L.A.S.
Lima Astronomical Society

STAR GAZER

Night Sky Network
Astronomy clubs bringing the wonders of the universe to the public

Member of the Astronomical League and the NASA Night Sky Network

May 2023

Lima Astronomical Society • PO Box 201 • Lima, OH 45802
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CLUB NEWS AND EVENTS

MONTHLY MEETINGS

Board Meeting – May 5 @ 7:00 p.m.
Members Meeting – May 5 @ 8:00 p.m.
Held at Schoonover Observatory

PROGRAM: Michael Ritchie recently attended the Northeast Astronomy Forum & Space Expo (NEAF) in April, and will present a program about the benefits of attending the expo, and information about this year's event. NEAF is the largest astronomy trade show in the world.

UNDER THE DOME

April meeting snippets:

City of Lima officials reviewed plans for proposed improvements at Schoonover Observatory. Some of the highlights are: New HVAC system, building electrical and lighting upgrades, repairs to the dome and weather seals, and various building repairs and maintenance.

The club is vigorously on the hunt for a new telescope system at Schoonover Observatory. More details about this may be available at the May 5 meeting. Bottom-line is we are *very* excited with the options that are currently being explored.

Michael Ritchie represented the club at the Lima South Science and Technology Magnet School on April 13 for their annual STEAM program.

April Program

Club member, Joanne Konst, provided a detailed and fascinating program about the development of the modern calendar system, and the astronomical events and cycles that played a part in creating it over the centuries.

ASTRONOMY NEWS

TOTAL SOLAR ECLIPSE OCCURRED ON APRIL 20

A hybrid solar eclipse was visible in northern Australia and surrounding regions on April 20th. Due to the further distance of the Moon at the time, the path of totality was only ~30 miles wide. Compare this to the total solar eclipse that will be visible in Ohio on April 8, 2024, where the path of totality will be ~100 miles wide, with totality lasting for several minutes.

VOYAGER 2 MISSION EXTENDED THROUGH 2026

Remember the Voyager 2 space probe launced way back in 1977? It's still out there, well-beyond Pluto's orbit and outside the heliosphere. The original Voyager 2 mission was planned to only last four years; however, 45-years later it is still relaying valuable scientific data to Earth. NASA's Jet Propulsion Laboratory (JPL) had planned to shut down one of the probe's scientific instruments this year due to an anticipated reduction in availble power as the probe travels further away; however, they identified a way to keep that instrument running for another three years. By shutting down the probe's voltage regulation system, they are able to save the availble power for instruments. The system monitors for unusual voltage spikes to protect systems. NASA has stated that the risk vs. reward for this decision is well worth it, as Voyager 2 is already 41 years past it's mission-end date.

SPACE X NO-GO

Space X's held an unmanned launch of its latest vehicle, Starship Super-Heavy, on April 20. The launch was for the first planned orbital test flight of the vehicle. After reaching an altitude of 24 miles, the rocket was intentionally destroyed after encountering a failure to separate from the second stage.

HOW TO CHOOSE A FIRST TELESCOPE

NIGHT SKY NETWORK

A telescope is a great gift for the budding astronomer in your life - or, of course, for yourself! While it may be tempting to go for an ultra cheap impulse buy spotted while shopping at a local store, or to splurge on a super-expensive, deluxe computerized model found online, we urge you to hold off on a major purchase before first doing a bit of research. You might even be able to try out a few potential telescopes with the help of your local astronomy club before making your final decision.

Right off, the best way to start observing the night sky is with your own unaided eyes, the most old-fashioned way to stargaze. The following tips will assume you have been stargazing for a while and want a better peek at the Moon, planets, and stars. A good telescope doesn't work like a video game cheat code that instantly turns you into an expert astronomer, not even with a computerized setup that claims to instantly slew to any one of thousands of targets. You still need to practice your stargazing skills, and a good first telescope or pair of binoculars will help you do just that while expanding your skillset and giving you the confidence to search for more and more celestial sights.

A first telescope should be easy to use and still be of a high enough quality and power to provide years of use-while not being terribly expensive. Those requirements give a surprising winner for many novice stargazers: a good pair of binoculars!

Binoculars, it turns out, are an excellent first instrument for many stargazers due to their ease of use and versatility. Binoculars can be used not just for stargazing but for bird watching and other outdoor activities and can be easily packed away while traveling. Binoculars can easily fit onto carry-on for airline travel, which is an impossible feat for most telescopes. A good pair of binoculars, anywhere from 7x35 to 10x50,will give you great views of the Moon, open star clusters like the Pleiades, the brighter, larger galaxies like Andromeda (from dark skies), large nebula like Orion, and even peeks at Jupiter's moons and some globular clusters once your observing skills improve.

What do those binocular numbers mean? The first number is the magnification, while the second number is the size in millimeters of the lenses. So a 7x35 pair means that these binoculars will magnify 7x, and have lenses 35 mm in diameter. When starting out it is tempting to get the biggest you can find, but try not to get anything much more powerful than a 10x50 pair at first. Larger binoculars with more power often have narrower fields of vision and are heavier. So, while technically more powerful, they are much more difficult to hold steady in your hands and "jiggle" quite a bit-unless you buy binoculars with image stabilization, or mount them to a tripod.

For many objects, binoculars are even the preferred method for viewing them due to their large field of view compared to a telescope. Most telescopes are unable to keep the entirety of the Pleiades or Andromeda Galaxy in their field of view, for instance. Binoculars are also a great investment for more advanced observing, as later on they are useful for spotting objects to observe in more detail with a telescope.

A good pick for a starter telescope retains much of the same requirements as a pair of binoculars: small-ish in size, sturdy, and easy to handle. Many astronomers will recommend avoiding a computerized telescope until you have learned the sky a bit better, as these systems generally require you know the sky fairly well, since their initial setup usually involves their systems pointing to several test stars and asking you to confirm if those are indeed the correct stars, before fine-tuning the focus; these are steps a beginner may find intimidating or confusing.

That's why a small manual telescope often works best for most beginning stargazers- plus you will save quite a bit of money by forgoing

electronics. For many, a small reflector telescope on a tabletop or Dobsonian mount (rather than tripod) works out best due to the bare-bones nature of the setup. With a small Dobsonian telescope, you can pick it up, bring it out to your yard, set it down and immediately start observing (though you might want it

to cool down a little bit first). Most models in the range of 4.5-8 inches (the size of their light-gathering mirrors) will cost anywhere between $200-$500 and include the telescope tube, the mount or base, a finder scope or red dot finder to help in aiming the telescope, and a couple of good starter eyepieces. An example of a Dobsonian mounted telescope is at the top of this article; they are often compared to "cannons" or "light buckets" because of their appearance. A good recommended size for a first reflecting telescope with this type of mount usually ranges between a 4.5 inch to 8 inch mirror. Those sizes usually give good to great views of the heavens while keeping costs, weight, and size down to easy to manage levels.

The classic "refractor" telescope on a tripod is often what most people think of when a telescope is mentioned-like in the image above. These telescopes use lenses rather than mirrors to gather light, and require very little maintenance compared to reflector type telescopes, which may require a bit of adjustment, or collimation, of their mirrors every now and again. Refractors tend to be larger and more expensive than similarly powerful reflectors, however, and are often aimed at the higher end of the market, and so for many folks would not make a good first telescope simply out of cost or size. However, if you find a good deal on a refractor, it can indeed make an excellent starter scope! Just don't buy a cheap one at a local store advertising amazing magnifications of 600x. Those are, to be honest, bad telescopes-truly a deal too good to be true.

We hope this helps you in your search for a first astronomical instrument! There are many other great guides to finding your first scope or pair of binoculars. Some can be found at the EarthSky, Sky & Telescope, StarDate, Cloudy Nights, and many more. A fair warning: it's easy to get a bit overwhelmed by the wealth of information found in all of the astronomy resources found online!

If you are able to do so real-world advice and experience is still the best for something you will be spending a lot of time with! The best place to go for advice is with your local experts in a nearby astronomy club. You can find a club or star party near you on the Night Sky Network's very own Clubs & Events page. Going to an in-person star party hosted by a local club is a great way to get familiar with telescopes and binoculars. Some clubs and local libraries even have telescope lending programs. Just like with a car, you could take a potential model of telescope out for a "test drive" before deciding to buy.

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.

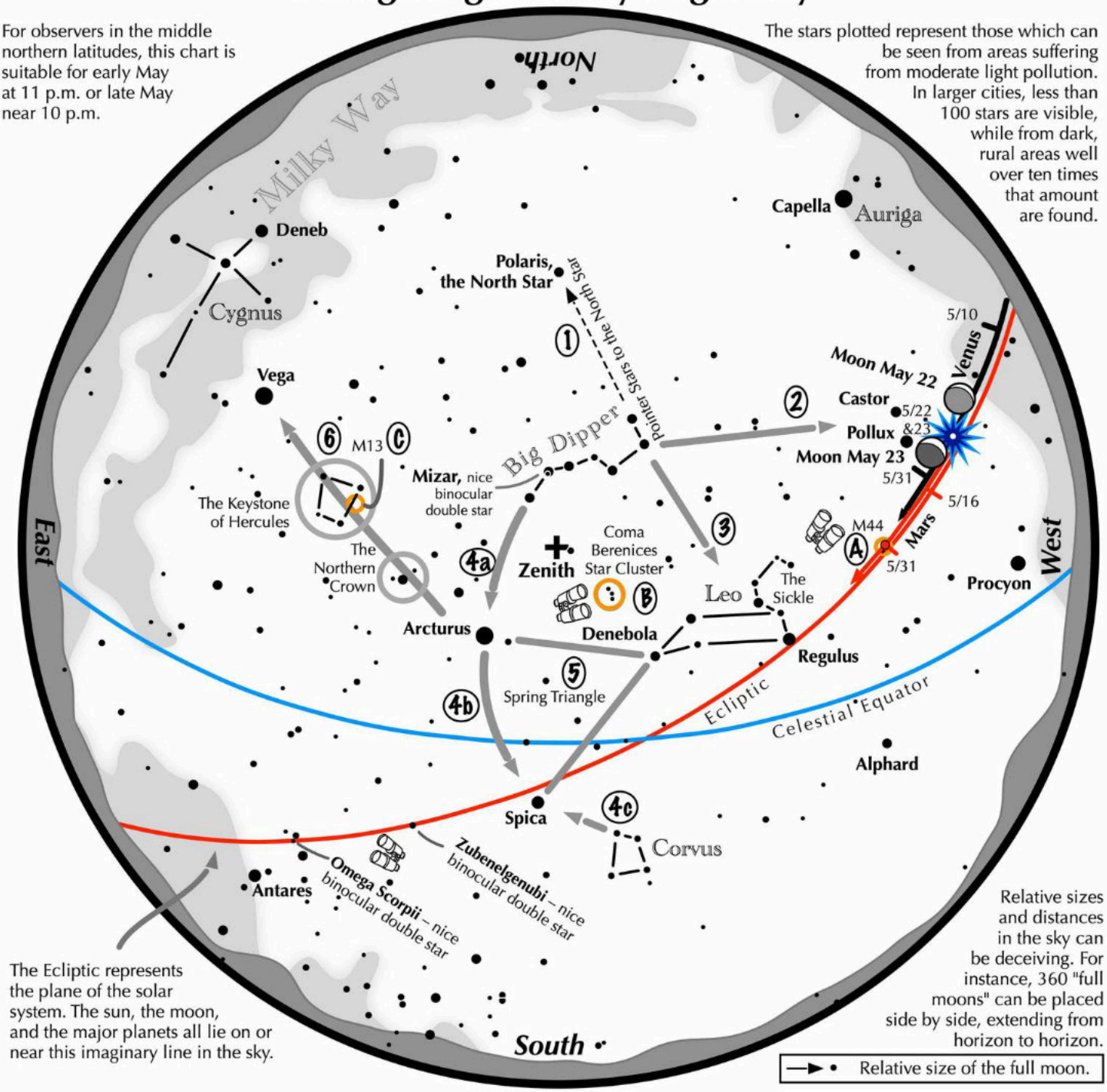
Pins and logos from the Astronomical League's many excellent observing programs- there are even more than seen here!

Image Credit: The Astronomical League.

Navigating the May Night Sky

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

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

—▶• Relative size of the full moon.

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

1. Extend a line northward from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
2. Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
3. Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
4. Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica. Confirm Spica by noting that two moderately bright stars just to its southwest form a straight line with it.
5. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
6. Draw a line from Arcturus to Vega. One-third of the way sits "The Northern Crown." Two-thirds of the way hides the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.

Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. **B:** Look near the zenith for the loose star cluster of Coma Berenices. **C:** M13, a round glow from a cluster of over 500,000 stars.

Observing Lists

Top ten deep-sky objects for May	
M 3	M 87
M 51	M 104
M 63	M 106
M 64	NGC 4449
M 83	NGC 4565

Top ten binocular objects for May	
M 3	M 86
M 51	M 87
M 63	M 104
M 64	M 106
M 84	Mel 111

Challenge deep-sky object for May
3C 273
A quasar located at the center of a giant elliptical galaxy in the constellation of Virgo. The first quasar ever to be identified, and the brightest as seen from Earth. Apparent magnitude: +12.9

The Planets in May

Mercury: Begins May in inferior conjunction. Returns to the morning sky around mid-month just as it is achieving aphelion, so relatively dim at ~mag. +2. It brightens oh-so-slowly, achieving maximum western elongation on the 29th when it is some 25° from the Sun but shining weakly at mag. +0.6. A subtle apparition best seen by southern observers..

Venus: Achieves maximum declination of +26° on the 9th, when it lies above the highest point of the ecliptic some 44° east of the Sun, setting after midnight local daylight time at mid-northern latitudes, including most of Canada. Earth's brilliant neighbor will continue to rule our evening skies for the rest of the month. The waxing crescent Moon passes 2° to the north on the 23rd, with Eastern Hemisphere observers again favored..

Mars: Gleaming ever more dimly in the western sky in the evening twilight, falling closer to Venus from night to night. Crosses the border from Gemini to Cancer in mid-month. Part of a nice cluster with the Moon, Venus, Pollux, and Castor on the 23–24.

Jupiter: Emerges into morning twilight very early in the month. Crosses the border from Pisces into Aries in mid-month, where it will spend the rest of the year. Achieves a close conjunction with the waning crescent Moon on the 17th, with an occultation visible in most of North America. Undergoes a series of double shadow transits in the second half of the month (see calendar on the following page).

Saturn: Still holding steady at mag. +1.0 in the morning sky, creeping eastward among the stars of Aquarius. The last-quarter Moon is nearby on the 13th..

Uranus: Too close to the Sun to be seen. In solar conjunction on the 9th.

Neptune: In the morning sky among the stars of extreme southwestern Pisces.

Astronomy History This Month

- The first recorded perihelion passage of Comet Halley (1P/Halley) occurred on May 25, 240 BC.
- Thales of Miletus accurately predicted a solar eclipse on May 28, 585 BC.
- The German astronomers Gottfried and Maria Magarethe Kirch discovered the bright globular cluster M5 on May 5, 1702.
- On May 1, 1759, the English amateur astronomers John Bevis and Nicholas Munckley observed Comet Halley on its first predicted return.
- The French astronomer Charles Messier discovered the globular cluster M3 on May 3, 1764 and the globular cluster M10 on May 29, 1764.
- The Italian astronomer Annibale de Gasparis discovered asteroid 11 Parthenope on May 11, 1850.
- Asteroid 14 Irene was discovered on May 19, 1851 by the English astronomer John Russell Hind.
- The German astronomer Robert Luther discovered asteroid 26 Proserpina on May 6, 1853.
- The Australian astronomer John Tebbutt discovered the Great Comet of 1861 on May 13.
- The English astronomer Norman Pogson discovered asteroid 80 Sappho on May 2, 1864.
- Norman Pogson discovered asteroid 87 Sylvia on May 16, 1866.
- The 40-inch Clark refractor at the Yerkes Observatory saw first light on May 21, 1897.
- The Griffith Observatory opened to the public on May 14, 1935.
- Nereid, Neptune's third-largest satellite, was discovered on May 1, 1949 by the Dutch-American astronomer Gerard Kuiper.

May 2023 Astronomy Events Calendar

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 Mercury in inferior conjunction	**2**	**3**	**4** Mercury at descending node	**5** **Full Moon**	**6** **LAS Meeting @ 8pm** η-Aquariid meteors peak	**7** Antares 1.5° S of Moon
8	**9** Venus at greatest heliocentric lat. N Venus 1.8° N of M35 Uranus in conjunction with the Sun	**10**	**11** Moon at perigee	**12** **Last Quarter Moon**	**13** Ceres stationary Saturn 3° N of Moon	**14** Mercury at aphelion Mercury stationary
15 **Neptune 2° N of Moon**	**16**	**17** **Double shadows and transits on Jupiter** **Jupiter 0.8° S of Moon, occultation** Moon at ascending node	**18** Mercury 4° S of Moon	**19** **New Moon**	**20**	**21** **Double shadows and transits on Jupiter**
22 **Double shadows and transits on Jupiter**	**23** **Venus 2° S of Moon**	**24** **Pollux 1.6° N of Moon** **Double shadows and transits on Jupiter** Mars 4° S of Moon	**25**	**26** Moon at apogee	**27** **First Quarter Moon**	**28** **Double shadow and transits on Jupiter**
29 **Mercury greatest elongation W (25°)** **Double shadows on Jupiter**	**30** Mars at aphelion	**31** **Double shadows and transits on Jupiter**				

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.