



CLUB NEWS AND EVENTS

MONTHLY MEETINGS

Board Meeting – June 2 @ 7:00 p.m.

Members Meeting – June 2 @ 8:00 p.m.

Held at Schoonover Observatory

PROGRAM: Professor Emeritus, Earl Lhamon, will be speaking at the Schoonover Observatory about Radio Astronomy. The title of his talk is "The Invisible Universe. He will describe his experiences at The National Radio Astronomy Observatory at Green Bank, W.V. and the Very Large Array (VLA) at Scorro N.M. Radio telescopes have opened additional windows for viewing the universe.

UNDER THE DOME

2023 Summer Viewing Program Begins!

Through Summer, Schoonover Observatory will be open every Friday night starting at 8:00pm.

Observe through the telescope in the dome, catch a different solar system program weekly, learn to setup and use a telescope, and more!

Keep in mind the sky does not get completely dark until much later this time of year. Experienced observers wishing to see some of the dimmer objects should keep this in mind.

If you're a new observer, brighter objects can be seen at dusk, with Venus currently shining brightly in the evening sky. There are different things to observe each month as we make our way around the Sun, so make sure to check in throughout the Summer.

April Program Recap

Club member, Michael Ritchie, provided detailed synopsis of his visit to NEAF this year. NEAF is the largest astronomy trade show in the world.

ASTRONOMY NEWS

SCIENTISTS CONFIRM: METEORITE CRASHED INTO NEW JERSEY HOME - SkyandTelescope.org

A rock that crashed through the roof of a house in New Jersey proved to be the real thing — a chunk spalled from a 4.5 billion-year-old asteroid. The meteorite struck the floor with such force that it rebounded and punched a second hole in the ceiling before landing back on the floor. Nobody was injured.

ANCIENT OCEAN ON MARS? CHINESE ROVER FINDS MARINE SEDIMENTS - EarthSky.org

Researchers in China and the U.S. say they have found new clues in marine sedimentary rocks in Utopia Planitia that may prove the existence of that ocean. China's Zhurong rover discovered the sedimentary formations. The researchers announced the tantalizing findings in Science China Press on May 21, 2023. The rover has been studying the rocks in the area with its multispectral camera (MSCam), and the science team says that Zhurong has found marine sedimentary rocks. While most other data supporting the ocean hypothesis has come from orbiting spacecraft, this new data is in situ (on site).

WEIRD COMET IN ASTEROID BELT TARGETED BY WEBB - EarthSky.org

Comets are rare in the asteroid belt between the planets Mars and Jupiter. But some comets do reside there, including Comet Read (238P/Read). On May 15, 2023, NASA said the Webb space telescope has taken a close look at Comet Read. Webb confirmed water vapor, a first for a comet in the asteroid belt. More unexpected was what Webb didn't find. It found no sign of carbon dioxide, a gas expected and observed in most comets.



LOOK UP IN THE SKY - IT'S A BIRD

THERESA SUMMER - NIGHT SKY NETWORK

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.

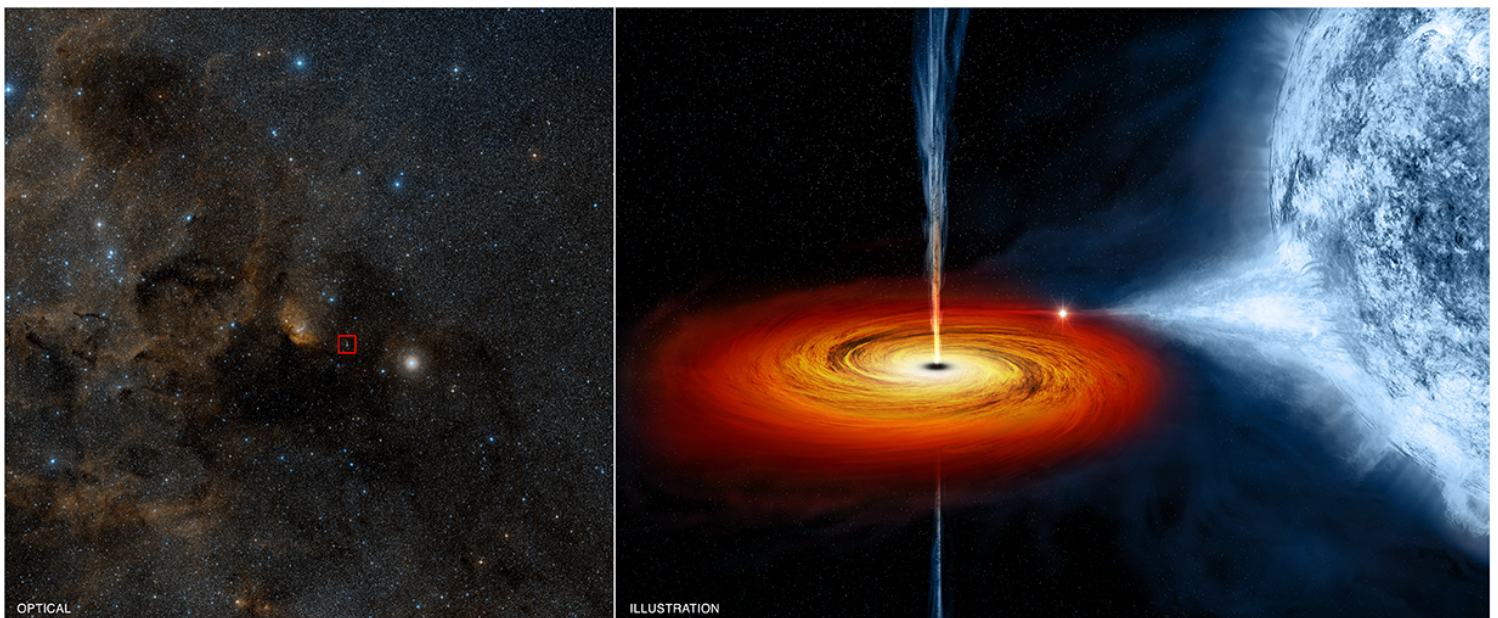
From light-polluted skies, you may only see the brightest stars, sometimes called the Northern Cross.

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.



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/)



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

Eclipse glasses are available **NOW!**

Stop by a Lima Astro meeting or event to get yours!
\$5.00 donation per pair



Eclipse glasses will start going **FAST** now that we are less than a year away from the **April 2024 Total Solar Eclipse!**

Lima Astro's glasses are **ISO certified safe for solar observing.**

Funds received from the sale of eclipse glasses go towards programming, outreach, and future projects such as the proposed Dark Sky Observatory at Kendrick Woods.

FIND AN OBSERVING PROGRAM FOR YOU WITH THE ASTRONOMICAL LEAGUE!

Looking for something to jump-start your stargazing? Maybe need a bit of direction? Or possibly you are tired of looking at the same set of objects every time you observe? If so you should definitely check out one of the [Astronomical League's observing programs!](#)

The League has run their excellent observing programs for [the past 50 years](#). Since 1967, the Astronomical League's observing programs have awarded over 10,000 observing certificates to skilled amateurs in recognition of their stargazing achievements - along with some great pins, too! These programs have helped amateur astronomers shore up their observing legs as well. Many folks might eventually observe all of the Messier objects, for example; but the League's requirements for their Messier program will make that observer carefully take into consideration the factors around their observation, such as the time and observing conditions present that night, as part

of their needed documentation. Some harder to spot objects may even go unnoticed but for the need to complete the observing list - helping to sharpen those eyes and star-hopping skills, with a cool pin and certificate as a reward - although the true reward is the boost in confidence and knowledge gleaned from working towards these observations for the participating observers.

The are programs for observers of all levels and interests. Beginners can start with programs like the Binocular Messier or Constellation Hunter programs. The Caldwell Observing Program, Two in the View, or Asteroid Observing programs are great programs for stargazers who have gotten a few observations under their belt and want to further sharpen their skills! Experts can test their mettle and go deep with programs like the Binocular Variable Star Observing Program, Herschel 400, or Master Observing Program. Even stargazers

who are surrounded by light pollution in urban areas can participate in programs like the Urban Observers Program or Lunar Observing Program - or help fight light pollution and attain the Dark Sky Advocate award. Fans of astronomy outreach, like many members of Night Sky network clubs, can pursue the Outreach Observing Award - and snag another pin to feature alongside their NSN award pins! You don't even need a telescope to participate in an observing program,; there are programs for naked-eye observations and binocular-wielding observers. Participants aren't even necessarily restricted by observing in visible light, as there is even a Radio Astronomy Observing Program.

There are many, many more programs you can find on their program list. Find one today and take up the challenge. Keep it up and one day you too will become a recognized as a master observer!

Members of the Lima Astronomical Society are automatically enrolled in the Astronomical League and are eligible to complete the Observing Programs!

Speak with a club officer for more information.



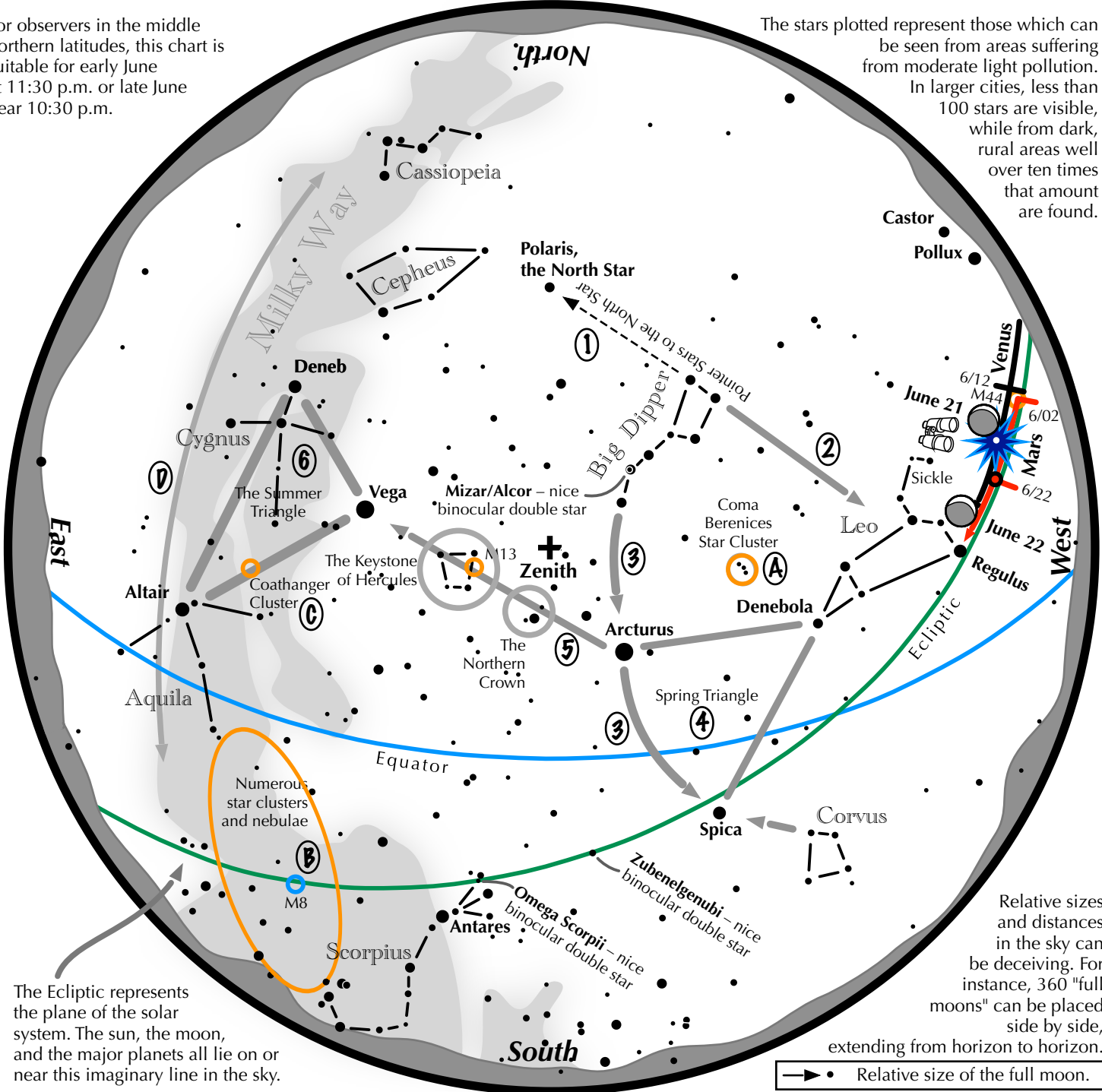
Pins and logos from the Astronomical League's many excellent observing programs- there are even more than seen here!

Image Credit: The Astronomical League.

Navigating the June Night Sky

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Navigating the June night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Draw another line in the opposite direction. It strikes the constellation Leo high in the west.
- 3 Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.
- 4 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 5 To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 6 High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

Binocular Highlights

- A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
- B: Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays.



Observing Lists

Top ten deep-sky objects for June

M 5	NGC 5689
M 101	NGC 5746
M 102	NGC 5813
NGC 5566	NGC 5838
NGC 5585	NGC 5907

Top five binocular objects for June

M 5
M 101
M 102
NGC 5466
NGC 5907

Challenge deep-sky object for June

Abell 2065

A highly concentrated galaxy cluster in the constellation of Corona Borealis containing over 400 member galaxies, the brightest of which are 16th magnitude. The cluster is more than one billion light-years from Earth.

The Planets in June

Mercury: Gradually getting reined in by the Sun after its May 29 elongation, but it brightens substantially in the first half of June while remaining favorably placed for southern observers. Passes 3° S of Uranus on the 4th when both bodies are some 24° from the Sun.

Venus: Continues to dominate the evening sky, entering the constellation of Cancer on the 2nd where it joins Earth's other neighbor, Mars. Achieves maximum eastern elongation on the 4th when it is 45° -half of a season-ahead of the Sun along the ecliptic. As twilight deepens around that date, look for a pleasing unaided-eye arc of Mars, Venus, Pollux, and Castor, with Venus outshining each of the other luminaries by a factor of 100+. Venus continues its pursuit of Mars all month long right into neighboring Leo, but ultimately falls short by under 5°, technically a quasi-conjunction. The Moon passes 4° to the north of both rocky planets on the 21-22, with low-power, wide-field binoculars best suited to the task.

Mars: Continues to crawl eastward across the sky, but now losing about 10° of elongation from the Sun per month. Crosses from Gemini to Leo on the 20th and ever closer toward Regulus as the month draws to a close. Undergoes a quasi-conjunction with Venus for much of June and July as the inner planet draws close but never catches up. The waxing crescent Moon joins the scene on the 21-22.

Jupiter: Becoming ever more prominent in the morning sky, Jupiter's series of double shadow transits continues. The Moon passes close by on the 14th.

Saturn: Gradually brightening as it approaches Earth, Saturn slows to its stationary point on the 18th, then begins its leisurely 4.5-month retrograde motion, which is completely contained within the constellation of Aquarius. Its monthly date with the Moon comes on the 9-10.

Uranus: Emerging in the morning sky, its elongation from the Sun surging from 21° to 47° during the month.

Neptune: In the morning sky in the constellation of Pisces, almost imperceptibly slowing toward its first stationary point.

Astronomy History This Month

- 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 6288 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.

June 2023 Astronomy Events Calendar

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2 LAS Meeting @ 8pm Mars 0.1° S of Beehive (M44)	3 Antares 1.5° S of Moon
4 Mercury at greatest heliocentric lat. S Full Moon Mercury 3° S of Uranus Double shadows on Jupiter Venus greatest elongation E (45°)	5	6 Moon at perigee	7 Double shadows on Jupiter	8	9 Saturn 3° N of Moon	10 Last Quarter Moon
11 Double shadows on Jupiter Neptune 2° N of Moon	12	13 Venus 0.6° N of Beehive (M44)	14 Jupiter 1.5° S of Moon Double shadows on Jupiter	15 Uranus 2° S of Moon	16 Moon 1.8° S of Pleiades (M45) Mercury 4° S of Moon	17
18 New Moon Double shadows on Jupiter Saturn stationary	19	20 Juno in conjunction with the Sun Pollux 1.7° N of Moon	21 Summer Solstice	22 Venus 4° S of Moon Mars 4° S of Moon Moon at apogee	23 Mercury at ascending node	24
25	26 First quarter Moon	27 Mercury at perihelion	28	29	30	

ASTRONOMY CALENDAR TERMINOLOGY

Aphelion – The point in the orbit of a planet, asteroid, or comet at which it is furthest from the Sun.

Apogee – The point in the orbit of the Moon, planet, or satellite at which it is furthest from the Earth.

Ascending Node – The point along a planet's orbit where it crosses the ecliptic (Earth's orbital plane) from S to N.

Conjunction – When the Moon or a planet appears especially close to another planet or bright star.

Descending Node – The point along a planet's orbit where it crosses the ecliptic (Earth's orbital plane) from N to S.

Elongation – The angular distance the Moon or a planet is from the Sun. Mercury and Venus are best seen when at "greatest" elongation, and will appear at their highest position above the horizon before sunrise or sunset.

Heliocentric Latitude – The longitude of a heavenly body, as seen from the Sun's center (the Sun is at the center in the heliocentric model of the solar system). Essentially, if you could stand in the center of the Sun and draw a plane straight out in front of you (this would be 0.0°), heliocentric latitude is the number of degrees above or below that plane where the planet appears.

Inferior Conjunction – When a planet (Mercury or Venus) passes between the Earth and the Sun.

Occultation – When the Moon or a planet passes directly in front of a more distant planet or star. (*Occult, as a verb, means to obscure the view of an object*).

Opposition – When a planet or asteroid is directly *opposite* the Sun in the sky. Just like the Full Moon, a planet will appear brighter and fully lit during this time.

Perigee – the point in the orbit of the Moon, planet, or satellite at which it is nearest to the Earth.

Perihelion – the point in the orbit of a planet, asteroid, or comet at which it is closest to the Sun.

Superior Conjunction – When a planet (Mercury or Venus) passes behind the Sun, out of our view.

Transit – When a smaller object passes in front of a larger object. Such as when Mercury or Venus pass in front of the Sun, silhouetting them against the disc; or when one of Jupiter's Galilean moons pass in front of the planet.

Zodiacal Light – Sunlight that is reflected off celestial dust that is concentrated in the plane of the Solar System. It appears as a faint glow in the sky extending from the horizon in late winter/early spring, and requires the darkest skies to be observed. In the darkest sky conditions, zodiacal light can cast very faint shadows.

Examples

Mars 1.1° S of Moon, occultation

On this night, Mars would appear in the sky very close to the Moon – only 1.1 degrees away from it. At a point during this night the Moon would pass in front of Mars, hiding it from view.

Double shadow transit on Jupiter

On this night, two of Jupiter's Galilean moons will cast shadows on the surface of Jupiter simultaneously, appearing as two dark discs moving across the face of the planet. If you were standing on the surface of Jupiter as one of these shadows passed over, you would witness a solar eclipse.

Mercury greatest elongation E

On this night, Mercury will be at a point in its orbit where it appears highest in the sky. From our point of view, this is the furthest apart Mercury and the Sun will appear from each other. E or W indicate which side of the Sun the planet appears on in its orbital cycle, and can also tell you when to look for Mercury. The planet can be found in the evening sky during the greatest elongation E, and in the morning sky in the greatest elongation W.