



## CLUB NEWS AND EVENTS

### MONTHLY MEETINGS

**Board Meeting** – March 3 @ 7:00 p.m.

**Members Meeting** – March 3 @ 8:00 p.m.

Held at Schoonover Observatory

A program will be presented by a Lima Astronomical Society member after the meeting.

### UNDER THE DOME

#### February meeting snippets:

Equipment replacement continued to be a large part of the discussion. Officers are working with the City of Lima to bring the observatory back to regular operation as soon as possible.

The club will have a booth at the Allen County Fair this year. Members interested in assisting can inquire with any of the club officers. Helping at the fair is a great way to get involved with the club and your community.

There is a limited stock of Lima Astro t-shirts remaining and plenty of eclipse glasses! Visit Schoonover Observatory to get yours!

#### February Program

Joshua Crawford presented a program on the history of the telescope and famous astronomers. The program covered astronomers from Greek times through modern-day, and prompted some great discussion from members who personally knew some of the more recent astronomers, such as Leslie Peltier from Delphos, Ohio, as well as bringing to light the amount of history the Lima Astronomical Society has within the area and its members.

### ASTRONOMY NEWS

#### [SMALL ASTEROID SPOTTED HOURS BEFORE DEMISE](#)

On the night of February 12th into the morning of February 13th, astronomers detected a 1-meter asteroid just hours before it impacted Earth's atmosphere. Observers tracked the asteroid from 20 sites across Europe until it met its demise less than seven hours after discovery, burning up harmlessly over the Channel between France and England.

#### [NORTHEAST ASTRONOMY FORUM \(NEAF\) 2023](#)

The Northeast Astronomy Forum, or NEAF, is the world's largest astronomy and science expo. Hosted at Rockwell Community College in Suffolk, NY April 15 & 16 this year. Click on the link above for more information and to purchase tickets. Lima Astro is not affiliated with NEAF – we just want to make sure you to know about it!

#### [UNEXPECTED RING DISCOVERED AROUND DISTANT DWARF PLANET](#)

The distant dwarf planet 50000 Quaoar appears to have a ring that spans far beyond where it ought to be stable. French astronomer Edouard Roche defined the concept of the Roche limit in 1848, calculating where a planet's tidal forces would exceed the gravitational force holding a moon together. Inside that region, the stronger gravitational force of the planet overpowers the moon's gravity and that tidal pull eventually tears the moon apart. Only outside that limit can small objects, dust, and debris coalesce under their own gravity to form a moon. With the ring's discovery, the Roche limit may need a rethink..



## SPOT THE MORNING AND EVENING STAR: OBSERVE VENUS

DAVID PROSPER - NIGHT SKY NETWORK

**Venus is usually** the brightest planet in our skies, and is called “Earth’s Twin” due to its similar size to Earth and its rocky composition. However, Venus is a nightmare version of our planet, featuring a thick, crushing atmosphere of acidic clouds, greenhouse gasses, howling winds, and intense heat at its surface.

**This rocky inner** world’s orbit brings it closer to Earth than any of the other planets, and is the second closest to the Sun after Mercury. Like Mercury, Venus orbits between our planet and the Sun, so Earth-based observers can observe Venus in the morning before sunrise, or in the evening after sunset – but never high in the sky in the middle of the evening, unlike the outer planets.

Since Venus is so striking in its twilight appearances, the planet features heavily in sky mythologies worldwide. Venus’s bright morning and evening appearances are the origin for its dual nicknames: the Morning Star, and the Evening Star. Some ancient astronomers never made the connection, and assumed the Evening Star and Morning Star were two unrelated objects! Observers can even spot Venus during the daytime, if the sky is very clear and the planet is bright enough. Venus also has phases, similar to the Moon and Mercury. Galileo’s observations of Venus’s phases helped turn the astronomy world upside down in the early 1600s, and you can see them yourself using a telescope or even a

surprisingly low-power pair of binoculars. Warning: Please be very careful when observing Venus with a telescope in the early morning or daytime. Never allow the Sun to enter your instrument’s field of view, as you could be permanently blinded.

**Venus’s other moniker** of “Earth’s Twin” is a bit misleading. In terms of their surface temperatures and atmospheres, Venus and Earth are extremely different! The surface of Venus is warmer than that of Mercury, despite Mercury being many millions of miles closer to the Sun. While Mercury is still a scorching 800 degrees Fahrenheit (427 degrees Celsius), Venus is even hotter: 900 degrees Fahrenheit (482

Jupiter



Venus

Facing West

After Sunset

March 1, 2023

West

Venus and Jupiter continue to move closer together in the evening sky this month. Jupiter will continue its descent towards the horizon while Venus will continue to climb and will be visible in the evenings through mid-summer of 2023. It’s a great year for Venus fans!

*Image created with assistance from Stellarium*

degrees Celsius). The vast amount of carbon dioxide in the thick Venusian atmosphere acts as an insulating blanket that retains much of the Sun's heat, creating the runaway greenhouse effect that dominates its present-day climate. The Venusian surface is a crushing 90 Earth atmospheres on top of its absurd temperatures. These extreme conditions mean that the mission life of any past Venusian robotic landers were measured in hours at best – and usually minutes! However, conditions in Venus's upper atmosphere may be much more hospitable, with temperatures and pressures at 30 miles (50 km) above the surface that are much more Earth-

like in temperature and pressure. Studies of the Venusian atmosphere, including seasonal appearances of dark streaks and faint signals of suggestive chemistry, intrigue researchers with the possibility that some sort of life may persist in its clouds. But far more evidence is needed to confirm such a claim, since non-biological factors like volcanism and other processes could also be the source for these signals.

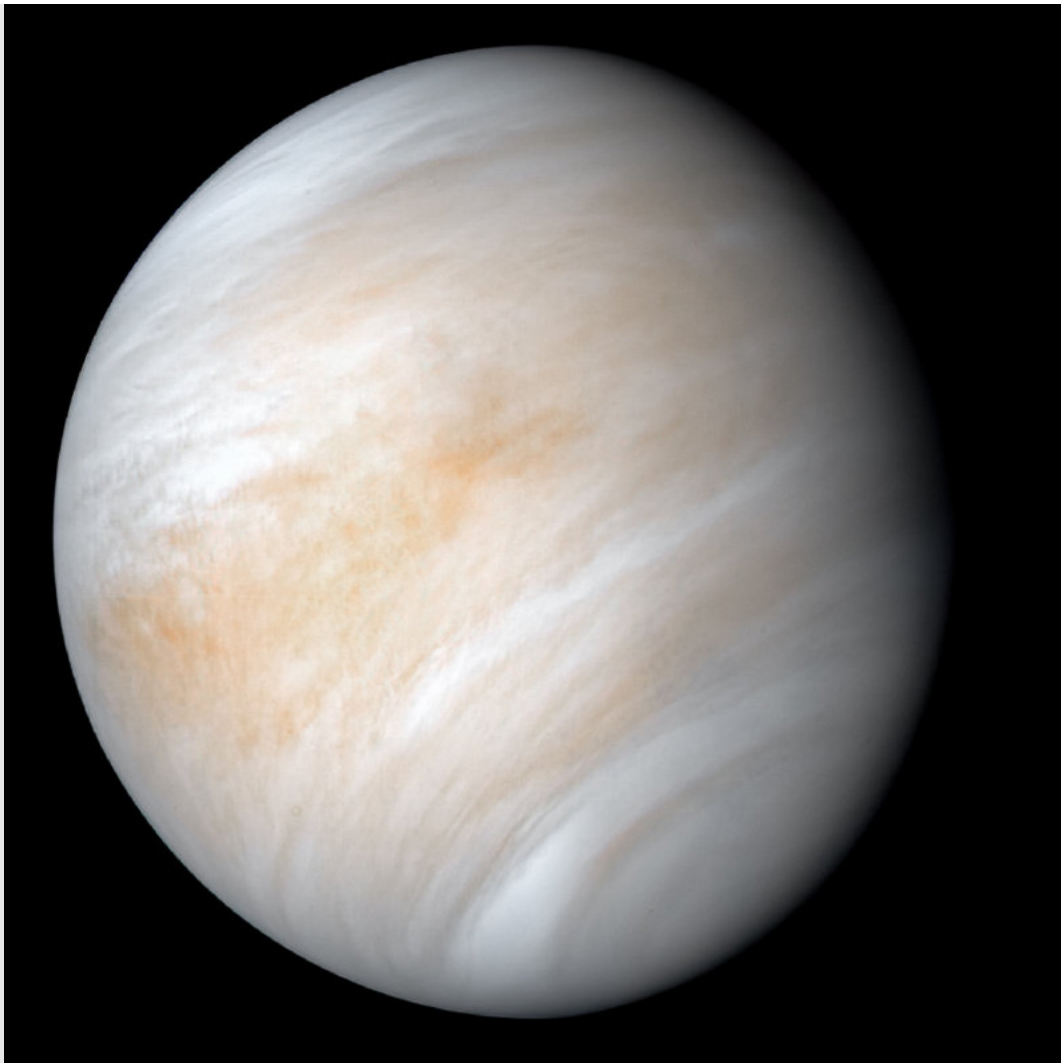
**Venus's thick sulfuric** acid clouds block direct visual observations of its surface from optical telescopes on Earth. Multiwavelength observations from space probes show evidence of active volcanoes and possibly some

sort of plate tectonics, but followup missions will be needed to confirm the presence of active volcanism, plate tectonics, and any possible signs of life. In order to do so, NASA is sending two new missions to Venus by the end of this decade: the orbiter VERITAS, which will map the surface in high detail and study the chemistry of its rocks and volcanoes, and DAVINCI+, which will study its atmosphere and possible tectonic surface features via a "descent sphere" that will plunge into Venus's clouds. Follow their development and discover more about Venus at [solarsystem.nasa.gov/venus](https://solarsystem.nasa.gov/venus), and of course, continue your exploration of the universe at [nasa.gov](https://nasa.gov).

The top layers of Venus's cloud pop in this contrast-enhanced image, reprocessed with modern techniques from Mariner 10 data.

*Credit: NASA/JPL-Caltech*

Source: <https://solarsystem.nasa.gov/resources/2524/newly-processed-views-of-venus-from-mariner-10/>



## Observing Lists

Top ten deep-sky objects for March		Top ten binocular objects for March		Challenge deep-sky object for March
M 44	NGC 2654	M 44	NGC 2571	<b>Abell 30</b> A planetary nebula located in the constellation Cancer. The remnant of a long-gone star, Abell 30 shows a distinctive "bubble", which is the shed outer layer of the former star. Magnitude: 13.0
M 48	NGC 2683	M 48	NGC 2683	
M 67	NGC 2835	M 67	NGC 2841	
M 81	NGC 2841	M 81	NGC 2903	
M 82	NGC 2903	M 82	NGC 2976	

## The Planets in March

**Mercury:** Remains visible to southern hemisphere observers in the morning sky for the first week, paradoxically brightening as it recedes from Earth due to its increasing phase angle. By the 6<sup>th</sup>, it shines at mag.  $-0.8$  at just  $10^\circ$  elongation, still accessible with optical aid to the careful observer. After passing through superior conjunction on the 17<sup>th</sup>, it returns to the evening sky in the last few days of the month, passing just  $1.5^\circ$  N of Jupiter on the 28<sup>th</sup> when both are some  $11^\circ$  from the Sun.

**Venus:** Very prominent in the western evening sky for northern observers in particular. Soars northward up the ecliptic from  $+4^\circ$  declination on the 1<sup>st</sup> to  $+18^\circ$  on the 31<sup>st</sup>, its elongation from the Sun stretching from  $31^\circ$  to  $37^\circ$  in the process. In close conjunction with Jupiter on the 2<sup>nd</sup>; see Jupiter comment. Passes just  $1.3^\circ$  from Uranus on the 30<sup>th</sup>, visible from sunset until both planets set around 10:30pm EST.

**Mars:** Still very well placed in the evening sky, surrounded by the bright stars of the Winter Hexagon. Around mid-month, the Red Planet forms a near-equilateral triangle with the red-giant stars Aldebaran and Betelgeuse, and shines at a similar brightness to both at mag.  $+0.7$ . Crosses the border from Taurus to Gemini late month, with the first-quarter Moon passing  $2^\circ$  to the north on the 28<sup>th</sup>.

**Jupiter:** Has a spectacular conjunction with Venus on the 2<sup>nd</sup>, when the two brightest planets are separated by just  $0.5^\circ$ , visible from sunset until the two planets set around 8:45pm EST. Both are at  $30^\circ$  elongation from the Sun. Has a close encounter with the thin crescent Moon on the 22<sup>nd</sup>. After March, Jupiter will not be visible again until the early morning hours in May, as it will be too close to the Sun to be seen. Will not be visible again before midnight until later in the year.

**Saturn:** Emerging into morning twilight by the second week of the month, though meekly at mag.  $+0.9$ ; the planet is becoming intrinsically dimmer as the ring system closes (next ring-plane crossing in 2025), and is currently far beyond the Sun near its furthest distance from Earth. The waning crescent Moon passes  $4^\circ$  to its south on the 19<sup>th</sup>.

**Uranus:** Its evening viewing window is closing rapidly as its elongation from the Sun narrows from  $64^\circ$  on the first to  $36^\circ$  on the 31<sup>st</sup>.

**Neptune:** Too close to the Sun to be seen. In solar conjunction on the 16<sup>th</sup>.

## Historical Astronomical Events 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 M101 was 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 Luboř 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 discovered supernova SN 1993 in the spiral galaxy M81 (Bode's Galaxy) on March 28<sup>th</sup>, 1993.

# March 2023 Astronomy Events Calendar

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2 Venus 0.5° N of Jupiter	3 <b>LAS Meeting @ 8pm</b> Moon at apogee Pollux 1.7° N of Moon	4
5	6	7 Full Moon	8 Mercury at greatest heliocentric lat. S	9 Zodiacal light vis. in N lat. in W after evening twilight for next two weeks	10	11 Moon at descending node
12 Daylight Saving Time Begins	13	14 Venus at ascending node Antares 1.6° S of Moon	15 Last quarter Moon	16 Neptune in conjunction with the Sun	17 Mercury in superior conjunction	18
19 Saturn 4° N of Moon Moon at perigee	20 Equinox	21 New Moon	22 Jupiter 0.5° N of Moon	23	24 Moon at ascending node Venus 0.1° N of Moon	25 Uranus 1.5° S of Moon
26 Moon 1.9° S of Pleiades (M45)	27 Mercury at ascending node	28 Mars 2° S of Moon	29 First Quarter Moon	30 Mars 1.2° N of M35 Pollux 1.6° N of Moon	31 Mercury at perihelion Moon at apogee Venus 1.3° N of Uranus	

# 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  $0.0^\circ$ ), 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.