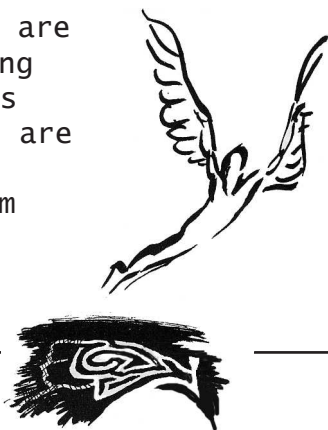


The left column gives Julian Dates (number of days from 4713 B.C. Jan. 1 noon), useful for finding time spans between events by subtraction. The first 3 digits of the Julian date (245) are omitted.

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 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

2020

8850.565	Jan	2	Thu	2	Moon at apogee; distance 63.43 Earth-radii
8851.006	Jan	2	Thu	12	Mercury at southernmost declination, -24.66°
8851.146	Jan	2	Thu	16	Mercury 1.50° S of Jupiter; 5° from the Sun in the morning sky; magnitudes -0.9 and -1.8
8851.698	Jan	3	Fri	4:46	First Quarter Moon
8852.019	Jan	3	Fri	12	Mars and Uranus at heliocentric opposition; longitudes 215.3° and 35.3°
8852.5	Jan	4	SAT		Quadrantid meteors ; ZHR 110; peak Jan 4 2h; 1 day after First Quarter

8853.438	Jan	4	SAT	23	Moon 4.3° SE of Uranus; 109° from the Sun in the evening sky
8853.807	Jan	5	SUN	7:22	Latest sunrise, at latitude 40° north
8853.840	Jan	5	SUN	8	Earth at perihelion ; 0.9832 AU from the Sun
8855.667	Jan	7	Tue	4	Moon 7.3° SE of the Pleiades; 135° and 134° from the Sun in the evening sky
8856.375	Jan	7	Tue	21	Moon 2.96° N of Aldebaran; 143° from the Sun in the evening sky
8858.063	Jan	9	Thu	14	Moon 1.50° SE of M35 cluster; 164° from the Sun in the evening sky
8858.479	Jan	9	Thu	23	Moon at ascending node; longitude 98.4°
8859.126	Jan	10	Fri	15	Mercury at superior conjunction with the Sun; 1.430 AU from Earth; latitude -6.15°
8859.307	Jan	10	Fri	19:22	Full Moon. Penumbral eclipse of the Moon
8859.417	Jan	10	Fri	22	Moon 9.0° S of Castor; 178° and 170° from the Sun in the morning sky
8859.510	Jan	11	SAT	0	Uranus stationary in longitude; resumes direct motion
8859.604	Jan	11	SAT	3	Moon 5.3° S of Pollux; 176° and 173° from the Sun in the midnight sky
8859.736	Jan	11	SAT	6	Uranus stationary in right ascension; resumes direct motion
8860.563	Jan	12	SUN	2	Moon 1.33° NNE of Beehive Cluster; 163° and 164° from the Sun in the morning sky
8860.896	Jan	12	SUN	10	Mercury 2.04° S of Saturn; 2° and 1° from the Sun in the evening sky; magnitudes -1.2 and 0.5
8861.782	Jan	13	Mon	7	Pluto at conjunction with the Sun; 34.942 AU from Earth; latitude -0.69°
8862.104	Jan	13	Mon	15	Moon 3.7° NNE of Regulus; 142° and 143° from the Sun in the morning sky
8862.141	Jan	13	Mon	15	Saturn at conjunction with the Sun; 11.017 AU from Earth; latitude 0.04°
8862.349	Jan	13	Mon	20:23	Moon at perigee; distance 57.38 Earth-radii
8865.875	Jan	17	Fri	9	Moon 7.1° NNE of Spica; 92° and 93° from the Sun in the morning sky
8866.041	Jan	17	Fri	12:59	Last Quarter Moon
8866.875	Jan	18	SAT	9	Mars 4.7° N of Antares; 48° from the Sun in the morning sky; magnitudes 1.5 and 1.0
8867.987	Jan	19	SUN	12	Mercury at southernmost latitude from the ecliptic plane, -7.0°
8868.856	Jan	20	Mon	9	Sun enters Capricornus, at longitude 299.73° on the ecliptic
8869.124	Jan	20	Mon	15	Sun enters the astrological sign Aquarius, i.e. its longitude is 300°
8869.250	Jan	20	Mon	18	Moon 7.0° NNE of Antares; 49° and 50° from the Sun in the morning sky
8869.354	Jan	20	Mon	21	Moon 2.21° NNE of Mars; 48° from the Sun in the morning sky
8871.357	Jan	22	wed	21	Moon at descending node; longitude 278.4°
8871.625	Jan	23	Thu	3	Moon 0.39° SE of Jupiter; 21° from the Sun in the morning sky

8871.786	Jan 23	Thu	7	Uranus at east quadrature, 90° from the Sun
8872.604	Jan 24	Fri	3	Moon 1.47° SE of Saturn; 9° from the Sun in the morning sky
8873.405	Jan 24	Fri	21:43	New Moon ; beginning of lunation 1201
8874.313	Jan 25	SAT	20	Moon 1.33° SE of Mercury; 11° and 10° from the Sun in the evening sky
8876.354	Jan 27	Mon	21	Venus 0.07° SE of Neptune; 40° from the Sun in the evening sky; magnitudes -4.1 and 7.9
8876.900	Jan 28	Tue	10	Moon, Venus, and Neptune within circle of diameter 3.86°; about 39° from the Sun in the evening sky; magnitudes -7, -4, 8
8876.917	Jan 28	Tue	10	Moon 3.8° SE of Neptune; 39° from the sun in the evening sky
8876.958	Jan 28	Tue	11	Moon 3.8° SE of Venus; 40° from the Sun in the evening sky
8878.391	Jan 29	wed	21	Moon at apogee; distance 63.56 Earth-radii
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8880.792	Feb 1	SAT	7	Moon 4.2° SE of Uranus; 81° from the sun in the evening sky
8881.252	Feb 1	SAT	18	Mars at descending node through the ecliptic plane
8881.5	Feb 2	SUN		Ground Hog Day
8881.571	Feb 2	SUN	1:42	First Quarter Moon
8883.063	Feb 3	Mon	14	Moon 7.2° SE of the Pleiades; 107° and 106° from the Sun in the evening sky
8883.771	Feb 4	Tue	7	Moon 3.0° N of Aldebaran; 115° from the Sun in the evening sky
8885.5	Feb 6	Thu	0	Moon 1.45° SE of M35 cluster; 136° from the Sun in the evening sky
8885.875	Feb 6	Thu	9	Moon at ascending node; longitude 97.9°
8886.854	Feb 7	Fri	9	Moon 8.9° S of Castor; 153° and 151° from the Sun in the evening sky
8887.042	Feb 7	Fri	13	Moon 5.3° S of Pollux; 156° and 154° from the sun in the evening sky
8887.043	Feb 7	Fri	13	Mercury at ascending node through the ecliptic plane
8887.5	Feb 8	SAT		Alpha Centaurid meteors; ZHR 6; peak Feb 8 13h; 1 day before Full
8887.979	Feb 8	SAT	12	Moon 1.28° NNE of Beehive Cluster; 168° from the Sun in the evening sky
8888.815	Feb 9	SUN	7:33	Full Moon
8889.5	Feb 10	Mon	0	Moon 3.6° NNE of Regulus; 170° and 171° from the Sun in the morning sky
8890.074	Feb 10	Mon	14	Mercury at easternmost elongation ; 18.2° from sun in evening sky
8890.355	Feb 10	Mon	20:31	Moon at perigee; distance 56.52 Earth-radii
8891.398	Feb 11	Tue	22	The equation of time is at a minimum of -14.24 minutes.
8891.713	Feb 12	wed	5	Mercury at perihelion, 0.3075 AU from the Sun
8892.610	Feb 13	Thu	3	Saturn at descending node through the ecliptic plane
8893.146	Feb 13	Thu	16	Moon 7.0° NNE of Spica; 120° from the sun in the morning sky

8893.5	Feb 14	Fri		St. Valentine's Day
8894.732	Feb 15	SAT	6	Venus at ascending node through the ecliptic plane
8895.354	Feb 15	SAT	21	Mercury 5.8° W of Neptune; 16° and 21° from the Sun in the evening sky; magnitudes 0.5 and 8.0; quasi-conjunction
8895.429	Feb 15	SAT	22:18	Last Quarter Moon
8895.922	Feb 16	SUN	10	Mercury stationary in right ascension; starts retrograde motion
8896.479	Feb 16	SUN	24	Moon 6.9° NNE of Antares; 77° and 78° from the Sun in the morning sky
8896.533	Feb 17	Mon	1	Mercury stationary in longitude; starts retrograde motion
8896.631	Feb 17	Mon	3	Sun enters Aquarius, at longitude 327.90° on the ecliptic
8898.083	Feb 18	Tue	14	Moon 0.80° NNE of Mars; 58° from the Sun in the morning sky
8898.509	Feb 19	wed	0	Moon at descending node; longitude 277.3°
8898.709	Feb 19	wed	5	Sun enters the astrological sign Pisces, i.e. its longitude is 330°
8899.333	Feb 19	wed	20	Moon 0.94° SE of Jupiter; 43° from the Sun in the morning sky
8900.104	Feb 20	Thu	15	Moon 1.75° SE of Saturn; 34° from the Sun in the morning sky
8900.166	Feb 20	Thu	16	Mars at southernmost declination, -23.67°
8901.923	Feb 22	SAT	10	Mercury at northernmost latitude from the ecliptic plane, 7.0°
8903.148	Feb 23	SUN	15:33	New Moon ; beginning of lunation 1202
8903.521	Feb 24	Mon	1	Moon 8.1° SE of Mercury; 6° from the Sun in the evening sky
8904.292	Feb 24	Mon	19	Moon 3.8° SE of Neptune; 13° and 12° from the Sun in the evening sky
8905.5	Feb 26	wed		Ash Wednesday
8905.568	Feb 26	wed	2	Mercury at inferior conjunction with the Sun; 0.637 AU from Earth; latitude 6.65°
8905.630	Feb 26	wed	3	Jupiter at descending node through the ecliptic plane
8905.975	Feb 26	wed	11	Moon at apogee; distance 63.70 Earth-radii
8907.250	Feb 27	Thu	18	Moon 5.8° SE of Venus; 45° and 44° from the Sun in the evening sky
8908.146	Feb 28	Fri	16	Moon 4.0° SE of Uranus; 55° and 54° from the Sun in the evening sky
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8910.396	Mar 1	SUN	22	Moon 7.0° SE of the Pleiades; 79° from the Sun in the evening sky
8911.125	Mar 2	Mon	15	Moon 3.3° N of Aldebaran; 88° from the Sun in the evening sky
8911.332	Mar 2	Mon	19:57	First Quarter Moon
8912.896	Mar 4	wed	10	Moon 1.27° SE of M35 cluster; 109° and 108° from the Sun in the evening sky
8913.125	Mar 4	wed	15	Moon at ascending node; longitude 95.8°

8914.292	Mar	5	Thu	19	Moon 8.8° S of Castor; 126° and 124° from the Sun in the evening sky
8914.479	Mar	5	Thu	24	Moon 5.1° S of Pollux; 128° and 127° from the Sun in the evening sky
8915.438	Mar	6	Fri	23	Moon 1.39° NNE of Beehive Cluster; 141° from the Sun in the evening sky
8916.5	Mar	8	SUN		Clocks forward 1 hour (America)
8916.958	Mar	8	SUN	11	Moon 3.6° NNE of Regulus; 161° and 162° from the Sun in the evening sky
8917.021	Mar	8	SUN	13	Neptune at conjunction with the Sun; 30.924 AU from Earth; latitude -1.05°
8917.167	Mar	8	SUN	16	Venus 2.20° NNW of Uranus; 45° from the Sun in the evening sky; magnitudes -4.3 and 5.9
8917.832	Mar	9	Mon	8	Mercury stationary in right ascension; resumes direct motion
8918.241	Mar	9	Mon	17:47	Full Moon
8918.654	Mar	10	Tue	4	Mercury stationary in longitude; resumes direct motion
8918.767	Mar	10	Tue	6:24	Moon at perigee; distance 56.00 Earth-radii
8918.767	Mar	10	Tue	6:24	Perigee only 12.6 hours after Full Moon
8920.216	Mar	11	wed	17	Sun enters Pisces, at longitude 351.59° on the ecliptic
8920.542	Mar	12	Thu	1	Moon 6.8° NNE of Spica; 147° and 148° from the Sun in the morning sky
8922.5	Mar	14	SAT		Gamma Normid meteors; ZHR 6; peak Mar 14 3h; 2 days before Last Quarter
8923.750	Mar	15	SUN	6	Moon 6.7° NNE of Antares; 104° and 105° from the Sun in the morning sky
8924.899	Mar	16	Mon	9:35	Last Quarter Moon
8925.327	Mar	16	Mon	20	Mercury at descending node through the ecliptic plane
8925.5	Mar	17	Tue		St. Patrick's Day
8925.542	Mar	17	Tue	1	Moon at descending node; longitude 274.6°
8926.875	Mar	18	wed	9	Moon 0.79° SE of Mars; 67° from the Sun in the morning sky
8926.900	Mar	18	wed	10	Moon, Mars, and Jupiter within circle of diameter 1.59°; about 66° from the Sun in the morning sky; magnitudes -9, 1, -2
8926.958	Mar	18	wed	11	Moon 1.52° SE of Jupiter; 66° from the Sun in the morning sky
8927.542	Mar	19	Thu	1	Moon 2.11° SE of Saturn; 59° from the Sun in the morning sky
8928.612	Mar	20	Fri	3	Venus at perihelion, 0.7184 AU from the Sun
8928.662	Mar	20	Fri	3:54	March or spring or vernal equinox
8928.662	Mar	20	Fri	3:54	Sun enters the astrological sign Aries, i.e. its longitude is 0°
8928.958	Mar	20	Fri	11	Mars 0.71° S of Jupiter; 67° from the Sun in the morning sky; magnitudes 0.9 and -2.1
8930.375	Mar	21	SAT	21	Moon 3.4° SE of Mercury; 28° from the Sun in the morning sky

8931.625	Mar	23	Mon	3	Moon 3.8° SE of Neptune; 15° and 14° from the Sun in the morning sky
8932.581	Mar	24	Tue	2	Mercury at westernmost elongation ; 27.8° from Sun in morning sky
8932.895	Mar	24	Tue	9:28	New Moon ; beginning of lunation 1203
8933.145	Mar	24	Tue	15	Moon at apogee; distance 63.76 Earth-radii; farthest in year
8933.415	Mar	24	Tue	22	Venus at easternmost elongation ; 46.1° from Sun in evening sky
8935.521	Mar	27	Fri	1	Moon 3.8° SE of Uranus; 29° and 28° from the Sun in the evening sky
8935.529	Mar	27	Fri	1	Venus dichotomy (D-shape)
8935.697	Mar	27	Fri	5	Mercury at aphelion, 0.4667 AU from the Sun
8937.167	Mar	28	SAT	16	Moon 6.5° SE of Venus; 47° and 46° from the Sun in the evening sky
8937.5	Mar	29	SUN		Clocks forward 1 hour (Europe)
8937.646	Mar	29	SUN	4	Moon 6.7° SE of the Pleiades; 52° and 51° from the Sun in the evening sky
8938.396	Mar	29	SUN	22	Moon 3.5° N of Aldebaran; 60° and 61° from the Sun in the evening sky
8940.188	Mar	31	Tue	17	Moon 0.96° SE of M35 cluster; 81° from the Sun in the evening sky
8940.203	Mar	31	Tue	17	Moon at ascending node; longitude 92.7°
8940.250	Mar	31	Tue	18	Mars 0.91° SE of Saturn; 71° from the Sun in the morning sky; magnitudes 0.8 and 0.7
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8940.5	Apr	1	Wed		All Fools' Day
8940.931	Apr	1	Wed	10:21	First Quarter Moon
8941.646	Apr	2	Thu	4	Moon 8.5° S of Castor; 99° and 98° from the Sun in the evening sky
8941.833	Apr	2	Thu	8	Moon 4.9° S of Pollux; 101° and 100° from the Sun in the evening sky
8942.833	Apr	3	Fri	8	Moon 1.61° NNE of Beehive Cluster; 114° from the Sun in the evening sky
8943.542	Apr	4	SAT	1	Mercury 1.33° SE of Neptune; 25° from the Sun in the morning sky; magnitudes 0.0 and 8.0
8943.563	Apr	4	SAT	2	Venus 0.25° SE of Alcyone; 46° from the Sun in the evening sky; magnitudes -4.4 and 2.9
8944.396	Apr	4	SAT	22	Moon 3.8° NNE of Regulus; 134° and 135° from the Sun in the evening sky
8944.5	Apr	5	SUN		Palm Sunday.
8947.249	Apr	7	Tue	17:59	Perigee only 8.6 hours before Full Moon
8947.249	Apr	7	Tue	17:59	Moon at perigee; distance 55.96 Earth-radii; nearest in year
8947.559	Apr	8	Wed	1	Autumn equinox on Mars
8947.559	Apr	8	Wed	1	Autumn equinox on Mars
8947.607	Apr	8	Wed	2:34	Full Moon
8948.000	Apr	8	Wed	12	Moon 6.7° NNE of Spica; 173° and 175° from the Sun in the midnight sky
8949.5	Apr	10	Fri		Good Friday

8950.209	Apr 10	Fri 17	Autumn equinox on Mars
8950.209	Apr 10	Fri 17	Autumn equinox on Mars
8950.237	Apr 10	Fri 18	Venus at northernmost latitude from the ecliptic plane, 3.4°
8951.125	Apr 11	SAT 15	Moon 6.4° NNE of Antares; 131° and 132° from the Sun in the morning sky
8951.5	Apr 12	SUN	Easter
8952.626	Apr 13	Mon 3	Moon at descending node; longitude 271.6°
8954.455	Apr 14	Tue 22:56	Last Quarter Moon
8954.5	Apr 15	Wed 0	Moon 2.00° SE of Jupiter; 89° and 90° from the Sun in the morning sky
8954.563	Apr 15	Wed 2	Venus 9.9° NNW of Aldebaran; 44° and 45° from the Sun in the evening sky; magnitudes -4.5 and 0.9
8954.644	Apr 15	Wed 3	The equation of time is 0.
8954.800	Apr 15	Wed 7	Moon, Jupiter, and Saturn within circle of diameter 5.50° ; about 87° from the Sun in the morning sky; magnitudes -10 , -2 , 1
8954.938	Apr 15	Wed 11	Moon 2.45° SE of Saturn; 84° from the Sun in the morning sky
8954.958	Apr 15	Wed 11	Jupiter at west quadrature, 90° from the Sun
8955.750	Apr 16	Thu 6	Moon 1.97° SE of Mars; 75° from the Sun in the morning sky
8955.956	Apr 16	Thu 11	Mercury at southernmost latitude from the ecliptic plane, -7.0°
8958.198	Apr 18	SAT 17	Sun enters Aries, at longitude 29.10° on the ecliptic
8958.958	Apr 19	SUN 11	Moon 3.9° SE of Neptune; 40° from the Sun in the morning sky
8959.117	Apr 19	SUN 15	Sun enters the astrological sign Taurus, i.e. its longitude is 30°
8960.283	Apr 20	Mon 19	Moon at apogee; distance 63.73 Earth-radii
8960.5	Apr 21	Tue	Lyrid meteors ; ZHR 18; peak Apr 21 24h; 1 day before New
8960.791	Apr 21	Tue 7	Saturn at west quadrature, 90° from the Sun
8961.375	Apr 21	Tue 21	Moon 2.87° SE of Mercury; 14° from the Sun in the morning sky
8962.5	Apr 23	Thu	Pi Puppis meteors; ZHR 10; peak Apr 23 5h; near New
8962.601	Apr 23	Thu 2:26	New Moon ; beginning of lunation 1204
8962.896	Apr 23	Thu 10	Moon 3.7° SE of Uranus; 5° and 3° from the Sun in the evening sky
8963.5	Apr 24	Fri	1st day of Ramadan (1441 A.H.)
8964.706	Apr 25	SAT 5	Pluto stationary in longitude; starts retrograde motion
8964.896	Apr 25	SAT 10	Moon 6.6° SE of the Pleiades; 26° and 25° from the Sun in the evening sky
8965.524	Apr 26	SUN 1	Pluto stationary in right ascension; starts retrograde motion
8965.625	Apr 26	SUN 3	Moon 3.7° N of Aldebaran; 34° from the Sun in the evening sky
8965.879	Apr 26	SUN 9	Uranus at conjunction with the sun; 20.811 AU from Earth; latitude -0.47°

8966.250	Apr 26	SUN	18	Moon 5.9° SE of Venus; 41° and 40° from the Sun in the evening sky
8967.248	Apr 27	Mon	18	Moon at ascending node; longitude 90.3°
8967.438	Apr 27	Mon	23	Moon 0.78° SE of M35 cluster; 55° and 54° from the Sun in the evening sky
8967.549	Apr 28	Tue	1	Venus shows greatest illuminated extent, 48.3 square seconds
8968.104	Apr 28	Tue	15	Venus brightest; magnitude -4.52°
8968.896	Apr 29	Wed	10	Moon 8.3° S of Castor; 72° and 71° from the Sun in the evening sky
8969.104	Apr 29	Wed	15	Moon 4.6° S of Pollux; 74° from the Sun in the evening sky
8970.125	Apr 30	Thu	15	Moon 1.84° NNE of Beehive Cluster; 87° from the Sun in the evening sky
8970.359	Apr 30	Thu	20:38	First Quarter Moon
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8970.688	May 1	Fri	5	Mercury 0.30° SE of Uranus; 4° from the Sun in the morning sky; magnitudes -1.7 and 5.9
8971.750	May 2	SAT	6	Moon 4.0° NNE of Regulus; 108° from the Sun in the evening sky
8973.501	May 4	Mon	0	Venus at northernmost declination, 27.82°
8974.395	May 4	Mon	21	Mercury at superior conjunction with the Sun; 1.325 AU from Earth; latitude -0.45°
8974.5	May 5	Tue		Eta Aquarid meteors; ZHR 50; peak May 5 13h; 2 days before Full
8975.013	May 5	Tue	12	Mercury at ascending node through the ecliptic plane
8975.438	May 5	Tue	23	Moon 6.7° NNE of Spica; 158° from the Sun in the evening sky
8975.622	May 6	Wed	2:56	Moon at perigee; distance 56.39 Earth-radii
8976.948	May 7	Thu	10:44	Full Moon
8977.5	May 8	Fri		Eta Lyrid meteors; ZHR 3; peak May 8 3h; 1 day after Full
8978.542	May 9	SAT	1	Moon 6.3° NNE of Antares; 158° from the Sun in the morning sky
8979.682	May 10	SUN	4	Mercury at perihelion, 0.3075 AU from the Sun
8979.877	May 10	SUN	9	Moon at descending node; longitude 269.7°
8980.597	May 11	Mon	2	Saturn stationary in longitude; starts retrograde motion
8980.818	May 11	Mon	8	Saturn stationary in right ascension; starts retrograde motion
8981.667	May 12	Tue	4	Mercury 2.93° SE of Alcyone; 9° from the Sun in the evening sky; magnitudes -1.5 and 2.9
8981.938	May 12	Tue	11	Moon 2.24° S of Jupiter; 115° from the Sun in the morning sky
8982.100	May 12	Tue	14	Moon, Jupiter, and Saturn within circle of diameter 4.72°; about 113° from the Sun in the morning sky; magnitudes -11, -2, 1
8982.313	May 12	Tue	20	Moon 2.66° SE of Saturn; 110° and 111° from the Sun in the morning sky

8982.778	May 13	wed	7	Venus stationary in longitude; starts retrograde motion
8982.925	May 13	wed	10	Venus stationary in right ascension; starts retrograde motion
8983.115	May 13	wed	15	The equation of time is at a maximum of 3.65 minutes.
8983.315	May 13	wed	20	Sun enters Taurus, at longitude 53.48° on the ecliptic
8984.082	May 14	Thu	14	Jupiter stationary in longitude; starts retrograde motion
8984.085	May 14	Thu	14:02	Last Quarter Moon
8984.246	May 14	Thu	18	Jupiter stationary in right ascension; starts retrograde motion
8984.688	May 15	Fri	5	Moon 2.63° SE of Mars; 83° from the Sun in the morning sky
8986.142	May 16	SAT	15	Mars and Jupiter at heliocentric conjunction; longitude 287.4°
8986.146	May 16	SAT	16	Mercury 7.2° N of Aldebaran; 14° and 15° from the Sun in the evening sky; magnitudes -1.1 and 0.9
8986.292	May 16	SAT	19	Moon 4.1° SE of Neptune; 66° from the Sun in the morning sky
8987.729	May 18	Mon	6	Jupiter 4.7° WSW of Saturn; 121° and 116° from the Sun in the morning sky; magnitudes -2.5 and 0.6 ; quasi-conjunction
8987.818	May 18	Mon	8	Moon at apogee; distance 63.59 Earth-radii
8989.892	May 20	wed	9	Mercury at northernmost latitude from the ecliptic plane, 7.0°
8990.077	May 20	wed	14	Sun enters the astrological sign Gemini, i.e. its longitude is 60°
8990.292	May 20	wed	19	Moon 3.6° SE of Uranus; 22° from the Sun in the morning sky
8991.917	May 22	Fri	10	Mercury 0.88° SE of Venus; 19° from the Sun in the evening sky; magnitudes -0.6 and -4.2
8992.146	May 22	Fri	16	Moon 6.6° SE of the Pleiades; 3° and 4° from the Sun in the morning sky
8992.235	May 22	Fri	17:39	New Moon ; beginning of lunation 1205
8992.875	May 23	SAT	9	Moon 3.7° N of Aldebaran; 7° and 9° from the Sun in the evening sky
8993.688	May 24	SUN	5	Moon 3.6° SE of Venus; 17° and 16° from the Sun in the evening sky
8993.758	May 24	SUN	6	Moon, Mercury, and Venus within circle of diameter 4.44° ; about 18° from the Sun in the evening sky; magnitudes -6 , 0 , -4
8994.021	May 24	SUN	13	Moon 2.76° SE of Mercury; 21° and 20° from the Sun in the evening sky
8994.401	May 24	SUN	22	Moon at ascending node; longitude 89.2°
8994.667	May 25	Mon	4	Moon 0.66° SE of M35 cluster; 28° from the Sun in the evening sky
8996.125	May 26	Tue	15	Moon 8.2° S of Castor; 46° from the Sun in the evening sky

8996.333	May 26	Tue	20	Moon 4.5° S of Pollux; 48° from the Sun in the evening sky
8996.693	May 27	Wed	5	Mercury at northernmost declination, 25.66°
8997.354	May 27	Wed	21	Moon 1.98° NNE of Beehive Cluster; 61° from the Sun in the evening sky
8999.000	May 29	Fri	12	Moon 4.1° NNE of Regulus; 82° from the Sun in the evening sky
8999.645	May 30	SAT	3:29	First Quarter Moon
9000.063	May 30	SAT	14	Mercury 1.18° N of M35 cluster; 23° from the Sun in the evening sky; magnitudes 0.1 and 5.3
9000.5	May 31	SUN		Whit Sunday
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9002.260	Jun 1	Mon	18	Mars and Saturn at heliocentric conjunction; longitude 297.1°
9002.813	Jun 2	Tue	8	Moon 6.8° NNE of Spica; 132° from the Sun in the evening sky
9003.649	Jun 3	Wed	3:35	Moon at perigee; distance 57.13 Earth-radii
9004.234	Jun 3	Wed	18	Venus at inferior conjunction with the Sun; 0.289 AU from Earth; latitude 0.19°
9005.040	Jun 4	Thu	13	Mercury at easternmost elongation ; 23.6° from Sun in evening sky
9005.979	Jun 5	Fri	12	Moon 6.3° NNE of Antares; 175° and 173° from the Sun in the midnight sky
9006.291	Jun 5	Fri	19	Venus at descending node through the ecliptic plane
9006.300	Jun 5	Fri	19:12	Full Moon. Penumbral eclipse of the Moon
9006.5	Jun 6	SAT		Daytime Arietid meteors; ZHR 30; peak Jun 6 21h; 1 day after Full
9007.257	Jun 6	SAT	18	Moon at descending node; longitude 269.1°
9007.294	Jun 6	SAT	19	Mars at west quadrature, 90° from the Sun
9009.271	Jun 8	Mon	19	Moon 2.21° SE of Jupiter; 142° from the Sun in the morning sky
9009.400	Jun 8	Mon	22	Moon, Jupiter, and Saturn within circle of diameter 5.06°; about 140° from the Sun in the morning sky; magnitudes -12, -3, 0
9009.646	Jun 9	Tue	4	Moon 2.66° SE of Saturn; 137° from the Sun in the morning sky
9013.131	Jun 12	Fri	15	The equation of time is 0.
9013.296	Jun 12	Fri	19	Mercury at descending node through the ecliptic plane
9013.375	Jun 12	Fri	21	Venus 4.2° NNW of Aldebaran; 14° and 13° from the Sun in the morning sky; magnitudes -4.1 and 0.9
9013.600	Jun 13	SAT	2	Moon, Mars, and Neptune within circle of diameter 4.16°; about 92° from the Sun in the morning sky; magnitudes -10, 0, 8
9013.604	Jun 13	SAT	3	Moon 2.54° SE of Mars; 92° from the Sun in the morning sky
9013.646	Jun 13	SAT	4	Moon 4.2° SE of Neptune; 91° and 92° from the Sun in the morning sky
9013.767	Jun 13	SAT	6:24	Last Quarter Moon
9014.021	Jun 13	SAT	13	Mars 1.63° SE of Neptune; 92° from the Sun in the morning sky; magnitudes -0.2 and 7.9

9014.688	Jun 14	SUN	4:31	Earliest sunrise, at latitude 40° north
9015.542	Jun 15	Mon	1	Moon at apogee; distance 63.44 Earth-radii
9017.708	Jun 17	wed	5	Moon 3.6° SE of Uranus; 47° from the Sun in the morning sky
9018.310	Jun 17	wed	19	Mercury stationary in right ascension; starts retrograde motion
9018.705	Jun 18	Thu	5	Mercury stationary in longitude; starts retrograde motion
9019.458	Jun 18	Thu	23	Moon 6.6° SE of the Pleiades; 27° and 28° from the Sun in the morning sky
9019.875	Jun 19	Fri	9	Moon 0.75° N of Venus; 22° and 23° from the Sun in the morning sky
9019.958	Jun 19	Fri	11	Moon, Venus, and Aldebar within circle of diameter 4.85°; about 21° from the Sun in the morning sky; magnitudes -6, -4, 1
9020.188	Jun 19	Fri	17	Moon 3.7° N of Aldebaran; 19° and 20° from the Sun in the morning sky
9020.542	Jun 20	SAT	1	Middle of eclipse season: Sun is at same longitude as Moon's ascending node, 89.2°
9020.979	Jun 20	SAT	12	Venus 8.9° SE of the Pleiades; 24° and 30° from the Sun in the morning sky; magnitudes -4.3 and 2.9; quasi-conjunction
9021.406	Jun 20	SAT	21:45	June or summer solstice
9021.406	Jun 20	SAT	21:45	Sun enters the astrological sign Cancer, i.e. its longitude is 90°
9021.685	Jun 21	SUN	4	Moon at ascending node; longitude 89.1°
9021.779	Jun 21	SUN	6:41	New Moon ; beginning of lunation 1206. Annular-total eclipse of the Sun
9021.873	Jun 21	SUN	9	Sun enters Gemini, at longitude 90.44° on the ecliptic
9021.958	Jun 21	SUN	11	Moon 0.70° SE of M35 cluster; 2° from the Sun in the evening sky
9022.833	Jun 22	Mon	8	Moon 3.9° N of Mercury; 13° from the Sun in the evening sky
9023.396	Jun 22	Mon	22	Moon 8.1° S of Castor; 20° and 21° from the Sun in the evening sky
9023.453	Jun 22	Mon	23	Neptune stationary in longitude; starts retrograde motion
9023.5	Jun 23	Tue		June Boötid meteors; ZHR 5; peak Jun 23 0h; 2 days after New
9023.583	Jun 23	Tue	2	Moon 4.5° S of Pollux; 22° from the Sun in the evening sky
9023.666	Jun 23	Tue	4	Mercury at aphelion, 0.4667 AU from the Sun
9024.041	Jun 23	Tue	13	Neptune stationary in right ascension; starts retrograde motion
9024.604	Jun 24	wed	3	Moon 2.03° NNE of Beehive Cluster; 35° from the Sun in the evening sky
9025.254	Jun 24	wed	18	Venus stationary in right ascension; resumes direct motion
9025.782	Jun 25	Thu	7	Venus stationary in longitude; resumes direct motion

9026.229	Jun 25	Thu 18	Moon 4.2° NNE of Regulus; 56° from the Sun in the evening sky
9028.315	Jun 27	SAT 19:33	Latest sunset, at latitude 40° north
9028.844	Jun 28	SUN 8:15	First Quarter Moon
9030.083	Jun 29	Mon 14	Moon 6.8° NNE of Spica; 106° from the Sun in the evening sky
9030.348	Jun 29	Mon 20	Asteroid 3 Juno at opposition. Magnitude 9.8.
9030.588	Jun 30	Tue 2:07	Moon at perigee; distance 57.85 Earth-radii
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9031.615	Jul 1	wed 3	Mercury at inferior conjunction with the Sun; 0.563 AU from Earth; latitude -5.47°
9033.333	Jul 2	Thu 20	Moon 6.3° NNE of Antares; 150° and 148° from the Sun in the evening sky
9034.638	Jul 4	SAT 3	Moon at descending node; longitude 269.1°
9034.940	Jul 4	SAT 11	Earth at aphelion ; 1.0167 AU from the Sun
9035.697	Jul 5	SUN 4:44	Full Moon. Penumbral eclipse of the Moon
9036.438	Jul 5	SUN 23	Moon 1.88° SE of Jupiter; 171° from the Sun in the midnight sky
9036.896	Jul 6	Mon 10	Moon 2.47° S of Saturn; 165° from the sun in the morning sky
9038.547	Jul 8	wed 1	Mars at southernmost latitude from the ecliptic plane, -1.8°
9038.993	Jul 8	wed 12	Venus brightest; magnitude -4.48°
9040.816	Jul 10	Fri 8	Venus shows greatest illuminated extent, 47.4 square seconds
9040.979	Jul 10	Fri 12	Moon 4.1° SE of Neptune; 117° and 118° from the Sun in the morning sky
9041.098	Jul 10	Fri 14	Venus at aphelion, 0.7282 AU from the Sun
9041.999	Jul 11	SAT 12	Mars crosses equator northward
9042.417	Jul 11	SAT 22	Moon 1.81° SE of Mars; 102° from the Sun in the morning sky
9042.563	Jul 12	SUN 2	Venus 0.95° N of Aldebaran; 40° from the Sun in the morning sky; magnitudes -4.5 and 0.9
9042.786	Jul 12	SUN 7	Mercury stationary in right ascension; resumes direct motion
9042.848	Jul 12	SUN 8	Mercury stationary in longitude; resumes direct motion
9043.309	Jul 12	SUN 19	Moon at apogee; distance 63.37 Earth-radii
9043.479	Jul 12	SUN 23:30	Last Quarter Moon
9043.925	Jul 13	Mon 10	Mercury at southernmost latitude from the ecliptic plane, -7.0°
9044.826	Jul 14	Tue 8	Jupiter at opposition ; magnitude -2.8
9045.125	Jul 14	Tue 15	Moon 3.5° SE of Uranus; 72° from the Sun in the morning sky
9045.625	Jul 15	wed 3	Mercury 6.0° SE of M35 cluster; 18° and 21° from the Sun in the morning sky; magnitudes 1.6 and 5.3
9045.988	Jul 15	wed 12	Pluto at opposition ; magnitude 14.3
9046.813	Jul 16	Thu 8	Moon 6.6° SE of the Pleiades; 53° and 54° from the Sun in the morning sky

9047.521	Jul 17	Fri	1	Moon 3.7° N of Aldebaran; 45° from the Sun in the morning sky
9047.600	Jul 17	Fri	2	Moon, Venus, and Aldebar within circle of diameter 4.13°; about 44° from the Sun in the morning sky; magnitudes -8, -4, 1
9047.771	Jul 17	Fri	7	Moon 3.1° N of Venus; 42° from the Sun in the morning sky
9049.024	Jul 18	SAT	13	Moon at ascending node; longitude 89.0°
9049.292	Jul 18	SAT	19	Moon 0.62° SE of M35 cluster; 24° from the Sun in the morning sky
9049.688	Jul 19	SUN	5	Moon 3.9° N of Mercury; 19° and 20° from the Sun in the morning sky
9050.729	Jul 20	Mon	6	Moon 8.2° S of Castor; 7° and 13° from the Sun in the morning sky
9050.917	Jul 20	Mon	10	Moon 4.5° S of Pollux; 5° and 8° from the Sun in the morning sky
9051.051	Jul 20	Mon	13	Sun enters Cancer, at longitude 118.27° on the ecliptic
9051.231	Jul 20	Mon	17:32	New Moon ; beginning of lunation 1207
9051.429	Jul 20	Mon	22	Saturn at opposition ; magnitude 0.1
9051.917	Jul 21	Tue	10	Moon 2.00° NNE of Beehive Cluster; 9° from the Sun in the evening sky
9052.860	Jul 22	wed	9	Sun enters the astrological sign Leo, i.e. its longitude is 120°
9053.127	Jul 22	wed	15	Mercury at westernmost elongation ; 20.1° from Sun in morning sky
9053.5	Jul 23	Thu	0	Moon 4.1° NNE of Regulus; 30° from the Sun in the evening sky
9055.712	Jul 25	SAT	5:05	Moon at perigee; distance 57.75 Earth-radii
9056.234	Jul 25	SAT	18	The equation of time is at a minimum of -6.55 minutes.
9057.292	Jul 26	SUN	19	Moon 6.7° NNE of Spica; 80° from the Sun in the evening sky
9057.5	Jul 27	Mon		Piscid Austrinid meteors; ZHR 5; peak Jul 27 14h; near First Quarter
9058.023	Jul 27	Mon	12:33	First Quarter Moon
9059.5	Jul 29	wed		Southern Delta Aquarid meteors ; ZHR 25; peak Jul 29 16h; 2 days after First Quarter
9059.5	Jul 29	wed		Alpha Capricornid meteors; ZHR 5; peak Jul 29 16h; 2 days after First Quarter
9060.604	Jul 30	Thu	3	Moon 6.2° NNE of Antares; 124° and 123° from the Sun in the evening sky
9061.897	Jul 31	Fri	10	Moon at descending node; longitude 268.6°
9062.982	Aug 1	SAT	12	Mercury at ascending node through the ecliptic plane
9063.142	Aug 1	SAT	15	Venus at southernmost latitude from the ecliptic plane, -3.4°
9063.5	Aug 2	SUN	0	Moon 1.52° S of Jupiter; 160° from the Sun in the evening sky

9063.521	Aug	2	SUN	1	Mercury 6.6° S of Pollux; 16° and 18° from the Sun in the morning sky; magnitudes -0.9 and 1.2
9063.968	Aug	2	SUN	11	Uranus at west quadrature, 90° from the Sun
9064.083	Aug	2	SUN	14	Moon 2.26° SE of Saturn; 167° from the Sun in the evening sky
9064.881	Aug	3	Mon	9	Mars at perihelion, 1.3814 AU from the Sun
9065.166	Aug	3	Mon	15:58	Full Moon
9067.651	Aug	6	Thu	4	Mercury at perihelion, 0.3075 AU from the Sun
9068.271	Aug	6	Thu	19	Moon 4.0° SE of Neptune; 144° from the Sun in the morning sky
9070.542	Aug	9	SUN	1	Mercury 0.06° SE of Beehive Cluster; 9° from the Sun in the morning sky; magnitudes -1.5 and 3.7
9070.875	Aug	9	SUN	9	Moon 0.71° SE of Mars; 115° from the Sun in the morning sky
9071.074	Aug	9	SUN	14	Moon at apogee; distance 63.45 Earth-radii
9071.882	Aug	10	Mon	9	Sun enters Leo, at longitude 138.20° on the ecliptic
9071.938	Aug	10	Mon	11	Venus 4.4° S of M35 cluster; 46° from the Sun in the morning sky; magnitudes -4.3 and 5.3
9072.5	Aug	11	Tue	0	Moon 3.3° SE of Uranus; 98° from the Sun in the morning sky
9073.199	Aug	11	Tue	16:47	Last Quarter Moon
9073.5	Aug	12	Wed		Perseid meteors ; ZHR 110; peak Aug 12 6h; 1 day after Last Quarter
9074.167	Aug	12	Wed	16	Moon 6.4° SE of the Pleiades; 79° and 80° from the Sun in the morning sky
9074.364	Aug	12	Wed	21	Venus dichotomy (D-shape)
9074.497	Aug	12	Wed	24	Venus at westernmost elongation ; 45.8° from Sun in morning sky
9074.896	Aug	13	Thu	10	Moon 3.9° N of Aldebaran; 71° from the Sun in the morning sky
9076.309	Aug	14	Fri	19	Moon at ascending node; longitude 87.8°
9076.688	Aug	15	SAT	5	Moon 0.59° SE of M35 cluster; 50° and 51° from the Sun in the morning sky
9076.958	Aug	15	SAT	11	Uranus stationary in longitude; starts retrograde motion
9077.063	Aug	15	SAT	14	Moon 4.0° N of Venus; 46° from the Sun in the morning sky
9077.063	Aug	15	SAT	14	Uranus stationary in right ascension; starts retrograde motion
9077.861	Aug	16	SUN	9	Mercury at northernmost latitude from the ecliptic plane, 7.0°
9078.104	Aug	16	SUN	15	Moon 8.1° S of Castor; 33° and 35° from the Sun in the morning sky
9078.313	Aug	16	SUN	20	Moon 4.5° S of Pollux; 30° and 32° from the Sun in the morning sky
9078.5	Aug	17	Mon		Kappa Cygnid meteors; ZHR 3; peak Aug 17 11h; 2 days before New
9079.121	Aug	17	Mon	15	Mercury at superior conjunction with the Sun; 1.354 AU from Earth; latitude 6.96°

9079.292	Aug 17	Mon	19	Moon 1.99° NNE of Beehive Cluster; 18° from the Sun in the morning sky
9080.612	Aug 19	wed	2:41	New Moon ; beginning of lunation 1208
9080.750	Aug 19	wed	6	Moon 2.70° NNE of Mercury; 5° and 2° from the Sun in the evening sky
9080.842	Aug 19	wed	8	Moon, Mercury, and Regulus within circle of diameter 4.04°; only about 4° from the Sun; magnitudes -5, -2, 1
9080.875	Aug 19	wed	9	Moon 4.1° NNE of Regulus; 6° and 3° from the Sun in the evening sky
9081.5	Aug 20	Thu		1st day of Muslim year (1442 A.H.)
9081.646	Aug 20	Thu	4	Mercury 1.27° NNE of Regulus; 3° from the Sun in the evening sky; magnitudes -1.7 and 1.4
9082.957	Aug 21	Fri	10:58	Moon at perigee; distance 57.00 Earth-radii
9084.158	Aug 22	SAT	16	Sun enters the astrological sign Virgo, i.e. its longitude is 150°
9084.563	Aug 23	SUN	2	Moon 6.6° NNE of Spica; 54° from the Sun in the evening sky
9085.433	Aug 23	SUN	22	Mars and Neptune at heliocentric conjunction; longitude 349.4°
9087.249	Aug 25	Tue	17:58	First Quarter Moon
9087.813	Aug 26	wed	8	Moon 6.0° NNE of Antares; 97° and 96° from the Sun in the evening sky
9088.995	Aug 27	Thu	12	Moon at descending node; longitude 266.8°
9090.583	Aug 29	SAT	2	Moon 1.41° S of Jupiter; 132° from the Sun in the evening sky
9091.229	Aug 29	SAT	18	Moon 2.21° SE of Saturn; 139° from the Sun in the evening sky
9092.5	Aug 31	Mon		Aurigid meteors; ZHR 5; peak Aug 31 14h; 2 days before Full
9093.354	Aug 31	Mon	21	Venus 8.6° S of Pollux; 45° and 46° from the Sun in the morning sky; magnitudes -4.2 and 1.2
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9093.581	Sep 1	Tue	2	The equation of time is 0.
9094.724	Sep 2	wed	5:22	Full Moon
9095.521	Sep 3	Thu	1	Moon 3.9° SE of Neptune; 170° and 171° from the Sun in the morning sky
9096.656	Sep 4	Fri	4	winter solstice on Mars
9096.656	Sep 4	Fri	4	winter solstice on Mars
9098.729	Sep 6	SUN	6	Moon 0.36° ENE of Mars; 136° from the Sun in the morning sky
9098.779	Sep 6	SUN	7	Moon at apogee; distance 63.59 Earth-radii
9099.792	Sep 7	Mon	7	Moon 3.1° SE of Uranus; 124° and 125° from the Sun in the morning sky
9100.5	Sep 8	Tue		September Epsilon Perseid meteors; ZHR 10; peak Sep 8 22h; 1 day before Last Quarter
9101.265	Sep 8	Tue	18	Mercury at descending node through the ecliptic plane
9101.479	Sep 8	Tue	24	Moon 6.2° SE of the Pleiades; 106° from the Sun in the morning sky

9102.229	Sep	9	Wed	18	Moon 4.1° N of Aldebaran; 97° from the Sun in the morning sky
9102.243	Sep	9	Wed	18	Mars stationary in right ascension; starts retrograde motion
9102.432	Sep	9	Wed	22	Mars stationary in longitude; starts retrograde motion
9102.894	Sep	10	Thu	9:27	Last Quarter Moon
9103.463	Sep	10	Thu	23	Moon at ascending node; longitude 85.2°
9104.063	Sep	11	Fri	14	Moon 0.47° ESE of M35 cluster; 77° from the Sun in the morning sky
9104.343	Sep	11	Fri	20	Neptune at opposition ; magnitude 7.8
9105.477	Sep	12	SAT	23	Jupiter stationary in right ascension; resumes direct motion
9105.5	Sep	13	SUN	0	Moon 7.9° S of Castor; 59° and 61° from the Sun in the morning sky
9105.509	Sep	13	SUN	0	Jupiter stationary in longitude; resumes direct motion
9105.708	Sep	13	SUN	5	Moon 4.3° S of Pollux; 57° and 58° from the Sun in the morning sky
9105.896	Sep	13	SUN	10	Venus 2.27° S of Beehive Cluster; 43° from the Sun in the morning sky; magnitudes -4.1 and 3.7
9106.708	Sep	14	Mon	5	Moon 2.11° NNE of Beehive Cluster; 44° from the Sun in the morning sky
9106.758	Sep	14	Mon	6	Moon, Venus, and Beehive within circle of diameter 4.36°; about 44° from the Sun in the morning sky; magnitudes -8, -4, 4
9106.792	Sep	14	Mon	7	Moon 4.4° NNE of Venus; 43° from the Sun in the morning sky
9107.316	Sep	14	Mon	20	Jupiter at southernmost declination, -22.72°
9108.292	Sep	15	Tue	19	Moon 4.1° NNE of Regulus; 24° and 23° from the Sun in the morning sky
9109.100	Sep	16	wed	14	Sun enters Virgo, at longitude 174.17° on the ecliptic
9109.958	Sep	17	Thu	10:60	New Moon ; beginning of lunation 1209
9110.5	Sep	18	Fri		Rosh Hashanah, 1st say of Hebrew year 5781 A.M.
9111.080	Sep	18	Fri	13:55	Moon at perigee; distance 56.30 Earth-radii
9111.625	Sep	19	SAT	3	Moon 5.9° NNE of Mercury; 24° and 23° from the Sun in the evening sky
9111.636	Sep	19	SAT	3	Mercury at aphelion, 0.4667 AU from the Sun
9111.917	Sep	19	SAT	10	Moon 6.4° NNE of Spica; 28° and 27° from the Sun in the evening sky
9115.000	Sep	22	Tue	12	Mercury 0.27° NE of Spica; 24° from the Sun in the evening sky; magnitudes -0.0 and 1.0
9115.064	Sep	22	Tue	13:32	Sun enters the astrological sign Libra, i.e. its longitude is 180°
9115.064	Sep	22	Tue	13:32	September of fall or autumn equinox
9115.083	Sep	22	Tue	14	Moon 5.8° NNE of Antares; 71° and 70° from the Sun in the evening sky
9116.023	Sep	23	wed	13	Moon at descending node; longitude 263.9°
9116.580	Sep	24	Thu	1:55	First Quarter Moon

9117.813	Sep 25	Fri	8	Moon 1.62° SE of Jupiter; 105° from the Sun in the evening sky
9118.387	Sep 25	Fri	21	Asteroid 2 Pallas at opposition. Magnitude 8.3.
9118.396	Sep 25	Fri	22	Moon 2.32° S of Saturn; 112° from the Sun in the evening sky
9119.435	Sep 26	SAT	22	Venus at ascending node through the ecliptic plane
9121.547	Sep 29	Tue	1	Saturn stationary in right ascension; resumes direct motion
9121.642	Sep 29	Tue	3	Saturn stationary in longitude; resumes direct motion
9122.729	Sep 30	wed	6	Moon 3.9° SE of Neptune; 161° and 162° from the Sun in the evening sky
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9124.163	Oct 1	Thu	16	Mercury at easternmost elongation ; 25.8° from Sun in evening sky
9124.379	Oct 1	Thu	21:06	Full Moon
9125.479	Oct 2	Fri	24	Venus 0.09° S of Regulus; 40° from the Sun in the morning sky; magnitudes -4.1 and 1.4
9125.688	Oct 3	SAT	5	Moon 0.70° SE of Mars; 165° and 166° from the Sun in the morning sky
9126.187	Oct 3	SAT	16	Pluto stationary in right ascension; resumes direct motion
9126.233	Oct 3	SAT	18	Moon at apogee; distance 63.70 Earth-radii
9126.602	Oct 4	SUN	2	Pluto stationary in longitude; resumes direct motion
9127.000	Oct 4	SUN	12	Moon 2.96° SE of Uranus; 151° and 152° from the Sun in the morning sky
9127.5	Oct 5	Mon		October Camelopardalid meteors; ZHR 5; peak Oct 5 7h; 3 days after Full
9128.750	Oct 6	Tue	6	Moon 5.9° SE of the Pleiades; 132° and 133° from the Sun in the morning sky
9129.099	Oct 6	Tue	14	Mars nearest to Earth, 0.415 AU
9129.5	Oct 7	wed	0	Moon 4.4° N of Aldebaran; 124° from the Sun in the morning sky
9130.5	Oct 8	Thu		Draconid meteors ; ZHR 20; peak Oct 8 6h; 2 days before Last Quarter
9130.521	Oct 8	Thu	1	Moon at ascending node; longitude 82.2°
9131.354	Oct 8	Thu	21	Moon 0.15° E of M35 cluster; 104° from the Sun in the morning sky
9131.5	Oct 9	Fri		Southern Taurid meteors; ZHR 5; peak Oct 9 21h; near Last Quarter
9131.894	Oct 9	Fri	9	Mercury at southernmost latitude from the ecliptic plane, -7.0°
9132.5	Oct 10	SAT		Delta Aurigid meteors; ZHR 2; peak Oct 10 21h; 1 day after Last Quarter
9132.528	Oct 10	SAT	0:40	Last Quarter Moon
9132.854	Oct 10	SAT	9	Moon 7.7° S of Castor; 86° and 87° from the Sun in the morning sky
9133.063	Oct 10	SAT	14	Moon 4.0° S of Pollux; 84° from the Sun in the morning sky
9134.063	Oct 11	SUN	14	Jupiter at east quadrature, 90° from the Sun

9134.104	Oct 11	SUN	15	Moon 2.35° NNE of Beehive Cluster; 71° from the Sun in the morning sky
9135.729	Oct 13	Tue	6	Moon 4.3° NNE of Regulus; 50° from the Sun in the morning sky
9136.472	Oct 13	Tue	23	Mars at opposition ; magnitude -2.6
9136.542	Oct 14	Wed	1	Mercury stationary in longitude; starts retrograde motion
9136.646	Oct 14	Wed	4	Moon 4.1° NNE of Venus; 38° from the Sun in the morning sky
9136.685	Oct 14	Wed	4	Mercury stationary in right ascension; starts retrograde motion
9138.099	Oct 15	Thu	14	Pluto at southernmost declination, -22.65°
9139.313	Oct 16	Fri	19:31	New Moon ; beginning of lunation 1210
9139.375	Oct 16	Fri	21	Moon 6.3° NNE of Spica; 4° and 2° from the Sun in the evening sky
9139.498	Oct 16	Fri	23:57	Moon at perigee; distance 55.96 Earth-radii; nearest in year
9139.498	Oct 16	Fri	23:57	Perigee only 4.4 hours after New Moon
9139.5	Oct 17	SAT		Epsilon Geminid meteors; ZHR 3; peak Oct 17 22h; 1 day after New
9140.458	Oct 17	SAT	23	Moon 6.3° NNE of Mercury; 17° and 16° from the Sun in the evening sky
9141.079	Oct 18	SUN	14	Saturn at east quadrature, 90° from the Sun
9142.438	Oct 19	Mon	23	Moon 5.6° NNE of Antares; 44° and 43° from the Sun in the evening sky
9142.5	Oct 20	Tue		Orionid meteors ; ZHR 25; peak Oct 20 23h; 3 days before First Quarter
9143.162	Oct 20	Tue	16	Moon at descending node; longitude 261.3°
9145.250	Oct 22	Thu	18	Moon 2.03° SE of Jupiter; 80° from the Sun in the evening sky
9145.457	Oct 22	Thu	23	Sun enters the astrological sign Scorpius, i.e. its longitude is 210°
9145.5	Oct 23	Fri		Leo Minorid meteors; ZHR 2; peak Oct 23 23h; near First Quarter
9145.600	Oct 23	Fri	2	Moon, Jupiter, and Saturn within circle of diameter 5.92°; about 83° from the Sun in the evening sky; magnitudes -10, -2, 1
9145.708	Oct 23	Fri	5	Moon 2.61° SE of Saturn; 86° from the Sun in the evening sky
9146.058	Oct 23	Fri	13:23	First Quarter Moon
9147.5	Oct 25	SUN		Clocks back 1 hour (Europe)
9148.262	Oct 25	SUN	18	Mercury at inferior conjunction with the Sun; 0.671 AU from Earth; latitude -1.91°
9149.917	Oct 27	Tue	10	Moon 4.0° SE of Neptune; 134° from the Sun in the evening sky
9150.951	Oct 28	Wed	11	Mercury at ascending node through the ecliptic plane
9152.292	Oct 29	Thu	19	Moon 2.72° SE of Mars; 160° from the Sun in the evening sky
9153.280	Oct 30	Fri	19	Moon at apogee; distance 63.72 Earth-radii

9153.293	Oct 30	Fri 19	Sun enters Libra, at longitude 217.82° on the ecliptic
9153.476	Oct 30	Fri 23	Venus at perihelion, 0.7184 AU from the Sun
9154.118	Oct 31	SAT 14:50	Full Moon
9154.152	Oct 31	SAT 16	Uranus at opposition ; magnitude 5.7
9154.167	Oct 31	SAT 16	Moon 2.98° SE of Uranus; 177° and 180° from the Sun in the midnight sky
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9154.5	Nov 1	SUN	Clocks back 1 hour (America)
9155.313	Nov 1	SUN 20	Mercury 4.0° NE of Spica; 14° and 16° from the Sun in the morning sky; magnitudes 1.2 and 1.0; quasi-conjunction
9155.621	Nov 2	Mon 3	Mercury at perihelion, 0.3075 AU from the Sun
9156.000	Nov 2	Mon 12	Moon 5.8° SE of the Pleiades; 159° and 160° from the Sun in the morning sky
9156.272	Nov 2	Mon 19	Jupiter and Saturn at heliocentric conjunction ; longitude 301.8°
9156.371	Nov 2	Mon 21	The equation of time is at a maximum of 16.49 minutes.
9156.750	Nov 3	Tue 6	Moon 4.5° N of Aldebaran; 151° from the Sun in the morning sky
9156.844	Nov 3	Tue 8	Mercury stationary in right ascension; resumes direct motion
9157.239	Nov 3	Tue 18	Mercury stationary in longitude; resumes direct motion
9157.611	Nov 4	Wed 3	Moon at ascending node; longitude 80.3°
9158.604	Nov 5	Thu 3	Moon 0.23° NE of M35 cluster; 131° from the Sun in the morning sky
9160.125	Nov 6	Fri 15	Moon 7.5° S of Castor; 113° and 114° from the Sun in the morning sky
9160.333	Nov 6	Fri 20	Moon 3.8° S of Pollux; 111° from the Sun in the morning sky
9161.396	Nov 7	SAT 22	Moon 2.54° NNE of Beehive Cluster; 98° from the Sun in the morning sky
9162.074	Nov 8	SUN 13:46	Last Quarter Moon
9163.083	Nov 9	Mon 14	Moon 4.4° NNE of Regulus; 77° and 78° from the Sun in the morning sky
9164.205	Nov 10	Tue 17	Mercury at westernmost elongation ; 19.1° from Sun in morning sky
9164.5	Nov 11	Wed	Armistice Day
9164.5	Nov 11	Wed	Northern Taurid meteors; ZHR 5; peak Nov 11 23h; 3 days before New
9165.830	Nov 12	Thu 8	Mercury at northernmost latitude from the ecliptic plane, 7.0°
9166.483	Nov 12	Thu 24	Mars and Uranus at heliocentric conjunction; longitude 38.8°
9166.521	Nov 13	Fri 1	Moon 2.81° NNE of Venus; 31° and 32° from the Sun in the morning sky
9166.833	Nov 13	Fri 8	Moon 6.4° NNE of Spica; 27° from the Sun in the morning sky

9167.438	Nov 13	Fri 23	Moon 1.61° NE of Mercury; 18° and 19° from the Sun in the morning sky
9167.519	Nov 14	SAT 0	Mars stationary in longitude; resumes direct motion
9167.993	Nov 14	SAT 11:49	Perigee only 17.3 hours before New Moon
9167.993	Nov 14	SAT 11:49	Moon at perigee; distance 56.11 Earth-radii
9168.714	Nov 15	SUN 5:08	New Moon ; beginning of lunation 1211
9169.309	Nov 15	SUN 19	Mars stationary in right ascension; resumes direct motion
9169.875	Nov 16	Mon 9	Moon 5.5° NNE of Antares; 16° from the Sun in the evening sky
9170.313	Nov 16	Mon 20	Venus 3.8° NNE of Spica; 31° from the Sun in the morning sky; magnitudes -4.0 and 1.0
9170.5	Nov 17	Tue	Leonid meteors ; ZHR 15; peak Nov 17 4h; 2 days after New
9170.506	Nov 17	Tue 0	Moon at descending node; longitude 260.1°
9172.917	Nov 19	Thu 10	Moon 2.50° SE of Jupiter; 57° and 56° from the Sun in the evening sky
9173.042	Nov 19	Thu 13	Moon, Jupiter, and Saturn within circle of diameter 3.78°; about 58° from the Sun in the evening sky; magnitudes -9, -2, 1
9173.167	Nov 19	Thu 16	Moon 2.85° SE of Saturn; 60° from the Sun in the evening sky
9174.5	Nov 21	SAT	Alpha Monocerotid meteors; ZHR 5; peak Nov 21 4h; 1 day before First Quarter
9174.937	Nov 21	SAT 10	Venus at northernmost latitude from the ecliptic plane, 3.4°
9175.333	Nov 21	SAT 20	Moon shows maximum libration for the year, 9.44°
9175.360	Nov 21	SAT 21	Sun enters the astrological sign Sagittarius, i.e. its longitude is 240°
9175.698	Nov 22	SUN 4:45	First Quarter Moon
9176.503	Nov 23	Mon 0	Sun enters Scorpius, at longitude 241.15° on the ecliptic
9177.167	Nov 23	Mon 16	Moon 4.2° SE of Neptune; 107° and 106° from the Sun in the evening sky
9179.521	Nov 26	Thu 1	Moon 4.5° SE of Mars; 132° from the Sun in the evening sky
9180.394	Nov 26	Thu 21	Dwarf planet 1 Ceres at opposition. Magnitude 7.0.
9180.528	Nov 27	Fri 1	Moon at apogee; distance 63.64 Earth-radii
9181.333	Nov 27	Fri 20	Moon 3.1° SE of Uranus; 152° from the Sun in the evening sky
9181.5	Nov 28	SAT	November Orionid meteors; ZHR 3; peak Nov 28 0h; 2 days before Full
9182.368	Nov 28	SAT 21	Neptune stationary in longitude; resumes direct motion
9182.725	Nov 29	SUN 5	Neptune stationary in right ascension; resumes direct motion
9183.271	Nov 29	SUN 19	Moon 5.8° SE of the Pleiades; 173° and 171° from the Sun in the midnight sky
9183.321	Nov 29	SUN 20	Sun enters Ophiuchus, at longitude 248.05° on the ecliptic

9183.896	Nov 30	Mon	9:31	Full Moon. Penumbral eclipse of the Moon
9184.000	Nov 30	Mon	12	Moon 4.5° N of Aldebaran; 179° and 174° from the Sun in the midnight sky
9184.5	Dec 1	Tue		Phoenicid meteors; ZHR 5; peak Dec 1 18h; 1 day after Full
9184.823	Dec 1	Tue	8	Moon at ascending node; longitude 79.9°
9185.639	Dec 2	Wed	3	Mars at ascending node through the ecliptic plane
9185.854	Dec 2	Wed	9	Moon 0.37° NE of M35 cluster; 158° from the Sun in the morning sky
9186.542	Dec 3	Thu	1	Moon at northernmost declination in year, 24.88°
9187.354	Dec 3	Thu	21	Moon 7.4° S of Castor; 141° from the Sun in the morning sky
9187.563	Dec 4	Fri	2	Moon 3.7° S of Pollux; 138° from the Sun in the morning sky
9188.646	Dec 5	SAT	4	Moon 2.65° NNE of Beehive Cluster; 126° from the Sun in the morning sky
9189.234	Dec 5	SAT	18	Mercury at descending node through the ecliptic plane
9190.333	Dec 6	SUN	20	Moon 4.5° NNE of Regulus; 105° from the Sun in the morning sky
9190.5	Dec 7	Mon		Puppis-Velid meteors; ZHR 10; peak Dec 7 0h; 1 day before Last Quarter
9191.191	Dec 7	Mon	16:35	Earliest sunset, at latitude 40° north
9191.5	Dec 8	Tue		Monocerotid meteors; ZHR 3; peak Dec 8 15h; 1 day after Last Quarter
9191.526	Dec 8	Tue	0:37	Last Quarter Moon
9191.958	Dec 8	Tue	11	Mercury 4.3° NNE of Antares; 6° and 8° from the Sun in the morning sky; magnitudes -0.9 and 1.0
9194.229	Dec 10	Thu	18	Moon 6.4° NNE of Spica; 54° and 55° from the Sun in the morning sky
9194.5	Dec 11	Fri		Sigma Hydrid meteors; ZHR 3; peak Dec 11 14h; 3 days before New
9195.029	Dec 11	Fri	13	Middle of eclipse season: Sun is at same longitude as Moon's descending node, 259.9°
9196.363	Dec 12	SAT	20:43	Moon at perigee; distance 56.72 Earth-radii
9196.396	Dec 12	SAT	22	Moon 0.78° NNE of Venus; 25° from the Sun in the morning sky
9196.5	Dec 13	SUN		Geminid meteors ; ZHR 120; peak Dec 13 18h; 1 day before New
9197.000	Dec 13	SUN	12	Moon shows minimum libration for the year, 2.41°
9197.333	Dec 13	SUN	20	Moon 5.5° NNE of Antares; 12° and 13° from the Sun in the morning sky
9197.961	Dec 14	Mon	11	Moon at descending node; longitude 260.0°
9197.979	Dec 14	Mon	12	Moon 1.01° NNE of Mercury; 3° from the Sun in the morning sky
9198.179	Dec 14	Mon	16:18	New Moon ; beginning of lunation 1212. Total eclipse of the Sun
9198.5	Dec 15	Tue		Coma Berenicid meteors; ZHR 3; peak Dec 15 13h; 1 day after New
9199.417	Dec 15	Tue	22	Moon at southernmost declination in year, -24.88°

9199.606	Dec 16	wed	3	Mercury at aphelion, 0.4667 AU from the Sun
9200.729	Dec 17	Thu	6	Moon 2.90° S of Jupiter; 34° from the Sun in the evening sky
9200.758	Dec 17	Thu	6	Moon, Jupiter, and Saturn within circle of diameter 3.03°; about 34° from the Sun in the evening sky; magnitudes -7, -2, 1
9200.771	Dec 17	Thu	7	Moon 3.0° SE of Saturn; 34° from the Sun in the evening sky
9201.598	Dec 18	Fri	2	Sun enters Sagittarius, at longitude 266.62° on the ecliptic
9202.5	Dec 19	SAT		December Leo Minorid meteors; ZHR 5; peak Dec 19 11h; 3 days before First Quarter
9203.631	Dec 20	SUN	3	Mercury at superior conjunction with the Sun; 1.447 AU from Earth; latitude -4.53°
9204.5	Dec 21	Mon	0	Moon 4.2° SE of Neptune; 79° from the Sun in the evening sky
9204.917	Dec 21	Mon	10:01	Sun enters the astrological sign Capricornus, i.e. its longitude is 270°
9204.917	Dec 21	Mon	10:01	December or winter solstice
9205.271	Dec 21	Mon	19	Jupiter 0.10° SE of Saturn; 30° from the Sun in the evening sky; magnitudes -2.0 and 0.7
9205.487	Dec 21	Mon	23:41	First Quarter Moon
9205.5	Dec 22	Tue		Ursid meteors ; ZHR 15; peak Dec 22 3h; near First Quarter
9207.354	Dec 23	wed	21	Venus 5.6° N of Antares; 22° and 23° from the Sun in the morning sky; magnitudes -3.9 and 1.0
9207.5	Dec 24	Thu	0	Moon 5.1° SE of Mars; 112° and 111° from the Sun in the evening sky
9207.772	Dec 24	Thu	7	Mercury at southernmost declination, -25.08°
9208.195	Dec 24	Thu	17	Moon at apogee; distance 63.50 Earth-radii
9208.398	Dec 24	Thu	22	The equation of time is 0.
9208.5	Dec 25	Fri		Christmas
9208.583	Dec 25	Fri	2	Moon 3.2° SE of Uranus; 124° and 123° from the Sun in the evening sky
9210.563	Dec 27	SUN	2	Moon 5.8° SE of the Pleiades; 145° and 144° from the Sun in the evening sky
9211.313	Dec 27	SUN	20	Moon 4.6° N of Aldebaran; 153° from the Sun in the evening sky
9212.127	Dec 28	Mon	15	Moon at ascending node; longitude 80.0°
9213.146	Dec 29	Tue	16	Moon 0.42° NE of M35 cluster; 174° from the Sun in the midnight sky
9213.645	Dec 30	wed	3:29	Full Moon
9214.625	Dec 31	Thu	3	Moon 7.4° S of Castor; 168° and 165° from the Sun in the morning sky
9214.833	Dec 31	Thu	8	Moon 3.8° S of Pollux; 166° and 165° from the Sun in the morning sky