Keene Amateur Astronomers

The Newsletter for Keene Amateur Astronomers

Vol. 2026 No. 9 September 2026

M74

Classified as an Sc galaxy, M74's graceful spiral arms are traced by bright blue star clusters and dark cosmic dust lanes. Constructed from archival images, this sharp composite is from the Hubble Space Telescope. **Image Credit:** NASA, ESA, and the Hubble Heritage (STScI / AURA)- ESA / Hubble Collaboration Acknowledgment: R. Chandar (U. Toledo) & J. Miller (U. Michigan)

Contents

Editor's Message

We have entered the 'ber' months and the end of summer. Fall officially starts on the Autumnal Equinox on September 22nd and for those of us in New Hampshire, equal day and night will fall a few days later on the 25th. After that, the nights will be longer than our days. Great for astronomers and stargazing.

On the 16th, use the waxing crescent Moon to find Antares in the constellation Scorpius in the Southwest sky after sunset. Next to Scorpius is Sagitarius, the teapot, whose spout points to the heart of the Milky Way. On the 18th, the Moon will hover to the right of the spout at the center of the Milky Way before it passes through Sagittarius the following night. Later in the month, on the 29th and 30th, the Moon will pass through the Pleiades.

Be sure to check out Venus to the right of Antares. Venus will reach peak brightness mid month on the 18th. Saturn will be up all night rising around 9 pm the beginning of the month and earlier each night as the month progresses. Jupiter is currently visible in the morning sky. Jupiter will be joined by Regulus mid month and together they will rise higher in the predawn sky as the month progresses. Mars is also visible in the East before sunrise and can be seen near Castor and Pollux.

September 19th is International Observe the Moon Night. The event is hosted by the Keene Public Library (KPL). We will be co-hosting the event. We will set up in the parking lot of the Asheulot River Park. The event runs from 6:30 - 8:30. This is a public event. All are welcome. Please spread the word. In addition, KPL will have a table set up with hands-on activities for children.

This past month Kevin and I traveled to Europe to see the eclipse. It did not disappoint. Although Totality was short, the view was spectacular with the largest corona I have seen and ended with a spectacular Diamond Ring. I believe the large corona may be due to the increased amount of atmosphere the light passed through on the horizon. It was a breathtaking sight to behold and experience. The next eclipse is in 2027. There

is plenty of time to plan your trip to see it but I am hearing several individuals reporting that their accommodations have been canceled (multiple times in some cases), price increases, river cruise cancellations etc. It looks like anyone planning to go will need to stay on top of their travel arrangements. I think I will be sitting this one out but 6 minutes of Totality sounds amazing.

Great objects to view this month:

- **NGC 7635 - The Bubble Nebula** located in Cassiopeia near M52. It is a H II region emission nebula and best viewed with a large telescope with a OIII or UHC filters. With an 8 or 10" telescope it will be visible but extremely faint. A long exposure image from a smart telescope will reveal the expanding nebula's bubble of gas.

- **Messier 52 - The Scorpion Cluster** is an open cluster in Cassiopeia. It can be seen with binoculars and with a telescope the cluster can be resolved into blue-white stars.

- **Delta Cephei** - a cepheid variable in Cepheus. It is the prototype of Cepheid Variables from which this group gets its name. Its visual magnitude changes from 3.5 to 4.4 over the course of 5 to 6 nights making it visible to the unaided eye under dark sky conditions in a very short period of time. As it changes in brightness, it appears to shift in color from white to yellow. Through a telescope, it resolves to an optical double star with its companion glowing blue.

- **Messier 30 - The Jellyfish Cluster** is a globular cluster of stars in Capricornus. Binoculars will show this cluster as a faint blur and a telescope will resolve it into a tight cluster of stars.

I hope you are able to find time to step outside this month and enjoy the beauty and wonder of the night sky.

- Susan Rolke

Monthly Business Meeting

The business meeting will be held at Keene State College in the Student Young Center on September 11th at 7 pm. Observing, weather permitting, the 12th at the Observatory in Sullivan at 8 pm.

Club Happenings

Observing at the Frost Free Library in Marlborough on September 14th at 7 pm with the following night set as the rain date. All are welcome.

International Observe the Moon Night is September 19th in the Ashuelot River Park parking lot from 6:30 - 8:30 pm. Bring your telescope if you have one. If you don't have a telescope, you can still participate and help with the event as well as enjoy the view of the Moon. We are co-hosting the event with the Keene Public Library. We have had multiple telescopes and binoculars set up in the past. All are welcome. Please spread the word. Tell your neighbors, bring your friends and family. The Keene Public Library will have a table set up with crafts for the kids. This has been a stellar event in the past.

Astronomy Conventions, Retreats, and More

Appalachian Mountain Club is celebrating its 150th year and offering two opportunities to see the dark, the first in October and the second in December.

Maine Astronomy Retreat, Washington, ME will take place September 7th - 13th this year. Enjoy a vacation with your telescope and stay in one of their cabins. See the website for more information.

Dark Sky Maine Star Party, September 12 at Flye Point (Flye Point Road, Brooklin, Maine). Free to the public. *Donations accepted to help defray the cost*. Pay as you choose. Inquiries welcome at darkskyaine@gmail.com. Check this webpage for updates as the event gets closer!

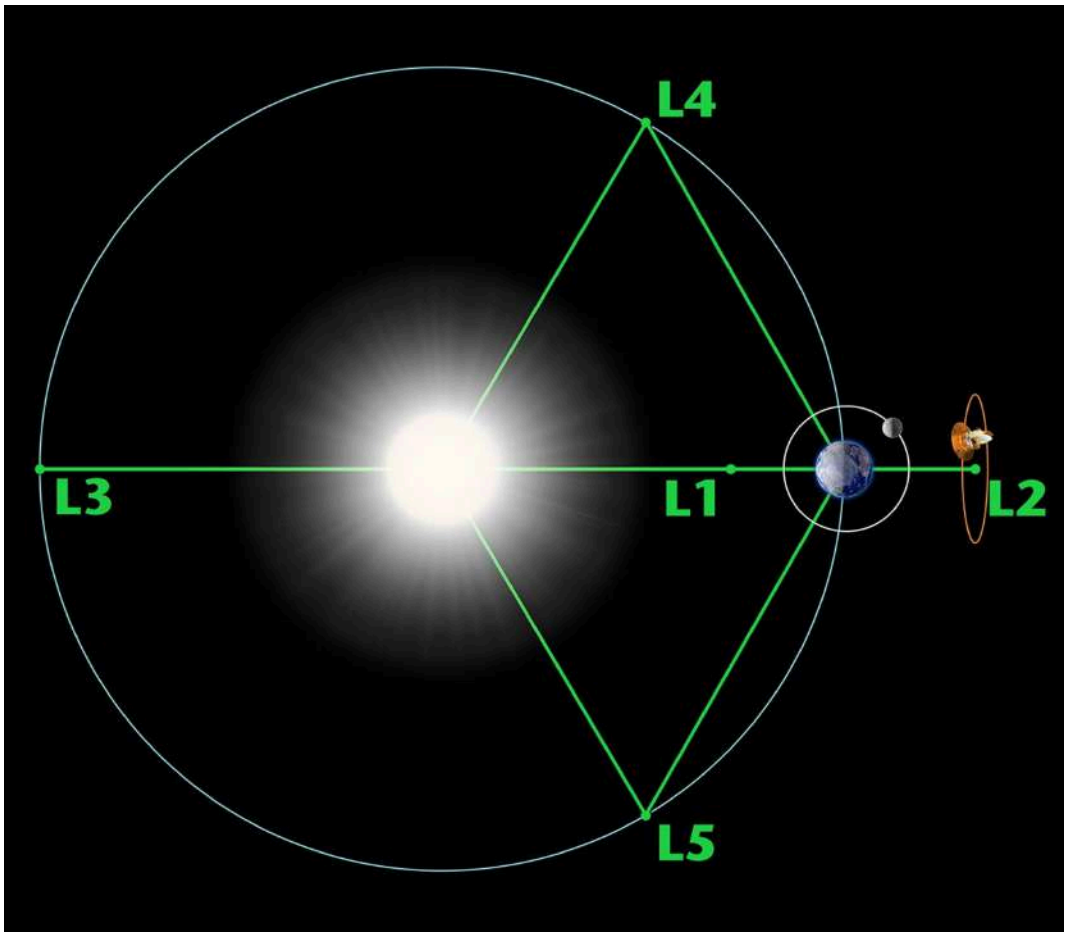
New England Fall Astronomy Festival at UNH in Durham NH. This year's festival will be held October 16th and 17th. Admission is Free.

The Nancy Grace Roman Space Telescope: A New View of the Universe

By Susan Rolke

Astronomers are about to gain a powerful new tool for exploring the universe. The Nancy Grace Roman Space Telescope, often simply called Roman, will study everything from exploding stars and distant galaxies to exoplanets, dark matter, and the mysterious force known as dark energy. The new observatory could provide important clues that may fundamentally change our current understanding of the universe.

Roman launched on August 30 and is now making its way toward a position approximately one million miles from Earth known as the second Lagrange point, or L2. The location of L2 lies beyond the orbit of the Moon. There, Roman will join other space telescopes, including the James Webb Space Telescope (JWST), in an orbit around the Sun while traveling along with Earth.

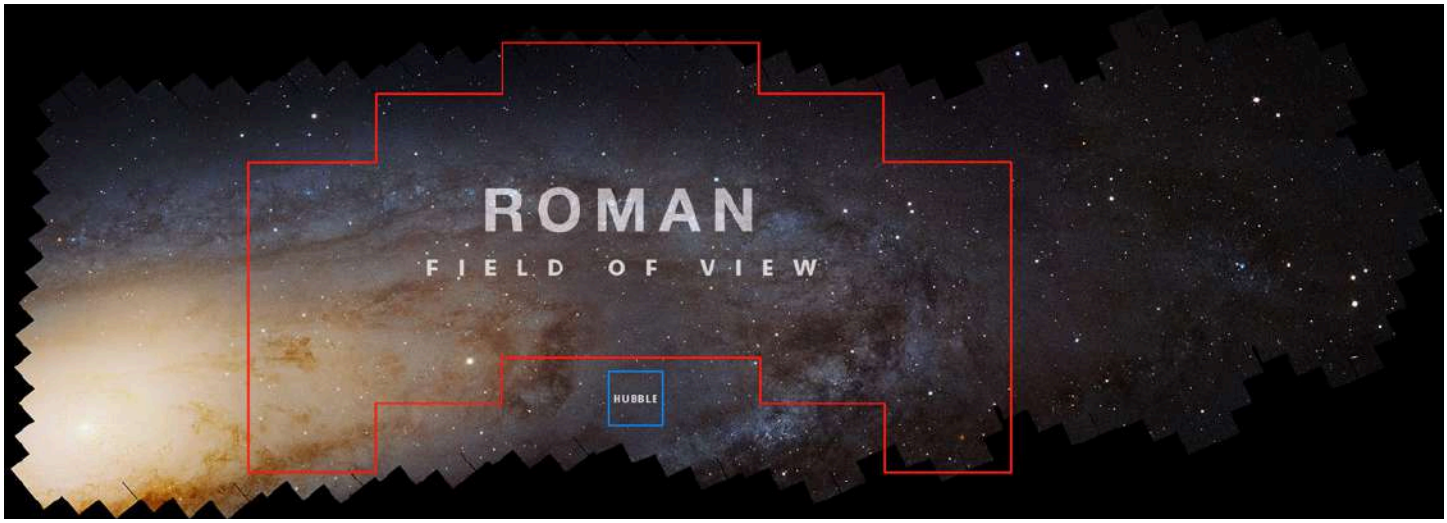


Not to Scale. The image shows the position of the Lagrange Points relative to the Sun and Earth.
Credit: NASA/WMAP Science Team

L2 is an ideal location for a space telescope. The gravitational forces of the Sun and Earth allow a spacecraft to remain in a relatively stable orbit while requiring little fuel for station-keeping. From this location, Roman will also have a largely unobstructed view of deep space.

Roman's 2.4-meter primary mirror is the same size as the mirror on the Hubble Space Telescope, and its optical resolution will be comparable to Hubble's. The major difference between the two telescopes, however, is how much of the sky they can see at once.

Roman's field of view will be approximately 200 times larger than Hubble's, making it an exceptionally powerful survey telescope. It will be capable of mapping large areas of the sky roughly 1,000 times faster than Hubble. A comparison of the field of view of each telescope is shown in the image below. It took 400 Hubble images to create the image. It will only take two of Roman's images to create a similar image.



The Roman Space Telescope's field of view will dwarf the Hubble's. Credit: NASA/GSFC/JPL

A useful way to think about the difference between Roman and JWST is to imagine two different camera lenses. Roman is the wide-angle lens, while JWST is the zoom lens. Roman will be able to survey enormous regions of the sky quickly, while JWST can concentrate on much smaller areas and study them in extraordinary detail. The two telescopes therefore complement one another rather than compete with each other.

Roman's combination of a wide field of view and sensitivity extending from visible light into the infrared will make it particularly valuable for large-scale surveys. It will create high-resolution maps that can then be followed up by other telescopes for more detailed observations. It will also work to complement the 10 year survey being completed by the Rubin Observatory by providing infrared data that can reveal objects and details that are difficult or impossible to see in visible light. By combining the data from these two powerful surveys, astronomers will be able to study the universe across a broader range of wavelengths, giving them a more complete picture of everything from distant galaxies and exploding stars to the structure and evolution of the Milky Way.

It has two additional traits in common with Rubin. It will be collecting an enormous amount of data and the data will be available to everyone. However, unlike Rubin, Roman will be accepting general science proposals from the research community.

Several major surveys are planned. One of Roman's early projects will be to map large portions of the Milky Way. This initial survey is expected to take approximately a month. Other planned observations include

detailed surveys of the galactic bulge, the dense concentration of stars surrounding the center of the Milky Way, as well as large-scale surveys designed to map the distant universe.

The idea for Roman grew out of a need identified by astronomers roughly 15 years ago: a wide-field, infrared space telescope that could help investigate one of the biggest mysteries in modern cosmology. Dark energy.

The primary mirror of the Roman Space Telescope; donated to NASA by the NRO in 2012. Credit: NASA/Chris Gunn

Dark energy is the mysterious force that is believed to be driving the accelerating expansion of the universe. We know the universe is expanding, and observations show that this expansion is speeding up. However, we still do not know what dark energy actually is. Dark is simple the way astronomers and physicists say they don't know what it is.

One way Roman will investigate this mystery is by observing Type Ia supernovae. These stellar explosions have a predictable brightness, which allows astronomers to use them as a kind of cosmic measuring tool known as a "standard candle."

By observing large numbers of these stellar explosions at different distances and measuring how their light has been affected by the expansion of the universe, astronomers can build a more precise picture of how

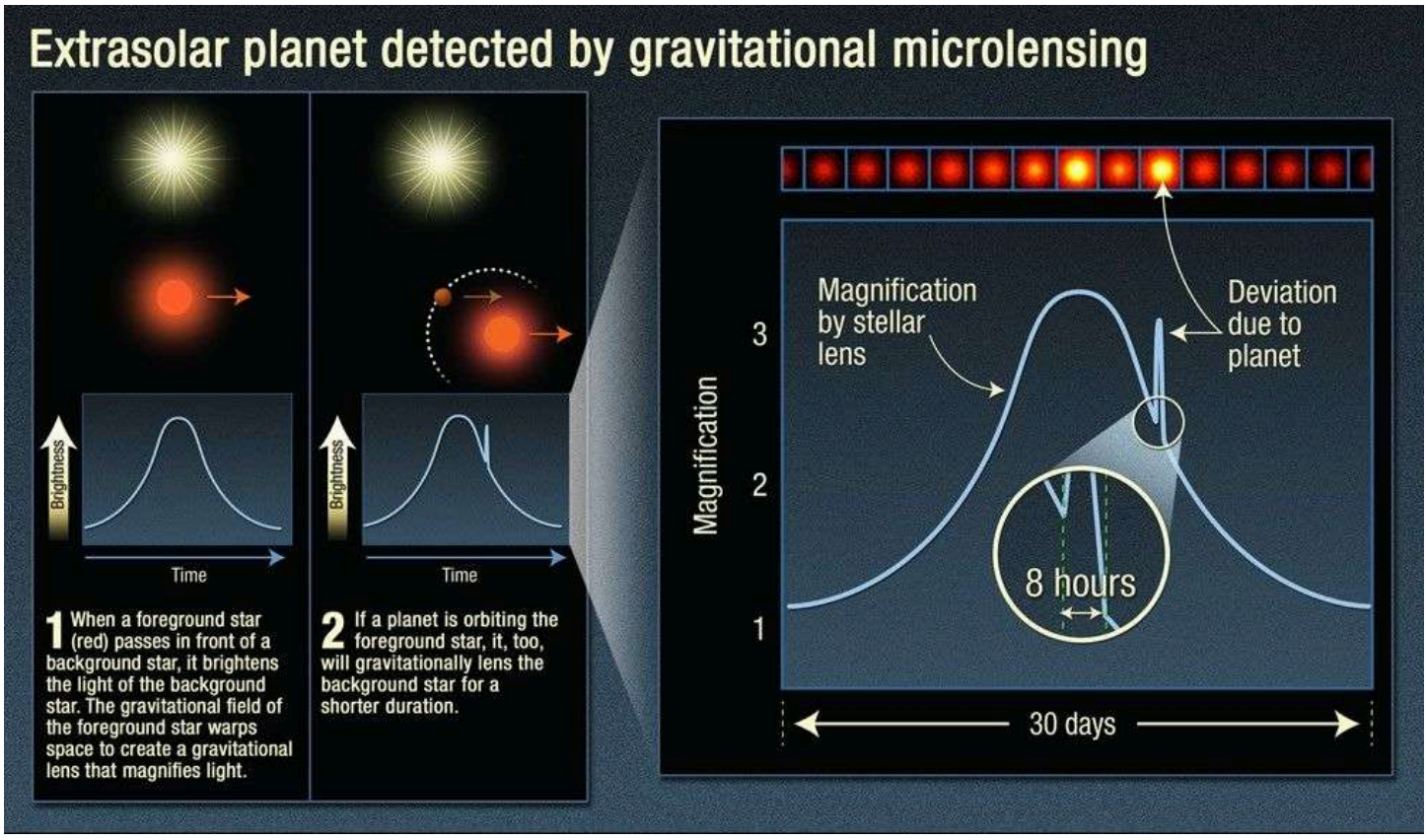
that expansion has changed over time. Roman's ability to survey enormous areas of the sky makes it particularly well suited for finding these distant supernovae.

Dark energy isn't the only cosmic mystery Roman will investigate. The telescope will also search for evidence of dark matter, the invisible material thought to make up much of the mass of galaxies and large-scale structures in the universe. Although dark matter does not emit or reflect light that we can directly observe, we can see its gravitational influence. Gravity bends the path of light as it travels through space. By carefully measuring how the light from distant galaxies is distorted, astronomers can create maps showing where dark matter is concentrated.

Perhaps one of Roman's most exciting missions will be its search for exoplanets. During its five-year mission, Roman is expected to spend more than a quarter of its observing time surveying the region around the Milky Way's galactic bulge. In a relatively narrow slice of this crowded region, an area roughly equivalent to the width of eight full Moons, Roman will observe hundreds of millions of stars.

Why observe so many stars?

Because Roman will be looking for a subtle phenomenon known as gravitational microlensing.



Credit: NASA, ESA, and K. Sahu (STScI)

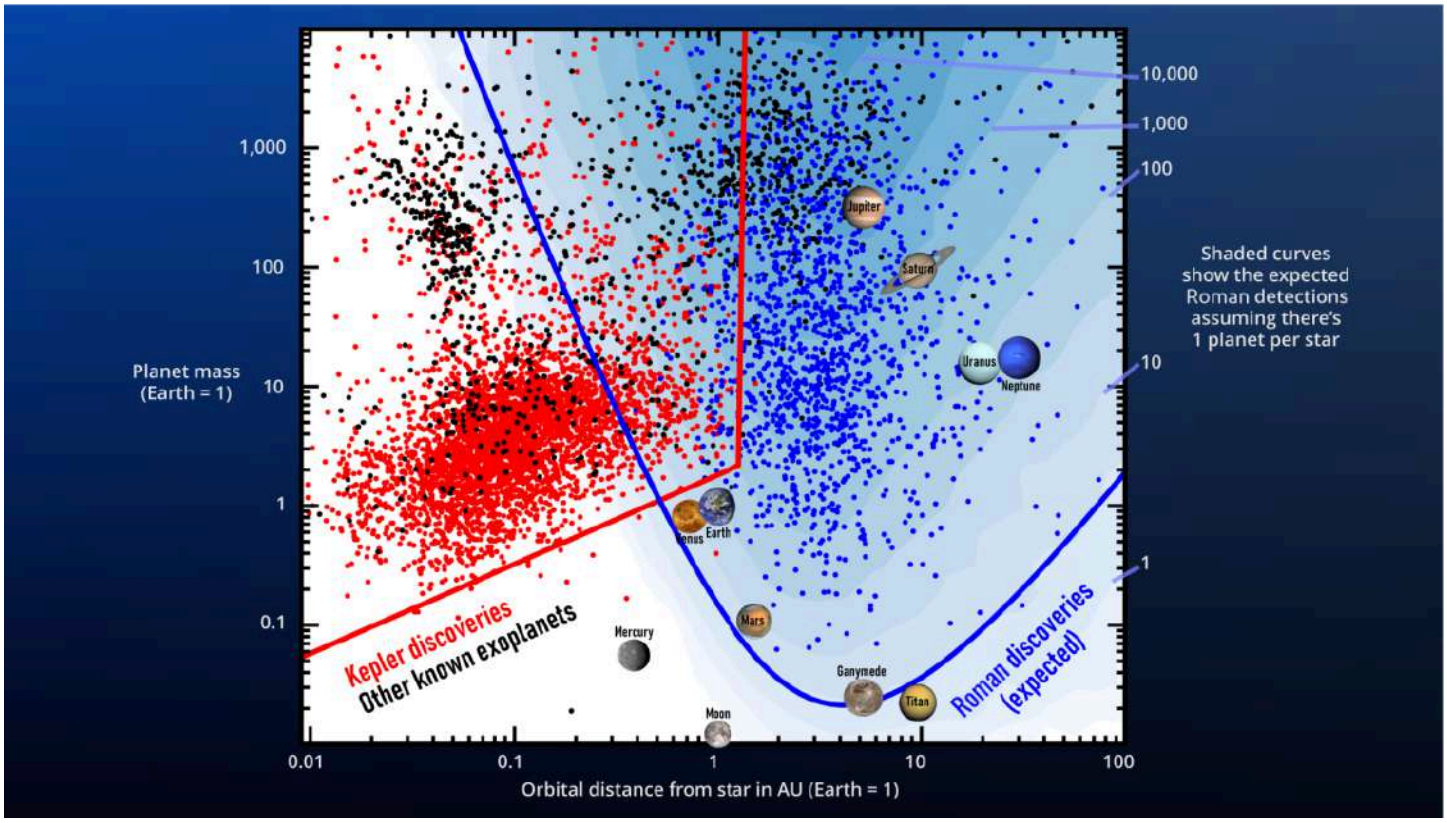
When two stars happen to line up closely from our perspective on Earth, the gravity of the foreground star bends and magnifies the light coming from the more distant star. The foreground star effectively acts as a

gravitational lens. If the star that acts as a lens has a planet orbiting it, the planet's gravity can produce a small additional change in the magnification. By detecting this brief disturbance, astronomers can infer the presence of the planet.

Microlensing is particularly exciting because it allows astronomers to find planets that are difficult to detect using other methods. It will be able to detect planets with masses comparable to Earth and Mars. It can also reveal planets orbiting much farther from their stars as well as rogue planets.

Interesting note, the transit method used to find the majority of the exoplanets that we have discovered to date would fail to detect any of the planets in our own solar system. The sensitivity of the technique skews our data to planets larger than the Earth that closely orbit their star. Microlensing will open up new possibilities.

Roman will use several techniques to search for exoplanets, including transits, gravitational microlensing, and direct imaging. NASA expects Roman to discover more than 100,000 exoplanets through these combined methods.



Kepler and other exoplanet search efforts have discovered thousands of large planets with small orbits, represented by the red and black dots on this chart. Roman will find planets with a much wider range of masses orbiting farther from their host star, shown by the blue dots. Credit: NASA / GSFC / Penny et al. (2019)

This article has only scratched the surface of the science that will be conducted with the Nancy Grace Roman Space Telescope. From the smallest planets to the largest structures in the universe, Roman will give astronomers a new way to explore the cosmos.

Its greatest strength may be its ability to see the universe on an enormous scale. Where Hubble and JWST can examine individual objects in extraordinary detail, Roman will survey vast regions of space and reveal patterns that are difficult to see through narrower observations. The resulting data will provide targets for other observatories to study in greater detail and will give astronomers an entirely new perspective on the universe.

Roman is therefore not simply another space telescope. It is a new kind of astronomical survey instrument. One designed to help us see the big picture of the cosmos.

For those interested in learning more, the links below provide an opportunity to explore Roman's mission, instruments, and planned science in greater detail.

Resources to Investigate Further:

- NASA Interactive Tour of Nancy Grace Roman Space Telescope
- Webpage for Roman by the Space Telescope Science Institute (STSci)
- Roman Science and Technical Overview - brochure created by STSci
- NASA's webpage for Nancy Grace Roman Space Telescope
- NASA's blog for Roman
- Video - Everything You Need to Know About NASA's Roman Space Telescope
- Video - Why NASA's new Roman Space Telescope is a Huge Deal
- Video - Finding Exoplanets Using Microlensing
- Comparison Info Sheet of Hubble, Roman, and JWST (click on image to enlarge)

Night Sky Network Online Webinar

Check out past webinars from the Night Sky Network.

McDonald Observatory

McDonald Observatory Livestream at 8:30 EST on September 16th will host a talk about Moon phases and eclipses.

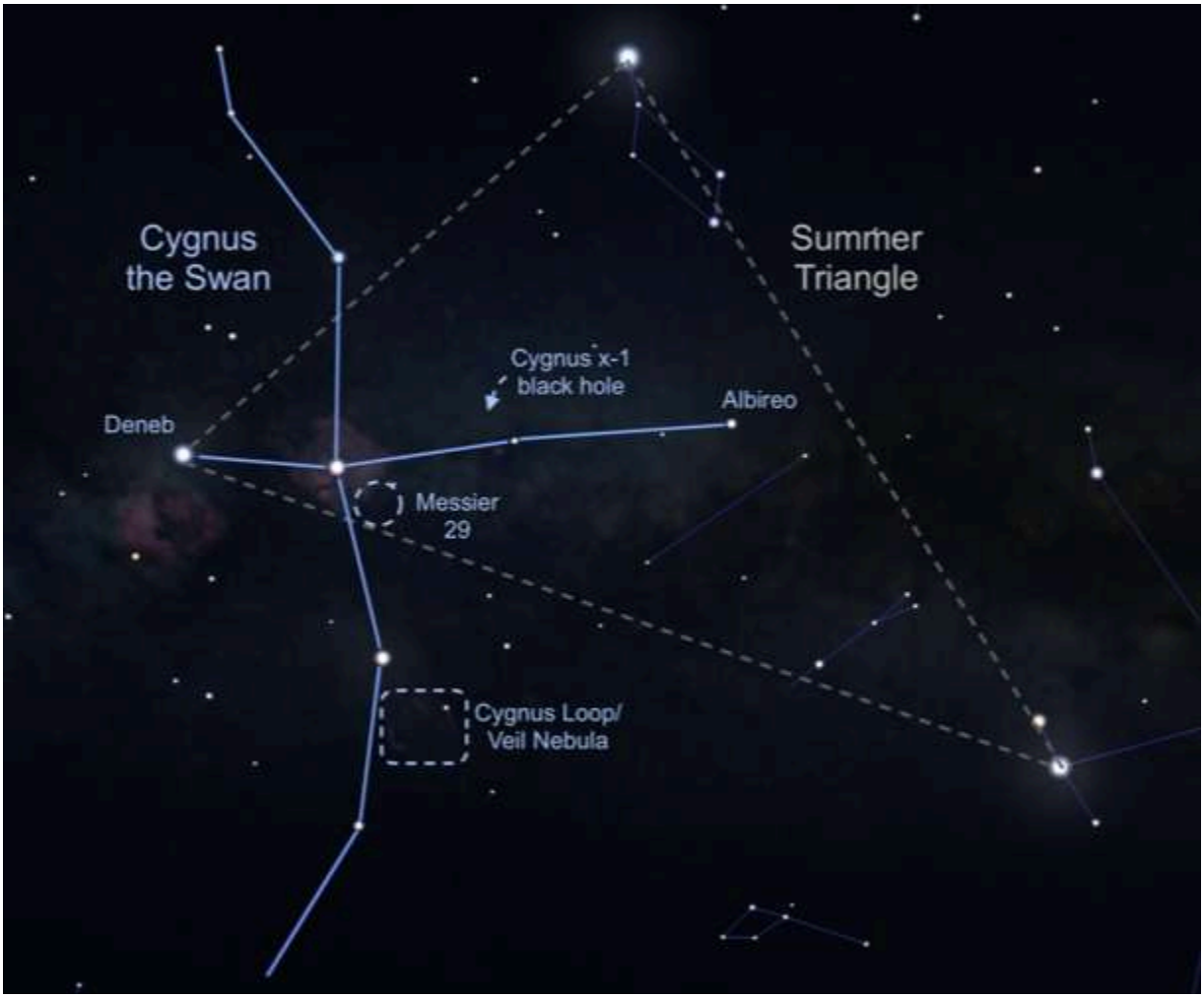
Observing

To find skywatching tips for this month, click on the following link to learn more.

Video: What's Up September 2026 Sky Watching Tips from NASA

NASA Night Sky Notes

Summer Triangle Corner: Deneb



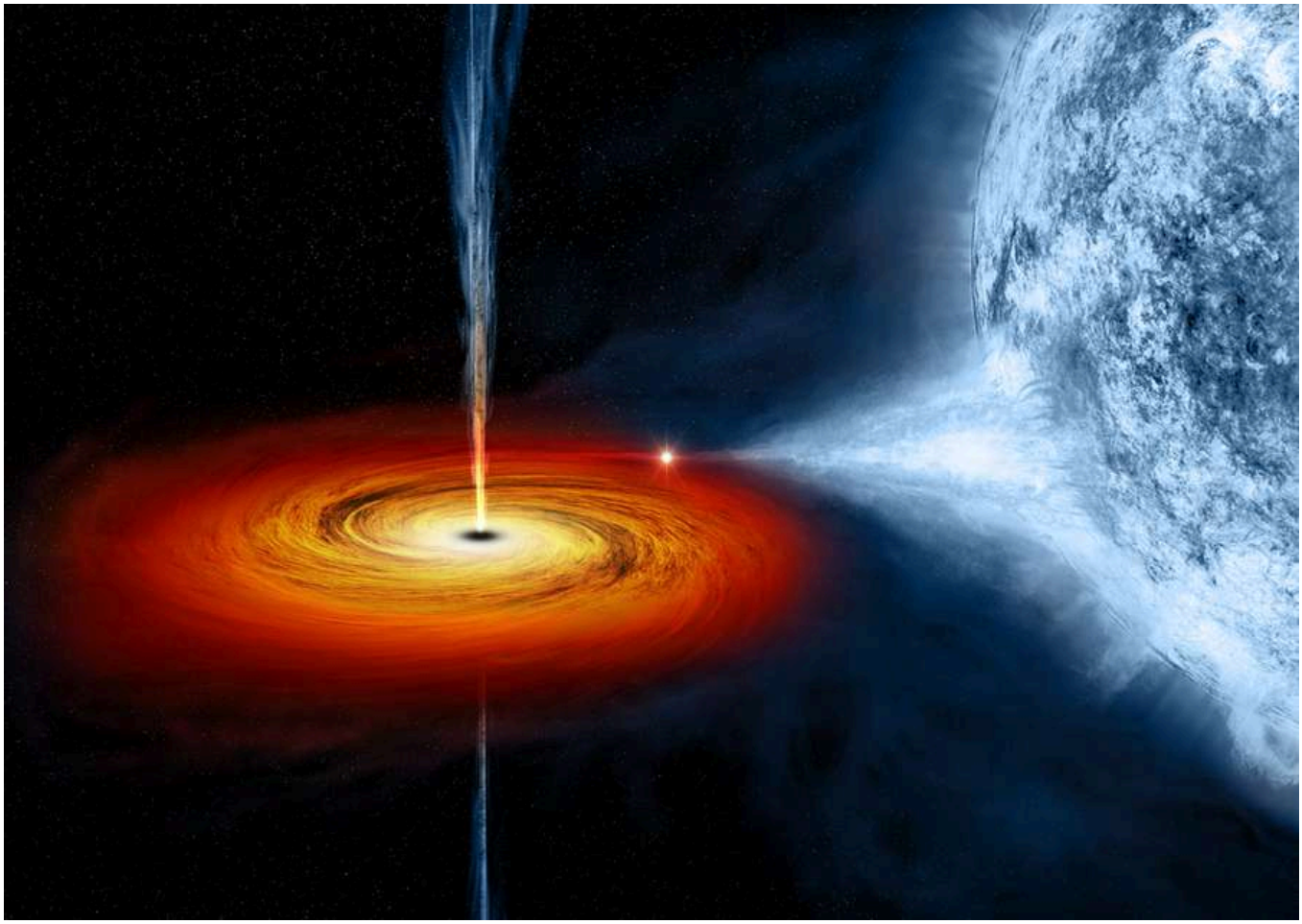
This image shows an illustration of the constellation Cygnus, Latin for "swan," in the night sky. The Cygnus Loop supernova remnant, also known as the Veil Nebula, is located near one of the swan's wings, outlined here in a rectangular box. Credit: NASA

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 northeasternmost 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 reddish 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).



The black hole named Cygnus X-1 formed when a large star caved in. This black hole pulls matter from the blue star beside it. Image: NASA, CXC, Melissa Weiss (CXC)

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.

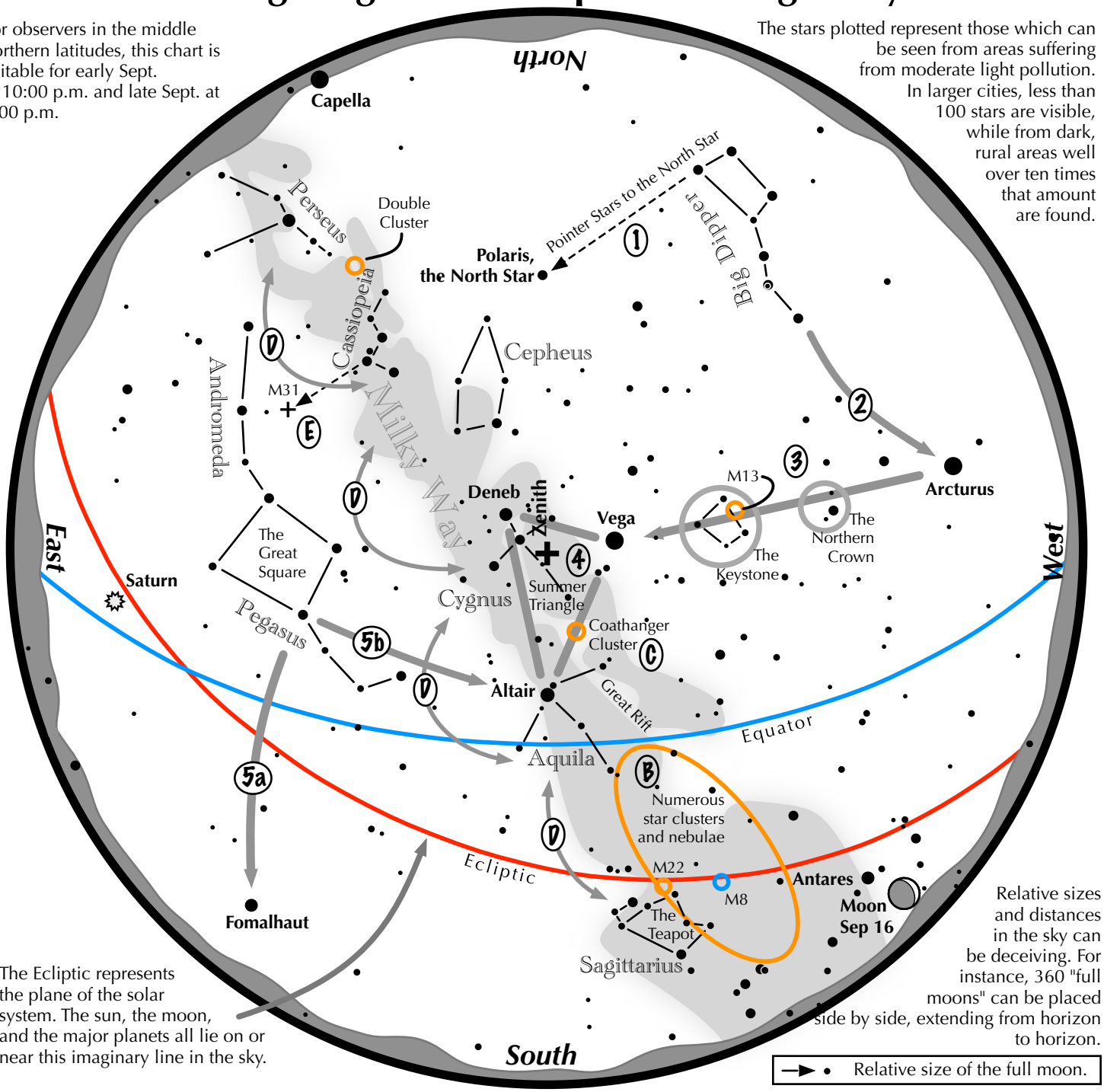
Check out the beautiful bird in your sky this evening, and you will be delighted to add Cygnus to your go-to summer viewing list and visit NASA's Black Hole Basics page to learn more!

Originally posted by Dave Prosper: May 2023
Last Updated by Kat Troche: July 2026

Navigating the mid September Night Sky 2026

For observers in the middle northern latitudes, this chart is suitable for early Sept. at 10:00 p.m. and late Sept. at 9:00 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 mid September 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. Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the September evening sky.
3. Nearly overhead shines a star of similar brightness as Arcturus, 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.
4. The stars of the summer triangle, Vega, Altair, and Deneb, shine overhead.
5. The westernmost two stars of the Great Square, which lies high in the east, point south to Fomalhaut. The southernmost two stars point west to Altair.

Binocular Highlights

A: On the western side of the Keystone glows the Great Hercules Cluster.
B: Between the bright stars 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, including the Great Rift.
E: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.

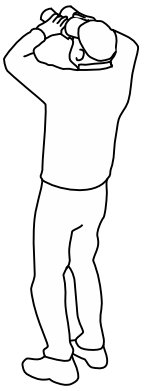
Astronomical League *www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.*

Galileo Observing Program Activity

All you need are 10x50 binoculars on a steady mount – and clear and reasonably dark skies!

Observe (and draw) ...

- the Pleiades star cluster visible from late fall through early spring,
- the changing phases of Venus,
- craters and surface markings on the moon,
- the Beehive star cluster (M44) in winter through mid spring,
- sunspots *(must use proper full–aperture solar filters)*,
- the changing positions of Jupiter's Galilean moons,
- Jupiter's Galilean moons in eclipse,
- a comet and track its path across the heavens,
- the stars of the Orion's Head Nebula (Lambda Orionis),
- the non-starlike quality of Saturn,
- and identify Neptune,



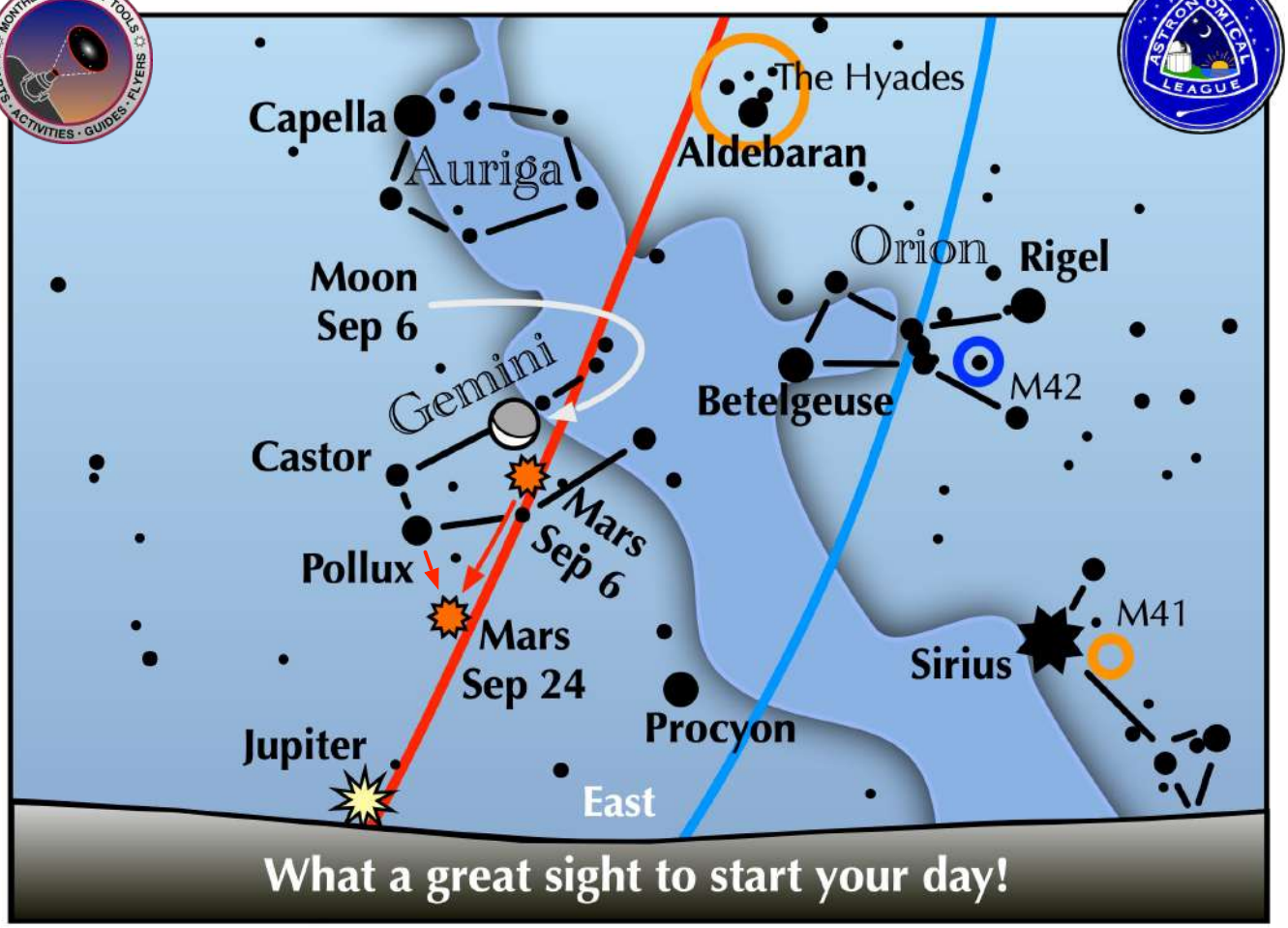
Optional ...

- aurora,
- supernova.

for all the details of this wonderful program, please visit:

https://www.astroleague.org/galileo-observing-program/

If you can catch only one celestial event in the morning this September, see one of these two.



September 6:
Celestial Parallelogram of Castor, Pollux, Mars, and the Moon
September 24:
Mars aligns with Castor and Pollux forming the Triplets of Gemini

Look in the east 90 minutes before sunrise on Sep. 6.

• The twin stars of Gemini – Castor and Pollux – along with Mars and the crescent moon, full with earthshine, form an attractive parallelogram.

• Jupiter peeks above the eastern horizon.

Again, look in the east 90 minutes before sunrise on Sep. 24.

• Mars aligns with Castor and Pollux, forming the Triplets of Gemini. Its brightness equals that of Pollux.