August Celestial Calendar by Dave Mitsky

All times, unless otherwise noted, are UT (subtract four hours and, when appropriate, one calendar day for EDT)

8/1  Mercury is at the ascending node through the ecliptic plane at 12:00; Venus is at its southermost latitude from the ecliptic plane (-3.4 degrees) at 15:00

8/2  The Moon is 1.5 degrees south of Jupiter at 0:00; Mercury is 6.6 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 1:00; the Moon is 1.1 degrees south of Pluto, with an occultation taking place in most of eastern Antarctica, at 6:00; Uranus is at western quadrature at 11:00; the Moon is 2.3 degrees southeast of Saturn at 14:00

8/3  Mars is at perihelion (1.3814 astronomical units from the Sun) at 9:00; Full Moon (known as the Fruit, Grain, Green Corn, or Sturgeon Moon) occurs at 15:59

8/5  The astronomical cross-quarter day known as Lammas or Lughnasadh, the midpoint between the summer solstice and the autumnal equinox, occurs today

8/6  Mercury is at perihelion (0.3075 astronomical units from the Sun) at 4:00; the Moon is 4.0 degrees southeast of Neptune at 19:00

8/9  Mercury is 0.1 degrees southeast of the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 1:00; the Moon is 0.8 degrees southeast of Mars, with an occultation occurring in the Ascension Islands, southeastern South America, and most of western Antarctica, at 8:00; the Moon is at apogee, subtending 29' 32'' at a distance of 404,659 kilometers (251,443 miles) at 14:00

8/10 The Sun enters the constellation of Leo, at longitude 138.2 degrees on the ecliptic, at 9:00; Venus is 4.4 degrees south of the bright open cluster M35 in Gemini at 16:00; Venus is at dichotomy (50% illumination) at 21:00

8/11 The Moon is 3.3 degrees southeast of Uranus at 0:00; Last Quarter Moon occurs at 16:45

8/12 The Curtiss Cross, an X-shaped clair-obscurs illumination effect located between the craters Parry and Gambart, is predicted to be visible at 12:56; the peak of the Perseid meteor shower (a zenithal hourly rate of 90 or more per hour) occurs at 13:00; the Moon is 6.4 degrees southeast of the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 16:00; Venus is at dichotomy (50% illumination) at 21:00

8/13 Venus is at greatest western elongation (45.8 degrees) at 0:00; the Moon is 3.9 degrees north of the first-magnitude star Aldebaran (Alpha Tauri) at 10:00

8/14 The Moon is at the ascending node (longitude 87.8 degrees) at 19:00

8/15 A double Galilean shadow transit (Io's shadow follows Ganymede's) begins at 4:08; the Moon is 0.6 degrees southeast of the bright open cluster M35 at 5:00; the Moon is 4.0 degrees north of Venus at 14:00; Uranus is stationary, with retrograde (western) motion to begin, at 17:00

8/16 Mercury is at its northernmost latitude from the ecliptic plane (7.0 degrees) at 9:00; the Moon is 8.1 degrees south of the first-magnitude star Castor (Alpha Geminorum) at 15:00; the Moon is 4.5 degrees south of the first-magnitude star Pollux at 20:00

8/17 Mercury is in superior conjunction with the Sun (1.354 astronomical units from Earth, latitude 7.0 degrees) at 15:00; the Moon is 2.0 degrees north-northeast of the bright open cluster M44 at 19:00

8/19 New Moon (lunation 1208) occurs at 2:42; the Moon is 2.7 degrees north-northeast of Mercury at 6:00; the Moon, Mercury, and the first-magnitude star Regulus (Alpha Leonis) lie within a circle with a diameter of 4.0 degrees at 8:00; the Moon is 4.1 degrees north-northeast of Regulus at 9:00

8/20 Mercury is 1.3 degrees north-northeast of Regulus at 4:00

8/21 The Moon is at perigee, subtending 32' 52'' from a distance of 363,513 kilometers (225,876 miles), at 11:00; the Sun's longitude is 150 degrees at 16:00

8/22 A double Galilean shadow transit (Ganymede's shadow follows Io's) begins at 6:32
8/23 The Moon is 6.6 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 2:00; Mars and Neptune are at heliocentric conjunction (longitude 349.4 degrees) at 22:00

8/25 First Quarter Moon occurs at 17:58

8/26 The Lunar X, also known as the Werner or Purbach Cross, an X-shaped clair-obscur illumination effect involving various ridges and crater rims located between the craters La Caille, Blanchnus, and Purbach, is predicted to be fully formed at 1:06; the Moon is 6.0 degrees north-northeast of the first-magnitude star Antares (Alpha Scorpii) at 8:00

8/27 The Moon is at the descending node (longitude 266.8 degrees) at 12:00

8/28 The dwarf planet/asteroid 1 Ceres is at opposition at 12:00

8/29 The Moon is 1.4 degrees south of Jupiter at 2:00; the Moon is 1.2 degrees south of Pluto, with an occultation taking place in most of western Antarctica and Queen Maude Land, at 11:00; the Moon is 2.2 degrees southeast of Saturn at 18:00

8/31 Venus is 8.6 degrees south of Pollux at 21:00

John Flamsteed, Christian Mayer, Pierre François André Méchain, Maria Mitchell, and Otto Struve were born this month.

The gibbous phase of Mars was first observed by Francesco Fontana on August 24, 1638. Abraham Ihle discovered the globular cluster M22 on August 26, 1665. Nicolas Sarabat discovered Comet C/1729 P1 (Sarabat) on August 1, 1729. Caroline Herschel discovered Comet C/1786 P1 (Herschel) on August 1, 1786. The Saturnian satellite Enceladus was discovered by William Herschel on August 28, 1789. Dominique Dumouchel was the first person to observe the return of Comet 1P/Halley on August 5, 1835. John Russell Hind discovered asteroid 7 Iris on August 13, 1847. Asaph Hall discovered Deimos on August 11, 1877 and Phobos on August 17, 1877. The first extragalactic supernova, S Andromedae, was discovered by Ernst Hartwig on August 20, 1885. David Jewitt and Jane Luu discovered the trans-Neptunian object (15760) 1992 QB1 on August 30, 1992. The Jovian satellite 2002 Laomedea was discovered by Matthew Holman on August 13th, 2002.

The peak of the Perseid meteor shower takes place on the night of August 11th/12th and is compromised by moonlight from an almost Last Quarter Moon. The periodic comet 109P/Swift-Tuttle is the source of Perseid meteors. The shower’s radiant lies just to the southeast of the Double Cluster (NGC 869 and NGC 884). For more on this year’s Perseids, see page 50 of the August 2020 issue of Sky & Telescope or click on https://earthsky.org/astronomy-essentials/everything-you-need-to-know-perseid-meteor-shower and https://earthsky.org/?p=165416

Information on passes of the ISS, the USAF’s X-37B, the HST, and other satellites can be found at http://www.heavens-above.com/

The Moon is 11.1 days old, is illuminated 91.3%, subtends 31.6 arc minutes, and is located in Sagittarius on August 1st at 0:00 UT. The Moon is at its greatest northern declination on August 16th (+24.1 degrees) and its greatest southern declination on August 1st (-24.0 degrees) and on August 29th (-24.1 degrees). Longitudinal libration is at a maximum of +4.9 degrees on August 2nd and +5.9 degrees on August 28th and a minimum of -6.3 degrees on August 16th. Latitudinal libration is at a maximum of +6.7 degrees on August 7th and a minimum of -6.6 degrees on August 21st. Favorable librations for the following lunar features occur on the indicated dates: Mare Marginis on August 1st, Mare Orientale on August 16th, Mare Australe on August 24th, and Mare Smythii on August 27th. An article on observing lunar maria during librations taking place this month appears on pages 52 and 53 of the August 2020 issue of Sky & Telescope. The Moon is at apogee (at a distance 63.45 Earth-radii) on August 9th and at perigee (at a distance of 57.00 Earth-radii) on August 21st. New Moon (i.e., the dark of the Moon) occurs on August 19th. A young waxing crescent Moon passes a bit more than one degree from the binary star Porrima (Gamma Virginis) on August 21st. The Moon occults Pluto on August 2nd and August 29th and Mars on August 9th from certain parts of the world. Browse

The Sun is located in Cancer on August 1st. It enters the constellation of Leo on August 10th and achieves an ecliptic longitude of 150 degrees on August 21st.

Brightness, apparent size, illumination, distance from the Earth in astronomical units, and location data for the planets and Pluto on August 1:

Mercury (magnitude -0.9, 6.1", 70% illuminated, 1.10 a.u., Gemini), Venus (magnitude -4.5, 27.2", 43% illuminated, 0.61 a.u., Taurus), Mars (magnitude -1.1, 14.6", 86% illuminated, 0.64 a.u., Pisces), Jupiter (magnitude -2.7, 47.2", 100% illuminated, 4.18 a.u., Sagittarius), Saturn (magnitude +0.1, 18.4", 100% illuminated, 9.01 a.u., Sagittarius), Uranus (magnitude +5.7, 3.6", 100% illuminated, 19.54 a.u. on August 16th, Aries), Neptune (magnitude +7.8, 2.4", 100% illuminated, 29.02 a.u. on August 16th, Aquarius), and Pluto (magnitude +14.3, 0.1", 100% illuminated, 33.11 a.u. on August 16th, Sagittarius).

Mercury lies very low in the eastern sky at dawn. It's at perihelion on August 6th and at its greatest heliocentric latitude north on August 16th. The speediest planet is in inferior conjunction on August 17th. It will become visible again in the evening sky near the end of the month.

During August, Venus dips in brightness from magnitude -4.5 to magnitude -4.3 and in angular size from 27.2 arc seconds to 21.7 arc seconds, while it grows in illumination from 43% to 59%. Venus and the third-magnitude star Zeta Tauri are less than two degrees apart in early August. Venus is at its greatest heliocentric latitude south on August 2nd. It reaches greatest western elongation on August 12th but doesn't attain its highest sunrise altitude of approximately 40 degrees until month's end. The waning crescent Moon passes four degrees to the north of the planet on August 15th. Venus travels eastward through Taurus and northern Orion and enters southern Gemini near the end of August.

Mars rises two hours after sunset by the end of August. The Red Planet brightens from magnitude -1.1 to magnitude -1.8 and increases in angular diameter from 14.6 arc seconds to 18.7 arc seconds. Mars is at perihelion on August 3rd. An impressive lunar conjunction takes place on August 9th, when the waning gibbous Moon passes about one degree to the south of Mars.

Jupiter decreases slightly in brightness from magnitude -2.7 to magnitude -2.6 and diminishes in apparent size from 47.2 to 44.4 arc seconds during August. Jupiter remains approximately eight degrees west of Saturn this month. The distance slowly increases as both gas giants retrograde. The Moon passes two degrees to the south of Jupiter on August 1st/August 2nd and again on August

Saturn shrinks from 18.4 to 18.0 arc seconds in angular diameter and drops in brightness from magnitude +0.1 to +0.3 this month. Its rings are inclined by more than 22 degrees with respect to the Earth and span 42 arc seconds. On August 2nd and August 29th, the Moon passes two degrees to the south of Saturn. For information on Saturn’s satellites, browse http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/.

Uranus is located in southern Aries. It transits the meridian around sunrise. The waning gibbous Moon passes three degrees southeast of Uranus on the night of August 10th/August 11th. Uranus reaches its first stationary point on August 15th. On that date, it will be at its highest declination (almost +15 degrees) since the early 1960s. Visit http://www.nakedeyeplanets.com/uranus.htm for a finder chart.

Neptune can be found in eastern Aquarius. The waning gibbous Moon passes four degrees southeast of Neptune on August 6th. Mars and Neptune are at heliocentric conjunction on August 23rd. Browse http://www.nakedeyeplanets.com/neptune.htm for a finder chart.


The dwarf planet Pluto is occulted by the Moon from some parts of the world on August 2nd and August 29th. Finder charts can be found at pages 48 and 49 of the July 2020 issue of Sky & Telescope and on page 243 of the RASC Observer’s Handbook 2020.

For more on the planets and how to locate them, see http://www.nakedeyeplanets.com/

Comet C/2020 F3 (NEOWISE) put on a fine show last month, reaching naked-eye visibility from reasonably dark sites and producing rather long ion and dust tails. It reached perihelion on July 3rd and made its closest approach to the Earth on July 23rd. Comet NEOWISE will continue to dim as it moves increasingly farther from the Earth. See https://spaceweathergallery.com/index.php?title=neowise for a photo gallery of the comet. For further information on comets visible this month, browse http://cometchasing.skyhound.com/ and http://www.aerith.net/comet/future-n.html.

Asteroid 1 Ceres (magnitude +7.7), which is also classified as a dwarf planet, reaches opposition in southern Aquarius on August 28th. An article on the largest of the asteroids appears on pages 50 and 51 of the August 2020 issue of Sky & Telescope. Other asteroids brighter than magnitude +11.0 reaching opposition include 44 Nysa (magnitude +10.6), 138 Tolosa (magnitude +10.8), and 20 Massalia (magnitude +9.7). For information on asteroid occultations taking place this month, see http://www.asteroidoccultation.com/2020_08_si.htm.


Free star maps for this month can be downloaded at
http://www.skymaps.com/downloads.html and
https://www.telescope.com/content.jsp?pageName=Monthly-Star-Chart

Data on current supernovae can be found at
http://www.rochesterastronomy.org/snimages/

Finder charts for the Messier objects and other deep-sky objects are posted at
https://freestarcharts.com/messier and https://freestarcharts.com/ngc-ic and
https://www.cambridge.org/tourleft-seasonal_skies_july-september

Telrad finder charts for the Messier Catalog are posted at
http://www.custerobservatory.org/docs/messier2.pdf

Information pertaining to observing some of the more prominent Messier
galaxies can be found at http://www.cloudynights.com/topic/358295-how-to-
locate-some-of-the-major-messier-galaxies-and-helpful-advice-for-novice-
amateur-astronomers/

Freeware sky atlases can be downloaded at
and http://astro.mxd120.com/free-star-atlases

Author Phil Harrington offers an excellent freeware planetarium program for
binocular observers known as TUBA (Touring the Universe through Binoculars
Atlas), which also includes information on purchasing binoculars,
at http://www.philharrington.net/tuba.htm

Stellarium and Cartes du Ciel are two excellent freeware planetarium programs
that are available at http://stellarium.org/ and
https://www.ap-i.net/skychart/en/start

Deep-sky object list generators can be found at
http://www.virtualcolony.com/sac/ and https://dso-browser.com/ and
http://tonightssky.com/MainPage.php

Sixty binary and multiple stars for August: 5 Aquilae, Struve 2404, 11 Aquilae, Struve 2426, 15 Aquilae, Struve 2449, 23 Aquilae, Struve 2532, Pi Aquilae, 57 Aquilae (Aquila); Beta Cygni (Albireo), 16 Cygni, Delta Cygni, 17 Cygni (Cygaeus); 41 & 40 Draconis, 39 Draconis, Struve 2348, Sigma Draconis, Struve 2573, Epsilon Draconis (Draco); 95 Herculis, 100 Herculis, Struve 2289, Struve 2411 (Hercules); Struve 2349, Struve 2372, Epsilon-1 & Epsilon-2 Lyrae (the Double-Double), Zeta-2 Lyrae, Beta Lyrae, Otto Struve 525, Struve 2470 & Struve 2474 (the Other Double-Double) (Lyra); 67 Ophiuchi, 69 Ophiuchi, 70 Ophiuchi, Struve 2276, 74 Ophiuchi (Ophiuchus); Mu Sagittarii, Eta Sagittarii, 21 Sagittarii, Zeta Sagittarii, H N 119, 52 Sagittarii, 54 Sagittarii (Sagittarius); Struve 2306, Delta Scuti, Struve 2373 (Scutum); Struve 2296, Struve 2303, 59 Serpentis, Theta Serpentis (Serpens Cauda); Struve 2445, Struve 2455, Struve 2457, 4 Vulpeculae, Struve 2521, Struve 2523, Struve 2540, Struve 2586, Otto Struve 388, Struve 2599 (Vulpecula)

Notable carbon star for August: V Aquilae

Eighty deep-sky objects for August: B139, B142, B143, NGC 6709, NGC 6738, NGC 6741, NGC 6751, NGC 6755, NGC 6772, NGC 6778, NGC 6781, NGC 6804, PK64+5.1 (Aquila); NGC 6819, NGC 6826, NGC 6834, (Cygaeus); NGC 6643, NGC 6742 (Draco); DoDz 9 (Hercules); M56, M57, NGC 6703, NGC 6791, Stel (Lyra); NGC 6572, NGC 6633 (Ophiuchus); H20, M71 (Sagittarii); B86, B87, B90, B92, B93, M8, M17, M18, M20, M21, M22, M23, M24, M25, M28, M54, M55, M69, M70, M75, NGC 6520, NGC 6544, NGC 6546, NGC 6553, NGC 6565, NGC 6603, NGC 6618, NGC 6822 (Sagittarius); IC 4703, IC 4756, M16, NGC 6604 (Serpens Cauda); B100, B101, B103, B104, B110, B111, B113, Bas 1, IC 1295, M11, M26, NGC 6649, NGC 6712
(Scutum); Cr 399 (asterism), M27, NGC 6802, NGC 6823, NGC 6834, NGC 6940, St 1 (Vulpecula)

Top ten binocular deep-sky objects for August: Cr 399, IC 4756, M8, M11, M17, M22, M24, M25, M27, NGC 6633 (IC 4756 and NGC 6633 are collectively known as the Binocular Double Cluster)

Top ten deep-sky objects for August: M8, M11, M16, M17, M20, M22, M24, M27, M55, M57

Challenge deep-sky object for August: Abell 53 (Aquila)

The objects listed above are located between 18:00 and 20:00 hours of right ascension.