#### **CELESTIAL MARIPOSA**

# Go Loony on Oct. 4

Everyone has seen our Moon as a shining beacon lighting up the night sky. It has captivated humanity for millennia; inspired mythological gods and goddesses, guided farmers and seafarers and fueled tales of romance and adventure.

It's even been the subject of the odd conspiracy theory or two — yes, we really did land on the Moon six times, in fact!



The Moon is hard to miss; its familiar glow is visible from even the most light-polluted city. And this month, on International Observe the Moon Night, Oct. 4, is a particularly good time to get to know our celestial neighbor.

## The Moon in story and song

Since antiquity people looked up and saw the Moon as more than just a silvery orb in the sky. They envisioned gods and goddesses, rabbits and faces, omens and calendars.

The Greeks revered Selene, the radiant goddess driving her silver chariot across the heavens. In Asia, people still

talk about the "Rabbit in the Moon" and in the West, children grow up with tales of the "Man in the Moon." The full Moon was said to stir madness — hence the words lunacy and lunatic — and loony. Farmers planted crops in tune with its motions. Poets, painters, songwriters

and filmmakers have all turned to it for inspiration. From Shakespeare's verses to old folk songs to early Hollywood's rockets-in-the-eye imagery, the Moon

has, and still does, capture our imagination.

## A chip off the ol' block

The early solar system was a very rough neighborhood. Large planetary bodies formed out of the leftover debris from the Sun's birth frequently slammed into each other. The best scientific evidence tells us that the Moon

was born from one of these cosmic smash-ups about 4.5 billion years ago, when a body the size of Mars slammed into the young Earth. The debris from that colossal impact collapsed under gravity to form our Moon.

The celestial pinball game still continued for millions of years afterward, though, with bombardment by asteroids and comets forming the lunar craters we see today. Some of these impacts were so large that they fractured the Moon's crust, allowing molten rock to rise, flooding areas on the surface.

These lava flows, thought by the ancients to be water, are still known today by the Latin word maria, meaning sea.

### Force of nature

The Moon is a little less than a quarter of the diameter of Earth — about 2,200 miles. That's still pretty large as solar system moons go, ranking at number five, behind Ganymede, Titan, Callisto and Io — Titan is a Moon of Saturn, while the other three orbit Jupiter.

Still, the Moon's gravity is only one-sixth of Earth's, which is why astronauts could hop around like kids on a trampoline.

The Moon is, on average, about 239,000 miles away from us, but even at this great distance it has a big influence on life here on Earth. Its gravity — along with that of the Sun — is strong enough to drive the rise and fall of the tides, keeping our oceans in constant motion. It also helps steady Earth's tilt, which keeps our seasons from going completely haywire. No Moon?

No gentle rhythm of tides, no stable climate and life on Earth might have turned out very differently. In turn, Earth's gravity has had a profound effect

of the Moon, throwing the brakes on its rotation over time, so that now it is "tidally locked," with the same side of the Moon always facing us.

The Moon is also slowly sneaking away from us, drifting about an inch and a half farther each year. We know this very precisely from lasers bounced off of retroreflectors — special mirrors — left on the Moon during Apollo and other missions.

This drift is a side effect of tides on Earth, which slightly accelerate the Moon, increasing its orbit, while ever so slightly slowing down the Earth's rotation.

## It's just a phase

One of the most delightful things about the Moon is that it never looks quite the same two nights in a row. It goes through phases, becoming more or less illuminated by our Sun in a graceful dance that takes about 29 and a half days — the period of the Moon's orbit around the Earth.

That repeating cycle is where we get the word month. When the illumination of the Moon's face is increasing night after night, we say it is waxing, and when its face is more than half illuminated, we say that it is gibbous.

This month, we will have a waxing gibbous Moon from Oct. 1-6, when we will be treated to a Full Moon. When the Moon's illumination is decreasing, we say it is waning. After Oct. 6, the Moon will be waning, becoming a crescent

after last — or third — quarter on the Oct. 13. We will have a New Moon on the 19th — the best time for star gazing! From there the cycle continues, with the Moon becoming an ever-broader waxing crescent as

t approaches first quarter on the 29th. You might wonder why we call it "First Quarter"



The Mariposa Night Sky on Oct. 19 at 8 p.m. Find constellations, bright stars and planets.

Celestial Highlights for October, 2025

Oct 4		Tonight is <i>International Observe the Moon Night!</i> Be a part of the festivities on the courthouse lawn at 7:00 PM for this event, sponsored by the Mariposa County Library. See the library website at <a href="https://www.mariposalibrary.org/events.html">https://www.mariposalibrary.org/events.html</a> for more information.
Oct 6		The <u>Full Moon</u> rises at 6:18 PM on October 6 <sup>th</sup> and sets at 7:39 AM on the 7 <sup>th</sup> . It will be visible all night near the <i>Circlet</i> in the constellation <i>Pisces</i> . While you're looking at the Moon, check out bright <u>Saturn</u> to the right – southeast – of the Moon in the evening hours.
Oct 13		The <u>Last Quarter Moon</u> rises in the Constellation <i>Gemini</i> at 11:00 PM on the night of the 12 <sup>th</sup> , reaches its highest point in the sky (transit) at 6:52 AM on the 13 <sup>th</sup> and sets at 2:36 PM. Also, in the early morning hours of the 13 <sup>th</sup> , checkout bright <u>Jupiter</u> below the Moon and to the right of the <u>Castor</u> and <u>Pollux</u> , the twin bright stars of <i>Gemini</i> .
Oct 19	e	If you are an early riser, go out at about 6:30 AM and look low to the east to catch the thin sliver of a crescent Moon to the right of bright Venus in the constellation Virgo.
Oct 21	A	Our Milky Way Galaxy is easiest to see around this date of the New Moon. It will be fully dark by 7:40 PM. Saturn will be visible until well after midnight in the constellation <i>Pisces</i> . Also, checkout the <i>Orionid</i> meteor shower on the nights of October 20-21 and a new comet around these same dates!
Oct 29		The <u>First Quarter Moon</u> rises in the constellation <i>Capricornus</i> at 2:25 PM on the 29 <sup>th</sup> , and sets at 12:33 AM on the 30 <sup>th</sup> . You should be able to easily see it during the day in the late afternoon.
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and "Last Quarter," when clearly the Moon is half illuminated. The reason is that at this time the Moon is one quarter, and three quarters of the way, respectively, through its 29-1/2 day cycle from New Moon, through Full Moon and back to New Moon again.

#### Going over to the dark side $Many \ of \ us --mysel \ \check{f} \ included --have$

probably enjoyed listening to the classic Pink Floyd album "Dark Side of the Moon."

The haunting instrumentals conjure up visions of the lunar far side, eternally shrouded in blackness. But the Moon's far side isn't always dark; it goes through the same phases that we see on the near side — our side — just in reverse order.

So, when we have a New Moon, the far side will see a Full Moon, and when we have First Quarter, the far side will see Third Quarter, and so on. Now you know.

#### See the Moon on Oct. 4

The Moon is perhaps the most exciting object for beginning sky-watchers to observe. It's big, bright and easy to find.

Although you can see some detail with just the naked eye, you can really appreciate details on the surface with a decent pair of binoculars or a small telescope. And there's no better time to see the Moon through a

telescope than on Oct. 4th at 7 p.m., during International Observe the Moon Night, when the Mariposa County Library is sponsoring an event on the Mariposa Courthouse lawn. Telescopes will be available for public viewing and

visitors are free to bring their own as well. You can find more information online at the library website: mariposalibrary.org/events and from NASA at their website: moon.nasa.gov/observe-the-moon-night/ The NASA site includes Moon maps, observing

tips, a viewing guide and even a guide to help you

photograph the Moon. It's really great, check it out! The Oct. 4 event will be amazing, but take the opportunity to check out the Moon during

the remainder of the month as well. As the phase of the Moon transitions from Full back to New, the day/night line — called the terminator — progresses to reveal different features: craters, mountains, maria and rilles (valleys) for an ever-changing viewing experience.

You would think that the best time to observe the Moon would be when it is full, since that's when it is brightest; but you will actually be able to see more detail during the partial phases.

At Full Moon there are minimal shadows, so the lighting is "flat," whereas during partial phases the shadows from craters and mountain ranges allow features to be seen in relief, giving a dramatic three-dimensional effect.

# Back to the future

Half a century after humans last walked on the Moon, we're going back!

NASA's Artemis program is currently scheduled to launch four astronauts on a trip around the Moon — Artemis II - in the spring of next year, with a landing at the Moon's south pole — Artemis III — currently planned for 2027.

There's a lot of work to be done between now and then, but good progress is being made. The Space Launch System (SLS) rocket and Orion capsule successfully flew in 2022 on the uncrewed Artemis I mission and stacking of the Artemis II SLS and Orion, which have already been delivered to Kennedy Space Center, is expected this month.

## What else is up this month?

You can use this month's Night Sky Chart to orient yourself to the heavens. For example, to find the Keystone in the constellation Hercules, look to the west, place the chart with the "W" toward you and look half way up from the horizon.

If you missed the Perseid meteor shower in August, take heart! Although not generally as dense as the Perseids, this month's Orionid meteor shower has the advantage of peaking during the moonless nights of the 20th and 21st. The Orionids are formed by tiny particles, the size of

grains of sand, cast off over the millennia from the famed Halley's Comet. You can expect somewhere around 10-30 meteors per hour if you are someplace dark and can wait until after midnight when the shower's radiant — the point the meteors trace back to — is high in the sky. You'll see fewer meteors earlier in the night or from light-polluted skies. Speaking of comets, a new visitor from the depths

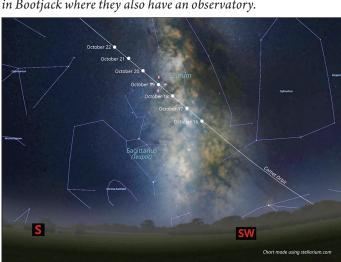
of our solar system was just discovered on Sept. 11. Designated as C/2025 R2 (SWAN), the comet is currently climbing higher in the night sky. By coincidence, it makes its closest approach to the Earth

on Oct. 19, close to the date of the new Moon. You probably won't be able to see it with your naked eye, but the comet should be visible with binoculars or a small telescope as a small fuzzy green blob, perhaps with a short tail, in the constellation Scutum, above the Sagittarius teapot. See the finder chart to know where and when to look! I hope you found this article informative as you continue

your exploration of the night sky. If you want to learn more, there is a wonderful reference at: https://science.nasa.gov/ moon/ that goes into greater depth on all of the Moonrelated topics discussed in this article. There are articles, videos and interactive resources for adults and kids alike.

As always, if you have questions, comments or suggestions for future articles, you can get in touch with me by email at: celestialdeep55@gmail.com, or visit my website at https://celestialdeep.space/. If you have a question of general interest, I'll try to answer it in my next article.

Manny Leinz is a long-time amateur astronomer and night sky photographer. He and his wife live part time in Bootjack where they also have an observatory.



Use this chart to find newly discovered comet C/2025 R2 (SWAN) on the moonless nights around its closest approach to Earth on Oct. 19.

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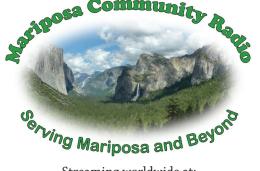
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