



# The Eyepiece

SW FL Astronomical Society, Inc.  
3236 Forum Blvd #1160  
Fort Myers, FL 33905

NGC 2174 - The Monkey Head Nebula  
by Reggie Blackmon  
Taken on a SeeStar 50



**Editor - Mike Jensen**

It's February and there's a LOT going on!

First, and I hope some more of you will help with this is our initiative on darker skies. This has come out of Dr. Mario Motta's talk last month about the effects of darker skies on the human body and the environment we live in, oh and our interest in astronomy and astrophotography. I brought it up for discussion at the Astro SIG meeting in January, and John Udart took the baton and put together an outline to start with. We'll be discussing more at the SIG and general meetings.

## Time To Pay Your 2025 Membership Dues

Once again this year we offer a very affordable \$30 family membership. To pay online, [please click this link](#). You can also pay by check and mail it to:  
Southwest Florida Astronomical Society  
3236 Forum Blvd #1160  
Fort Myers, FL 33905

Or pay in cash or check at the Feb. 6th meeting.

Second, THE SKIES ARE GREAT! We love Winter in Florida for many reasons but they are great for Winter star parties, observing and astrophotography.

Third, public outreach. We have a number of events coming up and we need some people to help man the tables and chat up the club. See Brian if you're interested. Easy stuff!

## Table of Contents

Monthly Meetings	2
Astro Sig Schedule 2025	2
President's Message	3
Club Officers & Positions	3
GUEST SPEAKER PRESENTATIONS SERIES	4
Next Steps After Learning Light Pollution Effects	5
Starship's Seventh Flight Test	7
The Starship Program	8
NASA's Hubble Traces Hidden History of Andromeda Galaxy	11
The Astronomical League	13
What's Going On in the SIG Group?	17
Astro SIG Images	18
Membership Meeting Minutes	25

## Pre Meeting Dinner??

Well, we had such a great time and such good pizza that we've decided to go back to Baked (Formerly Buddyz) for our pre meeting dinner.

**Meet us at 5:15pm at:  
3268 Forum Blvd,  
Fort Myers, FL 33905**

## Monthly Meetings

Our monthly meetings are held on the **first Thursday of each month**. The meetings begin at 7:00pm.

Here is the Zoom link:

<https://zoom.us/j/97435302223?pwd=Y3A2dlk2Q3M2eG1ENTJuOXp-4TEZEQT09>

Passcode: 874185

**Each meeting is usually a combined live and Zoom meeting.**

The in person meeting is held at:  
 Calusa Nature Center/Planetarium  
 3450 Ortiz Ave,  
 Fort Myers, FL 33905



Below are the dates for the meetings of 2024:

- Feb. 6, 2025
- March 6, 2025
- April 3, 2025

## 2025 Observatory & Solar Dates

### Astro Sig Schedule 2025

All Meetings at 7:00pm

- Feb 18, 2025
- March 18, 2025
- April 15, 2025

### ASTRO SIG MEETING ZOOM LINK NEW LINK

<https://zoom.us/j/95463483537?pwd=6EprbaLEuVacLvRgBTVxehkT-Gh1WSP.1>

Meeting ID: 954 6348 3537  
 Passcode: 052283

Below are the new schedules for the FSW Observatory and the Solar Observing events for the coming school year. Note that the observatory events will be the fourth Friday of each month, and the Solar observing events will be the second Saturday of each month at the indicated parks in Charlotte County.



### FSW Observatory

- Feb 28, 2025
- Mar 28, 2025
- Apr 25, 2025
- May 23, 2025

### Solar Observing

- Feb 8, 2025
- Mar 8, 2025
- Apr 12, 2025
- May 10, 2025

### Park

- Gilchrist
- Ponce deLeon
- Bayshore Live Oak
- Gilchrist

## President's Message

Brian Risley

I hope everyone is having a good start to the new year.

We have a lot going on in February. ***There are three major public events that I will need help with.***

**On the 8th**, we have STEMtastic downtown at the Caloosa Sound Convention Center. We will be solar observing and have handouts and exhibits. It runs from 10am to 2pm. Setup starts at 8 am.

**On the 22nd** we have another solar observing event at the Burrowing Owl Festival at Rotary Park in south Cape Coral. This is our biggest event and will have handouts as well as scopes setup for the Sun. Event runs 10-4 and setup starts at 8 am. We also can push our next event on the evening of the 28th, our Rotary Park Public Star Party. Setup starts at 5pm and runs to 10 pm.

### Seahawk Park Star Parties

We are looking at the following schedule for the Seahawk Park Star Parties which start at sunset:

February 1, March 22, April 26, May 24, September 20, October 18, November 15, December 13

We have a lot of planets to look at the Feb 1st one!

Big Cypress reported that they had 400 people come out for their event January 25th. Their next event is February 22nd, 2025 8pm Seagrape Drive Ochopee

Tom and the Port Charlotte group have events at FSW on the evening of Feb 28th and are scheduled for solar observing on the 8th at Gilchrest Park in Punta Gorda.

## Attending the Winter Star Party!



## Club Officers & Positions

President/Equipment  
Brian Risley  
[swfaspres@gmail.com](mailto:swfaspres@gmail.com)  
239-464-0366

Vice President/  
Newsletter/Website/Astro SIG  
Mike Jensen  
[info@jensenone.com](mailto:info@jensenone.com)  
913-304-0495

Secretary  
Dan Dannenhauer  
[gawomp@aol.com](mailto:gawomp@aol.com)  
239-850-7111

Treasurer/AL Coordinator  
John MacLean  
[john.maclean.arcs1969@gmail.com](mailto:john.maclean.arcs1969@gmail.com)  
239-707-3365

Charlotte Event Coordinators  
Tony Heiner  
[verahei@aol.com](mailto:verahei@aol.com)  
941-457-9700

Thomas Segur  
[tsegur479@comcast.net](mailto:tsegur479@comcast.net)  
941-249-8726

Big Cypress Viewing Coordinator  
Mike Jensen  
[info@jensenone.com](mailto:info@jensenone.com)  
913-304-0495

FSW Punta Gorda Moore Observatory  
Director Thomas Segur  
[tsegur479@comcast.net](mailto:tsegur479@comcast.net)  
941-249-8726

Club Librarian  
Maria Berni  
239-940-2935

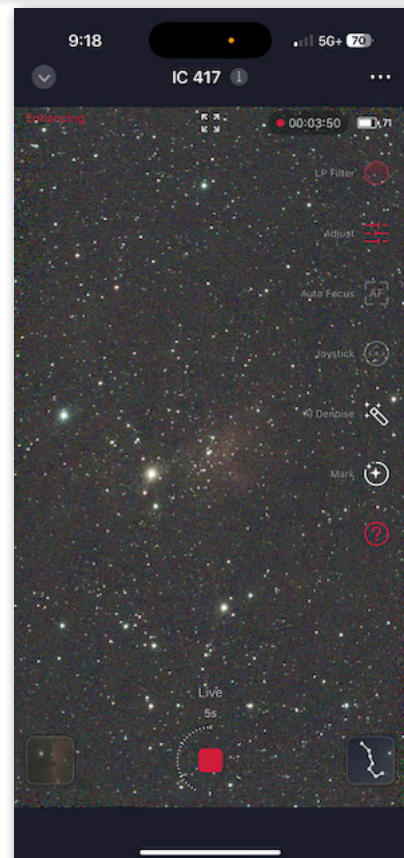
Club Historian  
Danny Secary  
[asecary@gmail.com](mailto:asecary@gmail.com)  
239-470-4764

## GUEST SPEAKER PRESENTATIONS SERIES

Here's our lineup for the "SWFAS Guest Speaker Presentations" series of talks. These will cover astronomical science and space exploration along with practical astronomy and astrophotography talks by various subject matter experts. We are lining up prominent scientists and researchers to explain the science and technology behind the exciting discoveries being made in recent years in astronomy.

The following presentations are already scheduled and we will be firming up talks in 2025 on a month-to-month basis. **February 6, 2025 Star Parties with Dan Dannenhauer, Dr. Mario Motta & Tony Costanzo**

Our February 5, 2025 presentation will illustrate the annual Winter Star Party in the Florida Keys. Members will delight in the overall knowledge of the origins of the WSP, the lecturers, the walk around telescopes sharing, viewing is a 2 on the Bortle scale, vendors equipment sales and repairs, and the astrophotography wonders of the Southern Cross. Please join us with presenters Mario Motta (MD in cardiology, dark and quiet skies author, UN office for Outer space affairs, and multiple lecturers presentations at the WSP), along with Tony Costanzo ( Holder of various Education degrees with 53 awards in astrological presentations plus master of telescope building).



## Next Steps After Learning Light Pollution Effects

By Mike Jensen

At the January general meeting of the Southwest Florida Astronomical Society we were treated to a thoughtful & well presented program from our friend and member Dr. Mario Motta. If you missed the presentation or would like to watch it again, it is available on [our YouTube channel](#). You can read Mario's article in the AMA Journal of Ethics by [clicking here](#). To cut to the chase, here is the conclusion of the article:

***“Thus, in a very real sense, the loss of a starry sky is directly correlated with human health risk and environmental damage. The fewer stars you see when you look up can be a marker of that risk. This is not to say that the loss of visibility of stars in the sky is causally related to human and environmental health, of course, but there exists a correlation between them that can be quantified. It behooves us to restore balance between natural and outdoor, built environments. To do so is not difficult: use outdoor lighting responsibly; use outdoor LAN only where needed, for the time needed; and don't overlight. Shield light sources from direct eye contact, and especially avoid outdoor nighttime blue light emission. These commonsense steps, if implemented, will lead to a healthier environment, help restore nature's balance, and maybe even gain back a starry sky to inspire all of us once more.”***

So, now that we have the knowledge, what do we do with it? I pondered this as I walked out of the planetarium and noticed some pretty bright parking lot lights. I guess our presentation was a bit too late for those lights.

Ok, so what can we do to improve the condition of our skies in what is one of the most harmful of all the states, Florida? From his comments we learned that North Carolina and Florida are among the worst bright sky offenders. Obviously some of this comes from the population of the larger cities of both states. After the talk, I asked Mario, “What can we do?” and he said “Write letters and contact the power companies and leadership.”

So, taking that a step further, I went online and found some sample letters that other communities and astronomy clubs had produced. I copied them and placed them on [our website here](#). I also wrote a simple light pollution statement for our website. The next steps are in fact up to you. If you are really passionate about darker skies that benefit our hobbies and our health, then copy the letter templates and start writing. Start with your local city, county and state officials along with your electricity power supplier.

I posed this question to our Astro SIG group in January. We had a great discussion and John Udart took the baton and created a good outline and point of direction for us. My thanks to John for taking the initiative to write something up after our conversations at the SIG meeting. We'll talk about this at the general meeting, and certainly much more at the Feb. SIG meeting.

Time to get involved folks. Some join our club and just come along for the ride to see what's in the skies. That's great, but there are some places you can't see the skies because of this light pollution, and now thanks to the research of the AMA, we find out (no surprise) that the light domes are not good for us and not good for mother earth. So, now is the time we need you to write letters, sign a petition, come to a meeting, please. You may not know it, but we are an affiliated group with the International Dark Sky Assn. <https://darksky.org/> Take a look at their website and see if it's a good fit for you.

Thanks!  
Mike





# The ABCs of Stargazing



How would you describe to a friend the size of a sky object, its distance from a particular star, its brightness, or its location on the celestial dome?

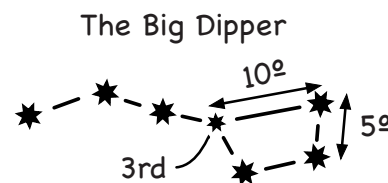
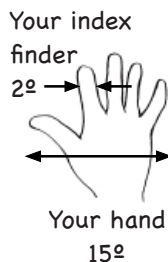
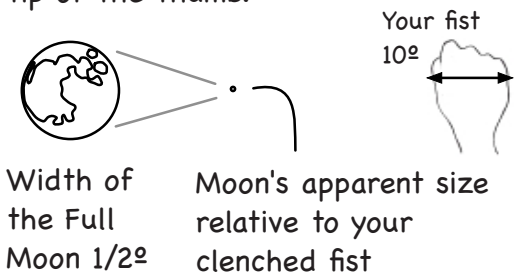
**The ABCs of stargazing allow you to do just that!**



## "A" is for angular size and distance

Be sure to remember these handy references when discussing size or distance in the sky:

- The moon spans  $1/2^\circ$ . It would take 360 "full moons" to reach from horizon to horizon!
- The apparent width of the tip of your index finger on your extended arm is less than  $2^\circ$ .
- The width of the bowl of the Big Dipper is  $5^\circ$  and the bowl's length is  $10^\circ$ .
- Your clenched fist on your fully extended arm is  $10^\circ$  from side to side.
- Your outstretched hand on your extended arm is  $15^\circ$  from the tip of the pinky to the tip of the thumb.



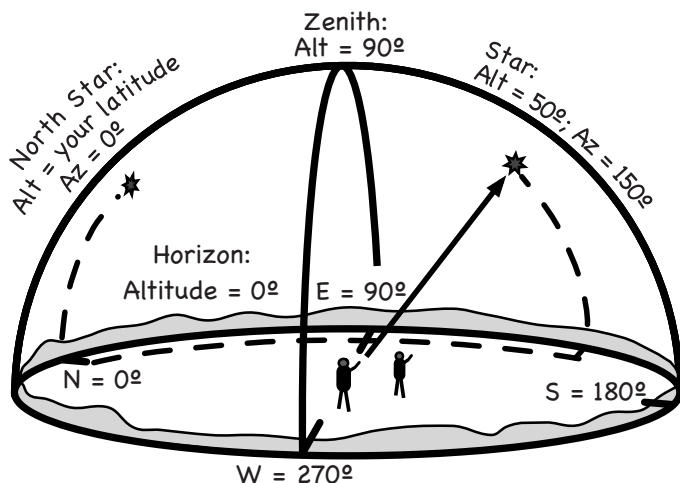
Six of the seven stars of the Big Dipper are of the 2nd magnitude.

## "B" is for brightness

Skywatchers use the "magnitude" scale to describe an object's brightness. Don't be confused by the reverse nature of the scale: The brighter the object, the smaller the magnitude. Objects with negative magnitudes are very bright, indeed!

Polaris, the North Star, always has an azimuth of  $0^\circ$  and has an altitude above the northern horizon matching the latitude of the observer.

Mag.	Object
-26	Sun (never look at the sun!)
-12	Full moon
-4	Venus
-2.5	Jupiter at its brightest
-1.5	Sirius, the brightest star in the night
0	Arcturus, Vega, Capella, Saturn
+1	Pollux, Regulus, Altair
+2	Six stars of the Big Dipper, North Star
+6	The faintest star seen by unaided eyes



## "C" is for coordinates

Stargazers often use the simple, but descriptive altitude-azimuth (alt-az) system to locate objects in the sky.

Azimuth coordinate:	Altitude coordinate:
North is $0^\circ$	Horizon is $0^\circ$
East is $90^\circ$	Zenith is $90^\circ$
South is $180^\circ$	
West is $270^\circ$	

## Starship's Seventh Flight Test

Content from [SpaceX.com](https://www.spacex.com)

The first Starship flight test of 2025 flew with ambitious goals: seeking to repeat our previous success of launching and catching the world's most powerful launch vehicle while putting a redesigned and upgraded Starship through a rigorous set of flight demonstrations.

It served as a reminder that development testing, by definition, can be unpredictable.

On its seventh flight test, Starship successfully lifted off from Starbase in Texas at 4:37 p.m. CT on Thursday, January 16. At launch, all 33 Raptor engines powered the Super Heavy booster and Starship on a nominal ascent. Following a successful hot-stage separation, the booster successfully transitioned to its boostback burn, with 12 of the planned 13 Raptor engines relighting, to begin its return to the launch site.

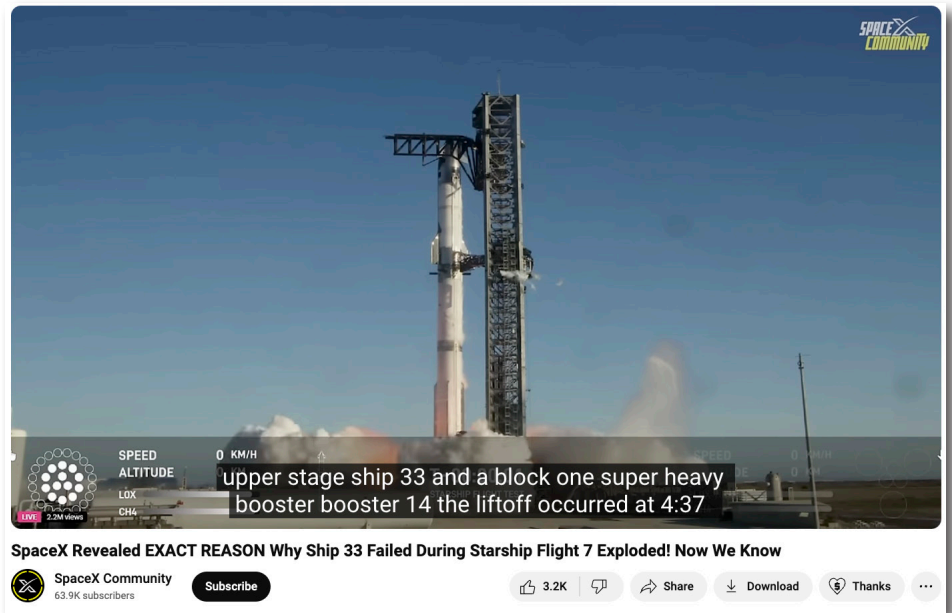
Super Heavy then relit all 13 planned middle ring and center Raptor engines and performed its landing burn, including the engine that did not relight for boostback burn. The landing burn slowed Super Heavy down and maneuvered itself to the launch and catch tower arms, resulting in the second successful catch of a Super Heavy booster.

Following stage separation, the Starship upper stage successfully lit all six Raptor engines and performed its ascent burn to space. Prior to the burn's completion, telemetry was lost with the vehicle after approximately eight and a half minutes of flight. Initial data indicates a fire developed in the aft section of the ship, leading to a rapid unscheduled disassembly.

Starship flew within its designated launch corridor – as all U.S. launches do to safeguard the public both on the ground, on water and in the air. Any surviving pieces of debris would have fallen into the designated hazard area. If you believe you have identified a piece of debris, please do not attempt to handle or retrieve the debris directly. Instead, please contact your local authorities or the SpaceX Debris Hotline at 1-866-623-0234 or at [recovery@spacex.com](mailto:recovery@spacex.com).

As always, success comes from what we learn, and this flight test will help us improve Starship's reliability as SpaceX seeks to make life multiplanetary. Data review is already underway as we seek out root cause. We will conduct a thorough investigation, in coordination with the FAA, and implement corrective actions to make improvements on future Starship flight tests.

The ship and booster for Starship's eighth flight test are built and going through prelaunch testing and preparing to fly as we continue a rapid iterative development process to build a fully and rapidly reusable space transportation system.



## *The Starship Program*

Article Compiled by Mike Jensen but created by AI

In the realm of aerospace innovation, few developments have captured the imagination quite like SpaceX's Starship rocket. As humanity progresses deeper into the final frontier, the advancements and capabilities embodied in Starship promise to redefine our relationship with space exploration and commercial travel. This article delves into the remarkable features, recent launches, strategic ambitions, and the broader implications of the Starship program.



The Starship rocket is one of the most ambitious projects in the realm of aerospace engineering, primarily developed by SpaceX, the private space exploration company founded by Elon Musk. Starship is designed to be a fully reusable spacecraft that can carry both crew and cargo to a variety of destinations, including Earth orbit, the Moon, Mars, and potentially beyond. This article will delve into its design, capabilities, missions, and the implications it holds for the future of space travel. The plan for Starship aligns with Musk's goal of establishing a human settlement on Mars and making space travel accessible to all. With a fully reusable spacecraft designed to carry both crew and cargo, Starship represents a pivotal shift in how we approach missions beyond our planet.

### **Design and Specifications**

Starship is composed of two main components: the Starship spacecraft itself and the Super Heavy booster. The Super Heavy, which is the first stage of the launch system, is designed to provide the necessary thrust to lift Starship out of the Earth's atmosphere. Once the booster has completed its job, it separates from Starship and returns to Earth for reuse.

Starship, the second stage, is a towering structure standing approximately 50 meters tall and capable of carrying over 100 metric tons of cargo into low Earth orbit. Constructed primarily from stainless steel, Starship's design is not only focused on durability but also on heat resistance. The metal will help the spacecraft withstand the extreme temperatures of re-entry, making it suitable for regular flights.

The rocket's aerodynamic design is enhanced by its flaps, which are used for landing and maneuvering during aerobraking. SpaceX has focused heavily on reusability, a key aspect of reducing costs in space travel. By allowing both the booster and the spacecraft to be reused multiple times, SpaceX hopes to lower the price of sending materials and people beyond our planet.

### **Engine Technology**

The power behind Starship comes from SpaceX's Raptor engines. These engines are designed to be highly efficient and capable of producing significant thrust. Raptor engines use a full-flow staged combustion cycle, which is a cutting-edge technology allowing them to burn both liquid oxygen (LOX) and methane. This choice of fuel is strategic; methane can potentially be produced on Mars from local resources, making it easier for mis-



sions to be self-sustaining.

Each Starship is designed to be equipped with six Raptor engines, providing it with an impressive thrust-to-weight ratio that enhances its capability to reach its intended destinations. The Raptor engines have undergone numerous tests, with each iteration improving reliability and performance, key elements for manned missions.

One of the most remarkable aspects of Starship is its advanced technology. Made primarily of stainless steel, the spacecraft showcases high strength, resistance to heat, and a striking aesthetic that evokes a sense of futuristic ambition. The use of Raptor engines, designed specifically for performance at high altitudes and speeds, further enhances its capabilities. Each Raptor engine is powered by a combination of liquid oxygen and methane, which can be potentially produced on Mars, aligning with Musk's vision of in-situ resource utilization.



Starship's reusability is another factor that significantly reduces the cost of access to space. The ability to land vertically and be refurbished rapidly enables SpaceX to plan frequent launches without the exponential costs typically associated with traditional rocket systems. This model is a game-changer for the aerospace industry, as it has the potential to lower launch costs dramatically and democratize access to space.

## Missions and Objectives

SpaceX envisions Starship not just as a transport vehicle but as a vehicle that can partake in a wide array of missions. One of its primary objectives is to facilitate human exploration of Mars. Elon Musk has often shared his ambitious goal of establishing a self-sustaining city on the red planet, which requires a reliable means of transport and logistics for both people and goods.

The lunar missions are another significant focus for Starship. NASA has selected SpaceX's Starship to land astronauts on the Moon as part of its Artemis program, which aims to return humans to the lunar surface and establish a sustainable presence. This mission will utilize the vehicle's capabilities to transport both crew and cargo to the lunar surface and back, showcasing the versatility of Starship.

Additionally, Starship is set to revolutionize satellite deployment. Its massive payload capacity allows for the launch of multiple satellites in a single mission, streamlining the costs and logistics associated with satellite placement in orbit. This aspect is crucial for the growing demand for satellite services, particularly as the demand for broadband internet access continues to rise globally.

## Recent Launches and Milestones

The journey of Starship has not been without its challenges, but each launch has brought invaluable data and lessons. Notable test flights, including the SN series, have demonstrated critical systems such as landing mechanisms, structural integrity, and overall flight dynamics. The fully integrated orbital flight test, which took place in 2023, marked a significant milestone in the program, despite the challenges faced on launch day.

During the orbital flight, the Starship successfully completed stages of its ascent before experiencing an anomaly during re-entry. This event highlighted the importance of robust testing protocols and the iterative process that SpaceX embraces. Each failure informs future design adjustments, leading toward the ultimate goal of achieving a reliable and safe spacecraft capable of interplanetary travel.

## The Future of Space Travel

The implications of Starship and its missions extend far beyond just scientific exploration. With its reusability and cost-effectiveness, Starship has the potential to democratize space travel, making it more accessible for various entities, including private companies, educational institutions, and even individual space tourists.

In turn, this accessibility could spark a new era of innovation and research, as more people will be able to conduct experiments and experience space firsthand. The idea of launching dedicated research missions, space tourism, or even interplanetary cargo deliveries could become a reality sooner than previously thought.

Furthermore, the development of Starship aligns with the broader goals of humanity to become a multi-planetary species. The threat of climate change, potential asteroid impacts, and other existential risks underscore the importance of exploring and potentially colonizing other planets. By developing a reliable spacecraft like Starship, humanity is taking significant steps toward ensuring long-term survival.

SpaceX has outlined an ambitious future for Starship that extends far beyond Earth. The spacecraft is slated to play a critical role in NASA's Artemis program, which aims to return humans to the lunar surface by the mid-2020s. Starship has been chosen as the lunar lander, made possible by its capacity and design. This mission not only ushers in a new era of lunar exploration but also serves as a stepping stone for Mars missions.

Looking further ahead, SpaceX envisions Starship missions carrying the first humans to Mars, with aspirations of establishing a sustainable human presence on the planet within the next decade. These aspirations bring significant technological, ethical, and logistical considerations to the forefront. Developing life support systems, creating habitats, and addressing the psychological impacts of long-duration space travel are paramount as we prepare to take our next giant leap.

The implications of the Starship program are profound. As the boundaries of space exploration expand, so too do the philosophical and ethical questions surrounding our journey beyond Earth. What does it mean to be a multiplanetary species? How will we safeguard environments beyond our planet? These questions necessitate dialogue among scientists, ethicists, and policymakers as we chart our course toward the stars.

Moreover, Starship's potential impact on space tourism cannot be understated. By lowering the costs and increasing the frequency of launches, SpaceX is opening the door for private individuals to experience space travel. Companies are already looking into offering suborbital flights for tourists, potentially transforming human interaction with space into something much more common.

## *NASA's Hubble Traces Hidden History of Andromeda Galaxy*

Content from [Hubblesite.org](https://hubblesite.org)

In the years following the launch of NASA's Hubble Space Telescope, astronomers have tallied over 1 trillion galaxies in the universe. But only one galaxy stands out as the most important nearby stellar island to our Milky Way — the magnificent Andromeda galaxy (Messier 31). It can be seen with the naked eye on a very clear autumn night as a faint cigar-shaped object roughly the apparent angular diameter of our Moon.

A century ago, Edwin Hubble first established that this so-called “spiral nebula” was actually very far outside our own Milky Way galaxy — at a distance of approximately 2.5 million light-years or roughly 25 Milky Way diameters. Prior to that, astronomers had long thought that the Milky Way encompassed the entire universe. Overnight, Hubble's discovery turned cosmology upside down by unveiling an infinitely grander universe.

Now, a century later, the space telescope named for Hubble has accomplished the most comprehensive survey of this enticing empire of stars. The Hubble telescope is yielding new clues to the evolutionary history of Andromeda, and it looks markedly different from the Milky Way's history.

Without Andromeda as a proxy for spiral galaxies in the universe at large, astronomers would know much less about the structure and evolution of our own Milky Way. That's because we are embedded inside the Milky Way. This is like trying to understand the layout of New York City by standing in the middle of Central Park.

“With Hubble we can get into enormous detail about what's happening on a holistic scale across the entire disk of the galaxy. You can't do that with any other large galaxy,” said principal investigator Ben Williams of the University of Washington. Hubble's sharp imaging capabilities can resolve more than 200 million stars in the Andromeda galaxy, detecting only stars brighter than our Sun. They look like grains of sand across the beach. But that's just the tip of the iceberg. Andromeda's total population is estimated to be 1 trillion stars, with many less massive stars falling below Hubble's sensitivity limit.

Photographing Andromeda was a herculean task because the galaxy is a much bigger target on the sky than the galaxies Hubble routinely observes, which are often billions of light-years away. The full mosaic was carried out under two Hubble programs. In total it required over 1,000 Hubble orbits, spanning more than a decade.

This panorama started with the Panchromatic Hubble Andromeda Treasury (PHAT) program about a decade ago. Images were obtained at near-ultraviolet, visible, and near-infrared wavelengths using the Advanced Camera for Surveys and the Wide Field Camera 3 aboard Hubble to photograph the northern half of Andromeda.

This program was followed up by the Panchromatic Hubble Andromeda Southern Treasury (PHAST), recently



*M31 Andromeda Astrophoto by Mike Jensen*

published in *The Astrophysical Journal* and led by Zhuo Chen at the University of Washington, which added images of approximately 100 million stars in the southern half of Andromeda. This region is structurally unique and more sensitive to the galaxy's merger history than the northern disk mapped by the PHAT survey.

The combined programs collectively cover the entire disk of Andromeda, which is seen almost edge-on — tilted by 77 degrees relative to Earth's view. The galaxy is so large that the mosaic is assembled from approximately 600 separate fields of view. The mosaic image is made up of at least 2.5 billion pixels.

The complementary Hubble survey programs provide information about the age, heavy-element abundance and stellar masses inside Andromeda. This will allow astronomers to distinguish between competing scenarios where Andromeda merged with one or more galaxies. Hubble's detailed measurements constrain models of Andromeda's merger history and disk evolution.

## **A Galactic 'Train Wreck'**

Though the Milky Way and Andromeda formed presumably around the same time many billions of years ago, observational evidence shows that they have very different evolutionary histories, despite growing up in the same cosmological neighborhood. Andromeda seems to be more highly populated with younger stars and unusual features like coherent streams of stars, say researchers. This implies it has a more active recent star-formation and interaction history than the Milky Way.

"Andromeda's a train wreck. It looks like it has been through some kind of event that caused it to form a lot of stars and then just shut down," said Daniel Weisz at the University of California, Berkeley. "This was probably due to a collision with another galaxy in the neighborhood."

A possible culprit is the compact satellite galaxy Messier 32, which resembles the stripped-down core of a once-spiral galaxy that may have interacted with Andromeda in the past. Computer simulations suggest that when a close encounter with another galaxy uses up all the available interstellar gas, star formation subsides.

"Andromeda looks like a transitional type of galaxy that's between a star-forming spiral and a sort of elliptical galaxy dominated by aging red stars," said Weisz. "We can tell it's got this big central bulge of older stars and a star-forming disk that's not as active as you might expect given the galaxy's mass."

"This detailed look at the resolved stars will help us to piece together the galaxy's past merger and interaction history," added Williams.

Hubble's new findings will support future observations by NASA's James Webb Space Telescope and the upcoming Nancy Grace Roman Space Telescope. Essentially a wide-angle version of Hubble (with the same sized mirror), Roman will capture the equivalent of at least 100 high-resolution Hubble images in a single exposure. These observations will complement and extend Hubble's huge dataset.

The Hubble Space Telescope has been operating for over three decades and continues to make ground-breaking discoveries that shape our fundamental understanding of the universe. Hubble is a project of international cooperation between NASA and ESA (European Space Agency). NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope and mission operations. Lockheed Martin Space, based in Denver, also supports mission operations at Goddard. The Space Telescope Science Institute in Baltimore, which is operated by the Association of Universities for Research in Astronomy, conducts Hubble science operations for NASA.

## *The Astronomical League*

As a member of the Southwest Florida Astronomical Society you are automatically also a member of the Astronomical League, a nationwide affiliation of astronomy clubs. Membership in the AL provides a number of benefits for you including receipt of *The Reflector*, the AL's quarterly newsletter, use of the Book Service, through which you can buy astronomy related books at a 10% discount. You can also participate in the Astronomical League's Observing Clubs. The Observing Clubs offer encouragement and certificates of accomplishment for demonstrating observing skills with a variety of instruments and objects. These include the Messier Club, Binocular Messier Club, the Herschel 400 Club, the Deep Sky Binocular Club, and many others. To learn more about the Astronomical League and its benefits for you, visit <http://www.astroleague.org>

### **Reflector Magazine**

The latest – December 2024 - of the Reflector magazine was emailed on December 9. It is also available via the web at <https://www.astroleague.org/reflector>

### **What's up with the Astronomical League – November 2024**

The link to the latest happenings is at : <https://www.astroleague.org/wp-content/uploads/2025/01/Whats-Up-with-Astro-League-January-11-2025.pdf>

### **Monthly highlight of the Astronomical League Observing Programs (Article prepared by SWFAS Astronomical League Coordinator John MacLean)**

This month we'll take a look at the Caldwell Observing program compiled by the late Sir Patrick Moore.  
Caldwell Observing Program

As the Astronomical League introduction points out, the Messier list was originally compiled as a list of objects (faint fuzzies) to be avoided while searching for comets. The Caldwell List, on the other hand, was generated as a list of objects to be sought out for their beauty and interest and well worth the effort to go out of one's way (literally in the case of the full list!) to find.

The full Caldwell list contains 109 objects varying in magnitude from 1 to 13. Unlike the Messier list, the Caldwell objects extend well into the southern hemisphere and so to log them all travel to the Southern hemisphere will be required.

However, the Astronomical League provides two levels of awards, one including just 70 objects which will allow observations to remain in the northern hemisphere and the other for the full list.

As is the case for the Messier observing programs, computer guided scopes are not allowed although the aperture requirement is a modest 6 inches.

The Caldwell list is mutually exclusive of the Messier list and is sequenced in order of Declination, North to South. Well known targets in the northern hemisphere include the Cat's Eye Nebula in Draco, the Sword Handle (Double Cluster) in Perseus, the Blinking Nebula and the North American Nebula in Cygnus, the Hyades and the Eskimo Nebula in Gemini.

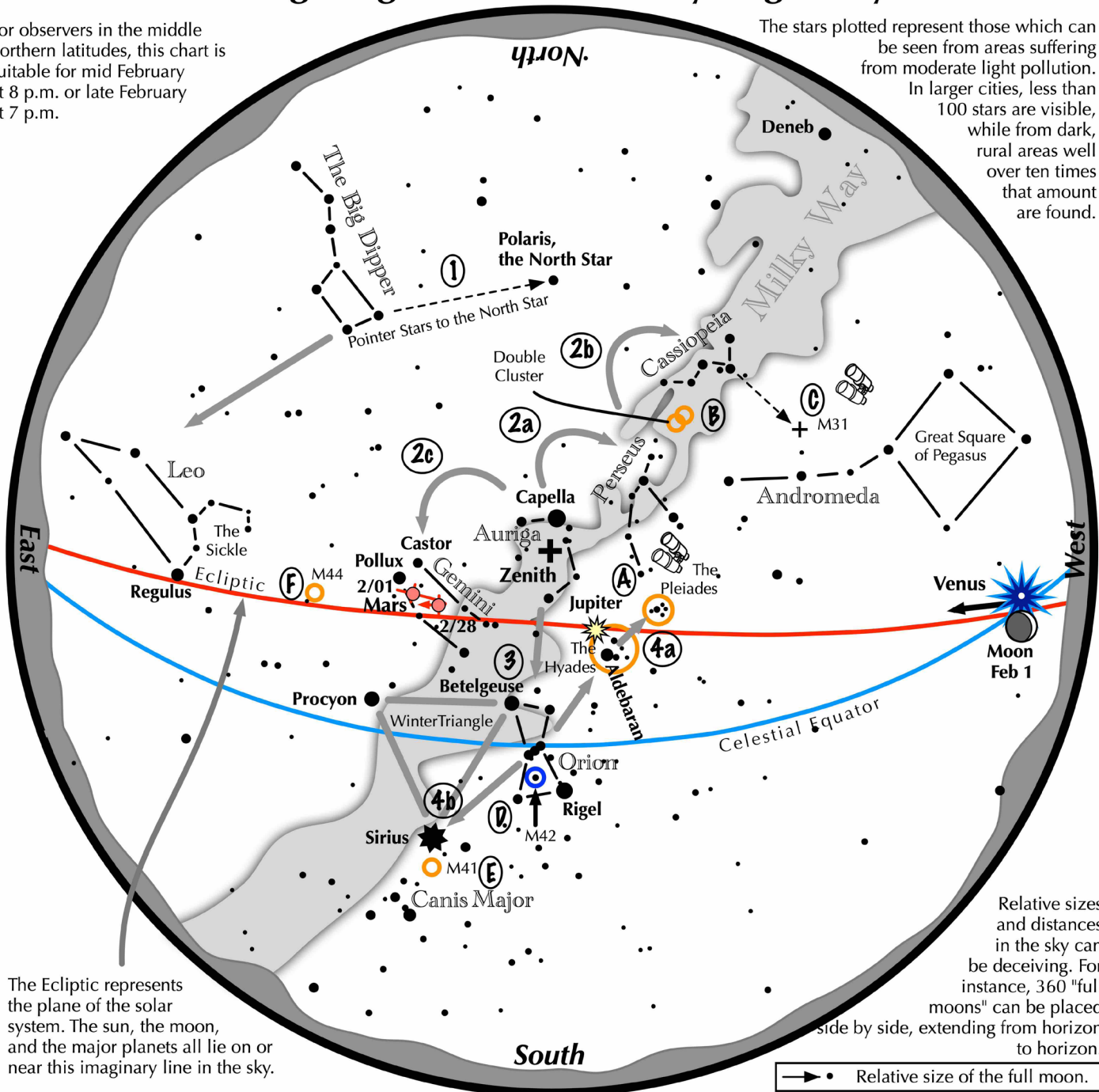
Southern hemisphere targets include the Coal Sack and the Jewel Box cluster in Crux, The Tarantula Nebula in the Large Magellanic Cloud, and the globular cluster 47 Tucanae.

The awards for successful completion of either program consist of a certificate and a pin including a picture of two of Sir Patrick's favorite objects, the Cat's Eye Nebula and the Tarantula Nebula.

# Navigating the mid February Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid February at 8 p.m. or late February at 7 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

## Navigating the February night sky: Simply start with what you know or with what you can easily find.

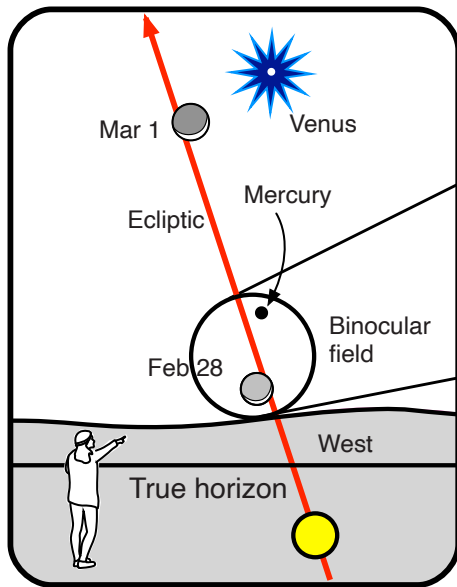
- 1 Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
- 2 Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars of Castor and Pollux in Gemini.
- 3 Directly south of Capella stands the constellation of Orion with its three Belt stars, its bright red star Betelgeuse, and its bright blue-white star Rigel.
- 4 Use Orion's three Belt stars to point northwest to the red star Aldebaran and the Hyades star cluster, then to the Pleiades star cluster. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius, a member of the Winter Triangle.

### Binocular Highlights

- A:** Examine the stars of two naked eye star clusters, the Pleiades and the Hyades.
- B:** Between the "W" of Cassiopeia and Perseus lies the Double Cluster.
- C:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
- D:** M42 in Orion is a star forming nebula. **E:** Look south of Sirius for the star cluster M41.
- F:** M44, a star cluster barely visible to the naked eye, lies southeast of Pollux.

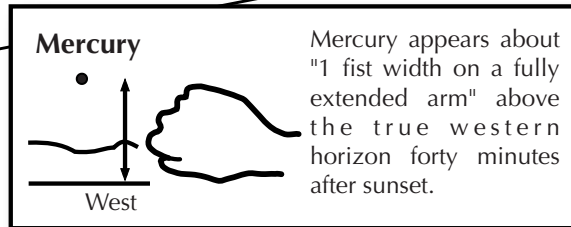
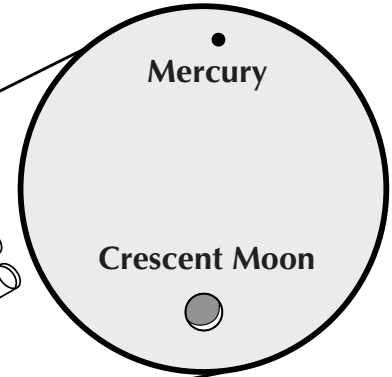


## Mercury, Venus, and the young moon in the evening twilight



**February 28 and March 1, 2025:  
Mercury and the young crescent moon  
forty minutes after sunset in the west**

View through  
10x50 binoculars  
on February 28



Mercury appears about  
"1 fist width on a fully  
extended arm" above  
the true western  
horizon forty minutes  
after sunset.

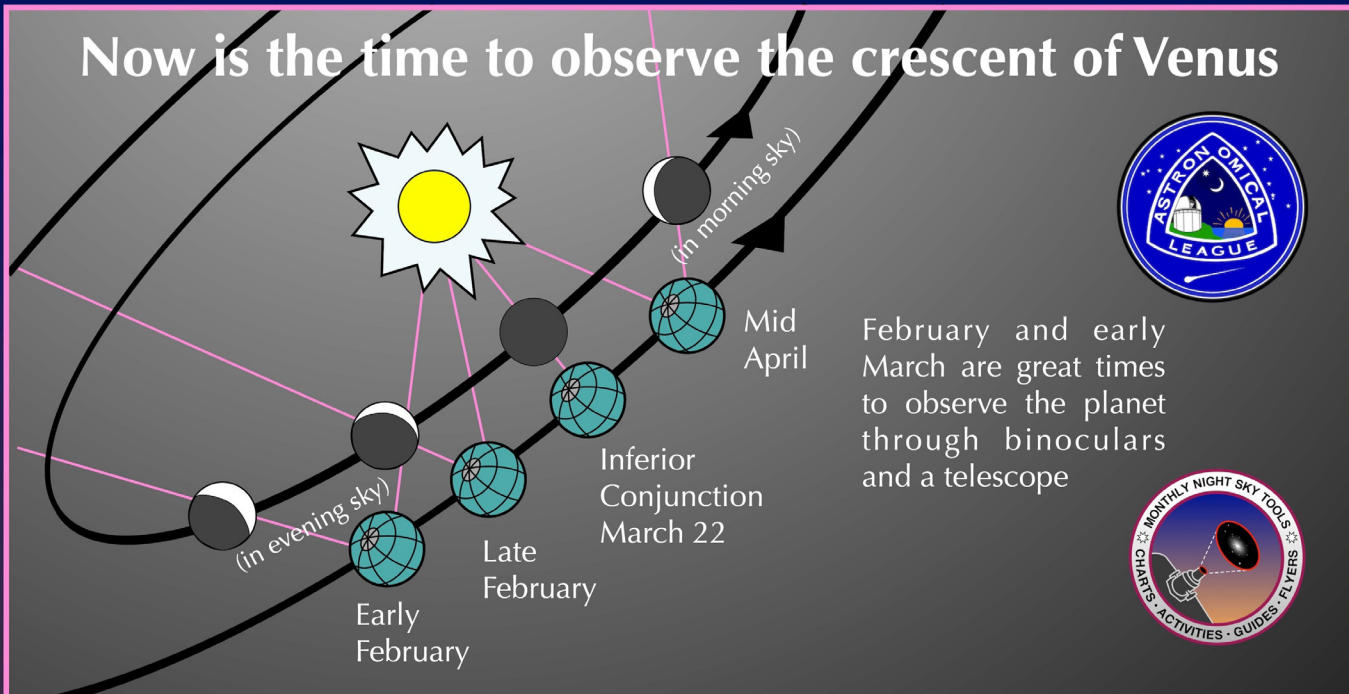
### The young moon & Mercury in the evening twilight

Have you ever spotted Mercury? Many stargazers have not. The early evening on February 28 presents a good opportunity to catch the elusive little planet. Look low into the western twilight forty minutes after sunset.

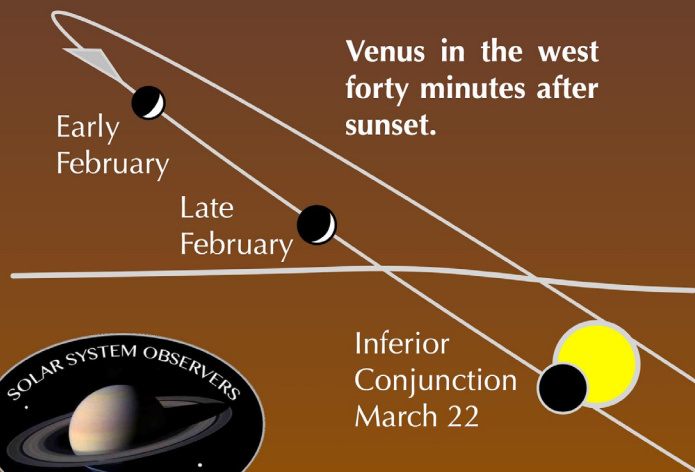


- Using binoculars, look on February 28 for the very thin crescent Moon floating above Mercury. Can you see Earthshine on the Moon's dark side or is the twilight too bright?
- On the next evening, Mercury is in the same place, but the moon has moved to higher and closer to brilliant Venus. Earthshine should be more easily visible.

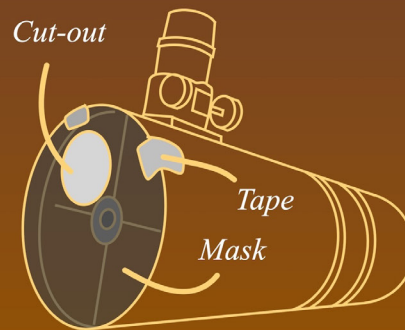
# Now is the time to observe the crescent of Venus



The view through a telescope changes quickly in just six weeks. As the Venus - Earth gap narrows, Venus becomes a thinner, but wider crescent.



If you use a reflector or SCT, placing an off-centered cut-out mask over the optical tube entrance helps give a sharper view.





## What's Going On in the SIG Group?

By Mike Jensen,  
SIG Founder/Leader



Every month we get together on a Zoom call with a pretty loose agenda and manage to have an absolute blast talking about Astrophotography. I hope you'll join us if you're interested in Astrophotography.

There are many who are on the SIG email list but many fewer who actually join the meeting. We'd love to have you join us, and at some point I will begin removing non-participating members from the email list to protect our participating members who send out their images for critique and feedback.

If you are new to the club or have just decided to dip a toe in the astrophotography world, this is the group to become associated with! I have yet to see a question asked, or a plea for help that did not result in an answer and some help. PLUS, we have a heck of a lot of fun together, usually at nights at Big Cypress or at dinner before the general meeting.

Here's the link for the Zoom call. Occasionally this link may change so check the monthly newsletter for the most accurate link.

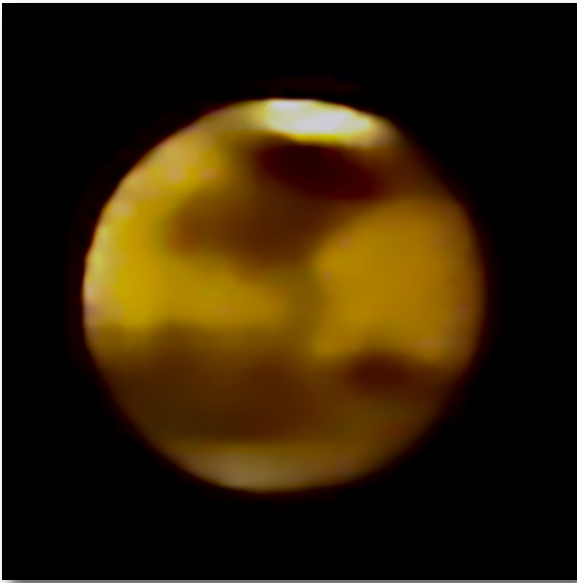
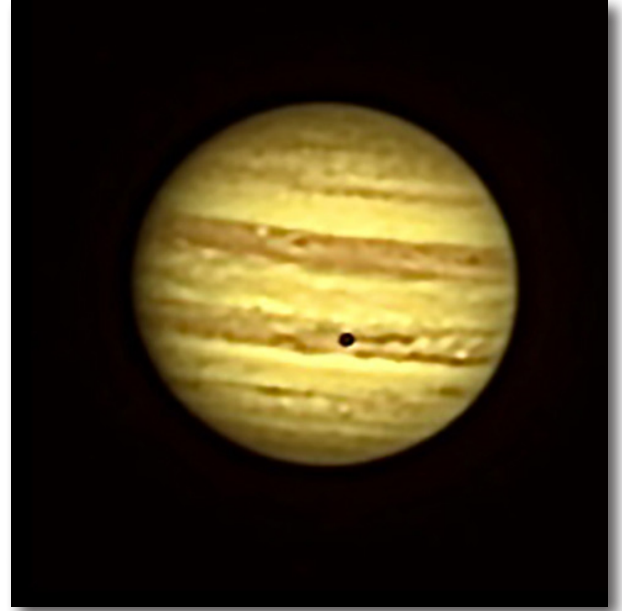
<https://zoom.us/j/95463483537?pwd=6EprbaLEuVacLvRgBTVxehkTGh1WSP.1>

Meeting ID: 954 6348 3537

Passcode: 052283

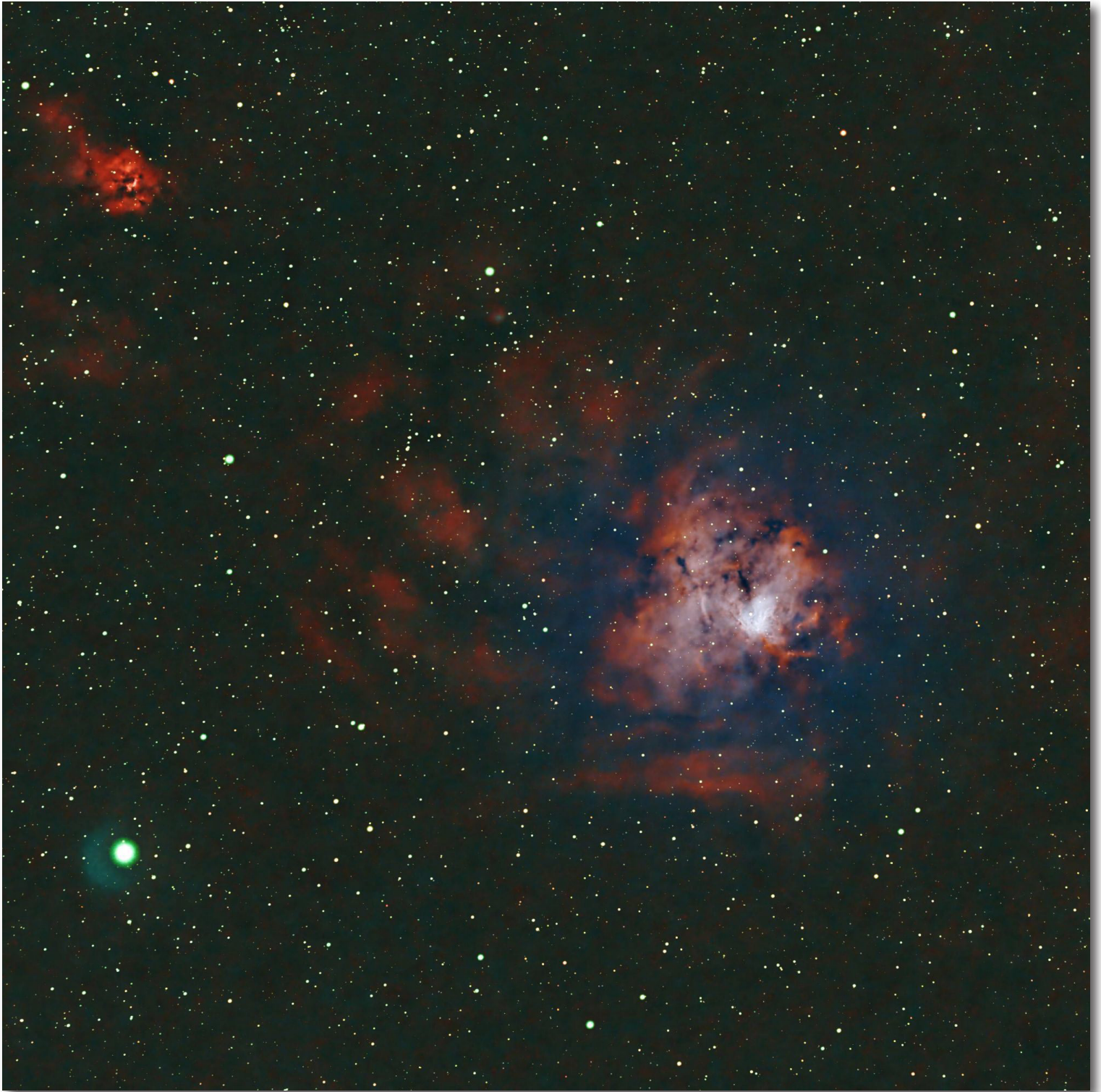


## *Astro SIG Images*



### **Images by Ray Bratton**

Upper Left - The Horsehead Nebula. Upper Right - Jupiter with Io Crossing.  
Lower Left - Mars. Lower Right - M 31 Andromeda



### **NGC1491 - Fossil Footprint Nebula by Jim Vaughan\_NGC1491**

Brand/Type of Telescope/Lens: WO RedCat 51 - 51mm - 250mm fl

Mount: ZWO AM5

Exposures: 60 subs @ 300s each, ZWO 533MC Pro with SvBony dual band (HaO) filter SV220

Processing Software: Pixinsight

Here's the story: NGC1491 is an HII ionized region in the constellation Perseus. Usually shown as the large HII emission area with the bright central star powering the nebula. This larger field of view gives a hint to the nebula's nickname of Fossil Footprint, as we can see the 'Toes' of the cosmic dinosaur point out of its' foot pad. The bright star in the lower left corner is Lambda Perseus. But I have not been able to identify the small emission area in the upper left. Possibly the beast's next meal.



### **SH2-231, SH2-232, SH2-233 and SH2-235 by Scott Cruzen**

Brand/Type of Telescope/Lens: Astro-Tech 130mm F7 EDT APO Triplet Refractor 910mm FL with 1x Flattener

Mount: skywatcher EQ6-R Pro, ASIAir Plus

Exposures: 88 x 240sec SII, 90 x 240sec Ha, 85 x 240sec OIII, ASI2600MM Pro Camera

Processing Software: SiriL/SiriLic, GIMP, DarkTable, Topaz

Here's the story:

SH2-232 is called the Great Pumpkin, for obvious reasons, since it greatly resembles a big Jack-O-Lantern, maybe after it has decayed on the front porch for a couple of weeks. The other smaller nebulae don't have names, as far as I've been able to tell. The brightest one is SH2-235. There is a small circular planetary nebula, PN G173.5, that appears as a magenta spot in the middle of the pumpkin head. SH2-232 is about 7500 light years away in the constellation Auriga and is rather dim, requiring some aperture and a fair amount of integration time to image.



### **NGC 2174 - The Monkey Head Nebula by Reggie Blackmon**

Brand/Type of Telescope/Lens: ZWO Seestar S50 50mm/250mm

Mount: Alt-Az

Exposures: 6.8 hrs Integration

Processing Software: Siril, GraXpert

Here's the story: The Monkey Head Nebula is an emission nebula located in the constellation Orion, the Hunter. It is located near the head of Orion, in the direction of the Gemini Constellation. It lies roughly a third of the distance from the bright star Alhena, Gamma Geminorum, to Elnath, Beta Tauri. The nebula is an H II region, a large cloud of ionized gas in which new stars are being formed. The low-density cloud is a site of intense star formation. The Monkey Head Nebula lies about 6,400 light years from Earth. It is associated with the open cluster NGC 2175. It has the designation NGC 2174 in the New General Catalogue. The open cluster NGC 2175 was discovered by the Italian astronomer Giovanni Batista Hodierna before 1654. It lies at a distance of 6,350 light years from the solar system. The cluster was independently discovered by the German astronomer Karl Christian Bruhns in 1857. NGC 2175 is embedded in a diffuse nebula, designated Sh 2-252 in the Sharpless catalogue. NGC 2174 covers an area larger than the full Moon and can be seen in binoculars. However, one needs a larger telescope to make out any of the details. The stellar nursery contains many young stars that are embedded within the surrounding dust and gas. These stars emit intense ultraviolet radiation which ionize the hydrogen gas, making the nebula glow.

The light and winds from the newly formed stars are dispersing the clouds in which the stars were formed. The nebula surrounds several loose clusters of young stars and will evaporate and disappear into the surrounding space within the next few million years.



### **NGC 281 - The Pacman Nebula by Reggie Blackmon**

Brand/Type of Telescope/Lens: ZWO Seestar S50 50mm /250mm

Mount: Alt-AZ

Exposures: 1226 10 sec subs (3.4 hrs) , Bortle 5, 97.4% Waxing Gibbous

Processing Software: Siril, GraXpert

Here's the story: Discovered by American astronomer Edward Emerson Barnard in August 1883, NGC 281, IC 11 or Sh2-184 is an emission nebula in the northern constellation of Cassiopea and is part of the Milky Way's Perseus Spiral Arm.

Its associated star cluster is IC 1590, was discovered later by Guillaume Bigourdan of France. Likewise, multiple star 'B 1' or  $\alpha$  1 was later discovered by S W Burnham. Its bright component is identified as the highly luminous O6 spectral class star, HD 5005 or HIP 4121.

NGC 281 is also known as the Pacman Nebula for its resemblance to the video game character.



### **IC 405 The Flaming Star Nebula by Scott Cruzen**

Brand/Type of Telescope/Lens: Astro-Tech 130mm F7 EDT APO Triplet Refractor 910mm FL with 1x Flattener

Mount: Skywatcher EQ6-R Pro, ASIAir Plus

Exposures:

80 x 240sec SII

82 x 240sec Ha

72 x 240sec OIII

Processing Software: SiriL/SiriLic, GIMP, DarkTable, Topaz

Here's the story: IC 405 is an emission and reflection nebula in the constellation Auriga in the same neighborhood as IC 410, the Tadpoles Nebula. The Flaming Star is located about 1,500 light years away and is about 5 light years in diameter. IC405 is illuminated by its central star AE Auriga, an irregular variable. Apparently AE Auriga is quite peripatetic; having once been located near Orion's Belt. I decided to image this nebula after working on The Tadpoles back in December, since it is close by and in the right part of the sky for me to get an entire night's unobstructed imaging.



## IC 405 The Flaming Star Nebula by Mike Jensen

Brand/Type of Telescope/Lens: Explore Scientific CF 127

Mount: Skywatcher EQ6-R Pro, ASI Air Plus

Exposures: 10 x 300sec R,G, & B

63 x 3000sec SII

39 x 300sec Ha

Processing Software: PixInsight, Photoshop, Topaz

Here's the story: You can read the scientific explanation of the nebula in Scott's story. For me, this started out at Big Cypress for a night under the dark skies with the guys. I joined a handful of our AstroSIG members at Big Cypress on Jan. 4th for the new moon. WOW! Was the sky dark (after the sliver of a moon set). I set up my rig inbetween Don Bishop and Dick Cogswell, fired up my ASI AIR Plus software on my iPad Pro and started scanning on what I wanted to image. I found the Flaming Star and it looked like a target I could continue working on at home (given a bit of a limited view of the South & West skies at home). My typical approach is to research a project on [Astrobin](#) or some of the other Astrophotography apps/sites. I didn't do that this time so I decided to do some research of my own. I shot the RGB channels, usually for fore/background stars, and to see if there's any fun visible imagery in there. I then shot the Ha, Oii, and Sii filters. I didn't see much in the Oii filter so I decided to omit it. Clearly there's something there if you look at Scott's image. So why does mine look different from Scott's. 1. He imaged longer, mine was 11 hours, his 15.6. The bigger difference is that we chose to assign different colors to different channels. We have that choice as the photographers since no one really knows what color these subjects are. Enjoy!



## Membership Meeting Minutes

### Southwest Florida Astronomical Society Jan. 2, 2025

Southwest Florida Astronomical Society Membership meeting January 2, 2025 Minutes at the Caloosa Center Planetarium. President Risley opened the meeting at 7:07PM by thanking Tom Klein for his computer assistance regarding our 16 Zoom attendees, stated that there were 24 Planetarium attendees and introduced Bob Kincowski as a first timer, asking John MacLean to introduce our guest speaker. John MacLean, program coordinator, proudly introduced one of our own members, Doctor Mario Motta...board certified cardiologist, dark and quiet skies author and UN once for outer space affairs.

Program: Medical and Environmental effects of Outdoor LED Lighting AMA and U recommendations, latest from the starlight conference NZ by Mario Motta, MD, FACC....Mario illustrated his homemade telescope and the Bode's constellation and other various constellations and clusters. Yet his main objective was to educate the members on Light Pollution affecting the human health. To that end, Mario illustrates the dangers of road glare, interfering with our circadian rhythms, melatonin suppression inhibiting our immune system, psychiatric disturbances, obesity, increased diabetes and endocrine related carcinomas. Doctor Richard Stevens began this light pollution theory causing increases in breast cancer. Today this research shows that outside lighting, set at more than 3,000K, causes blue light, which is the core of the problem. FP&L and others have a supply of 4,000K in Florida and refuses to replace their street lights.

The brighter the outside lights, the higher the crime rate, showing that robbers hide in the shadows. So much data, which members can review on line. Many questions were asked and answered. Doctor Motta was applauded for his presentation and thanked by President Risley.

Outreach Events:

Charlotte County.....Tom Segur stated that the Solar viewing event held on 12/14/24 was somewhat difficult due to Hurricane damage to

all three County parks. The FSW Moore Observatory 12/27/24 was well received.

Lee County..... Brian Risley stated that only 8 people attended the Seahawk Park party on 12/7/24.

Upcoming Events:

Charlotte County...Tom Segur stated that the January 11th solar viewing event will take place at the Punta Gorda Library parking lot from 9AM until Noon.... Tom further stated that the FSW Observatory meeting will take place on January 24, 2025....Tom is hopeful that Gilchrist Park will be clear from Cane damage to have future outings.

Lee County...

Brian Risley advised that the Big Cypress viewing will be on January 25th and February 22nd... That the Seahawk Party meeting dates have yet to be determined....The STEMastic February 8th event will be at the Caloosa Sound Convention Center at 10AM until 2PM....

The Burrowing Owl Festival will be on February 22nd at Rotary Park in Cape Coral from 10 AM until 4 PM.... Brian further stated that the Rotary Park Public Star Party will be held on February 28th from 6-10 PM.

Officer and Committee Reports:

President: President Brian Risley advised that the officer elections were positively approved without objection by the members. Brian also advised that the members approved the 2025 financial budget without objection. President Risley asked for a volunteer to perform the annual audit. Tony Costanzo volunteered and John MacLean met with him to enable the needed audit by our February 6, 2025 membership meeting. President Risley stated that Heather is no longer with the Planetarium and her replacement is Mr. Tod Sherman.

Brian told the members that the Planetarium director has always held an honorary membership in SWFAS and that President Risley has approved such. Mike Jensen agreed, as did John MacLean and Dan Dannenhauer. Officer approval was uncontested.

Vice President: Vice President Mike Jensen enthusiastically stated that 8 members held a social dinner prior to this meeting and encouraged others to join in future social dinners. Mike stated that several members were going down to Big Cypress this weekend and encouraged others to join, as a matter of fact, Mike asked all members to get involved in our activities. Vice President Jensen then offered his Astrophotographers to meet and discuss the March 14th upcoming Lunar eclipse, including other issues.

Secretary: Dan Dannenhauer asked for approval of his minutes as documented in the monthly Newsletter. John MacLean moved such, seconded by Tony Costanzo and approved unanimously.

Treasurer: John MacLean advised that all financial data was reviewed by the officers and approved. No further action needed.

Program Coordinator: John MacLean advised that there was no speaker set for February. Dan Dannenhauer, Tony Costanzo and Mario Motta stated that they could present the views and activities resulting from this year's January 27 to February 1st Winter Star Party at the Scout Campsites near Big Pine Key. Several members asked about the WSP and seemed excited to discover the happenings.

Open Forum and Adjournment : President Risley advised that there were no other committee reports and asked members for any old or new business. There being none, President Risley asked for a motion to adjourn.....so moved by John MacLean and seconded by Tony Costanzo, passed unanimously.