



SPACE

St. Petersburg Astronomy Club Examiner

March 2024

Editor – Guy Earle

The St. Petersburg Astronomy Club has been the center of family astronomy in the Tampa Bay Area since 1927. Our 404 adult members are dedicated to promoting and sharing the wonders and science of astronomy. We host a dark-sky star party each New Moon at Withlacoochee River Park, along with local star parties, telescope-making workshops, science lectures, astronomy lectures, educational outreach sessions and much more.

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M51 and NGC 5195 with 9.25 Edge HD by Jamie Kenas



April Preview

In next month's *Examiner*, I'm **SURE** we'll be recapping the total solar eclipse on April 8th, from both those who are around Tampa and traveling to the path of totality.

Look for Mercury near March 23rd (picture to the right) just after sunset. Due to it being the closest planet to the Sun, it never is far from it, reaching peak altitude of 17 degrees on March 25th. Typically, there's only two times to see it each year, next being in early September in the morning sky.



April General Meeting

This month's general meeting will take place on Thursday, March 28th at **7:30 PM**. The meeting will be *in person* at St. Petersburg College, Gibbs Campus, 6405 5th Avenue North, Natural Science Building, Classroom 236, 2nd floor, and **also virtual**. This month, there are two programs, one being the **OBS Recap** by our **Intrepid Field Reporter, Kelly Anderson,**



and **Remote Control Options for Imaging Telescopes** by Les Gatechair.



Join Zoom Meeting [HERE](#)

Meeting ID: 852 9687 2152

Passcode: 111992

The club's **New Moon observing weekend** will be by April 5th- 7th at [Withlacoochee River Park](#) east of Dade City.



New SPAC Members

We would like to welcome Dan Aldridge, Jamie & Jamie Corrigan, Robert Anglen, and Joseph Mandara to our family of members.

Examiner Staff

Editor	Guy Earle
Space News	Steve Robbins
Field Reporter	Kelly Anderson
Mirror Lab	Ralph Craig

President's Message



Happy Friday to everyone,

Our next general meeting will be March 28th at the St Petersburg College.

We will have a presentation from one of our members on Remote control options for imaging telescopes. We will also have a photo recap of last month's OBS 2024. Hopefully, we are transitioning away from El Nino and into a more favorable weather pattern for both the eclipse and our Spring observing season. If you haven't been out to our observing site at the Withlacoochee River Park near Dade City, this is the best time of year to observe and camp. Come out and join us. Next month will be our solar eclipse and many of our members, including me, our traveling out West to find our spot for totality. Please be sure to post your pictures on our Facebook page and share your adventure. Clear skies and take care.

SPAC Business Meeting update

Please note, the **April business meeting date has been changed** from the 10th to the 17th due to the prior solar eclipse on the 8th, as many of the board will be unavailable until the following week.

*SPAC New Moon Weekend
Orange Blossom Special 2024
February 7 - 11*

By Intrepid Field Reporter

I've lost track of how many OBSs that SPAC has put on (41? 42?), but it seems every year we get more creative than the last. Of course, advancing technology enables us to do things impossible only a few years ago (area broadcast of iNet access, text messages keeping us informed of current events, telescopes that think for themselves allowing us to party-on while the astronomy bits get done, etc.).



We did experience a few firsts this time around. Those of us who arrived the Sunday before the grand opening to work on the setup had the unique experience of a pretty annoying hailstorm ... marble sized little chunks of ice that sounded like a mob was stoning my travel trailer. The angry clouds went away and we had a pretty good night of viewing. I got an OK image of the Rosette Nebula. Somehow all my gear decided to play nice that night.

Monday evening was really clear and Tuesday almost as good. Then, things went slowly downhill, with successive nights of decreasing visibility and diminishing sucker holes. The less-than-ideal viewing conditions evoked fond memories of the Seven-Days-Of-Clear-Skies OBS we had a couple of years ago, but even so our intrepid imagers rose to the occasion and we had a lively imaging contest of quality entries. More on this in a bit.

Our always creative leadership this decided to amend the door prize process this year by giving us the opportunity to put our raffle tickets



NGC 2244 Rosette Nebula - K. Anderson

in boxes for only the prizes we'd like to get. This way our more generously proportioned members didn't have to worry about getting a size-small orange T-shirt. I'm still trying to lose enough weight to fit into mine.

The wide area access to the Internet was greatly appreciated as well as the timely text messages keeping everyone up to date on the latest events, like the sheriff's search and rescue team looking for a lost hiker or the massive "controlled" burn upwind of our little star city. The smoke and ash engendered an ambiance of a friendly campfire ... always look for the silver lining, eh?

Opening day on Wednesday was filled with the fun of getting checked in and situated. Les Gatechair presented an Introduction to N.I.N.A., "Nighttime Imaging 'N' Astronomy." NINA is a software package designed to make deep-space imaging easier and more comfortable. It provides a fairly simple package for newbies yet also has the capability to expand into more advanced techniques. It not only helps to make better images, but automates a lot of the drudgery common to capturing sky wonders. The best part? It's FREE! <https://nighttime-imaging.eu/>

On Thursday Mike Davis and Allen Maroney led a discussion of Three-D Printing (if that doesn't boggle your mind, you ain't got no boggles!). Les Gatechair followed up his Wednesday software seminar with "What I Love and Hate About Astronomy Software." Everyone has their favorites in each of those categories which sparked a lively conversation filled with stories about problems and fixes.

Activities on Friday began with a couple of healthy (puff-puff) outdoor events, the Bicycle Trail Ride led by Tim Harris, and the Nature Walk with Mike Davis in the lead. It was a great time for both parties getting out in the great outdoors, taking in a bit of nature while exercising our collective *corpum totalis*. The weather was close to perfect, with mild temperatures and sunny dispositions.

John Martin led an eye opening seminar on Star Parties and Clubs. Who knew there were so many astronomy activities in so many places?

Carli Partain facilitated the annual Ladies Luncheon at Kafe Kokopelli, a perennial favorite with the SPAC crowd (<https://www.kafekokopelli.com/>).

Mike Davis was back in the Mirror Lab tent where he demonstrated how to make your own very high quality mirror. It was also an enlightening conversation concerning how to understand the subtleties of hearing "MORE GRIT!" at regular intervals.

The Swap Meet, usually held on Saturday morning was moved this year to Friday afternoon. Treasures changed hands at a brisk pace while Johnny White made a half ton of kettle corn to patrons' and sellers' delight.

Allen Maroney and Mike Davis led the Telescope Walkabout of the many astronomical delights (mostly telescopes) that were set up in anticipation of clear skies that evening.

Later that evening our beloved President, Mike Parting ... Portine ... Pardoning ... whatever, demonstrated his night vision system that changes night into day while still being night, to everyone's

amazement. This technology truly adds another dimension to star gazing. Also makes it very difficult to hide in the dark.

For Saturday, sadly the tractor normally used in our annual Hee-Haw Hay Ride (*sans* hay) had been temporarily reassigned to a high priority project elsewhere in Pasco County. Undaunted, several OBSers gathered in chairs under the Reception Tent awning and traded favorite Hayride stories.

Peter McLean, who went from neophyte to advanced imager in just a couple of years, presented “One Shot Color Astrophoto Nebula Processing with Pixinsight.” Pixinsight is an advanced software package that has amazing capabilities but has a steep learning curve. Pete’s step-by-step approach introduced his fundamental workflow that makes this tool usable for even the beginning imager. Once the neophyte gets comfortable with this process the door opens for getting further into the program’s more advanced capabilities.

Bob Stelmock, guru of the “Easy-Peasy” school of astrophotography, demonstrated the capabilities of the See Star smart (very, very smart) astronomy system. You turn it on, wait a few minutes for it to wake up and figure out where it is, then tell it what you want to look at. The See Star gives amazing results for a 50 mm scope. The technology hidden inside is almost indistinguishable from magic. If you try to look inside to see how it works it will self-destruct, so don’t try it.

Another new thing this year was on-line voting for best images in each of six categories. Here they are:

Category Winner

Smart Telescope

Contestant 7

Gerry Graszi

M42 Orion Nebula

The Orion Nebula (also known as Messier 42, M42, or NGC 1976) is a diffuse nebula situated in the Milky Way, being south of Orion's Belt in the constellation of Orion,[b] and is known as the middle "star" in the "sword" of Orion. It is one of the brightest nebulae and is visible to the naked eye in the night sky with apparent magnitude 4.0. It is 1,344 ± 20 light-years (412.1 ± 6.1 pc) away[3][6] and is the closest region of massive star formation to Earth. The M42 nebula is estimated to be 24 light -years across (so its apparent size from Earth is approximately 1 degree). It has a mass of about 2,000 times that of the Sun. Older texts frequently refer to the Orion Nebula as the Great Nebula in Orion or the Great Orion Nebula.[7]



Seestar M 42
J Dade City / 2024 02 07 20:41 45min

SPAC Image Contest 2024
15

Category Winner Galaxies-Star Clusters-Comets

Contestant 10

Peter McLean

M101 Pinwheel Galaxy

The Pinwheel Galaxy (also known as Messier 101, M101 or NGC 5457) is a face-on spiral galaxy 21 million light-years (6.4 megaparsecs)[5] away from Earth in the constellation Ursa Major. It was discovered by Pierre Méchain in 1781[a] and was communicated that year to Charles Messier, who verified its position for inclusion in the Messier Catalogue as one of its final entries.



SPAC Image Contest 2024

5

Category Winner Starscapes

Contestant 7

Gerry Graszl

A day in the park

Withlacoochee River Park is located in Pasco County, in the U.S. state of Florida. The property is 260 acres (1.1 km²) and is located at 12449 Withlacoochee Boulevard in Dade City. It includes a canoe launch, dock, 1.5 miles (2.4 km) of hiking trails, as well a bicycling, bird watching, picnic facilities, camping, fishing, an observation tower, and a 30-acre rec field. Habitats in the area include high sandhills and low riverine swamp.[1]



SPAC Image Contest 2024

13

Category Winner Planetary-Lunar

Contestant 1
Les Gatechair
The Moon



The Moon is Earth's only natural satellite. It orbits at an average distance of 384,400 km (238,900 mi), about 30 times Earth's diameter. The Moon always presents the same side to Earth, because gravitational pull has locked its rotation to the planet. This results in the lunar day of 29.5 Earth days matching the lunar month. The Moon's gravitational pull – and to a lesser extent the Sun's – are the main drivers of the tides.

SPAC Image Contest 2024

9

Category Winner Nebula

Contestant 4
Philip Roey
NGC2242 Rosette Nebula



The Rosette Nebula (also known as Caldwell 49) is an H II region located near one end of a giant molecular cloud in the Monoceros region of the Milky Way Galaxy. The open cluster NGC 2244 (Caldwell 50) is closely associated with the nebulosity, the stars of the cluster having been formed from the nebula's matter.

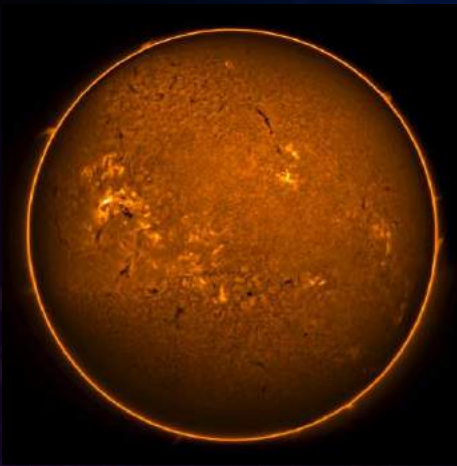
SPAC Image Contest 2024

7

Category Winner
Solar

Contestant 9
Christian Rubach
The Sun

The Sun is the star at the center of the Solar System. It is a massive, hot ball of plasma, inflated and heated by energy produced by nuclear fusion reactions at its core. Part of this internal energy is emitted from its surface as light, ultraviolet, and infrared radiation, providing most of the energy for life on Earth.



SPAC Image Contest 2024 11

Before the grand finale presentations, we gaggled for the Group Photo.

Raffle prize winning tickets were drawn from the boxes for each prize. The raffle scope drawing was made on-line.

The final event was a Barbeque Dinner served by D 'n D Barbeque & Catering. If anyone went hungry it was their own damn fault.



February General Meeting



GUY EARLE



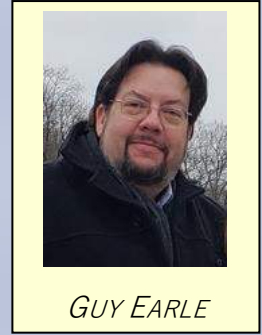
SPAC member Greg Shanos did a great presentation at our February meeting on the *OSIRIS-Rex and Hayabusa 2* missions and the samples brought back from these missions. Any SPAC'er familiar with Greg knows his love of meteors and asteroids, with his own private collection, and he brings that enthusiasm to his presentations. Well done, Greg!



Thoughts on the Seestar

Seriously, who doesn't have or at least have ordered a **Seestar** yet? This tiny little telescope is bringing astronomy, especially astrophotography, to a quickly growing group of amateur astronomers. This little piece of portable technology has that popular appeal that is reserved for "that item" that blazes across the bank accounts once every decade. Like the first Nagler eyepieces or when Dobsonians first showed up in the Meade, Celestron and Orion lineups in astronomy magazines, there's a popular appeal that is well-earned. As for myself, it fits that niche perfectly, as I don't have the patience to go down that deep sky imaging rabbit hole. Don't take me wrong, the work that I see done by Bob Stelmock, Jamie Kenas, Joe Canz, Peter McLean, Joe Reiche, Christian Rubach, and others is spectacular. Stuff that's posted on our club FB page would rival the best that observatories did just decades ago. We've been seeing a shift from visual to imaging in this hobby, but it's always been out of the casual reach for most people, especially those starting out. I remember back in the 90's when John O'Neil, the great Wizard of Imaging, was alone out of all us at the old Hickory Hill observing site in Brooksville, set up on one of the north-facing concrete pads. There was always a crowd wishing to check out the new digital technology, while there were still plenty who used film for their images. I also distinctly remember his table collapsing, spilling his gear and laptop all over the field, followed by a quick literal tossing of the stuff into his vehicle before heading home. Producing images of galaxies, nebulae, anything deep sky was the realm of those wishing to put some cash down on gear and learn some fairly complex post processing programs.

The Seestar just changed all that with a scope that fits in a small case and uses your phone or tablet to take the pictures. You can watch that episode of *The Big Bang Theory* for the umpteenth time, your phone on the arm of the couch, while the little scope ticks away in 10-second exposures and the object gets brighter and brighter on your screen. If you've been reading the *Examiner* or on FB for a while, you know that I do planetary imaging, which is definitely different and it's own process. But it's a few programs that are pretty easy to learn, so I'm not new to imaging but deep sky is very different. The Seestar fits that place in-between and it's great. However, like one of Odysseus' sailors, the temptation to learn a separate post processing program such as Siril, calls to me like one of the Sirens in Homer's *Odyssey*. That is one of the strengths of this hobby that has kept me in it for over three decades, the constant and continuing education coupled with new technology. What was it the Borg said in *Star Trek*, "resistance is futile?"



GUY EARLE



Editor's Note

The Examiner has a solid group of volunteers that helps to make the newsletter one of substance, and I'm looking for one more. *I really could use some help with the SPAC Image Gallery each month.* I try to keep an eye on what's posted and gather them up for each month's edition, but I don't get to spend as much time on that section as I'd hoped. I'm looking for a volunteer to oversee the SPAC Image Gallery each month, to collect and send me a selection of images to share with their descriptions and by whom it was taken. This can be done in an email. If you're interested to help me out, please shoot me an email.



GUY EARLE

The April 8th Eclipse and Comet Pons Brooks 2024

I would be shocked if anyone reading this newsletter doesn't know about the upcoming eclipse across North America on the afternoon of Monday, April 8th. Pick up the latest edition of *Astronomy* or *Sky & Telescope* and you can read all about it; *Astronomy* even has a great multi-page visual of the totality path. Some SPAC members are making travel plans to get into the path, especially since a full solar eclipse won't happen again in the US until 2044.

You'll still see a partial solar eclipse if you're staying in town. Get some special solar glasses, look up during those three-plus minutes, and enjoy the view. Take a moment to look down at the shadows of the eclipse streaming onto the ground under trees.

If you are going to be in totality, there's the chance that you can see Comet Pons-Brooks 2024 near Jupiter. Pictures of the comet are becoming frequent on social media as it continues to brighten, especially with all the Seestar's out there.

Credit to Starwalk.space and earthsky.org for some of the comet content:

Well-placed for the Northern Hemisphere, comet 12P/Pons-Brooks is predicted to range in magnitude from 6.8 to 5.5 throughout March, which brings it close to being visible to the naked eye! See the comet in the evening and morning hours as it moves across the constellations of Andromeda, Pisces, and Aries this month. You can spot 12P/Pons-Brooks in the sky right now with the free astronomy app Sky Tonight.



Comet Pons-Brooks taken on the night of March 11th, taken with the Seestar. I stacked the 14-minute exposure in Siril and did post in Lightroom Classic.










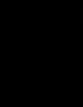



















SPAC Outreach

Last week Jack, Sam, Steve and I attended the Tarpon Springs Elementary "Reading Under The Stars Program" as part of our club's outreach program. The weather did not cooperate but nonetheless we set up our scopes and had a great turn out of around 160 students and parents. We were able to focus our scopes on terrestrial targets and my dob's mirror provided entertainment in

the form of abnormally large heads. Outreaches such as this one provide us an opportunity to make a mark upon kids so that one day they may look to the stars and enjoy them as we do with our hobby.



April Lunar Calendar

April 2024						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 	2 	3 	4 	5 	6 
7 	8 	9 	10 	11 	12 	13 
14 	15 	16 	17 	18 	19 	20 
21 	22 	23 	24 	25 	26 	27 
28 	29 	30 				

Third Quarter April 1

April 5, Mars will be 2.0° north of the Moon

April 6, Saturn will be 1.2° north of the Moon occulting Saturn in Antarctica

April 7, Venus will be occulted beginning ~12:10 to 13:35 by a 2% illuminated Moon

April 7, the Moon will be at Perigee: 358,850 km from Earth

New Moon April 8

April 8 a total solar eclipse again transits the USA magnitude 1.057

April 8, the Moon will cross the celestial equator going northward at the Ascending Node

April 10, Mars will be .4° south of Saturn

April 10, the Pleiades will be .4° north of the Moon

April 11, Jupiter will be 3.6° south of the Moon

April 14, the Pleiades will be 0.4° north of the Moon

First Quarter April 15

April 15, Pollux will be 1.5° north of the Moon

April 18, Regulus will be 3.6° south of the Moon

April 19, the Moon will be at Apogee: 405,625 km from Earth

April 22 is the Lyrid Meteor Shower with a ZHR of ~10 to 15 in dark sky. The sky will not be dark.

April 22, the Moon will cross the celestial equator going southward at the Descending Node

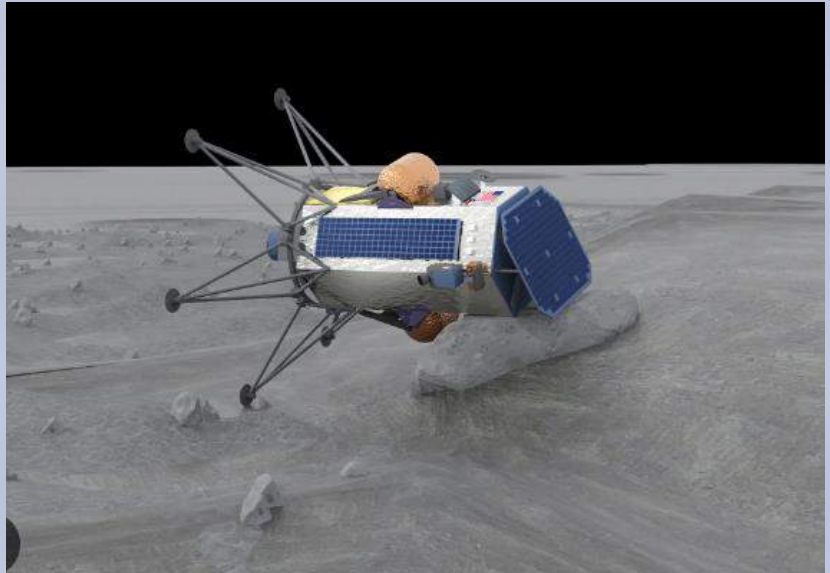
April 22, Spica will be 1.5° south of the Moon

Full Moon, April 23, the Full Pink Moon

April 30, Antares will be $.3^\circ$ south of the Moon

Space Exploration News

Odysseus has had a Moon landing so complex that it is difficult to assess whether it was a success or failure. Certainly, it was both. It [was a success](#) in that after landing all payloads except its rover and Embry Riddle Aeronautical University's EagleCam worked and sent back valuable data after landing. It was a failure on several levels. First of all a quality control problem meant that a pencil shaped



device that should have been removed before flight was not removed and subsequently the LIDAR landing system couldn't be powered on. Odysseus [would have never been able to land at all](#) except for NASA's LIDAR payload, which was only supposed to be tested after landing. A quick software patch to link the NASA LIDAR to Odysseus' guidance system allowed Intuitive Machines to attempt a landing, except that the link didn't provide real time positions and was at times several minutes behind real time. As a result, the last altitude measurement Odysseus got was 30 kilometers above the Moon's surface and all maneuvering after that was strictly theoretical. Odysseus thought it was

1000 meters higher than it was and slammed into the Moon hard enough to break its landing legs, falling on its face. “Help, I’ve fallen and can’t get up” jokes may now commence. STOP. In spite of this all payloads survived the “landing” and functioned afterward. The rover ended up on the bottom and couldn’t be deployed. EagleCam was deployed but the wireless network failed to link up so it could send data to Earth. We’ll call it a win.

As of yesterday morning, [the FAA has announced](#) all items have been handled and it will issue SpaceX final clearance for the launch of Integrated Flight Test 3 of Starship. In the spirit of mercy to editor, Guy Earle, I will simply recount the state of the launch before the event. Launch is scheduled for Thursday, March 14 at 07:30 EDT. [The goals are much the same as IFT 2](#), normal 1st stage performance to separation and controlled landing in the Gulf of Mexico, successful hot staging, second stage reaching orbital velocity and normal shutdown of engines, testing of orbital refuelling technology and controlled splashdown in the Indian Ocean. SpaceX is seeking FAA clearance to launch at least nine Starship missions this year.

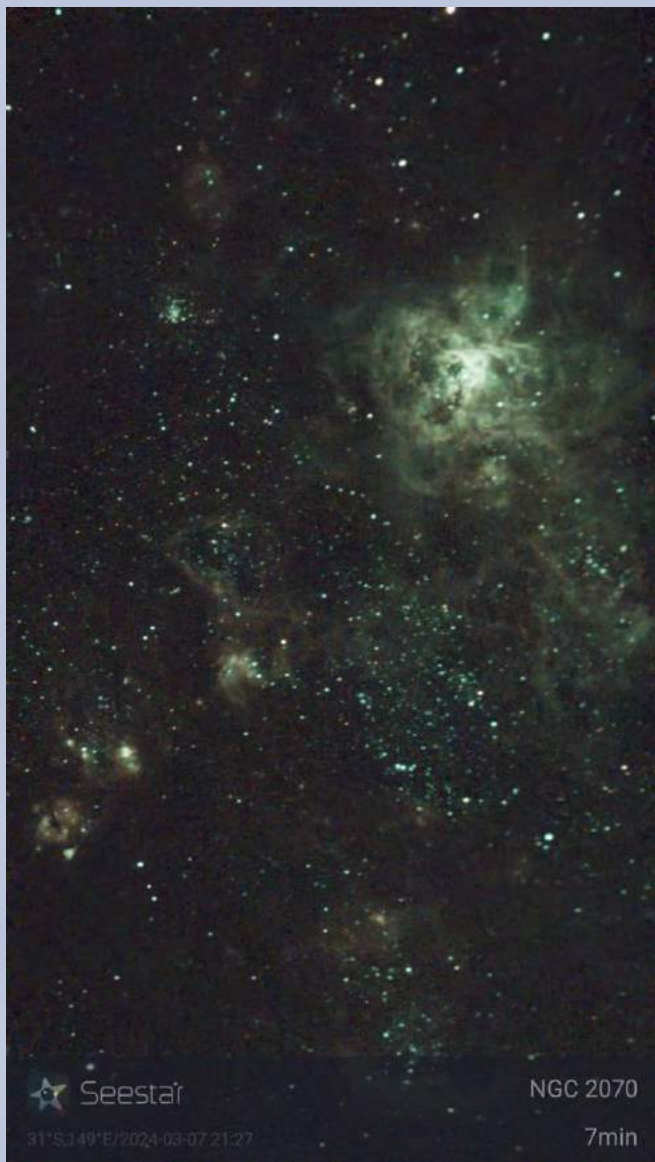
Meanwhile, on Mars more information has emerged regarding Mars helicopter, Ingenuity’s final fate. Because Ingenuity [crashed on the top of a sand ripple](#), Perseverance is unable to approach closer than 800 meters, about ¼ mile away. In spite of that, Perseverance has a telescope integrated into its SuperCam atop its tall mast. New photography reveals that a whole blade can be seen about 50 feet from Ingenuity, broken off at the rotor hub. Apparently the 4 foot long blades impacted the sand at 2,500 RPM, causing fatal carnage, although Ingenuity remained upright with full communications ability. Because of the sand ripples, unnavigable by Perseverance, the two craft must now separate forever. Salute to three years of Mars helicopter flights where an unwelcome stowaway became a most useful partner in Mars exploration.

Just in case you’re planning, as unfortunately I have, to skip March’s total solar eclipse two compelling reasons not to miss it are that this will be the longest duration solar eclipse visible from North America since 1806, the darkest for the next 217 years, AND there may be a comet visible at totality. Wait. That’s three reasons. [And there are more.](#)

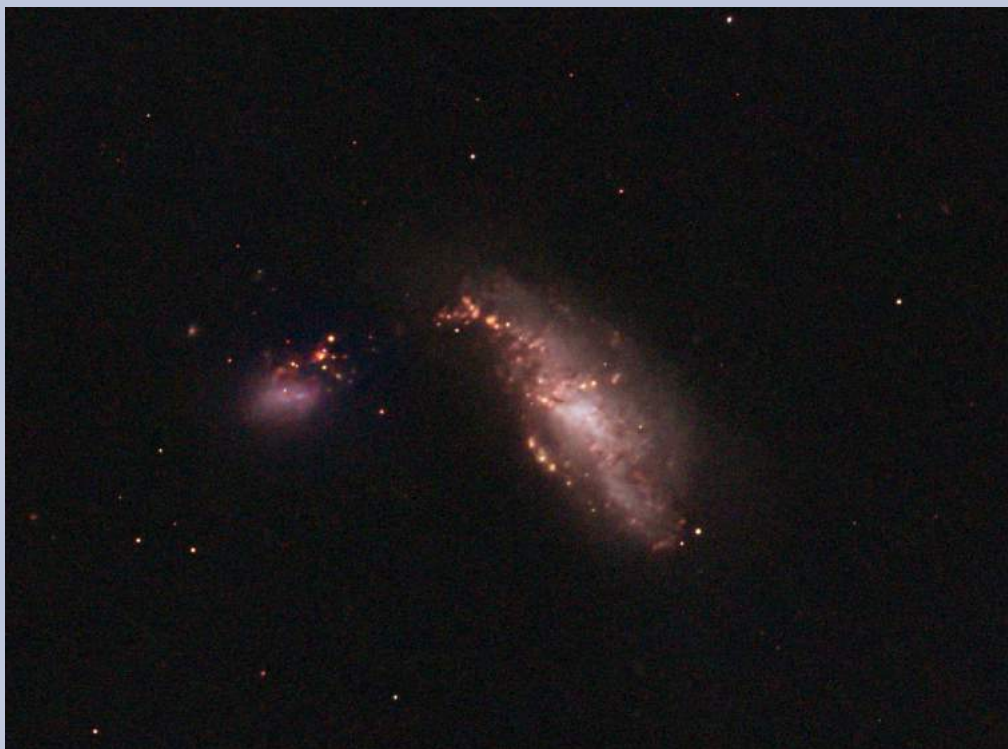
SPAC Image Gallery



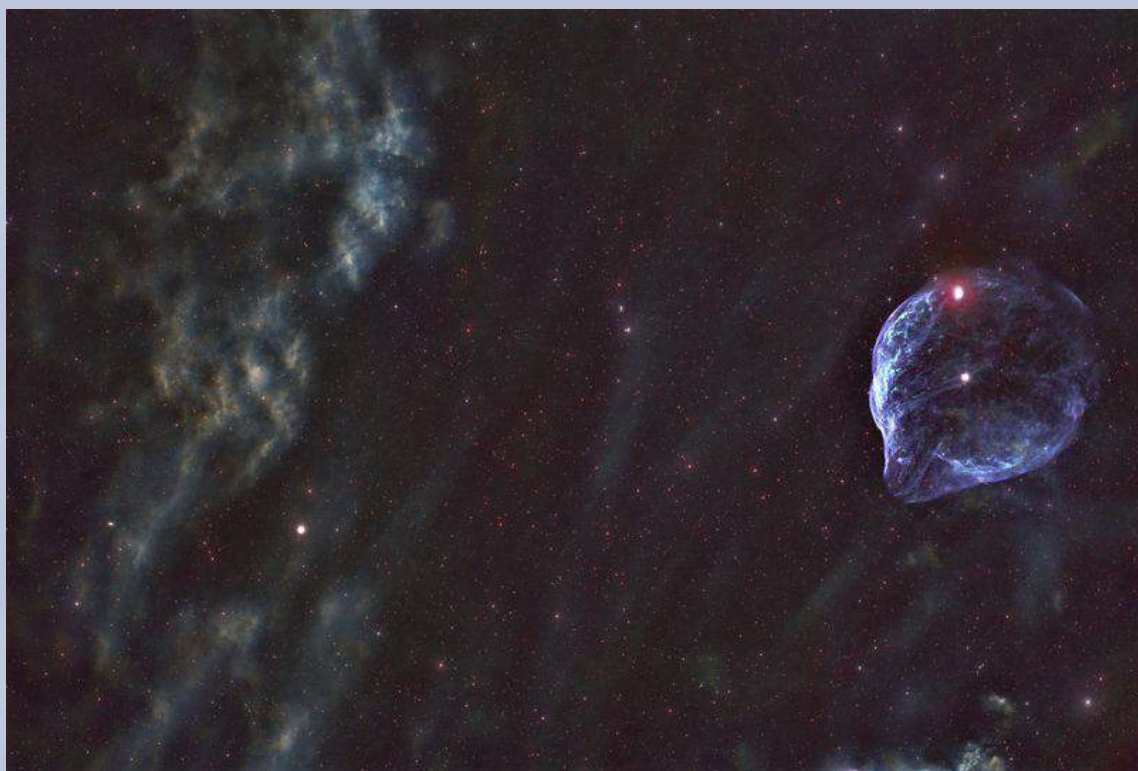
Here are some excellent astrophotography highlights from our fellow SPAC members. Anyone who would like to share his or her work, I encourage you to [email the editor](#) to submit for future newsletters or share them on our [SPAC Facebook page](#).



Above: **The Tarantula Nebula and Omega Centauri** taken with the Seestar from Australia by **Philip Roey**

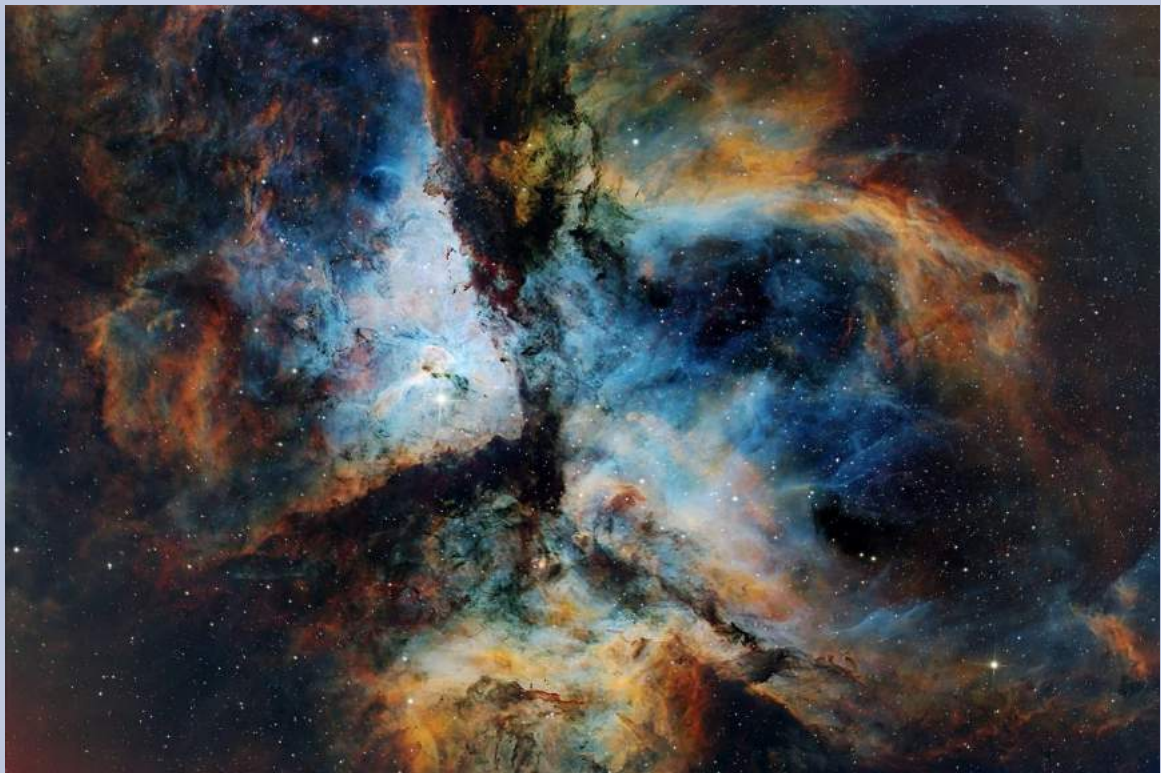


Above: **The Cocoon Galaxy (NGC 4490)** taken with Celestron 8" HD & ASI2600MC by **Johnny White**
Below: **SH2-308 The Dolphin Head** taken with Williams Optics GT-81 & CEM 70 by **Jamie Kenas**





Above: **The Eta Carina Nebula (NGC 3372)**
&
Below: **The Statue of Liberty Nebula (NGC 3590)** taken by Philip Roey





Above: **M82** taken 2024-03-12, OTA: Celestron 9.25 Edge HD, Mount: CEM 70,
Camera: ZWO ASI 2600MC, Exposures: 300s x25, Filters: Idas D2 at Chiefland Astro Ranch
by **Jamie Kenas**

Lunar Imaging with the new ZWO SeeStar S50 Smart Scope

by Gregory T. Shanos



A novel way to image the moon is with the use of a smart scope. A Smart Telescope utilizes sophisticated sensors, camera systems, and software to capture stunning images of the universe. I always wanted to purchase a smart scope; however, the price was prohibitive starting at \$3,999 to \$4999. Recently the ZWO SeeStar S50 has entered the market at an astonishingly low price of \$499. This smart scope is one of the most cost-effective, fastest and easiest ways to take impressive images of the Moon, Sun, Deep-Sky as well as Terrestrial objects. In this short review, I shall focus only on how to take impressive images of the Moon with the SeeStar S50. (See figure 1) There is also another smart scope on the market at this price range namely the Dwarf II. I do not own a Dwarf II therefore I cannot say anything regarding this smart scope. I refer everyone to check out YouTube videos that do side by side comparisons of the Dwarf II, SeeStar and other smart scopes before you decide which one to purchase.

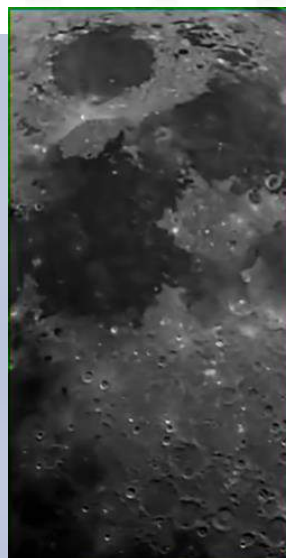
The SeeStar is easy to use and setup. It only takes approximately 5 to 10 minutes to set up the telescope and you are ready to go. After turning on the device, you sync it using built-in Wi-Fi to your iPhone/Android cell phone or Apple iPad. I highly recommend using an iPad since the image appears rather small on a cell phone. Next you need to calibrate the compass by turning the alt-azimuth mounted telescope and tripod 360 degrees several times until the telescope states the calibration is complete. Next you need to level the SeeStar. There is an auto-level feature that successfully levels the telescope. You are now ready to begin imaging. There are four separate modes, namely Stargazing, Lunar, Solar and Scenery. Just click on Lunar mode and the SeeStar automatically finds the moon! The moon is centered in the field of view and is tracked accordingly. Next click on autofocus and you're ready to image. You can take a single photographic snapshot of the moon which is at lower resolution. (See images 2, 4, & 6) The photograph appears and is saved as a jpg on your cell phone or iPad.

The SeeStar features two video modes namely AVI (Raw) and MP4 (Compressed) for the Sun, Moon, and Planets. I recommend using only AVI (RAW) since this is uncompressed and compatible with Autostakkert. However, the file sizes will be very large. For a five-minute exposure, the file size of the video was a whopping 8 GB. This large video file is stored in the SeeStars SSD internal memory which is 64GB in size. A recent software/firmware update now allows for 2X and 4X digital zoom so you can focus on various craters and maria. (See images 4 thru 7) You can then connect the SeeStar and download the video file to your computer. Once the AVI is downloaded you can import it into Autostakkert for aligning and stacking.

Unfortunately, planets in the SeeStar appear very small due to the short focal length of only 250mm. The SeeStar is optimized for a larger field of view that would encompass the Sun, Moon and Deep-Sky Objects.

The ZWO SeeStar S50 software/firmware is updated at least twice a month with new features added at every upgrade. I have contacted ZWO support on several occasions and always receive a response within 24hours!

The introduction of smart scopes will soon revolutionize the field of amateur astronomy. The SeeStar and other smart scopes are light weight, easy to use and can take scientific quality images. In conclusion, a smart scope in the price range of \$499 is affordable and a necessary addition to everyone's arsenal of astronomical equipment. These powerful new instruments make astrophotography easy and fun with an added scientific value.



Here is something shared from SPAC member Greg Simpson, a passage from a book he is currently reading, which he thought would interest other members. Please enjoy.

“Dawn was approaching at Las Campanas Observatory in Chile, 1980. I’d been up all night in the control room of the 2.5-meter du Pont telescope with a wry, bearded astronomer and the telescope’s night assistant. Outside, the mountains—so metallic that tossed a rock rings out when it lands, and you hear earthquakes before you feel them—were bathed in gentle starlight, but we could see none of it. We’d remained in the warm, brightly lit control room, where our work consisted of punching buttons to keep guide stars centered on crosshairs on a computer monitor, making photographs of galaxies on big, square glass photographic plates attached to a telescope that we hadn’t seen all night, either.

“Now came the moment I’d been waiting for. We’d reached the onset of astronomical dawn—too late to start another time exposure, for fear the brightening sky would fog the plate before we’d finished, but still dark enough for visual observing. I took a weighty brass eyepiece out of a drawer—a dusty relic of an earlier epoch, big as a can of beer—and made my way into the inky blackness of the dome. There the massive telescope was silhouetted against clouds of stars visible through the dome slit. As I groped in the darkness it swung toward the Large Magellanic Cloud, a neighboring galaxy, and the dome rotated to follow its progress, the Milky Way crossing the slit like a river seen out the door of a banking helicopter. Then, with a descending bass note from the gears, all came to a halt. I inserted the eyepiece and prepared to do something almost unheard of in modern professional astronomy: I was going to actually look through a large telescope.

“I focused on a rich field of stars and could see a waft of gray haze intruding into the left side of the field of view—the outskirts of the Tarantula nebula, a gigantic star-forming region in the Cloud. I pressed a button on the steel control box, and the telescope glided toward the center of the nebula. I gasped at the sight: Reefs of brick-red and pearl-gray gas clouds were parading by like drapery in a palace of dreams. The nebulosity became ever brighter until I arrived at the core, where sheets of gas entangled the stars of the cluster 30 Doradus. Their light had been traveling through intergalactic space for 180,000 years, dissipating all the while as it spread out, but it was still bright enough to make me squint. I recoiled, leaned back, and found myself gazing at a stream of light that spilled out from the eyepiece like a flashlight beam. Looking up, I saw that it projected a fuzzy, circular image of the nebula on the inside of the dome.

“The night assistant’s voice crackled through the intercom. ‘Tim, you OK down there?’ I tried to speak, but could find no words.”

–Timothy Ferris, “Seeing in the Dark,” 2002

SPAC Mirror Lab: Restoring a Meade ETX-125 for Hollins High School



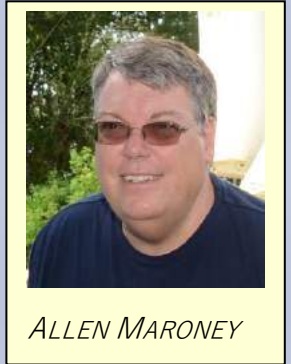
Back in mid-November of last year I had the pleasure of participating in the Great American Teach-In at Hollins High School (formerly known as Dixie Hollins High School). I was the guest astronomy speaker for a 90-minute Astronomy class. The

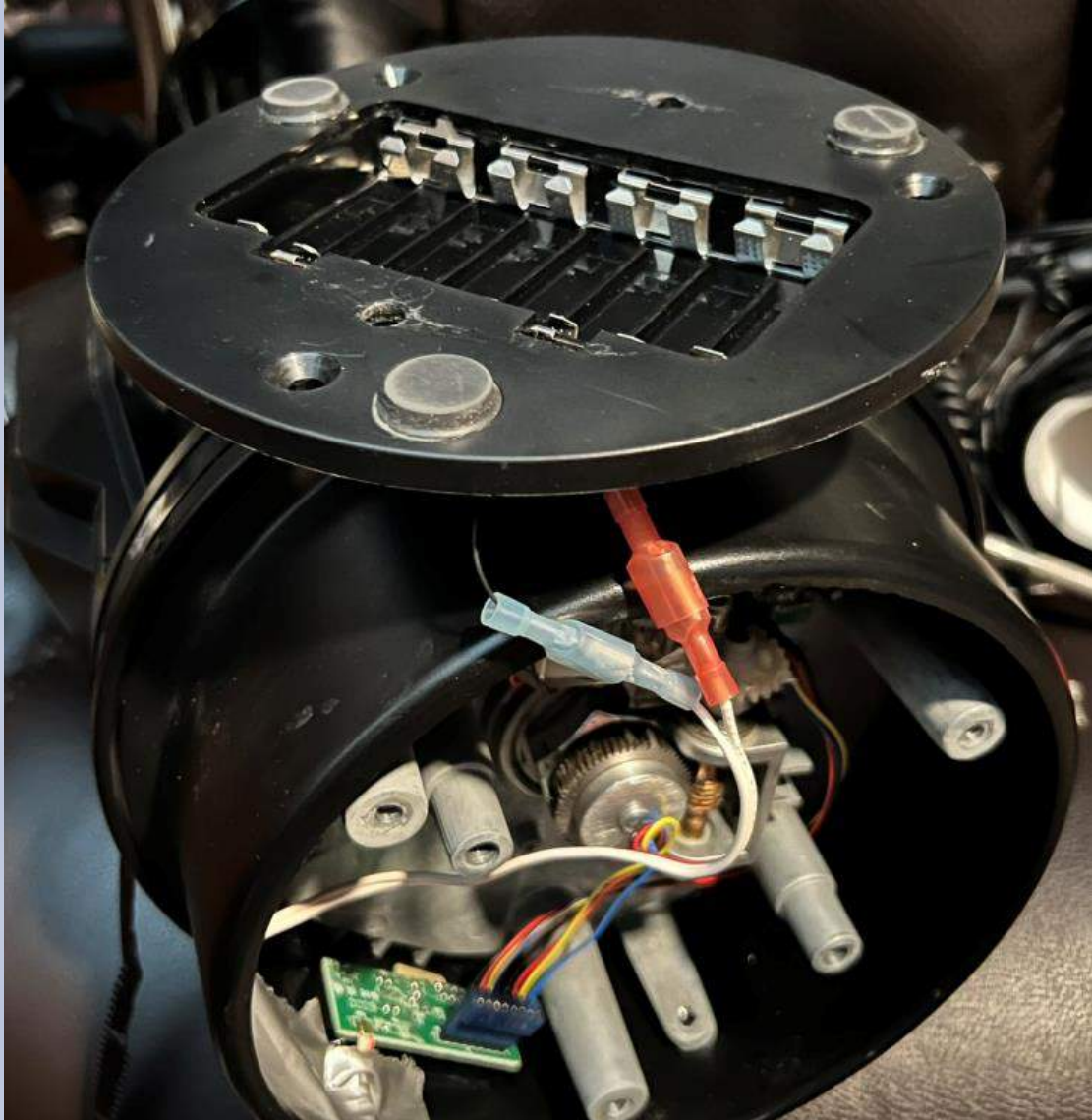
class went well and at the end I was talking with the astronomy instructor, Christine Cook, and found out that the class didn't have a telescope. I told her that I would check with SPAC board and see if they had a donated telescope that would be appropriate for an Astronomy class that meets on the second floor and may need to carry the telescope up and down stairs.

At the 2004 OBS I was given a large tool box and a tripod for the class. The box contained a Meade ETX-125EC, hand controller, a huge 12v power supply and four Plossl eyepieces, a 2x Barlow as well as some long dead lead-acid batteries and loose wires and pipe fittings. The status of all except the pipe fittings were unknown.

Dangling out of the bottom of the ETX was a 5' power wire that was used to connect the ETX to the old batteries. The wire went into the battery compartment of the ETX and inside the motor housing. Also dangling was the right ascension hour scale used if the scope was on an equatorial wedge.

First, I dusted off the scope. Next, I cleaned the optics (they were in great condition) and the eyepieces. The RA hour scale was glued back in place. This was followed by taking off the base plate and removing the loose power wire. Where the loose power wire attached to the scope wires it was disconnected and the internal wires were reattached. This allows the internal eight AA batteries or an external 12v source to power the scope. While in there I cleaned and regreased the azimuth gears.





The ETX125 bottom plate removed just after I cut the added power wire (white) and before I reattached the connections from the AA batteries to the circuit.

Now it was time to see what worked and what needed work. I started with the 120v to 12v power supply. It was old and big and output to a female cigarette lighter socket. Checking the output voltage came in at 16.4v. This appeared to be an unregulated power supply which means as a load is put on it the voltage drops. Not wanting to risk the telescope's circuit boards I opted to use a 12v drill power supply and used the included cigarette plug power cord.

When the power switch on the scope was flicked on the telescope and hand controller came to life and both the altitude and azimuth motors worked. I also tested it with AA batteries and the repaired connections worked also.

After confirming that the motors worked, I connected the hand controller to my PC and updated its firmware and added some of the current comets. This confirmed that the firmware update cable was also good.

The right side of the scope has the altitude friction clutch and the left side has adjustable altitude markings. The left side fell off almost as soon as I touched it. Upon further inspection this was a brass nut pressed into plastic and the altitude dial screwed into it. The brass nut was cleaned, coated with super glue gel and pressed back into the plastic. After a few hours the altitude dial worked like new.

Next, I pointed the telescope out of the window and aimed at a distant tree. This telescope has an official Meade motor focuser bolted on that uses a 9v battery. Sticking out of the focuser was a user added toggle switch. Hmm. Ignoring the toggle switch I attempted to focus the scope. The motor whirled but the focus didn't seem to change. Toggling the switch made no difference.



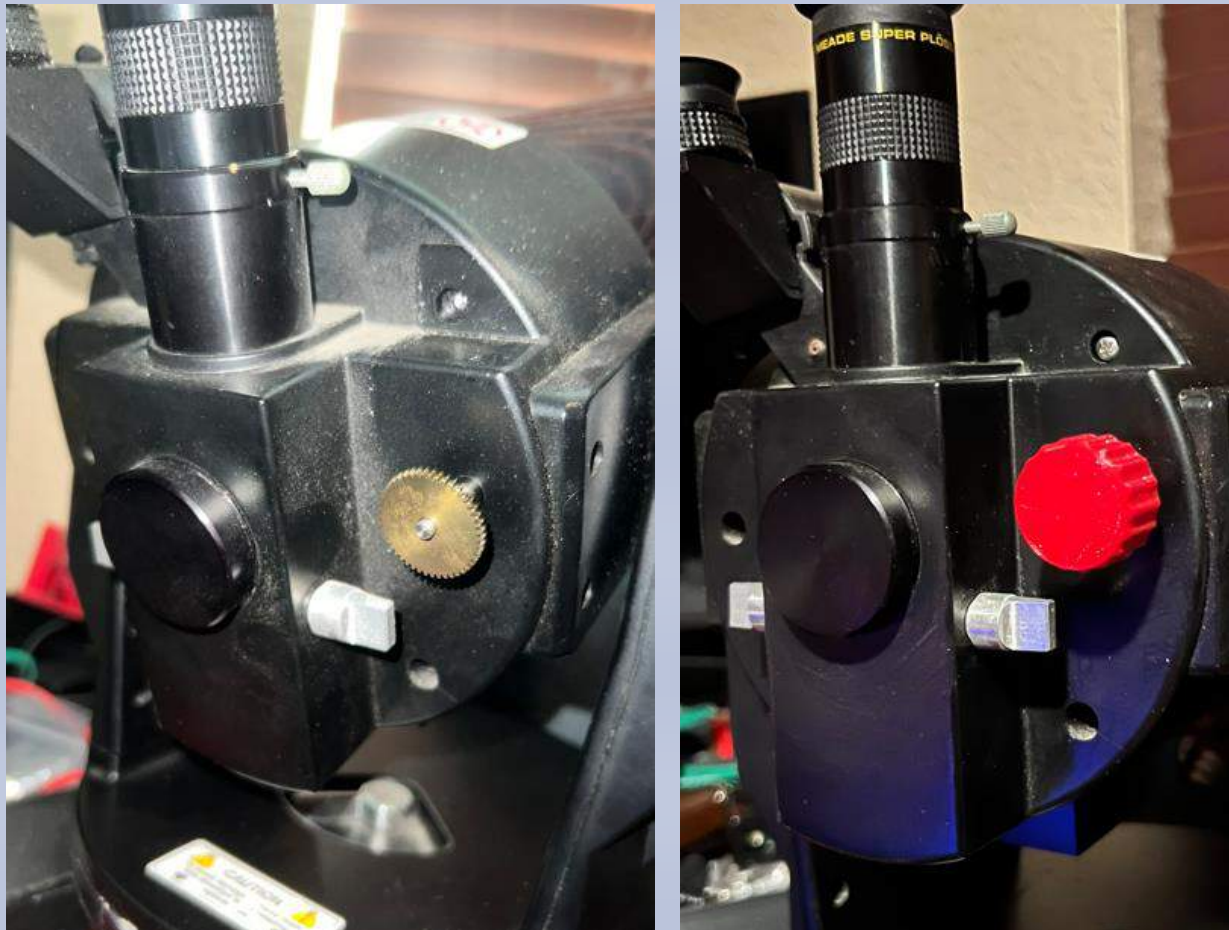
The electronic focuser with the broken spur gear (lower left) and the user added toggle switch (lower right). You can see where the motor shaft is missing the gear.

Removing the motor focuser and opening the case showed me that the user added toggle switch went to four resistors in a Delta pattern with the lower bar having two resistors in parallel. It appears that this switch was added to slow down the focuser with two speeds. I removed it and soldered the

original wiring back to its pre-toggle switch era. Note the long brass spur gear. That's needed because the focuser shaft on the scope moves in and out as focus is changed causing the gear on that shaft to move in and out sliding across the length of this gear. That didn't fix the bigger issue.

The small spur gear that went on the motor shaft was broken in multiple pieces and I didn't have all of the pieces. It wouldn't have mattered if I did. The plastic, which looked like nylon, did not glue well and Meade no longer offers this focuser or parts for it. Printing a 3D gear would not hold up either.

Enter plan 'B'. I removed the metal spur gear that attached to the telescope's focuser shaft and 3D printed a manual focuser knob. For a classroom setting I like this option better than the electronic focuser. Just turn the big red knob. The remaining hole where the motor focuser attached (above the red knob) to the scope was filled with a short M6 stainless screw with a dab of Loc-Tite. Focusing now works and no batteries are required. A bonus was that the finder scope appeared to be in alignment also.



The spur gear for the motor focuser and the new manual focus knob.

You may recall that this telescope came with a tripod. To attach the scope to the tripod a wooden adapter board was made by the previous owner that offsets the scope about 8" from the

center of the tripod. To make this stable an offset weight would be needed. Since the ETX125 is designed to work on a table or any level, stable surface and the school has tables this tripod set-up didn't make sense for a classroom.

Now that everything was checked out and working a new 12v 5A regulated power supply was ordered and came in the next day. Finder caps and a plug for the eyepiece hole were made. The scope storage toolbox was cleaned out and is about half of the original weight with the scope, power supply and eyepieces stored away.



All caps in place (left) and ready for use (right).

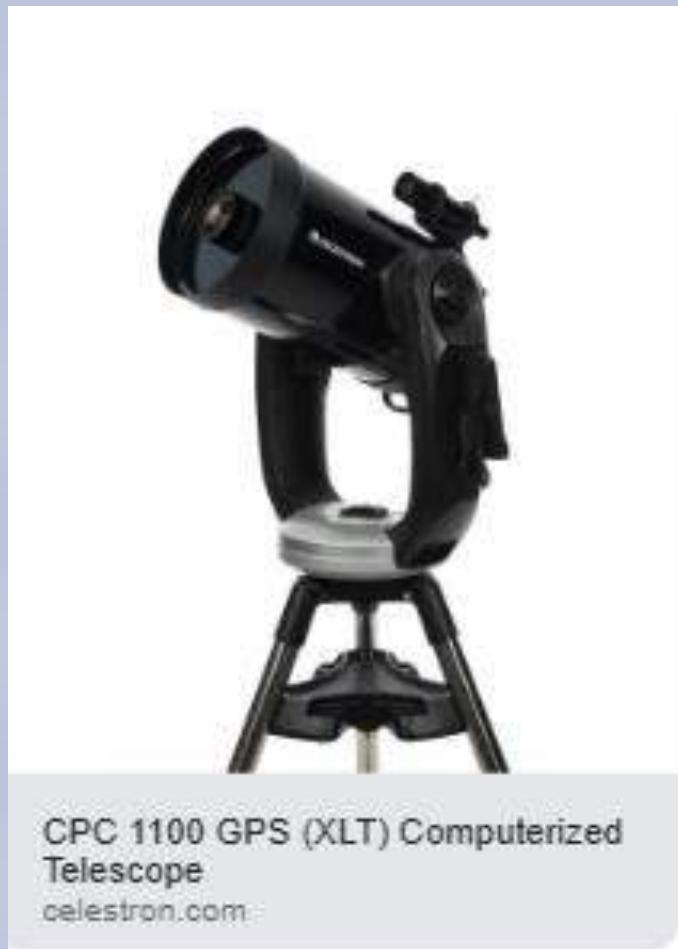
I would have liked to use this telescope under the stars. To do that I needed stars and since I have been working on it there has been nothing but clouds. I tested the go-to alignment routines inside and they appear to point it where I would expect the various stars to be.

As I write this Hollins High School's Astronomy class doesn't know that they are getting a telescope. I look forward to dropping it off in the next few days. It should be a great teaching telescope both in and out of the classroom.



For Sale

Listing #1: CPC 1100 GPS XLT and have a ton of accessories. “We live in Largo / Pinellas County for anyone who is interested (not far from the intracoastal). We do have wheels on the telescope plus a ramp and it separates into in 2 sections.” If interested, please reach out to JoAnne DeVargas @ jo@filmedresearch.com for more information and pictures. This scope is needing a new home for a fellow amateur astronomer who is no longer able to observe due to health issues. Asking \$2800.



SPAC Business Meeting 🏠

Our next business meeting is **Wed., Apr. 17th, at 8:00 PM** via conference call; details upon request. All interested members are invited to attend. All club business decisions are made at the business meeting so as not to encumber the general meeting.

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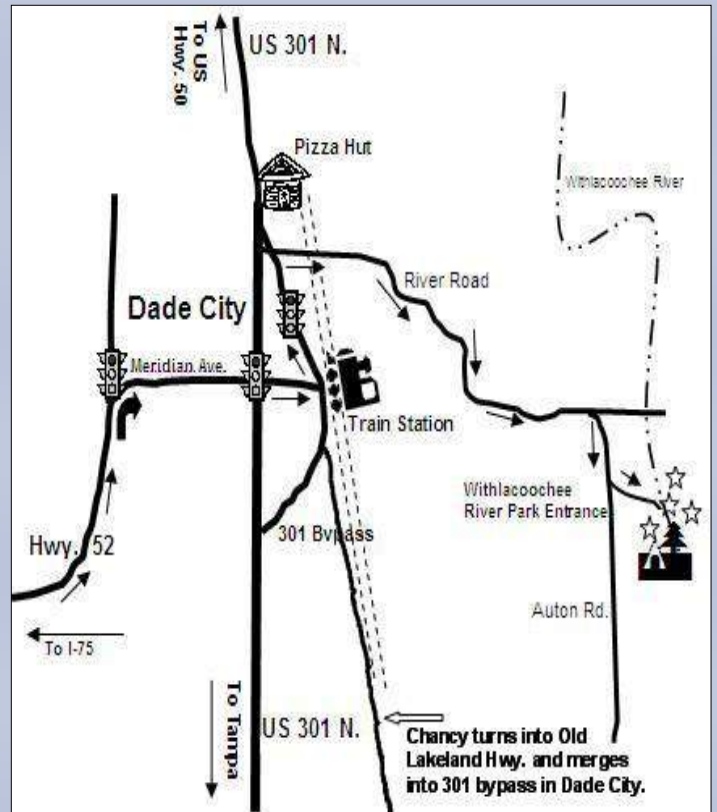
Withlacoochee New Moon Weekends

There's no need for reservations. However, the park closes at sundown, so you will need to arrive before then. The park rangers will give you the gate-code once you're inside the park. Please do not call for the gate code as they are not allowed to give it out over the phone.



Reservations are not necessary. Please print and display our [Friends-Of-The-Park Pass](#) on your dashboard.

Please join us! All astronomy enthusiasts are welcome. You do not need to be a club member to attend. Please refer to our [Club Calendar](#) for details and scheduled dates.



Withlacoochee River Park - Dade City, FL
 Detailed directions can be found at:
www.StPeteAstronomyClub.org



St. Petersburg Astronomy Club

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St. Petersburg Astronomy Club Membership Form

Membership in St. Petersburg Astronomy Club, Inc. (SPAC) is open to anyone, regardless of age, who is interested in astronomy. Benefits of membership include a monthly subscription to the SPAC Examiner newsletter, reduced camping rates and use of the club's bunkhouse at our dark sky site at Withlacoochee River Park, the ability to serve on the SPAC board and voting privileges. Dues are considered donations and are non-refundable. Membership options are available as listed below.

You are now able to choose how you wish to join or renew your membership:

- **Preferred On-line Website Option: New instructions as our website has been updated.**

Go to https://www.stpeteastronomyclub.org/Sign_In.php on the SPAC website where you can join, view and update your membership profile, provide payment, and **print your membership card.**

- **US Mail Option: Takes more time to process manually because we are all volunteers.**

Complete the attached membership form and send it along with your payment to:

Jim Hunter
17316 Oak Ledge Drive
Lutz, FL 33549.
(Checks should be made payable to SPAC, Inc.)

Adult 1: _____ Adult 2: _____

Street: _____

City, State, Zip: _____

Home Phone: _____ Cell Phone: _____

Email Address: _____

Number of Children under 18: _____

Memberships:

Single: \$ 30.00/YR. Includes one adult, minor children, the "SPACE" newsletter, and all the rights and privileges of membership.

Family: \$ 35.00/YR. Includes two adults, minor children and the above rights and privileges.

Patron: \$ 50.00/YR. A Patron member is entitled to the above rights and privileges.

Benefactor: \$100.00/YR. A Benefactor member is entitled to the above rights and privileges.

Student: FREE. SPAC offers free membership to full time high school and college students.
Expected date of graduation: _____

Total Submitted: \$ _____

Your SPAC Membership Card is required for reduced fees at the campground.