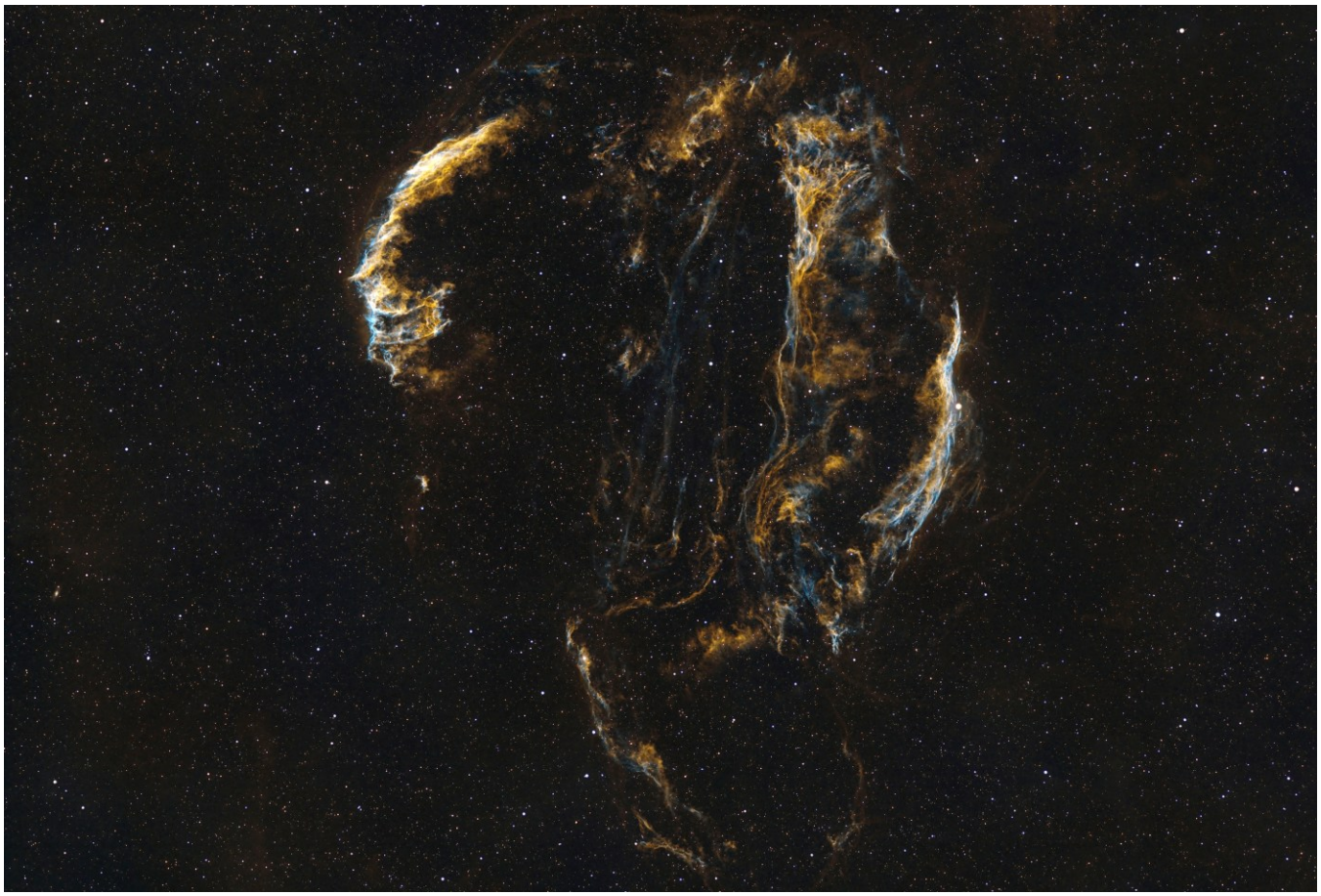
SkyWAAtch

The Monthly Publication of Westchester Amateur Astronomers

WINNER 2025 APEX® AWARDS FOR PUBLICATION EXCELLENCE

September 2025



Cygnus Loop by Steve Bellavia

Steve sent us a new image of the Eastern Veil (see page 30) and in his email provided a link to this image of the full supernova remnant, properly called the Cygnus Loop, made three years ago but not previously published in *SkyWAAtch*. He used a 200-mm f/2.8 Canon EF lens and an ASI294MM Pro camera, equatorially mounted. The field of view is 5.63 x 3.8 degrees, and north is up.

Our club meetings are held at the David Pecker Conference Room, Willcox Hall, Pace University, Pleasantville, NY, or on-line via Zoom (the link is on our web site, www.westchesterastronomers.org).

WAA September Meeting

Friday, September 12 at 7:30 pm

Members' Night

WAA Members

Club members present brief talks on their equipment, techniques, travel, or any other subject of general astronomy interest. A unique WAA tradition!

Please contact Pat Mahon (waa-programs@westchesterastronomers.org) if you would like to make a presentation.

Call: **1-877-456-5778** (toll free) for announcements, weather cancellations, or questions. Also, don't forget to visit the WAA website.

WAA October Meeting

Friday, October 10 at 7:30 pm

The Sloan Digital Sky Survey

Michael Blanton, PhD

Professor of Physics, New York University
Director, Sloan Digital Sky Survey IV

Starway to Heaven

Meadow Picnic Area parking lot
Ward Pound Ridge Reservation,
Cross River, NY

Date	Sunset	Moon Phase	Moon Set/Rise
9/13	7:06 p.m.	0.55	Rises 10:35 p.m.
9/20	6:54 p.m.	0.01	New
9/27	6:42 p.m.	0.32	Sets 9:27 p.m.

Check out the new WAA web site. The Newsletter archive now goes back to issue #1 in 1990!

New Members

Sophia Austin	Warwick
Martin Brennan	Darien
Rajan Chari	Scarsdale
Fred Elmes	Somers
David Garcia	Bronx
Jose Garcia	Pelham
Kevin Giguere	Bloomfield
Mark Hauge	Brooklyn
John Kalamaras	Ancram
Cindy Pagnotta	White Plains
Cindy Polera	Ossining

Renewing Members

Salman Abbasi	Yonkers
Liv Andersen	Westport
Eric and Katherine	Redding
Brian Blaufeux	Larchmont
Thomas Boustead	White Plains
Courtney Cameron	Mount Vernon
Michael & Ann Cefola	Commack
Byron Collie	Croton on Hudson
Federico Duay	Briarcliff Manor
Brian and Min Yoo Folk	South Salem
John & Maryann Fusco	Yonkers
Eva Gao	Millwood
Joe Geller	Hartsdale
Charlie Gibson	Scarsdale
Terry Jackson	New York
George & Susan Lewis	Mamaroneck
Joe Lisle & Alex Zoubine	White Plains
Arumugam Manoharan	Yonkers
Scott Mellis	New Rochelle
Gary Miller	Pleasantville
Scott Nammacher	Athens
Alfred J. Padilla	Armonk
Robert Peck	Greenwich
Lydia Maria Petrosino	Bronxville
Deidre Raver	Mahopac
William Rothman	Bronxville
Peter Rothstein	Bronxville
Anthony Sarro	Brooklyn
Kathlyn Schwartz	Purchase
Robin Schwartz	Riverdale
Jordan Solomon	Pleasantville
Ihor Szkolar	White Plains
Kathleen Thrane	Greenwich
Joseph Trerotola	Bethany
Jordan Webber	Rye Brook
Roger Woolcott	Brewster

ALMANAC for September 2025

Bob Kelly, WAA VP of Field Events


Bob Kelly


Full 9/7


3Q 9/17


New 9/21


1Q 9/29

Eclipses on the other side of the world

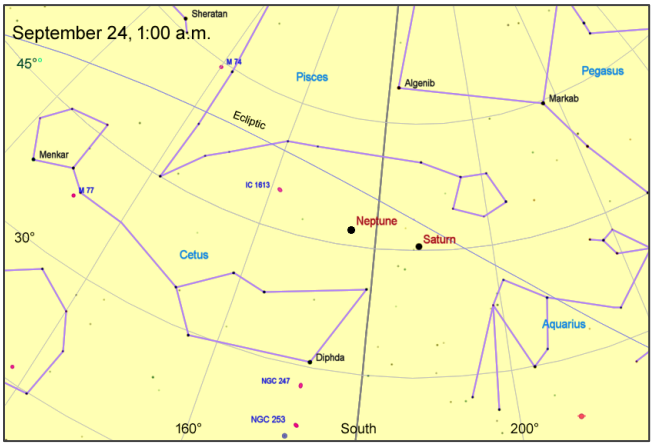
Two eclipses in September! One total lunar eclipse, one partial solar eclipse, neither visible from North America. September 7th's total lunar eclipse is centered in the Indian Ocean and visible from most of Asia. The partial solar eclipse on the 21st is visible from New Zealand and part of Antarctica. New Zealanders gets a partial eclipse with 70 to 80 percent of the Sun obscured at maximum.

Here Comes Saturn!

Saturn comes to opposition, up all night on the 21st. Its ring looks more like a line than a hoop, tilted two degrees from our line of sight. You'll need to look around a bit for Saturn, at magnitude +0.6, which is still brighter than all but two of the planets and ten of the stars right now. Get one of those Saturn's Moons apps or programs to keep track of great times to see Titan, the sixth brightest moon as seen from Earth (pop quiz: Can you name the other five?). Iapetus, Saturn's light side/dark side moon has its brighter side facing Earth in the first half of the month, located to the west of the planet and shining at magnitude +10.2, compared to closer-in Titan at +8.4.

Hop Over to Neptune

Neptune reaches its brightest for the year at magnitude +7.8 on the 23rd, about three degrees from Saturn. It's tiny, at just 2.5 arcseconds in diameter. Look for a blueish "star" with a steadier light than the surrounding luminaries.



Jupiter on the Rise

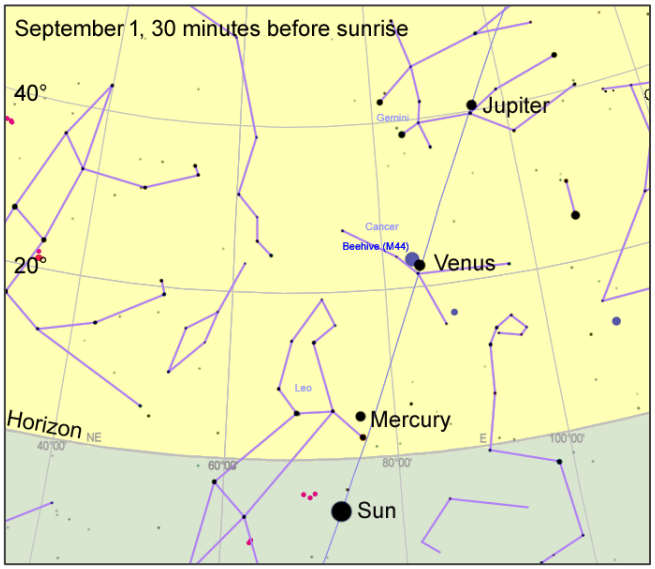
Jupiter spends September in the morning sky, increasing its separation from Venus. We knew the beautiful coupling of the two brightest planets wouldn't last. Jupiter-rise is after midnight all month. It keeps its title as second-brightest planet in our skies for the rest of the year. Watch it creep a bit away from the Twins of Gemini.

Jupiter Moon Shadows

Jupiter gets shade thrown at it by two moons at a time several times this month. Only one that happens when Jupiter is up in our night sky: Just after midnight on the 27th. However, Jupiter is barely above the eastern horizon at that time. There'll be more of these events in October.

Venus Falling

Venus is dropping out of the morning sky, but at magnitude -3.9, it's still easy to spot before sunrise, sometimes even though gaps in tree branches. On the 19th, Venus, the crescent Moon, and Regulus will be near each other for a nice photo op. I can't wait to see what the crazy Facebook posts call this lineup.



Uranus Hangs with the Bull and the Sisters

Uranus is in a nice spot between the Hyades and Pleiades clusters. At magnitude +5.6, it's a tiny, blueish

dot. Use optical aid and get a finder chart for the area to hop on over to the sideways planet.

Mars Just Hangs On

Mars continues its extended stay low in the western evening sky, seeming to fight the fall into the solar glare. At magnitude + 1.6, it's a tiny, dim version of the planet that was at magnitude -1.4 at opposition back in January. Its just 4.0 arcseconds in diameter.

Mercury Gone for Now

Mercury is in superior conjunction with the Sun on the 13th. It'll be back in the evening sky in October, keeping Mars company.

Minor Planets at Opposition

(1) Ceres and (6) Hebe are the brightest minor planets this year. They peak now at magnitude +7.6, not the brightest possible for these objects we used to call asteroids. The official "dwarf planet" Ceres is at opposition on the 3rd in Cetus. Hebe was at opposition on August 26th and is in Aquarius.

Disappearing Act

Near 4 a.m. EDT on September 6th, the dark limb of the Moon covers up magnitude +2.9 Delta Capricornus. The Moon is 96 percent full, so the star will be hard to find before it disappears. A small telescope is needed.

Comets

3I/ATLAS, the comet from interstellar space, will keep its distance from our Sun, only getting to 1.4 astronomical units away from us at perihelion, so it won't get very bright even at closest approach on October 29. In September it will be in Libra, most likely 13th to 14th magnitude, and peaking at magnitude 11 at the end of October as it zips through the solar system at 58 kilometers/second.

C/2025 K1 (ATLAS) is heading to the morning sky for October. It may get as bright as magnitude +5 to +7.5. It will be hard to see because it's close to the horizon at sunset. We may have a crummy apparition, with it falling all to pieces after its 0.3 AU perihelion.

Space Station Long Range Predictions

The International Space Station may be visible in the mornings through the 7th, then evenings starting the 7th for the rest of the month.

China's Tiangong space station may be visible in the mornings on the 1st and 2nd and the evenings from the 7th through the 23rd.

Check satellite overflight prediction websites, including heavens-above.com, for updates and the many other satellites visible before and during morning twilight and during and after evening twilight.

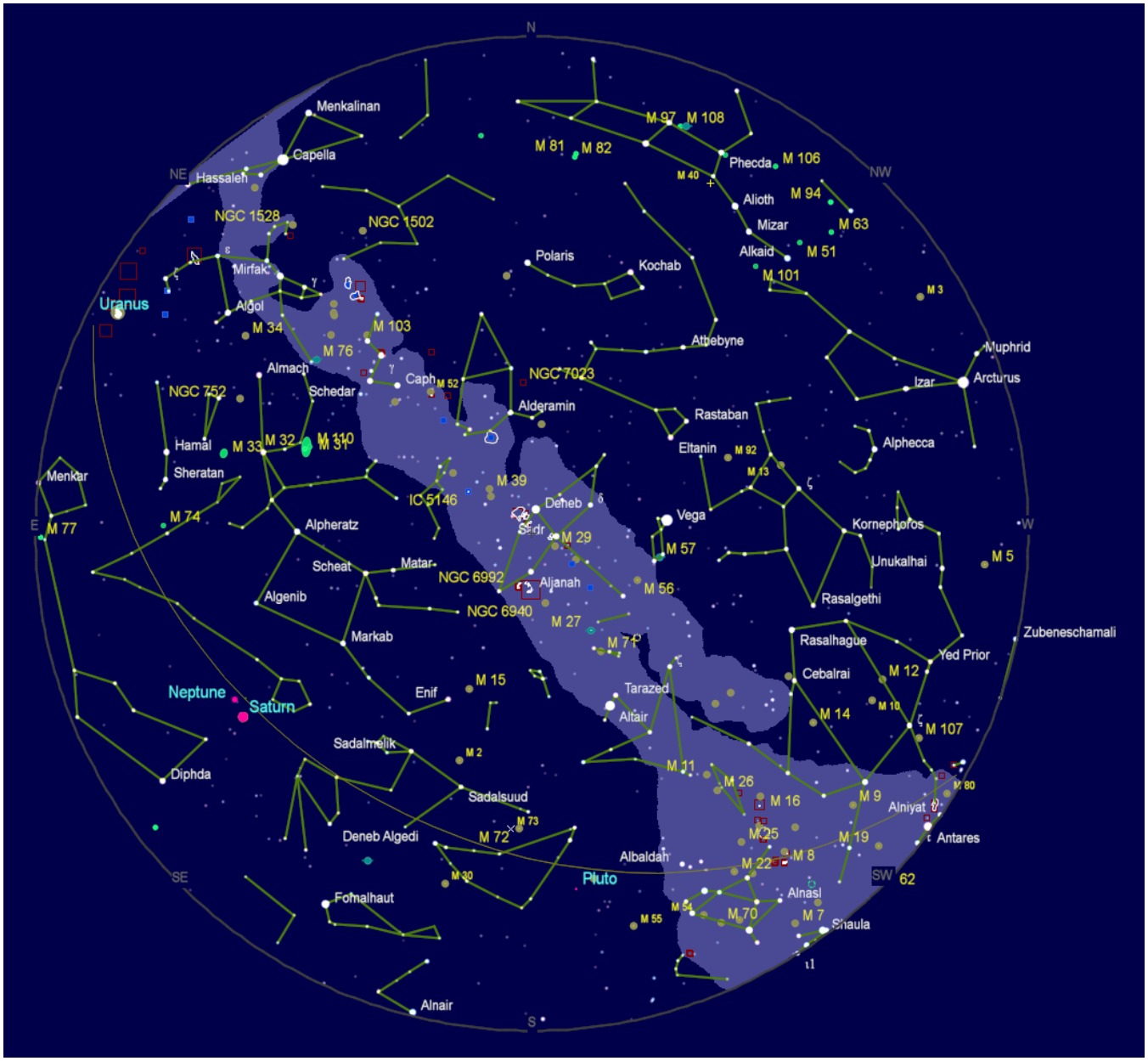
Equinox

Our Autumnal Equinox occurs at 2:19p.m. on the 22nd. Nights will be longer than days until the Sun crosses ecliptic the celestial equator next March. ■

In this issue

Where are these cows and why are they relevant to astronomy? Read the *October 2025 SkyWAAtch* to find out!

September Sky Map



The map shows the sky at 10 p.m. on September 15. Except for the Moon, the sky will appear similar at 11 p.m. on September 1 and 9 p.m. on September 30.

Join the WAA Discord Server

Discord is an app (iOS, Android, Windows) that will vastly enhance communication within the club and increase the value of your membership. It's free.

Join the "Office Hours" Discord chat hosted by WAA President Jordan Webber every other Wednesday at 7:00 p.m. For more information and to join, go to https://is.gd/WAADisc.

SkyWAAtch Wins Grand Award from Apex Communications

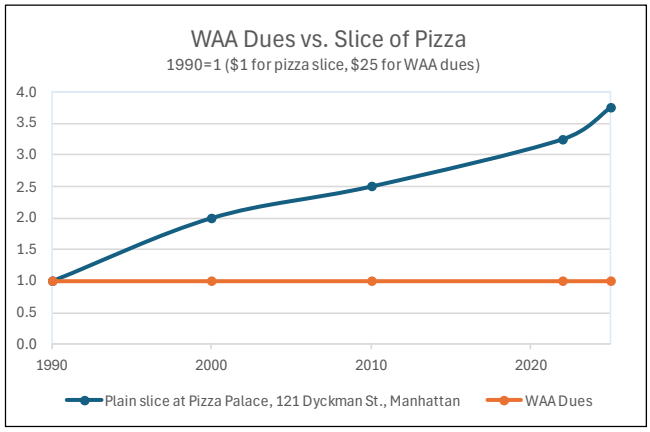
We've entered SkyWAAtch in the prestigious Apex Awards competition for five years. In each of the previous years we've been given an "Award of Excellence." This year we received the Grand Award.

APEX is the Annual Awards for Publication Excellence Competition. It is open to communicators in corporate, nonprofit and independent settings. APEX 2025 is the 37th annual APEX, which began in 1988. APEX is sponsored by the editors of Writer's Web Watch, an e-newsletter for communicators who write, edit, and manage business publications. Writer's Web Watch is published by Communications Concepts, Inc., providing problem-solving information to professional communicators since 1984.

The APEX awards are based on excellence in graphic design, editorial content and the success of the entry—in the opinion of the judges—in achieving overall communications effectiveness and excellence. There are a variety of entry categories: we enter *SkyWAAtch* in the Newsletters category, submitting four issues each year for consideration.

All the WAA newsletters, dating back to our first issue n 1990, are now on the WAA web site!

From the Editor: WAA Dues



Since its inception in the late 1980s, Westchester Amateur Astronomers has charged dues of $25, bucking all inflationary economic trends by a combination of membership growth and wise fiscal management. We've saved money by making SkyWAAtch an all-electronic publication, eliminating printing and mailing costs and allowing full-color images. We've even managed to increase our reserves in spite of expenses for insurance to meet coverage levels required by Pace University and Ward Pound Ridge, who have really been wonderfully generous hosts.

We measured our dues against one of the most important and frequently cited economic indicators, the cost of a slice of pizza. On the Internet we found data going back to 1990 for a pizzeria in the Inwood section of Manhattan, Pizza Palace. We even stopped there in August to verify the 2025 price. Pizza Palace is a sliver of a place, barely 12 feet wide at the counter, but it was crowded with neighborhood folks picking up pies and slices. It was a basic no-frills pizzeria, perfect as an economic touchstone.

Due will remain at $25. Paraphrasing Mad Magazine: "$25…cheap!" "When the Moon hits your eye like a big pizza pie…."

Another Movie Telescope: *Zoolander 2*

In this farcical, silly, occasionally quite funny 2016 sequel to Ben Stiller's 2001 hit *Zoolander*, most of the action takes place in Rome. In one scene, Stiller, as the ultra-stupid male model Derek Zoolander, and his sidekick Owen Wilson, as the ultra-horny male model Hansel, have simultaneous crises of confidence. The scene begins with Hansel crying out "Who am I?" Suddenly Zoolander appears on a balcony. Here's the dialogue:

Zoolander: "Hey Hansel, are you trying to figure out who you are also?"

Hansel: "Yep."

Katy Perry, not previously in the film and appearing on another balcony for absolutely no reason whatsoever, sings "Who am I?" and makes an anguished gesture.

Zoolander: "Hey Katy, yeah, it's like, when will we find out who we really are?"

Perry: "Ya' know, right?"

Neil deGrasse Tyson, also not previously in the film and appearing on another balcony also for absolutely no reason: "Who am I?"

Zoolander: "Neil deGrasse Tyson, even <u>you</u> don't know who you really are?"

Tyson, with his characteristic punchy, sing-song delivery: "In an ever expanding universe, slowly pulling itself apart into nothingness, what use does the question 'Who am I?' even have?"

Hansel: "Neil, I gotta say, you are totally blowing my mind right now."

Tyson: "That's what I do. I'm Neil deGrasse Tyson…*bitch*."

The telescope is probably an 80-mm refractor on a non-go-to equatorial mount, but we never quite see all of it in the 17 seconds of screen time given to NdGT. It's obviously there for the very few people left on planet Earth who need to be reminded that Tyson is an astronomer (actually, he would say he's an astrophysicist).

All those domes? The scene was probably filmed with rear projection, the producers eschewing the expense of bringing Tyson on location in Rome. But it looks good: there are 800 churches in Rome. At least two of them have connections to astronomy. Santa Maria degli Angeli, designed by Michelangelo and built on the ruins of the baths of the Emperor Diocletian, has a meridian line. The dome-less roof of Sant'Ignazio, adjacent to the Collegio Romano, once the Jesuit university, was the site of Angelo Secchi's observatory from 1853 to 1878.

Deep Sky Object of the Month: IC 4756

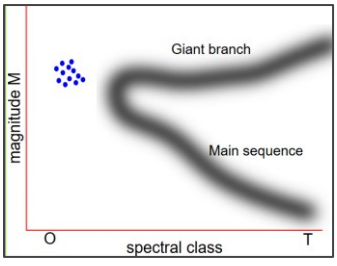
IC 4796, christened the Tweedledee Cluster by Stephen James O'Meara, is just 3° from NGC 6633 (Tweedledum), across the Serpens-Ophiuchus border. NGC 6633 is an equally bright but slightly more compact collection of stars. Both clusters can be naked eye objects in a dark sky.

While NGC 6633 was observed by Philippe Loys de Chesaeaux in 1745, the observation was not published and it was not included in Messier's catalogue, waiting for Caroline Herschel to find it in 1783. The larger IC 4756 somehow escaped detection until the Harvard astronomer Solon Irving Bailey noticed it on a plate from Harvard's Arequipa station in Peru. Discovery was (erroneously) attributed to Kasimir Romuald Graff at the Hamburg Observatory in 1922, and it is still occasionally called Graff's Cluster.

If the two clusters are similar in brightness and not immensely different in size, how come IC 4756 had to wait until photography to be found? Stephen James O'Meara, who gave the two clusters the "Tweedledee/Tweedledum" appellation, notes that,

> … until rich field telescopes came into vogue, some of the bright yet diffuse deep-sky objects remained beyond the reach of telescopic observers…even though they could be seen with the unaided eye… Seeing IC 4756 in a powerful telescope with a narrow field is like trying to drive under a rainbow; the closer one sees it the more diffuse and obscure it becomes.

The magnitude 6.3 star HD 172365 (also known as HR 7008) in IC 4796 shows high lithium abundance in its spectrum (R. Earle Luck, *Publications of the Astronomical Society of the Pacific* 94:811–814, 1982). He suggested the star was an evolved G or K supergiant blue straggler. Blue stragglers are more luminous (hotter) and bluer than expected for their mass. They appear offset to the left of the turnoff from the main sequence on the Hertzsprung-Russell diagram. They are probably formed by interactions within a dense globular or open cluster.

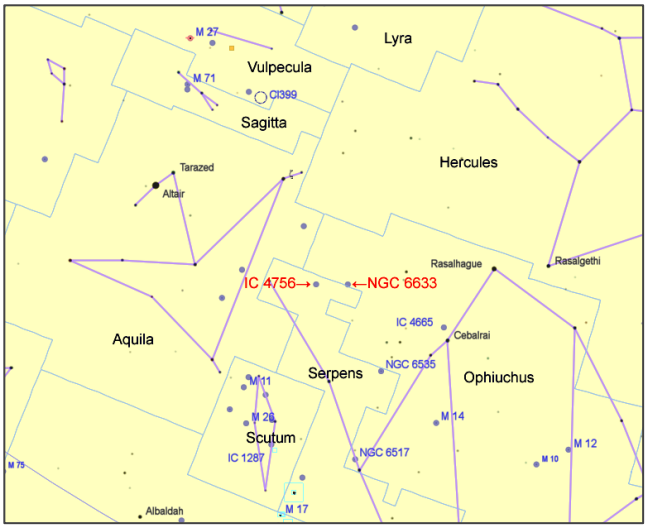


Andrievsky, et al. suggested that HD 172365 was formed by a merger of a close binary system. (*Astronomische Nachrichten* 320:35–41, 1999)..

IC4756 (left) and NGC 6633 (right)

IC 4756	
Constellation	Serpens Cauda
Object type	Open Cluster
Right Ascension J2000	18h 38.9m
Declination J2000	+ 5° 20"
Magnitude	4.6
Size	40 arcminutes
Distance	1,300 light years
Discovery	Solon Irving Bailey
Other names	Tweedledee Cluster Secret Garden Cluster Graff's Cluster

Visibility for IC 4756			
2200 EDT	9/1	9/15	9/30
Altitude	50° 56'	44° 34'	35° 32
Azimuth	208° 33'	226° 44'	241° 58'



August 1 Outreach at Wave Hill

Wave Hill, the beautiful public garden and cultural center in Riverdale overlooking the Hudson River, asked WAA to do an astronomy program, which they dubbed “Summer Nights, Starry Skies.” We recommended, as we usually do for outreach programs in urban/suburban areas, a night with a 7 to 10-day Moon. The program took place on Friday, August 1. WAA members Jordan Webber, Paul Alimena, Bob Kelly, Eli Goldfine and Larry Faltz brought telescopes (two 10” Dobs, 2 8” Dobs and an 8” SCT). Jordan and Eli brought Seestar S50s and Larry set up a Seestar S30. It was quite cloudy earlier in the day, but fortunately the skies cleared enough for us to hold the session and avoid shifting to the Sunday night back-up date.

Larry gave an introductory talk which covered the Moon, planets (mainly why there weren’t any in the sky that evening), deep sky objects, light pollution, and the physiology of night vision. By he time he finished, civil twilight was nearing an end and it was dark enough to get a good look at the Moon. Later we showed a few double stars and attempted brighter DSOs. At the end of the evening, around 11 p.m., Larry measured the sky darkness at 17.89, “inner city sky.” Welcome to astronomy in the Bronx and the impact of high thin clouds and residual smoke from western and Canadian fires. Nevertheless, the feedback was very positive.

Bob (left) wrote,

My 8-inch dobsonian telescope spent time with the Moon at 40x with a 30mm 2-inch eyepiece into which fit the entire lunar disc, with lots of detail. The craters along the sunrise line showed lots of terrain. Proclus, with its V-shaped fan of ejecta, seemed especially bright. It’s located between Mare Crisium and Mare Tranquillitatis, but my *Sky and Telescope* Moon map didn't show it well. As twilight faded, we pointed out the brightest stars. I could see only a dozen, as twilight illuminated the high cirrus clouds and haze from distant smoke provided further obscuration. We talked about the Big Dipper, arcing over to Arcturus from its handle. I showed the pairing of Alcor and Mizar, and explained how most of the stars in the Dipper were born in the same star formation cluster. There were lots of questions and stories about aurora and how to see it. Some of the people had been to Iceland or Alaska to see the aurora and others wanted to go to see it. I related how Carol and I saw the aurora in Iceland and from our front porch. We discussed efforts to reduce light pollution with some of our guests who have been working on addressing light pollution locally relating their experiences.

Paul Alimena wrote,

It was a beautiful evening, in spite of the moisture in the atmosphere. Thankfully, the worst of the rain missed our area. I mostly was on the Moon, at 60 or 110X. Since I was not tracking, that was as much scope jockeying I

was willing to do. I did have a good look at Albireo, and convinced some viewers to distinguish between white and alabaster! I had a steady stream of customers - hence didn't get a chance to check out the S30 and S50 side by side. Hopefully they'll invite us back.

Jordan wrote,

Jordan's M51 image (cropped from the original)

I had the Moon at around 120x (in a 10-inch reflector) for a while, then Albireo, M57, and M13 at the end. I was able to locate M27 at one point but it was too difficult for anyone else to make out. With M81/M82 I was unable to locate at all. I switched back to the Moon for a final look near the end. I was showing M51 on the SeeStar S50 that I brought. I had a large iPad propped up against the inside of my eyepiece case. It drew a pretty good bit of attention; a lot of people assumed the image was coming from the 10" and hadn't even noticed the SeeStar itself. It was a fun time. I'd gladly do it again.

Eli wrote,

I brought my 10" dob and originally had some difficulty with collimation. After that was fixed, I was able to locate the Moon in a 40mm Plössl, then a 27mm Panoptic, and eventually a 4" DeLite that gave a magnified image that fascinated many of the attendees. There was a great view of the shadows of the Montes Apenninus, and the attendees were struck by the the shadow detail of the terminator. I also brought one of the club's Seestar S50s, which I used to take images of M27 and M51, which were impressive considering the SQM reading of 18.16 SQM. However, attendees didn't seem as interested in the Seestar images due to their perceived artificiality, which was also something I've noticed at other events. Overall, it was a great event that brought quality astronomy to some of the brightest skies in the country.

Larry wrote,

The CPC800 always garners attention, with its fork mount, hand control, astrosticker-festooned dew shield, laser finder, 50-mm right-angle finder, dew controller, and dew heaters, and I got quite a few questions about the equipment, including the inevitable "How much does it cost?" I showed the Moon of course, and taking advantage of the CPC's tracking ability I popped in a 9-mm Nagler T6, with its 82 degree field, for a closeup look at the Alpine Valley at 225x. That got some gasps from the group. Later I also went to Alcor/Mizar and M13, which looked pretty good. I tried for M11, but although visible it didn't stand out enough, and like Jordan I found that M27 was lost in the haze. The colors of Albireo were impressive at 225x, and that made it easy to begin discussing elementary astrophysics. At one point I found myself explaining the Hertzsprung-Russell diagram, probably incomprehensibly without a proper graph, but I couldn't help myself. I had the Seestar S30 tracking M81 and M82, the image displayed on an iPad mounted on the tripod. In spite of the somewhat murky atmosphere, the two galaxies looked fine and provoked a variety of interesting questions. At least we could talk about the immense distances of these objects. The highly intelligent attendees and the very hospitable and involved Wave Hill staff made this a particularly gratifying event.

Seestar S30 image of M81/M82 at Wave Hill (cropped)

August 16 Star Party — Larry Faltz

It's been a frustrating year for star parties, with almost all the dates canceled for poor weather, and the few that were held suffered from very suboptimal conditions. As of this writing, we've not had a single crystal clear night. August 16th was only a slight exception. Although the forecast Friday was optimistic, thunderstorms in the late afternoon Saturday might have been a big disincentive, especially when they gave way to clouds around sunset that you might think would dissuade anyone from loading up their equipment. But astronomers by nature are optimists, and there were a substantial number of scopes and visitors at Ward Pound Ridge. More than half a dozen new club members (and families) were attending their first star party, some with new equipment. It was an opportunity to welcome fellow enthusiasts, help solve problems and provide an orientation to the night sky, such as it was on a humid evening with limited transparency but unlimited enthusiasm.

Here are some of the attendees with their scopes.

Jorge and Priscilla Camino with a Celestron Evolution 9.25 SCT. I was happy to spend an hour with them collimating the scope, aligning it and finding deep sky objects that they had not seen before.

Tony Ortega with an iOptron 6-inch RC, chatting with the Caminos before dark.

Cindy Pagnotta (standing) and Angela Gomes brought a Dianfan 80-mm refractor.

Aurelio and Fiorella Papile with a Celestron 130 on a go-to mount, getting its first light.

A brief report on the August 23 star party, sadly without pictures, is on page 34.

Mike Chamberlain with a DSLR. Mike brought a dozen Lewisboro cub scouts.

And here are some of the scouts with WAA President Jordan Webber, looking at something on the western horizon that took them away from Jordan's 10-inch reflector.

Gary Miller with his Explore Scientific carbon fiber 127-mm refractor, imaging setup and two enthusiastic guests.

Bob Kelly, WAA VP for Field Events, and 8-inch Dobsonian.

WAA Secretary Tim Holden and 80-mm refractor.

Nathan Hartshorne with 8-inch SCT ib AVX mount, talking with Jeff McFadden.

The Astronomer at the Museum

"Child with Orrery, Tellurian, and Other Astronomical Instruments," was shown at the Metropolitan Museum of Art's show *The New Art: American Photography, 1839–1910*, which closed in July. Drawing from the Met's extensive William L. Schaeffer Collection of photographs, the show presented images by famous American photographers as well as obscure or even unknown practitioners from small towns and cities from coast to coast. This salted paper print was made from a paper negative. It dates from around 1857.

The Met notes,

> As early nineteenth-century reformers encouraged interactive modes of learning, progressive educator Josiah Holbrook began to manufacture instructional devices for classroom use. The set of astronomical instruments pictured here was sold by his company, Holbrook's Common School Apparatus. The orrery (left) is a mechanical model which plots the orbits of planets and moons, and the tellurian (right) operates similarly to show the changing of seasons and shortening of days as the earth circles the sun. A young boy solemnly presides over the instruments, boosted by a chair. His oversize Renaissance costume affects an air of Copernican expertise.

A small armillary sphere is seen on the left side of the table. One wonders if the sphere on the right is a lunar globe. The sphere in the center is an Earth globe with the circles for the zodiac and the ecliptic. The device in the middle of the table is mysterious. For more on orreries and tellurians, see the March 2023 SkyWAAtch.

Josiah Holbrook (1788–1854) founded the first industrial school in the country and later developed the influential lyceum movement, which combined academic subjects like Greek, history, and mathematics with practical farming skills and crafts. He advocated professional teacher training and women's education.

The Astronomer at the Jeweler

The Mignone Halls of Gems and Minerals at the American Museum of Natural History is surely one of the greatest mineral collect ions in the world. It is filled with both scientific and aesthetic wonders. Although focusing on mineral specimens (large and small) and crystals, it also displays precious stones, the most notable being the spectacular 563.35-gram Star of India sapphire, probably the most perfect star sapphire in the world, and among the largest. It was stolen in 1964 by "Murph the Surf" (Jack Roland Murphy) and his associates, fortunately recovered in Miani a few months later.

The Star of India

The Minerals Gallery currently hosts a display of astronomy-themed jewelry by the Parisian-based Van Cleef and Arpels. Van Cleef is known for elegant, complex and often innovative (and always expensive) jewelry. We featured some of their watches in a piece in the June 2019 SkyWAAtch, and showed the jewel-encrusted Planétarium Automaton in an article on orreries in the March 2023 SkyWAAtch.

A few of the bijoux on display under the title "Cosmic Splendor" have an obvious relationship to astronomical objects, although for some the links seemed to us a bit stretched. There are also many zodiac figures.

V&A made the Moon pendant in 1969 to celebrate the Apollo 11 landing. Armstrong, Aldrin, and Collins each received one, and one was also given to President Nixon. He only made a phone call to the Moon, so we're not sure why Nixon deserved one.

Spiral, a pin made in 1942.

Clips made with pink and mauve sapphires, rubies and diamonds set in gold, representing spiral galaxies.

This watch shows when major meteor showers are occurring.

The “Tampa Necklace,” made in 2010, is designed to honor Jules Verne’s novel *From the Earth to the Moon*.

We were really impressed with this dramatic, one-of-a kind “Ciel de minuit” necklace, an homage to the Milky Way. It looked more luminous and galactic under the lighting and dark background at the exhibit, the lapis lazuli radiating a rich, cosmic blue to accompany the diamond and sapphire stars.

This clip is named “Galaxie Tourbillon” (Whirlpool Galaxy) but the label at the show carried a description of the Ring Nebula, not a galaxy. V&A is better at jewelry than astronomy!

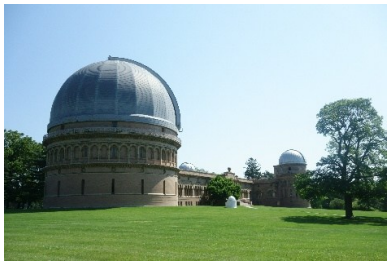
Cosmic Splendor, the exhibition of astronomy-themed Van Cleef and Arpels jewelry, will be on display at the American Museum of Natural History through January 4, 2026. By the way, if you have to ask, you can’t afford it.

The Astronomer in the Closet

This new SkyWAAtch feature is not what you first may have thought from the title. Most of us commemorate important experiences and allegiances with mementos. We are likely to come back from trips, star parties, museums, or NEAF with hats and tee shirts, among other ephemera. Some vendors will even supply a hat or other branded object when they sell you a piece of equipment. "The Astronomer in the Closet" will celebrate the sartorial/souvenir aspect of our hobby. This is a member-participation feature, so we want to hear from you. What's in your closet?

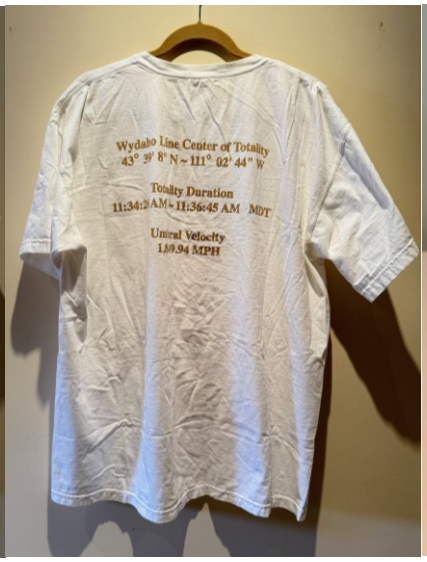
I'll inaugurate The Astronomer in the Closet with some of my observatory hats and eclipse swag.

We visited Yerkes in late June 2018, just before the University of Chicago shuttered it. UC had tried to sell the property to a developer for a luxury resort. The town of Williams Bay, WI refused to change the zoning and the project was abandoned. The observatory, housing the world's largest refractor and several other telescopes, was acquired by a not-for-profit group, the Yerkes Future Foundation, in 2020. They reopened the facility for outreach and education, and they are restoring the 40-inch. The historic, richly ornamented building, full of wonderful architectural detail and cheeky images, was designed by Henry Ives Cobb.



We spent a breathless hour on top of Mauna Kea (13,599 feet) two days before the Transit of Venus in 2012. We got a glimpse of Keck 1 from a small observation room, looking up at the jungle of struts that hold the secondary mirror above the 10-meter primary. A day after the transit, we toured the observatory's headquarters in the town of Waimea, at a more breathable 2,600 feet, and scored the hat (and a shirt). If you want to get a better look at the scopes than we did, *Sky & Telescope* has a tour to Big Island in March 2026 that will go inside the domes. Details are on the *S&T* web site.

Mt. Wilson Observatory is just seven miles from downtown Pasadena as the crow flies, but the 25-mile car route runs in the San Gabriel mountains on a picturesque, somewhat twisty road. In 2016, we spent the day there. After a chili dog lunch at the Cosmic Cafe we went on a well-curated tour that included close-up looks at the 100-inch Hooker telescope and the 150-foot solar telescope. Light pollution from Los Angeles has shuttered Mt. Wilson's astronomical research program, but there are public observation nights as well as opportunities to rent either the 60-inch or 100-inch scopes for the entire night (expensive!).



We saw the August 21, 2017 total solar eclipse from Victor, Idaho. It was a glorious event, with perfect weather, a great site close on center line, and wonderful compatriots. On our way out of town a couple of days later, we stopped in a store for souvenirs. The only tee shirt left was an XL, much too large for me to wear, but I got it anyway. It's been sitting at the bottom of a drawer, thus accounting for the wrinkles. The 2017 eclipse was seen by many WAA members. Their experiences are collected in the October 2017 Sky-WAAtch. "Wydaho," mentioned on the back of the shirt, is a tourist region in Teton County, Idaho, but it includes the small town of Alta, Wyoming, isolated from the rest of Wyoming by the Grand Teton range. Grand Targhee, a Wyoming ski area reachable only from Idaho, marks Wydaho's easternmost extent.

The hat reads "The Big One! I was there!" Indeed, we were there, but the eclipse wasn't.

The July 11, 1991 solar eclipse crossed the Big Island of Hawai'i and the tip of the Baja peninsula. This would be our first trip to Hawaii, so we added a week in Kauai and Oahu after the five-day eclipse trip. Although the prediction for clear skies was 97% along the Kona coast, the normally cloudless leeward side of the island, a freak low pressure system 300 miles to the north reversed the atmospheric circulation. Clouds piled up along the western side of Mauna Kea and Mauna Loa, and the 6½ minute eclipse wasn't visible. The rest of the trip assuaged our disappointment. We had great experiences, including a helicopter tour of Kauai that went into the crater of Mt. Wai'ale'ale (the wettest spot on Earth), kayaking on Kauai's Hanalei River, where the opening scene of *Raiders of the Lost Ark* was filmed, snorkeling in Oahu's Hanauma Bay, and a visit to Pearl Harbor.

WAA members: Take a snapshot of your astro-swag and memorabilia (selfies are acceptable) and send the files to waa-newsletter@westchesterastronomers.org, along with a paragraph on howyou came to acquire the item(s).

The Regretful Life of a Renowned Observer Robert Burnham Jr.

Eli Goldfine

In this digital age, most information about astronomy is dispersed via the internet, but many observers still have shelves full of astronomy reference books. Some might say that having an astronomy book collection is a requirement to call oneself an amateur astronomer.

These astronomy books travel one of two routes: either they are opened once every five years "out of curiosity," or they are coverless with 50 dog-eared pages.

My shelf of endless pages.

One staple of these collections is the famous three-volume *Burnham's Celestial Handbook.* This 2,100-page guide is one and a half times the size of Tolstoy's *War and Peace*. The first volume features a 100-page detailed introduction on how to observe the sky, followed by a description of each of the 88 constellations. Each constellation has a data table listing the objects within it, followed by notes about the history and significance of the constellation and its stars and brighter deep sky objects: double stars, variable stars, open and globular star clusters, nebulas, and galaxies.

But the *Handbook* is more than just a reference book. It contains passages that are philosophical and historical. As the blurb of the book says, "While there are many books on stars, there is only one *Celestial Handbook*." Who had the time, resources, and knowledge to write it?

With one final stroke of the brush, he was finished with his latest work of art. He set the painting down on a tarp, hoping to sell it to a passer-by. He was proud of this painting; the tail looked soft and silky, yet the cat's eyes remained ever-observant.

But ever-observant the painter was no longer. The Air Force veteran who used to be an esteemed researcher at Lowell Observatory in Flagstaff, Arizona, the place where Pluto was discovered, was now just a homeless man selling paintings of cats in a San Diego park.

His life was like this for 14 years until he died in 1993 at the age of 61.

How did readers of the Celestial Handbook *not know what was happening to its author? It was most likely because an unrelated editor of Astronomy magazine also happened to be named Robert Burnham, and readers assumed he was the author of the series.*

This is the story of the author of the universe: Robert Burnham Jr.

Early Life

Robert Burnham Jr., a self-described "warped genius or first-rank crank, was born in Chicago in 1933 into a lower-middle-class family. Burnham, along with his mother and sister, moved to Prescott, Arizona, in 1940. Burnham graduated high school in 1949 and had neither the desire nor the means to attend college.

He spent a couple years working on hobbies until he enlisted in the Air Force, serving as a radar technician for four years. It was during this time that he first conceived the idea of a *Celestial Survey,* a record describing and detailing the entire night sky as we know it. He was using a small refractor as part of his duties but was frustrated by the lack of explanation of many of the small marks on star maps the Air Force

provided. He thought that each dot was an entire other world, but no information was provided about most of the dots.

After discharge, he returned home to pursue his hobbies and develop the *Survey*, which later became the *Celestial Handbook*.

Burnham's study in Prescott.

He landed a job as a shipping clerk. During long, dull workdays he decided to pursue his true passion: astronomy. He built a telescope out of old parts gathered from his home. He never even built a mount for the scope, just an OTA (optical tube assembly). He spent the majority of his free time observing.

The First Discovery

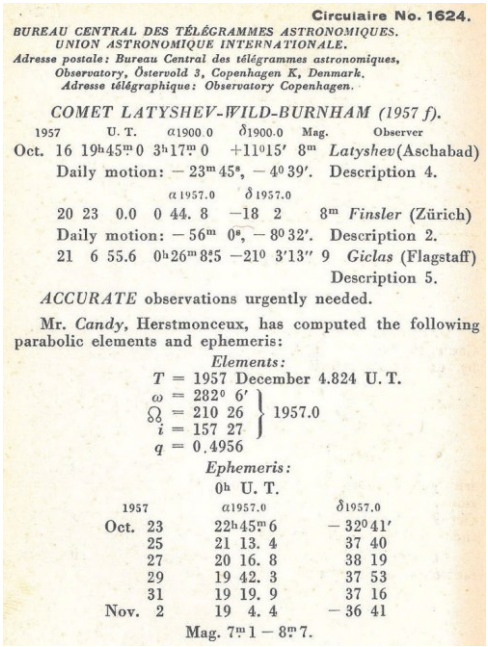
On October 16, 1957, Ivan N. Latyshev was in the control room of his observatory in Aschabad, Turkmenistan, working on a survey of RR Lyrae-type variable stars. He was looking at the star X Arietis in the constellation Aries when a comet appeared in the field of view. Latyshev noted this but continued his work on the RR Lyrae survey rather than reporting it.

Three days later, Paul Wild, a Swiss astronomer, was observing at the Zimmerwald Observatory near Bern when he spotted the same comet as Latyshev. Wild called in his finding to the International Astronomical Union (IAU).

Meanwhile, Burnham was observing with his crude home-built scope. He was cataloging minuscule portions of the sky for data to be included in the *Handbook.* But just hours after Wild, Burnham saw a glowing bluish smudge in his field of view. It was not listed in any of his reference books. As an Arizonan, he knew of Lowell Observatory, the renowned "Home of Pluto" in Flagstaff.

He called in his findings to Lowell (the phone was answered by none other than Vesto Slipher, who had discovered galactic redshift in 1912) and he sent a telegram to the Harvard College Observatory (HCO). Unfortunately, Mars Hill, where Lowell was located, was plagued by clouds that night, but the HCO was able to verify Burnham's discovery in the following nights.

Burnham with his home-built reflector.



Circulaire No. 1624.

BUREAU CENTRAL DES TÉLÉGRAMMES ASTRONOMIQUES.
UNION ASTRONOMIQUE INTERNATIONALE.
Adresse postale: Bureau Central des télégrammes astronomiques, Observatory, Østervold 3, Copenhagen K, Denmark.
Adresse télégraphique: Observatory Copenhagen.

COMET LATYSHEV-WILD-BURNHAM (1957 f).

1957	U. T.	$\alpha_{1900.0}$	$\delta_{1900.0}$	Mag.	Observer
Oct. 16	19^h45^m0	3^h17^m0	$+11^\circ15'$	8^m	*Latyshev* (Aschabad)

Daily motion: -23^m45^s, $-4^\circ39'$. Description 4.

	$\alpha_{1957.0}$	$\delta_{1957.0}$		
20 23 0.0	0 44. 8	−18 2	8^m	*Finsler* (Zürich)

Daily motion: -56^m 0^s, $-8^\circ32'$. Description 2.

21 6 55.6	$0^h26^m8^s.5$	$-21^\circ3'13''.9$		*Giclas* (Flagstaff)

Description 5.

ACCURATE observations urgently needed.

Mr. *Candy*, Herstmonceux, has computed the following parabolic elements and ephemeris:

Elements:

T = 1957 December 4.824 U. T.
ω = 282° 6′
Ω = 210 26 } 1957.0
i = 157 27
q = 0.4956

Ephemeris:

0h U. T.

1957	$\alpha_{1957.0}$	$\delta_{1957.0}$
Oct. 23	$22^h45^m.6$	$-32^\circ41'$
25	21 13. 4	37 40
27	20 16. 8	38 19
29	19 42. 3	37 53
31	19 19. 9	37 16
Nov. 2	19 4. 4	−36 41

Mag. $7^m1 - 8^m7$.

The IAU circular announcing the discovery of C/1957 U1.

When word of Wild's discovery in Bern circulated in the astronomy community, Burnham and Latyshev were able to prove that they had also independently discovered the comet. When the IAU announced the

discovery in publication a week after Latyshev's original sighting, all three astronomers were listed as co-discoverers.

Considering that Latyshev and Wild were using professional observatory equipment, it is impressive that Burnham was able to discover this independently. It is a testament to his telescope making skills, and his observing skills as well.

The Arizona news media flagged Burnham as a hometown hero. The story got quite a bit of national attention, and even Arizona senator Barry Goldwater, later the 1964 Republican candidate for president, visited Burnham. Though Goldwater used the visit as a political ploy, he did offer Burnham an 1882 brass refractor telescope from his late uncle's estate.

An aerial view of Lowell Observatory.

Career

With Goldwater's refractor, Burnham independently discovered another comet on February 22, 1958. Lowell Observatory learned about Burnham's second discovery and offered him a job as a researcher with a starting salary of $6,000 per year (equivalent to about $67,000 in 2025). He would be working on a two-year proper motion survey.

The job almost fell through after Burnham's mother reported the job offer to a local newspaper. Lowell found out it was not Burnham himself who had submitted the information, and they were still open to hiring him after his mother wrote a formal apology to the Observatory.

The dome that holds the Pluto Discovery Telescope that was used in the Lowell Proper Motion Survey.

The Proper Motion Survey

The proper motion survey, expected to take two years, became a 20-year mega-survey. While the head of the project, Henry Giclas, wanted to get the project done as fast as possible, Burnham and Norm Thomas, another non-professional astronomer on the project, wanted to make more thoughtful and detailed observations. They had a good working relationship in spite of Burnham's reclusiveness. Giclas stepped back from the project after a couple weeks.

Thomas with photographic plates from the Lowell Proper Motion Survey.

The project used Clyde Tombaugh's photographic plates made during his search for "Planet X" thirty years earlier. The team would take long-exposure photographs in the same fields as Tombaugh and

compare the plates with a blink comparator, hoping to detect and measure proper motion of field stars. Burnham and Thomas would compare their findings, creating a sort of competition between the two.

Burnham at the Pluto discovery telescope

Life at Lowell

Burnham's life during this time was good. He lived in a cabin on the observatory's property that he turned into a gallery or "Cabinet of Curiosities" displaying his quirky tchotchkes and found objects, including fluorescent minerals, shark teeth, rare books, and ancient coins.

Living at Lowell rent-free, he spent most of his days analyzing data or simply reading in his rocking chair. He wanted no attention and had little social life, but he did have a few girlfriends, including Julie Lutz, who later became the chair of the astronomy department at Washington State University.

Even though Burnham was very busy at night with the proper motion survey, he managed to fit in observing sessions with Thomas, simply for the joy of exploring the universe. During these observing sessions, Burnham would make notes on the objects he encountered. After 16 years of these observing sessions, Burnham had six large notebooks filled with observing notes. It occurred to him that publishing them might bridge a gap in the astronomical literature. It would be a *descriptive* star atlas, designed neither for the beginner nor the professional. The only other book remotely like this was T.W. Webb's *Celestial Objects for Common Telescopes*, first published in 1881.

Artefacts displayed in Burnham's home

Burnham once said of his notebooks, "The whole thing started quite innocently, without malice aforethought. It's like being born, you know. At the time, you have no idea you're being shoved off a cliff."

Burnham's Celestial Handbook

Burnham decided to self-publish the *Celestial Handbook*. He had helpers from Thomas's family collate the loose-leaf volumes that he was to distribute. At one point there were half a million pages on the table in a meeting room at the Lowell campus.

His queries at multiple publishing houses met with various complaints and criticisms, among them that there was no demand, that it was too long, or that printing was not economical. Lowell would not help, citing reputational concerns if the book contained errors. They did not know he had third parties checking the data.

Burnham sent some of his limited supply of loose-leaf *Handbooks* to places like *Sky & Telescope,* which published glowing reviews that particularly cited the book's extensive detail and accuracy.

In 1976, Burnham won a contract with Dover Publications, which specializes in reprinting books that have been long out-of-print, including astronomy books. Dover paid him a flat fee of $3,000. Dover would turn the original loose-leaf notebooks into three volumes.

The *Celestial Handbook* quickly became a go-to guide for amateurs looking for anything in the night sky, and Burnham enjoyed regular royalty checks from the Astronomy Book Club, published it separately. Details about this company have faded into obscurity.

It seemed to Burnham that he would be at Lowell forever, continuing the proper motion survey and receiving a steady income in royalties until the day he died. But then, Burnham learned he was to be fired.

Laid Off

The proper motion survey ended in 1979 after a run of 21 years. It resulted in the discovery of 10 comets, 1,500 asteroids, 2,000 white dwarf candidates, 9,000 high-motion stars, and 3,000 variable stars. The universe is infinite, but the number of degrees in the sky is not. The survey had reached Polaris at the north celestial pole. There was no more sky left to observe.

Norm Thomas, who had a master's degree in geology, was reassigned to a project relating to asteroids. By the time he retired, Thomas ended up discovering 55 asteroids.

But Burnham could not be reassigned. Not only did the new leadership of Lowell know Burnham had no formal education, but they believed he was taking advantage of the resources of his job to promote the *Handbook.*

Lowell offered Burnham a job as a janitor which he declined. He made a proposal to Lowell asking to turn his occasional tours and presentations into a full-time job. Lowell declined, giving him eight months' notice and offering to help him find work elsewhere.

In December 1979, he packed up his cabin and descended Mars Hill for the final time.

Burnham had an impressive 21-year legacy at Lowell Observatory.

And then, his life took a turn for the worse.

Later Life

Burnham rented an apartment in Flagstaff but did not look for a new job. He was making all his income off of the sizable, but not tremendous royalty checks from Dover. He received about $5,000 every six months (equivalent to around $20,000 in 2025).

During his time in Flagstaff, he focused on hobbies such as writing and painting. He began to write a very long fantasy novel.

Burnham became angry with Dover for supposedly underpricing the book, not translating it to Japanese, and lacking interest in his upcoming fantasy novel. In 1981, the price of all the books dropped to $2.95 (equivalent to around $11 in 2025). Burnham's royalties dropped substantially.

By then, Burnham refused to promote the *Handbook* at all, perhaps because of a profound fear of attention. Dover pressured Burnham to do an interview as publicity for the book but Burnham refused. Instead, he composed an extremely odd self-interview. At 24,000 words, it is one of the strangest things you will ever read. You can find it at https://is.gd/BurnhamInterview.

The Spiral

While Burnham's friends, family, loyal readers, and supporters all pressured him to find work and offered him various job opportunities, he repeatedly declined. He was quickly spiraling into monetary challenges.

Burnham realized that he needed another source of income. On one occasion, he lost money in a pyramid scheme. Other times, he tried various ventures such as enlisting children to resell jewelry. He also resorted to selling some of his precious collectables from his home museum.

He would now spend hours a day with a metal detector looking for valuable items buried in the ground, but as expected, nothing of value turned up. Norm Thomas's family was paying him a weekly allowance to stay afloat.

After *Sky and Telescope* published a note commending the effort Burnham put into the *Handbook,* Burnham wrote a "Letter to the Editor" expressing his frustration with how little he was rewarded for the decades of work he spent writing the series. The letter was published with Burnham's address, and many fans of the *Handbook* sent him letters of appreciation, but he replied to none of them.

Burnham Goes Missing

In July 1985, a missing person report was filed for Burnham. His apartment was left with most of his possessions, save for a few valuable antiques. Burnham's sister and niece paid Burnham's rent for the month as they cleared out his collection. At the spot Burnham looked for gold with his metal detector, they found Burnham's trailer but no traces of the man himself.

Burnham is Found

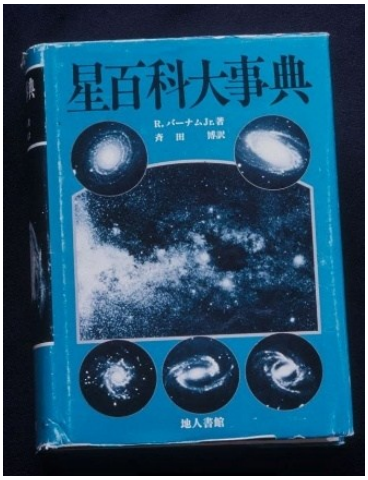
Seven weeks later, a Newport Beach police officer found a homeless man walking on the beach. He identified himself as Robert Burnham. He was sunburned from head-to-toe and had a limp. He was treated at a hospital before being discharged to a homeless shelter. Burnham's sister picked him up from the shelter and took care of him in her mobile home. When asked what had happened during the time he was missing, he provided a strange, hallucinating, schizophrenic narrative: he saw elephants, a woman with a child, and a cat that would magically disappear when it moved near him. He said his hand went through the door of a car to go to a hotel room in a skyscraper where a loud noise ushered him slowly towards a glassless window and someone said "Let's go to the beach."

Then he remembered telling the police officer his name, and everything again felt normal. There is no evidence that Burnham was using controlled substances to account for the change in his mental status.

The Trailer

Burnham became a bit saner by this point. He recognized he needed to find a job, and he did some telemarketing from inside the trailer.

The Japanese edition of the *Handbook* was finally about to be published and Burnham was counting on a huge royalty check. The check came, but it was only for $500. He was devastated.



The Japanese edition

Burnham's sister repeatedly tried to get him to either go to a doctor or get a real job. Burnham didn't want this, and he was sick of his sister trying to make him do something. In fact, he seemed sick of life all together.

Burnham Goes Missing… Again

In May 1986, Burnham saw his sister for the last time before vanishing with $20, some clothes, and a government ID. Dover forwarded his small royalty checks to a new address, which they refused to share with his sister. He walked to San Diego. A missing person report was never filed.

Life in the Park

On weekends, Burnham would sit down on a bench in front of the Reuben Fleet Planetarium with his paintings arranged in front of him. He didn't actively try to sell them. He would just wait until someone walked by and perhaps showed interest.

There is evidence that Burnham lived at an extended-stay hotel about a mile away from the park for the last seven years of his life. He was paying $200 a month from income from royalty checks and cat painting sales. Thousands of dollars in a retirement fund were apparently forgotten.

A Burnham cat painting

Burnham's neighbors in the hotel remembered that he was very kind and gracious, but he seemed very sick, especially in the last few years of his stay.

One weekend, Norm Thomas's son ran into Burnham in the park. He arranged for Thomas to come to San Diego, and the two astronomers met and discussed their days at Lowell. Thomas informed Burnham that he was to name an asteroid after him. It was named 3467 Bernheim because the asteroid "Burnham" had been named for astronomer Sherburne Burnham.

Burnham was appreciative of this gesture. He thought the visit was pleasant, but not very meaningful. Thomas, on the other hand, was very upset. He was angry about how desolate Burnham's life seemed, and he desperately wished he could do something to help.

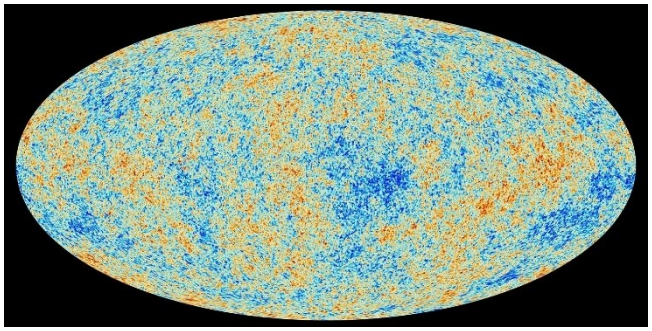
But sadly, he could not. Burnham, in his declining health, was quite content and did not wish for a change.

On March 20, 1993, Burnham's heart beat for the final time. Burnham was cremated and his remains lie at Fort Rosecrans National Cemetery. There is a cross above Burnham's name on his headstone, even though he was an agnostic. He said he had no specific set of beliefs. Everything is a mystery waiting to be solved. He had expressed belief in the Tao, the one wholeness of the universe, which is a tenet of many East Asian religions, most notably Taoism and Buddhism.

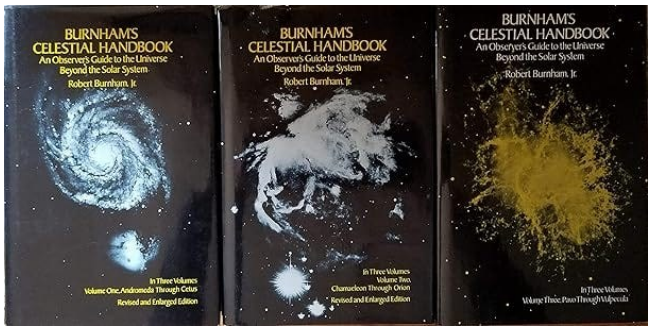
Burnham's Legacy

If you are in the northern hemisphere, it is impossible to find a spot of the sky that was not extensively catalogued by Burnham, complete with pages of description and hand-drawn diagrams.

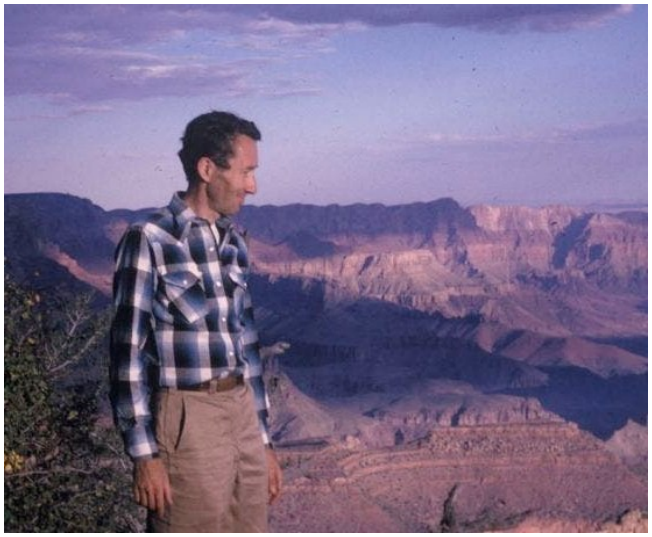
This is a heat map of the entire observable universe, as seen by the Planck spacecraft. We might consider it the single best representation we have of the cosmos:



But maybe an equal representation of the entire universe is this:



Mr. Robert Burnham Jr. has taken thousands of observers to the far reaches of the universe, beyond the narrow limits of sight and the unbreakable restrictions of mind. Because when the confines of earth are departed, nothing is ever what it appears to be; the seemingly infallible eye is suddenly deceived. The fact is undeniable: the heavens are incomprehensible without someone or something to guide us. And for every little dot on a planisphere, Burnham uncovers our eyes, activates our imagination, and opens our window to a new world, a contrasting reality. And all of a sudden, what seemed infinitely far becomes almost tangible… incredibly close, impossibly real. ■



Eli Goldfine is a member of the WAA Advisory Board and a student at the Masters School in Dobbs Ferry. He now has a Substack, Magnitude Zero: Annals of Astronomy, from which this article was taken, with permission.

Images by Members

Four Targets in Four Nights by Steve Bellavia

Steve writes,

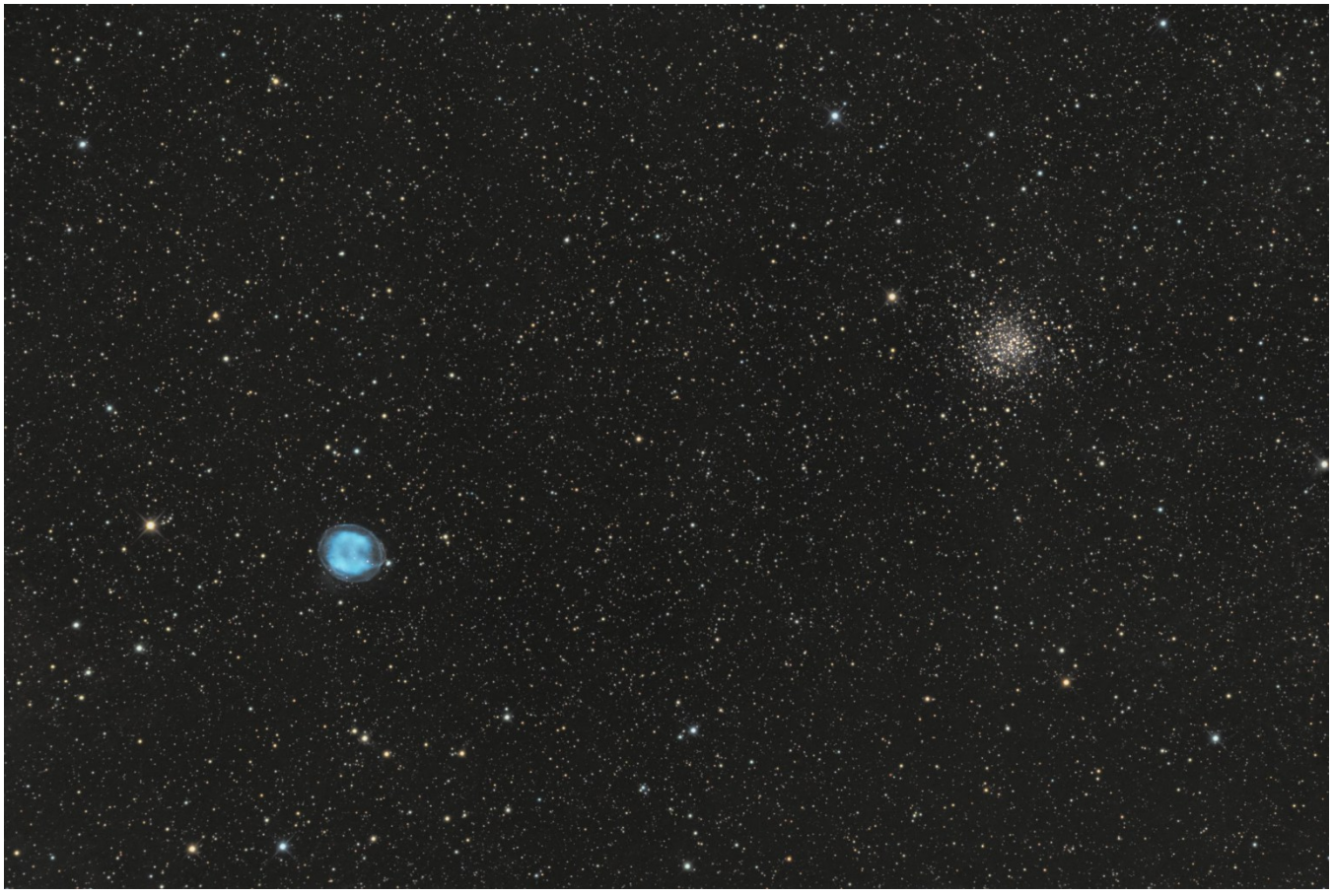
I went to Cherry Springs State Park, from Sunday, July 20 to Wednesday, July 23, and had three clear nights in a row. When I got home to Virginia Wednesday night, it was clear, so I added a fourth target from there.

All of these targets were captured with 30-second exposures, despite being very faint. After performing many tests, I discovered that I was getting more detail by reducing accumulated guiding and seeing errors with the shorter exposures. I was also able to accept and reject more frames, based on FWHM and eccentricity of the stars, which was expected. I was also getting a better signal-to-noise ratio (SNR), which was unexpected.

Richard Feynman once said, "If it disagrees with experiment, it's wrong.” In that simple statement is the key to science. I've seen many theorists claiming you need very long exposures, especially if using a slow optical system (I was at f/7.1). But it just isn't so.

My main goal was to capture IC 1295, an "Owl-like" planetary nebula in Scutum. Planetary nebulas are often the most difficult objects to capture, as they are very small and faint, but often have nice details. IC 1295 is only 1.5 arcminutes across, less than half the size of the Owl nebula (M97). It’s magnitude 12.5, so 33 times fainter than the magnitude 8.7 Owl.

While researching the framing for this target, I noticed that the globular cluster NGC6712 was only 24 arcminutes away. I searched astrobin.com but could not find any images of the two objects together in the same field. I was able to find them imaged together on the internet, so I am certainly not the first.



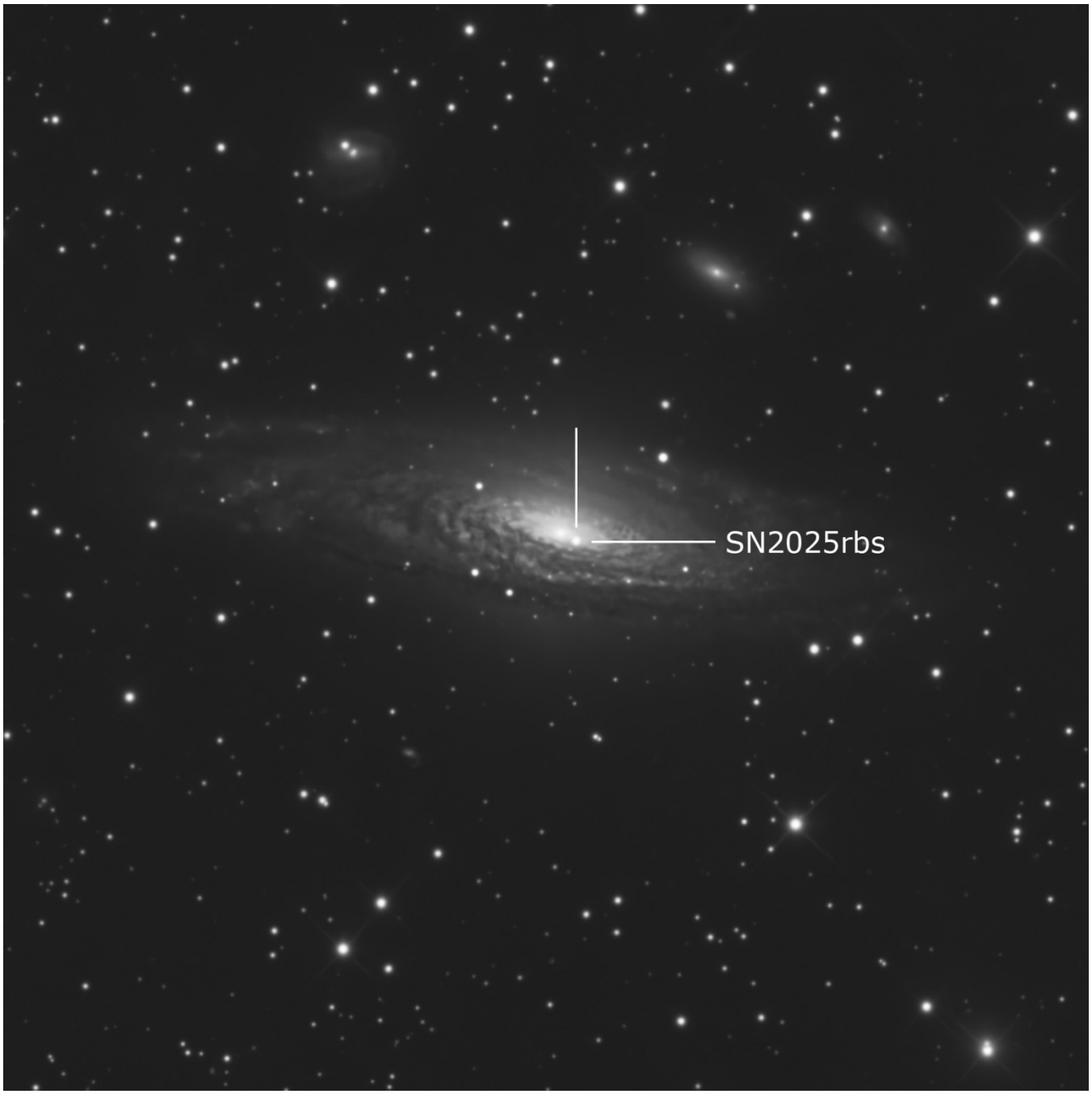
IC 1295, also catalogued as PK05-4.2, is a planetary nebula in the constellation Scutum and is approximately 4,700 light years from Earth. It was discovered by Truman Safford in 1867 using the 18.5-inch refractor at the Dearborn Observatory in Chicago. Also in the image is another planetary nebula, PK025-04.1. It is really tiny, so we enlarged a section of the image and marked the object. NGC 6712 is a globular cluster, also in Scutum, probably discovered by Le Gentil on July 9, 1749 when investigating the Milky Way star cloud in Aquila. John Herschel was the first to describe it as a globular star cluster during his observations in the 1830s. It is 26,000 light years from Earth, and the stars are estimated to be 12 billion years old. The field is 46.2 x 30.8 arcminutes. Technical information is at https://www.astrobin.com/3p82p7/.

I also captured the much more frequently imaged Eagle Nebula, with its famous "Pillars of Creation." The nebula, M16 and also catalogued as NGC 6611, is a young open cluster of stars in the constellation Serpens. It was discovered by Jean-Philippe de Cheseaux in 1745–46. The nebula contains several active star-forming gas and dust regions, including the Pillars of Creation. The Eagle Nebula lies in the Sagittarius Arm of the Milky Way. It is actually part of a diffuse emission nebula, or H II region, which is catalogued as IC 4703. This region of active current star formation is about 5,700 light-years distant. A spire of gas that can be seen coming off the nebula to northeast is approximately 9.5 light-years long. The cluster embedded in the nebula contains approximately 8100 stars. The field is 52.8 x 35.2 arcminutes. Technical information at https://www.astrobin.com/bjd0zl/.

Another frequently viewed and imaged planetary is the Cat's Eye Nebula, NGC 6543, also listed as Caldwell 6. This is a challenging object because its tiny 20 arcsecond core, which has some nice details, is very bright, while the outer portions are extremely faint and often not seen on otherwise good images. The galaxy NGC 6552, to the left of the Cat's Eye, is an SB spiral at a redshift of 0.0286, distance 394 million light years. Visual magnitude 13.74. The field is 26.5 x 26.5 arcminutes. Technical information at https://www.astrobin.com/mqzdy6/.

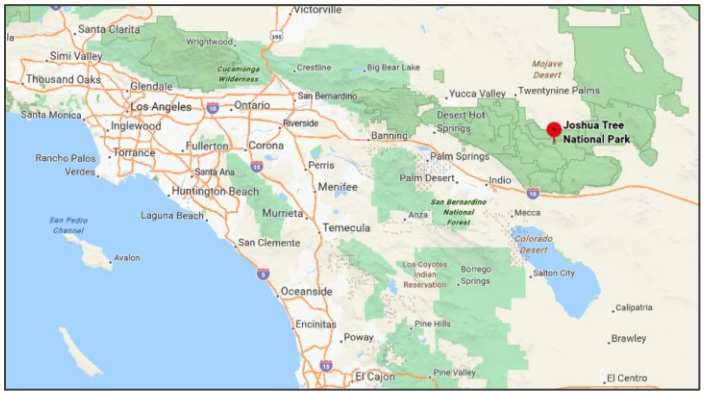
The core of the Cat's Eye is magnitude 8.3 and 20 arcseconds across. It's in Draco and at 66 degrees declination it's circumpolar from our latitude. It's highest overhead in late spring and summer evenings.

And lastly, the supernova, SN2025rbs that recently appeared in galaxy NGC 7331 (Caldwell 30), the main galaxy of the "Deer Lick Group" in Pegasus, some 40 million light years away. It was discovered on July 14. It is a type Ia supernova. The field of view of the image is 13.2 x 13.2 arcminutes Technical information at https://www.astro-bin.com/rktn2m/



The Veil Nebula from Joshua Tree National Park by Derek Davis

Derek was in California for work but took some time to rent a camper van and take advantage of the dark skies and new moon at the Cottonwood Campground in Joshua Tree National Park. The Western (left) and Eastern (right) components of the Cygnus Loop, better known as the Veil Nebula, were captured with a Seestar S50, 3 hours of 20 second subs each.



In addition, Derek made a clever timelapse of the Milky Way using an Insta360 1" Edition camera. You can see it (and some of the goings-on in the campground) at https://is.gd/DavisMWVideo.

Another take on the Eastern Veil by Steve Bellavia

Steve Bellavia's image was made with a 6-inch Celestron SCT with a Starizona Hyperstar, which converts it to an f/2 astrograph. He made the image the night of July 4–5 at his home in Smithfield, Virginia. The field is 1.68 x 1.26 degrees. Full technical information at https://app.astrobin.com/i/cqpm1w.

Steve writes,

> The Eastern Veil Nebula, NGC 6992, NGC 6995 and IC 1340 (catalogued as Caldwell 33) is part of a cloud of heated and ionized gas and dust in the constellation Cygnus that formed when a star 20 times more massive than the Sun exploded approximately 15,000 years ago. This supernova remnant has expanded to cover an area of the sky roughly 3 degrees in diameter (about six times the diameter of the full Moon). It is 2,400 light years distant.
>
> It is part of the much larger complex, known as the "Cygnus Loop," all from the same supernova, spreading its material over vast expanses of space.

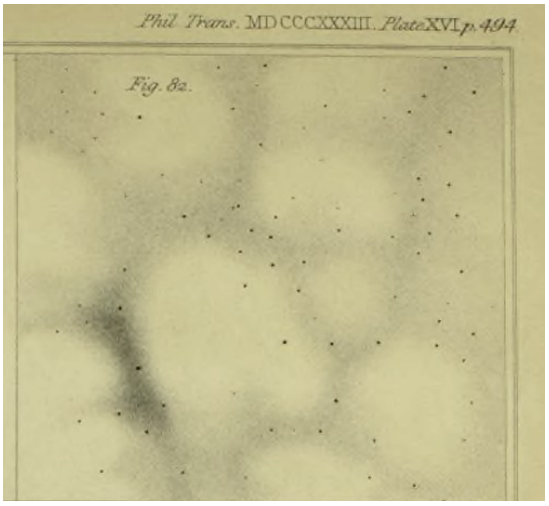
Steve noted that he started making the image

> at 10:00 p.m., but I discarded most of the early data, as the Moon was up until 1:30 a.m. There was a distinct clearing at 3:00 a.m. I stopped at 4:20 a.m., 20 minutes into astronomical twilight. The transparency started out very poor but after 3:00 a.m. became very good. The seeing started out poor, and became average after 3:00 a.m. Temperature was 15° C to 20° C with no wind and it was relatively dry.

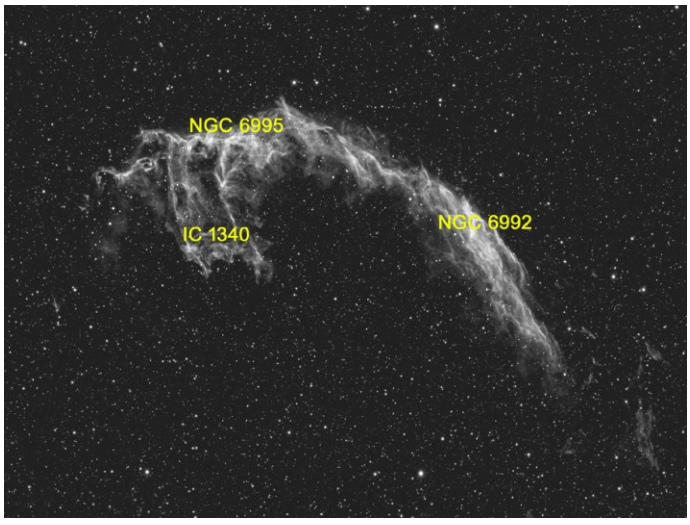
NGC 6992, the largest extended knot of gas extending to the right nebula, was found by William Herschel on September 5, 1784. He called it a "branching nebulosity." His son John Herschel was apparently the first to notice the central knot of gas, listing it as #2093 in his 1833 catalog (it would become #4618 in his 1864 *General Catalogue* and #6995 in Dreyer's 1888 *New General Catalogue*). Herschel describes it as "a most wonderful phenomenon" and Herschel made a drawing, which he admitted did not provide "minute details of this object, which would be extremely difficult to give with any degree of fidelity."

In the United States, Ebenezer Porter Mason built a 12-inch speculum-metal reflector while an undergraduate at Yale. He observed and drew a number of nebulae. His observations were published in the *Transactions of the American Philosophical Society* in 1841,[1] the year after his death at age 21 from tuberculosis. In the *General Catalogue*, John Herschel appends this note to #4618: "In conformity of Mr. Mason's remarks on my observations of this nebula, and with his elaborate and excellent monograph of the great nebulous system of which it forms a part, I have diminished the P.D. [polar distance, meaning 90°-declination] in my Catalogue of 1833 by 1°." Mason's life and contributions can be found in a fine article in the *Journal of the British Astronomical Association*.[2]

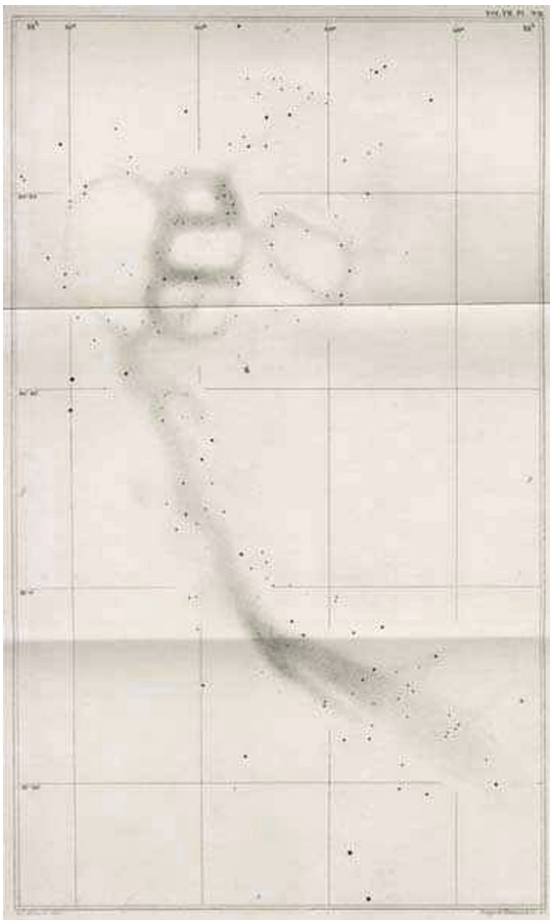
Dreyer's first Index Catalog (1895) credits IC 1340 to Truman Henry Safford, an American astronomer who was the second director of the Hopkins Observatory at Williams College.



John Herschel's drawing of #2903 in his 1833 catalog



Map of the Eastern Veil



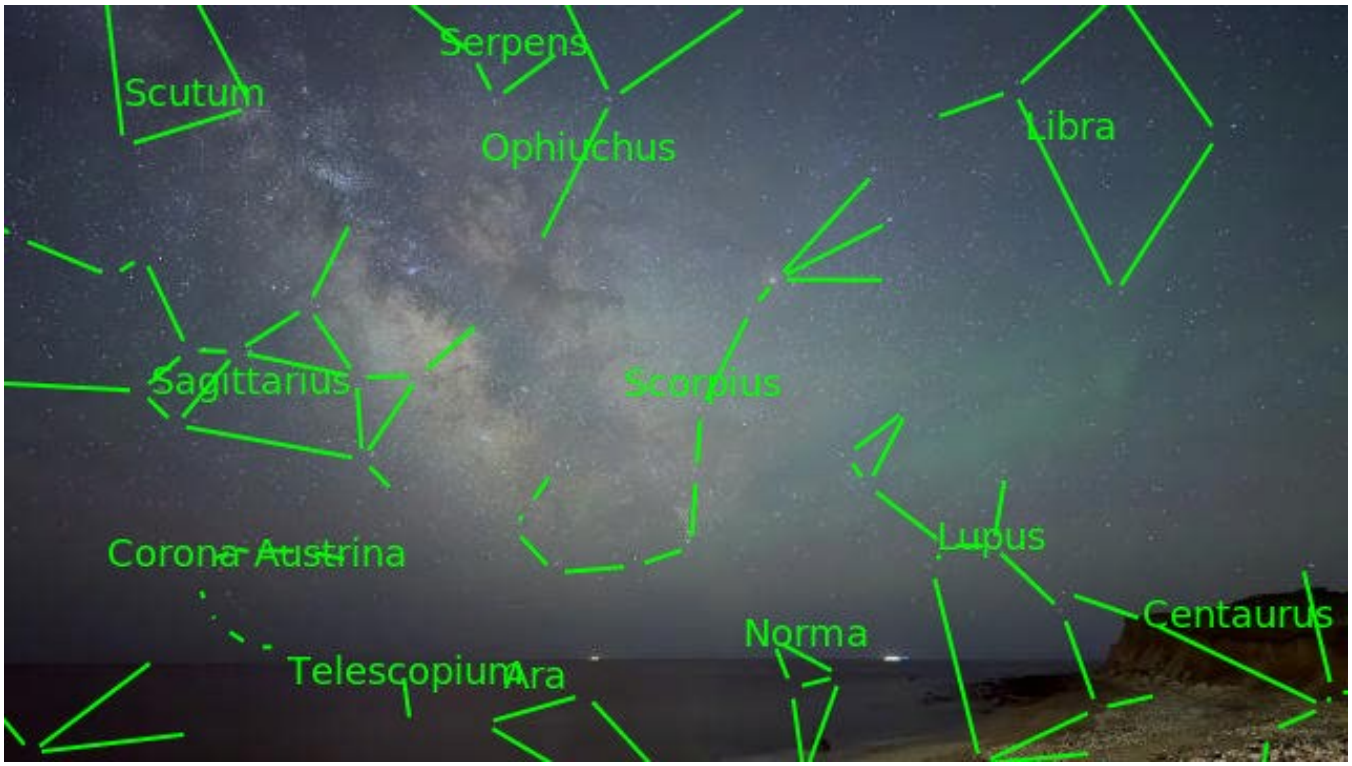
Mason's drawing of the Eastern Veil

[1] Mason, EP, Observations on Nebulæ with a Fourteen Feet Reflector, Made by H. L. Smith and E. P. Mason, during the Year 1839, *Transactions of the American Philosophical Society*, 7: 165–213 (1841), https://www.jstor.org/stable/1005305?seq=1

[2] Shears, J, Knight, C, Lewis, M, et al., In the footsteps of Ebenezer Porter Mason and his nebulae, *Journal of the British Astronomical Association* 125: 164–169 (2015), https://articles.adsabs.harvard.edu/pdf/2015JBAA..125..164S.

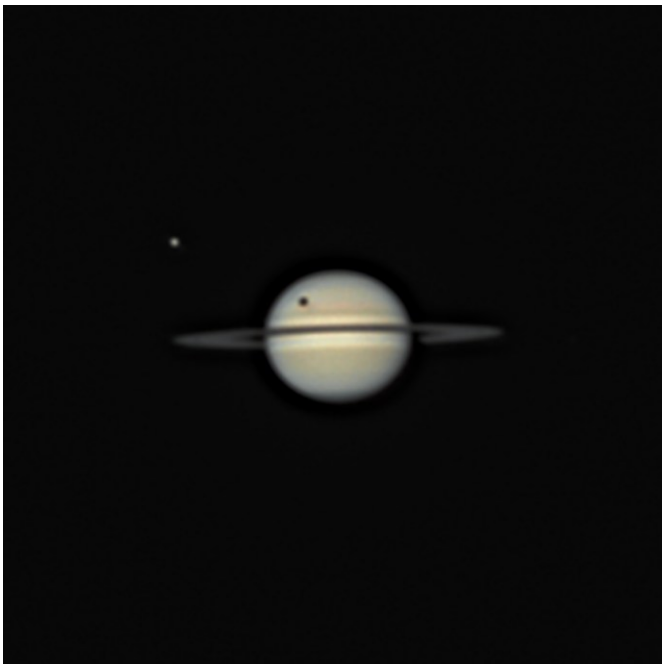
The Milky Way from Montauk by Haoquan Liang

On May 27th, Haoquan put his iPhone 16 Pro Max on a tripod and made this 30-second exposure of the Milky Way. The field is 81.2 x 45.6 degrees. The bright star above center is Antares. Astrometry.net drew the constellations for us.



Shadow Transits of Titan

A series of shadow transits of Saturn's moon Titan occurs every 15 years. There are nine or ten events, separated by 16 days, which is the satellite's orbital period.



Steve Bellavia made this image in Virginia on July 18 with an Explore Scientific 152-mm Maksutov-Cassegrain.

Larry Faltz used a Celestron CPC800, 2x Barlow and Mallincam DS287 to make this shot at the Quaker Ridge School in Scarsdale on August 3. Both seeing and transparency were poor.

In Mahopac on August 19, John Paladini used a venerable Criterion RV-6 reflector (6" f/8), 2.5x Televue Barlow and an ASI678MC camera.

John commented that in bad seeing, details are somewhat better in smaller scopes than larger ones. This is a well-established principle in amateur astronomy. J.B. Sidgwick, in the *Amateur Astronomer's Handbook* (1971), notes that when there is atmospheric turbulence, "what in a small instrument appears as a well-defined but much agitated stellar image is in a large instrument a practically motionless, structureless, circular blob" (p. 462).

There will be two more transits in September.

Times are EDT	Begins	Mid	Ends
September 4	1:25	3:09	4:50
September 20	1:09	2:20	3:34

The last transit on October 6 will skim the planet's edge and the full shadow disk will not be visible. The next one after that will be in 2040.

In Eustis, Maine, WAA member Robin Stuart captured the August 19th transit. In his very dark skies, he managed to capture Dione, on the left, and Rhea, on the right, in addition to Titan and his shadow.

The image was taken through a Televue NP127 with a 5x Powermate using a cooled ZWO 2600MC camera. The capture was done with ZWO's ASICap software. The best 50% of 500 × ½ second subframes were processed in AutoStakkert and RegiStax. Soon afterwards clouds rolled in obscuring the rest of the event.

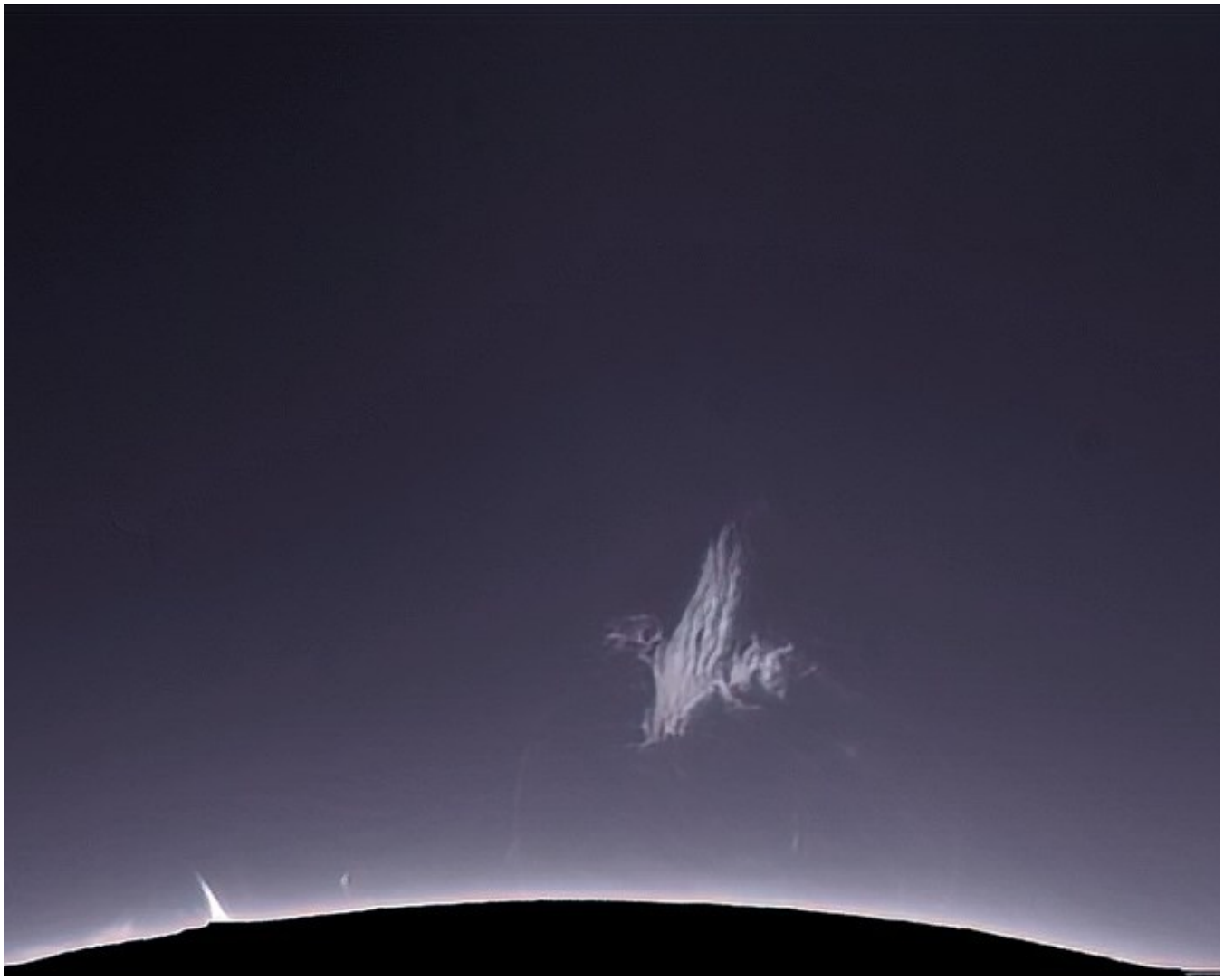
Titan orbits Saturn with a semi-major axis of 1,221,870 km, orbital eccentricity 0.0288, period 15.945 days. The orbit is inclined 0.34854 degrees to Saturn's equator. It's not much, but combined with the tilt of the planet's axis to its orbit of 26.73 degrees and the inclination of its orbit to the ecliptic of 2.49 degrees, it's enough to make Titan shadow transits rare events.

August 23 Star Party Report — Jordan Webber

The August 23rd Star Party was a success, thanks to an evening of very nice clear skies (finally!). We had approximately 40 people in attendance including WAA board members Tim Holden, Paul Alimena, and Mike Lomsky. Many other faces, both new and familiar, came out to take advantage of the first properly clear-sky star party this season. Attendees enjoyed views of objects such as M13, M31, M27, M57, and M81/M82. Saturn cleared the trees after dark and wasted no time putting smiles onto many faces (onlookers were told to check back in next year for an even more impressive view when Saturn's rings will be at a more favorable angle).

Later in the evening after many attendees and guests had packed up and left, those who remained were treated to a terrific view of the "Witch's Broom", part of the Western Veil Nebula (NGC 6969), through Mike Lomsky's impressive Orion SkyQuest XX14g Dobsonian. He used an OIII filter to help highlight the nebula. Lingering Perseid meteors made appearances throughout the evening as well, with at least two bright fireballs eliciting gasps from the crowd (I only saw one of the two myself, but I caught several other fainter meteors as well).

Fleur-de-lis Solar Prominence by John Paladini

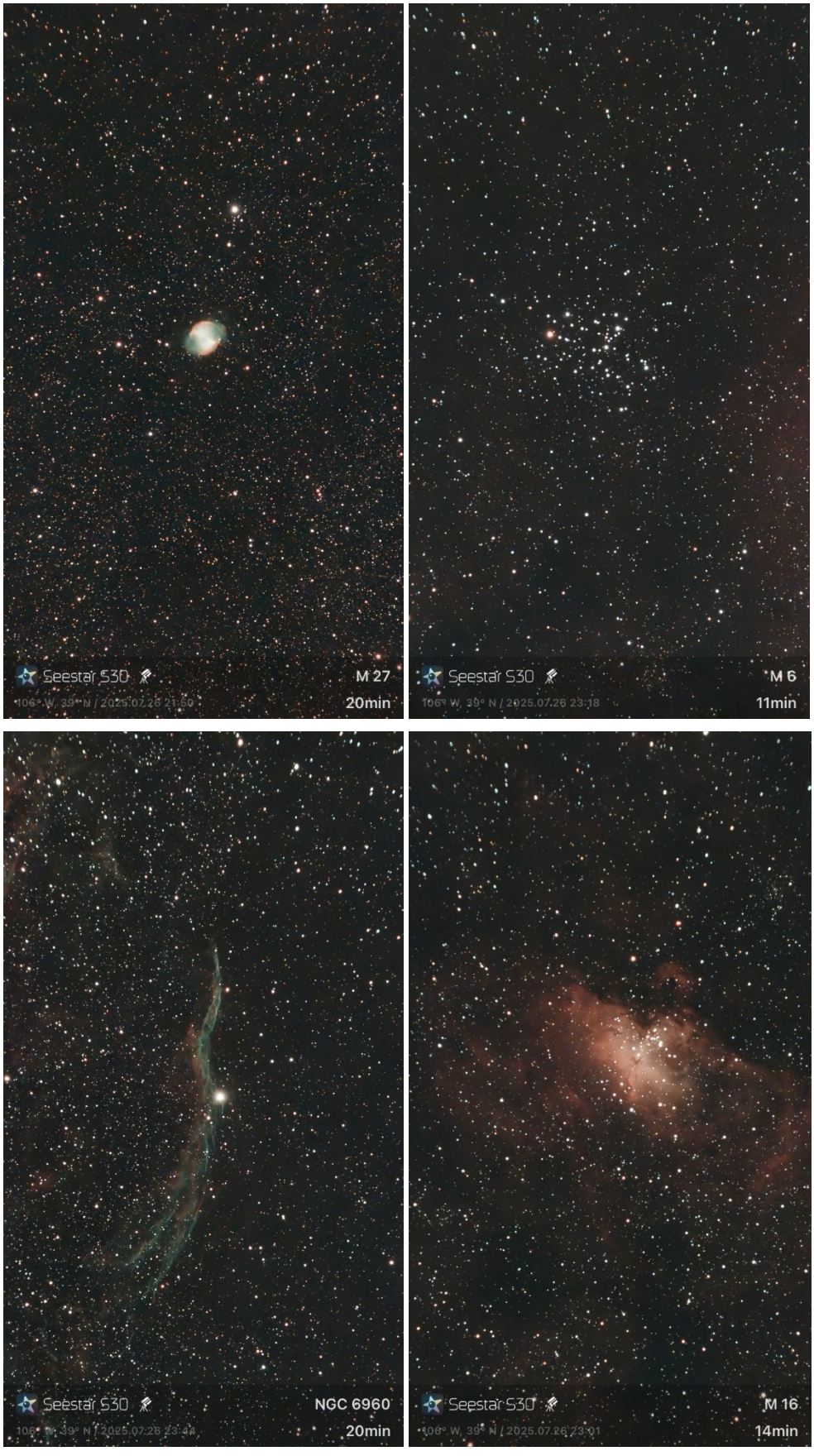


On August 10th John captured this eruptive prominence. It has disconnected from the photosphere and is moving into the corona. He used an old Thousand Oaks solar filter setup on his 8-inch SCT. The off-axis 70-mm filter in front of the telescope is mated with a tiltable filter near the eyepiece. This system was used by Thousand Oaks and Lumicon and was popular in the 1980s and 1990s. They require slow optics (John used a 2X Barlow to achieve f/20) and have difficulty showing detail on the solar disc, although they are capable of excellent performance on prominences.

Arms of the Kings of France

The shape of the prominence reminded John of the *fleur-de-lis*, a stylized representation of the lily that served as a heraldic symbol of the French monarchy from medieval times until its downfall in 1792. It nevertheless remains a symbol of France and is even on the flag of Quebec. It competes with other French national symbols, in particular the Gallic rooster (chantecler) and Marianne, the "national personification," symbolizing the values of the Republic: liberté, égalité and fraternité. She is pictured on French currency and government documents, as well as statues all around France, and on a famous Delacroix painting, *Liberty Leading the People*, in the Louvre.

There are two types of solar prominences. Quiescent prominences may persist for weeks, while eruptive prominences form rapidly and dissipate quickly. Coronal mass ejections (CMEs) often occur in conjunction with eruptive prominences.



Seestar images from Camp Hale, Colorado by Larry Faltz

The darker the sky, the better, right? These images were made on July 26 at the Camp Hale-Continental Divide National Monument in Colorado, elevation 9,350 feet, SQM 21.62. The Seestar30 was in equatorial mode for these short exposures.

The objects are, clockwise from upper left:

Dumbbell Nebula (Messier 27)

Ptolemy's Cluster (Messier 7)

Eagle Nebula (Messier 16)

Western Veil Nebula (NGC 6960)

I would have made many more images, but after a while I didn't want to spoil my dark adaptation fussing with the iPad. The Milky Way was blazing overhead, and lying on a zero-gravity chair using just binoculars or viewing with the naked eye was the real treat of the evening. Eventually the temperature dropped to the low 40s. I was prepared, but my companion wasn't, and the evening ended around 12:30 a.m. Our 35-minute drive back to Vail was on twisty, cliff-hugging, scary US 24.

Research Highlight of the Month

Yang, ZL, Han, JL, Zhou, DJ, et al., A pulsar-helium star compact binary system formed by common envelope evolution, *Science* 388:659–863.

Using the 500-meter FAST radio telescope in China, a group of astronomers from several Chinese universities detected the pulsar PSR J1928+1815 was spinning every 10.5 milliseconds and had a binary companion in a tight system with an orbital period of 3.60 hours. They determined that the companion was a stripped helium star with a mass of between 1.0 and 1.6 solar masses and eclipses the pulsar for about 17% of its orbit. Investigating possible formation and evolutionary scenarios, the authors believe that the system recently underwent a common envelope phase. When this occurs, the binary orbit shrinks rapidly, within 10^3 years, leading either to a core merger or the ejection of the envelope, in which case the star is stripped of its outer shell and achieves a very compact orbit. Stellar wind from the companion effectively blocks radio transmission.

One possible outcome of this type of binary system is the formation of a Thorne-Żitkow object, which we reviewed in the April 2025 SkyWAAtch. However, the energy parameters for this system appear to prevent merger of the two stellar cores, so a tight binary results.

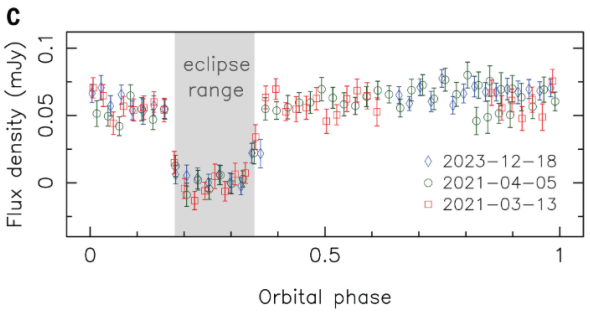


Fig 1C showing radio flux densities as functions of orbital phase.

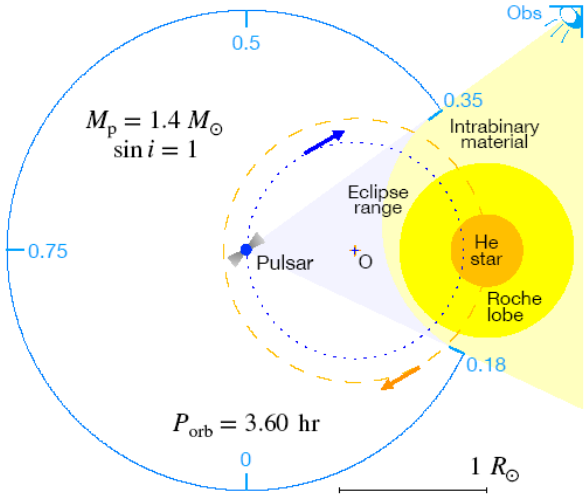


Fig S3 showing the proposed orbital geometry of the system.

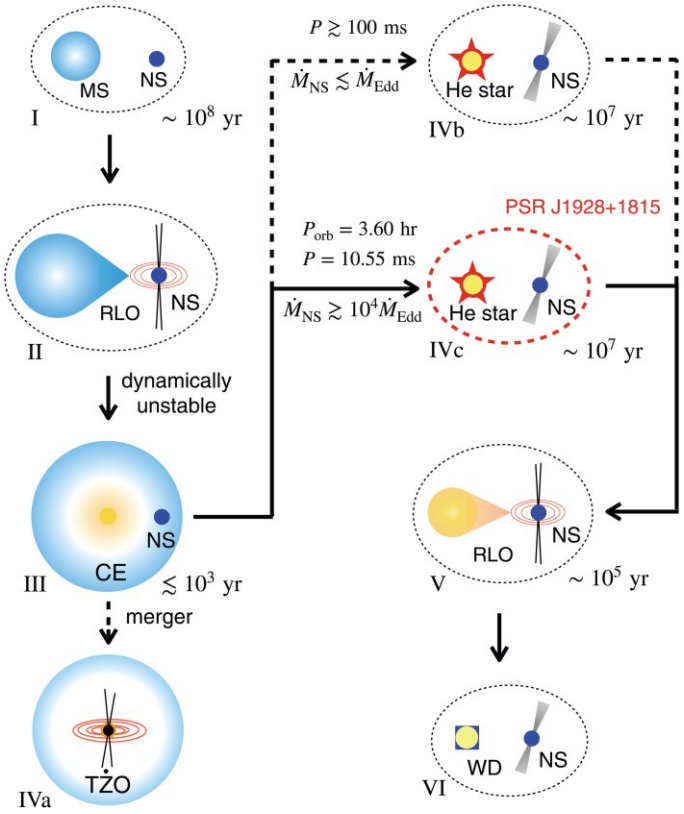


Fig 3: Proposed stellar evolution of the PSR J1928+1815 binary system. RLO=Roche lobe overflow, WD=white dwarf, CE=common enveloped, NS=neutron star, TŻO=Thorne-Żitkow object.

Member & Club Equipment for Sale

Item	Description	Asking Price	Name/Email
Sky-Watcher 8" Dobsonion	With Synscan. 8x50 finder scope,20mm and 12.5mm eye-pieces. Only used once, works great. Manufacturer's page here. List $1,400.	$900	Anthony Maida LVAM1521@yahoo.com
Questar 3.5" f/14.6 Maksutov-Cassegrain	A classic. This scope was made in 1979 and has had the same owner since new. Fully reconditioned, including new Pyrex mirror by Questar in April 2025. Broad-band and low reflection coatings. Sliding dew shield with sky map. Brandon 8, 16, and 24 mm eyepieces, 2X Barlow, camera coupling set, table-top tripod (this has been customized to also be used on a regular tripod). Motor drive on RA axis. Includes oak surveyors tripod.	$4200	Richard Rubin rrubin5@gmail.com
Meade 2080 8" SCT	A complete, nearly mint condition 8" Meade SCT dating from the 1980s. These were rivals of the Celestron orange tube telescopes and were nearly identical optically and mechanically, with a better RA gear system. 110-volt motor drive on the RA axis, tangent arm on the declination axis. Wedge, excellent Bausch and Lomb tripod (better than the fixed height tripod that Celestron used). Aluminum dew shield. Telrad finder. This is a non-go-to scope of classic vintage. Image here. If the non-go-to fork mounting is a disincentive, consider deforking the optical tube and mating it with a new strain-wave drive. A Celestron 8" SCT OTA (the equivalent to this Meade) lists at $1,299. An alt-az go-to 8" Celestron CPC is $2,800. You could put this OTA on a ZWO AM5n (does both alt-az and EQ) for the same total price and have a scope that's great for both visual and imaging (which the purely alt-az CPC is not).	$400	WAA ads@westchesterastronomers.org
8-inch f/5 reflector optical tube	Celestron-branded Newtonian OTA with tube rings and Vixen style dovetail plate. Can take 1 1/4 or 2" eyepieces. Like new condition. Donated to WAA.	$100	WAA ads@westchesterastronomers.org
6-inch f/5 reflector optical tube	Orion-branded scope. 1.25" rack and pinion focuser. Excellent condition optically and mechanically. New 6" f/5 OTAs cost over $300. Donated to WAA.	$100	WAA ads@westchesterastronomers.org
1.25" Filters	Thousand Oaks LP-3 Oxygen III (2 available)	$50	Eugene Lewis genelew1@gmail.com
	Astronomic UHC (2 available)	$75	
	High Point Neutral Density (2 available)	$10	

Want to list something for sale in the next issue of the WAA newsletter? Send the description and asking price to ads@westchesterastronomers.org. Member submissions only. Please offer only serious and useful astronomy equipment. WAA reserves the right not to list items we think are not of value to our members. All receipts for items owned by WAA goes to support club activities.

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