61 ⁰ 13.7 1 ⁰ 38.8	75 ⁰ 44.1 1 ⁰ 49.5	+30.6 15.7 -10.6 57.7
●	Tu 16	293 ⁰ 16.8 4 ⁰ 28.5	307 ⁰ 46.7 4 ⁰ 39.1	322 ⁰ 16.6 4 ⁰ 49.6	336 ⁰ 46.3 5 ⁰ 00.1	351 ⁰ 16.6 5 ⁰ 10.5	5 ⁰ 45.7 5 ⁰ 21.0	20 ⁰ 15.3 5 ⁰ 31.4	34 ⁰ 44.9 5 ⁰ 41.8	49 ⁰ 14.4 5 ⁰ 52.2	64 ⁰ 43.3 6 ⁰ 02.6	78 ⁰ 13.3 6 ⁰ 12.9	+29.7 15.9 -10.4 58.3
	We 17	295 ⁰ 28.5 8 ⁰ 44.4	309 ⁰ 57.0 8 ⁰ 54.2	324 ⁰ 25.5 9 ⁰ 03.9	338 ⁰ 54.0 9 ⁰ 13.7	353 ⁰ 24.0 9 ⁰ 23.3	5 ⁰ 50.7 9 ⁰ 33.0	22 ⁰ 18.9 9 ⁰ 42.6	36 ⁰ 47.1 9 ⁰ 52.1	51 ⁰ 15.2 10 ⁰ 01.6	65 ⁰ 43.3 10 ⁰ 11.0	80 ⁰ 11.3 10 ⁰ 20.4	+28.3 16.1 -9.6 58.9
	Th 18	297 ⁰ 03.6 12 ⁰ 34.1	311 ⁰ 30.5 12 ⁰ 42.5	325 ⁰ 57.5 12 ⁰ 50.8	340 ⁰ 24.2 12 ⁰ 59.0	354 ⁰ 51.0 13 ⁰ 07.2	9 ⁰ 17.6 13 ⁰ 15.3	23 ⁰ 44.2 13 ⁰ 23.3	38 ⁰ 10.8 13 ⁰ 31.2	52 ⁰ 37.3 13 ⁰ 39.1	67 ⁰ 03.7 13 ⁰ 46.9	81 ⁰ 30.7 13 ⁰ 54.6	+26.6 16.2 -8.1 59.5
●	Fr 19	297 ⁰ 57.2 15 ⁰ 39.5	312 ⁰ 22.5 15 ⁰ 45.7	326 ⁰ 47.7 15 ⁰ 51.9	341 ⁰ 12.9 15 ⁰ 57.9	355 ⁰ 38.0 16 ⁰ 03.8	10 ⁰ 03.1 16 ⁰ 09.6	24 ⁰ 28.1 16 ⁰ 15.4	38 ⁰ 53.0 16 ⁰ 21.0	53 ⁰ 17.9 16 ⁰ 26.5	67 ⁰ 42.7 16 ⁰ 31.9	82 ⁰ 07.5 16 ⁰ 37.2	+25.0 16.4 -5.8 60.0
	Sa 20	298 ⁰ 12.8 17 ⁰ 42.7	312 ⁰ 36.8 17 ⁰ 46.2	327 ⁰ 00.7 17 ⁰ 49.5	341 ⁰ 24.6 17 ⁰ 52.6	355 ⁰ 48.5 17 ⁰ 55.7	10 ⁰ 12.3 17 ⁰ 58.6	24 ⁰ 36.1 18 ⁰ 01.4	38 ⁰ 59.9 18 ⁰ 04.0	53 ⁰ 23.7 18 ⁰ 06.6	67 ⁰ 47.4 18 ⁰ 09.0	82 ⁰ 11.1 18 ⁰ 11.3	+23.8 16.4 -2.9 60.3
	Su 21	298 ⁰ 03.9 18 ⁰ 29.8	312 ⁰ 27.3 18 ⁰ 30.0	326 ⁰ 50.8 18 ⁰ 30.8	341 ⁰ 14.2 18 ⁰ 29.9	355 ⁰ 37.6 18 ⁰ 29.7	10 ⁰ 01.0 18 ⁰ 29.4	24 ⁰ 24.5 18 ⁰ 28.9	38 ⁰ 47.9 18 ⁰ 28.3	53 ⁰ 11.4 18 ⁰ 27.5	67 ⁰ 34.8 18 ⁰ 26.6	81 ⁰ 58.3 18 ⁰ 25.6	+23.4 16.5 -4.0 60.4
●	Mo 22	297 ⁰ 52.5 17 ⁰ 54.6	312 ⁰ 16.3 17 ⁰ 51.6	326 ⁰ 40.2 17 ⁰ 48.3	341 ⁰ 04.1 17 ⁰ 45.0	355 ⁰ 28.0 17 ⁰ 41.5	9 ⁰ 52.0 17 ⁰ 38.0	24 ⁰ 16.1 17 ⁰ 34.2	38 ⁰ 40.1 17 ⁰ 30.4	53 ⁰ 04.3 17 ⁰ 26.5	67 ⁰ 28.4 17 ⁰ 22.4	81 ⁰ 52.6 17 ⁰ 18.2	+24.0 16.4 -3.6 60.2
	Tu 23	298 ⁰ 02.1 16 ⁰ 01.7	312 ⁰ 27.2 15 ⁰ 55.7	326 ⁰ 52.4 15 ⁰ 49.6	341 ⁰ 17.6 15 ⁰ 43.4	355 ⁰ 42.9 15 ⁰ 37.2	10 ⁰ 08.3 15 ⁰ 30.8	24 ⁰ 33.7 15 ⁰ 24.3	38 ⁰ 59.2 15 ⁰ 17.8	53 ⁰ 24.8 15 ⁰ 11.1	67 ⁰ 50.5 15 ⁰ 04.3	82 ⁰ 16.2 14 ⁰ 57.5	+25.4 16.3 -6.4 59.7
	We 24	298 ⁰ 50.5 13 ⁰ 04.5	313 ⁰ 17.4 12 ⁰ 56.3	327 ⁰ 44.4 12 ⁰ 48.1	342 ⁰ 11.4 12 ⁰ 39.8	356 ⁰ 38.6 12 ⁰ 31.4	11 ⁰ 05.7 12 ⁰ 23.0	25 ⁰ 33.0 12 ⁰ 14.5	40 ⁰ 00.4 12 ⁰ 05.9	54 ⁰ 27.8 11 ⁰ 57.3	68 ⁰ 55.3 11 ⁰ 48.6	83 ⁰ 29.2 11 ⁰ 39.8	+27.2 16.1 -8.5 59.1
●	Th 25	300 ⁰ 25.5 9 ⁰ 22.0	314 ⁰ 54.3 5 ⁰ 12.4	329 ⁰ 23.2 0 ⁰ 02.8	343 ⁰ 52.1 8 ⁰ 53.2	358 ⁰ 21.1 8 ⁰ 43.5	12 ⁰ 50.1 8 ⁰ 33.8	27 ⁰ 19.3 8 ⁰ 24.0	41 ⁰ 48.5 8 ⁰ 14.2	56 ⁰ 17.8 8 ⁰ 04.4	70 ⁰ 47.1 7 ⁰ 54.6	85 ⁰ 16.5 7 ⁰ 46.7	+29.1 15.9 -9.7 58.2
	Fr 26	302 ⁰ 45.7 5 ⁰ 13.7	317 ⁰ 16.1 5 ⁰ 03.5	331 ⁰ 46.6 4 ⁰ 53.2	346 ⁰ 17.2 4 ⁰ 43.0	357 ⁰ 17.2 4 ⁰ 32.8	15 ⁰ 18.5 4 ⁰ 22.5	29 ⁰ 49.3 4 ⁰ 12.2	44 ⁰ 20.1 4 ⁰ 02.0	58 ⁰ 50.9 3 ⁰ 51.7	73 ⁰ 21.8 3 ⁰ 41.4	87 ⁰ 52.8 3 ⁰ 31.1	+30.7 15.6 -10.3 57.3
	Sa 27	317 ⁰ 16.1 5 ⁰ 03.5	331 ⁰ 46.6 4 ⁰ 53.2	346 ⁰ 17.2 4 ⁰ 43.0	357 ⁰ 17.2 4 ⁰ 32.8	15 ⁰ 18.5 4 ⁰ 22.5	29 ⁰ 49.3 4 ⁰ 12.2	44 ⁰ 20.1 4 ⁰ 02.0	58 ⁰ 50.9 3 ⁰ 51.7	73 ⁰ 21.8 3 ⁰ 41.4	87 ⁰ 52.8 3 ⁰ 31.1	102 ⁰ 23.8 3 ⁰ 20.8	+30.8 15.6 -10.3 57.3
●	Su 28	320 ⁰ 15.1 0 ⁰ 46.6	334 ⁰ 46.9 0 ⁰ 36.4	349 ⁰ 18.7 0 ⁰ 26.2	3 ⁰ 50.6 0 ⁰ 16.0	18 ⁰ 22.5 0 ⁰ 05.8	32 ⁰ 54.4 -0 ⁰ 04.4	47					

SUN

February 2035

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Th 1	266°38.2 -17°08.2	2281°38.1 -17°07.5	296°38.0 -17°06.8	311°37.9 -17°06.1	326°37.8 -17°05.3	341°37.8 -17°04.6	356°37.7 -17°03.9	11°37.6 -17°03.2	26°37.5 -17°02.5	41°37.4 -17°01.8	56°37.3 -17°01.1	71°37.3 -17°00.4	-0.1 +0.7
Fr 2	266°36.2 -16°51.0	2281°36.1 -16°50.3	296°36.1 -16°49.6	311°36.0 -16°48.8	326°35.9 -16°48.1	341°35.8 -16°47.4	356°35.8 -16°46.7	11°35.7 -16°45.9	26°35.6 -16°45.2	41°35.5 -16°44.5	56°35.5 -16°43.8	71°35.4 -16°43.0	-0.1 +0.7
Sa 3	266°34.5 -16°33.5	2281°34.4 -16°32.8	296°34.3 -16°32.1	311°34.3 -16°31.3	326°34.2 -16°30.6	341°34.1 -16°29.9	356°34.0 -16°29.1	11°34.0 -16°28.4	26°33.9 -16°27.7	41°33.8 -16°26.9	56°33.8 -16°26.2	71°33.7 -16°25.4	-0.1 +0.7
Su 4	266°32.9 -16°15.8	2281°32.8 -16°15.0	296°32.8 -16°14.3	311°32.7 -16°13.5	326°32.6 -16°12.8	341°32.6 -16°12.0	356°32.5 -16°11.3	11°32.5 -16°10.5	26°32.4 -16°09.8	41°32.4 -16°09.0	56°32.3 -16°08.3	71°32.2 -16°07.5	-0.1 +0.7
Mo 5	266°31.5 -15°57.7	2281°31.5 -15°57.0	296°31.4 -15°56.2	311°31.4 -15°55.5	326°31.3 -15°54.7	341°31.3 -15°53.9	356°31.2 -15°53.2	11°31.2 -15°52.4	26°31.1 -15°51.7	41°31.1 -15°50.9	56°31.0 -15°50.1	71°31.0 -15°49.4	-0.1 +0.8
Tu 6	266°30.4 -15°39.4	2281°30.3 -15°38.7	296°30.3 -15°37.9	311°30.2 -15°37.1	326°30.2 -15°36.3	341°30.1 -15°35.6	356°30.1 -15°34.8	11°30.0 -15°34.0	26°30.0 -15°33.3	41°30.0 -15°32.5	56°29.9 -15°31.7	71°29.9 -15°30.9	-0.0 +0.8
We 7	266°29.4 -15°20.8	2281°29.3 -15°20.1	296°29.3 -15°19.3	311°29.3 -15°18.5	326°29.2 -15°17.7	341°29.2 -15°16.9	356°29.2 -15°16.2	11°29.1 -15°15.4	26°29.1 -15°14.6	41°29.1 -15°13.8	56°29.0 -15°13.0	71°29.0 -15°12.2	-0.0 +0.8
Th 8	266°28.6 -15°02.0	2281°28.6 -15°01.2	296°28.6 -15°00.4	311°28.5 -14°59.6	326°28.5 -14°58.8	341°28.5 -14°58.0	356°28.4 -14°57.2	11°28.4 -14°56.4	26°28.4 -14°55.7	41°28.4 -14°54.9	56°28.3 -14°54.1	71°28.3 -14°53.3	-0.0 +0.8
Fr 9	266°28.0 -14°42.9	2281°28.0 -14°42.1	296°28.0 -14°41.3	311°28.0 -14°40.5	326°28.0 -14°39.7	341°27.9 -14°38.9	356°27.9 -14°38.1	11°27.9 -14°37.3	26°27.9 -14°36.5	41°27.9 -14°35.7	56°27.9 -14°34.9	71°27.8 -14°34.1	-0.0 +0.8
Sa 10	266°27.7 -14°23.8	2281°27.6 -14°22.7	296°27.6 -14°21.9	311°27.6 -14°21.1	326°27.6 -14°20.3	341°27.6 -14°19.5	356°27.6 -14°18.7	11°27.6 -14°17.9	26°27.6 -14°17.0	41°27.6 -14°16.2	56°27.6 -14°15.4	71°27.5 -14°14.6	+0.0 +0.8
Su 11	266°27.5 -14°04.0	2281°27.5 -14°03.1	296°27.5 -14°02.3	311°27.5 -14°01.5	326°27.5 -14°00.7	341°27.5 -13°59.8	356°27.5 -13°59.0	11°27.5 -13°58.2	26°27.5 -13°57.4	41°27.5 -13°56.6	56°27.5 -13°55.7	71°27.5 -13°54.9	+0.0 +0.8
Mo 12	266°27.5 -13°44.1	2281°27.5 -13°43.3	296°27.5 -13°42.5	311°27.5 -13°41.6	326°27.5 -13°40.8	341°27.5 -13°40.0	356°27.5 -13°39.1	11°27.5 -13°38.3	26°27.5 -13°37.5	41°27.5 -13°36.6	56°27.5 -13°35.8	71°27.6 -13°35.0	+0.0 +0.8
Tu 13	266°27.7 -13°24.1	2281°27.7 -13°23.3	296°27.7 -13°22.4	311°27.7 -13°21.6	326°27.7 -13°20.7	341°27.8 -13°19.9	356°27.8 -13°19.0	11°27.8 -13°18.2	26°27.8 -13°17.4	41°27.8 -13°16.5	56°27.8 -13°15.7	71°27.8 -13°14.8	+0.0 +0.8
We 14	266°28.1 -13°03.8	2281°28.1 -13°03.0	296°28.1 -13°02.1	311°28.1 -13°01.3	326°28.2 -13°00.4	341°28.2 -12°59.6	356°28.2 -12°58.7	11°28.2 -12°57.9	26°28.3 -12°57.0	41°28.3 -12°56.2	56°28.3 -12°55.3	71°28.3 -12°54.5	+0.0 +0.9
Th 15	266°28.7 -12°43.4	2281°28.7 -12°42.5	296°28.7 -12°41.6	311°28.8 -12°40.8	326°28.8 -12°39.9	341°28.8 -12°39.1	356°28.8 -12°38.2	11°28.9 -12°37.3	26°28.9 -12°36.5	41°28.9 -12°35.6	56°28.9 -12°34.8	71°29.0 -12°33.9	+0.0 +0.9
Fr 16	266°29.4 -12°22.7	2281°29.5 -12°21.8	296°29.5 -12°20.9	311°29.5 -12°20.1	326°29.6 -12°19.2	341°29.6 -12°18.3	356°29.7 -12°17.5	11°29.7 -12°16.6	26°29.7 -12°15.7	41°29.8 -12°14.9	56°29.8 -12°14.0	71°29.9 -12°13.1	+0.0 +0.9
Sa 17	266°30.4 -12°01.8	2281°30.4 -12°00.9	296°30.5 -12°00.1	311°30.5 -11°59.2	326°30.6 -11°58.3	341°30.6 -11°57.4	356°30.7 -11°56.6	11°30.7 -11°55.7	26°30.8 -11°54.8	41°30.8 -11°53.9	56°30.8 -11°53.0	71°30.9 -11°52.2	+0.0 +0.9
Su 18	266°31.5 -11°40.7	2281°31.6 -11°39.9	296°31.6 -11°39.0	311°31.7 -11°38.1	326°31.7 -11°37.2	341°31.8 -11°36.3	356°31.8 -11°35.4	11°31.9 -11°34.6	26°31.9 -11°33.7	41°32.0 -11°32.8	56°32.1 -11°31.9	71°32.1 -11°31.0	+0.1 +0.9
Mo 19	266°32.8 -11°19.5	2281°32.9 -11°18.6	296°33.0 -11°17.7	311°33.0 -11°16.8	326°33.1 -11°15.9	341°33.1 -11°15.0	356°33.2 -11°14.1	11°33.2 -11°13.3	26°33.3 -11°12.4	41°33.4 -11°11.5	56°33.4 -11°10.6	71°33.5 -11°09.7	+0.1 +0.9
Tu 20	266°34.3 -10°58.1	2281°34.4 -10°57.2	296°34.4 -10°56.3	311°34.5 -10°55.4	326°34.6 -10°54.5	341°34.6 -10°53.6	356°34.7 -10°52.7	11°34.8 -10°51.8	26°34.8 -10°50.9	41°34.9 -10°50.0	56°35.0 -10°49.1	71°35.1 -10°48.2	+0.1 +0.9
We 21	266°36.5 -10°36.5	2281°36.0 -10°35.6	296°36.1 -10°34.7	311°36.7 -10°33.7	326°36.3 -10°32.8	341°36.3 -10°31.9	356°36.4 -10°31.0	11°36.5 -10°30.1	26°36.5 -10°29.2	41°36.6 -10°28.3	56°36.7 -10°27.4	71°36.8 -10°26.5	+0.1 +0.9
Th 22	266°37.8 -10°14.7	2281°37.9 -10°13.8	296°37.9 -10°12.9	311°38.0 -10°12.0	326°38.1 -10°11.1	341°38.2 -10°10.1	356°38.3 -10°09.2	11°38.3 -10°08.3	26°38.4 -10°07.4	41°38.5 -10°06.5	56°38.6 -10°05.6	71°38.7 -10°04.7	+0.1 +0.9
Fr 23	266°39.7 -9°52.8	2281°39.8 -9°51.9	296°39.9 -9°50.9	311°40.0 -9°50.0	326°40.1 -9°49.1	341°40.2 -9°48.2	356°40.3 -9°47.3	11°40.3 -9°46.4	26°40.4 -9°45.4	41°40.5 -9°44.5	56°40.6 -9°43.6	71°40.7 -9°42.7	+0.1 +0.9
Sa 24	266°41.9 -9°30.7	2281°41.9 -9°29.8	296°42.0 -9°28.9	311°42.1 -9°27.9	326°42.2 -9°27.0	341°42.3 -9°26.1	356°42.4 -9°25.2	11°42.5 -9°24.2	26°42.6 -9°23.3	41°42.7 -9°22.4	56°42.8 -9°21.5	71°42.9 -9°20.6	+0.1 +0.9
Su 25	266°44.1 -9°08.5	2281°44.2 -9°07.6	296°44.3 -9°06.6	311°44.4 -9°05.7	326°44.5 -9°04.8	341°44.6 -9°03.9	356°44.7 -9°02.9	11°44.8 -9°02.0	26°44.9 -9°01.1	41°45.0 -9°00.1	56°45.1 -8°59.2	71°45.2 -8°58.3	+0.1 +0.9
Mo 26	266°46.5 -8°46.2	2281°46.6 -8°45.2	296°46.7 -8°44.3	311°46.8 -8°43.3	326°46.9 -8°42.4	341°47.1 -8°41.5	356°47.2 -8°40.5	11°47.3 -8°39.6	26°47.4 -8°38.7	41°47.5 -8°37.7	56°47.6 -8°36.8	71°47.7 -8°35.9	+0.1 +0.9
Tu 27	266°49.4 -8°23.7	2281°49.2 -8°22.7	296°49.3 -8°21.8	311°49.4 -8°20.8	326°49.5 -8°19.9	341°49.6 -8°19.0	356°49.7 -8°18.0	11°49.8 -8°17.1	26°50.0 -8°16.1	41°50.1 -8°15.2	56°50.2 -8°14.3	71°50.3 -8°13.3	+0.1 +0.9
We 28	266°51.8 -8°01.1	2281°51.9 -8°00.1	296°52.0 -7°59.2	311°52.1 -7°58.2	326°52.2 -7°57.3	341°52.3 -7°56.3	356°52.4 -7°55.4	11°52.6 -7°54.4	26°52.7 -7°53.5	41°52.8 -7°52.6	56°52.9 -7°51.6	71°53.0 -7°50.7	+0.1 +0.9

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

February 2035

D	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	Δ'/h SH
Th 1	236°32.7 -15°29.9	251°05.0 -15°35.0	265°37.0 -15°40.1	280°09.5 -15°45.1	294°41.7 -15°50.1	309°13.9 -15°55.0	323°46.1 -15°59.8	338°18.2 -16°04.5	352°50.4 -16°09.2	7°22.5 -16°13.8	21°54.6 -16°18.3	+32.2 14.8 -4.8 54.1
Fr 2	251°05.0 -15°35.0	265°37.2 -15°40.1	280°09.5 -15°45.1	294°41.7 -15°50.1	309°13.9 -15°55.0	323°46.1 -15°59.8	338°18.2 -16°04.5	352°50.4 -16°09.2	7°22.5 -16°13.8	21°54.6 -16°18.3	36°26.6 -16°22.8	+32.2 14.8 -4.8 54.1
Sa 3	254°24.5 -17°20.7	268°56.2 -17°23.9	283°27.8 -17°27.1	297°59.4 -17°30.2	312°31.0 -17°33.2	327°02.6 -17°36.2	341°34.1 -17°39.0	356°05.6 -17°41.8	10°37.1 -17°44.5	25°08.6 -17°47.1	39°40.0 -17°49.7	+31.6 14.8 -2.9 54.1
Su 4	257°28.9 -18°17.9	272°00.0 -18°19.1	286°31.0 -18°20.3	301°02.1 -18°21.3	315°33.1 -18°22.3	330°04.1 -18°23.1	344°35.0 -18°23.9	359°06.0 -18°24.6	13°36.9 -18°25.2	28°07.8 -18°25.8	42°38.7 -18°26.2	+31.0 14.8 -0.8 54.3
Mo 5	260°20.0 -18°22.4	274°50.6 -18°21.4	289°21.2 -18°20.4	303°51.8 -18°19.2	318°22.4 -18°18.0	332°53.0 -18°16.7	347°23.5 -18°15.3	1°54.1 -18°13.8	16°24.6 -18°12.2	30°55.1 -18°10.6	45°25.7 -18°08.8	+30.6 14.9 +1.4 54.6
Tu 6	263°02.3 -17°31.7	277°32.7 -17°28.6	292°03.0 -17°25.3	306°33.4 -17°22.0	321°03.8 -17°18.5	335°34.1 -17°15.0	350°04.5 -17°11.4	4°34.9 -17°07.7	19°05.2 -17°03.9	33°35.6 -17°00.0	48°05.9 -16°55.0	+30.4 15.0 +3.6 55.1
We 7	265°41.2 -15°46.3	280°11.6 -15°41.0	294°41.9 -15°35.6	309°12.3 -15°30.2	323°42.7 -15°24.6	338°13.0 -15°19.0	352°43.4 -15°13.2	7°13.8 -15°07.4	21°44.2 -15°01.5	36°14.6 -14°55.6	50°45.0 -14°49.5	+30.4 15.2 +5.7 55.6
Th 8	268°21.5 -13°09.7	282°52.0 -13°02.5	297°22.5 -12°55.2	311°53.0 -12°47.8	326°23.5 -12°40.4	340°54.0 -12°32.8	355°24.5 -12°25.2	9°55.0 -12°17.6	24°25.6 -12°09.9	38°56.1 -12°02.1	53°26.7 -11°54.2	+30.5 15.3 +7.6 56.1
Fr 9	271°05.6 -9°48.8	285°36.2 -9°40.0	300°06.9 -9°31.1	314°37.5 -9°22.1	329°08.3 -9°13.1	343°38.8 -9°04.1	358°09.5 -8°55.0	12°40.2 -8°45.8	27°10.8 -8°36.6	41°41.5 -8°27.4	56°12.2 -8°18.1	+30.7 15.4 +9.1 56.7
Sa 10	273°52.5 -5°53.2	288°23.0 -5°43.3	302°53.9 -5°33.2	317°24.6 -5°23.2	331°55.3 -5°13.1	346°26.0 -5°03.0	361°56.0 -4°52.9	15°27.3 -4°42.7	29°58.0 -4°32.5	44°28.6 -4°22.2	58°59.3 -4°12.0	+30.7 15.6 +10.1 57.2
Su 11	276°38.1 -1°35.1	291°08.6 -1°24.5	305°39.1 -1°13.9	320°09.6 -1°03.3	334°40.1 -0°52.7	349°10.5 -0°42.0	3°41.0 -0°31.4	18°11.4 -0°20.7	32°41.8 -0°10.0	47°12.2 0°00.7	61°42.5 0°11.4	+30.4 15.7 +10.1 57.7
Mo 12	279°15.5 2°51.7	293°45.5 3°02.3	308°15.3 3°13.0	322°45.5 3°23.6	337°15.4 3°34.2	351°45.3 3°44.8	6°15.1 3°55.4	20°45.0 4°05.9	35°14.8 4°16.5	49°44.6 4°27.0	64°14.3 4°37.5	+29.9 15.8 +10.6 58.1
Tu 13	281°36.3 7°12.2	296°05.5 7°22.3	310°34.6 7°32.3	325°03.7 7°42.3	339°32.7 7°52.3	354°01.7 8°02.2	8°30.7 8°12.1	22°59.6 8°21.9	37°28.5 8°31.7	51°57.3 8°41.4	66°26.1 8°51.1	+29.0 15.9 +9.9 58.5
We 14	283°32.3 11°10.5	298°00.4 11°19.3	312°28.3 11°28.1	326°56.3 11°36.8	341°24.2 11°45.5	355°52.0 11°54.1	10°19.8 12°02.6	24°47.5 12°11.0	39°15.2 12°19.4	53°42.8 12°27.7	68°10.4 12°35.9	+27.8 16.0 +8.5 58.8
Th 15	284°58.0 14°30.2	299°24.7 14°37.1	313°51.4 14°44.0	328°18.1 14°50.8	342°44.7 14°57.5	357°11.3 15°04.1	11°37.8 15°10.6	26°04.0 15°17.0	40°30.7 15°23.3	54°57.0 15°29.5	69°23.3 15°35.7	+26.5 16.1 +6.6 59.1
Fr 16	285°52.6 16°55.6	300°18.2 17°00.0	314°43.7 17°04.4	329°09.3 17°08.7	343°34.3 17°12.8	358°00.2 17°16.9	12°25.6 17°20.8	26°51.6 17°24.6	41°16.3 17°28.3	55°41.6 17°31.9	70°06.9 17°35.4	+25.4 16.2 +4.0 59.3
Sa 17	286°22.6 18°13.5	300°47.5 18°15.1	315°12.4 18°16.5	324°32.7 18°17.8	344°02.0 18°19.1	358°26.8 18°20.1	12°51.6 18°21.1	27°16.4 18°21.9	41°41.2 18°22.7	56°05.9 18°23.3	70°30.7 18°23.7	+24.8 16.2 +1.0 59.5
Su 18	286°41.8 18°15.9	301°06.5 18°14.4	315°31.3 18°12.8	329°56.1 18°11.0	344°21.0 18°09.2	358°45.8 18°07.2	13°10.6 18°05.0	27°35.5 18°02.8	42°00.4 17°58.4	56°25.3 17°55.4	70°50.2 17°55.4	+24.8 16.2 -2.1 59.4
Mo 19	287°07.5 17°02.3	301°32.9 16°57.8	315°58.3 16°53.3	330°23.8 16°48.6	344°49.3 16°43.8	359°14.9 16°38.9	13°40.5 16°33.9	28°06.2 16°28.8	42°31.9 16°23.6	56°57.6 16°18.3	71°23.4 16°12.9	+25.6 16.2 -4.9 59.3
Tu 20	287°56.2 14°39.9	302°22.8 14°32.9	316°49.4 14°25.9	331°16.1 14°18.8	345°42.9 14°11.6	0°09.7 14°04.3	14°36.6 13°56.9	29°03.6 13°49.5	43°30.6 13°41.9	57°57.6 13°34.3	72°24.7 13°26.6	+26.9 16.1 -7.3 59.8
We 21	289°18.6 11°22.6	303°46.7 11°13.8	318°14.8 11°04.9	332°43.0 10°56.0	347°11.3 10°47.1	1°39.6 10°38.0	16°07.9 10°29.0	30°36.4 10°19.8	45°04.9 10°10.6	59°33.4 10°01.4	74°02.0 9°52.1	+28.3 15.9 -9.1 58.4
Th 22	291°18.3 7°27.7	305°47.8 7°17.8	320°17.4 7°07.8	334°47.1 6°57.9	349°16.8 6°47.8	3°46.6 6°37.8	18°16.4 6°27.8	32°46.2 6°17.7	47°16.2 6°07.6	61°46.1 5°57.4	76°16.2 5°47.3	+29.8 15.8 -10.0 57.8
Fr 23	293°52.5 3°13.1	308°23.3 3°02.8	322°54.1 2°52.4	337°25.0 2°42.1	351°56.0 2°31.7	6°26.9 2°21.3	20°58.0 2°11.0	35°29.0 2°00.6	50°00.1 1°50.2	64°31.2 1°39.9	79°02.4 1°29.5	+31.0 15.6 -10.4 57.1
Sa 24	296°54.5 -1°04.9	311°26.2 -1°15.1	325°58.0 -1°25.3	340°29.8 -1°35.4	355°01.6 -1°45.6	9°33.5 -1°55.7	24°05.4 -2°05.8	38°37.3 -2°15.9	53°09.2 -2°25.9	67°41.2 -2°35.9	82°13.2 -2°46.0	+31.9 15.4 -10.1 56.3
Su 25	300°15.7 -5°12.8	314°48.0 -5°22.4	329°20.3 -5°31.9	343°52.7 -5°41.3	358°25.1 -5°50.8	12°57.4 -6°00.2	27°29.8 -6°09.5	42°02.2 -6°18.9	56°34.7 -6°28.1	71°07.1 -6°37.4	85°39.5 -6°46.6	+32.4 15.2 -9.4 55.6
Mo 26	314°48.0 -5°22.4	329°20.3 -5°31.9	343°52.7 -5°41.3	358°25.1 -5°50.8	12°57.4 -6°00.2	27°29.8 -6°09.5	42°02.2 -6°18.9	56°34.7 -6°28.1	71°07.1 -6°37.4	85°39.5 -6°46.6	100°12.0 -6°55.8	+32.4 15.2 -9.3 55.6
Tu 27	318°19.8 -9°08.1	332°52.4 -9°16.6	347°24.9 -9°25.0	357°5.5 -9°33.3	16°30.1 -9°41.6	31°02.7 -9°49.9	45°35.2 -9°58.1	60°07.8 -10°06.3	74°40.4 -10°14.4	89°12.9 -10°22.4	103°45.5 -10°30.4	+32.6 15.0 -8.2 55.0
We 28	321°53.7 -12°23.8	336°26.2 -12°30.9	350°58.6 -12°37.9	3°31.1 -12°44.9	20°03.6 -12°51.8	34°36.1 -12°58.7	49°08.5 -13°05.4	63°41.0 -13°12.2	78°13.4 -13°18.8	92°45.8 -13°25.5	107°18.2 -13°32.0	+32.5 14.9 -6.8 54.6

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 8 08h22 — FQ: 15 13h17 — FM: 22 08h53

SUN

March 2035

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Th 1	266°54.6 -7°38.3	281°54.7 -7°37.4	296°54.8 -7°36.4	311°54.9 -7°35.5	326°55.0 -7°34.5	341°55.2 -7°33.6	356°55.3 -7°32.6	11°55.4 -7°31.7	26°55.5 -7°30.7	41°55.6 -7°29.8	56°55.8 -7°28.8	71°55.9 -7°27.9	+0.1 +1.0
Fr 2	266°57.5 -7°15.5	281°57.6 -7°14.5	296°57.7 -7°13.6	311°57.9 -7°12.6	326°58.0 -7°11.7	341°58.1 -7°10.7	356°58.2 -7°09.8	11°58.4 -7°08.8	26°58.5 -7°07.9	41°58.6 -7°06.9	56°58.7 -7°06.0	71°58.9 -7°05.0	+0.1 +1.0
Sa 3	267°00.5 -6°52.6	282°00.7 -6°51.6	297°00.8 -6°50.6	312°00.9 -6°49.7	327°01.1 -6°48.7	342°01.2 -6°47.8	357°01.3 -6°46.8	12°01.4 -6°45.8	27°01.4 -6°44.9	42°01.7 -6°43.9	57°01.8 -6°43.0	72°02.0 -6°42.0	+0.1 +1.0
Su 4	267°03.7 -6°29.5	282°03.8 -6°28.6	297°04.0 -6°27.6	312°04.1 -6°26.6	327°04.2 -6°25.7	342°04.4 -6°24.7	357°04.5 -6°23.7	12°04.6 -6°22.8	27°04.8 -6°21.8	42°04.9 -6°20.9	57°05.0 -6°19.9	72°05.2 -6°18.9	+0.1 +1.0
Mo 5	267°07.0 -6°06.4	282°07.1 -6°05.4	297°07.2 -6°04.5	312°07.4 -6°03.5	327°07.5 -6°02.5	342°07.7 -6°01.6	357°07.8 -6°00.6	12°07.9 -5°59.6	27°08.1 -5°58.7	42°08.2 -5°57.7	57°08.4 -5°56.7	72°08.5 -5°55.8	+0.1 +1.0
Tu 6	267°10.3 -5°43.2	282°10.5 -5°42.2	297°10.6 -5°41.2	312°10.8 -5°40.3	327°10.9 -5°39.3	342°11.1 -5°38.3	357°11.2 -5°37.4	12°11.3 -5°36.4	27°11.5 -5°35.4	42°11.6 -5°34.4	57°11.8 -5°33.5	72°11.9 -5°32.5	+0.1 +1.0
We 7	267°13.8 -5°19.9	282°14.0 -5°18.9	297°14.1 -5°17.9	312°14.3 -5°17.0	327°14.4 -5°16.0	342°14.6 -5°15.0	357°14.7 -5°14.0	12°14.8 -5°13.1	27°15.0 -5°12.1	42°15.1 -5°11.1	57°15.3 -5°10.1	72°15.4 -5°09.2	+0.1 +1.0
Th 8	267°17.4 -4°56.5	282°17.5 -4°55.5	297°17.7 -4°54.6	312°17.8 -4°53.6	327°18.0 -4°52.6	342°18.1 -4°51.6	357°18.3 -4°50.7	12°18.4 -4°49.7	27°18.6 -4°48.7	42°18.7 -4°47.7	57°18.9 -4°46.8	72°19.1 -4°45.8	+0.2 +1.0
Fr 9	267°21.1 -4°33.1	282°21.2 -4°32.1	297°21.4 -4°31.1	312°21.5 -4°30.1	327°21.7 -4°29.2	342°21.8 -4°28.2	357°22.0 -4°27.2	12°22.1 -4°26.2	27°22.3 -4°25.2	42°22.4 -4°24.3	57°22.6 -4°23.3	72°22.8 -4°22.3	+0.2 +1.0
Sa 10	267°24.8 -4°09.6	282°25.0 -4°08.6	297°25.1 -4°07.6	312°25.3 -4°06.6	327°25.4 -4°05.7	342°25.6 -4°04.7	357°25.8 -4°03.7	12°25.9 -4°02.7	27°26.1 -4°01.7	42°26.2 -4°00.8	57°26.4 -3°59.8	72°26.6 -3°58.8	+0.2 +1.0
Su 11	267°28.6 -3°46.0	282°28.8 -3°45.1	297°29.0 -3°44.1	312°29.1 -3°43.1	327°29.3 -3°42.1	342°29.5 -3°41.1	357°29.6 -3°40.1	12°29.8 -3°39.2	27°29.9 -3°38.2	42°30.1 -3°37.2	57°30.3 -3°36.2	72°30.4 -3°35.2	+0.2 +1.0
Mo 12	267°32.6 -3°23.5	282°32.7 -3°21.5	297°32.9 -3°20.5	312°33.1 -3°19.5	327°33.2 -3°18.5	342°33.4 -3°17.5	357°33.6 -3°16.5	12°33.7 -3°15.6	27°33.9 -3°14.6	42°34.1 -3°13.6	57°34.2 -3°12.6	72°34.4 -3°11.6	+0.2 +1.0
Tu 13	267°36.6 -2°58.8	282°36.7 -2°57.8	297°36.9 -2°56.9	312°37.1 -2°55.9	327°37.2 -2°54.9	342°37.4 -2°53.9	357°37.6 -2°52.9	12°37.7 -2°51.9	27°37.9 -2°50.9	42°38.1 -2°50.0	57°38.2 -2°49.0	72°38.4 -2°48.0	+0.2 +1.0
We 14	267°40.6 -2°35.2	282°40.8 -2°34.2	297°41.0 -2°33.2	312°41.1 -2°32.2	327°41.3 -2°31.2	342°41.5 -2°30.2	357°41.7 -2°29.2	12°41.8 -2°28.3	27°42.0 -2°27.3	42°42.2 -2°26.3	57°42.3 -2°25.3	72°42.5 -2°24.3	+0.2 +1.0
Th 15	267°44.8 -2°11.5	282°44.9 -2°10.5	297°45.1 -2°09.5	312°45.3 -2°08.5	327°45.5 -2°07.5	342°45.6 -2°06.5	357°45.8 -2°05.6	12°45.8 -2°04.6	27°46.0 -2°03.6	42°46.2 -2°02.6	57°46.3 -2°01.6	72°46.7 -2°00.6	+0.2 +1.0
Fr 16	267°49.0 -1°47.8	282°49.1 -1°46.8	297°49.3 -1°45.8	312°49.5 -1°44.8	327°49.7 -1°43.8	342°49.8 -1°42.8	357°50.0 -1°41.8	12°50.0 -1°40.9	27°50.2 -1°39.9	42°50.4 -1°38.9	57°50.5 -1°37.9	72°50.7 -1°36.9	+0.2 +1.0
Sa 17	267°53.2 -1°24.1	282°53.4 -1°23.1	297°53.6 -1°22.1	312°53.8 -1°21.1	327°53.9 -1°20.1	342°54.1 -1°19.1	357°54.3 -1°18.1	12°54.3 -1°17.1	27°54.5 -1°16.1	42°54.6 -1°15.2	57°54.8 -1°14.2	72°55.0 -1°13.2	+0.2 +1.0
Su 18	267°57.5 -1°00.3	282°57.7 -0°59.3	297°57.9 -0°58.4	312°58.1 -0°57.4	327°58.3 -0°56.4	342°58.4 -0°55.4	357°58.6 -0°54.4	12°58.6 -0°53.4	27°59.0 -0°52.4	42°59.2 -0°51.4	57°59.3 -0°50.4	72°59.5 -0°49.5	+0.2 +1.0
Mo 19	268°01.9 -0°36.6	283°02.1 -0°35.6	298°02.3 -0°34.6	313°02.4 -0°33.6	328°02.6 -0°32.7	343°02.8 -0°31.7	358°03.0 -0°30.7	13°03.2 -0°29.7	28°03.4 -0°28.7	43°03.5 -0°27.7	58°03.7 -0°26.7	73°03.9 -0°25.7	+0.2 +1.0
Tu 20	268°06.3 -0°12.9	283°06.5 -0°11.9	298°06.7 -0°10.9	313°06.8 -0°09.9	328°07.0 -0°08.9	343°07.2 -0°07.9	358°07.4 -0°07.0	13°07.2 -0°06.0	28°07.4 -0°05.0	43°07.6 -0°04.0	58°07.8 -0°03.0	73°08.3 -0°02.0	+0.2 +1.0
We 21	268°10.7 0°10.8	283°10.9 0°11.8	298°11.1 0°12.8	313°11.3 0°13.8	328°11.5 0°14.8	343°11.7 0°15.8	358°11.9 0°16.7	13°12.0 0°17.7	28°12.2 0°18.7	43°12.4 0°19.7	58°12.6 0°20.7	73°12.8 0°21.7	+0.2 +1.0
Th 22	268°15.2 0°34.5	283°15.4 0°35.5	298°15.6 0°36.5	313°15.8 0°37.5	328°16.0 0°38.5	343°16.1 0°39.4	358°16.3 0°40.4	13°16.5 0°41.4	28°16.7 0°42.4	43°16.9 0°43.4	58°17.1 0°44.4	73°17.3 0°45.4	+0.2 +1.0
Fr 23	268°19.7 0°58.2	283°19.9 0°59.2	298°20.1 1°00.2	313°20.3 1°01.1	328°20.5 1°02.1	343°20.6 1°03.1	358°20.8 1°04.1	13°20.8 1°05.1	28°21.0 1°06.1	43°21.4 1°07.0	58°21.6 1°08.0	73°21.8 1°09.0	+0.2 +1.0
Sa 24	268°24.2 1°21.8	283°24.4 1°22.8	298°24.6 1°23.8	313°24.8 1°24.8	328°25.0 1°25.8	343°25.2 1°26.7	358°25.3 1°27.7	13°25.8 1°28.7	28°25.7 1°29.7	43°25.9 1°30.7	58°26.1 1°31.7	73°26.3 1°32.6	+0.2 +1.0
Su 25	268°28.7 1°45.4	283°28.9 1°46.4	298°29.1 1°47.4	313°29.3 1°48.4	328°29.5 1°49.4	343°29.7 1°50.3	358°29.9 1°51.3	13°30.1 1°52.3	28°30.3 1°53.3	43°30.4 1°54.3	58°30.6 1°55.2	73°30.8 1°56.2	+0.2 +1.0
Mo 26	268°33.3 2°09.0	283°33.5 2°10.0	298°33.7 2°11.0	313°33.8 2°11.9	328°34.0 2°12.9	343°34.2 2°13.9	358°34.4 2°14.9	13°34.6 2°15.9	28°34.8 2°16.8	43°35.0 2°17.8	58°35.2 2°18.8	73°35.4 2°19.8	+0.2 +1.0
Tu 27	268°37.8 2°32.5	283°38.0 2°33.5	298°38.2 2°34.5	313°38.4 2°35.4	328°38.6 2°36.4	343°38.8 2°37.4	358°39.0 2°38.4	13°39.1 2°39.4	28°39.3 2°40.3	43°39.5 2°41.3	58°39.7 2°42.3	73°39.9 2°43.3	+0.2 +1.0
We 28	268°42.3 2°56.0	283°42.5 2°57.0	298°42.7 2°57.9	313°42.9 2°58.9	328°43.1 2°59.9	343°43.3 3°00.9	358°43.5 3°01.8	13°43.3 3°02.8	28°43.4 3°03.8	43°43.6 3°04.8	58°44.0 3°05.7	73°44.4 3°06.7	+0.2 +1.0
Th 29	268°46.9 3°19.4	283°47.1 3°20.4	298°47.3 3°21.3	313°47.4 3°22.3	328°47.6 3°23.3	343°47.8 3°24.3	358°48.0 3°25.2	13°48.2 3°26.2	28°48.2 3°27.2	43°48.4 3°28.2	58°48.6 3°29.1	73°48.9 3°30.1	+0.2 +1.0
Fr 30	268°51.4 3°42.7	283°51.6 3°43.7	298°51.7 3°44.7	313°51.9 3°45.7	328°52.1 3°46.6	343°52.3 3°47.6	358°52.5 3°48.6	13°52.7 3°49.5	28°52.9 3°50.5	43°53.1 3°51.5	58°53.2 3°52.5	73°53.4 3°53.4	+0.2 +1.0
Sa 31	268°55.9 4°06.0	283°56.0 4°07.0	298°56.2 4°08.0	313°56.4 4°08.9	328°56.6 4°09.9	343°56.8 4°10.9	358°57.0 4°11.8	13°57.2 4°12.8	28°57.3 4°13.8	43°57.5 4°14.7	58°57.7 4°15.7	73°57.9 4°16.7	+0.2 +1.0

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°

Row 2: Dec (Declination, – = South), Δ°/h = dec. change

Semi-diameter: 16.1'

MOON

March 2025

	D	20h	21h	22h	23h	0h	1h	2h	3h	4h	5h	6h	Δ'/h SH
O	Th 1	227°00.4 -16°30.2	241°32.3 -16°34.4	256°04.2 -16°38.5	270°36.1 -16°42.6	285°07.9 -16°46.5	299°39.8 -16°50.4	314°11.6 -16°54.3	328°43.4 -16°58.0	343°15.2 -17°01.7	357°47.0 -17°05.2	12°18.7 -17°08.7	+31.8 14.8 -3.9 54.2
	Fr 2	230°12.8 -17°51.9	244°44.2 -17°54.2	259°15.7 -17°56.3	273°47.1 -17°58.4	288°18.5 -18°00.4	302°49.9 -18°02.3	317°21.2 -18°04.1	331°52.6 -18°05.9	346°23.9 -18°07.5	0°55.2 -18°09.1	15°26.5 -18°10.6	+31.4 14.8 -1.9 54.2
	Sa 3	233°13.8 -18°22.9	247°44.9 -18°23.1	262°15.9 -18°23.1	276°46.9 -18°23.1	291°17.8 -18°23.0	305°48.8 -18°22.8	320°19.7 -18°22.5	334°50.7 -18°22.1	349°21.6 -18°21.1	3°52.5 -18°20.5	18°23.4 -18°19.7	+31.0 14.8 +0.5 54.5
●	Su 4	247°44.9 -18°23.1	262°15.9 -18°23.1	276°46.9 -18°23.1	291°17.8 -18°23.0	305°48.8 -18°22.8	320°19.7 -18°22.5	334°50.7 -18°22.1	349°21.6 -18°21.1	3°52.5 -18°20.5	18°23.4 -18°20.5	32°54.3 -18°19.7	+30.9 14.8 +0.3 54.5
	Mo 5	250°35.8 -17°58.4	265°06.5 -17°56.2	279°37.2 -17°54.0	294°07.8 -17°51.7	308°38.5 -17°49.3	323°09.1 -17°46.9	337°39.7 -17°44.3	352°10.3 -17°41.6	6°40.9 -17°38.9	21°11.5 -17°36.1	35°42.1 -17°33.2	+30.6 15.0 +2.5 54.9
	Tu 6	253°20.0 -16°39.0	267°50.5 -16°34.7	282°20.9 -16°30.3	296°51.4 -16°25.8	311°21.9 -16°21.3	325°52.3 -16°16.6	340°22.8 -16°11.9	354°53.2 -16°07.1	0°23.6 -16°02.2	23°54.1 -15°57.2	38°24.5 -15°52.2	+30.4 15.1 +4.7 55.4
●	We 7	256°00.5 -14°26.3	270°30.9 -14°20.0	285°01.2 -14°13.5	299°31.6 -14°07.0	314°02.0 -14°00.4	328°32.3 -13°53.7	343°02.7 -13°47.0	357°33.1 -13°40.2	12°03.4 -13°33.3	26°33.8 -13°26.3	41°04.1 -13°19.2	+30.4 15.3 +6.7 56.0
	Th 8	258°39.2 -11°24.7	273°09.5 -11°16.5	287°39.8 -11°08.3	302°10.1 -10°59.9	316°40.4 -10°51.5	331°10.8 -10°43.1	345°41.1 -10°34.6	0°11.4 -10°26.6	14°41.7 -10°17.4	29°12.0 -10°08.7	43°42.2 -9°59.9	+30.3 15.5 +8.5 56.7
	Fr 9	261°16.0 -7°41.6	275°46.3 -7°31.9	290°16.5 -7°22.2	304°46.7 -7°12.5	319°16.8 -7°02.7	333°47.0 -6°52.9	348°17.2 -6°43.0	2°47.4 -6°33.1	17°17.5 -6°23.1	31°47.7 -6°13.1	46°17.8 -6°03.0	+30.2 15.7 +9.9 57.4
●	Sa 10	263°48.5 -3°27.8	278°18.5 -3°17.2	292°48.4 -3°06.6	307°18.3 -2°55.9	321°48.2 -2°45.3	336°18.1 -2°34.6	350°48.0 -2°23.8	5°17.8 -2°13.1	19°47.7 -2°02.3	34°17.5 -1°51.5	48°47.3 -1°40.7	+29.9 15.8 +10.7 58.0
	Su 11	266°11.9 1°02.7	280°41.4 1°13.7	295°10.8 1°24.6	309°40.2 1°35.6	324°09.6 1°46.5	338°39.0 1°57.5	353°08.3 2°08.4	7°37.6 2°19.3	22°06.9 2°30.3	36°36.2 2°41.2	51°05.4 2°52.1	+29.7 16.0 +10.9 58.5
	Mo 12	268°20.2 5°33.8	282°48.9 5°44.4	297°17.6 5°55.0	311°46.3 6°05.5	326°14.9 6°16.1	340°43.5 6°26.5	355°12.1 6°37.0	9°40.6 6°47.4	24°09.1 6°57.8	38°37.1 7°08.1	53°05.9 7°18.4	+28.6 16.1 +10.5 58.9
●	Tu 13	270°07.5 9°47.6	284°35.3 9°57.2	299°03.1 10°06.6	313°30.8 10°16.1	327°58.5 10°25.4	342°26.1 10°34.7	356°53.7 10°43.9	11°21.2 10°53.1	25°48.8 11°02.2	40°16.2 11°13.1	54°43.6 11°20.2	+27.6 16.1 +9.3 59.2
	We 14	271°30.1 13°26.2	285°56.9 13°33.9	300°23.7 13°41.6	314°50.4 13°49.2	329°17.0 13°56.7	343°43.6 14°04.1	358°10.2 14°11.5	12°36.8 14°18.7	27°03.3 14°25.9	41°29.7 14°32.9	55°56.2 14°39.9	+26.6 16.2 +7.4 59.3
	Th 15	272°28.4 16°12.9	286°54.3 16°18.3	301°20.1 16°23.6	315°46.0 16°28.7	330°11.8 16°33.8	344°37.6 16°38.8	359°03.3 16°43.6	13°29.0 16°48.4	27°54.7 16°53.0	42°20.4 16°57.5	56°46.0 17°01.9	+25.8 16.2 +4.9 59.3
●	Fr 16	273°08.3 17°54.6	287°33.7 17°57.2	301°59.9 17°59.6	316°24.4 18°02.0	330°49.7 18°04.2	345°15.0 18°06.3	359°40.4 18°08.3	14°05.7 18°10.2	28°31.4 18°11.9	42°56.3 18°13.5	57°21.6 18°15.1	+25.3 16.1 +2.0 59.2
	Sa 17	273°41.4 18°23.3	288°06.7 18°22.9	302°32.3 18°22.4	316°57.5 18°21.7	331°23.0 18°21.0	345°48.4 18°20.1	0°13.8 18°19.1	14°39.3 18°18.0	28°40.8 18°16.7	43°30.4 18°15.4	57°55.8 18°13.9	+25.4 16.1 -0.9 59.0
	Su 18	274°21.8 17°37.8	288°47.8 17°34.5	303°13.8 17°31.1	317°39.8 17°27.6	332°05.9 17°23.9	346°32.0 17°20.2	0°58.2 17°16.3	15°24.2 17°12.4	29°50.6 17°08.3	44°16.9 17°04.1	58°43.2 16°59.8	+26.1 16.0 -3.8 58.7
●	Mo 19	275°23.0 15°43.5	289°50.0 15°37.6	304°17.1 15°31.6	318°44.2 15°25.6	333°11.3 15°19.4	347°38.6 15°13.2	2°05.8 15°06.9	16°33.1 15°00.5	31°00.5 14°54.0	45°27.9 14°47.4	59°55.4 14°40.7	+27.2 15.9 -6.3 58.4
	Tu 20	276°53.6 12°51.1	291°21.9 12°43.2	305°50.3 12°35.3	320°18.7 12°27.2	334°47.7 12°19.1	349°15.7 12°10.9	3°44.2 12°02.7	18°12.8 11°54.4	32°41.5 11°46.0	47°10.2 11°37.6	61°39.0 11°29.1	+28.5 15.8 -8.2 58.0
	We 21	278°56.7 9°15.2	293°26.3 9°05.9	307°56.0 8°56.5	322°25.6 8°47.1	336°55.4 8°37.7	351°25.2 8°28.2	5°55.0 8°18.7	20°24.8 8°09.1	34°54.8 7°59.5	49°24.7 7°49.8	63°54.7 7°40.2	+29.8 15.7 -9.5 57.5
●	Th 22	281°30.2 5°11.5	296°00.9 5°01.4	310°31.6 4°51.2	325°02.4 4°41.1	339°33.2 4°31.0	354°04.0 4°20.8	8°34.9 4°10.6	23°05.8 4°00.4	37°36.8 3°50.2	52°07.8 3°39.9	66°38.8 3°29.7	+30.9 15.5 -10.2 57.0
	Fr 23	284°28.3 0°55.5	298°59.8 0°45.2	313°31.4 0°34.9	328°02.9 0°24.6	342°34.6 0°14.4	357°06.2 0°04.1	11°37.9 -0°06.1	26°09.9 -0°16.4	40°41.3 -0°26.6	55°13.3 -0°36.9	69°44.8 -0°47.1	+31.7 15.4 -10.3 56.5
	Sa 24	287°43.7 -3°18.4	302°15.8 -3°28.3	316°47.9 -3°38.2	331°20.0 -3°48.1	345°52.1 -3°58.0	0°24.2 -4°07.8	14°56.4 -4°17.6	29°28.8 -4°27.4	44°00.7 -4°37.1	58°32.9 -4°46.8	73°05.0 -4°56.5	+32.1 15.2 -9.8 55.9
●	Su 25	291°09.0 -7°17.6	305°41.3 -7°26.7	320°13.6 -7°35.8	334°45.9 -7°44.8	349°18.3 -7°53.8	3°50.6 -8°02.7	18°22.9 -8°11.6	32°55.3 -8°20.5	47°27.6 -8°29.3	61°59.9 -8°38.0	76°32.3 -8°46.8	+32.3 15.1 -8.9 55.3
	Mo 26	294°37.3 -10°51.5	309°09.6 -10°59.4	323°41.9 -11°07.3	338°14.2 -11°15.1	352°46.5 -11°22.8	7°18.8 -11°30.5	21°51.1 -11°38.1	36°23.4 -11°45.7	50°55.7 -11°53.2	65°27.9 -12°00.6	80°00.2 -12°08.0	+32.3 15.0 -7.6 54.9
	Tu 27	298°03.3 -13°51.4	312°35.4 -13°57.8	327°07.5 -14°04.1	341°39.6 -14°10.3	356°11.7 -14°16.5	10°43.8 -14°22.6	25°15.9 -14°28.7	39°48.0 -14°34.6	54°20.0 -14°40.5	68°52.1 -14°46.4	83°24.1 -14°52.2	+32.1 14.9 -6.1 54.5
●	We 28	312°35.4 -13°57.8	327°07.5 -14°04.1	341°39.6 -14°10.3	356°11.7 -14°16.5	10°43.8 -14°22.6	25°15.9 -14°28.7	39°48.0 -14°34.6	54°20.0 -14°40.5	68°52.1 -14°46.4	83°24.1 -14°52.2	97°56.1 -14°57.9	+32.1 14.9 -6.0 54.5
	Th 29	315°55.1 -16°14.8	330°27.0 -16°19.3	344°58.8 -16°23.8	359°30.6 -16°28.2	14°02.4 -16°32.5	28°34.2 -16°36.7	43°06.0 -16°40.9	57°37.7 -16°45.5	72°09.5 -16°49.0	86°41.2 -16°52.9	101°12.9 -16°56.8	+31.8 14.8 -4.2 54.2
	Fr 30	319°07.2 -17°45.1	333°38.8 -17°47.7	348°10.3 -17°50.2	2°41.8 -17°52.6	17°13.3 -17°55.0	31°44.7 -17°57.2	46°16.2 -17°59.4	60°47.6 -18°01.5	75°19.1 -18°03.5	89°50.6 -18°05.5	104°21.9 -18°07.3	+31.5 14.8 -2.2 54.1
●	Sa 31	322°11.9 -18°25.0	336°43.1 -18°25.5	351°14.4 -18°25.9	5°45.6 -18°26.2	20°16.8 -18°26.5	34°48.0 -18°26.7	49°19.2 -18°26.7	63°50.4 -18°26.7	78°21.6 -18°26.6	92°52.8 -18°26.5	107°23.9 -18°26.2	+31.2 14.8 -0.1 54.2

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

LQ: 2 03h01 — NM: 9 23h09 — FQ: 16 20h15 — FM: 23 22h42 — LQ: 31 23h06

SUN

April 2035

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Su 1	269°00.3 4°29.2	284°00.5 4°30.2	299°00.7 4°31.2	314°00.9 4°32.1	329°01.1 4°33.1	344°01.2 4°34.1	359°01.4 4°35.0	14°01.6 4°36.0	29°01.3 4°37.0	44°02.0 4°37.9	59°02.2 4°38.9	74°02.4 4°39.8	+0.2 +1.0
Mo 2	269°04.7 4°52.4	284°04.9 4°53.3	299°05.1 4°54.3	314°05.3 4°55.2	329°05.5 4°56.2	344°05.7 4°57.2	359°05.8 4°58.1	14°06.0 4°59.1	29°06.2 5°00.1	44°06.4 5°01.0	59°06.6 5°02.0	74°06.8 5°02.9	+0.2 +1.0
Tu 3	269°09.1 5°15.4	284°09.3 5°16.4	299°09.5 5°17.3	314°09.7 5°18.3	329°09.9 5°19.2	344°10.0 5°20.2	359°10.2 5°21.2	14°10.4 5°22.1	29°10.6 5°23.1	44°10.8 5°24.0	59°11.0 5°25.0	74°11.1 5°25.9	+0.2 +1.0
We 4	269°13.5 5°38.4	284°13.7 5°39.3	299°13.9 5°40.3	314°14.0 5°41.2	329°14.2 5°42.2	344°14.4 5°43.1	359°14.6 5°44.1	14°14.8 5°45.0	29°14.9 5°46.0	44°15.1 5°46.9	59°15.3 5°47.9	74°15.5 5°48.8	+0.2 +1.0
Th 5	269°17.8 6°01.2	284°18.0 6°02.2	299°18.2 6°03.1	314°18.3 6°04.1	329°18.5 6°05.0	344°18.7 6°06.0	359°18.9 6°06.9	14°19.0 6°07.9	29°19.2 6°08.8	44°19.4 6°09.8	59°19.6 6°10.7	74°19.8 6°11.7	+0.2 +0.9
Fr 6	269°22.1 6°24.0	284°22.2 6°24.9	299°22.4 6°25.9	314°22.6 6°26.8	329°22.8 6°27.7	344°22.9 6°28.7	359°23.1 6°29.6	14°23.3 6°30.6	29°23.5 6°31.5	44°23.6 6°32.5	59°23.8 6°33.4	74°24.0 6°34.4	+0.2 +0.9
Sa 7	269°26.3 6°46.6	284°26.4 6°47.5	299°26.6 6°48.5	314°26.8 6°49.4	329°27.0 6°50.4	344°27.1 6°51.3	359°27.3 6°52.2	14°27.5 6°53.2	29°27.7 6°54.1	44°27.8 6°55.1	59°28.0 6°56.0	74°28.2 6°56.9	+0.2 +0.9
Su 8	269°30.4 7°09.1	284°30.6 7°10.1	299°30.8 7°11.0	314°30.9 7°11.9	329°31.1 7°12.9	344°31.3 7°13.8	359°31.4 7°14.7	14°31.6 7°15.7	29°31.8 7°16.6	44°32.0 7°17.5	59°32.1 7°18.5	74°32.3 7°19.4	+0.2 +0.9
Mo 9	269°34.5 7°31.5	284°34.7 7°32.5	299°34.9 7°33.4	314°35.0 7°34.3	329°35.2 7°35.3	344°35.4 7°36.2	359°35.5 7°37.1	14°35.7 7°38.0	29°35.9 7°39.0	44°36.0 7°39.9	59°36.2 7°40.8	74°36.4 7°41.8	+0.2 +0.9
Tu 10	269°38.5 7°53.8	284°38.7 7°54.7	299°38.9 7°55.7	314°39.0 7°56.6	329°39.2 7°57.5	344°39.4 7°58.4	359°39.5 7°59.4	14°39.7 8°00.3	29°39.9 8°01.2	44°40.0 8°02.1	59°40.2 8°03.1	74°40.4 8°04.0	+0.2 +0.9
We 11	269°42.5 8°16.0	284°42.7 8°16.9	299°42.8 8°17.8	314°43.0 8°18.7	329°43.2 8°19.6	344°43.3 8°20.5	359°43.5 8°21.5	14°43.7 8°22.4	29°43.8 8°23.3	44°44.0 8°24.2	59°44.1 8°25.1	74°44.3 8°26.1	+0.2 +0.9
Th 12	269°46.4 8°38.0	284°46.6 8°38.9	299°46.7 8°39.8	314°46.9 8°40.7	329°47.1 8°41.6	344°47.2 8°42.5	359°47.4 8°43.4	14°47.4 8°44.3	29°47.7 8°45.3	44°47.7 8°46.2	59°47.9 8°47.1	74°48.2 8°48.0	+0.2 +0.9
Fr 13	269°50.2 8°59.8	284°50.4 9°00.7	299°50.6 9°01.6	314°50.7 9°02.5	329°50.9 9°03.4	344°51.0 9°04.4	359°51.2 9°05.3	14°51.3 9°06.2	29°51.6 9°07.1	44°51.8 9°08.0	59°51.8 9°08.9	74°52.0 9°09.8	+0.2 +0.9
Sa 14	269°54.0 9°21.5	284°54.1 9°22.4	299°54.3 9°23.3	314°54.4 9°24.2	329°54.6 9°25.1	344°54.8 9°26.0	359°54.9 9°26.9	14°55.4 9°27.8	29°55.5 9°28.7	44°55.8 9°29.6	59°55.5 9°30.5	74°55.7 9°31.4	+0.2 +0.9
Su 15	269°57.7 9°43.1	284°57.8 9°44.0	299°58.0 9°44.9	314°58.1 9°45.8	329°58.3 9°46.7	344°58.4 9°47.5	359°58.6 9°48.4	14°58.7 9°49.3	29°58.9 9°50.2	44°59.0 9°51.1	59°59.2 9°52.0	74°59.3 9°52.9	+0.2 +0.9
Mo 16	270°01.2 10°04.5	285°01.4 10°05.4	300°01.5 10°06.2	315°01.7 10°07.1	330°01.8 10°08.0	345°02.0 10°08.9	0°02.1 10°09.8	15°02.3 10°10.7	30°02.4 10°11.6	45°02.6 10°12.4	60°02.7 10°13.3	75°02.9 10°14.2	+0.1 +0.9
Tu 17	270°04.8 10°25.7	285°04.9 10°26.6	300°05.0 10°27.4	315°05.2 10°28.3	330°05.3 10°29.2	345°05.5 10°30.1	0°05.6 10°31.0	15°05.8 10°31.8	30°05.9 10°32.7	45°06.0 10°33.6	60°06.2 10°34.5	75°06.3 10°35.4	+0.1 +0.9
We 18	270°08.2 10°46.7	285°08.3 10°47.6	300°08.4 10°48.5	315°08.6 10°49.4	330°08.7 10°50.2	345°08.9 10°51.1	0°08.9 10°52.0	15°09.1 10°52.8	30°09.3 10°53.7	45°09.4 10°54.6	60°09.6 10°55.5	75°09.7 10°56.3	+0.1 +0.9
Th 19	270°11.5 11°07.6	285°11.6 11°08.5	300°11.8 11°09.3	315°11.9 11°10.2	330°12.0 11°11.1	345°12.2 11°11.9	0°12.3 11°12.8	15°12.4 11°13.7	30°12.6 11°14.5	45°12.7 11°15.4	60°12.8 11°16.2	75°13.0 11°17.1	+0.1 +0.9
Fr 20	270°14.7 11°28.3	285°14.8 11°29.1	300°15.0 11°30.0	315°15.1 11°30.9	330°15.2 11°31.7	345°15.4 11°32.6	0°15.5 11°33.4	15°15.6 11°34.3	30°15.8 11°35.1	45°15.9 11°36.0	60°16.0 11°36.8	75°16.1 11°37.7	+0.1 +0.9
Sa 21	270°17.8 11°48.8	285°17.9 11°49.6	300°18.1 11°50.5	315°18.2 11°51.3	330°18.3 11°52.2	345°18.5 11°53.0	0°18.6 11°53.9	15°18.7 11°54.7	30°18.8 11°55.6	45°19.0 11°56.4	60°19.1 11°57.3	75°19.2 11°58.1	+0.1 +0.8
Su 22	270°20.8 12°09.1	285°21.0 12°09.9	300°21.1 12°10.8	315°21.2 12°11.6	330°21.3 12°12.4	345°21.4 12°13.3	0°21.6 12°14.1	15°21.7 12°15.0	30°21.8 12°15.8	45°21.9 12°16.6	60°22.0 12°17.5	75°22.2 12°18.3	+0.1 +0.8
Mo 23	270°23.7 12°29.2	285°23.8 12°30.0	300°24.0 12°30.8	315°24.1 12°31.7	330°24.2 12°32.5	345°24.3 12°33.3	0°24.4 12°34.2	15°24.5 12°35.0	30°24.7 12°35.8	45°24.8 12°36.7	60°24.9 12°37.5	75°25.0 12°38.3	+0.1 +0.8
Tu 24	270°26.5 12°49.1	285°26.6 12°49.9	300°26.7 12°50.7	315°26.8 12°51.5	330°27.0 12°52.4	345°27.1 12°53.2	0°27.2 12°54.0	15°27.3 12°54.8	30°27.4 12°55.6	45°27.5 12°56.5	60°27.6 12°57.3	75°27.7 12°58.1	+0.1 +0.8
We 25	270°29.2 13°08.7	285°29.3 13°09.6	300°29.4 13°10.4	315°29.5 13°11.2	330°29.6 13°12.0	345°29.7 13°12.8	0°29.8 13°13.6	15°29.9 13°14.4	30°30.0 13°15.3	45°30.1 13°16.1	60°30.2 13°16.9	75°30.3 13°17.7	+0.1 +0.8
Th 26	270°31.7 13°28.2	285°31.8 13°29.0	300°31.9 13°29.8	315°32.0 13°30.6	330°32.1 13°31.4	345°32.2 13°32.2	0°32.3 13°33.0	15°32.4 13°33.8	30°32.5 13°34.6	45°32.6 13°35.5	60°32.7 13°36.3	75°32.8 13°37.1	+0.1 +0.8
Fr 27	270°34.1 13°47.5	285°34.2 13°48.3	300°34.3 13°49.0	315°34.4 13°49.8	330°34.5 13°50.6	345°34.6 13°51.4	0°34.7 13°52.2	15°34.8 13°53.0	30°34.9 13°53.8	45°35.0 13°54.6	60°35.1 13°55.4	75°35.2 13°56.2	+0.1 +0.8
Sa 28	270°36.4 14°06.5	285°36.5 14°07.3	300°36.6 14°08.0	315°36.7 14°08.8	330°36.8 14°09.6	345°36.9 14°10.4	0°37.0 14°11.2	15°37.0 14°12.0	30°37.1 14°12.8	45°37.2 14°13.5	60°37.3 14°14.3	75°37.4 14°15.1	+0.1 +0.8
Su 29	270°38.6 14°25.3	285°38.6 14°26.0	300°38.7 14°26.8	315°38.8 14°27.6	330°38.9 14°28.4	345°39.0 14°29.1	0°39.1 14°29.9	15°39.2 14°30.7	30°39.2 14°31.5	45°39.3 14°32.2	60°39.4 14°33.0	75°39.5 14°33.8	+0.1 +0.8
Mo 30	270°40.6 14°43.8	285°40.7 14°44.6	300°40.7 14°45.3	315°40.8 14°46.1	330°40.9 14°46.9	345°41.0 14°47.6	0°41.1 14°48.4	15°41.1 14°49.2	30°41.2 14°49.9	45°41.3 14°50.7	60°41.4 14°51.5	75°41.5 14°52.2	+0.1 +0.8

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.9'

MOON

April 2035

	D	21h	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	Δ°/h	SH
●	Su 1	226°28.4 -17°29.4	240°59.4 -17°26.2	255°30.9 -17°22.9	270°01.2 -17°19.6	284°32.2 -17°16.2	299°03.1 -17°12.6	313°34.0 -17°09.0	328°04.9 -17°05.3	342°35.9 -17°01.6	357°06.8 -16°57.7	11°37.7 -16°53.8	+30.9 +3.6	15.0 54.9
	Mo 2	229°20.8 -15°44.7	243°51.6 -15°39.4	258°22.4 -15°34.1	272°53.3 -15°28.7	287°24.1 -15°23.2	301°54.9 -15°17.6	316°25.7 -15°11.9	330°56.6 -15°06.2	345°27.4 -15°00.3	359°58.2 -14°54.4	14°29.0 -14°48.5	+30.8 +5.5	15.1 55.5
●	Tu 3	243°51.6 -15°39.4	258°22.4 -15°34.1	272°53.3 -15°28.7	287°24.1 -15°23.2	301°54.9 -15°17.6	316°25.7 -15°11.9	330°56.6 -15°06.2	345°27.4 -15°00.3	359°58.2 -14°54.4	14°29.0 -14°48.5	28°59.8 +5.7	+30.8 +5.5	15.1 55.5
	We 4	246°41.1 -13°02.3	261°11.8 -12°55.0	275°42.5 -12°47.6	290°13.2 -12°40.2	304°43.9 -12°32.7	319°14.6 -12°25.2	333°45.3 -12°17.5	348°16.0 -12°09.8	2°46.6 -12°02.0	17°17.3 -11°54.2	31°47.9 -11°46.3	+30.7 +7.6	15.3 56.2
●	Th 5	249°26.5 -9°39.6	263°56.9 -9°30.7	278°27.4 -9°21.7	292°57.9 -9°12.6	307°28.3 -9°03.5	321°58.8 -8°54.3	336°29.2 -8°45.0	350°59.6 -8°35.7	5°30.0 -8°26.4	20°00.3 -8°17.0	34°30.7 -8°07.5	+30.4 +9.2	15.6 57.0
	Fr 6	252°04.0 -5°39.4	266°34.1 -5°29.1	281°04.2 -5°18.8	295°34.2 -5°08.5	310°04.2 -4°58.1	324°34.2 -4°47.7	339°04.1 -4°37.3	353°34.1 -4°26.8	8°04.0 -4°16.3	22°33.9 -4°05.7	37°03.7 -3°55.1	+30.0 +10.4	15.8 57.9
●	Sa 7	254°28.4 -1°12.7	268°57.8 -1°01.6	283°27.2 -0°50.6	297°56.5 -0°39.6	312°25.9 -0°28.5	326°55.1 -0°17.4	341°24.4 -0°06.3	355°53.6 0°04.8	10°22.8 0°15.9	24°51.9 0°27.1	39°21.0 0°38.2	+29.3 +11.1	16.0 58.7
	Su 8	256°33.1 3°25.6	271°01.6 3°36.7	285°30.0 3°47.8	299°58.4 3°58.9	314°26.8 4°10.0	328°55.1 4°21.1	343°23.3 4°32.1	357°51.6 4°43.2	12°19.8 4°54.2	26°47.9 5°05.2	41°16.0 5°16.2	+28.3 +5.3	16.2 59.3
●	Mo 9	258°11.9 7°57.2	272°39.2 8°07.6	287°06.5 8°18.0	301°33.8 8°28.4	316°01.0 8°38.7	330°28.1 8°48.9	344°55.2 8°59.1	359°22.3 9°09.3	13°48.9 9°19.4	28°16.2 9°29.4	42°43.2 9°39.4	+27.1 +10.2	16.3 59.9
	Tu 10	259°21.0 12°01.7	273°47.2 12°10.6	288°13.3 12°19.4	302°39.3 12°28.2	317°05.3 12°36.9	331°31.3 12°45.5	345°57.2 12°54.0	0°23.1 13°02.4	14°48.9 15°10.8	29°14.7 15°21.8	43°40.5 15°27.2	+25.9 +8.6	16.4 60.1
●	We 11	260°01.7 15°18.7	274°26.9 15°25.4	288°51.9 15°31.9	303°17.0 15°38.3	317°42.0 15°44.6	332°07.0 15°50.8	346°32.2 15°56.9	0°56.9 16°02.9	15°21.8 16°08.8	29°46.7 16°14.6	44°11.6 16°20.3	+25.0 +6.2	16.4 60.1
	Th 12	260°21.8 17°31.3	274°46.3 17°35.1	289°10.9 17°38.7	303°35.4 17°42.3	317°59.9 17°45.7	332°24.4 17°49.0	346°49.0 17°52.2	1°13.5 17°55.2	15°38.0 17°58.1	30°02.5 18°00.9	44°27.0 18°03.6	+24.5 +3.2	16.3 59.9
●	Fr 13	260°35.3 18°28.7	274°59.9 18°29.4	289°24.6 18°29.9	303°49.3 18°30.3	318°14.0 18°30.6	332°38.7 18°30.8	347°03.5 18°30.8	1°28.2 18°30.7	15°53.0 18°30.5	30°17.9 18°30.2	44°42.7 18°29.7	+24.7 +0.1	16.2 59.5
	Sa 14	260°59.5 18°08.4	275°24.9 18°06.0	289°50.4 18°03.5	304°15.9 18°00.9	318°41.4 17°58.2	333°07.1 17°55.3	347°32.7 17°52.4	1°58.4 17°49.3	16°24.1 17°25.1	30°49.9 17°42.9	45°15.8 17°39.5	+25.6 -2.9	16.1 59.0
●	Su 15	261°49.7 16°35.7	276°16.4 16°30.6	290°43.2 16°25.5	305°10.0 16°20.2	319°36.9 16°14.9	334°03.8 16°09.4	348°30.8 16°03.9	2°57.9 15°58.2	17°26.0 15°52.5	31°52.2 15°46.7	46°19.4 15°40.8	+27.0 -5.5	15.9 58.5
	Mo 16	263°15.3 14°01.9	277°43.5 13°54.6	292°11.8 13°47.3	306°40.1 13°40.0	321°08.5 13°32.5	335°37.0 13°25.0	350°05.4 13°17.4	4°34.1 13°09.7	19°02.7 13°02.0	33°31.4 12°54.2	48°00.2 12°46.3	+28.5 -7.6	15.8 57.9
●	Tu 17	265°18.5 10°41.1	279°48.2 10°32.3	294°17.7 10°23.4	309°08.7 10°14.5	323°17.5 10°05.6	337°47.4 9°56.6	352°17.4 9°47.6	6°47.4 9°38.5	21°17.4 9°29.3	35°47.5 9°20.2	50°17.7 9°11.0	+29.9 -9.7	15.6 57.4
	We 18	267°55.7 6°48.3	282°26.6 6°38.6	296°57.6 6°28.6	311°28.6 6°18.9	325°59.6 6°09.1	340°30.7 5°59.2	355°01.8 5°49.3	9°32.9 5°39.4	24°04.1 5°29.5	38°35.3 5°19.5	53°06.6 5°09.6	+31.1 -9.9	15.5 56.8
●	Th 19	270°59.7 2°38.2	285°31.5 2°28.0	300°03.3 2°17.8	314°35.2 2°07.6	329°07.0 1°57.4	343°38.9 1°47.3	358°10.9 1°37.1	12°42.8 1°26.9	27°14.8 1°16.7	41°46.8 1°06.5	56°18.8 0°56.3	+31.9 -10.2	15.3 56.3
	Fr 20	274°21.7 -1°35.9	288°54.0 -1°46.0	303°26.4 -1°56.0	317°58.7 -2°06.0	332°31.1 -2°16.1	347°03.5 -2°26.1	1°35.9 -2°36.1	16°08.3 -2°46.0	30°40.7 -2°56.0	45°13.1 -3°05.9	59°45.5 -3°15.8	+32.4 -10.0	15.2 55.8
○	Sa 21	277°53.0 -5°41.5	292°25.5 -5°51.0	306°58.1 -6°00.5	321°30.6 -6°09.9	336°03.1 -6°19.3	350°35.7 -6°28.7	5°08.2 -6°38.0	19°40.7 -6°47.3	34°13.3 -6°56.5	48°45.8 -7°05.7	63°18.4 -7°14.9	+32.5 -9.3	15.1 55.3
	Su 22	281°26.1 -9°27.7	295°58.5 -9°36.2	310°31.0 -9°44.6	325°03.4 -9°53.0	339°35.9 -10°01.3	354°08.3 -10°09.6	8°40.8 -10°17.9	23°13.2 -10°26.1	37°45.6 -10°34.2	52°18.0 -10°42.3	66°50.4 -10°50.4	+32.4 -8.3	15.0 54.9
○	Mo 23	284°55.2 -12°44.4	299°27.4 -12°51.5	313°59.6 -12°58.6	328°31.8 -13°05.6	343°04.0 -13°12.6	357°36.2 -13°19.4	12°08.4 -13°26.3	26°40.5 -13°33.0	41°12.7 -13°39.7	55°44.8 -13°46.3	70°16.9 -13°52.9	+32.2 -6.9	14.9 54.5
	Tu 24	288°17.0 -15°23.3	302°48.9 -15°28.8	317°20.8 -15°34.2	331°52.7 -15°39.5	346°24.5 -15°44.7	0°56.4 -15°49.9	15°28.2 -15°55.0	30°00.0 -16°00.1	44°31.8 -16°05.0	59°03.6 -16°09.9	73°35.4 -16°14.7	+31.8 -5.1	14.8 54.3
○	We 25	291°30.6 -17°17.6	306°02.1 -17°21.2	320°33.7 -17°24.7	335°05.3 -17°28.1	349°36.8 -17°31.4	4°08.4 -17°34.7	18°39.9 -17°37.8	33°11.4 -17°40.9	47°42.9 -17°43.9	62°14.4 -17°46.9	76°45.9 -17°49.7	+31.5 -3.2	14.7 54.1
	Th 26	294°37.1 -18°22.5	309°08.5 -18°25.4	323°39.8 -18°25.4	338°11.2 -18°26.8	352°42.5 -18°28.1	7°13.9 -18°29.2	21°45.2 -18°30.3	36°16.5 -18°31.3	50°47.8 -18°32.2	65°19.1 -18°33.1	79°50.4 -18°33.1	+31.3 -1.1	14.7 54.0
○	Fr 27	309°08.5 -18°24.0	323°39.8 -18°25.4	338°11.2 -18°26.8	352°42.5 -18°28.0	7°13.9 -18°29.2	21°45.2 -18°30.3	36°16.5 -18°31.3	50°47.8 -18°32.2	65°19.1 -18°33.1	79°50.4 -18°33.1	94°21.7 -18°33.5	+31.3 -1.1	14.7 54.0
	Sa 28	312°10.8 -18°34.3	326°42.0 -18°33.2	341°13.3 -18°32.8	355°44.5 -18°32.0	10°15.8 -18°32.0	24°47.0 -18°30.0	39°18.3 -18°28.8	53°49.5 -18°27.6	68°20.8 -18°26.3	82°52.0 -18°25.0	97°23.2 -18°23.5	+31.2 +1.1	14.8 54.2
○	Su 29	315°12.1 -17°51.4	329°43.3 -17°48.5	344°14.6 -17°45.6	358°45.9 -17°42.7	13°17.1 -17°39.6	27°48.4 -17°36.4	42°19.7 -17°33.2	56°51.0 -17°29.9	71°22.3 -17°26.5	85°53.3 -17°23.0	100°24.8 -17°19.4	+31.3 +3.2	14.8 54.5
	Mo 30	318°14.5 -16°16.2	332°45.8 -16°11.3	347°17.2 -16°06.4	1°48.5 -16°01.4	16°19.8 -15°56.3	30°51.2 -15°51.1	45°22.5 -15°45.9	59°53.9 -15°40.5	74°25.2 -15°35.1	88°56.6 -15°29.6	103°27.9 -15°24.1	+31.3 +5.2	15.0 54.9

Row 1: GHA, Δ°/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (– = South), Δ°/h = dec. change, SH = horizontal parallax

Column = (UTC hour – day) mod 24

NM: 8 10h57 — FQ: 15 02h54 — FM: 22 13h20 — LQ: 30 16h53

SUN

May 2035

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Tu 1	270°42.5	285°42.5	300°42.6	315°42.7	330°42.8	345°42.8	0°42.9	15°43.0	30°43.1	45°43.1	60°43.2	75°43.3	+0.1
	15°02.1	15°02.9	15°03.6	15°04.4	15°05.1	15°05.9	15°06.7	15°07.4	15°08.2	15°08.9	15°09.7	15°10.4	+0.8
We 2	270°44.2	285°44.3	300°44.3	315°44.4	330°44.5	345°44.6	0°44.6	15°44.7	30°44.8	45°44.8	60°44.9	75°45.0	+0.1
	15°20.2	15°20.9	15°21.7	15°22.4	15°23.2	15°23.9	15°24.6	15°25.4	15°26.1	15°26.9	15°27.6	15°28.4	+0.7
Th 3	270°45.8	285°45.9	300°45.9	315°46.0	330°46.1	345°46.1	0°46.2	15°46.3	30°46.3	45°46.4	60°46.4	75°46.5	+0.1
	15°38.0	15°38.7	15°39.4	15°40.2	15°40.9	15°41.7	15°42.4	15°43.1	15°43.9	15°44.6	15°45.3	15°46.1	+0.7
Fr 4	270°47.3	285°47.3	300°47.4	315°47.5	330°47.5	345°47.6	0°47.6	15°47.7	30°47.7	45°47.8	60°47.8	75°47.9	+0.1
	15°55.5	15°56.3	15°57.0	15°57.7	15°58.4	15°59.1	15°59.9	16°00.6	16°01.3	16°02.0	16°02.8	16°03.5	+0.7
Sa 5	270°48.6	285°48.7	300°48.7	315°48.8	330°48.8	345°48.9	0°48.9	15°49.0	30°49.0	45°49.1	60°49.1	75°49.2	+0.1
	16°12.8	16°13.5	16°14.2	16°15.0	16°15.7	16°16.4	16°17.1	16°17.8	16°18.5	16°19.2	16°19.9	16°20.6	+0.7
Su 6	270°49.8	285°49.8	300°49.9	315°49.9	330°50.0	345°50.0	0°50.1	15°50.1	30°50.1	45°50.2	60°50.2	75°50.3	+0.0
	16°29.8	16°30.5	16°31.2	16°31.9	16°32.6	16°33.3	16°34.0	16°34.7	16°35.4	16°36.1	16°36.8	16°37.5	+0.7
Mo 7	270°50.8	285°50.9	300°50.9	315°50.9	330°51.0	345°51.0	0°51.1	15°51.1	30°51.1	45°51.2	60°51.2	75°51.2	+0.0
	16°46.6	16°47.3	16°48.0	16°48.6	16°49.3	16°50.0	16°50.7	16°51.4	16°52.1	16°52.8	16°53.5	16°54.1	+0.7
Tu 8	270°51.7	285°51.7	300°51.8	315°51.8	330°51.8	345°51.9	0°51.9	15°51.9	30°52.0	45°52.0	60°52.0	75°52.1	+0.0
	17°03.0	17°03.7	17°04.4	17°05.1	17°05.7	17°06.4	17°07.1	17°07.8	17°08.5	17°09.1	17°09.8	17°10.5	+0.7
We 9	270°52.5	285°52.5	300°52.5	315°52.5	330°52.6	345°52.6	0°52.6	15°52.7	30°52.7	45°52.7	60°52.7	75°52.8	+0.0
	17°19.2	17°19.9	17°20.5	17°21.2	17°21.9	17°22.5	17°23.2	17°23.9	17°24.5	17°25.2	17°25.9	17°26.5	+0.7
Th 10	270°53.1	285°53.1	300°53.1	315°53.1	330°53.2	345°53.2	0°53.2	15°53.2	30°53.2	45°53.3	60°53.3	75°53.3	+0.0
	17°35.1	17°35.8	17°36.4	17°37.1	17°37.7	17°38.4	17°39.0	17°39.7	17°40.3	17°41.0	17°41.6	17°42.3	+0.7
Fr 11	270°53.5	285°53.6	300°53.6	315°53.6	330°53.6	345°53.6	0°53.6	15°53.7	30°53.7	45°53.7	60°53.7	75°53.7	+0.0
	17°50.7	17°51.3	17°52.0	17°52.6	17°53.3	17°53.9	17°54.5	17°55.2	17°55.8	17°56.5	17°57.1	17°57.7	+0.6
Sa 12	270°53.9	285°53.9	300°53.9	315°53.9	330°53.9	345°53.9	0°53.9	15°54.0	30°54.0	45°54.0	60°54.0	75°54.0	+0.0
	18°06.0	18°06.6	18°07.2	18°07.9	18°08.5	18°09.1	18°09.8	18°10.4	18°11.0	18°11.6	18°12.3	18°12.9	+0.6
Su 13	270°54.1	285°54.1	300°54.1	315°54.1	330°54.1	345°54.1	0°54.1	15°54.1	30°54.1	45°54.1	60°54.1	75°54.1	+0.0
	18°21.0	18°21.6	18°22.2	18°22.8	18°23.4	18°24.1	18°24.7	18°25.3	18°25.9	18°26.5	18°27.1	18°27.7	+0.6
Mo 14	270°54.1	285°54.1	300°54.1	315°54.1	330°54.1	345°54.1	0°54.1	15°54.1	30°54.1	45°54.1	60°54.1	75°54.1	-0.0
	18°35.6	18°36.3	18°36.9	18°37.5	18°38.1	18°38.7	18°39.3	18°39.9	18°40.5	18°41.1	18°41.7	18°42.3	+0.6
Tu 15	270°54.1	285°54.0	300°54.0	315°54.0	330°54.0	345°54.0	0°54.0	15°54.0	30°54.0	45°54.0	60°54.0	75°54.0	-0.0
	18°50.0	18°50.6	18°51.2	18°51.8	18°52.4	18°53.0	18°53.6	18°54.1	18°54.7	18°55.3	18°55.9	18°56.5	+0.6
We 16	270°53.8	285°53.8	300°53.8	315°53.8	330°53.8	345°53.8	0°53.8	15°53.8	30°53.7	45°53.7	60°53.7	75°53.7	-0.0
	19°04.1	19°04.6	19°05.2	19°05.8	19°06.4	19°06.9	19°07.5	19°08.1	19°08.7	19°09.2	19°09.8	19°10.4	+0.6
Th 17	270°53.5	285°53.5	300°53.5	315°53.5	330°53.4	345°53.4	0°53.4	15°53.4	30°53.3	45°53.3	60°53.3	75°53.3	-0.0
	19°17.8	19°18.3	19°18.9	19°19.5	19°20.0	19°20.6	19°21.2	19°21.7	19°22.3	19°22.8	19°23.4	19°23.9	+0.6
Fr 18	270°53.0	285°53.0	300°53.0	315°52.9	330°52.9	345°52.9	0°52.9	15°52.8	30°52.8	45°52.8	60°52.8	75°52.7	-0.0
	19°31.2	19°31.7	19°32.3	19°32.8	19°33.4	19°33.9	19°34.5	19°35.0	19°35.6	19°36.1	19°36.6	19°37.2	+0.5
Sa 19	270°52.4	285°52.4	300°52.3	315°52.3	330°52.3	345°52.2	0°52.2	15°52.2	30°52.1	45°52.1	60°52.1	75°52.1	-0.0
	19°44.2	19°44.8	19°45.3	19°45.8	19°46.4	19°46.9	19°47.4	19°48.0	19°48.5	19°49.0	19°49.6	19°50.1	+0.5
Su 20	270°51.6	285°51.6	300°51.6	315°51.5	330°51.5	345°51.5	0°51.4	15°51.4	30°51.3	45°51.3	60°51.3	75°51.2	-0.0
	19°56.9	19°57.5	19°58.0	19°58.5	19°59.0	19°59.5	20°00.1	20°00.6	20°01.1	20°01.6	20°02.1	20°02.7	+0.5
Mo 21	270°50.7	285°50.7	300°50.7	315°50.6	330°50.6	345°50.5	0°50.5	15°50.5	30°50.4	45°50.4	60°50.3	75°50.3	-0.0
	20°09.3	20°09.8	20°10.3	20°10.8	20°11.3	20°11.9	20°12.4	20°12.9	20°13.4	20°13.9	20°14.4	20°14.9	+0.5
Tu 22	270°49.7	285°49.7	300°49.6	315°49.6	330°49.5	345°49.5	0°49.4	15°49.4	30°49.3	45°49.3	60°49.2	75°49.2	-0.0
	20°21.3	20°21.8	20°22.3	20°22.8	20°23.3	20°23.8	20°24.3	20°24.8	20°25.3	20°25.8	20°26.3	20°26.7	+0.5
We 23	270°48.6	285°48.5	300°48.5	315°48.4	330°48.4	345°48.3	0°48.3	15°48.2	30°48.1	45°48.1	60°48.0	75°48.0	-0.1
	20°33.0	20°33.5	20°34.0	20°34.5	20°34.9	20°35.4	20°35.9	20°36.4	20°36.8	20°37.3	20°37.8	20°38.3	+0.5
Th 24	270°47.3	285°47.2	300°47.2	315°47.1	330°47.1	345°47.0	0°46.9	15°46.9	30°46.8	45°46.8	60°46.7	75°46.6	-0.1
	20°44.4	20°44.8	20°45.3	20°45.8	20°46.2	20°46.7	20°47.1	20°47.6	20°48.1	20°48.5	20°49.0	20°49.4	+0.5
Fr 25	270°45.9	285°45.8	300°45.7	315°45.7	330°45.6	345°45.6	0°45.5	15°45.4	30°45.4	45°45.3	60°45.2	75°45.2	-0.1
	20°55.3	20°55.8	20°56.2	20°56.7	20°57.1	20°57.6	20°58.0	20°58.5	20°58.9	20°59.4	20°59.8	21°00.2	+0.4
Sa 26	270°44.3	285°44.3	300°44.2	315°44.1	330°44.1	345°44.0	0°43.9	15°43.9	30°43.8	45°43.7	60°43.7	75°43.6	-0.1
	21°06.0	21°06.4	21°06.8	21°07.3	21°07.7	21°08.1	21°08.6	21°09.0	21°09.4	21°09.8	21°10.3	21°10.7	+0.4
Su 27	270°42.7	285°42.6	300°42.4	315°42.5	330°42.4	345°42.3	0°42.2	15°42.2	30°42.1	45°42.0	60°41.9	75°41.9	-0.1
	21°16.2	21°16.6	21°17.0	21°17.5	21°17.9	21°18.3	21°18.7	21°19.1	21°19.5	21°19.9	21°20.4	21°20.8	+0.4
Mo 28	270°40.9	285°40.8	300°40.7	315°40.7	330°40.6	345°40.5	0°40.4	15°40.4	30°40.3	45°40.2	60°40.1	75°40.0	-0.1
	21°26.1	21°26.5	21°26.9	21°27.3	21°27.7	21°28.1	21°28.5	21°28.9	21°29.3	21°29.7	21°30.1	21°30.5	+0.4
Tu 29	270°39.0	285°38.9	300°38.8	315°38.7	330°38.7	345°38.6	0°38.5	15°38.4	30°38.3	45°38.2	60°38.2	75°38.1	-0.1
	21°35.6	21°36.0	21°36.4	21°36.8	21°37.2	21°37.5	21°37.9	21°38.3	21°38.7	21°39.1	21°39.5	21°39.8	+0.4
We 30	270°37.0	285°36.9	300°36.8	315°36.7	330°36.6	345°36.5	0°36.5	15°36.4	30°36.3	45°36.2	60°36.1	75°36.0	-0.1
	21°44.7	21°45.1	21°45.5	21°45.9	21°46.2	21°46.6	21°47.0	21°47.4	21°47.7	21°48.1	21°48.4	21°48.8	+0.4
Th 31	270°34.8	285°34.8	300°34.7	315°34.6	330°34.5	345°34.4	0°34.3	15°34.2	30°34.1	45°34.0	60°33.9	75°33.8	-0.1
	21°53.5	21°53.9	21°54.2	21°54.6	21°54.9	21°55.3	21°55.6	21°56.0	21°56.3	21°56.7	21°57.0	21°57.4	+0.4

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ°/h = dec. change
Semi-diameter: 15.8'

MOON

May 2035

	D	21h	22h	23h	0h	1h	2h	3h	4h	5h	6h	7h	Δ' /h SH
●	Tu 1	222°42.1 -11°39.2	237°13.4 -11°31.2	251°44.6 -11°23.2	266°15.9 -11°15.1	280°47.1 -11°06.9	295°18.4 -10°58.6	309°49.6 -10°50.3	324°20.9 -10°41.9	338°52.1 -10°33.5	353°23.3 -10°25.0	7°54.5 -10°16.4	+31.2 15.3 +8.3 56.1
	We 2	225°40.9 -8°00.9	240°11.8 -7°51.4	254°42.8 -7°41.9	269°13.7 -7°32.3	283°44.6 -7°22.7	298°15.5 -7°13.0	312°46.4 -7°03.3	327°17.2 -6°53.5	341°48.1 -6°43.7	356°18.9 -6°33.8	10°49.6 -6°23.9	+30.9 15.5 +9.7 57.0
	Th 3	240°51.8 -7°51.4	254°42.8 -7°41.9	269°13.7 -7°32.3	283°44.6 -7°22.7	298°15.5 -7°13.0	312°46.4 -7°03.3	327°17.2 -6°53.5	341°48.1 -6°43.7	356°18.9 -6°33.8	10°49.6 -6°23.9	25°20.4 -6°13.9	+30.9 15.6 +9.8 57.0
●	Fr 4	242°58.6 -3°39.3	257°28.9 -3°28.7	271°59.2 -3°18.1	286°29.4 -3°07.4	300°59.6 -2°56.7	315°29.8 -2°46.0	329°59.9 -2°35.2	344°30.0 -2°24.4	359°00.1 -2°13.6	13°30.1 -2°02.7	28°00.1 -1°51.8	+30.2 15.8 +10.8 58.0
	Sa 5	245°24.9 0°53.9	259°54.2 1°05.1	274°23.4 1°16.2	288°52.6 1°27.4	303°21.7 1°38.6	317°50.8 1°49.8	332°19.9 2°01.0	346°48.9 2°12.2	1°17.8 2°23.5	15°46.7 2°34.7	30°15.6 2°45.9	+29.1 16.1 +11.2 58.9
	Su 6	247°21.5 5°33.2	261°49.4 5°44.2	276°17.3 5°55.2	290°45.1 6°06.2	305°12.8 6°17.2	319°40.5 6°28.1	334°08.1 6°39.1	348°35.7 6°49.9	3°03.2 7°00.8	17°30.6 7°11.6	31°58.0 7°22.4	+27.7 16.3 +10.9 59.8
●	Mo 7	248°40.8 9°59.3	263°07.1 10°09.4	277°33.4 10°19.4	291°59.6 10°29.4	306°25.7 10°39.2	320°51.8 10°49.1	335°17.8 10°58.8	349°43.7 11°08.5	4°09.6 11°18.2	18°35.4 11°27.7	33°01.1 11°37.2	+26.0 16.5 +9.8 60.4
	Tu 8	249°19.8 13°50.2	263°44.5 13°58.4	278°09.2 14°06.5	292°33.9 14°14.5	306°58.5 14°22.3	321°23.0 14°30.1	335°47.5 14°37.8	350°11.9 14°45.4	4°36.3 14°52.9	19°00.6 15°00.3	33°24.9 15°07.6	+24.5 16.6 +7.7 60.8
	We 9	249°23.5 16°43.6	263°47.0 16°49.9	278°10.6 16°54.4	292°34.1 16°59.7	306°57.6 17°04.8	321°21.1 17°09.7	335°44.5 17°14.6	350°07.9 17°19.3	4°31.3 17°23.9	18°54.7 17°28.4	33°18.0 17°32.7	+23.5 16.6 +4.9 60.9
●	Th 10	249°06.6 18°22.1	263°29.8 18°24.3	277°53.0 18°26.4	292°16.2 18°28.4	306°39.4 18°30.2	321°02.7 18°31.9	335°25.9 18°33.4	349°49.1 18°34.8	4°12.4 18°36.1	18°35.7 18°37.2	32°59.0 18°38.2	+23.2 16.5 +1.6 60.6
	Fr 11	248°51.4 18°37.2	263°15.1 18°36.0	277°38.9 18°34.8	292°02.8 18°33.4	306°26.6 18°31.9	320°50.6 18°30.2	335°14.6 18°28.4	349°38.6 18°26.5	4°02.7 18°24.5	18°26.8 18°22.3	32°51.0 18°20.0	+24.0 16.4 -1.7 60.1
	Sa 12	249°00.5 17°31.2	263°25.6 17°27.1	277°50.8 17°22.8	292°16.1 17°18.4	306°41.4 17°13.8	321°06.8 17°09.2	335°32.3 17°04.5	349°57.9 16°59.7	4°23.5 16°54.7	18°49.2 16°49.7	33°14.9 16°44.5	+25.4 16.2 -4.7 59.4
●	Su 13	249°50.3 15°15.6	264°17.3 15°09.0	278°44.3 15°02.2	293°11.4 14°55.4	307°38.6 14°48.5	322°05.9 14°41.5	336°33.2 14°34.4	351°00.7 14°27.3	5°28.2 14°20.1	19°55.8 14°12.8	34°23.4 14°05.4	+27.3 16.0 -7.0 58.7
	Mo 14	251°27.2 12°06.4	265°56.1 11°57.9	280°25.0 11°49.4	294°54.0 11°40.9	309°23.0 11°32.3	323°52.2 11°23.6	338°21.4 11°14.9	352°50.3 11°06.1	7°20.0 10°57.3	21°49.4 10°57.3	36°18.8 10°39.5	+29.2 15.8 -8.7 57.9
	Tu 15	253°48.7 8°20.5	268°19.2 8°10.9	282°49.7 8°01.3	297°20.7 7°51.7	311°51.0 7°42.0	326°21.7 7°32.3	340°52.4 7°22.6	355°23.3 7°12.9	9°54.1 7°03.1	24°25.0 6°53.3	38°56.0 6°43.5	+30.7 15.6 -9.7 57.1
●	We 16	256°46.5 4°13.6	271°18.2 4°03.5	285°49.9 3°53.4	290°21.7 3°43.3	314°55.6 3°33.1	329°25.4 3°23.0	343°57.3 3°12.8	358°29.3 3°02.7	13°01.3 2°52.5	27°33.3 2°42.3	42°05.3 2°32.2	+31.9 15.4 -10.2 56.4
	Th 17	260°09.7 -0°00.5	274°42.2 -0°10.6	289°14.7 -0°20.8	303°47.1 -0°30.9	318°19.8 -0°41.0	332°52.4 -0°51.1	347°25.0 -1°01.2	1°57.6 -1°11.3	16°30.3 -1°21.4	31°03.9 -1°31.4	45°35.6 -1°41.5	+32.6 15.2 -10.1 55.8
	Fr 18	263°47.3 -4°10.0	278°20.2 -4°19.8	292°55.1 -4°29.5	307°25.9 -4°39.2	321°58.8 -4°48.8	336°31.7 -4°58.4	351°04.6 -5°08.0	5°37.5 -5°17.6	20°10.4 -5°27.2	34°43.3 -5°36.7	49°16.2 -5°46.2	+32.9 15.1 -9.6 55.3
●	Sa 19	267°29.4 -8°04.4	282°02.3 -8°13.3	296°35.1 -8°22.2	311°08.0 -8°31.0	325°40.8 -8°39.8	340°13.7 -8°48.6	354°46.5 -8°57.3	9°19.3 -9°06.0	23°52.1 -9°14.6	38°24.9 -9°23.2	52°57.7 -9°31.7	+32.8 15.0 -8.7 54.8
	Su 20	271°08.0 -11°33.9	285°40.6 -11°41.7	300°13.2 -11°49.3	314°45.7 -11°57.0	329°18.3 -12°04.5	343°50.8 -12°12.1	358°23.3 -12°19.5	12°55.8 -12°26.9	27°28.3 -12°34.3	42°00.8 -12°41.6	56°33.2 -12°48.8	+32.5 14.9 -7.5 54.5
	Mo 21	274°37.9 -14°29.8	289°10.0 -14°36.0	303°42.2 -14°42.2	318°14.3 -14°48.3	332°46.4 -14°54.3	347°18.5 -15°00.2	1°50.6 -15°06.1	16°22.7 -15°11.9	30°54.7 -15°17.7	45°26.8 -15°23.4	59°58.8 -15°29.0	+32.1 14.8 -5.9 54.2
●	Tu 22	277°56.8 -16°44.3	292°28.5 -16°53.1	307°00.3 -16°53.1	321°32.0 -17°05.7	336°03.6 -17°01.5	350°35.3 -17°05.7	5°07.0 -17°09.7	19°38.6 -17°13.7	34°10.2 -17°17.5	48°41.8 -17°21.3	63°13.4 -17°25.1	+31.7 14.7 -4.1 54.0
	We 23	281°05.8 -18°11.2	295°37.2 -18°13.6	310°08.6 -18°16.6	324°40.0 -18°18.2	339°11.3 -18°20.4	353°42.7 -18°22.5	8°14.1 -18°24.5	22°45.4 -18°26.4	37°16.7 -18°28.2	51°48.1 -18°30.0	66°19.4 -18°31.6	+31.4 14.7 -2.0 53.9
	Th 24	284°08.5 -18°46.4	298°39.7 -18°46.7	313°10.9 -18°46.9	327°42.2 -18°47.0	342°13.4 -18°47.0	356°44.7 -18°47.0	11°15.9 -18°46.9	25°47.1 -18°46.6	40°18.4 -18°46.3	54°49.9 -18°45.9	69°20.8 -18°45.5	+31.2 14.7 +0.1 54.0
●	Fr 25	287°09.6 -18°28.0	301°40.9 -18°26.1	316°12.2 -18°24.2	330°43.5 -18°22.2	345°14.8 -18°20.1	359°46.1 -18°17.9	14°17.4 -18°15.6	28°48.8 -18°13.3	43°20.1 -18°10.8	57°51.4 -18°08.3	72°22.8 -18°05.7	+31.3 14.8 +2.2 54.1
	Sa 26	290°13.9 -17°16.6	304°45.4 -17°12.7	319°16.8 -17°08.7	333°48.3 -17°04.6	348°19.8 -17°00.5	2°51.4 -16°56.2	17°22.9 -16°51.9	31°54.4 -16°47.5	46°26.0 -16°43.0	60°57.5 -16°38.5	75°29.1 -16°33.9	+31.5 14.8 +3.4 54.4
	Su 27	304°45.4 -17°12.7	319°16.8 -17°08.7	333°48.3 -17°04.6	348°19.8 -17°00.5	2°51.4 -16°56.2	17°22.9 -16°51.9	31°54.4 -16°47.5	46°26.0 -16°43.0	60°57.5 -16°38.5	75°29.1 -16°33.9	90°00.7 -16°29.1	+31.5 14.8 +4.4 54.4
●	Mo 28	307°55.5 -15°09.3	322°27.2 -15°03.4	336°58.9 -14°57.4	351°30.7 -14°51.3	6°02.4 -14°45.4	20°34.2 -14°39.2	35°05.9 -14°32.7	49°37.7 -14°26.4	64°09.5 -14°19.9	78°41.3 -14°13.5	93°13.1 -14°06.9	+31.8 15.0 +6.2 54.8
	Tu 29	311°10.7 -12°10.0	325°42.5 -12°12.8	340°14.4 -12°05.1	354°46.3 -12°05.1	9°18.2 -11°49.5	23°50.0 -11°41.6	38°21.9 -11°33.7	52°53.8 -11°25.7	67°25.7 -11°17.7	81°57.5 -11°09.5	96°29.4 -11°01.4	+31.9 15.1 +7.9 55.4
	We 30	314°27.0 -8°51.9	328°58.8 -8°42.8	343°30.6 -8°33.3	358°02.3 -8°24.5	12°34.1 -8°15.3	27°05.8 -8°06.8	41°37.6 -7°56.7	56°09.3 -7°47.4	70°41.0 -7°38.0	85°12.7 -7°28.5	99°44.3 -7°19.0	+31.7 15.3 +3.9 56.2
●	Th 31	317°37.2 -4°51.1	332°08.6 -4°41.0	346°39.9 -4°30.7	1°11.2 -4°20.5	15°42.5 -4°10.2	30°13.7 -3°59.9	44°44.9 -3°49.5	59°16.1 -3°39.1	73°47.3 -3°28.7	88°18.4 -3°18.3	102°49.5 -3°07.8	+31.2 15.6 +10.3 57.1

Row 1: GHA, Δ' /h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (— = South), Δ' /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 7 20h03 — FQ: 14 10h28 — FM: 22 04h25 — LQ: 30 07h30

SUN

June 2035

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Fr 1	276°32.6 22°01.9	285°32.5 22°02.2	300°32.4 22°02.6	315°32.3 22°02.9	330°32.2 22°03.2	345°32.1 22°03.6	6°32.0 22°03.9	15°31.9 22°04.3	30°31.8 22°04.6	45°31.7 22°04.9	60°31.6 22°05.3	75°31.5 22°05.6	-0.1 +0.3
Sa 2	276°30.3 22°09.9	285°30.2 22°10.2	300°30.1 22°10.5	315°30.0 22°10.9	330°29.9 22°11.2	345°29.8 22°11.5	0°29.7 22°11.8	15°29.6 22°12.1	30°29.5 22°12.5	45°29.4 22°12.8	60°29.3 22°13.1	75°29.2 22°13.4	-0.1 +0.3
Su 3	276°27.8 22°17.5	285°27.7 22°17.8	300°27.6 22°18.1	315°27.5 22°18.4	330°27.4 22°18.7	345°27.3 22°19.0	0°27.2 22°19.3	15°27.1 22°19.6	30°27.0 22°19.9	45°26.9 22°20.2	60°26.8 22°20.5	75°26.7 22°20.8	-0.1 +0.3
Mo 4	276°25.3 22°24.7	285°25.2 22°25.0	300°25.1 22°25.3	315°25.0 22°25.6	330°24.9 22°25.9	345°24.8 22°26.2	0°24.6 22°26.5	15°24.5 22°26.7	30°24.4 22°27.0	45°24.3 22°27.3	60°24.2 22°27.6	75°24.1 22°27.9	-0.1 +0.3
Tu 5	276°22.7 22°31.5	285°22.6 22°31.8	300°22.4 22°32.1	315°22.3 22°32.4	330°22.2 22°32.6	345°22.1 22°32.9	0°22.0 22°33.2	15°21.9 22°33.5	30°21.8 22°33.7	45°21.7 22°34.0	60°21.5 22°34.3	75°21.4 22°34.5	-0.1 +0.3
We 6	276°20.0 22°38.0	285°19.8 22°38.2	300°19.7 22°38.5	315°19.6 22°38.8	330°19.5 22°39.0	345°19.4 22°39.3	0°19.3 22°39.5	15°19.2 22°39.8	30°19.0 22°40.0	45°18.9 22°40.3	60°18.8 22°40.5	75°18.7 22°40.8	-0.1 +0.3
Th 7	276°17.2 22°44.0	285°17.1 22°44.3	300°16.9 22°44.5	315°16.8 22°44.7	330°16.7 22°45.0	345°16.6 22°45.2	0°16.5 22°45.5	15°16.3 22°45.7	30°16.2 22°45.9	45°16.1 22°46.2	60°16.0 22°46.4	75°15.9 22°46.7	-0.1 +0.2
Fr 8	276°14.3 22°49.7	285°14.2 22°49.9	300°14.1 22°50.1	315°14.0 22°50.3	330°13.8 22°50.6	345°13.7 22°50.8	0°13.6 22°51.0	15°13.5 22°51.2	30°13.4 22°51.4	45°13.2 22°51.7	60°13.1 22°51.9	75°13.0 22°52.1	-0.1 +0.2
Sa 9	276°11.4 22°54.9	285°11.3 22°55.1	300°11.2 22°55.3	315°11.0 22°55.5	330°10.9 22°55.7	345°10.8 22°55.9	0°10.7 22°56.1	15°10.5 22°56.4	30°10.4 22°56.6	45°10.3 22°56.8	60°10.2 22°57.0	75°10.0 22°57.2	-0.1 +0.2
Su 10	276°08.4 22°59.7	285°08.3 22°59.9	300°08.2 22°00.1	315°08.0 22°00.3	330°07.9 22°00.5	345°07.8 22°00.7	0°07.7 22°00.9	15°07.5 22°01.1	30°07.4 22°01.3	45°07.3 22°01.4	60°07.2 22°01.6	75°07.0 22°01.8	-0.1 +0.2
Mo 11	276°05.4 22°04.2	285°05.3 22°04.5	300°05.1 22°04.5	315°05.0 22°04.7	330°04.9 22°04.9	345°04.8 22°05.0	0°04.6 22°05.2	15°04.5 22°05.4	30°04.4 22°05.6	45°04.2 22°05.7	60°04.1 22°05.9	75°04.0 22°06.1	-0.1 +0.2
Tu 12	276°02.3 22°08.2	285°02.2 22°08.3	300°02.1 22°08.3	315°01.9 22°08.7	330°01.8 22°09.0	345°01.7 22°09.0	0°01.5 22°09.1	15°01.4 22°09.3	30°01.3 22°09.4	45°01.2 22°09.6	60°01.0 22°09.7	75°00.9 22°09.9	-0.1 +0.2
We 13	269°59.2 23°11.8	284°59.1 23°11.9	299°58.9 23°12.1	314°58.8 23°12.2	329°58.7 23°12.4	344°58.6 23°12.5	359°58.4 23°12.6	14°58.3 23°12.8	29°58.2 23°12.9	44°58.0 23°13.1	59°57.9 23°13.2	74°57.8 23°13.3	-0.1 +0.1
Th 14	269°56.1 23°15.0	284°55.9 23°15.1	299°55.8 23°15.3	314°55.7 23°15.4	329°55.5 23°15.5	344°55.4 23°15.6	359°55.3 23°15.7	14°55.1 23°15.9	29°55.0 23°16.0	44°54.8 23°16.2	59°54.7 23°16.3	74°54.6 23°16.3	-0.1 +0.1
Fr 15	269°52.9 23°17.8	284°52.7 23°17.9	299°52.6 23°18.0	314°52.5 23°18.1	329°52.4 23°18.2	344°52.3 23°18.3	359°52.1 23°18.4	14°52.0 23°18.5	29°51.8 23°18.6	44°51.7 23°18.7	59°51.6 23°18.8	74°51.4 23°18.9	-0.1 +0.1
Sa 16	269°49.7 23°20.2	284°49.5 23°20.3	299°49.4 23°20.4	314°49.3 23°20.5	329°49.1 23°20.5	344°49.0 23°20.6	359°48.9 23°20.7	14°48.7 23°20.8	29°48.5 23°20.9	44°48.4 23°21.0	59°48.3 23°21.1	74°48.2 23°21.1	-0.1 +0.1
Su 17	269°46.5 23°22.2	284°46.3 23°22.2	299°46.2 23°22.3	314°46.1 23°22.4	329°45.9 23°22.4	344°45.8 23°22.5	359°45.7 23°22.6	14°45.5 23°22.7	29°45.4 23°22.7	44°45.2 23°22.8	59°45.1 23°22.9	74°45.0 23°22.9	-0.1 +0.1
Mo 18	269°43.2 23°23.7	284°43.1 23°23.8	299°43.0 23°23.8	314°42.8 23°23.9	329°42.7 23°23.9	344°42.5 23°24.0	359°42.4 23°24.0	14°42.3 23°24.1	29°42.1 23°24.1	44°42.0 23°24.2	59°41.9 23°24.2	74°41.7 23°24.3	-0.1 +0.1
Tu 19	269°40.0 23°24.9	284°39.8 23°24.9	299°39.7 23°24.9	314°39.6 23°25.0	329°39.4 23°25.0	344°39.3 23°25.0	359°39.2 23°25.1	14°39.0 23°25.1	29°38.9 23°25.2	44°38.8 23°25.2	59°38.6 23°25.2	74°38.5 23°25.2	-0.1 +0.0
We 20	269°36.7 23°25.6	284°36.6 23°25.6	299°36.5 23°25.6	314°36.3 23°25.7	329°36.2 23°25.7	344°36.1 23°25.7	359°35.9 23°25.7	14°35.8 23°25.7	29°35.6 23°25.7	44°35.5 23°25.8	59°35.4 23°25.8	74°35.2 23°25.8	-0.1 +0.0
Th 21	269°33.5 23°25.9	284°33.3 23°25.9	299°33.2 23°25.9	314°33.1 23°25.9	329°32.9 23°25.9	344°32.8 23°25.9	359°32.7 23°25.9	14°32.5 23°25.9	29°32.4 23°25.9	44°32.3 23°25.9	59°32.1 23°25.9	74°32.0 23°25.9	-0.1 +0.0
Fr 22	269°30.2 23°25.8	284°30.1 23°25.8	299°30.0 23°25.8	314°29.8 23°25.8	329°29.7 23°25.8	344°29.6 23°25.7	359°29.4 23°25.7	14°29.3 23°25.7	29°29.2 23°25.7	44°29.0 23°25.7	59°28.9 23°25.7	74°28.8 23°25.6	-0.1 -0.0
Sa 23	269°27.0 23°25.3	284°26.9 23°25.3	299°26.7 23°25.2	314°26.6 23°25.2	329°26.5 23°25.2	344°26.3 23°25.2	359°26.2 23°25.1	14°26.1 23°25.1	29°25.9 23°25.2	44°25.8 23°25.0	59°25.7 23°25.0	74°25.5 23°24.9	-0.1 -0.0
Su 24	269°23.8 23°24.4	284°23.7 23°24.3	299°23.5 23°24.3	314°23.4 23°24.2	329°23.3 23°24.2	344°23.1 23°24.1	359°23.0 23°24.1	14°22.9 23°24.1	29°22.6 23°24.2	44°22.6 23°24.2	59°22.5 23°24.3	74°22.3 23°23.8	-0.1 -0.1
Mo 25	269°20.6 23°25.1	284°20.5 23°23.0	299°20.3 23°22.9	314°20.2 23°22.9	329°20.1 23°22.8	344°20.0 23°22.7	359°19.8 23°22.7	14°19.7 23°22.6	29°19.6 23°22.5	44°19.4 23°22.5	59°19.3 23°22.4	74°19.2 23°22.3	-0.1 -0.1
Tu 26	269°17.4 23°21.3	284°17.3 23°21.2	299°17.2 23°21.1	314°17.1 23°21.1	329°16.9 23°21.0	344°16.8 23°20.9	359°16.7 23°20.8	14°16.5 23°20.7	29°16.4 23°20.6	44°16.3 23°20.5	59°16.1 23°20.5	74°16.0 23°20.4	-0.1 -0.1
We 27	269°14.3 23°19.2	284°14.2 23°19.0	299°14.1 23°19.0	314°13.9 23°18.9	329°13.8 23°18.8	344°13.7 23°18.7	359°13.5 23°18.6	14°13.4 23°18.5	29°13.3 23°18.3	44°13.2 23°18.2	59°13.0 23°18.1	74°12.9 23°18.0	-0.1 -0.1
Th 28	269°11.2 23°16.6	284°11.1 23°16.5	299°11.0 23°16.4	314°10.8 23°16.2	329°10.7 23°16.1	344°10.6 23°16.0	359°10.5 23°15.9	14°10.3 23°15.8	29°10.2 23°15.6	44°10.0 23°15.5	59°09.9 23°15.4	74°09.8 23°15.3	-0.1 -0.1
Fr 29	269°08.2 23°13.6	284°08.0 23°13.5	299°07.9 23°13.4	314°07.8 23°13.2	329°07.7 23°13.1	344°07.5 23°12.9	359°07.4 23°12.8	14°07.3 23°12.7	29°07.2 23°12.5	44°07.0 23°12.4	59°06.9 23°12.3	74°06.8 23°12.1	-0.1 -0.1
Sa 30	269°05.2 23°10.2	284°05.0 23°10.1	299°04.9 23°09.9	314°04.8 23°09.8	329°04.6 23°09.6	344°04.5 23°09.5	359°04.4 23°09.3	14°04.3 23°09.2	29°04.2 23°09.0	44°04.0 23°08.9	59°03.9 23°08.7	74°03.8 23°08.6	-0.1 -0.2

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

June 2035

	D	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	Δ'/h	SH
●	Fr 1	247°58.5 -1°21.5	262°29.2 -1°10.7	276°59.8 -0°59.9	291°30.5 -0°49.1	306°01.0 -0°38.3	320°31.6 -0°27.4	335°02.0 -0°16.5	349°32.5 -0°05.7	4°02.9 0°05.3	18°33.2 0°16.2	33°03.8 0°27.1	+30.5 +10.9	15.8 57.8
	Sa 2	250°31.9 3°12.1	265°01.3 3°03.2	279°30.7 3°34.2	294°00.1 3°45.2	308°29.9 3°56.2	322°58.5 4°07.2	337°27.7 4°18.2	351°56.8 4°29.2	6°25.8 4°20.2	20°54.8 4°51.2	35°23.6 5°02.1	+29.2 +11.0	16.0 58.8
	Su 3	253°28.8 7°44.3	266°56.6 7°54.9	281°24.3 8°05.4	295°51.9 8°15.9	310°19.5 8°26.4	324°47.0 8°36.9	339°14.4 8°47.3	353°41.7 8°57.7	8°08.9 9°08.0	22°36.1 9°18.3	37°03.2 9°28.5	+27.4 +10.4	16.3 59.8
●	Mo 4	253°40.1 11°55.7	268°06.0 12°05.1	282°31.7 12°14.3	296°57.4 12°23.5	311°23.0 12°32.6	325°48.5 12°41.6	340°13.9 12°50.6	354°39.3 12°59.4	9°04.6 13°08.2	23°29.8 13°16.9	37°54.9 13°25.6	+25.5 +9.0	16.5 60.6
	Tu 5	254°02.8 15°24.2	268°26.7 15°31.3	282°50.6 15°38.3	297°14.5 15°45.2	311°38.2 15°52.0	326°01.9 15°58.6	340°25.6 16°05.2	354°49.1 16°11.7	9°12.6 16°18.0	23°36.1 16°24.2	37°59.5 16°30.3	+23.7 +6.6	16.7 61.1
	We 6	253°44.3 17°47.1	268°06.9 17°51.2	282°29.5 17°55.2	296°52.1 17°59.0	311°14.6 18°02.7	325°37.2 18°06.2	339°59.6 18°09.6	354°22.1 18°12.9	8°44.6 18°16.1	23°07.0 18°19.1	37°29.4 18°21.9	+22.5 +3.5	16.7 61.3
●	Th 7	253°04.2 18°47.9	267°26.5 18°48.5	281°48.9 18°48.9	296°11.2 18°49.2	310°33.6 18°49.4	324°56.0 18°49.4	339°18.4 18°49.3	353°40.8 18°48.6	8°03.3 18°48.1	22°25.7 18°48.1	36°48.2 18°47.4	+22.4 -0.0	16.7 61.1
	Fr 8	252°30.2 18°20.5	266°53.3 18°17.6	281°16.5 18°14.6	295°39.8 18°11.5	310°03.2 18°08.2	324°26.5 18°04.8	338°50.0 18°01.3	353°13.5 15°54.9	7°37.1 15°53.9	22°00.7 17°50.0	36°24.4 17°45.9	+23.4 -3.5	16.5 60.6
	Sa 9	252°28.6 16°31.6	266°53.5 16°25.7	281°18.4 16°19.8	295°43.5 16°13.7	310°08.6 16°07.5	324°33.8 16°01.3	338°59.1 15°48.5	353°24.5 15°48.5	7°50.0 15°41.9	22°15.5 15°33.5	36°41.2 15°28.5	+25.3 -6.3	16.3 59.9
●	Su 10	253°16.0 13°37.1	267°43.1 13°29.0	282°10.2 13°20.9	296°37.4 13°12.7	311°04.6 13°04.4	325°32.0 12°56.1	339°59.4 12°47.6	354°27.0 12°36.2	8°54.6 12°22.0	23°22.3 12°12.0	37°50.1 12°13.4	+27.4 -8.4	16.1 59.9
	Mo 11	254°56.8 9°56.8	269°25.9 9°47.3	283°55.0 9°37.8	298°24.3 9°28.3	312°53.6 9°18.6	327°23.0 9°09.0	341°52.4 8°59.3	356°22.0 8°49.6	10°51.6 8°39.9	25°21.3 8°30.1	39°51.0 8°20.3	+29.4 -9.7	15.8 58.1
	Tu 12	257°25.4 5°49.8	271°56.2 5°39.6	286°27.0 5°29.4	300°57.9 5°19.2	315°28.9 5°08.9	329°59.9 4°58.7	344°31.0 4°48.4	359°02.1 4°38.1	13°33.3 4°27.8	28°04.6 4°17.5	42°35.9 4°07.2	+31.1 -10.3	15.6 57.1
●	We 13	260°31.0 1°32.2	275°03.0 1°21.9	289°35.1 1°11.5	304°07.1 1°01.2	318°39.9 0°50.9	333°11.4 0°40.6	347°43.6 0°30.3	2°15.9 0°20.0	16°48.1 0°09.7	31°20.4 -0°00.6	45°52.8 -0°10.8	+32.2 -10.3	15.4 56.3
	Th 14	264°01.0 -9°43.0	278°33.8 -2°53.0	293°06.5 -3°02.9	307°39.3 -3°12.9	322°12.1 -3°22.8	336°44.9 -3°32.7	351°17.7 -3°42.6	5°50.5 -3°52.5	20°23.4 -4°02.3	34°56.3 -4°12.1	49°21.9 -4°21.9	+32.8 -9.9	15.2 55.6
	Fr 15	267°43.4 -6°44.9	282°16.3 -6°54.2	296°49.3 -7°03.4	311°22.3 -7°12.6	325°55.3 -7°21.8	340°28.3 -7°30.9	355°01.3 -7°40.0	9°34.3 -7°49.0	24°07.3 -7°58.0	38°40.3 -8°07.2	53°13.9 -8°15.9	+33.0 -9.1	15.0 55.0
●	Sa 16	271°27.4 -10°24.5	286°00.0 -10°32.7	300°33.2 -10°40.0	315°06.0 -10°48.9	329°38.6 -10°57.0	344°11.7 -11°05.0	358°44.5 -11°12.9	13°17.3 -11°20.8	27°50.1 -11°28.6	42°22.9 -11°36.4	56°55.7 -11°44.1	+32.8 -8.0	14.9 54.5
	Su 17	275°05.3 -13°38.5	289°37.8 -13°40.1	304°10.3 -13°46.8	318°42.8 -13°53.5	333°15.7 -14°00.1	347°47.6 -14°06.7	2°20.0 -14°13.2	16°52.4 -14°19.6	31°24.8 -14°25.9	45°57.2 -14°32.2	60°29.5 -14°38.5	+32.4 -6.5	14.8 54.2
	Mo 18	278°32.1 -16°03.7	293°04.1 -16°08.8	307°36.1 -16°13.9	322°08.1 -16°18.9	336°40.1 -16°23.8	351°12.0 -16°28.6	5°43.9 -16°33.3	20°15.8 -16°38.0	34°47.7 -16°42.6	49°19.5 -16°47.2	63°51.4 -16°51.6	+31.9 -4.8	14.7 54.0
●	Tu 19	281°46.7 -17°49.1	296°18.3 -17°52.2	310°49.8 -17°55.4	325°21.3 -17°58.4	339°52.8 -18°01.4	354°24.3 -18°04.2	8°55.8 -18°07.0	23°27.3 -18°09.7	37°58.7 -18°12.4	52°30.1 -18°14.9	67°01.5 -18°17.4	+31.5 -2.8	14.7 53.9
	We 20	284°51.3 -18°44.1	299°22.6 -18°45.2	313°53.8 -18°46.2	328°25.0 -18°47.2	342°56.3 -18°48.0	357°27.5 -18°48.8	11°58.7 -18°49.5	26°29.9 -18°50.0	41°01.1 -18°50.5	55°32.2 -18°51.0	70°03.4 -18°51.3	+31.2 -0.7	14.7 53.9
	Th 21	287°50.9 -18°45.8	302°22.0 -18°44.7	316°53.2 -18°43.6	331°24.4 -18°42.3	345°55.5 -18°41.0	0°26.7 -18°39.6	14°57.9 -18°38.1	29°29.1 -18°36.5	44°00.2 -18°34.0	58°31.4 -18°33.1	73°02.6 -18°31.3	+31.2 +1.4	14.7 54.0
●	Fr 22	290°51.3 -17°53.5	305°22.6 -17°50.4	319°54.0 -17°47.7	334°25.3 -17°43.7	348°56.6 -17°36.8	3°28.0 -17°36.8	17°59.4 -17°35.2	32°30.7 -17°29.5	47°02.1 -17°25.7	61°33.5 -17°21.9	76°05.0 -17°18.0	+31.4 +3.6	14.8 54.2
	Sa 23	293°57.7 -16°09.6	308°29.3 -16°04.4	323°01.0 -15°59.2	337°32.6 -15°53.9	352°04.3 -15°48.5	6°36.0 -15°43.0	21°07.7 -15°37.4	35°39.4 -15°31.8	50°11.1 -15°26.1	64°42.9 -15°20.4	79°14.0 -15°14.5	+31.7 +5.5	14.9 54.3
	Su 24	297°12.5 -10°17.9	311°44.5 -10°09.4	326°16.5 -10°00.9	340°48.5 -9°52.3	355°20.5 -9°43.6	9°52.5 -13°03.1	24°24.5 -12°55.8	38°56.5 -12°48.5	53°28.6 -12°41.1	68°00.6 -12°33.7	82°32.7 -12°26.1	+32.0 +7.2	15.0 54.9
●	Mo 25	311°44.5 -13°31.5	326°16.5 -13°24.5	340°48.5 -13°17.4	355°20.5 -13°10.3	9°52.5 -13°03.1	24°24.5 -12°55.8	38°56.5 -12°48.5	53°28.6 -12°41.1	68°00.6 -12°33.7	82°32.7 -12°26.1	97°04.8 -12°18.6	+32.0 +7.3	15.0 54.9
	Tu 26	315°06.8 -10°17.9	329°39.0 -10°09.4	344°11.2 -10°00.9	358°43.4 -9°52.3	13°15.6 -9°43.6	27°47.8 -9°35.0	42°20.0 -9°26.2	56°52.2 -9°17.4	71°24.4 -9°08.6	85°56.6 -8°59.7	100°28.8 -8°50.7	+32.2 +8.7	15.1 55.5
	We 27	318°31.3 -6°31.2	333°03.4 -6°21.5	347°35.5 -6°11.8	2°07.6 -6°02.1	16°39.7 -5°52.4	31°11.8 -5°42.6	45°43.8 -5°32.7	60°15.9 -5°22.9	74°47.9 -5°13.0	89°19.9 -5°03.1	103°51.9 -4°53.1	+32.1 +9.8	15.3 56.1
●	Th 28	321°49.6 -9°20.0	336°21.4 -2°09.6	350°52.9 -1°59.2	5°24.5 -1°48.7	19°56.1 -1°38.2	34°27.6 -1°27.7	48°59.2 -1°17.2	63°30.6 -1°06.7	78°02.1 -0°56.1	92°33.5 -0°45.5	107°04.9 -0°34.9	+31.5 +10.5	15.5 56.9
	Fr 29	324°50.9 2°05.3	339°21.7 2°16.0	353°52.3 2°26.7	8°23.0 2°37.5	22°53.5 2°48.2	37°24.1 2°58.9	51°54.5 3°09.7	66°25.0 3°20.4	80°55.3 3°31.1	95°25.7 3°41.9	109°55.9 3°52.6	+30.5 +10.7	15.8 57.8
	Sa 30	327°22.9 6°32.0	341°52.2 6°42.5	356°21.4 6°53.0	10°50.5 7°03.4	25°19.6 7°13.8	39°48.6 7°24.6	54°17.6 7°34.6	68°46.5 7°44.9	83°15.3 7°55.2	97°44.0 8°05.5	112°12.7 8°15.7	+29.0 +10.4	16.0 58.7

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter
Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax
Column = (UTC hour - day) mod 24
NM: 6 03h20 — FQ: 12 19h50 — FM: 20 19h37 — LQ: 28 18h42

SUN

July 2025

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Su 1	268°02.2	284°02.1	299°02.0	314°01.8	329°01.7	344°01.6	359°01.5	14°01.4	29°01.2	44°01.1	59°01.0	74°00.9	-0.1
	23°06.5	23°06.3	23°06.1	23°05.9	23°05.8	23°05.6	23°05.4	23°05.3	23°05.1	23°04.9	23°04.8	23°04.6	-0.2
Mo 2	268°59.3	283°59.2	298°59.1	313°59.0	328°58.8	343°58.7	358°58.6	13°58.5	28°58.4	43°58.3	58°58.1	73°58.0	-0.1
	23°02.3	23°02.1	23°01.9	23°01.7	23°01.5	23°01.3	23°01.1	23°01.0	23°00.8	23°00.6	23°00.4	23°00.2	-0.2
Tu 3	268°56.5	283°56.4	298°56.3	313°56.1	328°56.0	343°55.9	358°55.8	13°55.7	28°55.6	43°55.5	58°55.3	73°55.2	-0.1
	22°57.7	22°57.5	22°57.3	22°57.1	22°56.9	22°56.7	22°56.5	22°56.3	22°56.0	22°55.8	22°55.6	22°55.4	-0.2
We 4	268°53.7	283°53.6	298°53.5	313°53.4	328°53.3	343°53.2	358°53.1	13°52.9	28°52.8	43°52.7	58°52.6	73°52.5	-0.1
	22°52.7	22°52.5	22°52.2	22°52.0	22°51.8	22°51.6	22°51.4	22°51.1	22°50.9	22°50.7	22°50.5	22°50.3	-0.2
Th 5	268°51.1	283°50.9	298°50.8	313°50.7	328°50.6	343°50.5	358°50.4	13°50.3	28°50.2	43°50.1	58°50.0	73°49.9	-0.1
	22°47.3	22°47.0	22°46.8	22°46.6	22°46.3	22°46.1	22°45.9	22°45.6	22°45.4	22°45.2	22°44.9	22°44.7	-0.2
Fr 6	268°48.5	283°48.4	298°48.3	313°48.1	328°48.0	343°47.9	358°47.8	13°47.7	28°47.6	43°47.5	58°47.4	73°47.3	-0.1
	22°41.5	22°41.2	22°41.0	22°40.7	22°40.5	22°40.2	22°40.0	22°39.7	22°39.5	22°39.2	22°39.0	22°38.7	-0.3
Sa 7	268°46.0	283°45.9	298°45.8	313°45.7	328°45.6	343°45.5	358°45.4	13°45.3	28°45.2	43°45.0	58°44.9	73°44.8	-0.1
	22°35.3	22°35.0	22°34.8	22°34.5	22°34.2	22°34.0	22°33.7	22°33.4	22°33.2	22°32.9	22°32.6	22°32.4	-0.3
Su 8	268°43.6	283°43.5	298°43.4	313°43.3	328°43.2	343°43.1	358°43.0	13°42.9	28°42.8	43°42.7	58°42.6	73°42.5	-0.1
	22°28.7	22°28.5	22°28.2	22°27.9	22°27.6	22°27.3	22°27.0	22°26.8	22°26.6	22°26.2	22°25.9	22°25.6	-0.3
Mo 9	268°41.3	283°41.2	298°41.1	313°41.0	328°40.9	343°40.8	358°40.7	13°40.6	28°40.5	43°40.4	58°40.3	73°40.2	-0.1
	22°21.8	22°21.5	22°21.2	22°20.9	22°20.6	22°20.3	22°20.0	22°19.7	22°19.4	22°19.1	22°18.8	22°18.5	-0.3
Tu 10	268°39.1	283°39.0	298°38.9	313°38.8	328°38.7	343°38.6	358°38.5	13°38.4	28°38.3	43°38.3	58°38.2	73°38.1	-0.1
	22°14.4	22°14.1	22°13.8	22°13.5	22°13.2	22°12.9	22°12.5	22°12.2	22°11.9	22°11.6	22°11.3	22°10.9	-0.3
We 11	268°37.0	283°36.9	298°36.8	313°36.7	328°36.6	343°36.5	358°36.5	13°36.4	28°36.3	43°36.2	58°36.1	73°36.1	-0.1
	22°06.7	22°06.4	22°06.1	22°05.7	22°05.4	22°05.1	22°04.7	22°04.4	22°04.1	22°03.7	22°03.4	22°03.0	-0.1
Th 12	268°35.0	283°34.9	298°34.9	313°34.8	328°34.7	343°34.6	358°34.5	13°34.5	28°34.4	43°34.3	58°34.2	73°34.1	-0.3
	21°58.6	21°58.3	21°57.9	21°57.6	21°57.2	21°56.9	21°56.5	21°56.2	21°55.8	21°55.5	21°55.1	21°54.8	-0.3
Fr 13	268°33.2	283°33.1	298°33.0	313°32.9	328°32.7	343°32.8	358°32.7	13°32.6	28°32.4	43°32.5	58°32.4	73°32.4	-0.1
	21°50.1	21°49.8	21°49.4	21°49.0	21°48.7	21°48.3	21°47.9	21°47.6	21°47.2	21°46.8	21°46.5	21°46.1	-0.4
Sa 14	268°31.4	283°31.4	298°31.3	313°31.2	328°31.1	343°31.1	358°31.0	13°31.0	28°30.9	43°30.8	58°30.8	73°30.7	-0.1
	21°41.3	21°40.9	21°40.5	21°40.1	21°39.8	21°39.4	21°39.0	21°38.6	21°38.2	21°37.8	21°37.5	21°37.1	-0.4
Su 15	268°29.8	283°29.8	298°29.7	313°29.7	328°29.6	343°29.5	358°29.5	13°29.4	28°29.3	43°29.3	58°29.2	73°29.2	-0.1
	21°32.0	21°31.6	21°31.3	21°30.9	21°30.5	21°30.1	21°29.7	21°29.3	21°28.9	21°28.5	21°28.1	21°27.7	-0.4
Mo 16	268°28.4	283°28.3	298°28.3	313°28.2	328°28.1	343°28.1	358°28.0	13°28.0	28°27.9	43°27.9	58°27.8	73°27.8	-0.1
	21°22.4	21°22.0	21°21.6	21°21.2	21°20.8	21°20.4	21°20.0	21°19.6	21°19.2	21°18.8	21°18.3	21°17.9	-0.4
Tu 17	268°27.0	283°27.0	298°26.9	313°26.9	328°26.8	343°26.8	358°26.7	13°26.7	28°26.6	43°26.6	58°26.5	73°26.5	-0.1
	21°12.5	21°12.1	21°11.6	21°11.2	21°10.8	21°10.4	21°09.9	21°09.5	21°09.1	21°08.7	21°08.2	21°07.8	-0.4
We 18	268°25.8	283°25.8	298°25.8	313°25.7	328°25.7	343°25.6	358°25.6	13°25.5	28°25.4	43°25.4	58°25.4	73°25.3	-0.0
	21°02.2	21°01.7	21°01.3	21°00.9	21°00.4	21°00.0	20°59.5	20°59.1	20°58.7	20°58.2	20°57.8	20°57.3	-0.4
Th 19	268°24.8	283°24.7	298°24.7	313°24.7	328°24.6	343°24.6	358°24.5	13°24.5	28°24.4	43°24.4	58°24.4	73°24.3	-0.0
	20°51.5	20°51.1	20°50.6	20°50.1	20°49.7	20°49.2	20°48.8	20°48.3	20°47.9	20°47.4	20°47.0	20°46.5	-0.5
Fr 20	268°23.9	283°23.8	298°23.8	313°23.7	328°23.7	343°23.7	358°23.6	13°23.6	28°23.5	43°23.5	58°23.5	73°23.5	-0.0
	20°40.5	20°40.0	20°39.5	20°39.1	20°38.6	20°38.1	20°37.7	20°37.2	20°36.7	20°36.2	20°35.8	20°35.3	-0.5
Sa 21	268°23.1	283°23.0	298°23.0	313°23.0	328°23.0	343°22.9	358°22.9	13°22.9	28°22.8	43°22.8	58°22.8	73°22.8	-0.0
	20°29.1	20°28.6	20°28.1	20°27.7	20°27.2	20°26.7	20°26.2	20°25.7	20°25.2	20°24.8	20°24.3	20°23.8	-0.5
Su 22	268°22.4	283°22.4	298°22.4	313°22.4	328°22.3	343°22.3	358°22.3	13°22.3	28°22.2	43°22.2	58°22.2	73°22.2	-0.0
	20°17.4	20°16.9	20°16.4	20°15.9	20°15.4	20°14.9	20°14.4	20°13.9	20°13.4	20°12.9	20°12.4	20°11.9	-0.5
Mo 23	268°21.9	283°21.9	298°21.9	313°21.9	328°21.9	343°21.8	358°21.8	13°21.8	28°21.8	43°21.8	58°21.8	73°21.7	-0.0
	20°05.3	20°04.8	20°04.3	20°03.8	20°03.3	20°02.8	20°02.3	20°01.8	20°01.3	20°00.7	20°00.2	19°59.7	-0.5
Tu 24	268°21.6	283°21.5	298°21.5	313°21.5	328°21.5	343°21.5	358°21.5	13°21.5	28°21.5	43°21.5	58°21.5	73°21.4	-0.0
	19°53.0	19°52.4	19°51.9	19°51.4	19°50.9	19°50.3	19°49.8	19°49.3	19°48.8	19°48.2	19°47.7	19°47.2	-0.5
We 25	268°21.3	283°21.3	298°21.3	313°21.3	328°21.3	343°21.3	358°21.3	13°21.3	28°21.3	43°21.3	58°21.3	73°21.3	-0.0
	19°40.2	19°39.7	19°39.2	19°38.6	19°38.1	19°37.6	19°37.0	19°36.5	19°35.9	19°35.4	19°34.8	19°34.3	-0.5
Th 26	268°21.3	283°21.3	298°21.3	313°21.3	328°21.3	343°21.3	358°21.3	13°21.3	28°21.3	43°21.3	58°21.3	73°21.3	+0.0
	19°27.2	19°26.6	19°26.1	19°25.5	19°25.0	19°24.4	19°23.9	19°23.3	19°22.8	19°22.2	19°21.7	19°21.1	-0.6
Fr 27	268°21.3	283°21.4	298°21.4	313°21.4	328°21.4	343°21.4	358°21.4	13°21.4	28°21.4	43°21.4	58°21.4	73°21.4	+0.0
	19°13.8	19°13.3	19°12.7	19°12.1	19°11.6	19°11.0	19°10.4	19°09.9	19°09.3	19°08.7	19°08.2	19°07.6	-0.6
Sa 28	268°21.6	283°21.6	298°21.6	313°21.6	328°21.6	343°21.6	358°21.6	13°21.7	28°21.7	43°21.7	58°21.7	73°21.7	+0.0
	19°00.1	18°59.6	18°59.0	18°58.4	18°57.8	18°57.3	18°56.7	18°56.1	18°55.5	18°54.9	18°54.3	18°53.8	-0.6
Su 29	268°21.9	283°21.9	298°22.0	313°22.0	328°22.0	343°22.0	358°22.0	13°22.1	28°22.1	43°22.1	58°22.1	73°22.1	+0.0
	18°46.1	18°45.6	18°45.0	18°44.4	18°43.8	18°43.2	18°42.6	18°42.0	18°41.4	18°40.8	18°40.2	18°39.6	-0.6
Mo 30	268°22.4	283°22.5	298°22.5	313°22.5	328°22.5	343°22.6	358°22.6	13°22.6	28°22.6	43°22.7	58°22.7	73°22.7	+0.0
	18°31.8	18°31.2	18°30.6	18°30.0	18°29.4	18°28.8	18°28.2	18°27.6	18°27.0	18°26.4	18°25.8	18°25.2	-0.6
Tu 31	268°23.1	283°23.1	298°23.2	313°23.2	328°23.2	343°23.2	358°23.3	13°23.3	28°23.3	43°23.4	58°23.4	73°23.4	+0.0
	18°17.2	18°16.6	18°16.0	18°15.4	18°14.8	18°14.1	18°13.5	18°12.9	18°12.3	18°11.7	18°11.0	18°10.4	-0.6

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.7'

MOON

July 2035

D	23h	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	Δ'/h SH
Su 1	242°27.3 9°46.2	256°55.2 9°56.1	271°23.1 10°05.9	285°50.8 10°15.6	300°18.5 10°25.3	314°46.1 10°35.0	329°13.6 10°44.6	343°41.0 10°54.1	358°08.4 11°03.6	12°35.6 11°13.0	27°02.8 11°22.4	+27.6 16.2 +9.6 59.4
	243°40.8 13°35.2	258°06.7 13°43.5	272°32.5 13°51.7	286°58.2 13°59.8	301°23.8 14°07.8	315°49.3 14°15.8	330°14.8 14°23.6	344°40.2 14°31.4	359°05.5 14°46.7	13°30.7 14°06.7	27°55.8 14°54.2	+25.5 16.4 +7.9 60.2
Tu 3	244°03.5 16°34.7	258°27.4 16°40.5	272°51.2 16°46.3	287°15.0 16°51.9	301°38.7 16°57.4	316°02.4 17°02.7	330°26.0 17°08.0	344°49.5 17°13.1	359°13.0 17°18.2	13°36.4 17°23.1	27°59.7 17°27.8	+23.6 16.6 +5.3 60.8
We 4	243°43.6 18°24.0	258°06.2 18°26.7	272°28.7 18°29.2	286°51.2 18°31.6	301°13.7 18°33.9	315°36.1 18°36.0	329°58.6 18°38.0	344°21.0 18°39.8	358°43.3 18°41.5	13°05.7 18°43.1	27°28.0 18°44.5	+22.4 16.7 +2.1 61.2
Th 5	243°02.0 18°48.6	257°24.2 18°47.7	271°46.5 18°46.7	286°08.8 18°45.5	300°31.2 18°44.2	314°53.5 18°42.8	329°15.9 18°41.2	343°38.3 18°39.5	358°00.7 18°37.6	12°23.1 18°35.6	26°45.6 18°33.5	+22.4 16.7 -1.5 61.2
Fr 6	242°27.2 17°44.9	256°50.3 17°40.7	271°13.5 17°36.2	285°36.8 17°31.7	300°00.1 17°27.0	314°23.5 17°22.2	328°46.9 17°17.3	343°14.0 17°12.3	357°34.0 17°07.1	11°57.7 17°01.9	26°21.4 16°56.5	+23.4 16.6 -4.9 60.8
Sa 7	242°25.6 15°22.2	256°50.5 15°15.1	271°15.5 15°07.9	285°40.5 15°00.6	300°05.4 14°53.2	314°30.9 14°45.7	328°56.2 14°38.1	343°21.6 14°30.5	357°47.1 14°22.7	12°12.6 14°14.8	26°38.3 14°06.9	+25.3 16.4 -7.5 60.2
Su 8	243°13.2 11°58.7	257°40.2 11°49.6	272°07.3 11°40.5	286°34.5 11°31.2	301°01.8 11°22.0	315°29.1 11°12.6	329°56.6 11°03.2	344°24.1 10°53.8	358°51.7 10°44.3	13°19.4 10°34.7	27°47.2 10°25.1	+27.4 16.2 -9.4 59.3
Mo 9	244°53.5 7°56.0	259°22.5 7°45.8	273°51.6 7°35.6	288°20.8 7°25.3	302°50.1 7°15.0	317°19.4 7°04.6	331°48.9 6°54.3	346°18.3 6°43.9	357°47.1 6°33.5	15°17.5 6°23.1	29°47.2 6°12.6	+29.4 15.9 -10.3 58.4
Tu 10	247°20.4 3°34.4	261°51.1 3°23.8	276°21.9 3°13.2	290°52.7 3°02.6	305°23.5 2°52.0	319°54.5 2°41.4	334°25.4 2°30.8	348°56.5 2°20.1	3°27.5 2°09.5	17°58.7 1°58.9	32°29.8 1°48.3	+30.9 15.6 -10.6 57.4
We 11	250°22.9 -0°49.5	264°54.8 -0°59.9	279°26.7 -1°10.3	293°58.6 -1°20.7	308°30.6 -1°31.0	323°02.6 -1°41.3	337°34.7 -1°51.6	352°06.7 -2°01.9	6°38.8 -2°12.2	21°11.0 -2°22.5	35°43.1 -2°32.7	+32.0 15.4 -10.3 56.5
Th 12	253°48.6 -5°02.7	268°21.1 -5°12.5	282°53.7 -5°22.2	297°26.2 -5°31.9	311°58.8 -5°41.5	326°31.4 -5°51.2	341°04.0 -6°00.7	355°36.6 -6°10.3	10°09.3 -6°19.8	24°41.9 -6°29.3	39°14.6 -6°38.7	+32.6 15.2 -9.6 55.6
Fr 13	257°25.4 -8°55.2	271°58.1 -9°03.9	286°30.9 -9°12.6	301°03.6 -9°21.3	315°36.8 -9°29.9	330°09.1 -9°38.4	344°41.9 -9°46.9	359°14.6 -9°55.4	13°47.4 -10°03.8	28°20.1 -10°12.1	42°52.9 -10°20.4	+32.8 15.0 -8.5 55.0
Sa 14	261°03.2 -10°18.6	275°35.8 -10°26.0	290°08.4 -10°33.4	304°41.0 -10°40.7	319°13.6 -10°47.9	333°46.2 -10°55.1	348°18.7 -13°02.2	353°18.7 -13°09.3	17°23.8 -13°16.3	31°56.3 -13°23.3	46°28.8 -13°30.1	+32.6 14.9 -7.2 54.5
Su 15	264°34.6 -15°05.6	279°06.8 -15°11.5	293°39.1 -15°17.2	308°11.3 -15°22.9	322°43.5 -15°28.6	337°15.7 -15°34.1	351°47.8 -15°39.6	6°20.0 -15°45.0	20°52.1 -15°50.4	35°24.2 -15°55.6	49°56.3 -16°00.8	+32.2 14.8 -5.5 54.2
Mo 16	267°55.3 -17°10.0	282°27.7 -17°14.0	296°58.9 -17°17.9	311°30.6 -17°21.7	326°02.3 -17°25.5	340°34.1 -17°29.2	355°05.7 -17°32.8	9°37.4 -17°36.3	24°09.1 -17°39.8	38°40.7 -17°43.3	53°12.3 -17°46.4	+31.7 14.7 -3.6 54.0
Tu 17	271°04.7 -18°26.0	285°36.1 -18°28.0	300°07.4 -18°29.9	314°38.8 -18°31.7	329°10.1 -18°33.4	343°41.4 -18°35.1	358°12.7 -18°36.6	12°44.0 -18°38.1	27°15.3 -18°39.5	41°46.6 -18°40.8	56°17.8 -18°42.0	+31.3 14.7 -1.6 53.9
We 18	274°05.5 -18°49.8	288°36.6 -18°49.6	303°07.7 -18°49.4	317°38.9 -18°49.0	332°10.0 -18°48.6	346°41.1 -18°48.1	11°12.2 -18°47.5	15°43.2 -18°46.8	30°14.3 -18°46.0	44°45.4 -18°45.1	59°16.5 -18°44.2	+31.1 14.7 -0.6 54.0
Th 19	277°02.8 -18°19.4	291°33.9 -18°17.7	306°05.0 -18°15.6	320°36.1 -18°12.1	335°07.2 -18°09.5	349°38.3 -18°06.8	4°09.5 -18°04.0	18°40.6 -18°01.2	33°11.7 -17°58.3	47°42.9 -17°55.2	62°14.0 -17°52.1	+31.1 14.8 +2.7 54.2
Fr 20	280°02.3 -16°55.5	294°33.6 -16°51.1	309°04.9 -16°46.6	323°36.2 -16°42.0	338°07.6 -16°37.4	352°38.9 -16°32.6	7°10.3 -16°27.8	21°41.7 -16°22.9	36°13.0 -16°17.9	50°44.4 -16°12.9	65°15.8 -16°07.7	+31.4 14.9 +4.8 54.5
Sa 21	283°08.6 -14°41.8	297°40.3 -14°35.4	312°11.9 -14°29.1	326°43.6 -14°22.6	341°15.3 -14°16.1	355°47.0 -14°09.5	10°18.7 -14°02.8	24°50.4 -13°56.1	39°22.1 -13°49.3	53°53.9 -13°42.4	68°25.6 -13°35.5	+31.7 14.9 +6.6 54.4
Su 22	286°23.6 -11°43.9	300°55.6 -11°36.0	315°27.6 -11°28.0	329°59.6 -11°20.0	344°31.6 -11°11.9	359°03.6 -11°03.7	13°35.6 -10°55.5	28°07.6 -10°47.3	42°39.7 -10°38.8	57°11.7 -10°30.6	71°43.8 -10°22.1	+32.0 15.1 +8.2 55.2
Mo 23	289°45.5 -8°09.8	304°17.7 -8°00.6	318°49.8 -7°51.4	333°22.0 -7°42.1	347°54.1 -7°32.8	2°26.3 -7°23.5	16°58.5 -7°14.1	31°30.6 -7°04.6	46°02.8 -6°55.1	60°35.5 -6°45.6	75°07.1 -6°36.1	+32.2 15.2 +9.4 55.7
Tu 24	293°09.0 -4°08.7	307°41.1 -3°58.6	322°13.2 -3°48.5	336°45.2 -3°38.4	351°17.2 -3°28.3	5°49.2 -3°18.1	20°21.3 -3°07.9	34°53.2 -2°57.7	49°25.2 -2°47.5	63°57.2 -2°37.2	78°29.1 -2°26.9	+32.0 15.3 +10.2 56.3
We 25	307°41.1 -3°58.6	322°13.2 -3°48.5	336°45.2 -3°38.4	351°17.2 -3°28.3	5°49.2 -3°18.1	20°21.3 -3°07.9	34°53.2 -2°57.7	49°25.2 -2°47.5	63°57.2 -2°37.2	78°29.1 -2°26.9	93°01.0 -2°16.6	+32.0 15.4 +10.2 56.3
Th 26	310°57.5 0°19.7	325°29.0 0°30.2	340°00.6 0°40.7	354°32.1 0°51.2	9°03.5 1°01.8	23°35.0 1°12.3	38°06.4 1°22.8	52°37.8 1°33.4	67°09.1 1°43.9	81°40.4 1°54.4	96°11.7 2°05.0	+31.4 15.5 +10.5 57.0
Fr 27	313°56.1 4°42.5	328°26.8 4°52.9	342°57.3 5°03.4	357°27.8 5°13.7	11°58.3 5°24.1	26°28.7 5°34.5	40°59.1 5°44.8	55°29.9 5°55.1	69°59.7 6°05.4	84°29.9 6°15.7	99°00.1 6°26.0	+30.4 15.7 +10.3 57.7
Sa 28	316°25.7 8°56.4	330°54.9 9°06.1	345°24.0 9°15.9	359°53.1 9°25.5	14°22.1 9°35.2	28°51.1 9°44.7	43°20.0 9°54.3	57°48.8 10°03.8	72°17.6 10°13.2	86°46.2 10°22.6	101°14.9 10°32.0	+28.9 15.9 +9.6 58.4
Su 29	318°15.6 12°45.6	332°43.1 12°54.0	347°10.4 13°02.3	1°37.8 13°10.6	16°05.0 13°18.8	30°32.2 13°26.9	44°59.2 13°44.9	59°26.2 13°62.3	73°55.2 13°50.8	88°20.1 13°58.6	102°46.8 14°06.4	+27.1 16.1 +14.0 59.1
Mo 30	319°19.6 15°52.2	333°45.2 15°58.5	348°10.7 16°04.7	2°36.2 16°10.9	17°01.5 16°16.9	31°26.8 16°28.6	45°52.1 16°29.6	60°17.2 16°37.4	74°42.2 16°39.9	89°07.4 16°45.4	103°32.3 16°50.8	+25.3 16.3 +5.9 59.8
Tu 31	319°39.2 17°57.9	334°03.2 18°01.4	348°27.1 18°04.8	2°51.0 18°08.1	17°14.8 18°11.2	31°38.6 18°14.2	46°02.4 18°17.1	60°26.1 18°19.9	74°49.7 18°22.5	89°13.3 18°25.0	103°36.9 18°27.4	+23.8 16.5 +3.0 60.3

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 5 09h59 — FQ: 12 07h32 — FM: 20 10h36 — LQ: 28 02h55

SUN

August 2035

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
We 1	268°23.9 18°02.3	283°23.9 18°01.7	298°24.0 18°01.0	313°24.0 18°00.4	328°24.0 17°59.8	343°24.1 17°59.2	358°24.1 17°58.5	13°24.2 17°57.9	28°24.3 17°57.3	43°24.2 17°56.6	58°24.3 17°56.0	73°24.3 17°55.4	+0.0 -0.6
Th 2	268°24.9 17°47.1	283°24.9 17°46.5	298°24.9 17°45.8	313°25.0 17°45.2	328°25.0 17°44.5	343°25.1 17°43.9	358°25.1 17°43.2	13°25.2 17°42.6	28°25.2 17°42.0	43°25.2 17°41.3	58°25.3 17°40.7	73°25.3 17°40.0	+0.0 -0.6
Fr 3	268°26.0 17°31.6	283°26.0 17°30.9	298°26.1 17°30.3	313°26.1 17°29.6	328°26.2 17°29.0	343°26.2 17°28.3	358°26.3 17°27.7	13°26.3 17°27.0	28°26.4 17°26.4	43°26.4 17°25.7	58°26.5 17°25.1	73°26.5 17°24.4	+0.1 -0.7
Sa 4	268°27.2 17°15.8	283°27.3 17°15.1	298°27.3 17°14.5	313°27.4 17°13.8	328°27.4 17°13.2	343°27.5 17°12.5	358°27.5 17°11.8	13°27.6 17°11.2	28°27.7 17°10.5	43°27.7 17°09.8	58°27.8 17°09.2	73°27.8 17°08.5	+0.1 -0.7
Su 5	268°28.6 16°59.8	283°28.7 16°59.1	298°28.7 16°58.4	313°28.8 16°57.7	328°28.9 16°57.0	343°28.9 16°56.4	358°29.0 16°55.7	13°29.1 16°55.0	28°29.1 16°54.3	43°29.2 16°53.7	58°29.2 16°53.0	73°29.3 16°52.3	+0.1 -0.7
Mo 6	268°30.2 16°43.4	283°30.2 16°42.7	298°30.3 16°42.0	313°30.4 16°41.4	328°30.4 16°40.7	343°30.5 16°40.0	358°30.6 16°39.3	13°30.7 16°38.6	28°30.7 16°37.9	43°30.8 16°37.2	58°30.9 16°36.5	73°30.9 16°35.8	+0.1 -0.7
Tu 7	268°31.9 16°26.8	283°32.0 16°26.1	298°32.0 16°25.4	313°32.1 16°24.7	328°32.2 16°24.0	343°32.3 16°23.3	358°32.3 16°22.6	13°32.4 16°21.9	28°32.5 16°21.2	43°32.6 16°20.5	58°32.6 16°19.8	73°32.7 16°19.1	+0.1 -0.7
We 8	268°33.7 16°09.9	283°33.8 16°09.2	298°33.9 16°08.5	313°34.0 16°07.8	328°34.1 16°07.1	343°34.2 16°06.4	358°34.2 16°05.7	13°34.3 16°05.0	28°34.4 16°04.3	43°34.5 16°03.5	58°34.5 16°02.8	73°34.6 16°02.1	+0.1 -0.7
Th 9	268°35.8 15°52.8	283°35.8 15°52.1	298°35.9 15°51.4	313°36.0 15°50.7	328°36.1 15°49.9	343°36.2 15°49.2	358°36.3 15°48.5	13°36.4 15°47.8	28°36.5 15°47.0	43°36.6 15°46.3	58°36.6 15°45.6	73°36.7 15°44.9	+0.1 -0.7
Fr 10	268°37.9 15°35.4	283°38.0 15°34.7	298°38.1 15°34.0	313°38.2 15°33.2	328°38.3 15°32.5	343°38.4 15°31.8	358°38.5 15°31.0	13°38.6 15°30.3	28°38.6 15°29.6	43°38.8 15°28.9	58°38.9 15°28.1	73°38.9 15°27.4	+0.1 -0.7
Sa 11	268°40.2 15°17.8	283°40.3 15°17.1	298°40.4 15°16.3	313°40.5 15°15.6	328°40.6 15°14.8	343°40.7 15°14.1	358°40.8 15°13.4	13°40.9 15°12.6	28°40.9 15°11.9	43°41.0 15°11.1	58°41.1 15°10.4	73°41.3 15°09.6	+0.1 -0.7
Su 12	268°42.7 15°09.9	283°42.8 15°09.2	298°42.9 15°08.4	313°43.0 15°07.7	328°43.1 15°06.9	343°43.2 15°06.2	358°43.3 15°05.4	13°43.4 15°04.7	28°43.5 15°03.9	43°43.7 15°03.2	58°43.8 15°02.4	73°43.9 15°01.7	+0.1 -0.8
Mo 13	268°45.3 14°41.8	283°45.4 14°41.1	298°45.5 14°40.3	313°45.6 14°39.5	328°45.7 14°38.8	343°45.9 14°38.0	358°46.0 14°37.3	13°46.1 14°36.5	28°46.2 14°35.7	43°46.3 14°35.0	58°46.4 14°34.2	73°46.5 14°33.4	+0.1 -0.8
Tu 14	268°48.0 14°23.5	283°48.2 14°22.7	298°48.3 14°21.9	313°48.4 14°21.2	328°48.5 14°20.4	343°48.6 14°19.6	358°48.7 14°18.9	13°48.9 14°18.1	28°49.0 14°17.3	43°49.1 14°16.5	58°49.2 14°15.8	73°49.3 14°15.0	+0.1 -0.8
We 15	268°50.9 14°04.9	283°51.0 14°04.1	298°51.2 14°03.3	313°51.3 14°02.6	328°51.4 14°01.8	343°51.5 14°01.0	358°51.7 14°00.2	13°51.8 13°59.4	28°51.9 13°58.7	43°52.0 13°57.9	58°52.2 13°57.1	73°52.3 13°56.3	+0.1 -0.8
Th 16	268°53.9 13°46.1	283°54.1 13°45.3	298°54.2 13°44.5	313°54.3 13°43.7	328°54.5 13°43.0	343°54.6 13°42.2	358°54.7 13°41.4	13°54.8 13°40.6	28°55.0 13°39.8	43°55.1 13°39.0	58°55.2 13°38.2	73°55.4 13°37.4	+0.1 -0.8
Fr 17	268°57.1 13°27.1	283°57.2 13°26.3	298°57.4 13°25.5	313°57.5 13°24.7	328°57.6 13°23.9	343°57.8 13°23.1	358°57.9 13°22.3	13°58.0 13°21.5	28°58.2 13°20.7	43°58.3 13°19.9	58°58.4 13°19.1	73°58.6 13°18.3	+0.1 -0.8
Sa 18	269°00.4 13°07.9	284°00.5 13°07.1	299°00.7 13°06.3	314°00.8 13°05.5	329°00.9 13°04.6	344°01.1 13°03.8	359°01.2 13°03.0	14°01.2 13°02.2	29°01.5 13°01.4	44°01.6 13°00.6	59°01.8 12°59.8	74°01.9 12°59.0	+0.1 -0.8
Su 19	269°03.8 12°48.4	284°03.9 12°47.6	299°04.1 12°46.8	314°04.2 12°46.0	329°04.3 12°45.2	344°04.5 12°44.4	359°04.7 12°43.5	14°04.8 12°42.7	29°04.9 12°41.9	44°05.1 12°41.1	59°05.2 12°40.3	74°05.4 12°39.5	+0.1 -0.8
Mo 20	269°07.3 12°28.8	284°07.5 12°28.0	299°07.6 12°27.2	314°07.8 12°26.3	329°07.9 12°25.5	344°08.1 12°24.7	359°08.2 12°23.9	14°08.2 12°23.0	29°08.5 12°22.2	44°08.7 12°21.4	59°08.8 12°20.6	74°09.0 12°19.7	+0.2 -0.8
Tu 21	269°11.0 12°09.0	284°11.1 12°08.1	299°11.3 12°07.3	314°11.4 12°06.5	329°11.6 12°05.6	344°11.7 12°04.8	359°11.9 12°04.0	14°12.0 12°03.2	29°12.4 12°02.3	44°12.5 12°01.5	59°12.5 12°00.7	74°12.7 11°59.8	+0.2 -0.8
We 22	269°14.7 11°48.9	284°14.9 11°48.1	299°15.0 11°47.3	314°15.2 11°46.4	329°15.4 11°45.6	344°15.5 11°44.8	359°15.7 11°43.9	14°15.8 11°43.1	29°16.0 11°42.2	44°16.2 11°41.4	59°16.3 11°40.5	74°16.5 11°39.7	+0.2 -0.8
Th 23	269°18.6 11°28.7	284°18.8 11°27.9	299°18.9 11°27.1	314°19.1 11°26.2	329°19.3 11°25.3	344°19.4 11°24.5	359°19.6 11°23.7	14°19.8 11°22.8	29°19.9 11°22.0	44°20.0 11°21.1	59°20.0 11°20.3	74°20.2 11°19.4	+0.2 -0.8
Fr 24	269°22.6 11°08.3	284°22.7 11°07.5	299°22.9 11°06.6	314°23.1 11°05.8	329°23.3 11°04.9	344°23.4 11°04.1	359°23.6 11°03.2	14°23.8 11°02.4	29°23.9 11°01.5	44°24.1 11°00.6	59°24.1 10°59.8	74°24.4 10°58.9	+0.2 -0.9
Sa 25	269°26.7 10°47.8	284°26.8 10°46.9	299°27.0 10°46.0	314°27.2 10°45.2	329°27.4 10°44.3	344°27.5 10°43.5	359°27.7 10°42.6	14°27.9 10°41.7	29°28.0 10°40.9	44°28.2 10°40.0	59°28.2 10°39.1	74°28.6 10°38.3	+0.2 -0.9
Su 26	269°30.8 10°27.0	284°31.0 10°26.2	299°31.2 10°25.3	314°31.4 10°24.4	329°31.5 10°23.6	344°31.7 10°22.7	359°31.9 10°21.8	14°32.1 10°20.9	29°32.3 10°20.1	44°32.6 10°19.2	59°32.6 10°18.3	74°32.8 10°17.5	+0.2 -0.9
Mo 27	269°35.1 10°06.1	284°35.3 10°05.3	299°35.5 10°04.4	314°35.7 10°03.5	329°35.8 10°02.6	344°36.0 10°01.7	359°36.2 10°00.9	14°36.4 10°00.0	29°36.6 9°59.1	44°36.7 9°58.2	59°36.9 9°57.4	74°37.1 9°56.5	+0.2 -0.9
Tu 28	269°39.5 9°45.0	284°39.7 9°44.2	299°39.8 9°43.3	314°40.0 9°42.4	329°40.2 9°41.5	344°40.4 9°40.6	359°40.6 9°39.7	14°40.8 9°38.9	29°41.0 9°38.0	44°41.5 9°37.1	59°41.5 9°36.2	74°41.5 9°35.3	+0.2 -0.9
We 29	269°43.9 9°23.8	284°44.1 9°22.9	299°44.3 9°22.0	314°44.5 9°21.1	329°44.7 9°20.3	344°44.9 9°19.4	359°45.1 9°18.5	14°45.2 9°17.6	29°45.4 9°16.7	44°45.6 9°15.8	59°45.7 9°14.9	74°46.0 9°14.0	+0.2 -0.9
Th 30	269°48.5 9°02.4	284°48.7 9°01.5	299°48.8 9°00.6	314°49.0 8°59.8	329°49.2 8°58.9	344°49.4 8°58.0	359°49.6 8°57.1	14°49.9 8°56.2	29°50.0 8°55.3	44°50.2 8°54.4	59°50.2 8°53.5	74°50.6 8°52.6	+0.2 -0.9
Fr 31	269°53.1 8°40.9	284°53.3 8°40.0	299°53.5 8°39.1	314°53.7 8°38.2	329°53.8 8°37.3	344°54.0 8°36.4	359°54.2 8°35.5	14°54.4 8°34.6	29°54.6 8°33.7	44°54.8 8°32.8	59°55.0 8°31.9	74°55.2 8°31.0	+0.2 -0.9

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°
Row 2: Dec (Declination, - = South), Δ'/h = dec. change
Semi-diameter: 15.8'

MOON

August 2035

	D	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Δ'/h SH
●	We 1	247°30.6 18°43.9	261°63.8 18°44.8	276°17.0 18°45.6	290°40.2 18°46.2	305°03.3 18°46.7	319°26.4 18°47.0	333°49.5 18°47.3	348°12.6 18°47.4	2°35.7 18°47.3	16°58.8 18°47.1	31°21.8 18°46.8	+23.1 16.5 +0.3 60.6
	Th 2	247°07.4 18°25.4	261°30.5 18°22.9	275°53.7 18°20.2	290°16.8 18°17.5	304°40.0 18°14.5	319°03.2 18°11.5	333°26.4 18°08.3	347°49.6 18°05.0	2°12.9 17°58.0	16°36.2 17°58.0	30°59.5 17°54.2	+23.2 16.6 -3.1 60.7
	Fr 3	246°54.0 16°43.5	261°18.0 16°37.8	275°44.2 16°32.0	290°06.1 16°26.1	304°30.3 16°20.0	318°54.3 16°13.9	333°18.8 16°07.6	347°43.3 16°01.3	2°07.5 15°54.8	16°32.0 15°48.2	30°56.5 15°41.5	+24.2 16.5 -6.2 60.5
●	Sa 4	247°12.0 13°49.3	261°37.6 13°41.1	276°03.3 13°32.8	290°29.0 13°24.4	304°54.8 13°16.0	319°20.7 13°07.4	333°46.7 12°58.8	348°12.7 12°50.1	2°38.8 12°41.3	17°05.0 12°32.5	31°31.2 12°23.6	+25.9 16.4 -8.6 60.0
	Su 5	248°13.9 10°02.0	262°41.4 9°52.1	277°08.9 9°42.2	291°36.5 9°32.2	306°04.2 9°22.1	320°31.9 9°12.1	334°59.7 9°01.9	349°27.6 8°51.8	3°55.6 8°41.6	18°23.6 8°31.3	32°51.7 8°21.0	+27.8 16.2 -10.1 59.3
	Mo 6	250°01.5 5°43.1	264°30.7 5°32.4	279°00.0 5°21.6	293°29.3 5°10.9	307°58.7 5°00.1	322°28.1 4°49.3	336°57.6 4°38.5	351°27.2 4°27.7	5°56.8 4°16.9	20°26.5 4°06.1	34°56.4 3°55.3	+29.5 15.9 -10.8 58.4
●	Tu 7	252°29.0 1°12.7	266°59.6 1°01.9	281°30.2 0°51.1	296°00.9 0°40.3	310°31.7 0°29.5	325°02.4 0°18.8	339°33.3 0°08.0	354°04.1 -0°02.7	8°35.1 -0°13.4	23°06.0 -0°24.1	37°37.0 -0°34.8	+30.8 15.7 -10.8 57.5
	We 8	255°26.6 -3°12.5	269°58.1 -3°02.2	284°29.7 -3°33.1	299°01.4 -3°43.3	313°33.0 -3°53.6	328°04.7 -4°03.7	342°36.4 -4°13.9	357°08.2 -4°24.0	11°40.0 -4°34.1	26°11.7 -4°44.1	40°43.6 -4°54.2	+31.7 15.4 -10.2 56.6
	Th 9	258°43.3 -7°19.7	273°15.8 -7°29.0	287°47.6 -7°38.3	302°19.7 -7°47.6	316°51.9 -7°56.8	331°24.0 -8°06.0	345°56.2 -8°15.2	0°28.4 -8°24.2	15°00.6 -8°33.8	29°32.8 -8°42.3	44°05.1 -8°51.2	+32.2 15.2 -9.2 55.8
●	Fr 10	263°09.0 -10°58.9	276°41.3 -11°07.0	291°13.6 -11°15.0	305°45.9 -11°23.0	320°18.2 -11°30.9	334°50.5 -11°38.7	349°22.7 -11°46.5	3°55.0 -11°54.3	18°27.3 -12°01.9	32°59.6 -12°09.5	47°31.9 -12°17.1	+32.3 15.0 -7.8 55.1
	Sa 11	265°35.2 -14°02.6	280°07.4 -14°09.2	294°39.6 -14°15.6	309°11.7 -14°22.0	323°43.8 -14°28.3	338°16.0 -14°34.5	352°48.1 -14°40.7	7°20.2 -14°46.8	21°52.3 -14°52.9	36°24.4 -14°58.8	50°56.4 -15°04.7	+32.1 14.9 -6.2 54.6
	Su 12	268°56.0 -16°24.5	283°27.8 -16°29.2	297°59.7 -16°33.8	312°31.5 -16°38.4	327°03.3 -16°42.9	341°35.2 -16°47.4	356°06.9 -16°51.7	10°38.7 -16°56.6	25°10.5 -17°00.2	39°42.2 -17°04.3	54°14.0 -17°08.3	+31.8 14.8 -4.4 54.2
●	Mo 13	272°08.3 -17°59.3	286°39.8 -18°02.0	301°11.3 -18°04.7	315°42.7 -18°07.3	330°14.2 -18°09.8	344°45.7 -18°12.2	359°17.1 -18°14.5	13°48.5 -18°16.8	28°19.9 -18°19.0	42°51.3 -18°21.1	57°22.7 -18°23.1	+31.4 14.7 -2.4 54.1
	Tu 14	275°12.1 -18°42.9	289°43.4 -18°43.6	304°14.6 -18°44.1	318°45.8 -18°44.6	333°16.9 -18°45.3	347°48.1 -18°45.5	2°19.3 -18°45.5	16°50.4 -18°45.6	31°21.6 -18°45.6	45°52.7 -18°45.6	60°23.9 -18°45.4	+31.2 14.7 -0.3 54.1
	We 15	278°10.3 -18°32.9	292°41.4 -18°31.4	307°12.4 -18°29.8	321°43.5 -18°28.1	336°14.6 -18°26.3	350°45.6 -18°24.4	5°16.7 -18°22.4	19°47.8 -18°20.4	34°18.8 -18°18.2	48°49.9 -18°16.0	63°20.9 -18°13.7	+31.1 14.8 +1.9 54.2
●	Th 16	281°07.0 -17°28.8	295°38.1 -17°25.1	310°09.3 -17°21.4	324°40.4 -17°17.5	339°11.5 -17°13.6	353°42.6 -17°09.6	8°13.7 -17°05.5	22°44.9 -17°01.3	37°16.0 -16°57.1	51°47.2 -16°52.7	66°18.3 -16°48.3	+31.1 14.9 +4.0 54.5
	Fr 17	284°06.6 -15°32.5	298°37.9 -15°26.8	313°09.2 -15°21.1	327°40.5 -15°15.3	342°11.9 -15°09.4	356°43.2 -15°03.4	11°14.5 -14°57.3	40°17.2 -14°51.2	54°48.6 -14°45.0	69°20.0 -14°38.7	83°28.4 -14°32.4	+31.3 15.0 +6.0 54.9
	Sa 18	287°11.9 -12°48.8	301°43.5 -12°41.3	316°15.0 -12°33.8	330°46.6 -12°26.2	345°18.2 -12°18.6	359°49.7 -12°10.9	14°21.3 -12°03.1	28°52.9 -11°55.3	43°24.6 -11°47.4	57°56.2 -11°39.5	72°27.2 -11°31.5	+31.6 15.1 +7.7 55.3
●	Su 19	290°23.2 -9°24.6	304°54.9 -9°15.7	319°26.7 -9°06.7	333°58.4 -8°57.8	348°30.2 -8°48.7	3°02.0 -8°39.7	17°33.7 -8°30.5	32°05.3 -8°21.4	46°37.3 -8°12.1	61°09.3 -8°02.9	75°40.6 -7°53.6	+31.8 15.2 +9.1 55.8
	Mo 20	293°37.6 -5°29.2	308°09.4 -5°19.2	322°41.2 -5°09.3	337°13.0 -4°59.3	351°44.7 -4°49.3	6°16.5 -4°39.3	20°48.2 -4°29.2	35°20.0 -4°19.1	49°51.7 -4°09.0	64°23.4 -3°58.8	78°55.4 -3°48.6	+31.8 15.3 +10.1 56.3
	Tu 21	296°49.6 -1°13.4	311°21.1 -1°03.0	325°52.6 -0°52.5	340°24.1 -0°42.0	354°55.6 -0°31.4	9°27.0 -0°20.9	23°58.5 -0°10.4	38°29.9 0°00.1	53°01.3 0°10.7	67°32.6 0°21.2	82°04.6 0°31.8	+31.4 15.5 +10.5 56.8
●	We 22	299°51.1 3°10.2	314°22.0 3°20.7	328°52.9 3°31.2	343°23.8 3°41.7	357°54.6 3°52.2	12°25.4 4°02.7	26°56.1 4°13.2	41°26.8 4°23.6	55°57.5 4°34.0	70°28.1 4°44.5	84°58.7 4°54.9	+30.8 15.6 +10.5 57.3
	Th 23	314°22.0 3°20.7	328°52.9 3°31.2	343°23.8 3°41.7	357°54.6 3°52.2	12°25.4 4°02.7	26°56.1 4°13.2	41°26.8 4°23.6	55°57.5 4°34.0	70°28.1 4°44.5	84°58.7 4°54.9	99°29.3 5°05.2	+30.7 15.6 +10.5 57.4
	Fr 24	317°02.9 7°38.1	331°32.7 7°48.0	346°02.6 7°57.9	0°32.4 8°07.8	15°02.1 8°17.7	29°31.8 8°27.5	44°01.4 8°37.3	58°31.0 8°47.0	73°00.6 8°56.7	87°30.0 9°06.3	101°59.5 9°15.9	+29.7 15.8 +9.8 57.9
●	Sa 25	319°14.5 11°34.1	333°43.1 11°42.8	348°01.6 11°51.6	2°40.0 12°00.2	17°08.4 12°08.8	31°36.7 12°17.3	46°05.0 12°25.8	60°33.2 12°34.2	75°01.3 12°42.5	89°29.4 12°50.7	103°57.4 12°58.9	+28.3 15.9 +8.5 58.4
	Su 26	320°50.4 14°52.7	335°17.4 14°59.6	349°04.5 15°06.4	4°11.3 15°13.2	18°38.2 15°19.9	33°05.0 15°26.5	47°31.7 15°33.0	61°58.4 15°39.4	76°25.0 15°45.7	90°51.6 15°51.9	105°18.1 15°58.0	+26.8 16.1 +6.5 58.9
	Mo 27	321°48.7 17°17.8	336°14.3 17°22.2	350°39.9 17°26.6	5°05.4 17°30.8	19°30.8 17°35.0	33°56.2 17°40.8	48°21.6 17°42.9	62°46.6 17°46.7	77°12.2 17°50.4	91°37.2 17°54.0	106°02.6 17°57.4	+25.4 16.2 +4.0 59.3
●	Tu 28	322°15.3 18°34.9	336°39.9 18°36.4	351°04.5 18°37.8	5°29.0 18°39.0	19°53.5 18°40.2	34°17.9 18°42.0	48°42.4 18°42.0	63°06.6 18°42.8	77°31.2 18°43.4	91°55.6 18°43.9	106°19.9 18°44.3	+24.5 16.3 +0.9 59.7
	We 29	322°24.0 18°34.3	336°48.2 18°32.6	351°12.4 18°30.8	5°36.7 18°28.9	20°00.9 18°26.8	34°25.2 18°24.6	48°49.4 18°22.2	63°13.7 18°19.8	77°38.0 18°17.2	92°02.3 18°14.4	106°26.6 18°11.6	+24.3 16.3 -2.3 59.9
	Th 30	322°33.5 17°14.0	336°58.2 17°09.2	351°22.7 17°04.3	5°47.6 16°59.3	20°12.4 16°54.3	34°37.2 16°48.9	49°02.0 16°43.5	63°26.9 16°38.0	77°51.8 16°32.4	92°16.8 16°26.7	106°41.8 16°20.8	+24.8 16.3 -5.3 59.9
●	Fr 31	323°02.3 14°40.8	337°28.0 14°33.4	351°53.8 14°25.8	6°19.7 14°18.2	20°45.6 14°10.4	35°11.6 14°02.6	49°37.6 13°54.7	64°03.7 13°46.7	78°29.8 13°38.6	92°56.0 13°30.4	107°22.3 13°22.2	+26.0 16.3 -7.9 59.7

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (– = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour – day) mod 24

NM: 3 17h11 — FQ: 10 21h52 — FM: 19 01h00 — LQ: 26 09h08

SUN

September 2035

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ'/h
Sa 1	260°57.8 8°19.2	284°58.0 8°18.3	299°58.2 8°17.4	314°58.4 8°16.5	329°58.6 8°15.6	344°58.8 8°14.7	359°58.9 8°13.8	14°59.1 8°12.9	29°59.3 8°12.0	44°59.5 8°11.1	59°59.7 8°10.2	74°59.9 8°09.3	+0.2 -0.9
Su 2	270°02.5 7°57.5	285°02.7 7°56.5	300°02.9 7°55.6	315°03.1 7°54.7	330°03.3 7°53.8	345°03.5 7°52.9	0°03.7 7°52.0	15°03.9 7°51.1	30°04.1 7°50.2	45°04.3 7°49.2	60°04.5 7°48.3	75°04.7 7°47.4	+0.2 -0.9
Mo 3	270°07.4 7°35.5	285°07.6 7°34.6	300°07.8 7°33.7	315°08.0 7°32.8	330°08.2 7°31.9	345°08.4 7°30.9	0°08.6 7°30.0	15°08.8 7°29.1	30°09.0 7°28.2	45°09.2 7°27.3	60°09.4 7°26.4	75°09.6 7°25.4	+0.2 -0.9
Tu 4	270°12.3 7°13.5	285°12.5 7°12.6	300°12.7 7°11.6	315°12.9 7°10.7	330°13.1 7°09.8	345°13.3 7°08.9	0°13.5 7°08.0	15°13.7 7°07.0	30°13.9 7°06.1	45°14.1 7°05.2	60°14.3 7°04.3	75°14.5 7°03.3	+0.2 -0.9
We 5	270°17.2 6°51.3	285°17.4 6°50.4	300°17.7 6°49.5	315°17.9 6°48.5	330°18.1 6°47.6	345°18.3 6°46.7	0°18.5 6°45.8	15°18.7 6°44.8	30°18.9 6°43.9	45°19.1 6°43.0	60°19.3 6°42.0	75°19.5 6°41.1	+0.2 -0.9
Th 6	270°22.3 6°29.0	285°22.5 6°28.1	300°22.7 6°27.2	315°22.9 6°26.3	330°23.1 6°25.3	345°23.3 6°24.4	0°23.5 6°23.5	15°23.7 6°22.5	30°24.0 6°21.6	45°24.2 6°20.7	60°24.4 6°19.7	75°24.6 6°18.8	+0.2 -0.9
Fr 7	270°27.4 6°06.7	285°27.6 6°05.7	300°27.8 6°04.8	315°28.0 6°03.9	330°28.2 6°02.0	345°28.4 6°02.0	0°28.6 6°01.1	15°28.8 6°00.1	30°29.1 5°59.2	45°29.3 5°58.2	60°29.5 5°57.3	75°29.7 5°56.4	+0.2 -0.9
Sa 8	270°32.5 5°44.2	285°32.7 5°43.2	300°32.9 5°42.3	315°33.1 5°41.4	330°33.3 5°40.4	345°33.5 5°39.5	0°33.8 5°38.5	15°34.0 5°37.6	30°34.2 5°36.7	45°34.4 5°35.7	60°34.6 5°34.8	75°34.9 5°33.9	+0.2 -0.9
Su 9	270°37.7 5°21.6	285°37.9 5°20.7	300°38.1 5°19.7	315°38.3 5°18.8	330°38.5 5°17.8	345°38.8 5°16.9	0°39.0 5°15.9	15°39.2 5°15.0	30°39.4 5°14.1	45°39.6 5°13.1	60°39.9 5°12.2	75°40.1 5°11.2	+0.2 -0.9
Mo 10	270°42.9 4°58.9	285°43.1 4°58.0	300°43.3 4°57.0	315°43.6 4°56.1	330°43.8 4°55.2	345°44.0 4°54.2	0°44.2 4°53.3	15°44.4 4°52.3	30°44.7 4°51.4	45°44.9 4°50.4	60°45.1 4°49.5	75°45.3 4°48.5	+0.2 -0.9
Tu 11	270°48.2 4°36.2	285°48.4 4°35.2	300°48.6 4°34.3	315°48.8 4°33.3	330°49.1 4°32.4	345°49.3 4°31.4	0°49.5 4°30.5	15°49.7 4°29.5	30°49.9 4°28.6	45°50.2 4°27.6	60°50.4 4°26.7	75°50.6 4°25.7	+0.2 -1.0
We 12	270°53.5 4°13.4	285°53.7 4°12.4	300°53.9 4°11.5	315°54.1 4°10.5	330°54.4 4°09.6	345°54.6 4°08.6	0°54.8 4°07.7	15°55.0 4°06.7	30°55.3 4°05.7	45°55.5 4°04.8	60°55.7 4°03.8	75°55.9 4°02.9	+0.2 -1.0
Th 13	270°58.8 3°50.5	285°59.0 3°49.5	300°59.3 3°48.6	315°59.5 3°47.6	330°59.7 3°46.6	345°59.9 3°45.7	1°00.1 3°44.7	16°00.4 3°43.8	31°00.6 3°42.8	46°00.8 3°41.9	61°01.0 3°40.9	76°01.3 3°40.0	+0.2 -1.0
Fr 14	271°04.2 3°27.5	286°04.4 3°26.5	301°04.6 3°25.6	316°04.8 3°24.6	331°05.1 3°23.7	346°05.3 3°22.7	1°05.5 3°21.8	16°05.7 3°20.8	31°06.0 3°19.8	46°06.2 3°18.9	61°06.4 3°17.9	76°06.6 3°17.0	+0.2 -1.0
Sa 15	271°09.5 3°04.5	286°09.8 3°03.5	301°10.0 3°02.6	316°10.2 3°01.6	331°10.5 3°00.6	346°10.7 2°59.7	1°10.9 2°58.7	16°11.1 2°57.8	31°11.3 2°56.8	46°11.6 2°55.8	61°11.8 2°54.9	76°12.0 2°53.9	+0.2 -1.0
Su 16	271°14.9 2°41.4	286°15.1 2°40.4	301°15.4 2°39.5	316°15.6 2°38.5	331°15.8 2°37.5	346°16.0 2°36.6	1°16.3 2°35.6	16°16.5 2°34.7	31°16.7 2°33.7	46°16.9 2°32.7	61°17.2 2°31.8	76°17.4 2°30.8	+0.2 -1.0
Mo 17	271°20.3 2°18.3	286°20.5 2°17.3	301°20.8 2°16.3	316°21.0 2°15.4	331°21.2 2°14.4	346°21.4 2°13.4	1°21.7 2°12.5	16°21.9 2°11.5	31°22.1 2°10.5	46°22.3 2°09.6	61°22.6 2°08.6	76°22.8 2°07.6	+0.2 -1.0
Tu 18	271°25.7 1°55.1	286°25.9 1°54.1	301°26.1 1°53.1	316°26.4 1°52.2	331°26.6 1°51.2	346°26.8 1°50.2	1°27.0 1°49.3	16°27.3 1°48.3	31°27.5 1°47.3	46°27.7 1°46.4	61°27.9 1°45.4	76°28.2 1°44.4	+0.2 -1.0
We 19	271°31.1 1°31.9	286°31.3 1°30.9	301°31.5 1°29.9	316°31.8 1°29.0	331°32.0 1°28.0	346°32.2 1°27.0	1°32.4 1°26.0	16°32.7 1°25.1	31°32.9 1°24.1	46°33.1 1°23.1	61°33.3 1°22.2	76°33.5 1°21.2	+0.2 -1.0
Th 20	271°36.5 1°08.6	286°36.7 1°07.6	301°36.9 1°06.7	316°37.1 1°05.7	331°37.4 1°04.7	346°37.6 1°03.8	1°37.8 1°02.8	16°38.0 1°01.8	31°38.2 1°00.8	46°38.5 0°59.9	61°38.7 0°58.9	76°38.9 0°57.9	+0.2 -1.0
Fr 21	271°41.8 0°45.3	286°42.0 0°44.3	301°42.3 0°43.4	316°42.5 0°42.4	331°42.7 0°41.4	346°42.9 0°40.5	1°43.1 0°39.5	16°43.4 0°38.5	31°43.6 0°37.5	46°43.8 0°36.6	61°44.0 0°35.6	76°44.3 0°34.6	+0.2 -1.0
Sa 22	271°47.1 0°22.0	286°47.4 0°21.0	301°47.6 0°20.1	316°47.8 0°19.1	331°48.0 0°18.1	346°48.3 0°17.1	1°48.5 0°16.2	16°48.7 0°15.2	31°48.9 0°14.2	46°49.1 0°13.3	61°49.4 0°12.3	76°49.6 0°11.3	+0.2 -1.0
Su 23	271°52.4 -0°01.3	286°52.7 -0°02.3	301°52.9 -0°03.3	316°53.1 -0°04.2	331°53.3 -0°05.2	346°53.5 -0°06.2	1°53.8 -0°07.2	16°54.0 -0°08.1	31°54.2 -0°09.1	46°54.4 -0°10.1	61°54.6 -0°11.1	76°54.9 -0°12.0	+0.2 -1.0
Mo 24	271°57.7 -0°24.7	286°57.9 -0°25.6	301°58.2 -0°26.6	316°58.4 -0°27.6	331°58.6 -0°28.6	346°58.8 -0°29.5	1°59.0 -0°30.5	16°59.2 -0°31.5	31°59.5 -0°32.5	46°59.7 -0°33.4	61°59.9 -0°34.4	77°00.1 -0°35.4	+0.2 -1.0
Tu 25	272°02.9 -0°48.0	287°03.2 -0°49.0	302°03.4 -0°50.0	317°03.6 -0°50.9	332°03.8 -0°51.8	347°04.0 -0°52.9	2°04.2 -0°53.9	17°04.5 -0°54.8	32°04.7 -0°55.8	47°04.9 -0°56.8	62°05.1 -0°57.8	77°05.3 -0°58.7	+0.2 -1.0
We 26	272°08.1 -1°11.4	287°08.3 -1°12.4	302°08.6 -1°13.3	317°08.8 -1°14.3	332°09.0 -1°15.3	347°09.2 -1°16.3	2°09.4 -1°17.2	17°09.6 -1°18.2	32°09.8 -1°19.2	47°10.1 -1°20.1	62°10.3 -1°21.1	77°10.5 -1°22.1	+0.2 -1.0
Th 27	272°13.3 -1°34.7	287°13.5 -1°35.7	302°13.7 -1°36.7	317°13.9 -1°37.7	332°14.1 -1°38.6	347°14.3 -1°39.6	2°14.5 -1°40.6	17°14.7 -1°41.6	32°15.0 -1°42.5	47°15.2 -1°43.5	62°15.4 -1°44.5	77°15.6 -1°45.4	+0.2 -1.0
Fr 28	272°18.3 -1°58.1	287°18.5 -1°59.1	302°18.7 -2°00.0	317°19.0 -2°01.0	332°19.2 -2°02.0	347°19.4 -2°03.0	2°19.6 -2°03.9	17°19.8 -2°04.9	32°20.0 -2°05.9	47°20.2 -2°06.8	62°20.4 -2°07.8	77°20.6 -2°08.8	+0.2 -1.0
Sa 29	272°23.3 -2°21.4	287°23.6 -2°22.4	302°23.8 -2°23.4	317°24.0 -2°24.3	332°24.2 -2°25.3	347°24.4 -2°26.3	2°24.6 -2°27.2	17°24.8 -2°28.2	32°25.0 -2°29.2	47°25.2 -2°30.2	62°25.4 -2°31.1	77°25.6 -2°32.1	+0.2 -1.0
Su 30	272°28.3 -2°44.7	287°28.5 -2°45.7	302°28.7 -2°46.7	317°28.9 -2°47.6	332°29.1 -2°48.6	347°29.3 -2°49.6	2°29.5 -2°50.6	17°29.7 -2°51.5	32°29.9 -2°52.5	47°30.1 -2°53.5	62°30.3 -2°54.4	77°30.5 -2°55.4	+0.2 -1.0

Row 1: GHA (Greenwich Hour Angle), Δ'/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ'/h = dec. change

Semi-diameter: 15.9'

MOON

September 2025

	D	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	Δ'/h SH
●	Sa 1	237°21.1 12°04.3	251°47.9 11°55.3	266°14.8 11°46.2	280°41.7 11°37.0	295°08.7 11°27.8	309°35.8 11°18.5	324°02.9 11°09.2	338°30.1 10°59.7	352°57.3 10°50.3	7°24.6 10°40.7	21°52.0 10°31.1	+27.1 16.2 -9.3 59.4
	Su 2	238°49.5 8°00.9	253°17.8 7°50.5	267°46.2 7°40.1	282°14.6 7°29.6	296°43.4 7°19.2	311°11.6 7°08.6	325°40.2 6°58.1	340°08.8 6°47.5	354°37.5 6°36.9	9°06.2 6°26.3	23°35.1 6°15.6	+28.6 16.1 -10.5 58.9
	Mo 3	240°53.4 3°33.3	255°33.0 3°22.4	269°52.7 3°11.5	284°22.4 3°00.5	298°52.2 2°49.6	313°22.0 2°38.6	327°51.8 2°27.7	342°21.7 2°16.7	356°51.7 2°05.8	11°21.7 1°54.8	25°51.7 1°43.9	+29.8 15.9 -10.9 58.2
●	Tu 4	243°27.0 -0°59.4	257°57.6 -1°10.2	272°28.3 -1°21.0	286°59.0 -1°31.7	301°29.8 -1°42.4	316°00.6 -1°53.1	330°31.4 -2°03.8	345°02.2 -2°14.4	359°33.1 -2°25.1	14°04.0 -2°35.7	28°34.9 -2°46.3	+30.8 15.6 -10.7 57.4
	We 5	246°22.1 -5°21.2	260°53.5 -5°31.3	275°24.8 -5°41.3	289°56.2 -5°51.3	304°27.6 -6°01.2	318°59.0 -6°11.1	333°30.4 -6°21.0	348°01.9 -6°30.8	2°33.3 -6°40.5	17°04.8 -6°50.2	31°36.3 -6°59.9	+31.4 15.4 -9.9 56.6
	Th 6	249°30.4 -9°19.3	264°02.1 -9°28.2	278°33.8 -9°37.0	293°05.5 -9°45.8	307°37.2 -9°54.5	322°08.9 -10°03.1	336°40.6 -10°11.7	351°12.4 -10°20.3	5°44.1 -10°28.8	20°15.9 -10°37.2	34°47.6 -10°45.6	+31.7 15.2 -8.6 55.8
●	Fr 7	252°44.2 -12°43.8	267°15.9 -12°51.1	281°47.7 -12°58.4	296°19.5 -13°05.7	310°51.3 -13°12.8	325°23.0 -13°19.9	339°54.8 -13°27.0	354°26.6 -13°33.9	8°58.3 -13°40.4	23°30.1 -13°47.6	38°01.9 -13°54.4	+31.8 15.0 -7.1 55.1
	Sa 8	255°57.7 -15°27.2	270°29.4 -15°32.8	285°01.0 -15°38.3	299°32.7 -15°43.8	314°04.4 -15°49.2	328°36.0 -15°54.5	343°07.7 -15°59.7	357°39.3 -16°04.8	12°10.9 -16°09.9	26°42.6 -16°14.9	41°14.2 -16°19.8	+31.6 14.9 -5.3 54.6
	Su 9	259°07.4 -17°24.1	273°38.9 -17°27.7	288°10.4 -17°31.3	302°41.9 -17°34.8	317°13.3 -17°38.2	331°44.8 -17°41.5	346°16.2 -17°44.7	360°47.7 -17°50.9	15°19.1 -17°53.9	29°50.5 -17°58.8	44°21.9 -17°56.8	+31.4 14.8 -3.3 54.3
●	Mo 10	262°12.2 -18°30.4	276°43.5 -18°31.9	291°14.8 -18°33.4	305°46.1 -18°34.8	320°17.3 -18°36.1	334°48.6 -18°37.3	349°19.9 -18°38.4	363°51.1 -18°40.5	18°22.4 -18°41.3	32°53.6 -18°42.1	47°24.9 -18°42.1	+31.3 14.8 -1.2 54.2
	Tu 11	265°12.9 -18°43.5	279°14.1 -18°42.2	294°15.2 -18°42.2	308°46.4 -18°41.5	323°17.6 -18°40.6	337°48.7 -18°39.7	352°19.9 -18°38.6	366°51.0 -18°37.5	21°22.2 -18°36.3	35°53.3 -18°35.0	50°24.5 -18°33.6	+31.2 14.8 +1.0 54.2
	We 12	268°11.8 -18°02.6	282°42.9 -17°59.9	297°14.1 -17°57.0	311°45.3 -17°54.1	326°16.4 -17°51.1	340°47.6 -17°48.0	355°18.7 -17°44.8	369°49.5 -17°41.6	24°21.1 -17°38.2	38°52.3 -17°34.8	53°23.4 -17°31.3	+31.2 14.8 +3.1 54.4
●	Th 13	271°11.5 -16°28.6	285°42.8 -16°23.8	300°14.4 -16°18.8	314°45.3 -16°13.9	329°16.5 -16°08.8	343°47.8 -16°03.6	358°19.0 -15°58.4	372°53.1 -15°53.1	27°21.6 -15°47.7	41°52.9 -15°42.2	56°26.7 -15°36.7	+31.3 14.9 +5.2 54.8
	Fr 14	274°14.0 -17°04.5	288°45.4 -17°07.7	303°16.8 -17°03.5	317°48.2 -17°00.9	332°19.5 -16°57.1	346°50.9 -16°53.0	361°22.3 -16°48.2	375°53.7 -16°43.8	30°25.1 -16°38.6	44°56.5 -16°33.1	59°27.9 -16°28.3	+31.4 15.1 +7.1 55.3
	Sa 15	277°19.5 -10°55.5	291°50.9 -10°47.2	306°22.4 -10°38.7	320°53.9 -10°30.2	335°25.3 -10°21.7	349°56.8 -10°13.0	364°28.2 -10°04.4	378°59.7 -9°55.6	33°31.2 -9°46.8	48°02.6 -9°36.9	62°34.1 -9°22.9	+31.5 15.2 +8.6 55.5
●	Su 16	280°25.8 -7°09.6	294°57.2 -6°59.9	309°28.6 -6°50.2	324°00.0 -6°40.5	338°31.4 -6°30.7	353°02.8 -6°20.8	367°34.2 -6°10.9	381°55.2 -6°01.0	36°36.9 -5°51.1	51°08.3 -5°41.1	65°39.6 -5°31.1	+31.4 15.4 +9.9 56.4
	Mo 17	283°28.5 -2°56.8	297°59.7 -2°46.3	312°30.7 -2°35.8	327°01.9 -2°25.2	341°33.0 -2°14.6	356°04.1 -2°04.1	370°35.2 -1°53.5	385°06.2 -1°42.8	39°37.2 -1°32.2	54°08.3 -1°21.5	68°39.2 -1°10.9	+31.1 15.5 +10.6 57.0
	Tu 18	286°21.4 -0°30.4	300°52.0 1°41.2	315°22.6 1°52.0	329°53.1 2°02.8	344°23.3 2°13.6	358°54.1 2°24.4	373°24.6 2°35.1	387°55.0 2°45.9	42°25.4 2°56.7	56°55.5 3°07.4	71°26.1 3°18.2	+30.5 15.7 +10.8 57.6
●	We 19	288°57.0 5°57.5	303°26.7 6°08.0	317°56.5 6°18.4	332°26.1 6°28.8	346°55.8 6°39.2	361°25.4 6°49.5	375°54.9 6°59.8	390°24.4 7°10.1	44°53.9 7°20.4	59°23.3 7°30.6	73°52.7 7°40.8	+29.6 15.8 +10.3 58.1
	Th 20	291°08.0 10°08.3	305°36.7 10°17.8	320°05.3 10°27.2	334°33.8 10°36.5	349°02.3 10°45.8	363°30.8 10°55.1	377°59.2 11°04.2	392°27.5 11°13.3	46°55.9 11°22.3	61°24.1 11°31.4	75°52.3 11°40.3	+28.4 15.9 +9.2 58.5
	Fr 21	292°49.3 13°45.9	307°16.7 13°53.7	321°04.0 14°01.4	336°11.3 14°09.0	350°38.6 14°16.5	365°05.8 14°23.9	379°32.9 14°31.3	394°00.0 14°38.6	48°27.1 14°45.8	62°54.1 14°52.9	77°21.4 14°59.9	+27.2 16.0 +7.4 58.8
●	Sa 22	307°16.7 13°53.7	321°44.0 14°01.4	336°11.3 14°09.0	350°38.6 14°16.5	365°05.8 14°23.9	379°32.9 14°31.3	394°00.0 14°38.6	408°27.1 14°45.8	62°54.1 14°52.9	77°21.4 14°59.9	91°47.9 15°06.8	+27.1 16.0 +7.3 58.8
	Su 23	308°25.8 16°39.2	322°51.9 16°44.5	337°18.6 16°49.8	351°44.1 16°54.9	366°10.2 17°00.7	380°36.2 17°04.9	395°02.1 17°09.8	409°28.1 17°14.5	63°54.0 17°19.1	78°19.6 17°23.8	92°45.6 17°28.0	+26.0 16.1 +4.9 59.0
	Mo 24	309°08.9 18°20.2	323°34.2 18°22.7	337°59.5 18°25.2	352°24.8 18°27.5	367°50.0 18°31.7	382°15.3 18°36.6	396°40.5 18°33.6	410°50.5 18°35.5	64°30.9 18°37.2	78°56.0 18°38.7	93°21.2 18°40.2	+25.2 16.1 +2.0 59.2
●	Tu 25	309°37.2 18°47.2	324°02.3 18°46.6	338°27.3 18°46.0	352°52.3 18°45.2	367°17.4 18°44.3	381°47.3 18°42.1	395°07.5 18°40.2	409°32.6 18°40.5	64°57.6 18°39.5	79°22.7 18°38.0	93°47.8 18°36.3	+25.1 16.2 -1.1 59.2
	We 26	310°06.1 17°57.1	324°31.5 17°53.5	338°56.9 17°56.9	353°22.4 17°46.1	367°47.8 17°42.1	382°13.3 17°38.1	396°38.9 17°34.0	410°04.4 17°29.7	65°30.0 17°25.3	79°55.6 17°20.8	94°21.3 17°16.2	+25.5 16.1 -4.1 59.2
	Th 27	310°50.5 15°54.3	325°16.8 15°48.0	339°43.1 15°41.6	354°09.5 15°35.1	368°35.9 15°28.5	383°02.4 15°21.9	397°28.8 15°15.1	411°55.2 15°08.4	66°22.0 15°01.2	80°48.6 14°54.2	95°15.3 14°47.0	+26.5 16.1 -6.7 59.1
●	Fr 28	312°01.3 12°49.5	326°28.7 12°41.1	340°56.2 12°33.2	355°23.3 12°23.9	369°51.4 12°15.2	384°19.1 12°06.4	398°46.8 11°57.6	413°14.5 11°48.7	67°42.3 11°39.7	82°10.2 11°30.7	96°38.1 11°21.6	+27.7 16.0 -8.8 58.8
	Sa 29	313°42.7 8°58.2	328°11.4 8°50.8	342°40.1 8°38.2	357°08.9 8°28.1	371°37.8 8°18.0	385°06.6 8°07.8	400°35.6 7°57.6	415°04.5 7°47.4	69°33.6 7°37.1	84°02.6 7°26.8	98°31.7 7°16.5	+28.9 15.9 -10.2 58.5
	Su 30	315°53.5 4°37.8	330°23.3 4°27.0	344°53.1 4°16.2	359°23.0 4°05.4	373°52.8 3°54.6	388°22.8 3°43.8	402°52.7 3°32.9	417°22.7 3°22.1	71°52.8 3°11.2	86°22.8 3°00.3	100°53.0 2°49.5	+29.9 15.8 -10.8 58.0

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameterRow 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

NM: 2 01h59 — FQ: 9 14h47 — FM: 17 14h23 — LQ: 24 14h39

SUN

October 2035

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Mo 1	257°33.0 -3°07.0	272°33.2 -3°08.0	287°33.4 -3°09.0	302°33.6 -3°10.0	317°33.8 -3°10.9	332°34.0 -3°11.9	347°34.2 -3°12.9	2°34.4 -3°13.8	17°34.6 -3°14.8	32°34.8 -3°15.8	47°35.0 -3°16.7	62°35.2 -3°17.7	+0.2 -1.0
Tu 2	257°37.8 -3°30.3	272°38.0 -3°31.3	287°38.2 -3°32.2	302°38.4 -3°33.2	317°38.6 -3°34.2	332°38.8 -3°35.1	347°39.0 -3°36.1	2°39.2 -3°37.1	17°39.4 -3°38.0	32°39.6 -3°39.0	47°39.8 -3°40.0	62°40.0 -3°40.9	+0.2 -1.0
We 3	257°42.5 -3°53.5	272°42.7 -3°54.7	287°42.9 -3°55.4	302°43.1 -3°56.1	317°43.3 -3°57.4	332°43.5 -3°58.3	347°43.7 -3°59.3	2°43.9 -4°00.3	17°44.1 -4°01.2	32°44.3 -4°02.2	47°44.5 -4°03.2	62°44.7 -4°04.1	+0.2 -1.0
Th 4	257°47.2 -4°16.7	272°47.4 -4°17.6	287°47.6 -4°18.6	302°47.8 -4°19.6	317°48.0 -4°20.5	332°48.2 -4°21.5	347°48.4 -4°22.5	2°48.5 -4°23.4	17°48.7 -4°24.4	32°48.9 -4°25.3	47°49.1 -4°26.3	62°49.3 -4°27.3	+0.2 -1.0
Fr 5	257°51.8 -4°39.8	272°52.0 -4°40.8	287°52.2 -4°41.7	302°52.4 -4°42.7	317°52.5 -4°43.6	332°52.7 -4°44.6	347°52.9 -4°45.6	2°53.1 -4°46.5	17°53.3 -4°47.5	32°53.5 -4°48.4	47°53.7 -4°49.4	62°53.9 -4°50.4	+0.2 -1.0
Sa 6	257°56.3 -5°02.8	272°56.5 -5°03.8	287°56.6 -5°04.8	302°56.8 -5°05.7	317°57.0 -5°06.7	332°57.2 -5°07.6	347°57.4 -5°08.6	2°57.6 -5°09.6	17°57.8 -5°10.5	32°57.9 -5°11.5	47°58.1 -5°12.4	62°58.3 -5°13.4	+0.2 -1.0
Su 7	258°00.7 -5°25.8	273°00.9 -5°26.8	288°01.0 -5°27.8	303°01.2 -5°28.7	318°01.4 -5°29.7	333°01.6 -5°30.6	348°01.8 -5°31.6	3°01.9 -5°32.5	18°02.1 -5°33.5	33°02.3 -5°34.4	48°02.5 -5°35.4	63°02.7 -5°36.4	+0.2 -1.0
Mo 8	258°05.0 -5°48.8	273°05.2 -5°49.7	288°05.3 -5°50.7	303°05.5 -5°51.6	318°05.7 -5°52.6	333°05.9 -5°53.5	348°06.0 -5°54.5	3°06.2 -5°55.4	18°06.4 -5°56.4	33°06.6 -5°57.3	48°06.7 -5°58.3	63°06.9 -5°59.2	+0.2 -1.0
Tu 9	258°09.2 -6°11.6	273°09.3 -6°12.6	288°09.5 -6°13.5	303°09.7 -6°14.5	318°09.9 -6°15.4	333°10.0 -6°16.4	348°10.2 -6°17.3	3°10.4 -6°18.3	18°10.5 -6°19.2	33°10.7 -6°20.2	48°10.9 -6°21.1	63°11.1 -6°22.1	+0.2 -0.9
We 10	258°13.4 -6°34.4	273°13.4 -6°35.3	288°13.6 -6°36.3	303°13.8 -6°37.2	318°13.9 -6°38.2	333°14.1 -6°39.1	348°14.3 -6°40.1	3°14.4 -6°41.0	18°14.6 -6°41.9	33°14.8 -6°42.8	48°14.9 -6°43.8	63°15.1 -6°44.8	+0.2 -0.9
Th 11	258°17.2 -6°57.1	273°17.4 -6°58.0	288°17.6 -6°58.9	303°17.7 -6°59.9	318°17.9 -7°00.8	333°18.1 -7°01.8	348°18.2 -7°02.7	3°18.4 -7°03.7	18°18.3 -7°04.6	33°18.7 -7°05.5	48°18.9 -7°06.5	63°19.0 -7°07.4	+0.2 -0.9
Fr 12	258°21.1 -7°19.6	273°21.3 -7°20.6	288°21.4 -7°21.5	303°21.6 -7°22.5	318°21.7 -7°23.4	333°21.9 -7°24.3	348°22.1 -7°25.3	3°22.2 -7°26.2	18°22.4 -7°27.1	33°22.5 -7°28.1	48°22.5 -7°29.0	63°22.8 -7°30.0	+0.2 -0.9
Sa 13	258°24.9 -7°42.1	273°25.0 -7°43.1	288°25.2 -7°44.0	303°25.3 -7°44.9	318°25.5 -7°45.9	333°25.6 -7°46.8	348°25.8 -7°47.7	3°25.9 -7°48.7	18°26.1 -7°49.6	33°26.2 -7°50.5	48°26.4 -7°51.5	63°26.5 -7°52.4	+0.2 -0.9
Su 14	258°28.5 -8°04.5	273°28.6 -8°05.4	288°28.8 -8°06.4	303°28.9 -8°07.3	318°29.1 -8°08.2	333°29.2 -8°09.1	348°29.4 -8°10.1	3°29.5 -8°11.0	18°29.6 -8°11.9	33°29.8 -8°12.9	48°29.9 -8°13.8	63°30.1 -8°14.7	+0.1 -0.9
Mo 15	258°32.0 -8°26.8	273°32.1 -8°27.7	288°32.2 -8°28.6	303°32.4 -8°29.5	318°32.5 -8°30.4	333°32.7 -8°31.4	348°32.8 -8°32.3	3°32.9 -8°33.2	18°33.1 -8°34.1	33°33.2 -8°35.1	48°33.4 -8°36.0	63°33.5 -8°36.9	+0.1 -0.9
Tu 16	258°35.3 -8°48.9	273°35.4 -8°49.8	288°35.6 -8°50.7	303°35.7 -8°51.6	318°35.9 -8°52.6	333°36.0 -8°53.5	348°36.1 -8°54.4	3°36.3 -8°55.3	18°36.4 -8°56.2	33°36.5 -8°57.2	48°36.6 -8°58.1	63°36.8 -8°59.0	+0.1 -0.9
We 17	258°38.5 -9°10.9	273°38.6 -9°11.8	288°38.8 -9°12.7	303°38.9 -9°13.6	318°39.0 -9°14.6	333°39.2 -9°15.5	348°39.3 -9°16.4	3°39.4 -9°17.3	18°39.6 -9°18.2	33°39.7 -9°19.1	48°39.8 -9°20.0	63°39.9 -9°21.0	+0.1 -0.9
Th 18	258°41.6 -9°32.8	273°41.7 -9°33.7	288°41.8 -9°34.6	303°41.9 -9°35.5	318°42.1 -9°36.4	333°42.2 -9°37.3	348°42.3 -9°38.2	3°42.4 -9°39.1	18°42.6 -9°40.1	33°42.7 -9°41.0	48°42.8 -9°41.9	63°42.9 -9°42.8	+0.1 -0.9
Fr 19	258°44.5 -9°54.5	273°44.6 -9°55.4	288°44.7 -9°56.3	303°44.8 -9°57.2	318°44.9 -9°58.1	333°45.1 -9°59.0	348°45.2 -9°59.9	3°45.3 -10°00.8	18°45.4 -10°01.7	33°45.5 -10°02.6	48°45.6 -10°03.6	63°45.8 -10°04.5	+0.1 -0.9
Sa 20	258°47.2 -10°16.1	273°47.3 -10°17.0	288°47.4 -10°17.9	303°47.6 -10°18.8	318°47.7 -10°19.7	333°47.8 -10°20.6	348°47.9 -10°21.5	3°48.0 -10°22.4	18°48.1 -10°23.3	33°48.2 -10°24.2	48°48.3 -10°25.1	63°48.4 -10°26.0	+0.1 -0.9
Su 21	258°49.8 -10°37.6	273°49.9 -10°38.5	288°50.0 -10°39.4	303°50.1 -10°40.3	318°50.2 -10°41.1	333°50.3 -10°42.0	348°50.4 -10°42.9	3°50.5 -10°43.8	18°50.6 -10°44.7	33°50.7 -10°45.6	48°50.8 -10°46.5	63°50.9 -10°47.4	+0.1 -0.9
Mo 22	258°52.2 -10°58.9	273°52.3 -10°59.8	288°52.4 -11°00.6	303°52.5 -11°01.5	318°52.6 -11°02.4	333°52.7 -11°03.3	348°52.8 -11°04.2	3°52.9 -11°05.1	18°53.0 -11°05.9	33°53.1 -11°06.8	48°53.2 -11°07.7	63°53.3 -11°08.6	+0.1 -0.9
Tu 23	258°54.5 -11°20.9	273°54.6 -11°20.9	288°54.6 -11°21.8	303°54.7 -11°22.8	318°54.8 -11°23.5	333°54.9 -11°24.4	348°55.0 -11°25.3	3°55.1 -11°26.1	18°55.2 -11°27.0	33°55.3 -11°27.9	48°55.4 -11°28.8	63°55.4 -11°29.6	+0.1 -0.9
We 24	258°56.5 -11°41.0	273°56.6 -11°41.9	288°56.7 -11°42.7	303°56.8 -11°43.6	318°56.9 -11°44.5	333°56.9 -11°45.3	348°57.0 -11°46.2	3°57.1 -11°47.1	18°57.2 -11°47.9	33°57.3 -11°48.8	48°57.3 -11°49.7	63°57.4 -11°50.5	+0.1 -0.9
Th 25	258°58.4 -12°01.8	273°58.5 -12°02.6	288°58.6 -12°03.5	303°58.6 -12°04.4	318°58.7 -12°05.2	333°58.8 -12°06.1	348°58.9 -12°06.9	3°58.9 -12°07.8	18°59.0 -12°08.7	33°59.1 -12°09.5	48°59.2 -12°10.4	63°59.2 -12°11.2	+0.1 -0.9
Fr 26	259°00.0 -12°22.4	274°00.2 -12°23.2	289°00.3 -12°24.1	304°00.3 -12°24.9	319°00.4 -12°25.8	334°00.5 -12°26.6	349°00.5 -12°27.5	4°00.6 -12°28.4	19°00.7 -12°29.2	34°00.7 -12°30.1	49°00.8 -12°30.9	64°00.8 -12°31.8	+0.1 -0.9
Sa 27	259°01.6 -12°42.8	274°01.7 -12°43.6	289°01.8 -12°44.5	304°01.8 -12°45.3	319°01.9 -12°46.2	334°01.9 -12°47.0	349°02.0 -12°47.9	4°02.0 -12°48.7	19°02.1 -12°49.6	34°02.2 -12°50.4	49°02.2 -12°51.2	64°02.3 -12°52.1	+0.1 -0.8
Su 28	259°03.0 -13°03.0	274°03.0 -13°03.9	289°03.1 -13°04.7	304°03.1 -13°05.5	319°03.2 -13°06.4	334°03.2 -13°07.2	349°03.3 -13°08.0	4°03.3 -13°08.9	19°03.4 -13°09.7	34°03.4 -13°10.5	49°03.4 -13°11.4	64°03.5 -13°12.2	+0.0 -0.8
Mo 29	259°04.1 -13°23.0	274°04.1 -13°23.9	289°04.2 -13°24.7	304°04.2 -13°25.5	319°04.3 -13°26.4	334°04.3 -13°27.2	349°04.4 -13°28.0	4°04.4 -13°28.9	19°04.4 -13°29.7	34°04.5 -13°30.5	49°04.5 -13°31.3	64°04.6 -13°32.1	+0.0 -0.8
Tu 30	259°05.0 -13°42.8	274°05.1 -13°43.7	289°05.1 -13°44.5	304°05.2 -13°45.3	319°05.2 -13°46.1	334°05.2 -13°46.9	349°05.3 -13°47.8	4°05.3 -13°48.6	19°05.3 -13°49.4	34°05.4 -13°50.2	49°05.4 -13°51.0	64°05.4 -13°51.9	+0.0 -0.8
We 31	259°05.8 -14°02.4	274°05.8 -14°03.3	289°05.8 -14°04.1	304°05.9 -14°04.9	319°05.9 -14°05.7	334°05.9 -14°06.5	349°06.0 -14°07.3	4°06.0 -14°08.1	19°06.0 -14°08.9	34°06.0 -14°09.7	49°06.0 -14°10.5	64°06.1 -14°11.3	+0.0 -0.8

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change – 15°Row 2: Dec (Declination, – = South), Δ°/h = dec. change

Semi-diameter: 16.0'

MOON

October 2035

	D	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	Δ /h	SH
●	Mo 1	245 [°] 55.8 1 [°] 00.4	260 [°] 26.3 0 [°] 49.5	274 [°] 56.8 0 [°] 38.6	289 [°] 27.3 0 [°] 27.7	303 [°] 57.8 0 [°] 16.9	318 [°] 28.4 0 [°] 06.0	332 [°] 59.0 -0 [°] 04.9	347 [°] 29.6 -0 [°] 15.7	2 [°] 00.3 -0 [°] 37.4	16 [°] 30.9 -0 [°] 48.3	31 [°] 01.7 -0 [°] 57.5	+30.6	15.7
	Tu 2	248 [°] 44.9 -3 [°] 28.5	263 [°] 15.9 -3 [°] 39.0	277 [°] 47.0 -3 [°] 49.5	292 [°] 18.1 -3 [°] 59.9	306 [°] 49.2 -4 [°] 10.3	321 [°] 20.3 -4 [°] 20.7	335 [°] 51.4 -4 [°] 31.1	350 [°] 22.5 -4 [°] 41.4	4 [°] 53.7 -5 [°] 02.0	19 [°] 24.9 -5 [°] 12.2	33 [°] 56.1 -5 [°] 22.2	+31.1	15.5
	We 3	251 [°] 45.2 -7 [°] 40.8	266 [°] 16.5 -7 [°] 50.4	280 [°] 47.9 -7 [°] 59.9	295 [°] 19.3 -8 [°] 09.4	309 [°] 50.6 -8 [°] 18.8	324 [°] 22.0 -8 [°] 28.2	338 [°] 53.4 -8 [°] 37.5	353 [°] 24.8 -8 [°] 46.7	7 [°] 56.2 -8 [°] 56.0	22 [°] 27.6 -9 [°] 05.1	36 [°] 59.0 -9 [°] 14.2	+31.4	15.3
	Th 4	254 [°] 50.3 -11 [°] 24.2	269 [°] 21.8 -11 [°] 32.4	283 [°] 53.2 -11 [°] 40.5	298 [°] 24.7 -11 [°] 48.6	312 [°] 56.1 -11 [°] 56.6	327 [°] 27.5 -12 [°] 04.5	341 [°] 59.0 -12 [°] 12.4	356 [°] 30.4 -12 [°] 20.2	11 [°] 01.8 -12 [°] 28.0	25 [°] 33.2 -12 [°] 35.6	40 [°] 04.7 -12 [°] 43.2	+31.4	15.2
	Fr 5	257 [°] 55.8 -14 [°] 29.1	272 [°] 27.2 -14 [°] 35.6	286 [°] 58.5 -14 [°] 42.0	301 [°] 29.9 -14 [°] 48.3	316 [°] 01.3 -14 [°] 54.6	330 [°] 32.6 -15 [°] 00.8	345 [°] 04.0 -15 [°] 06.9	359 [°] 35.4 -15 [°] 12.9	14 [°] 06.7 -15 [°] 18.9	28 [°] 38.1 -15 [°] 24.7	43 [°] 09.4 -15 [°] 30.6	+31.4	15.0
●	Sa 6	260 [°] 59.0 -16 [°] 48.2	275 [°] 30.3 -16 [°] 52.8	290 [°] 01.6 -16 [°] 57.2	304 [°] 32.9 -17 [°] 01.6	319 [°] 04.1 -17 [°] 05.9	333 [°] 35.4 -17 [°] 10.1	348 [°] 06.6 -17 [°] 14.2	2 [°] 37.9 -17 [°] 18.3	17 [°] 09.1 -17 [°] 22.3	31 [°] 40.4 -17 [°] 26.1	46 [°] 11.6 -17 [°] 29.9	+31.3	14.9
	Su 7	263 [°] 59.8 -18 [°] 16.8	278 [°] 31.0 -18 [°] 19.2	293 [°] 02.2 -18 [°] 21.6	307 [°] 33.4 -18 [°] 23.9	322 [°] 04.6 -18 [°] 26.1	336 [°] 35.8 -18 [°] 28.2	351 [°] 07.0 -18 [°] 30.2	5 [°] 38.1 -18 [°] 34.0	20 [°] 09.3 -18 [°] 35.7	34 [°] 40.5 -18 [°] 37.4	49 [°] 11.7 -18 [°] 37.4	+31.2	14.8
	Mo 8	266 [°] 59.5 -18 [°] 52.0	281 [°] 30.7 -18 [°] 52.5	296 [°] 01.9 -18 [°] 52.5	310 [°] 33.0 -18 [°] 52.6	325 [°] 04.2 -18 [°] 52.6	339 [°] 35.5 -18 [°] 52.5	354 [°] 06.7 -18 [°] 52.4	8 [°] 37.9 -18 [°] 52.1	23 [°] 09.1 -18 [°] 51.8	37 [°] 40.3 -18 [°] 51.4	52 [°] 11.5 -18 [°] 50.9	+31.2	14.8
	Tu 9	270 [°] 00.2 -18 [°] 33.0	284 [°] 31.5 -18 [°] 31.1	299 [°] 02.8 -18 [°] 29.1	313 [°] 34.1 -18 [°] 27.1	328 [°] 05.4 -18 [°] 25.9	342 [°] 36.7 -18 [°] 24.7	357 [°] 08.0 -18 [°] 22.0	11 [°] 39.3 -18 [°] 18.0	26 [°] 10.6 -18 [°] 15.5	40 [°] 41.9 -18 [°] 12.9	55 [°] 13.3 -18 [°] 10.3	+31.3	14.8
	We 10	273 [°] 04.1 -17 [°] 20.5	287 [°] 35.5 -17 [°] 16.5	302 [°] 06.9 -17 [°] 12.5	316 [°] 38.4 -17 [°] 08.3	331 [°] 09.8 -17 [°] 04.1	345 [°] 41.3 -16 [°] 59.8	0 [°] 12.8 -16 [°] 55.4	14 [°] 44.3 -16 [°] 51.0	29 [°] 15.7 -16 [°] 46.4	43 [°] 47.2 -16 [°] 41.8	58 [°] 18.7 -16 [°] 37.1	+31.5	14.9
●	Th 11	276 [°] 11.9 -15 [°] 17.1	290 [°] 43.5 -15 [°] 11.2	305 [°] 15.1 -15 [°] 05.1	319 [°] 46.7 -14 [°] 59.1	334 [°] 18.3 -14 [°] 52.9	348 [°] 49.9 -14 [°] 46.6	5 [°] 21.5 -14 [°] 40.3	17 [°] 53.2 -14 [°] 33.9	32 [°] 24.8 -14 [°] 27.5	46 [°] 56.4 -14 [°] 20.9	61 [°] 28.6 -14 [°] 14.3	+31.6	15.0
	Fr 12	279 [°] 22.8 -12 [°] 26.8	293 [°] 54.5 -12 [°] 19.1	308 [°] 26.1 -12 [°] 11.4	322 [°] 57.8 -12 [°] 03.5	337 [°] 29.5 -11 [°] 55.6	352 [°] 01.1 -11 [°] 47.7	6 [°] 32.8 -11 [°] 39.6	21 [°] 04.4 -11 [°] 31.5	35 [°] 36.1 -11 [°] 23.4	50 [°] 07.8 -11 [°] 15.2	64 [°] 39.4 -11 [°] 06.9	+31.7	15.1
	Sa 13	282 [°] 33.6 -8 [°] 55.6	297 [°] 05.2 -8 [°] 46.4	311 [°] 36.7 -8 [°] 37.2	326 [°] 08.3 -8 [°] 27.9	340 [°] 39.8 -8 [°] 18.5	355 [°] 11.3 -8 [°] 09.1	9 [°] 42.8 -7 [°] 59.7	24 [°] 14.3 -7 [°] 50.2	38 [°] 45.8 -7 [°] 40.6	53 [°] 17.3 -7 [°] 31.0	67 [°] 48.8 -7 [°] 21.4	+31.5	15.3
	Su 14	285 [°] 38.9 -4 [°] 51.5	300 [°] 10.2 -4 [°] 41.1	314 [°] 41.3 -4 [°] 30.8	329 [°] 12.5 -4 [°] 20.4	343 [°] 43.6 -4 [°] 10.0	358 [°] 14.8 -3 [°] 59.6	12 [°] 45.9 -3 [°] 49.1	27 [°] 16.9 -3 [°] 38.6	41 [°] 48.0 -3 [°] 28.0	56 [°] 19.0 -3 [°] 17.5	70 [°] 50.0 -3 [°] 06.9	+31.1	15.5
	Mo 15	288 [°] 31.8 -0 [°] 25.0	303 [°] 02.4 -0 [°] 14.1	317 [°] 32.9 -0 [°] 03.1	332 [°] 03.3 0 [°] 07.8	346 [°] 33.4 0 [°] 18.8	1 [°] 04.2 0 [°] 29.8	15 [°] 34.6 0 [°] 40.8	30 [°] 05.4 0 [°] 51.8	44 [°] 35.3 1 [°] 02.8	59 [°] 05.5 1 [°] 13.8	73 [°] 35.8 1 [°] 24.8	+30.4	15.7
○	Tu 16	291 [°] 04.4 4 [°] 10.0	305 [°] 33.9 4 [°] 21.0	320 [°] 03.5 4 [°] 31.9	334 [°] 32.9 4 [°] 42.8	349 [°] 02.4 4 [°] 53.7	3 [°] 31.7 5 [°] 04.6	18 [°] 01.1 5 [°] 15.5	32 [°] 30.4 5 [°] 26.4	46 [°] 56.9 5 [°] 37.2	61 [°] 28.8 5 [°] 48.0	75 [°] 57.9 5 [°] 58.8	+29.4	15.9
	We 17	293 [°] 09.0 8 [°] 37.0	307 [°] 37.3 8 [°] 47.3	322 [°] 05.5 8 [°] 57.5	336 [°] 33.7 9 [°] 07.7	351 [°] 01.9 9 [°] 17.8	5 [°] 30.0 9 [°] 27.8	19 [°] 58.0 9 [°] 37.9	34 [°] 26.0 9 [°] 47.8	48 [°] 54.0 9 [°] 57.7	63 [°] 21.8 10 [°] 07.6	77 [°] 49.7 10 [°] 17.4	+28.1	16.1
	Th 18	294 [°] 40.4 12 [°] 37.2	309 [°] 07.3 12 [°] 46.0	323 [°] 34.2 12 [°] 54.6	338 [°] 01.0 13 [°] 03.3	352 [°] 27.8 13 [°] 11.8	6 [°] 54.5 13 [°] 20.3	21 [°] 21.2 13 [°] 28.6	35 [°] 47.8 13 [°] 36.9	50 [°] 14.3 13 [°] 45.2	64 [°] 40.8 13 [°] 53.3	79 [°] 07.3 14 [°] 01.3	+26.7	16.2
	Fr 19	295 [°] 38.1 15 [°] 51.1	310 [°] 03.8 15 [°] 57.6	324 [°] 29.4 16 [°] 04.0	338 [°] 55.0 16 [°] 10.4	353 [°] 20.5 16 [°] 16.6	7 [°] 46.0 16 [°] 22.7	22 [°] 11.5 16 [°] 28.7	36 [°] 36.9 16 [°] 34.6	51 [°] 02.3 16 [°] 40.4	65 [°] 27.6 16 [°] 46.1	79 [°] 52.9 16 [°] 51.7	+25.5	16.2
	Sa 20	296 [°] 08.4 18 [°] 01.5	310 [°] 33.3 18 [°] 05.3	324 [°] 58.0 18 [°] 08.8	339 [°] 22.8 18 [°] 12.3	353 [°] 47.6 18 [°] 15.7	8 [°] 12.3 18 [°] 18.9	22 [°] 37.0 18 [°] 22.0	37 [°] 01.7 18 [°] 24.9	51 [°] 26.4 18 [°] 27.8	65 [°] 51.1 18 [°] 30.5	80 [°] 15.7 18 [°] 33.1	+24.7	16.3
○	Su 21	310 [°] 33.3 18 [°] 05.3	324 [°] 58.0 18 [°] 08.8	339 [°] 22.8 18 [°] 12.3	353 [°] 47.6 18 [°] 15.7	8 [°] 12.3 18 [°] 18.9	22 [°] 37.0 18 [°] 22.0	37 [°] 01.7 18 [°] 24.9	51 [°] 26.4 18 [°] 27.8	65 [°] 51.1 18 [°] 30.5	80 [°] 15.7 18 [°] 33.1	94 [°] 40.4 18 [°] 35.6	+24.7	16.3
	Mo 22	310 [°] 49.4 18 [°] 57.4	325 [°] 14.0 18 [°] 57.8	339 [°] 38.6 18 [°] 58.1	354 [°] 03.3 18 [°] 58.3	8 [°] 27.3 18 [°] 58.9	22 [°] 52.6 18 [°] 58.2	37 [°] 17.2 18 [°] 58.0	51 [°] 41.9 18 [°] 57.7	66 [°] 06.6 18 [°] 57.2	80 [°] 31.3 18 [°] 56.7	94 [°] 56.0 18 [°] 55.9	+24.7	16.2
	Tu 23	311 [°] 09.8 18 [°] 30.2	325 [°] 35.0 18 [°] 27.5	340 [°] 00.2 18 [°] 24.6	354 [°] 25.4 18 [°] 21.7	8 [°] 50.6 18 [°] 15.5	23 [°] 15.9 18 [°] 15.5	37 [°] 41.3 18 [°] 12.2	52 [°] 06.7 18 [°] 08.7	66 [°] 32.1 18 [°] 05.2	80 [°] 57.5 18 [°] 01.6	95 [°] 23.5 17 [°] 57.8	+25.3	16.2
	We 24	311 [°] 51.0 16 [°] 48.0	326 [°] 17.3 16 [°] 42.5	340 [°] 43.6 16 [°] 36.8	355 [°] 10.0 16 [°] 31.1	9 [°] 36.4 16 [°] 25.3	24 [°] 02.8 16 [°] 19.4	38 [°] 29.4 16 [°] 13.4	52 [°] 55.9 16 [°] 07.3	67 [°] 22.6 16 [°] 01.1	81 [°] 49.3 15 [°] 54.8	96 [°] 16.8 15 [°] 48.4	+26.5	16.1
	Th 25	313 [°] 03.9 14 [°] 01.6	327 [°] 31.5 13 [°] 53.9	341 [°] 59.2 13 [°] 46.0	356 [°] 27.0 13 [°] 38.0	10 [°] 54.8 13 [°] 30.0	25 [°] 22.6 13 [°] 21.9	39 [°] 50.6 13 [°] 13.8	54 [°] 18.5 13 [°] 05.5	68 [°] 46.6 12 [°] 57.2	83 [°] 14.7 12 [°] 48.8	97 [°] 42.8 12 [°] 40.4	+27.9	16.0
●	Fr 26	314 [°] 51.7 10 [°] 25.9	329 [°] 20.7 10 [°] 16.5	343 [°] 49.8 10 [°] 07.0	358 [°] 18.9 9 [°] 57.4	12 [°] 48.7 9 [°] 47.9	17 [°] 17.3 9 [°] 38.2	41 [°] 46.6 9 [°] 28.5	56 [°] 15.9 9 [°] 18.8	70 [°] 45.2 9 [°] 09.0	85 [°] 14.7 8 [°] 59.2	99 [°] 44.1 8 [°] 49.4	+29.2	15.8
	Sa 27	317 [°] 11.5 6 [°] 16.9	331 [°] 41.7 6 [°] 06.4	346 [°] 11.9 5 [°] 56.0	0 [°] 42.2 5 [°] 45.5	15 [°] 12.4 5 [°] 35.0	29 [°] 42.8 5 [°] 24.5	44 [°] 13.1 5 [°] 14.0	58 [°] 43.5 5 [°] 03.4	73 [°] 14.5 4 [°] 52.8	87 [°] 44.4 4 [°] 42.2	102 [°] 14.6 4 [°] 31.6	+30.3	15.7
	Su 28	319 [°] 56.3 1 [°] 50.7	334 [°] 27.3 1 [°] 39.9	348 [°] 58.3 1 [°] 29.1	3 [°] 29.4 1 [°] 18.3	18 [°] 00.4 1 [°] 07.5	32 [°] 31.5 0 [°] 56.8	47 [°] 02.6 0 [°] 46.0	61 [°] 33.8 0 [°] 35.2	76 [°] 04.9 0 [°] 24.4	90 [°] 36.1 0 [°] 13.6	105 [°] 07.3 0 [°] 02.9	+31.1	15.6
	Mo 29	322 [°] 57.4 -2 [°] 37.4	337 [°]											

SUN

November 2035

D	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	Δ°/h
Th 1	259°06.3 -14°21.8	274°06.4 -14°22.6	289°06.4 -14°23.4	304°06.4 -14°24.2	319°06.4 -14°25.0	334°06.4 -14°25.8	349°06.5 -14°26.6	4°06.5 -14°27.4	15°06.5 -14°28.2	34°06.5 -14°29.0	45°06.5 -14°29.8	64°06.5 -14°30.6	+0.0 -0.8
Fr 2	259°06.7 -14°41.0	274°06.7 -14°41.7	289°06.7 -14°42.5	304°06.7 -14°43.3	319°06.7 -14°44.1	334°06.7 -14°44.9	349°06.8 -14°45.7	4°06.8 -14°46.5	15°06.8 -14°47.3	34°06.8 -14°48.1	45°06.8 -14°48.9	64°06.8 -14°49.6	+0.0 -0.8
Sa 3	259°06.9 -14°59.9	274°06.9 -15°00.6	289°06.9 -15°01.4	304°06.9 -15°02.2	319°06.9 -15°03.0	334°06.9 -15°03.8	349°06.9 -15°04.5	4°06.9 -15°05.3	15°06.9 -15°06.1	34°06.9 -15°06.9	45°06.9 -15°07.7	64°06.9 -15°08.4	-0.0 -0.8
Su 4	259°06.8 -15°18.5	274°06.8 -15°19.3	289°06.8 -15°20.1	304°06.8 -15°20.8	319°06.8 -15°21.6	334°06.8 -15°22.4	349°06.8 -15°23.1	4°06.8 -15°23.9	15°06.7 -15°24.7	34°06.7 -15°25.4	45°06.7 -15°26.2	64°06.7 -15°27.0	-0.0 -0.8
Mo 5	259°06.6 -15°36.9	274°06.5 -15°37.7	289°06.5 -15°38.4	304°06.5 -15°39.2	319°06.5 -15°40.0	334°06.5 -15°40.7	349°06.5 -15°41.5	4°06.5 -15°42.2	15°06.4 -15°43.0	34°06.4 -15°43.8	45°06.4 -15°44.5	64°06.4 -15°45.3	-0.0 -0.8
Tu 6	259°06.1 -15°55.1	274°06.1 -15°55.8	289°06.1 -15°56.6	304°06.0 -15°57.3	319°06.0 -15°58.1	334°06.0 -15°58.8	349°06.0 -15°59.6	4°05.9 -16°00.3	15°05.9 -16°01.1	34°05.9 -16°01.8	45°05.9 -16°02.6	64°05.8 -16°03.3	-0.0 -0.7
We 7	259°05.5 -16°13.0	274°05.4 -16°13.7	289°05.4 -16°14.4	304°05.4 -16°15.2	319°05.3 -16°15.9	334°05.3 -16°16.6	349°05.3 -16°17.4	4°05.2 -16°18.1	15°05.2 -16°18.9	34°05.2 -16°19.6	45°05.1 -16°20.3	64°05.1 -16°21.1	-0.0 -0.7
Th 8	259°04.6 -16°30.6	274°04.6 -16°31.3	289°04.5 -16°32.0	304°04.5 -16°32.7	319°04.4 -16°33.5	334°04.4 -16°34.2	349°04.3 -16°34.9	4°04.3 -16°35.6	15°04.3 -16°36.4	34°04.2 -16°37.1	45°04.2 -16°37.8	64°04.1 -16°38.5	-0.0 -0.7
Fr 9	259°03.5 -16°47.9	274°03.5 -16°48.6	289°03.4 -16°49.3	304°03.4 -16°50.0	319°03.3 -16°50.8	334°03.3 -16°51.5	349°03.2 -16°52.2	4°03.2 -16°52.9	15°03.1 -16°53.6	34°03.1 -16°54.3	45°03.0 -16°55.0	64°03.0 -16°55.7	-0.1 -0.7
Sa 10	259°02.3 -17°04.9	274°02.2 -17°05.6	289°02.1 -17°06.3	304°02.1 -17°07.1	319°02.0 -17°07.8	334°02.0 -17°08.5	349°01.9 -17°09.2	4°01.8 -17°09.9	15°01.8 -17°10.6	34°01.7 -17°11.3	45°01.7 -17°12.0	64°01.6 -17°12.7	-0.1 -0.7
Su 11	259°00.8 -17°21.7	274°00.7 -17°22.4	289°00.6 -17°23.1	304°00.6 -17°23.8	319°00.5 -17°24.5	334°00.4 -17°25.1	349°00.4 -17°25.8	4°00.3 -17°26.5	15°00.2 -17°27.2	34°00.2 -17°27.9	45°00.1 -17°28.6	64°00.0 -17°29.3	-0.1 -0.7
Mo 12	258°59.1 -17°38.2	273°59.0 -17°38.8	288°58.9 -17°39.5	303°58.9 -17°40.2	318°58.8 -17°40.9	333°58.7 -17°41.5	348°58.6 -17°42.2	3°58.5 -17°42.9	15°58.5 -17°43.6	33°58.4 -17°44.2	45°58.3 -17°44.9	63°58.2 -17°45.6	-0.1 -0.7
Tu 13	258°57.2 -17°54.4	273°57.1 -17°55.0	288°57.0 -17°55.6	303°56.9 -17°56.3	318°56.8 -17°57.0	333°56.8 -17°57.6	348°56.7 -17°58.3	3°56.6 -17°59.0	15°56.5 -17°59.6	33°56.4 -18°00.3	45°56.3 -18°00.9	63°56.2 -18°01.6	-0.1 -0.7
We 14	258°55.1 -18°10.1	273°55.0 -18°10.8	288°54.9 -18°11.4	303°54.8 -18°12.1	318°54.7 -18°12.7	333°54.6 -18°13.4	348°54.5 -18°14.0	3°54.4 -18°14.7	15°54.3 -18°15.3	33°54.2 -18°16.0	45°54.1 -18°16.6	63°54.0 -18°17.3	-0.1 -0.6
Th 15	258°52.8 -18°25.7	273°52.7 -18°26.3	288°52.6 -18°26.9	303°52.5 -18°27.6	318°52.3 -18°28.2	333°52.2 -18°28.8	348°52.1 -18°29.5	3°52.0 -18°30.1	15°51.9 -18°30.8	33°51.8 -18°31.4	45°51.7 -18°32.0	63°51.6 -18°32.7	-0.1 -0.6
Fr 16	258°50.2 -18°40.9	273°50.1 -18°41.5	288°50.0 -18°42.1	303°49.9 -18°42.7	318°49.8 -18°43.4	333°49.7 -18°44.0	348°49.6 -18°44.6	3°49.5 -18°45.2	15°49.3 -18°45.8	33°49.2 -18°46.5	45°49.1 -18°47.1	63°49.0 -18°47.7	-0.1 -0.6
Sa 17	258°47.5 -18°55.7	273°47.4 -18°56.3	288°47.2 -18°56.9	303°47.1 -18°57.6	318°47.0 -18°58.2	333°46.9 -18°58.8	348°46.8 -18°59.4	3°46.6 -19°00.0	15°46.5 -19°00.6	33°46.4 -19°01.2	45°46.3 -19°01.8	63°46.2 -19°02.4	-0.1 -0.6
Su 18	258°44.5 -19°10.2	273°44.4 -19°10.8	288°44.3 -19°11.4	303°44.2 -19°12.0	318°44.0 -19°12.6	333°43.9 -19°13.2	348°43.8 -19°13.8	3°43.6 -19°14.4	15°43.5 -19°15.0	33°43.4 -19°15.6	45°43.2 -19°16.2	63°43.1 -19°16.8	-0.1 -0.6
Mo 19	258°41.4 -19°24.4	273°41.2 -19°25.0	288°41.1 -19°25.6	303°41.0 -19°26.2	318°40.8 -19°26.8	333°40.7 -19°27.3	348°40.6 -19°27.9	3°40.4 -19°28.5	15°40.3 -19°29.1	33°40.1 -19°29.7	45°40.0 -19°30.2	63°39.9 -19°30.8	-0.1 -0.6
Tu 20	258°38.0 -19°38.3	273°37.9 -19°38.8	288°37.7 -19°39.4	303°37.6 -19°40.0	318°37.4 -19°40.5	333°37.3 -19°41.1	348°37.1 -19°41.7	3°37.0 -19°42.2	15°36.8 -19°42.8	33°36.7 -19°43.4	45°36.5 -19°43.9	63°36.4 -19°44.5	-0.1 -0.6
We 21	258°34.4 -19°51.8	273°34.3 -19°52.3	288°34.1 -19°52.9	303°34.0 -19°53.4	318°33.8 -19°54.0	333°33.6 -19°54.5	348°33.5 -19°55.1	3°33.3 -19°55.6	15°33.2 -19°56.2	33°33.0 -19°56.7	45°32.9 -19°57.3	63°32.7 -19°57.8	-0.2 -0.5
Th 22	258°30.6 -20°04.9	273°30.5 -20°05.4	288°30.3 -20°06.0	303°30.1 -20°06.5	318°30.0 -20°07.0	333°29.8 -20°07.6	348°29.7 -20°08.1	3°29.5 -20°08.8	15°29.3 -20°09.2	33°29.2 -20°09.7	45°29.0 -20°10.2	63°28.8 -20°10.8	-0.2 -0.5
Fr 23	258°26.6 -20°17.6	273°26.5 -20°18.2	288°26.3 -20°18.7	303°26.1 -20°19.2	318°26.0 -20°19.7	333°25.8 -20°20.2	348°25.6 -20°20.8	3°25.4 -20°21.3	15°25.3 -20°21.8	33°25.1 -20°22.3	45°24.9 -20°22.8	63°24.7 -20°23.4	-0.2 -0.5
Sa 24	258°22.2 -20°30.0	273°22.3 -20°30.5	288°22.1 -20°31.0	303°21.9 -20°31.5	318°21.7 -20°32.0	333°21.6 -20°32.6	348°21.4 -20°33.1	3°21.2 -20°33.6	15°21.0 -20°34.1	33°20.8 -20°34.6	45°20.6 -20°35.1	63°20.5 -20°35.6	-0.2 -0.5
Su 25	258°18.1 -20°42.0	273°17.9 -20°42.5	288°17.7 -20°43.0	303°17.5 -20°43.5	318°17.3 -20°44.0	333°17.1 -20°44.5	348°16.9 -20°45.0	3°16.7 -20°45.5	15°16.6 -20°45.9	33°16.4 -20°46.4	45°16.3 -20°46.9	63°16.0 -20°47.2	-0.2 -0.5
Mo 26	258°13.5 -20°53.6	273°13.3 -20°54.1	288°13.1 -20°54.6	303°12.9 -20°55.1	318°12.7 -20°55.5	333°12.5 -20°56.0	348°12.3 -20°56.5	3°12.1 -20°57.0	15°11.9 -20°57.4	33°11.7 -20°57.9	45°11.5 -20°58.4	63°11.3 -20°58.8	-0.2 -0.5
Tu 27	258°08.7 -21°04.9	273°08.5 -21°05.3	288°08.3 -21°05.8	303°08.1 -21°06.3	318°07.9 -21°06.7	333°07.7 -21°07.2	348°07.5 -21°07.6	3°07.3 -21°08.1	15°07.3 -21°08.5	33°06.9 -21°09.0	45°06.7 -21°09.4	63°06.5 -21°09.9	-0.2 -0.5
We 28	258°03.7 -21°15.7	273°03.5 -21°16.2	288°03.3 -21°16.6	303°03.1 -21°17.0	318°02.9 -21°17.5	333°02.7 -21°17.9	348°02.5 -21°18.4	3°02.3 -21°18.8	15°02.1 -21°19.2	33°01.8 -21°19.7	45°01.6 -21°20.1	63°01.4 -21°20.6	-0.2 -0.4
Th 29	257°58.6 -21°26.2	272°58.4 -21°26.6	287°58.2 -21°27.0	302°58.0 -21°27.4	317°57.7 -21°27.9	332°57.5 -21°28.3	347°57.3 -21°28.7	2°57.1 -21°29.1	15°56.9 -21°29.5	32°56.6 -21°30.0	45°56.4 -21°30.4	62°56.2 -21°30.8	-0.2 -0.4
Fr 30	257°53.3 -21°36.2	272°53.1 -21°36.6	287°52.8 -21°37.0	302°52.6 -21°37.4	317°52.4 -21°37.8	332°52.2 -21°38.2	347°51.9 -21°38.6	2°51.7 -21°39.0	15°51.5 -21°39.4	32°51.3 -21°39.8	45°51.0 -21°40.2	62°50.8 -21°40.6	-0.2 -0.4

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

November 2035

	D	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	Δ /h	SH
●	Th 1	245°14.3 -13°17.4	259°45.7 -13°24.8	274°17.1 -13°32.1	288°48.5 -13°39.3	303°19.9 -13°45.6	317°51.2 -13°53.6	332°22.6 -14°00.7	346°53.9 -14°07.9	1°25.3 -14°14.5	15°56.6 -14°21.3	30°27.9 -14°28.1	+31.4	15.1
	Fr 2	248°16.6 -16°00.4	262°47.8 -16°06.0	277°19.0 -16°11.4	291°50.1 -16°16.8	306°21.1 -16°22.3	320°52.4 -16°27.3	335°23.6 -16°32.5	349°54.7 -16°37.5	4°25.9 -16°42.5	18°57.0 -16°47.4	33°28.1 -16°52.2	+31.1	14.9
	Sa 3	251°14.2 -17°54.4	265°45.3 -17°57.9	280°16.3 -18°01.3	294°47.3 -18°06.4	309°18.4 -18°07.8	323°49.4 -18°10.9	338°20.4 -18°14.0	352°51.5 -18°15.9	7°22.5 -18°19.8	21°53.5 -18°23.6	36°24.0 -18°25.3	+31.0	14.8
	Su 4	254°10.0 -18°55.2	268°41.1 -18°56.4	283°12.1 -18°57.6	297°43.2 -18°58.7	312°14.2 -18°59.8	326°45.3 -19°00.7	341°16.4 -19°01.6	355°47.4 -19°02.3	10°18.5 -19°03.0	24°49.6 -19°03.6	39°20.7 -19°04.1	+31.1	14.8
	Mo 5	257°08.0 -19°00.9	271°39.2 -19°00.0	286°10.5 -18°59.0	300°41.7 -18°57.9	315°13.0 -18°56.7	329°44.2 -18°55.5	344°15.5 -18°54.1	358°46.8 -18°52.7	13°18.1 -18°51.2	27°49.4 -18°49.6	42°20.7 -18°47.9	+31.3	14.7
	Tu 6	260°12.0 -18°12.3	274°43.5 -18°09.3	289°15.1 -18°06.2	303°46.6 -18°03.0	318°18.2 -17°59.7	332°49.8 -17°56.3	347°21.3 -17°52.8	1°53.0 -17°49.3	16°24.6 -17°45.7	30°56.2 -17°42.0	45°27.8 -17°38.2	+31.6	14.8
	We 7	263°24.2 -16°32.0	277°56.0 -16°27.0	292°27.9 -16°21.9	306°59.8 -16°16.7	321°31.7 -16°11.4	336°03.6 -16°06.1	350°35.5 -16°00.7	5°07.5 -15°55.2	19°39.4 -15°49.6	34°11.4 -15°44.0	48°43.3 -15°38.3	+31.9	14.8
	Th 8	266°44.1 -14°04.0	281°16.2 -13°57.2	295°48.3 -13°50.3	310°20.5 -13°43.3	324°52.6 -13°36.2	339°24.7 -13°29.1	353°56.9 -13°21.9	8°29.1 -13°14.7	23°01.2 -13°07.4	37°33.4 -13°00.0	52°05.6 -12°52.6	+32.1	15.0
	Fr 9	270°08.4 -10°53.4	284°40.6 -10°45.0	299°12.8 -10°36.5	313°44.9 -10°28.0	328°17.1 -10°19.4	342°49.3 -10°10.7	357°21.5 -9°53.6	11°53.6 -9°45.3	26°25.8 -9°35.5	40°57.9 -9°26.7	55°30.4 -9°16.7	+32.2	15.1
	Sa 10	273°31.0 -9°06.6	288°02.9 -6°56.9	302°34.9 -6°47.1	317°06.8 -6°37.3	331°38.7 -6°27.5	346°10.6 -6°17.6	6°42.5 -6°07.7	15°14.3 -5°57.7	29°46.1 -5°47.7	44°17.9 -5°37.6	58°49.7 -5°27.5	+31.9	15.3
○	Su 11	276°43.4 -2°51.7	291°14.8 -2°41.9	305°46.1 -2°30.3	320°17.4 -2°19.6	334°48.6 -2°08.9	349°19.8 -1°58.2	3°51.0 -1°47.4	18°22.1 -1°36.6	32°53.2 -1°25.8	47°24.3 -1°14.9	61°55.3 -1°04.1	+31.2	15.6
	Mo 12	279°35.6 1°40.9	294°05.9 1°52.0	308°36.2 2°03.1	323°06.4 2°14.2	337°36.6 2°25.3	352°06.7 2°36.4	6°36.8 2°47.5	21°06.8 2°58.6	35°36.7 3°09.7	50°06.6 3°20.8	64°36.5 3°31.9	+30.8	15.8
	Tu 13	281°57.1 6°17.2	296°26.0 6°28.1	310°54.8 6°39.0	325°23.6 6°49.8	339°52.3 7°00.7	354°20.9 7°11.4	8°49.5 7°22.2	23°18.0 7°32.9	37°46.4 7°43.6	52°14.7 7°54.3	66°43.9 8°04.9	+28.6	16.1
	We 14	283°38.9 10°39.5	298°06.1 10°49.4	312°33.2 10°59.3	327°00.2 11°09.1	341°27.1 11°18.8	355°54.0 11°28.5	10°20.8 11°38.1	24°47.5 11°47.6	39°14.2 11°57.1	53°40.4 12°06.5	68°07.7 12°15.9	+26.8	16.3
	Th 15	284°36.4 14°26.8	299°01.8 14°34.9	313°27.8 14°42.8	327°52.4 14°50.7	342°17.6 14°58.5	356°52.3 15°06.2	11°07.8 15°13.7	25°32.6 15°21.2	40°03.5 15°28.6	54°27.2 15°35.9	68°47.4 15°43.0	+25.1	16.6
	Fr 16	284°52.9 17°17.5	299°16.9 17°22.9	313°40.8 17°28.1	328°04.7 17°33.2	342°28.5 17°38.2	356°52.3 17°43.1	11°16.1 17°47.9	25°39.8 17°52.5	40°03.5 17°57.0	54°27.2 18°01.4	68°50.8 18°05.6	+23.8	16.5
	Sa 17	284°42.0 18°53.4	299°05.3 18°55.5	313°28.5 18°57.5	327°51.8 18°59.3	342°15.1 19°01.0	356°38.3 19°02.6	11°01.6 19°04.0	25°24.9 19°05.3	39°48.1 19°06.4	54°11.4 19°07.4	68°34.7 19°08.3	+23.3	16.5
	Su 18	284°25.6 19°04.8	298°49.2 19°03.4	313°12.8 19°02.0	327°36.4 19°00.4	342°00.1 18°58.7	356°23.8 18°56.8	10°47.6 18°54.8	25°11.3 18°52.7	39°35.2 18°50.4	54°12.9 18°48.0	68°38.3 18°45.5	+23.7	16.4
	Mo 19	284°27.8 17°52.6	298°52.5 17°48.1	313°17.3 17°43.5	327°42.2 17°38.8	342°07.2 17°33.9	356°32.2 17°29.0	10°57.3 17°23.9	25°22.4 17°18.7	39°47.6 17°13.4	54°12.9 17°08.0	68°38.3 17°02.5	+25.0	16.3
	Tu 20	298°52.5 17°48.1	313°17.3 17°43.5	327°42.2 17°38.8	342°07.2 17°33.9	356°32.2 17°29.0	10°57.3 17°23.9	25°22.4 17°18.7	39°47.6 17°13.4	54°12.9 17°08.0	68°38.3 17°02.5	83°03.3 16°56.9	+25.1	16.3
●	We 21	299°33.2 15°20.5	313°59.8 15°13.3	328°26.4 15°06.1	342°53.1 14°58.7	357°19.9 14°51.3	11°46.7 14°43.7	26°13.6 14°36.1	40°40.6 14°28.4	55°07.7 14°20.6	69°34.8 14°12.8	84°02.1 14°04.8	+26.9	16.1
	Th 22	300°58.9 11°57.1	315°27.3 11°48.1	329°55.7 11°39.0	344°24.2 11°29.9	358°52.8 11°20.6	13°21.4 11°11.4	27°50.1 11°02.0	42°18.9 10°52.7	56°47.7 10°43.2	71°16.6 10°33.8	85°45.6 10°24.2	+28.7	15.9
	Fr 23	303°07.6 7°56.0	317°37.6 7°45.8	332°07.6 7°35.6	346°37.6 7°25.3	361°07.7 7°15.1	15°37.9 7°04.7	30°08.1 6°54.4	44°38.4 6°44.0	59°08.7 6°33.7	73°39.0 6°23.2	88°09.4 6°12.8	+30.2	15.7
	Sa 24	305°51.1 3°23.3	320°22.3 3°12.6	334°53.4 3°12.6	349°24.6 3°01.9	364°55.8 2°51.1	18°27.1 2°40.4	32°58.4 2°29.7	47°29.7 2°19.0	62°01.1 2°08.2	76°32.4 1°57.5	91°03.4 1°46.8	+31.3	15.6
	Su 25	308°58.5 -0°53.9	323°30.3 -1°04.5	338°02.2 -1°15.2	352°34.0 -1°25.8	367°05.9 -1°36.9	21°37.8 -1°47.0	36°09.7 -1°57.6	50°41.7 -2°08.1	65°13.6 -2°18.6	79°45.6 -2°29.2	94°17.6 -2°39.7	+31.9	15.4
	Mo 26	312°18.4 -5°14.4	326°50.6 -5°24.5	341°22.7 -5°34.6	355°54.8 -5°44.6	370°26.9 -5°54.6	24°59.0 -6°04.6	39°31.2 -6°14.5	54°03.3 -6°24.4	68°35.4 -6°34.3	83°07.5 -6°44.1	97°39.7 -6°53.9	+32.1	15.3
	Tu 27	315°41.2 -9°15.8	330°13.2 -9°24.9	344°45.3 -9°33.9	359°17.3 -9°42.9	373°49.3 -9°51.9	28°21.4 -10°00.8	42°53.4 -10°09.6	57°25.4 -10°18.4	71°57.4 -10°27.2	86°29.3 -10°35.9	101°01.3 -10°44.5	+32.0	15.1
	We 28	318°59.4 -12°47.3	333°31.2 -12°55.0	348°02.9 -13°02.6	362°13.0 -13°10.2	376°06.4 -13°17.7	31°38.1 -13°25.1	46°09.8 -13°32.5	60°41.5 -13°39.8	75°13.1 -13°47.1	89°44.8 -14°01.4	104°16.4 -14°01.4	+31.7	15.0
	Th 29	322°09.1 -15°39.5	336°40.4 -15°45.5	351°11.9 -15°51.4	365°43.0 -15°57.2	380°14.6 -16°02.9	34°46.0 -16°08.6	49°17.3 -16°14.1	63°48.6 -16°19.6	78°19.9 -16°25.1	92°51.2 -16°30.1	107°22.5 -16°35.7	+31.3	14.9
	Fr 30	325°10.1 -17°44.8	339°41.2 -17°48.7	354°12.3 -17°52.6	368°44.4 -17°56.4	383°14.5 -18°00.1	37°45.5 -18°03.7	52°16.6 -18°07.2	66°47.6 -18°10.6	81°18.7 -18°14.0	95°49.7 -18°17.2	110°20.7 -18°20.4	+31.1	14.8

Row 1: GHA, Δ /h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ /h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 8 05h50 — FM: 15 13h48 — LQ: 22 05h16 — NM: 29 19h37

SUN

December 2035

D	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	Δ°/h
Sa 1	272°47.6 -21°46.2	287°47.4 -21°46.6	302°47.1 -21°47.0	317°46.9 -21°47.4	332°46.7 -21°47.8	347°46.4 -21°48.1	2°46.2 -21°48.5	17°46.0 -21°48.9	32°45.7 -21°49.3	47°45.5 -21°49.7	62°45.3 -21°50.1	77°45.0 -21°50.5	-0.2 -0.4
Su 2	272°41.9 -21°55.4	287°41.7 -21°55.8	302°41.5 -21°56.1	317°41.2 -21°56.5	332°41.0 -21°56.9	347°40.7 -21°57.2	2°40.5 -21°57.6	17°40.3 -21°58.0	32°40.0 -21°58.4	47°39.8 -21°58.7	62°39.5 -21°59.1	77°39.3 -21°59.5	-0.2 -0.4
Mo 3	272°36.1 -22°04.2	287°35.9 -22°04.5	302°35.7 -22°04.9	317°35.4 -22°05.2	332°35.2 -22°05.6	347°34.9 -22°05.9	2°34.7 -22°06.3	17°34.4 -22°06.6	32°34.2 -22°07.0	47°33.9 -22°07.3	62°33.7 -22°07.7	77°33.4 -22°08.0	-0.2 -0.4
Tu 4	272°30.2 -22°12.5	287°29.9 -22°12.8	302°29.7 -22°13.2	317°29.4 -22°13.5	332°29.2 -22°13.8	347°28.9 -22°14.2	2°28.7 -22°14.5	17°28.4 -22°14.8	32°28.2 -22°15.2	47°27.9 -22°15.5	62°27.7 -22°15.8	77°27.4 -22°16.2	-0.3 -0.3
We 5	272°24.1 -22°20.4	287°23.8 -22°20.7	302°23.6 -22°21.0	317°23.3 -22°21.4	332°23.1 -22°21.7	347°22.8 -22°22.0	2°22.6 -22°22.3	17°22.3 -22°22.6	32°22.0 -22°22.9	47°21.8 -22°23.3	62°21.5 -22°23.6	77°21.3 -22°23.9	-0.3 -0.3
Th 6	272°17.9 -22°27.9	287°17.6 -22°28.2	302°17.4 -22°28.5	317°17.1 -22°28.8	332°16.8 -22°29.1	347°16.6 -22°29.4	2°16.3 -22°29.7	17°16.0 -22°30.0	32°15.8 -22°30.3	47°15.5 -22°30.6	62°15.2 -22°30.9	77°15.0 -22°31.2	-0.3 -0.3
Fr 7	272°11.5 -22°34.9	287°11.3 -22°35.2	302°11.0 -22°35.5	317°10.7 -22°35.8	332°10.4 -22°36.1	347°10.2 -22°36.3	2°09.9 -22°36.6	17°09.6 -22°36.9	32°09.4 -22°37.2	47°09.1 -22°37.4	62°08.8 -22°37.7	77°08.6 -22°38.0	-0.3 -0.3
Sa 8	272°05.0 -22°41.5	287°04.8 -22°41.8	302°04.5 -22°42.0	317°04.2 -22°42.3	332°04.0 -22°42.6	347°03.7 -22°42.8	2°03.4 -22°43.1	17°03.1 -22°43.4	32°02.9 -22°43.6	47°02.6 -22°43.9	62°02.3 -22°44.2	77°02.0 -22°44.4	-0.3 -0.3
Su 9	271°58.5 -22°47.7	286°58.2 -22°47.9	301°57.9 -22°48.2	316°57.6 -22°48.4	331°57.3 -22°48.7	346°57.1 -22°48.9	1°56.8 -22°49.1	16°56.5 -22°49.4	31°56.2 -22°49.6	46°56.0 -22°49.9	61°55.7 -22°50.1	76°55.4 -22°50.3	-0.3 -0.2
Mo 10	271°51.8 -22°55.6	286°51.5 -22°55.8	301°51.2 -22°55.9	316°50.9 -22°56.1	331°50.6 -22°56.3	346°50.3 -22°56.5	1°50.1 -22°56.8	16°49.8 -22°57.1	31°49.5 -22°57.4	46°49.2 -22°57.7	61°48.9 -22°58.0	76°48.7 -22°58.2	-0.3 -0.2
Tu 11	271°45.0 -22°58.6	286°44.7 -22°58.8	301°44.4 -22°59.0	316°44.1 -22°59.2	331°43.8 -22°59.5	346°43.5 -22°59.7	1°43.2 -22°59.9	16°43.0 -23°00.1	31°42.7 -23°00.3	46°42.4 -23°00.5	61°42.1 -23°00.7	76°41.8 -23°00.9	-0.3 -0.2
We 12	271°38.1 -23°03.4	286°37.8 -23°03.6	301°37.5 -23°03.8	316°37.2 -23°04.0	331°36.9 -23°04.2	346°36.6 -23°04.4	1°36.3 -23°04.5	16°36.0 -23°04.7	31°35.7 -23°04.9	46°35.5 -23°05.1	61°35.2 -23°05.3	76°34.9 -23°05.5	-0.3 -0.2
Th 13	271°31.1 -23°07.8	286°30.8 -23°07.9	301°30.5 -23°08.1	316°30.2 -23°08.3	331°29.9 -23°08.4	346°29.6 -23°08.6	1°29.3 -23°08.8	16°29.0 -23°08.9	31°28.7 -23°09.1	46°28.4 -23°09.3	61°28.2 -23°09.4	76°27.9 -23°09.6	-0.3 -0.2
Fr 14	271°24.0 -23°11.6	286°23.7 -23°11.9	301°23.4 -23°12.1	316°23.1 -23°12.2	331°22.8 -23°12.4	346°22.5 -23°12.5	1°22.2 -23°12.7	16°22.0 -23°12.8	31°21.7 -23°12.9	46°21.4 -23°13.0	61°21.1 -23°13.1	76°20.8 -23°13.3	-0.3 -0.1
Sa 15	271°16.9 -23°15.9	286°16.6 -23°15.2	301°16.3 -23°15.3	316°16.0 -23°15.4	331°15.7 -23°15.6	346°15.4 -23°15.7	1°15.1 -23°15.8	16°14.8 -23°16.0	31°14.5 -23°16.1	46°14.0 -23°16.2	61°13.9 -23°16.3	76°13.6 -23°16.5	-0.3 -0.1
Su 16	271°09.7 -23°19.5	286°09.4 -23°18.1	301°09.1 -23°18.2	316°08.8 -23°18.3	331°08.5 -23°18.6	346°08.2 -23°18.7	1°07.9 -23°18.8	16°07.6 -23°18.9	31°07.3 -23°19.0	46°07.0 -23°19.1	61°06.7 -23°19.4	76°06.4 -23°19.2	-0.3 -0.1
Mo 17	271°02.4 -23°20.5	286°02.1 -23°20.6	301°01.8 -23°20.7	316°01.5 -23°20.8	331°01.2 -23°20.9	346°00.9 -23°21.0	1°00.6 -23°21.1	16°00.3 -23°21.2	31°00.0 -23°21.3	46°59.7 -23°21.4	61°59.4 -23°21.4	76°59.1 -23°21.5	-0.3 -0.1
Tu 18	270°55.1 -23°22.5	285°54.8 -23°22.6	300°54.5 -23°22.7	315°54.2 -23°22.7	330°53.9 -23°22.8	345°53.6 -23°22.9	0°53.3 -23°22.9	15°53.0 -23°23.0	30°52.7 -23°23.1	45°52.4 -23°23.2	60°52.1 -23°23.2	75°51.8 -23°23.3	-0.3 -0.1
We 19	270°47.8 -23°24.1	285°47.5 -23°24.1	300°47.2 -23°24.2	315°46.8 -23°24.2	330°46.5 -23°24.3	345°46.2 -23°24.3	0°45.9 -23°24.4	15°45.6 -23°24.4	30°45.3 -23°24.5	45°45.0 -23°24.5	60°44.7 -23°24.6	75°44.4 -23°24.6	-0.3 -0.1
Th 20	270°40.4 -23°25.2	285°40.1 -23°25.2	300°39.8 -23°25.2	315°39.4 -23°25.3	330°39.1 -23°25.3	345°38.8 -23°25.3	0°38.5 -23°25.4	15°38.2 -23°25.4	30°37.9 -23°25.4	45°37.6 -23°25.4	60°37.3 -23°25.5	75°37.0 -23°25.5	-0.3 -0.0
Fr 21	270°32.9 -23°25.8	285°32.6 -23°25.8	300°32.3 -23°25.8	315°32.0 -23°25.8	330°31.7 -23°25.8	345°31.4 -23°25.8	0°31.1 -23°25.9	15°30.8 -23°25.9	30°30.5 -23°25.9	45°30.2 -23°25.9	60°29.8 -23°25.9	75°29.5 -23°25.9	-0.3 -0.0
Sa 22	270°25.5 -23°25.9	285°25.2 -23°25.9	300°24.9 -23°25.9	315°24.6 -23°25.9	330°24.3 -23°25.9	345°23.9 -23°25.9	0°23.6 -23°25.9	15°23.3 -23°25.9	30°23.0 -23°25.9	45°22.7 -23°25.8	60°22.4 -23°25.8	75°22.1 -23°25.8	-0.3 +0.0
Su 23	270°18.6 -23°25.6	285°17.7 -23°25.6	300°17.4 -23°25.5	315°17.1 -23°25.5	330°16.8 -23°25.5	345°16.5 -23°25.5	0°16.2 -23°25.4	15°15.9 -23°25.4	30°15.6 -23°25.4	45°15.2 -23°25.3	60°14.9 -23°25.3	75°14.6 -23°25.3	-0.3 +0.0
Mo 24	270°10.6 -23°24.8	285°10.3 -23°24.8	300°10.0 -23°24.7	315°09.6 -23°24.7	330°09.3 -23°24.6	345°09.0 -23°24.6	0°08.7 -23°24.5	15°08.4 -23°24.4	30°08.1 -23°24.4	45°07.8 -23°24.4	60°07.5 -23°24.4	75°07.2 -23°24.3	-0.3 +0.0
Tu 25	270°03.1 -23°23.5	285°02.8 -23°23.5	300°02.5 -23°23.4	315°02.2 -23°23.3	330°01.9 -23°23.3	345°01.6 -23°23.3	0°01.3 -23°23.1	15°00.9 -23°23.0	30°00.6 -23°23.0	45°00.3 -23°22.9	60°00.0 -23°22.9	74°59.7 -23°22.8	-0.3 +0.1
We 26	269°55.7 -23°21.8	284°55.4 -23°21.7	299°55.1 -23°21.6	314°54.7 -23°21.5	329°54.4 -23°21.5	344°54.1 -23°21.4	359°53.8 -23°21.5	14°53.5 -23°21.2	29°53.2 -23°21.1	44°52.9 -23°21.0	59°52.6 -23°20.9	74°52.3 -23°20.8	-0.3 +0.1
Th 27	269°48.3 -23°19.6	284°47.9 -23°19.5	299°47.6 -23°19.4	314°47.3 -23°19.3	329°47.0 -23°19.2	344°46.7 -23°19.1	359°46.4 -23°19.0	14°46.1 -23°18.9	29°45.8 -23°18.7	44°45.5 -23°18.6	59°45.2 -23°18.5	74°44.9 -23°18.4	-0.3 +0.1
Fr 28	269°40.9 -23°16.9	284°40.6 -23°16.8	299°40.3 -23°16.7	314°39.9 -23°16.5	329°39.6 -23°16.4	344°39.3 -23°16.3	359°39.0 -23°16.2	14°38.7 -23°16.0	29°38.4 -23°15.9	44°38.1 -23°15.8	59°37.8 -23°15.7	74°37.5 -23°15.5	-0.3 +0.1
Sa 29	269°33.5 -23°13.8	284°33.2 -23°13.6	299°32.9 -23°13.5	314°32.6 -23°13.3	329°32.3 -23°13.2	344°32.0 -23°13.1	359°31.7 -23°12.9	14°31.4 -23°12.8	29°31.1 -23°12.6	44°30.8 -23°12.5	59°30.5 -23°12.4	74°30.2 -23°12.2	-0.3 +0.1
Su 30	269°26.2 -23°10.2	284°25.9 -23°10.0	299°25.6 -23°09.8	314°25.3 -23°09.7	329°25.0 -23°09.5	344°24.7 -23°09.4	359°24.4 -23°09.2	14°24.1 -23°08.9	29°23.8 -23°08.8	44°23.5 -23°08.7	59°23.2 -23°08.5	74°22.9 -23°08.4	-0.3 +0.2
Mo 31	269°19.0 -23°06.1	284°18.7 -23°05.7	299°18.4 -23°05.7	314°18.1 -23°05.4	329°17.8 -23°05.4	344°17.5 -23°05.2	359°17.2 -23°05.0	14°16.9 -23°04.8	29°16.6 -23°04.6	44°16.3 -23°04.3	59°16.0 -23°04.1	74°15.7 -23°04.1	-0.3 +0.2

Row 1: GHA (Greenwich Hour Angle), Δ°/h = GHA change - 15°

Row 2: Dec (Declination, - = South), Δ°/h = dec. change

Semi-diameter: 16.2'

MOON

December 2035

	D	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	Δ'/h SH
C	Sa 1	240°59.7 -18°45.1	255°30.7 -18°47.4	270°01.7 -18°49.6	284°32.6 -18°51.7	299°03.6 -18°53.7	313°34.6 -18°55.7	328°05.6 -18°57.5	342°36.5 -18°59.3	357°07.5 -19°01.0	11°38.5 -19°02.6	26°09.5 -19°04.1	+31.0 14.8 -1.9 54.1
	Su 2	243°54.5 -19°15.9	258°25.6 -19°16.0	272°56.6 -19°16.6	287°27.7 -19°15.9	301°58.8 -19°15.7	316°29.9 -19°15.4	331°01.0 -19°15.4	345°32.1 -19°14.0	0°03.2 -19°14.0	14°34.3 -19°13.4	29°05.4 -19°12.7	+31.1 14.7 +0.3 54.0
	Mo 3	246°53.9 -18°51.3	261°25.3 -18°49.2	275°56.7 -18°47.0	290°28.1 -18°44.7	304°59.5 -18°42.4	319°30.9 -18°39.9	334°02.3 -18°37.4	348°33.8 -18°34.7	3°05.2 -18°32.0	17°36.7 -18°29.2	32°08.2 -18°26.4	+31.4 14.7 +2.5 53.9
	Tu 4	250°03.1 -17°33.4	264°34.9 -17°29.2	279°06.7 -17°25.0	293°38.6 -17°20.7	308°10.4 -17°16.3	322°42.3 -17°11.8	337°14.2 -17°07.2	351°46.2 -17°02.6	6°18.1 -16°57.9	20°50.1 -16°53.1	35°22.1 -16°48.2	+31.9 14.7 +4.5 54.0
	We 5	253°24.3 -15°26.4	267°56.6 -15°20.4	282°28.9 -15°14.3	297°01.3 -15°08.1	311°33.6 -15°01.8	326°06.0 -14°55.5	340°38.4 -14°49.2	355°10.8 -14°42.7	9°43.2 -14°36.2	24°15.7 -14°29.7	38°48.1 -14°23.0	+32.4 14.8 +6.3 54.3
	Th 6	256°56.7 -12°35.7	271°29.3 -12°28.1	286°02.0 -12°20.4	300°34.7 -12°12.6	315°07.4 -12°04.8	329°40.1 -11°56.9	344°12.8 -11°49.0	358°45.5 -11°41.0	13°18.3 -11°32.9	27°51.0 -11°24.8	42°23.7 -11°16.7	+32.7 14.9 +7.9 54.7
	Fr 7	260°35.3 -9°07.8	275°08.1 -8°58.9	289°40.9 -8°49.8	304°13.6 -8°40.7	318°46.4 -8°31.6	333°19.1 -8°22.4	347°51.9 -8°13.2	2°24.7 -8°03.9	16°57.4 -7°54.6	31°30.1 -7°45.2	46°02.9 -7°35.8	+32.8 15.1 +9.2 55.3
	Sa 8	264°12.3 -5°09.9	278°44.8 -4°59.8	293°17.3 -4°49.8	307°49.8 -4°39.6	322°22.2 -4°29.5	336°54.6 -4°19.3	351°27.0 -4°09.1	5°59.4 -3°58.9	20°31.7 -3°48.6	35°04.1 -3°38.4	49°36.4 -3°28.0	+32.4 15.3 +10.2 56.0
	Su 9	267°37.1 -0°50.0	282°08.9 -0°39.3	296°40.6 -0°28.6	311°12.3 -0°17.9	325°43.9 -0°07.1	340°15.5 0°03.7	354°47.1 0°14.5	9°18.6 0°25.3	23°50.1 0°36.1	38°21.5 0°46.9	52°52.9 0°57.8	+31.6 15.5 +8.6 57.0
	Mo 10	270°37.3 3°41.2	285°07.9 3°52.1	299°38.3 4°03.1	314°08.7 4°14.0	328°39.0 4°24.9	343°09.3 4°35.7	357°39.5 4°46.6	12°09.6 4°57.5	26°39.7 5°08.4	41°09.7 5°19.2	55°39.7 5°30.1	+30.2 15.8 +10.9 57.9
O	Tu 11	273°00.2 8°10.5	287°29.0 8°20.9	301°57.7 8°31.4	316°26.3 8°41.8	330°54.8 8°52.2	345°23.3 9°02.6	359°51.6 9°12.9	14°19.9 9°23.2	28°48.1 9°33.4	43°16.3 9°43.6	57°44.3 9°53.8	+28.4 16.1 +10.3 59.0
	We 12	274°34.7 12°20.0	289°01.4 12°29.3	303°28.4 12°38.5	317°54.5 12°47.7	332°20.9 12°56.7	346°47.2 13°05.7	1°13.4 13°14.7	15°39.6 13°23.5	30°05.6 13°32.3	44°31.6 13°41.0	58°57.5 13°49.6	+26.3 16.3 +9.0 59.9
	Th 13	275°15.5 15°48.6	289°40.4 15°55.7	304°04.4 16°02.8	318°28.8 16°09.7	332°53.1 16°16.6	347°17.3 16°23.3	1°41.5 16°30.5	16°05.5 16°36.5	30°29.5 16°42.9	44°53.5 16°49.2	59°17.3 16°55.4	+24.2 16.5 +6.7 60.6
	Fr 14	275°07.1 18°13.5	289°29.9 18°17.7	303°52.8 18°21.7	318°15.5 18°25.6	332°38.2 18°29.4	347°00.9 18°33.0	1°23.5 18°36.5	15°46.1 18°39.9	30°48.9 18°43.1	44°31.1 18°46.2	58°53.6 18°49.2	+22.6 16.7 +3.6 61.1
	Sa 15	274°27.5 19°16.2	288°49.6 19°16.8	303°11.8 19°17.3	317°33.9 19°17.7	331°56.0 19°17.9	346°18.2 19°17.9	0°40.3 19°17.8	15°02.5 19°17.6	29°24.6 19°17.2	43°46.8 19°16.6	58°09.0 19°16.0	+22.1 16.7 -0.0 61.2
	Tu 16	273°44.6 18°48.3	288°07.3 18°45.3	302°30.0 18°42.2	316°52.7 18°38.9	331°15.5 18°35.6	345°38.4 18°32.0	0°01.2 18°28.4	14°24.2 18°24.6	28°47.2 18°20.6	43°10.2 18°16.6	57°33.3 18°12.4	+22.9 16.6 -3.6 61.0
	Mo 17	273°27.6 16°54.5	287°51.8 16°48.3	302°16.3 16°42.1	316°40.4 16°35.7	331°42.0 16°29.2	345°29.3 16°22.6	359°53.9 16°15.9	14°18.6 16°09.1	28°43.3 16°02.2	43°08.1 15°55.2	57°33.0 15°48.1	+24.5 16.5 -6.6 60.5
	Tu 18	273°56.5 13°50.4	288°22.7 13°41.8	302°49.1 13°33.2	317°15.5 13°24.5	331°42.0 13°15.8	346°08.6 13°06.9	0°35.3 12°58.0	15°02.0 12°49.1	29°28.9 12°40.0	43°55.8 12°30.9	58°22.8 12°21.7	+26.6 16.8 -8.9 59.7
	We 19	275°18.0 9°57.0	289°46.3 9°46.9	304°14.7 9°36.8	318°43.2 9°26.7	333°11.8 9°16.5	347°40.4 9°06.3	2°09.1 8°56.0	16°37.9 8°45.7	31°06.8 8°35.4	45°35.7 8°25.0	60°04.7 8°14.6	+28.7 16.0 -10.2 58.8
	Th 20	289°46.3 9°46.9	304°14.7 9°36.8	318°43.2 9°26.7	333°11.8 9°16.5	347°40.4 9°06.3	3°09.1 8°56.0	16°37.9 8°45.7	31°06.8 8°35.4	45°35.7 8°25.0	60°04.7 8°14.6	74°33.8 8°04.2	+28.7 16.0 -10.3 58.8
Q	Fr 21	291°58.0 5°24.5	306°28.2 5°13.6	320°58.4 5°02.8	335°28.6 5°52.0	349°58.9 4°41.1	3°29.3 4°30.3	18°59.7 4°19.4	33°30.2 4°08.6	48°00.7 3°57.7	62°31.3 3°46.8	77°01.9 3°35.9	+30.4 15.8 -10.9 57.9
	Sa 22	294°47.1 0°52.4	309°18.5 0°41.5	323°49.8 0°30.6	338°21.3 0°19.8	352°52.7 0°08.9	7°24.3 -0°01.9	21°55.8 -0°12.7	36°27.4 -0°23.5	50°59.0 -0°34.3	65°30.0 -0°45.1	80°02.3 -0°55.8	+31.5 15.6 -10.8 57.0
	Su 23	298°00.6 -3°34.8	312°32.7 -3°45.2	327°04.7 -3°55.6	341°36.8 -4°05.9	356°09.0 -4°16.3	10°41.1 -4°26.6	25°13.3 -4°36.8	39°45.4 -4°47.1	54°17.6 -4°57.3	68°49.8 -5°07.4	83°22.0 -5°17.6	+32.1 15.3 -10.3 56.3
	Mo 24	301°26.1 -7°45.2	315°58.4 -7°54.7	330°30.7 -8°04.2	345°03.0 -8°13.6	359°35.3 -8°23.0	14°07.7 -8°32.4	28°40.0 -8°41.7	43°12.3 -8°50.9	57°44.6 -9°00.1	72°16.9 -9°09.2	86°49.2 -9°18.4	+32.3 15.2 -9.3 55.6
	Tu 25	304°53.1 -11°28.8	319°25.3 -11°37.1	333°57.5 -11°45.3	348°29.7 -11°53.4	3°01.8 -12°01.5	17°34.0 -12°09.5	32°06.1 -12°17.5	46°38.3 -12°25.4	61°10.4 -12°33.2	75°42.5 -12°41.0	90°14.6 -12°48.7	+32.1 15.0 -8.0 55.0
	We 26	308°14.2 -14°36.8	322°46.1 -14°43.5	337°17.9 -14°50.1	351°49.8 -14°56.6	6°21.6 -15°03.5	20°53.4 -15°09.5	35°25.1 -15°15.8	49°56.9 -15°22.0	64°28.6 -15°28.2	79°00.4 -15°34.3	93°32.1 -15°40.3	+31.8 14.9 -6.3 54.6
	Th 27	311°25.7 -17°01.5	325°57.2 -17°06.3	340°28.6 -17°11.0	355°00.1 -17°15.7	9°31.5 -17°20.2	24°02.9 -17°24.7	38°34.2 -17°29.1	53°05.6 -17°33.4	67°36.9 -17°37.6	82°08.3 -17°41.7	96°39.9 -17°45.8	+31.4 14.8 -4.4 54.3
	Fr 28	314°28.0 -18°36.6	328°59.1 -18°39.3	343°30.2 -18°41.9	358°01.4 -18°44.4	12°42.5 -18°42.5	27°03.6 -18°49.2	41°34.7 -18°51.5	56°05.5 -18°53.7	70°36.9 -18°55.8	85°08.0 -18°57.8	99°39.0 -18°59.7	+31.1 14.7 -2.3 54.1
	Sa 29	317°24.9 -19°17.7	331°55.9 -19°18.2	346°27.0 -19°18.6	0°58.0 -19°19.0	15°29.1 -19°19.2	30°00.2 -19°19.3	44°31.2 -19°19.4	59°02.3 -19°19.2	73°33.4 -19°19.2	88°04.4 -19°19.0	102°35.5 -19°18.7	+31.1 14.7 -0.1 53.9
	Su 30	320°22.8 -19°03.4	334°54.0 -19°01.7	349°25.2 -18°59.8	3°56.5 -18°58.0	18°27.8 -18°57.8	32°59.1 -18°53.9	47°30.4 -18°51.7	62°01.7 -18°49.5	76°33.0 -18°47.2	91°04.4 -18°44.8	105°35.7 -18°42.7	+31.3 14.7 +2.1 53.9
	Mo 31	323°28.2 -17°54.8	337°59.9 -17°51.0	352°31.6 -17°47.0	7°03.3 -17°43.1	21°35.0 -17°39.0	36°06.7 -17°34.9	50°38.5 -17°30.6	65°10.2 -17°26.3	79°42.0 -17°22.0	94°13.9 -17°17.5	108°45.7 -17°13.0	+31.7 14.7 +4.2 53.9

Row 1: GHA, Δ'/h = GHA change - 14°, SH = semi-diameter

Row 2: Dec (- = South), Δ'/h = dec. change, SH = horizontal parallax

Column = (UTC hour - day) mod 24

FQ: 8 01h05 — FM: 15 00h33 — LQ: 21 16h28 — NM: 29 14h30