Keene Amateur Astronomers

The Newsletter for Keene Amateur Astronomers

Vol. 2025 No. 6 June 2025

The Lagoon Nebula

This image was created using 20 hours of exposure data from the Cerro Tololo Inter-American Observatory (CTIO),, part of NSF's NOIRLab in Chile. The bright, candy-colored glow comes from ionized gas and interstellar dust within the nebula. The dark regions, called Bok Globules, are dense, cold clouds of gas—prime sites for future star formation. Image Credit: SSRO/PROMPT & CTIO/NOIRLab/NSF/AURA

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Editor’s Message

June has started off with more promises of auroras. Perhaps there will be more opportunities for sightings later this month.

Saturn and Venus will be visible in the early morning sky. Mars continues to shine in the night sky making a close pass to Regulus in the constellation Leo on the 16th and 17th. June is also an excellent time to view the Milky Way under a dark sky. If you are planning a trip, consider one to the country away from city lights or to a certified dark sky place which can be found on this map. Plan to stay up late this month for observing as we approach the Summer Solstice and our longest day on the year on June 20th.

I am heading to Chile on the 26th. As part of ACEAP, I will be visiting a number of the large telescopes including the new Vera C. Rubin Observatory. I have included a high level overview of the innovative new technology that sets this telescope apart from prior ones. I hope to share with you more information after my trip. I will be posting images and videos to instagram at rolkesofia and to my youtube with the same name as time permits while I’m in Chile. When I return, I will document my travels and experiences at https://rolkesofia.wordpress.com/

The distribution of the July newsletter will be delayed due to my travels.

- Susan Rolke

Monthly Business Meeting

Our next meeting will take place on June 20th at 7:00 at the Observatory with a Zoom back up if it rains.

Astronomy Conventions, Retreats, and More

DarkSky International's Photo Contest - Capture the Dark, submit your entry by June 30th. There are multiple categories.

Stellafane, July 24 - 27 hosted by the Springfield Telescope Makers. For more details click here.

The Vera C. Rubin Observatory: Revolutionizing Astronomy

By Susan Rolke

The highly anticipated Vera C. Rubin Observatory is expected to begin operations and release its first image later this month. Jointly funded by the U.S. National Science Foundation and the Department of Energy's Office of Science, the observatory is located atop Cerro Pachón in Chile at an elevation of 8,684 feet.

The Rubin Observatory is revolutionary in both its design and mission. It features cutting-edge technology that redefines ground-based astronomy, including a unique three-mirror system fused into a single glass structure and the largest, most sensitive digital camera ever built. To manage the enormous volume of data collected each night, an entirely new computing infrastructure was developed.

Rubin Observatory's 8.4-meter mirror awaits coating. The change in the curvature of the surface between the primary and tertiary surfaces is visible as a ring midway toward the center of the glass. Credit: Vera C. Rubin Observatory

The Simonyi Survey Telescope, with its 8.4-meter aperture, delivers sharp images across a 3.5-degree field of view—wide enough to fit seven full moons side by side. Rubin's one of a kind mirror combines the primary and tertiary mirror into one. This unique mirror is a critical component of its mission to map the night sky. Its innovative design allows the telescope to rapidly shift between targets, capturing approximately 1,000 images every night.

Rubin's 8.4-meter Primary/tertiary Mirror with Reflective Coating   Credit: Rubin Observatory/NSF/AURA

The Vera C. Rubin Observatory will play a pivotal role in expanding our understanding of the universe and create an extensive catalog of objects in our solar system including Near Earth Objects. Rubin's primary mission is the Legacy Survey of Space and Time (LSST). Every five seconds, Rubin's powerful 3.2 gigapixel camera will capture a 15-second exposure, imaging the entire southern sky every three nights. This unprecedented survey will help unlock mysteries of dark matter, dark energy, asteroid tracking, supernovae, and more, marking a new era in time-domain astronomy.

Finished LSST Camera. LSST Camera Deputy Project Manager, Travis Lange, shines a flashlight into the [LSST Camera](#).

Credit: RubinObs/NOIRLab/SLAC/NSF /DOE/AURA/J. Ramseyer Orrell

A single image from Rubin would fill the space of 400 Ultra HD TVs. Due to the immense size and quantity of images captured, it will generate 20 terabytes of data every night. By the end of its 10-year mission, Rubin is expected to produce approximately 500 petabytes of processed data, which is roughly equivalent to all the words ever written in every language throughout history.

In order to make sense of the massive amount of data Rubin will produce, scientists have developed a type of artificial intelligence called a neural network. This is a form of AI designed to work a bit like the human brain. It uses layers of connected units that process information and learn patterns over time. This approach allows the system to quickly sort through huge amounts of data and identify important features, such as new asteroids, supernovae, or distant galaxies.

Credit: Rubin Observatory/NSF/AURA/B. Quint

The Rubin Observatory's night sky survey will establish a detailed baseline of the sky, allowing researchers to detect changes almost immediately. This is essential for identifying transient objects, celestial events or bodies that appear, disappear, or vary in brightness. (We previously explored this topic in our August 2024 newsletter.)

Rubin is expected to detect around 10 million changes in the sky every night, more than 100 times what previous surveys could capture!

So, what kinds of changes will it find? Some will be solar system objects like asteroids and comets, which move across the sky and shift position. But it is expected that most of these transient events will involve objects that change in brightness, such as exploding stars (supernovae), variable stars, or distant galaxies flaring into view.

The findings from Rubin will open the door to new research and discoveries with the vast amount of transient events it will capture as it sweeps the night sky.

Currently, the telescope is undergoing its final calibrations and preparations before its ‘first light’ and the anticipated release of its first image on June 23rd.

Video [Light Bounces Through the Rubin Mirrors]

Visit the [Vera C Rubin Observatory website]

Night Sky Network Online Webinar

Join NASA [Night Sky Network] Tuesday, July 22, 2025, at 9:00 PM Eastern along with Alena Gavrilenko to learn about NASA’s Lucy mission, an epic 12-year journey to explore 11 asteroids, including Jupiter’s Trojans.

Join NSN for an exciting presentation on NASA’s Lucy mission, the first spacecraft set to explore the Trojan Asteroids—ancient remnants from the early Solar System. Launched in 2021, Lucy is on a 12-year, 4-billion-mile journey to visit eight of these distant bodies, using advanced imaging and spectrometry to study their composition and history. The talk will highlight Lucy’s trajectory, innovative technologies, and how its discoveries may shed light on the origins of water and organic materials on Earth.

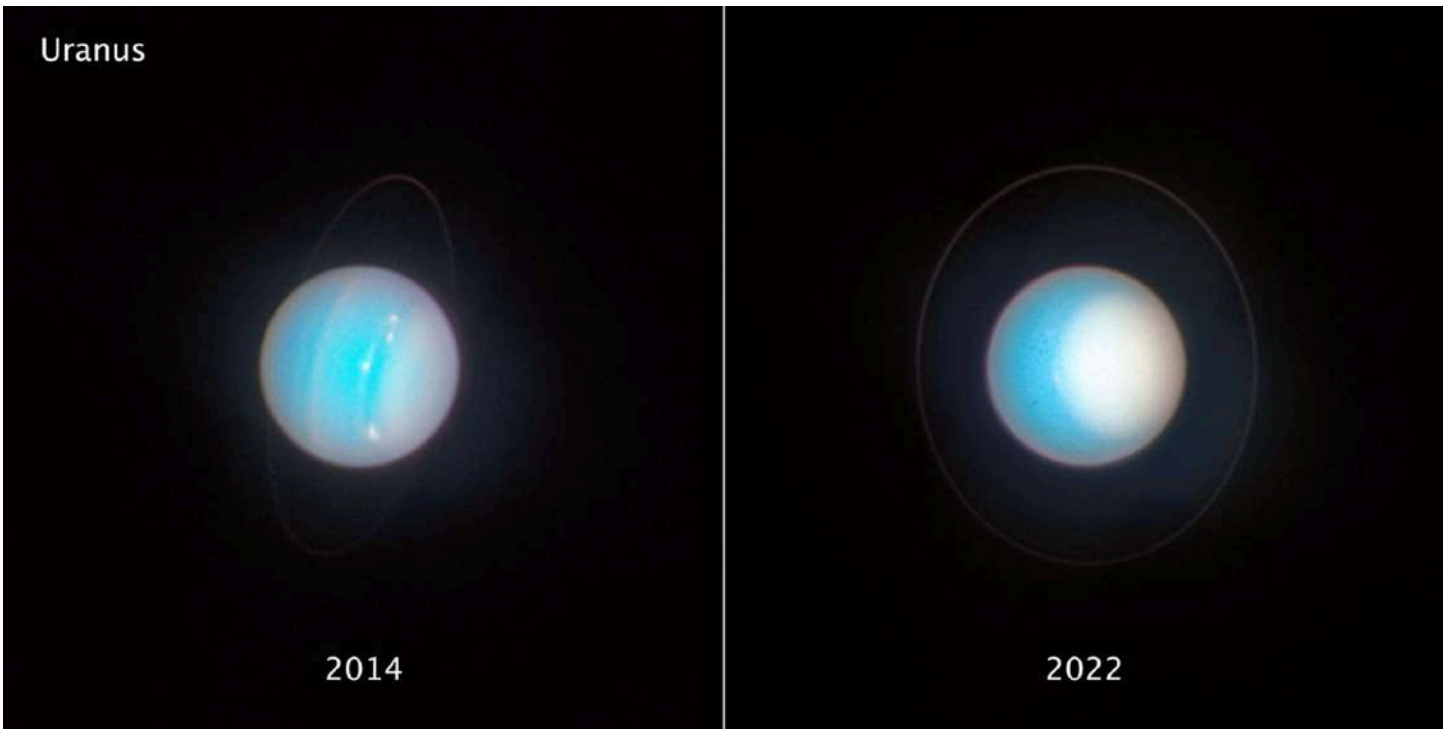
Alena Gavrilenko, a planetary science graduate student and Lucy Mission Ambassador, brings hands-on experience from NASA-affiliated research programs. Currently, she serves as a Lucy Mission Ambassador and enjoys sharing her passion for the Lucy Mission and space exploration with the community.

NASA Night Sky Notes, June 2025

This article is distributed by NASA's Night Sky Network (NSN).
The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

June's Night Sky Notes: Seasons of the Solar System

By: Kat Troche

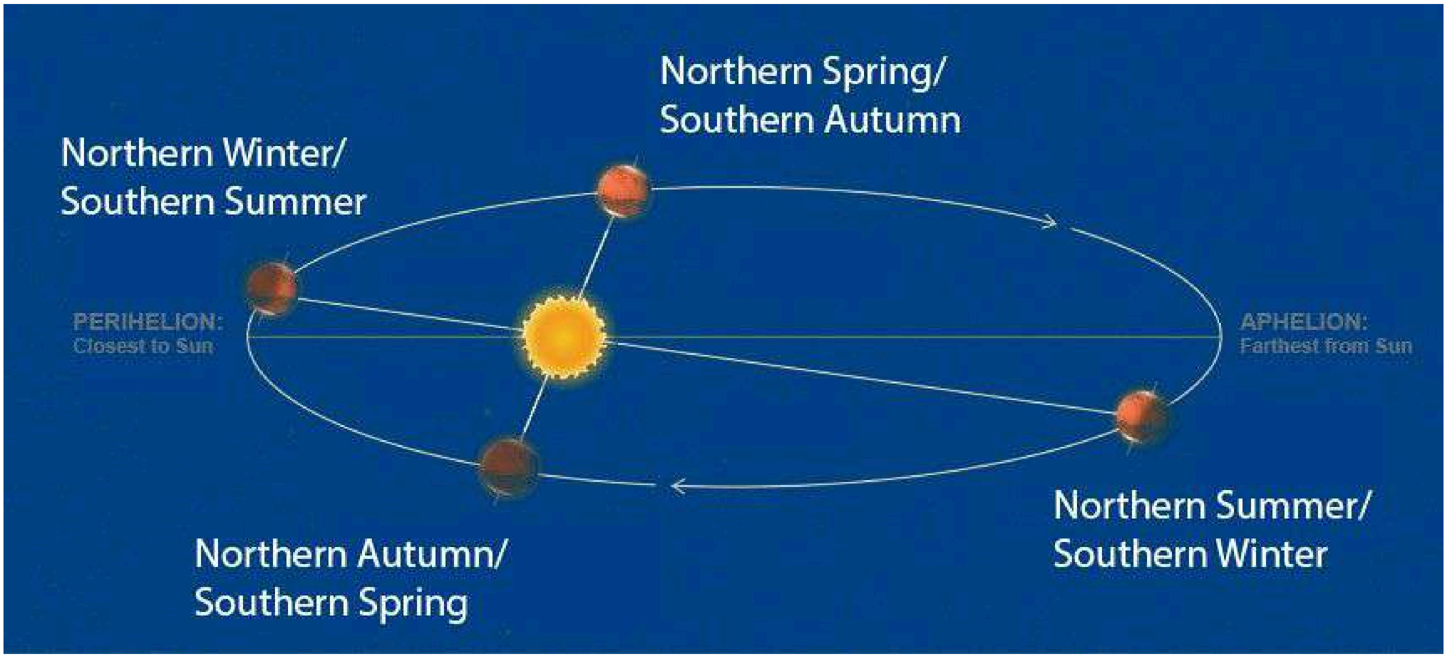


Uranus rolls on its side with an 84-year orbit and a tilt just 8° off its orbital plane. Its odd tilt may be from a lost moon or giant impacts. Each pole gets 42 years of sunlight or darkness. Voyager 2 saw the south pole lit; now Hubble sees the north pole facing the Sun. Credit: NASA, ESA, STScI, Amy Simon (NASA-GSFC), Michael Wong (UC Berkeley); Image Processing: Joseph DePasquale (STScI)

Here on Earth, we undergo a changing of seasons every three months. But what about the rest of the Solar System? What does a sunny day on Mars look like? How long would a winter on Neptune be? Let's take a tour of some other planets and ask ourselves what seasons might look like there.

Martian Autumn

Although Mars and Earth have nearly identical axial tilts, a year on Mars lasts 687 Earth days (nearly 2 Earth years) due to its average distance of 142 million miles from the Sun, making it late autumn on the red planet. This distance and a thin atmosphere make it less than perfect sweater weather. A recent weather report from Gale Crater boasted a high of -18 degrees Fahrenheit for the week of May 20, 2025.

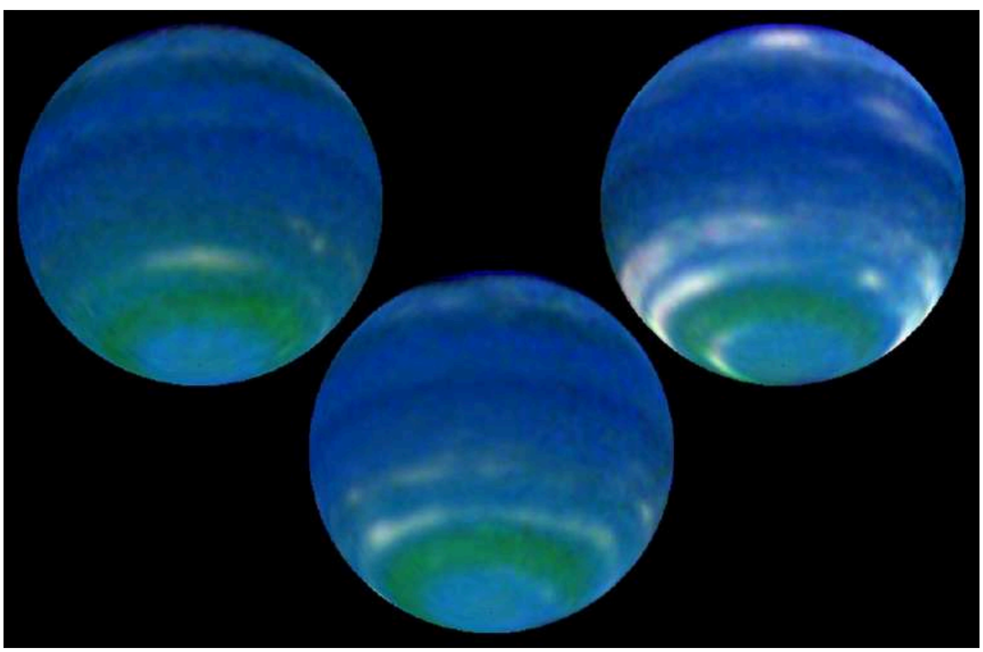


An artist's rendition of Mars' orbit around the Sun, and its seasons. Credit: NASA/JPL-Caltech

Seven Years of Summer

Saturn has a 27-degree tilt, very similar to the 25-degree tilt of Mars and the 23-degree tilt of Earth. But that is where the similarities end. With a 29-year orbit, a single season on the ringed planet lasts seven years. While we can't experience a Saturnian season, we can observe a ring plane crossing here on Earth instead. The most recent plane crossing took place in March 2025, allowing us to see Saturn's rings 'disappear' from view.

A Lifetime of Spring



NASA Hubble Space Telescope observations in August 2002 show that Neptune's brightness has increased significantly since 1996. The rise is due to an increase in the amount of clouds observed in the planet's southern hemisphere. Credit: NASA, L. Sromovsky, and P. Fry (University of Wisconsin-Madison)

Even further away from the Sun, each season on Neptune lasts over 40 years. Although changes are slower and less dramatic than on Earth, scientists have observed seasonal activity in Neptune's atmosphere. These images were taken between 1996 and 2002 with the Hubble Space Telescope, with brightness in the southern hemisphere indicating seasonal change.

As we welcome summer here on Earth, you can build a Suntrack model that helps demonstrate the path the Sun takes through the sky during the seasons. You can find even more fun activities and resources like this model on NASA's Wavelength and Energy activity.

Observing

To find out skywatching tips for this month, click on the following links (in blue and underlined) to learn more.

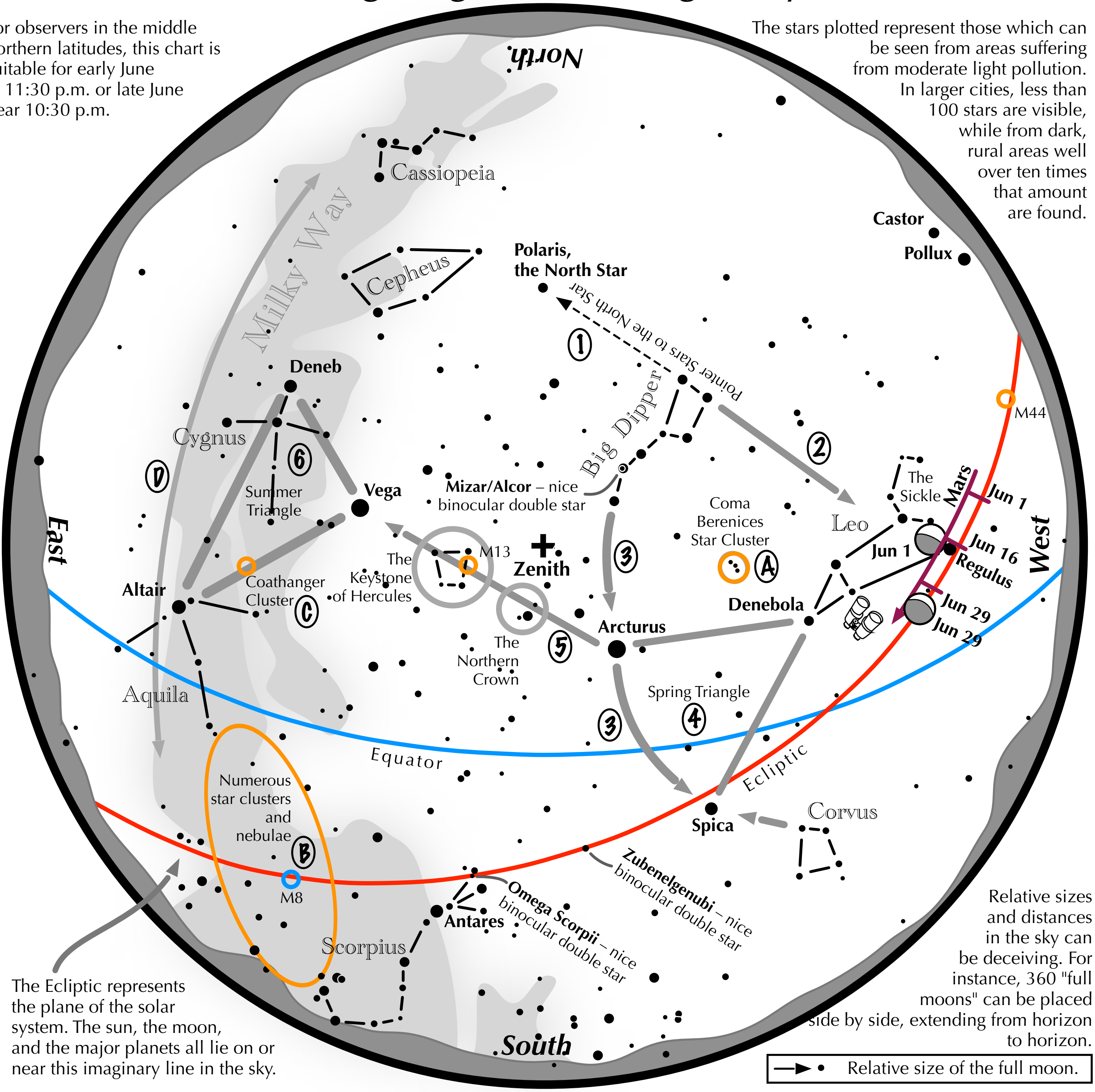
Video: What's Up June 2025 Sky Watching Tips from NASA

Full page charts for June are available on the following pages or you can access them at the Astronomical League's website **here**.

Navigating the June Night Sky

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 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 June 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 Draw another line in the opposite direction. It strikes the constellation Leo high in the west.

3 Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.

4 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

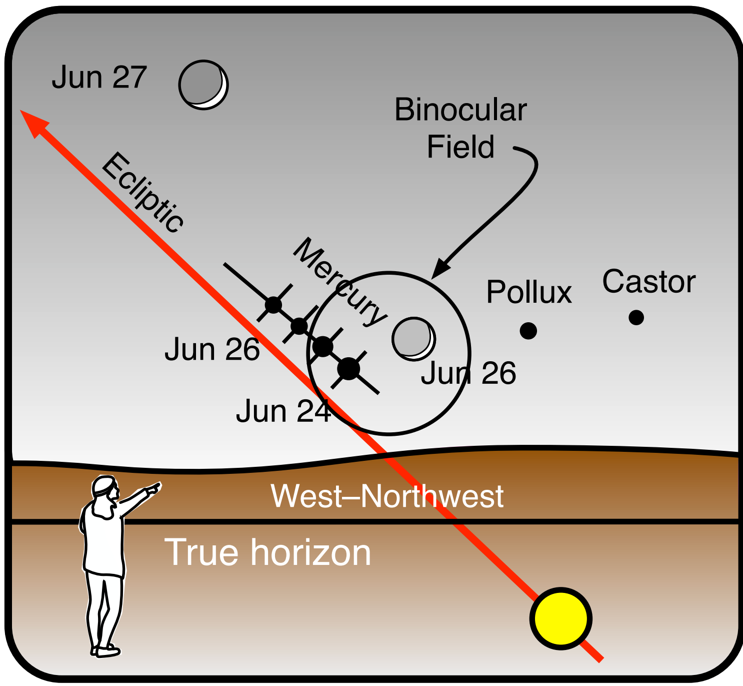
5 To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.

6 High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

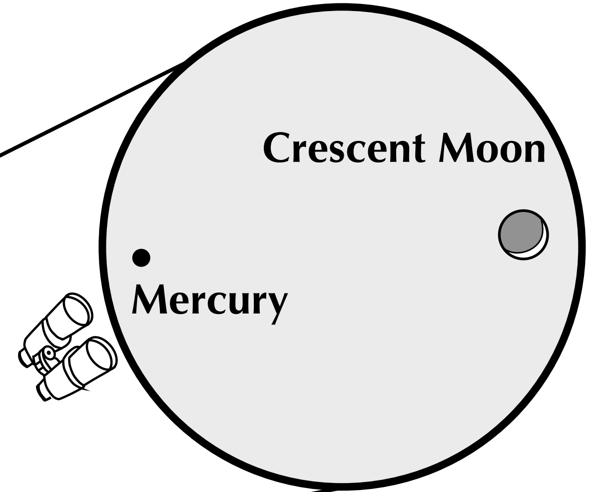
Binocular Highlights

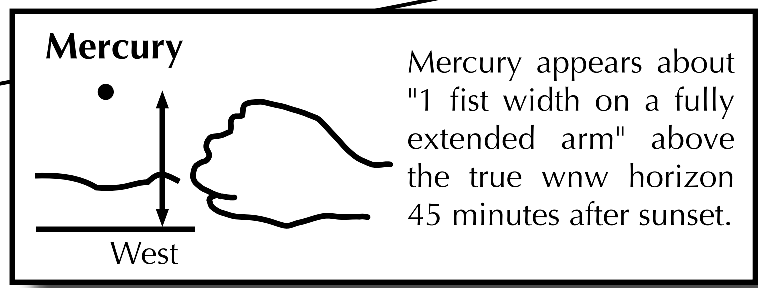
A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
B: Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
D. Sweep along the Milky Way for an astounding number of faint glows and dark bays.

Mercury, Castor & Pollux, and the young moon in the evening twilight



View through 10x50 binoculars on June 26





June 24 – June 27, 2025:
Mercury and the young crescent moon
45 minutes after sunset in the west-northwest

The young moon & Mercury in the evening twilight

Have you ever spotted Mercury? Many stargazers have not. The early evenings of June 24 – 27 present good opportunities to catch the elusive little planet. Look low into the western twilight 45 minutes after sunset.

- Using binoculars, look on June 24 for the stars Castor and Pollux in a line with Mercury.
- Two nights later, the very thin crescent Moon joins them, floating between Mercury and Pollux. The Moon and Mercury lie in the same binocular field. Can you see Earthshine on the Moon's dark side or is the twilight too bright?
- On June 27, a slightly thicker crescent Moon hangs above Mercury. Earthshine should be more easily visible.

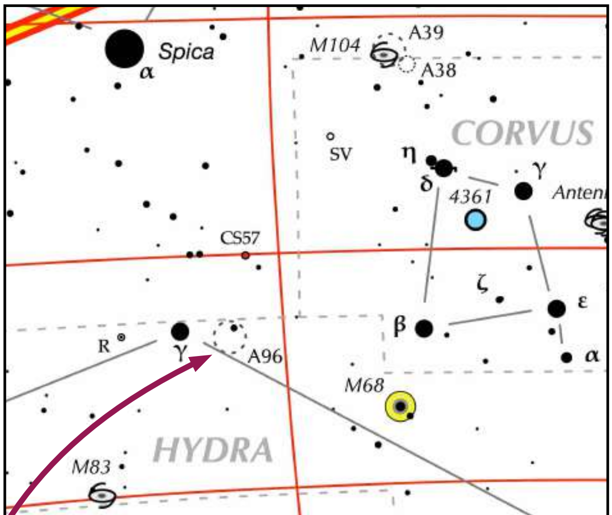
Seahorse Asterism

On the Astronomical League's Asterism list as no. 96

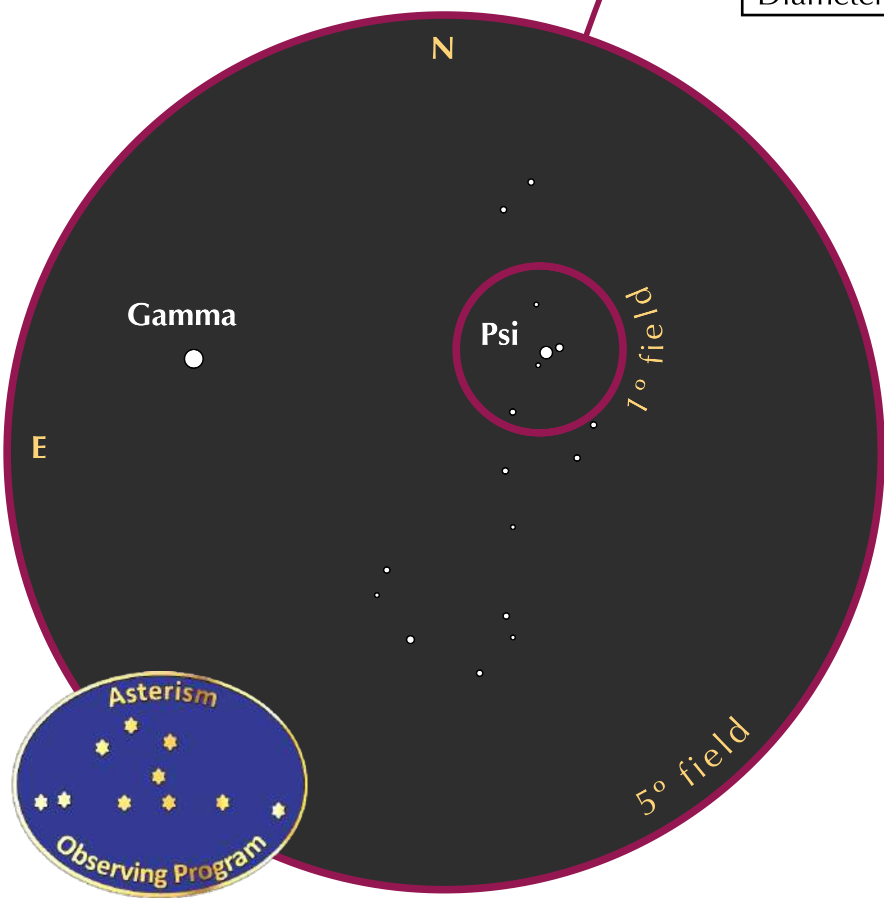
How to find the Seahorse ...

1. 10º south of Spica lies 3rd magnitude Gamma Hydrae. (10º is the angular width of your fist on your outstretched arm.)
2. Place Gamma at the center of the finder (or binocular) field.
3. At the west edge of the finder (or binocular) field lies the 4.9 magnitude Psi Hydrae.
4. Aim the finder (or binoculars) at Psi.
5. Follow the string of 7th, 8th, and 9th magnitude stars as it roughly traces the outline of a seahorse.

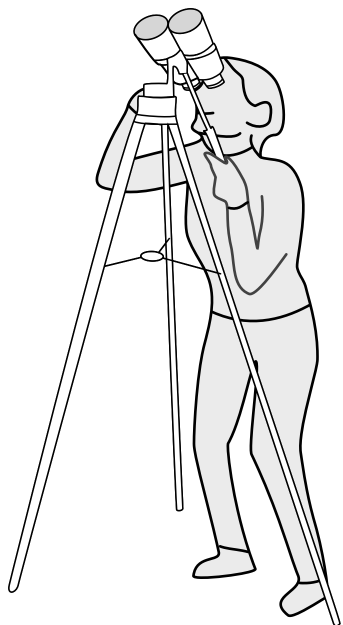
To see it through a finderscope or binoculars, clear, dark skies are a must!



96 Asterism: Seahorse
Magnitudes: 4.9 – 9.6
Diameter: 15 x 90 arc–minutes



Use a tripod to help bring in the asterism's 7th, 8th, and 9th magnitude stars.



 www.astroleague.org