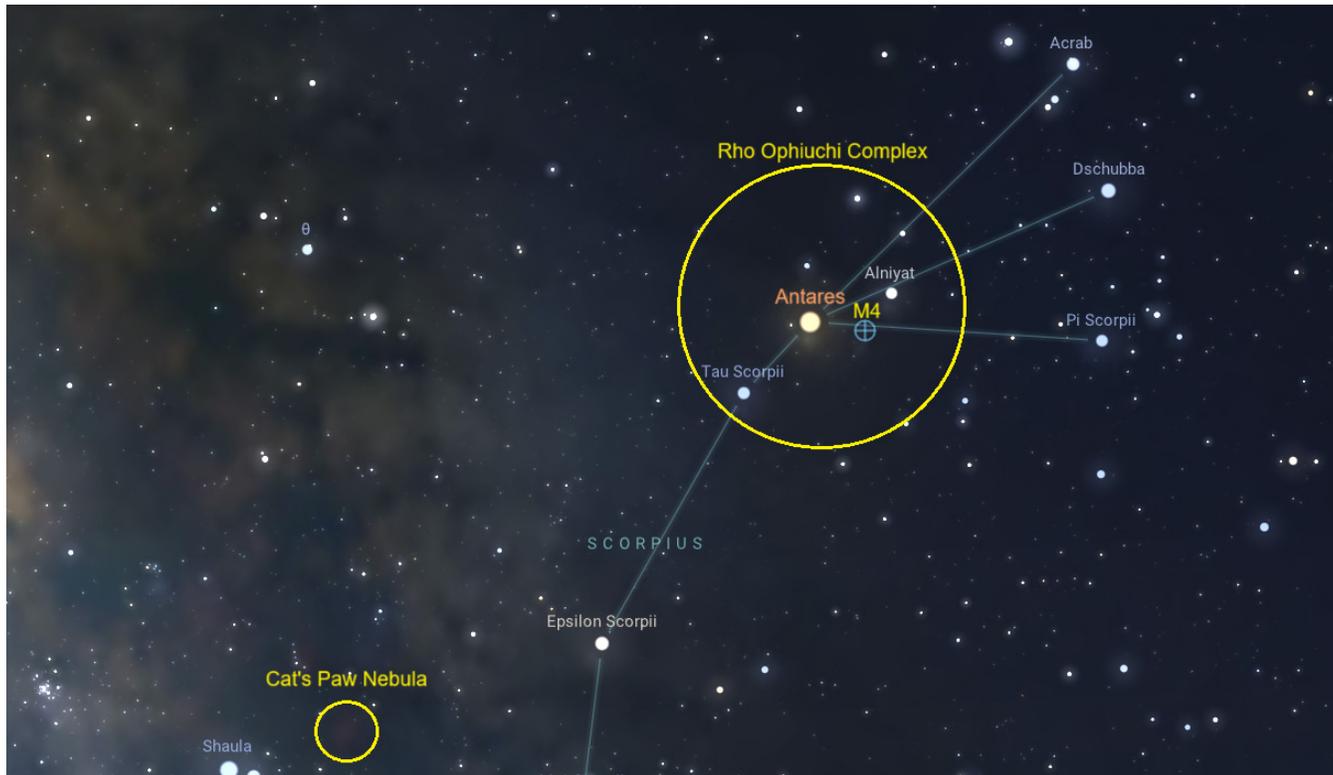


The ECLIPSE

July 2025

The Newsletter of the Barnard-Seyfert Astronomical Society



Spy the Scorpion

By: Kat Troche

As summer deepens in the Northern Hemisphere, a familiar constellation rises with the galactic core of the Milky Way each evening: Scorpius the Scorpion. One of the twelve zodiacal constellations, Scorpius contains many notable objects, making it an observer's delight during the warmer months. Here are some items to spy in July:

The star map of the Scorpius constellation highlights the star Antares and several notable deep-sky objects like the Rho Ophiuchi Complex, Messier 4, the Cat's Paw Nebula, and Caldwell 76, the Baby Scorpion Cluster. Credit: Stellarium Web

Antares: referred to as “the heart of the scorpion,” this supergiant has a distinct reddish hue and is visible to the naked eye. If you have good skies, try to split this binary star with a medium-sized telescope. Antares is a double star with a white main-sequence companion that comes in at a 5.4 magnitude.

Messier 4: one of the easiest globular clusters to find, M4 is the closest of these star clusters to Earth at 5,500 light years. With a magnitude of about 5.6, you can spot this with a small or medium-sized telescope in average skies. Darker skies will reveal the bright core. Use Antares as a guide star for this short trip across the sky.

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Contact BSAS officers at
bsasnashville.com/contact, or email info@bsasnashville.com

About BSAS

Organized in 1928, the Barnard-Seyfert Astronomical Society is an association of amateur and professional astronomers who have joined to share our knowledge and our love of the sky.

The BSAS meets on the third Wednesday of each month at the at the Dyer Observatory in Nashville. Experienced members or guest speakers talk about some aspect of astronomy or observing. Subjects range from how the universe first formed to how to build your own telescope. The meetings are informal and time is allotted for fellowship. You do not have to be a member to attend the meetings.

Membership entitles you to subscriptions to *Astronomy and Sky & Telescope* at reduced rates; the club's newsletter, the *Eclipse*, is sent to members monthly. BSAS members also receive membership in the Astronomical League, receiving their quarterly newsletter, the *Reflector*, discounts on all astronomical books, and many other benefits.

In addition to the meetings, BSAS also sponsors many public events, such as star parties and Astronomy Day; we go into the schools on occasion to hold star parties for the children and their parents. Often the public star parties are centered on a special astronomical event, such as a lunar eclipse or a planetary opposition.

Most information about BSAS and our activities may be found at bsasnashville.com. If you need more information, write to us at info@bsasnashville.com.

Free Telescope Offer!

Did someone say free telescope? Yes, you did read that correctly. The BSAS Equipment & Facilities Committee has free telescopes ranging in size from 2.6" to 8" that current members can actually have to use for up to 60 days at a time. We also have some other items in the loaner program such as a photometer, H-alpha solar telescope, educational CDs, tapes, DVDs, and books. Some restrictions apply. A waiting list is applicable in some cases. The BSAS Equipment Committee will not be held responsible for lost sleep or other problems arising from use of this excellent astronomy gear. For information on what equipment is currently available, contact info@bsasnashville.com.

Happy Discovery Anniversary: Comet Hale-Bopp

by Robin Byrne

This month we celebrate the anniversary of the discovery of one of the brightest comets in my lifetime.

During the evening of July 23, 1995, Alan Hale had become frustrated by the fact that he had devoted hundreds of hours trying to find a new comet with no success. So this evening, he would set up his telescope in his New Mexico driveway, and just observe some known comets. A little after midnight, looking in the constellation Sagittarius near the globular cluster M70, he noticed a 10.5 magnitude fuzzy patch where no documented deep sky objects were listed. Next, he checked to see if any comets had been reported in the area, and none had been. Hale observed the new object long enough to confirm that it was moving relative to the background stars. At that point, he emailed the Central Bureau for Astronomical Telegrams with his observations.

That same evening, Thomas Bopp was observing with some friends near Stanfield, Arizona. Since Bopp didn't own a telescope, he was using one belonging to a friend. They were primarily observing star clusters and galaxies that night, including M70. Looking through the eyepiece, Bopp also noticed something in the field of view that wasn't on the star chart. Taking the name "Central Bureau for Astronomical Telegrams" literally, Bopp sent a telegram with his observation.

Brian Marsden, then the director of the Minor Planet Center, had said, "Nobody sends telegrams anymore. I mean, by the time that telegram got here, Alan Hale had already e-mailed us three times with updated coordinates."

By the next day, the comet had been confirmed and given the designation C/1995 O1 by the International Astronomical Union. At the time of discovery, the comet was located between the orbits of Jupiter and Saturn, making it the most distant comet to be discovered by amateur astronomers. The reason they could see it at such a large distance was because it was much brighter than a typical comet. In comparison, Hale-Bopp was a thousand times brighter than Comet Halley when it was the same distance away, and Hale-Bopp already had an observable coma. As astronomers scanned through earlier images of the sky to see if the comet had been captured, they found a photograph taken two years earlier, when the comet was almost twice as far away, where most comets would not be visible at all. As the comet was studied and measured, the reason for its easy visibility became more apparent - it was huge - possibly as much as 6 times as big as Halley's Comet.

By May of 1996, Hale-Bopp had reached naked-eye visibility for those in dark locations. After being blocked from view by the Sun in December, Hale-Bopp emerged in January 1997 appearing bright enough to even be seen from large, light-polluted cities, and it hadn't even reached its closest approach to the Sun yet! In February, at a brightness of 2nd magnitude, Hale-Bopp's two tails were easily distinguished, with a blue gas tail pointed away from the Sun, while the broad, curved yellow/white dust tail showed the path the comet had followed in its orbit. On March 22, 1997, Hale-Bopp came closest to Earth, at 1.3 Astronomical Units.



Seasons, continued from Page One

Caldwell 76: If you prefer open star clusters, locate C76, also known as the Baby Scorpion Cluster, right where the ‘stinger’ of Scorpius starts to curve. At a magnitude of 2.6, it is slightly brighter than M4, albeit smaller, and can be spotted with binoculars and the naked eye under good sky conditions.

A digital map of the Rho Ophiuchi Complex. Credit: Stellarium Web

Rho Ophiuchi. Credit: JWST/NASA

Lastly, if you have an astrophotography setup, capture the **Cat’s Paw Nebula** near the stinger of Scorpius. You can also capture the **Rho Ophiuchi cloud complex** in the nearby constellation Ophiuchus. Brilliant Antares can be found at the center of this wondrous structure.



Manaiakalani

While many cultures tell tales of a ‘scorpion’ in the sky, several Polynesian cultures see the same stars as the demigod Māui’s fishhook, **Manaiakalani**. It is said that Māui didn’t just use his hook for giant fish in the sea, but to pull new islands from the bottom of the ocean. There are many references to the Milky Way representing a fish. As Manaiakalani rises from the southeast, it appears to pull the great celestial fish across a glittering sea of stars.

Measure Your Darkness

While you can use smartphone apps or dedicated devices like a Sky Quality Meter, Scorpius is a great constellation to measure your sky darkness with! On a clear night, can you trail the curve of the tail? Can you see the scorpion’s heart? Use our free printable **Dark Sky Wheel**, featuring the stars of Scorpius on one side and Orion on the other for measurements during cooler months. You can find this resource and more in the **Big Astronomy Toolkit**.

On The Cover: *The star map of the Scorpius constellation highlights the star Antares and several notable deep-sky objects like the Rho Ophiuchi Complex, Messier 4, the Cat’s Paw Nebula, and Caldwell 76, the Baby Scorpion Cluster. Credit: Stellarium Web*

Hale-Bopp, Continued from Page 3

NASA's Jet Propulsion Laboratory had created a web page devoted to the comet. Even though the internet was still relatively new, they were getting over 1.2 million hits per day, and two mirror sites had to be set up to handle the traffic. Hale-Bopp was so popular, it almost broke the internet, and it wasn't even at its brightest, yet!

On April 1, 1997, Hale-Bopp made its closest approach to the Sun, achieving its brightest appearance with a magnitude of -1.8. And if that weren't impressive enough, its tail spanned about 40° across the sky. After its close approach to the Sun, Hale-Bopp left the Northern Hemisphere skies, but observers in the Southern Hemisphere continued to see it through December of 1997. In total, Hale-Bopp was visible to the naked eye for 18 months - longer than any other comet in recorded history.

Even after fading from naked-eye visibility, astronomers continued to follow Hale-Bopp through telescopic observations. The last recorded Earth-based observation of Hale-Bopp was made in 2001 by the European Southern Observatory with the La Silla Telescope in Chile, when the comet was about half-way between the orbits of Saturn and Uranus. In 2022, the James Webb Space Telescope observed it at a distance of 46.2 AU from the Sun, beyond the orbit of Pluto.

Like most comets that visit the inner solar system, every passage involves interactions with the planets, especially the large Jovians. These interactions change the shape and period of the orbit. It is estimated that Hale-Bopp previously visited our skies about 4200 years earlier, around the year 2215 BC. This may have been its first trip to the inner solar system. A close encounter with Jupiter changed its orbit during that trip, and in 1996, Hale-Bopp flew close enough to Jupiter again to alter its orbit even more. This encounter shortened its orbital period almost in half, to 2399 years, bringing it back to our skies in the year 4385. Mark your calendars! Because its orbit is now almost vertical compared to the orbital plane of the planets, future orbital changes are less likely, so this may be close to its permanent orbital rate.

During its time in our celestial neighborhood, professional astronomers extensively studied Comet Hale-Bopp. Using the Hubble Space Telescope, its diameter was found to be about 19-25 miles across, compared to most comets being at most a few miles across. Assuming a density similar to that of other comets, Hale-Bopp would be about 100 times more massive than Halley's Comet. Observations of distinct gas jets on the nucleus allowed astronomers to determine its rotation period to be 11 hours 46 minutes. And in addition to the gas and dust tails, Hale-Bopp was found to have a third, faint tail, composed of sodium, something never before observed.

Because it was so bright, Hale-Bopp may go down as the most-observed comet in history. In the U.S. alone, at least 70% of the population had witnessed the celestial visitor. That prominence did have one tragic consequence, when 39 members of the Heaven's Gate cult committed suicide in the belief that their spirits would be transported to a spaceship hidden in the tail of the comet. While we have had a few good comets since Hale-Bopp, none have blazed in the sky with as much intensity, nor have been seen by so many people. Hopefully we won't have to wait until 4385 to see something as spectacular as Hale-Bopp again.

References:

[Comet Hale-Bopp Wikipedia](#)

[Comet Hale-Bopp: Facts about the bright and tragic comet](#) by Daisy Dobrijevic, Elizabeth Howell April 18, 2022, Space.com

[Comet Hale-Bopp closest to the sun 27 years ago today](#); April 1 2024, EarthSky

Page 3 Image Credit & Copyright: [Wally Pacholka \(Astropics, TWAN\)](#)

Member Memoir: An Avid Student

by Ann McKinley Meehan

As someone not particularly fond of science, I never in my wildest dreams thought that looking upward could be a life-altering experience. It would take The Great American Eclipse of 2017 to be the catalyst to my journey into heavenly discoveries. The eclipse had been advertised for quite a while on all media outlets, but I was consulting, working long hours and traveling, so taking a Monday off from work didn't seem like a good idea. I reasoned that if I happened to be at home, I could step outside and look up. However, when I learned that friends were coming to Nashville to view it, I was motivated to reach out to see if they wanted to watch it with my husband and me, and they said, "yes!" I was given the day off from work. I quickly researched basic details and learned that middle-Tennessee was in the direct path of the total eclipse with the maximum totality just north of Nashville in southern Kentucky. Wanting to be close to Nashville, I



found a location on Facebook, Triple Creek Park in Gallatin, approximately 30 miles north of Nashville, and one of the closest locations for the longest length of totality. Being a planner, I dug into find out more about the actual event – timing, phases, and what to expect.

Eclipse Day, Aug. 21, 2017, arrived. Driving north out of Nashville, the traffic was bumper-to-bumper as we inched toward Gallatin. As we parked and exited the car, the hot, humid air hit us hard. We were determined not to let the heat dampen our spirits.

The park was perfect with 185 acres of green, wide-open spaces bordered by trees. Birds flew overhead as

threatening fluffy white clouds marched across the sky. Over 50,000 people were expected from all over the world, and it was starting to get busy with folks setting up chairs, telescopes, and cameras. I'd never seen so much equipment coming out of carrying cases – telescopes of every shape and size, cameras with varying sized lenses, tall and short tripods, and laptops hooked up to various gadgets. In the distance, you could hear musicians on the park stage entertaining everyone while they waited, and it truly was a waiting game.

We settled in for the wait with open umbrellas shading our sunscreened bodies – it was going to be a hot one with the high temperatures expected to be in the 90s and not one bit of intentional shade where we'd strategically set up. The only relief was the unwanted passing clouds.

I had tested my certified eclipse glasses at home, looking for any defects, as instructed by all the experts. As I slipped the cardboard glasses behind my ears and across my nose, my world took on a whole new perspective. Reality had been replaced by disorientation. I could hear all the activity around me, but I could see nothing. This is what it feels like to be blind, I thought. I felt momentary panic. I turned and tilted my head in search of the sun, not daring to take off my glasses for fear of damaging my eyes. My neck was angled in an awkward position as I located the sun. It was a pale orange orb suspended in a sea of darkness, and it comforted me to have something I could see. As clouds moved across the sun, they appeared to be smokey, ghost-like shadows. I was both excited and nervous. What if the clouds prevented us from seeing the eclipse? How disappointing that would be!

Just before noon, the band stopped playing, the crowd became quiet, and the moon started taking bites out of the sun as it slowly moved across its surface – the bites small then growing larger. The Great American Eclipse had begun, nature’s major production of the year. As I watched the moon inch across the sun, I’d occasionally remove my glasses to look at what was going on around me. People were looking up, either through their telescopes, cameras, or eclipse glasses. It was beginning to slowly darken all around, eerily mimicking dusk, all rosy and gray.

After a time, I could no longer see or hear any birds. They had settled down for what they thought was the night. Crickets chirped and frogs croaked across the field and through the trees. I felt chilled as the temperature was dropping. Despite the chill, there was something comforting about the beauty of the surroundings. I had to pull myself away from these supporting actors in nature’s play and put on my glasses to get back to the two main cast members, the sun and the moon.

At 1:27 pm, the total eclipse started. The crowd of 50,000 cheered and clapped as if some famous rock band had appeared on stage. I certainly wasn’t expecting that reaction! What a moment! Now that the moon had moved into position to cover the entire sun, I could take off my glasses and view the eclipse unaided. At 1:28 pm the sun was entirely covered, and the maximum of the eclipse was achieved. Clapping continued to ring out. Admittedly, I had my own moments of clapping and gasping with joy. It’s hard to describe what I saw that day, but it was beautiful, glorious, miraculous. Through the occasional clouds, I could see a glow around the sun that looked like a halo, a bulge of bright light protruding from the sun’s surface known as the diamond ring, and some small flares off its surface. It was better than any fireworks display I’d ever witnessed. My eyes welled up with tears of joy. Nature was certainly showing off!



It was mind-blowing that it appeared to be dusk and chilly in the middle of the day in August! In what seemed like mere seconds, the two minutes and 39 seconds of totality were over, and the moon continued its dance with the sun and started its exit. I had to put my glasses on again. In reverse, it got brighter and warmer, the birds woke up and began to sing. The crickets and frogs went to sleep.

Our friends had a flight home, so we had to depart the park early with the partial eclipse underway. Walking under the canopy of trees, I saw small silver and gray crescent moon shapes reflected on the ground. It turned out to be the partially eclipsed sun shining through the leaves of the trees overhead - not the moon at all. We looked at each other with wide eyes. We weren’t expecting this second act in nature’s play.

Having experienced the magnificence of a total solar eclipse, it’s easy to understand how people become eclipse chasers. Viewing the total solar eclipse felt spiritual. Science and religion complementing each other – the one explaining the other. I swore that while it was my first total eclipse, it would not be my last. While I don’t call myself an amateur astronomer, I can emphatically say that I’m an avid student of the celestial sphere that surrounds us and I seek out every opportunity to learn more and view firsthand what our sky has to offer. Given a clear sky, I look up. I’m never disappointed.

Barnard-Seyfert Astronomical Society Minutes — Regular Meeting July 16, 2025

The Barnard-Seyfert Astronomical Society met at Vanderbilt's Dyer Observatory and on-line for the regular general meeting on Wednesday, July 16, 2025, Dr Tom Beckermann presiding. The meeting was called to order at 7:00 p.m.. About 25 members were at Dyer. and 12 members zoomed in.

Minutes: The minutes for the June 18, 2025, meeting were adopted without discussion.

Membership Report: Keith Rainey reported 235 members.

Treasurer's Report: Theo Wellington reported the Truist bank balance to be \$7,824.98.

Telescope Loan: The PST H-alpha solar telescope was available for loan at the meeting.

Social Media Report: The Facebook page (<https://www.facebook.com/bsasnashville>) had 2.4K likes and 2.7K followers. The Instagram account (<https://www.instagram.com/bsasnashville/>) had 89 posts and 320 followers and follows 60.

The BSASNashville Google Group is a members-only discussion group. It includes content from members, information on loaner telescopes, the Natchez Trace National Park permit, and so on. Contact info@basanashville.com for a link to join the discussion group. Astrobin (<https://www.astrobin.com>) is available for posting astrophotographs. Night Sky Network (<https://nightsky.jpl.nasa.gov/>) is used as a portal to club membership, and has other resources. "Spot the Station" now is available only as an app for iPhone and Android smartphones. "Heavens Above" (<https://heavens-above.com/>) has web based ISS flyover information (and much more).

Upcoming Events

The next regular meeting will be at Vanderbilt's Dyer Observatory on Wednesday, Aug. 20, 2025, from 7:00 p.m. to 8:30 p.m.. Let us have your thoughts on meeting topics and speakers. Regular meetings are open to all.

Scheduled Public Star Parties: Friday, July 18, at Henry Horton State Park. Saturday, July 19, Cedars of Lebanon State Park. Friday, July 25, at Cedars of Lebanon State Park. Saturday, July 26, at Henry Horton State Park. Contact Randy Oakes via Google Groups if you can assist. Saturday, August 2, 2025, from 9 p.m. to 11 p.m., at Edwin Warner Park Model Airplane Field. Be at the site an hour early if you bring a telescope. Public star parties are open to anyone and are usually held at municipal or state parks. Some events may require registration through the park's events pages because of limited parking.

Scheduled Private StarParties: Saturday, July 26, 2025 Natchez Trace Mile Marker 435.3. Private star parties are open only to members. Members need to have a copy of the Park Service Permit (a copy of the PDF on your smart phone is OK). The permit is posted on the BSAS Nashville Google group.

Other Scheduled Events: NanoCon Saturday, July 26, at Montgomery Bell State Park.

Previous Events

Public Star Parties: Friday, June 27, at Montgomery Bell State Park ball field, was cancelled because of weather. Saturday, June 28, at Cornelia Fort Air Park, was cancelled because of weather.

Other Scheduled Events: Chuck Schlemm was able to make a presentation at Hidden Lake Trails Junior Rangers on June 26 despite the weather.

Theo presented “Practical Astronomy / How to find your way around your planet.” One book she mentioned was *Longitude* by Dava Sobel.

The meeting adjourned at 8:30 p.m.

Respectfully submitted,

Bud Hamblen
Secretary

[Click here for the YouTube recording of the meeting.](#)

The cover article is distributed by NASA Night Sky Network.

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more! You can catch up on all of NASA's current and future missions at nasa.gov.

With articles, activities and games NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!

Become a Member of BSAS! Visit bsasnashville.com to join online.

All memberships have a vote in BSAS elections and other membership votes. Also included are subscriptions to the BSAS and Astronomical League newsletters.

Annual dues:

- Regular: \$25
- Family: \$35
- Senior/Senior Family: \$20
- Student: * \$15



*** To qualify as a student, you must be enrolled full time in an accredited institution or home schooled.**



In honor of the club's 90th anniversary we partnered with Hatch Show Print to create a unique poster that would honor the achievement of the club. For those who don't know Hatch Show has been making posters for a variety of events and concerts for 140 years. In all that time we are their first astronomy club.

On the poster at the center is the moon. This was made from a wood grained stencil that the shop has used for over 50 years. To contrast that the telescope that the people are using is a brand new stencil made for our poster.

The poster has three colors. First the pale yellow color of the moon was applied. Next the small stars, circles, and figures at the bottom were colored in metallic gold. The third color is a blue for the night sky.

Where it overlaps with the metallic gold it creates a darker blue leaving the figures at the bottom looking like silhouettes.

This was a one time printing so the 100 that we have are all that will be printed.

The prints are approximately 13 3/4" x 22 1/4" and are available for \$20 at our membership meetings, or \$25 with shipping by ordering through bsasnashville.com. Frame not included.



Next BSAS meeting
Wednesday, Aug. 20, 7:00 p.m.

Dyer Observatory
 1000 Oman Dr.
 Brentwood, TN 37027