

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, to save space.

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 day or hour.)

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 nearest to 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 kind of event in *The Astronomical Companion*. And events in this list can be traced in the large *Zodiac Wavy Chart* for the year.

For all these, see [universalworkshop.com](http://universalworkshop.com)

2021				UT	
9217.043	Jan	2	SAT	13	<b>Earth at perihelion</b> ; 0.9833 AU from the Sun
9217.5	Jan	3	SUN		<b>Quadrantid meteors</b> ; ZHR 110; peak Jan 3 8h; 3 days before Last Quarter
9217.563	Jan	3	SUN	2	Moon 4.5° NNE of Regulus; 133° from the Sun in the morning sky
9218.807	Jan	4	Mon	7:22	Latest sunrise, at latitude 40° north
9219.863	Jan	5	Tue	9	Mercury at southernmost latitude from the ecliptic plane, -7.0°
9220.901	Jan	6	wed	9:37	<b>Last Quarter Moon</b>

9221.5	Jan	7	Thu	0	Moon 6.4° NNE of Spica; 82° and 83° from the Sun in the morning sky
9224.157	Jan	9	SAT	15:47	Moon at perigee; distance 57.60 Earth-radii
9224.688	Jan	10	SUN	5	Saturn 1.61° NNW of Mercury; 13° from the Sun in the evening sky; magnitudes 0.6 and -0.9
9224.688	Jan	10	SUN	5	Mercury 1.61° SE of Saturn; 13° from the Sun in the evening sky; magnitudes -0.9 and 0.6
9224.729	Jan	10	SUN	6	Moon 5.4° NNE of Antares; 39° and 40° from the Sun in the morning sky
9225.292	Jan	10	SUN	19	<b>Mercury, Jupiter, and Saturn within circle of diameter 2.39°</b> ; about 13° from the Sun in the evening sky; magnitudes -1, -2, 1
9225.345	Jan	10	SUN	20	Moon at descending node; longitude 259.7°
9226.292	Jan	11	Mon	19	Mercury 1.41° SE of Jupiter; 14° from the Sun in the evening sky; magnitudes -0.9 and -1.9
9226.292	Jan	11	Mon	19	Jupiter 1.41° NNW of Mercury; 14° from the Sun in the evening sky; magnitudes -1.9 and -0.9
9226.354	Jan	11	Mon	21	<b>Moon 1.50° S of Venus</b> ; 18° from the Sun in the morning sky
9226.354	Jan	11	Mon	21	<b>Venus 1.50° N of Moon</b> ; 18° from the Sun in the morning sky; magnitudes -3.9 and -5.9
9226.753	Jan	12	Tue	6	Venus at southernmost declination, -23.18°
9227.709	Jan	13	wed	5:01	<b>New Moon</b> ; beginning of lunation 1213
9228.438	Jan	13	wed	23	Moon 3.2° SE of Saturn; 10° and 9° from the Sun in the evening sky
9228.438	Jan	13	wed	23	Saturn 3.2° NNW of Moon; 9° and 10° from the Sun in the evening sky; magnitudes 0.6 and -5.0
9228.5	Jan	14	Thu	0	Moon, Mercury, and Saturn within circle of diameter 5.96°; about 12° from the Sun in the evening sky; magnitudes -5, -1, 1
9228.5	Jan	14	Thu	0	Moon, Jupiter, and Saturn within circle of diameter 3.77°; about 11° from the Sun in the evening sky; magnitudes -5, -2, 1
9228.625	Jan	14	Thu	3	Jupiter 3.3° NNW of Moon; 12° from the Sun in the evening sky; magnitudes -1.9 and -5.3
9228.625	Jan	14	Thu	3	Moon 3.3° SE of Jupiter; 12° from the Sun in the evening sky
9228.700	Jan	14	Thu	5	Moon, Mercury, and Jupiter within circle of diameter 3.96°; about 13° from the Sun in the evening sky; magnitudes -5, -1, -2
9228.772	Jan	14	Thu	7	Uranus stationary in longitude; resumes direct motion
9228.806	Jan	14	Thu	7	Pluto at conjunction with the Sun; 35.184 AU from Earth; latitude -1.25°
9228.896	Jan	14	Thu	10	Moon 2.28° SE of Mercury; 16° and 15° from the Sun in the evening sky
9228.896	Jan	14	Thu	10	Mercury 2.28° NNW of Moon; 15° and 16° from the Sun in the evening sky; magnitudes -0.9 and -5.6
9228.971	Jan	14	Thu	11	Uranus stationary in right ascension; resumes direct motion
9230.988	Jan	16	SAT	12	Venus at descending node through the ecliptic plane

9231.917	Jan 17	SUN	10	Neptune 4.1° NNW of Moon; 51° and 52° from the Sun in the evening sky; magnitudes 7.9 and -8.3
9231.917	Jan 17	SUN	10	Moon 4.1° SE of Neptune; 52° and 51° from the Sun in the evening sky
9234.107	Jan 19	Tue	15	Sun enters Capricornus, at longitude 299.74° on the ecliptic
9234.361	Jan 19	Tue	21	Sun enters the astrological sign Aquarius, i.e. its longitude is 300°
9235.313	Jan 20	wed	20	Mars 1.62° NNW of Uranus; 96° from the Sun in the evening sky; magnitudes 0.2 and 5.8
9235.313	Jan 20	wed	20	<b>Uranus 1.62° SE of Mars</b> ; 96° from the Sun in the evening sky; magnitudes 5.8 and 0.2
9235.377	Jan 20	wed	21:02	<b>First Quarter Moon</b>
9235.896	Jan 21	Thu	10	Moon 3.1° SE of Uranus; 96° and 95° from the Sun in the evening sky
9235.896	Jan 21	Thu	10	Uranus 3.1° NNW of Moon; 95° and 96° from the Sun in the evening sky; magnitudes 5.8 and -10.2
9235.900	Jan 21	Thu	10	Moon, Mars, and Uranus within circle of diameter 4.65°; about 95° from the Sun in the evening sky; magnitudes -10, 0, 6
9235.938	Jan 21	Thu	11	Moon 4.7° SE of Mars; 96° and 95° from the Sun in the evening sky
9235.938	Jan 21	Thu	11	Mars 4.7° NNW of Moon; 95° and 96° from the Sun in the evening sky; magnitudes 0.2 and -10.3
9236.055	Jan 21	Thu	13	Moon at apogee; distance 63.40 Earth-radii
9237.917	Jan 23	SAT	10	Moon 5.7° SE of the Pleiades; 118° and 117° from the Sun in the evening sky
9238.575	Jan 24	SUN	2	<b>Mercury at easternmost elongation</b> ; 18.6° from Sun in evening sky
9238.629	Jan 24	SUN	3	Saturn at conjunction with the Sun; 10.968 AU from Earth; latitude -0.45°
9238.646	Jan 24	SUN	4	Moon 4.6° N of Aldebaran; 126° from the Sun in the evening sky
9238.920	Jan 24	SUN	10	Mercury at ascending node through the ecliptic plane
9239.408	Jan 24	SUN	22	Moon at ascending node; longitude 79.1°
9240.479	Jan 25	Mon	24	Moon 0.31° NNE of M35 cluster; 146° from the Sun in the evening sky
9241.029	Jan 26	Tue	13	Uranus at east quadrature, 90° from the Sun
9241.958	Jan 27	wed	11	Moon 7.4° S of Castor; 163° and 160° from the Sun in the evening sky
9242.167	Jan 27	wed	16	Moon 3.8° S of Pollux; 166° and 164° from the Sun in the evening sky
9243.208	Jan 28	Thu	17	Moon 2.57° NNE of Beehive Cluster; 176° and 178° from the Sun in the midnight sky
9243.304	Jan 28	Thu	19:17	<b>Full Moon</b>
9243.573	Jan 29	Fri	2	Jupiter at conjunction with the Sun; 6.071 AU from Earth; latitude -0.63°
9243.590	Jan 29	Fri	2	Mercury at perihelion, 0.3075 AU from the Sun
9244.591	Jan 30	SAT	2	Mercury stationary in right ascension; starts retrograde motion

9244.854	Jan	30	SAT	9	Moon 4.4° NNE of Regulus; 160° and 161° from the Sun in the morning sky
9245.157	Jan	30	SAT	16	Mercury stationary in longitude; starts retrograde motion
9246.936	Feb	1	Mon	10	Mars at east quadrature, 90° from the Sun
9247.5	Feb	2	Tue		Ground Hog Day
9248.729	Feb	3	Wed	6	Moon 6.2° NNE of Spica; 110° from the Sun in the morning sky
9249.283	Feb	3	Wed	18:48	Moon at perigee; distance 58.03 Earth-radii
9250.234	Feb	4	Thu	17:38	<b>Last Quarter Moon</b>
9251.813	Feb	6	SAT	8	Venus 0.38° SE of Saturn; 12° from the Sun in the morning sky; magnitudes -3.9 and 0.7
9251.813	Feb	6	SAT	8	Saturn 0.38° NNW of Venus; 12° from the Sun in the morning sky; magnitudes 0.7 and -3.9
9251.875	Feb	6	SAT	9	<b>Venus, Jupiter, and Saturn within circle of diameter 5.43°</b> ; about 10° from the Sun in the morning sky; magnitudes -4, -2, 1
9252.000	Feb	6	SAT	12	Moon 5.3° NNE of Antares; 67° and 68° from the Sun in the morning sky
9252.5	Feb	7	SUN		Alpha Centaurid meteors; ZHR 6; peak Feb 7 18h; 4 days before New
9252.522	Feb	7	SUN	1	Moon at descending node; longitude 258.2°
9252.960	Feb	7	SUN	11	Spring equinox on Mars
9253.799	Feb	8	Mon	7	Mercury at northernmost latitude from the ecliptic plane, 7.0°
9254.071	Feb	8	Mon	14	Mercury at inferior conjunction with the Sun; 0.652 AU from Earth; latitude 7.00°
9256.042	Feb	10	wed	13	Saturn 3.4° NNW of Moon; 16° from the Sun in the morning sky; magnitudes 0.7 and -5.6
9256.042	Feb	10	wed	13	Moon 3.4° SE of Saturn; 16° from the Sun in the morning sky
9256.158	Feb	10	wed	16	Moon, Venus, and Saturn within circle of diameter 5.18°; about 14° from the Sun in the morning sky; magnitudes -5, -4, 1
9256.438	Feb	10	wed	23	Moon 3.1° SE of Venus; 11° from the Sun in the morning sky
9256.438	Feb	10	wed	23	Venus 3.1° NNW of Moon; 11° from the Sun in the morning sky; magnitudes -3.9 and -5.1
9256.458	Feb	10	wed	23	Moon, Venus, and Jupiter within circle of diameter 3.57°; about 11° from the Sun in the morning sky; magnitudes -5, -4, -2
9256.479	Feb	10	wed	24	Jupiter 3.6° NNW of Moon; 10° and 11° from the Sun in the morning sky; magnitudes -2.0 and -5.1
9256.479	Feb	10	wed	24	Moon 3.6° SE of Jupiter; 11° and 10° from the Sun in the morning sky
9256.642	Feb	11	Thu	3	The equation of time is at a minimum of -14.23 minutes.
9256.813	Feb	11	Thu	8	Moon 8.0° SE of Mercury; 7° from the Sun in the morning sky

9256.813	Feb 11	Thu	8	Mercury 8.0° NNW of Moon; 7° from the Sun in the morning sky; magnitudes 3.7 and -4.7
9257.125	Feb 11	Thu	15	Venus 0.43° SE of Jupiter; 11° from the Sun in the morning sky; magnitudes -3.9 and -2.0
9257.125	Feb 11	Thu	15	Jupiter 0.43° NNW of Venus; 11° from the Sun in the morning sky; magnitudes -2.0 and -3.9
9257.297	Feb 11	Thu	19:07	<b>New Moon</b> ; beginning of lunation 1214
9258.917	Feb 13	SAT	10	Mercury 4.6° NNW of Venus; 11° and 10° from the Sun in the morning sky; magnitudes 2.7 and -3.9
9258.917	Feb 13	SAT	10	Venus 4.6° SE of Mercury; 10° and 11° from the Sun in the morning sky; magnitudes -3.9 and 2.7
9258.958	Feb 13	SAT	11	<b>Mercury, Venus, and Jupiter within circle of diameter 4.59°</b> ; about 11° from the Sun in the morning sky; magnitudes 3, -4, -2
9259.354	Feb 13	SAT	21	Moon 4.0° SE of Neptune; 25° and 24° from the Sun in the evening sky
9259.354	Feb 13	SAT	21	Neptune 4.0° NNW of Moon; 24° and 25° from the Sun in the evening sky; magnitudes 8.0 and -6.4
9259.5	Feb 14	SUN		St. Valentine's Day
9261.083	Feb 15	Mon	14	Mercury 3.9° NNW of Jupiter; 15° and 14° from the Sun in the morning sky; magnitudes 2.0 and -2.0
9261.083	Feb 15	Mon	14	Jupiter 3.9° SE of Mercury; 14° and 15° from the Sun in the morning sky; magnitudes -2.0 and 2.0
9261.884	Feb 16	Tue	9	Sun enters Aquarius, at longitude 327.92° on the ecliptic
9262.5	Feb 17	wed		Ash Wednesday
9263.271	Feb 17	wed	19	Moon 2.80° SE of Uranus; 68° from the Sun in the evening sky
9263.271	Feb 17	wed	19	Uranus 2.80° NNW of Moon; 68° from the Sun in the evening sky; magnitudes 5.8 and -9.1
9263.935	Feb 18	Thu	10	Moon at apogee; distance 63.41 Earth-radii
9263.948	Feb 18	Thu	11	Sun enters the astrological sign Pisces, i.e. its longitude is 330°
9264.583	Feb 19	Fri	2	Moon 3.5° SE of Mars; 82° from the Sun in the evening sky
9264.583	Feb 19	Fri	2	Mars 3.5° NNW of Moon; 82° from the Sun in the evening sky; magnitudes 0.8 and -9.7
9265.250	Feb 19	Fri	18	Moon 5.5° SE of the Pleiades; 90° and 89° from the Sun in the evening sky
9265.283	Feb 19	Fri	18:48	<b>First Quarter Moon</b>
9265.845	Feb 20	SAT	8	Venus at aphelion, 0.7282 AU from the Sun
9266.000	Feb 20	SAT	12	Moon 4.9° N of Aldebaran; 98° from the Sun in the evening sky
9266.016	Feb 20	SAT	12	Mercury stationary in right ascension; resumes direct motion
9266.533	Feb 21	SUN	1	Mercury stationary in longitude; resumes direct motion
9266.573	Feb 21	SUN	2	Moon at ascending node; longitude 76.7°
9267.875	Feb 22	Mon	9	Moon 0.59° NE of M35 cluster; 119° and 118° from the Sun in the evening sky

9268.833	Feb 23	Tue	8	Mercury 4.1° NE of Saturn; 24° and 27° from the Sun in the morning sky; magnitudes 0.6 and 0.7
9268.833	Feb 23	Tue	8	Saturn 4.1° SW of Mercury; 27° and 24° from the Sun in the morning sky; magnitudes 0.7 and 0.6
9269.354	Feb 23	Tue	21	Moon 7.3° S of Castor; 136° and 134° from the Sun in the evening sky
9269.563	Feb 24	wed	2	Moon 3.7° S of Pollux; 138° and 137° from the Sun in the evening sky
9270.604	Feb 25	Thu	3	Moon 2.64° NNE of Beehive Cluster; 151° from the Sun in the evening sky
9272.229	Feb 26	Fri	18	Moon 4.3° NNE of Regulus; 171° and 172° from the Sun in the midnight sky
9272.846	Feb 27	SAT	8:18	<b>Full Moon</b>
9275.720	Mar 2	Tue	5:17	Moon at perigee; distance 57.29 Earth-radii
9276.000	Mar 2	Tue	12	Moon 6.0° NNE of Spica; 137° and 138° from the Sun in the morning sky
9277.203	Mar 3	wed	17	Mercury at descending node through the ecliptic plane
9278.167	Mar 4	Thu	16	Mars 2.60° SE of Pleiades; 76° from the Sun in the evening sky; magnitudes 1.0 and 2.9
9278.771	Mar 5	Fri	7	<b>Mercury 0.32° N of Jupiter</b> ; 27° from the Sun in the morning sky; magnitudes 0.2 and -2.0
9278.771	Mar 5	Fri	7	<b>Jupiter 0.32° S of Mercury</b> ; 27° from the Sun in the morning sky; magnitudes -2.0 and 0.2
9279.208	Mar 5	Fri	17	Moon 5.0° NNE of Antares; 95° from the Sun in the morning sky
9279.540	Mar 6	SAT	1	Moon at descending node; longitude 255.4°
9279.563	Mar 6	SAT	1:31	<b>Last Quarter Moon</b>
9279.967	Mar 6	SAT	11	<b>Mercury at westernmost elongation</b> ; 27.3° from Sun in morning sky
9283.542	Mar 10	wed	1	Saturn 3.6° NNW of Moon; 40° from the Sun in the morning sky; magnitudes 0.8 and -7.6
9283.542	Mar 10	wed	1	Moon 3.6° SE of Saturn; 40° from the Sun in the morning sky
9284.250	Mar 10	wed	18	Moon 3.9° SE of Jupiter; 32° from the Sun in the morning sky
9284.250	Mar 10	wed	18	Jupiter 3.9° NNW of Moon; 32° from the Sun in the morning sky; magnitudes -2.0 and -6.9
9284.400	Mar 10	wed	22	Moon, Mercury, and Jupiter within circle of diameter 5.33°; about 30° from the Sun in the morning sky; magnitudes -7, 0, -2
9284.504	Mar 11	Thu	0	Neptune at conjunction with the Sun; 30.919 AU from Earth; latitude -1.10°
9284.667	Mar 11	Thu	4	Moon 3.5° SE of Mercury; 27° from the Sun in the morning sky
9284.667	Mar 11	Thu	4	Mercury 3.5° NNW of Moon; 27° from the Sun in the morning sky; magnitudes 0.1 and -6.5
9285.473	Mar 11	Thu	23	Sun enters Pisces, at longitude 351.60° on the ecliptic
9286.667	Mar 13	SAT	4	Moon 3.6° SE of Venus; 6° and 4° from the Sun in the morning sky

9286.667	Mar 13	SAT	4	Venus 3.6° NNW of Moon; 4° and 6° from the Sun in the morning sky; magnitudes -3.9 and -4.5
9286.742	Mar 13	SAT	6	Moon, Venus, and Neptune within circle of diameter 3.90°; only about 4° from the Sun; magnitudes -4, -4, 8
9286.771	Mar 13	SAT	7	Neptune 3.9° NNW of Moon; 2° and 5° from the Sun in the evening sky; magnitudes 8.0 and -4.4
9286.771	Mar 13	SAT	7	Moon 3.9° SE of Neptune; 5° and 2° from the Sun in the evening sky
9286.932	Mar 13	SAT	10:22	<b>New Moon</b> ; beginning of lunation 1215
9287.5	Mar 14	SUN		Clocks forward 1 hour (America)
9287.5	Mar 14	SUN		Gamma Normid meteors; ZHR 6; peak Mar 14 9h; 1 day after New
9287.574	Mar 14	SUN	2	Mercury at aphelion, 0.4667 AU from the Sun
9287.688	Mar 14	SUN	5	Neptune 0.37° NNW of Venus; 3° from the Sun in the morning sky; magnitudes 8.0 and -3.9
9287.688	Mar 14	SUN	5	Venus 0.37° SE of Neptune; 3° from the Sun in the morning sky; magnitudes -3.9 and 8.0
9287.840	Mar 14	SUN	8	Venus at southernmost latitude from the ecliptic plane, -3.4°
9290.5	Mar 17	wed		St. Patrick's Day
9290.688	Mar 17	wed	5	Uranus 2.52° NNW of Moon; 41° and 42° from the Sun in the evening sky; magnitudes 5.8 and -7.6
9290.688	Mar 17	wed	5	Moon 2.52° SE of Uranus; 42° and 41° from the Sun in the evening sky
9291.702	Mar 18	Thu	5	Moon at apogee; distance 63.54 Earth-radii
9292.583	Mar 19	Fri	2	Moon 5.2° SE of the Pleiades; 62° from the Sun in the evening sky
9293.313	Mar 19	Fri	20	<b>Mars 1.89° NNW of Moon</b> ; 70° from the Sun in the evening sky; magnitudes 1.2 and -9.2
9293.313	Mar 19	Fri	20	<b>Moon 1.89° SE of Mars</b> ; 70° from the Sun in the evening sky
9293.333	Mar 19	Fri	20	Moon 5.1° N of Aldebaran; 71° from the Sun in the evening sky
9293.647	Mar 20	SAT	4	Moon at ascending node; longitude 73.6°
9293.902	Mar 20	SAT	9:40	<b>March or spring or vernal equinox</b>
9293.902	Mar 20	SAT	9:40	Sun enters the astrological sign Aries, i.e. its longitude is 0°
9294.813	Mar 21	SUN	8	Mars 6.9° N of Aldebaran; 69° from the Sun in the evening sky; magnitudes 1.2 and 0.9
9295.112	Mar 21	SUN	14:41	<b>First Quarter Moon</b>
9295.208	Mar 21	SUN	17	Moon 0.73° N of M35 cluster; 91° from the Sun in the evening sky
9296.729	Mar 23	Tue	6	Moon 7.0° S of Castor; 108° and 107° from the Sun in the evening sky
9296.958	Mar 23	Tue	11	Moon 3.4° S of Pollux; 111° and 110° from the Sun in the evening sky
9298.000	Mar 24	wed	12	Moon 2.81° NNE of Beehive Cluster; 123° and 124° from the Sun in the evening sky

9299.667	Mar 26	Fri	4	Moon 4.5° NNE of Regulus; 144° from the Sun in the evening sky
9299.762	Mar 26	Fri	6	Venus at superior conjunction with the Sun; 1.723 AU from Earth; latitude -3.21°
9301.5	Mar 28	SUN		Clocks forward 1 hour (Europe)
9301.5	Mar 28	SUN		Palm Sunday.
9302.284	Mar 28	SUN	18:49	<b>Full Moon</b>
9302.600	Mar 29	Mon	2	Venus brightest; magnitude -3.91°
9303.375	Mar 29	Mon	21	Moon 5.9° NNE of Spica; 164° and 165° from the Sun in the morning sky
9303.667	Mar 30	Tue	4	Mercury 1.28° SE of Neptune; 18° from the Sun in the morning sky; magnitudes -0.4 and 8.0
9303.667	Mar 30	Tue	4	<b>Neptune 1.28° NNW of Mercury</b> ; 18° from the Sun in the morning sky; magnitudes 8.0 and -0.4
9303.761	Mar 30	Tue	6:16	Moon at perigee; distance 56.49 Earth-radii
9305.5	Apr 1	Thu		All Fools' Day
9306.5	Apr 2	Fri		Good Friday
9306.5	Apr 2	Fri	0	Moon 4.8° NNE of Antares; 122° from the Sun in the morning sky
9306.613	Apr 2	Fri	3	Moon at descending node; longitude 252.6°
9307.831	Apr 3	SAT	8	Mercury at southernmost latitude from the ecliptic plane, -7.0°
9308.5	Apr 4	SUN		Easter
9308.919	Apr 4	SUN	10:03	<b>Last Quarter Moon</b>
9309.133	Apr 4	SUN	15	Pluto at northernmost declination, -22.15°
9310.938	Apr 6	Tue	11	Saturn 3.9° NNW of Moon; 65° from the Sun in the morning sky; magnitudes 0.8 and -9.0
9310.938	Apr 6	Tue	11	Moon 3.9° SE of Saturn; 65° from the Sun in the morning sky
9311.938	Apr 7	wed	11	Jupiter 4.2° NNW of Moon; 53° from the Sun in the morning sky; magnitudes -2.1 and -8.4
9311.938	Apr 7	wed	11	Moon 4.2° SE of Jupiter; 53° from the Sun in the morning sky
9314.104	Apr 9	Fri	15	Neptune 4.0° NNW of Moon; 28° from the Sun in the morning sky; magnitudes 8.0 and -6.6
9314.104	Apr 9	Fri	15	Moon 4.0° SE of Neptune; 28° from the Sun in the morning sky
9315.896	Apr 11	SUN	10	Moon 2.71° SE of Mercury; 9° and 8° from the Sun in the morning sky
9315.896	Apr 11	SUN	10	Mercury 2.71° NNW of Moon; 8° and 9° from the Sun in the morning sky; magnitudes -1.2 and -4.8
9316.605	Apr 12	Mon	2:32	<b>New Moon</b> ; beginning of lunation 1216
9317.042	Apr 12	Mon	13	Moon, Venus, and Pleiade within circle of diameter 2.61°; only about 5° from the Sun; magnitudes -4, -4, 3
9317.042	Apr 12	Mon	13	Venus 2.61° NNW of Moon; 5° and 6° from the Sun in the evening sky; magnitudes -3.9 and -4.4
9317.042	Apr 12	Mon	13	Moon 2.61° SE of Venus; 6° and 5° from the Sun in the evening sky
9317.5	Apr 13	Tue		1st day of Ramadan (1442 A.H.)



9318.083	Apr 13	Tue 14	Moon 2.31° SE of Uranus; 16° from the Sun in the evening sky
9318.083	Apr 13	Tue 14	Uranus 2.31° NNW of Moon; 16° from the Sun in the evening sky; magnitudes 5.9 and -5.5
9319.239	Apr 14	wed 18	Moon at apogee; distance 63.68 Earth-radii
9319.854	Apr 15	Thu 9	Moon 5.0° SE of the Pleiades; 35° from the Sun in the evening sky
9319.887	Apr 15	Thu 9	The equation of time is 0.
9320.604	Apr 16	Fri 3	Moon 5.3° NNW of Aldebaran; 43° and 44° from the Sun in the evening sky
9320.746	Apr 16	Fri 6	Moon at ascending node; longitude 71.4°
9322.021	Apr 17	SAT 13	<b>Moon 0.20° SE of Mars</b> ; 59° from the Sun in the evening sky
9322.021	Apr 17	SAT 13	<b>Mars 0.20° NW of Moon</b> ; 59° from the Sun in the evening sky; magnitudes 1.5 and -8.6
9322.521	Apr 18	SUN 1	Moon 0.99° NNE of M35 cluster; 64° from the Sun in the evening sky
9323.453	Apr 18	SUN 23	Sun enters Aries, at longitude 29.12° on the ecliptic
9323.567	Apr 19	Mon 2	Mercury at superior conjunction with the Sun; 1.331 AU from Earth; latitude -2.33°
9324.063	Apr 19	Mon 14	Moon 6.8° S of Castor; 82° and 81° from the Sun in the evening sky
9324.271	Apr 19	Mon 19	Moon 3.2° S of Pollux; 84° from the Sun in the evening sky
9324.358	Apr 19	Mon 21	Sun enters the astrological sign Taurus, i.e. its longitude is 30°
9324.791	Apr 20	Tue 6:59	<b>First Quarter Moon</b>
9325.375	Apr 20	Tue 21	Moon 3.0° NNE of Beehive Cluster; 97° from the Sun in the evening sky
9326.5	Apr 22	Thu	<b>Lyrid meteors</b> ; ZHR 18; peak Apr 22 6h; 2 days after First Quarter
9326.889	Apr 22	Thu 9	Mercury at ascending node through the ecliptic plane
9327.063	Apr 22	Thu 14	Moon 4.6° NNE of Regulus; 117° from the Sun in the evening sky
9327.399	Apr 22	Thu 22	Mars at northernmost declination, 24.90°
9327.5	Apr 23	Fri	Pi Puppis meteors; ZHR 10; peak Apr 23 11h; 3 days after First Quarter
9327.563	Apr 23	Fri 2	Uranus 0.24° NNW of Venus; 7° from the Sun in the evening sky; magnitudes 5.9 and -3.9
9327.563	Apr 23	Fri 2	Venus 0.24° SE of Uranus; 7° from the Sun in the evening sky; magnitudes -3.9 and 5.9
9328.771	Apr 24	SAT 7	Mercury 0.74° NNW of Uranus; 6° from the Sun in the evening sky; magnitudes -1.7 and 5.9
9328.771	Apr 24	SAT 7	Uranus 0.74° SE of Mercury; 6° from the Sun in the evening sky; magnitudes 5.9 and -1.7
9328.875	Apr 24	SAT 9	Mercury, Venus, and Uranus within circle of diameter 1.68°; about 7° from the Sun in the evening sky; magnitudes -2, -4, 6
9330.229	Apr 25	SUN 18	Mercury 1.16° NNW of Venus; 8° from the Sun in the evening sky; magnitudes -1.6 and -3.9

9330.229	Apr 25	SUN	18	Venus 1.16° SE of Mercury; 8° from the Sun in the evening sky; magnitudes -3.9 and -1.6
9330.833	Apr 26	Mon	8	Moon 5.9° NNE of Spica; 168° from the Sun in the evening sky
9331.559	Apr 27	Tue	1	Mercury at perihelion, 0.3075 AU from the Sun
9331.647	Apr 27	Tue	3:32	<b>Full Moon</b>
9331.745	Apr 27	Tue	6	Pluto stationary in longitude; starts retrograde motion
9331.771	Apr 27	Tue	7	Mars 0.55° N of M35 cluster; 55° from the Sun in the evening sky; magnitudes 1.5 and 5.3
9332.139	Apr 27	Tue	15:20	Moon at perigee; distance 56.03 Earth-radii
9332.139	Apr 27	Tue	15:20	Perigee only 11.8 hours after Full Moon
9332.732	Apr 28	Wed	6	Pluto stationary in right ascension; starts retrograde motion
9333.875	Apr 29	Thu	9	Moon 4.7° NNE of Antares; 148° and 149° from the Sun in the morning sky
9333.888	Apr 29	Thu	9	Moon at descending node; longitude 251.0°
9335.332	Apr 30	Fri	20	Uranus at conjunction with the Sun; 20.764 AU from Earth; latitude -0.43°
9337.916	May 3	Mon	10	Saturn at west quadrature, 90° from the Sun
9338.313	May 3	Mon	20	Moon 4.1° SE of Saturn; 90° from the Sun in the morning sky
9338.313	May 3	Mon	20	Saturn 4.1° NNW of Moon; 90° from the Sun in the morning sky; magnitudes 0.8 and -10.1
9338.327	May 3	Mon	19:51	<b>Last Quarter Moon</b>
9338.875	May 4	Tue	9	Mercury 2.12° SE of Pleiades; 16° and 17° from the Sun in the evening sky; magnitudes -0.8 and 2.9
9339.5	May 5	Wed		<b>Eta Aquarid meteors</b> ; ZHR 50; peak May 5 19h; 2 days after Last Quarter
9339.521	May 5	Wed	1	Moon 4.4° SE of Jupiter; 76° from the Sun in the morning sky
9339.521	May 5	Wed	1	Jupiter 4.4° NNW of Moon; 76° from the Sun in the morning sky; magnitudes -2.2 and -9.5
9341.417	May 6	Thu	22	Neptune 4.0° NNW of Moon; 54° from the Sun in the morning sky; magnitudes 7.9 and -8.3
9341.417	May 6	Thu	22	Moon 4.0° SE of Neptune; 54° from the Sun in the morning sky
9341.768	May 7	Fri	6	Mercury at northernmost latitude from the ecliptic plane, 7.0°
9342.5	May 8	SAT		Eta Lyrid meteors; ZHR 3; peak May 8 9h; 3 days before New
9342.792	May 8	SAT	7	Mars and Saturn at heliocentric opposition; longitudes 127.5° and 307.5°
9343.938	May 9	SUN	11	Venus 4.1° SE of the Pleiades; 11° and 12° from the Sun in the evening sky; magnitudes -3.9 and 2.9
9344.135	May 9	SUN	15	Venus at ascending node through the ecliptic plane
9344.667	May 10	Mon	4	Mercury 7.9° N of Aldebaran; 20° and 21° from the Sun in the evening sky; magnitudes -0.3 and 0.9
9345.479	May 10	Mon	24	Uranus 2.20° NNW of Moon; 9° from the Sun in the morning sky; magnitudes 5.9 and -4.7

9345.479	May 10	Mon 24	Moon 2.20° SE of Uranus; 9° from the Sun in the morning sky
9346.292	May 11	Tue 19:00	<b>New Moon</b> ; beginning of lunation 1217
9346.421	May 11	Tue 22	Moon at apogee; distance 63.73 Earth-radii; farthest in year
9347.104	May 12	wed 15	Moon 5.0° SE of the Pleiades; 9° from the Sun in the evening sky
9347.458	May 12	wed 23	Venus 0.71° NNW of Moon; 12° and 13° from the Sun in the evening sky; magnitudes -3.9 and -5.1
9347.458	May 12	wed 23	Moon 0.71° SE of Venus; 13° and 12° from the Sun in the evening sky
9347.854	May 13	Thu 9	Moon 5.4° NNW of Aldebaran; 17° and 18° from the Sun in the evening sky
9347.939	May 13	Thu 11	Moon at ascending node; longitude 70.7°
9348.313	May 13	Thu 20	Mercury 2.09° NNW of Moon; 22° from the Sun in the evening sky; magnitudes 0.1 and -6.0
9348.313	May 13	Thu 20	Moon 2.09° SE of Mercury; 22° from the Sun in the evening sky
9348.353	May 13	Thu 20	The equation of time is at a maximum of 3.65 minutes.
9348.570	May 14	Fri 2	Sun enters Taurus, at longitude 53.50° on the ecliptic
9349.771	May 15	SAT 7	Moon 1.07° N of M35 cluster; 38° from the Sun in the evening sky
9350.729	May 16	SUN 6	<b>Mars 1.50° SSW of Moon</b> ; 48° and 49° from the Sun in the evening sky; magnitudes 1.7 and -8.0
9350.729	May 16	SUN 6	<b>Moon 1.50° NNE of Mars</b> ; 49° and 48° from the Sun in the evening sky
9351.313	May 16	SUN 20	Moon 6.7° S of Castor; 55° from the Sun in the evening sky
9351.542	May 17	Mon 1	Moon 3.1° S of Pollux; 58° and 57° from the Sun in the evening sky
9351.646	May 17	Mon 4	Venus 5.8° N of Aldebaran; 13° and 15° from the Sun in the evening sky; magnitudes -3.9 and 0.9
9351.740	May 17	Mon 6	<b>Mercury at easternmost elongation</b> ; 22.0° from Sun in evening sky
9352.332	May 17	Mon 20	Mercury at northernmost declination, 25.25°
9352.646	May 18	Tue 4	Moon 3.1° NNE of Beehive Cluster; 70° from the Sun in the evening sky
9354.300	May 19	wed 19:12	<b>First Quarter Moon</b>
9354.396	May 19	wed 22	Moon 4.7° NNE of Regulus; 91° from the Sun in the evening sky
9355.318	May 20	Thu 20	Sun enters the astrological sign Gemini, i.e. its longitude is 60°
9356.126	May 21	Fri 15	Jupiter at west quadrature, 90° from the Sun
9357.5	May 23	SUN	Whit Sunday
9357.849	May 23	SUN 8	Saturn stationary in longitude; starts retrograde motion
9358.271	May 23	SUN 19	Moon 5.9° NNE of Spica; 142° and 141° from the Sun in the evening sky

9358.287	May	23	SUN	19	Saturn stationary in right ascension; starts retrograde motion
9360.574	May	26	wed	1:46	Perigee only 9.5 hours before Full Moon
9360.574	May	26	wed	1:46	Moon at perigee; distance 56.02 Earth-radii
9360.968	May	26	wed	11:14	<b>Full Moon. Total eclipse of the Moon</b>
9361.313	May	26	wed	20	Moon 4.6° NNE of Antares; 175° and 174° from the Sun in the midnight sky
9361.317	May	26	wed	20	Moon at descending node; longitude 250.7°
9361.583	May	27	Thu	2	Mars 8.7° S of Castor; 44° and 45° from the Sun in the evening sky; magnitudes 1.7 and 1.5
9363.646	May	29	SAT	4	<b>Mercury 0.40° SE of Venus</b> ; 17° from the Sun in the evening sky; magnitudes 2.2 and -3.9
9363.646	May	29	SAT	4	Venus 0.40° NNW of Mercury; 17° from the Sun in the evening sky; magnitudes -3.9 and 2.2
9364.167	May	29	SAT	16	Mercury 7.6° W of M35 cluster; 16° and 24° from the Sun in the evening sky; magnitudes 2.3 and 5.3; quasi-conjunction
9364.437	May	29	SAT	22	Mercury stationary in longitude; starts retrograde motion
9364.573	May	30	SUN	2	Mercury stationary in right ascension; starts retrograde motion
9365.171	May	30	SUN	16	Mercury at descending node through the ecliptic plane
9365.646	May	31	Mon	4	Saturn 4.1° NNW of Moon; 116° from the Sun in the morning sky; magnitudes 0.6 and -11.0
9365.646	May	31	Mon	4	Moon 4.1° SE of Saturn; 116° from the Sun in the morning sky
9366.479	May	31	Mon	24	Mars 5.3° S of Pollux; 43° from the Sun in the evening sky; magnitudes 1.7 and 1.2
9366.620	Jun	1	Tue	3	Middle of eclipse season: Sun is at same longitude as Moon's ascending node, 70.9°
9367.021	Jun	1	Tue	13	Jupiter 4.4° NNW of Moon; 100° and 99° from the Sun in the morning sky; magnitudes -2.4 and -10.4
9367.021	Jun	1	Tue	13	Moon 4.4° SE of Jupiter; 99° and 100° from the Sun in the morning sky
9367.809	Jun	2	wed	7:25	<b>Last Quarter Moon</b>
9368.708	Jun	3	Thu	5	Neptune 4.1° NNW of Moon; 80° from the Sun in the morning sky; magnitudes 7.9 and -9.6
9368.708	Jun	3	Thu	5	Moon 4.1° SE of Neptune; 80° from the Sun in the morning sky
9369.938	Jun	4	Fri	11	Venus 0.11° NNE of M35 cluster; 18° from the Sun in the evening sky; magnitudes -3.9 and 5.3
9370.237	Jun	4	Fri	18	Mars at northernmost latitude from the ecliptic plane, 1.8°
9370.998	Jun	5	SAT	12	Venus at northernmost declination, 24.43°
9372.344	Jun	6	SUN	20	Mars and Jupiter at heliocentric opposition; longitudes 140.7° and 320.7°
9372.5	Jun	7	Mon		Daytime Arietid meteors; ZHR 30; peak Jun 7 3h; 3 days before New
9372.854	Jun	7	Mon	9	Moon 2.09° SE of Uranus; 34° from the Sun in the morning sky

9372.854	Jun	7	Mon	9	Uranus 2.09° NNW of Moon; 34° from the Sun in the morning sky; magnitudes 5.9 and -6.9
9373.588	Jun	8	Tue	2	Moon at apogee; distance 63.69 Earth-radii
9374.375	Jun	8	Tue	21	Moon 5.0° SE of the Pleiades; 17° and 18° from the Sun in the morning sky
9375.125	Jun	9	Wed	15	Moon 5.4° N of Aldebaran; 9° and 10° from the Sun in the morning sky
9375.197	Jun	9	Wed	17	Moon at ascending node; longitude 70.8°
9375.543	Jun	10	Thu	1	Mercury at aphelion, 0.4667 AU from the Sun
9375.953	Jun	10	Thu	10:53	<b>New Moon</b> ; beginning of lunation 1218. Annular eclipse of the Sun
9376.021	Jun	10	Thu	13	Moon 3.9° N of Mercury; 1° and 3° from the Sun in the evening sky
9376.021	Jun	10	Thu	13	Mercury 3.9° S of Moon; 3° and 1° from the Sun in the evening sky; magnitudes 5.4 and -3.8
9376.546	Jun	11	Fri	1	Mercury at inferior conjunction with the Sun; 0.551 AU from Earth; latitude -3.70°
9377.021	Jun	11	Fri	13	Moon 1.10° NNE of M35 cluster; 12° from the Sun in the evening sky
9377.813	Jun	12	SAT	8	<b>Moon 1.51° NNE of Venus</b> ; 21° and 20° from the Sun in the evening sky
9377.813	Jun	12	SAT	8	<b>Venus 1.51° SSW of Moon</b> ; 20° and 21° from the Sun in the evening sky; magnitudes -3.9 and -5.9
9378.233	Jun	12	SAT	18	Venus at perihelion, 0.7184 AU from the Sun
9378.362	Jun	12	SAT	21	The equation of time is 0.
9378.563	Jun	13	SUN	2	Moon 6.7° S of Castor; 29° and 30° from the Sun in the evening sky
9378.771	Jun	13	SUN	7	Moon 3.1° S of Pollux; 32° from the Sun in the evening sky
9379.396	Jun	13	SUN	22	Mars 2.79° SSW of Moon; 38° and 39° from the Sun in the evening sky; magnitudes 1.8 and -7.4
9379.396	Jun	13	SUN	22	Moon 2.79° NNE of Mars; 39° and 38° from the Sun in the evening sky
9379.688	Jun	14	Mon	4:31	Earliest sunrise, at latitude 40° north
9379.875	Jun	14	Mon	9	Moon 3.1° NNE of Beehive Cluster; 44° from the Sun in the evening sky
9381.646	Jun	16	Wed	4	Moon 4.7° NNE of Regulus; 65° from the Sun in the evening sky
9383.662	Jun	18	Fri	3:54	<b>First Quarter Moon</b>
9385.042	Jun	19	SAT	13	Venus 8.7° S of Castor; 22° and 24° from the Sun in the evening sky; magnitudes -3.9 and 1.5
9385.646	Jun	20	SUN	4	Moon 5.9° NNE of Spica; 116° and 115° from the Sun in the evening sky
9386.106	Jun	20	SUN	15	Jupiter stationary in longitude; starts retrograde motion
9386.648	Jun	21	Mon	3:32	<b>June or summer solstice</b>
9386.648	Jun	21	Mon	3:32	Sun enters the astrological sign Cancer, i.e. its longitude is 90°
9386.663	Jun	21	Mon	4	Jupiter stationary in right ascension; starts retrograde motion

9387.129	Jun 21	Mon	15	Sun enters Gemini, at longitude 90.46° on the ecliptic
9387.417	Jun 21	Mon	22	Venus 5.2° S of Pollux; 23° and 24° from the Sun in the evening sky; magnitudes -3.9 and 1.2
9388.396	Jun 22	Tue	22	Mercury 6.1° ENE of Aldebaran; 16° and 22° from the Sun in the morning sky; magnitudes 2.3 and 0.9; quasi-conjunction
9388.413	Jun 22	Tue	22	Mercury stationary in longitude; resumes direct motion
9388.440	Jun 22	Tue	23	Mercury stationary in right ascension; resumes direct motion
9388.5	Jun 23	Wed		June Boötid meteors; ZHR 5; peak Jun 23 0h; 2 days before Full
9388.750	Jun 23	Wed	6	Moon shows minimum libration for the year, 0.05°
9388.754	Jun 23	Wed	6	Moon at descending node; longitude 250.7°
9388.771	Jun 23	Wed	7	Moon 4.6° NNE of Antares; 159° and 158° from the Sun in the evening sky
9388.911	Jun 23	Wed	9:52	Moon at perigee; distance 56.44 Earth-radii
9389.438	Jun 23	Wed	23	Mars 0.03° SE of Beehive Cluster; 35° from the Sun in the evening sky; magnitudes 1.8 and 3.7
9390.277	Jun 24	Thu	18:39	<b>Full Moon</b>
9391.042	Jun 25	Fri	13	Neptune stationary in longitude; starts retrograde motion
9391.659	Jun 26	SAT	4	Neptune stationary in right ascension; starts retrograde motion
9392.979	Jun 27	SUN	12	Moon 3.9° SE of Saturn; 143° from the Sun in the morning sky
9392.979	Jun 27	SUN	12	Saturn 3.9° NNW of Moon; 143° from the Sun in the morning sky; magnitudes 0.5 and -11.8
9393.315	Jun 27	SUN	19:33	Latest sunset, at latitude 40° north
9394.417	Jun 28	Mon	22	Jupiter 4.2° NNW of Moon; 125° from the Sun in the morning sky; magnitudes -2.6 and -11.2
9394.417	Jun 28	Mon	22	Moon 4.2° SE of Jupiter; 125° from the Sun in the morning sky
9395.800	Jun 30	Wed	7	Mercury at southernmost latitude from the ecliptic plane, -7.0°
9396.042	Jun 30	Wed	13	Moon 4.0° SE of Neptune; 105° and 106° from the Sun in the morning sky
9396.042	Jun 30	Wed	13	Neptune 4.0° NNW of Moon; 106° and 105° from the Sun in the morning sky; magnitudes 7.9 and -10.6
9397.383	Jul 1	Thu	21:11	<b>Last Quarter Moon</b>
9399.000	Jul 3	SAT	12	Venus 0.35° NNE of Beehive Cluster; 26° from the Sun in the evening sky; magnitudes -3.9 and 3.7
9399.637	Jul 4	SUN	3	Venus at northernmost latitude from the ecliptic plane, 3.4°
9400.229	Jul 4	SUN	18	<b>Uranus 1.94° NNW of Moon</b> ; 59° from the Sun in the morning sky; magnitudes 5.8 and -8.6
9400.229	Jul 4	SUN	18	Moon 1.94° SE of Uranus; 59° from the Sun in the morning sky

9400.317	Jul	4	SUN	20	<b>Mercury at westernmost elongation;</b> 21.5° from Sun in morning sky
9401.115	Jul	5	Mon	15	Moon at apogee; distance 63.55 Earth-radii
9401.483	Jul	5	Mon	24	<b>Earth at aphelion;</b> 1.0167 AU from the Sun
9401.646	Jul	6	Tue	4	Moon 5.0° SE of the Pleiades; 43° and 44° from the Sun in the morning sky
9402.396	Jul	6	Tue	22	Moon 5.4° N of Aldebaran; 35° from the Sun in the morning sky
9402.447	Jul	6	Tue	23	Moon at ascending node; longitude 70.5°
9403.667	Jul	8	Thu	4	Moon 3.7° N of Mercury; 21° from the Sun in the morning sky
9403.667	Jul	8	Thu	4	Mercury 3.7° S of Moon; 21° from the Sun in the morning sky; magnitudes 0.1 and -5.9
9404.271	Jul	8	Thu	19	Moon 1.04° N of M35 cluster; 15° from the Sun in the morning sky
9405.553	Jul	10	SAT	1:17	<b>New Moon;</b> beginning of lunation 1219
9405.813	Jul	10	SAT	8	Moon 6.7° S of Castor; 5° and 10° from the Sun in the evening sky
9406.042	Jul	10	SAT	13	Moon 3.2° S of Pollux; 7° and 8° from the Sun in the evening sky
9407.125	Jul	11	SUN	15	Moon 3.1° NNE of Beehive Cluster; 19° and 18° from the Sun in the evening sky
9407.979	Jul	12	Mon	12	Moon 3.1° NNE of Venus; 29° and 28° from the Sun in the evening sky
9407.979	Jul	12	Mon	12	Venus 3.1° SSW of Moon; 28° and 29° from the Sun in the evening sky; magnitudes -3.9 and -6.6
9408.000	Jul	12	Mon	12	Moon, Venus, and Mars within circle of diameter 3.63°; about 29° from the Sun in the evening sky; magnitudes -7, -4, 2
9408.042	Jul	12	Mon	13	Mars 3.6° SSW of Moon; 29° from the Sun in the evening sky; magnitudes 1.8 and -6.7
9408.042	Jul	12	Mon	13	Moon 3.6° NNE of Mars; 29° from the Sun in the evening sky
9408.521	Jul	13	Tue	0	Mars at aphelion, 1.6660 AU from the Sun
9408.875	Jul	13	Tue	9	Moon 4.6° NNE of Regulus; 39° from the Sun in the evening sky
9409.083	Jul	13	Tue	14	<b>Venus 0.47° NNE of Mars;</b> 29° and 28° from the Sun in the evening sky; magnitudes -3.9 and 1.8
9409.083	Jul	13	Tue	14	<b>Mars 0.47° SSW of Venus;</b> 28° and 29° from the Sun in the evening sky; magnitudes 1.8 and -3.9
9409.125	Jul	13	Tue	15	Mercury 2.15° S of M35 cluster; 19° from the Sun in the morning sky; magnitudes -0.5 and 5.3
9412.896	Jul	17	SAT	10	Moon 5.7° NNE of Spica; 90° and 89° from the Sun in the evening sky
9412.924	Jul	17	SAT	10:10	<b>First Quarter Moon</b>
9413.120	Jul	17	SAT	15	<b>Pluto at opposition in longitude;</b> magnitude 14.3
9414.858	Jul	19	Mon	9	Mercury at ascending node through the ecliptic plane
9415.492	Jul	19	Mon	24	Mercury at northernmost declination, 22.86°
9416.056	Jul	20	Tue	13	Moon at descending node; longitude 249.8°

9416.125	Jul	20	Tue	15	Moon 4.5° NNE of Antares; 133° and 132° from the Sun in the evening sky
9416.306	Jul	20	Tue	19	Sun enters Cancer, at longitude 118.29° on the ecliptic
9416.933	Jul	21	wed	10:24	Moon at perigee; distance 57.15 Earth-radii
9417.646	Jul	22	Thu	4	<b>Venus 1.09° NNE of Regulus</b> ; 31° from the Sun in the evening sky; magnitudes -3.9 and 1.4
9418.102	Jul	22	Thu	14	Sun enters the astrological sign Leo, i.e. its longitude is 120°
9419.354	Jul	23	Fri	21	Mercury 9.3° S of Castor; 10° and 15° from the Sun in the morning sky; magnitudes -1.4 and 1.5
9419.528	Jul	24	SAT	1	Mercury at perihelion, 0.3075 AU from the Sun
9419.609	Jul	24	SAT	2:36	<b>Full Moon</b>
9420.271	Jul	24	SAT	19	Moon 3.7° SE of Saturn; 170° and 171° from the Sun in the midnight sky
9420.271	Jul	24	SAT	19	Saturn 3.7° NNW of Moon; 171° and 170° from the Sun in the midnight sky; magnitudes 0.3 and -12.5
9420.646	Jul	25	SUN	4	Mercury 5.7° S of Pollux; 9° and 11° from the Sun in the morning sky; magnitudes -1.5 and 1.2
9421.474	Jul	25	SUN	23	The equation of time is at a minimum of -6.55 minutes.
9421.688	Jul	26	Mon	5	Moon 3.9° SE of Jupiter; 152° and 153° from the Sun in the morning sky
9421.688	Jul	26	Mon	5	Jupiter 3.9° NNW of Moon; 153° and 152° from the Sun in the morning sky; magnitudes -2.8 and -12.0
9422.5	Jul	27	Tue		Piscid Austrinid meteors; ZHR 5; peak Jul 27 20h; 4 days before Last Quarter
9423.396	Jul	27	Tue	22	Neptune 3.8° NNW of Moon; 132° from the Sun in the morning sky; magnitudes 7.8 and -11.4
9423.396	Jul	27	Tue	22	Moon 3.8° SE of Neptune; 132° from the Sun in the morning sky
9424.5	Jul	29	Thu		<b>Southern Delta Aquarid meteors</b> ; ZHR 25; peak Jul 29 22h; 2 days before Last Quarter
9424.5	Jul	29	Thu		Alpha Capricornid meteors; ZHR 5; peak Jul 29 22h; 2 days before Last Quarter
9425.563	Jul	30	Fri	2	<b>Mars 0.63° NNE of Regulus</b> ; 23° from the Sun in the evening sky; magnitudes 1.8 and 1.4
9427.054	Jul	31	SAT	13:17	<b>Last Quarter Moon</b>
9427.188	Jul	31	SAT	17	Mercury 0.35° NNE of Beehive Cluster; 2° from the Sun in the morning sky; magnitudes -2.0 and 3.7
9427.604	Aug	1	SUN	3	<b>Uranus 1.72° NNW of Moon</b> ; 84° from the Sun in the morning sky; magnitudes 5.8 and -9.7
9427.604	Aug	1	SUN	3	Moon 1.72° SE of Uranus; 84° from the Sun in the morning sky
9428.080	Aug	1	SUN	14	Mercury at superior conjunction with the Sun; 1.342 AU from Earth; latitude 6.92°
9428.752	Aug	2	Mon	6	<b>Saturn at opposition in longitude</b> ; magnitude 0.2
9428.822	Aug	2	Mon	8	Moon at apogee; distance 63.41 Earth-radii
9428.938	Aug	2	Mon	11	Moon 4.8° SE of the Pleiades; 70° from the Sun in the morning sky



9429.622	Aug	3	Tue	3	Moon at ascending node; longitude 68.9°
9429.708	Aug	3	Tue	5	Moon 5.6° N of Aldebaran; 61° from the Sun in the morning sky
9429.737	Aug	3	Tue	6	Mercury at northernmost latitude from the ecliptic plane, 7.0°
9431.583	Aug	5	Thu	2	Moon 1.13° N of M35 cluster; 41° from the Sun in the morning sky
9433.125	Aug	6	Fri	15	Moon 6.7° S of Castor; 23° and 26° from the Sun in the morning sky
9433.333	Aug	6	Fri	20	Moon 3.1° S of Pollux; 21° and 22° from the Sun in the morning sky
9433.494	Aug	6	Fri	24	Uranus at west quadrature, 90° from the Sun
9434.417	Aug	7	SAT	22	Moon 3.0° NNE of Beehive Cluster; 9° and 8° from the Sun in the morning sky
9435.076	Aug	8	SUN	13:50	<b>New Moon</b> ; beginning of lunation 1220
9435.750	Aug	9	Mon	6	Mercury 3.2° SSW of Moon; 8° and 10° from the Sun in the evening sky; magnitudes -1.2 and -4.9
9435.750	Aug	9	Mon	6	Moon 3.2° NNE of Mercury; 10° and 8° from the Sun in the evening sky
9436.146	Aug	9	Mon	16	Moon 4.5° NNE of Regulus; 14° and 13° from the Sun in the evening sky
9436.5	Aug	10	Tue		1st day of Muslim year (1443 A.H.)
9436.667	Aug	10	Tue	4	Moon 4.0° NNE of Mars; 20° and 19° from the Sun in the evening sky
9436.667	Aug	10	Tue	4	Mars 4.0° SSW of Moon; 19° and 20° from the Sun in the evening sky; magnitudes 1.8 and -5.9
9437.135	Aug	10	Tue	15	Sun enters Leo, at longitude 138.21° on the ecliptic
9437.958	Aug	11	wed	11	Moon 3.9° NNE of Venus; 36° and 35° from the Sun in the evening sky
9437.958	Aug	11	wed	11	Venus 3.9° SSW of Moon; 35° and 36° from the Sun in the evening sky; magnitudes -4.0 and -7.3
9438.5	Aug	12	Thu		<b>Perseid meteors</b> ; ZHR 110; peak Aug 12 12h; 3 days before First Quarter
9438.521	Aug	12	Thu	1	Mercury 1.08° NNE of Regulus; 11° from the Sun in the evening sky; magnitudes -0.9 and 1.4
9440.125	Aug	13	Fri	15	Moon 5.5° NNE of Spica; 64° and 63° from the Sun in the evening sky
9442.139	Aug	15	SUN	15:20	<b>First Quarter Moon</b>
9443.058	Aug	16	Mon	13	Mars and Neptune at heliocentric opposition; longitudes 171.6° and 351.6°
9443.170	Aug	16	Mon	16	Moon at descending node; longitude 247.6°
9443.396	Aug	16	Mon	22	Moon 4.4° NNE of Antares; 107° and 106° from the Sun in the evening sky
9443.5	Aug	17	Tue		Kappa Cygnid meteors; ZHR 3; peak Aug 17 17h; 2 days after First Quarter
9443.889	Aug	17	Tue	9:20	Moon at perigee; distance 57.87 Earth-radii
9445.667	Aug	19	Thu	4	<b>Mercury 0.08° S of Mars</b> ; 16° from the Sun in the evening sky; magnitudes -0.5 and 1.8
9445.667	Aug	19	Thu	4	<b>Mars 0.08° N of Mercury</b> ; 16° from the Sun in the evening sky; magnitudes 1.8 and -0.5

9446.427	Aug 19	Thu	22	Uranus stationary in longitude; starts retrograde motion
9446.510	Aug 20	Fri	0	Uranus stationary in right ascension; starts retrograde motion
9446.513	Aug 20	Fri	0	<b>Jupiter at opposition in longitude</b> ; magnitude -2.9
9447.5	Aug 21	SAT	0	Moon 3.6° SE of Saturn; 160° and 161° from the Sun in the evening sky
9447.5	Aug 21	SAT	0	Saturn 3.6° NNW of Moon; 161° and 160° from the Sun in the evening sky; magnitudes 0.3 and -12.2
9448.813	Aug 22	SUN	8	Jupiter 3.7° NNW of Moon; 177° and 175° from the Sun in the midnight sky; magnitudes -2.9 and -12.6
9448.813	Aug 22	SUN	8	Moon 3.7° SE of Jupiter; 175° and 177° from the Sun in the midnight sky
9449.001	Aug 22	SUN	12:01	<b>Full Moon</b>
9449.400	Aug 22	SUN	22	Sun enters the astrological sign Virgo, i.e. its longitude is 150°
9450.729	Aug 24	Tue	6	Moon 3.7° SE of Neptune; 158° and 159° from the Sun in the morning sky
9450.729	Aug 24	Tue	6	Neptune 3.7° NNW of Moon; 159° and 158° from the Sun in the morning sky; magnitudes 7.8 and -12.1
9451.510	Aug 25	wed	0	Summer solstice on Mars
9453.141	Aug 26	Thu	15	Mercury at descending node through the ecliptic plane
9454.938	Aug 28	SAT	11	<b>Uranus 1.44° NNW of Moon</b> ; 111° and 110° from the Sun in the morning sky; magnitudes 5.7 and -10.7
9454.938	Aug 28	SAT	11	Moon 1.44° SE of Uranus; 110° and 111° from the Sun in the morning sky
9455.688	Aug 29	SUN	5	Venus at descending node through the ecliptic plane
9456.271	Aug 29	SUN	19	Moon 4.6° SE of the Pleiades; 96° from the Sun in the morning sky
9456.596	Aug 30	Mon	2	Moon at apogee; distance 63.36 Earth-radii
9456.719	Aug 30	Mon	5	Moon at ascending node; longitude 66.2°
9456.801	Aug 30	Mon	7:14	<b>Last Quarter Moon</b>
9457.021	Aug 30	Mon	13	Moon 5.8° NNW of Aldebaran; 88° and 87° from the Sun in the morning sky
9457.5	Aug 31	Tue		Aurigid meteors; ZHR 5; peak Aug 31 19h; 2 days after Last Quarter
9458.828	Sep 1	wed	8	The equation of time is 0.
9458.938	Sep 1	wed	11	Moon 1.36° N of M35 cluster; 67° from the Sun in the morning sky
9460.458	Sep 2	Thu	23	Moon 6.6° S of Castor; 50° and 51° from the Sun in the morning sky
9460.688	Sep 3	Fri	5	Moon 2.98° S of Pollux; 47° and 48° from the Sun in the morning sky
9461.771	Sep 4	SAT	7	Moon 3.1° NNE of Beehive Cluster; 34° from the Sun in the morning sky
9463.375	Sep 5	SUN	21	<b>Venus 1.57° NNE of Spica</b> ; 41° from the Sun in the evening sky; magnitudes -4.1 and 1.0
9463.5	Sep 6	Mon	0	Moon 4.5° NNE of Regulus; 14° from the Sun in the morning sky
9463.513	Sep 6	Mon	0	Mercury at aphelion, 0.4667 AU from the Sun

9464.535	Sep	7	Tue	0:51	<b>New Moon</b> ; beginning of lunation 1221
9465.333	Sep	7	Tue	20	Moon 3.8° NNE of Mars; 11° and 10° from the Sun in the evening sky
9465.333	Sep	7	Tue	20	Mars 3.8° SSW of Moon; 10° and 11° from the Sun in the evening sky; magnitudes 1.8 and -5.1
9466.5	Sep	9	Thu		September Epsilon Perseid meteors; ZHR 10; peak Sep 9 4h; 2 days after New
9466.583	Sep	9	Thu	2	Moon 5.9° NNE of Mercury; 27° and 26° from the Sun in the evening sky
9466.583	Sep	9	Thu	2	Mercury 5.9° SSW of Moon; 26° and 27° from the Sun in the evening sky; magnitudes 0.1 and -6.6
9467.396	Sep	9	Thu	22	Moon 5.3° NNE of Spica; 38° and 37° from the Sun in the evening sky
9467.750	Sep	10	Fri	6	Venus 3.7° SSW of Moon; 42° from the Sun in the evening sky; magnitudes -4.1 and -7.8
9467.750	Sep	10	Fri	6	Moon 3.7° NNE of Venus; 42° from the Sun in the evening sky
9468.912	Sep	11	SAT	9:53	Moon at perigee; distance 57.77 Earth-radii
9470.191	Sep	12	SUN	17	Moon at descending node; longitude 244.7°
9470.604	Sep	13	Mon	3	Moon 4.1° NNE of Antares; 80° from the Sun in the evening sky
9471.361	Sep	13	Mon	20:40	<b>First Quarter Moon</b>
9471.677	Sep	14	Tue	4	<b>Mercury at easternmost elongation</b> ; 26.8° from Sun in evening sky
9471.881	Sep	14	Tue	9	<b>Neptune at opposition in longitude</b> ; magnitude 7.8
9474.354	Sep	16	Thu	20	Sun enters Virgo, at longitude 174.19° on the ecliptic
9474.688	Sep	17	Fri	5	Saturn 3.7° NNW of Moon; 133° from the Sun in the evening sky; magnitudes 0.5 and -11.5
9474.688	Sep	17	Fri	5	Moon 3.7° SE of Saturn; 133° from the Sun in the evening sky
9475.335	Sep	17	Fri	20	Mars crosses equator southward
9475.896	Sep	18	SAT	10	Jupiter 3.8° NNW of Moon; 148° from the Sun in the evening sky; magnitudes -2.8 and -11.9
9475.896	Sep	18	SAT	10	Moon 3.8° SE of Jupiter; 148° from the Sun in the evening sky
9478.021	Sep	20	Mon	13	Neptune 3.7° NNW of Moon; 174° and 173° from the Sun in the midnight sky; magnitudes 7.8 and -12.5
9478.021	Sep	20	Mon	13	Moon 3.7° SE of Neptune; 173° and 174° from the Sun in the midnight sky
9478.496	Sep	20	Mon	23:54	<b>Full Moon</b>
9479.125	Sep	21	Tue	15	<b>Mercury 1.42° SSW of Spica</b> ; 25° from the Sun in the evening sky; magnitudes 0.4 and 1.0
9480.307	Sep	22	wed	19:22	Sun enters the astrological sign Libra, i.e. its longitude is 180°
9480.307	Sep	22	wed	19:22	<b>September or fall or autumn equinox</b>
9482.229	Sep	24	Fri	18	<b>Uranus 1.26° NNW of Moon</b> ; 138° and 137° from the Sun in the morning sky; magnitudes 5.7 and -11.5
9482.229	Sep	24	Fri	18	Moon 1.26° SE of Uranus; 137° and 138° from the Sun in the morning sky

9483.604	Sep 26	SUN	3	Moon 4.3° SE of the Pleiades; 122° and 123° from the Sun in the morning sky
9483.769	Sep 26	SUN	6	Mercury at southernmost latitude from the ecliptic plane, -7.0°
9483.816	Sep 26	SUN	8	Moon at ascending node; longitude 63.4°
9484.354	Sep 26	SUN	21	Moon 6.0° N of Aldebaran; 114° from the Sun in the morning sky
9484.402	Sep 26	SUN	22	Moon at apogee; distance 63.44 Earth-radii
9484.668	Sep 27	Mon	4	Mercury stationary in right ascension; starts retrograde motion
9484.711	Sep 27	Mon	5	Mercury stationary in longitude; starts retrograde motion
9486.271	Sep 28	Tue	19	Moon 1.59° N of M35 cluster; 93° and 94° from the Sun in the morning sky
9486.581	Sep 29	wed	1:57	<b>Last Quarter Moon</b>
9487.833	Sep 30	Thu	8	Moon 6.3° S of Castor; 76° and 77° from the Sun in the morning sky
9488.042	Sep 30	Thu	13	Moon 2.76° S of Pollux; 74° from the Sun in the morning sky
9489.146	Oct 1	Fri	16	Moon 3.3° NNE of Beehive Cluster; 61° from the Sun in the morning sky
9489.896	Oct 2	SAT	10	Mercury 1.49° SSW of Spica; 15° from the Sun in the evening sky; magnitudes 1.9 and 1.0
9490.522	Oct 3	SUN	1	Venus at aphelion, 0.7282 AU from the Sun
9490.896	Oct 3	SUN	10	Moon 4.7° NNE of Regulus; 40° from the Sun in the morning sky
9492.5	Oct 5	Tue		October Camelopardalid meteors; ZHR 5; peak Oct 5 13h; 1 day before New
9493.435	Oct 5	Tue	22	Pluto stationary in right ascension; resumes direct motion
9493.765	Oct 6	wed	6	Pluto stationary in longitude; resumes direct motion
9493.962	Oct 6	wed	11:05	<b>New Moon</b> ; beginning of lunation 1222
9494.042	Oct 6	wed	13	Mars 3.2° SSW of Moon; 1° and 4° from the Sun in the evening sky; magnitudes 1.7 and -4.4
9494.042	Oct 6	wed	13	Moon 3.2° NNE of Mars; 4° and 1° from the Sun in the evening sky
9494.458	Oct 6	wed	23	Moon 6.2° NNE of Mercury; 8° and 6° from the Sun in the evening sky
9494.458	Oct 6	wed	23	Mercury 6.2° SSW of Moon; 6° and 8° from the Sun in the evening sky; magnitudes 3.8 and -4.8
9494.5	Oct 7	Thu		Rosh Hashanah, 1st say of Hebrew year 5782 A.M.
9494.750	Oct 7	Thu	6	Moon 5.3° NNE of Spica; 11° and 10° from the Sun in the evening sky
9495.5	Oct 8	Fri		<b>Draconid meteors</b> ; ZHR 20; peak Oct 8 11h; 2 days after New
9495.683	Oct 8	Fri	4	Mars at conjunction with the Sun; 2.628 AU from Earth; latitude 1.05°
9496.227	Oct 8	Fri	17:28	Moon at perigee; distance 56.97 Earth-radii
9497.175	Oct 9	SAT	16	Mercury at inferior conjunction with the Sun; 0.662 AU from Earth; latitude -3.72°

9497.316	Oct	9	SAT	20	Moon at descending node; longitude 242.5°
9497.354	Oct	9	SAT	21	Venus 2.74° SSW of Moon; 46° from the Sun in the evening sky; magnitudes -4.2 and -8.1
9497.354	Oct	9	SAT	21	Moon 2.74° NNE of Venus; 46° from the Sun in the evening sky
9497.5	Oct	10	SUN		Southern Taurid meteors; ZHR 5; peak Oct 10 2h; 3 days before First Quarter
9497.708	Oct	10	SUN	5	Mercury 2.41° SW of Mars; 2° and 1° from the Sun in the morning sky; magnitudes 5.2 and 1.6
9497.708	Oct	10	SUN	5	Mars 2.41° NE of Mercury; 1° and 2° from the Sun in the morning sky; magnitudes 1.6 and 5.2
9497.875	Oct	10	SUN	9	Moon 3.9° NNE of Antares; 53° from the Sun in the evening sky
9498.292	Oct	10	SUN	19	Mercury, Mars, and Antares within circle of diameter 4.29°; only about 2° from the Sun; magnitudes 5, 2, 1
9498.5	Oct	11	Mon		Delta Aurigid meteors; ZHR 2; peak Oct 11 3h; 2 days before First Quarter
9498.562	Oct	11	Mon	1	Saturn stationary in longitude; resumes direct motion
9498.568	Oct	11	Mon	2	Saturn stationary in right ascension; resumes direct motion
9500.643	Oct	13	wed	3:26	<b>First Quarter Moon</b>
9501.149	Oct	13	wed	16	Pluto at southernmost declination, -22.88°
9501.875	Oct	14	Thu	9	Saturn 3.8° NNW of Moon; 106° from the Sun in the evening sky; magnitudes 0.6 and -10.7
9501.875	Oct	14	Thu	9	Moon 3.8° SE of Saturn; 106° from the Sun in the evening sky
9502.828	Oct	15	Fri	8	Mercury at ascending node through the ecliptic plane
9503.042	Oct	15	Fri	13	Moon 4.0° SE of Jupiter; 120° from the Sun in the evening sky
9503.042	Oct	15	Fri	13	Jupiter 4.0° NNW of Moon; 120° from the Sun in the evening sky; magnitudes -2.6 and -11.1
9504.354	Oct	16	SAT	21	<b>Venus 1.44° NNE of Antares</b> ; 47° from the Sun in the evening sky; magnitudes -4.3 and 1.0
9505.229	Oct	17	SUN	18	Neptune 3.7° NNW of Moon; 146° from the Sun in the evening sky; magnitudes 7.8 and -11.8
9505.229	Oct	17	SUN	18	Moon 3.7° SE of Neptune; 146° from the Sun in the evening sky
9505.5	Oct	18	Mon		Epsilon Geminid meteors; ZHR 3; peak Oct 18 4h; 2 days before Full
9505.533	Oct	18	Mon	1	Mercury stationary in right ascension; resumes direct motion
9505.693	Oct	18	Mon	5	Jupiter stationary in longitude; resumes direct motion
9505.919	Oct	18	Mon	10	Jupiter stationary in right ascension; resumes direct motion
9506.133	Oct	18	Mon	15	Mercury stationary in longitude; resumes direct motion
9507.498	Oct	19	Tue	24	Mercury at perihelion, 0.3075 AU from the Sun
9508.123	Oct	20	wed	14:56	<b>Full Moon</b>

9508.5	Oct 21	Thu	Orionid meteors; ZHR 25; peak Oct 21 5h; 1 day after Full
9509.375	Oct 21	Thu 21	Mars $2.60^\circ$ NNE of Spica; $5^\circ$ from the Sun in the morning sky; magnitudes 1.6 and 1.0
9509.458	Oct 21	Thu 23	Moon $1.24^\circ$ SE of Uranus; $165^\circ$ from the Sun in the morning sky
9509.458	Oct 21	Thu 23	<b>Uranus <math>1.24^\circ</math> NNW of Moon</b> ; $165^\circ$ from the Sun in the morning sky; magnitudes 5.7 and -12.2
9510.702	Oct 23	SAT 5	Sun enters the astrological sign Scorpius, i.e. its longitude is $210^\circ$
9510.917	Oct 23	SAT 10	Moon $4.2^\circ$ SE of the Pleiades; $149^\circ$ and $150^\circ$ from the Sun in the morning sky
9510.993	Oct 23	SAT 12	Moon at ascending node; longitude $61.9^\circ$
9511.5	Oct 24	SUN	Leo Minorid meteors; ZHR 2; peak Oct 24 5h; 4 days after Full
9511.667	Oct 24	SUN 4	Moon $6.2^\circ$ N of Aldebaran; $141^\circ$ from the Sun in the morning sky
9512.149	Oct 24	SUN 16	Moon at apogee; distance 63.60 Earth-radii
9512.539	Oct 25	Mon 1	Venus at southernmost latitude from the ecliptic plane, $-3.4^\circ$
9512.723	Oct 25	Mon 5	<b>Mercury at westernmost elongation</b> ; $18.4^\circ$ from Sun in morning sky
9513.583	Oct 26	Tue 2	Moon $1.77^\circ$ N of M35 cluster; $120^\circ$ and $121^\circ$ from the Sun in the morning sky
9515.146	Oct 27	wed 16	Moon $6.2^\circ$ S of Castor; $103^\circ$ and $104^\circ$ from the Sun in the morning sky
9515.375	Oct 27	wed 21	Moon $2.58^\circ$ S of Pollux; $101^\circ$ from the Sun in the morning sky
9516.100	Oct 28	Thu 14	Venus dichotomy (D-shape)
9516.337	Oct 28	Thu 20:06	<b>Last Quarter Moon</b>
9516.5	Oct 29	Fri 0	Moon $3.5^\circ$ NNE of Beehive Cluster; $88^\circ$ from the Sun in the morning sky
9517.358	Oct 29	Fri 21	<b>Venus at easternmost elongation</b> ; $47.1^\circ$ from Sun in evening sky
9517.707	Oct 30	SAT 5	Mercury at northernmost latitude from the ecliptic plane, $7.0^\circ$
9517.909	Oct 30	SAT 10	Saturn at east quadrature, $90^\circ$ from the Sun
9518.292	Oct 30	SAT 19	Moon $4.8^\circ$ NNE of Regulus; $67^\circ$ from the Sun in the morning sky
9518.5	Oct 31	SUN	Clocks back 1 hour (Europe)
9518.551	Oct 31	SUN 1	Sun enters Libra, at longitude $217.83^\circ$ on the ecliptic
9520.771	Nov 2	Tue 7	Mercury $4.1^\circ$ NNE of Spica; $16^\circ$ from the Sun in the morning sky; magnitudes -0.8 and 1.0
9521.616	Nov 3	wed 3	The equation of time is at a maximum of 16.49 minutes.
9522.188	Nov 3	wed 17	Moon $5.3^\circ$ NNE of Spica; $17^\circ$ from the Sun in the morning sky
9522.333	Nov 3	wed 20	<b>Moon <math>1.12^\circ</math> NE of Mercury</b> ; $15^\circ$ from the Sun in the morning sky

9522.333	Nov	3	Wed	20	<b>Mercury 1.12° SW of Moon</b> ; 15° from the Sun in the morning sky; magnitudes -0.9 and -5.6
9522.742	Nov	4	Thu	6	Moon, Mercury, and Mars within circle of diameter 5.99°; about 11° from the Sun in the morning sky; magnitudes -5, -1, 2
9522.792	Nov	4	Thu	7	Mars 2.13° SW of Moon; 9° from the Sun in the morning sky; magnitudes 1.6 and -5.0
9522.792	Nov	4	Thu	7	Moon 2.13° NE of Mars; 9° from the Sun in the morning sky
9523.385	Nov	4	Thu	21:14	<b>New Moon</b> ; beginning of lunation 1223
9523.489	Nov	4	Thu	24	<b>Uranus at opposition in longitude</b> ; magnitude 5.6
9524.436	Nov	5	Fri	22:28	Moon at perigee; distance 56.26 Earth-radii
9524.653	Nov	6	SAT	4	Moon at descending node; longitude 241.8°
9525.150	Nov	6	SAT	16	Venus at southernmost declination, -27.24°
9525.250	Nov	6	SAT	18	Moon 3.8° NNE of Antares; 26° from the Sun in the evening sky
9525.5	Nov	7	SUN		Clocks back 1 hour (America)
9526.750	Nov	8	Mon	6	<b>Venus 1.14° SSW of Moon</b> ; 47° from the Sun in the evening sky; magnitudes -4.5 and -8.2
9526.750	Nov	8	Mon	6	<b>Moon 1.14° NNE of Venus</b> ; 47° from the Sun in the evening sky
9529.167	Nov	10	Wed	16	Mars 0.96° SSW of Mercury; 11° from the Sun in the morning sky; magnitudes 1.6 and -0.9
9529.167	Nov	10	Wed	16	Mercury 0.96° NNE of Mars; 11° from the Sun in the morning sky; magnitudes -0.9 and 1.6
9529.188	Nov	10	Wed	17	Moon 4.0° SE of Saturn; 79° from the Sun in the evening sky
9529.188	Nov	10	Wed	17	Saturn 4.0° NNW of Moon; 79° from the Sun in the evening sky; magnitudes 0.7 and -9.8
9529.5	Nov	11	Thu		Armistice Day
9530.033	Nov	11	Thu	12:47	<b>First Quarter Moon</b>
9530.354	Nov	11	Thu	21	Moon 4.2° SE of Jupiter; 94° from the Sun in the evening sky
9530.354	Nov	11	Thu	21	Jupiter 4.2° NNW of Moon; 94° from the Sun in the evening sky; magnitudes -2.4 and -10.3
9530.5	Nov	12	Fri		Northern Taurid meteors; ZHR 5; peak Nov 12 4h; 1 day after First Quarter
9532.438	Nov	13	SAT	23	Neptune 3.9° NNW of Moon; 119° from the Sun in the evening sky; magnitudes 7.9 and -11.1
9532.438	Nov	13	SAT	23	Moon 3.9° SE of Neptune; 119° from the Sun in the evening sky
9534.329	Nov	15	Mon	20	Jupiter at east quadrature, 90° from the Sun
9535.5	Nov	17	Wed		Leonid meteors; ZHR 15; peak Nov 17 10h; 2 days before Full
9536.646	Nov	18	Thu	4	Moon 1.37° SE of Uranus; 167° and 166° from the Sun in the evening sky
9536.646	Nov	18	Thu	4	<b>Uranus 1.37° NNW of Moon</b> ; 166° and 167° from the Sun in the evening sky; magnitudes 5.7 and -12.3
9537.874	Nov	19	Fri	8:58	<b>Full Moon. Partial eclipse of the Moon</b>

9538.188	Nov 19	Fri 17	Moon 4.2° SE of the Pleiades; 177° and 175° from the Sun in the midnight sky
9538.250	Nov 19	Fri 18	Moon at ascending node; longitude 61.7°
9538.938	Nov 20	SAT 11	Moon 6.2° N of Aldebaran; 168° and 167° from the Sun in the morning sky
9539.5	Nov 21	SUN	Alpha Monocerotid meteors; ZHR 8; peak Nov 21 10h; 2 days after Full
9539.600	Nov 21	SUN 2	Moon at apogee; distance 63.70 Earth-radii
9540.606	Nov 22	Mon 3	Sun enters the astrological sign Sagittarius, i.e. its longitude is 240°
9540.854	Nov 22	Mon 9	Moon 1.81° N of M35 cluster; 148° from the Sun in the morning sky
9541.110	Nov 22	Mon 15	Mercury at descending node through the ecliptic plane
9541.458	Nov 22	Mon 23	Moon at northernmost declination in year, 26.34°
9541.763	Nov 23	Tue 6	Sun enters Scorpius, at longitude 241.17° on the ecliptic
9542.145	Nov 23	Tue 15	Middle of eclipse season: Sun is at same longitude as Moon's descending node, 241.6°
9542.438	Nov 23	Tue 23	Moon 6.1° S of Castor; 130° and 131° from the Sun in the morning sky
9542.667	Nov 24	wed 4	Moon 2.54° S of Pollux; 128° from the Sun in the morning sky
9543.813	Nov 25	Thu 8	Moon 3.6° NNE of Beehive Cluster; 115° and 116° from the Sun in the morning sky
9545.625	Nov 27	SAT 3	Moon 4.8° NNE of Regulus; 95° from the Sun in the morning sky
9546.020	Nov 27	SAT 12:29	<b>Last Quarter Moon</b>
9546.5	Nov 28	SUN	November Orionid meteors; ZHR 3; peak Nov 28 0h; near Last Quarter
9547.682	Nov 29	Mon 4	Mercury at superior conjunction with the Sun; 1.451 AU from Earth; latitude -2.24°
9548.580	Nov 30	Tue 2	Sun enters Ophiuchus, at longitude 248.07° on the ecliptic
9549.5	Dec 1	wed	Phoenicid meteors; ZHR 5; peak Dec 1 24h; 2 days before New
9549.646	Dec 1	wed 4	Moon 5.3° NNE of Spica; 44° and 45° from the Sun in the morning sky
9549.688	Dec 1	wed 5	Mercury 3.7° NNE of Antares; 1° and 5° from the Sun in the evening sky; magnitudes -1.2 and 1.0
9549.876	Dec 1	wed 9	Neptune stationary in longitude; resumes direct motion
9550.259	Dec 1	wed 18	Neptune stationary in right ascension; resumes direct motion
9551.483	Dec 2	Thu 24	Mercury at aphelion, 0.4667 AU from the Sun
9551.563	Dec 3	Fri 2	<b>Mars 0.75° SW of Moon</b> ; 18° from the Sun in the morning sky; magnitudes 1.6 and -5.9
9551.563	Dec 3	Fri 2	<b>Moon 0.75° NE of Mars</b> ; 18° from the Sun in the morning sky
9552.125	Dec 3	Fri 15	Moon at descending node; longitude 241.8°



9552.708	Dec	4	SAT	5	Moon 3.8° NNE of Antares; 2° and 5° from the Sun in the morning sky
9552.809	Dec	4	SAT	7	Venus shows greatest illuminated extent, 55.4 square seconds
9552.822	Dec	4	SAT	7:43	<b>New Moon</b> ; beginning of lunation 1224. Total eclipse of the Sun
9552.925	Dec	4	SAT	10:12	Moon at perigee; distance 55.94 Earth-radii; nearest in year
9552.925	Dec	4	SAT	10:12	Perigee only 2.5 hours after New Moon
9553.063	Dec	4	SAT	14	Mercury 0.42° WNW of Moon; 3° and 4° from the Sun in the evening sky; magnitudes -1.0 and -4.5
9553.063	Dec	4	SAT	14	Moon 0.42° ESE of Mercury; 4° and 3° from the Sun in the evening sky
9554.625	Dec	6	Mon	3	Moon at southernmost declination in year, -26.33°
9554.943	Dec	6	Mon	11	Mars and Uranus at heliocentric opposition; longitudes 223.1° and 43.1°
9555.5	Dec	7	Tue		Puppis-Velid meteors; ZHR 10; peak Dec 7 0h; 3 days after New
9555.563	Dec	7	Tue	2	<b>Venus 1.88° NNW of Moon</b> ; 39° from the Sun in the evening sky; magnitudes -4.7 and -7.6
9555.563	Dec	7	Tue	2	<b>Moon 1.88° SE of Venus</b> ; 39° from the Sun in the evening sky
9556.169	Dec	7	Tue	16	Venus brightest; magnitude -4.67°
9556.191	Dec	7	Tue	16:35	Earliest sunset, at latitude 40° north
9556.5	Dec	8	wed		Monocerotid meteors; ZHR 3; peak Dec 8 21h; 2 days before First Quarter
9556.667	Dec	8	wed	4	Moon 4.1° SE of Saturn; 54° and 53° from the Sun in the evening sky
9556.667	Dec	8	wed	4	Saturn 4.1° NNW of Moon; 53° and 54° from the Sun in the evening sky; magnitudes 0.8 and -8.5
9557.896	Dec	9	Thu	10	Jupiter 4.2° NNW of Moon; 69° from the Sun in the evening sky; magnitudes -2.2 and -9.3
9557.896	Dec	9	Thu	10	Moon 4.2° SE of Jupiter; 69° from the Sun in the evening sky
9558.792	Dec	10	Fri	7	Moon shows maximum libration for the year, 10.39°
9559.5	Dec	11	SAT		Sigma Hydrid meteors; ZHR 3; peak Dec 11 20h; 1 day after First Quarter
9559.567	Dec	11	SAT	1:36	<b>First Quarter Moon</b>
9559.688	Dec	11	SAT	5	Neptune 3.9° NNW of Moon; 91° from the Sun in the evening sky; magnitudes 7.9 and -10.2
9559.688	Dec	11	SAT	5	Moon 3.9° SE of Neptune; 91° from the Sun in the evening sky
9561.5	Dec	13	Mon		<b>Geminid meteors</b> ; ZHR 120; peak Dec 13 24h; 3 days after First Quarter
9563.5	Dec	15	wed		Coma Berenicid meteors; ZHR 3; peak Dec 15 18h; 3 days before Full
9563.813	Dec	15	wed	8	Moon 1.43° SE of Uranus; 138° from the Sun in the evening sky
9563.813	Dec	15	wed	8	<b>Uranus 1.43° NNW of Moon</b> ; 138° from the Sun in the evening sky; magnitudes 5.7 and -11.5

9564.591	Dec 16	Thu	2	Mercury at southernmost declination, $-25.44^\circ$
9565.438	Dec 16	Thu	23	Moon $4.2^\circ$ SE of the Pleiades; $156^\circ$ and $155^\circ$ from the Sun in the evening sky
9565.508	Dec 17	Fri	0	Moon at ascending node; longitude $61.7^\circ$
9566.188	Dec 17	Fri	17	Moon $6.2^\circ$ NNW of Aldebaran; $164^\circ$ and $163^\circ$ from the Sun in the evening sky
9566.600	Dec 18	SAT	2	Moon at apogee; distance 63.70 Earth-radii
9566.857	Dec 18	SAT	9	Sun enters Sagittarius, at longitude $266.63^\circ$ on the ecliptic
9566.959	Dec 18	SAT	11	Venus stationary in right ascension; starts retrograde motion
9567.5	Dec 19	SUN		December Leo Minorid meteors; ZHR 5; peak Dec 19 17h; 1 day after Full
9567.692	Dec 19	SUN	4:37	<b>Full Moon</b>
9567.943	Dec 19	SUN	11	Venus stationary in longitude; starts retrograde motion
9568.104	Dec 19	SUN	15	Moon $1.78^\circ$ N of M35 cluster; $175^\circ$ and $176^\circ$ from the Sun in the midnight sky
9568.194	Dec 19	SUN	17	Mars at descending node through the ecliptic plane
9568.832	Dec 20	Mon	8	Venus at ascending node through the ecliptic plane
9569.688	Dec 21	Tue	5	Moon $6.2^\circ$ S of Castor; $158^\circ$ and $157^\circ$ from the Sun in the morning sky
9569.917	Dec 21	Tue	10	Moon $2.59^\circ$ S of Pollux; $155^\circ$ from the Sun in the morning sky
9570.165	Dec 21	Tue	15:57	<b>December or winter solstice</b>
9570.165	Dec 21	Tue	15:57	Sun enters the astrological sign Capricornus, i.e. its longitude is $270^\circ$
9570.5	Dec 22	Wed		Ursid meteors; ZHR 15; peak Dec 22 8h; 3 days after Full
9571.042	Dec 22	wed	13	Moon $3.5^\circ$ NNE of Beehive Cluster; $143^\circ$ from the Sun in the morning sky
9571.739	Dec 23	Thu	6	Mercury at southernmost latitude from the ecliptic plane, $-7.0^\circ$
9572.875	Dec 24	Fri	9	Moon $4.7^\circ$ NNE of Regulus; $122^\circ$ and $123^\circ$ from the Sun in the morning sky
9573.5	Dec 25	SAT		Christmas
9573.646	Dec 25	SAT	3	The equation of time is 0.
9575.601	Dec 27	Mon	2:25	<b>Last Quarter Moon</b>
9576.313	Dec 27	Mon	20	Mars $4.5^\circ$ N of Antares; $26^\circ$ and $27^\circ$ from the Sun in the morning sky; magnitudes 1.5 and 1.0
9577.021	Dec 28	Tue	13	Moon $5.2^\circ$ NNE of Spica; $72^\circ$ and $73^\circ$ from the Sun in the morning sky
9577.729	Dec 29	wed	6	Mercury $4.2^\circ$ S of Venus; $17^\circ$ from the Sun in the evening sky; magnitudes $-0.7$ and $-4.4$
9577.729	Dec 29	wed	6	Venus $4.2^\circ$ N of Mercury; $17^\circ$ from the Sun in the evening sky; magnitudes $-4.4$ and $-0.7$
9579.548	Dec 31	Fri	1	Moon at descending node; longitude $241.2^\circ$

