Monthly Notices
of the
Everglades
Astronomical Society
Naples, FL
April 1, 2025

Officers: **President:** Paul Leopold **Treasurer**: Kathy James
Home Page: https://evergladesastronomicalsociety.org/Home.php

President's Message

Greetings EAS Members,

I've just returned from Belize where I explored the inner space on Turneffe Atoll. This is literally another world where you can fly like a bird - amazing! I noticed that many of you enjoyed a clear night at Big Cypress the weekend of March 29th. My imaging efforts were underwater rather than the night sky.

Our April meeting will feature a talk from Trevor Braun, who is the President of the Cuyahoga Astronomical Association. His presentation will cover everything you want to know about eyepieces. It is one of the best I have ever heard on the subject and I'm sure you will find it very informative. We will be tallying the votes for the Board of Directors, which will consist of five (5) active members of EAS. I will make a spreadsheet of the results and submit them to you for review and approval.

It is getting late in the observing season and April brings views of Omega Centauri and Centaurus-A radio galaxy. These two objects are considered showpieces of our spring skies and I look forward to viewing them every year. The Coma-Virgo realm of galaxies rises in the east providing scores of targets for our viewing an imaging. Hopefully the rainy seasons sticks to schedule so we can enjoy viewing these beautiful objects.

Best regards,
Paul Leopold

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UPCOMING EAS MEETINGS

Our monthly meetings are the 2nd Tuesday of each month and usually start at 7pm.

April 8, 2025: Time 7:00 – 8:00 pm
North Collier Government Center
2335 Orange Blossom Dr., Naples, FL
Guest Speaker: Travor Braun will talk on eyepieces

Reminder: Please cast your votes electronically and mail to Paul Leopold at paul@theleopolds.net before the April meeting, or make sure to attend the April meeting in person so we can complete voting for our Board.

May 13, 2025: Time 7:00 – 8:00 pm
North Collier Government Center
2335 Orange Blossom Dr., Naples, FL

****All meetings are accessible via ZOOM:
Meeting ID: 349 568 7507
Passcode: telescope

Please do NOT share this info with non-club members.

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OUTREACH & MEMBER VIEWING

We do not have any sungazing/stargazing outreach dates with the public scheduled until the autumn. However, please monitor the GroupMe app for

member trips out to Big Cypress or for last minute outreach requests that might arise this spring.

A Note from Your Editor

To our friends packing up and heading north: please remember to keep us informed about your astronomy adventures and travels, and continue to share your astrophotography images for our monthly newsletter. As a year-rounder here in Florida, I can attest that we live vicariously through our fellow members' astronomical experiences in cooler, clearer latitudes during the summer and early autumn. Email me at RJSherman@hotmail.com.

Surviving in Space and Little Known Facts
By Rich Sherman

On March 18, 2025, the two astronauts who were "stuck" in space returned home.

On June 5, 2024, NASA Astronauts Suni Williams and Butch Wilmore boarded a Boeing Starliner spacecraft on an eight-day test mission to the International Space Station (ISS). However, after a series of technical issues arose, the Starliner was deemed unfit for human flight and returned to Earth without the American astronauts. Eight days turned into 286 days. Finally, the two astronauts, along with NASA Astronaut Nick Hague and Russian cosmonaut Aleksandr Gorbunov who flew to the ISS aboard a SpaceX's "Dragon" capsule to recover the crew, touched down 50 miles off the coast of Tallahassee, Florida last month.

This event got me wondering: what is the longest number of consecutive days a human has been in space. The answer is 437, and that record is held by Russian Cosmonaut Valeri Polyakov. He was onboard Russia's Mir space station for nearly 14 months between 1994 and 1995. He currently ranks eighth in total (not consecutive) days spent in space.

Frank Rubio holds the American record for the most consecutive days in space at 371. He became the first American to spend more than one year in space and returned in September, 2023. Like Williams and Wilmore, Rubio was "stuck" in space due to coolant leaks in a Soyuz spacecraft.

Most days spent in space as of 3/19/25

Oleg Kononenko	1,111
*Gannadi Padalka	878
*Yuri Malenchenko	827
*Sergei Krikalyov	803
*Aleksandr Kaleri	769
*Sergei Avdeyev	747
*Anton Shkaplerov	709
*Valeri Polyakov	678
*Peggy Whitson	675
*Fyodor Yurchikhin	672
*Anatoli Soloviyov	650
Sunita Williams	608
Sergei Prokopyev	567
Oleg Artemyev	560
*Viktor Afanasiyev	555

** retired;* (source: Reuters)

Of course, the furthest a human being has ever been from Earth was during the beleaguered Apollo 13 mission in 1970. NASA astronauts James Lovell, Fred Haise, and John Swigert passed over the poorly-named "dark" side of the Moon, and reached 248,655 miles from Mother Earth.

The longest *unmanned* space missions are the Voyager spacecrafts. I did not know, however, that Voyager 2 launched first, on August 20, 1977. Voyager 1 then launched on September 5, 1977. That said, Voyager 1 is much further from Earth than Voyager 2 (around 15.4 billion miles from Earth versus approximately 12.9 billion for Voyager 2) due to different flight paths and missions assigned to these two extraordinary spacecraft.

As luck would have it, SpaceX announced in mid-March that it will launch a mission to Mars in 2026 and an interesting BBC article came out around the same time. Of note, the BBC article estimates that it would take a human being about 1,100 days (that's more than three years) to travel *each way* to Mars. To travel one way to Mars would equate to roughly the same number of total days that record-holder Oleg Kononenko has spent in space. It is important to note that Kononenko's total was accumulated over five (5) missions to the ISS over 15 years.

Here are some interesting factoids about health-impacts of spaceflight from the BBC article:

- We know that muscles atrophy without the pull of gravity, but I learned that after "just two weeks, muscle mass can fall by as much as 20% and in longer mission of three-to-six months it can fall by 30%."
- Astronauts can lose 1% to 2% of bone mass per month while in space, and "up to 10% over a six-month period (on Earth, older men and women lose bone mass at a rate of 0.5%-1% every year)."
- In microgravity, blood flow is also affected, and can accumulate in the head. "Some of this fluid can pool at the back of the eye and around the optic nerve, leading to oedema. This can lead to changes in vision such as decreased sharpness and structural changes in the eye itself. These changes can start to occur after just two weeks in space but as that time goes on, the risk increases. Some of the vision changes reverse within about a year of astronauts returning to Earth, but others can be permanent."

As we all know, distances in space are vast compared to life on our home planet. And a spacecraft that would fly to Mars would be tiny even compared to the small International Space Station which measures 356 by 224 feet. For me, the BBC article is a strong reminder of the serious—perhaps even insurmountable—biological and psychological challenges of human space travel anywhere beyond the moon.

If you would like to read the BBC article, here is the link:
https://www.bbc.com/future/article/20230927-what-a-long-term-mission-in-space-does-to-the-human-body

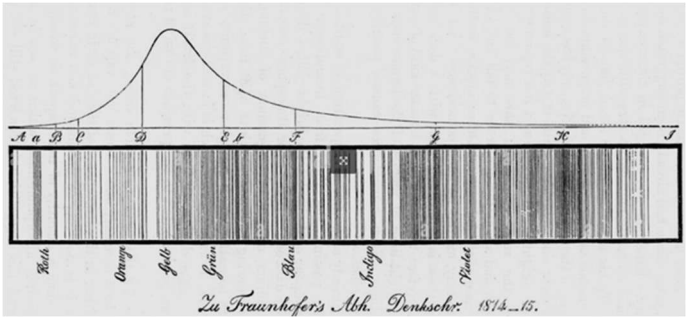
Solar Spectroscope
By Bart Thomas

I have always been interested in seeing Fraunhofer lines. It is very easy to see emission spectra using gas discharge tubes in the classroom. The bright lines, unique to each element, are clearly seen on a dark background using a simple spectroscope (diffraction grating).

The history of the solar spectrum began when dark lines were first seen in the spectrum of the sun in 1802 by William Hyde Wollaston of England. He reported a division of the visual spectrum into four parts.

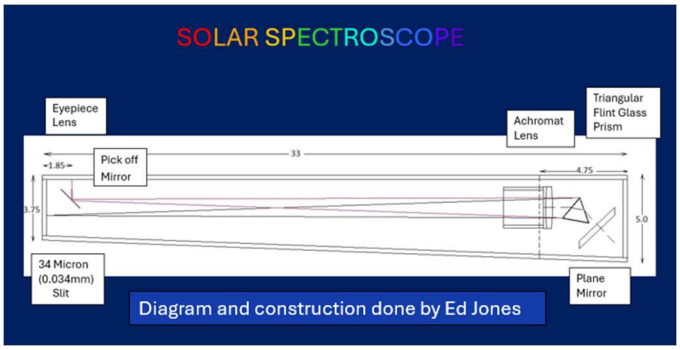
In 1814, Joseph Fraunhofer, a glass maker that invented measuring instruments, discovered 574 dark lines in the spectrum of the sun using his spectroscope (Golub and Pasachoff, The Sun, p. 74-76).

Fraunhofer's original solar spectrum diagram published in 1817:



"Spectroscopy, starting with Wollaston's and Fraunhofer's work has transformed the astronomy of previous millennia into the astrophysics of the twentieth and twenty-first centuries"
--Golub and Pasachoff, The Sun, p. 77

I can now show students the dark solar absorption lines in the spectra of the sun. I have a solar spectroscope made from Baltic birch wood. It is 33 inches long. It has a 34 micron slit that is fixed and the opening not adjustable. The light from the sun goes through the slit and travels down to the achromat lens toward the opposite end of the spectroscope. The sunlight then refracts through the prism and bounces off the movable plane mirror. The light comes back through the prism, achromat lens and travels to the front pick off mirror. The 25 mm FL eyepiece at the top of the spectroscope is used to see a portion of the solar spectra. A knob on the back of the spectroscope is used to move the plane mirror to see absorption lines in different colors of the solar spectrum (ROYGBIV).

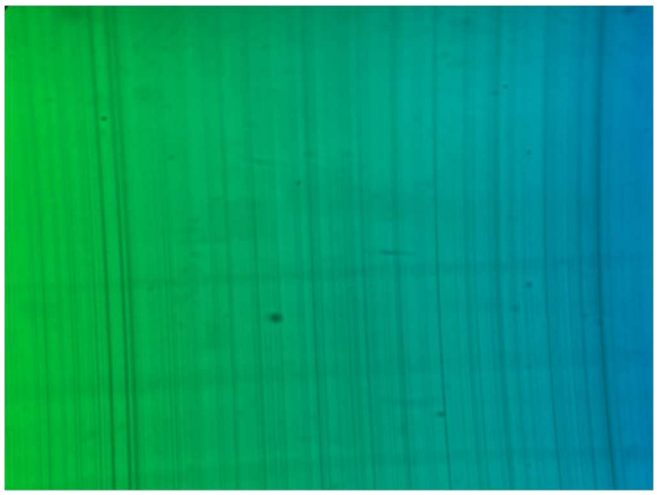


I had shined a green laser light down the spectroscope opening to adjust the plane mirror. You can see the optical components clearly. There is a small removable panel in the back of the spectroscope. I adjust the plane mirror, before starting to observe, to be sure I can see the solar spectrum.

The plane mirror is moved with the black knob in the back of the spectroscope.

You will only see a small section (color) of the solar absorption spectra in the eyepiece. The knob will move the plane mirror so to shift the spectrum to another color(s).

I am very excited to show students these Fraunhofer lines. I am very thankful to Ed Jones who agreed to make my spectroscope. There is a lot to discuss with students regarding these lines.



This is a photo of the blue/green absorption lines of the sun seen through my spectroscope. The actual view of the spectra is much brighter than the photo. An iPhone was used to take the photo through the eyepiece. The three prominent lines in the green are from **Mg** absorption in the solar chromosphere at 516.7, 517.3, and 518.4 nm. The single dark line in the blue comes from the element $\mathbf{H_\beta}$ at 486.1 nm. All the lines seen in the spectra are from different elements present in the outer atmosphere of the sun. However, there are some dark lines that are produced from the gases in earth's atmosphere (ex: oxygen).

Dark Skies Update
By Rich Sherman

We had a great presentation at our February 2025 meeting by Dr. Mario Motta, a light pollution expert and former member of the Board at Dark Sky International. As we start April, it is a good time to remind everyone that International Dark Sky Week is April 21st to April 28th. For more information and resources on how to educate your community and for details about Dark Sky Week visit: https://idsw.darksky.org/. There are kits available with a click of a button for Outreach programs like ours. I also wanted to tip the hat to long-time EAS member Bob Gurnitz who has been instrumental in getting his HOA to adopt sensible and safe lighting standards.

Sadly, on March 25th, alarming news arrived from Chile where many of the world's best terrestrial research telescopes are located. A new industrial "mega-project" is being planned for construction just "5-11 kilometers" from the Very Large Telescope (VLT) at Cerro Paranal. While we shake our heads, Dark Sky International is actively fighting the project. You can read more about this distressing development and watch a short video here: https://darksky.org/news/dark-skies-vital-for-astronomy-in-northern-chile-now-at-risk/.

In closing, I want to share that Dark Sky International also has cool sweatshirts, hats, and T-shirts on their website. The gear is inexpensive and it is an easy and fun way to get the message out about light pollution and the important work that Dark Sky International is doing. I can vouch for the quality of the sweatshirts since I have two of them, and bought two as Christmas gifts for family in 2024. They cost less than $47 each. Here is the link to their online store: https://www.bonfire.com/org/the-international-dark-sky-association-inc-742493011/

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ASTRO NEWS & NOTES

- NEAF, the Northeast Astronomy Forum 4/5/2025 to 4/6/2025 at Suffern, NY, more details at https://neafexpo.com.
- International Dark Sky Week 4/21/2025 to 4/28/2025, more info at https://idsw.darksky.org
- Texas Star Party (90 mins. SW of Dallas): 4/20/2025 to 4/27/2025, more info at https://texasstarparty.org/
- Cherry Springs Star party at Cherry Strings State Park, PA from 6/19/2025 to 6/25/2025. Details at https://sites.google.com/astrohbg.org/Cherry-Springs-Star-Party
- Grand Canyon Star Party (Grand Canyon N.P.): 6/21/2025 to 6/28/2025, more info at https://www.nps.gov/grca/planyourvisit/grand-canyon-star-party.htm
- Oregon Star Party, Indian Trail Springs OR from 6/24/2025 to 6/29/2025. More details at https://oregonstarparty.com.
- ASTROCON and Bryce Canyon Astro Festival at Bryce Canyon National Park (UT), from 6/25/2025 to 6/28/2025, more info at www.Astrocon2025.org
- Green Bank Star Quest (West VA), from 6/25/2025 to 6/28/2025. More info at https://greenbankstarquest.org/
- Adirondack Astronomy Retreat (Wadhams, New York), from 7/20/25 to 7/27/25, more details at https://adirondackastronomyretreat.squarespace.com/
- Stellafane Convention (Vermont), from 7/24/25 to 7/27/25. For more information visit https://stellafane.org/convention/
- Almost Heaven Star Party (Circleville, WV), exact dates TBD but usually last week in August. To learn more, visit https://www.ahsp.org/

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ARTICLES OF INTEREST

Could a star-bathing retreat help calm your frazzled mind?
https://www.bbc.com/travel/article/20250324-star-bathing-the-next-big-thing-in-travel

A neutrino telescope spots the signs of something cataclysmic:
https://www.economist.com/science-and-technology/2025/02/12/a-neutrino-telescope-spots-the-signs-of-something-cataclysmic
Note: This is article was published by The Economist. As a subscriber I can gift the article to you if you want to read it in its entirety, just email me at RJSherman@hotmail.com

SpaceX rocket explodes shortly after lift-off in Texas:
https://www.bbc.com/news/videos/c5yxk9yvyvko

SpaceX debris grounds flights at South Florida airports:
https://www.cbsnews.com/miami/news/spacex-debris-grounds-flights-at-south-florida-airports/

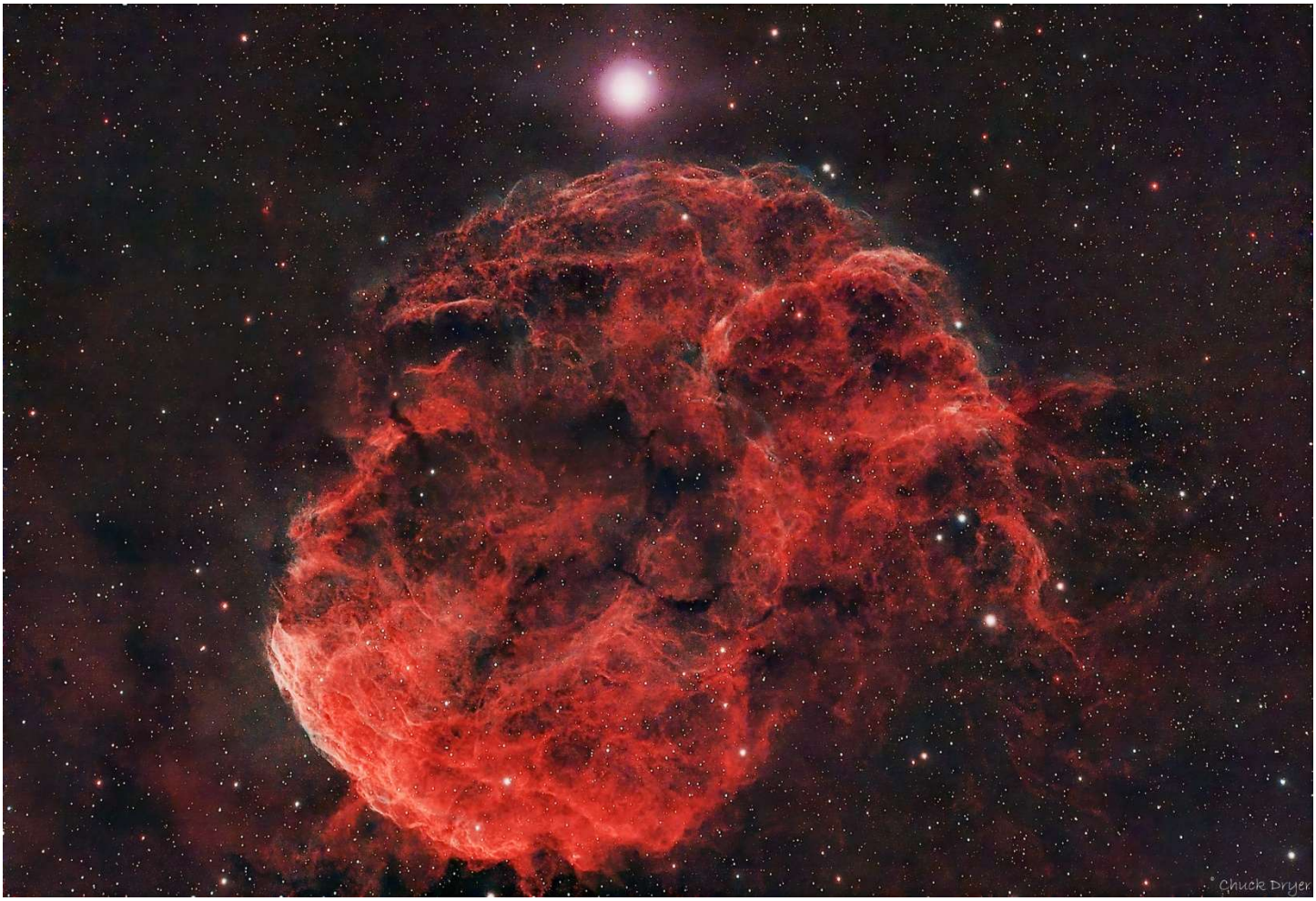
The Bizarre Quantum Paradox of Negative Time:
https://www.bbc.com/future/article/20250306-the-bizarre-quantum-paradox-of-negative-time

ASTRO IMAGES FROM EAS MEMBERS:

For inclusion in future newsletters, please send your images to Rich at RJSherman@hotmail.com. Please include at a minimum:

- the name and/or catalog number of the object (e.g., “M33” or “Triangulum Galaxy”)
- the location where you took the image
- the date of the image
- the telescope you used to take the image

Additional information such as the camera, the number of frames, the filter you used, the number of exposures, and the length of each exposure are also very welcome.

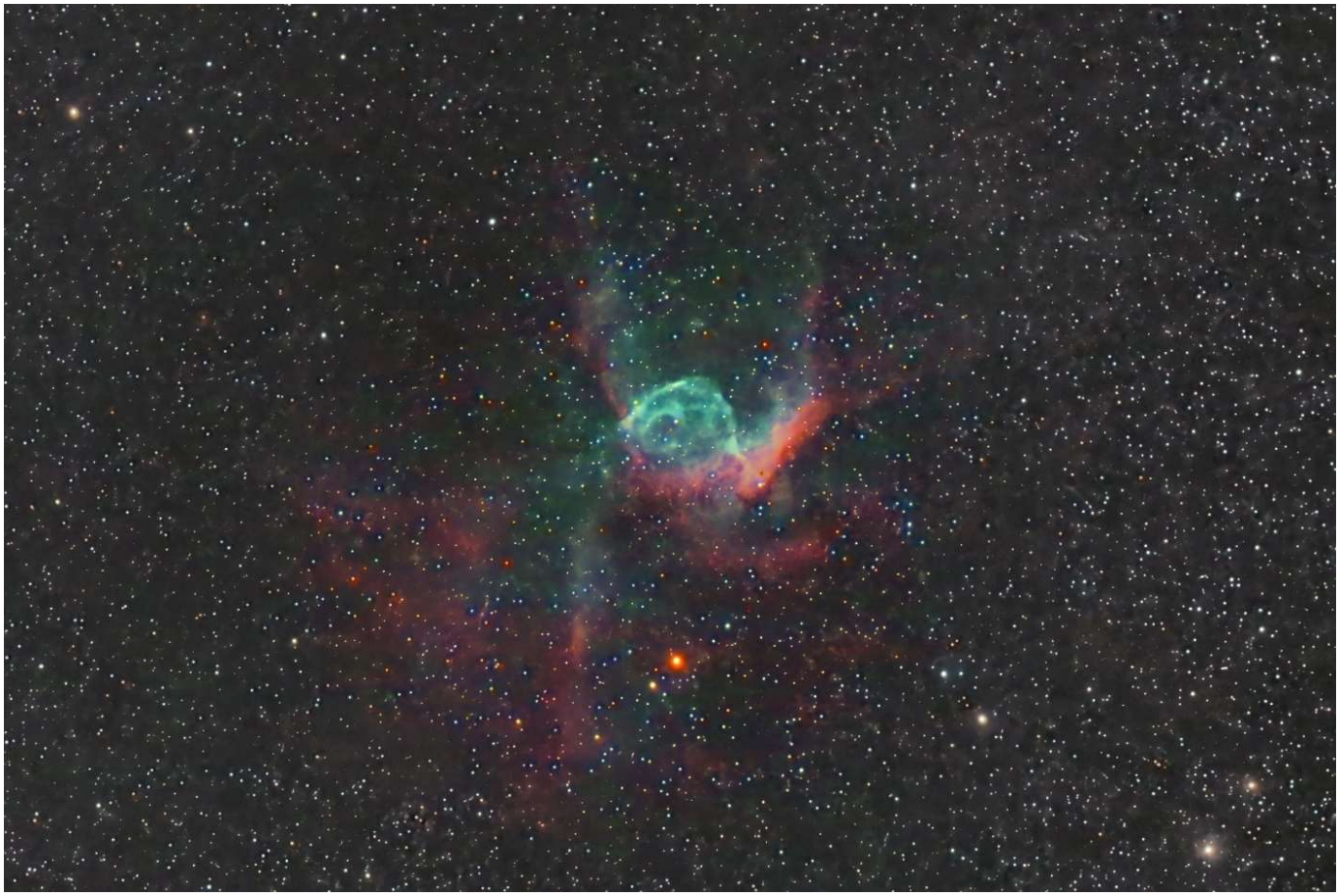


IC443, the Jellyfish Nebula, by Chuck Dryer
Big Cypress, FL, 3/19/2025
Astronomics AT115 refractor with ZWO ASI294MC and Optolong L-Ultimate filter
Astro Seti Statistical Stretch, Siril, Photoshop AstroPanel, APF-R and Topaz Denoise

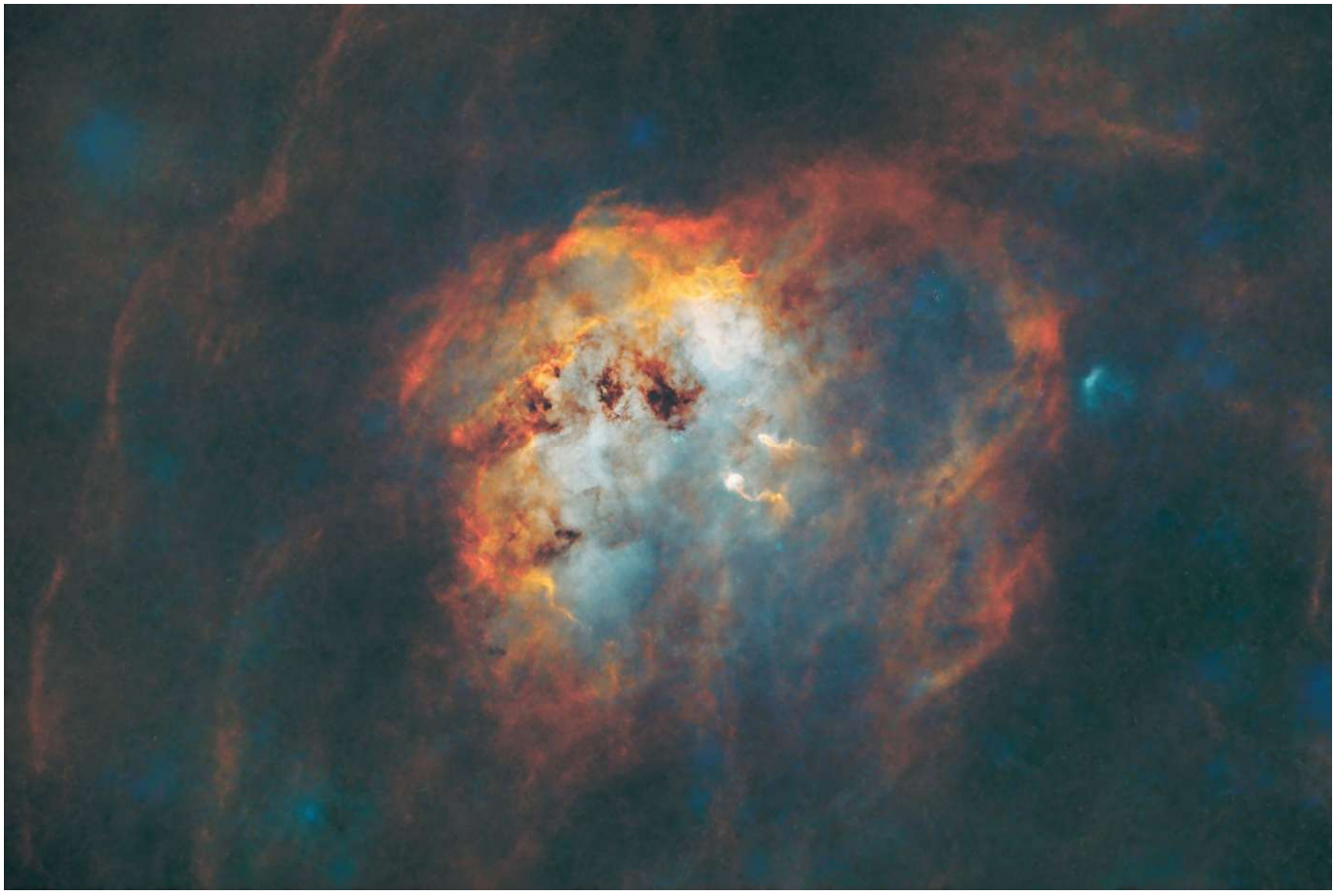
Lunar Eclipse, by Chuck Dryer
Near Marco Island, FL, 3/14/2025
Canon R7 camera at 500mm, f/8 for 2 seconds at ISO 800
Stacked best 60 of 200 shots
PIPP, AutoStakkert, and Photoshop

M78, by Victor Farris
Murfreesboro, TN, 2/22/2025
SkyWatcher Esprit 100ED and ZWO ASI2600MM camera
Filter: Antlia Red, Green, Blue
120 x 30 second frames of each color (total integration: 3.0 hours)
PixInsight

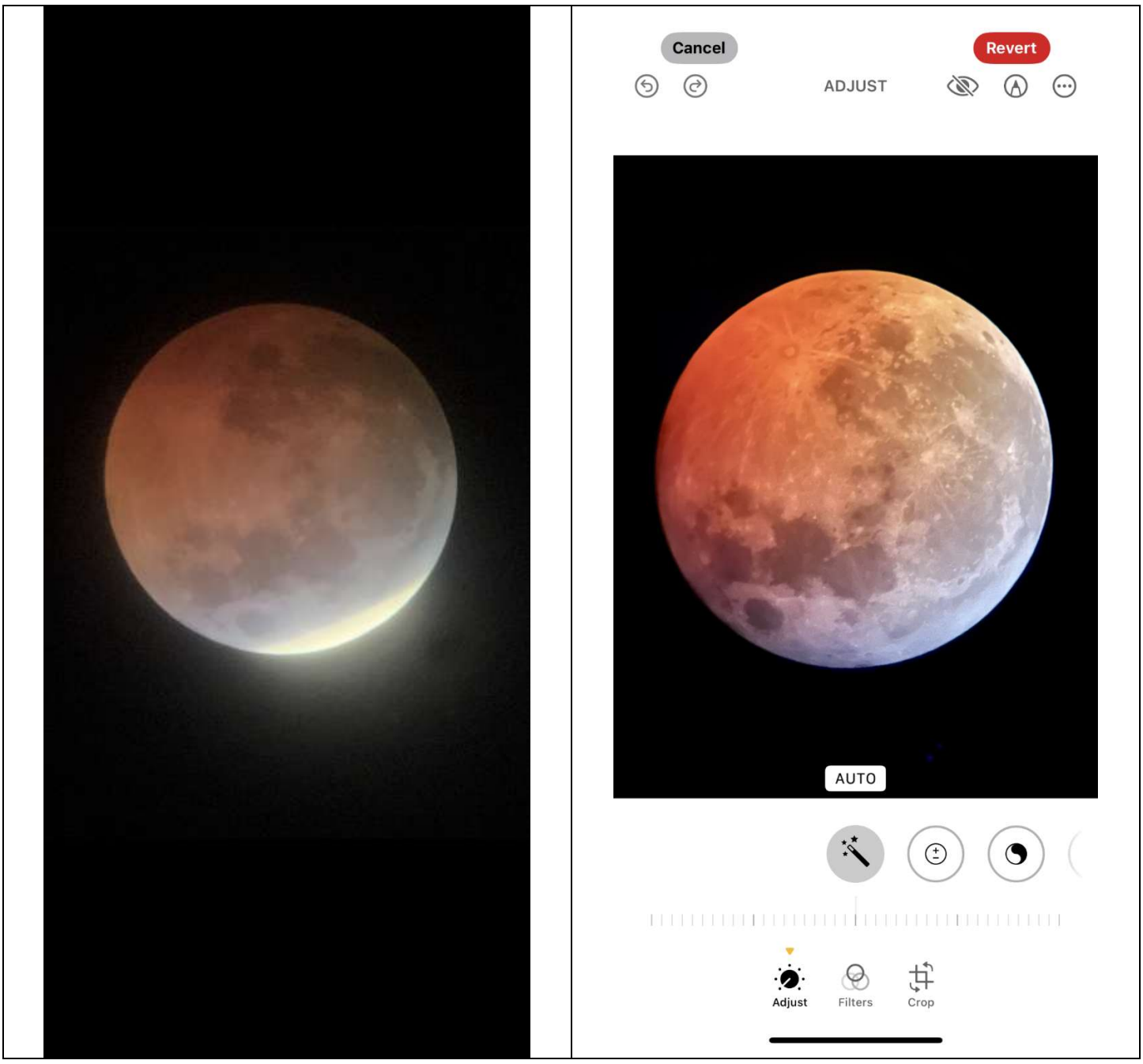
Lunar Eclipse, by Monica Starks
Bonita Springs, FL, 3/14/2025
Seestar S50



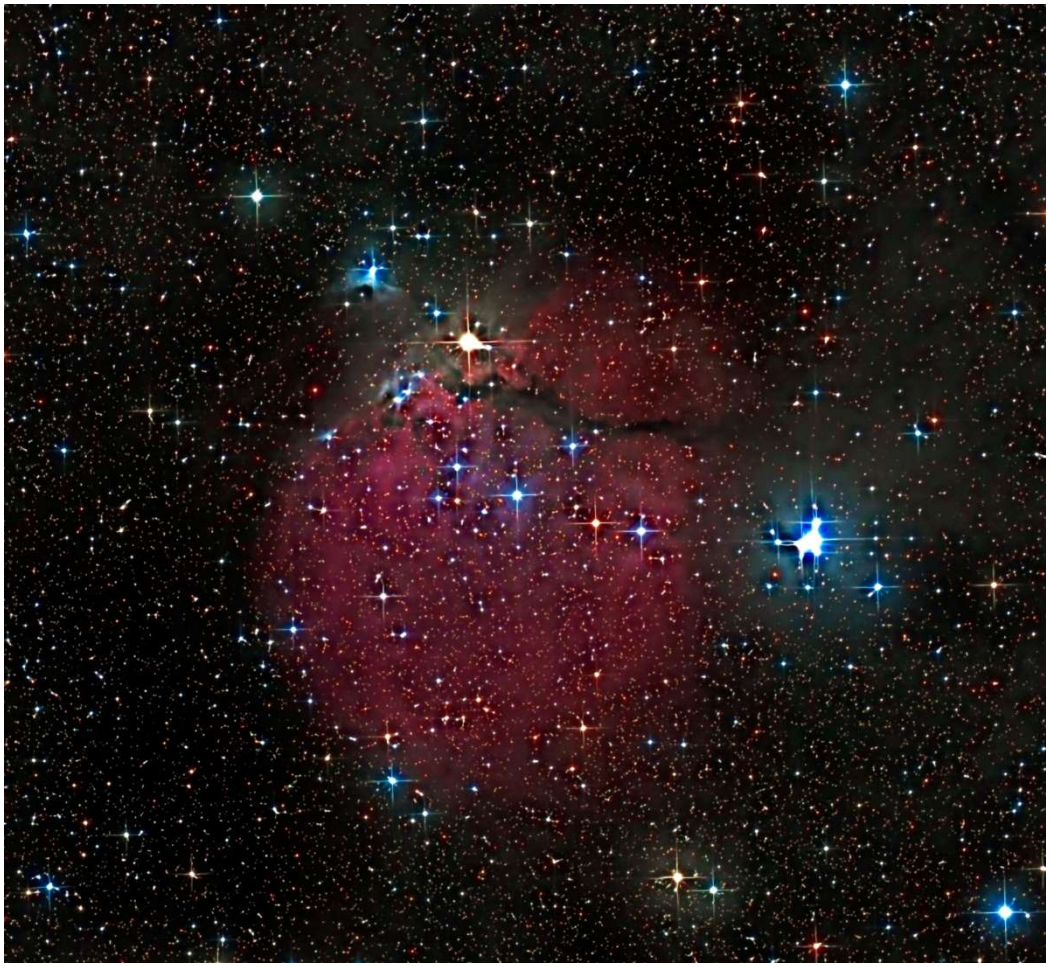
NGC 2359, Thor's Helmet (Wolf Rayet star), by Armando Merlo
Celestron 11HD telescope with 0.7 reducer and ASI2600MC camera
100 exposures at 60 seconds each



IC410, the Tadpole Nebula, by Armando Merlo
Celestron 11HD telescope with Hyperstar and ASI2600MC camera
65 exposures at 120 seconds each



Lunar Images, by Bart Thomas
12.5” Dobsonian with an iPhone 14 Plus through the eyepiece



SH2-306, by Ted Wolfe
Atacama Desert, northern Chile
12.5" PlaneWave astrograph and ZWO ASI 6200 mono camera
7 hour LRGB image

M81 and M82, by Chuck Pavlick
Cape Coral, FL
Takahashi FSQ 106 telescope and ASI533MC and ASI1600 mono cameras
1.7 hours with the ASI1600 with Ha filter plus 7 hours with the ASI 533

Lunar Eclipse, by Bob Gurnitz
Marco Island, FL, 3/14/2025
Seestar S50

Leo Triplet, by Robyn Pritchard
Big Cypress, FL, 3/27/2025
Seestar S50 in Mosaic Mode

Orion Nebula and Running Man Nebula, by Robyn Pritchard
Big Cypress, FL, 3/19/2025
Seestar S50 in Mosaic Mode