CELESTIAL MARIPOSA

Now presenting, our galaxy!

By MANNY LEINZ

Have you ever looked up to see the ethereal arc of the Milky Way stretching overhead on a summer night?

We are fortunate here in Mariposa, thanks to our dark skies, to have this opportunity on a regular basis. But have you ever stopped to ponder just what that smoky band is?

The ancient Greeks believed it was a river of milk, cast by a goddess into the sky, and called it galaxias kyklos meaning "milky wheel." By the 14th century, galaxias became galaxy in the English language to describe this mysterious celestial cloud.

Manny Leinz

When Galileo pointed his telescope at the Milky Way in 1610, it became clear that the cloud was actually the combined light of literally billions of individual stars, too dim to see individually with the naked eye.

Throughout history it was believed that the Milky Way — our own personal galaxy that contains our solar system — was all there was to the universe. That all changed in 1924 when Edwin Hubble, for whom the famous space telescope is named, discovered that another "cloud" in the heavens, then known as the Andromeda Nebula, was actually made up of stars.

He determined that these stars were much further away than any others in the sky; Andromeda was its own separate galaxy!

The Andromeda Galaxy — known as M31 or Messier 31 to astronomers — is visible by eye as a small fuzzy patch on the sky. Yet Andromeda has more stars than the Milky Way, up to a trillion by some estimates, while the Milky Way — which includes all of the stars that we can see without large telescopes — has around 400 billion.

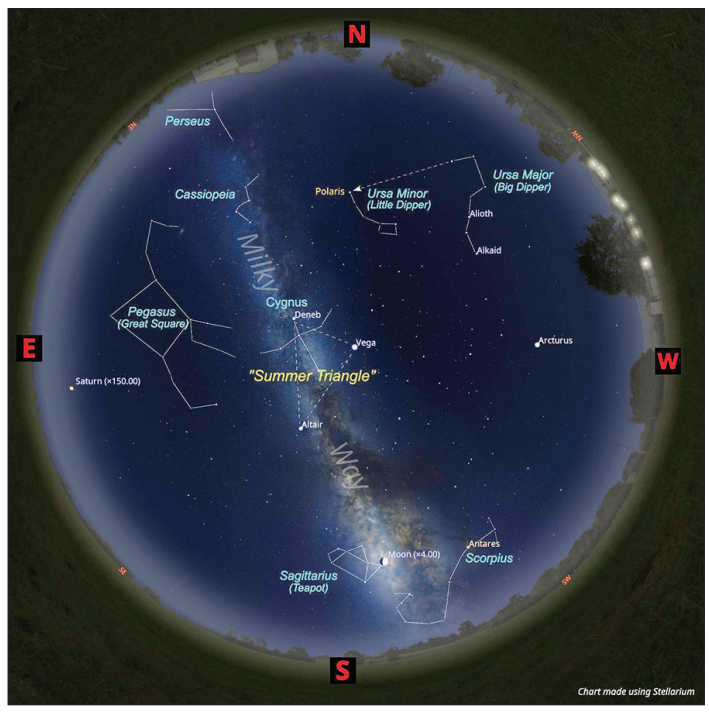
Today we know that the Milky Way and Andromeda are but two of literally hundreds of billions of individual galaxies in the observable universe, each containing many billions of stars. The nearest galaxies, of which the Milky Way and Andromeda are members, are in what we call the "Local Group."

These lie within three million light-years or so of us, while the farthest galaxies are billions of light–years away at the edge of the known universe.

Time to get out under the stars!

Around this month's new Moon, Sept. 21, is a great time to get in touch with the galaxy that we all call home, while it is still overhead in the early evening. To explore the depths of the Milky Way, a pair of binoculars will be very useful.

As always, find a dark place away from bright lights and allow time — at least 20 minutes — for your eyes to adapt to the dark to enhance your viewing experience. Start in the south, with your binoculars pointed at the teapot of the constellation Sagittarius to see the dense star clouds, clusters and nebulae in the direction of our galaxy's center.



The Mariposa Night Sky on Sept. 1, 2025 at 9:00 p.m. How to find constellations, bright stars and planets.

Continue scanning north along the Milky Way until you come to a twin knot of stars: the Double Cluster, in the constellation Perseus. You may find the cluster easier to spot with the naked eye as a pair of small, faint gray smudges, before training your binoculars on it.

Finally, test your vision by trying to find the Andromeda galaxy, which Dr. Hubble observed to make his groundbreaking discovery. Face east and use the finder chart to help you locate the Great Square of Pegasus, the winged horse. It will be oriented more like a diamond in the early evening.

From the leftmost star, Alpheratz, proceed past two stars diagonally to the lower left, then two more stars up diagonally to the left. The galaxy should be obvious in binoculars as an elongated gray cloud.

Finding Andromeda by naked eye is more difficult, but definitely possible, if you are away from lights and your eyes are dark adapted. You may need to use "averted vision," using your peripheral vision to look slightly to the side while continuing to concentrate on your target.

This technique relies on the more sensitive rod cells in your eyes to pick up the galaxy. If you are successful, congratulate yourself! The light falling on your eyes has been traveling through space from the Andromeda galaxy for about 2.5 million years, since well before human beings first roamed the earth.

Just what is a light–year, anyway?

As the term implies, a light–year is simply the distance that light travels in a year: about six trillion miles. Astronomers use light–years to convey the vast distances across space, without needing to use extremely large conventional units like miles or kilometers.

Our Sun is about eight light–minutes away, while the nearest star besides our Sun, Proxima Centauri, is about 4.25 light–years away.

Our Milky Way Galaxy is about 100,000 light-years in diameter, and the nearest galaxies — within the Local Group — are within about three million light–years from us. Light from the furthest reaches of the observable universe has been traveling toward us for 13.8 billion light–years.

Galactic Smoke — Our Milky Way Galaxy appears to rise like smoke from the open roof of the Leinz observatory in Bootjack on Sept. 22, 2022. This image is a combination of 11 individual 30 second exposures.

What's the angle?

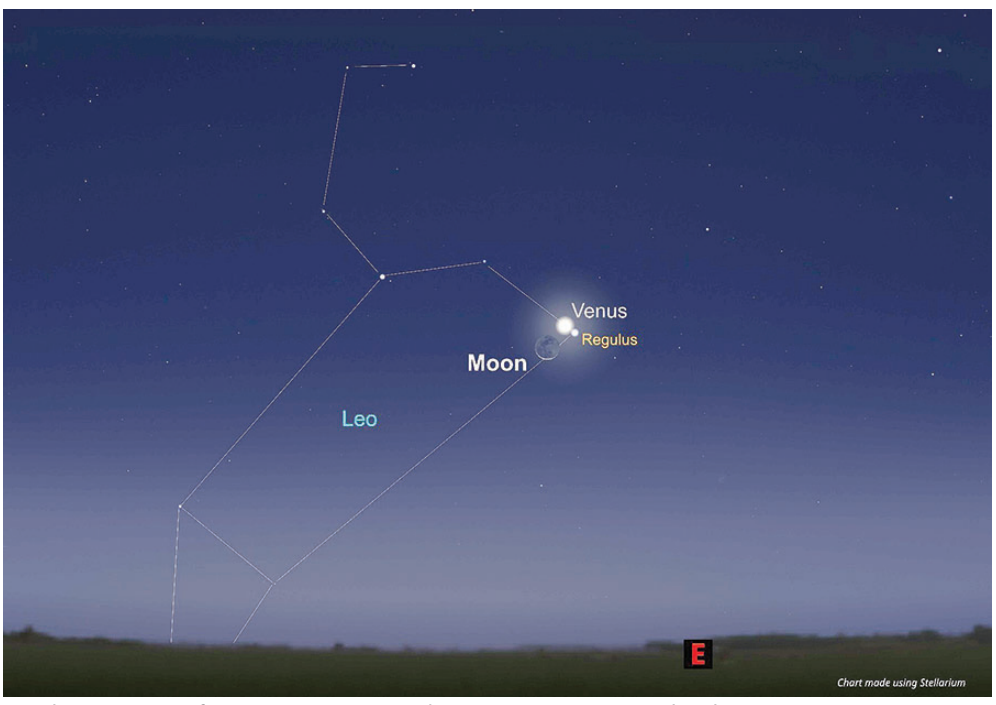
You've heard me mention angles several times in this and prior articles to describe how far objects appear apart in the sky. Here are some simple "rulers" to help you measure the separation:

- The full Moon spans about half a degree on the sky, whereas your pinky finger, extended at arm's length, spans about a degree — two full Moons. That's the approximate separation of the Moon, Venus and Regulus on the morning of Sept. 19.
- You can use your hand and your fist to find larger angles. Your fist, extended at arm's length, spans about 10 degrees, whereas your hand at arm's length and stretched wide open spans about 25 degrees from the tip of your pinky to the tip of your thumb. That's about the angle that Saturn will appear above the horizon on Sept. 1.

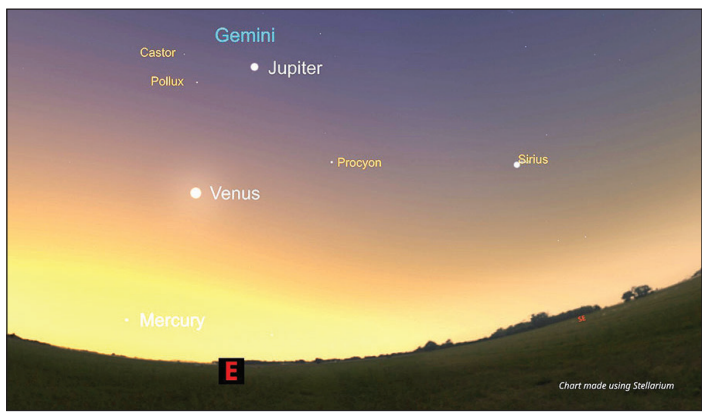
I hope you found this article informative as you continue your exploration of the night sky. Do you have questions, comments or suggestions for future articles?

You can get in touch with me by email at: celestialdeep55@gmail.com, or visit my website at https://celestialdeep.space/ If you post a question of general interest, I'll try to answer it in my next article.

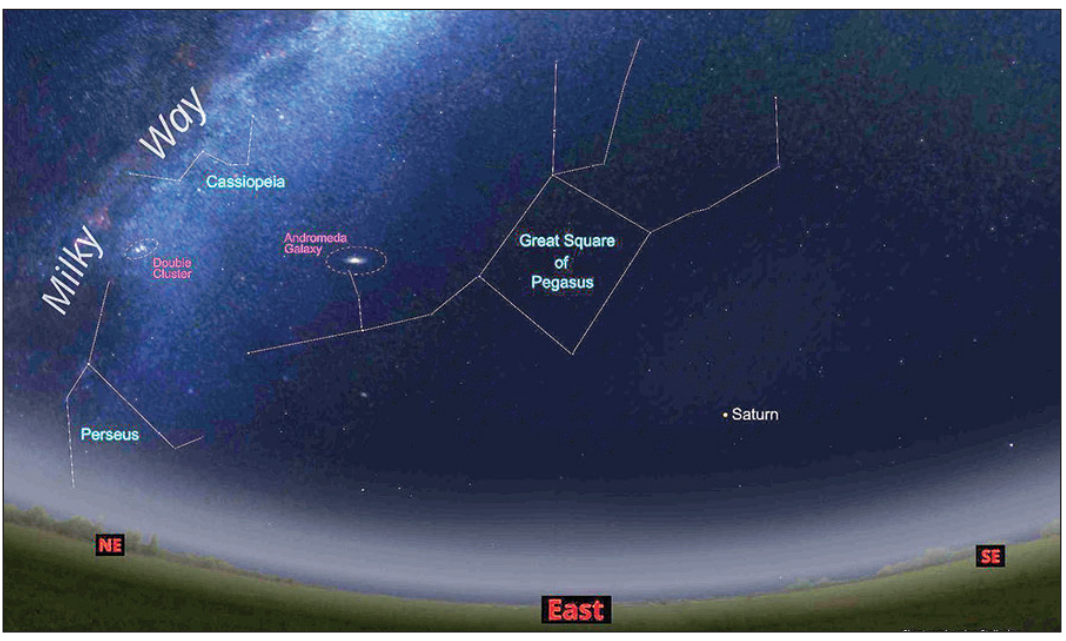
Manny Leinz is a long-time amateur astronomer and night sky photographer. He and his wife live part time in Bootjack where they also have an observatory.



On the morning of Sept. 19, go out at about 5:45 a.m. to see the thin crescent Moon, Venus and the bright star Regulus in the east.



On the Morning of Sept. 1, go out early, at 6 a.m., to see Jupiter, Venus and Mercury in the east. Binoculars will help to see Mercury low on the horizon.



Around the date of the Sept. 21 New Moon, go out in the evening to find the Andromeda Galaxy and Double Cluster in the east-northeast. Binoculars will help in finding Andromeda.

Celestial Highlights for September, 2025

Sept 1		Go out early, at 6:00 AM, to see three planets: Jupiter, Venus and Mercury, in the east. You'll want binoculars to see Mercury, which will be low on the horizon. As a bonus, look to the west/southwest to see Saturn about 25 degrees up from the horizon. As a reminder, with the naked eye or with binoculars, planets will look like bright stars.
Sept 7		The Full Moon rises at 7:26 PM on September 7th and sets at 7:37 AM on the 8th. It will be visible all night in the constellation Pisces. While you're looking at the Moon, check out bright Saturn, below and to the left of the Moon in the evening hours.
Sept 12-14		Go out about 8:00 PM and look to the west-southwest to see rusty Mars just above the bright star, Spica. September 14th is also the date of the last quarter Moon. The Moon rises in the Constellation Taurus at 11:00 PM on the night of the 13th, reaches its highest point in the sky (transit) at 6:56 AM on the 14th and sets at 2:54 PM.
Sept 19		If you are an early riser, don't miss this tight grouping – a *conjunction* - of the thin crescent Moon, Venus and the star Regulus, the brightest light in the constellation Leo, the Lion. Go out at about 5:45 AM to see all three within about one degree of each other to the east.
Sept 21		Our Milky Way Galaxy is easiest to see around this date of the New Moon. Go someplace away from bright lights in the evening and allow your eyes to adapt to the dark for at least 20 minutes. Wait until about 8:30 PM, when it will be fully dark, to see the Milky way stretching in a high arc from horizon to horizon! Be sure to check out Saturn, which is at *opposition* – directly opposite the Sun from our vantage point – and so will be visible all night in the constellation Pisces.
Sept 29		The First Quarter Moon rises in the constellation Sagittarius at 2:29 PM, and sets at 11:34 PM. You should be able to easily see it the late afternoon during the day.

These are the celestial highlights for September 2025.