Keene Amateur Astronomers

The Newsletter for Keene Amateur Astronomers

Vol. 2026 No. 8 August 2026

COSMOS Field

This exceptionally deep image from NSF–DOE Vera C. Rubin Observatory reveals the renowned COSMOS field and its surroundings in the constellation Sextans. The view is crowded with galaxies and galaxy clusters spanning an immense range of distances and cosmic ages, while only a handful of foreground stars belong to our own Milky Way. You can explore a more detailed zoomable image here. Credit: NSF–DOE Vera C. Rubin Observatory/NOIRLab/SLAC/AURA

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Editor's Message

I always think of August as a month filled with long summer evenings and watching for meteors. This is probably because of this month's well known Perseid Meteor shower. I have countless memories of watching the sky hoping to see a 'falling star.' A tradition I carried on with my own children which included watching in our backyard to sitting on the beach at night in Maine.

This year the Perseid's will peak on the evening of August 12th and morning of the 13th. This also coincides with the solar eclipse which means the Moon will be absent from the night sky and will not interfere with viewing. The meteors will appear to radiate from the Perseus constellation in the Northeast once it clears the horizon but they can appear anywhere so kick back and enjoy the night sky. There is the potential to see 80 to 100 meteors an hour under dark sky conditions. If you are fortunate, you might even see a fireball.

Unfortunately, we will only experience a partial solar eclipse in the United States. If you still have your solar eclipse viewing glasses from 2024 you can use them to view the Sun. It is also an excellent opportunity to use a solar telescope to view the Sun. Locally, the partial eclipse will begin at 1 pm and reach a maximum at 1:52 pm with roughly 20% of the Sun covered. In order to view Totality you would need to travel to Iceland or Spain.

Venus will remain very bright this month. Check out the Astronomical League chart at the end of the newsletter to learn how to view its thin crescent with the help of filters.

Saturn will be an excellent target this month. Its rings are once again becoming visible after disappearing earlier this year due to its tilt relative to us. Mars will be visible before dawn, rising with the Waning Crescent Moon above it on the 8th. Mercury will also be visible in the morning until mid month. Mercury will appear with a thin Crescent Moon on the 11th and appear 0.5 degrees from Jupiter on the 15th.

Solar and lunar eclipses come hand in hand. The alignment of the Sun and Moon that resulted in the solar eclipse on the 12th will be followed by an alignment of the Sun and Earth on the 28th. This will be a partial lunar eclipse resulting in the majority of the Moon eclipsed shortly after midnight of the 27th at 12:12 am on the 28th. The Moon will be a lovely rusty red due to the scattering of light and should be a magnificent sight.

Conversation at our most recent business meeting touched briefly on SETI. This provided the initial seeds for my article this month which I explored when several articles on how the search is changing ended up in my inbox. The public view of SETI has been largely shaped by events prior to its formation, Hollywood, and science fiction.

SETI Institute was founded in 1984. In addition to astronomy, astrobiology and searching for technosignals from aliens, SETI Institute (which I will be referring to as SETI) is involved with educational outreach including overseeing NASA's Airborne Astronomy Ambassador program, connecting college professors with NASA scientists, providing educational materials for astronomy and astrobiology, and more. This month I took a deep dive into how SETI has conducted its search for alien civilizations and how that is changing. I hope you enjoy the article and it engages your curiosity. I have also included a link for SETI's new WOW! Literary Award for emerging writers and poets.

Great objects to view this month:

- **Messier 27 - The Dumbbell Nebula** located in Vulcepula is a planetary nebula. It will appear as a small gray patch with binoculars but its hourglass shape can be seen with a telescope. A large telescope or smart scope will resolve it into its colors of green and red.

- **NGC 7000 - The North American Nebula** - an emission nebula in Cygnus. This large nebula spans 2 degrees across or the equivalent of 4 full moons and glows faintly along the band of the Milky Way. It can be seen with the naked eye under dark sky conditions and binoculars and small telescopes will reveal its hazy outline.

- **Messier 2** - a globular cluster in Aquarius. It has a 6.6 magnitude and can be found with binoculars. Through a telescope it will appear as a tightly packed core 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 on August 21st at 7 pm at the Observatory followed by observing.

Astronomy Conventions, Retreats, and More

Stellafane will be held August 13th - 16th. You can learn more and buy tickets for the event at their new website dedicated to their 90th convention.

Acadia Night Sky Program is presented by park rangers every week on Sunday and Wednesday at 9:00 PM from July 15, 2026 to August 12, 2026. Join the rangers at Sand Beach to view and learn about Acadia's amazing night sky!

Adirondack Astronomy Retreat in Westport, NY will take place from August 11 - 13.

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.

Are We Listening to the Right Frequency?

By Susan Rolke

Are we alone in the Milky Way? That simple question lies at the heart of the Search for Extraterrestrial Intelligence (SETI). It is one of the most profound questions humanity can ask, both as a civilization and as individuals. If life exists elsewhere in our galaxy, it would fundamentally change our understanding of our place in the universe. If we are alone, that realization is equally profound. It is this search for answers that continues to drive SETI.

SETI researchers revisited astronomical data taken by the ALMA telescope high in the Chajnantor desert plateau above Chile. Credit: ALMA / Alex Pérez

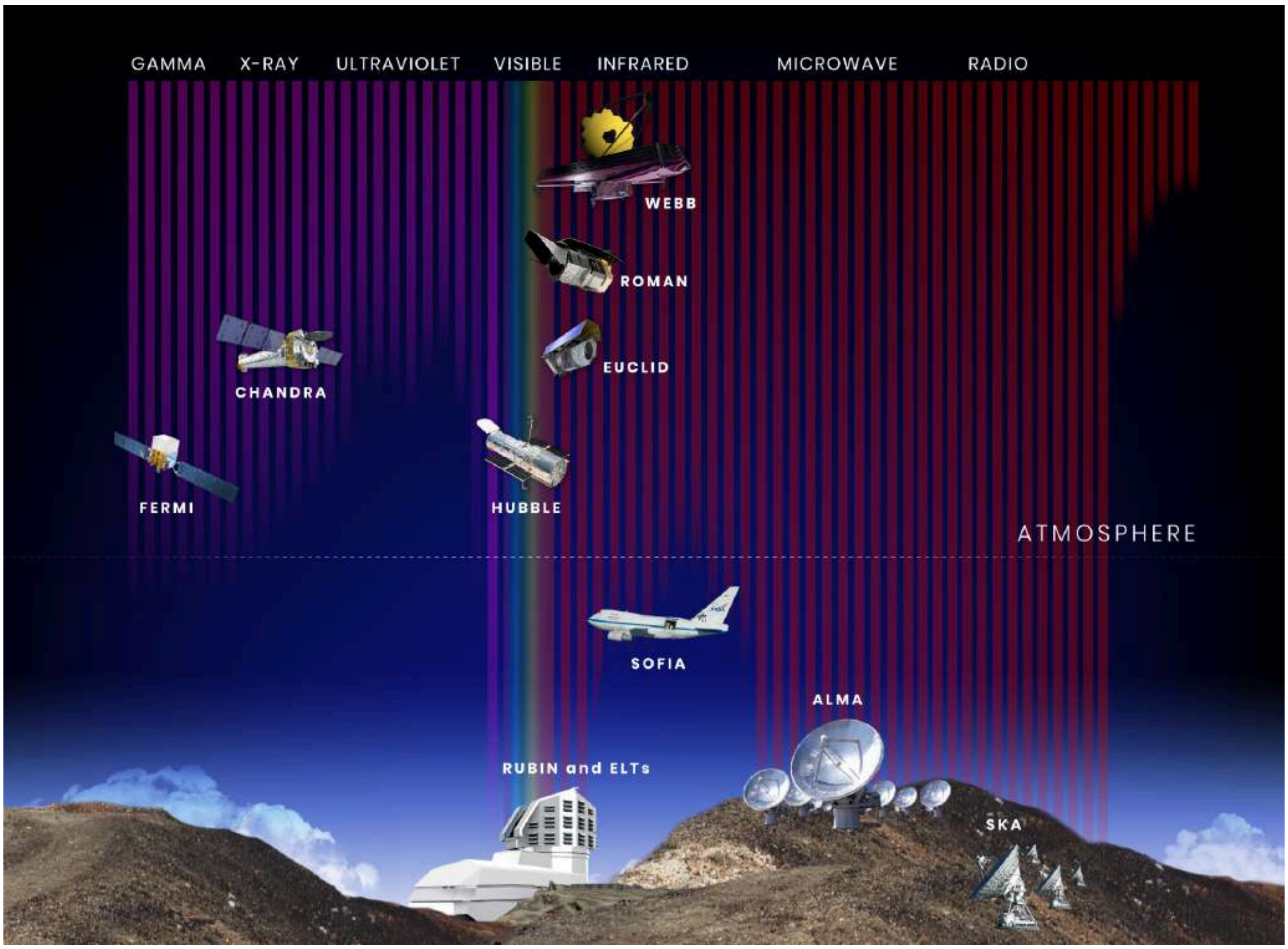
For more than 50 years, SETI has searched for evidence of intelligent life by listening for signals in a very narrow band of radio frequencies. In addition, optical SETI searches for laser or intentional pulsating light signals. Yet despite decades of searching, no confirmed signal has been detected. Today, astronomers are beginning to wonder if they have been listening to the wrong frequency.

So how did we get here? Why have we only been focusing on a narrow range of frequencies?

To understand why SETI has concentrated on such a small portion of the electromagnetic spectrum, we first need to consider the question which researchers several decades ago based their answers upon. The question they asked themselves was how would an advanced civilization attempt to communicate with another civilization across the vast distances between the stars?

One of the first challenges a communicating civilization would need to overcome is distance. As a transmission of light or radio waves travels through space, it spreads out over an ever increasing volume of space. As a result, its intensity rapidly decreases with distance, following a principle known as the inverse square law. If the distance to the source doubles, the signal reduces to one quarter its original strength. Triple the distance and it falls to one ninth its original intensity. At four times the distance, only one sixteenth of the original transmission would arrive at a given point. Over the enormous distances between stars, even a powerful transmission can diminish to almost nothing.

The second challenge is choosing the right wavelength. Any signal would need to be distinguishable from the emissions created by natural phenomena. Additionally, it must survive not only its journey through the gas and dust between the stars, but also be able to pass through a planet's atmosphere. Our planet's atmosphere blocks large parts of the electromagnetic spectrum, effectively shielding us from the vast majority of dangerous wavelengths. It is also why astronomers build their observatories on mountains, develop flying observatories such as SOFIA, or locate telescopes in space.



Astronomers typically rely on data from multiple ground- and space-based telescopes to fully understand the objects and phenomena they are studying. This illustration shows the wavelength sensitivity of a number of current and future space- and ground-based observatories, along with their position relative to the ground and to Earth's atmosphere. The wavelength bands are arranged from shortest (gamma rays) to longest (radio waves). The vertical color bars show the relative penetration of each band of light through Earth's atmosphere. Credit: NASA, STScI

The challenges of interstellar communication led astronomers to conclude that only a small portion of the electromagnetic spectrum would be practical for broadcasting a signal. As a result the majority of SETI searches have focused on a narrow range of the radio spectrum known as the ‘water hole.’

The name comes from two important substances in the universe, hydrogen and hydroxyl (OH). Hydrogen is the most common element in the universe. Neutral hydrogen naturally emits radio waves at a wavelength of 21 centimeters (1,420 MHz) through a quantum process known as the spin-flip transition of its lone electron. Hydroxyl, composed of one hydrogen and one oxygen atom, emits radio waves at approximately 18 centimeters (1,612–1,720 MHz). Together, hydrogen and hydroxyl form water, a molecule that is essential for life as we know it. Assuming every technologically advanced civilization would almost certainly recognize the importance of both hydrogen and water, astronomers reasoned that this quiet region of the radio spectrum would be a logical "meeting place" for civilizations attempting to communicate.

The ‘water hole’ offers several practical advantages as well. Radio waves at these frequencies can travel through the interstellar medium and penetrate Earth's atmosphere. They also lie within a naturally quiet part of the radio spectrum, making an artificial signal easier to distinguish from background noise. By these assumptions and constraints, these characteristics made this narrow bandwidth an ideal place for an alien civilization to broadcast a signal.

While the majority of the SETI search has centered around the ‘water hole’ it isn’t the only part of the spectrum that has been monitored. Other frequencies have been ‘listened’ to over the years. The 42 radio antennae that make up the Allen Telescope Array, which is run by SETI and the University of California, is conducting a survey of nearby stars at a frequency of pi times 1,420 MHz. A frequency chosen because it is based on the universal mathematical constant π multiplied by the frequency of the hydrogen line.

For decades, these searches were guided by one important assumption: a civilization trying to announce its presence would broadcast a signal broadly in many directions, hoping that someone, somewhere, would hear it. If that were true, concentrating on the most logical and efficient communication frequencies made perfect sense.

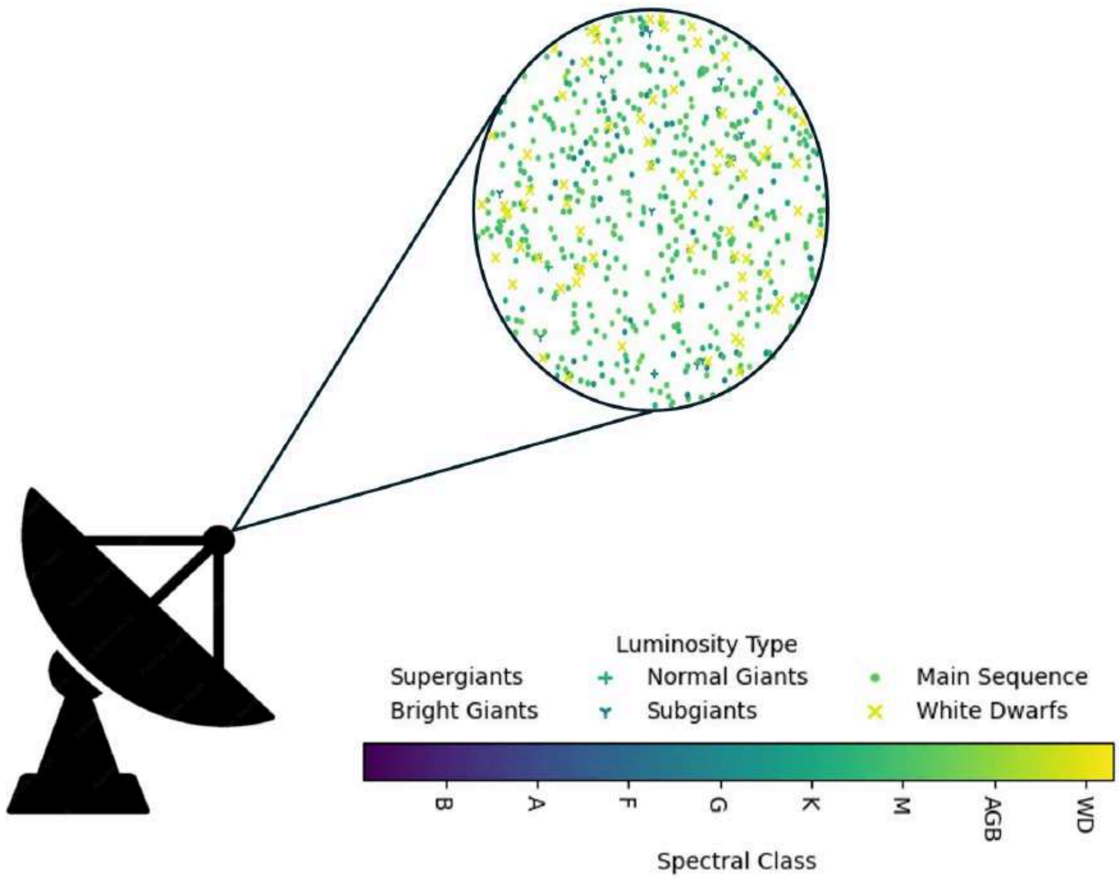
Now, that assumption is changing.

Over the past two decades, astronomers have discovered thousands of exoplanets and have begun identifying worlds that may be capable of supporting life. An advanced civilization would likely possess similar, or far superior, capabilities. Rather than transmitting a beacon in every direction, it could identify promising planets with liquid water and oxygen-rich atmospheres and send a powerful, directed signal to those worlds. Earth would be identified as one of those potential worlds that might support life.

Assuming any advanced civilization looking to establish contact with other worlds knows where to look, the answer to the question begins to change. They would no longer need to limit their broadcast to a narrow range of radio frequencies. A directed transmission at a potential exoplanet could use a much broader range of frequencies across the electromagnetic spectrum and carry far more information.

If SETI researchers are correct that technologically advanced civilizations might use a broader range of frequencies, exciting new opportunities emerge. Instead of building new observatories, researchers can expand their search by analyzing the enormous archives of observations data that already exist. Data gathered for one scientific purpose often contains important data for other later research projects. There is a possibility that archived data contains overlooked technosignatures from another civilization.

This idea is at the heart of new research presented at the Royal Astronomical Society's National Astronomy Meeting by Louisa Mason, a PhD researcher at the University of Manchester. Mason's work expands the search for technosignatures by analyzing archived observations from the Atacama Large Millimeter/submillimeter Array (ALMA). To date, four archived data sets have been analyzed for technosignatures, but so far no signal has been found. This study demonstrates the enormous potential of mining existing astronomical data for evidence of extraterrestrial technology.



A single radio telescope observation records not only the intended target star but also every other star within its field of view. This "stellar bycatch" greatly increases the number of stars that may have already been searched for technosignatures. Credit: Louisa Mason.

Mason also recognized another important limitation in previous SETI surveys which underestimated the number of stars surveyed. When a radio telescope points toward a single target star, it simultaneously collects data from everything within its field of view. That result illustrates an important point. Every radio observation may contain far more information than originally recognized. A telescope aimed at one star is, in effect, conducting a survey of a multitude of other stars lying in the same direction.

Traditional estimates of how many stars have actually been surveyed relied primarily on star catalogs such as Gaia, counting only stars that had already been identified. Instead, Mason used the Besançon Galactic Model, a sophisticated simulation of the Milky Way that estimates the total stellar population, including stars that are too distant, too faint, or too crowded to appear in existing catalogs. Applying this model to 1,327 targeted observations dramatically changed the picture. Applying this new model expanded the estimated number of stars surveyed from 288,000 to 6.1 million stars.

The expansion of where to look for a signal opens up new possibilities. Instead of waiting years to collect new observations, SETI researchers can immediately begin exploring existing data sets across a broader range of frequencies. Modern computational tools can be employed to help researchers analyze the vast amount of data that has been collected for technosignatures that prior researchers were never looking for.

What if we still fail to find anything in our expanded search? Does that mean we are alone?

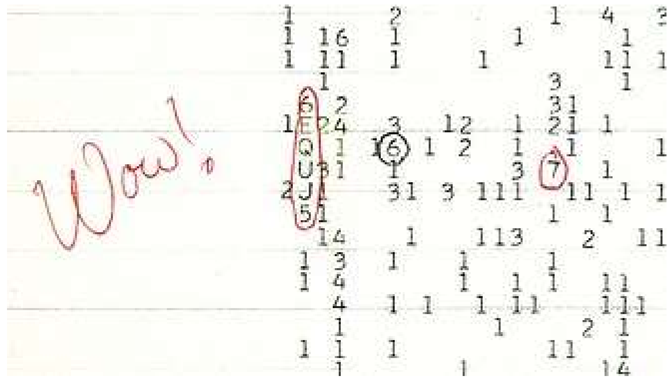
Not necessarily.

Failing to detect a signal would simply mean we have not detected a technological civilization actively trying to communicate with us. It would not rule out the existence of intelligent life elsewhere in our galaxy. Instead, it would provide us with more valuable scientific information to better refine estimates in the Drake Equation, specifically the term that estimates the number of civilizations capable of communicating across interstellar distances.

There is another possibility. We assume that other civilizations want to communicate with other worlds. What if they, like us, are mainly monitoring the stars for a signal?

SETI passively monitors space for a signal. However, prior to the formation of SETI, a group of scientists from Cornell University and Arecibo collaborated on creating an interstellar radio message in binary that would include information on humanity and the Earth. In 1974 a radio signal containing this message, now known as the Arecibo message, was directed toward globular cluster M13. The transmission was designed primarily as a demonstration of the telescope's capabilities rather than as a genuine attempt to contact another civilization. Several other transmissions have been sent over the years but attempts have been intermittent and future transmissions remain a highly controversial topic.

Although we have not discovered evidence of an alien race, one of the most famous signals continues to captivate the public’s imagination. In August of 1977 a strong 72 second radio signal was detected by Ohio State Radio Observatory as part of a routine sky survey. This signal has been dubbed the Wow! signal. It remains the most famous single event radio transmission recorded. Its mysterious origin has remained a source of speculation. However, recent papers have proposed several viable transient astronomy phenomena including a rare hydrogen flare energized by a magnetar.



The Wow! signal represented as "6EQUJ5". Credit: Big Ear Radio Observatory and North American AstroPhysical Observatory (NAAPO).

Whether SETI eventually detects a technosignature or not, the search itself is worthwhile. Every observation teaches us something about our galaxy, about the prevalence of communicating civilizations, and about the assumptions we make when searching for them. Along the way, the search has driven advances in astronomy and our understanding of the cosmos.

If we one day detect a signal from another civilization, it would forever change humanity's place in the universe. If we never do, the search will still have contributed to our understanding of the Milky Way and perhaps given us a greater appreciation for the extraordinary rarity and beauty of life on Earth. Either outcome would teach us something profound about our place in the cosmos.

Resources:

- Article Alien Signals May Be Hiding Where We Rarely Listen, Science Daily
- Video - A New Way to Search for Aliens from the SETI Institute .
- Article in the Astrophysical Journal Broadband Searches for Extraterrestrial Technological Intelligence: A New Strategy to Find Nearby Alien Civilizations by B. Zuckerman, April 2026
- WOW! Literary Award information

Night Sky Network Online Webinar

Check out past webinars from the Night Sky Network.

McDonald Observatory

McDonald Observatory Livestream at 10:30 EST on August 12th will host a talk about exoplanets, how we find them, and enjoy live views (if weather permits) of several targets through a 16in telescope.

If you missed last month's talk on eclipses, you can find it here.

Observing

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

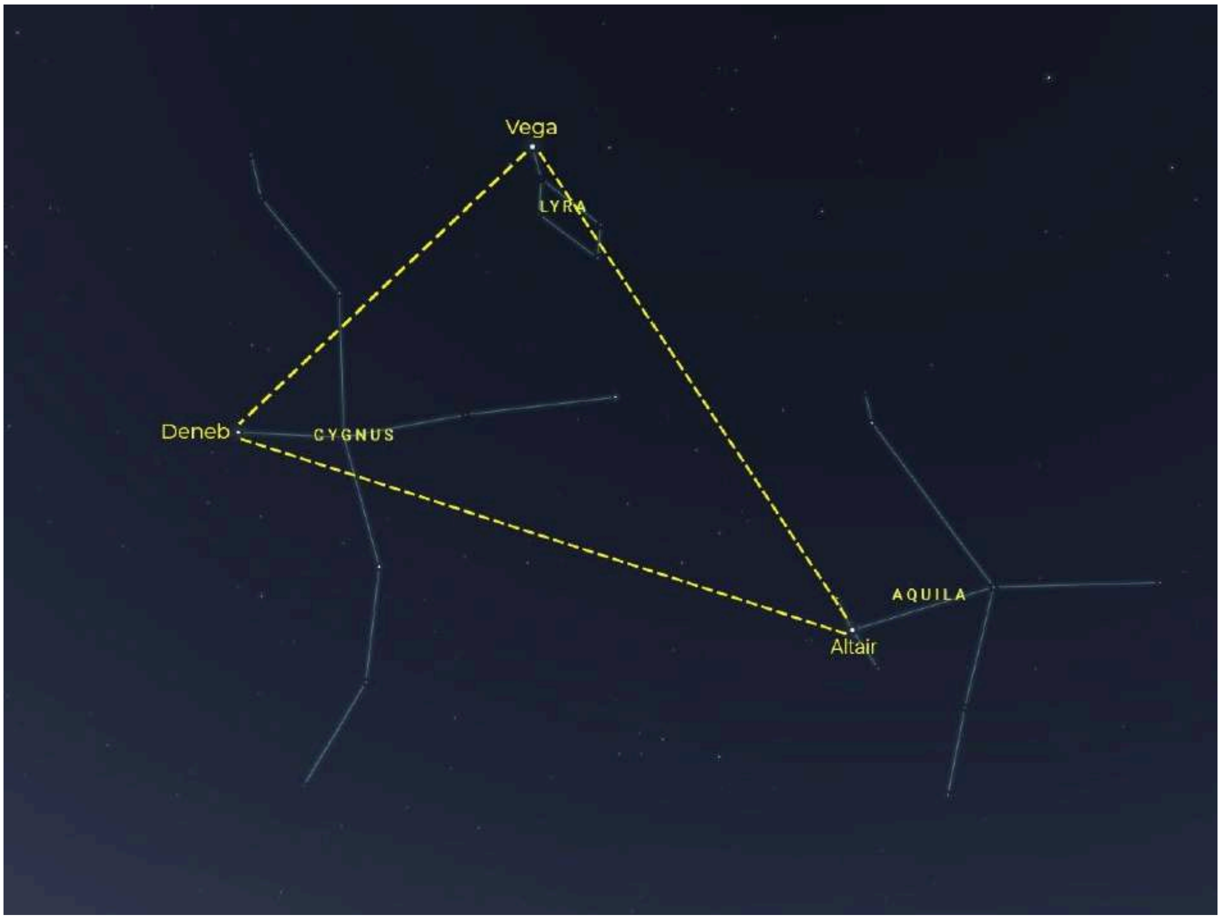
Video: What's Up August 2026 Sky Watching Tips from NASA

You can find past pdfs of the Astronomical League charts **here**. Turn to the end of the Newsletter to see what is up this month.

NASA Night Sky Notes

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!

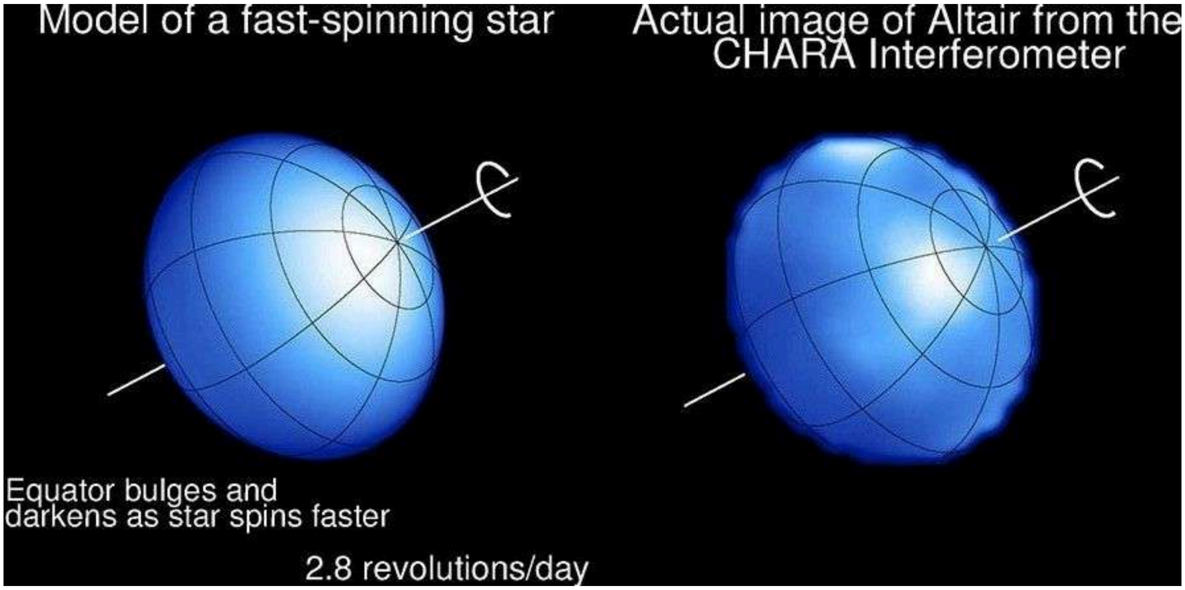
Summer Triangle Corner: Altair



A map of the asterism known as the Summer Triangle. This asterism is made up of three stars: Vega in the Lyra constellation, Altair in the Aquila constellation, and Deneb in the Cygnus constellation. Credit: Stellarium Web

Altair is the last stop on our trip around the Summer Triangle! The last star in the asterism to rise for Northern Hemisphere observers before summer begins, brilliant Altair is high overhead at sunset at the end of the season in September. Altair might be the most unusual of the three stars of the Triangle, due to its great speed: this star spins so rapidly that it appears "squished."

Altair is the brightest star in the constellation of Aquila, the Eagle. A very bright star, Altair holds a notable place in the mythologies of cultures around the world. As discussed in a previous article, Altair represents the cowherd in the ancient tale "Cowherd and the Weaver Girl." While described as part of an eagle by ancient peoples around the Mediterranean, it was also seen as part of an eagle by the Koori people in Australia. They saw the star itself as representing a wedge-tailed eagle, and two nearby stars as his wives, a pair of black swans. More recently, one of the first home computers was named after the star: the Altair 8800.



A rapidly spinning star darkens and exhibits a bulge at the equator, as shown by the model at left. At right, an actual CHARA interferometer image of the star Altair. Credit: NASA/NSF/Center for High Angular Resolution Astronomy/Zina Deretsky

Altair's rapid spinning was first detected in the 1960s. The close observations that followed tested the limits of technology available to astronomers, eventually resulting in direct images of the star's shape and surface by using a technique called *interferometry*, which combines the light from two or more instruments to produce a single image. Predictions about how the surface of a rapidly spinning massive star would appear held true to the observations; models predicted a squashed, almost "pumpkin-like" shape instead of a round sphere, along with a dimming effect along the widened equator, and the observations confirmed this!

This equatorial dimming is due to a phenomenon called *gravity darkening*. Altair is wider at the equator than it is at the poles due to centrifugal force, resulting in the star's mass bulging outwards at the equator. This results in the denser poles of the star being hotter and brighter, and the less dense equator being cooler and therefore dimmer. This doesn't mean that the equator of Altair or other rapidly spinning stars are actually dark, but rather that the equator is dark in comparison to the poles; this is similar in a sense to sunspots. If you were to observe a sunspot on its own, it would appear blindingly bright, but it is cooler than the surrounding plasma in the Sun and so appears dark in contrast.

As summer winds down, you can still take a Trip Around the Summer Triangle with this activity from the Night Sky Network. Mark some of the sights in and around the Summer Triangle at: bit.ly/TriangleTrip.

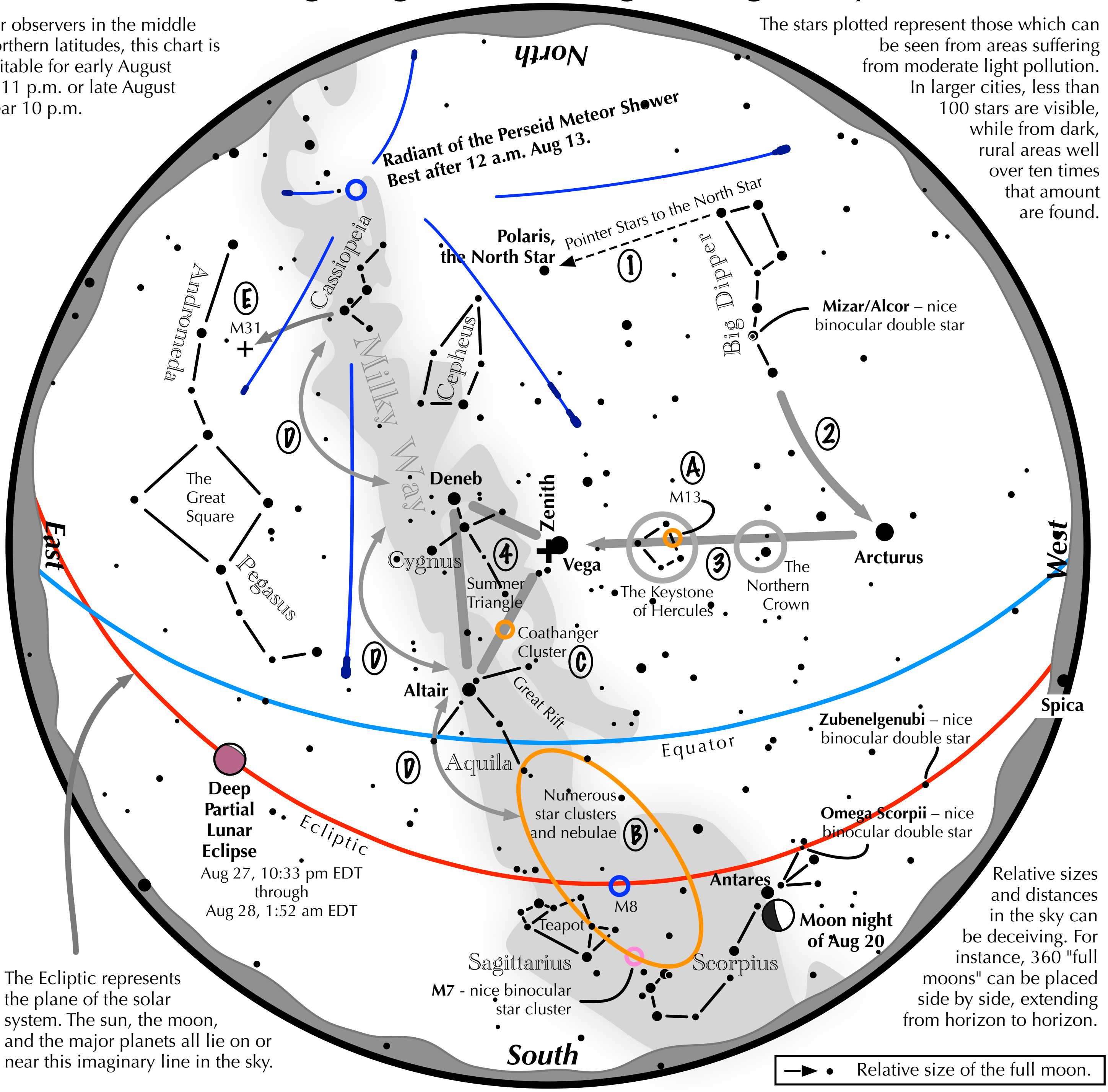
Originally posted by Dave Prosper: August 2020

Last Updated by Kat Troche: July 2025

Navigating the mid August Night Sky 2026

For observers in the middle northern latitudes, this chart is suitable for early August at 11 p.m. or late August near 10 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.

Navigating the mid August 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 June evening sky.

3 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.

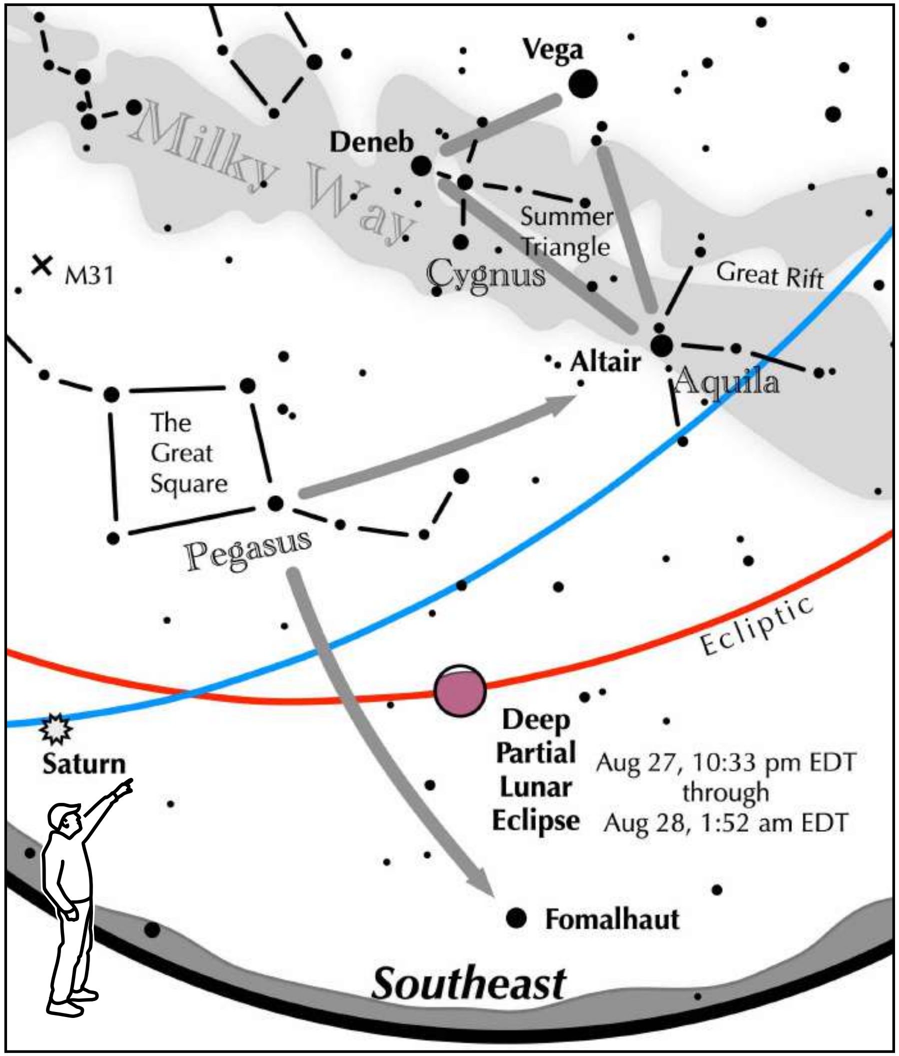
4 High in the East lie the summer triangle stars of Vega, Altair, and Deneb.

Binocular Highlights

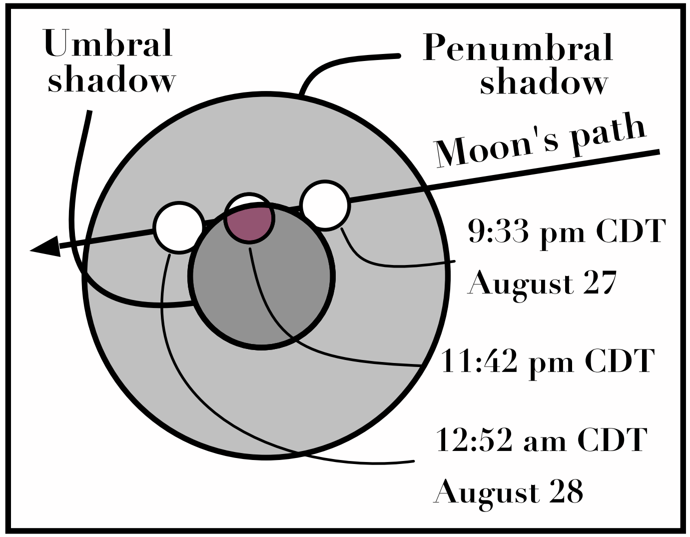
A: On the western side of the Keystone glows the Great Hercules Cluster.
B: Between the bright stars Antares and Altair, hides an area containing many star clusters and nebulae.
C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
D: Sweep along 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; duplication is allowed and encouraged for all free distribution.*

If you can observe only one celestial event in the evening this August, see this one.



View to the southeast on August 27-28
Mid eclipse: Aug 27, 11:42 pm CDT



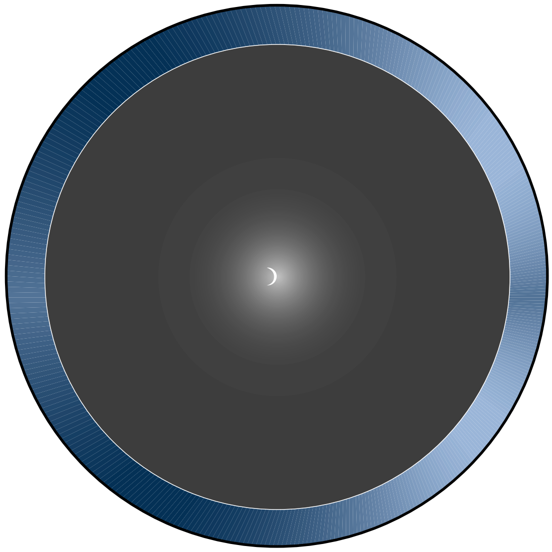
The Moon slides through a deep partial eclipse

In the late evening hours on August 27 into the early morning hours on August 28, the brilliant full moon slides into Earth's shadow.

- Even though the partial umbral eclipse begins at 9:33 pm CDT on Aug 27, any dark bite might not be noticed for another 5 minutes.
- At mid eclipse (11:42 pm CDT Aug 27) when 93% of the moon lies in the umbral shadow, what color is the moon? How red is it?
- Do you notice that the shadow's edge is not straight, but curved?

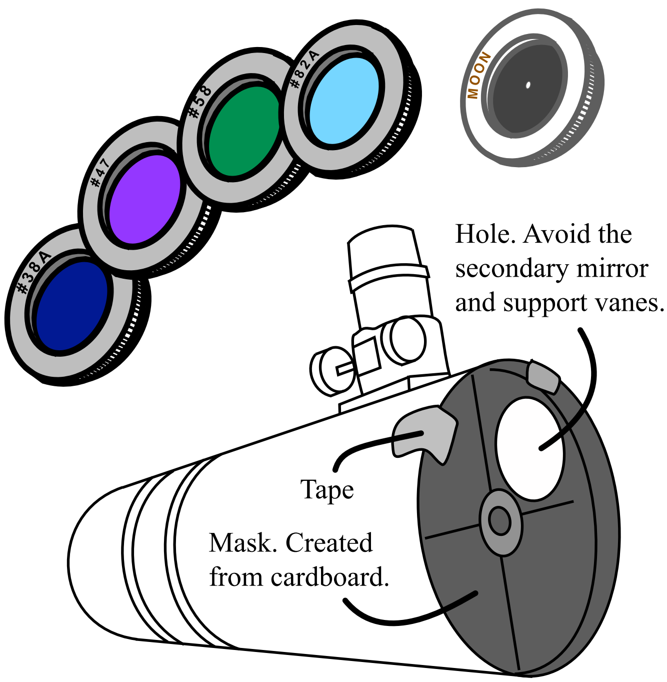
Enhance your view of the thin crescent of Venus

Venus is bright. So bright that's its glare becomes interfering, especially when viewed in its beautiful crescent phase. Many people see it as a bright blur.



For a more satifying view, take one or more of these steps:

1. Place a **moon filter** over the eyepiece.
2. Depending on telescope aperture, try **colored filters** such as #38A (dark blue), #47 (violet), and #58 (green). #82A (light blue) works well in general. They may bring out very subtle details in that planet's cloudtops.
Because they transmit little light, the darker filters are better suited for apertures greater than 8-inches.



3a. Use an **aperture mask**. Since Venus is bright – really *too* bright – reducing the effective aperture won't hurt viewing. Doing so will also increase the scope's f ratio.

3b. If an SCT or reflector is used that has an aperture of 8-inches or larger, place an **off-axis mask** over the entrance of the optical tube. (Smaller apertures won't have the spacing for large enough holes.) Center the hole in the mask so that light enters the optical tube unobstructed, avoiding the secondary mirror and any vanes. The result – a dimmer, but sharper image.

4. **Daytime viewing.** Being higher above the horizon just might improve viewability!
• Place the sun behind a building. Make sure you can't inadvertently view the sun.
• Find the alt-az coordinates of Venus and its elongation from the sun.
• Scan that area of the sky with binoculars. Once you spot it, aim your scope at it.
• Consider using a variable polarizing filter, a Wratten #15 (deep yellow), or a #21 (orange) filter to improve sky contrast.