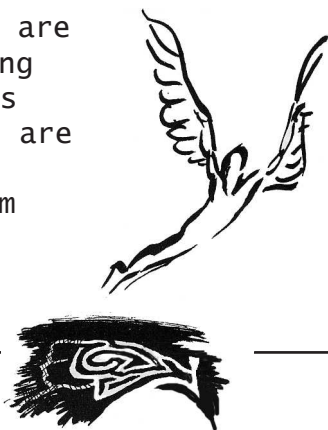


The left column gives Julian Dates (number of days from 4713 B.C. Jan. 1 noon), useful for finding time spans between events by subtraction. The first 3 digits of the Julian date (245) are omitted.

Hours and minutes, where given, are in Universal Time. (Sometimes the hour appears as "24" or the minute as "60," because the instant was shortly before the end of the UT day.)

Occasions such as "Moon 1.25° NNE of Venus" are **appulses**: closest apparent approaches. They are slightly different from conjunctions, when one passes north of the other as measured in right ascension or in ecliptic longitude. A quasi-conjunction is an appulse without a conjunction, and typically happens when a planet is near its stationary moment.

Occasions when three bodies are within a circle of small size are "**trios.**" Like appulses, they are most interesting when the bodies are bright and are not at small elongation from the sun.



For **meteor showers**: ZHR (zenithal hourly rate) is an estimate of the number to be seen under ideal conditions at the peak time if the radiant were overhead; actual rates may be very different. Peak times (predicted from where the center of the stream seems to cross Earth's orbit) are uncertain; best to start watching the night before. Meteor are usually most abundant in the morning hours.

Tell me of errors you notice. It's hard to check the accuracy of every detail, but errors are more easily corrected here than in the former printed *Astronomical Calendars!*

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This calendar may be subject to improvement. Come back to it!

Explanation of terms can be found in our glossary book *Albedo to Zodiac*. There is more about each topic in *The Astronomical Companion*. And events in this list can be traced in the large *Zodiac Wavy Charts* for the year. For all these, see

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2017

7755.875	Jan	2	Mon	9	Moon 1.87° N of Venus; 47° from the Sun in the evening sky
7756.261	Jan	2	Mon	18	Moon at descending node; longitude 334.5°
7756.5	Jan	3	Tue		Quadrantid meteors ; ZHR 110; peak Jan 3 9h; 2 days before First Quarter
7756.688	Jan	3	Tue	5	Moon 0.46° NNE of Neptune; 57° from the Sun in the evening sky
7756.700	Jan	3	Tue	5	Moon, Mars, and Neptune within circle of diameter 1.40°; about 57° from the Sun in the evening sky; magnitudes -9, 1, 8

7756.792	Jan	3	Tue	7	Moon 0.29° NNE of Mars; 58° from the Sun in the evening sky
7757.807	Jan	4	wed	7:22	Latest sunrise, at latitude 40° north
7758.084	Jan	4	wed	14	Earth at perihelion; 0.983 AU from the Sun
7758.323	Jan	4	wed	20	Mercury at northernmost latitude from the ecliptic plane, 7.0°
7759.324	Jan	5	Thu	19:47	First Quarter Moon
7759.688	Jan	6	Fri	5	Moon 3.1° SE of Uranus; 95° from the Sun in the evening sky
7760.546	Jan	7	SAT	1	Pluto at conjunction with the Sun; 34.230 AU from Earth; latitude 1.04°
7761.901	Jan	8	SUN	10	Mercury stationary in longitude; resumes direct motion
7761.907	Jan	8	SUN	10	Mercury stationary in right ascension; resumes direct motion
7762.458	Jan	8	SUN	23	Moon 9.2° SE of the Pleiades; 131° from the Sun in the evening sky
7762.896	Jan	9	Mon	10	Mercury 6.8° E of Saturn; 21° and 27° from the Sun in the morning sky; magnitudes 0.3 and 0.6; quasi-conjunction
7763.125	Jan	9	Mon	15	Moon 0.49° NE of Aldebaran; 141° and 140° from the Sun in the evening sky
7763.747	Jan	10	Tue	5:56	Moon at perigee; distance 56.95 Earth-radii
7764.176	Jan	10	Tue	16	Uranus at east quadrature, 90° from the Sun
7764.646	Jan	11	wed	4	Moon 5.5° S of M35 cluster; 161° from the Sun in the evening sky
7765.692	Jan	12	Thu	5	Jupiter at west quadrature, 90° from the Sun
7765.982	Jan	12	Thu	11:34	Full Moon
7766.048	Jan	12	Thu	13	Venus at easternmost elongation; 47.2° from Sun in evening sky
7766.396	Jan	12	Thu	22	Venus 0.36° NNW of Neptune; 47° from the Sun in the evening sky; magnitudes -4.4 and 7.9
7766.563	Jan	13	Fri	2	Mars and Uranus at heliocentric conjunction; longitude 23.5°
7767.083	Jan	13	Fri	14	Moon 3.6° S of Beehive Cluster; 165° and 166° from the Sun in the morning sky
7768.054	Jan	14	SAT	13	Venus dichotomy (D-shape)
7768.688	Jan	15	SUN	5	Moon 0.83° S of Regulus; 145° from the Sun in the morning sky
7768.949	Jan	15	SUN	11	Moon at ascending node; longitude 153.9°
7771.239	Jan	17	Tue	18	Venus at ascending node through the ecliptic plane
7772.813	Jan	19	Thu	8	Moon 2.56° NNE of Jupiter; 97° from the Sun in the morning sky
7772.898	Jan	19	Thu	10	Mercury at westernmost elongation; 24.1° from Sun in morning sky
7772.917	Jan	19	Thu	10	Moon 6.0° NNE of Spica; 96° and 95° from the Sun in the morning sky
7773.082	Jan	19	Thu	14	Sun enters Capricornus, at longitude 299.69° on the ecliptic

7773.390	Jan 19	Thu 21	Sun enters the astrological sign Aquarius, i.e. its longitude is 300°
7773.426	Jan 19	Thu 22:13	Last Quarter Moon
7775.510	Jan 22	SUN 0	Moon at apogee; distance 63.49 Earth-radii
7776.813	Jan 23	Mon 8	Moon 9.7° N of Antares; 53° and 54° from the Sun in the morning sky
7777.979	Jan 24	Tue 12	Moon 3.6° N of Saturn; 41° from the Sun in the morning sky
7779.542	Jan 26	Thu 1	Moon 3.7° N of Mercury; 23° from the Sun in the morning sky
7781.011	Jan 27	Fri 12	Mercury at southernmost declination, -22.51°
7781.505	Jan 28	SAT 0:07	New Moon ; beginning of lunation 1164
7781.729	Jan 28	SAT 6	Mercury at descending node through the ecliptic plane
7782.993	Jan 29	SUN 12	Mars crosses equator northward
7783.432	Jan 29	SUN 22	Moon at descending node; longitude 333.4°
7784.000	Jan 30	Mon 12	Moon 0.41° NE of Neptune; 30° from the Sun in the evening sky
7785.229	Jan 31	Tue 18	Moon 3.9° SE of Venus; 46° from the Sun in the evening sky
7785.400	Jan 31	Tue 22	Moon, Venus, and Mars within circle of diameter 5.45° ; about 48° from the Sun in the evening sky; magnitudes -8, -5, 1
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7785.625	Feb 1	Wed 3	Moon 2.23° SE of Mars; 51° and 50° from the Sun in the evening sky
7786.063	Feb 1	Wed 14	Jupiter 3.6° N of Spica; 110° and 109° from the Sun in the morning sky; magnitudes -2.2 and 1.0
7786.5	Feb 2	Thu	Ground Hog Day
7786.938	Feb 2	Thu 11	Moon 3.3° SE of Uranus; 67° from the Sun in the evening sky
7787.000	Feb 2	Thu 12	Venus 5.4° W of Mars; 45° and 50° from the Sun in the evening sky; magnitudes -4.6 and 1.1; quasi-conjunction
7788.680	Feb 4	SAT 4:19	First Quarter Moon
7789.729	Feb 5	SUN 6	Moon 9.3° SE of the Pleiades; 104° from the Sun in the evening sky
7790.417	Feb 5	SUN 22	Moon 0.34° NE of Aldebaran; 113° from the Sun in the evening sky
7790.751	Feb 6	Mon 6	Jupiter stationary in longitude; starts retrograde motion
7791.094	Feb 6	Mon 14:15	Moon at perigee; distance 57.82 Earth-radii
7791.270	Feb 6	Mon 18	Jupiter stationary in right ascension; starts retrograde motion
7791.5	Feb 7	Tue	Alpha Centaurid meteors; ZHR 6; peak Feb 7 19h; 3 days before Full
7791.979	Feb 7	Tue 12	Moon 5.5° S of M35 cluster; 134° and 133° from the Sun in the evening sky
7792.095	Feb 7	Tue 14	Mercury at aphelion, 0.4667 AU from the Sun
7794.479	Feb 9	Thu 24	Moon 3.6° S of Beehive Cluster; 166° from the Sun in the evening sky

7795.523	Feb 11	SAT	0:33	Full Moon. Penumbral eclipse of the Moon
7795.664	Feb 11	SAT	4	The equation of time is at a minimum of -14.24 minutes.
7796.104	Feb 11	SAT	15	Moon 0.79° S of Regulus; 173° from the Sun in the midnight sky
7796.326	Feb 11	SAT	20	Moon at ascending node; longitude 153.3°
7798.5	Feb 14	Tue		St. Valentine's Day
7800.208	Feb 15	Wed	17	Moon 2.57° NNE of Jupiter; 124° from the Sun in the morning sky
7800.292	Feb 15	Wed	19	Moon 6.2° NNE of Spica; 123° from the Sun in the morning sky
7800.858	Feb 16	Thu	9	Sun enters Aquarius, at longitude 327.86° on the ecliptic
7801.687	Feb 17	Fri	4	Jupiter at aphelion, 5.4565 AU from the Sun
7801.783	Feb 17	Fri	7	Venus shows greatest illuminated extent, 53.2 square seconds
7802.979	Feb 18	SAT	11	Sun enters the astrological sign Pisces, i.e. its longitude is 330°
7803.155	Feb 18	SAT	16	Venus brightest; magnitude -4.63°
7803.315	Feb 18	SAT	19:34	Last Quarter Moon
7803.386	Feb 18	SAT	21	Moon at apogee; distance 63.40 Earth-radii
7804.167	Feb 19	SUN	16	Moon 9.8° NNE of Antares; 81° from the Sun in the morning sky
7805.191	Feb 20	Mon	17	Venus at perihelion, 0.7184 AU from the Sun
7805.521	Feb 21	Tue	1	Moon 3.6° N of Saturn; 66° from the Sun in the morning sky
7806.421	Feb 21	Tue	22	Middle of eclipse season: Sun is at same longitude as Moon's descending node, 333.5°
7810.563	Feb 26	SUN	2	Moon 2.41° N of Mercury; 7° and 8° from the Sun in the morning sky
7810.771	Feb 26	SUN	6	Moon at descending node; longitude 333.4°
7811.124	Feb 26	SUN	14:59	New Moon ; beginning of lunation 1165. Annular eclipse of the Sun
7811.396	Feb 26	SUN	22	Moon 0.31° NE of Neptune; 4° and 3° from the Sun in the evening sky
7811.521	Feb 27	Mon	1	Mars 0.57° NNW of Uranus; 43° from the Sun in the evening sky; magnitudes 1.3 and 5.9
7811.711	Feb 27	Mon	5	Mars at ascending node through the ecliptic plane
7812.357	Feb 27	Mon	21	Mercury at southernmost latitude from the ecliptic plane, -7.0°
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7813.5	Mar 1	Wed		Ash Wednesday
7813.583	Mar 1	Wed	2	Moon 9.7° SE of Venus; 32° and 33° from the Sun in the evening sky
7814.271	Mar 1	Wed	19	Moon 3.4° SE of Uranus; 41° from the Sun in the evening sky
7814.358	Mar 1	Wed	21	Moon, Mars, and Uranus within circle of diameter 4.15°; about 42° from the Sun in the evening sky; magnitudes -8, 1, 6

7814.417	Mar	1	Wed	22	Moon 4.1° SE of Mars; 43° from the Sun in the evening sky
7814.614	Mar	2	Thu	3	Neptune at conjunction with the Sun; 30.941 AU from Earth; latitude -0.88°
7815.094	Mar	2	Thu	14	Venus stationary in right ascension; starts retrograde motion
7815.812	Mar	3	Fri	7:29	Moon at perigee; distance 57.86 Earth-radii
7816.881	Mar	4	SAT	9	Venus stationary in longitude; starts retrograde motion
7816.958	Mar	4	SAT	11	Moon 9.3° SE of the Pleiades; 77° and 76° from the Sun in the evening sky
7817.000	Mar	4	SAT	12	Mercury 1.03° SE of Neptune; 3° and 2° from the Sun in the morning sky; magnitudes -1.5 and 8.0
7817.646	Mar	5	SUN	4	Moon 0.37° NE of Aldebaran; 86° and 85° from the Sun in the evening sky
7817.981	Mar	5	SUN	11:33	First Quarter Moon
7819.229	Mar	6	Mon	18	Moon 5.5° S of M35 cluster; 106° from the Sun in the evening sky
7819.511	Mar	7	Tue	0	Mercury at superior conjunction with the Sun; 1.363 AU from Earth; latitude -6.19°
7821.792	Mar	9	Thu	7	Moon 3.6° S of Beehive Cluster; 139° from the Sun in the evening sky
7823.458	Mar	10	Fri	23	Moon 0.84° S of Regulus; 160° from the Sun in the evening sky
7823.680	Mar	11	SAT	4	Moon at ascending node; longitude 153.4°
7824.445	Mar	11	SAT	23	Sun enters Pisces, at longitude 351.55° on the ecliptic
7824.5	Mar	12	SUN		Clocks forward 1 hour (America)
7825.121	Mar	12	SUN	14:54	Full Moon
7826.5	Mar	14	Tue		Gamma Normid meteors; ZHR 6; peak Mar 14 10h; 2 days after Full
7826.743	Mar	14	Tue	6	Venus at northernmost latitude from the ecliptic plane, 3.4°
7827.417	Mar	14	Tue	22	Moon 2.34° NNE of Jupiter; 153° from the Sun in the morning sky
7827.646	Mar	15	Wed	4	Moon 6.1° NNE of Spica; 150° and 151° from the Sun in the morning sky
7829.5	Mar	17	Fri		St. Patrick's Day
7830.403	Mar	17	Fri	22	Saturn at west quadrature, 90° from the Sun
7831.222	Mar	18	SAT	17	Moon at apogee; distance 63.44 Earth-radii
7831.271	Mar	18	SAT	19	Mercury 8.5° SE of Venus; 11° and 14° from the Sun in the evening sky; magnitudes -1.3 and -4.2
7831.413	Mar	18	SAT	22	Mercury at ascending node through the ecliptic plane
7831.5	Mar	19	SUN	0	Moon 9.8° N of Antares; 108° and 109° from the Sun in the morning sky
7832.935	Mar	20	Mon	10:26	March or spring or vernal equinox
7832.935	Mar	20	Mon	10:26	Sun enters the astrological sign Aries, i.e. its longitude is 0°
7832.979	Mar	20	Mon	12	Moon 3.4° N of Saturn; 92° from the Sun in the morning sky

7833.167	Mar	20	Mon	16:00	Last Quarter Moon
7836.080	Mar	23	Thu	14	Mercury at perihelion, 0.3075 AU from the Sun
7837.928	Mar	25	SAT	10	Venus at inferior conjunction with the Sun; 0.281 AU from Earth; latitude 3.23°
7838.155	Mar	25	SAT	16	Moon at descending node; longitude 333.1°
7838.5	Mar	26	SUN		Clocks forward 1 hour (Europe)
7838.875	Mar	26	SUN	9	Moon 0.34° ENE of Neptune; 23° from the Sun in the morning sky
7838.958	Mar	26	SUN	11	Mercury 2.10° NNW of Uranus; 17° from the Sun in the evening sky; magnitudes -0.8 and 5.9
7840.624	Mar	28	Tue	2:58	New Moon ; beginning of lunation 1166
7841.729	Mar	29	Wed	6	Moon 3.5° SE of Uranus; 15° from the Sun in the evening sky
7841.979	Mar	29	Wed	12	Moon 6.3° SE of Mercury; 19° from the Sun in the evening sky
7843.024	Mar	30	Thu	12:34	Moon at perigee; distance 57.05 Earth-radii
7843.167	Mar	30	Thu	16	Moon 5.3° SE of Mars; 35° from the Sun in the evening sky
7844.229	Mar	31	Fri	18	Moon 9.2° SE of the Pleiades; 50° and 49° from the Sun in the evening sky
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7844.5	Apr	1	SAT		All Fools' Day
7844.896	Apr	1	SAT	10	Moon 0.40° NNE of Aldebaran; 59° and 58° from the Sun in the evening sky
7844.924	Apr	1	SAT	10	Mercury at easternmost elongation ; 19.0° from Sun in evening sky
7846.293	Apr	2	SUN	19	Mercury at northernmost latitude from the ecliptic plane, 7.0°
7846.458	Apr	2	SUN	23	Moon 5.4° S of M35 cluster; 79° from the Sun in the evening sky
7847.278	Apr	3	Mon	18:40	First Quarter Moon
7848.021	Apr	4	Tue	13	Moon 9.9° S of Pollux; 100° and 98° from the Sun in the evening sky
7849.021	Apr	5	Wed	13	Moon 3.5° S of Beehive Cluster; 112° from the Sun in the evening sky
7849.665	Apr	6	Thu	4	Saturn stationary in longitude; starts retrograde motion
7849.675	Apr	6	Thu	4	Saturn stationary in right ascension; starts retrograde motion
7850.708	Apr	7	Fri	5	Moon 0.73° S of Regulus; 133° and 132° from the Sun in the evening sky
7850.886	Apr	7	Fri	9	Moon at ascending node; longitude 152.7°
7851.394	Apr	7	Fri	21	Jupiter at opposition ; magnitude -2.5
7852.5	Apr	9	SUN		Palm Sunday.
7853.466	Apr	9	SUN	23	Mercury stationary in longitude; starts retrograde motion
7853.552	Apr	10	Mon	1	Mercury stationary in right ascension; starts retrograde motion
7854.458	Apr	10	Mon	23	Moon 2.07° NNE of Jupiter; 175° and 176° from the Sun in the midnight sky

7854.756	Apr 11	Tue	6:08	Full Moon
7854.958	Apr 11	Tue	11	Moon 6.1° NNE of Spica; 175° and 177° from the Sun in the midnight sky
7856.486	Apr 12	Wed	24	Venus stationary in right ascension; resumes direct motion
7857.5	Apr 14	Fri		Good Friday
7857.730	Apr 14	Fri	6	Uranus at conjunction with the Sun; 20.933 AU from Earth; latitude -0.59°
7858.813	Apr 15	SAT	8	Moon 9.6° NNE of Antares; 135° from the Sun in the morning sky
7858.913	Apr 15	SAT	10	The equation of time is 0.
7858.914	Apr 15	SAT	10	Moon at apogee; distance 63.57 Earth-radii
7858.930	Apr 15	SAT	10	Venus stationary in longitude; resumes direct motion
7859.5	Apr 16	SUN		Easter
7860.292	Apr 16	SUN	19	Moon 3.2° N of Saturn; 119° from the Sun in the morning sky
7862.430	Apr 18	Tue	22	Sun enters Aries, at longitude 29.06° on the ecliptic
7862.916	Apr 19	Wed	9:59	Last Quarter Moon
7863.392	Apr 19	Wed	21	Sun enters the astrological sign Taurus, i.e. its longitude is 30°
7863.530	Apr 20	Thu	1	Pluto stationary in longitude; starts retrograde motion
7863.742	Apr 20	Thu	6	Mercury at inferior conjunction with the Sun; 0.575 AU from Earth; latitude 2.20°
7863.939	Apr 20	Thu	11	Pluto stationary in right ascension; starts retrograde motion
7865.333	Apr 21	Fri	20	Mars 3.5° SE of the Pleiades; 28° and 29° from the Sun in the evening sky; magnitudes 1.6 and 2.9
7865.439	Apr 21	Fri	23	Moon at descending node; longitude 331.5°
7865.5	Apr 22	SAT		Lyrid meteors ; ZHR 18; peak Apr 22 6h; 4 days before New
7866.354	Apr 22	SAT	21	Moon 0.36° ESE of Neptune; 49° from the Sun in the morning sky
7866.5	Apr 23	SUN		Pi Puppis meteors; ZHR 10; peak Apr 23 12h; 3 days before New
7867.396	Apr 23	SUN	22	Moon 4.9° SE of Venus; 36° from the Sun in the morning sky
7869.271	Apr 25	Tue	19	Moon 3.5° SE of Uranus; 11° from the Sun in the morning sky
7869.342	Apr 25	Tue	20	Moon, Mercury, and Uranus within circle of diameter 4.26° ; about 10° from the Sun in the morning sky; magnitudes -5, 4, 6
7869.375	Apr 25	Tue	21	Moon 4.3° SE of Mercury; 10° and 9° from the Sun in the morning sky
7869.699	Apr 26	Wed	5	Mercury at descending node through the ecliptic plane
7870.012	Apr 26	Wed	12:17	New Moon ; beginning of lunation 1167
7870.278	Apr 26	Wed	19	Venus brightest; magnitude -4.53°
7871.177	Apr 27	Thu	16:14	Moon at perigee; distance 56.34 Earth-radii
7871.604	Apr 28	Fri	3	Moon 9.1° SE of the Pleiades; 23° from the Sun in the evening sky

7871.917	Apr 28	Fri 10	Moon 5.7° SE of Mars; 27° from the Sun in the evening sky
7872.021	Apr 28	Fri 13	Mercury 0.09° SE of Uranus; 13° from the Sun in the morning sky; magnitudes 3.0 and 5.9; quasi-conjunction
7872.250	Apr 28	Fri 18	Moon 0.55° NNE of Aldebaran; 32° from the Sun in the evening sky
7873.667	Apr 30	SUN 4	Venus shows greatest illuminated extent, 49.2 square seconds
7873.771	Apr 30	SUN 7	Moon 5.2° S of M35 cluster; 53° and 52° from the Sun in the evening sky
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7874.782	May 1	Mon 7	Mars and Saturn at heliocentric opposition; longitudes 83.1° and 263.1°
7875.271	May 1	Mon 19	Moon 9.7° S of Pollux; 73° and 72° from the Sun in the evening sky
7876.095	May 2	Tue 14	Mercury stationary in right ascension; resumes direct motion
7876.271	May 2	Tue 19	Moon 3.3° S of Beehive Cluster; 86° and 85° from the Sun in the evening sky
7876.616	May 3	Wed 2:47	First Quarter Moon
7877.187	May 3	Wed 16	Mercury stationary in longitude; resumes direct motion
7877.938	May 4	Thu 11	Moon 0.57° SE of Regulus; 106° from the Sun in the evening sky
7877.947	May 4	Thu 11	Moon at ascending node; longitude 150.5°
7878.466	May 4	Thu 23	Spring equinox on Mars
7878.466	May 4	Thu 23	Spring equinox on Mars
7878.5	May 5	Fri	Eta Aquarid meteors ; ZHR 50; peak May 5 20h; 3 days after First Quarter
7879.417	May 5	Fri 22	Mars 6.2° N of Aldebaran; 24° and 25° from the Sun in the evening sky; magnitudes 1.6 and 0.9
7880.065	May 6	SAT 14	Mercury at aphelion, 0.4667 AU from the Sun
7881.464	May 7	SUN 23	Spring equinox on Mars
7881.464	May 7	SUN 23	Spring equinox on Mars
7881.479	May 7	SUN 24	Moon 2.02° NNE of Jupiter; 147° from the Sun in the evening sky
7881.5	May 8	Mon	Eta Lyrid meteors; ZHR 3; peak May 8 10h; 2 days before Full
7882.208	May 8	Mon 17	Moon 6.1° NNE of Spica; 155° and 156° from the Sun in the evening sky
7882.796	May 9	Tue 7	Venus at descending node through the ecliptic plane
7884.405	May 10	Wed 21:43	Full Moon
7886.083	May 12	Fri 14	Moon 9.5° N of Antares; 161° from the Sun in the morning sky
7886.343	May 12	Fri 20	Moon at apogee; distance 63.69 Earth-radii
7887.399	May 13	SAT 22	The equation of time is at a maximum of 3.65 minutes.
7887.479	May 13	SAT 24	Moon 3.1° N of Saturn; 146° and 147° from the Sun in the morning sky

7887.546	May 14	SUN	1	Sun enters Taurus, at longitude 53.44° on the ecliptic
7891.469	May 17	wed	23	Mercury at westernmost elongation ; 25.8° from Sun in morning sky
7892.524	May 19	Fri	0:34	Last Quarter Moon
7892.563	May 19	Fri	2	Moon at descending node; longitude 328.7°
7893.771	May 20	SAT	7	Moon 0.59° ESE of Neptune; 75° from the Sun in the morning sky
7894.354	May 20	SAT	20	Sun enters the astrological sign Gemini, i.e. its longitude is 60°
7896.104	May 22	Mon	15	Moon 2.27° SE of Venus; 45° from the Sun in the morning sky
7896.792	May 23	Tue	7	Moon 3.7° SE of Uranus; 36° from the Sun in the morning sky
7897.604	May 24	wed	3	Moon 1.56° SE of Mercury; 25° from the Sun in the morning sky
7899.042	May 25	Thu	13	Moon 9.1° SE of the Pleiades; 6° from the Sun in the morning sky
7899.323	May 25	Thu	19:45	New Moon ; beginning of lunation 1168
7899.556	May 26	Fri	1:20	Moon at perigee; distance 56.01 Earth-radii; nearest in year
7899.556	May 26	Fri	1:20	Perigee only 5.6 hours after New Moon
7899.688	May 26	Fri	5	Moon 0.66° NNE of Aldebaran; 7° from the Sun in the evening sky
7900.326	May 26	Fri	20	Mercury at southernmost latitude from the ecliptic plane, -7.0°
7900.5	May 27	SAT		1st day of Ramadan (1438 A.H.)
7900.625	May 27	SAT	3	Moon 5.3° S of Mars; 19° and 18° from the Sun in the evening sky
7901.167	May 27	SAT	16	Moon 5.1° S of M35 cluster; 27° and 26° from the Sun in the evening sky
7902.625	May 29	Mon	3	Moon 9.5° S of Pollux; 47° and 46° from the Sun in the evening sky
7903.583	May 30	Tue	2	Moon 3.0° S of Beehive Cluster; 59° from the Sun in the evening sky
7904.998	May 31	wed	12	Moon at ascending node; longitude 147.6°
7905.208	May 31	wed	17	Moon 0.40° SE of Regulus; 80° from the Sun in the evening sky
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7906.029	Jun 1	Thu	12:42	First Quarter Moon
7907.729	Jun 3	SAT	6	Venus 1.69° SE of Uranus; 46° from the Sun in the morning sky; magnitudes -4.3 and 5.9
7908.013	Jun 3	SAT	12	Venus at westernmost elongation ; 45.9° from Sun in morning sky
7908.5	Jun 4	SUN		Whit Sunday
7908.583	Jun 4	SUN	2	Moon 2.20° NNE of Jupiter; 120° from the Sun in the evening sky
7908.752	Jun 4	SUN	6	Venus dichotomy (D-shape)
7909.458	Jun 4	SUN	23	Moon 6.3° NNE of Spica; 129° and 130° from the Sun in the evening sky

7910.778	Jun	6	Tue	7	Mars at northernmost declination, 24.33°
7911.5	Jun	7	Wed		Daytime Arietid meteors; ZHR 30; peak Jun 7 4h; 2 days before Full
7911.833	Jun	7	Wed	8	Mercury 5.5° SE of the Pleiades; 16° and 17° from the Sun in the morning sky; magnitudes -0.8 and 2.9
7912.542	Jun	8	Thu	1	Mars 0.01° NE of M35 cluster; 15° from the Sun in the evening sky; magnitudes 1.7 and 5.3; quasi-conjunction
7913.333	Jun	8	Thu	20	Moon 9.5° N of Antares; 171° from the Sun in the midnight sky
7913.424	Jun	8	Thu	22	Moon at apogee; distance 63.71 Earth-radii
7914.049	Jun	9	Fri	13:10	Full Moon
7914.064	Jun	9	Fri	14	Jupiter stationary in longitude; resumes direct motion
7914.583	Jun	10	SAT	2	Moon 3.1° N of Saturn; 173° and 174° from the Sun in the midnight sky
7914.686	Jun	10	SAT	4	Jupiter stationary in right ascension; resumes direct motion
7916.396	Jun	11	SUN	22	Mercury 4.9° NNW of Aldebaran; 12° from the Sun in the morning sky; magnitudes -1.2 and 0.9
7917.387	Jun	12	Mon	21	Venus at aphelion, 0.7282 AU from the Sun
7917.436	Jun	12	Mon	22	The equation of time is 0.
7918.688	Jun	14	wed	4:31	Earliest sunrise, at latitude 40° north
7919.382	Jun	14	wed	21	Mercury at ascending node through the ecliptic plane
7919.611	Jun	15	Thu	3	Moon at descending node; longitude 326.0°
7919.920	Jun	15	Thu	10	Saturn at opposition ; magnitude 0.0
7920.816	Jun	16	Fri	8	Neptune stationary in longitude; starts retrograde motion
7921.063	Jun	16	Fri	14	Moon 0.73° SE of Neptune; 101° from the Sun in the morning sky
7921.326	Jun	16	Fri	20	Neptune stationary in right ascension; starts retrograde motion
7921.982	Jun	17	SAT	11:34	Last Quarter Moon
7924.050	Jun	19	Mon	13	Mercury at perihelion, 0.3075 AU from the Sun
7924.271	Jun	19	Mon	19	Moon 3.9° SE of Uranus; 61° from the Sun in the morning sky
7925.458	Jun	20	Tue	23	Moon 2.31° SE of Venus; 45° from the Sun in the morning sky
7925.683	Jun	21	wed	4:23	June or summer solstice
7925.683	Jun	21	wed	4:23	Sun enters the astrological sign Cancer, i.e. its longitude is 90°
7926.085	Jun	21	wed	14	Mercury at superior conjunction with the Sun; 1.324 AU from Earth; latitude 4.69°
7926.106	Jun	21	wed	15	Sun enters Gemini, at longitude 90.40° on the ecliptic
7926.479	Jun	21	wed	24	Moon 9.1° SE of the Pleiades; 31° from the Sun in the morning sky
7926.938	Jun	22	Thu	11	Mercury 0.30° N of M35 cluster; 2° and 1° from the Sun in the evening sky; magnitudes -2.2 and 5.3

7927.125	Jun 22	Thu	15	Moon 0.58° NNE of Aldebaran; 22° from the Sun in the morning sky
7927.5	Jun 23	Fri		June Boötid meteors; ZHR 5; peak Jun 23 0h; 1 day before New
7927.953	Jun 23	Fri	10:52	Perigee only 15.7 hours before New Moon
7927.953	Jun 23	Fri	10:52	Moon at perigee; distance 56.12 Earth-radii
7928.604	Jun 24	SAT	3	Moon 5.0° S of M35 cluster; 4° and 1° from the Sun in the morning sky
7928.605	Jun 24	SAT	2:32	New Moon ; beginning of lunation 1169
7928.700	Jun 24	SAT	5	Moon, Mercury, and M35 clu within circle of diameter 5.90°; only about 2° from the Sun; magnitudes -4, -2, 5
7928.847	Jun 24	SAT	8	Mercury at northernmost declination, 24.71°
7928.896	Jun 24	SAT	10	Moon 5.3° S of Mercury; 6° and 4° from the Sun in the evening sky
7929.333	Jun 24	SAT	20	Moon 4.4° S of Mars; 11° and 10° from the Sun in the evening sky
7930.042	Jun 25	SUN	13	Moon 9.4° S of Pollux; 20° from the sun in the evening sky
7930.979	Jun 26	Mon	12	Moon 2.86° S of Beehive Cluster; 33° from the Sun in the evening sky
7932.186	Jun 27	Tue	16	Moon at ascending node; longitude 145.2°
7932.315	Jun 27	Tue	19:33	Latest sunset, at latitude 40° north
7932.563	Jun 28	wed	2	Moon 0.39° ESE of Regulus; 54° from the Sun in the evening sky
7933.333	Jun 28	wed	20	Mercury 0.78° N of Mars; 9° from the Sun in the evening sky; magnitudes -1.4 and 1.7
7934.262	Jun 29	Thu	18	Mercury at northernmost latitude from the ecliptic plane, 7.0°
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7935.535	Jul 1	SAT	0:51	First Quarter Moon
7935.625	Jul 1	SAT	3	Mercury 8.2° S of Castor; 11° and 15° from the Sun in the evening sky; magnitudes -1.1 and 1.5
7935.917	Jul 1	SAT	10	Moon 2.59° NNE of Jupiter; 94° from the Sun in the evening sky
7936.708	Jul 2	SUN	5	Moon 6.5° NNE of Spica; 103° and 104° from the Sun in the evening sky
7937.083	Jul 2	SUN	14	Mercury 4.8° S of Pollux; 13° and 14° from the sun in the evening sky; magnitudes -1.0 and 1.2
7938.259	Jul 3	Mon	18	Earth at aphelion ; 0x{, AU from the Sun
7939.649	Jul 5	wed	4	Venus at southernmost latitude from the ecliptic plane, -3.4°
7939.854	Jul 5	wed	9	Venus 6.6° SE of the Pleiades; 43° from the Sun in the morning sky; magnitudes -4.1 and 2.9
7940.396	Jul 5	wed	22	Mars 9.1° S of Castor; 7° and 12° from the Sun in the evening sky; magnitudes 1.7 and 1.5
7940.604	Jul 6	Thu	3	Moon 9.5° NNE of Antares; 146° from the Sun in the evening sky
7940.610	Jul 6	Thu	3	Jupiter at east quadrature, 90° from the Sun
7940.667	Jul 6	Thu	4	Moon at apogee; distance 63.65 Earth-radii

7941.688	Jul	7	Fri	5	Moon 3.2° N of Saturn; 158° from the Sun in the evening sky
7943.672	Jul	9	SUN	4:07	Full Moon
7944.421	Jul	9	SUN	22	Pluto at opposition ; magnitude 14.2
7944.813	Jul	10	Mon	8	Mercury 0.31° NNE of Beehive Cluster; 19° from the Sun in the evening sky; magnitudes -0.4 and 3.7
7944.958	Jul	10	Mon	11	Mars 5.6° S of Pollux; 5° and 8° from the Sun in the evening sky; magnitudes 1.7 and 1.2
7946.415	Jul	11	Tue	22	Jupiter and Uranus at heliocentric opposition ; longitudes 205.4° and 25.4°
7946.721	Jul	12	wed	5	Moon at descending node; longitude 324.5°
7948.292	Jul	13	Thu	19	Moon 0.90° SE of Neptune; 127° from the Sun in the morning sky
7948.479	Jul	13	Thu	24	Venus 3.1° N of Aldebaran; 42° from the Sun in the morning sky; magnitudes -4.1 and 0.9
7951.310	Jul	16	SUN	19:27	Last Quarter Moon
7951.604	Jul	17	Mon	3	Moon 4.1° SE of Uranus; 86° from the Sun in the morning sky
7953.854	Jul	19	wed	9	Moon 9.3° SE of the Pleiades; 56° and 57° from the Sun in the morning sky
7954.521	Jul	20	Thu	1	Moon 0.56° NNE of Aldebaran; 47° and 48° from the Sun in the morning sky
7955.021	Jul	20	Thu	13	Moon 2.73° SE of Venus; 40° and 41° from the Sun in the morning sky
7955.282	Jul	20	Thu	19	Sun enters Cancer, at longitude 118.23° on the ecliptic
7955.513	Jul	21	Fri	0	Uranus at west quadrature, 90° from the Sun
7956.021	Jul	21	Fri	13	Moon 5.0° S of M35 cluster; 27° from the Sun in the morning sky
7956.217	Jul	21	Fri	17:13	Moon at perigee; distance 56.64 Earth-radii
7957.135	Jul	22	SAT	15	Sun enters the astrological sign Leo, i.e. its longitude is 120°
7957.479	Jul	22	SAT	24	Moon 9.3° S of Pollux; 6° and 10° from the Sun in the morning sky
7957.668	Jul	23	SUN	4	Mercury at descending node through the ecliptic plane
7957.907	Jul	23	SUN	9:46	New Moon ; beginning of lunation 1170
7958.021	Jul	23	SUN	13	Moon 3.1° S of Mars; 3° and 2° from the Sun in the evening sky
7958.242	Jul	23	SUN	18	Moon, Mars, and Beehive within circle of diameter 5.50°; only about 4° from the Sun; magnitudes -4, 2, 4
7958.417	Jul	23	SUN	22	Moon 2.82° S of Beehive Cluster; 7° and 6° from the Sun in the evening sky
7959.533	Jul	25	Tue	1	Moon at ascending node; longitude 144.3°
7959.896	Jul	25	Tue	10	Moon 0.85° NNE of Mercury; 27° from the Sun in the evening sky
7959.900	Jul	25	Tue	10	Moon, Mercury, and Regulus within circle of diameter 1.12°; about 27° from the Sun in the evening sky; magnitudes -7, 0, 1

7959.958	Jul 25	Tue 11	Moon 0.21° E of Regulus; 28° and 27° from the Sun in the evening sky
7960.438	Jul 25	Tue 23	Mercury 0.95° SSW of Regulus; 27° from the Sun in the evening sky; magnitudes 0.3 and 1.4
7960.513	Jul 26	wed 0	The equation of time is at a minimum of -6.54 minutes.
7961.5	Jul 27	Thu	Piscid Austrinid meteors; ZHR 5; peak Jul 27 21h; 3 days before First Quarter
7961.552	Jul 27	Thu 1	Mars at conjunction with the Sun; 2.655 AU from Earth; latitude 1.78°
7963.458	Jul 28	Fri 23	Moon 2.99° NNE of Jupiter; 71° from the Sun in the evening sky
7963.5	Jul 29	SAT	Southern Delta Aquarid meteors ; ZHR 25; peak Jul 29 23h; 1 day before First Quarter
7963.5	Jul 29	SAT	Alpha Capricornid meteors; ZHR 5; peak Jul 29 23h; 1 day before First Quarter
7964.042	Jul 29	SAT 13	Moon 6.6° NNE of Spica; 78° and 77° from the Sun in the evening sky
7964.688	Jul 30	SUN 5	Mercury at easternmost elongation ; 27.2° from Sun in evening sky
7965.141	Jul 30	SUN 15:23	First Quarter Moon
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7966.771	Aug 1	Tue 7	Mars 0.18° SSW of Beehive Cluster; 2° from the Sun in the morning sky; magnitudes 1.7 and 3.7
7967.875	Aug 2	wed 9	Moon 9.6° N of Antares; 120° from the Sun in the evening sky
7968.035	Aug 2	wed 13	Mercury at aphelion, 0.4667 AU from the Sun
7968.167	Aug 2	wed 16	Venus 2.40° S of M35 cluster; 38° from the Sun in the morning sky; magnitudes -4.0 and 5.3
7968.250	Aug 2	wed 18	Moon at apogee; distance 63.51 Earth-radii
7968.598	Aug 3	Thu 2	Uranus stationary in longitude; starts retrograde motion
7968.778	Aug 3	Thu 7	Uranus stationary in right ascension; starts retrograde motion
7968.854	Aug 3	Thu 9	Moon 3.4° N of Saturn; 131° and 130° from the Sun in the evening sky
7973.258	Aug 7	Mon 18:12	Full Moon. Partial eclipse of the Moon
7973.955	Aug 8	Tue 11	Moon at descending node; longitude 324.2°
7975.479	Aug 9	wed 24	Moon 0.85° SE of Neptune; 154° from the Sun in the morning sky
7976.110	Aug 10	Thu 15	Sun enters Leo, at longitude 138.15° on the ecliptic
7977.5	Aug 12	SAT	Perseid meteors ; ZHR 110; peak Aug 12 13h; 3 days before Last Quarter
7977.760	Aug 12	SAT 6	Mercury stationary in right ascension; starts retrograde motion
7978.540	Aug 13	SUN 1	Mercury stationary in longitude; starts retrograde motion
7978.833	Aug 13	SUN 8	Moon 4.2° SE of Uranus; 112° from the Sun in the morning sky
7980.553	Aug 15	Tue 1:16	Last Quarter Moon

7981.125	Aug 15	Tue 15	Moon 9.3° SE of the Pleiades; 82° and 83° from the Sun in the morning sky
7981.813	Aug 16	wed 8	Moon 0.50° NNE of Aldebaran; 73° and 74° from the Sun in the morning sky
7982.357	Aug 16	wed 21	Middle of eclipse season: Sun is at same longitude as Moon's ascending node, 144.2°
7982.5	Aug 17	Thu	Kappa Cygnid meteors; ZHR 3; peak Aug 17 18h; 4 days before New
7983.375	Aug 17	Thu 21	Moon 5.1° S of M35 cluster; 52° and 53° from the Sun in the morning sky
7984.053	Aug 18	Fri 13:16	Moon at perigee; distance 57.40 Earth-radii
7984.708	Aug 19	SAT 5	Moon 2.26° S of Venus; 34° and 35° from the Sun in the morning sky
7984.875	Aug 19	SAT 9	Moon 9.4° S of Pollux; 32° and 34° from the Sun in the morning sky
7985.813	Aug 20	SUN 8	Moon 2.82° S of Beehive Cluster; 19° and 20° from the Sun in the morning sky
7986.479	Aug 20	SUN 24	Venus 7.2° S of Pollux; 34° and 35° from the Sun in the morning sky; magnitudes -4.0 and 1.2
7986.688	Aug 21	Mon 5	Moon 1.51° S of Mars; 8° from the Sun in the morning sky
7986.940	Aug 21	Mon 11	Moon at ascending node; longitude 144.2°
7987.271	Aug 21	Mon 18:30	New Moon ; beginning of lunation 1171. Total eclipse of the Sun
7987.375	Aug 21	Mon 21	Moon 0.28° E of Regulus; 1° from the Sun in the evening sky
7987.896	Aug 22	Tue 10	Moon 5.9° NNE of Mercury; 8° and 9° from the Sun in the evening sky
7988.296	Aug 22	Tue 19	Mercury at southernmost latitude from the ecliptic plane, -7.0°
7988.430	Aug 22	Tue 22	Sun enters the astrological sign Virgo, i.e. its longitude is 150°
7990.931	Aug 25	Fri 10	Saturn stationary in longitude; resumes direct motion
7991.057	Aug 25	Fri 13	Saturn stationary in right ascension; resumes direct motion
7991.146	Aug 25	Fri 16	Moon 3.3° NNE of Jupiter; 48° from the Sun in the evening sky
7991.396	Aug 25	Fri 22	Moon 6.6° NNE of Spica; 51° from the Sun in the evening sky
7992.359	Aug 26	SAT 21	Mercury at inferior conjunction with the Sun; 0.625 AU from Earth; latitude -6.76°
7994.842	Aug 29	Tue 8:13	First Quarter Moon
7995.208	Aug 29	Tue 17	Moon 9.6° NNE of Antares; 94° and 93° from the Sun in the evening sky
7995.939	Aug 30	wed 11	Venus at ascending node through the ecliptic plane
7995.981	Aug 30	wed 12	Moon at apogee; distance 63.39 Earth-radii
7996.146	Aug 30	wed 16	Moon 3.6° NNE of Saturn; 104° from the Sun in the evening sky
7996.310	Aug 30	wed 19	Mars at northernmost latitude from the ecliptic plane, 1.8°

7996.5	Aug 31	Thu		Aurigid meteors; ZHR 5; peak Aug 31 20h; 2 days after First Quarter
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7997.843	Sep 1	Fri	8	The equation of time is 0.
7998.083	Sep 1	Fri	14	Venus 1.19° S of Beehive Cluster; 32° from the Sun in the morning sky; magnitudes -4.0 and 3.7
8001.160	Sep 4	Mon	16	Mercury stationary in right ascension; resumes direct motion
8001.279	Sep 4	Mon	19	Moon at descending node; longitude 324.2°
8001.5	Sep 5	Tue	0	Mercury, Mars, and Regulus within circle of diameter 3.19° ; about 13° from the Sun in the morning sky; magnitudes 2, 2, 1
8001.521	Sep 5	Tue	1	Mercury 3.2° SW of Mars; 14° and 13° from the Sun in the morning sky; magnitudes 1.5 and 1.8; quasi-conjunction
8001.717	Sep 5	Tue	5	Neptune at opposition ; magnitude 7.8
8001.975	Sep 5	Tue	11	Mercury stationary in longitude; resumes direct motion
8002.000	Sep 5	Tue	12	Mars 0.70° NNE of Regulus; 13° from the Sun in the morning sky; magnitudes 1.8 and 1.4
8002.729	Sep 6	Wed	6	Moon 0.79° SE of Neptune; 178° and 179° from the Sun in the midnight sky
8002.794	Sep 6	Wed	7:04	Full Moon
8005.5	Sep 9	SAT		September Epsilon Perseid meteors; ZHR 10; peak Sep 9 5h; 3 days after Full
8006.042	Sep 9	SAT	13	Moon 4.1° SE of Uranus; 139° from the Sun in the morning sky
8006.917	Sep 10	SUN	10	Mercury, Mars, and Regulus within circle of diameter 3.25° ; about 17° from the Sun in the morning sky; magnitudes 0, 2, 1
8007.021	Sep 10	SUN	13	Mercury 0.60° S of Regulus; 18° from the Sun in the morning sky; magnitudes 0.0 and 1.4
8007.352	Sep 10	SUN	20	Mercury at ascending node through the ecliptic plane
8008.354	Sep 11	Mon	21	Moon 9.3° SE of the Pleiades; 109° from the Sun in the morning sky
8008.563	Sep 12	Tue	2	Jupiter 3.1° NNE of Spica; 35° from the Sun in the evening sky; magnitudes -1.7 and 1.0
8008.923	Sep 12	Tue	10	Mercury at westernmost elongation ; 17.9° from Sun in morning sky
8009.042	Sep 12	Tue	13	Moon 0.54° NNE of Aldebaran; 100° from the Sun in the morning sky
8009.768	Sep 13	Wed	6:26	Last Quarter Moon
8010.174	Sep 13	Wed	16:11	Moon at perigee; distance 57.99 Earth-radii
8010.620	Sep 14	Thu	3	Saturn at east quadrature, 90° from the Sun
8010.625	Sep 14	Thu	3	Moon 5.0° S of M35 cluster; 79° from the Sun in the morning sky
8012.019	Sep 15	Fri	12	Mercury at perihelion, 0.3075 AU from the Sun
8012.167	Sep 15	Fri	16	Moon 9.3° S of Pollux; 58° and 60° from the Sun in the morning sky

8013.125	Sep 16	SAT	15	Moon 2.78° S of Beehive Cluster; 46° from the Sun in the morning sky
8013.292	Sep 16	SAT	19	Mercury 0.06° NNE of Mars; 17° from the Sun in the morning sky; magnitudes -0.8 and 1.8
8013.328	Sep 16	SAT	20	Sun enters Virgo, at longitude 174.13° on the ecliptic
8014.269	Sep 17	SUN	18	Moon at ascending node; longitude 144.0°
8014.542	Sep 18	Mon	1	Moon 0.55° S of Venus; 28° from the Sun in the morning sky
8014.700	Sep 18	Mon	5	Moon, Venus, and Regulus within circle of diameter 2.35°; about 26° from the Sun in the morning sky; magnitudes -6, -4, 1
8014.729	Sep 18	Mon	6	Moon 0.31° E of Regulus; 25° from the Sun in the morning sky
8015.354	Sep 18	Mon	21	Moon 0.40° E of Mars; 17° and 18° from the Sun in the morning sky
8015.358	Sep 18	Mon	21	Moon, Mercury, and Mars within circle of diameter 1.83°; about 17° from the Sun in the morning sky; magnitudes -6, -1, 2
8015.5	Sep 19	Tue	0	Moon 0.32° ESE of Mercury; 15° and 16° from the Sun in the morning sky
8016.604	Sep 20	wed	3	Venus 0.46° NNE of Regulus; 27° from the Sun in the morning sky; magnitudes -3.9 and 1.4
8016.729	Sep 20	wed	5:30	New Moon ; beginning of lunation 1172
8017.5	Sep 21	Thu		Rosh Hashanah, 1st say of Hebrew year 5778 A.M.
8018.5	Sep 22	Fri		1st day of Muslim year (1439 A.H.)
8018.771	Sep 22	Fri	7	Moon 6.6° NNE of Spica; 25° from the Sun in the evening sky
8018.938	Sep 22	Fri	11	Moon 3.5° NNE of Jupiter; 27° from the Sun in the evening sky
8019.334	Sep 22	Fri	20:00	September of fall or autumn equinox
8019.334	Sep 22	Fri	20:00	Sun enters the astrological sign Libra, i.e. its longitude is 180°
8022.231	Sep 25	Mon	18	Mercury at northernmost latitude from the ecliptic plane, 7.0°
8022.542	Sep 26	Tue	1	Moon 9.5° NNE of Antares; 67° from the Sun in the evening sky
8023.542	Sep 27	wed	1	Moon 3.5° N of Saturn; 78° from the Sun in the evening sky
8023.783	Sep 27	wed	7	Moon at apogee; distance 63.40 Earth-radii
8024.393	Sep 27	wed	21	Pluto stationary in right ascension; resumes direct motion
8024.621	Sep 28	Thu	2:54	First Quarter Moon
8024.948	Sep 28	Thu	11	Pluto stationary in longitude; resumes direct motion
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8028.587	Oct 2	Mon	2	Moon at descending node; longitude 323.4°
8029.729	Oct 3	Tue	5	Venus at perihelion, 0.7184 AU from the Sun
8030.042	Oct 3	Tue	13	Moon 0.74° SE of Neptune; 152° from the Sun in the evening sky

8031.5	Oct	5	Thu	October Camelopardalid meteors; ZHR 5; peak Oct 5 14h; near Full
8032.208	Oct	5	Thu 17	Venus 0.21° NNE of Mars; 23° from the sun in the morning sky; magnitudes -3.9 and 1.8
8032.278	Oct	5	Thu 18:41	Full Moon
8033.292	Oct	6	Fri 19	Moon 4.0° SE of Uranus; 166° and 167° from the Sun in the morning sky
8034.418	Oct	7	SAT 22	Mars at aphelion, 1.6661 AU from the sun
8034.5	Oct	8	SUN	Draconid meteors; ZHR 20; peak Oct 8 12h; 3 days after Full
8035.360	Oct	8	SUN 21	Mercury at superior conjunction with the Sun; 1.408 AU from Earth; latitude 3.81°
8035.625	Oct	9	Mon 3	Moon 9.1° SE of the Pleiades; 135° and 136° from the Sun in the morning sky
8035.745	Oct	9	Mon 5:53	Moon at perigee; distance 57.52 Earth-radii
8036.292	Oct	9	Mon 19	Moon 0.72° NNE of Aldebaran; 126° from the Sun in the morning sky
8036.5	Oct	10	Tue	Southern Taurid meteors; ZHR 5; peak Oct 10 3h; 2 days before Last Quarter
8037.5	Oct	11	wed	Delta Aurigid meteors; ZHR 2; peak Oct 11 3h; 1 day before Last Quarter
8037.854	Oct	11	wed 9	Moon 4.8° S of M35 cluster; 105° and 106° from the Sun in the morning sky
8039.018	Oct	12	Thu 12:26	Last Quarter Moon
8039.375	Oct	12	Thu 21	Moon 9.2° S of Pollux; 85° and 86° from the Sun in the morning sky
8040.354	Oct	13	Fri 21	Moon 2.62° S of Beehive Cluster; 73° from the Sun in the morning sky
8040.375	Oct	13	Fri 21	Mercury 2.65° NNE of Spica; 4° from the Sun in the evening sky; magnitudes -1.2 and 1.0
8041.424	Oct	14	SAT 22	Moon at ascending node; longitude 142.6°
8042.000	Oct	15	SUN 12	Moon 0.38° ENE of Regulus; 52° from the Sun in the morning sky
8043.979	Oct	17	Tue 12	Moon 1.70° NNE of Mars; 28° from the Sun in the morning sky
8044.5	Oct	18	wed	Epsilon Geminid meteors; ZHR 3; peak Oct 18 5h; 2 days before New
8044.583	Oct	18	wed 2	Moon 1.87° NNE of Venus; 21° and 20° from the Sun in the morning sky
8044.833	Oct	18	wed 8	Mercury 0.93° SSW of Jupiter; 7° from the Sun in the evening sky; magnitudes -0.9 and -1.7
8045.637	Oct	19	Thu 3	Mercury at descending node through the ecliptic plane
8046.104	Oct	19	Thu 15	Moon 6.5° NNE of Spica; 5° and 3° from the Sun in the morning sky
8046.223	Oct	19	Thu 17	Uranus at opposition ; magnitude 5.7
8046.300	Oct	19	Thu 19:12	New Moon ; beginning of lunation 1173
8046.750	Oct	20	Fri 6	Moon 3.7° NNE of Jupiter; 7° and 5° from the Sun in the evening sky

8046.900	Oct 20	Fri	10	Moon, Mercury, and Jupiter within circle of diameter 5.03°; about 7° from the Sun in the evening sky; magnitudes -5, -1, -2
8046.979	Oct 20	Fri	12	Moon 5.0° NNE of Mercury; 9° and 8° from the Sun in the evening sky
8047.5	Oct 21	SAT		Orionid meteors ; ZHR 25; peak Oct 21 5h; 1 day after New
8049.726	Oct 23	Mon	5	Sun enters the astrological sign Scorpius, i.e. its longitude is 210°
8049.875	Oct 23	Mon	9	Moon 9.4° NNE of Antares; 41° and 40° from the Sun in the evening sky
8049.900	Oct 23	Mon	10	Mars and Neptune at heliocentric opposition; longitudes 163.1° and 343.1°
8050.5	Oct 24	Tue		Leo Minorid meteors; ZHR 2; peak Oct 24 6h; 4 days before First Quarter
8051.042	Oct 24	Tue	13	Moon 3.3° NNE of Saturn; 53° from the Sun in the evening sky
8051.439	Oct 24	Tue	23	Venus at northernmost latitude from the ecliptic plane, 3.4°
8051.601	Oct 25	wed	2	Moon at apogee; distance 63.52 Earth-radii
8053.261	Oct 26	Thu	18	Jupiter at conjunction with the Sun; 6.435 AU from Earth; latitude 1.20°
8053.439	Oct 26	Thu	23	Mars crosses equator southward
8054.432	Oct 27	Fri	22:22	First Quarter Moon
8055.5	Oct 29	SUN		Clocks back 1 hour (Europe)
8055.780	Oct 29	SUN	7	Moon at descending node; longitude 321.1°
8056.004	Oct 29	SUN	12	Mercury at aphelion, 0.4667 AU from the Sun
8057.417	Oct 30	Mon	22	Moon 0.89° SE of Neptune; 124° from the Sun in the evening sky
8057.518	Oct 31	Tue	0	Sun enters Libra, at longitude 217.77° on the ecliptic
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8060.292	Nov 2	Thu	19	Venus 3.5° NNE of Spica; 16° and 17° from the Sun in the morning sky; magnitudes -3.9 and 1.0
8060.636	Nov 3	Fri	3	The equation of time is at a maximum of 16.48 minutes.
8060.646	Nov 3	Fri	4	Moon 4.0° SE of Uranus; 165° from the Sun in the evening sky
8061.725	Nov 4	SAT	5:23	Full Moon
8062.5	Nov 5	SUN		Clocks back 1 hour (America)
8062.979	Nov 5	SUN	12	Moon 9.0° SE of the Pleiades; 162° and 163° from the Sun in the morning sky
8063.515	Nov 6	Mon	0:21	Moon at perigee; distance 56.67 Earth-radii
8063.625	Nov 6	Mon	3	Moon 0.81° NNE of Aldebaran; 153° from the Sun in the morning sky
8065.146	Nov 7	Tue	16	Moon 4.6° S of M35 cluster; 132° and 133° from the Sun in the morning sky
8066.625	Nov 9	Thu	3	Moon 8.9° S of Pollux; 113° from the Sun in the morning sky

8067.604	Nov 10	Fri	3	Moon 2.40° S of Beehive Cluster; 100° from the Sun in the morning sky
8068.359	Nov 10	Fri	20:37	Last Quarter Moon
8068.444	Nov 10	Fri	23	Moon at ascending node; longitude 139.8°
8068.5	Nov 11	SAT		Armistice Day
8069.229	Nov 11	SAT	18	Moon 0.60° ENE of Regulus; 79° from the Sun in the morning sky
8069.5	Nov 12	SUN		Northern Taurid meteors; ZHR 5; peak Nov 12 5h; 1 day after Last Quarter
8070.438	Nov 12	SUN	23	Mercury 2.21° NNE of Antares; 20° from the Sun in the evening sky; magnitudes -0.3 and 1.0
8070.875	Nov 13	Mon	9	Venus 0.26° NNE of Jupiter; 14° from the Sun in the morning sky; magnitudes -3.9 and -1.7
8072.646	Nov 15	wed	4	Moon 3.0° NNE of Mars; 38° from the Sun in the morning sky
8073.375	Nov 15	wed	21	Moon 6.6° NNE of Spica; 30° from the Sun in the morning sky
8074.5	Nov 17	Fri		Leonid meteors ; ZHR 15; peak Nov 17 11h; 1 day before New
8074.521	Nov 17	Fri	1	Moon 3.9° NNE of Jupiter; 17° from the Sun in the morning sky
8074.642	Nov 17	Fri	3	Moon, Venus, and Jupiter within circle of diameter 4.86°; about 15° from the Sun in the morning sky; magnitudes -6, -4, -2
8074.854	Nov 17	Fri	9	Moon 3.8° NNE of Venus; 14° and 13° from the Sun in the morning sky
8075.987	Nov 18	SAT	11:42	New Moon ; beginning of lunation 1174
8076.265	Nov 18	SAT	18	Mercury at southernmost latitude from the ecliptic plane, -7.0°
8077.167	Nov 19	SUN	16	Moon 9.2° NNE of Antares; 14° and 13° from the Sun in the evening sky
8078.000	Nov 20	Mon	12	Moon 6.8° N of Mercury; 23° and 22° from the Sun in the evening sky
8078.5	Nov 21	Tue		Alpha Monocerotid meteors; ZHR 5; peak Nov 21 11h; 3 days after New
8078.563	Nov 21	Tue	2	Moon 3.0° N of Saturn; 28° from the Sun in the evening sky
8079.287	Nov 21	Tue	19	Moon at apogee; distance 63.68 Earth-radii
8079.628	Nov 22	wed	3	Sun enters the astrological sign Sagittarius, i.e. its longitude is 240°
8079.962	Nov 22	wed	11	Neptune stationary in longitude; resumes direct motion
8080.227	Nov 22	wed	17	Neptune stationary in right ascension; resumes direct motion
8080.348	Nov 22	wed	20	Summer solstice on Mars
8080.348	Nov 22	wed	20	Summer solstice on Mars
8080.730	Nov 23	Thu	6	Sun enters Scorpius, at longitude 241.11° on the ecliptic
8081.512	Nov 24	Fri	0	Mercury at easternmost elongation ; 22.0° from Sun in evening sky

8081.522	Nov 24	Fri	1	Mercury at southernmost declination, -25.77°
8082.851	Nov 25	SAT	8	Moon at descending node; longitude 318.0°
8084.210	Nov 26	SUN	17:02	First Quarter Moon
8084.771	Nov 27	Mon	7	Moon 1.13° SE of Neptune; 96° from the Sun in the evening sky
8085.5	Nov 28	Tue		November Orionid meteors; ZHR 3; peak Nov 28 0h; 1 day after First Quarter
8087.479	Nov 29	wed	24	Mars 3.1° NNE of Spica; 44° from the Sun in the morning sky; magnitudes 1.7 and 1.0
8087.547	Nov 30	Thu	1	Sun enters Ophiuchus, at longitude 248.01° on the ecliptic
8088.021	Nov 30	Thu	13	Moon 4.1° SE of Uranus; 136° and 137° from the Sun in the evening sky
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8089.5	Dec 2	SAT		Phoenicid meteors; ZHR 5; peak Dec 2 0h; 2 days before Full
8090.438	Dec 2	SAT	23	Moon 9.0° SE of the Pleiades; 169° from the Sun in the evening sky
8090.811	Dec 3	SUN	7	Mercury stationary in longitude; starts retrograde motion
8090.818	Dec 3	SUN	8	Mercury stationary in right ascension; starts retrograde motion
8091.063	Dec 3	SUN	14	Moon 0.83° N of Aldebaran; 175° and 174° from the Sun in the midnight sky
8091.158	Dec 3	SUN	15:47	Full Moon
8091.874	Dec 4	Mon	8:59	Perigee only 17.2 hours after Full Moon
8091.874	Dec 4	Mon	8:59	Moon at perigee; distance 56.05 Earth-radii
8092.542	Dec 5	Tue	1	Moon 4.5° S of M35 cluster; 160° and 161° from the Sun in the morning sky
8093.000	Dec 5	Tue	12	Moon at northernmost declination in year, 20.01°
8093.979	Dec 6	wed	12	Moon 8.7° S of Pollux; 140° and 141° from the Sun in the morning sky
8094.5	Dec 7	Thu		Puppis-Velid meteors; ZHR 10; peak Dec 7 0h; 3 days before Last Quarter
8094.604	Dec 7	Thu	3	Mercury 1.24° SSW of Saturn; 13° from the Sun in the evening sky; magnitudes 1.6 and 0.5
8094.917	Dec 7	Thu	10	Moon 2.14° S of Beehive Cluster; 127° and 128° from the Sun in the morning sky
8095.191	Dec 7	Thu	16:35	Earliest sunset, at latitude 40° north
8095.321	Dec 7	Thu	20	Mercury at ascending node through the ecliptic plane
8095.5	Dec 8	Fri		Monocerotid meteors; ZHR 3; peak Dec 8 22h; 1 day before Last Quarter
8095.527	Dec 8	Fri	1	Moon at ascending node; longitude 136.9°
8096.479	Dec 8	Fri	24	Moon 0.73° NNE of Regulus; 107° from the Sun in the morning sky
8096.958	Dec 9	SAT	11	Venus 5.0° N of Antares; 7° and 9° from the Sun in the morning sky; magnitudes -3.9 and 1.0
8097.828	Dec 10	SUN	7:52	Last Quarter Moon
8098.5	Dec 11	Mon		Sigma Hydrid meteors; ZHR 3; peak Dec 11 21h; 2 days after Last Quarter

8099.989	Dec 12	Tue	12	Mercury at perihelion, 0.3075 AU from the Sun
8100.571	Dec 13	Wed	2	Mercury at inferior conjunction with the Sun; 0.678 AU from Earth; latitude 3.80°
8100.604	Dec 13	Wed	3	Moon 6.8° NNE of Spica; 57° from the Sun in the morning sky
8101.313	Dec 13	Wed	20	Moon 3.9° NNE of Mars; 49° from the Sun in the morning sky
8101.5	Dec 14	Thu		Geminid meteors ; ZHR 120; peak Dec 14 1h; 4 days before New
8102.229	Dec 14	Thu	18	Moon 4.1° NNE of Jupiter; 39° from the Sun in the morning sky
8102.5	Dec 15	Fri		Coma Berenicid meteors; ZHR 3; peak Dec 15 19h; 2 days before New
8103.021	Dec 15	Fri	13	Mercury 2.18° N of Venus; 6° from the Sun in the morning sky; magnitudes 3.5 and -3.9
8104.438	Dec 16	SAT	23	Moon 9.2° NNE of Antares; 15° and 16° from the Sun in the morning sky
8104.896	Dec 17	SUN	10	Moon 1.75° NNE of Mercury; 10° from the Sun in the morning sky
8105.000	Dec 17	SUN	12	Moon, Mercury, and Venus within circle of diameter 5.35°; about 8° from the Sun in the morning sky; magnitudes -5, 2, -4
8105.313	Dec 17	SUN	20	Moon 4.1° N of Venus; 6° and 5° from the Sun in the morning sky
8105.771	Dec 18	Mon	6:30	New Moon ; beginning of lunation 1175
8105.827	Dec 18	Mon	8	Sun enters Sagittarius, at longitude 266.58° on the ecliptic
8106.083	Dec 18	Mon	14	Moon 2.78° N of Saturn; 5° and 3° from the Sun in the evening sky
8106.5	Dec 19	Tue		December Leo Minorid meteors; ZHR 5; peak Dec 19 17h; 1 day after New
8106.557	Dec 19	Tue	1	Moon at apogee; distance 63.75 Earth-radii; farthest in year
8106.917	Dec 19	Tue	10	Moon at southernmost declination in year, -20.06°
8107.493	Dec 19	Tue	24	Venus at descending node through the ecliptic plane
8108.125	Dec 20	Wed	15	Moon shows minimum libration for the year, 3.35°
8109.187	Dec 21	Thu	16:29	Sun enters the astrological sign Capricornus, i.e. its longitude is 270°
8109.187	Dec 21	Thu	16:29	December or winter solstice
8109.385	Dec 21	Thu	21	Saturn at conjunction with the Sun; 11.048 AU from Earth; latitude 0.99°
8109.5	Dec 22	Fri		Ursid meteors ; ZHR 15; peak Dec 22 9h; 4 days before First Quarter
8109.922	Dec 22	Fri	10	Moon at descending node; longitude 315.7°
8110.201	Dec 22	Fri	17	Mercury at northernmost latitude from the ecliptic plane, 7.0°
8110.573	Dec 23	SAT	2	Mercury stationary in longitude; resumes direct motion
8110.605	Dec 23	SAT	3	Mercury stationary in right ascension; resumes direct motion

8111.542	Dec 24	SUN	1	Mercury 8.1° NNE of Antares; 20° and 23° from the Sun in the morning sky; magnitudes 0.2 and 1.0
8112.083	Dec 24	SUN	14	Moon 1.39° SE of Neptune; 69° from the Sun in the evening sky
8112.5	Dec 25	Mon		Christmas
8112.657	Dec 25	Mon	4	The equation of time is 0.
8113.229	Dec 25	Mon	18	Venus 1.13° S of Saturn; 3° and 4° from the Sun in the morning sky; magnitudes -3.9 and 0.5
8113.888	Dec 26	Tue	9:19	First Quarter Moon
8115.292	Dec 27	wed	19	Moon shows maximum libration for the year, 9.87°
8115.375	Dec 27	wed	21	Moon 4.3° SE of Uranus; 108° from the Sun in the evening sky
8115.950	Dec 28	Thu	11	Venus at southernmost declination, -23.71°
8116.559	Dec 29	Fri	1	Saturn at southernmost declination, -22.53°
8117.896	Dec 30	SAT	10	Moon 9.1° SE of the Pleiades; 141° from the Sun in the evening sky
8118.542	Dec 31	SUN	1	Moon 0.78° N of Aldebaran; 150° from the Sun in the evening sky