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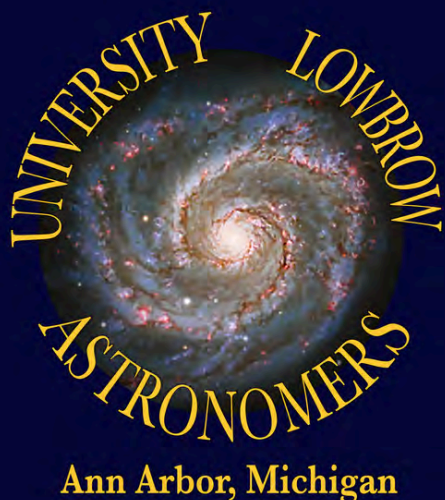
M82, CIGAR GALAXY

BY GLENN KAATZ

Glenn used his new AM5N Harmonic Drive to take this photo. (Check out his review: **First Light Using the ZWO AM5N Harmonic Drive Equatorial Mount** on page 7.)

Details: Celestron Edge HD 8+ telescope equipped with:
Celestron 0.7X focal reducer | Celestron off-axis guider | ASI174MM guide camera | ASI533MC Pro imaging camera | ZWO automatic focuser | ZWO electronic filter wheel | Optolong L-Pro filter | ASIAir Plus microcomputer

One hundred 180 sec subframes (total 5 hrs integration time). 25 flats and 25 dark flats. Processed with Pixinsight and Photoshop, including the Pixinsight plug-ins Star, Noise, and BlurXterminators.



ARTEMIS 2: MAKING SPACE REAL

BY ALEX SWARTZINKSI

Three weeks ago, humanity stepped back into the void, returning to deep space for the first time in 53 years. Four brave astronauts, Reid Wiseman, Victor Glover, Kristina Koch, and Jeremy Hansen strapped into a van-sized capsule named Integrity and blasted off on the most ambitious test flight since the Shuttle's first launch in 1981. Their destination: a lunar flyby, visiting cislunar space for the first time since December of 1972.

The mission's goal was to complete a comprehensive checkout of the spacecraft to support future Lunar landings in NASA's Artemis program. The trajectory was brilliant. Starting in a highly elliptical Earth orbit, the crew and mission control checked out the ship's life support systems one by one. This orbit was remarkable. Their highest point (apogee) was over 38,000 miles from Earth, far beyond geostationary satellites. Their lowest point (perigee) was only 115 miles above the surface, barely in space. When all systems were go, they did a five-minute trans lunar injection burn to escape orbit. This maneuver set the crew up for a free return trajectory, requiring no major burns to intercept Earth. In the words of Christina, "With this burn, we don't leave Earth, we choose it."

Artemis 2 went extremely well. All systems (minus some toilet issues and false caution alarms) performed nominally, and the crew flew further into space than anyone before, achieving a max distance from Earth of 252,760 miles.

The crew captured high-resolution images of our beautiful tiny world, suspended in the Milky Way. They conducted incredible close-up observations of the Moon, and they experienced an hour-long total eclipse on their way home. Beyond the science and test flight objectives, this mission provided a rare glimpse into the daily life of astronauts during flight. Unlike many recent commercial crew operations, NASA kept the public in the loop for the entire mission. Livestreams broadcast the crew's activities and communications with mission control. I found myself constantly listening in the background as I went about the day. We heard the crew get emotional, express joy, frustration, and neutral content. This realistic and surprisingly relatable glimpse into the daily lives of humans in space reached a mainstream audience. Artemis 2 was a trending topic on social media platforms. Media outlets of all types reported on the crew's travel and activities. This mission truly reached everyone.



As someone who did not get to experience Apollo, it was bizarre to watch a translunar coast in real time. Initially, I felt a sense of vulnerability knowing the crew were days away from home should a major malfunction occur. As the mission progressed, a new sense of normalcy emerged. I found myself having sudden realizations about what was happening: We were really headed for the Moon again!

In Southeast Michigan, we experienced extremely cloudy weather during this mission, but I found myself lying awake (partially thinking about the flight) at midnight on the day of the lunar flyby. Looking at the weather, thin clouds were expected at Moonrise. I waited for the Moon to get a few degrees above the horizon before venturing to a nearby clearing about a quarter of a mile from my front door. I've spent a significant amount of time alone in the woods at my darksite, but it was still unsettling to walk down an urban street at 1:30 on a Monday morning. I gazed to the east in anticipation of a bright full Moon, but it wasn't there. Disappointed by the heavy cloud cover, I retreated towards bed. Taking a look behind, out of sleep-deprived paranoia, I was greeted by a magical sight. The full Moon was emerging, silhouetted by a halo of thin clouds. It was hanging there silently, seemingly lifeless. I'd seen this same sight countless times, but this was different. Four people were in the gravitational sphere of influence of this bright celestial body, only 38,000 miles away. They were venturing to the other side in a matter of hours. It felt like a fever dream as I stood under the streetlights. I'll never forget that perfect view.

Artemis 2 was a culmination of thousands of people working together for a common goal. It was a reminder that we can do incredible things, that life is a true gift on this incredible little world. On a personal level, it

ARTEMIS 2 continues, p. 3

ARTEMIS 2 continues ...

provided me with a much-needed reminder about our capabilities as a species and as individuals.

Human spaceflight has always been controversial. The risks, funding, and complexity of human spaceflight operations raise many questions. These are valid concerns, but Artemis 2 has once again demonstrated that people connect with people. The crew on this mission was truly remarkable, and their close bond and teamwork were extremely refreshing to witness. Humans are a means for the universe to see itself, and this reality becomes evident when we venture beyond our oasis in space.

We have lots of work to do, but anything is possible if we can visit the Moon...



Above: I added the official Artemis 2 patch to my collection, under Apollo 17, the prior Lunar flight



FIRST QUARTER MOON

BY TOM RYAN

This photo was taken with a hand-held iPhone X through a 12mm Nagler eyepiece, coupled with a 12" f/5.6 Zambuto mirror, without a drive. Only the central part of the image is sharp, because the iPhone has some sharpness and color-error problems and maybe the Nagler does, too, that far off-axis, but I like the center.

THE ROSS LENS, AKA PARACORR, and BEST FOCUSING

BY TOM RYAN

If you own a big Dobsonian telescope, the odds are good that you also own, or wish to own, a lens that will correct the astoundingly large coma of a fast focal ratio Newtonian. The most famous of these lenses was designed in 1935 by Frank Ross to correct the coma of the 60-inch f/5 reflector on Mt. Wilson. His solution consisted of a negative singlet, followed by a positive singlet, which combined to have almost no power.

A modern version of this field-correcting lens can be purchased from Tele-Vue in the form of a Paracorr Type 1, or a Paracorr Type 2, or their larger diameter 3" Big Paracorr Type 2 coma correctors. I have a couple of the above, and I can testify that they work very well to reduce coma.

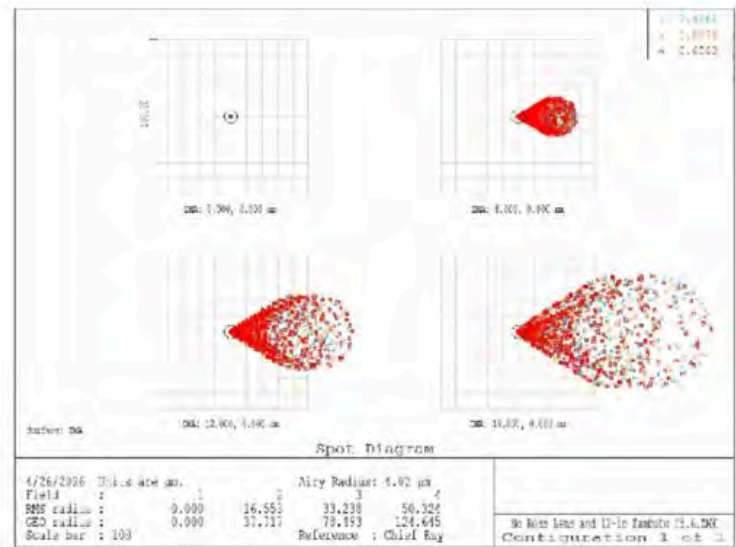
I pretend to be an optical engineer when I'm not messing around with telescopes and, with an optical design program handy, I got to wondering how these coma correctors work for different aperture and different focal ratio mirrors? So, I fired up Zemax and took a look.

Tele-Vue is an extremely helpful company, but they don't publish manufacturing data on their products, so I had to guess what might be the optical design of the Paracorr. Fortunately, a close imitation of the Ross Lens/Paracorr design appears in **Telescopes, Eyepieces, and Astrographs**, by Greg Smith, so I used that. That design is not exactly a Paracorr because some of the numbers are off, but it is close enough for our purposes.

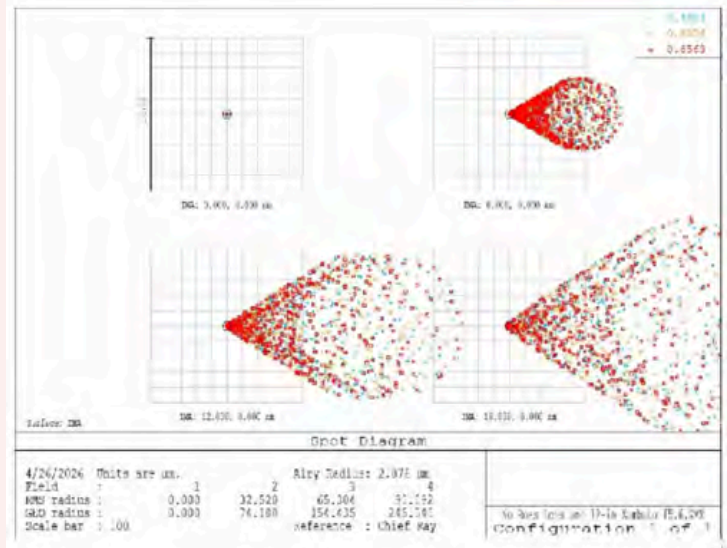
The author of the design said that there weren't enough design variables to correct everything, which is the story of my life, too, but he achieved an 80% reduction in coma and increased the focal ratio by a factor of 1.11X. The real Paracorr increases the mirror's focal ratio by 1.15X, which just goes to show the size of the solution space.

I coupled the Ross lens with two 12" mirrors that I have, an F/4 and an F/5.6, and looked at the spot diagrams.

The spot diagrams for the basic Newtonian mirrors without coma correctors, with a field-of-view diameter of 36mm at the focal plane, appear at right. For scale, the small grid squares are ten microns square, and the little black ring in the center of the grid is the Airy disk's diameter.



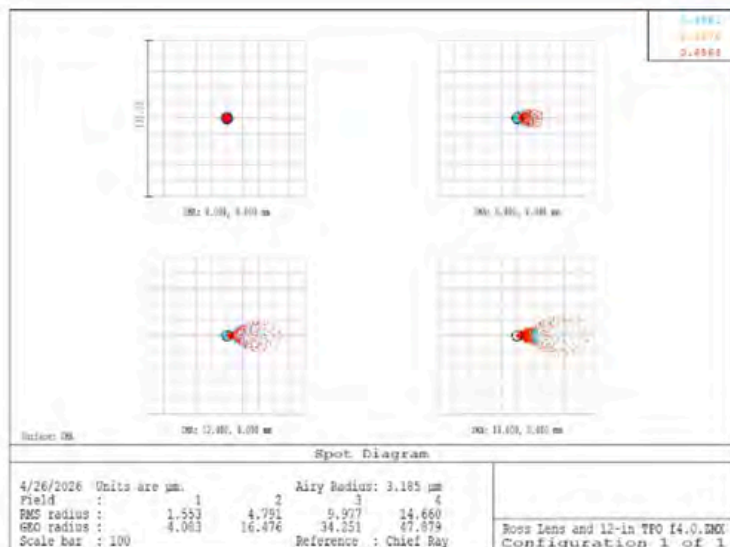
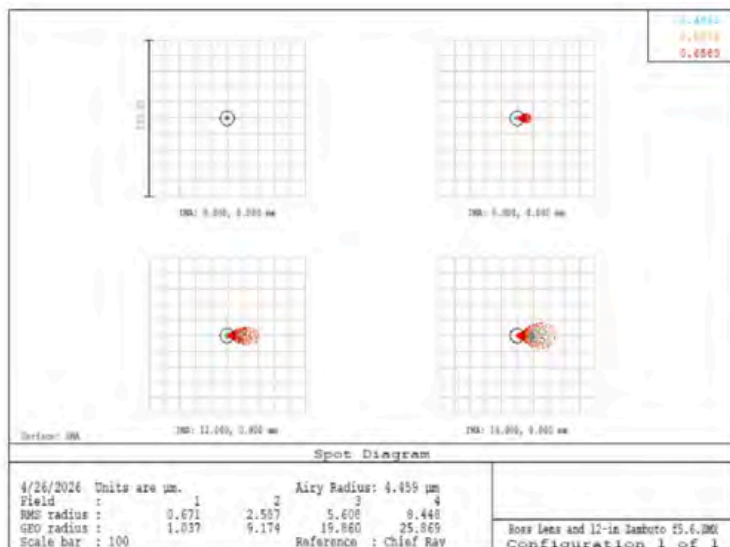
Spot sizes for 12" F/5.6 Newtonian.



Spot sizes for 12" F/4.0 Newtonian.

The next images (page 5) show the spots at the focal plane with the Ross Lens/Paracorr in place, at the recommended back focal length. Because, of course, that matters.

ROSS LENS continues, p. 5



Spot sizes, 12" F/5.6 Newtonian & Paracorr. Spot sizes, 12" F/4.0 Newtonian & Paracorr

Coma, as stated earlier, is reduced by 80% in this design. Coma reduction for the Paracorr will almost certainly be similar. And, surprisingly to me, the coma reduction is greater in the longer F/ratio mirror, which has less coma to begin with.

One of the design practices that I live by is to ask, "What are the tolerances on the lens placement and the manufacturing dimensions?", because that can make or break a design. In the case of the Paracorr, Tele-Vue states that the back focal distance, which is the distance from the last optical surface to the image plane, is 56mm. The design from the book has a BFL of 55mm, which is different, but it is close enough for this analysis.

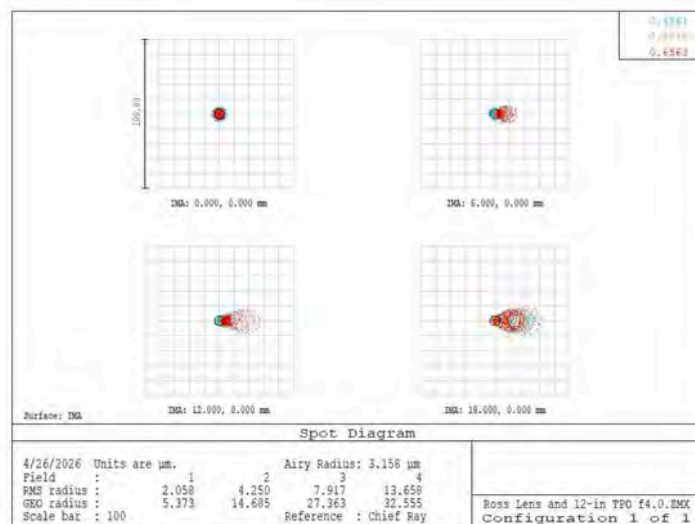
But what happens if you insert your Paracorr into your eyepiece focuser, and then connect your imaging camera to the Paracorr, and then get the wrong back focal distance between the Paracorr lens and the camera? It's pretty easy to do, you know. Your spacers and the camera's flange-to-sensor distance might not add up perfectly. You will still find a focus for your particular camera-Paracorr combination, but are you hitting the sweet spot of the system? And if you aren't hitting it exactly, then by how much can you miss, and still get good images?

To find the answer, it was back to Zemax and a simulation of the spacing errors between the Paracorr and the camera sensor. I'm going to use the F/4.0

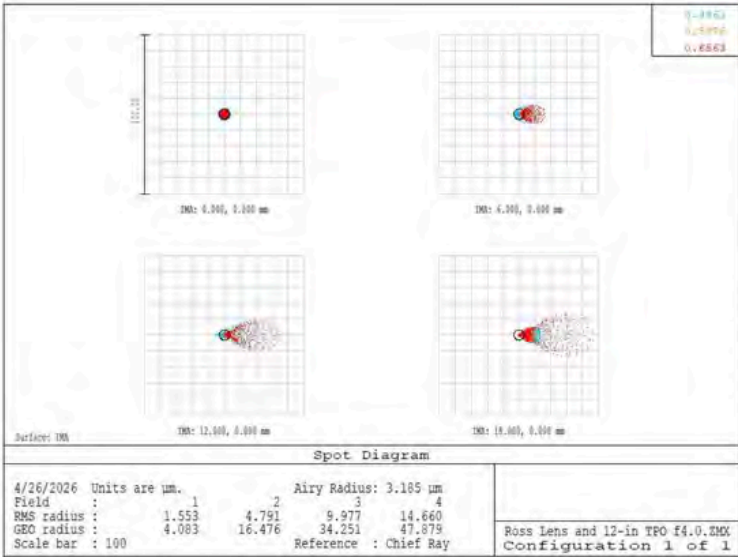
system in the analysis, but the results for the F/5.6 system should be similar.

I assumed that I might miss the Paracorr-to-sensor distance by 3mm, in either direction, and then I refocused the assembly, just as you would do at the telescope.

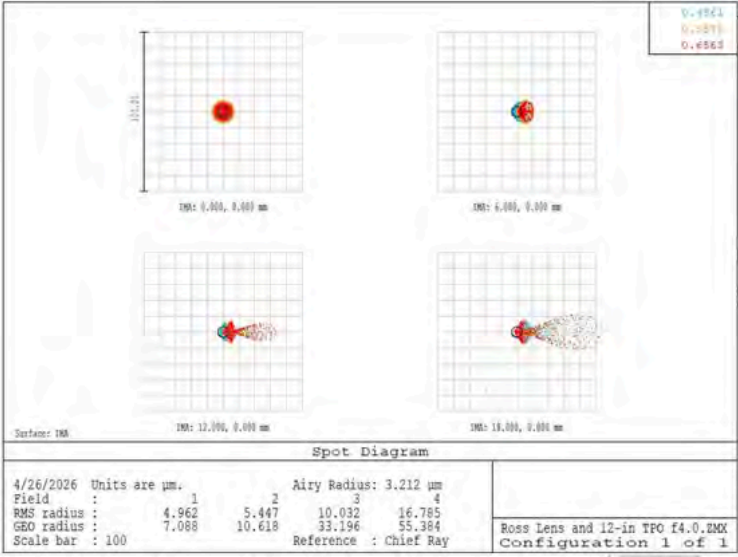
First, the results of having the camera spacers too thick, so the Paracorr-to-sensor distance is greater than designed, then the results at the design distance, then too thin.



Spacer distance, Paracorr-to-Sensor, 3mm too thick.

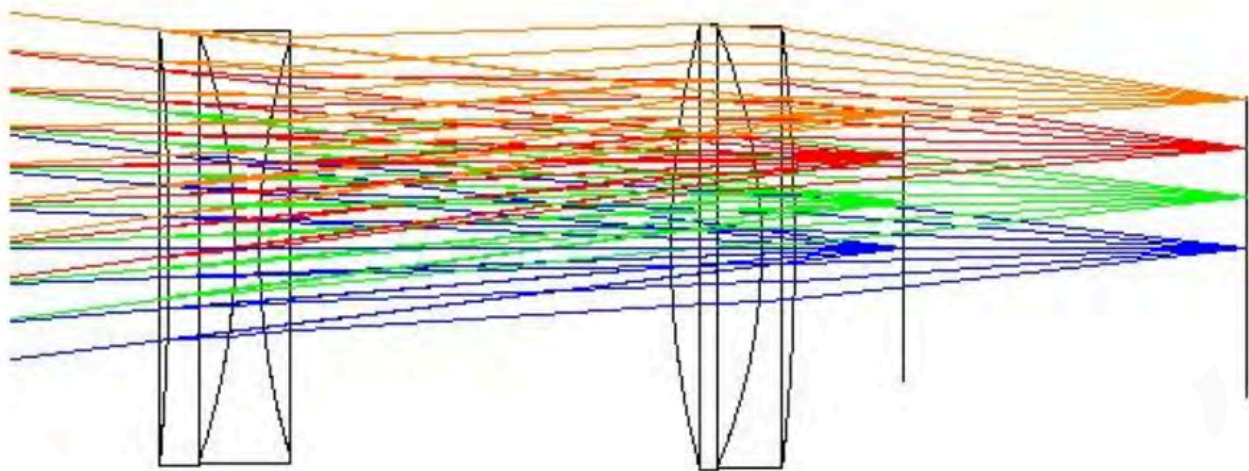


Spacer distance, Paracorr-to-Sensor, correct.



Spacer distance, Paracorr-to-Sensor, 3mm too thin.

If you look closely at the numbers, you can tell that the nominal design gives the smallest spots in the middle of the field. However, if you are taking a photograph, you might want to consider erring on the side of the spacers being too thin and placing the sensor too close to the Paracorr, because that error results in larger, but more uniform, spot sizes. On the other hand, if your images are going deep, then they might record the thin, blown-out sections to the right of the Airy disk images above, and if so, then you might want to go for the “too thick” solution.



Layout of the Ross Lens/Paracorr, showing the original position of the focal plane, and the new, moved-back position caused by the insertion of the coma correcting lenses.

First Light Using the ZWO AM5N Harmonic Drive Equatorial Mount

BY GLENN KAATZ

Getting older often comes with challenges that I never considered in my younger years. These include joint issues, and I have problems with one knee and one shoulder. Lifting heavy equipment has become increasingly difficult, and those German Equatorial mounts are heavy! I have two Celestron versions, both of which weigh 40+ pounds. As such, I decided to lighten the load and give the new harmonic drive mounts a go.

I am heavily into the ZWO ecosystem, with all my Astroimaging devices, automatic focusers, automatic filter wheels, off-axis guiders, and microcomputers controlling everything (ASIAir family) from those folks. I decided to stay within that system for a new mount and after a bit of research, went with the AM5N (\$2,299; Agena Astro). This device weighs a mere 12 pounds and can handle 15 kg (33 pounds) without a counterweight, or 20 kg (44 pounds) with one. My heaviest telescopes, which have a variety of paraphernalia mounted on them, are roughly 20 pounds and well within the range that this mount can handle.

The mount can be operated in equatorial or alt-az modes, has a much smaller periodic error than the older and heavier mounts, and a good cable management system, including a DEC saddle-based power port (12V 3A) and USB-C connection for mount control. My ASIAir Plus connects seamlessly to these ports. The front panel has connection sites for power (12V 3A), a hand controller (comes with the mount), an ST-4 autoguiding interface, and a USB 2.0 port. The DEC saddle can handle Vixen/Losmandy dovetail bars. The underside of the mount has an integrated counterweight bar attachment site, closed with a screw that also serves as the counterweight bar retaining screw that prevents counterweights from potentially falling off.

A tripod made specifically for this mount can be obtained, but with the size and weight of my telescopes, I decided I wanted to use something more substantial to prevent possible tip-overs. I had a tripod made for my Celestron CGEM mount and researched ways in which I could attach the AM5N to this. The CGEM tripod uses a 10mm system to secure the mount and accessory tray as well as spread the 2-inch legs, whereas the AM5N needs a 3/8" connection to secure it to a tripod. After much online research I found a way to accomplish this by removing the stock 10mm connection and purchasing a threaded 3/8" rod along with appropriate washers and plastic tightening knob, which worked like a charm. The azimuth alignment pin on the top surface of the mount needed to be removed to make room for the AM5N,



however.

My first night out with this mount, loaded with my Celestron Edge HD 8-inch reflector and all the gear attached to that (camera, focal reducer, off-axis guider, automatic focuser, and filter wheel), was quite an adventure. The polar alignment procedure is automated within the ASIAir and functions very much like that used for the ZWO SeeStar smart telescopes. A series of images is obtained with the mount rotating, and then the necessary altitude and azimuthal adjustments are provided. After a bit of work, the software informs you that you are good to go.

Mount calibration proceeds in an identical fashion to typical CGEM mounts, with movements north and south as well as east and west. It is recommended to choose calibration settings that result in 15-20 moves in both calibration directions as ideal, and guiding corrections should be relatively fast (1 second). It took me nearly an hour to hone the settings in to not get overcorrections resulting in sawtooth RA and DEC guiding curve.

Ultimately, I ended up with a total RMS error of about 0.5 arcsecond or less. I can obtain this degree of accuracy with my heavy CGEM mounts as well, but more typically they give me 0.7-1.0 arcsecond. I did have higher total RMS errors, which I was trying to dial in the RA and DEC aggression parameters, but there were occasional wind gusts that complicated things with this big telescope.

ZWO AM5N continues, p. 8

ZWO AM5N continues ...

The second night with the mount went much smoother as all the parameters were dialed in and there was no wind. Between the two nights I obtained 5 hours' worth of 180 sec images of the Cigar Galaxy (M82), using an ASI533MC Pro camera. While this target needs more time than this to get good resolution of detail, processing using Pixinsight and Photoshop gave me the result on page 1.

In conclusion, I found this mount to be much easier to lift and mount on a tripod, have better cable management than I was used to with my bigger and heavier mounts, and to deliver a great RMS error consistently. The learning curve to master the mount was not steep at all. Please feel free to contact me if you have any questions or need more details about the mount and/or my method of adapting it to the Celestron CGEM tripod. I have since purchased a ZWO pier extension that I have adapted to this tripod as well, which eliminated possible tripod leg collisions with longer refractor telescopes.

ORION CLOUD COMPLEX

BY GARY NICHOLS



UPCOMING SPEAKER SCHEDULE

**May 15: Jeff Kopmanis/
Charlie Nielsen**

Topic: Seestar - What We've
Learned (In the Last Year)

June 19: TBD

July 17: TBD

August 21: Club Picnic!

**September 18: canceled
(conflict with AATB)**

October 16: TBD

November 20: Sebastian Garcia

Topic: Telescopius Software
Update

SYQON PRISM: THE NOISE BUSTER

BY JEFF KOPMANIS

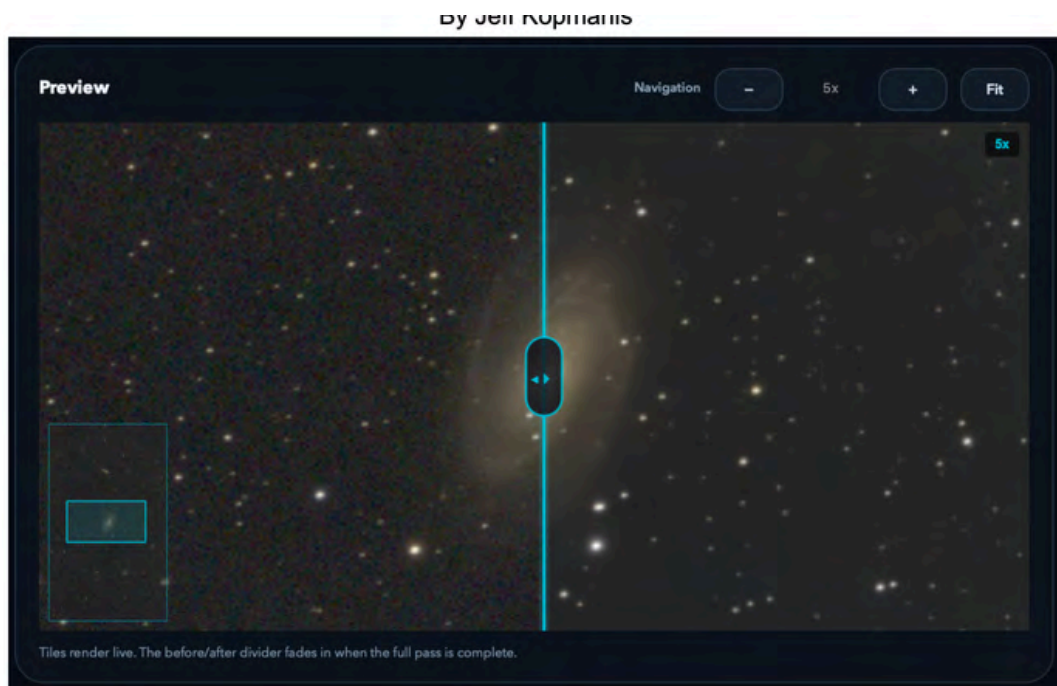
Every astrophotography (AP) enthusiast encounters background noise and gradients in their newly stacked photos. The first photo (near right) illustrates the noise/gradient issues in M81/M82. It was taken with 60 second subs for 65 minutes at Algonac State Park on April 26, 2026. It has some haze and a darker area in the lower left, with general noise throughout, and especially prevalent along the bottom. The second photo (far right) is zoomed in to really show the red/green noise present. Blech!



The clever folks at SyQon have a tool called Prism that you can install into Siril, PixInsight and Photoshop. (<https://syqon.it/prism/>) I've used the version for Siril, the free AP processing software (<https://siril.org>). Installation is easy in Siril: just go to the Scripts > Get Scripts menu and check the box for SyQon Prism (and Starless, for it's excellent as well). Prism has a free model, "Mini", which works well, but for €30 (about \$30), you can type in a code and have access to the "Deep" model, which is well worth it for the extra finesse it performs.

Previously, my workflow ran through the AutoBGE (Automatic Background Extraction), the Remove Green Noise tool, and, if needed, the Cosmic Clarity Denoise utility. The results were OK, but usually required more work in the stretching phase to coax out details and subtle features. Prism is super-easy to use, just choose Scripts > Python Scripts > Processing > SyQon-Prism.py

I've used its preview image controls to zoom into the image to reveal the noise, but otherwise, this is what comes up:



SYQON
continues, p. 10

SYQON continues ...

Set the Model to be either Prism Mini or Prism Deep. You can control how much effect you'd like it to have by varying the Strength control. The other settings can largely be ignored, as they affect how the model will segment your image during processing. Just press the Denoise button to start processing. When it finishes, it'll give you a preview to demonstrate what it did.

The control enables you to move back and forth over the image to see the "before" on the left side of the slider and the "after" on the right.

Clearly, the background noise is simply eradicated. What's left is a smooth background with sharper stars and more clearly visible details in your target object. Here's a pair of before/after of M82's detail and color brilliance:



What this means is that down the line, in your workflow, you'll spend a lot less time trying to eek out the detail and colors, for Prism has done the work for you.



Additionally, we've found that if you use Prism first, your stretching will reveal additional detail that wasn't even visible previously—exactly the effect you'd expect stretching to accomplish! Effectively getting rid of noise is the key. Here's that same view of M82 after stretching:

So, check out Prism. The Mini model works equally well with the Denoising, but Deep does a better job of finding subtle details around nebulae that would otherwise never show up, which makes the \$30 a very affordable improvement.

OBSERVATORY DECK WALK COMPLETED

BY JACK BRISBAN

Don Fohey, Jim Forrester, and Jack Brisbin met at the Observatory on March 12 and discussed the possibilities to make it easier to move the club's 17-inch telescope from the Observatory to the field. (For more background on this project review: Observatory Ramp Conclusion Report, April 2026, Reflections/Refractions newsletter, page 16.)

At the April 17 club meeting, I gave an overview of the Deck Walk installation. Because of the weather conditions, I did a pre-build/setup in my garage using the same materials we would use at the Observatory. The deck walk is made of all ground-contact treated wood.



On Wednesday, April 8, it was partially clear, no rain, and it fit my schedule. I transported all the pre-cut wood to the Observatory and started to build the deck walk at the Observatory. The 4 x 4 beams were cut on a 10-degree angle and set against the concrete door pad, so you could dig the dirt trench at the correct angles



The 4x4 beams are placed, based on the 4-foot-wide deck walk. The beams are leveled to a certain depth to give them a 9.5 to 10 degree angle. Then the ½ inch holes were drilled in the beams, and ½ inch steel rods were pounded 24 inches into the ground at 4 rods to each beam. The deck boards are 2" x 6" x 4 feet all ground-treated wood and will add to the strength of the deck.



The deck screws are number 10 x 4-inch deck force exterior screws to go deep into the 4x4 beams. Each board has 3 screws vertical in each beam, about 180 screws. As you can see from the angle finder we are at ten degrees. This allows us to move the 17.5 dob easier in and out of the observatory. This will also allow a person using a wheelchair/walker to have easier access to the Observatory. I returned Friday late afternoon when the rain stopped to clean up around the Observatory.



Our next Observatory open house is May 9, and the rain date is May 16.

To our new members that have not been to the Observatory, this would be a good time to bring your telescope or observe with club members who bring their telescopes out.

Don't forget to come to the Observatory look through the 24" McMath telescope and do a Deck Walk!

University Lowbrow Astronomers - Meeting Minutes April 17, 2025 7:30pm - revised

Our March meeting at the Detroit Observatory began at 7:35 PM with Dr Fan Zhou from U of M discussing black holes at the heart of Active Galactic Nuclei (AGNs). His research integrates data from all parts of the electromagnetic spectrum: Infrared, visible, ultraviolet, X-ray, and gamma rays, with new data from the Legacy Survey of Space and Time (LSST) from the Vera Rubin observatory. The non-visible wavelengths provide some of the most accurate quantitative results for determining the mass of the black holes.

At 8:48 PM Charlie Nielsen began our business meeting.

Our first order of business was the election of club officers. There were no nominations from the floor nor online. Members in-person and online, elected the slate of officers. None opposed.

President: Charlie Nielsen

Treasurer: Doug Scobel

Observatory Director: Jack Brisbin

Newsletter Editor: Amy Cantu

Vice Presidents: Ken Cook, Don Fohey, Tim Miller, Brian Ottum

Webmaster: Barry Chapman

Online Coordinator: Jeff Kopmanis

Members in-person, online, and email votes, approval amendment #5 of our by-laws. None opposed.

Amendment #5 increased the amount the officers may authorize for an expense without a member vote to under \$500. Please see the amendment for details.

Online Coordinator Jeff Kopmanis recognized and thanked Tim Miller and Barry Chapman for their continued work on our website and internet domains. The YoungAstronomers.org domain should move over the weekend.

Jeff mentioned we still have a small number of RASC handbooks and calendars. Please email Doug Scobel or Jeff Kopmanis if you are interested in purchasing either.

VP Ken Cook recommended the book "Gemini - Stepping stone to the moon" by Jeffry Kluger. Also Christine Cook had submitted our activities to the Ann Arbor Observer online and print calendar.

OD Jack Brisbin reported that the observatory is in good shape.

Jack, Jim Forrester, and Don Fohey had planned a walkway entrance ramp. Jack built the wooden ramp in his garage, took it apart, and rebuilt it at the observatory. Pictures of the sturdy ramp were shown and will be published in our newsletter. Many thanks to Jack for his hard work.

The secondary mirror from the McMath was removed, cleaned, and reinstalled. Tom Ryan measured the radius of curvature and focal length, which closely matched the original McMath design documents.

Jack mentioned he received a mailing from the Meade Celestron price fixing lawsuit settlement. If you purchased a scope or parts from 2005 to 2023 you might also be part of the class.

VP Don Fohey had no report.

Webmaster Barry Chapman had no report.

VP Tim Miller reported that the public portions of our website are migrated and online. He is working on a webmaster contact form for future requests that will send email to asklowbrows@gmail.com. Tim mentioned that the current events calendar has a bug which will delete current events, he is working to correct this.

He received a request from the Ypsilanti public library for a public event.

Tim will look at a possible online member voting form.

By email, Treasurer Doug Scobel submitted his report.

We have 215 memberships.

Doug did the following:

- made our usual monthly payments to AT&T for our Open House "hotline".
- paid \$26.60 for a second attempt to mail a cap to September 2025 guest speaker Sebastian Garcia, who lives in Argentina. It made it to him this time!
- deposited \$140.00 from Jack Brisbin, for Lowbrow-owned items that he sold at the FAAC swap meet.
- reimbursed Jack Brisbin \$25.00 for the club table he rented at the FAAC swap meet.
- paid \$216.00 to renew the club's Green Road post office box.
- reimbursed Jack Brisbin \$211.17 for his expenses for revamping the observatory deck and walkway.

As always, the records he keeps are open for any and all Lowbrow members to examine.

Meeting adjourned at 9:07, motion by Jack Brisbin, support from Ken Cook

REMINDER: MEMBERS PLEASE HELP!

Plan on attending an open house this summer. Your presence with or without a scope is helpful. Come and share the night sky with the public, they appreciate learning about and seeing the stars that are fading away in our overly bright suburban nights.

Minutes respectfully submitted,
Ken Cook, VP
attachment.

Proposed By-laws Amendment #5

During our officers' meeting on January 26, 2026, it was proposed to ask the membership for approval of an amendment to our By-laws, specifically, the maximum amount of money the officers can expend in one transaction without a vote of approval from the general membership. This was prompted when our total expenditure for our 2025 meeting at EMU exceeded the current \$250 limit. Traditionally, our host paid for the pizza order, and the Lowbrow President bought the beverages and cookies. So, two receipts were sent to our Treasurer for reimbursement. In 2025 neither receipt exceeded the threshold, but the combined amount did.

The last increase in the amount was approved in 2010. Prices for most things have increased greatly since then. Another consideration was not having to revisit this issue too often in the next few years, due to continuing inflation. Therefore, the officers voted to ask for a By-laws amendment to increase the amount to \$500. Below is the section of our By-laws that would be affected, with the proposed new amount in place of the current amount. This is Article IV, section B, part 3, f, 3.

- 3) **Special expenditures are one-time expenses for a special purpose or of a large sum (over \$500). These do require a vote by the membership to pay. Examples:**
- a) **Major expenses towards the repair and upkeep of the McMath telescope and observatory.**
 - b) **Purchases of equipment for the telescope or observatory,**
 - c) **Expenses of special events and activities planned by the Club.**
 - d) **Special expenditures under \$500 must be approved by a majority of the club officers, including either the President and/or Treasurer.**

Our By-laws state that proposed amendments must be emailed to the membership and published in our newsletter at least one month before the meeting when the vote is to be taken. Voting can occur in-person or by emailing your vote to lowbrow-members@umich.edu.

PLACES & TIMES

Monthly meetings of the University Lowbrow Astronomers are held on the third Friday of each month at 7:30 p.m. The location is usually the Judy & Stanley Frankel Detroit Observatory. The Observatory is located at 1398 E. Ann St., Ann Arbor. The Ann Street Parking Structure (M86), the Catherine Street Structure (M5), the Glen Street Structure (M61), and the School of Public Health II Lot are usually open after 6:00 p.m. Mon-Fri. The M86 structure is closest to the Detroit Observatory.

Peach Mountain Observatory is the home of the University of Michigan's 25-meter radio telescope and McMath 24" telescope, which is maintained and operated by the Lowbrows. The entrance is addressed at 10280 North Territorial Road, Dexter MI, which is 1.1 miles west of Dexter-Pinckney Rd. A maize and blue sign marks the gate. Follow the gravel road to the top of the hill to a parking area south of the radiotelescope, then walk about 100 yards along the path west of the fence to reach the McMath Observatory.



PUBLIC OPEN HOUSE / STAR PARTIES

Public Open Houses / Star Parties are generally held on the Saturdays before and after the New Moon at the Peach Mt. Observatory but are usually canceled if the forecast is for clouds or temperatures below 10 degrees F. For the most up-to-date info on the Open House / Star Party status call: (734) 975-3248 after 4 pm. Many members bring their telescope to share with the public and visitors are welcome to do the same. Mosquitoes can be numerous, so be prepared with bug repellent. Evenings can be cold so dress accordingly.

Lowbrow's Home Page
<http://www.umich.edu/~lowbrows/>

MEMBERSHIP

Annual dues are \$30 for individuals and families, or \$20 for full time students and seniors age 55+. If you live outside of Michigan's Lower Peninsula then dues are just \$5.00. Membership lets you access our monthly newsletter online and use the 24" McMath telescope (after some training). Dues can be paid by PayPal or by mailing a check. For details about joining the Lowbrows, contact the club treasurer at: lowbrowdoug@gmail.com

Newsletter Contributions:

Members and non-members are encouraged to write about any astronomy-related topic. Contact the Newsletter Editor: Amy Cantu cantu.amy@gmail.com to discuss format. Announcements, article, and images are due by the 1st day of the month as publication is the 7th.

Telephone Numbers:

President:	Charlie Nielsen (734) 747-6585
Vice President:	Don Fohey Brian Ottum Ken Cook Tim Miller
Treasurer:	Doug Scobel
Observatory Director:	Jack Brisbin
Newsletter Editor:	Amy Cantu
Key-holders:	Jim Forrester Jack Brisbin Charlie Nielsen
Webmaster:	Barry Chapman
Online Coordinator	Jeff Kopmanis

A NOTE ON KEYS: The Club currently has three keys to the Observatory and the North Territorial Road gate to Peach Mountain. University policy limits possession of keys to those whom they are issued. If you desire access to the property at an unscheduled time, contact one of the key-holders. Lowbrow policy is to provide as much member access as possible.

Email to all members
Lowbrow-members@umich.edu