

VILLAGES STAR

Newsletter of The Villages Astronomy Club

Volume 7, Number 9

September 2026

Club Website:

<http://vlgastroclub.org/>

Facebook:

<https://www.facebook.com/groups/vlgastroclub/>



UPCOMING EVENTS

Smart Scope Meeting, Wed. Sept 2nd, 7:30pm,
Everglades Rec Center, 5497 Marsh Bend Trl,
North Pavilion (by basketball court.)

Join us for our first Smart Scope Meeting of the new season. We have relocated these meetings to Everglades Rec Center, and the mosquitos aren't invited!

Join us as we discuss the ever-developing world of smart telescopes, use our scopes to take images of the sky, and share techniques for image capturing, using software features, and otherwise getting the most out of our telescopes.

Visual observers who wish to join us are welcome.

We will be at the Pavilion near the site where we hold Starry Starry Night. This is near the pickleball and platform tennis courts, not far from the multi-use field. This is **not** the pavilion near the pool!



NGC 6820 & NGC 6823 by member Randy Gilbert.
Emission nebula around young stars.

Executive Directors' Meeting, Fri Sep 4th,
11am-12pm, Fishhawk Rec Center,
2318 Buttonwood Run

All members welcome to our monthly planning meeting. This month we'll be reviewing our Space Coast bus trip, planning our Starry Starry Night and other outreach events.

Space Academy, Mon Sep 7th, 6:30pm
Truman Rec Ctr, 2705 Canal St.

Join us as Space Academy, where we talk about the basics of space, astronomy, and astrophysics. We cover recent events in astronomy research and space exploration.

Observers Workshop, Mon Sep 7th, 8pm,
Truman Rec Ctr, 2705 Canal St.

Join us for assistance with visual or smart telescopes, binoculars, observing, or working on Astronomical League programs.

General Meeting, Tue Sep 15th, 6:30pm:
Carlos Garcia, Southern Cross Astronomical Society, "Remote Observing with SeeStar and other Smart Telescopes", Laurel Manor Rec Ctr, 1985 Laurel Manor Dr.

Join us for a presentation from astrophotographer Carlos Garcia, a smart scope astrophotographer and pioneer in the remote operation of the SeeStar smart telescope. August 2026 marks the second anniversary of his milestone installation of the first remote SeeStar at Star Front Observatory in Texas. Since then, he has inspired hundreds of astrophotographers to host their SeeStars at remote observatories in dark-sky locations across North America. He has single-handedly used in a new era of affordable remote astrophotography.

Expanding his vision, Carlos launched Easy Scopes, a state of the art remote observatory located in West Texas that offers global users access to the world-renowned Big Bend Dark Sky Preserve.

You can view Carlos' work and story at his website: [Star Pictures Miami](#)

Learn more about Easy Scopes at: [Easy Scopes Remote Observatories](#)

Come hear from a pioneer in using the new equipment that's democratizing astronomy, making it possible to image the sky without traditional obstacles.



Carlos Garcia, ready for a night's observing.

Fruitland Park Astronomy Group, June 20th, 5pm, 300 Shiloh Rd, Fruitland Park

Join us for an evening of observing and astronomy talk with the Fruitland Park Astronomy Group! Come to Cales Soccer Field in Fruitland Park, 300 Shiloh Road (at the corner of Shiloh Road and Dixie Avenue, north of the Fruitland Park water tower.) Enter on Shiloh Road (some GPS's will guide you to the Dixie Avenue entrance.) Gate opens at 5pm. We will stay as late as conditions permit and people are interested in observing. Bring power if required.

Public is welcome to this event, **no Villages ID required!** Bring family and friends to view the evening sky with our astronomers!



Your Club Officers & Directors

President	Mark Graybill
Vice President	Ken Katta
Secretary	Randy Gilbert
Treasurer	Linda Meng
Space Academy	Toni Graybill
Public Relations	Jeffrey Kahler, Sr.
Directors	Craig Henry
	Burt Salk
	Tommy Kehne

Newsletter Contact: saunderby@gmail.com

See Calendar at End of Newsletter, before star chart.

Club Calendar Online:

<https://vlgastroclub.org/calendar/>

SpaceX Announces Starbase, LA



SpaceX render of a massive new launch site for Starship on Louisiana.

On August 25th, SpaceX and the State of Louisiana held a joint press conference to announce a new launch site to be developed in the Pecan Island area of Louisiana. The site will be dedicated to SpaceX's massive new Starship launch vehicles.

The area of the launch site is nearly that of Cape Canaveral and Kennedy Space Center combined. Conceptual renders show ten launch pads arranged in pairs, while statements from Elon Musk state that "at least a dozen" launch pads will be on site.

The site will include its own on site power production, as well as production of the rocket propellants. This will avoid the need for massive shipping of propellants from outside, which has been a limiting factor in recycling from launch aborts for Starship already.

Work will commence with coastal restoration activities. The area loses between 3-23 meters of coastal land each year to uncontrolled erosion. The area was used for petroleum tanker transfers starting in the 1950s, but the area has suffered from a cessation of operations and legal entanglements over responsibilities for several decades. A recent court decision has cleared the path for new development and restoration of the site.

SpaceX will be committing over \$100 billion to the site, both for environmental

restoration and for development of local power, propellant production, launch facilities, and construction facilities for Starship. SpaceX expects between 60 and 80% of all employees on the site to be hired from the local area, a minimum of 3,000, but likely closer to 10,000 as the site nears maturity.

The appeal of the site to SpaceX is obvious. They will be the sole user of the site, as well as the operator. They won't have to compete with other companies for launch times or site access. They will be able to scale to practically as many launch pads as they wish without interagency reviews involving NASA, the Department of Defense, and multiple other government agencies in years-long processes.

Meanwhile, they will be operating the site as a wilderness preserve, just as they operate wilderness preserves already at their launch sites in Texas, Florida, and California. At this site they have agreed to take on a very large responsibility in managing the site and its local ecology while protecting and restoring wetlands and the coastline.

The lack of any large local population will avoid issues with keep-out zones for launches for local population. The site is large enough to allow SpaceX to maintain a buffer zone between the launch sites and any other local development that results from their development of the site.



The Starbase, LA video shows what appear to be self-driving vehicle transport stands. SpaceX.

Starship Growth

The hunt for a site to expand Starship's operations has been going on since 2019, even beyond the twin launch sites in Texas, and the three now here in Florida.

The addition of Starbase, LA, brings the number of total Starship launch pads from 5 to at least 15. Online sources have stated that long lead parts for the launch sites have been put into work for as many as 30 new pads, fueling speculation about other possible sites on the west coast, in Alaska, or potentially overseas.

Since Starship will be not only supporting Artemis in landing astronauts and moon base equipment, but also carrying the new Starlink satellites to orbit, the new StarMind AI data centers into space where they will not compete with ground-based consumers for water and power resources, as well as SpaceX's other commercial launch customers, it is easy to see that Starship will grow as rapidly as it can to meet demand.

Already, a larger version of Starship is in development. Currently known as V4, or Version 4, it stretches the vehicle to be even taller than the current Starship, and it adds 3 more engines to the second stage to carry heavier payloads to orbit and to the Moon. By the time the Louisiana site is ready for its first launch, V4 will likely be ready for flight.

Elon Musk has stated that by 2030, there will be multiple launches of Starship per day, perhaps as many as 10,000 launches per year. The many new launch pads in Starbase, LA will be critical to allowing that amount of scale-up to happen.

SpaceX Article: [Starbase, LA](#)

State of Louisiana Site: [SpaceX in Vermilion Parish, Louisiana - LED](#)

Announcement Video: [SpaceX on X: "Starbase, Louisiana will be built to support thousands of Starship flights a year with missions launching to Earth orbit, the Moon, Mars, and beyond" / X](#)

SeeStar Releases SeeStar 50 Pro



The most popular smart telescope on the market now has an upgraded version available: The SeeStar 50 Pro. It adds several new features over the popular SeeStar 50, and is available at an introductory price \$100 off its MSRP until September 15th.

This model, and the strongly rumored SeeStar 70, have been long awaited as successors to the SeeStar 50. The SeeStar 50's combination of aperture, weight, size, and software have made it the strong market leader. Now the Pro model is the same size, roughly the same weight, and uses the same software with additional upgrades for the Pro model.

With a modest increase in weight (300 grams) it provides increased battery capacity, upgraded optics, and a new wide field camera like those in the SeeStar 30 Pro and the Dwarflab smart telescopes.

The wide field camera adds wide field astrophotography capability to the SeeStar 50, including Milky Way and Star Trail imaging. (See model comparison image, below.)

The price is higher than that of the SeeStar 50, which is reported to be maintaining its current

price in the market, and it will remain available even with the addition of newer models, for now.

SeeStar 50 Pro site: [Seestar S50 Pro Smart Telescope](#)

Model Comparison			
	S50 Pro	S50	S30 Pro
Sensor	Telephoto: 1/1.2 in (8.3 MP) Wide-Angle: 1/2 in (8.3 MP)	Telephoto: 1/2.8 in (2.0 MP) No Wide-Angle Camera	Telephoto: 1/1.2 in (8.3 MP) Wide-Angle: 1/2 in (8.3 MP)
Resolution	Telephoto: 2160 × 3840 Wide-Angle: 2160 × 3840	Telephoto: 1080 × 1920 —	Telephoto: 2160 × 3840 Wide-Angle: 2160 × 3840
Field of View	Telephoto: 2.8° Wide-Angle: 63°	Telephoto: 1.46° —	Telephoto: 4.6° Wide-Angle: 63°
Optics	4-Element Apochromatic Lens	3-Element Apochromatic Lens	4-Element Apochromatic Lens
Aperture / Focal Length	50mm/260mm	50mm/250mm	30mm/160mm
Milky Way / Star Trail Imaging	Supported	Not Supported	Supported
Battery Capacity/ Runtime	10,000mAh/9h	6,000mAh/6h	6,000mAh/6h
Storage	128G	64G	128G
NFC	Supported	Not Supported	Supported
Focusing Range	15m~∞	30m~∞	10m~∞
Dimensions	140×149×268mm	142.5×130×257mm	140×80×210mm
Weight	2.8Kg	2.5Kg	1.65Kg

China Lands Two Booster Rockets

On July 10th, China made its first successful recovery of an orbital-class rocket booster when it captured the first stage of its Long March 10B launch vehicle on a drone ship platform using a wire capture system.

Then, on August 18th, the semi-private company LandSpace landed the booster for their Zuque-3 booster Falcon-9 style on a landing pad downrange from its launch site.

These represent the first non-US vehicles to successfully recover their boosters.

Both Long March 10B and Zuque-3 are designed as partially reusable launch vehicles, similar to Falcon 9. The first stages are designed to be landed and re-used to reduce launch costs. They join Falcon 9, Falcon Heavy, New Glenn,

and Electron as partially reusable orbital launchers.



LandSpace's Zuque-3 Booster Lands After Sending Payload to Orbit. LandSpace image.

Starship has also successfully caught and reflow its booster, and is expected to catch its second stage as well in coming months. It is designed to be the first fully reusable launch system. Rocketlab's Electron is another new design that is yet to fly that will be partially reusable, carrying its second stage inside a "Hungry Hippo" fairing that will deploy it, then close up for aerodynamics when the first stage returns to Earth. It is also expected to fly within the next few months.

The economic advantages of at least partial re-use have become compelling now, over 10 years after SpaceX made their first landing and reflight of a rocket booster. While Europe, Russia, India, and Japan have all chosen to develop new rockets that do not include re-use, along with the U.S.A.'s own ULA, they are facing an ever more difficult launch market and much

higher launch costs than users of reusables. Availability also becomes an issue as each launch requires another complete vehicle to be manufactured, requiring time, resources, specialty materials and manufacturing equipment.



China's Long March 10B Comes in for a Seaborne Capture. CSAS image.

These recoveries show China's commitment to ensuring their ability to compete in space in the future. They still have a way to go before they can replicate SpaceX, however. Both boosters suffered unexpected damage in the recoveries, with a fire in the Long March booster, plus damage from its capture, and the Zuque-3 booster fell over after a leg failed subsequent to its successful landing. However, these are likely

short-term issues. Just as SpaceX took several attempts to recover a booster before they were able to re-launch it, their competitors will go through the same learning cycle.

All it will take to overcome the problems is the patience and dedication to do so.

The future is reusable.

Final Florida Starlink Launch



SpaceX Florida Falcon Launch Team with Final Starlink Payload. SpaceX image.

On August 25th, SpaceX launched Starlink group 10-49 from Launch Complex 40 atop booster B1067. This was the 260th flight of Starlink Satellites from Florida, and will be the last Starlink flight in Florida launched using a Falcon 9.

Falcon 9 flights will continue to carry Starlink from Vandenberg Space Force Base in

California, but future Florida Starlink launches will be of the new Starlink V3 satellites. These are too large for Falcon 9, and will be carried aboard Starship.

Starlink's final launch from Florida produced a show in the sky for the east coast, producing a 'jellyfish' in the pre-dawn sky. This is a phenomenon where exhaust from the rocket catches sunshine in the pre-dawn sky, creating a glowing cloud. It can also happen after sunset--any time that sunlight can strike the high altitude exhaust plume while observers on the ground are in darkness.

The flight successfully placed 29 new Starlinks in orbit, and marked the 37th launch and recovery of booster B1067, the most of any Falcon 9 booster. It is nearing Space Shuttle Discovery's record of 39 flights for a reusable orbital rocket element.



"Space Jellyfish" as seen from The Villages. Image by member Jeffrey Kahler, Sr.

SWIFT Rescue Mission Fails



After a successful launch aboard the final Pegasus-XL rocket, Katalyst Space and NASA have announced that attitude control problems for the LINK spacecraft mean that they will not be able to rescue the SWIFT space observatory.

The mission was conceived as a high risk, high reward mission to boost the SWIFT observatory back to its original operational altitude. It is currently in a much lower orbit, that will result in its demise soon after a long and successful extended mission. The high levels of solar activity during this solar cycle's solar maximum caused the Earth's atmosphere to expand more than expected, placing extra drag on SWIFT in its lower orbit. This in turn has taken about 2 years off the extended life of SWIFT.

SWIFT has been extremely successful. It was designed to rapidly detect and located gamma ray bursts so that other instruments could be directed in a timely fashion to study them. When it was launched, these radiation outbursts and their sources were poorly understood, and

hard to catch. SWIFT was designed specifically to detect them, and figure out their location in the sky so that they could be better studied and understood.

Now we have a much better understanding of the objects that create them, and the physics behind the gamma ray outbursts.

When it became clear that SWIFT was going to have its orbit decay and be destroyed with no replacement spacecraft in work, a modest budget was allocated to provide an attempt at a reboost mission. Unfortunately, the timing required a very fast launch of the mission, and the funding didn't allow for the costs of a full regular mission to be developed, nor for a launch aboard a large vehicle like Falcon 9.



Neils Gehrels Swift Observatory. NASA.

NASA found a partner in Katalyst Space, however, who were developing a commercial satellite servicing robot. The mission would require them to accelerate the schedule for their first flight. It would also require tricky work to find a launch vehicle that could carry it to space within the available funding.

They managed to negotiate a special rate for the final Pegasus-XL rocket. At its normal cost, it would be more expensive than a Falcon 9. But Northrop-Grumman provided it at a lower cost, bringing it within the budget for the SWIFT reboost. Among its advantages for this mission is that being air-launched, it was able to launch at the correct inclination to directly send LINK into SWIFT's orbit, it would not require a separate "plane change maneuver" that a launch from

Florida or Vandenberg would need. This saved propellant and extra mass in the vehicle.

Once in orbit, the LINK spacecraft suffered an anomaly during its checkouts, prior to it approaching the SWIFT spacecraft. It entered a violent spin, had two of its three attitude control wheels fail, and depleted much of its attitude control propellant.

Through heroic efforts, the Katalyst team were able to regain control of the spacecraft and slow its rotation to only just over a degree per second. But they were not able to completely stop it. Changes to software failed to restore full control of the vehicle's attitude.

Therefore, NASA and Katalyst jointly announced that they would not approach the SWIFT spacecraft. Instead, they will continue to learn what then can from what they can do with LINK without approaching SWIFT in order to make future flights of Katalyst's spacecraft more successful. This is their first mission in space.

Meanwhile, the SWIFT spacecraft, which has paused operations while waiting for LINK, will resume operating until the bitter end when it comes back to a destructive re-entry over Earth. Measure will be taken to bring it down in a controlled fashion to avoid re-entry over populated areas.

The mission was put together rapidly, and was always recognized as a high risk mission. Sometimes it pays off, but while it did not this time, many lessons have been learned that will help Katalyst develop their spacecraft to successfully undertake satellite servicing missions in the future. While this mission failed, it gave them experience that may have been delayed for years without this unique opportunity to take a shot at a gold ring.

Katalyst Space: [Link Mission | Katalyst Space](#)

NASA: [NASA Updates Next Steps for Commercial Swift Boost Mission](#)

IN THE SKY THIS MONTH

Also refer to the sky map on the last page.

THE MOON

Last Quarter, Sept 4th

New Moon, Sept 10th

1st Quarter, Sept 18th

Full Moon, Sept 26th

Last Quarter, Oct 3rd

THE PLANETS

September 1, 2026

Planet	Rise	Transit	Set
Mercury	7:30 am	1:50 pm	8:10 pm
Venus	10:30 am	4:10 pm	9:40 pm
Mars	2:50 am	9:50 am	4:40 pm
Jupiter	5:10 am	11:50 am	6:30 pm
Saturn	9:30 pm	3:40 am	9:50 am

September 15, 2026

Planet	Rise	Transit	Set
Mercury	8:20 am	2:20 pm	8:20 pm
Venus	10:20 am	3:50 pm	9:10 pm
Mars	2:30 am	9:30 am	4:20 pm
Jupiter	4:30 am	11:10 am	5:50 pm
Saturn	8:30 pm	2:40 am	8:50 am

September 30, 2026

Planet	Rise	Transit	Set
Mercury	9:10 am	2:40 pm	8:10 pm
Venus	9:50 am	3:00 pm	8:20 pm
Mars	2:20 am	9:10 am	4:00 pm
Jupiter	3:40 am	10:20 am	5:00 pm
Saturn	7:30 pm	1:40 am	7:50 am

Moon/Venus Close Approach Sept 14th

In the early evening of Sept 14, **the Moon** and **Venus** will be visible in a single low power view in a telescope.

With 28.8 arcminutes of separation, Venus will be a bit less than 1 Moon width away from the Moon between 7 and 8pm at twilight. Use your lowest power eyepiece to see them both together.

Binoculars will show them together as well,

easily, but a telescope will allow the phase of Venus to be observed.

The Moon will be a young 3 day waxing crescent, so its light will not obscure Venus significantly. Venus will also be a crescent, echoing the shape of the Moon, just under 30% illuminated.

This will be a very easy and fun conjunction to observe, if our skies cooperate!

Mercury is low in the dusk sky this month.

Visible with binoculars or a telescope as a red star, it will not be the best time to view it, but it is a convenient time to check this planet off your list if you've never viewed it directly. It will be low in the west, at magnitude -1.5 at the start of the month and somewhat dimmer at magnitude -0.1 at the end of the month.

Low powers will show it as a starlike object. There is nothing much to see with magnification, as its diameter is only 5 to 6 arcsec and the details on its surface are very faint.

Mercury online viewing chart:

<https://in-the-sky.org//data/object.php?id=P1>

Venus will be visible after sunset this month, at magnitude -4.7, shining bright in our twilight and post-sunset sky. It will go from just under half illuminated to a beautiful narrow crescent over the course of the month. **Be sure to view Venus multiple times this month to enjoy the crescent phases.**

Use low (50-100x) to medium (150-200x) powers to view the phases. Venus does not show surface detail because it is covered in clouds. The phases will make it look like a "mini-Moon" this month.

As the month progresses, Venus will get significantly closer to Earth. This will make its apparent size grow dramatically. It grows from 30 arcsec across at the start of the month to a huge 47 arcsec at the end of the month when its crescent is the slimmest.

Venus online finder chart:

<https://in-the-sky.org//data/object.php?id=P2>

Mars is an early morning object this month, which, in this time of the year is the most reliable period for clear skies in The Villages.

It will shine at magnitude 1.2 as a red star in Gemini. It is still small at only just over 5 arcsec in diameter, but when it is high in the sky before sunrise begins to brighten the horizon, you can use high powers with a good telescope and a steady mount to observe its larger details, such as its north polar cap and Syrtis Major. Use magnifications of 300x or more if your scope and mount are capable of it.

Color filters will help bring out details. A light blue or blue filter will bring out the polar cap and any atmospheric clouds. A yellow filter will bring out the bright areas like Egyptus Planum. A green filter will increase the contrast of dark areas like Syrtis Major.

Now is a good time to practice observing Mars and using high magnifications in preparation for our next opposition of Mars, in February 2027. High power observing is difficult and painstaking, Mars is one of the objects that rewards developing that skill. Particularly when you are used to seeing Mars when it is smaller, like now, then get a chance to see it about 3 times larger near opposition (February will bring Mars to just shy of 14 arcsec in size, vs. the current 5.)

Observing information for Mars:

<https://in-the-sky.org//data/object.php?id=P4>

Jupiter has its conjunction with the Sun this month, on September 29th, and so won't be observable for much of the month. It will be an pre-dawn object when it can be observed early in the month. It will be magnitude -1.8 and about 32 arcsec in diameter despite its distance.

Jupiter observing information:

<https://in-the-sky.org//data/object.php?id=P5>

Saturn is our showpiece object in the sky this fall. With its rings continuing to open toward us after being edge-on last year, and rising shortly after sunset in the evening, it will be a great month to observe it.

It will be mag. 0.4 this month, slightly brightening from month start to month end. It will be about 19 arcsec across (planetary disk). **The rings will span a masterly 44 arcsec.**

Locate and center Saturn using low powers (50-100x), and to see Saturn's moons with it. Titan is very bright and is usually the first moon you will see, but depending on your telescope and the sky conditions, from 5 to 9 moons may be visible.

Go to medium powers for observation of the disk and the rings (~150-250x). Light color filters can be used to bring out different features of Saturn, as can a variable density filter. I find light yellow and light red filters to be the most effective at seeing atmospheric detail, but a light blue filter can bring out white storms nicely when they are present. Some people swear by a light green or green filter--give it a try.

Saturn finder chart:

<https://in-the-sky.org//data/object.php?id=P6>

Saturn's Moons Location Calculator:

[Saturn's Moons](#)



Noctilucent clouds 33 minutes after Falcon 9's launch and Jellyfish. Jeff Kahler.

Annual Resources Round-Up

Each August, we hold a round table meeting where our members share the resources they find useful for astronomy. We report on those resources to our membership in each September issue (except in our first Resources Issue, Aug 2022.)

Below you will find the retailers, equipment, publications, media, and other things that your fellow members provided for us to share with you.

OUR CLUB

The Villages Astronomy Club seeks to serve all Villagers with an interest in astronomy, space, and space exploration. We host a wide range of meetings and activities to both support that interest, and to provide opportunities for our members to share their interest outside the club.

Most importantly, we work to share our passion with younger generations through educational events for families and children. By doing so we hope to introduce them to the universe they live in, spur their interest in science and the cosmos, and provide them with support in developing toward a career in related fields.

We also want to share our passion and knowledge with our fellow Villagers. We hold multiple events each year to allow them to enjoy and connect with the universe beyond Earth.

Our club is one of the oldest clubs in The Villages, starting as the Stargazer's Club in 1989. Our Starry Starry Night event for The Villages goes back to the 1990s, when it was organized by The Villages Recreation with John Rohan and Pam Henry personally organizing the event.

Our February 2025 Starry Starry Night was the largest club event ever held in The Villages, with over 2000 attendees. Our April 2025 Eclipse event had over 1400.

Meetings

Each month we host multiple meetings:

GENERAL MEETING

Our General Meeting each month is an indoor meeting with no observing, unless it's performed as part of the presentation that night.

Here we manage club business, celebrate accomplishments by our members, and hear presentations each year from both members and outside experts. Through the year we have talks on basic astronomy, astrophysics, cosmology, space exploration, observing, astrophotography, and biographies of notable figures in astronomy.



A non-technical talk on orbital mechanics at one of our General Meetings.

SPACE ACADEMY



Space Academy Coordinator Toni Graybill introduces a video presentation at Space Academy.

Space Academy is another indoor meeting, held in conjunction with our Observers' Workshop meeting. This allows attendees to go outside to the Observers' Workshop afterward to look through astronomers' telescopes and binoculars.

Space Academy presentations vary more than those at the General Meeting. We may have a speaker, or a video presentation with discussion. Presentations are generally a mix of astronomy basics and current events in astronomy and space exploration. Topics and presentation style can vary a lot from month to

month. Space Academy is where we explore subjects in astronomy more broadly and with more open conversation, as well as where we experiment with new subjects and presentation formats.

OBSERVERS' WORKSHOP



Observers' Workshop meeting, including visual scopes, smart scopes, binoculars, and visual observers.

Observers' Workshops are where we help Villagers with their instruments, developing their observing skills, discuss instruments, accessories, observing sites, and techniques.

It is open to all Villagers.

Want help with your new telescope? Want to discuss what telescope you should purchase? Need a leg up on an Astronomical League observing program, or just want to learn the constellations by eye? All these and more are why we have the Observers' Workshops, where experienced observers are on hand to assist you (and each other!)

Held in conjunction with Space Academy, the Observers' Workshop meets outside on the same night as Space Academy is held indoors. Start time varies by when dusk occurs for that time of the year, so check the calendar or newsletter for the scheduled start. Generally it begins about a half hour before sunset, rounded to the nearest half hour. This allows setup of instruments in daylight, before the sky darkens enough for observation.

In summer, storms often push the Observers' Workshop activities indoors, after Space Academy wrap up.

SMART SCOPE MEETINGS

Smart scopes have rapidly become central to amateur observing, and for good reason! They remove a lot of the tedium and effort from finding objects, and make astrophotography accessible to everyone.

Speaking of accessibility, they are generally also lighter and easier to set up than a traditional scope, and don't require you to bend your back or neck to an uncomfortable angle to observe.

Our club celebrates these instruments with a monthly meeting held outside where we can use our smart scopes, talk about the software, our techniques for photography and image processing, and discuss new models and updates to our scopes.

Anyone interested in smart telescopes is invited to attend, as well as owners of any brand or type of smart telescope or telescope with a smart controller (e.g. ASIAir, StellarMate).

The site is also open to visual astronomers who would like to get in a night of observing alongside the smart scope users.



Smart scope users setting up for an evening's photography and conversation.

FRUITLAND PARK ASTRONOMY

Our sister club, The Fruitland Park Astronomy Group, invites us to join them each month for their meeting at Cales Soccer Field in Fruitland Park to enjoy the sky, talk astronomy,

and share the sky with the public.

The club invites local families both inside and outside The Villages to look through the telescopes at the meeting as well as enjoy the images captured by smart telescopes.

Membership is open, any astronomers who attend are part of the Fruitland Park club by default.



Setting up for a night of astronomy and public outreach at the Fruitland Park Astronomy Group meeting.

EXECUTIVE DIRECTORS MEETING

All these meetings, and our club events, require planning and decision-making. That happens at our Executive Directors Meeting each month. The meeting is open to all members of the Astronomy Club. The meetings typically cover logistics for any meetings and events coming before the next meeting, planning for meetings and events from 3-12 months out, discussions of club materials development including new infographics and presentation materials for public outreach, etc.

More attendees mean more ideas and hands to share the load of managing events and volunteers for those events.

Events

STARRY STARRY NIGHT

Twice a year we hold a star party for our neighbors in The Villages, called Starry Starry Night. We invite all residents and guests with ID

to come look through our telescopes, binoculars, and see the images we are capturing live with our smart telescopes and astrophotography rigs. It gives us a chance to show the sky and represent ourselves and our hobby to our neighbors.

We schedule one in winter and another in late fall each year to take advantage of early sunsets and beneficial timing relative to the time changes. Usually one will be in November or December, the other in February or March. We try to have a young Moon for early observing, and find a good date that doesn't conflict with holidays or The Villages Outdoor Expo.



Starry Starry Night.

ASTRONOMY DAY

Once or twice each year our club holds a daytime astronomy event. We take out solar scopes, our Solar Walk, and our booth with infographics about the Sun, universe, and current space missions.

Several of our members have special telescopes built to observe the sun. White light telescopes reduce the light from the Sun to less than one part in 10,000 to reduce the brightness to safe levels, while also blocking harmful ultraviolet and infrared frequencies. This allows sunspots to be observed.

Solar scopes with narrowband filters, such as Hydrogen-Alpha telescopes, allow only a

single wavelength of light through, while also reducing the light to safe levels and blocking harmful radiant energy frequencies. These allow for clear views of solar prominences, and the clearest views of the surface features of the Sun.

Our Solar Walk acts as a scale model of the solar system. Our members act as guides for the walk, leading visitors on a walking tour of the solar system while describing its main features, scale, and extent.

Our booth has helpful members answering questions about space and astronomy, with infographics on the Sun, other astronomy topics, and space missions.



Solar Observing at Astronomy Day.

SPECIAL ASTRONOMY EVENTS

Sometimes we have special observing events to see an unusual phenomenon, such as an eclipse. Our astronomers bring out the appropriate instruments for the event, and our members provide information to attendees about the event, our club, and our other events.

THE VILLAGES OUTDOOR EXPO

Each year The Villages invites us to the Expo to represent ourselves to our neighbors who are looking for new clubs and activities. Our volunteers go out on the two days of the expo to talk about our club to about 1000 people each year.

This gives our members a chance to share their own passion for astronomy with our

community and find new friends to join us in the club!

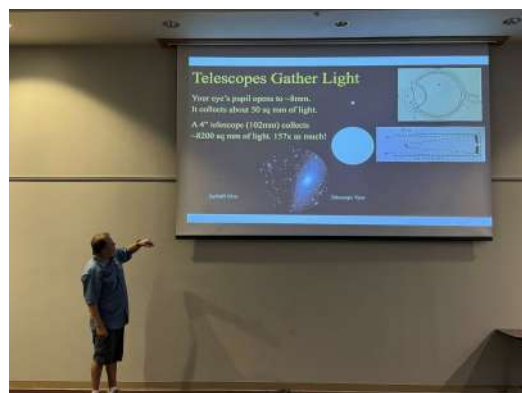


Our club booth at The Villages Outdoor Expo

OUTREACH EVENTS

Our club has many outreach events each year where we bring our equipment and expertise to share with local communities and groups. We have put on star parties for special needs groups, youth organizations, local parks, and Camp Villages.

We have also provided speakers for events related to astronomy or space for local institutions such as libraries.



At Leesburg Library.



At CEMEX/Sumter Schools Earth Day.

Resources

NEWSLETTER

You're reading one of our club resources right now. Our newsletter comes out 12 times a year with information about each month's upcoming events, news in space and astronomy, a look at what's up in the sky that month, additional feature articles, and a monthly star chart courtesy of The Astronomical League.

WEBSITE

The club website includes the current meeting and event calendar for the club as well as a full archive of the newsletter since its inception. It also has useful links for information, our officer roster, videos made by the club, and a link to The Villages' media video on our club.

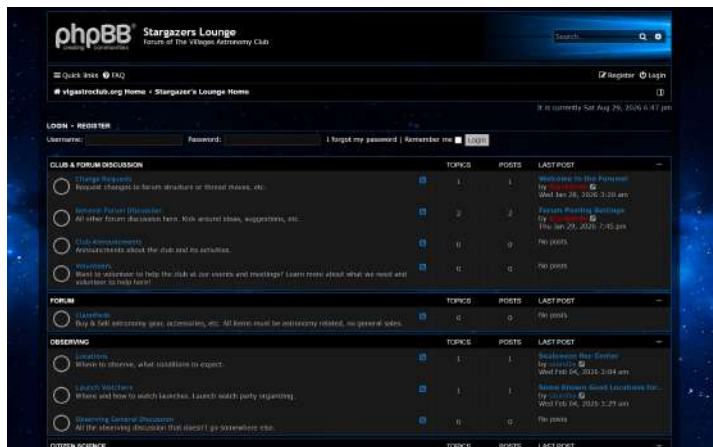
The website also includes our online discussion forums.

<https://vlgastroclub.org/>

THE STARGAZERS LOUNGE

New this last year, we have online forums for discussion of many topics including equipment, astrophotography, citizen science projects, and more. Have a look as we seek to grow this important communication tool within the club!

<https://vlgastroclub.org/forum/>



Online Forum Welcome Page

THE ASTRONOMICAL LEAGUE

Our club is a member organization within

The Astronomical League, a national astronomy group for astronomy clubs.

They provide lots of information for observers, including how to guides, observing programs and certificates, and discounts at many major astronomy retailers.

<https://www.astroleague.org/>



OUR FACEBOOK GROUP

The Villages Astronomy Club has a Facebook group. We post astrophotos, discuss events and astronomy, post links to interesting articles, and discuss our shared interests.



Search Facebook



The Villages Astronomy Club

Private group · 759 members

[The Villages Astronomy Club | Facebook](https://www.facebook.com/vlgastroclub/)

EQUIPMENT

Manufacturers

STELLARVUE

<https://www.stellarvue.com/>

U.S. manufacturer of telescopes, all parts made in the U.S. Sells full setups for observing or photography.

LUNT

<https://luntsolarsystems.com/>

U.S. manufacturer of solar telescopes and small refractors. Convertible solar/night scopes.

CELESTRON

<https://www.celestron.com/>

Full line manufacturer and retailer of telescopes and other astronomy equipment. Stay away from

their low end instruments. Owned by Chinese company Synta, does some manufacturing in the U.S. Midrange and high end equipment they sell is the most popular for U.S. Astronomers.

APERTURA <https://apertura-website.web.app/>
Apertura is a manufacturer primarily known for their Newtonian telescopes, both Dobsonians and photographic. They also manufacture refractors and other items. Their own website is fitfully maintained. To view their line, it is best to visit their primary retailer, High Point Scientific at: <https://www.highpointscientific.com/shop?q=apertura>

EXPLORE SCIENTIFIC

<https://explorescientific.com/>

Explore Scientific is a retailer with a line of house-branded telescopes and eyepieces. They sell classic style Dobsonian telescopes and excellent eyepieces. Their products are also carried by other retailers, including High Point Scientific and Amazon.

SVBONY <https://www.svbony.com/>

SVBony is a Chinese manufacturer known for good value equipment for amateurs, including telescopes, eyepieces, cameras, photo filters, mounts, and finders.

ZWO <https://us.zwoastro.com/>

ZWO sells high quality astrophotography equipment including cameras and smart controllers for astrophotography. They are also the company behind the Seestar line of smart telescopes. <https://us.seestar.com/>

OBERWERK <https://oberwerk.com/>

Oberwerk is a U.S. manufacturer of high quality binoculars for general use as well as astronomy. Since the quality decline in Celestron's binoculars, these are the only binoculars we currently recommend for astronomy.

DWARF LAB <https://www.dwarflab.com/us>

Manufacturers of the Dwarf and Draco line of smart telescopes.

TELRAD REFLEX SIGHT

The Telrad finder is a non-magnifying finder scope that appears to project rings onto the sky. It makes pointing at objects easy, just put the rings around where you want to look. No squinting required!

The rings are 1/2 degree, 2 degrees, and 4 degrees so that you can use them to align easily on non-visible objects by using visible stars near them. Many catalogs exist for the Telrad that show how to position the rings to find all of the Messier, Caldwell, and many NGC objects, and the Telrad rings are a standard finder reticle for use in Stellarium and other mobile device planetarium programs!



It's available with a dew shield, and bases are available separately to allow it to be moved from scope to scope. There's also a pulser to allow the

rings to be blinked on and off when seeking especially dim objects. The standard unit has a nice adjustment for the brightness of the rings.

The manufacturer doesn't have their own webpage, but it can be purchased from many retailers, including High Point Scientific, Agena Astro, Amazon, and B&H Photo.

A recent model allows the LED to be changed between green and red for about \$10 more.

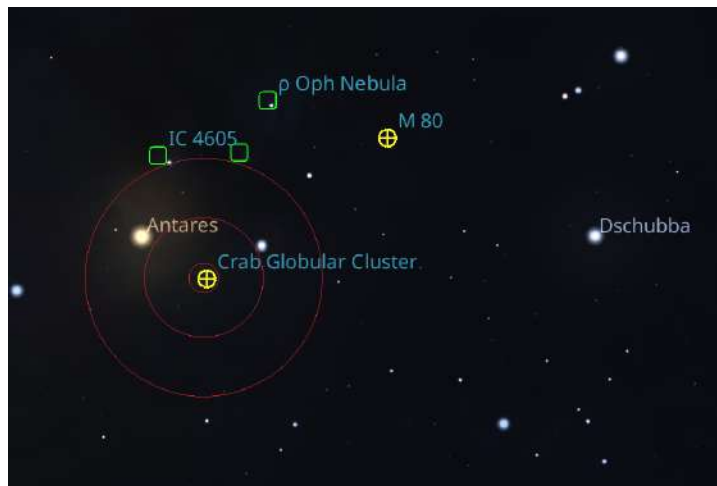
An alternate base that fits a standard finder dovetail is also available.

[Telrad Reflex Sight Finder | High Point Scientific](#)

[Telrad Telescope Reflex Finder with Mounting Base and Red Illumination # 1001](#)

<https://www.amazon.com/Telrad-Telescope-Finder-Selectable-Illumination/dp/B076CV9ZL6/>

[Telrad Reflex Sight with Mounting Base 1001 B&H Photo Video](#)

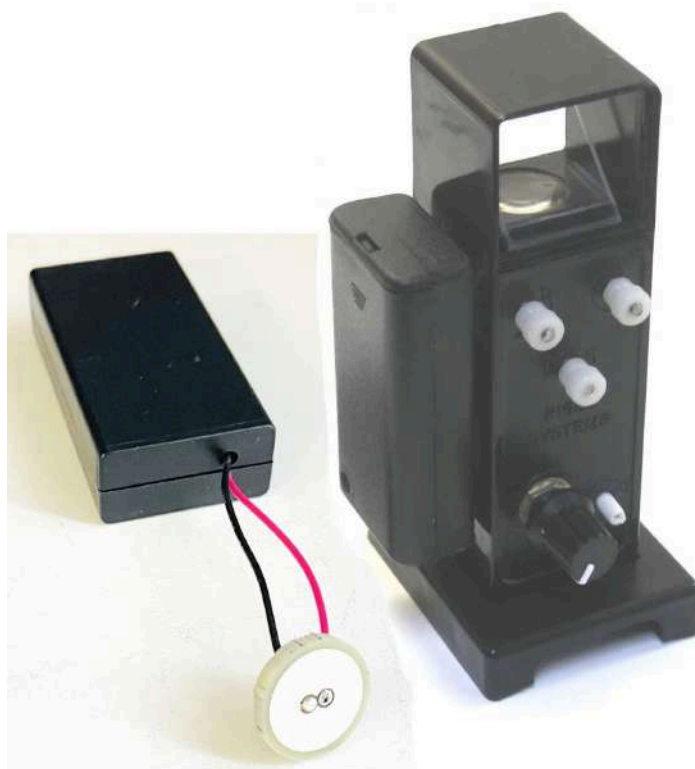


Telrad Reticle Rings in Stellarium

RIGEL QUIKFINDER

The only complaint most people have about the Telrad is its size. The Rigel Quikfinder does the same job in a more compact form. It loses the outer ring of the Telrad, having rings of 1/2 degree and 2 degrees in size. It fits better on

smaller telescopes (like an ETX-90 or Short Tube 80) or even on a smart scope as a quick visual check of alignment for a Seestar, Dwarf Mini, or other tube-based optical system.



Rigel Quikfinder with optional external battery pack to replace the standard coin battery.

The Quikfinder includes pulsing as a standard feature, as well as brightness adjustment. A Telrad is a better solution in most cases, but the Quikfinder works well if you have limited space, or as a quick backup to a large optical finder (35mm or more diameter.)

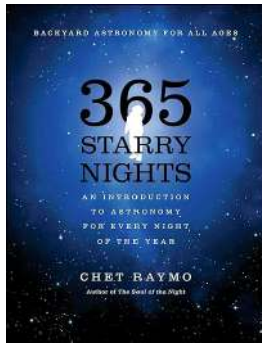
Both reflex sights make visual astronomy much easier, and finding objects faster, even when used alongside other finders, including electronic imaging finders.

<https://www.amazon.com/Rigel-Systems-QuikFinder-Reflex-Sight/dp/B006IJECSI/>

<https://agenaastro.com/rigel-systems-quikfinder.html>

BOOKS

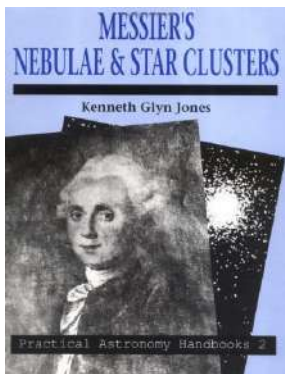
365 Starry Nights by Chet Raymo



365 Starry Nights is a naked-eye astronomy book that gently takes the reader through the stars and constellations one night at a time. There is a page for each night of the year, so the reader can simply open the book to today's date and learn about what they can see up that night. Each month has a theme and a section of the sky that it covers. Binocular highlights get an occasional sidebar, and there are comments about interesting telescopic objects in the areas described as well.

Amazon: <https://amzn.to/4n4pb2j>

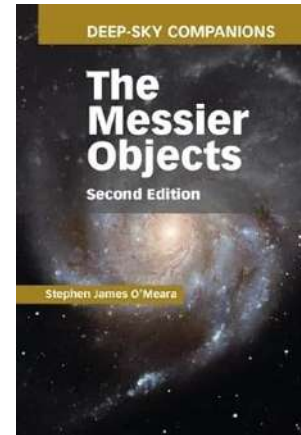
Messier's Nebulae & Star Clusters by Kenneth Glyn Jones



An overview of the history behind the famous catalog of deep sky objects including information about Charles Messier and Pierre Mechain, comet hunters who were the primary contributors to the catalog. Includes several pages on each object including how to find it, what to expect it to look like in different sized telescopes, and historical records of observation by early astronomers like Herschel, Rosse, etc. Still the best guide to the Messier objects for

beginners. Amazon: <https://amzn.to/3UOneer>

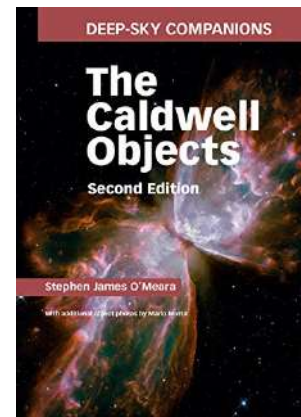
The Messier Objects by Stephen James O'Meara



A more recent book on the Messier Objects, has excellent detail on viewing each object with excellent indexing for each object on the pages to make it easy to find them.

Amazon: <https://amzn.to/4mFzeeA>

The Caldwell Objects by Stephen James O'Meara



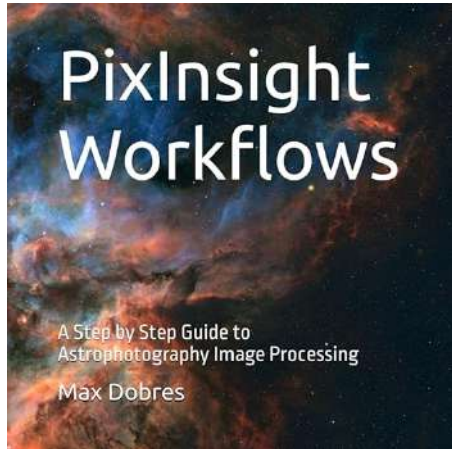
Astronomer and astronomy popularizer Patrick Moore decided to make a complementary catalog of objects to the Messier catalog--other objects that were bright, easy to observe in small telescopes, and representative of a wide variety of deep space objects--that had not been included in Messier's catalog. Some were so well known that Messier didn't feel like he needed them in his list (which was a list of things to not mistake for comets, since he and Pierre Mechain were comet hunters), others were too far south for him to observe from Paris.

Since Moore didn't want to confuse things by calling it the Moore catalog, creating a new set of M-numbers to confuse with Messier's, he used his family name of Caldwell to distinguish the

C-objects from the M-objects. So we can say C-31 and know we're talking about the Flame Nebula, and not M-31 The Andromeda Galaxy.

This book gives a comprehensive guide to each of the objects, how to observe it, and what it is. Amazon: <https://amzn.to/4ml2K3g>

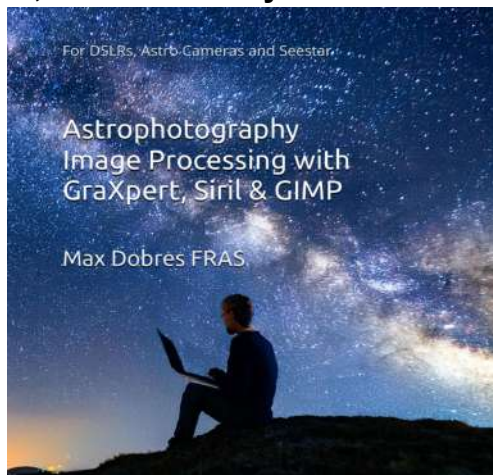
Pixinsight Workflows by Max Dobres



Use PixInsight with Confidence. If you're already familiar with astrophotography and want to learn to use PixInsight, this book is designed as a practical, workflow-based guide—not an overwhelming manual—this resource will help you process images efficiently and effectively.

Amazon: <https://amzn.to/3HXntkj>

Astrophotography Image Processing with GraXpert, Siril & GIMP by Max Dobres



Covers using popular free software to process astro images effectively, with understanding of the various features each program offers. *Currently out of print, it is being updated to cover the current software versions.*

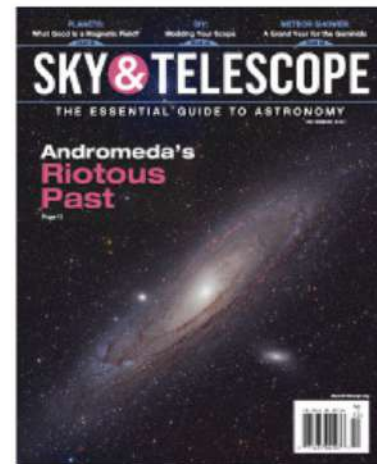
Amazon: <https://amzn.to/45TXuSP>

MAGAZINES

Sky & Telescope Magazine

Monthly magazine of space and astronomy, including regular features on astronomical events, space exploration in our solar system, amateur astronomy, monthly star charts and detailed information on solar system observation each month, as well as regular events such as minimal of Algol. The magazine's website also provides a wealth of information and observing tools.

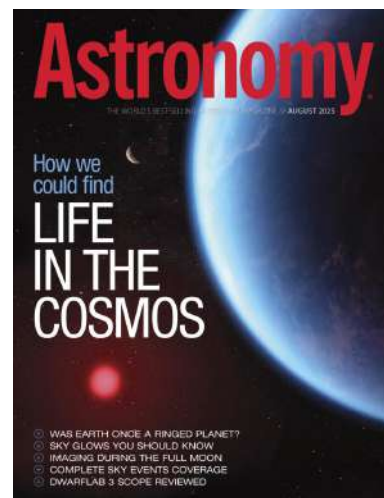
<https://skyandtelescope.org/>



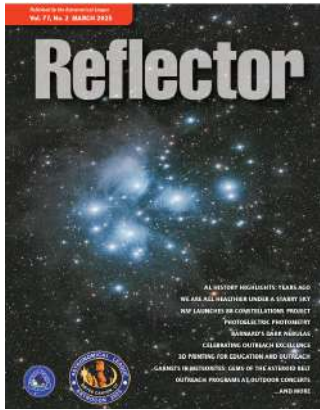
Astronomy Magazine

Monthly magazine of astronomy, with regular news about research and discoveries, professional astronomy sites and instruments, lunar observing, naked eye and binocular observation, etc.

<https://www.astronomy.com/>



Reflector Magazine



Reflector magazine is the quarterly magazine of The Astronomical League (see below, under Organizations.) It is available in electronic form free online. Members of The Villages Astronomy Club are members of The Astronomical League, and will receive hardcopy of Reflector mailed to their address each quarter.

It includes historical articles, articles on observation, interesting things to look at, research on astronomy, and honorees in the Astronomical League's programs, including youth.

Education Resources

Australian National University School of Astronomy and Astrophysics

\$200 for 4 courses, including homework, tests, and math. Professor Brian Schmidt's course on Basic Astronomy has been recommended.

<https://rsaa.anu.edu.au/>

Petersen Academy

\$400/year access to all courses. Homework and tests optional. Courses include Introduction to Cosmology, Introductory Applied Mathematics, Plato: The Dawn of Thought, Algebra, Trigonometry, and Astronomy 101.

<https://peteracademy.com/>

Coursera: Science of the Solar System

Free online course by Caltech professor Mike Brown introduced the solar system and the science used to study it.

[The Science of the Solar System | Coursera](#)

The Open University

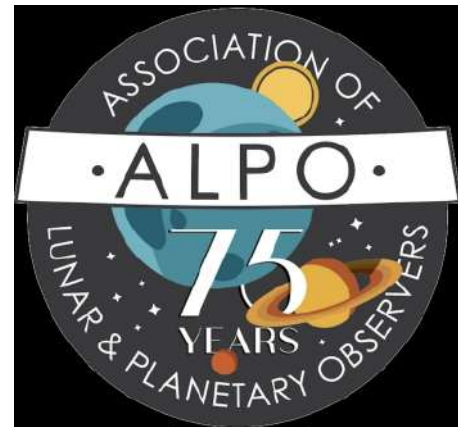


[The Open University](#)

The Open University offers formal certification and degree programs online for both full time and part time students. As with traditional universities, students must qualify, and there is tuition for the courses. Financial aid is available.

Citizen Science

Association of Lunar and Planetary Observers



ALPO coordinates the observations of solar system bodies and phenomena and publishes work in its own journal for presentation to the greater scientific community. ALPO is a resource for professional astronomers to obtain access to systematic observing patrols of interested amateurs seeking to contribute to scientific work. Amateurs will have an opportunity to challenge and develop their observational skills while contributing directly to the advancement of science.

<https://alpo-astronomy.org/>

American Meteor Society



The AMS is the American branch of the International Meteor Organization, a group that specifically studies meteors and their relationship

to their parent bodies and interactions with other bodies in their orbits. AMS members provide data that allows mapping of the dust streams that form meteor showers, changes to those streams, and data to provide predictions of meteor storms. Data collected from many amateurs adds up to powerful information for scientific analysis.

Introductory requirements are very minor, and any amateur can submit reports whether a member or regular contributor or not.

<https://www.amsmeteors.org/>

American Association of Variable Star Observers



The AAVSO is a long-established organization that brings together professional and amateur astronomers to conduct studies that reveal much of what we know about the inner workings of stars. Since the work of Henrietta Leavitt first opened the field of cosmology through the study of variable stars a century ago, the AAVSO has been organizing coordinated study of variable stars in the pursuit of international science, initially under the Harvard Observatory, for use by the general scientific community.

The AAVSO maintains and publishes data on observations of variable stars, and coordinates connections between professionals and amateurs to obtain data for specific studies.

<https://www.aavso.org/>

Zooniverse

Zooniverse is a single point of contact for hundreds of crowdsourced science projects requiring help from volunteers to complete.

ZOONIVERSE

PEOPLE-POWERED RESEARCH

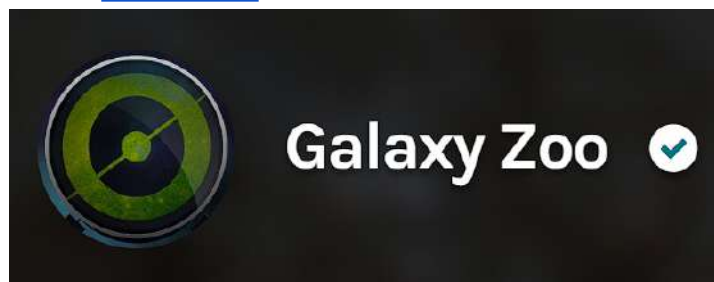
Zooniverse started in 2007 as Galaxy Zoo,

a pioneer in crowdsourced science. The project was a huge success, so much so that the biggest response was other researchers contacting them, wanting to do the same thing with their data!

Thus was born Zooniverse, which was opened up to new projects in a wide range of fields, and every expanding. Now with nearly 3,000,000 registered contributors, they have done research on many astronomical subjects, ancient textiles, medieval manuscripts, art, biology, medicine, and many other fields where great masses of data can be easily classified by amateurs.

Available as an app for iOS and Android as well as on the web:

[Zooniverse](#)



Two current Galaxy Zoo projects are in progress, classifying galaxy images from JWST: COSMOS. COSMOS is a deep, wide area, multi-wavelength survey aimed at measuring the evolution of galaxies on scales from a few Kpc to 10's of Mpc.

Also, classifying galaxy images from the Vera Rubin telescope:

[Galaxy Zoo — Zooniverse](#)

JunoCam Citizen Science Image Processing

You can work for NASA! The JunoCAM project posts unprocessed images from the Juno spacecraft at Jupiter. It takes images that can see features deep in the Jovian atmosphere. Citizen scientists are invited to process these images then upload them for use by the Juno team.



JunoCam image processed by Jackie Branc

The Juno mission reduced its costs to taxpayers by planning to have citizen scientists process JunoCam imagery. So if you've seen Jupiter images in the media, chances are they were produced from the raw data by ordinary citizens turning the raw images into gorgeous breathtaking images of the largest planet in the solar system. Visit the JunoCam Imaging site to learn more.

[JunoCam : Processing - Mission Juno](#)

Videos Online and Offline

The Great Courses *Plus*



[The Great Courses Plus](#)

The Great Courses Plus produces video courses on many subjects, including astronomy and astrophysics. They provide the videos through streaming. Courses may be purchased individually from \$15 to \$100, with the more expensive courses usually being many more lectures (Understanding the Universe, at \$100, is a 96 lecture course.)

Subscriptions of \$7-13/month with special yearly rates allow access to the full library of videos for the duration of the subscription.



[Ed Ting - YouTube](#)

Recommendations for new astronomers, telescope reviews and comparisons, practical observing tips, scope repair, accessories, reconstruction, retro-reviews (old telescopes

reviewed.) Ed is in the New Hampshire Astronomical Society, and is a great resource of observing knowledge and advice.



[Dr. Becky - YouTube](#)

Astrophysicist speaking at a normal person's level explaining current subjects in astrophysics, basics of astronomy, and supposed conflicts being inflated by the media.



<https://www.youtube.com/@NebulaPhotos>

Nebula Photos. Host Nico Carver covers beginning astrophotography, astrophotography without a telescope or tracking mount, equipment reviews, portable equipment, astrophotography with DSLRs and other non-specialist equipment, basic photo processing software.



[Cuiv, The Lazy Geek - YouTube](#)

Equipment reviews, telescopes, mounts, photography equipment, astrophotography how-tos, image processing software, filters, techniques for astronomy.



[NASA - YouTube](#)

NASA's YouTube channel. Streams current launches and events, has historical video and education programs, current information on projects, probes, etc.



<https://www.youtube.com/@MarcusHouse>

Marcus House does weekly news videos on space launches, deep dive videos on launch vehicles and space probes. He has a fun, enthusiastic style that permeates his videos.



[Retro Space HD - YouTube](#)

Historical films from NASA and U.S. manufacturers remastered and repaired for modern viewing. Mercury, Gemini, Apollo, Skylab, Space Shuttle, early satellites, launch vehicles, educational videos for schools, etc.



[RGV Aerial Photography - YouTube](#)

Aerial photographers covering the details of work at Starbase, TX to build the launch complex, test area, and factory complex for Starship. Weekly updates and commentary video covering ongoing work in detail. SpaceX moves fast, so there's always a lot new to see!



[NASASpaceflight - YouTube](#)

News, commentary, live streams, scheduled programming, and deep dive videos into all things space exploration. Live cameras on Starbase, TX and on the Florida launch sites. Regular updates on work on all launch sites in the U.S. and Europe, as well as all launch vehicles and missions.



<https://www.youtube.com/@SpaceflightNowVideo>

SpaceFlightNow provides news and commentary program in a professional style covering space news in a way that regular media don't any more. Live streams of launches, coverage of press conferences, programs covering significant events in the Artemis program.



[Avid Space - YouTube](#)

Live video feeds of SpaceX sites, including the McGregor, TX engine test facility tests of Falcon 9, Falcon Heavy, and Starship engines (the video feeds have a feature to find recent engine firings in the feed.) They also cover Starbase, TX, and the launch complexes here in FL with 24 hour cameras.



[Hazegrayart - YouTube](#)

Realistic video animations of space vehicles that never flew. Versions of Shuttle that were never built, versions of Saturn that never flew. Also visualizations of actual events, like the EVA movements of the astronauts on the Moon during Apollo 11 and 12, Falcon 9 and Falcon Heavy launches from each complex each year.



[Deep Space Astro - YouTube](#)

Videos on astrophotography, equipment, and tutorials on processing software.



[Rocket Lab - YouTube](#)

Commercial launch company's YouTube channel. Watch official video of Electron vehicle launches and Neutron vehicle development, as well as informational videos on their satellite bus, launch sites, and other work in space exploration.



[NASA Goddard - YouTube](#)

NASA Goddard Space Center YouTube channel, filled with NASA science videos and information on projects and space telescopes managed out of NASA Goddard.



[ISRO Official - YouTube](#)

Official YouTube channel of the Indian Space Research Organization, covering India's launches, space program, and exploration at the Moon and Mars.



[CuriousMarc - YouTube](#)

Retro hardware restoration channel with videos on restoring old space hardware such as the Apollo DSKY computer used on both the command and lunar modules and operating it. Includes visits with original designers, and video from original sources.



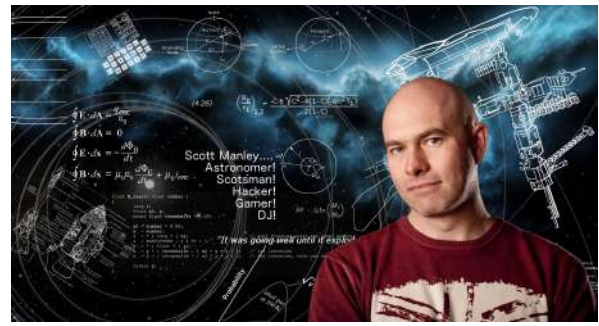
[SmarterEveryDay - YouTube](#)

Educational video channel by an engineer at Huntsville, Alabama who makes all original content including a video on the construction of JWST (his father is the heat shield engineer), how Apollo astronauts trained to land on the Moon, interviews with original designers of NASA Apollo hardware, and a wide range of other subjects including fireflies and why chickens move their heads like that.



[Small Optics - YouTube](#)

Channel on hand-on telescope use with low-no money solutions, use of minimalist equipment, restoring and recovering telescopes, as well as observing tips, tricks, and accessories for amateur observers.



[Scott Manley - YouTube](#)

Scott Manley is a physicist who does videos describing practical issues in spaceflight, nuclear power, and looks at specific space missions and launch vehicles. He does a regular update on launches and a monthly video answering viewers' questions about space and science. His light style and approachable funloving personality (and Scottish accent) have made him one of the most popular and well-known YouTube personalities.



[Galactic Hunter - YouTube](#)

Astrophotography centric channel does equipment reviews, how-to on imaging many types of objects, remote observatory discussion.



<https://www.youtube.com/@astrofalls>

Astrophotography, remote astrophotography, telescopes, equipment reviews and guides.



The Everyday Astronaut

Space enthusiast channel that covers major launch events and has had many in depth interviews and tours with leaders in the space industry including Elon Musk (SpaceX), Jeff Bezos (Blue Origin), and Tory Bruno (United Launch Alliance).

<https://www.youtube.com/@EverydayAstronaut>

Websites, Software, & Apps

Stellarium



Stellarium is a planetarium program for multiple platforms--web, desktop, and mobile devices. It can be used on mobile devices to identify sky objects and find constellations. On desktop, it can be configured to give views matching your telescope, finder, or binoculars. A paid version on mobile adds additional features:

<https://stellarium.org/>

The Sky Live



The Sky Live is a comprehensive information site about what's up in the sky right now. It includes the Moon, planets, comets, the Sun, top-down views of the solar system, stars, and other events.

<https://theskylive.com/>

Astrosports



Astrosports is an online map with information about many observing locations across the world. The information is populated by its users, who provide site information for locations in their area. Membership is free.

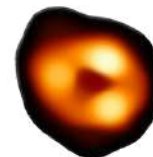
<https://astrosports.com/AstroSpots/Index>

SkyView Lite



App for Android and iOS. Locate objects in the sky, get predictions for ISS passes. Identify objects in the sky. Get viewing highlights for tonight. Premium version has enhanced features for \$2.

blackholefinder.org Citizen Science



App for web and mobile devices. Citizen science app to assist astronomers in locating and identifying black holes.

<https://www.blackholefinder.org/>

Chandra X-Ray Observatory



Information about and images from the Chandra X-Ray observatory. Notices of current research, brief articles on studies performed with Chandra, technical information about Chandra's capabilities, and information about the Chandra team.

<https://chandra.harvard.edu/>

AstroWizard Astrophoto Processing (Free)



AstroWizard is a new free photo processing package that simplifies image processing as much as you like! It integrates with 3rd party packages like GraXpert, Noise Xterminator, and Blur Xterminator as well as using its own algorithms for bringing out the best in your images with just a few clicks.

[AstroWizard](#)

Siril Astrophoto Processing (Free)



[Siril](#)

Siril is free general purpose astrophoto processing software that can use free plug-in packages to extend its abilities (similar to PixInsight, below.) Widely used and well supported by many astrophotographers.

PixInsight Astrophoto Processing Software



[PixInsight](#)

Pixinsight is a commercial astrophoto processing software package that is very highly featured. The license for the base software is 300 Euros (about \$300), many of the add-ons that make PixInsight particularly useful are

commercial add-ons that require additional license fees. However, there are also some free add-ons that can be used, and PixInsight itself is particularly good at automating processes and allowing for A/B comparisons of changes in processing photos.

Widely used with a large user community, though noted for having a steep learning curve for newbies.

GraXpert Image Processing Software (Free)



[GraXpert](#)

Free astrophotography program specializing in gradient removal (such as differences in sky background due to lunar illumination) and noise reduction. Can be used as a stand-alone application or as a plug-in to other software including Siril and PixInsight (above.)

Sky & Telescope Website

SKY & TELESCOPE

[Sky & Telescope](#)

Sky & Telescope's website includes a star chart program, information on what is up in the sky this week and how to see it, tips on observing, news about new equipment and software for astronomy, beginner level articles on general astronomy as well as observing with telescopes, binoculars, or your eyes.

NextSpaceFlight Website & App



[Next Spaceflight](#)

NextSpaceFlight is a service by NASA Spaceflight (see below) to provide information on upcoming launches and flight events such as planetary fly-bys. It is a website and apps for iOS

and Android. The apps can have alerts tailored to give alarms for launches in selected areas (such as Florida launches.)

Celestia Space Simulation Software



[Celestia](#)

Celestia is a free 3D space simulator that you can use to view the universe from different perspectives, create your own worlds, observe the orbits of the planets and their moons in real time or accelerated, or use it as a planetarium!

Bright Supernova List of Purdue University



[Bright Supernova](#)

Find out where there are supernovas right now that you can see or image! The supernova list is maintained by the University of Purdue.

NASA Exoplanet Watch



[Exoplanets - NASA Science](#)

Want the latest news on exoplanets? Learn about new discoveries, work to detect atmospheres, compositions, and sizes of planets outside our solar system.

Astronomy Tools



[astronomy.tools](#)

Astronomy tools is an online toolbox for astronomers to find out the field of view of their instruments with any eyepiece, camera, or other setup, as well as sky conditions at their site, and custom star charts to help find the objects they're looking for.

SkyPortal Data Platform



[SkyPortal](#)

SkyPortal Astronomical Data Platform is a place to store, correlate, and discover astronomical data on specific objects of study. Include citations, sources, notes, and data collected on objects and areas of study. Originally developed to support observations of the Zwicky Transient Facility, it has had its abilities extended to support general scientific observation at levels from citizen scientist to advanced institutional research.

Telescopius



[Telescopius](#)

Telescopius is a website and apps for Android and iOS that are general purpose assistants for observers. Everything from tonight's sky conditions to field of view simulators to production of viewing lists and finder charts can be done using the online interface.

Astronomy Technology Today



<https://astronomytechnologytoday.com/>

Astronomy Technology Today is a web magazine on astronomy equipment. It covers the full range of commercially available equipment with commentary and reviews. Some free content, subscriptions are \$12/year or \$18/2 years. As of this writing, subscriptions are half off (\$6/\$9.)

SkyPortal for SkySafari by Celestron



[SkyPortal Powered by SkySafari™ Mobile App](#)

SkyPortal is an app that pairs with your Celestron Skyportal device to either control your telescope or allow for computer-aided manual guidance of your scope. Extensive object lists and information on objects.

NasaSpaceFlight Website and Forums



NASASpaceFlight.com -

NASASpaceFlight's website is a space news and commentary site with extensive public and private forums to discuss everything from past space programs to inside scoops on the latest developments. The articles are deeply researched and authoritative.

The forum areas hold a wealth of information as well as being a meeting-point for both enthusiasts and industry insiders. The L2 (Level 2) forums for paid members include an even greater wealth of data, including uploaded engineering and operations manuals for spacecraft and launch vehicles, archives of images, and access to forums where industry insiders meet to discuss topics such as new vehicle development, and certain highly-placed people in SpaceX have been known to drop in and let fall some bon mots every so often!

Heavens-Above website & app



<https://heavens-above.com/>

Heavens-Above is a satellite pass prediction site and app for Android that will give information about bright satellites that you can see in the sky. You can select a specific satellite (such as ISS or Hubble) and get overflight predictions for today or a chosen time period, or you can select all satellites brighter than a chosen magnitude.

Results will give you the direction where they will rise, be highest, and set as well as precise timings for those events (See example summary below).



Daily predictions for brighter satellites

Month: Day: ☐ Morning ☒ Evening

Minimum brightness: ☐ 3.0 ☐ 3.5 ☐ 4.0 ☒ 4.5 ☐ 5.0 ☒ exclude Starlink passes

Satellite	Brightness (mag)	Start				Highest point				End			
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Time	Altitude	Azimuth	
ARIANE 5 R/B	3.4	18:12:47	10°	S	18:17:50	56°	WSW	18:22:54	10°	NNW			
Spot 4 Rocket	4.5	18:17:32	10°	SE	18:22:16	39°	ENE	18:26:59	10°	N			
BlueWalker 3	4.4	18:21:28	10°	WSW	18:24:24	23°	NW	18:27:18	10°	N			
Cosmos 1867	3.6	18:20:34	10°	NNW	18:25:58	88°	ENE	18:31:21	10°	SSE			
HETE-2	4.3	18:25:49	10°	W	18:29:31	75°	S	18:32:53	12°	E			
Exosat Rocket	3.6	18:24:48	10°	S	18:29:42	62°	ESE	18:35:19	10°	NNE			
IUS-12 SRM-1	3.6	18:26:53	10°	WSW	18:30:33	43°	NNW	18:33:19	10°	NE			
Cosmos 1745 Rocket	4.4	18:24:42	10°	S	18:30:54	70°	W	18:36:59	10°	N			
USA 281	4.3	18:26:26	10°	S	18:32:43	49°	WSW	18:38:59	10°	NW			
SJ-7	4.3	18:31:52	10°	SSE	18:35:31	54°	E	18:39:13	10°	N			
Cosmos 1709 Rocket	4.0	18:31:42	10°	S	18:37:49	90°	W	18:43:55	10°	N			
Aurora 2 Rocket	2.0	18:35:01	10°	WSW	18:38:18	70°	SSE	18:41:45	14°	ENE			
Cosmos 304 Rocket	4.0	18:37:50	10°	NNW	18:42:31	73°	WSW	18:47:14	10°	S			
DELTA 2 R/B (1)	4.3	18:40:20	10°	WSW	18:45:41	52°	NW	18:51:02	10°	NNE			
Cosmos 2221	3.0	18:43:22	10°	NNW	18:47:30	61°	W	18:51:40	10°	S			
ASTEX 1	3.3	18:44:10	10°	N	18:49:07	84°	E	18:54:05	10°	S			

Astrospheric website & app



<https://www.astrospheric.com/>

Astrospheric is a weather prediction program for astronomers that tracks clouds, sky transparency, and light levels. It has a useful free level, and upgrades at paid levels.

Space.com website



[Space](#)

Space and astronomy news website targeted to the general population. Comprehensive and in depth coverage of current news stories on NASA, SpaceX, Blue Origin, space probes, research, etc. Written in an easily approachable style for non-specialists.

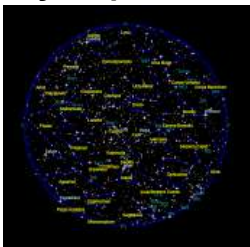
The Sky Live website



[TheSkyLive](#)

Current information on the sky, including locations of planets, their moons (see image above), the side facing Earth, what to look for, special events, etc.

Sky Map Online website



[Sky Map](#)

Displays a current star chart for your location with selectable parameters, including finder reticles, scaling, and printing ability.

Google Sky Map App for Android



[Sky Map - Apps on Google Play](#)

Planetarium app with features for finding objects, identifying objects in the sky, and seeking specific types of objects.

CollectSpace



[collectSPACE.com](#)

CollectSpace is not only a site for collectors of space memorabilia, but also an excellent resource for information about historical items on display. For example, do you want to know more about the Saturn V displays around the country? The pages at CollectSpace will tell you which missions they were originally intended for, what pieces they were put together from, and where and when you can see them!

In-The-Sky.org Website



<https://in-the-sky.org/>

In-The-Sky.org has current events in astronomy, such as eclipses, conjunctions, and occultations, listed on its home page, with links to detailed observing pages for each event on its site including timing information for specific viewing locations, guides to visibility, and finder charts. It also contains a planetarium tailored for your location.

Astroberry Telescope Control Software



[Astroberry Server](#)

Astroberry is a remote telescope control solution for 32-bit Raspberry Pis and compatible hardware. Based on Linux, it is a turnkey package for controlling telescope mounts, focusers, cameras, guidescopes, etc. using free software. Unfortunately, it is limited to older hardware due to the limitation of running on a 32 bit system, but it is very easy to set up and get running compared to other free solutions like AstroArch (see below.)

Install this on an SD card for your Raspberry Pi 3 or earlier to get a smart remote controller for your telescope setup. Easy setup.

AstroArch Telescope Control



<https://github.com/devDucks/astroarch>

Free and Open Source telescope control software. AstroArch requires more technical engagement from the user to get it set up and running than Astroberry, but it supports all current equipment with standard ASCOM drivers.

AstroArch can run on 64 bit architecture Raspberry Pis as well as mini PCs, laptops, or any other device that will support current Arch Linux distributions, including distros based on Arch such as Manjaro.

StellarMate



[StellarMate](#)

StellarMate is a low cost commercial solution for controlling telescopes and associated equipment. It can either be bought as an OS to install on a Raspberry Pi 4 or 5, or as software for a PC, or as a complete hardware and software package ready to go.

ASCOM Standards & Drivers

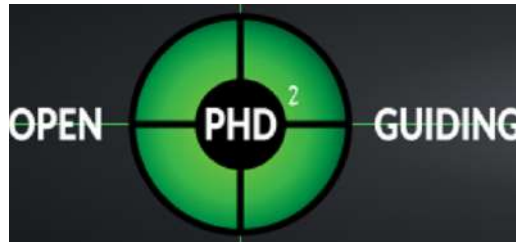


<https://ascom-standards.org/>

ASCOM is technology based on universal connectivity between astronomy apps/programs and the devices they use. ASCOM has opened up astronomy software innovation by eliminating the need to write special code for each device.

ASCOM hosts drivers for all equipment that support ASCOM standards (nearly everything made in the past 25 years except for one manufacturer, ZWO, who limit their ASCOM compatibility), allowing drivers to be downloaded directly from the ASCOM site rather than relying on manufacturer's continued support.

Open PHD2 Guiding



<https://openphdguiding.org/>

PHD2 is guiding software inspired by Stark Labs PHD Guiding. PHD2 is free of cost, open source, and community-developed and supported. Available for all major OSes, including some embedded/small devices.

INDI Control Library



<https://indilib.org/>

INDI, the Instrument Neutral Distributed Interface Library, is software to control telescopes and associated equipment transparently over networks, wires, or locally. It supports a wide range of devices and is scalable to control anything from a backyard telescope to a network of professional observatories across the world.

Forsyth Astronomical Society Website



[Forsyth Astronomical Society](#)

This entry is included in this section rather than Organizations because its primary interest for our members is the information the group presents on their website. They have copious information about astrophotography and image processing with specific programs. Since the group is outside our nearby area, we have elected to place it here rather than under Organizations.

There is lots of other great information on their site as well.

Nighttime Imaging 'N' Astronomy (NINA)



[Nighttime Imaging 'N' Astronomy](#)

NINA is the software of choice for many astrophotographers and remote imagers. It provides a comprehensive solution for control of imaging setups and scheduling of sessions.

Sequence Generator Pro



[Sequence Generator Pro](#)

Full featured astroimaging sequencing and control, there is a free Lite version with limited features. Full version costs \$150 for saved equipment profiles, automatic object centering, autofocus, meridian flip, mosaic mode, etc.

SharpCap



[SharpCap](#)

Imaging control and live processing

software. Pro version adds features like auto polar alignment, sky framing, and mosaic imaging control.

AutoStakkert

AUTOSTAKKERT!

AutoStakkert!4 Stacking Software – Lucky Imaging with an Edge

[AutoStakkert!](#)

AutoStakkert is software designed to perform “Lucky Imaging”, picking the clearest image frames out of video to produce a finished image that is “clearer than seeing.” Designed to be simple to use, it is most effective for planetary imaging, though the latest version 4 software can also be used for deep sky images as well. (Side note: this was the first astrophotography image stacking software I used a couple of decades ago with a web cam modified for astro imaging.--Mark.)

Organizations

Central Florida Astronomical Society



[Central Florida Astronomical Society](#)

<https://www.facebook.com/CFASoc/>

Based in Oveido, FL, the CFAS has an extensive website and active membership. They have an impressive speaker series, drawing scientists, engineers, authors, and debunkers of pseudoscience.

Moonstruck Astronomy Club



[Moonstruck Astronomy Club](#)

Serving the On Top Of The World community as our club serves The Villages, the Moonstruck Club holds monthly meetings on the first Thursday of the month. If you would be interested in giving a presentation to their club, please contact our club president, Mark Graybill,

to get contact information for Moonstruck (or contact them directly via the email form on their website.)

Fruitland Park Astronomy Group



[The Fruitland Park Astronomy Group | Facebook](#)

The Fruitland Park Astronomy Group is our sister club in Fruitland Park. Their events are open to the public, including both our members and non-residents of The Villages. We encourage our members in the Villages of Pine Ridge and Pine Hills to become directly active in the club, assisting club president Dave Scruggs in managing the group and helping it grow. They meet on the 3rd Saturday of the month, and it is included on The Villages Astronomy Club's calendar. Dave is a font of information on astronomy and telescopes, who has a deep love for the Fruitland Park community he grew up in. Invite families, beginning astronomers, students, and astronomers from the surrounding area to their meetings, which are centered around observation.

St. Petersburg Astronomy Club



[St. Petersburg Astronomy Club](#)

[St. Petersburg Astronomy Club | Facebook](#)

The St. Petersburg Astronomy Club, Inc. (SPAC), has been Tampa Bay's 'Home for Family Astronomy' for more than 98 years. We provide free educational programs for our members and the public.

Meetings - General Meetings are normally held on the fourth Thursday of each month (except November and December when it is on the third Thursday) at St. Petersburg College/Gibbs Campus 6605 5th Ave North, Saint Petersburg, FL 33710, at 7:30 PM. Meetings are

free and open to the public.

General meetings take place in the Natural Sciences Building, Room SC236. Parties and picnics are held in the Philip Benjamin Social Arts Building, Room SA114.

Please contact our Membership Chair, Peter McLean, for additional information.

Institutions & Museums

Embry-Riddle Aeronautical University

EMBRY-RIDDLE
Aeronautical University
100 YEARS | 1926-2026

DAYTONA BEACH
FLORIDA CAMPUS

<https://daytonabeach.erau.edu/>

Our club has had a long association with ERAU. They have provided speakers to our group, and we have reciprocated by connecting our members with ways to support student programs there. They have monthly speakers and observing sessions held by their astronomy department while school is in session, see their astronomy department's open house page here:

[Open House - Observatory](#)

Univ. of Central Florida Planetary Sciences



[UCF Planetary Sciences](#)

UCF has a strong planetary sciences program with active research. They also have an observatory with public events. Dates are listed at this web page, along with instructions for registration to attend:

<https://planets.ucf.edu/observatory/>

Museum of Science & Industry



[MOSI](#)

The Museum of Science & Industry in Tampa has many programs including a **planetarium**, public observing nights, and, of

course, the museum itself. Open most days from 10am to 5pm (closed Sept-2-5th for facility work, but open on the 1st.)

See the website for further information.

Public astronomy night information here:

[SkyWatch - MOSI](#)

Cape Canaveral Space Force Museum



[Cape Canaveral Space Force Museum](#)

There are two parts to the CC Space Force Museum, one is the former Air Force Missile Museum, which can be visited via an arranged tour through Canaveral Tours (along with a Canaveral Lighthouse Tour) or Space Shuttle Excursions for a space-oriented tour:

[Canaveral Tours](#)

[Space Shuttle Excursions](#)

The other part is the Sands Space History Center, which does not require a scheduled tour to visit. It may occasionally be reserved for groups, so check their availability on their "Locations & Hours" page when planning a trip:

[Sands Space History Center](#)

[Location & Hours](#)

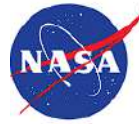
American Space Museum Titusville



[American Space Museum](#)

The American Space Museum in Titusville is walking distance from Space View Park, a popular site for watching launches in Titusville. The inside of the museum features actual control panels from launch complexes that can be interacted with, models of spacecraft and launch facilities, test equipment, and a space suit simulator. At the far end of the parking lot sit several rocket engines and some turbopump bodies around a Shuttle Orbiter model.

Kennedy Space Center Visitor Complex



[Kennedy Space Center](#)

The Kennedy Space Center Visitor Complex contains some of the best exhibits of space exploration hardware anywhere in the world. It is divided into two parts, the main complex which houses the rocket garden and Space Shuttle Atlantis display, and the Saturn Building which houses the Saturn V rocket display and Apollo control room simulator.

Buy your tickets ahead of time online from the center, or through a valid ticket discounter. Purchase tickets in advance, if possible. Plan to arrive early, and go directly to the bus tickets to get either the free tickets to the Saturn Building or one of the extra cost tours if you choose. If this is your first time, our members do not recommend paying extra for an upcharged bus tour, because there is more than you can do in a full day's touring without paying extra past the entry fee. Note that it is no longer possible to drive yourself to the Saturn Building as in years past, the bus is the only way to reach it, and a Visitor Center ticket is necessary for admission.

Also, our members do not recommend paying for the "Meet an Astronaut" experiences, as they have found these to be disappointing and not allow any real interaction with the astronaut.

It is also best to get to the Saturn Building as early as possible to avoid late in the day crowds and lines for return buses.

The indoor display of the Space Shuttle Orbiter Atlantis is rated as a must-do by our members. The display outside the building is a stack of the solid rocket boosters and External Tank components of the Space Shuttle to give you an idea of how large the whole thing was on the pad. It doesn't include an Orbiter, however, so the whole thing was actually much larger.

The rocket garden display can be seen at any time, try to avoid the heat of the day when viewing it.

A much overlooked display area is the museum area at the Gateway: The Deep Space Space Launch Complex, north of the rocket garden. It includes more recent space hardware

such as a Falcon 9 booster, a Dragon capsule, a Dream Chaser lifting body, and an Orion capsule.

The United States Astronaut Hall of Fame used to be an independent museum outside the Visitor Complex, but has been moved inside the main Visitor Complex south of the rocket garden. Formerly it provided a chance to visit a museum without paying the expensive entry price of the Visitor Center, but now it has been gobbled up by the Money Borg. While it is very nice to visit, if you have only one day at the Visitor Center, you will find it to be a time-costly distraction, unfortunately. The biographies and personal items of the astronauts and the history are top-notch, but being part of the inside-the-gates attractions destroys its tourism value in many ways.

It should be noted that NASA does not operate the Visitor Center themselves, they have contracted that task out to a for-profit organization who have increasingly sought to bring the peripheral attractions in the area into their own control.

When visiting KSC, consider bringing food or snacks to avoid the high prices, limited selection and quality of the onsite food, and to allow you to maintain your own schedule. Plan to stop for a good dinner outside the area and bring protein bars, home made sandwiches, and your own beverages to save time and money at the center. No glass containers are allowed, be sure to check the rules on the KSC VC website, above.

Before you go, study up on the artifacts on display, as not all exhibits are well described on site. For example, the Saturn IB rocket on display includes most of the parts of the rocket that was held in reserve for a potential Skylab rescue mission.

U.S. Space & Rocket Center, NASA Marshall Space Center



[U.S. Space & Rocket Center](#)

Similar to the Visitor Center at KSC, the Huntsville Visitor Center is operated by an outside contractor who have been making it impossible to

access the formerly public exhibits like the Rocket Park without visitor center admission.

However, the center has many unique exhibits among the major NASA visitor centers, centering on launch vehicle development and the SLS launch system for the Artemis program.

Purchase tickets in advance for best prices and to be certain of entry in the event of high demand periods (which vary wildly as a result of school and organizational tours.)

Space Center Houston (NASA Johnson Space Center)



[Space Center Houston](#)

As with the other two major space center visitor complexes, Space Center Houston has eliminated public access to its Rocket Park. As with the other centers, it offers some unique exhibits, particularly with regard to astronaut training and equipment. Extra cost experiences are not likely to add significantly to your visit, there is a lot to see without upcharges, including a Saturn V, space suits, Apollo capsules, the Shuttle Orbiter simulator Independence (a high quality full scale model of the Orbiter) mounted on an actual Shuttle Carrier Aircraft, with interior tours of both vehicles.

Smaller NASA Centers



[Centers and Facilities - NASA](#)

Smaller, less well known NASA centers tend to give far more “bang for the buck” than the major centers whose visitor centers are operated by commercial theme park contractors. While usually less extensive, for a day’s visit they will provide a more personal experience and a more up-close look at NASA hardware, operations, and facilities. Centers differ on the requirements to visit, so visit that site’s visitor center page (for example, Armstrong Research Center is on an Air

Force base and subject to the base's entry controls).

Most centers have other nearby space related attractions that can be used to expand your touring day, for example, near Armstrong there is the Flight Test Museum and Blackbird Airpark that all together provide more than a full day's touring.

Flight Test Museum, Edwards AFB



FLIGHT TEST HISTORICAL FOUNDATION

[Flight Test Historical Foundation](https://flighttestmuseum.org/blackbird-airpark/)

The Flight Test Museum at Edwards AFB includes many exhibits on flight test as well as displays of notable flight test vehicles such as engines from the X-1, SR-71, and X-15, Bell X-1, X-25B Gyrocopter, YF-22 Black Widow II, and X-48C Blended Wing at the main museum, with many more aircraft at the on-base Museum Air Park including an F-111, F-16XL prototype, and Thor IRBM. It shows the development of flight suits, ejection seats, models, and historical items.

Blackbird Air Park



<https://flighttestmuseum.org/blackbird-airpark/>

In addition to the on-base air park museum, the Flight Test Museum operates the off-base Blackbird Air Park. The Blackbird Air Park has unique craft on display such as the SR-71A, the first operational A-12 Oxcart, a J-58 engine used in the SR-71 and A-12, a U-2, and a D-21 Drone used with the Blackbirds. Inside displays include wind tunnel test models and other Blackbird & U-2 related displays about how these craft were used and flown, and the demands on their crews.

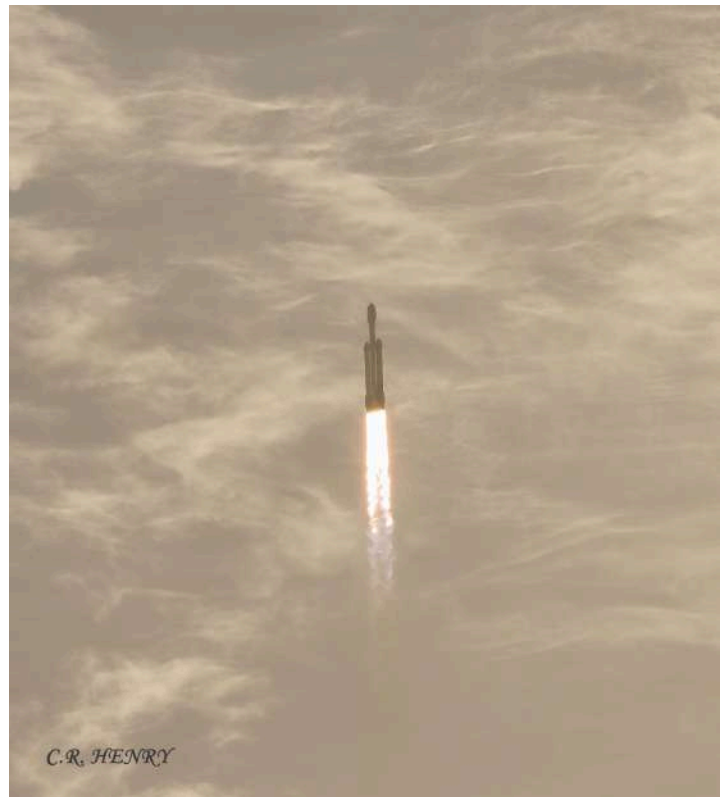
Orlando Science Center



Orlando Science Center is a child-oriented science museum that includes an area with space related exhibits about the planets and solar system. It also has sections about life science, ancient life, food, and STEM-related art.

Senior tickets cost \$30, 10% discount for online ticket purchases.

THE VILLAGES ASTRONOMY CLUB VIEWS ROMAN TELESCOPE LAUNCH



The 13th flight of the Falcon Heavy Booster carries the Roman Space Telescope aloft from Florida on August 30th. Image by member Craig Henry.

Nancy Grace Roman Rocket Launch Experience by Robin McBride

Seeing my first in-person rocket launch was so amazing. As someone whose imagination has always been fueled by astronomy and science fiction, standing on the Space Coast this morning, August 30, 2026, felt like stepping right into a sci-fi novel. Our journey began in the

pre-dawn hours with The Villages Astronomy Club, boarding the bus at 4:40 AM and departing by 5:00 AM. During the ride, the Club President and the Volunteer Coordinator, kept us captivated with fascinating insights about the Nancy Grace Roman Space Telescope. They explained how its massive wide-field views will complement the James Webb Space Telescope, mapping the universe at unprecedented speeds and reshaping our understanding of dark energy and exoplanets.

We arrived at our viewing area in Titusville, Florida at 6:38 AM, just as the sun was rising over the water directly across from the launch pads. The atmosphere was buzzing with genuine curiosity and shared excitement as I chatted with fellow club members. Right before the big moment, Mark, the Club President came around again to share tips on exactly where to spot the Falcon Heavy's side boosters as they returned to Earth. Listening to the live countdown via YouTube Launch Control heightened the anticipation, and any lingering exhaustion from the early morning completely vanished. Seeing that Falcon Heavy roar into the sky was an unforgettable, breathtaking experience that was worth every single early minute—I would do it again in a heartbeat!



Some of our club members waiting for the Roman Space Telescope Launch at St. Stephen's Retreat
Image by member Toni Graybill

SpaceX Falcon 9 Heavy Launch: A Great Experience (much of which was unexpected) by Frank Bridge

It was a privilege to be present at the launch of the Nancy Grace Roman Space Telescope. This successful launch will be the start of a great scientific endeavor that will greatly add

to our understanding of the universe, as well as helping us answer the greatest question in human history: are we alone?

But for now, I'd like to focus on the personal experience of attending the launch. My friends were disappointed that I took no pictures. But during my planning, I did not expect that I would. Particularly for first-time visual events, I did not want to miss anything because I been distracted by fiddling with equipment, or simply by the magnitude of the event itself.



Falcon Heavy on the launch pad at center. At right is the Starship Launch Pad, which will hopefully see a launch by the end of the year! Image by member Craig Henry

It turned out that my judgment was correct. I was looking around at the surroundings and missed the first two seconds of flight after ignition. Even so, as part of my pre-launch set-up, I attempted to see if my phone camera would be useful. I quickly saw that it would have been uselessly awkward to the point. It required about 15X zoom to get a reasonable view of the gantry, and the digital zoom badly degraded the image. Even leaning on the railing in front of me, I could not hold the phone camera steady enough. Also, that railing was a protective barrier to keep visitors from falling right into the Indian River.

While this protected me from an early-morning swim, it could easily have happened to my phone, so I put it into my pocket for the duration.

So instead, I used high-quality compact 8 X 21 binoculars—easy to carry, easy to deploy, with a sufficiently wide field to follow the rocket and show excellent detail. BTW, they had a neck strap. They were the perfect instrument for observing this event.

Even though I was physically ready, there were some surprises when comparing this event to watching similar events on television—or live, either from Tampa or The Villages.

First, even though the Falcon Heavy was a huge rocket, it ascended—and accelerated—very quickly. You don't see this on television at all, because TV isn't a three-dimensional experience and the camera is tightly focused on the rocket. Also, from Tampa or The Villages (about 100 miles away from the launch site), the rocket has already achieved considerable altitude, and it has pitched forward toward the east. At this distance and angle, the rocket traces a much smaller arc in the sky compared to the face-on angle during the early moments of the mission.



Falcon Heavy speeds away to the east, beyond the low altitude contrail it left in the foreground. Image by member Craig Henry

Second, even though I was 7 miles away from the launch site, the roar was far louder than I expected, and at one point the volume climbed to uncomfortable levels. Also, the exhaust fire was very bright yellow and left afterimages in my eyes--again unexpected.

The launches seen from Tampa and from The Villages showed a deep red exhaust plume—caused by atmospheric extinction effects like those causing the sun's ruddy appearance at sunset. And the rockets made no noise at those 100-mile distances.

Furthermore, the sonic booms caused by the two returning boosters were louder than I thought they would be, even having experienced them during incoming Shuttle landings while living in Tampa. At the sound of the first boom, a dog in a nearby group started barking. It was hilarious to experience the incongruity of hearing one single dog barking in protest among hundreds of relatively quiet people during such a significant event.

In addition, the rate of descent of the boosters was extreme—I saw the deceleration burn and then VERY shortly thereafter, that booster was much closer to the ground. I almost failed to locate it.

But most importantly, this experience was so moving that I must see more of these events. I am looking forward to the first SpaceX Starship launches. The SpaceX Falcon Heavy had about 5 million pounds of thrust. The Saturn V rockets in the late 60's and 1970's hurled the Apollo missions to the moon with 7.5 million pounds. At 365 feet tall, they were the world's most powerful rocket. The Starships will ultimately develop over 20 million pounds, and they are even taller than the Saturn V. Based on what I experienced on August 30, they will put on quite a show.

That said, I better bring along my hearing protectors—I am already wearing hearing aids, and I don't want to make things worse...

Club Calendar

Special events by The Villages Astronomy Club

Events not hosted by The Villages Astronomy Club

Notable dates with no event planned.

September 2026

2 Smart Scope Meeting 7:30pm

4 Astro Exec Meeting, 11am, Fishhawk Rec Ctr, 2318 Buttonwood Ln.

7 Space Academy 6:30pm, Observing Workshop 8pm, Truman Rec. Ctr. 2705 Canal St.

15 General Meeting, Laurel Manor Rec Ctr, 1985 Laurel Manor Dr., 6:30pm Carlos Garcia, Southern Cross Astro Soc., Remote Observing with SeeStar (& Other Smart Scopes)

19 Fruitland Park Observing, 5pm, 300 Shiloh St. Fruitland Park

October 2026

2 Astro Exec Meeting, 11am, Fishhawk Rec Ctr, 2318 Buttonwood Ln.

5 No Space Academy, No Observing Workshop Truman Rec Center Planned Maintenance.

7 Smart Scope Meeting, 7pm

13 camp geneva star party

17 Fruitland Park Observing, 5pm, 300 Shiloh St. Fruitland Park

20 General Meeting, Laurel Manor Rec Ctr, 1985 Laurel Manor Dr., 6:30pm Joel Nussbaum, Apollo 11 engineer.

November 2026

1 DST ENDS

2 Observing Workshop 7pm. Star Party for All Members., Truman Rec. Ctr. 2705 Canal St. Replaces Space Academy this month during polling at Truman.

4 Smart Scope Meeting, 6:30pm

6 Astro Exec Meeting, 11am, Fishhawk Rec Ctr, 2318 Buttonwood Ln.

7 Observing Session - Scouts, Sandhill Scout Reservation

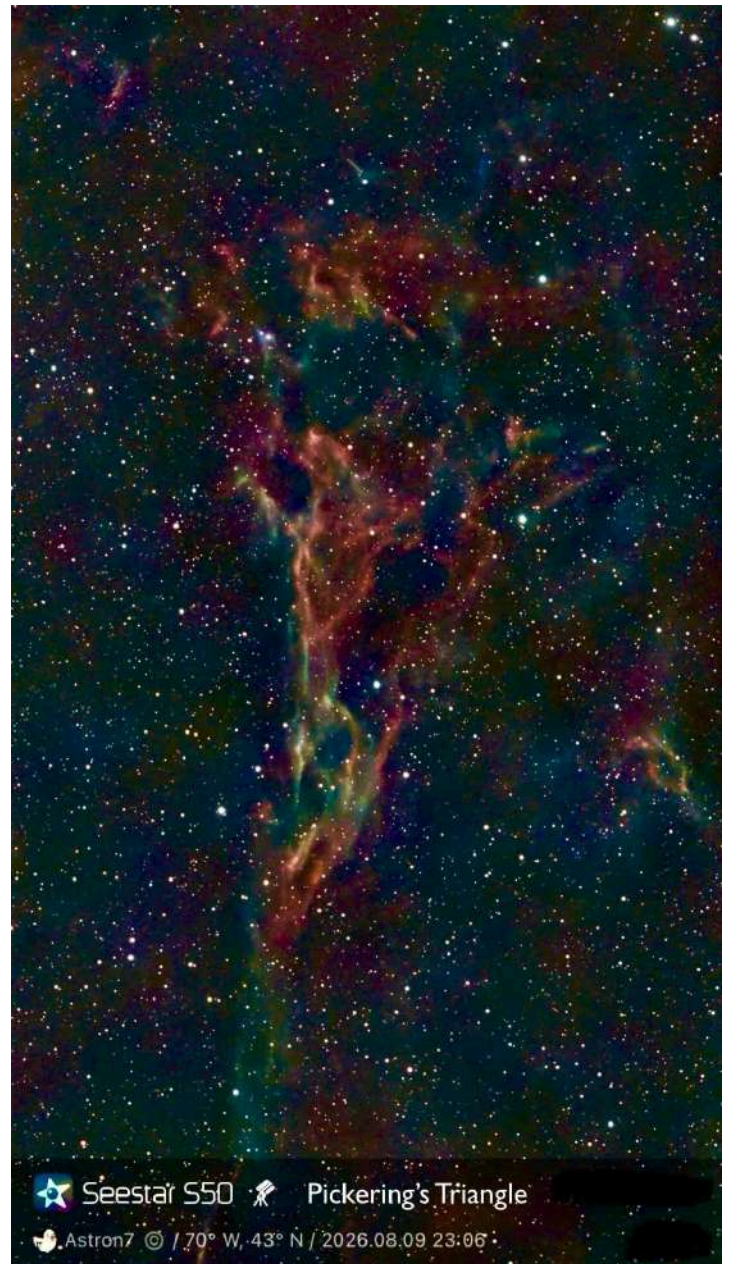
14 Starry Starry Night, 6pm-8:30pm, 5 day Moon, Saturn, Uranus, Cygnus, Lyra, Sagitta, Pisces, Taurus.

17 No General Meeting Laurel Manor Maintenance.

21 Fruitland Park Observing, 5pm, 300 Shiloh St. Fruitland Park

Club Calendar on the web:

<https://vlgastroclub.org/calendar/>



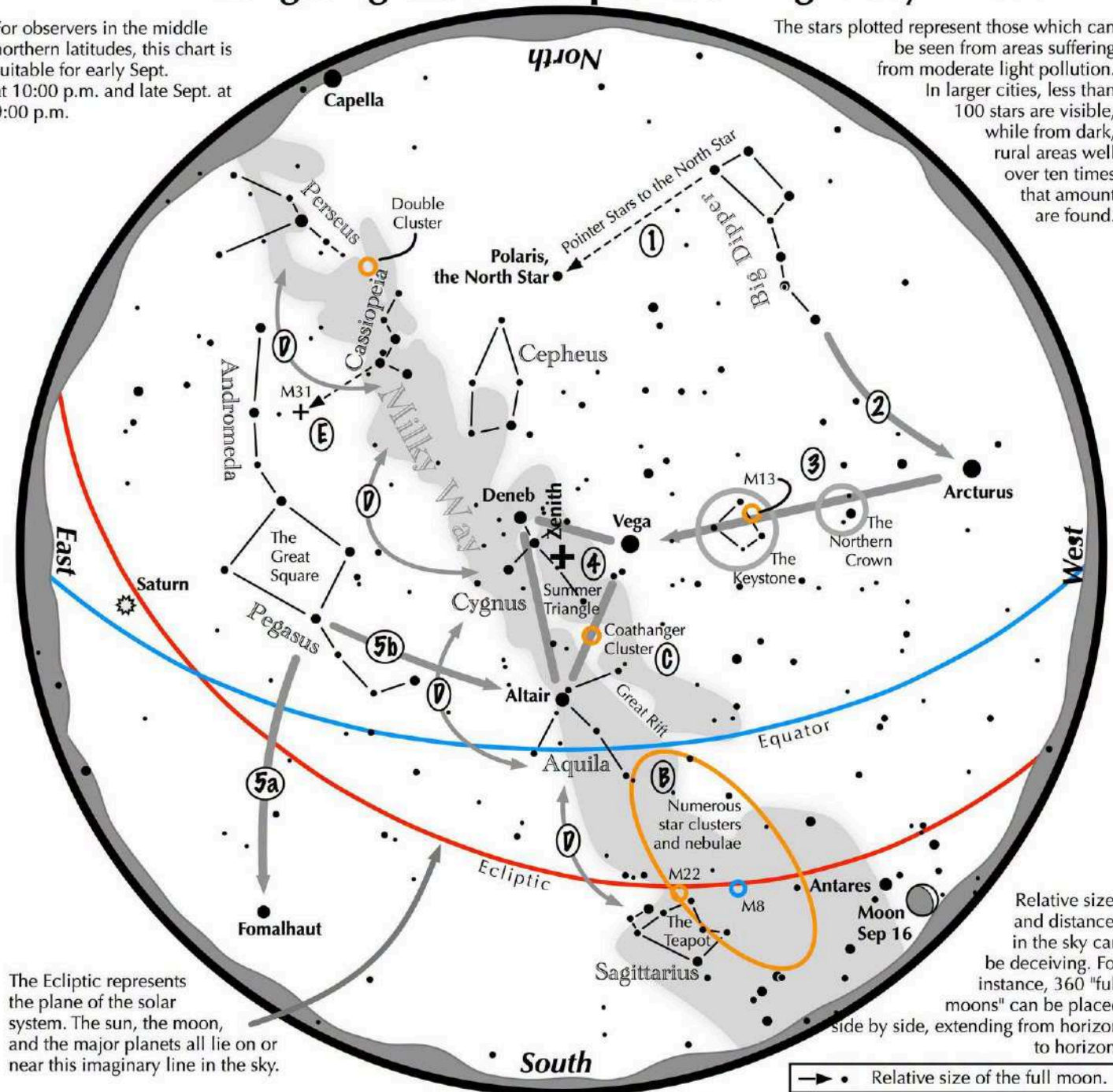
NGC 6979, Pickering's Triangle Nebula. Image by remote member John Keller in Maine.

See the monthly star chart on following page:

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.

