Snake River Skies

The Monthly Newsletter of the Magic Valley Astronomical Society

June 2023

Membership Meeting
June 10th at the Herrett Center
CSI main campus at 7:00pm

Centennial Observatory
See Inside for Details

Faulkner Planetarium
See Inside for Details

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Magic Valley Astronomical Society is a member of the Astronomical League

M-51 imaged by
Rick Widmer & Ken Thomason
Herrett Telescope - Shotwell Camera

www.mvastro.org

June 2023 President's Message

A happy first month of summer to you all. Sorry we couldn't get our last star party going on the 20th. Who would have predicted wildfires this early from Canada? Our next scheduled event is Saturday, June 17th near Thorn Creek Reservoir north of Gooding. Our MVAS group has visited this site before. And as I remembered it, horizons are fairly clear round about and dark sky seeing is excellent. As I posted last month, the observation site is about ½ mile east off Highway 46. The turnoff is about 15 miles north of Gooding.

Our June program will be hosted by Rick Hull. He'll be talking about solar eclipses. That will be Saturday, June 10th at the Herrett Ctr Library at 7:00pm. A couple other reminders, those of you who haven't paid their dues for 2023, please get settled with Jim Tubbs. Also, please don't forget to attend our annual BBQ Saturday, July 8th at the Herrett Center. MVAS will supply hamburgers and hotdogs, buns and beverages. Members are asked to supply sides, such as salads, desserts, chips, etc. We would like to get started at 6:30pm. Meanwhile, hope all of you have a great month, be safe and enjoy the skies.

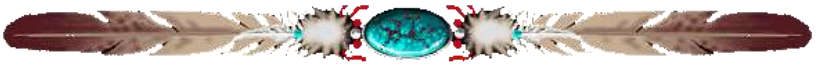
Gary Leavitt
MVAS President.

Lunar Calendar for May

Lunar Calendar for June

Su	Mo	Tu	We	Th	Fr	Sa
				1  88% visible	2  94% visible	3  Full moon
4  99% visible	5  99% visible	6  95% visible	7  89% visible	8  80% visible	9  70% visible	10  Last quarter
11  48% visible	12  37% visible	13  27% visible	14  18% visible	15  10% visible	16  5% visible	17  New moon
18  1% visible	19  1% visible	20  3% visible	21  7% visible	22  13% visible	23  20% visible	24  28% visible
25  37% visible	26  First quarter	27  57% visible	28  66% visible	29  76% visible	30  84% visible	

Humankind has not woven the web of life. We are but one thread within it.
Whatever we do to the web, we do to ourselves." ~ Chief Seattle 1854



Native American Tribes gave names to each of the full moons to keep track of the passing year. The names are associated with the entire month until the next full moon occurs. Since a lunar month averages 29 days, the dates of the moons change from year to year. June’s Full Moon in the language of the Shoshone is daa'za-mea' or Summer Moon. Other names are the Strawberry Moon.

Events & Holidays for June

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9 Centennial Observatory Public Star Party see next page for details.	10 **Membership Meeting** May 13th at the Herrett Center CSI main campus at 7:00pm
11	12	13	**Flag Day** 14 Centennial Observatory Solar Session see next page for details. 	15	16	17
18 Father's Day 	19	20	21 Centennial Observatory Solar Session see next page for details. 	22	23	24
25	26	27	28 Centennial Observatory Solar Session see next page for details. 	29	30	

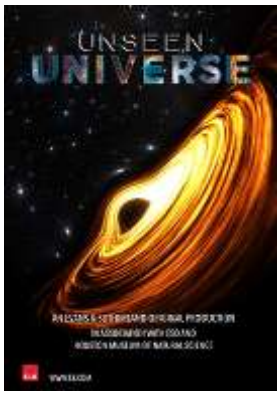
Centennial Observatory and Faulkner Planetarium Events

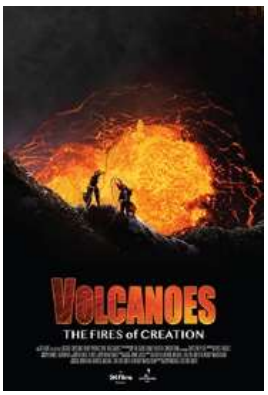
Observatory Upcoming Events

Event	Place	Date	Time	Admission
Monthly Free Star Party	Centennial Observatory	Saturday, June 10th, 2023	9:45 to 11:45 PM	FREE
Summer Solar Session #3	Centennial Observatory	Wednesday, June 14th, 2023	1:30 to 3:30 PM	FREE
Summer Solar Session #4	Centennial Observatory	Wednesday, June 21st, 2023	1:30 to 3:30 PM	FREE
Summer Solar Session #5	Centennial Observatory	Wednesday, June 28th, 2023	1:30 to 3:30 PM	FREE
Summer Solar Session #6	Centennial Observatory	Wednesday, July 5th, 2023	1:30 to 3:30 PM	FREE

Faulkner Planetarium Shows

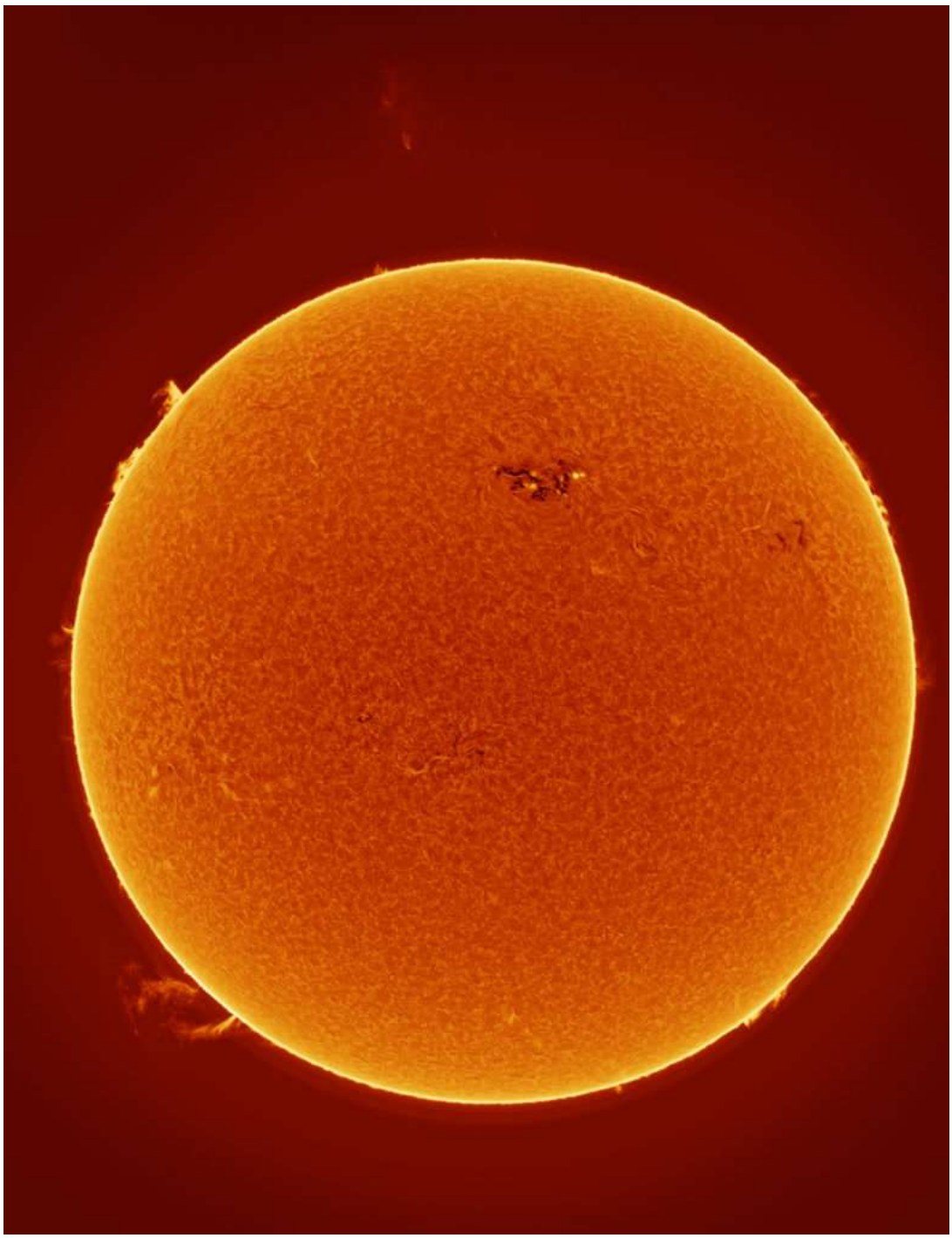
Now Showing!





Visit the Herrett Center Video Vault

The Night Sky This Month – June 2023

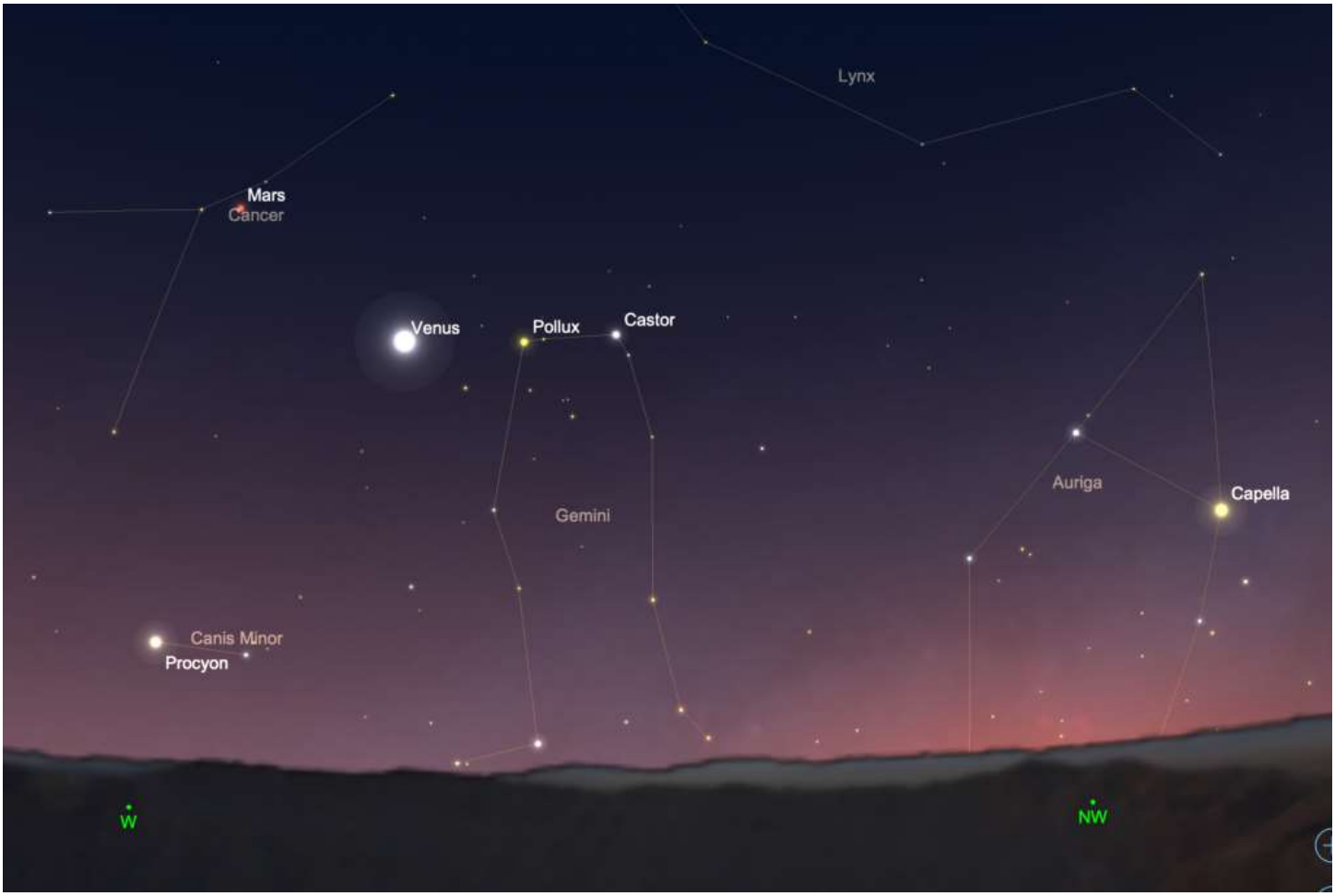


The Sun reaches its most northerly point on the ecliptic on June 21, 2023.

(Looking for last month's 'Night Sky'? Find it at this link…)

The June solstice arrives as stargazers in the southern hemisphere enjoy long nights and cooler temperatures, while we northerners enjoy some heat but much shorter nights. There's plenty to see this month as Venus, Mars, and the Moon play among the stars in the western sky after sunset, while Jupiter and Saturn grow in brightness and size in the eastern pre-dawn sky. Both Mars and Venus also make close conjunctions with the Beehive star cluster and with each other. And 'Milky Way season' gets underway as the thickest and brightest part of our galaxy emerges over the southern horizon through Scorpius and Sagittarius. Here's what to see in the night sky this month…

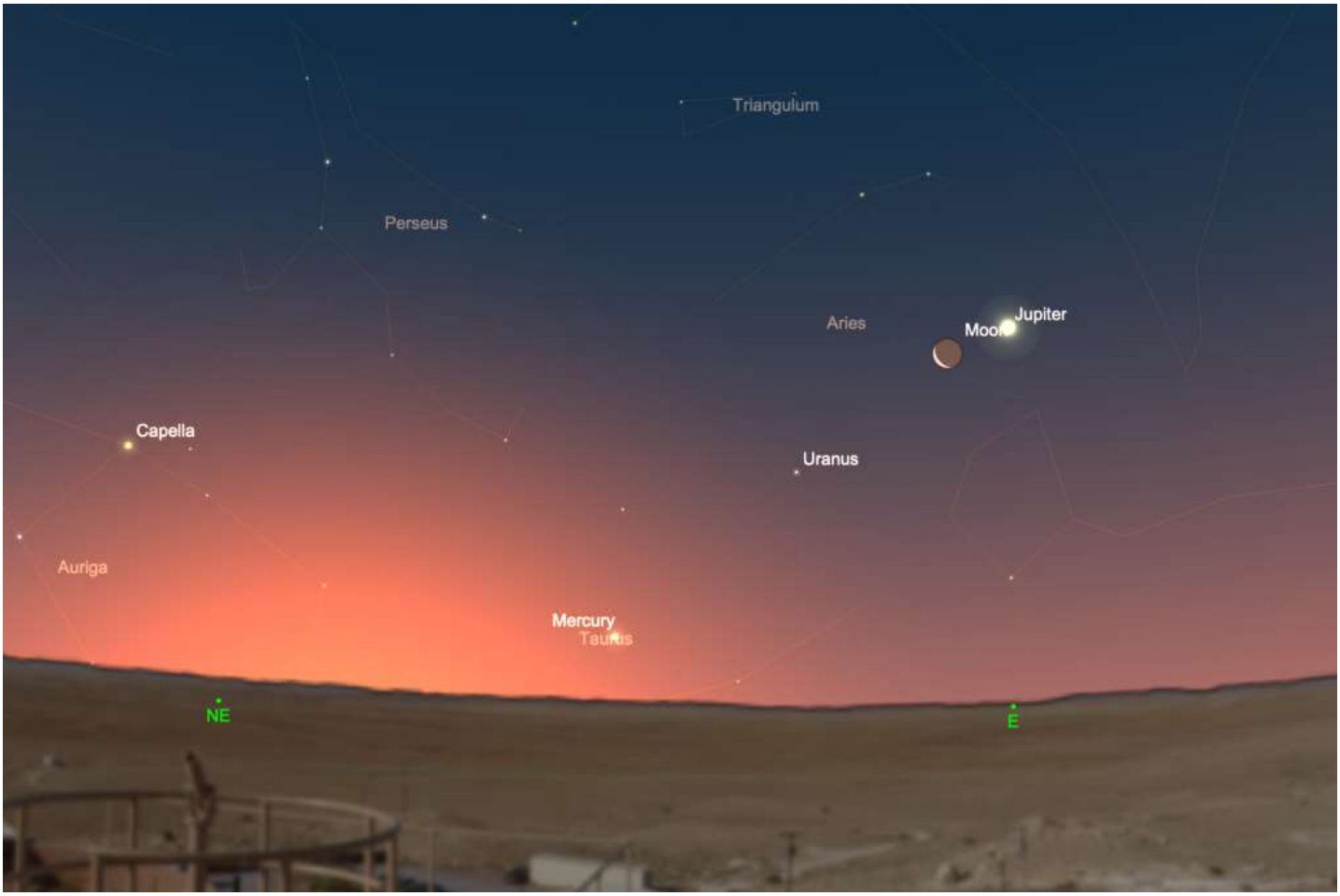
1-2 June 2023. Venus forms a line with Castor and Pollux in the northwestern sky as darkness falls. The planet lies about 5° from Pollux, which itself is about 5° from Castor.



Venus lines up with Castor and Pollux while Mars grazes the Beehive Star cluster in the western sky after sunset on June 2, 2023.

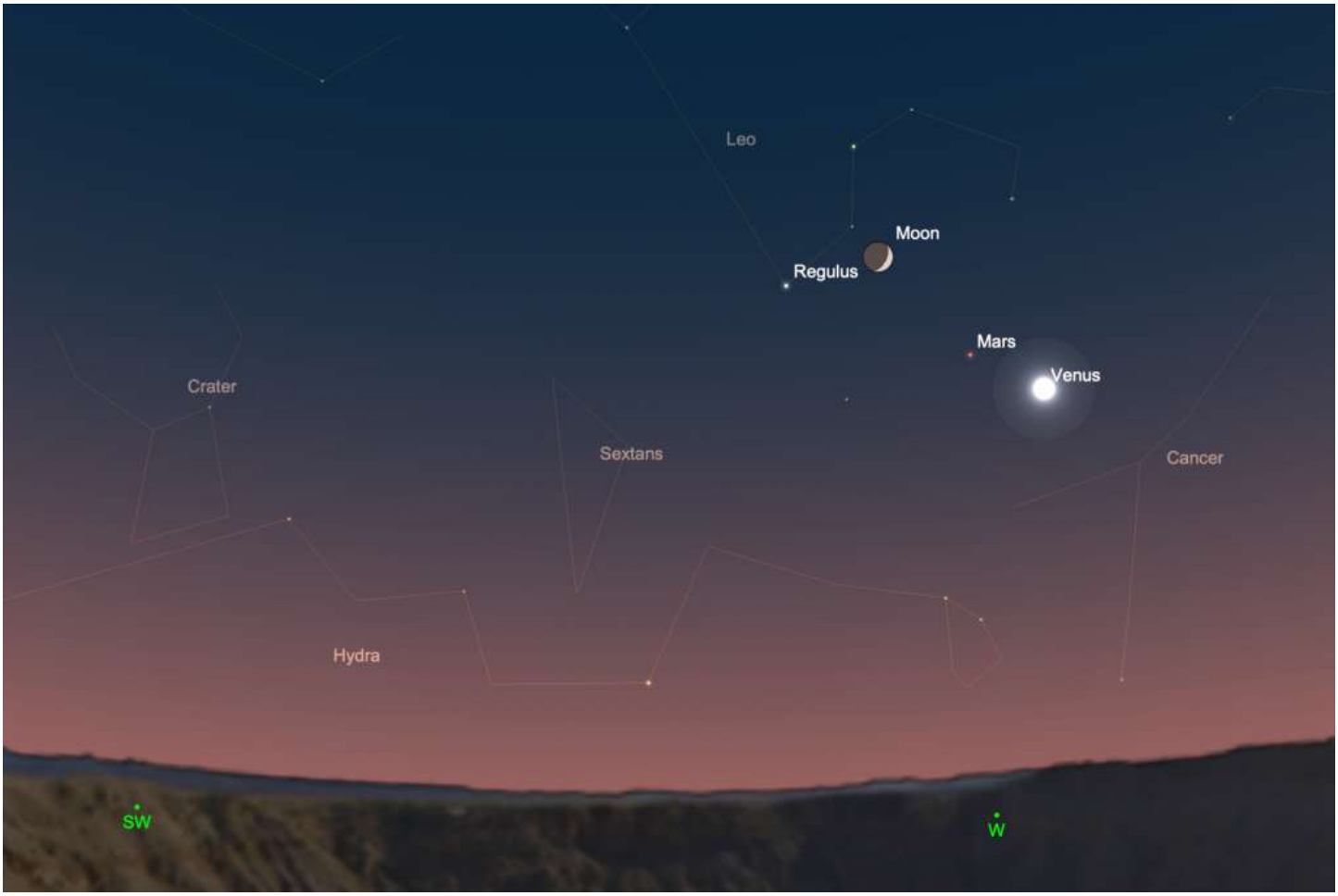
2 June. Mars makes a close approach to M44, the Beehive Star Cluster, with Venus and Castor and Pollux shining brightly to the west in the northwestern sky after sunset. Use a pair of binoculars to see the stars of M44 together with the Red Planet. Venus presents a splendid sight all month and reaches greatest eastern elongation on June 4 when it lies a full 45° from the Sun. Its disk is half lit and shines at magnitude -4.3.

3 June. The nearly full Moon lies less than 4° east of Antares all night over the southern horizon.
4 June. Full Moon, 03:42 UTC (The 'Strawberry Moon')
10 June. Last Quarter Moon, 19:31 UTC
10 June. Saturn and the Moon move together about 7° apart in the southeastern sky before dawn.
13 June. Remember Mars and the Beehive earlier in the month? Now Venus takes a turn grazing this little star cluster. Grab a pair of binoculars and see the brilliant planet on its outskirts. The bright twilight makes it a challenging observation to see the cluster.



The waning crescent Moon, Jupiter, and Mercury in the eastern sky before sunrise on June 14, 2023. \

14 June. The waning crescent Moon rises about 2^{o} from Jupiter in the eastern morning sky before sunrise. The planet rises earlier each morning in Aries and begins to adorn the morning sky in the coming months. The planet's disk has grown to an apparent diameter of 35" and it shines at magnitude -2.1. If you're out with your telescope, have a look.
16 June. Now wafer thin, the waning Moon lies near the Pleiades and Mercury in the eastern early-morning sky.
18 June. New Moon, 04:37 UTC
18 June. Saturn begins retrograde motion, now moving westward against the background stars in Aquarius in the early-morning sky as it slowly brightens and grows.



Venus, Mars, the Moon join Regulus after sunset on June 22, 2023.

21 June. The Sun reaches its northernmost point on the ecliptic at 14:58 UT. This solstice marks the beginning of summer in the northern hemisphere and winter in the southern hemisphere, and the longest and shortest days of the year, respectively.
21 June. Look for Venus, Mars, and the thickening crescent Moon in the west after sunset.
22 June. Venus, Mars, the Moon and the bright star Regulus congregate in the western sky after sunset.
26 June. First Quarter Moon, 07:50 UTC
28 June. After attracting attention all month in the western twilight sky, Mars and Venus move within 4° of each other, a lovely sight with or without optical aid. The planets remain close for the next week or so. Mars continues to move towards the Sun and appears too small to reveal much detail in a telescope.

Our Sun, the Moon, and the Solar System Planets – Celestial events

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

6/9 The Moon is 3 degrees south of Saturn at 20:00
6/10 Last Quarter Moon occurs at 19:31
6/11 A double Galilean shadow transit begins at 7:47; the Moon is 2 degrees south of Neptune at 8:00
6/12 The Curtiss Cross, an X-shaped clair-obscur illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to be visible at 10:16
6/13 Venus is 0.6 degrees north of M44 at 15:00
6/14 The earliest sunrise of the year at latitude 40 degrees north occurs today; the Moon is 1.5 degrees north of Jupiter at 7:00; a double Galilean shadow transit begins at 21:06
6/15 The Moon is 2 degrees north of Uranus at 10:00
6/16 The Moon 0.1 degrees south of the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 1:00; the Moon is 4 degrees north of Mercury at 21:00
6/17 The earliest onset of morning twilight at latitude 40 degrees north occurs today; Mercury is 4 degrees north of the first-magnitude star Aldebaran (Alpha Tauri) at 14:00
6/18 New Moon (lunation 1243) occurs at 4:37; a double Galilean shadow transit begins at 10:25; Saturn is stationary, with retrograde motion to begin, at 15:00
6/20 Asteroid 3 Juno is in conjunction with the Sun at 8:00
6/21 The northern hemisphere summer solstice occurs at 14:58
6/22 The Moon is 4 degrees north of Venus at 1:00; the Moon, Venus, and Mars lie within a circle with a diameter of 5 degrees at 8:00; the Moon is 4 degrees north of Mars at 10:00; the Moon is at apogee, subtending 29.5' from a distance of 405,385 kilometers (251,895 miles), at 23:06
6/23 Mercury is at the ascending node today
6/24 The latest end of evening twilight at latitude 40 degrees north occurs today
6/25 The Lunar X (the Purbach or Werner Cross), an X-shaped clair-obscur illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to be visible at 18:51
6/26 First Quarter Moon occurs at 7:50
6/27 The latest sunset of the year at latitude 40 degrees north occurs today; Mercury is at perihelion (0.31 astronomical units from the Sun) at 19:17

The British astronomer Edmund Halley discovered M13 on June 1, 1714. The French astronomer Nicolas Louis de Lacaille discovered the globular cluster M55 on June 16, 1752. A transit of the Sun by Venus was observed by Austrian, British, and French astronomers from various parts of the world on June 6, 1761. The French astronomer Charles Messier discovered the globular cluster M14 on June 1st, 1764, the emission and reflection nebula M20 (the Trifid Nebula) on June 5, 1764, and the open cluster M23 on June 20, 1764. The globular cluster M62 was discovered by Charles Messier on June 7, 1771. The French astronomer Pierre Méchain discovered his first deep-sky object, the spiral galaxy M63 (the Sunflower Galaxy), on June 14, 1779. The German/English astronomer William Herschel discovered the globular cluster NGC 6528 on June 24, 1784. Neptune was independently discovered by the British astronomer John Couch Adams on June 5, 1846. The Italian astronomer Giovanni Battista Donati discovered Comet C/1858 L1 (Donati), the first comet to be photographed, on June 2, 1858. A large storm on Saturn was observed by the American astronomer E. E. Barnard. The Tunguska event occurred on June 30, 1908. The largest known solar flare was recorded on June 27, 1984. The Georgian astronomer Givi Kimeridze discovered a Type Ia supernova in the spiral galaxy M58 on June 28, 1989. Namaka, a satellite of the dwarf planet Haumea, was discovered on June 30, 2005. Kerberos, Pluto's fourth satellite, was discovered by the Hubble Space Telescope team on June 28, 2011.

Information on passes of the ISS, the USAF's X-37B, the HST, the BlueWalker 3, Starlink, and other satellites can be found at http://www.heavens-above.com/

The Moon is 11.5 days old, is illuminated 88.6%, subtends 31.2 arc minutes, and is located in Virgo on June 1st at 0:00 UT. The Moon is at its greatest northern declination of +27.8 degrees on June 19th and at its greatest southern declination of -27.8 degrees on June 6th. Longitudinal libration is at a maximum of +5.4 degrees on June 14th and a minimum of -6.2 degrees on June 1st and -7.1 degrees on June 29th. Latitudinal libration is at a maximum of +6.6

degrees on June 8th and a minimum of -6.7 degrees on June 21st. The Moon is at perigee on June 6th and June 29th and at apogee on June 22nd. New Moon occurs on June 18th. The Moon passes close to the bright open cluster M35 in Gemini at 11:00 on June 1st, the first-magnitude star Castor (Alpha Geminorum) at 1:00 on June 3rd, the first-magnitude star Pollux (Beta Geminorum) at 6:00 on June 3rd, the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 11:00 on June 4th, the first-magnitude star Regulus (Alpha Leonis) at 8:00 on June 6th, the first-magnitude star Spica (Alpha Virginis) at 12:00 on June 10th, the first-magnitude star Antares (Alpha Scorpii) at 16:00 on June 13th, the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 1:00 on June 26th, and the first-magnitude star Aldebaran (Alpha Tauri) at 19:00 on June 26th. In 2023, 19 lunar occultations are expected to take place, 54 in 2024, 41 in 2025, 46 in 2026, and 22 in 2027. The Moon will occult the second-magnitude star Delta Scorpii from Antarctica, Australia, New Zealand and southern Chile on June 3rd. Browse http://www.lunar-occ.../iotandx.htmfor information on this and other lunar occultation events. Visit https://saberdoesthe...does-the-stars/ for tips on spotting extreme crescent Moons and https://curtrenz.com/moon.html for Full Moon and other lunar data. Go to https://skyandtelesc...ads/MoonMap.pdf and https://celestron-si...RReeves-web.pdf and https://nightsky.jpl...ObserveMoon.pdf for simple lunar maps. Click on https://astrostrona.pl/moon-map/ for an excellent online lunar map. Visit http://www.ap-i.net/avl/en/start to download the free Virtual Moon Atlas. Consult http://time.unitariu...moon/where.html for current information on the Moon and https://www.fourmila.../lunarform.html for information on various lunar features. See https://svs.gsfc.nasa.gov/4955 a lunar phase and libration calculator and https://quickmap.lro...2vIBvAXwF1SizSg for the Lunar Reconnaissance Orbiter Camera (LROC) Quickmap. Click on https://www.calendar...endar/2023/june for a lunar phase calendar for this month. Times and dates for the lunar crater light rays predicted to occur this month are available at http://www.lunar-occ...o/rays/rays.htm

The Sun is located in Taurus on June 1st. It enters Gemini on June 21st. The Sun reaches its farthest position north for the year on June 21st. It will subtend 31' 28" on that date. There are 15 hours and one minute of daylight at latitude 40 degrees north on that day. At latitude 40 degrees north, the earliest sunrise occurs on June 14th and the latest sunset on June 27th. For an explanation of why this occurs, click on https://www.universa...ise-and-sunset/

Brightness, apparent size, illumination, distance from the Earth in astronomical units, and location data for the major planets and Pluto on May 15th: Mercury on June 1st (magnitude +0.4, 7.8", 44% illuminated, 0.87 a.u., Aries), Venus (magnitude -4.5, 26.7", 43% illuminated, 0.62 a.u., Gemini), Mars (magnitude +1.7, 4.5", 94% illuminated, 2.10 a.u., Cancer), Jupiter (magnitude -2.1, 35.3", 99% illuminated, 5.59 a.u., Aries), Saturn (magnitude +0.7, 17.6", 100% illuminated, 9.46 a.u., Aquarius), Uranus (magnitude +5.9, 3.4", 100% illuminated, 20.49 a.u., Aries), Neptune (magnitude +7.8, 2.3", 100% illuminated, 29.97 a.u., Pisces), and Pluto (magnitude +14.4, 0.1", 100% illuminated, 33.97 a.u., Capricornus).

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

Mercury, Jupiter, and Uranus are all located in Aries as the month begins. For more on the planets and how to locate them, browse http://www.nakedeyeplanets.com/

Summaries on the planets for June can be found at https://www.astronom...onth-june-2023/ and https://earthsky.org... eid=9e4b41969c The graphic at https://www.timeandd...lanets/distance displays the apparent and comparative sizes of the planets, along with their magnitudes and distances, for a given date and time.

The rise and set times and locations of the planets can be determined by clicking on https://www.timeandd...stronomy/night/

The dwarf planet/asteroid 1 Ceres shines at eighth magnitude as it heads southeastward through Virgo during June. This denizen of the main asteroid belt passes just northwest of the elliptical galaxy NGC 4365 on June 30th. Asteroid 11 Parthenope (magnitude +9.5) reaches opposition in Ophiuchus on June 6th. Click on http://www.asteroido.../2023_06_si.htm for information on asteroid occultations taking place this month. See https://www.curtrenz.../asteroids.html for additional information on a number of asteroids.

The faint periodic comet 237P/Linear travels northwestward through Aquila this month. This Jupiter-family comet has an orbital period of 6.6 years. Visit http://cometchasing.skyhound.com/ and http://www.aerith.ne...t/future-n.html and https://cobs.si/ for additional information on this and other comets visible this month. A list of the closest approaches of comets to the Earth is posted at http://www.cometogra.../nearcomet.html

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

Information on the celestial events transpiring each week can be found at https://stardate.org/nightsky and http://astronomy.com/skythisweek and http://www.skyandtel...ky-at-a-glance/

Free star maps for June can be downloaded at http://www.skymaps.com/downloads.html and https://www.telescop...thly-Star-Chart and http://www.kenpress.com/index.html

Data on current supernovae can be found at http://www.rochester...y.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 http://www.cambridge..._april-june.htm

Telrad finder charts for the Messier Catalog are posted at http://www.custerobs...cs/messier2.pdf and http://www.star-shin...ssierTelrad.htm

Telrad finder charts for the SAC's 110 Best of the NGC are available at https://www.saguaroa...k110BestNGC.pdf

Information pertaining to observing some of the more prominent Messier galaxies can be found at http://www.cloudynig...ur-astronomers/

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://telescopius.com/ and http://tonightssky.com/MainPage.php

Freeware sky atlases can be downloaded at http://www.deepskywa...-atlas-full.pdf and https://www.cloudyni...ar-charts-r1021 and https://allans-stuff.com/triatlas/

Forty binary and multiple stars for June: Struve 1812, Kappa Bootis, Otto Struve 279, Iota Bootis, Struve 1825, Struve 1835, Pi Bootis, Epsilon Bootis, Struve 1889, 39 Bootis, Xi Bootis, Struve 1910, Delta Bootis, Mu Bootis (Bootes); Struve 1803 (Canes Venatici); Struve 1932, Struve 1964, Zeta Coronae Borealis, Struve 1973, Otto Struve 302 (Corona Borealis); Struve 1927, Struve 1984, Struve 2054, Eta Draconis, 17-16 Draconis, 17 Draconis (Draco); 54 Hydrae (Hydra); Struve 1919, 5 Serpentis, 6 Serpentis, Struve 1950, Delta Serpentis, Otto Struve 300, Beta Serpentis, Struve 1985 (Serpens Caput); Struve 1831 (Ursa Major); Pi-1 Ursae Minoris (Ursa Minor); Struve 1802, Struve 1833, Phi Virginis (Virgo)

Notable carbon star for June: V Coronae Borealis

Fifty deep-sky objects for June: NGC 5466, NGC 5676, NGC 5689 (Bootes); M102 (NGC 5866), NGC 5678, NGC 5879, NGC 5905, NGC 5907, NGC 5908, NGC 5949, NGC 5963, NGC 5965, NGC 5982, NGC 5985, NGC 6015 (Draco); NGC 5694 (Hydra); NGC 5728, NGC 5791, NGC 5796, NGC 5812, NGC 5861, NGC 5878, NGC 5897 (Libra); M5, NGC 5921, NGC 5957, NGC 5962, NGC 5970, NGC 5984 (Serpens Caput); M101, NGC 5473, NGC 5474, NGC 5485, NGC 5585, NGC 5631 (Ursa Major); NGC 5566, NGC 5634, NGC 5701, NGC 5713, NGC 5746, NGC 5750, NGC 5775, NGC 5806, NGC 5813, NGC 5831, NGC 5838, NGC 5846, NGC 5850, NGC 5854, NGC 5864 (Virgo)

Top ten deep-sky objects for June: M5, M101, M102, NGC 5566, NGC 5585, NGC 5689, NGC 5746, NGC 5813, NGC 5838, NGC 5907

Top five deep-sky binocular objects for June: M5, M101, M102, NGC 5466, NGC 5907

Challenge deep-sky object for June: Abell 2065. The objects listed above are located between 14:00 and 16:00 hours of right ascension.

June Skies by Dick Cookman

Highlights: Comet Journal, Martian Landers, Meteor Showers, Planet Plotting, June Moon

Focus Constellations: Ursa Major, Ursa Minor, Draco, Cepheus, Cassiopeia, Camelopardalis, Lynx, Leo Minor, Leo, Virgo, Coma Berenices, Bootes, Ophiucus, Hercules, Lyra, Cygnus

Comet Journals
Tenth magnitude Comet C/2023 E1 (ATLAS) has joined 9th magnitude Comet C/2021 T4 Lemmon in June skies. The latter may approach naked eye visibility in July. The former is an inner Kuiper Belt object and is currently in Draco. It will circuit through northern hemisphere skies this summer when it may brighten to 9th magnitude. It will pass perihelion on July 1 and be closest to Earth on August 18. Comet Lemmon is an Oort Belt comet. It is in Cetus in southern hemisphere skies and will move into Sculptor by months end. It will be closest to Earth on July 20 and then pass perihelion on the 31st. It will enter northern hemisphere skies at the end of the year as it retreats into the distant yonder.

Mars Landers
Ingenuity – the little rotorcraft that could! On April 2, after 49 flights scouting ahead for the Perseverance Rover, the Ingenuity team failed in their attempt to uplink instructions for the next flight. On the 40th flight, the rotorcraft began struggling with wintertime communication brownouts as it occasionally slipped into low-power mode. The April 2 (Sol 755) blackout ended on Sol 762 when quiet pings received by the rover from the spunky space helicopter confirmed that it had not died. Perseverance and Ingenuity were investigating the Jezero Delta and became separated by a ridge which interrupted communication. During the blackout, the rover moved toward the last known location of the helicopter and finally received the pings when approaching within 262 feet of its location, allowing the team to uplink flight 50 instructions.

Meteor Showers
Lyrid/Bootid meteor showers are possible June respites from May's meteor deficient skies.

June 16: Lyrids, Active (?) June 11-June 21. Radiant 18h32m 35°. ZHR variable. 31 km/sec. 2 days before New Moon. Progenitor:? June 27: Bootids, Active June 22-July 2. Radiant 14h56m 48°. ZHR up to 100. 18 km/sec. 1 day after 1st quarter Moon. Progenitor: Comet 7P/Pons-Winnecke

Planet Plotting's
Kepler died in 1630 and Galileo died right after Isaac Newton was born in 1642. In a letter to Robert Hooke in 1675 Newton wrote "If I have seen further, it is by standing on the shoulders of giants." Galileo and Kepler certainly are among the giants. After an extremely troubled childhood, in college, Newton graduated from Plato and Aristotle to Descartes, Robert Boyle, Galileo, and Kepler and incorporated their discoveries into a cohesive format that we call classical physics over the next few decades. To make the necessary accurate predictions concerning motion and gravitation, he had to invent a new branch of mathematics. Recent work by Einstein and others with even more advanced mathematics reveals Newtonian predictions fail only under the most extreme motion and gravitation conditions. Newton also was one of the earliest developers of rigorous optical science. He discovered white light composition and integrated color into the science of light, laying the foundation for modern physical optics.

Mercury (0.4 to -2.1) in Aries and Gemini, Uranus (5.8) in Aries, Jupiter (-1.9 to -2.1) in Aries, Neptune (7.9) in Pisces, and Saturn (1.0 to 0.8) in Aquarius are morning planets in June. Mercury passes 3.0° from Uranus on the 4th and is best viewed in the 1st half of June after which it drops into the glow of sunrise. The planets are arrayed in the above order along a line extending from Mercury near the ENE horizon to Saturn, high above the SSE horizon.

June is an awesome month to view brilliant Venus (-4.2 to -4.3) in Gemini and Leo. Red Mars (1.6 to 1.7) is much, much dimmer in Cancer and Leo. Both are evening planets. Venus is at greatest eastern elongation (45°) from the Sun on the 4th.

Planet	Constellation(s)	Magnitude	Planet Passages	Time	Date
Sun	Aries	-26.5	New Moon	12:37AM EDT	6/18
Mercury	Aries-Gemini	0.4 to -2.1	Uranus 3.0°N	1:00AM EDT	6/04
Venus	Gemini-Leo	-4.2 to -4.3	Max. East Elongation	7:00AM EDT	6/04
Mars	Cancer-Leo	1.6 to 1.7			
Jupiter	Aries	-1.9 to -2.1			
Saturn	Aquarius	1.0 to 0.8			
Uranus	Aries	5.8	Mercury 3.0°S	1:00AM EDT	6/04
Neptune	Pisces	7.9			

June Moon

The New Moon of June is in Taurus on the 18th at 12:37AM EDT, 3 days before the Summer Solstice at 10:58AM on the 21st. The New Moon marks the start of Lunation 1243 which ends 29.58 days later with the New Moon of July in Taurus on the 17th at 2:32PM EDT. The Full Moon is in Scorpius on the 3rd at 11:42PM EDT. The June Moon is called the “Flower, Rose, or Strawberry Moon” . It was called the “Dyan Moon” in Medieval England and for Celts it was the “Moon of Horses”. In China, it is the “Lotus Moon” and Colonial Americans called it “Rose Moon”. Anishnaabe (Odawa and Ojibwe) first people recognize the 6th Moon of the year as “Ode’imini-giizis” (Strawberry Moon) in the western dialect and “Baashkaabigonii-giizis” (Blooming Moon) in the eastern dialect.

Earth Haven Farm in Ontario documents the cultural teaching which explains the cycle of life and nature of the June Grandmother Moon of Creation as follows: “The medicine of the strawberry is reconciliation. It was during this moon cycle that communities usually held their annual feasts, welcoming everyone home, regardless of their differences over the past year, letting go of judgment and/or self-righteousness.”

Lunar Perigee distance (minimum lunar distance) is 226,714 mi. (57.91 Earth radiil) on the 6th at 7:06PM EDT. Lunar Apogee (maximum distance) is on June 22 at 2:30PM EDT at 251,895 mi. (63.42 Earth radii).

A waning gibbous Moon appears to pass Saturn on the 9th. The waning crescent passes Neptune on the 11th, Jupiter on the 14th, Uranus on the 15th, and Mercury on the 16th. The waxing crescent passes Venus on the 21st, and Mars on the 22nd.

Planet	Constellation	Magnitude	Moon Passages	Moon Phase	Moon Age
Sun	Taurus	-26.8	12:37AM EDT, 6/18	New	0 Days
Mercury	Taurus	-1.0	4.0°N, 5:00PM EDT, 6/16	Waning Crescent	28.21 Days
Venus	Cancer	-4.3	4.0°N, 9:00PM EDT, 6/21	Waxing Crescent	3.85 Days
Mars	Leo	1.7	4.0°N, 6:00AM EDT, 6/22	Waxing Crescent	4.22 Days
Jupiter	Aries	-2.0	1.5°N, 3:00AM EDT, 6/14	Waning Crescent	25.63 Days
Saturn	Aquarius	0.9	3.0°S, 4:00PM EDT, 6/9	Waning Gibbous	21.17Days
Uranus	Aries	5.8	2.0°N, 6:00AM EDT, 6/15	Waning Crescent	26.75 Days
Neptune	Pisces	7.9	2.0° S, 4:00AM EDT, 6/11	Waning Crescent	22.67 Days

NASA Night Sky Notes

This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Look Up in the Sky - It's a Bird

Theresa Summer

Bird constellations abound in the night sky, including **Cygnus**, the majestic swan. Easy to find with its dazzling stars, it is one of the few constellations that look like its namesake and it is full of treasures. Visible in the Northern Hemisphere all summer long, there's so much to see and even some things that can't be seen. To locate Cygnus, start with the brightest star, **Deneb**, also the northeastern most and dimmest star of the Summer Triangle. The Summer Triangle is made up of three bright stars from three different constellations – read more about it in the September 2022 issue of Night Sky Notes. "Deneb" is an Arabic word meaning the tail. Then travel into the triangle until you see the star **Albireo**, sometimes called the "beak star" in the center of the summer triangle. Stretching out perpendicular from this line are two stars that mark the crossbar, or the wings, and there are also faint stars that extend the swan's wings.

From light-polluted skies, you may only see the brightest stars, sometimes called the Northern Cross. In a darker sky, the line of stars marking the neck of the swan travels along the band of the **Milky Way**. A pair of binoculars will resolve many stars along that path, including a sparkling open cluster of stars designated **Messier 29**, found just south of the swan's torso star. This grouping of young stars may appear to have a reddish hue due to nearby excited gas.

Let's go deeper. While the bright beak star Albireo is easy to pick out, a telescope will let its true beauty shine! Like a jewel box in the sky, magnification shows a beautiful visual double star, with a vivid gold star and a brilliant blue star in the same field of view. There's another marvel to be seen with a telescope or strong binoculars – the Cygnus Loop. Sometimes known as the **Veil Nebula**, you can find this supernova remnant (the gassy leftovers blown off of a large dying star) directly above the final two stars of the swan's eastern wing. It will look like a faint ring of illuminated gas about three degrees across (six times the diameter of the Moon).

Speaking of long-dead stars, astronomers have detected a high-energy X-ray source in Cygnus that we can't see with our eyes or backyard telescopes, but that is detectable by NASA's Chandra X-ray Observatory. Discovered in 1971 during a rocket flight, Cygnus x-1 is the first X-ray source to be widely accepted as a black hole. This black hole is the final stage of a giant star's life, with a mass of about 20 Suns. Cygnus x-1 is spinning at a phenomenal rate – more than 800 times a second – while devouring a nearby star. Astronomically speaking, this black hole is in our neighborhood, 6,070 light years away. But it poses no threat to us, just offers a new way to study the universe.

Check out the beautiful bird in your sky this evening, and you will be delighted to add Cygnus to your go-to summer viewing list. Find out NASA's latest methods for studying black holes at www.nasa.gov/black-holes.

Look up after sunset during summer months to find Cygnus! Along the swan's neck find the band of our Milky Way Galaxy. Use a telescope to resolve the colorful stars of Albireo or search out the open cluster of stars in Messier 29. Image created with assistance from Stellarium: stellarium.org

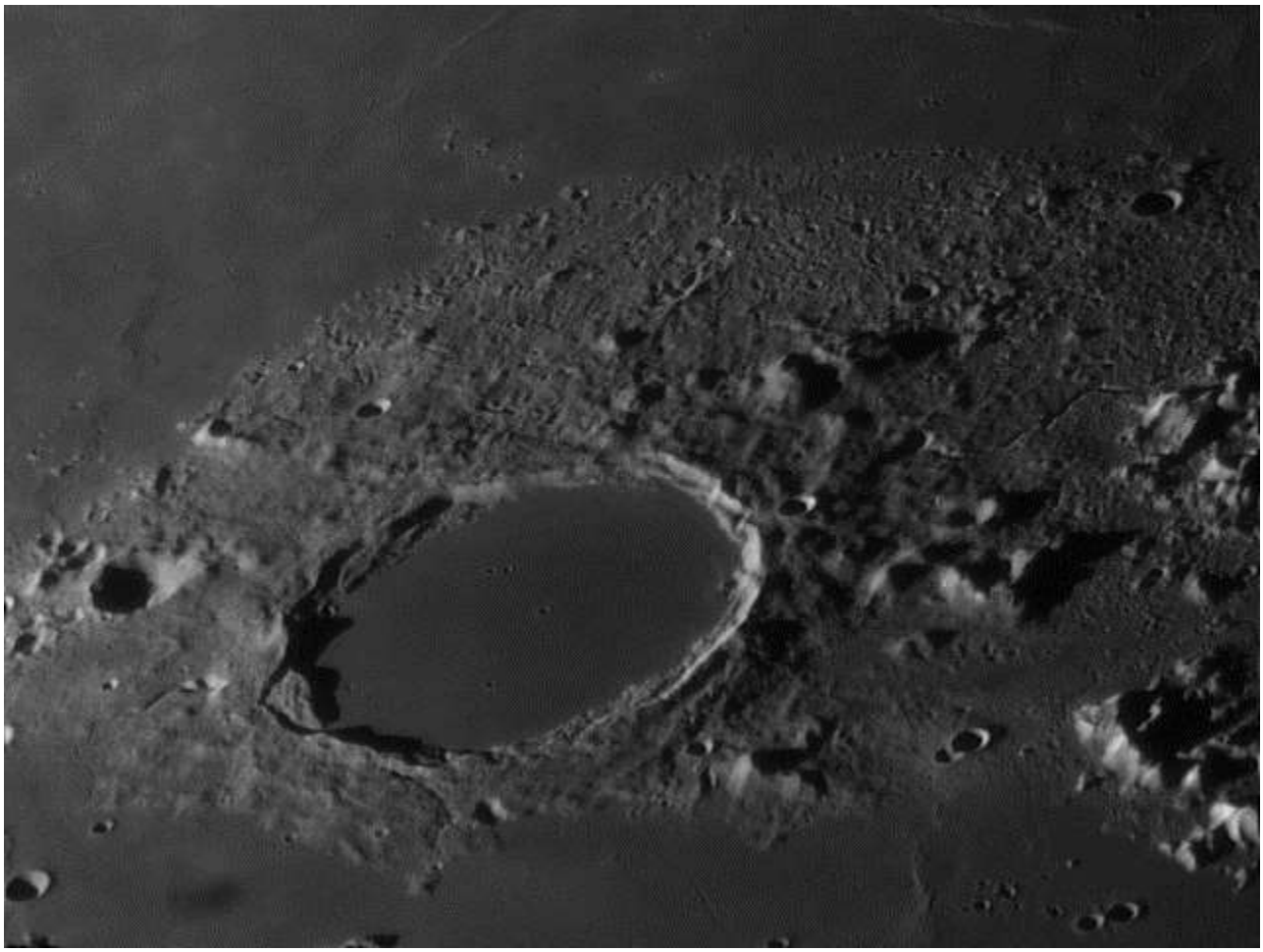
While the black hole Cygnus x-1 is invisible with even the most powerful Optical telescope, in X-ray, it shines brightly. On the left is the optical view of that region with the location of Cygnus x-1 shown in the red box as taken by the Digitized Sky Survey. On the right is an artist's conception of the black hole pulling material from its massive blue companion star. (Credit: NASA/CXC chandra.harvard.edu/photo/2011/cygx1/)

Phil Harrington's Cosmic Challenge

This month's suggested aperture range:	
	6 to 9.25 inch (15-24cm) telescopes. This month's featured telescope Meade ETX-LS 6"

Target	**Type**	**Best lunar phases (days after New Moon)**
Moon: Plato's craterlets	Walled plain and interior craterlets	Day 8.5 (June 27-28, July 26-27, August 25-26, 2023) Day 21 (June 10, July 10, August 8, 2023)

One of the great challenges facing even the most devoted lunar observers is trying to see the many small craters that dot the lava-covered floor of the walled plain **Plato**. Plato itself is a prominent impact scar measuring 62 miles across. It takes no more than 10x binoculars to see Plato once the Sun is up in its sky. In general, the best times to view Plato and its environs are about 1.5 days past First Quarter and again near Last Quarter.

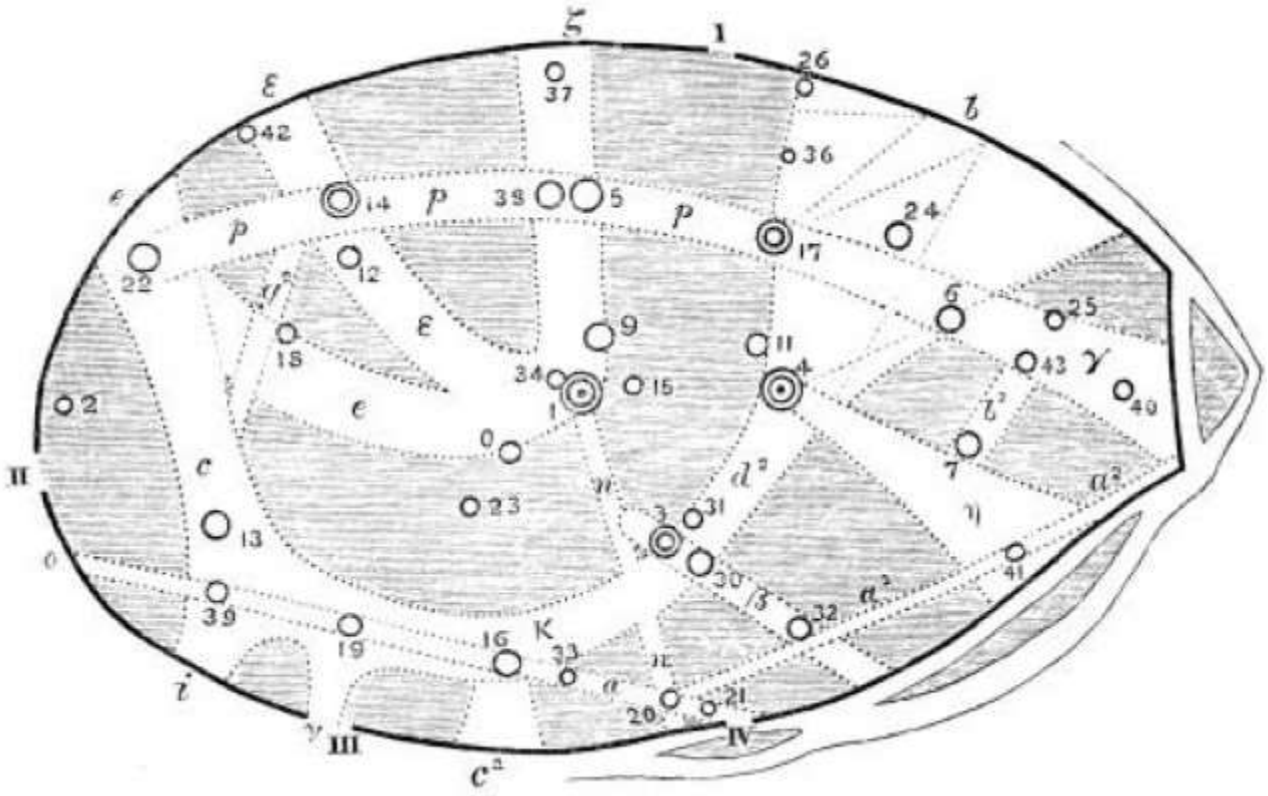


Above: Plato and some of its craterlets. Credit: CN member clavutich.

Unlike typical impact craters, Plato shows no sign of a central peak or a chaotic floor. Instead, it appears perfectly smooth and, at first blush, featureless. That's because shortly after the blast had excavated the bowl of Plato, lava welled up to flood its interior, hiding any central remnants of the original impact. As a result, we see an unusually dark floor that stands in stark contrast against the more lightly shaded Mare Imbrium to its south and Mare Frigorus to its north.

While viewing Plato through his telescope in 1824, German astronomer Franz von Paula Gruithuisen noticed something peculiar. He spotted a tiny speck on the floor of Plato, the first observation of a Plato craterlet. While Gruithuisen's place in history was tarnished by a second discovery he made, that of an expansive "lunar city" called Wallwerk north of the crater Schröter, his sighting of the first Plato craterlet prompted others to take a closer look.

Over the next several decades, interest in Plato increased dramatically, as did the number of craterlets. In a report published in the March 1883 issue of The Observatory (Vol. 6, p. 85-91), British observer A. Stanley Williams described how, over the years 1879 to 1883, he and several other observers had observed and accounted for more than 40 "spots" on Plato's floor, along with several crisscrossing "streaks."



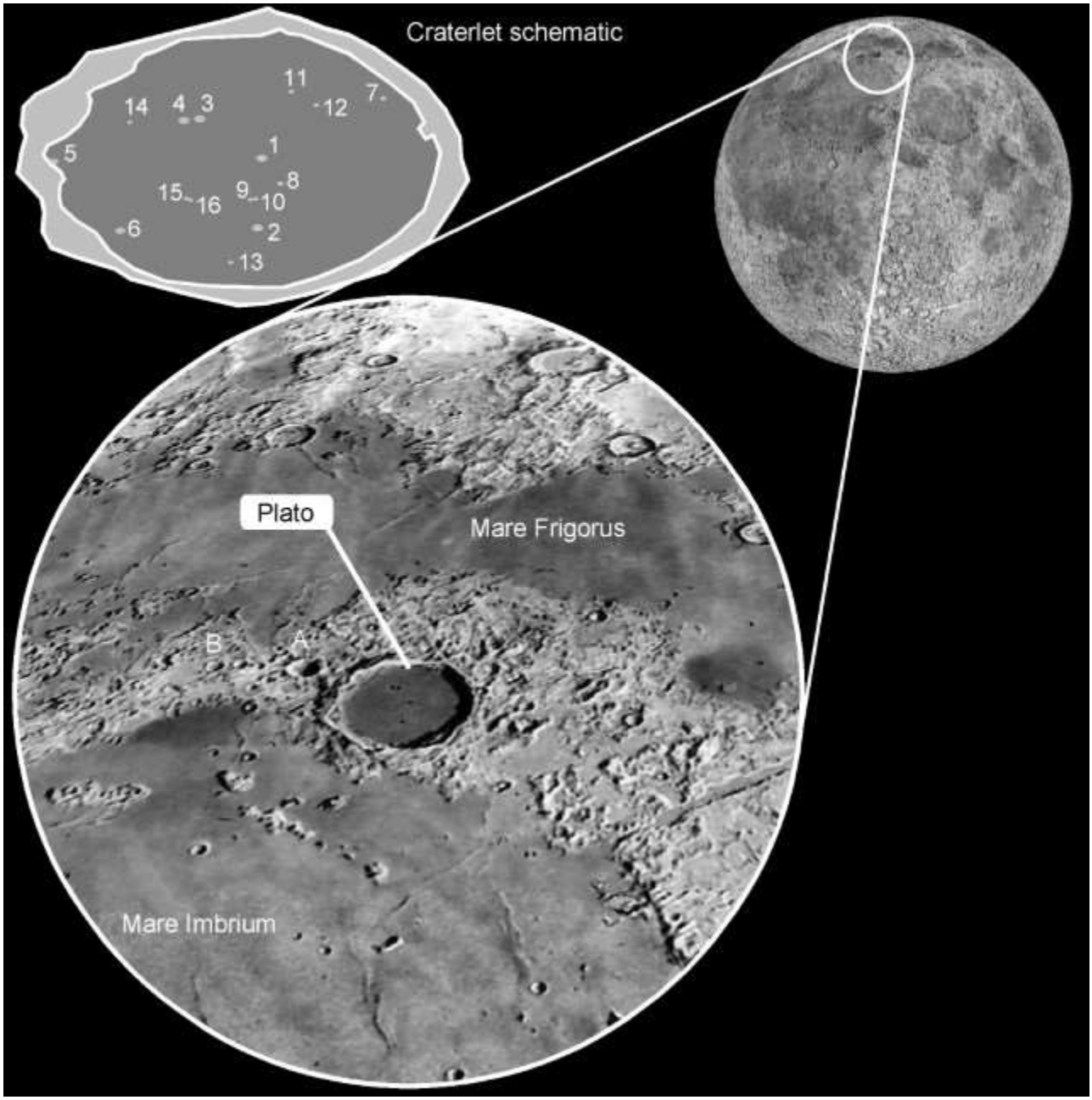
Above: Plato, as sketched by British observer A. Stanley Williams

In a sense, Williams was to Plato what Percival Lowell was to Mars. Lowell believed that Mars was inhabited by intelligent beings who constructed an elaborate array of crisscrossing canals that spanned the globe of the Red Planet. Although Williams didn't see canals within Plato, he did believe that the surface of that distant crater was home to a variety of so-called transient lunar phenomena. He would periodically see streaks come and go across the floor, or perhaps a new crater suddenly pops forth where none had existed before. While today we understand that what he perceived as changes across the floor of Plato was most likely caused by changes in our own turbulent atmosphere, alternately masking and revealing fine detail just at the edge of visibility, Williams was steadfast in his belief that these phenomena were related to lunar volcanic activity.

Although we shouldn't expect any stray volcanic emissions spewing across Plato, spotting the tenuous detail that so intrigued Williams is a challenge that many enjoy to this day. Several small craterlets are indeed strewn across Plato's otherwise smooth floor.

First, we need to take care of some bookkeeping. Since none of the Plato craterlets have official IAU designations, we are left to our own devices to create some. Although references sort them by letter, that system may be easily confused

with the IAU's convention of naming so-called satellite features after a major landmark. Plato has more than a dozen satellite features associated with it, labeled Plato A, Plato B, and so on.



Above: Finder chart for this month's Cosmic Challenge.
Credit: Chart adapted from Cosmic Challenge: The Ultimate Observing List for Amateurs by Phil Harrington.
Click on the chart to open a printable PDF version.

Below: Plato's 16 most prominent craterlets

Craterlet designation	Diameter (km)	Diameter (miles)
1	2.4	1.5
2	2.1	1.3
3	2.2	1.4
4	2.0	1.2
5	2.6	1.6
6	1.8	1.1
7	1.4	0.9
8	1.3	0.8
9	1.2	0.7
10	1.0	0.6
11	1.2	0.7
12	1.1	0.7
13	1.1	0.7
14	1.0	0.6
15	1.0	0.6
16	0.9	0.6

Instead, let's go with numbers, as Williams and other classic lunar observers did more than a century ago. Using this system, the most obvious craterlet is denoted on the chart and table above as "**Craterlet 1**." When sunlight strikes it just so, its steep walls appear brightly lit in contrast to the dark surrounding floor of Plato. Telescopes as small as 4 inchers can resolve it as a circular pit.

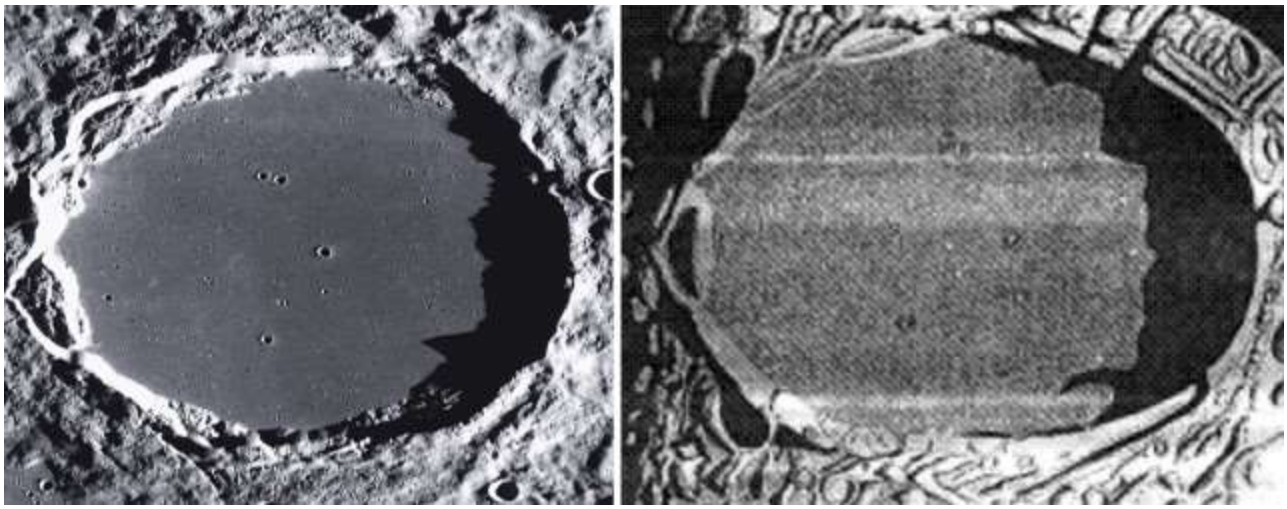
Four other craterlets, plotted here as **2**, **3**, and **4**, are also visible with difficulty through a 6-inch telescope. Craterlets 3 and 4 are especially close-set; can you resolve them both? The best chances to see all four as true depressions occur when the Sun is either rising or setting in their sky, on the nights immediately after the quarter phases. Closer to Full Moon, the stark lighting turns them into bright, almost starlike points against Plato's floor.

Craterlet 5 is from removed from the rest, embedded in Plato's eastern wall. Although it's the largest craterlet, the location against Plato's wall tends to mask it more than those centrally located on the floor. The best chance for spotting it comes during the waxing phases, since it remains hidden by the wall's shadow during the waning phases.

If you have success with the Plato quintet, try your luck with five smaller understudies. **Craterlets 6**, **7**, **8**, **9**, and **10** will likely need at least an 8-inch aperture and 200x to be seen, and even then, only with great difficulty. Yearning for even more? Try your luck with all 16 listed in the table. How many can you find?

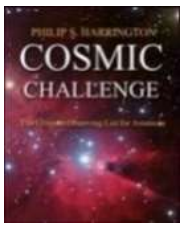
And if all this is not enough, here's an extra challenge. The rim surrounding the "Greater Black Lake," as Hevelius called it, is very rugged, which creates some fascinating shadow effects as the Sun rises and sets in its sky every month. One such effect has captured the imagination of observers since it was reported 71 years ago. It's called **Plato's Hook**.

On April 3, 1952, when the Moon's phase was 8 days past New, renowned lunar observers, Patrick Moore and Percy Wilkins, spotted and sketched an unusual "hook-shaped" shadow on Plato's floor. Since then, others have tried to replicate their observations to little or no avail. Where Moore and Wilkins saw a shadow shaped like the dorsal fin of a shark, others record a conical shadow with no evidence of any curvature.



Above: (Left) Lunar Reconnaissance Orbiter image of Plato showing may craters as well as the complex shadow caused by its craggy rim. (Right) Wilkins's rendering of "the hook." Montage posted by John Moore.

Cloudy Nighter John Moore started a fascinating thread in the Lunar Observing and Imaging three years ago entitled Hooked on Plato - an animated view that offers some great perspective of this elusive shadow feature. If you're interested in pursuing a fun mystery, be sure to visit that thread and watch John's linked YouTube video on "the Hook."



About the Author: Phil Harrington writes the monthly *Binocular Universe* column in Astronomy magazine and is the author of 9 books on astronomy, including Cosmic Challenge: The Ultimate Observing List for Amateurs.

MAgic Valley Astronomical Society
550 Sparks St.
Twin Falls, ID

The Magic Valley Astronomical Society (MVAS) was founded in 1976. The Society is a non-profit [501(c) 3] educational and scientific organization dedicated to bringing together people with an interest in astronomy.

In partnership with the Centennial Observatory, Herrett Center, College of Southern Idaho - Twin Falls; we hold regularly scheduled monthly meetings and observation sessions, at which we share information on current astronomical events, tools and techniques for observation, astrophotography, astronomical computer software, and other topics concerning general astronomy. Members enthusiastically share their telescopes and knowledge of the night sky with all who are interested. In addition to our monthly public star parties we hold members only star parties at various locations throughout the Magic Valley.

MVAS promotes the education of astronomy and the exploration of the night sky along with safe solar observing through our public outreach programs. We provide two types of outreach; public star parties and events open to anyone interested in astronomy, and outreach programs for individual groups and organizations (e.g. schools, churches, scout troops, company events, etc.), setting up at your location. All of our outreach programs are provided by MVAS volunteers at no cost. However, MVAS will gladly accept donations. Donations enable us to continue and improve our public outreach programs.

Membership is not just about personal benefits. Your membership dues support the work that the Magic Valley Astronomical Society does in the community to promote the enjoyment and science of astronomy.
Speakers, public star parties, classes and support for astronomy in schoolrooms, and outreach programs just to name a few of the programs that your membership dues support.

Annual Membership dues will be:
$20.00 for individuals, families, and $10.00 for students.
Contact Treasurer Jim Tubbs for dues information via e-mail: jtubbs015@msn.com

Donations to our club are always welcome and are even tax deductible. Please contact a board member for details.
Lending Telescopes: The society currently has three telescopes for loan and would gladly accept others please contact President Robert Mayer, for more information on these and other benefits.

Telescopes are an individual thing and not practical for public use. However, everyone should have the experience of a good look at the moon for at least 5 minutes in their life time. It is a dimension and feeling that is unexplainable. Pictures or TV can't give this feeling, awareness, or experience of true dimension. A person will not forget seeing our closest neighbor, the moon.

Norman Herrett in a letter to Dr. J. L. Taylor, president of the College