

Reflector

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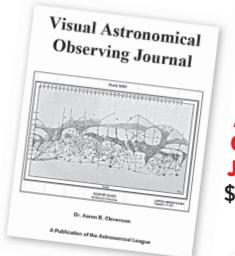


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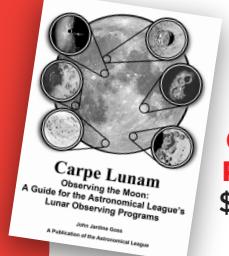
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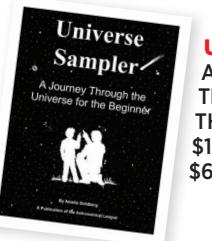
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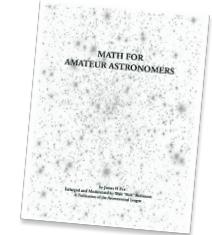
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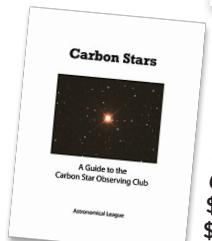
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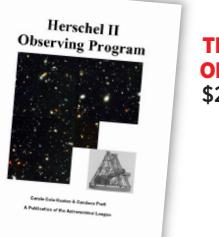
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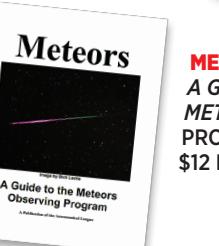
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Contents

- 4 President's Column
- 5 Deep-Sky Objects: Barnard's Galaxy
- 5 Full STEAM Ahead: Sidewalk Astronomy
- 6 DarkSky Corner: Marine Light Pollution
- 6 AL History Highlights
- 7 To the Editor: Free Magazine Collections, etc.
- 7 Night Sky Network: Centennial of the Planetarium
- 8 Amateur K-corona Imaging
- 10 Getting into (Astro) Gear
- 12 Bringing the Heavens Down to Earth: Caroline Furness's An Introduction to the Study of Variable Stars
- 14 Award Season 2025
- 18 Peltier Award
- 21 Observing Awards
- 24 Gallery



The Astronomical League Magazine

Vol. 77, No. 4 • ISSN: 0034-2963 • SEPT 2025

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606-340-0023

Reflector

QUARTERLY PUBLICATION OF THE ASTRONOMICAL LEAGUE

Issued by the Astronomical League in March, June, September, and December, *Reflector* (ISSN: 0034-2963) is sent directly, either by postal mail or via a digital link, to each individual member of its affiliate societies and to members-at-large as a benefit of League membership. Individual copies of *Reflector* are available at the following subscription rates, payable to the League's national office.

PAPER SUBSCRIPTIONS:

USA & possessions: \$3.00 each or \$10.00 per year (4 issues)
Canada: \$5.00 each or \$16.00 per year
Mexico: \$6.00 each or \$22.00 per year
Other countries: \$7.00 each or \$25.00 per year

DIGITAL SUBSCRIPTIONS:

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REFLECTOR AND CLUB ROSTER DEADLINES

March issue	January 1
June issue	April 1
September issue	July 1
December issue	October 1

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NATIONAL OFFICERS

President
Chuck Allen
4005 St. Germaine Court, Louisville, KY 40207
502-693-5504 • president@astroleague.org

Vice President
Terry Mann
9201 Ward Parkway, Suite 100, Kansas City, MO 64114 • vicepresident@astroleague.org

Secretary
Aaron Clevenson
19411 Cluster Oaks Dr, Humble, TX 77346-2918
281-852-4667 • secretary@astroleague.org

Treasurer
Mike Coucke
16901 SE Lee Blvd., Lawton, OK 73501
580-291-8392 • treasurer@astroleague.org

Executive Secretary
Lucia Harcum
1224 Cliffview Road, Waco, TX 76710
254-772-3738 • executivesecretary@astroleague.org

National Office
Mike Stoakes, Office Coordinator
Astronomical League National Headquarters
9201 Ward Parkway, Suite 100 • Kansas City, MO 64114
816-DEEP-SKY
leagueoffice.astroleague.org

Society rosters: rosters@astroleague.org
League sales: leaguesales@astroleague.org

National Observing Program Directors
Cliff Mygatt
cliffandchris@wavecable.com
Aaron B. Clevenson
aaron@clevenson.org
Al Lamperti
al.lamperti@temple.edu
Maynard Pittendreigh
maynard@pittendreigh.net

Astronomical League Historian
Denise Moser • historian@astroleague.org

LETTERS TO THE EDITOR

Send to larsen@ccsu.edu with subject line "letter to editor"

REFLECTOR STAFF

Managing Editor
Kristine Larsen
larsen@ccsu.edu
Assistant Editor
Kevin Jones
j11.kevin@gmail.com
Photo Editor
Dan Crowson
photoeditor@astroleague.org

Design/Production
Max Nomad
maxnomad68@gmail.com
Christopher Klein
chris_klein@me.com
Advertising Representative
advertising@astroleague.org



President's Column

From Your League President

I cannot adequately describe the excitement that flowed from our League convention at Bryce Canyon, Utah. Convention chair Lowell Lyon and his dedicated wife Linda worked for years to make this meeting special; this was their fourth time running League conventions.

Shout-outs also go to AstroCon '25 committee members Trevor Hebditch, Jenette Scott, Don Abernathy, Jamie Bradley, Krista Lemoine, Tony Sarra, and Aleta Cox of the Salt Lake Astronomical Society; David Moulton, Walter Williams, and Curtis MacDonald of the Utah Valley Astronomy Club; Toby Sheets of the Denver Astronomical Society; Marcy Curran of the Cheyenne Astronomical Society; Dave Walden and Carroll Iorg of the Astronomical Society of Kansas City; and Cindy La Russa of the Huachuca Astronomy Club.

How successful was the event? Registrations sold out. Meals sold out. Vendor space sold out. Clothing items sold out. Rainbow Point observing



Back Row (l to r): Joe Wheelock, Tony Bryan, Terry Mann, Chuck Allen, Simon Filbert, Zachary Harrington; Front Row: Donna Bryan, Scott Harrington, and Molly Harrington.

slots were booked solid. The convention was a who's who of amateur astronomy. A major vacation venue, Ruby's Inn offered a general store, a restaurant, pools, rodeos, helicopter tours, ice cream shops, rock shops, horse rides, and its beautiful Ebenezer's banquet and meeting hall with country and western entertainment in the evenings. And Ruby's Inn sits at the very entrance to one of the most beautiful national parks in the country, with its stunning views and extraordinary hiking trails.

Yes, a wildfire erupted a few miles to the west, and some of the smoke drifted toward Ruby's and the national park, but none of it curtailed the fun or the observing. At 9,200 feet elevation, Rainbow Point featured extraordinary skies, and the astrophoto contest conducted just a mile from Ruby's Inn was a huge success. Mount Palomar would be envious of the stunning color images taken during those few days, and I hope to see those images posted, with permission, in an upcoming *Reflector*.

Mitch Glaze, Scott Harrington, Joe Wheelock, and I observed one evening from a pullout at 8,600 feet, and the skies were magnificent in all directions but west. We observed V462 Lupi, the new nova in Lupus, using Scott's image-stabilized 15×50s and then a host of deep sky objects using Mitch Glaze's 10-inch Dob. M51's spiral arms were easily seen in the 10-inch despite some slight smokiness.

We were blessed to have our top three National Young Astronomer Award winners, Julian Shapiro, Howard Qian, and Julian Du, and both of our Horkheimer Service Award winners, Claire Zhao and Jericho Kuehl, at the convention. Julian Shapiro provided a program about his recent discovery of an extremely large quasar light echo. Howard Qian gave a talk on the algorithm that he and Tony Wu developed as a tool for

detecting potentially habitable planets around intermediate period exoplanets. Jericho Kuehl discussed his citizen science work on variable stars and exoplanet transit detection using a Unistellar eVscope 2.

Naturally, I was busy chairing council and business meetings, attending talks, giving a talk, attending a coordinators meeting, visiting with vendors, meeting with small groups, observing, and greeting many individuals. I

needed logistical, transportation, and other forms of support during those five days, and I received just that from great friends: Scott Harrington, Zachary Harrington, and Molly Harrington who traveled with me from Arkansas; our dedicated vice president and past president, Terry Mann; Joe Wheelock of McDonald Observatory; Donna and Tony Bryan of the Evansville Astronomical Society; Simon Filbert of the University of Utah; and Jason McAlister of California. Thanks for your help with the many sudden needs that arose. Thanks also to Scott Roberts and Kent Martz of Explore Scientific for your sponsorship of so many of our youth and imaging awards.

Due to the profitability of this convention, coupled with cost savings from the digital issue of the *Reflector* in March and anticipated cost savings from our new publisher, our budget for the coming year will balance without touching even half of our annual trust fund interest or any of the additional \$75,000 we received from a bequest. Our financial health is sound.

To all involved with AstroCon '25, thank you for a job well done.

—Chuck Allen, President

Deep-Sky Objects

Barnard's Galaxy

Barnard's Galaxy, NGC 6822, is an irregular galaxy located in the northeastern corner of the constellation Sagittarius. It is located halfway between Rho Sagittarii and Alpha Capricorni. In a telescope/eyepiece combination with a one-degree true field of view, planetary nebula NGC 6818, the Little Gem Nebula, can be seen at the same time as Barnard's Galaxy.

To star hop to Barnard's Galaxy, start at Beta Capricorni. Beta is the brightest star in the constellation Capricornus. (It is more than a magnitude brighter than Alpha. In most constellations the brightest star is called Alpha. When originally designated, Alpha Capricorni might have been brighter than Beta.) From Beta Capricorni, hop 5.5 degrees west and 1 degree south to a 5th magnitude star designated 61 Capricorni. From there, hop 4 degrees further west and one more degree south to a pair of 5th magnitude stars known as 54 and 55 Capricorni. 55 is slightly brighter and more northerly than 54. A mere 45 arcminutes north of 55 is another

Because of its low surface brightness and lack of a bright central core, Barnard's Galaxy can be very challenging to spy visually. From a dark site, it can be seen using averted vision in a 6-inch telescope. I have viewed it in telescopes of various sizes, but all views were unimpressive except in a 14-inch f/6 Dobsonian reflector



star of magnitude 5.5. Those three stars form an arc curving north. Follow the arc north-northeast another 45 arcminutes and you will be at NGC 6822.

Edward Emerson Barnard discovered NGC 6822 in 1884 using a 6-inch refractor. In his early years Barnard worked in a photography studio in his hometown of Nashville, Tennessee, developing photographic plates. He eventually purchased a 5-inch refractor and started hunting for comets. His comet discoveries in the early 1880s made him a local celebrity. He was offered a position at the new Vanderbilt University Observatory. He probably discovered NGC 6822 there while sweeping the skies for undiscovered comets. Barnard was one of the best visual astronomers who ever lived. But he also pioneered using photography in astronomy making it the most useful tool for new discoveries.

Barnard's Galaxy is a member of the Local Group of galaxies, and is only 1.6 million light-years away. The galaxy is classified as an irregular, similar to the Small Magellanic Cloud, which is a lot closer. In 1924, Edwin Hubble used Cepheid variables to calculate the distance to Barnard's Galaxy, the first galaxy beyond the Magellanic Clouds to have its distance determined. The galaxy is 11.8 arcminutes in diameter and has an integrated magnitude of 9.4. Like the Magellanic Clouds, NGC 6822 has lots of active star forming regions.

They picked up the 8-inch Orion telescope, which had external scratches and a large dent in the tube. Upon investigation, we found one spider leg was broken and another was rusted in place, the focuser was corroded from water damage, an eyepiece was rusted into its 2-inch to 1 1/4-inch adapter (along with and rust along the tube

where I could collect enough light to see some shape to the galaxy. Although many people report the galaxy to be square shaped, to me it looks more elliptical. This is due to a bar-like feature in the galaxy running north-south.

My image of NGC 6822 was taken with a 190 mm (7.5-inch) f/5.3 Maksutov-Newtonian telescope

with a SBIG ST-2000XCM CCD camera. The exposure was 170 minutes, barely enough time to capture faint detail. However, several H II regions are visible in the image. Most of the stars in the image are foreground Milky Way stars.

Note: This column was motivated by *The Barnard Objects*, by Tim B. Hunter, Gerald O. Dobek, and James E. McGaha, reviewed in the December 2024 issue of the *Reflector*.

—Dr. James R. Dire

Full STEAM Ahead

Sidewalk Astronomy: Remmie's Scope

When you encourage a young cosmos-loving family to investigate used telescopes due to the costs, be careful what you tell them—and what you don't tell them, for that matter. With the mom hooked on astronomy since high school, the Andrus family, including young Remmie, quickly became a fixture at our sidewalk events. They quickly sought out a smaller Dob than our homemade scope, "Moon Killer," which they used many times. We had said we would be happy to clean and collimate, and procure or lend eyepieces, when they found one. They found a scope for 100 dollars, but unbeknownst to them, it had several critical problems.

They picked up the 8-inch Orion telescope, which had external scratches and a large dent in the tube. Upon investigation, we found one spider leg was broken and another was rusted in place, the focuser was corroded from water damage, an eyepiece was rusted into its 2-inch to 1 1/4-inch adapter (along with and rust along the tube

seam), and there was a ton of dust and general crud. Miraculously, the mirror was in perfect shape and just needed a good cleaning. It became a bigger project than we expected.

Removing the spider was quite the endeavor, as a screw rusted to the tube indicated this scope had encountered water at some time. In fact, it had been stored in a leaky storage unit. Rick's high school metal shop came alive as he fabricated new legs for the spider, which I spray painted. The focuser was removed and had a Lime-A-Way bath, followed by a slight sanding and layers of hammered black spray paint.

The optics were taken care of in the garage, but the tube was an outside job. Layers of flat black paint were rolled on the inside of the tube and, once that was done, the outside of the tube needed help. The dent was carefully hammered out and then the tube was suspended between two ladders on a dowel. Three cans of gloss black paint were used after the seam was slightly sanded to loosen the rust and the area was wiped clean of debris. The eyepiece holder was also coated to match the tube. And then there was the base: it was fine, but in the hands of an astro-artist, everything is a canvas of potentiality.

This was all happening during unusual ice storms and low temperatures, so the Telrad and other things we needed took longer than normal to be delivered. That also impacted the paint department and even the optics, as the garage was frigid as well. The final touch was painting the Moon, asteroids, the Sun, an eclipse, a comet, planets, and the starfield base, with sewn night sky fabric end caps.

The delivery of the refurbished scope was met with great elation, and Remmie did not recognize her scope. The parents were so grateful for our work, and they were extremely patient while we maneuvered around the winter weather.

Now, when the Broken Arrow Sidewalk Astronomers sets up at our usual pizza place at first quarter Moon, Remmie and her scope are part of the crew.

Editor's note: See pictures of "Moon Killer" and Remmie's scope at www.facebook.com/BASideWalkAstronomer/photos_by

—Peggy Walker, Broken Arrow Sidewalk Astronomers

—Tim Hunter



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DarkSky Corner

AL History Highlights: Years Ago

50 Years Ago—August 1975

"Guideposts of the Universe: A Project in Observing"—[H]ow do astronomers measure such large distances [huge distances in the universe]? . . . The amateur observer can make his own estimates of the size of the galaxy, using quite modest equipment" Dr. Michael Flick explains that the key is observing a special type of variable stars: Type II Cepheid variables. These variable stars show a specific relationship between their luminosity and the period of their variation, which can be used to calculate distances. Henrietta Leavitt discovered these are the "Guideposts of the Universe" in 1912 at Harvard, and the physicist Harlow Shapley provided the useful mathematics. Cepheid variables were the first "candlestick" for distances in the universe. In his proposed method for the size of the Milky Way, Dr. Flick suggests the observation of such variables in globular clusters. Globular clusters reside in the halo of the galaxy, the sphere of stars that surround the galaxy's disk. "To determine the approximate diameter of that galaxy, it is thus only necessary to measure the diameter of the galactic halo."

Amateur astronomers can observe and plot these values from various globular clusters in the halo. After applying certain mathematical procedures, a rough diameter can be determined which improves with more observations. " . . . the process [is] easy, well within the reach and abilities of many observers." Automated surveys and computerized models may provide more precise results nowadays. Observing projects can still challenge dedicated and serious observers. [Note: Dr. Frick is a professor emeritus of Xavier University. He was vice president of the Astronomical League in the early 1980s, chair of League education in the 2010s, and active in the Great Lakes Region.]

25 Years Ago—August 2000

"A Grand Journey," the *Reflector* Wins APEX 2000 Award, and "Unknown Astronomer" . . . Comes Out of the Bag"—"A Grand Journey" was the farewell column by Ed Flaspoehler, *Reflector* editor, after more than a decade of service. Not only did Ed receive the President's Award at the annual convention in that year, but he also won the Award for Publication Excellence (APEX) for the second year in a row as *Reflector* editor, in the category for smaller newsletters. The recognition was from "Communication Concepts," a business publications group of editors. In expressing thanks to many supporting individuals, Ed includes a shout-out to the, until then, anonymous author of "The Tales of the Unknown Astronomer." In this issue, Mike Planchon revealed his identity with tales of his anonymity using his usual "style and wit." [Note: Mike Planchon was well known to members of the Southwest Region. His last column appeared in 2016. He passed away in 2023.]

—Denise Moser, AL Historian

To The Editor

Just got the June issue of the *Reflector* with the awesome article by Donald Lubowich. Here is a shout out and "hi" to Donald! I spent many wonderful years attending Astronomy on the National Mall as Caroline Herschel. It was quite an amazingly wonderful event. People came back year after year to say hi to and visit with Caroline. I am blessed to have been a small part of this wonderful event. Thank you, Donald!

—K. Lynn King, presenter of Caroline Herschel, 18th century astronomer

Re: "The Archduke and the Telescopes," what a heartbreaker to learn Albert's collections and

telescopes are lost. Perhaps a clue to finding any of it will surface some day.

—Nancy Huff

To the readers of the *Reflector*:

I would like to donate (for free) my collection of bound journals to a 501(c)(3) organization, such as an astronomy club. I cannot ship them, so you would need to pick them up (location is near Salt Lake City). I would like to keep the collection intact, if possible.

The collection includes complete collections of:

- *Sky & Telescope*
- *Astronomy*
- *The Planetary Report* (The Planetary Society)
- *Star and Sky* (few will remember that one)
- Several issues of *The Sky and The Telescope* (predecessors of *Sky & Telescope*)
- *National Geographic* 1973–2022
- *Observer's Handbook* 1965–2014

Anyone interested can reach me at 4099wiggins@gmail.com.

Clear skies,
—Patrick Wiggins

Night Sky Network



The first planetarium opened to the public in Munich, Germany, in 1925. Celebrate the 100th anniversary with the Centennial of the Planetarium at planetarium100.org.

For the last century, planetariums have inspired the next generation of scientists and stargazers. Today, many are facing significant staffing shortages that challenge their ability to deliver the live, engaging programming their audiences crave. According to the 2024 Planetarium Climate Survey, nearly 60% of responding facilities reported being understaffed, with many relying on a single presenter to serve thousands of annual visitors, particularly school groups. At the same time, public demand is

shifting. Audiences increasingly seek interactive experiences: live sky tours, real-time Q&A sessions, and community-based programs that go beyond the dome.

This is where amateur astronomy clubs can play a powerful role! As amateur astronomers, we bring both credibility and contagious enthusiasm to public science engagement. Our hands-on experience, storytelling skills, and deep commitment to outreach make us ideal partners for planetariums in support of our communities. The Planetarium Climate Survey highlighted collaboration with local astronomy clubs and individuals as a top opportunity for growth, and a key way to meet the surge in demand for live content.

Here are just a few ways amateur astronomers can contribute meaningfully:

- Leave handouts about your club at the planetarium to help community members find upcoming events.
- Co-host public events – telescope tours before or after shows offer seasonal context and personal insight.
- Guest presentations on topics like citizen science, astrophotography, or personal observing projects bring the sky to visitors.
- Event support for eclipses, meteor showers, or NASA mission milestones.
- Instrument demonstrations or DIY nights help families understand more about astronomy or even encourage them to build their own scopes.

To start building connections, explore the International Planetarium Society's "Find a Planetarium" directory (ips-planetarium.org/page/planetariumfinder) to locate facilities near you. IPS also offers a range of useful tools, including "Resources for Presenters" and professional development materials like sample curricula, training workshops, and links to member societies – all available on the Resources (ips-planetarium.org/page/resources) page of their website.

Whether you're an outreach veteran or just starting to share your passion for the night sky, planetariums offer a natural stage and a deeply appreciative audience. Together, we can foster lasting connections between science, sky, and the broad ecosystem of learning in our communities.

—Tony Smith, Theresa Summer, Shanil Virani, Astronomical Society of the Pacific

Amateur K-corona Imaging

By George Hripcak

During a total solar eclipse, the K-corona is the main thing you see, with its pearly white streamers near the eclipsed Sun. It comes from photospheric light scattered by free electrons in the corona and produces a continuous spectrum of highly polarized light. The E-corona looks similar to the K-corona but is 100 times dimmer and is emitted in narrow bands from ions like Fe XIV; it is not noticeable during an eclipse. The F-corona is photospheric light reflected off dust and appears as a dim glow further from the Sun during an eclipse.



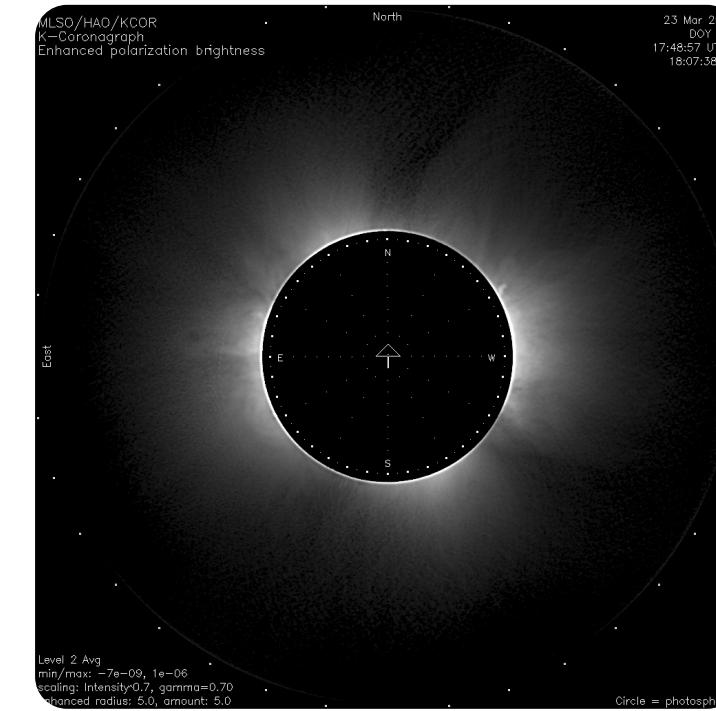
create an artificial eclipse, and a set of lenses and stops to reduce scattered light and create a parallel light beam. In this case, I used a 100-Å-wide filter at 6,900 Å to reduce the brightness of the blue sky around the Sun and a linear polarizing filter made for cameras, and then a 0.5x reducer and an ASI1600MM Pro camera. I took videos of 100 msec exposures at 0 gain and 12-bit ADC.

I went to Utsayantha Mountain (3,200 feet altitude) in New York on the clear morning of November 16, 2024, and grabbed some one-minute videos of the Sun with a polarizer set in two directions, 0 and 90 degrees. I subtracted the orientations to get the polarized light and found a subtle but unmistakable signal on either side of the Sun. I determined that I needed longer videos and more orientations to get something that looked like the corona.

I went back to Utsayantha on March 23, 2025. It was a clear but windy day, so windy that a lot of dust was unfortunately blown into the air. This time I took 20 one-minute videos with the polarizer oriented at 0, 45, 90, and 135 degrees; it was almost half a terabyte of data. I used AstroSurface to stack the videos and Photoshop to average and then subtract the polarizer orientations from each other, producing eight pie slices that I spliced together. (I also tried numeric processing of Stokes parameters to extract polarized light, but it produced less detailed images.) I repeated some videos with the telescope

Amateurs have begun to capture images of the solar E-corona outside of a total solar eclipse ever since Klaus Hartkorn made his inaugural images and sightings in 2020. Since then, a handful of amateurs have captured similar images. The E-corona is feasible to image because a narrowband filter can improve the signal-to-noise ratio by 2500-fold. The K-corona has been more elusive, with no previous amateur images outside of an eclipse that we know of. The K-corona is almost a million times dimmer than the photosphere just an arcminute away, so capturing it without the benefit of a narrowband filter has not been possible.

Using my 50 mm coronagraph described in the March 2022 and March 2024 issues of the *Reflector*, I switched from the narrowband E-corona filter to a linear polarizer. The coronagraph has a 50 mm f/20 uncoated singlet lens, an obscuring cone to



rotated 90 degrees to ensure that I was not imaging telescope aberrations. I also took images of the E-corona using my previously described 1.2-Å-wide 5,303 Å filter.

The first image is the K-corona, showing only polarized light. The second is my image of the E-corona showing the corona's loops and streamers and orientation. The third image was taken by the Mauna Loa K-coronagraph professional instrument that has been down since a 2022 lava flow, but which was turned on for three days with an image coinciding within three hours of mine.

The K-corona lit up when the polarizer direction was tangent to the solar surface, which is a known property and helps confirm this result. If you look carefully at the 8 o'clock position, you

will see a large but subtle loop; that loop is confirmed on the E-corona image and the professional view. Other structures are similarly parallel. There are some round artifacts perhaps due to dust. There is a bright jet at 2 o'clock that is confirmed on the Mauna Loa image and demonstrates that the K-corona and E-corona are similar but not identical. The jet is missing from my E-corona image taken 30 minutes earlier and is also missing from a Solar Dynamics Observatory satellite image (not shown) at 211 Å, which corresponds well to the E-corona, taken simultaneous with the K-corona shot.

The corona is an exciting new area for amateur astronomers. The development of K-corona imaging adds further to amateurs' possibilities. Because no narrowband filter is needed, the cost is less than common H-alpha imaging, but it does require persistence; this is my fifth year of effort.

Getting Into (Astro) Gear

By Chris Wilcox

According to Night Sky Network's ranking (NASA 2025) of club outreach activities, the Astronomy Club of Asheville (ACA) is one of the busiest in the nation. Weather permitting, we hold two public stargazes monthly and give numerous solar and nighttime presentations to kids throughout the school year. Though key parts of the Blue Ridge Parkway remain closed in the aftermath of Hurricane Helene, we're working to resume a steady cadence of pop-ups, which allow us to share the night sky when the short-term forecasts predict good viewing conditions. We maintain loaner scopes, publish a world-class calendar, award several scholarships annually, and host presenters at ten meetings in a typical year. But there's another less obvious avenue we've found to be very effective in fostering astronomy throughout western North Carolina: telescope sales.

Or, maybe we should say gear sales. Like many clubs, we receive offers of all manner of used astronomy equipment, ranging from "hobby killers" on shaky mounts to solid scopes, eyepieces, filters, lasers, and, occasionally, high-end astrographs and heavy-duty tripods. Donations arrive from various sources, including underutilized gifts, inherited items, and gently used equipment given to us by area astronomers as they upgrade their rigs. And, we're shameless: when folks contact us for assistance selling their gear, a member will likely reply asking if they would rather donate it to us instead!

The club's sales of astronomical gear are a win-win situation. Donors of quality items can often take a deduction on their taxes, and they can always feel good about supporting our non-profit, publicly engaged club. Low selling prices allow more folks to explore the hobby using expertly rehabilitated equipment, which

is good for the long-term health of the hobby and the club. Finally, proceeds from these sales have become a significant portion of our club's income.

Other Astronomy League-affiliated clubs can probably replicate the ACA's success with gear sales, but it certainly helps to have someone like Paul Henze. He's our secret sauce, running the sales program like a finely tuned machine. Before moving to Asheville, Paul helped build a planetarium and observatory at the Bear Branch Nature Center in Maryland. Working with other members of his local club at the time, the Westminster Astronomy Society (WASI), Paul's optical bench craftsmanship helped prove a concept for an occulter that might have flown in formation with the James Webb Space Telescope, allowing it to capture direct images of exoplanets (UMBRAS 2004). Over the years, he has built several telescopes, adjustable observing chairs, parallel binocular mounts, and many other items that make astronomy easier for people nationwide.

A lifetime WASI member, Paul joined the ACA soon after he and his wife Paula moved from Maryland to North Carolina in 2014. Paul is a regular volunteer at our outreach programs and has done extensive work maintaining and improving the club's observatory at Grassland Mountain. At Grassland during an August 2020 stargaze, Paul approached one of our web admins, Jerry Sherman, proposing that we add a page on the site for telescope sales. Jerry completed the requisite coding quickly, and our sales program was off to the races.

When someone contacts us about donating their astronomy gear, Paul usually drives to the donor's location to collect the items. During the periodic flood tides, all the donated gear may displace his car from the garage. His genius for tinkering is well suited to getting the equipment into working order, often with modifications that improve on the original design. A deep stock of components, tripods, and accessories allows Paul to mix and match as he creates some nice scope/mount combinations. We set prices lower than are typical for comparable used equipment, thus making it affordable to start or grow in the hobby. Club member Chris Wilcox recalls his first purchase from the ACA as revelatory. "My starter scope was an SCT on a go-to mount, which I received as a gift. That was great, but I didn't start really learning my way around the sky until I dropped \$250 for that 8-inch Dob and began star hopping."

Occasionally, Paul will select a restored item as a prize for the raffle that ACA vice president Bob Lewis runs at our regular meetings. More often, though, Paul

works with Jerry to create a listing. Jerry will use Paul's brief description, suggested price, and photos to flesh out a detailed and nicely formatted advertisement on our award-winning website's "For Sale" page. We don't offer shipping or a guarantee on electronic components. Our treasurer, Ilene Aronson, confirms payment using a no-frills PayPal form. Jerry marks the item as sold, and Paul follows up with the buyer to arrange delivery. He's apt to drive across several mountain counties for a rendezvous, at which he may impart a few observing tips and throw in an eyepiece not included in the original ad. Before heading home, Paul will invite the new telescope owner to attend upcoming ACA activities such as stargazes or lectures. Several current members mark their introduction to the club via Paul and the sales program he coordinates with grace and dedication.

We have a few closing thoughts on trash scopes and hobby killers. Paul and Todd Creamer, a fellow member with long ties to multiple clubs, were recently discussing what to do when approached with offers of dubious instruments like an f/15 refractor sized for 0.925-inch eyepieces featuring plastic lens elements. They agreed that the club could not provide a tax letter with such a telescope, but a question lingered. Are we duty-bound to accept the gift just to consign it to the landfill? Scavenging parts would yield little value, but allowing it to wind up at a thrift store might frustrate a budding observer's dreams. Another approach is politely declining, explaining that its highest purpose is as a decoration. Still, some old-timers recollect cutting their teeth on wonky department store telescopes and falling in love with astronomy despite early use of sub-standard equipment.

How does your club handle this type of situation? Contact us with questions or to compare notes: inquiry@AstroAsheville.org.

References:

NASA, Night Sky Network, "Stars in the Network"
nightsky.jpl.nasa.gov/stars/

UMBRAS
umbras.org/ground_testing.html

Did you know...

The Astronomy Genealogy Project (astrogen.aas.org) allows you to search for the thesis advisor and PhD students of your favorite 20th century astronomers. Some of these scientific genealogies are quite interesting (look up Neil DeGrasse Tyson, for example).

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Bringing the Heavens Down to Earth: Caroline Furness's *An Introduction to the Study of Variable Stars* (1915)

By Kristine Larsen

Springfield Telescope Makers and Central Connecticut State University

Caroline E. Furness (1869–1936) studied astronomy at Vassar College under Mary W. Whitney, herself a former student of Vassar's first astronomy professor, Maria Mitchell. After teaching high school math in Connecticut and Ohio for three years following her graduation, Furness returned to Vassar as Whitney's assistant and began taking graduate classes. Although Furness's 1900 PhD from Columbia in Astronomy (the first granted to a woman) was based on her measurement and reduction of Helsingfors plates of the north celestial polar region, at Vassar her main areas of research were computing cometary orbits and observing variable stars. From 1910 to 1915 Furness was acting director of the observatory while Whitney was on extended sick leave, and upon her mentor's retirement she took over the directorship and became Alumna Maria Mitchell Professor of Astronomy. She remained at Vassar until her death in 1936. Her 1915 book, *An Introduction to the Study of Variable Stars*, was the first major work on this subject published in English. It not only described the state of variable star science at that time, but provided instruction and advice for individuals interested in conducting their own variable star observations.

Furness was well qualified to write this book. She was a charter member of the American Association of Variable Star Observers (AAVSO) and later served on its council (1918–20). But her experience working with variable stars began at Vassar. Whitney had started a photographic photometry variable star observing program at the college in 1901, and not only did Furness learn observing from Whitney but also acted as a teaching assistant when Whitney developed a full course in variable stars at Vassar (the first of its kind in the country). When Furness became acting director of the observatory, the task of editing the results of the observing program fell to her; these were eventually published in 1913.



Caroline Furness, 1917 Vassar College yearbook. Wikimedia Commons image.

Furness's stated purpose in writing the book was to serve both the college student and the amateur observer through a complete, coherent, and clear review of the physics, observational techniques and technologies, and historical development of our understanding of variable stars. As was noted by Furness (and many reviewers), hers was the first book of its type written for this intended audience in English. Furness was generous with her acknowledgements, thanking, among others, astronomers at a number of observatories, secretarial help, students, and AAVSO members Helen Schwartz and David Blencoe and secretary William Tyler Olcott.

The work attempted to highlight all aspects of variable star astronomy, not just observing techniques. Besides chapters on star charts, catalogs, and an explanation of the magnitude system, the book covered visual, photographic, and photoelectric photometry, as well as basic statistical analysis.

The book was published in October 1915, one of a number of volumes issued in celebration of the 50th anniversary of the founding of Vassar College. It was very well received by the astronomical community (and others), and it was still considered an important reference decades after its publication. At the World's Fair in Chicago (1933–34) it was judged one of the best one hundred books written by an American woman during the previous century (Makemson 1936, 100). In 1940, Clinton B. Ford referenced Furness's book in a paper on observing long period variables, specifically directing the reader to her treatment of the Purkinje and Dove effects.

R.G. Aitken of Lick Observatory wrote in the *Publications of the Astronomical Society of the Pacific* that the work shows "that Miss Furness is a trained observer as well as a practical and successful teacher. The treatment is full and clear and the illustrative examples are given in sufficient detail" (1915, 253). H.E. Goodson of the Lockyer Observatory in Britain opined in *Nature* that the "intention of the work is primarily to make observers, and the practical side of the subject is kept prominently to the fore throughout" (1916, 674). Yerkes Observatory astronomer and photometry expert J.A. Parkhurst wrote three positive reviews, in *Popular Astronomy*, the *Astrophysical Journal*, and *Science*. For example, in the *ApJ* review he notes that Furness "shows herself to be possessed of the spirit of both the teacher and investigator, in thus combining the description of underlying principles with that of the latest extensions of work on variable stars" (1916, 87). His review in

PREFACE

DURING the past few years the subject of variable stars has become increasingly interesting to the amateur who is the owner of a telescope, as well as to the average college student who has some knowledge of astronomy, while to the research worker it offers many lines of investigation which are full of promise. However, so complex is the subject, and so diverse the principles involved in a complete understanding of it, that extensive reading in several different directions is required as a foundation.

It is with the purpose of supplying this need as well as of making an important and attractive branch of astronomy accessible to the student that the present volume has been prepared. It is the outcome of several years of teaching the subject in Vassar College, for which the material was primarily collected. This material is scattered throughout various periodicals in the form either of research papers or quite popular articles, intended to give directions for observation to owners of small telescopes. A large amount of historical matter is also included, which is taken from sources not within easy reach of the general reader. Mention may be made of some of the subjects treated, which are introductory to the study of stellar variation, such as the study of the *Durchmusterung* charts, photometry in all its branches, spectroscopy, and star color. The purpose of the present volume is to consider all of these points, and in particular to give in as simple and clear a form as possible a full presentation of the physical principles upon which many of the instruments and methods of investigation are based, principles such as those of polarized light, spectrum analysis, the formation of the photographic image, and photo-electricity. Textbooks on astronomy rarely include

Preface to Furness's book

Science explains that the "amateur will thus find not only clear and complete directions for work, but the basic principles which enable him to understand the significance of his results. The professional astronomer will also find the book useful on account of its convenient collection of data for which he had been obliged previously to search through periodicals" (1916, 502).

Furness's book provided two lists of "easy" variables for beginning visual observers (heavily weighted to long-period variables). The first was advertised as stars that are "easy to locate because of their proximity to lucid stars, and are therefore recommended for observation with small telescopes which are unmounted" (305). The source of this list is given as the AAVSO. The second list is for mounted telescopes (allowing for the use of setting circles to locate the stars). A comparison of Furness's lists to the modern AAVSO lists of stars for beginners shows about 50 percent overlap, demonstrating the scientific "staying power" of these stars. It is also interesting to note that Furness, like the modern AAVSO, suggests that long-period variables with large amplitudes are especially well suited for visual observers.

Given that astrophysical knowledge was much less well developed a century ago, it is not surprising that the classification of variable stars in Furness's book bears little resemblance to the modern taxonomy of these objects. For example, Furness cites Edward C. Pickering's 1880 Harvard system of five classes largely based on period and amplitude, without much understanding of the astrophysical processes responsible for those differences. A comparison of Pickering's system and the modern classification (www.aavso.org/types-of-variables-guide-for-beginners) demonstrates just how far our understanding of variable stars has come since the publication of Furness's work.

As previously noted, Furness was very familiar with the AAVSO, and was also of the opinion that situating the study of variable stars within a larger survey of the history of astronomy was pedagogically important. Therefore it should be no surprise that she devotes several pages of her chapter on "Hints for Observers" to the AAVSO. Given the book's publication only four years after the formation of the organization, it is interesting to read Furness's account of what she felt were the important highlights of its development. This is just another of the fascinating historical points that can be gleaned from a close reading of Furness's book. I invite you to peruse its pages for yourself, available for free at archive.org/details/introductiontost00furnrich.

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LIST I

- 072708 S Can. Min.
092411 R Leonis.
103769 R Ura. Maj.
141954 S Bootia.
154428 R Cor. Bor.
162119 U Herculis.
170215 R Ophiuchi.
180531 T Herculia.
184205 R Scuti.
198449 R Cygni.
230110 R Pegasi.

LIST II

- 021403 o Ceti.
023188 R Trianguli.
048274 X Camelop.
174922 U Geminorum.
123160 T Urs. Maj.
123961 S Urs. Maj.
134440 R Can. Ven.

142584 T Camelop.
154615 R Serpentis.
163266 R Draconis.
194632 x Cygni.
205923 R Vulpeculae.
210868 T Cephei.
213843 SS Cygni.
230759 V Cassiopeiae.

Furness's lists of recommended variable stars

Award Season 2025

By Terry Mann and Chuck Allen

This year, we received a record-setting 55 nominations and 11 applications for League general and youth awards. We were especially pleased to have the top three winners from our National Young Astronomer Award and the winners of both Horkheimer Youth Service Awards join us at AstroCon '25 in Utah. Here are our 2025 award winners.

GENERAL AWARDS

ASTRONOMICAL LEAGUE AWARD



WINNER: ALBERT H. NAGLER

At the Northeast Astronomy Forum (NEAF) in April, Terry Mann and Chuck Allen had the privilege of presenting the League's highest honor, the Astronomical League Award, to Al Nagler of Tele Vue Optics. The presentation took place on a theater stage during the event.

Al, who turns 90 this year, enjoyed strong educational preparation that included the prestigious Bronx High School of Science and a subsequent BS in physics. While in high school, he built an 8-inch reflector that earned him a prize, a paid article in *Mechanix Illustrated*, and a job at Farrand Optical Company where he worked for 16 years. Working under Farrand's Grumman Aerospace contract with NASA, he designed the optics for an infinity simulator used to train Gemini astronauts. After a stint as chief optical engineer at Keystone Camera Company, for whom he designed a zoom lens for the company's pocket camera, he founded Tele Vue in 1977. His work with Farrand introduced him to 45-lens optical elements that produced 145-degree fields, and he used that experience to develop Tele Vue eyepieces that soon took amateur and professional astronomy by storm. In 1977, he introduced the Tele Vue Nagler eyepieces whose 82-degree apparent fields and edge sharpness stunned observers. His newer eyepieces boast stunning 102-degree fields. He has even added a white phosphor night vision eyepiece that can triple the effective aperture of a telescope. Congratulations to Al for a lifetime of work that has benefitted untold thousands of amateur astronomers worldwide.

G.R. WRIGHT SERVICE AWARD



WINNER: DR. W. MAYNARD PITTEDREIGH

The G.R. Wright Award, founded in 1985, is our highest award for service to the League. This year's honor goes to Dr.

W. Maynard Pittendreigh of Winter Park, Florida. Maynard is a member of the Brevard Astronomical Society, the Central Florida Astronomical Society, the Fort Bend Astronomy Club, and the Royal Astronomical Society of Canada, and he has served as executive secretary of the League for the last six years. During that time, he has overseen the League's national office and staff, made meaningful contributions as a member of the League's bylaws revision effort from 2019 to 2023, and brought experience and collegiality to the League's executive committee.

Maynard chaired our 2019 League convention in Titusville, Florida, and pursued the dream of our late League president, Bill Bogardus, by arranging for the convention to include a three-day cruise to the Bahamas aboard Royal Caribbean's Mariner of the Seas. He has also served, and continues to serve, as a national director of the League's Observing Program Division and as coordinator of the popular Master Outreach Award Program.

Maynard was recently awarded the highest level of achievement in the League's Observing Programs: the Triple Crown Award for completing requirements for Master Observer Platinum, Master Imager, and Binocular Master Observer.

MABEL STERNS NEWSLETTER AWARD



This award recognizes club newsletter editors whose job is to communicate with members.

WINNER: KENNETH KOEPLINGER

Kenneth Koeplinger is editor for the *Delaware Valley Amateur Astronomer*, the newsletter of the *Delaware Valley Amateur Astronomers* in Pennsylvania. His astronomical interest derives from his training in materials science, nuclear chemistry, and molecular biology, and from his father's work as a metallurgist for the Gemini space program. Ken's interest in astrochemistry includes intrastellar nuclear fusion and the ongoing search for chemical signatures of life in our Solar System and the universe.

From the moment he joined DVAA, he became involved in outreach activities, and this year he signed on as outreach chair. Ken is a NASA volunteer at the Wallops Island Visitors Center, and last year was named a NASA Solar System Ambassador. Ken puts a great deal of thought and effort into creating a newsletter issue that is thematically coherent.

RUNNER-UP: BETH BERO

Beth Bero is editor of *Via Stellaris*, the 20-plus page newsletter of the Von Braun Astronomical Society in Huntsville, Alabama. The newsletter is a colorful and easily scrollable

document that highlights club activities, provides instructional articles on astrophotography, highlights club participation in special events like local science fair judging, and recognizes members who have completed Astronomical League Observing Awards (Thank you!).

THIRD PLACE: DAVID ROSSETTER

David Rossetter is editor of *The Desert Skies Bulletin*, newsletter of the Tucson Amateur Astronomy Association. His 30-plus page newsletter is especially noted for its spectacular gallery featuring extensive and impressive member astrophotography. The newsletter also highlights the monthly availability of targets tied to various League Observing Programs (Thank you, also!).

WEBMASTER AWARD

This award recognizes club webmasters whose job is to communicate with the public and with potential members.



WINNER: ROB FLEMING

Rob Fleming serves as webmaster for the Central Florida Astronomical Society. Rob updated the CFAS website in 2024 to bring it into line with modern design standards. He provided mock-ups to the club's design committee, quickly incorporating feedback and rolling out the redesigned site. He also maintains the site. In addition, Rob provided the club with a refreshed logo and design standards that have improved the look of CFAS signage and brochures at outreach events. Rob's work has had a direct impact on CFAS membership growth.

RUNNER-UP: CHRIS BERO

Chris Bero is webmaster for the Von Braun Astronomical Society in Huntsville, Alabama. He maintains a beautiful site that is easily navigated and that keeps members and potential members informed of club events and meetings, club history, library and planetarium activities, and more.

THIRD PLACE: ED FOLEY

Ed Foley is webmaster for the Tucson Amateur Astronomy Association. The website features an extraordinary array of more than 60 different menu items covering every aspect of club activity, history, membership activity, astronomy instruction, and community involvement.

WILLIAMINA FLEMING IMAGING AWARDS

The Williamina Fleming Imaging Awards recognize outstanding astronomical imaging by female League members aged 18 years and older.

SOLAR SYSTEM IMAGING (>500 mm)



WINNER: BRITNEY MILLER

Brittney Miller is a member of the Atlanta Astronomy Club. Her winning Solar System image recorded a lunar occultation of Mars. She imaged the event with a Celestron C-8 and a ZWO ASI224MC, and created a composite image using 2 AVI files.

RUNNER-UP: LAURIE ANSORGE

Laurie Ansorge is a Lifetime Member of the Astronomical League. Her winning Solar System image is a composite image of a total lunar eclipse. She used a Unistellar Odyssey Pro with a focal length of 320 mm.

RICH-FIELD IMAGING (201–500 mm)



WINNER: ANN CHAVTUR

Ann Chavtur is a member of the Colorado Springs Astronomical Society. Her winning rich-field image is of the Shark Nebula, LDN 1235. The image was taken from her residence in Monument, Colorado, using a William Optics Zenithstar 73 III telescope with a focal length of 430 mm and a Nikon D5300 DSLR, CMOS astro modified, creating 180 stacked 5-minute subs.

RUNNER-UP: BRITNEY MILLER

Brittney Miller's rich-field runner-up entry is an image of M1, the Crab Nebula. The image was taken from Tucson, Arizona, using an 90 mm aperture triplet APO with a focal length of 432 mm and a ZWO2600 MC-air camera, creating the image with a 68-minute integration time.

THIRD PLACE: SANDRA SWOVELAND

Sandra Swoveland is a member of the Central Texas Astronomical Society. Her third-place entry is an image of the Rosette Nebula, NGC 2244. The image was taken from Evant, Texas, using a ZWO Seestar S50 with a focal length of 250 mm with an IMX 462 sensor.



WIDE-FIELD IMAGING (200 mm or less)

WINNER: SUZANNE BEERS

Suzanne Beers is a member of the Colorado Springs Astronomical Society and is from Colorado Springs. Her winning wide-field submission is an image of the Milky Way over San Pedro de Atacama, Chile. She used a Canon 5DSR with a Sigma 14 mm 1:1.8 DG lens. Her panoramic image consists of seven sections, each with approximately sixteen 15-second exposure images.

SKETCHING AWARD



The League Sketching Award recognizes the art of astronomical sketching at the eyepiece.

WINNER: RICHARD LUECKE

Richard Luecke, of Gloucester, Massachusetts, is a League Member-at-Large. His winning entry is a sketch of Julius Caesar crater made on June 15, 2024, using a 15-inch Dobsonian at 314x. He used gray paper, a no. 2 pencil, white chalk, and a white pastel pencil with no digital manipulation. Richard received a cash prize of \$250.

RUNNER-UP: CHRISTIAN WEIS

Christian Weis is a member of the Tucson Amateur Astronomy Association living in Switzerland. His entry is a sketch of NGC 3372, the Eta Carinae Nebula, made on June 10–11, 2023, using a 24-inch f/4 Dobsonian at 78x. He used simple pencils of hardness 4H to 3B followed by digital inversion and desaturation using GIMP 2.10.38. Christian received a plaque. At his request, the cash prize of \$150 was donated to St. Jude Children's Research Hospital.

THIRD PLACE: LIAM YANULIS

Liam Yanulis is a member of the Tulsa Astronomical Society. His winning entry is a sketch of the Milky Way made using a white colored pencil on black paper at the 2024 Okie-Tex Star Party on October 5, 2024. Liam received a cash prize of \$75.

YOUTH AWARDS

NATIONAL YOUNG ASTRONOMER AWARD

Now in its 33rd year, the National Young Astronomer Award is supported by Scott Roberts and Explore Scientific. Scott has supported this award with telescope prizes, convention travel expenses, and award plaques since 1994, and we are deeply indebted to him for a third of a century of generosity. This year, we had 12 extraordinary submissions of International Science and Engineering Fair quality. The task that our four judges faced in selecting winners was substantial.



WINNER: JULIAN SHAPIRO

Julian is an award-year junior from New York City. He studies at The Dalton School in New York City, and his research over the last several years has resulted in discoveries that earned him NYAA runner-up honors in last year's competition and first-place honors this year. He is only the second student to finish first and second in NYAA competitions.

Julian's current project resulted in the discovery of an exceptionally large quasar light-echo that measures 180 by 80 kiloparsecs—roughly six times the diameter of the Milky Way. This object is an extended emission line region (EELR)/quasar light-echo potentially associated with the galaxy cluster CIZA J1324.6-5736, and is, by far, the largest EELR candidate known to date. The object was discovered in oxygen-III survey images originally intended to target galactic sources, and spectra were obtained using the SALT (South African Large Telescope) and high-resolution spectrograph.

Julian received his award plaque and presented his paper at AstroCon '25. In addition, he received an all-expenses paid trip to the convention and a telescope or equivalent prize.

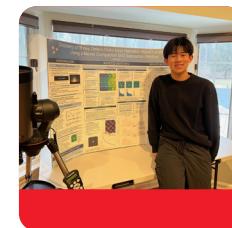


RUNNERS-UP: HOWARD QIAN AND TONY WU

NYAA runner-up honors go to the team of Howard Qian of Sunnyvale, California, and Tony Wu of Los Altos, California. Howard is an award-year junior at Bellarmine College Preparatory School in San Jose, California. Tony is an award-year sophomore at Pinewood High School in Los Altos Hills, California.

Working together, Howard and Tony developed an algorithm that shows great promise for detecting potentially habitable planets around Intermediate period planets—those that orbit their host stars in 10 to 100 days and that have a higher potential for habitability. Howard and Tony developed XRATE, a novel multi-stage detection pipeline that combined a 6-layer convolutional neural network (CNN) with the GPU-Accelerated Transit Least Squares (GLTS) algorithm to achieve 98.5% accuracy on systematic datasets and 100% accuracy on known low signal-to-noise ratio transits.

Howard received an all-expenses paid trip to AstroCon '25 and presented the team's paper at the convention. Telescope equipment prizes are being arranged through Explore Scientific.



THIRD PLACE: JULIAN DU

Julian Du of Darien, Connecticut, is an award year sophomore at Darien High School. His research paper reports the detection of debris disks around three Kepler stars that showed significant infrared excess and that have a low-mass, terrestrial-sized exoplanet candidate. Aperture photometry was performed on

observations from the Wide-Field Infrared Survey Explorer (WISE) to detect the infrared excess. Then a novel spectral energy distribution subtraction technique was performed. The study found infrared excess in 13.6% of the Kepler M-class habitable planet hosts and resulted in the discovery of a correlation between habitable planets and debris disks that counteracts the expected age-related disk dissipation.

Julian received convention registrations sponsored by the League.

HORKHEIMER YOUTH AWARDS

The League offers four major youth awards: the Horkheimer/Smith and Horkheimer/D'Auria Service Awards, the Horkheimer/Parker Imaging Awards, and the Horkheimer/O'Meara Journalism Awards. All are open to students under the age of 19 except for the Journalism Award that is limited to ages 8 to 14. All Horkheimer Awards offer substantial cash prizes.

HORKHEIMER/SMITH SERVICE AWARD



WINNER: CLAIRE ZHAO

Claire Zhao of Mercer Island, Washington, is this year's winner of the Horkheimer/Smith Youth Service Award. She is an award-year junior at the Lakeside School in Seattle.

Claire launched Star Truck, a mobile planetarium, to make astronomy accessible to people in rural and low-income areas. She has taken Star Truck programs to Boys and Girls Clubs in five locations across Washington State. Claire also designed Cosmo, an AI astronomy chatbot that makes astronomical information clear and accessible. Cosmo is tailored to different age groups and supports over 50 languages, ensuring that beginner students and students whose first language is not English can explore the universe without barriers. Cosmo has attracted more than 15,000 users and has been adopted by 40 astronomy clubs.

Claire has presented programs at the University of Washington Planetarium, organized an astronomy club at her high school, and served as an active member of the Seattle Astronomical Society where she helps with telescope setup and control during public outreach events.

Claire received a plaque, a cash prize of \$1,750, and an all-expenses paid trip to AstroCon '25.

HORKHEIMER/D'AURIA SERVICE AWARD



WINNER: JERICHO KUEHL

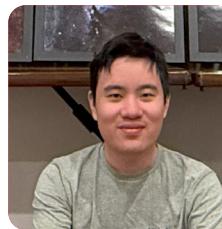
Jericho Kuehl is a member of the Milwaukee Astronomical Society (MAS), a key charter member society of the League.

He is an award-year junior at Star Ridge Academy (homeschool) and is this year's winner of the Horkheimer/D'Auria Youth Service Award.

A keyholder to the MAS Observatory, Jericho is an active participant in MAS open houses that draw as many as 200 visitors. He controls the club's optical and electronic telescopes for the public and co-authored an instruction manual for the club's Celestron 14-inch Edge HD telescope and accompanying software. He writes for the club's newsletter, *Focal Point*, and promotes and participates in the annual Fall Festival at the Horwitz-DeRemer Planetarium in Waukesha, Wisconsin. In the last year alone, he has logged more than 100 hours of public presentations, open house co-hosting, and planetarium volunteer work.

All the while, Jericho engages in meaningful citizen science using his Unistellar eVscope 2 to detect near earth asteroids, monitor the impending recurrent nova T Coronae Borealis, and record more than 10 exoplanet transits. Jericho received a plaque and a \$1,000 cash prize.

HORKHEIMER/PARKER IMAGING AWARD



WINNER: ANDREW YU

Andrew Yu of the Texas Astronomical Society of Dallas is this year's winner of the Horkheimer/Parker Youth Imaging Award. His winning image is a beautiful capture of NGC 2264 in Monoceros. Andrew is a senior (award year junior) at Plano West Senior High School in Plano, Texas.

Andrew's winning photo of NGC 2264 was taken from the X-Bar Ranch in Eldorado, Texas, using an AstroTech AT 80 EDT refractor, ZWO AM5 mount, and ZWO ASI2600 MC camera with an Antlia ALP-T dual-band filter. Andrew received a plaque and a cash prize of \$1,000.

RUNNER-UP: DANIEL ADIBI

Daniel Adibi is a member of the Delaware Valley Amateur Astronomers and is this year's runner-up for the Horkheimer/Parker Youth Imaging Award. He is an award year senior at The Episcopal Academy in Newtown Square, Pennsylvania. His image is an incredible wide-field image of Markarian's Chain. Daniel is also engaged in astronomical research and teaches classes for local middle school students and online classes for students in the Middle East.

Daniel's photo was taken outside Franklin, West Virginia, using a Sky-Watcher 6-inch Quattro Newtonian telescope on a ZWO AM5 mount and using a ZWO ASI294MM Pro camera with Antlia LRGB filters. Daniel received a plaque and a cash prize of \$500.

THIRD PLACE: MICHAEL TELESCO

Michael Telesco, a League Youth Member-at-Large, is this year's third-place winner in the Horkheimer/Parker Youth Imaging competition. Michael is an award-year junior at New Canaan High

School in New Canaan, Texas. He captured a magnificent image of elusive giant blue planetary nebula Hewett 1 in Sextans.

Michael's image was taken from Rockwood, Texas, using a Takahashi Epsilon E-160 ED, AP Mach2GTO, P1 Poseidon M-Pro, Astronomik Max-FR 6 nm O III and H-alpha, and Astronomik deep-sky RGB. Michael received a plaque and a cash prize of \$250.

HORKHEIMER/O'MEARA JOURNALISM AWARD



RUNNER-UP: JOSEPHINE PAGE

Josephine Page, 13, has won runner-up honors in the Horkheimer/O'Meara Journalism competition. Josephine is a freshman at the North Buncombe High School in Weaverville, North Carolina, and is a member of the Astronomy Club of Asheville.

Josephine received a plaque and a \$500 cash prize for an essay titled "Colony Collapse Disorder: A Grave Agricultural Threat." The essay focuses on how the weather threat has affected bees and the importance of bees in our society.

WINNER: AMELIA ALINKIL

Amelia Alinkil, 14, was judged the winner of the Horkheimer/O'Meara Journalism Award. Amelia is an eighth grader at the Daniel L. Jones Middle School in Frisco, Texas, and is a member of the Texas Astronomical Society of Dallas. Amelia received a plaque and a \$1,000 cash prize for the following untitled essay about recurrent nova T Coronae Borealis:

From tracking a single star, I won first place at the Dallas Regional Science Fair (DRSEF) and then first at the Texas Science and Engineering Fair (TXSEF). But this journey started long before the awards.

My fascination with T Coronae Borealis (T CrB) began when my coach, Kevin, introduced me to its impending eruption. T CrB is a recurring nova—every 80 years, a white dwarf siphons matter from its red giant companion until it ignites in a massive explosion. The next event was predicted for August 2024, so time was critical.

There was one problem—I was in India for the summer. But astronomy doesn't wait. Every morning, while it was night back home, I captured data, battling time zones and unpredictable skies. Clouds sometimes ruined my sessions, but persistence defines astronomy. As our data was refined, we presented at a Texas Astronomical Society meeting, and I saw an opportunity—the science fair.

Observing T CrB meant late nights, complex software, and constant troubleshooting. To capture my images, I visited my coach's house, where minimal light pollution made for ideal stargazing. I spent over 100 hours analyzing data, coding in Python, and predicting the nova's behavior. It was exhausting, but the challenge drove me forward.

Then came the competitions. I organized months of data, built clear visualizations, and presented my findings. Winning at DRSEF and TXSEF validated my work, but the true reward was deeper—proving that dedicated observation could contribute to real science.

Determined to push further, I began developing a machine learning model to refine nova predictions. I also shared my research at events like the National Space Society (NSS), the DFW Library, and 4-H Dallas County, inspiring others to look up at the stars.

THIRD PLACE: SADHVI PRASAD

Sadhvi Prasad, 13, has won third place honors in the Horkheimer/O'Meara Journalism competition. Sadhvi attends Marsh Creek Sixth Grade Center in Downingtown, Pennsylvania, and is a member of the Chester County Astronomical Society.

Sadhvi received a plaque and a \$250 cash prize for an essay titled "Stardust Trinkets." The essay describes the exceptionally detailed creation of a mining company that travels to any planet of a customer's choice to bring home a rock for use in making necklaces or other items that the customer may want.



And the Peltier Award Goes to Dan Green

Dr. Daniel Green has been chosen to receive the 2025 Leslie C. Peltier Award

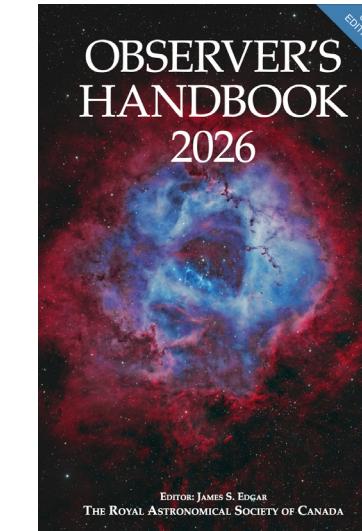
Dr. Green serves as the director of the Cometary Science Center, a role he has held since 2000, and editor of the International Comet Quarterly (ICQ) of the International

Continued on Page 20



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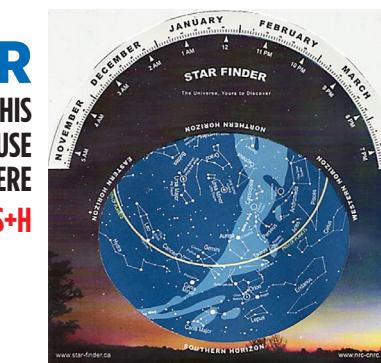
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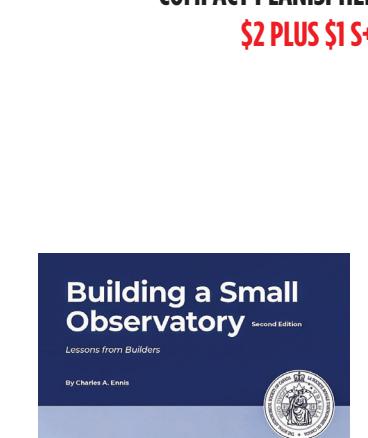
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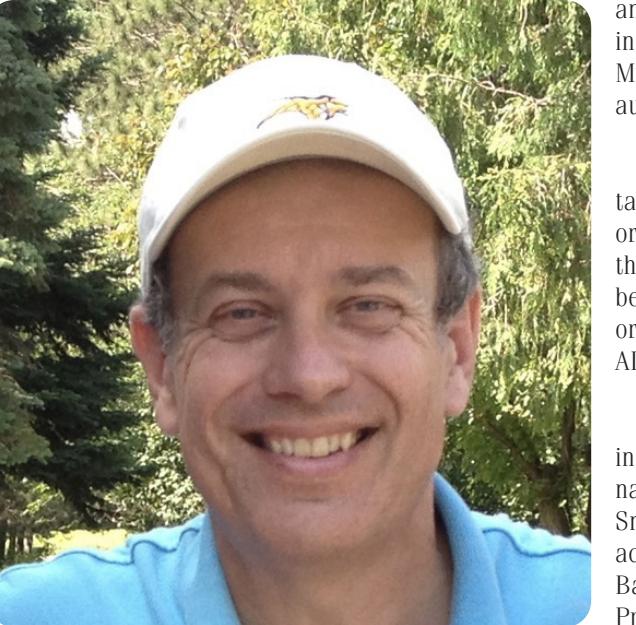
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Astronomical Union (IAU). He is co-director of the Jiamai'erding-Tianwendai/ICQ Search and Tracking (JIST) comet observing and search program using remote telescopes. In addition, he is a research associate and research scientist in the Department of Earth and Planetary Sciences at Harvard University. He is a member of the IAU Working Group on Small Bodies Nomenclature and has served as a teaching fellow and instructor at Harvard.

He is a long-time writer, editor, and referee of astronomical publications, and is responsible for thousands of Central Bureau for Astronomical Telegrams (CBAT), ICQ, and QSC web pages involving comets. In running CBAT, he has had continuous international interactions with amateur and professional astronomers regarding new discoveries and follow-up observations.

He has authored about two hundred scientific publications in astronomical journals, magazines, and encyclopedias, and books on comets, archiving astronomical data, the history of astronomy,



and observational astronomy. This includes work on a revision of The Mystery of Comets, originally co-authored with Fred Whipple in 1985.

He has given scores of invited talks to amateur and professional organizations and has interacted with the news media. Over the years he has been a contributing member of many organizations including the AAVSO and ALPO.

He has received numerous awards including minor planet 2068 Dangreen named after him in 1978, numerous Smithsonian Astrophysical Observatory achievement awards, the Priscilla and Bart Bok Award, the Donald Osterbrock Prize of the American Astronomical Society, the Carolyn Herschel Award,

the Western Amateur Astronomers Award, and the Walter Scott Houston Award of NERAL. Congratulations to Dr. Green for a lifetime of astronomical achievements!

—Roger Kolman



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ASTROCON 2025 OBSERVING CHALLENGE

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BINOCULAR MESSIER OBSERVING PROGRAM

No. 1274, **Clariza Kern**, Pontchartrain Astronomical Society

BINOCULAR VARIABLE STAR OBSERVING PROGRAM

No. 70, **Michael K. Roberts**, Midlands Astronomy Club

CALDWELL OBSERVING PROGRAM

No. 36, **Mark Simonson**, Gold, Everett Astronomical Society; No. 37, **Alex McConahay**, Gold, Riverside Astronomical Society; No. 306, **Michael Grabner**, Silver, Rose City Astronomers; No. 307, **Brian Hayward**, Silver, Rose City Astronomers;

CALDWELL IMAGING PROGRAM

No. 9, **Laurie V. Ansorge**, Silver, Lifetime Member; No. 10, **Brad Payne**, Silver, Northern Virginia Astronomy Club; No. 11, **Tom Holman**, Silver, Minnesota Astronomical Society

CARBON STAR OBSERVING PROGRAM

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CITIZEN SCIENCE SPECIAL PROGRAM

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tional, Variable Stars, Escambia Amateur Astronomers Association; **Brad Young**, Gold Class 17, Observational, Variable Stars, Astronomy Club of Tulsa

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FOUNDATIONS OF IMAGING OBSERVING PROGRAM

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GALILEO OBSERVING PROGRAM

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LUNAR II OBSERVING PROGRAM

No. 145-I, **Richard Wheeler**, Northeast Florida Astronomical Society

MARS OBSERVING PROGRAM

No. 16-I, **Richard Wheeler**, Northeast Florida Astronomical Society

MESSIER IMAGING PROGRAM

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MESSIER OBSERVING PROGRAM

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130-I, **Armen Akopian**, Gold Imaging, San Antonio Astronomy Association; No. 132, **Paul Morgan**, Gold, Umpqua Astronomers

OUTREACH PROGRAM

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Florida Astronomical Society; No. 1614, **Bart Fried**, Stellar, Amateur Astronomers Association of New York; No. 1614, **Bart Fried**, Outreach, Amateur Astronomers Association of New York; No. 1614, **Kat Troche**, Outreach, Amateur Astronomers Association of New York; No. 1615, **Tom Haeberle**, Outreach, Amateur Astronomers Association of New York; No. 1615, **Tom Haeberle**, Outreach, Amateur Astronomers Association of New York; No. 1617, **Carey Horwitz**, Outreach, Amateur Astronomers Association of New York; No. 1618, **Rori Baldari**, Outreach, Amateur Astronomers Association of New York; No. 1619, **Faissal Halim**, Outreach, Amateur Astronomers Association of New York; No. 1620, **Giselle Pemberton**, Outreach, Amateur Astronomers Association of New York; No. 1621, **David Kaufman**, Outreach, Amateur Astronomers Association of New York; No. 1623, **Peter Lipschutz**, Outreach, Amateur Astronomers Association of New York; No. 1624, **Joe DiNapoli**, Outreach, Amateur Astronomers Association of New York; No. 1625, **Tom Evangelist**, Outreach, Amateur Astronomers Association of New York; No. 1626, **David Shepherd**, Outreach, Amateur Astronomers Association of New York; No. 1628, **Willie Xu**, Outreach, Amateur Astronomers Association of New York; No. 1629, **Blake Hartstein**, Outreach, Amateur Astronomers Association of New York; No. 1630, **Will Deegan**, Outreach, Amateur Astronomers Association of New York; No. 1631, **Tim Doust**, Outreach, Amateur Astronomers Association of New York; No. 1632, **Alan Faitelewicz**, Outreach, Amateur Astronomers Association of New York; No. 1633, **Brian Falk**, Outreach, Amateur Astronomers Association of New York; No. 1634, **Elena Rivera**, Outreach, Amateur Astronomers Association of New York; No. 1635, **Ely Duenas**, Outreach, Amateur Astronomers Association of New York; No. 1636, **Howard Fink**, Outreach, Amateur Astronomers Association of New York; No. 1637, **Irene Pease**, Outreach, Amateur Astronomers Association of New York; No. 1638, **Charles Crockett**, Outreach, Amateur Astronomers Association of New York; No. 1639, **Art Kunhardt**, Outreach, Amateur Astronomers Association of New York; No. 1645, **Jim Reynolds**, Outreach, Stellar, Master, Westminster Astronomical Society; No. 1646, **Adrian Ocampo**, Outreach, Fort Bend Astronomical Club; No. 1647, **Bill Dillon**, Outreach, Fort Bend Astronomical Club; No. 1648, **Emily Carrico**, Outreach, Fort Bend Astronomical Club; No. 1649, **Willie Rainwater**, Outreach, Fort Bend Astronomical Club; No. 1650, **Kevin M. Walker**, Outreach, Astronomical Society of Kansas City; No. 1651, **Dena Laterza**, Outreach, Astronomical Society of Las Cruces; No. 1652, **Pakaj Desai**, Outreach, Stellar, Westminster Astronomical Society; No. 1653, **Christopher Bennett**, Outreach, Stellar, Westminster Astronomical Society; No. 1654, **Dan Packy**, Outreach, Stellar, Westminster Astronomical Society; No. 1655, **Victoria Barr**, Outreach, Westminster Astronomical Society; No. 1656, **Rob Williams**, Outreach, Westminster Astronomical Society; No. 1657, **Narayan Nair**, Outreach, Westminster Astronomical Society; No. 1658, **Michael Mangier**, Outreach, Westminster Astronomical Society; No. 1659, **Marisa Galitz**, Outreach, Westminster Astronomical Society; No. 1660, **Eric Smallwood**, Outreach, Westminster Astronomical Society; No. 1661, **Brooke Parkhurst**, Outreach, Westminster Astronomical Society; No. 1662, **Jackie Donaldson**, Outreach, Stellar, Westminster Astronomical Society; No. 1663, **Jeff Silver**, Outreach, Westminster Astronomical Society; No. 1664, **Michael Newman**, Outreach, Westminster Astronomical Society; No. 1665, **Finn Bair**, Outreach, Omaha Astronomical Society; No. 1666, **Alan Scott**, Outreach, Stellar, The Albuquerque Astronomical Society; No. 1667, **Preston Pendergraft**, Outreach, Birmingham Astronomical Society; No. 1668, **George Barber**, Outreach, Stellar, Tucson Amateur Astronomical Association; No. 1670, **Gary Copeland**, Outreach, Tucson Amateur Astronomical Association; No. 1671, **Bryan Betcher**, Outreach, Stellar, Tucson Amateur Astronomical Association; No. 1672, **Terry Dietz**, Outreach, Tucson Amateur Astronomical Association; No. 1673, **John Dwyer**, Outreach, Tucson Amateur Astronomical Association; No. 1674, **John Zimitsch**, Master, Minnesota Astronomical Society; No. 1675, **Stephen J. Nugent**, Member-at-Large; No. 251, **John Wesley Hardin**, Colorado Springs Astronomical Society; No. 252, **John Lucian Hardin**, Colorado Springs Astronomical Society; No. 253, **Chris Koers**, San Antonio League of Sidewalk Astronomers

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No. 272, **Michael J. Grabner**, Rose City Astronomers; No. 273, **Karl A. Schultz**, Central Arkansas Astronomical Society; No. 274, **Teresa Bippert-Plymate**, Bear Valley Springs Astronomical Club

ADVANCED OBSERVER

Alan Scott, The Albuquerque Astronomical Society

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Dean F. Herring, Raleigh Astronomy Club

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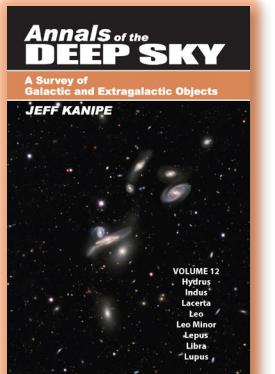
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Paul Lorenz (Tucson Amateur Astronomy Association) captured this image of M8 with an Astro-Tech AT152EDT and a ZWO ASI6200MC camera from AstroCon 2025 at Bryce Canyon.



M.J. Post (Longmont Astronomical Society) captured this image of NGC 1931 using a PlaneWave CDK14 and a ZWO ASI 6200MM camera from his DSNM observatory in Animas, New Mexico.

Gallery

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Clement Elechi (Roanoke Valley Astronomical Society) captured this image of Jones-Emberson 1 – the Headphone Nebula – using an Astro-Tech AT6RC and a ZWO ASI 2600MM camera.



Rodney Pommier (Rose City Astronomers) captured this image of Sharpless 112 using a PlaneWave CDK17 and a SBIG STL-11000M camera from his observatory in Portland, Oregon.

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