

Mercury: low in SW at dusk.  
Jupiter brightest object in sky, sets by 9h.

## December, 2009

Mars rises in late evening, achieves mag. -0.7.  
Saturn follows 4 hours later.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Nov 29 MS: 04:40 SR: 07:35 MR: 14:20 SS: 16:21	Nov 30	<b>1</b> • 7h: Moon 0.03° S (right) of M45. • 21h: Uranus sta. • 23:30: Full "Cold" Moon.	<b>2</b> • Moon at GND, 25.8°. <small>1971: USSR: Mars 3 made the first soft landing on, and returned the first signals from the surface of Mars.</small>	<b>3</b> • 12h: Moon 0.8° N of M35. <small>1973: USA: Pioneer 10 made the first flyby of, and returned the first close-up images of Jupiter.</small>	<b>4</b> • 7h: Moon @ pg, 363,479 km. • Earliest end of evening twilight.	<b>5</b> SR: 07:42 MS: 10:51 SS: 16:18 MR: 20:26
<b>6</b> • 19h: Moon 5° S of Mars.	<b>7</b> • 16:18: Earliest sunset. <small>1905: Netherlands: Gerard Kuiper was born.</small>	<b>8</b> • 16:13: LQ Moon.	<b>9</b> • 19 Fortuna at opp'n (m9.3).	<b>10</b> • 3h: Moon 8° S of Saturn. <small>1950: meteorite falls in St. Louis, striking a car.</small>	<b>11</b> • Libration 6.8° N. <small>1972: USA: Apollo 17 landed on the Moon.</small>	<b>12</b> • Libration 6.0° E. MR: 04:07 SR: 07:49 MS: 13:33 SS: 16:18
<b>13</b> • 21h: Geminid MSP (ZHR=120).	<b>14</b> <small>1546: Denmark: Tycho Brahe was born. 1962: USA: Mariner 2 made the first controlled flyby of another planet (Venus, at a distance of 34,752km).</small>	<b>15</b> <small>1970: USSR: Venera 7 became the first craft to softland on and return signals from the surface of Venus.</small>	<b>16</b> • 04:02: New Moon. • Moon at GSD, 25.8°.	<b>17</b> • Mercury GB. • 09:03: Moon rises lower left of Mercury.	<b>18</b> • 0h: Moon 1.4° N of Mercury. • 9h: Mercury at GEE (20°).	<b>19</b> • 21h: Jupiter 0.6° S of Neptune. SR: 07:54 MR: 10:04 SS: 16:20 MS: 19:38
<b>20</b> • 7h: Moon at apg, 405,731 km. • 17:34: Jup2ST.	<b>21</b> • 7h: Moon 4° N of Jupiter. • 8h: Mars sta. • 9:47: Sun passes Winter Solstice. • Shortest day, 9 <sup>h</sup> 20 <sup>m</sup> .	<b>22</b> • 6h: Ursid MSP (ZHR=10).	<b>23</b> <small>1672: France: Italian-born Giovanni Cassini discovered Saturn's moon Rhea.</small>	<b>24 Christmas Eve</b> • 09:36: FO Moon. • 10h: Pluto is in conjunction.	<b>25 Christmas</b> MS: 01:06 SR: 07:57 MR: 11:55 SS: 16:23	<b>26 Boxing</b> • 1h: Mercury sta. • Libration 7.3° W. • Libration 6.8° S.
<b>27</b> • 324 Bamberga at opp'n (m9.8). <small>1571: Germany: Johannes Kepler was born.</small>	<b>28</b> • 17h: Moon 0.03° N of M45 (occ'n).	<b>29</b> MS: 06:00 SR: 07:57 MR: 14:13 SS: 16:26	<b>30</b> • 22h: Moon 0.8° N of M35.	<b>31 New Year's Eve</b> • 11:13: Full "Blue" Moon, penumbral eclipse over Europe, Asia.	Jan 1, 2010 SR: 07:58 MS: 08:46 SS: 16:29 MR: 17:59	Jan 2, 2010

Mercury and Jupiter disappear in SW at dusk.  
Venus dominates the sky from the SW.

## January, 2009

Saturn rises before midnight.  
Mercury becomes visible in A.M. in late Jan.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Dec 28, 2008 SR: 07:57 MR: 09:03 SS: 16:25 MS: 17:36	Dec 29, 2008	Dec 30, 2008	Dec 31, 2008	<b>1 New Year's</b> • 12h: Saturn sta. SR: 07:57 MR: 10:28 SS: 16:29 MS: 22:09	<b>2</b> • Mercury GB, sets left of Jupiter. <small>1959: USSR: Luna 1 was launched to the Moon and solar orbit, became the first craft to leave the Earth's gravity.</small>	<b>3</b> • 5h: Quadrantid MSP (ZHR=120). • Libration 7.7° W. <small>1958: USSR: Sputnik 1 was destroyed during re-entry.</small>
<b>4</b> • 03:56: FO Moon. • 6h: Mercury at GEE (19°). • 7h: Earth at Perihelion (147.1 Mkm). • 07:57: Latest sunrise for 2009.	<b>5</b> <small>2005: USA: Michael Brown, Chadwick Trujillo, and David Rabinowitz discovered Eris within data collected in 2003, prompting the IAU to define "planet" and reclassify Pluto as a "dwarf planet".</small>	<b>6</b> • Libration 6.7° S.	<b>7</b> • 04:29: Moon sets right of the Pleiades. • Latest onset of morning twilight. • 11h: Moon 0.8° N (rises left) of M45.	<b>8</b> MS: 05:48 SR: 07:56 MR: 13:43 SS: 16:37	<b>9</b> • Moon at GND, 27.1°, BoY.	<b>10</b> • 3h: Moon at pg, 357,497 km (2 <sup>nd</sup> closest for 2009). • 19:27 Full "Wolf" Moon (BoY). • 23h: Mercury sta.
<b>11</b> • 22h: Moon 1.5° S of M44. <small>1610: Italy: Galileo Galilei discovered the fourth moon of Jupiter (Ganymede). 1787: England: Sir William Herschel discovered Uranus' moons Titania and Oberon.</small>	<b>12</b> • 19:09: Moon rises above right of Regulus. • 40 Harmonia at opp'n (m=9.9).	<b>13</b> <small>1986: USA: Stephen Synnott discovered Uranus' moons Belinda, Desdemona, and Rosalind.</small>	<b>14</b> • 13h: Venus at GEE (47°). <small>2004: Europe: Huygens successfully becomes first craft to land on a body beyond Mars (Saturn's moon, Titan).</small>	<b>15</b> • 4h: Moon 6° S of Saturn.	<b>16</b> • Libration 7.4° E. SR: 07:52 MS: 10:18 SS: 16:47	<b>17</b> • 10h: Ceres sta. • 18:46: LQ Moon. <small>1997: USA: Clyde Tombaugh, discoverer of planet Pluto, died.</small>
<b>18</b> • 654 Zelinda at opp'n (m9.9).	<b>19 M.L. King</b> • Libration 6.9° N. <small>1840: International: Antarctica (known since the 1820s) defined as a continent.</small>	<b>20</b> • 8h: Mercury at IC.	<b>21</b> • 5h: Pallas sta. • 5h: Moon 0.02° N of Antares, occ'n of M4 in SE US..	<b>22</b> • 8h: Venus 1.4° N of Uranus. • 16h: Moon at apg, 406,118 km. • Moon at GSD, 27.1°.	<b>23</b> • 22h: Jupiter is in conjunction.	<b>24</b> MR: 07:05 SR: 07:45 MS: 15:26 SS: 16:59
<b>25</b> • 23:55: New Moon (& annular eclipse in Asia).	<b>26</b> • 10h: Mercury 4° N of Mars.	<b>27</b> <small>1967: USA: 3 Apollo crewmen were killed in a "plugs-out" test of the CSM on the launch pad.</small>	<b>28</b> <small>1986: USA: space shuttle Challenger exploded 104 seconds after liftoff, killing all 7 crewmembers.</small>	<b>29</b> • 21:10: Moon sets upper-right of Uranus, lower right of Venus.	<b>30</b> • 4h: Moon 3° N of (above) Venus.	<b>31</b> • 18h: Mercury sta. SR: 07:37 MR: 09:26 SS: 17:10 MS: 23:35

## February, 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<p><b>1</b> SR: 07:35 MR: 09:46 SS: 17:11</p>	<p><b>2 Groundhog</b> • 15:13: <u>FQ Moon</u>. • Libration 6.8° S.</p>	<p><b>3</b> • 19h: Moon 0.9° N of M45.  <small>1966: USSR's Luna 9 landed on the Moon, becoming the first craft to softland on and return images from another celestial body.</small></p>	<p><b>4</b> • 03:28: Moon sets upper left of Aldebaran. • <b>27 Euterpe at opp'n (m8.7).</b></p>	<p><b>5</b> • Moon at GND, 27.1°  <small>1974: USA: Mariner 10 flew by and returned the first close-up (5,769km) images of Venus, and continued on to Mercury.</small></p>	<p><b>6</b> • Moon lower right of Pollux.</p>	<p><b>7</b> • 12h: Moon at pg (361,488 km). MS: 06:23 SR: 07:27 MR: 15:08 SS: 17:21</p>
<p><b>8</b> • 9h: Moon 1.5° S of M44.</p>	<p><b>9</b> • 6:49: <u>Full "Snow" Moon</u> (penumbral eclipse over Pacific, Asia).</p>	<p><b>10</b></p>	<p><b>11</b> • 12h: Moon 6° S of Saturn. • Mercury GB, lies in morning twilight.</p>	<p><b>12</b> • 5h: Neptune in conjunction. • <b>Zodiacal light visible in W for next two weeks.</b></p>	<p><b>13</b> • 13h: Mercury at GWE (26°). • Libration 6.5° E. <small>1852: Denmark: John Louis Emil Dreyer (author of the New General Catalog) was born in Copenhagen.</small></p>	<p><b>14 Valentine's</b> SR: 07:16 MS: 09:01 SS: 17:32</p>
<p><b>15</b> • Libration 6.9° N.  <small>1564: Italy: Galileo Galilei was born.</small></p>	<p><b>16 Presidents'</b> • 13:37: <u>LO Moon</u>.</p>	<p><b>17</b> • 2h: Mars 0.6° S of Jupiter. • 13h: Moon 0.04° N of Antares.</p>	<p><b>18</b> • Moon at GSD, 27.1°, BoY.  <small>1930: USA: Clyde W. Tombaugh discovered Pluto.</small></p>	<p><b>19</b> • 7h: <b>Venus GB</b>. • 9h: Moon at apg, (405,129 km).  <small>1473: Poland: Nicholas Copernicus was born.</small></p>	<p><b>20</b> MR: 05:04 SR: 07:06 MS: 13:14 SS: 17:41</p>	<p><b>21</b> • Venus reaches perihelion.</p>
<p><b>22</b> • 14h: Moon 1.1° N of Mercury. • 17h: Moon 0.7° N of Jupiter. • Midnight: Moon 1.7° N of Mars.</p>	<p><b>23</b> • 19h: Mercury 0.6° S of Jupiter. • Beautiful group of Moon and planets in AM twilight continues.</p>	<p><b>24 Mardis Gras</b> • 02:53: <b>Titan STS</b>. • Dawn: Mercury rises below Jupiter. • 17:35: <u>New Moon</u>.</p>	<p><b>25 Ash Wed.</b> • 6h: <b>Ceres reaches opp'n (m6.9)</b>, closest since 1857 and until 4164.</p>	<p><b>26</b></p>	<p><b>27</b> • 15h: <b>Moon 1.3° S (left) of Venus</b>. • Libration 5.5° W. • Uranus reaches aphelion.</p>	<p><b>28</b> SR: 06:51 MR: 07:53 SS: 17:53 MS: 22:41</p>

## November, 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<p><b>1</b> • 1h: Mars 0.05° S of M44. • 18h: Venus 4° N of Spica. <b>End Daylight Savings Time</b></p>	<p><b>2</b> • 11:14: <u>Full "Beaver" Moon</u>.</p>	<p><b>3</b> • 21h: Moon 0.02° S (below right) of M45.  <small>1973: USA: Pioneer 10 made the first flyby and returned the first close-up images of Jupiter.</small></p>	<p><b>4</b> • 11h: Neptune sta. • Midnight: Mercury is in SC.</p>	<p><b>5</b> • 2h: <b>S. Taurid MSP (ZHR=15)</b>. • Moon at GND (25.8°).</p>	<p><b>6</b> • 3h: Moon 0.9° N of M35. • 11:59: <b>Jup2ST</b>. • 23h: Moon at pg (368,903 km).</p>	<p><b>7</b> SR: 07:03 MS: 12:18 SS: 16:43 MR: 21:20</p>
<p><b>8</b> • 22h: Moon 3° S of Mars.  <small>1656: England: Sir Edmund Halley was born.</small></p>	<p><b>9</b> • 7:56: <u>LO Moon</u>.</p>	<p><b>10</b></p>	<p><b>11 Veterans'</b></p>	<p><b>12</b> • 2h: <b>N. Taurid MSP (ZHR=15)</b>. • 17h: Moon 8° S of Saturn.</p>	<p><b>13</b> MR: 03:49 SR: 07:12 MS: 14:40 SS: 16:35</p>	<p><b>14</b> • Libration 6.6° N.</p>
<p><b>15</b> • Libration 5.2° E.  <small>1630: Germany: Johannes Kepler was born. 1738: Germany: Sir William Herschel was born.</small></p>	<p><b>16</b> • 11:14: <u>New Moon</u>.</p>	<p><b>17</b> • 8h: <b>Leonid MSP (ZHR=15)</b>.</p>	<p><b>18</b> • Moon at GSD (25.8°).</p>	<p><b>19</b></p>	<p><b>20</b>  <small>1889: USA: Edwin Hubble was born.</small></p>	<p><b>21</b> SR: 7:24 MR: 11:36 SS: 16:27 MS: 20:45</p>
<p><b>22</b> • 12h: Moon at apg (404,733 km).</p>	<p><b>23</b> • 14h: Moon 4° N of Jupiter.</p>	<p><b>24</b> • 13h: <u>FQ Moon</u>.</p>	<p><b>25</b></p>	<p><b>26 Thanksgiving</b></p>	<p><b>27</b> MS: 02:15 SR: 07:32 MR: 13:33 SS: 16:22</p>	<p><b>28</b> • Libration 6.2° W. • Libration 6.7° S.  <small>1965: France: France became the third nation to launch a satellite, "A-1" later renamed "Asterix".</small></p>
<p><b>29</b>  <small>1961: USA: Mercury 5 launched Enos, a chimpanzee into Earth orbit.</small></p>	<p><b>30</b> MS: 05:57 SR: 07:36 MR: 14:53 SS: 16:20</p>	<p>Dec 1</p>	<p>Dec 2</p>	<p>Dec 3</p>	<p>Dec 4</p>	<p>Dec 5 SR: 07:42 MS: 10:51 SS: 16:18 MR: 20:26</p>

Jupiter is well up in SE at sunset.  
Mars rises before midnight.

## October, 2009

Mercury and Venus up, but sinking into dawn.  
Saturn emerges from dawn.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>Sep 27</b> MS: 00:01 SR: 07:03 MR: 16:10 SS: 18:56	<b>Sep 28</b>	<b>Sep 29</b>	<b>Sep 30</b>	<b>1</b>  1958: USA: The inauguration of the National Aeronautics and Space Administration (NASA) took place.	<b>2</b> MS: 05:34 SR: 07:10 MR: 17:50 SS: 18:46	<b>3</b> • 23:10: <u>Full "Hunter's" Moon.</u> • Libration 6.5° S.
<b>4</b>  1957: USSR: Sputnik 1 was launched to become the first artificial satellite. 1959: USSR: Luna 3 was launched to the first circumlunar flight.	<b>5</b> • 15h: Mars 6° S of Pollux. • 19h: Mercury at GWE (18°) - BoY.	<b>6</b> SR: 07:16 MS: 10:23 SS: 18:38 MR: 19:23	<b>7</b> • 15h: Moon 0.1° N (left) of M45. • Midnight: Draconid MSP.	<b>8</b> • 2h: Mercury .03° S of Saturn. • Next 9 mornings: Mercury, Venus, Saturn close together.	<b>9</b> • 22h: Moon 1.2° N of M35. • Moon at GND (26.1°). • 89 Julia at opp'n (m9.9).	<b>10</b> • 15:42: Io's shadow transits Europa. • 18 Melpomene at opp'n (m7.9).
<b>11</b> • 01:56: <u>LQ Moon.</u> • 18h: moon 1.2° S of Mars. • Mercury GB.	<b>12 Columbus</b>	<b>13</b> • 2h: Jupiter sta. • 5h: Moon at pg (369,067 km). • 8h: Venus 0.6° S of Saturn.	<b>14</b> MR: 03:11 SR: 07:27 MS: 16:34 SS: 18:23	<b>15</b> • Zodiacal light visible in E for next two weeks.	<b>16</b> • 6h Moon 7° S of Saturn. • 12h Moon 7° S of Venus.	<b>17</b> • 22:33: <u>New Moon.</u>
<b>18</b> • Libration 6.6° N.	<b>19</b> • Libration 5.6° E.	<b>20</b>  1972: USA: Harlow Shapley died.	<b>21</b> • 3h: Orionid MSP (ZHR=20). • 8h: Moon 1.0° S of Antares.	<b>22</b> • Moon at GSD (26.0°).  1975: USSR: USSR's Venera 9 sent the first images from and of the surface of Venus.	<b>23</b> SR: 07:40 MR: 13:33 SS: 18:06 MS: 21:49	<b>24</b>  1601: Bohemia; Danish astronomer Tycho Brahe died. 1851: England; William Lassell discovered Uranus' moons Ariel and Umbriel.
<b>25</b> • 16h: Moon at apg (404,166 km). • 17:42: <u>FQ Moon.</u>	<b>26</b> • 2h: Moon 3° N of Jupiter.	<b>27</b>	<b>28</b>	<b>29</b>  1656: England; Sir Edmund Halley was born.	<b>30</b> • 09:53: Jup2ST. MS: 04:25 SR: 07:51 MR: 16:12 SS: 17:54	<b>31 Halloween</b> • 3h: Juno sta. • Libration 5.1° W. • Mars passes through M44.

Venus begins the month as the evening star, but sinks into twilight by month's end.

## March, 2009

Saturn rises at sunset, and is up all night.  
Jupiter emerges from dawn twilight.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>1</b> • 12h: Mercury 0.6° S of Mars. • 6.7° S libration.	<b>2</b> • Midnight: Moon 0.8° N of M45 as they set Tues., 1h.	<b>3</b> • 23:46: <u>FQ Moon,</u> upper right of Aldebaran.	<b>4</b> • 16h: Mercury 1.6° S of Neptune. • 17h: Venus sta. • Moon at GND (27°).	<b>5</b>  1512: Flanders; Cartographer Gerardus Mercator (Gerhard Kremer) was born. 1982: USSR: Venera 14 softlanded on Venus and transmitted from the surface for 57 minutes.	<b>6</b> MS: 04:18 SR: 06:40 MR: 12:45 SS: 18:02	<b>7</b> • 8h: Moon at pg (367,017 km). • 18h: Moon 1.5° S of M44. • 20h: Mars 0.8° S of Neptune.
<b>8</b> • 13h: Saturn reaches opp'n (m0.5), 780.6 Mmi.  <b>Begin Daylight Savings Time.</b>	<b>9</b>  1979: USA: Voyager 1 returned the first images of active volcanism on another celestial body (Io).	<b>10</b> • 19:38: <u>Full "Worm" Moon.</u> • 20h: Moon 6° S of Saturn. • 21:03: Jup2ST.	<b>11</b>  1977: USA: Uranus' rings were discovered.	<b>12</b> • 02:34: Titan STS. • 18h: Uranus in conjunction.	<b>13</b> • 5.3° E libration. • Zodiacal light visible in W for next two weeks.	<b>14</b> • 6.7° N libration. SR: 07:24 MS: 08:26 SS: 19:14  1879: Germany: Albert Einstein was born.
<b>15</b>  1713: France; Nicolas Louis de Lacaille was born.	<b>16</b> • 22h: Moon 0.2° N of Antares.  1750: Germany; Caroline Herschel (sister and recorder for William Herschel) was born.	<b>17 St. Patrick's</b>	<b>18</b> • 10:47: <u>LO Moon.</u> • Moon at GSD (26.9°).	<b>19</b> • 6h: Moon at apg (404,299 km).	<b>20</b> • 04:44: Sun reaches Vernal equinox.	<b>21</b> MR: 05:04 SR: 07:10 MS: 14:14 SS: 19:24
<b>22</b> • 14h: Moon 1.5° N of Jupiter.	<b>23</b>  1840: The first photograph of the Moon was taken. 1912: Germany; Rocket scientist Wernher von Braun was born.	<b>24</b> • 7h: Moon 4° N of Mars.  1893: Germany; American astronomer Walter Baade was born.	<b>25</b> • 5.4° W libration.	<b>26</b> • 09:06: <u>New Moon.</u>	<b>27</b> • 12h: Venus at IC, 8.2° N of Sun.	<b>28</b> SR: 06:55 MR: 07:21 SS: 19:34 MS: 22:45  1802: Germany; Heinrich Olbers discovered asteroid 2 Pallas.
<b>29</b> • 29 Amphitrite at opp'n (m9.1).  1807: Germany; Heinrich Olbers discovered asteroid 4 Vesta.	<b>30</b> • 7h: Moon 0.6° N of M45. • Mercury at SC.	<b>31</b> MS: 01:19 SR: 06:49 MR: 09:17 SS: 19:38	Apr 1	Apr 2	Apr 3	Apr 4 MS: 04:26 SR: 06:41 MR: 14:15 SS: 19:44

Mercury starts in evening twilight and rises to best apparition of year by month's end.

## April, 2009

Saturn is up all night. Jupiter extricates itself from morning twilight. Mars rises near dawn.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Mar 29	Mar 30	Mar 31 MS: 01:19 SR: 06:49 MR: 09:17 SS: 19:38	<b>1 April Fool's</b> • 13h: Moon 2.0° N of M35. • 19h: Moon at pg (370,013 km). • Moon at GND (26.8°).	<b>2</b> • 07:34: <u>FO Moon</u> .  1845: The first photograph of the Sun was taken.	<b>3</b> MS: 03:55 SR: 06:43 MR: 12:54 SS: 19:43	<b>4</b> • 2h: Moon 1.7° S of M44. • 9h: Pluto sta.
<b>5 Palm Sunday</b>  1973: USA: Pioneer 11 was launched to the outer solar system.	<b>6</b> • 02:59: Io occults Ganymede (E N. America). • Midnight: Moon 6° S of Saturn.	<b>7</b>	<b>8</b> • 15 Eunomia at opp'n (m9.8).	<b>9 Passover</b> • 07:56: <u>Full "Pink" Moon</u> .	<b>10 Good Friday</b> • Libration 4.6° E. • Libration 6.6° N.	<b>11</b> SR: 06:28 MS: 06:54 SS: 19:54 MR: 23:01
<b>12 Easter</b> • Mercury GB.  1817: France: Charles Joseph Messier, successful comet hunter and cataloger of nebulae, died.	<b>13</b> • 00:22: <u>Titan STS</u> . • 6h: Moon 0.4° N of Antares. • 09:56: <u>Jup2ST</u> .	<b>14</b> • 06:06: Callisto occults half of Io. • 21h: Mars 0.5° S of Uranus. • Moon at GSD (26.7°).	<b>15</b> • 1h: Venus sta.	<b>16</b> • 2h: Moon at apg (404,232 km).	<b>17</b> • 06:36: <u>LQ Moon</u> . • 8h: Ceres sta.	<b>18</b> • 10h: Venus 6° N of Mars. MR: 03:29 SR: 06:14 MS: 13:06 SS: 20:04
<b>19</b> • 9h: Moon 2° N of Jupiter. • 8 Flora at opp'n (m 9.8).	<b>20</b>  1961: USA: The first rocket belt flight was performed.	<b>21</b> • Mars at perihelion. • 14 Irene at opp'n (m8.9).	<b>22 Earth Day</b> • 3h: <u>Lyrid MSP</u> . • 7h: <u>Moon 1.1° N of Venus (occ'n)</u> . • 12h: Moon 6° N of Mars. • Libration 6.2° W.	<b>23</b>  1971: USSR: Cosmonauts conducted the first manned docking with a space station.	<b>24</b> • 20:23: <u>New Moon</u> . • Libration 6.5° S.	<b>25</b> MR: 05:50 SR: 06:02 SS: 20:14 MS: 21:44
<b>26</b> • 0h: <u>Mercury at GEE (20°, BoY)</u> . • 9h: Moon 1.9° N of Mercury. • 14h: Moon 0.4° N of M45.	<b>27</b> • 23h: Moon at pg (366,040 km), lies left of M45. • 23:22: <u>Titan STS</u> .	<b>28</b> • 19h: Moon 1.8° N of M35.  1900: Netherlands: Jan H. Oort was born.	<b>29</b> • Mercury left of the Pleiades.	<b>30</b> MS: 01:55 SR: 05:53 MR: 10:43 SS: 20:21	May 1	May 2

Jupiter is up in SE at sunset. Saturn gets lost in dusk twilight. Mars rises around midnight.

## September, 2009

Mercury emerges from dawn by month's end for its best apparition of 2009.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Aug 30	Aug 31 MS: 02:13 SR: 06:27 MR: 18:09 SS: 19:51	<b>1</b> • 20h: Venus 1.5° S of M44.  1979: USA: Pioneer 11 flew past and returned the first close-up images of Saturn.	<b>2</b> • 14h: Moon 3° N of Jupiter. • 21:43: No moons of Jupiter visible. • 23:43: <u>Jup2ST</u> .	<b>3</b> MS: 05:33 SR: 06:31 MR: 19:10 SS: 19:45	<b>4</b> • 09:03: <u>Full "Harvest" or "Fruit" Moon</u> . • Earth crosses Saturn's ring plane (next occurs 2025).	<b>5</b> • 03:19: Io's shadow transits Europa.
<b>6</b> • 13h: Mercury sta.	<b>7 Labor</b>  1914: USA: James van Allen was born.	<b>8</b> • 016:37: Io's shadow transits Europa. • 42 Isis at opp'n (m 9.4). • Libration 6.7° S.	<b>9</b> • Libration 5.5° W.  1892: USA: Edward Emerson Barnard discovered Jupiter's moon Amalthea.	<b>10</b> • 9h: Moon 0.3° N of M45.	<b>11 Patriot</b> • 9h: Pluto sta. • 19:16: <u>LQ Moon</u> . SR: 06:42 MS: 14:57 SS: 19:29 MR: 22:57	<b>12</b> • 17h: Moon 1.4° N of M35. • Moon at GND (26.3°).
<b>13 Granparents'</b> • 9h: Moon 1.1° N of Mars.	<b>14</b>  1712: France: Italian astronomer Giovanni Cassini died. 1974: USA: Charles Kowal discovered Jupiter's moon Leda.	<b>15</b> • 19:11: Io's shadow transits Europa.	<b>16</b> • 1h: Moon at pg (364,053 km). • Moon 3° S of Venus. • <u>Zodiacal light visible in E for next two weeks</u> .	<b>17</b> • 3h: <u>Uranus at opp'n (m5.7)</u> . • 11h: Saturn is in conjunction.	<b>18</b> • 11:44: <u>New Moon</u> .  1819: France: Jean Benard Leon Foucault was born.	<b>19</b> SR: 06:52 MR: 08:12 MS: 19:12 SS: 19:13
<b>20</b> • 3h: Venus 0.5° N of Regulus. • 3h: Mercury at IC. • 17:46: Europa transits Jupiter, then Ganymede.	<b>21</b> • 1h: <u>Juno is at opp'n (m7.6)</u> . • Libration 6.6° N.	<b>22</b> • 14:19: <u>Sun reaches Autumnal Equinox</u> . • 21:40: Io's shadow transits Europa. • Libration 6.5° E.	<b>23</b> • 23h: Moon 0.8° N of Antares.	<b>24</b> • 20 Massalia at opp'n (m9.3).	<b>25</b> • 21:50: <u>FO Moon</u> . • Moon at GSD (26.2°).	<b>26</b> SR: 07:02 MR: 15:38 SS: 18:58
<b>27</b> • 20:37: Europa transits Ganymede. • 21h: Moon at apg (404,432 km).	<b>28</b> • 11h: Mercury sta.	<b>29</b> • 17h: Moon rises 3° N (upper-left) of Jupiter.	<b>30</b> • 00:06: Io's shadow transits Europa.	Oct 1 MS: 04:27 SR: 07:09 MR: 17:33 SS: 18:48	Oct 2	Oct 3

Mercury very low at dusk, sinks away by 31<sup>st</sup>.  
Saturn, low in SW, joins Mercury mid-month.

## August, 2009

Jupiter rises as Sun sets. Mars rises after 2am.  
Venus rises 1½ hrs later and drifts into dusk.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
July 26 SR: 05:40 MR: 11:46 MS: 22:46 SS: 20:51	July 27	July 28	July 29	July 30	July 31	<b>1</b> • Moon at GSD (26.5°). MS: 01:24 SR: 05:47 MR: 18:24 SS: 20:43
<b>2</b> • 12h: Mercury 0.6° N of Regulus. • 16h: Venus 2° S of M35. • 18:12: Titan STS.	<b>3</b> • 18h: Moon at apg (406,028 km).	<b>4</b>  <small>1971: USA: Apollo 15 launched the first lunar satellite from a manned spacecraft.</small>	<b>5</b> • 17:55: <u>Full</u> "Sturgeon" Moon.	<b>6</b> • 15h: Moon 3° N of Jupiter. • 16 Psyche at opp'n (m9.3).	<b>7</b> • 22:10: Io's shadow transits Europa. • 22:30: Io occults Europa.	<b>8</b> SR: 05:56 MS: 08:50 SS: 20:33 MR: 21:20
<b>9</b> SR: 05:58 MS: 09:57 SS: 20:31 MR: 21:36	<b>10</b> • Sun crosses plane of Saturn's rings (next crossing is in 2025).	<b>11</b> • 18:43: Ganymede eclipses Europa.	<b>12</b> • 11h: Perseid MSP (ZHR=90). • 14:12: Jup2ST. • Libration 6.7° W. • Libration 6.8° S.	<b>13</b> • 11:55: <u>LQ Moon</u> . • 23h: Moon rises right of M45, occ'ns by 2h.	<b>14</b> • 01:48. Io eclipses and its shadow transits Europa. • 11h: Jupiter is at close opposition (m-2.9), 603Mkm.	<b>15</b> • 11h: Juno sta. • 20h: Moon 3° N of Mars. • Moon at GND (26.4°).
<b>16</b> • 10h: Moon 1.6° N of M35. • Mercury 3° below Saturn in dusk.	<b>17</b> • 14h: Moon 1.7° N of Venus. • 14h: Neptune is at opp'n (m7.8). • Midnight: Moon 0.4° N of Vesta.	<b>18</b> • 14h: Mercury 3° S of Saturn. • 21:00: Ganymede eclipses Europa. • 22h: Moon at pg (359,639 km).	<b>19</b> • 16:47: Jup2ST. MR: 05:12 SR: 06:11 MS: 19:46 SS: 20:14	<b>20</b> • 03:02: <u>New Moon</u> . SR: 06:12 MR: 06:38 MS: 20:09 SS: 20:12	<b>21</b> • 03:10: Io occults Europa. • 21h: Venus 7° S of Pollux. • 23h: Moon 7° S of Saturn.	<b>22</b> • 5h: Moon 3° S of Mercury. • 20:15: Io's shadow transits Ganymede.
<b>23</b> • Libration 6.8° N. • 01:41: Io's shadow transits Ganymede	<b>24</b> • 9h: Mercury at GEE (27°). • 4h: Moon at apogee (405,269 km).	<b>25</b> • Libration 7.3° E. • Mercury GB. • 88 Thisbe at opp'n (m9.9).	<b>26</b> • 03:54: Ganymede eclipses Europa. • 19:42: Jup2ST.	<b>27</b> • 04:42: <u>FO Moon</u> . • 15h: Moon 0.6° N of Antares (daytime occultation).	<b>28</b> • 20h: Mars 0.8° S of M35.  <small>1789: England: Sir William Herschel discovered Saturn's moon Enceladus.</small>	<b>29</b> MS: 00:11 SR: 06:24 MR: 17:04 SS: 19:55
<b>30</b>	<b>31</b>					

Mercury disappears in dusk light by the 9<sup>th</sup>.  
Saturn is well up at sunset, sets after midnight.

## May, 2009

Jupiter leads Venus (sky's brightest object) rising before dawn. Mars emerges in dawn.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Apr 26 SR: 06:00 MR: 06:25 SS: 20:15 MS: 23:03	Apr 27	Apr 28	Apr 29	Apr 30 MS: 02:28 SR: 05:52 MR: 12:05 SS: 20:22	<b>1</b> • 7h: Moon 2° S of M44. • 13:44: <u>FO Moon</u> .	<b>2</b> • 8h: Venus GB (mag.-4.4). • 6 Hebe at opp'n (m9.9)
<b>3</b>	<b>4</b> • 02:36: Ganymede occults Io. • 4h: Moon ° S of Saturn.	<b>5</b> • 17h: Eta Aquarid MSP (ZHR=60).	<b>6</b> • Libration 5.0° E.	<b>7</b> • 9h: Mercury sta. • Libration 6.6° N.	<b>8</b> • 21:01: <u>Full</u> "Flower" Moon.	<b>9</b> MS: 05:25 SR: 05:40 SS: 20:33 MR: 21:53
<b>10 Mother's</b> • 14h: Moon 0.5° N of Antares.	<b>11</b> • 05:36: Ganymede occults most of Io. • Moon at GSD (26.5°).	<b>12</b>	<b>13</b> • 20h: Moon at apg (404,915 km).	<b>14</b> • 22:26: Titan STS.	<b>15</b> MR: 01:30 SR: 05:32 MS: 10:52 SS: 20:41	<b>16</b> • 03:34: Europa occults half of Io. • Moon passes Neptune.
<b>17</b> • 00:26: <u>LQ Moon</u> . • 00:56: Jup2ST. • 1h: Moon 3° N of Jupiter. • 12h: Saturn sta.	<b>18</b> • 3h: Mercury at IC.	<b>19</b>  <small>1971: USSR: Salyut 1 (the first space station) was launched to Earth orbit.</small>	<b>20</b> • 22:27: Io occults Europa. • Libration 7.1° W.	<b>21</b> • 1h: Moon 7° N of Venus. • 13h: Moon 7° N of Mars.	<b>22</b> • Libration 6.6° S. MR: 03:47 SR: 05:24 MS: 19:16 SS: 20:49	<b>23</b> • 03:34: Europa transits Io.
<b>24</b> • 05:11: <u>New Moon</u> . • 10h: Moon 6° S of Saturn.	<b>25 Memorial</b> • 6h: Jupiter 0.4° S of Neptune. • 21h: Moon at pg (361,153 km). • Moon at GND (26.5°).	<b>26</b> • 01:01: Ganymede occults most of Io. • 3h: Moon 1.6° N of M35.°). • 03:51: Europa transits Io.	<b>27</b>	<b>28</b> • 00:42: Io occults most of Europa.	<b>29</b> • 4h: Neptune sta. MS: 00:57 SR: 05:18 MR: 11:12 SS: 20:57	<b>30</b> • 9h: Mercury sta. • 20:22: <u>FO Moon</u> . • 21:32: Titan STS.
<b>31</b>						

Saturn up in SW at dusk, sets after midnight.  
Good chance for noctiluculent clouds in June.

## June, 2009

Jupiter rises after midnight. Venus and Mars rise two, then Mercury 1 hour before the Sun.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>May 31</b> MS: 01:40 SR: 05:16 MR: 13:46 SS: 20:59	<b>1</b> • 23:12: <i>Jup2ST</i> . • 23:24: <i>Ganymede</i> occults <i>Io</i> .	<b>2</b>	<b>3</b>  <small>1948: USA; Hale observatory's 200-inch telescope was dedicated.</small>	<b>4</b> • 02:55: <i>Io</i> occults half of <i>Europa</i> . • <i>Libration</i> 6.7° N.	<b>5</b> • 14h: <i>Venus</i> at GWE (46°). MS: 03:26 SR: 05:13 MR: 19:43 SS: 21:03	<b>6</b> • 21h: <b>Moon 0.6° N of Antares (Occ'n)</b> .
<b>7</b> • 11:12: <u>Full "Strawberry" or "Honey" Moon</u> , rises (21:41) left of <i>Antares</i> .	<b>8</b> • <i>Moon</i> at GSD (26.4°).  <small>1625: Italy; Giovanni Cassini was born.</small>	<b>9</b> • 01:06: <i>Jup2ST</i> .	<b>10</b> • 9h: <i>Moon</i> at apg (405,787 km).  <small>1973: USA; Explorer 49 was launched to perform radio astronomy from the lunar farside.</small>	<b>11</b> • 23h: <i>Mercury</i> 8° S of M45. • 05:08: <i>Io</i> occults half of <i>Europa</i> .	<b>12</b> SR: 05:11 MS: 09:48 SS: 21:08	<b>13</b> • 5h: <i>Mercury</i> at GWE (23°). • 11h: <i>Moon</i> 3° N of <i>Jupiter</i> .
<b>14</b> • Earliest sunrise (05:11).	<b>15</b> • 13h: <i>Jupiter</i> sta. • 15:15: <u>LQ Moon</u> . • 16h: <i>Moon</i> 0.4° S of <i>Juno</i> . • 20:40: <i>Titan STS</i> .	<b>16</b> • 03:39: <i>Jup2ST</i> .	<b>17</b> • <i>Libration</i> 7.6° W. • Earliest morning twilight.	<b>18</b> • <i>Libration</i> 6.7° S. MR: 01:46 SR: 05:11 MS: 16:49 SS: 21:10	<b>19</b> • 7h: <i>Venus</i> 2° S of <i>Mars</i> . • 10h: <i>Moon</i> 8° N of <i>Venus</i> and 6° N of <i>Mars</i> . • <i>Mercury</i> at peak altitude from Sun.	<b>20</b> • 10h: <i>Moon</i> 0.5° N of M45. • 22:46: <b>Sun is at Summer Solstice</b> . • Longest day of 2009, 16 <sup>h</sup> 00 <sup>m</sup> .
<b>21 Father's</b> • 2h: <i>Moon</i> 7° N of <i>Mercury</i> .	<b>22</b> • 7h: <i>Mercury</i> 3° N of <i>Aldebaran</i> . • 12:35: <u>New Moon</u> . • <i>Moon</i> at GND (26.4°).	<b>23</b> • 1h: <i>Pluto</i> at opp'n (m13.9). • 4h: <i>Moon</i> at pg (358,014 km).	<b>24</b> • Latest evening twilight.	<b>25</b> SR: 05:13 MR: 08:50 SS: 21:11 MS: 23:23  <small>1894: Romania; Hermann (Julius) Oberth was born.</small>	<b>26</b> • <i>Moon</i> lies below right of <i>Saturn</i> .  <small>1730: France; Charles Joseph Messier was born.</small>	<b>27</b> • 19h: <i>Moon</i> 7° S of <i>Saturn</i> . • 21:11: Latest sunset.
<b>28</b> • 04:28: <u>FO Moon</u> .	<b>29</b> • <i>Libration</i> 7.2° E.  <small>1868: USA; George Ellery Hale was born.</small>	<b>30</b> • 22:31: <i>Ganymede</i> eclipses <i>Io</i> .	<b>July 1</b> MS: 01:04 SR: 05:16 MR: 16:26 SS: 21:11	<b>July 2</b>	<b>July 3</b>	<b>July 4</b>

Saturn sets around 23<sup>h</sup>.  
Jupiter rises late evening, up all night.

## July, 2009

Mars climbs out of and Venus sinks into morning twilight.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>Jun 28</b>	<b>Jun 29</b>	<b>Jun 30</b> MS: 00:42 SR: 05:15 MR: 15:15 SS: 21:11	<b>1</b> • 9h: <i>Uranus</i> sta. • 19:49: <i>Titan STS</i> .	<b>2</b> MS: 01:29 SR: 05:16 MR: 17:35 SS: 21:10	<b>3</b> • 16h: <i>Venus</i> 7° S of M45. • 19h: <i>Earth</i> at ap-helion (152.1Mkm). • <i>Mercury</i> GB.	<b>4 Independence</b> • 0h: <i>Moon</i> occults M4. • 3h: <i>Moon</i> 0.5° N of <i>Antares</i> . • 19h: 7 <i>Iris</i> at opp'n (m8.7).
<b>5</b> • <i>Moon</i> at GSD (26.5°).	<b>6</b>  <small>1687: England; "Principia" was published by Sir Isaac Newton.</small>	<b>7</b> • 02:21: <u>Full "Buck" or "Thunder" Moon</u> , smallest of 2009. • 15h: <i>Moon</i> at apg (406,232 km), BoY.	<b>8</b> • 01:27: <i>Ganymede</i> eclipses <i>Io</i> .	<b>9</b> SR: 05:22 MS: 07:39 SS: 21:07 MR: 22:21	<b>10</b> • 9h: <i>Mars</i> 5° S of M45. • 15h: <i>Moon</i> 4° N of <i>Jupiter</i> .	<b>11</b> • 02:07: <i>Io</i> 's shadow transits <i>Ganymede</i> .
<b>12</b>  <small>2006: USA; Genesis Pathfinder was launched, a technology demonstration for the inflatable Nautilus space station structure.</small>	<b>13</b> • 12h: <i>Jupiter</i> 0.6° S of <i>Neptune</i> . • 19h: <i>Mercury</i> in SC.	<b>14</b> • 11h: <i>Venus</i> 3° N of <i>Aldebaran</i> .	<b>15</b> • 02:53: <u>LO Moon</u> . • 03:18: <i>Ganymede</i> eclipses <i>Io</i> . • <i>Libration</i> 7.5° W. • <i>Libration</i> 6.8° S.	<b>16</b> MR: 00:12 SR: 05:28 MS: 15:46 SS: 21:02	<b>17</b> • 19:00: <i>Titan STS</i> . • 20h: <i>Moon</i> 0.5° N of M45.  <small>1850: Vega became the first star to be photographed.</small>	<b>18</b> • 03:54: <i>Io</i> 's shadow transits <i>Ganymede</i> . • 5h: <i>Moon</i> 5° N of <i>Mars</i> . • 22h: <i>Moon</i> 6° N of <i>Venus</i> .
<b>19</b> • Midnight: <i>Moon</i> 1.6° N of M35. • <i>Moon</i> at GND (26.5°).	<b>20</b> • 03:59: <i>Io</i> 's shadow transits <i>Europa</i> . • 05:05: <i>Io</i> occults some of <i>Europa</i> .	<b>21</b> • 13h: <i>Moon</i> at pg (357463 km), BoY. • 19:35: <u>New Moon</u> , eclipse over Asia, Pacific, is longest for century.	<b>22</b>  <small>1972: USSR; Venera 8 softlanded on Venus.</small>	<b>23</b> • 17:11: <i>Io</i> 's shadow transits <i>Europa</i> .	<b>24</b> SR: 05:37 MR: 09:09 SS: 20:54 MS: 22:07	<b>25</b> • 8h: <i>Moon</i> 7° S of <i>Saturn</i> .
<b>26</b>	<b>27</b> • 4h: <i>Mars</i> 5° N of <i>Aldebaran</i> .  <small>1801: England; George Airy was born.</small>	<b>28</b> • 15:00: <u>FO Moon</u> . • 20h: <i>S. Delta Aquarid MSP</i> (ZHR=20). • <i>Libration</i> 7.6° E. • <i>Libration</i> 6.9° N.	<b>29</b> SR: 05:43 MR: 15:25 SS: 20:47	<b>30</b> • 19:39: <i>Io</i> 's shadow transits <i>Europa</i> . • 20:21: <i>Io</i> occults some of <i>Europa</i> .	<b>31</b> • 9h: <i>Moon</i> 0.5° N (rises below left) of <i>Antares</i> .	<b>Aug 1</b> MS: 01:24 SR: 05:47 MR: 18:24 SS: 20:43

### Printing Instructions:

- Print pages 1-6 of this document onto legal-sized (8.5x14-inch) paper duplexed (double-sided), rotated about the short side (vertical flip).

### Notes:

- This calendar was created for my own personal use. This means that “best” and “favorable” viewing conditions, times (including Sun and Moon rise and set times), and configurations are favorably and provincially biased towards Pacific Northwest viewers; specifically, those in Seattle.
- To the **left of the months’ names** are the month-long highlights of the evenings, and **to the right** appear the highlights of the mornings.
- Favorable events are printed in **bold face**.
- All **times** given are in Pacific Time, adjusted for Daylight Savings Time or Standard Time as applicable.
- I make **mistakes**. If you see an event listed and it’s important to you, confirm it for yourself.
- **Librations**: extremes are of personally trivial interest, and I don’t have exact times for them. In the cases where too many other events happen on the same day to fit it all in one day’s cell, I’ve moved the libration events to the previous day. The compass directions indicate exposed lunar surface.
- **Moon phases** are the only events underlined.
- Questions? Compliments? Complaints? Send them to [SkySea@aol.com](mailto:SkySea@aol.com)

### Abbreviations Used:

**app** – apogee, the point in the Moon’s orbit when it is farthest from the Earth.

**BoY** – Best of Year: closest approach, farthest from the Sun, whatever makes this configuration best for viewers.

**E** – East

**FQ** - First Quarter: of the Moon’s orbit, when the Moon appears “D”-shaped and in the evening.

**GB** – Greatest Brilliancy – when a planet is at its brightest, due to a combination of proximity and phase.

**GEE** – Greatest Eastern Elongation, when Mercury or Venus appear as “evening stars” and farthest to the east of the Sun for that apparition.

**GND** – Greatest Northern declination (for the month, unless otherwise stated).

**GSD** – Greatest Southern declination (for the month, unless otherwise stated).

**GWE** – Greatest Western Elongation, when Mercury or Venus appear as “morning stars” and farthest to the west of the Sun for that apparition.

**h** – Hour: a rounding of time to the nearest hour, mostly for events with broad time spans.

**IC** – Inferior Conjunction, when Mercury or Venus pass between the Sun and the Earth.

**Jup2ST** – Double-Shadow Transit on Jupiter: when shadows of two moons are simultaneously cast on Jupiter’s face.

**m** or **mag** – magnitude: a measure of brightness. 0 is a bright star, 6 is about the limit of naked-eye visibility. Some planets, the Sun, and the Moon reach negative values.

**Mkm** – Million kilometers.

**MR** – Moonrise.

**MS** – Moonset.

**MSP** – Meteor Shower Peak

**N** – North.

**LQ** – Last Quarter: last quarter of the Moon’s orbit, when the Moon appears “C”-shaped and in the morning.

**pg** – perigee: the point in the Moon’s orbit when it is closest to the Earth.

**Occ’n** – Occultation: when the Moon passes in front of a more distant object.

**Opp’n** – Opposition: when a superior body lies opposite the Sun in the sky as seen from the Earth.

**S** – South

**SC** – Superior Conjunction, when Mercury or Venus are on the opposite side of the Sun from the Earth.

**SR** – Sunrise.

**SS** – Sunset.

**sta.** – Stationary: when an object begins a change in longitudinal direction.

**STS** – (Titan) shadow transit on Saturn.

**W** – West