March Celestial Calendar by Dave Mitsky

All times, unless otherwise noted, are UT (subtract five hours and, when appropriate, one calendar day for EST and four hours for EDT as of March 11th)

3/1 The Moon is 0.91 degree north-northeast of the first-magnitude star Regulus (Alpha Leonis), with an occultation occurring in Greenland, northern Canada, and Alaska, at 6:00
3/2 Full Moon (known as the Crow, Lenten, and Sap Moon) occurs at 0:51
3/3 Mars and Jupiter are in heliocentric conjunction (heliocentric longitude is 223.3 degrees)
3/4 Mercury is 1.1 degrees northwest of Venus at 6:00; Neptune is in conjunction with the Sun at 14:00
3/5 The Moon is 6.9 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 2:00; Mercury is at the ascending node through the ecliptic plane at 19:00
3/6 Mercury crosses the celestial equator and enters the northern celestial hemisphere at 5:00
3/7 The Moon is 4.0 degrees north-northeast of Jupiter at 9:00
3/8 The Moon is 9.3 degrees north of the first-magnitude star Antares (Alpha Scorpii) at 18:00
3/9 Jupiter is stationary in longitude at 4:00; Venus crosses the celestial equator and enters the northern celestial hemisphere at 6:00; Jupiter is stationary in right ascension, with retrograde motion to begin, at 9:00; Last Quarter Moon occurs at 11:20; the Moon is 1.8 degrees south of asteroid 4 Vesta at 18:44
3/10 The Moon is 3.8 degrees north of Mars at 1:00; Mercury (magnitude -0.8) is at perihelion (0.3075 astronomical units from the Sun) at 11:00; the Curtiss Cross, an X-shaped clair-obscure illumination effect located between the craters Parry and Gambart, is predicted to be visible at 21:19
3/11 Daylight Saving Time (DST) begins today; the Moon is 2.2 degrees north of Saturn at 2:00; the Moon is at apogee, subtending 29' 32" from a distance of 404,678 kilometers (251,455 miles), at 9:00
3/12 The Sun enters Pisces (ecliptic longitude 351.57 degrees) at 5:00
3/14 Moon is at the descending node (longitude 314.5 degrees) at 3:48
3/15 Mercury is at its greatest eastern elongation (18.4 degrees) at 15:00
3/17 New Moon (lunation 1178) occurs at 13:12
3/16 Mars is at the descending node through the ecliptic plane at 19:00
3/18 The Moon is 3.5 degrees south-southeast of Venus at 22:00; the Moon is 7.3 degrees south-southeast of Mercury at 23:00
3/19 Mercury (magnitudes +0.5) is 3.8 degrees north-northwest of Venus (magnitude -3.9) at 8:00; the Moon is 4.4 degrees south-southeast of Uranus at 19:00
3/20 Mercury at its greatest latitude north (7.0 degrees) of the ecliptic plane at 16:00; the vernal equinox occurs at 16:15; dwarf planet/asteroid 1 Ceres is stationary at 21:00
3/22 The Moon is 9.0 degrees south-southeast of the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 6:00; Mercury (magnitude +1.3) is 10.8 degrees west of Uranus (magnitude +5.9) at 8:00; Mercury is stationary in right ascension, with retrograde motion to begin, at 17:00; the waxing crescent Moon is 0.85 degree north of the first-magnitude star Aldebaran (Alpha Tauri), with an occultation occurring in northern Europe, Greenland, the northwestern United States and western Canada, at 23:00
3/23 Mercury is stationary in longitude at 0:00

3/24 The Lunar X (the Purbach or Werner Cross), an X-shaped illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to visible at 6:57; the Moon is 4.3 degrees south of the bright open cluster M35 in Gemini at 13:00; First Quarter Moon occurs at 15:35; Mars is at western quadrature (i.e., 90 degrees from the Sun) at 16:00; sunrise takes place on the isolated lunar mountain Mons Pico at 16:13
3/25 Sunrise takes place on the isolated lunar mountain Mons Piton at 8:00
3/26 The Moon is 8.4 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 2:00; the Moon is at perigee, subtending 32' 22" from a distance of 369,106 kilometers (229,352 miles), at 17:00
3/27 The Moon is 1.8 degrees south of the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 1:00; the Moon is at the ascending node (longitude 133.7 degrees) at 10:59
3/28 Asteroid 3 Juno (magnitude +10.3) is 3.2 degrees north-northwest of Neptune (magnitude +8.0) at 10:44; the Moon is 0.98 degree north-northeast of the first-magnitude star Regulus (Alpha Leonis), with an occultation occurring in Alaska and northeastern Asia, at 15:00
3/29 Venus is 0.07 degree south-southeast of Uranus at 1:00; Saturn is at western quadrature at 14:00
3/31 Full Moon occurs at 12:37

Nicolas-Louis de Lacaille (1713-1762), Caroline Herschel (1750-1848), Josef von Fraunhofer (1787-1826), John Herschel (1792-1871), Percival Lowell (1855-1916), Albert Einstein (1879-1955), and Walter Baade (1893-1960) were born this month.

Titan, Saturn's largest satellite, was discovered on March 25, 1655 by the Dutch astronomer Christiaan Huygens. The English astronomer Edward Pigott discovered the spiral galaxy M63 (the Black Eye Galaxy) on March 23, 1779. The English astronomer Sir William Herschel discovered Uranus on March 13, 1781. The grand design spiral galaxy M101was discovered by the French astronomer Pierre Méchain on March 27, 1781. Asteroid 2 Pallas was discovered by the German astronomer Heinrich Wilhelm Matthias Olbers on March 28, 1802. Asteroid 4 Vesta was discovered by Heinrich Wilhelm Matthias Olbers on March 29, 1807. The first photograph of the Moon was taken on March 23, 1840. The Czech astronomer Luboš Kohoutek discovered Comet C/1973 E1 (Kohoutek) on March 7, 1973. The rings of Uranus were discovered on March 10, 1977. The Spanish amateur astronomer Francisco Garcia Diaz Garcia discovered supernova SN 1993 in the spiral galaxy M81 (Bode's Galaxy) on March 28th, 1993.

The zodiacal light may be visible in the western sky after sunset from dark locations during the second half of March.

Information on Iridium flares and passes of the ISS, the Tiangong-1, the Tiangong-2, the USAF's X-37B, the HST, and other satellites can be found at http://www.heavens-above.com/

The Moon is 12.9 days old, is illuminated 98.0%, subtends 33.0 arc minutes, and is located in the constellation of Leo at 0:00 UT on March 1st. Full Moon occurs on March 2nd and again on March 31st. (The second Full Moon in a month is now considered by some to be a Blue Moon.) New Moon occurs on March 7th. The Moon is at apogee (at a distance of 63.45 Earth-radii) on March 11th and perigee (at a distance of 57.87 Earth-radii) on March 26th. The Moon will

occult Regulus on March 1st and 28th and Aldebaran on March 22nd from certain parts of the world. Consult http://www.lunar-occultations.com/iota/bstar/bstar.htm for information on these lunar occultation events. Visit http://saberdoesthestars.wordpress.com/2011/07/05/saber-does-the-stars/ for tips on spotting extreme crescent Moons. Click on http://www.calendar-12.com/moon_calendar/2018/march for a March lunar calendar. Times and dates for the lunar light rays predicted to occur this month are available at http://www.lunar-occultations.com/rlo/rays/rays.htm

The Sun is in Aquarius on March 1st at 0:00 UT. It enters Pisces on March 12th. The Sun crosses the celestial equator at 16:15 UT on March 20th, bringing spring to the northern hemisphere. At the equinox, the Sun is located in Aries and has a longitude of zero degrees.

Brightness, apparent size, illumination, distance from the Earth in astronomical units, and location data for the planets and Pluto on March 1st: Mercury (magnitude -1.3, 5.3", 93%, 1.26 a.u., Aquarius), Venus (magnitude -3.9, 10.0", 98% illuminated, 1.66 a.u., Aquarius), Mars (magnitude +0.8, 6.7", 89% illuminated, 1.40 a.u., Ophiuchus), Jupiter (magnitude -2.2, 39.1", 99% illuminated, 5.05 a.u., Libra), Saturn (magnitude +0.6, 15.9", 100% illuminated, 10.48 a.u., Sagittarius), Uranus (magnitude +5.9, 3.4", 100% illuminated, 20.73 a.u. on March 15th, Pisces), Neptune (magnitude +8.0, 2.2", 100% illuminated, 30.92 a.u. on March 15th, Aquarius), and Pluto (magnitude +14.3, 0.1", 100% illuminated, 33.96 a.u. on March 15th, Sagittarius).

In the evening, Mercury, Venus, and Uranus can be seen in the west. Jupiter is located in the southeast at midnight. Mars and Jupiter are in the south, Saturn is in the southeast, and Neptune is in the east in the morning sky**.**

During March, Mercury dims in brightness from magnitude -1.3 to magnitude +5.3 but grows in apparent size from 5.3 to 11.0 arc seconds. Mercury and Venus are 1.1 degrees apart on the evening of March 3rd. On March 5th, Mercury is 1.4 degrees due north of Venus. The speediest planet continues to increase it separation from Venus until it attains its greatest altitude on March 15th when it reaches greatest eastern elongation. It's situated approximately 12 degrees above the western horizon 30 minutes after the Sun sets. Mercury draws closer to Venus again as its altitude decreases after maximum elongation.

Venus shines at magnitude -3.9 for the entire month but gains only 0.5 arc second in angular diameter. By the end of March, Venus sets more than 1.5 hours after the Sun.

Mars increases in apparent size by 25%, from 6.7 arc seconds to 8.4 arc seconds, and brightens from magnitude +0.8 to magnitude +0.3, this month. Mars exits Ophiuchus and enters Sagittarius on March 12th. The Red Planet is situated halfway between M8 (the Lagoon Nebula) and M20 (the Trifid Nebula) on the morning of March 19th. Mars is at western quadrature on March 24, which results in the planet exhibiting its largest phase effect. On the morning of March 28th, Mars passes 1.3 degrees north of the seventh-magnitude globular cluster M28. It passes 0.9 degree west-northwest of the fifth-magnitude globular cluster M22 on the morning of March 31st. Mars and Saturn are about 17 degrees apart as March begins but the gap closes to less than two degrees by the end of the month. At that time, the two planets rise within one minute of each other.

Jupiter increases in brightness from magnitude -2.2 to magnitude -2.4 and grows in apparent size by 3.4 arc seconds this month. It rises about 20 minutes before midnight on March 1st. The waning gibbous Moon passes four degrees north of the planet on March 7th. On March 9th, Jupiter ceases prograde or eastern motion and then begins to retrograde through the constellation of Libra. All four of the Galilean satellites are on the same side of Jupiter on March 1st, March 11th, March 24th, and March 25th. Callisto passes due north of Jupiter on the morning of March 25th. Data on these and other Galilean satellite events is available online at http://www.shallowsky.com/jupiter/ and http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/ and on page 51 of the March 2018 issue of *Sky & Telescope*. Click on http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/ or consult page 50 of the March 2018 issue of *Sky & Telescope* to determine transit times of the central meridian by the Great Red Spot.

Saturn rises around 3:30 a.m. local time as the month begins. Saturn's rings span 37 arc seconds and are inclined 26 degrees during March. The Ringed Planet can be found about two degrees north of M22 for the entire month. The waning crescent Moon passes two degrees to the north of Saturn on March 11th. Saturn is at western quadrature on March 29th. This produces an enhanced three-dimensional effect when observing the planet. Click on http://www.curtrenz.com/saturn for a wealth of information on Saturn. For information on the major satellites of Saturn, browse http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/

Uranus is located 2.3 degrees due west of the fourth-magnitude star Omicron Piscium in southeastern Pisces. The seventh planet is 25 degrees above the western horizon as darkness falls. The Moon passes 4.4 degrees south-southeast of Uranus on March 19th. Uranus and Venus undergo their closest conjunction since 2003 on March 28th.

Online finder charts for Uranus can be found at http://www.nakedeyeplanets.com/uranus.htm and http://www.skyandtelescope.com/wp-content/uploads/WEB_Uranus_Neptune17.pdf

Click on http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/ for JavaScript utilities that will illustrate the positions of the five brightest satellites of Uranus.

See http://www.curtrenz.com/uranep.html for additional information on Uranus.

Neptune is in conjunction with the Sun on March 4th. It rises an hour before sunrise on March 31st but won't be readily visible again until late April.

Pluto is not a viable target this month.

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

Comet C/12016 R2 (PanSTARRS) shines between tenth and eleventh magnitude as it heads northeastward through Perseus in March. It passes less than five degrees southeast of the faint emission nebula NGC 1499 (the California Nebula) in mid-March. Visit http://cometchasing.skyhound.com/ and http://www.aerith.net/comet/future-n.html for additional information on comets visible this month.

Dwarf planet/asteroid 1 Ceres dims from magnitude +7.4 to magnitude +8.0 as it loops southeastward through northern Cancer during March. Asteroid 51 Nemausa (magnitude +10.2) occults a 11.5-magnitude star in Sextans on the morning of March 14 along a path running from New Jersey and western New York into Canada. Consult http://asteroidoccultation.com/ for further information on the event. Asteroid 45 Eugenia (magnitude +10.8) reaches opposition in Virgo on March 18th. Asteroid 18 Melpomene (magnitude +10.2) reaches opposition in Virgo on March 21st.

A wealth of current information on solar system celestial bodies is posted at http://www.curtrenz.com/astronomy.html and http://nineplanets.org/

Various events taking place within our solar system are discussed at http://www.bluewaterastronomy.info/styled-4/index.html

Information on the celestial events transpiring each week can be found at http://astronomy.com/skythisweek and http://www.skyandtelescope.com/observing/sky-at-a-glance/

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

The famous eclipsing variable star Algol (Beta Persei) is at a minimum, decreasing in magnitude from 2.1 to 3.4, on March 2nd, 5th, 8th, 11th, 14th, 17th, 20th, 22nd, 25th, 28th, and 31st. Consult http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/ for the times of the eclipses. Favorable dates for observing Algol at mid-eclipse from the eastern United States include March 16th (12:50 a.m. EDT or 4:50 UT) and March 19th (9:39 p.m. EDT or 1:39 UT March 20th). For more on Algol, see http://stars.astro.illinois.edu/sow/Algol.html and http://www.solstation.com/stars2/algol3.htm

It is possible to observe all 109 (or 110) Messier objects during a single night around the time of the vernal equinox, if the Moon phase and local latitude are favorable. For information on running a so-called Messier Marathon, browse http://messier.seds.org/xtra/marathon/marathon.html and http://www.richardbell.net/marathon.html

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

Finder charts for the Messier objects and other deep-sky objects are posted at https://freestarcharts.com/messier and https://freestarcharts.com/ngc-7023 and http://www.cambridge.org/features/turnleft/seasonal_skies_october-december.htm

Telrad finder charts for the Messier Catalog and the SAC's 110 Best of the NGC are posted at http://www.astro-tom.com/messier/messier_finder_charts/map1.pdf and http://www.saguaroastro.org/content/db/Book110BestNGC.pdf respectively.

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

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

Freeware sky atlases can be downloaded at http://www.deepskywatch.com/files/deepsky-atlas/Deep-Sky-Hunter-atlas-full.pdf and https://www.uv.es/jrtorres/triatlas.html

Thirty binary and multiple stars for March: Struve 1173, Struve 1181, Struve 1187, Zeta Cancri, 24 Cancri, Phi-2 Cancri, Iota-1 Cancri, Struve 1245, Iota-2 Cancri, 66 Cancri, Struve 1327 (Cancer); Struve 1270, Epsilon Hydrae, 15 Hydrae, 17 Hydrae, Theta Hydrae, 27 Hydrae, Struve 1347, Struve 1357, Struve 1365 (Hydra); 3 Leonis, Struve 1360, 6 Leonis, Omicron Leonis (Leo); Struve 1274, Struve 1282, Struve 1333, 38 Lyncis, Struve 1369 (Lynx); h4046 (Puppis)

Notable carbon star for March: T Cancri (Cancer)

Thirty-five deep-sky objects for March: M44, M67, NGC 2775 (Cancer); Abell 33, M48, NGC 2610, NGC 2642, NGC 2811, NGC 2835, NGC 2855, NGC 2935, NGC 2992, NGC 3052, NGC 3078 (Hydra); NGC 2903, NGC 2916, NGC 2964, NGC 2968, NGC 3020 (Leo); NGC 2859, NGC 3003, NGC 3021 (Leo Minor); NGC 2683 (Lynx); NGC 2567, NGC 2571 (Puppis); M81, M82, NGC 2639, NGC 2654, NGC 2681, NGC 2685, NGC 2742, NGC 2768, NGC 2787, NGC 2841, NGC 2880, NGC 2950, NGC 2976, NGC 2985 (Ursa Major)

Top ten binocular deep-sky objects for March: M44, M48, M67, M81, M82, NGC 2571, NGC 2683, NGC 2841, NGC 2903, NGC 2976

Top ten deep-sky objects for March: M44, M48, M67, M81, M82, NGC 2654, NGC 2683, NGC 2835, NGC 2841, NGC 2903

Challenge deep-sky object for March: Abell 30 (Cancer)

The objects listed above are located between 8:00 and 10:00 hours of right ascension.