



PAStimes

A Publication of the Phoenix Astronomical Society

Stu's Views

Stu Brackney, President

Phoenix Astronomical Society

Well, my friends, it looks like we are making progress with our star parties at Apache Wash. The turnout of people and telescopes on May 18th was over 40 people, with some 13 telescopes of all sizes and shapes (pictures are in this issue).

A few reminders about our summer star parties: when you register, keep in mind it is warm out there, so bring yourself some liquids and of course a few munchies. We always encourage you to bring family and friends, but as always PLEASE register so we may alert you to cancellations due to weather restrictions.



Summer Months Activities (June, July & August)

No classroom lectures during the summer months! YOUR ideas matter. Who do you want to hear from in our lecture series? Let us know by contacting: vicepresident@pasaz.org. Our vice President Mark Johnston is working hard to find speakers that meet your interests. Let him know.

JUNE 8th: a DARK SKY Star Party. Check it out on our website: www.pasaz.org

Our Telescope Loaner Program is still active (for members only). So, if you want to borrow one, for an entire month, contact: telescope@pasaz.org. We also have some amazing eyepieces to lend out as well.

Apologies: Our website had some glitches after the May star party, so New Member Applications could not be processed. Looks like that has been resolved, thanks to Pete Turner, our Webmaster.

My broken record is playing again... we are still in need of an Event Manager, someone who can help schedule various PAS events. Contact me: president@pasaz.org if you want to lend a hand.

Clear Skies everyone...Stu



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June Upcoming Events

June 2024 starts our summer schedule of events, which includes an online-only lecture and the first dark site star party where we travel a little farther North to avoid the summer temperatures.



June 8th – Dark Site Star Party

For more information and to register for these events, go to the [PAS Event Calendar and Registration Site](#). It is important to register for all events. In case of an event change or cancellation, you will be notified via email.

June Lecture Series-Cancelled

May Lecture Series-Awards

Thank you, Paul Facuna and Richard Sauerbun! Your passion for our mission is evident in everything you do, and your positive impact resonates throughout the organization. Your willingness to go above and beyond is a testament to your dedication and integrity.

Paul Facuna:

Outstanding contributions and service as our Vice President.



Richard Sauerbun:

Taking PAS above and beyond



May 2024 Lecture - Mr. Richard Sauerbun "The Recent Renaissance in Astronomy Equipment"

By Richard Meyers



The May 2, 2024, speaker was Richard Sauerbun. The title of his presentation was: **"The Recent Renaissance in Astronomy Equipment"**

Richard Sauerbun's lecture provides a comprehensive exploration of the recent advancements in astronomy equipment, emphasizing their impact on amateur astronomy. He delves into the historical progression of tools used in astronomy, tracing the evolution from early observational methods to modern imaging technology.

Drawing from his personal experiences, Richard discusses his journey as an amateur astronomer, detailing his transition from owning basic telescopes to investing in more advanced equipment. His acquisition of a Celestron 8" Schmidt-Cassegrain telescope marks a significant turning point, as it allows him to delve deeper into celestial observations. Attending telescope workshops provided by the Phoenix Astronomical Society enables him to master the setup and operation of his new telescope effectively.

Richard's exploration extends beyond visual observation, as he embraces Electronically Assisted Astronomy (EAA) by integrating quality telescopes with specialized astronomy cameras. This approach opens up new vistas of the cosmos, allowing him to capture images of distant deep space objects that are beyond the reach of the human eye. The addition of a RedCat 51mm wide-field refractor further enhances his ability to photograph large celestial phenomena such as the Orion Nebula and the Andromeda Galaxy.

His involvement with the Star Tours group broadens his horizons, enabling him to share his passion for astronomy with others through private events and multimedia presentations. Even on cloudy nights, Richard remains engaged with the astronomical community by delivering educational talks and presentations, both indoors and outdoors.

Beyond his personal pursuits, Richard actively contributes to the Phoenix Astronomical Society, volunteering his time and expertise to assist with financial accounting and serving as treasurer on the Board of Directors. His dedication to continuous learning and improvement underscores his commitment to advancing both his own skills as an amateur astronomer and the collective knowledge of the cosmos within his community.

To see this very interesting presentation and other presentations, go to the recorded Lecture Series Videos found on the PAS website pasaz.org

May Outreach Events

The PAS outreach program held a very star party to conclude our regular season.

Telescope Workshop 101 – What to Buy

May's 101 workshop on the 16th at PVCC was canceled as 2 students who had signed up failed to attend.

Telescope Workshop 201 – How to Operate

May's 201 workshop on the 16th was moved to PVCC due to road construction at the normal Apache Wash trailhead site that prevented access. A very enthusiastic group of students attended and enjoyed their first-night sky observations. Instructors Damon Finell, Stu Brackney, and Richard Sauerbrun led the group's lessons.

Star Party – International Astronomy Day

A very large and enthusiastic group of thirty-plus individuals enjoyed a spectacular evening of moon and star gazing on Saturday, May 18th at our Apache Wash Trailhead Park site.

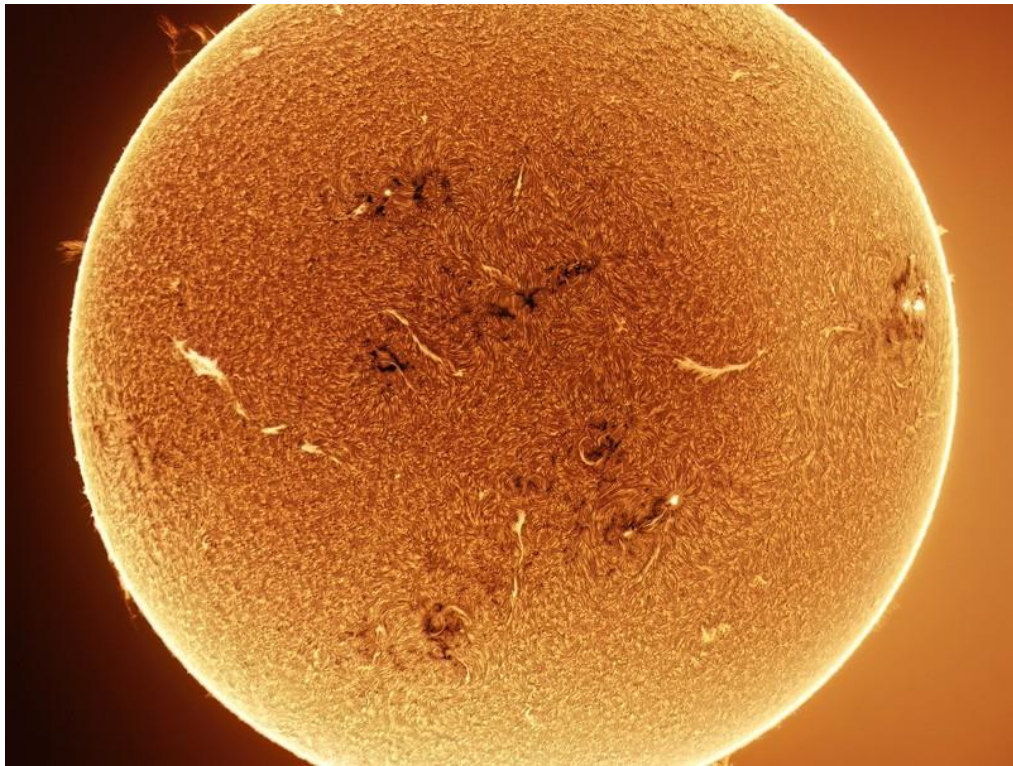
A wonderful variety of over a dozen telescope and binocular setups enabled all that attended to experience great views of our cosmos.

Several daytime photos of the setup session show off the great variety of equipment that was in use by both PAS members and guests.



Previous Outreach Events

Mark Johnston- Every year I do a solar observing event for the two grade 5 classes at Grayhawk Elementary School. I showed the Sun in white light and hydrogen alpha to about 65 students and 5 faculty. I explained the Photosphere view vs the Chromosphere view and the kids voted the hydrogen alpha view more interesting by about a 6:1 margin. This is how the Sun looked.



April 23, 2024

Andrew Stone- FOOTHILLS ELEMENTARY SCHOOL

It was good. A smaller school. I'd say we had about 50 or 60 students.

Stu, Roger, and I were all in attendance. Stu's commanding presence and free photographs, Roger's meteorites, and my simulated telescope viewing went very well.



T Corona Borealis

by Chris Maher

Get ready for T Corona Borealis, since its eruption is expected any time. If you were at the star party on April 20th, you heard me mention it. Here is more information:

The Big Picture: T Corona Borealis, a binary star system, is expected to brighten from its current magnitude 10 to approximately magnitude 2, sometime this year. It is a recurrent Nova, a cataclysmic variable with a period of 78 years. Similar eruptions were observed in 1866 and in 1946.

T Corone Borealis is a binary system, a red giant and a white dwarf. The white dwarf is vacuuming material off the red giant, and when enough material builds up on the white dwarf, it begins fusing hydrogen. Once this starts it will brighten in magnitude and we will see it.

A naked eye-visible nova is quite unusual, and this one will be bright enough to see in all but the most light-polluted skies. It should gather substantial media coverage, at least for the initial few days of the eruption.

For astrophotographers, it's a good idea to take some images right now, before the star erupts. Then you'll have something to compare to when it does erupt. You don't get a chance like this often in astronomy, a known, predictable, periodic nova. So, get on target and take ten or fifteen minutes of images, then stash it away on your hard drive or a thumb drive. Then, when it erupts, you'll have a before image and an after image.

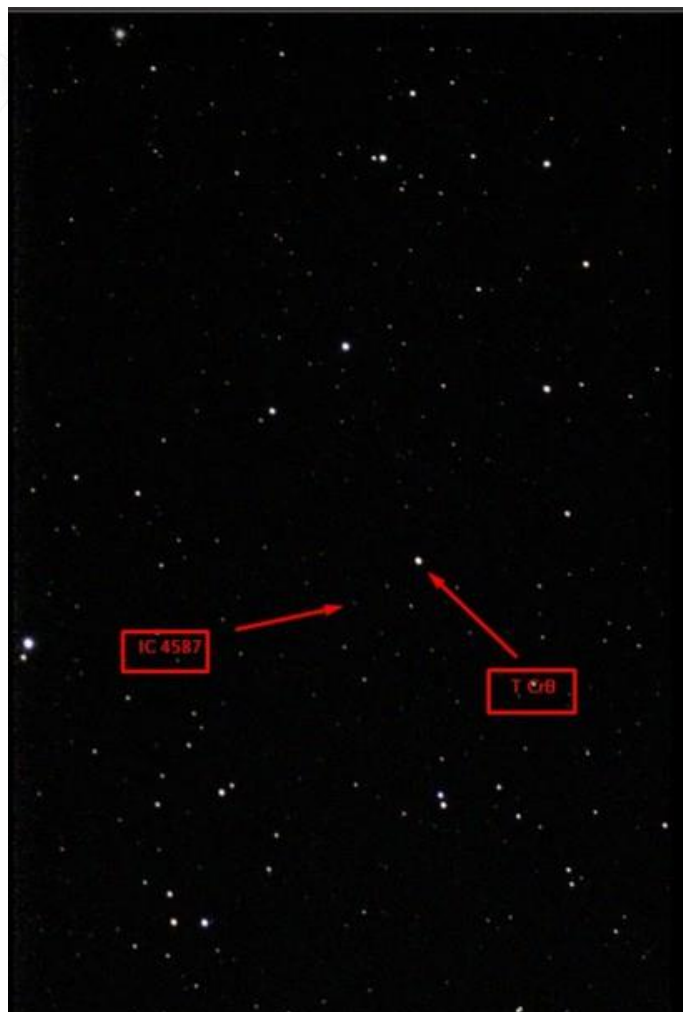
Video about T CrB from NASASpaceNews on YouTube:
<https://www.youtube.com/watch?v=gfK2jU5NiXA>

It is likely that your go-to telescope controller won't have this star in its catalog. So, an easy way to get on the star is to center on the IC 4587 Galaxy, and you'll have the star nearly centered. It's an orange star next to the galaxy, about 10th magnitude right now. Almost certainly galaxy IC 4587 will be in your go-to telescope's catalog.

Important thing to note about this: Don't confuse T Corona Borealis with Tau Corona Borealis, which is a different star. T Corona Borealis, or T CrB, is the one that's going nova. It's outside the horseshoe(crown) of the constellation Corona Borealis, while Tau Corona Borealis is inside the crown.

Also of note: The abbreviation most people are using is T CrB

Below is an image. If you center galaxy IC 4587, this is the frame in a Seestar S50 telescope.



Member Astro Images



AURORA
BOREALIS-
RICHARD
MEYERS



AURORA
BOREALIS-
PARAG
DESAI



SERENITY
AT
SAGUARO-
CARLA
MEESKE

Member Astro Images



CRESCENT NEBULA
- MARK JOHNSTON

IC4592 - MARK
JOHNSTON



M101 - MARK
JOHNSTON

M104 - MARK
JOHNSTON

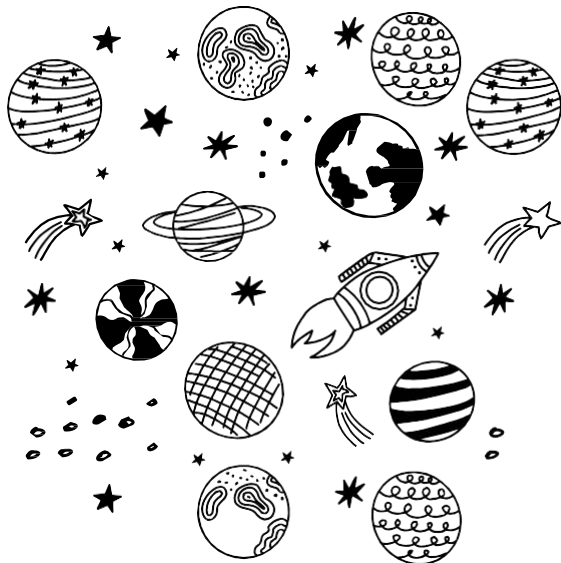


7 Telescope Targets for June

Each month we feature 7 good targets for small telescopes that should be visible in the evening:

1. Izar: Just above bright Arcturus is Izar, a tight yellow/blue binary star in Bootes.
2. Polaris: Our North Star is also a binary star. Small scopes will reveal a faint companion
3. M7: Also called the Ptolemy cluster, this is a naked-eye visible open cluster in Scorpius
4. M64: The Black Eye Galaxy is a spiral galaxy with a noticeable dark spot caused by a large region of dust
5. M5: Beautiful globular cluster found in Serpens
6. M25: The largest open cluster without a proper name. Found in Sagittarius
7. M83 (Southern Pinwheel): Beautiful barred spiral galaxy

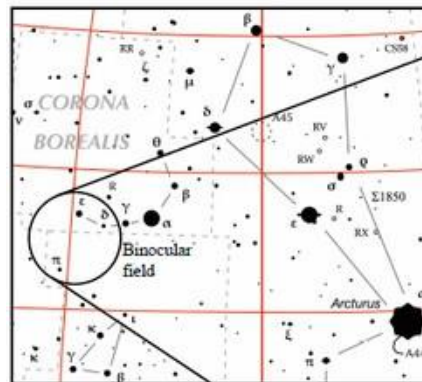
Cosmic Classroom (CC)



T Coronae Borealis

A nova waiting to happen – soon!

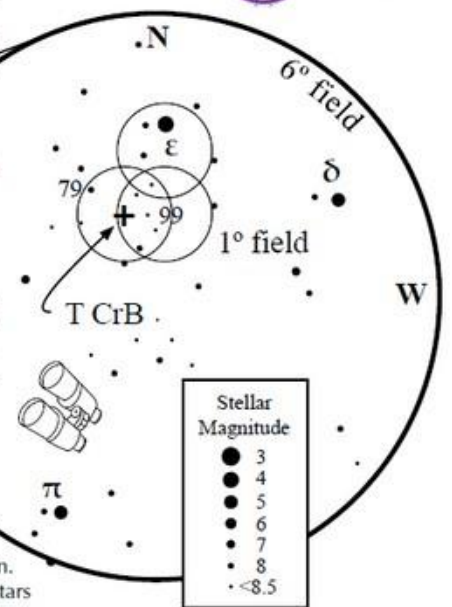
also known as HIP 78322 and the "Blaze Star"



How to find T Coronae Borealis

- Locate bright Arcturus and the kite shaped constellation Boötes.
- Corona Borealis lies directly east of Boötes.
- Trace the semi-circle of the stars of the crown.
- Epsilon and Delta are fourth magnitude stars shining east of Alpha (Gemma), the brightest member of the crown.
- Place Epsilon in the northern half of the binocular (or finder) field. Fifth magnitude Pi Serpentis lies near the bottom of the field.
- T Coronae Borealis is about 1/4 the distance between Epsilon and Pi.
- Move two low power eyepiece fields south of Epsilon.
- Then move 1/2 low power eyepiece field east.
- This is the vicinity of 10th magnitude T CBr.

- The star normally is magnitude 10.3.
- Ten years before its outburst, it rises to magnitude 9.8. It did this 10 years ago.
- It then dims to about magnitude 12 one year before outburst. It did this in April 2023.



Between now and September, T CrB is predicted to nova, quickly reaching 2nd magnitude and rivaling the brightness of Alpha CrB (Gemma).

- Its brightness rise will take one day or less.
- It will likely remain near maximum brightness (2nd mag.) for only a few days.



Phil Hoppes



Figures 27 & 28: Original and reprocessed images of M81

The visible rotation in my processed image is due to my selection of a reference image for the initial stacking.

Solar, Lunar and Planetary post-processing - If you are interested in post-processing your solar, lunar or planetary images from your Seestar this is easily accomplished by taking video images of your subject. You will need to do some trial and error to find the optimal exposure for your videos. For all of them I would recommend erring on the lower exposure vs higher. It is relatively easy, especially with stacking to make an image brighter. If you overexpose and saturate your camera there is basically nothing you can do to remove or enhance an overexposed image. Your Seestar will save your videos on its internal hard drive. You can access the drive two ways. If you have Station Mode activated on your Seestar you should be able to see your Seestar as a network drive on either a Mac, Windows or Linux OS system. If you connect this way, remember your speed will be set by the robustness of your WiFi connection to your Seestar. It is easy for your videos to be gigabytes in size. For a small number of subs on short DSO exposures this is probably a fine way to connect. For gigabyte files or file-sets your fastest option is to use a USB-C cable, turn your Seestar on and make a hard USB connection to your PC. Your download speeds are now set by USB-C connections which are lightning fast compared to a poor WiFi connection. Your Seestar will dump your video in a .mp4 format. For most users, the next software application of choice is usually a free application called Autostakkert (see links at the end). Autostakkert will not read a .mp4 file, even the latest version 4 of this application. The .mp4 needs to be converted to either a .ser or a non-compressed .avi. There is a free software package called PIPP (see links at the end) which can easily do this conversion. Once you import the proper video format the subs will be extracted, and you can process the rest with other packages specially made to enhance these types of images. Registax and ImPPG use a post-processing engine that implements Lucy-Richardson deconvolution algorithms that do a very good job of removing noise and enhancing details. Below are processed images of the Sun and the Moon.



Figures 29 & 30: Post-processed images of the Sun and Moon.

Let's go crazy! - I was interested in seeing what a very long exposure of an object could produce. I had an opportunity where I had 3 consecutive nights in a row of clear skies. I selected the Rosetta Nebula to image as it was up, it had a nice path across the night sky, and I figured I could just set up the Seestar and let it rip until the object went below the horizon. I knew the Seestar would shut off as I set the switch to auto shutdown. Across the 3 nights I accumulated 2427x10" subs. This equates to just under 6 hours and 45 minutes of imaging on just this object. I've just started to use Astro Pixel Processor (APP). This application is excellent for registering rotated image sets. Just what the Seestar produces.

Here is a screenshot of the final raw image APP produced with all those subs from the Seestar.

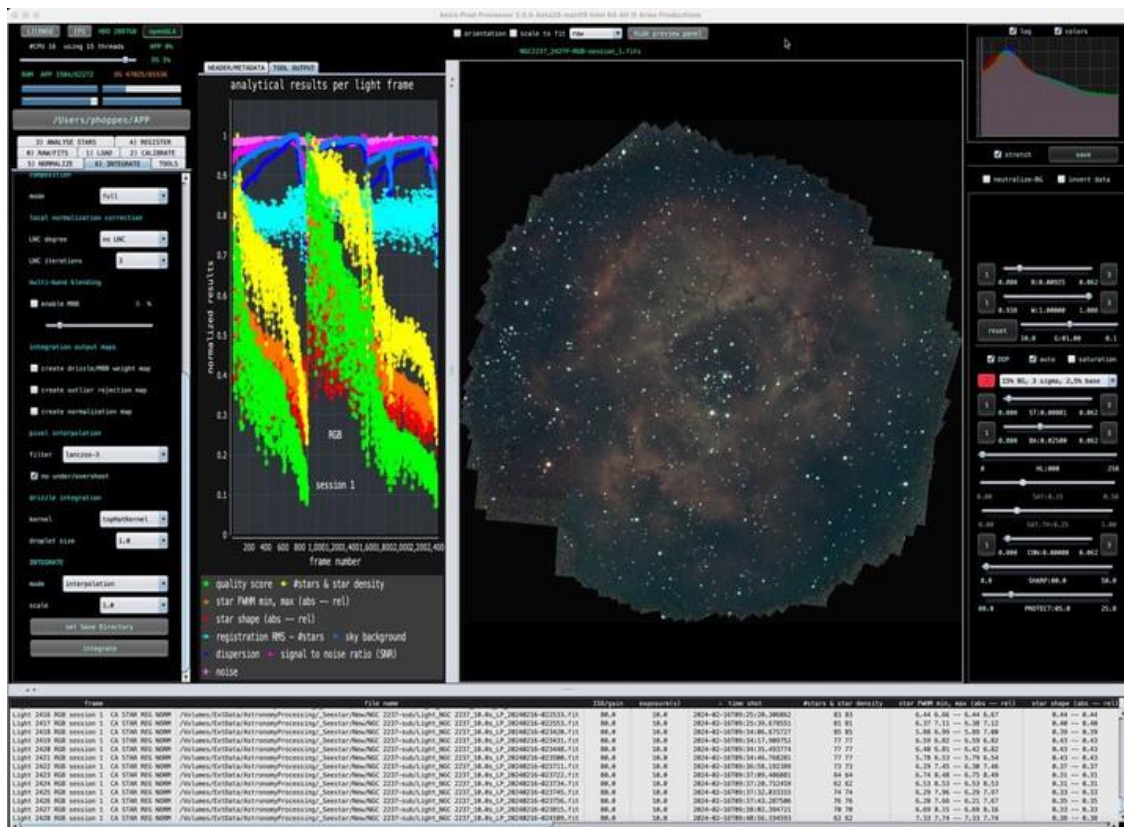


Figure 31: APP stacked image from 2427 subs of the Rosetta nebula.

Clearly the rotational effects can be seen since the final image is essentially round. This is what happens when you take a tall rectangle and rotate it about 180 degrees. Below is the final cropped and processed image of the Rosetta Nebula. This is quite impressive from a \$399 setup.

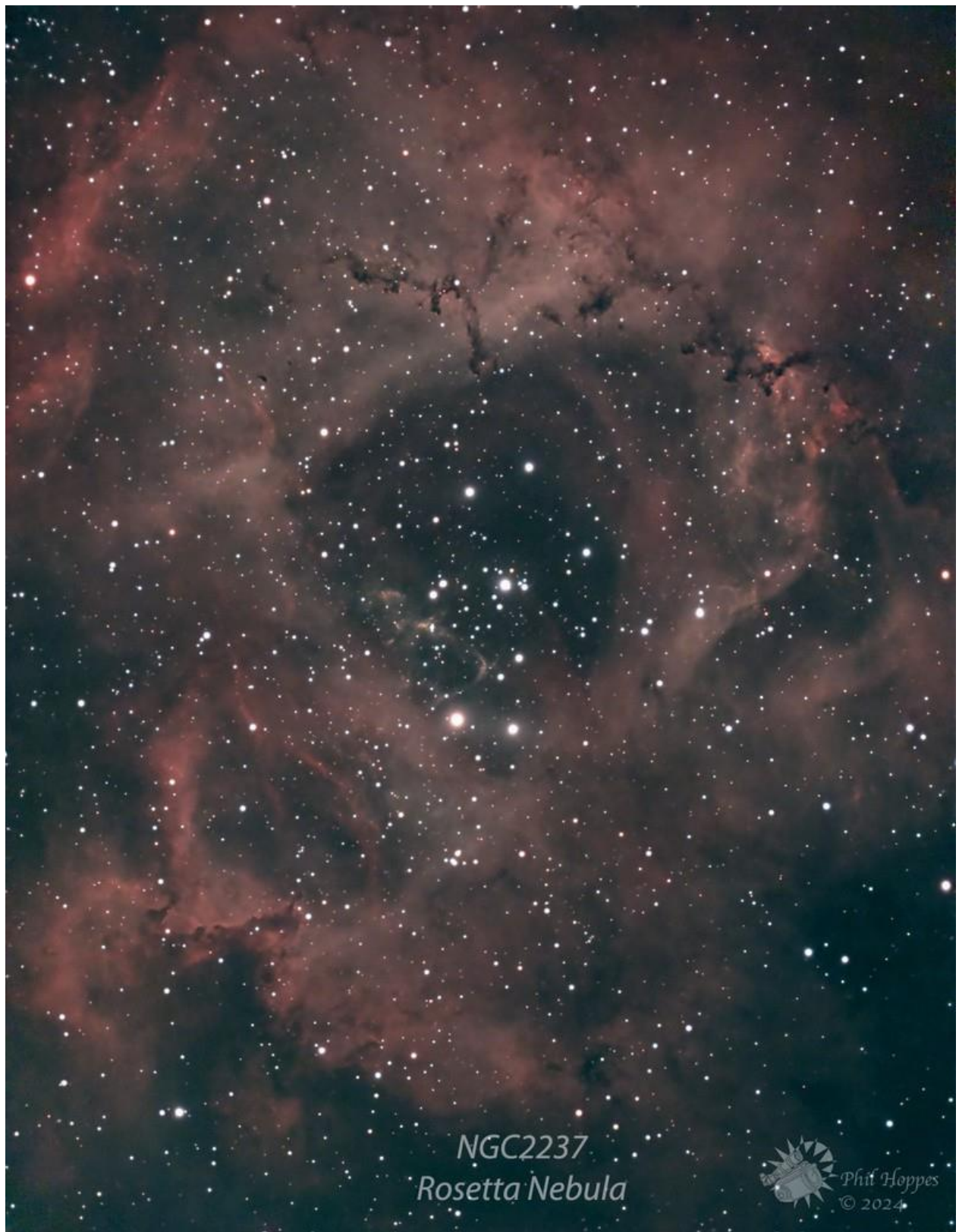


Figure 32: NGC2237 processed from 2427 subs across 3 nights of imaging.

It is quite apparent that the full rotation of the subs produces a much larger final image. The size of this image is 1310x1710 pixels. A standard Seestar image is 1080x1920 pixels. I basically traded some height in my final image for a wider image. The detail in the nebulosity is quite amazing, again considering this is a Seestar. I get this kind of detail with my multi thousand-dollar AM5/Redcat51 setup, but I expect that!

Add-ons, upgrades, accessories: Like all things there are already some nice add-ons and accessories that can be added to enhance your imaging sessions with your Seestar. The first thing I purchased was a power pack so I could extend the length of my imaging sessions with my Seestar. I picked up a nice powerpack from Amazon (see links below) that had a 6000ah capacity. With this attached to the USB-C input on the Seestar I have run my Seestar from 8pm at night all the way to the morning and there was still about 50% charge left on my Seestar. It is a bit tricky adding something like my powerpack because the cord attaching the powerpack to the Seestar can get wrapped around the tripod head which would cause lots of issues. When I use the powerpack I currently only use it to image one or at most two different objects in one night. This way I'm not spinning the cable around and around causing potential issues. I could attach it to the Seestar, but it is heavy enough that I'm concerned I could affect the guiding as the inertia of rotating the Seestar will have change significantly. Since I cannot change the guiding parameters, this could be a problem. The second thing I added is a clever tripod leveler. You can just see it on the bottom of this photograph. This works very well and leveling is a breeze and quite accurate.

Figure 33: Tripod leveler under my Seestar



The last thing I have done is purchased a larger case for my Seestar and the associated things I use. The Seestar comes with a nice case but there is no room for anything else inside. What I got is a standard Pelican case cut to fit my Seestar. I have in my powerpack a charger, the solar filter, cables, tripod leveler and probably down the road a small dew shield to screen the front of the OTA from neighborhood lights. I have two larger carbon tripods. One is for my Redcat 51 setup and the other for my NYX-101 setup. I can use either tripod to attach my Seestar to the top. The small bolt you see in the Pelican box is a standard 3/8" bolt which screws to the bottom of the tripod leveler. Putting the Seestar on one of these tripods is a snap.



Final thoughts: Sorry for being so wordy but the Seestar is an amazing instrument. After using it now for about 4 months I have been very impressed. It does bother me a tad when someone calls it a toy. It's not a toy. Being a retired engineer myself, I understand the world of making tradeoffs and the necessity to make something both low-cost but accurate, reliable, and manufacturable. I believe ZWO has done a great job with the Seestar S50 in this respect. I am more than aware of both the crowd that loves ZWO and the crowd that dislikes them. I'm not going to enter that debate. Suffice it to say, with this product, ZWO has done a good job of constantly patching bugs, releasing updates and continually improving the product. See my wish list below. ZWO is working hard right now to have a mosaic imaging mode for the Seestar. That will essentially render my "crazy" mode moot and we all will be able to take much larger FOV images with our Seestar. Others are finding out ways to make the Seestar work in EQ mode. The Seestar has clearly been a real hit with users and because of that, the user base will continue to embellish, enhance, and push the device into newer and better things.

Wish List - These are a few things that I have discovered that the Seestar S50 currently does not support but are items I would like to see. I have verified on the ZWO Seestar forum that all 3 of these items are under consideration and item number 1, Mosaic Mode, is under development.

1) Mosaic Mode: This is an obvious enhancement that would add a lot of functionality to the S50. The Vaonis series of smart telescopes support this feature in their software. When the S50 has it, we would literally have just about the same features and functionality as the Vespera II series smart telescope only \$1000 cheaper.

2) Coordinate object input: This one surprised me at first, that I could not directly input the RA/DEC coordinates for an object or location to go to. You can approximate this function by using the sky chart, but you are navigating on a chart vs directly inputting a coordinate set. Direct input would be much more accurate in my opinion.

3) Schedules: My experience has shown me that you can get substantially more detailed images with long exposure sessions, such as hours. The difficulty with this however is there is no way to stop your long sessions assuming the user wants to sleep. Great would be a schedule that operated both on either number of successful frames or wall clock time. This would allow for multiple targets over a night without forcing the S50 to shut down simply because the objects have set below the horizon or the S50 ran out of power, which are the only current options.

Helpful Links: Hardware is first followed by software. The hardware list has the items I've purchased and mentioned in the article. On the software links, those familiar with a few of these will recognize they are organized with planetarium software first followed by image processing applications. I've listed them with free versions first followed by various paid versions. Many, if not all, of the solar/moon/planetary processing packages are free and mostly Windows OS only.

I don't wish to publish my email, but you can PM me on either of these sites:

CN User - rimcrazy

Astrobin - <https://www.astrobin.com/users/rimcrazyph>

Hardware

ZWO Seestar S50 - <https://www.zwoastro.com/product/seestar-s50/>

Tripod Leveler Stand - <https://shrtm.nu/sVY>

Portable Power Bank - <https://shrtm.nu/sWm>

Pelican Case - <https://shrtm.nu/sW2>

Software

Stellarium - <https://stellarium.org>

Cartes du Ciel - <https://www.ap-i.net/skychart/en/start>

SkySafari - <https://skysafariastromy.com>

The Sky - <https://www.bisque.com/product-category/software/>

Siril - <https://siril.org>

Astro Pixel Processor - <https://www.astropixelprocessor.com>

PixInsight - <https://pixinsight.com>

RC Astro - <https://www.rc-astro.com>

PIPP – The developer's website is no longer available. The last published version can be downloaded here: <https://astrowhat.com/resources/planetary-imaging-preprocessor-pipp.38/>

Deep Sky Stacker - <http://deepskystacker.free.fr/english/index.html>

ASTAP - <http://www.hnsky.org/astap>

ImPPG - <https://greatattractor.github.io/imppg/>

Autostakkert - <https://www.autostakkert.com>

Registax - <https://www.astronomie.be/registax/>

Winjupos - <http://jupos.privat.t-online.de/index.htm>

Gimp - <https://www.gimp.org>

Affinity Photo - <https://affinity.serif.com/en-us/photo/>

Photoshop - <https://shrtm.nu/sW1>

Topaz Labs - <https://www.topazlabs.com>

Helpful Astronomy Websites

by Mark Johnston

The following websites are great free resources to help you plan and enjoy your astronomy adventures

Astromart astromart.com/

This is one of the top two sites for buying and selling used astronomy gear, product reviews, and forums where you can discuss any aspect of astronomy with other enthusiasts. A small fee is required.

Astrometry.net <https://nova.astrometry.net/>

This site will take any astronomy image you send it (galaxy, starfield, nebula, etc) and then tell you what it is and where it is in the sky.

Astronomy Tools astronomy.tools/calculators/field_of_view/

This site has a lot of capabilities but I use it primarily to figure out how a target (e.g. the Helix nebula) will look in my eyepiece or astronomy camera. You pick your scope, camera, eyepiece and target and the site does the rest.

Astrospheric www.astrospheric.com/

Probably the best short term astronomy weather forecasting tool, providing predictions of clouds, transparency and seeing.

Clear Sky Charts www.cleardarksky.com/

Excellent source of astronomy seeing conditions forecast. Also a great tool for finding observing sites with lower light pollution.

Cloudynights www.cloudynights.com/

This is one of the top two sites for buying and selling used astronomy gear, product reviews, and forums where you can discuss any aspect of astronomy with other enthusiasts. Free.

Dark site finder darksitefinder.com/map/

Great website for finding a dark observing location.

Heavens above heavens-above.com/

Top site for predicting naked eye observations of satellites. See when the ISS is visible in your neighborhood!

Jupiter transits shallowsky.com/jupiter/

For anyone with a small telescope, this is a great site. You can find out when the Great Red Spot and Jupiter's satellite transits are visible.

Solar Dynamic Observatory (SDO) <https://sdo.gsfc.nasa.gov/data/>

Find out how the Sun looks right now, at various wavelengths. If you own a solar telescope, this site coupled with Astrospheric is all you need to plan fabulous solar observing!

Telescopius telescopius.com/

This site is very helpful in planning an observing evening. It will tell you when any particular target is rising and setting and when is the best time to observe it. This allows you to sequence your observing in a planned manner.