

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



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

President's Message

Greetings EAS Members,

May is upon us and our observing season will soon give way to summer clouds and rain. It has been very dry and we need rain badly. A group of us were out at Big Cypress on Saturday April 19th. The transparency was pretty good and its galaxy season. We observed the usual suspects in Ursa Major as well as many galaxies in Virgo. As the evening drew on, I observed Omega Century which is an impressive sight in my 8" RFT reflector. We also viewed Centaurus A Galaxy which is just above Omega Centauri. These objects never fail to impress. The unusually dry weather continues to extend our observing season and with little standing water, the mosquitos have not been a real problem. I encourage you to visit Big Cypress before the rain and the bugs arrive in mid-May.

We have a new board of directors consisting of myself, Mike Usher, Rich Sherman, Kathy James and Denise Sabatini. I'm looking to have a board meeting by the end of May.

Our speaker for May is Chuck Dryer who will give us a presentation on astro-imaging. It should be entertaining. We are also looking to moving our meeting night to Wednesday evening by this fall. Chris Pritchard is contacting the county to request the change. The venue will remain the same.

Best regards, Paul Leopold * * *

UPCOMING EAS MEETINGS

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

May 13, 2025: Time 7:00 – 8:00 pm North Collier Government Center

2335 Orange Blossom Dr., Naples, FL

<u>**Guest Speaker</u>**: EAS member Chuck Dryer will talk on Astrophotography technology and techniques.</u>

We will discuss the schedule for summer and a possible change in date/time for our monthly meeting at May's meeting.

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

<u>Please do NOT share this info with non-club</u> 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 new developments, including impromptu viewing nights at Big Cypress.

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Seestar Adds Equatorial Mode By Rich Sherman

ZWO continues to add new features and capabilities to its Seestar line of smart telescopes. Recently, the company announced Seestars can now be run in Equatorial mode using a wedge. Thanks to EAS member Bob Gurnitz for sharing some screenshots and images.



Photo by Bob Gurnitz

Some things to note:

ZWO does not sell an equatorial wedge. However, there are numerous options from vendors including iOptron, William Optics and Sky-Watcher. Wedges can also be custom built at home using a 3D printer. There have been a number of problems reported online by owners trying to get the Seestar base to sit unencumbered on commercial equatorial wedges without bumping into adjustment knobs. The fixes include lengthening the adjustment bolts using Apertura and/or the leveler (https://www.highpointscientific.com/apertu

<u>ra-easy-leveler-for-seestar-telescopes</u>) that many members already have.

- Below is Bob's screenshot of the Equatorial mode setup in the Seestar app. Before you get started, it is important to mount your Seestar so that the lights are pointing upwards towards the sky and the head of the telescope is pointing as close as possible to due north. Then to reach the screen you see in Bob's screenshot, you need to boot up your Seestar, and then open the Seestar app. Once in the app, open the telescope's arm, and then go to "Advanced Feature." Next find "Mount Mode" and select "EQ Mode." From there, you just follow the directions to manually adjust the wedge's knobs to your current latitude (26° North for Naples, FL). Once the app confirms you have that correct, click on "Switch" in the top right section of the Seestar app, and then touch "OK" to send the telescope back to its "home position." Now click "Get Polar Alignment Deviation" at the bottom of the screen and wait as the telescope goes through a routine and takes a few photos of the sky. You will then get further direction on the app's screen which will tell you how to manually adjust your wedge's knobs to get proper polar alignment. While making those adjustments, watch your screen as the app dynamically updates your corrections to the wedge's alignment. When the numbers turn green, you are off to the races.
- If you're planning to use a Seestar at latitudes at 20° North or below then you may incur a problem with balance. The equatorial wedge's tilt can shift the telescope's center of gravity, causing a variety of potential problems, most notably, the rig tipping over. Some adjustable and riser-type adapters are now available but you should read the material carefully before selecting a wedge, especially if you plan to take your Seestar on a trip down to the Caribbean or points south.



Screenshot courtesy of Bob Gurnitz

• Lastly, Seestar will soon support exposures times longer than the current maximum of 30 seconds. Of course, the Seestar's "polar" alignment routine is not as rigorous as your German equatorial mounts (GEMs) or harmonic drives, so this might affect tracking. Nonetheless, 60 seconds or potentially longer exposures are expected soon.



Monkey Head Nebula by Bob Gurnitz 99 frames at 30 seconds Seestar S50 in Equatorial mode

EAS Website Adds Member Images By Rich Sherman

In past meetings, we have discussed some of the challenges with our existing hosting platform for the EAS website. We are fortunate to have many excellent astrophotographers in the club and it is certainly true that imagery is important to attracting new members and to keep the public informed of what we do at the EAS.

In that vein, let's all thank Dave Higgins for adding recent EAS member images to our website. Admittedly, my process for sharing photos with Dave was organic. While there have been many, many exceptional images shared with me in the last six months, I am unable to keep all the emails due to storage limitations on my email account. And so this time around, I shared several great-but-also-easilyaccessible images with Dave. I plan to continue sharing future photos with Dave so we should have new images regularly on the website.

You can see EAS member photos at: <u>https://evergladesastronomicalsociety.org/Photogall</u> ery.php.

Howling Coyote Remote Observatory By Emilio Robau

I took a trip to Santa Fe, NM a couple of weeks ago and visited Howling Coyote Remote Observatories (HRCO) from April 1st through April 8th to do some recon on a remote observatory location. I settled upon HCRO. I also visited Deep Sky West (Rowe, NM). I am excited to place some equipment out west to pursue remote imaging and give up imaging in Florida except for maybe the finest days in the winter for objects a bit further south. It was an interesting trip and a great location.

If anyone has interest in my venture which includes me and my partner deploying a 16" RCOS (Ritchey-Chrétien telescope) matched up with an Astro-Physics (AP) 110 refractor on an Astro-Physics 1600 mount with all the cameras and filters they should reach out to me. We may have room for one more participant although the equipment is pretty much selected. We also have access to an AP 155, AP130, AP92 as well as the stated AP110. Attached are some images including a shot of the observatory at HRCO.





Planets Hot and Cold By Rich Sherman

By April 2024, NASA reported that it had already identified more than 5,800 exoplanets. Among the growing list of other worlds (you can read a bit about each one on NASA's website at: https://science.nasa.gov/exoplanets/exoplanetcatalog/), there are only about 50 or so that the Kepler Space Telescope has deemed to be in the "habitable zone." Planets in the habitable zone have certain characteristics (e.g., distance from their host star, atmospheric composition, etc.) that correspond to temperatures ranging between 32°F to 122° F (0°C to 50°C) thus allowing for liquid water to potentially exist.

Life, of course, is different than intelligent life. And when looking for intelligent life, it doesn't take long before you realize how important our Moon is in protecting Earth so intelligent life had time to evolve. Among its critically important functions, the Moon causes tides in Earth's molten iron core which creates a magnetic field around our planet that protects us from otherwise life-destroying solar radiation. It also keeps our planet on a stable axis, preventing Earth from tipping over—perhaps by much as 90 degrees. This would destroy the polar caps and result in a much warmer planet.

There has been a lot of recent talk about "hot Jupiters" and large "mini-Neptunes" and I got to thinking about planetary temperature variations. So I started digging around and here are some things that I learned.

Within our solar systems, there is great temperature variability as shown in the table below. The first thing we notice is that Earth is the only planet in our solar system that currently falls into the "habitable" temperature range. Of note, the average can be misleading when there is broad temperature dispersion (wide ranges). While Earth's average sits at a comfortable 59°F, the coldest temperate recorded on Earth was -129°F which was, unsurprisingly, in Antarctica (source: Guinness World Records). And the hottest temperature was 134°F, which was recorded at Big Cypress last Saturday. No, I am joking. It was recorded in Death Valley, CA in 1913 (source: National Park Service).

Planet	Avg. Temp	AU*
Mercury	333°F (167°C)	0.4
Venus	867°F (464°C)	0.7
Earth	59°F (15°C)	1.0
Mars	-85°F (-65°C)	1.5
Jupiter	-166°F (-110°C)	5.2
Saturn	-220°F (-140°C)	9.6
Uranus	-320°F (-195°C)	19.2
Neptune	-330°F (-200°C)	30.0
Dwarf Planet	-375°F (-225°C)	39.5**
Pluto		

*AU, or astronomical unit, is defined as the distance from the Sun to the Earth, which equals 1.0 AU or 93 million miles.

**Pluto's distance from the sun ranges from 29.7AU to 49.3AU, the figure listed above is its average distance from the Sun

Lots of recent space exploration missions have been focused on Mars. The "Red Planet" is sometimes the closest planet to Earth (Venus actually gets closer), and it has temperatures most similar to ours as you can see from the table. And while we look diligently for signs of any life on Mars, the planet was unlikely warm and wet enough for the amount of time needed for intelligent life to develop. Today, Mars has an average surface temperature of -85°F, but NASA reports that the surface temperature can range from the 70s°F (yes, that's warm enough for mosquitoes!) to -225°F.

One of the surprising revelations from the table is that Venus is much hotter than Mercury even though Mercury is the closest planet to the Sun. So proximity to the Sun is the not the only factor in determining the temperature. Other important determinants include:

Atmosphere: The thickness and molecular composition of the planet's atmosphere greatly impacts its temperature. Of note, the hottest planet in our solar system is Venus which has a dense carbon dioxide-intensive atmosphere that cooks the surface and reveals the powerful impact of the greenhouse effect. Venus' average temperature (867°F) is more than 2.5 times higher than Mercury (333°F), which is much closer to the Sun. I should also mention that our beloved Moon has a razor-thin atmosphere. For

many decades, scientists did not think the Moon had an atmosphere and even today, no one really understands how it came to exist. Nonetheless, the Moon's atmosphere (known as an "exosphere") is comprised of helium, argon, neon, ammonia, methane and carbon dioxide. Remarkably, the exosphere also has sodium and potassium, which is not found in the atmospheres of Earth, Venus, or Mars. With its negligible atmosphere, the Moon has wide temperature variations, with recorded temperatures of 260°F (127°C) in direct sunlight to a low of -343°F (-173°C) during its night (source: Natural History Museum). It gets even colder in the deep craters that never see sunlight. NASA's Lunar Reconnaissance Orbiter measured temperatures below -410°F (-246°C) in some craters. These craters have received a lot of recent attention as they may contain frozen water that is billions of years old.

Albedo: The reflectivity of the planets is known as "Albedo." Venus has the highest Albedo of any planet in our solar system at 0.689. This seems a bit counter-intuitive, since a high Albedo would imply more of the Sun's heat is being reflected. However, the runaway greenhouse effect is the culprit for Venus' extreme heat. Gas-giant Jupiter, with an atmosphere of mostly Hydrogen (90%) and Helium (10%), is the second most reflective planet in our solar system with a score of 0.538. Of note, Jupiter's size along with its hydrogen and helium-rich atmosphere gives it the moniker as a "failed star." Jupiter's Albedo score means it has about the same reflectivity as concrete. Earth, with its Nitrogen (78%) and Oxygen (21%)-rich atmosphere, has an Albedo of 0.367.

<u>Gravity and Heat</u>: Uranus and Neptune have roughly the same color—suggesting similar atmospheres (although Neptune has a bit more methane)—and about the same reflectivity (Albedo of 0.3 and 0.29), but Uranus and Neptune have similar temperatures despite orbiting the Sun at vastly different distances. Neptune has a stronger internal heat source due to "gravitation contraction" of its dense core (the inward pull of strong gravity creates heat; this is the same force that eventually leads to nuclear fusion in stars). In addition, Uranus is tilted by about 90 degrees—appearing to lie on its side—which likely allowed more of its internal heat to escape. This harkens back to my earlier comment about the Moon protecting Earth from tipping over and losing its polar caps. The current consensus is that our Moon was formed from a collision with another body early in the formation of the solar system. A similar event is believed to have happened with Uranus, but rather than a large, protective Moon being kicked out into a planetary orbit, Uranus was knocked onto its side. As a result, Uranus and Neptune have similar mean temperatures despite Neptune being, on average, more than 10AU (so nearly a billion miles) further from the Sun.

When it comes to exoplanets, it isn't currently possible to get a direct measurement of surface temperatures. Scientists rely on various methods and models to estimate the planets' temperatures. Among those methods. NASA uses infrared (IR)spectroscopy to measure the amount of radiation a planet emits at each wavelength in the IR spectrum (780 to 1,000 nanometers). Fortunately, there is a direct relationship between these IR frequencies and temperature. Here is an interesting article about how the James Webb Space Telescope's "Mid-Infrared Instrument" (MIRI) measured the temperature (and composition) of a now well-known rocky exoplanet named "Trappist-1 b": https://esawebb.org/news/weic2309/.

In closing then, how hot are "hot Jupiters"? The cool ones can be around 1,300°F while the warmer ones are close to 5,000°F. They are, on average, much warmer than the mini-Neptunes that range from roughly 572°F to 3,100°F. Even rocky exoplanet Trappist-1 b (which lacks an atmosphere and orbits very close to its host star) is hot, with daytime temperatures around 450°F.

So, summer is coming soon to southwest Florida and it is going to get hot. But compared to these scorching exoplanets, it really ain't going to be that bad.



Source: NASA

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ASTRO NEWS & NOTES

- <u>On May 29th, a SpaceX "Falcon 9" rocket is</u> <u>scheduled to launch the 4th private astronaut</u> <u>mission to the International Space Station from</u> <u>the Kennedy Space Center (FL).</u>
- Cherry Springs Star party at Cherry Strings State Park, PA from 6/19/2025 to 6/25/2025. Details at <u>https://sites.google.com/astrohbg.org/Cherry-Springs-Star-Party</u>
- Grand Canyon Star Party (Grand Canyon N.P.): 6/21/2025 to 6/28/2025, more info at

https://www.nps.gov/grca/planyourvisit/grandcanyon-star-party.htm

- Oregon Star Party, Indian Trail Springs OR from 6/24/2025 to 6/29/2025. More details at <u>https://oregonstarparty.com</u>.
- 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 <u>https://adirondackastronomyretreat.squarespace.</u> <u>com/</u>
- Stellafane Convention (Vermont), from 7/24/25 to 7/27/25. For more information visit <u>https://stellafane.org/convention/</u>
- Almost Heaven Star Party (Circleville, WV), exact dates TBD but usually last week in August. To learn more, visit <u>https://www.ahsp.org/</u>

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ARTICLES OF INTEREST

Curiosity rover makes 'arguably the most exciting organic detection to date on Mars': <u>https://www.cnn.com/2025/03/29/science/mars-curiosity-large-organic-molecules/index.html</u>

New planet named Enaiposha is unlike anything in our solar system:

https://www.earth.com/news/new-planet-namedenaiposha-is-unlike-anything-in-our-solar-system/

Promising Hints of Life Found on Distant Planet K2-18b:

https://www.bbc.com/news/articles/c39jj9vkr340

ASTRO IMAGES FROM EAS MEMBERS:

For inclusion in future newsletters, please send your images to Rich at <u>RJSherman@hotmail.com</u>. 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 welcome.



Messier Objects Attribution (required): Michael A. Phillips I found this online and thought it was interesting. If you want the full-sized version, please me.



Jellyfish Nebula by Emilio Robau 12" GSO Ritchey-Chretien telescope



IC405 by Emilio Robau 12" GSO Ritchey-Chretien telescope



M44 the Beehive by Emilio Robau



Running Man Nebula by Emilio Robau



M46 by Emilio Robau



NGC3532 (upper left) and NGC3372 (Eta Carinae nebula) by Armando Merlo Florida Keys, FL Canon 6D Ha enhanced, Canon 300mm FD at f/2.8



Nebulae in Orion by Armando Merlo Big Cypress, FL, 3/30/2022 Canon Ra 300mm FD at F/2.8



Arcturus by Robyn Pritchard Seestar S50 Mosaic Mode



RCW32 in constellation Vela by Ted Wolfe Atacama Desert, Chile 12.5" telescope 7-hour exposure



Markarian's Chain by Bob Gurnitz Marco Island, FL, 4/18/2025 Seestar S 50 in Mosaic mode Stacked 206 x 10 second exposures with IRCUT filter



M99 by Bob Gurnitz Seestar S50 in Equatorial Mode 423 x 10 second exposures

M105 by Bob Gurnitz Marco Island, FL, 4/21/2025 Seestar S50 10 second exposures with IRCUT filter

Galaxies in Virgo by Chuck Dryer Midland, MI, 4/16/25 William Optics ZS61 telescope with ASI 294MC Pro camera iOptron CEM40 with ASIAIR Approximately 160 guided 60 second exposures Processed in Siril, SetiAstro Stretch, Photoshop

Rocket, Moon and Venus by Bart Thomas Naples, FL, 4-24-25