



Event Horizon

ENCOURAGE. EXPLORE. DISCUSS



December 2025

Suncoast Stargazers

<https://suncoaststargazers.com/>



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Classified Ads (New Feature)
Images to Amaze you with
Seasons Greetings
Observing Season

Image By **Jack Drew**



January 31st, 2026

4:30PM



The Suncoast Stargazer's Board of Directors invite you and your guest to a Bar-B-Que picnic before the full moon special on January 31st at Robinson Preserve.

The park is graciously allowing us the use of the 2 shelters opposite our usual spot in the parking lot. Join your fellow members for a BBQ fest and celebrate US.

Sundown is 6:11PM that day so arrive early and hungry. Dinner will be at 4:30ish -- Hope to see you there!



RSVP to this email by : December 15th

SCSGBBQRSPV@outlook.com

[Read about the Cover Image HERE!](#)

Basic Astronomy Terminology

1. Constellations.

The Constellations are fixed patterns of stars, long ago partitioned and named by our ancestors. Constellation recognition and identification is a fundamental key to understanding and enjoying amateur astronomy, as all celestial objects are identified by the constellation in which they are located. The Big Dipper and Orion are the two most easily identified constellations and once recognized, they provide a framework and pathway to identification of all Northern Hemisphere constellations.

2. Measuring Distances.

Understanding the scope of the universe and the enormous distances involved will greatly enhance your enjoyment of amateur astronomy. For this, two units of measurements are commonly employed:

A. The Astronomical Unit (AU). The Astronomical Unit denotes the distance from the Earth to the Sun (93,000,000 miles). This is considered 1 AU. The Astronomical Unit is typically used to measure distances within our own solar system and the separation between double stars outside of our solar system. Following are some examples:

- Earth to Sun – 1 AU
- Earth to Mercury – 0.7 AU
- Earth to Venus – 0.3 AU
- Earth to Mars – 0.5 AU
- Earth to Jupiter – 4.2 AU
- Earth to Saturn – 8.5 AU
- Earth to Uranus – 18 AU
- Earth to Neptune – 29 AU
- Earth to Pluto – 40 AU



B. The Light Year. The Light Year is the distance that light travels in one year at the speed of 186,000 miles per second. The light year is used to measure the distance to deep sky objects (all objects beyond our own solar system). One light year equals about 65,000 Astronomical Units. Trying to measure these distances in miles or Astronomical Units would generate numbers so big that they would be meaningless, as you will see in the following examples:

- Earth to Moon – 2 Light Seconds
- Earth to Sun – 8 Light Minutes
- Earth to Pluto – 6 Light Hours
- Earth to Alpha Centauri (nearest star) – 4 Light Years
- Earth to Sirius (brightest star) – 9 Light Years
- Earth to The Pleiades (brightest open star cluster) – 370 Light Years
- Earth to Polaris (the North Star) – 430 Light Years
- Earth to The Orion Nebula (brightest emission nebula) – 1400 Light Years
- Earth to M13 (brightest globular cluster) – 21,000 Light Years
- Diameter of Milky Way Galaxy – 90,000 Light Years
- Distance to Andromeda Galaxy (nearest spiral galaxy) – 2.3 Million Light Years
- Diameter of Local Galaxy Group – 10 Million Light Years
- Diameter of Virgo Supercluster Galaxy Group – 100 Million Light Years
- Distance to Hubble Deep Field Galaxy Group – 5 to 10 Billion Light Years
- Most Distant Observed Galaxies – 12 to 14 Billion Light Years

[Continued on Page 4 Basic Astronomy Terminology](#)

As you can see, a look through a telescope is not only a look across vast distances in space, but also a look back in time. For example, when we look at the Andromeda Galaxy through the eyepiece we see it not as it looks today, but how it looked over 2 million years ago!

3. Measuring Brightness.

In addition to distance measurements, all celestial objects are rated by their apparent brightness, a concept known as magnitude. Magnitude is simply a numerical measurement of how bright an object is relative to other celestial objects. The smaller the number, the brighter the object.

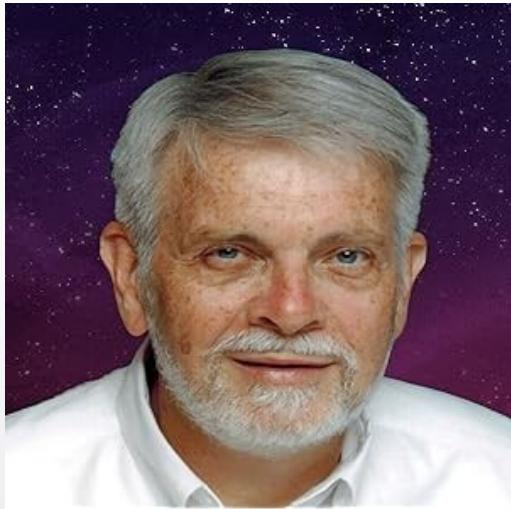
Following are some examples:

<u>Object</u>	<u>Magnitude</u>
Sun	-27
Full Moon	-13
Venus	-4
Jupiter	-3
Mars	-2 to +2
Sirius (brightest star)	-1
Mercury	0
15 Brightest Stars	0 to +1
Saturn	+1
Polaris (the North Star)	+2
Moderately Bright Stars	+2 to +3
Fainter Naked Eye Stars (Naked Eye Limit)	+4 to +6
Uranus	+6
Brighter Clusters, Nebulae and Galaxies	+4 to +8
Neptune	+8
Moderately Bright Clusters, Nebulae and Galaxies	+8 to +10
Fainter Clusters, Nebulae and Galaxies	+10 to +13
Pluto	+13
Faintest Objects Seen In Amateur (Backyard) Telescopes	+16
Faintest Objects Seen In Professional Observatory Telescopes	+24
Faintest Objects Detected By the Hubble Space Telescope	+30

As you can see, magnitude is often independent of distance. For example Pluto, a former planet in our own solar system and relatively “close”, is much fainter than many stars, clusters, nebulae and galaxies which are hundreds, thousands, even millions of light years away!

Ed McDonough

Five Questions With... Chap Percival



This edition of 5 Questions is with Chap Percival. Before the questions begin, I asked Chap to tell us a little about himself.

Chap: I have been actively involved in Astronomy Education since 1970. I have a Master of Arts in Teaching degree in Planetarium Education from Michigan State University. I retired from 44 years as a classroom teacher (three as a planetarium director) in 2015. At various points in my career, I taught Astronomy, Physics, Math, Computer Science, and Engineering. One of my big interests is total solar eclipses. Nothing in the heavens says "Wow!" like a TSE. My wife, Bonnie, and I have traveled to see seven of them on 4 continents. Not as many as some but more than most. During the summer of 2009 I volunteered with the National Park Service leading stargazes for the visiting public at Natural Bridges National Monument in Utah (the first certified Dark Sky Park.) I have taken my telescope to Grand Canyon NP three times for their week-long star party. I have spoken at that star party three times. I wrote a book encouraging people to see the TSE of August 21, 2017 and traveled the country speaking to groups about how to prepare for it.

I still get my scope out because the biggest thrill I get is from showing people things in the heavens that they have never seen.

Tim: What first inspired your interest in astronomy and the cosmos?

Chap: My first memory of anything related to astronomy happened when I was six years old. My father was an amateur photographer (amateur in the true sense – he did it because he loved it.) He had his own darkroom, enlarger, and many cameras. A partial solar eclipse occurred one day where we lived and the sky was clear. My dad took some fully exposed and developed black and white negatives and held them up for me to look through and see the crescent sun! I would say it wasn't an earth-shattering WOW moment but it was cool enough that it stuck with me.

Tim: When you look at the stars, do you see creation or a magnificent accident?

Chap: When I observe the heavens, I see the hallmark of a creator. The Psalmist wrote, "The heavens declare the glory of God, the skies proclaim the work of His hand." This is most clearly seen, in my mind, during a total solar eclipse. I have traveled to see seven of them on four continents. They are truly amazing, jaw-dropping, and awesome.

Tim: Which recent cosmos discovery excites you the most?

Chap: There are several but the one I find most intriguing is the filament of hot gas bridging four galaxy clusters discovered by using x-ray telescopes. The study of the universe uses models, mathematical constructs, that take what is observed and measured, apply the rules of the model to make predictions and look for evidence of the predicted outcome. As technology improves, we can investigate things in ways we could not before. Our models currently predict the universe to have a certain amount of 'normal' matter. Over one-third of it is missing, not accounted for. This filament could be an indicator of at least some of that missing matter.

Tim: Could the universe have dimensions, energies, or laws that we're fundamentally incapable of perceiving, even with the most advanced science?

Chap: When I taught physics, I would talk about how the rules of motion and matter formulated by Aristotle worked in most conditions in his time. As time went on those rules were insufficient to explain many observations, so they were subsumed by Newton and his laws. But as time went on, those were insufficient to account for new observations and data. In comes Einstein and his theory of relativity and Schrödinger and Heisenberg with quan-

[Continued on Page 6 Five Questions With...](#)

tum mechanics. It is definitely conceivable that there are laws and understandings that have not yet been formulated that will be at some future time.

Tim: Will we ever find definitive evidence of intelligent extraterrestrial life? Does the evidence already exist?

Chap: The short answer to the first question is "I don't know." But beyond that I will say this, unless

new means of communication and travel are invented/discovered, it is unlikely that we will ever encounter alien life. The problem is the scale of the universe. It is so vast, distances are so great, that there is simply not enough time to travel that far. Warp drive is, at best, a legitimate topic of scientific inquiry but the practical realization of it is, perhaps, not even possible. So I do not believe that we will find definitive evidence of intelligent extraterrestrial life any time soon.

By Timothy Milligan *Editor*

Photo Courtesy of Chap Percival

Total Solar Eclipse

August 21, 2017

Middle Corona



Chap Percival

[**See More of Chap's Work on Page 30**](#)

The ISS: 25 Years of Habitation Is Arduous

Spaceflight is hard. Complacency is deadly.

Two simple truths that are easy to forget when I look up at the night sky and see the International Space Station (ISS) silently orbiting overhead. But its presence is no accident. The ISS was designed to pass over 90% of the world's population⁽¹⁾ a constant reminder that "We are up here."

I grew up in the 1960s, fortunate enough to witness the live broadcast of Neil Armstrong's first steps on the Moon, July 20, 1969. NASA has been a part of my vocabulary since I was five years old. So, decades later, standing at NASA's press site to cover a space launch, I felt like I'd come full circle.

The launch in question was NASA's Northrop Grumman Commercial Resupply Services 23, or CRS-23 for short. On paper, it was "just" a resupply mission. In person, it was anything but.

Being at the Kennedy Space Center's press site, a place I'd only ever seen on television or online, was surreal. The nostalgia, the triumphs, the tragedies... it's all part of the history here. I felt honored. Humbled. But I was also there to work, to cover the launch from Space Launch Complex 40 (SLC-40).

Before this experience, I might have thought: "It's only a resupply mission." But not anymore. These missions are the lifeblood of the ISS. Without them, the station would soon become uninhabitable. Every launch is critical. Every payload matters. Every person involved is part of something extraordinary.

After 25 years of continuous human presence aboard the ISS, it's easy to forget just how hard it is to keep people alive in space. It takes constant effort, vigilance, and an unwavering

belief in the mission. Complacency is not an option. Not when the stakes are this high.

A bit of back history before I dive in too deep. The first component of the ISS was launched by Russia. The Functional Cargo Block (FGB) was deployed November of 1998⁽²⁾. It took two more years of construction before the permanent habitation of the ISS started in October of 2000⁽³⁾. This year we are celebrating the 25th anniversary of habitation on the ISS.

But how do you keep, on average, six people happy for months at a time while they live and work on the ISS? You give them what they need. First and foremost: air, water, and food.

Keep reading, there's more on that coming up.

On September 14th, 2025, I observed the launch of the NG-23 Cygnus Resupply Mission to the ISS from SLC-40 at Cape Canaveral Space Force Station. The launch vehicle was a SpaceX Falcon 9, carrying the Cygnus XL spacecraft. The mission delivered over 4,911 kilograms (approximately 10,828 pounds) of scientific investigations, research materials, and cargo to the ISS.

Liftoff occurred at 6:11 PM EDT, precisely on schedule. The skies around KSC were mostly clear, with only a few cumulus clouds in the distance. It was a beautiful Florida day, with the temperature at a comfortable 83°F (28°C).

This was my first time attending a Falcon 9 launch from the official NASA Press Site, which is located on KSC, not on Cape Canaveral. Standing approximately 6.2 miles (9.98 km) from the pad, I wasn't quite sure what to expect, particularly in terms of launch trajectory and booster return.

Fortunately, the rocket's direction was easy enough to follow visually, but the booster's reentry burn proved harder to track. In front of me, a tracking camera, belonging to a major online platform, was already aimed at the sky. Following its guidance, I looked up just in time to see what resembled a bright firework

[Continued on Page 8 ISS: 25 Years of Habitation...](#)

at the zenith. A large, fiery bloom marked the Falcon 9's reentry burn, used to slow its descent back through Earth's atmosphere.

Moments later, a collective murmur spread through the press observers: "There it is!" The Falcon 9 booster became visible as it descended gracefully toward Landing Zone 2 (LZ-2).

Then came the telltale sound: three sharp sonic booms echoed across the flat landscape, followed by the bright visual of the booster lowering itself behind the tree line for a precise, controlled landing.

While the visual spectacle was stunning, what stood out most was the intensity of the sonic booms, which felt louder than the initial launch sound. I heard three sonic booms in quick succession, a rapid triple report that echoed sharply across the press site. The sensation was physical as well as auditory, it felt like someone lightly pounding on your chest, each boom delivering a soft, percussive thump that you could feel. Then came the echoes off the Vehicle Assembly Building (VAB). It felt like the sound would never stop, bouncing and rolling across the landscape. These booms were generated by different parts of the booster, typically the engine section, interstage, and grid fins, as they broke the sound barrier during descent.

This observation aligns with research by Mark C. Anderson and Kent L. Gee, who found that: "For observers farther than 2 km from the launch and landing locations, the sonic boom peak overpressure exceeds the peak pressures experienced during the launch."⁽⁴⁾ This was certainly my experience. Although individual perception varies depending on atmospheric conditions and terrain, their data support the idea that sonic booms can register more forcefully than launch acoustics at certain distances, particularly in open areas like the NASA Press Site.

Words like "wow," "amazing," and "spectacular" only begin to describe how I felt

witnessing this launch. The weather was perfect, the countdown proceeded without delay, and ignition occurred precisely on time. Most importantly, the launch was not "scrubbed," a dreaded word around Kennedy Space Center.

As thrilling as it was to see the Falcon 9 lift off in person, it's essential to remember the purpose behind it. The ISS, is only as valuable as the international crew that lives aboard it, conducting research, maintaining systems, and representing a global effort in space exploration.

For more than 25 continuous years, humanity has maintained a presence on the ISS. Expedition 1, launched in 2000, began with just three crew members. As of this writing, Expedition 73 consists of 10 astronauts, a significant increase in both personnel and capability. When was the last time you had 10 people living in your house?

Thankfully, the ISS is equipped with three toilets to accommodate that many residents.⁽⁵⁾ But life aboard the station involves more than just work, although, what a place to work. Everything we take for granted on Earth, such as breathable air, clean water, and tasty food, must be transported or produced onboard. Most of these essentials are delivered via uncrewed resupply missions, including Northrop Grumman's "Cygnus," SpaceX's "Cargo Dragon," JAXA's "HTV," and Russia's "Progress" spacecraft.

These launches are not just about rockets, they are lifelines to the low Earth orbiting ISS.

As Sergeant Joe Friday from the classic TV series *Dragnet* would say, "Just the facts, sir." So here are some facts that might just baffle your mind.

All of the following figures are documented on NASA and related agency websites⁽⁶⁾ though the data is spread across multiple sources.

Total cargo flown to the ISS: 453,512.50 kilograms.

This includes consumable supplies such as air, water, food, and fuel. This figure does not include six launches for which I could not find data, nor does it account for launches that failed to deliver their cargo to the ISS. It also excludes manifest items not intended to be brought inside the ISS, such as satellites and special scientific investigations.

For those more comfortable with imperial units, that's **999,822.73 pounds**, just shy of one million.

To help visualize this: imagine a fully loaded Boeing 747 jet, complete with passengers, luggage, and yes, even the kid kicking the back of your seat. That's the scale we're talking about.

Let's break it down further (first in kilograms, then in pounds):

Total unmanned cargo flights: 169

Failed missions: 5

Fuel delivered: 57,426.5 kg (126,597 lbs.)

Air delivered: 3,830.00 kg (8,443.69 lbs.)

Water delivered: 26,602.50 kg (58,648.40 lbs.)

Food: Not listed separately in most sources, but rest assured, they're not starving up there.

Now, for a fun visual.

Imagine you're floating through the ISS and decide to visit the newly opened (and entirely fictional) *ISS Star Hop Bar*. You secure your feet in the stirrups on the floor and ask for a whiskey and Coke. The bartender smiles. You follow up with, "What's the house wine?" Again, just a smile. Finally, you ask for something simple, just some water.

He brings you a small bag containing about 8 ounces. Then he slides you the bill.

You gasp. **\$680 for a bag of water?** The bartender sees the look on your face. The bartender shrugs and says, "That's our SpaceX special price. It used to be higher."

You both laugh.

As history reminds us, spaceflight is not easy. It is dangerous. It is expensive. It can be deadly.

So next time the ISS passes overhead, step outside, whether with a telescope, binoculars, or just your own eyes, and take a moment to reflect. If you're lucky, you might even catch it transiting the Sun or Moon.⁽⁷⁾

But remember: the ISS is more than a piece of hardware orbiting Earth. It is **humanity, science, life**, and above all, **hope**, circling above the only home we have.

References:

[NASA, Station Facts](#)

NASA, 2015, "Reference Guide to the International Space Station", 78

NASA, 2015, "Reference Guide to the International Space Station", 89

[Acoustical Society of America, February 2025, "Why does the Falcon-9 booster make a triple sonic boom during fly-back?"](#)

Guinness World Records, 2021, [Most Toilets in a Space Station](#)

Wikipedia, [Uncrewed Spaceflights to the International Space Station](#)

NASA, [Spot the Station](#)

Additional Resources:

[NASA Northrop Grumman CRS-23 SpaceX Falcon 9 Launch](#)

[Flyback sonic booms from Falcon-9 rockets: Measured data and some considerations for future models](#)

[NASA, Partners Adjust Next Cygnus Resupply Launch](#)

[NASA, Northrop Grumman Assessing Cygnus XL Engine Burn Plan](#)

By Line: Timothy Milligan *Freelance Reporter* is an avid Astrophotographer. Awarded the "Imaging - Messier Observing Program" Certificate on September 12th 2025

A Lunar “X” and “V” on October 28

One of my favorite “features” on the moon is the Lunar “X” and “V”. This phenomenon is predictable and occurs on a monthly basis. (See table 1).

The Lunar X (also known as the Werner X) is a caille-obscur effect in which light and shadow create the appearance of a letter 'X' on the rim of the craters Blanchinus, La Caille and Purbach. The X is visible beside the terminator about one-third of the way up from the southern pole of the moon. The Lunar V forms along the northern part of the terminator near the crater Ukert. (See images 1-2)

I advise all amateur astronomers to consult this table to see if the Lunar X & V will be visible from your location. Time and date are listed in Universal Time therefore each individual observer will need to convert to their local time in order to observe the event. The easiest way to do this is with a free program called WinJupos. (<https://jupos.org/gh/download.htm>) WinJupos states both Universal Time and Local Time for the Sun, Moon and Planets. Enter your latitude and longitude first, then enter Universal Time stated on the table and your local time will appear above. Since the moon was riding low in the sky at approximately 37 degrees above the horizon, I began my imaging session soon after sunset in the daylight.

Fortunately, the X & V can appear sooner and last several hours later than the stated time on the table. This is a good thing, since it may be cloudy at the start of the event and an hour later the clouds may have dissipated. The Lunar X & V will still be visible!

In conclusion, the Lunar X & X is a monthly phenomenon not to be missed. Check the table, convert Universal Time to Local Time and see if it will be visible from your location. If it is, then get out your telescopes and cameras and submit your observations to ALPO's the Lunar Observer care of David Teske. david.teske@alpo-astronomy.org

Month	4 Year Lunar “X” and “V” Schedule * **			
	2025	2026	2027	2028
Jan	6: 1645	25: 1630	15: 0015	4: 0830
Feb	5: 0800	24: 0730	13: 1530	3: 0015
Mar	6: 2300	25: 2145	15: 0600	3: 1500
Apr	5: 1300	24: 1100	13: 1930	2: 0430
				1: 1700
May	5: 0130	23: 2245	13: 0730	31: 0400
Jun	3: 1330	22: 0945	11: 1830	29: 1430
Jul	3: 0015	21: 2000	11: 0500	29: 0030
				1: 1100
Aug	30: 2130	20: 0630	9: 1530	27: 1100
Sep	29: 0900	18: 1730	8: 0200	25: 2245
Oct	28: 2115	18: 0530	7: 1400	25: 1130
Nov	27: 1045	16: 1900	6: 0300	24: 0145
Dec	27: 0115	16: 0930	5: 1730	23: 1645

* All times are listed as the day of the month and then the hour in UT

** All times are approximations based on LTVT calculations. They are accurate to +/- 1 hour.

Table 1: Four year schedule for the “X” and “V” from ALPO's monthly journal- The Lunar Observer. <https://alpo-astronomy.org/lunar>

[Continued on Page 11 Lunar X and V](#)



Image 1: See Description on Page 12 *Image by Gregory T. Shanos*

Image 1 On Page 11: The Lunar X & V stands out in high relief on the disk of the moon on October 28, 2025 at 7:11pm local time or 23 11m UT. The moon was at 43% phase and only 37 degrees above the horizon. Weather conditions were ideal with perfectly clear skies and good seeing conditions. The image was taken in daylight with sunset at 6:52pm local time. An Orion ED80T CF 480mm f/6 triplet apo carbon fiber refractor was tracking on an Orion EQ-2 mount. A ZWO ASI 178MM monochrome camera and Baader CMOS optimized UV-IR cut filter using Firecapture v2.7.15 acquired the video through the refractor. Computer utilized was an MSI GF65 gaming computer upgraded to 40GB of RAM. The SER video was processed using Autostakkert 4.0.13 and Registax 6.1.0.8. Further sharpening and processing in Photoshop CS4.

Image by Gregory T. Shanos Longboat Key, (Sarasota), Florida.



Image 2: The Lunar X & V stand out in high relief on the disk of the moon on October 28, 2025 at 7:24pm local time or 23h 24m UT. The moon was at 43% phase and only 37 degrees above the horizon. Weather conditions included clear skies with good steady seeing. Image was taken with an altazimuth driven Meade LX200GPS ACF 8-inch GO-TO Schmidt-Cassegrain telescope utilizing an Optec 0.62X focal reducer. A ZWO ASI 178MM monochrome camera with an Optolong UV-IR cut filter using Firecapture v2.7.14 to acquire the video. Computer utilized was an MSI GF65 gaming computer upgraded to 40GB of RAM. The SER video was processed using Autostakkert 4.0.13 and Registax 6.1. Further sharpening and processing in Photoshop CS4.

Image by Gregory T. Shanos Longboat Key, (Sarasota), Florida.

Member Timothy Milligan Awarded Imaging – Messier Observing Program

September 12th might not stand out in your mind as a special day, but to me it is very special, it is the day the [Astronomical League](#) recognized my accomplishment.

And what accomplishment is that, you might ask? Just a few days earlier, on September 7th, I completed my imaging of the final Messier object. **M48** was my last target.

It all began 262 days earlier, on December 20th, when I received one of the best Christmas gifts of all time, a **SeeStar S50** telescope. On my very first night using it, I captured **M45 (the Pleiades)** and **IC 434 (the Horsehead Nebula)**. I was blown away by the results, and my new obsession began.

One of the great features of the SeeStar is its Community, where users can upload their images. Over time, I learned how to upload my stacked and denoised images there. One of the community activities is the Messier Challenge, and you can probably guess what that involves.

Just for fun, I opened the challenge details one day and realized I had already been credited with almost half of the 110 required objects. From that point on, my goal was clear, capture the rest of the Messier catalog.

If you are not familiar with the [Astronomical League](#), check out their website. If you own a SeeStar and you are a League member, you already have all the data you need in your images to qualify for this certificate. When you upload your images to the SeeStar Messier Challenge, the system automatically records the date, time, location, aperture size, and telescope used. Give it some thought.

The Astronomical League offers many different awards, but I was surprised to learn that my award was only number 29 ever given. The League has been around for 79 years and has over 23,000 members, so that felt pretty special. The **Imaging Messier Observing Program** is a relatively new addition to their catalog of awards, and it is one that welcomes the use of smart scopes.

So, if you have a smart telescope, think about going for this award. It took me a little less than nine months to complete, and honestly, I only started it as an afterthought. The award was not my goal when I began imaging the night sky, I just wanted a place to start, and I was familiar with objects like **M31**, **M45**, and **M1**. With a little focus and persistence, I ended up imaging all 110 Messier objects.

IMAGING - MESSIER OBSERVING PROGRAM ASTRONOMICAL LEAGUE



TIMOTHY MILLIGAN

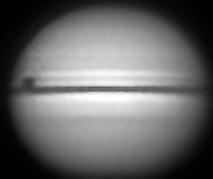


A Series of Shadow Transits of Titan in 2025

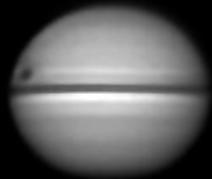
Saturn's rings were edge-on in 2025 which afforded the opportunity for shadow transits of various moons. I have imagined shadow transits of Dione, Rhea, Tethys which were difficult to see and rather unimpressive. An online article from Sky & Telescope indicated that a series of 11 shadow transits would occur from April 30, 2025 to Oct 6, 2025. See [Sky & Telescope](#) article. These shadow transits were visible only from the Western Hemisphere. This event is unique because another Shadow Transit of Titan would not occur until the 2040's! Since Titan's orbital period is 15 days 22 hours a shadow transit occurred on Saturn's disk every 16 days. I learned in the first week of May about this series of Titan shadow transits. Therefore, I was unaware of the first event on April 30th. Upon further inspection, this transit occurred during the daytime from my location, and the shadow was directly on the ring plane and virtually unobservable. Therefore, I did not really miss this event.

Once I became aware of the ten remaining Transits of Titan, I made it my mission to image ALL of them. This series of shadow transits will surely be historic since there are 11 in a row each 16 days apart. The odds of that happening are astronomical- pun intended!

Shadow Transits of Titan



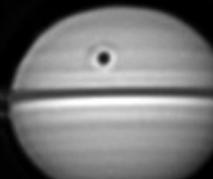
May 15, 2025 10h 25.4m UT
CM1: 197.6° CM2: 307.2° CM3: 226.0°



May 31, 2025 09h 39.9m UT
CM1: 359.8° CM2: 313.7° CM3: 213.0°



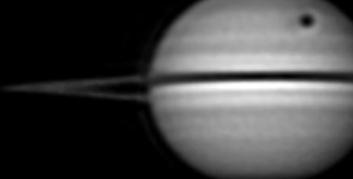
June 16, 2025 08h 42.6m UT
CM1: 155.4° CM2: 313.8° CM3: 193.8°



July 2, 2025 10h 06.8m UT
CM1: 34.4° CM2: 34.1° CM3: 254.7°



July 18, 2025 09h 18.3m UT
CM1: 195.9° CM2: 39.8° CM3: 241.2°



August 3, 2025 09h 56.6 m UT
CM1: 48.5° CM2: 94.7° CM3: 276.8°

The image above shows the first set of six shadow transits from May 15th through August 3, 2025, taken under adverse observing conditions. All were taken under cloud cover which thickened and thinned as the night progressed. Most planetary imagers would not have attempted to observe on an evening with such poor transparency. Fortunately, the seeing was above average through the cloud cover which resulted in a higher resolution image.

[Continued on Page 15 Transits 2025](#)

Shadow Transits of Titan



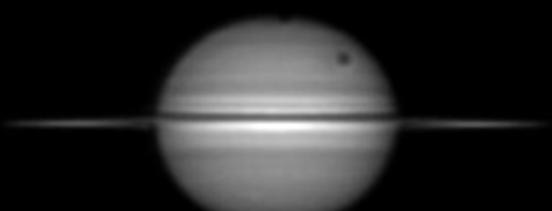
August 19, 2025 06h 09.4m UT
CM1: 105.6° CM2: 0.01° CM3: 163.0°



September 4, 2025 08h 21.8m UT
CM1: 13.5° CM2: 108.2° CM3: 251.7°
Tethys near rings



September 20, 2025 06h 21.9m UT
CM1: 133.3° CM2: 73.8° CM3: 198.2°
One day prior to Opposition



October 6 2025 05h 40.8 m UT
CM1: 298.9 ° CM2: 83.6 ° CM3: 188.7 °

The second set of images are from August 19th through Oct 6, 2025. The September 4th event was quite memorable since it rained at 11:30pm local time on September 3rd. By 1:00am on Sept 4th, it was still completely overcast. Then by 1:30am local time the clouds began to clear, and I was able to align my GO TO scope on Polaris and Fomalhaut. I started imaging Saturn at 1:52 am local time. The weather conditions kept improving throughout the night with clear, steady seeing with only a slight haze and humidity. Then at 4:07 am the weather took a turn for the worst with a few passing cloud banks. By 4:22 am it was completely overcast and remained that way through sunrise. I was able to image approximately 90% of the transit. I only lost 37 minutes from the beginning and 37 minutes from the end. The other moon that appears in the image is Tethys. If you look closely just above the rings, you can see a shadow transit of Tethys just about to start. Had it not clouded over, I would have continued imaging this transit once the shadow of Titan left the disk. Overall, a very successful imaging session. The months June 1st thru Nov 30th are Hurricane season in Florida. In 2025 we were fortunate not to have had any tropical storms or hurricanes hit Florida.

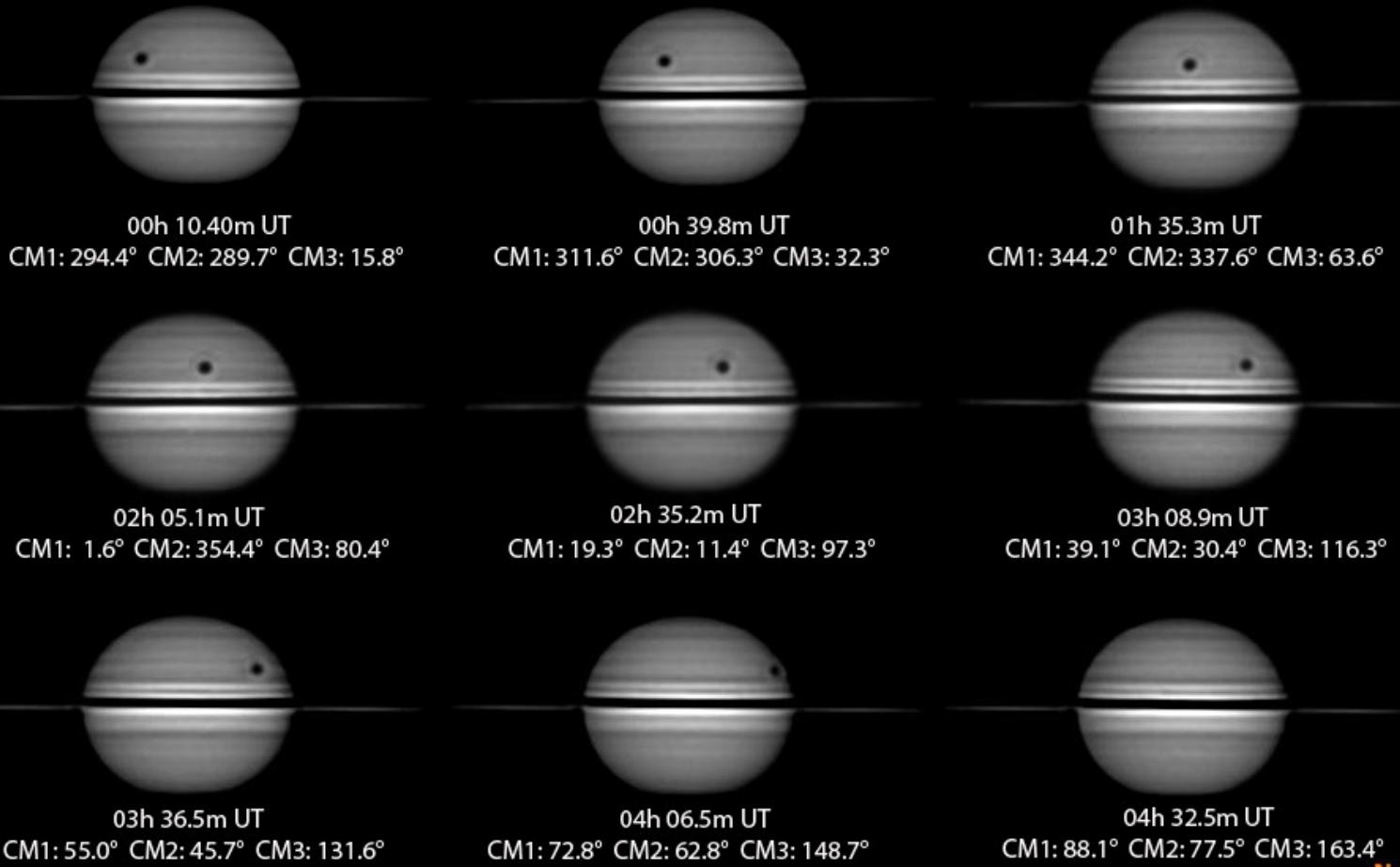
All the Saturn images were taken using a Vernonscope 1.25x Barlow and a ZWO ASI 462MM monochrome camera, therefore, the image scale remained constant. See figure 3. You can clearly see that the disk of Saturn is increasing in angular diameter and thus appears larger with each imaging run. The angular diameter of Saturn increased from 16.4" on May 15, 2025 to 19.4" on October 6, 2025. The September 20th transit occurred one day prior to Saturn's opposition. Note how the shadow of Titan began just above the ring plane on May 15th and rose higher on the disk of Saturn with each passing transit. On Sept 20th, the moon Titan was just below its shadow which was impressive. The final shadow transit occurred on Oct 6th where the shadow "grazed" the disk of Saturn. The Shadow Transits from August 19th through Oct 6th were under clear skies and I was able to record each event from beginning to end. I therefore was able to make animations of these transits. All these images were taken after midnight and into the early morning hours prior to sunrise. I had to stay awake all night as to not miss these events. This sacrifice was well worth the loss of sleep.

In conclusion, the mission was complete. I was able to successfully image ALL ten remaining shadow transits of Titan and submitted my results to the Association of Lunar and Planetary Observers ([ALPO](#)) Planetary Virtual Observatory and Laboratory ([PVOL](#)) and to [hstjupitergroups.io](#) for archive and research. I await the next shadow transit of Titan in 2040.

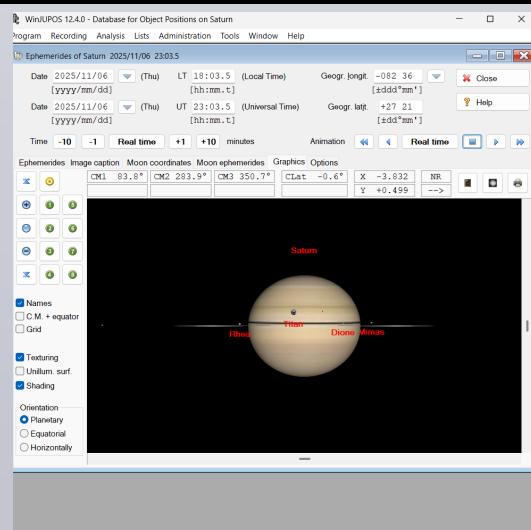
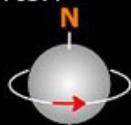
[Continued on Page 16 Shadow Transits 2025](#)

Transit of Titan Collage October 27th

Transit of Titan
October 22, 2025



Meade LX 200GPS SCT 250mm f/10 ZWO ASI 462MM camera Seeing: Good Transparency: Clear, Slight Haze
Gregory T. Shanos Longboat Key, (Sarasota), Florida USA



By Gregory T. Shanos

Taking my 12" f10 Meade SCT to the Winter Star Party for the first

The Winter Star Party, put on by the Southern Cross Astronomical Society normally scheduled for one week in January or February and held on Scout Key 32 miles east of Key West. Usually limited to 200+ attendees and well-known worldwide for some of the best seeing and no snow.



People come from all over the world, one year there was eight countries represented.



This guy, on the right, came from Germany he brought that 18" scope that he built and was delivering it to the buyer.

So, Considering I just drove 1300 miles from NJ, sleeping in my van parked along US Route

-1 in line waiting for the 10am gate opening I'm now awake with excitement anticipating a great week.

The Gates are Open!



We should be able to get a good spot because we were the 18th car in line. Securing a spot I first setup the tent then put the tripod out but wait till sunset to bring the scope out don't want to heat it up.

Ready for first night after setting up camp, my equipment and getting sunburned I tell myself I'm not tired because the weather and sky is perfect. So, I decided to collimate the 12" Meade asking my friend to help. When we were done, I decided to wonder around looking thru different scopes, 6" and 7" Astro Phys-



ics refractors a 10" Zambuto Portaball, 24",

[Continued on Page 18 Star Party](#)

30" & 36" Dobs. This was a great first day.



Night two, I'm ready for an all-nighter. My friend was observing Saturn with his new 6" Astro Physics triplet refractor it was beautiful and Saturn looked better than I've ever seen. I was setup next to him so I got Saturn in the 12" to compare. It blew me away, so I said you have to see this, when he looked his response was holy crap but mine looks better because it's a refractor.

Then a fellow AP (5") owner came over to look thru the new 6" and after a bit my friend said if you want to see a better Saturn look thru Jim's Meade. After some nasty comments about Meade and SCTs he came over. Still mumbling about Meade as he bent over to take a quick look and just stood there as the image of Saturn was burning a hole into his AP refractor mindset. So I said, sit down you'll be here a while. 15 or more minutes later he got up and said it's the best I have ever seen I'll be right back.

Well he came back with the King of all AP refractor SNOBS who owns a 7" AP refractor. They first went to the 6" AP and the snob said it's nice but my scope is better. Then the 5" AP owner said if you really want to see an even better image of Saturn look thru Jim's Meade and the guy said "A Meade, I will never look thru a Meade." I responded with it's your loss. The snob begrudgingly came over to take a quick look and the other guy, using my line, said "Sit down, you'll be here for a while."

He sat there for about 10 minutes or more never said a word got up and walked away. The rest of the week I had refractor guys coming over every night to look thru my 12" Meade SCT. I had a Great week, the snob not so good.

The day before leaving NJ



The day I got back home.



By Jim Mack

Total Eclipse of the Sun 2027

In April 2024, Suncoast Stargazer arranged a trip out to Dallas, TX to enjoy the city and experience this phenomenon. It was a success and we want to be even more adventurous now and venture further afield to Spain in 2027. There will be a 100% total eclipse of the sun that rotates through Gibraltar on August 2, 2027. We have taken one week to explore the southern coast towns of Spain including a couple of days on the Rock, (a UK protectorate), as well as a jaunt to Tangiers for a taste of that culture as well. These plans are developing and will change as we get closer to the event. I did want to give you a sample however of the plan as it now stands. As with the Dallas trip, you are encouraged to participate but are welcome to go your own way, if you prefer. Let's start with where on the planet Gibraltar is:



The proposed itinerary is as follows:

July 29, 2027	July 30, 2027	July 31, 2027	August 1, 2027	August 2, 2027	August 3, 2027	August 4, 2027	8/5/27
Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
TRAVEL	Malaga, Spain	Malaga, Spain	Gibraltar, UK	Gibraltar, UK	Gibraltar	Malaga	TRAVEL
				Tangiers sidetrip	/Malaga		

Malaga, Spain Arrival in Malaga, Spain and have 2 days to explore the ancient charm of this citadel and lounge by the beach.



[Continued on Page 20 Solar Eclipse 2027](#)

Continued from Page 19 Total Eclipse 2027

Day 4 has us moving on to Gibraltar by train. Under British rule since 1704, Gibraltar is a British enclave in the heart of Spain's Mediterranean coast. The top of the mountain is accessible via cable car. It is unclear at this time if we will be able to view the phenomena from "The Top of the Rock". There are interesting things to see and do while here, although our time here is limited.



The Hotel I've negotiated with is called The Rock and I include a few pictures to give you an idea of the facility but you can research it online if you like.



Continued on Page 21 Solar Eclipse 2027

Continued from Page 20 Total Eclipse 2027

Tangier: The eclipse is set for 9:40 AM on Monday, August 2, 2027. We are suggesting a hydrofoil over to Tangier, Morocco after that for the afternoon and evening. Our plan is to hire a guide for the day and safely explore the city, its bazar and local food. Returning to Gibraltar for Day 6 and back to Malaga for Day 7 and prepping for flights back to the States on Day 8.



Budget: Based on current 2025 prices and for discussion purposes only we estimate the following per person charges;

Airfare	Malaga Spain	1,600.00
Train/Ferry	Gibraltar	25.00
	Tangiers	70.00
	Malaga	25.00
Transfers	\$25/ person	150.00
Hotel	200/night X6	1,200.00
Food	100/day	600.00
Museums or Entrance Fees	\$20 x7	<u>140.00</u>
		3,810.00

Contact Donna Wright at:

donnareidwright@gmail.com to be placed on a Newsletter list for updates and to get further details as they come to fruition.

(New) Classified Ads (New)

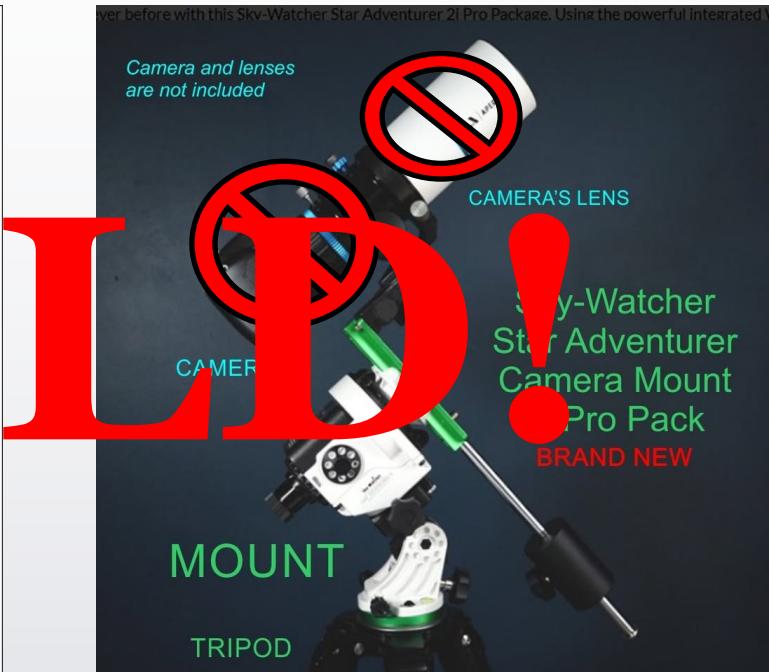
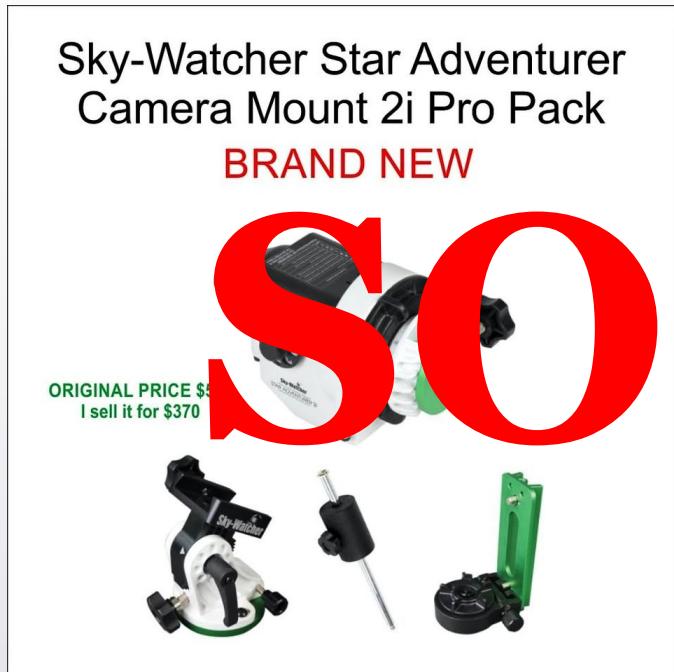
Item #	Item	Description / Model	Condition	Price
Telescopes and Mounts				
1	Meade LX200GPS 12" SCT	f/10 Schmidt-Cassegrain Telescope	Good	1000
2	Tele Vue 85 Refractor	85mm f/7 APO Doublet Refractor	Very Good	1200
3	Coronado PST Solar Scope	40mm H-alpha Solar Telescope	Very Good	400
4	Celestron CGEM Series Mount	German Equatorial Mount with tripod	Good	700
Eyepieces and Barlows				
1	Tele Vue Ethos 13mm Eyepiece	100° AFOV Premium Eyepiece	Very Good	495
2	Tele Vue 2X Powermate	2 inch Barlow w/ 1.25" adapter	Very Good	225
3	Tele Vue 4X Powermate	2 inch Barlow w/ 1.25" adapter	Very Good	250
4	Tele Vue 20mm Plossl	1.25 inch	Very Good	50
5	Tele Vue 90 diagonal	Everbrite Dielectric 2 inch	Very Good	200
6	Pentax Smc Pentax XW 30	2 inch	Very Good	150
7	Parks Illuminated Ortho 12.5mm	1.25 inch	Very Good	250
Numbers 7-15 are in a Meade case as a group				
8	Meade Super Plossl 6.4mm	1.25 inch	Very Good	
9	Meade Super Plossl 9.7mm	1.25 inch	Very Good	
10	Meade Super Plossl 12.4mm	1.25 inch	Very Good	
11	Meade Super Plossl 15mm	1.25 inch	Very Good	
12	Meade Super Plossl 20mm	1.25 inch	Very Good	
13	Meade Super Plossl 26mm	1.25 inch	Very Good	
14	Meade Super Plossl 32mm	1.25 inch	Very Good	
15	Meade Super Plossl 40mm	1.25 inch	Very Good	
Miscellaneous				
1	Celestron Radial Guider #94176	OAG 1.25 guide	Very Good	100
2	Meade Series 4000 Flip Mirror	Model 647 CCD 1.25 inch	Very Good	100

Contact Tom Cofer directly at tcofer@tampabay.rr.com about any of the listed above items for sale. Suncoast Stargazers gives no guarantee of functionality nor do we endorse any of the items. Please check all items carefully.

(New) Classified Ads (New)

~~NEW Sky Watcher Star Adventurer 2i Pro Package \$399~~ SOLD!

This package included: ~~Sky Watcher Star Adventurer 2i Pro Package With original Box, Sky Watcher Star Adventurer Tripod # S20555, Pelican Air 1525 Case (Hard), Gator Case (Soft)~~



~~Retail Price plus tax for all of this is OVER \$800~~

More Items for sale

Make	Description	Price	Part Number
Orion	30mm Ultra-Mini Guide Scope	\$90.00	53851
Orion	LaserMate Deluxe II Laser Collimator	\$40.00	5691
Orion	Orion Universal Field flattener	\$70.00	8893
Orion	Variable 12-17mm Spaccer T Ring	\$10.00	SOLD
Orion	EZ Finder II Reflex Sight	\$20.00	
Orion	2" Zero Profile Focus Cam Adaptor	\$10.00	SOLD
Orion	T-Thread Extension Tube Kit	\$20.00	7228
Orion	RA Polar Scope for EQ Mounts 1X 2X	\$40.00	5308
Orion	Orion SS P1 Polar Alignment Camera	\$40.00	5528
Orion	Orion SS P1 Polar Alignment Camera	\$30.00	5528
Orion	2" Mirror Diagonal, Refractor	\$45.00	
Orion	StarShoot AutoGuider PRO Mono	\$45.00	52031

Contact Timothy Milligan at srqcomputerguy@gmail.com for more information and to see items in person. Suncoast Stargazers gives no guarantee of functionality nor do we endorse any of the items. Please check all items carefully.



The
Witch Head
Nebula

GBGrimm 2023

Orion 80EDT CF. ASIAIR. 2600MC.
30 180 second subs @ f4.8. Taken on 2/18/23
Processed in Siril.
From the Manatee Gun Club

George Grimm



The Bubble Nebula. Mount: SW EQ6 R Pro, Telescope: AT 115EDT, Camera: ASI2600MC Pro, Filter: L-Pro and Alp-T, Guiding: 70mm scope w/ ASI174 Mini, Asiair Plus, Lights: L-Pro: 458/180 sec Alp-T: 251/300 sec/100 gain/32 F, Calibration: 25 dark/ 25 flat/ 25 dark flat , Processing: PixInsight and Photoshop Location: driveway in Lakewood Ranch Florida

Date: 09/28/2025

Tom Cofer

“Event Horizon” Is a quarterly publication of Suncoast Stargazers

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Seestar S50



C2025 A6 (Lemmon)



SSmith2112 / 82° W, 27° N / 2025.10.29 19:55

2min

C/2025 A6 (Lemmon) 8pm October 29, 2025 Skyway Bridge fishing pier area which I think is a bortle 5 area
3 minutes of 10 second subs in Alt/Az mode with the Seestar S50
In app De-Noise and slight sharpening.
October 29, 2025

Scott Smith



Centaurus A | exposed 7210 secs (721x10s)

Wed May 14, 2025 20:58 / Parrish, FL



Centaurs A (also known as NGC 5128 or Caldwell 77) is a galaxy in the constellation of Centaurus. The galaxy is also the fifth-brightest in the sky,[12] making it an ideal amateur astronomy target. [13] It is only visible from the southern hemisphere and low northern latitudes. The center of the galaxy contains a supermassive black hole with a mass of 55 million solar masses,[14] which ejects a relativistic jet that is responsible for emissions in the X-ray and radio wavelengths. Celestron Origin 721 10 second exposures for a total of 2 hours of exposure. Taken at our Dark Sky site located in beautiful Parrish, Florida. A great place to image with darker skies in our area. May 14, 2025

Ed McDonough

Bearable Through Love

Why do we look up? Is it a quest for purpose, an existential thirst for the unknown, or simply genetic code made manifest by the workings of evolution? Humans have used the sky as their most important tool for agriculture, science, and religion since records have been kept. Astronomy is the first science. I can't tell you why I always had an affinity for the cosmos, reading National Audubon Society star charts in third grade, or going through the futile task of landing my first astrophoto in middle school with a Pentax K series film SLR- on a telescope barely good enough to look through. Fast forward to today, and I finally feel my efforts haven't been in vain; improved technology- and frankly a bigger brain - have allowed me to capture the universe in ways I never dreamed of. There's something about those jewels of thermonuclear furnaces and wisps of glowing potential suffocated by a jet-black background that is both unsettling and mesmerizing. Maybe that thirst for the unknown is more powerful than I can imagine.

The biologist in me cringes when hearts are associated with love, since it is really the brain that causes the cascading effect of forgetting your name when that special someone actually speaks to you. This time, I think I'll make an exception. Enter the Heart Nebula, or IC1805, Running Dog Nebula, Sharpless 2-190, NGC 986... let's just stick to the first one. This is a large object, spanning more than four Full Moons across, so it's best to image with smaller telescopes, or use low power and wider field eyepieces in a dark sky. The nebulosity is part of a bigger structure that streams across the constellation Cassiopeia along the galactic plane in the northern sky, around late fall into winter. At its core, an open cluster of hot young stars called Mellote 15 is actively blowing out the cloud from intense radiation. If you understand how a neon sign works, you understand emission nebula. When atoms are exposed to enough energy, whether that be electricity or radiation, they enter an excited state. This is unstable, and according to the laws of thermodynamics, they must release that extra energy and return to a "ground" state. The released energy is often light. However, the *wavelength/frequency* of that light is entirely dependent on the type of atom- the element. Hydrogen will emit a different wave-

length than oxygen, for example. Excited hydrogen atoms will primarily emit light at ~656 nanometers. This is a nice, deep red, and is why many nebula photos are indeed pink/red. Hydrogen is plentiful and usually overpowers all other elements present. But there is oxygen as well, emitting at ~500 nanometers- green. In a neon sign, atoms of neon or other elements for different colors are excited by electricity in the same way that the nebulosity in this photo are excited by stellar radiation. So... why is it not red? That has to do with how some astrophotos are processed. Read on...

This image was taken with a Takahashi FSQ-85, a Petzval refractor that uses four lens elements to create a wide field of view and sharp stars to the edges. Light passes through these lenses, then a filter, and finally the camera sensor. I use monochrome cameras, which have the Bayer matrix removed from the sensor. The problem with one shot cameras (OSCs) is that all the pixels have a tiny filter above them, either red, green, or blue. Because of our eyes' sensitivity for green light and maintaining proper color curves (this has to do with the Sun's Planck Blackbody curve and our eyes' evolution to match it), there are two green pixels for every one red and one blue. Essentially, the camera is using 50% of its resolution for green, and only 25% for red and blue. When capturing elements in the excited state as described earlier, called narrow-band imaging, sensor efficiency drops even more. A monochrome camera captures all wavelengths with (relative) 100% of its resolution. To get a color image, I need to expose with three color filters separately, and combine the stacked masters. To achieve proper color balance, stars in the image are compared to known stellar spectroscopic data in the GAIA network after plate-solving, called spectroscopic color calibration. In addition, I also took exposures for three excited elements: Hydrogen, Oxygen, and Sulfur. Each are processed separately and combined using a linear fit algorithm to compensate for different median brightness values between them. As explained earlier, hydrogen is red and oxygen is green. But what about sulfur? It's also red. Unless you want a muddy image resembling a Christmas tree covered in blood, you need to assign different colors for each element. This

[Continued on Page 29 Bearable Through Love](#)

image utilized the Hubble Palette, or SHO. Sulfur is assigned to red, hydrogen to green, and oxygen to blue. Pioneered by astronomers processing data from the Hubble Space Telescope, the SHO palette allows use to see all three elements in a beautiful color image, and accentuating the structures of the object in each. Yes, it's false color, but in scientific imaging, the priority is to display the data in the best way possible.

Gigabytes of data. My MacBook cries in gigahertz as it calibrates, weights, registers, normalizes, and integrates loads of data. Zeros and ones blur in a cacophony of processing, all to create one black image. Hours of exposure, and hours more of pre-processing, to get a black panel. As with the jet-black background of space, it's unsettling. Yet, the

image is in there. Here, in my opinion, astrophotography abandons the science in favor of art. As we manipulate the histogram and stretch it far beyond what a wedding photographer would classify as sanity, we pull out the beauty of the cosmos. Stars begin to shine, wisps of nebulosity eek out of the darkness, and arms of distant galaxies reveal their intricate structures. This is about the time where I sit back in my chair, stare at the screen, and smile. Here, human nature takes hold, as I study every detail with that aggressive curiosity I had way back to my childhood. Here, I'm reminded by Carl Sagan that the darkness of the cosmos is only bearable through love.

Article and Image by:

Chris Schementi



Hope
your HOLIDAYS
are out of this world
and that all your gifts
don't get lost in a black hole!

Here are some great gift ideas!



Click on any of the above 3 items to purchase them.

About the Cover: The "Ghost of Cassiopeia" AKA: IC 63 By **Jack Drew**

William Optics GT71

William Optics 50mm Guide Scope

ZWO ASI533 MC PRO

AVX Advanced Mount

ASI Air Plus controller

Optolong 2" L-extreme Filter

Image was captured over 4 days with a total of 246 - 3 minute exposures in my Bortle 6 backyard
Stacked and edited in PixInsight using RC Astro tools

Total Solar Eclipse

August 21, 2017

3rd contact

Continued from Page 5 Five Questions with...



Chap Percival

2025/2026 Observing Season

12/27/25 – Robinson Preserve

01/10/26 – Lakewood Ranch Greenbrook Adv. Park

01/24/26 – The Bay Sarasota

01/31/26 – Robinson Preserve, Full Moon Special

02/14/26 – Myakka State Park, Dark Sky Special

02/21/26 – Robinson Preserve

03/21/26 – Robinson Preserve

03/28/26 – The Bay Sarasota

04/25/26 – Robinson Preserve

05/23/26 – Robinson Preserve

Special Events Can be added with short notice, follow us on [Facebook](#) and our [website](#) for more information. Also watch for email updates!

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A friendly reminder

Suncoast Stargazers has NO ANNUAL DUES! So please do your part to help this 501(c)(3) Private Foundation with a tax deductible contribution. Your help no matter how big or small, goes a LONG ways. Might I even say that it goes Lightyears?

You can make your contribution by following this link:
<https://my.cheddarup.com/c/tax-deductible-contribution/items>

Who are the Suncoast Stargazers?

We are the Suncoast Stargazers, a very large, active and knowledgeable astronomy group in the Bradenton, Sarasota and Venice area of the Suncoast. We strive to showcase our members community involvement with “open to the public” star parties monthly. Our members also have access to a dark site observing complex, monthly zoom meetings, help with using your equipment, and Astro Imaging guidance. Whether you are new to the hobby, mid-tier, or advanced, you are welcome here. Join us and register as a full benefit member and/or also feel free to follow us on our FB page. Post your questions. Ask for help. Show off your images. It’s all free, no membership fees.

We are also proud affiliate members of the Science and Environment Council of Southwest Florida
<https://www.scienceandenvironment.org/>

Goodbye to 2025. And to all the beauty you brought!



Comet Lemmon

By Jim Mack

20 - 60 seconds subs
WO 71mm GT triplet refractor at f4.7
ZWO 2600mc Pro camera
ZWO ASIair controller
ZWO AM5 mount
Celestron AVX tripod
Robinson Preserve
November 1st

Hello 2026!