

The ECLIPSE

The Newsletter of the Barnard-Seyfert Astronomical Society



January 2023



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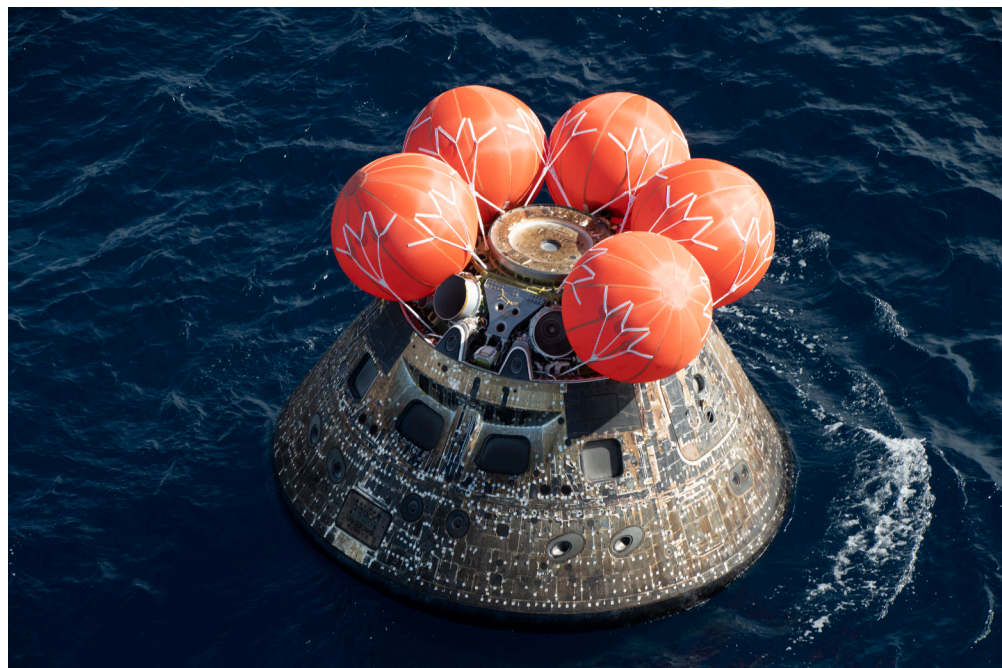
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Andy Reeves

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Contact BSAS officers at
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At 12:40 p.m. EST, Dec. 11, 2022, NASA's Orion spacecraft for the Artemis I mission splashed down in the Pacific Ocean after a 25.5 day mission to the Moon. Orion will be recovered by NASA's Landing and Recovery team, U.S. Navy and Department of Defense partners aboard the USS Portland. Credit: [NASA/JSC](#)

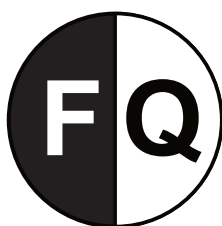


On the Cover: The peculiar spiral galaxy ESO 415-19, which lies around 450 million light-years away, stretches lazily across this image from the NASA/ESA Hubble Space Telescope. While the centre of this object resembles a regular spiral galaxy, long streams of stars stretch out from the galactic core like bizarrely elongated spiral arms. These are tidal streams caused by some chance interaction in the galaxy's past, and give ESO 415-19 a distinctly peculiar appearance.

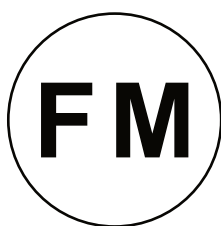
Credit: [ESA/Hubble & NASA, J. Dalcanton, Dark Energy Survey/DOE/FNAL/DECam/CTIO/NOIRLab/NSF/AURA](#)



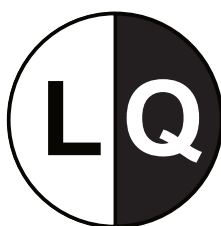
Jan 21
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Jan 6
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Jan 14
Feb 13

Book Review: Spooky Action At A Distance Reviewed by Robin Byrne

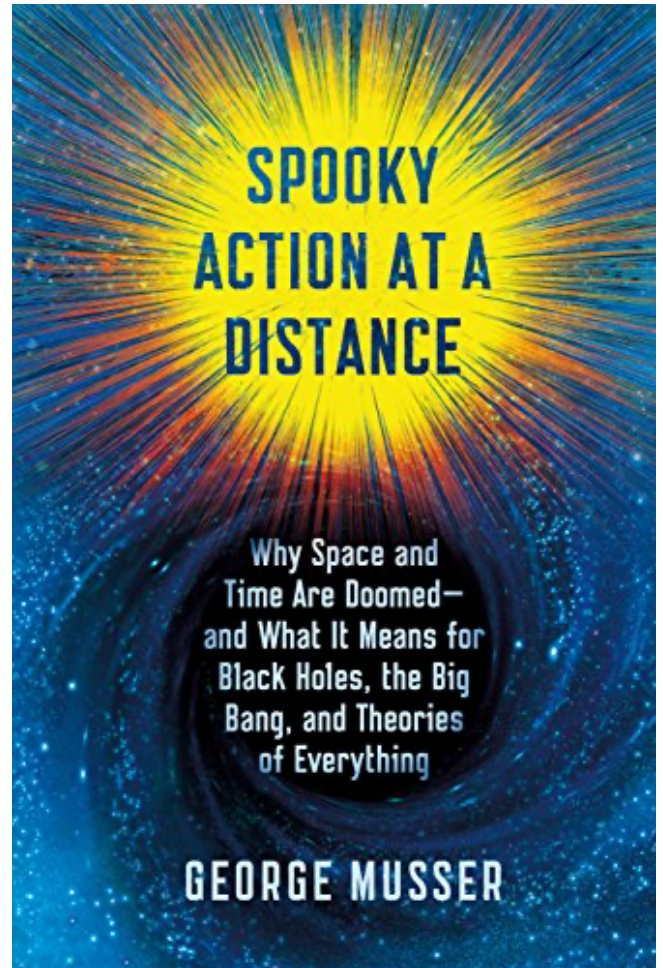
When the announcement for the Nobel Prize in Physics was made, I was excited to hear that John Clauser, Alain Aspect, and Anton Zeilinger won for their experiments that helped prove quantum entanglement. That inspired me to read a book in my collection: “Spooky Action At A Distance: The Phenomenon That Reimagines Space and Time - and What It Means for Black Holes, the Big Bang, and Theories of Everything” by George Musser.

That title alone sounds ambitious, and so is the book. There is much that Musser wanted to say about this topic, and he attempts to cover it all. He begins with the concept of nonlocality, which is the idea that two separate particles can influence each other, and is the basis of the entanglement experiments that won the Nobel Prize. Honestly, this was the part I was hoping the book would primarily cover, since I know very little about it. Alas, that was not meant to be.

Musser takes this idea, and runs with it in all sorts of directions. He draws parallels with other areas of physics where objects can interact without touching, such as gravitation and electromagnetism. Then he delves into the history of the field of quantum mechanics and the wide variety of ideas that have been explored since the early 20th century. From there, Musser looked at modern physicists and their various approaches to quantum physics, ultimately ending with theoretical ideas about whether space and time actually exist. With so many different ideas being presented, I was left wondering what the author hoped to convey.

Because he tried to cover so much material in a comparatively short book (roughly 200 pages), the author couldn't go into much detail about any one idea. The price of that brevity was the source of my confusion. Many of the ideas discussed, Musser didn't go into enough depth for me to understand what was really being talked about. He relied on simplistic analogies that didn't really clarify. I was left with a vague notion of the concepts, but nothing more. That's a shame, since I truly wanted to understand. Whether this brevity was the author's original intent, or whether it was the work of editors, I can't say, but whoever is responsible did the reader a disservice.

My guess is that someone very familiar with quantum physics and its history would enjoy this book. They would already know the ideas being discussed, and would appreciate the historical context, as well as the journey through the many iterations of ideas.

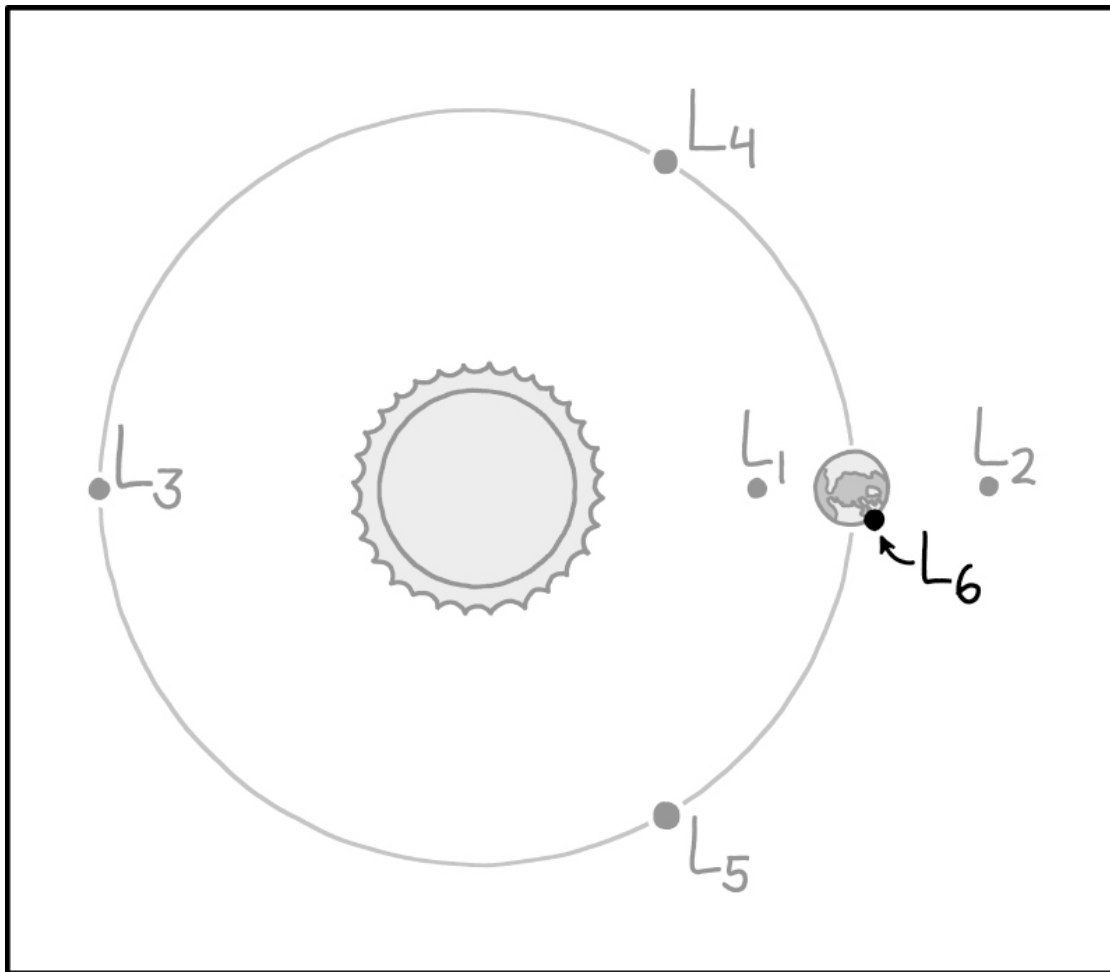


However, for someone like me, who has no background in quantum physics, “Spooky Action At A Distance” was a confusing and frustrating read. At every turn, just as I was hoping to grasp the ideas, we were off onto something new and different. There just wasn’t enough explanation to make it enjoyable or understandable. So, sadly, I cannot recommend “Spooky Action At A Distance” by George Musser. Maybe the latest Physics Nobel Prize award will inspire a better writer to tackle this subject.

References:

Spooky Action At A Distance: The Phenomenon That Reimagines Space and Time - and What It Means for Black Holes, the Big Bang, and Theories of Everything by George Musser, Scientific American/Farrar, Strauss and Giroux, 2015.

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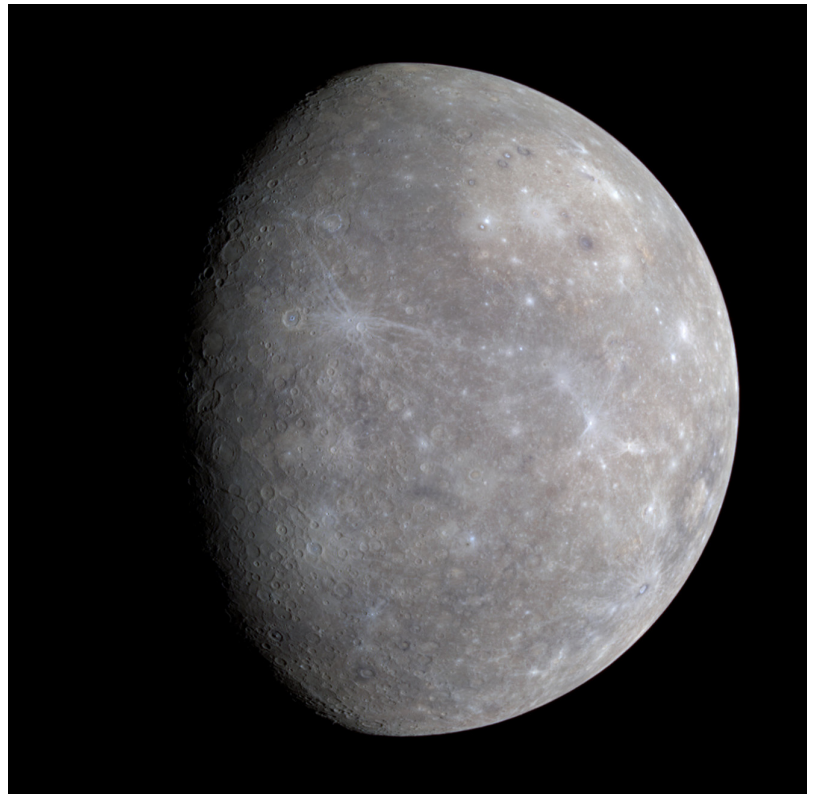
HUGE SPACE NEWS: ASTRONOMERS HAVE DISCOVERED
A NEW LAGRANGE POINT JUST OUTSIDE CLEVELAND.

Spot the Messenger: Observe Mercury

By David Prosper

Most planets are easy to spot in the night sky, but have you spotted Mercury? Nicknamed the Messenger for its speed across the sky, Mercury is also the closest planet to the Sun. Its swift movements close to our Sun accorded it special importance to ancient observers, while also making detailed study difficult. However, recent missions to Mercury have resulted in amazing discoveries, with more to come.

Mercury can be one of the brightest planets in the sky – but also easy to miss! Why is that? Since it orbits so close to the Sun, observing Mercury is trickier than the rest of the “bright planets” in our solar system: Venus, Mars, Jupiter, and Saturn. Mercury always appears near our Sun from our Earth-bound point of view, making it easy to miss in the glare of the Sun or behind small obstructions along the horizon. That’s why prime Mercury viewing happens either right before sunrise or right after sunset; when the Sun is blocked by the horizon, Mercury’s shine can then briefly pierce the glow of twilight. Mercury often appears similar to

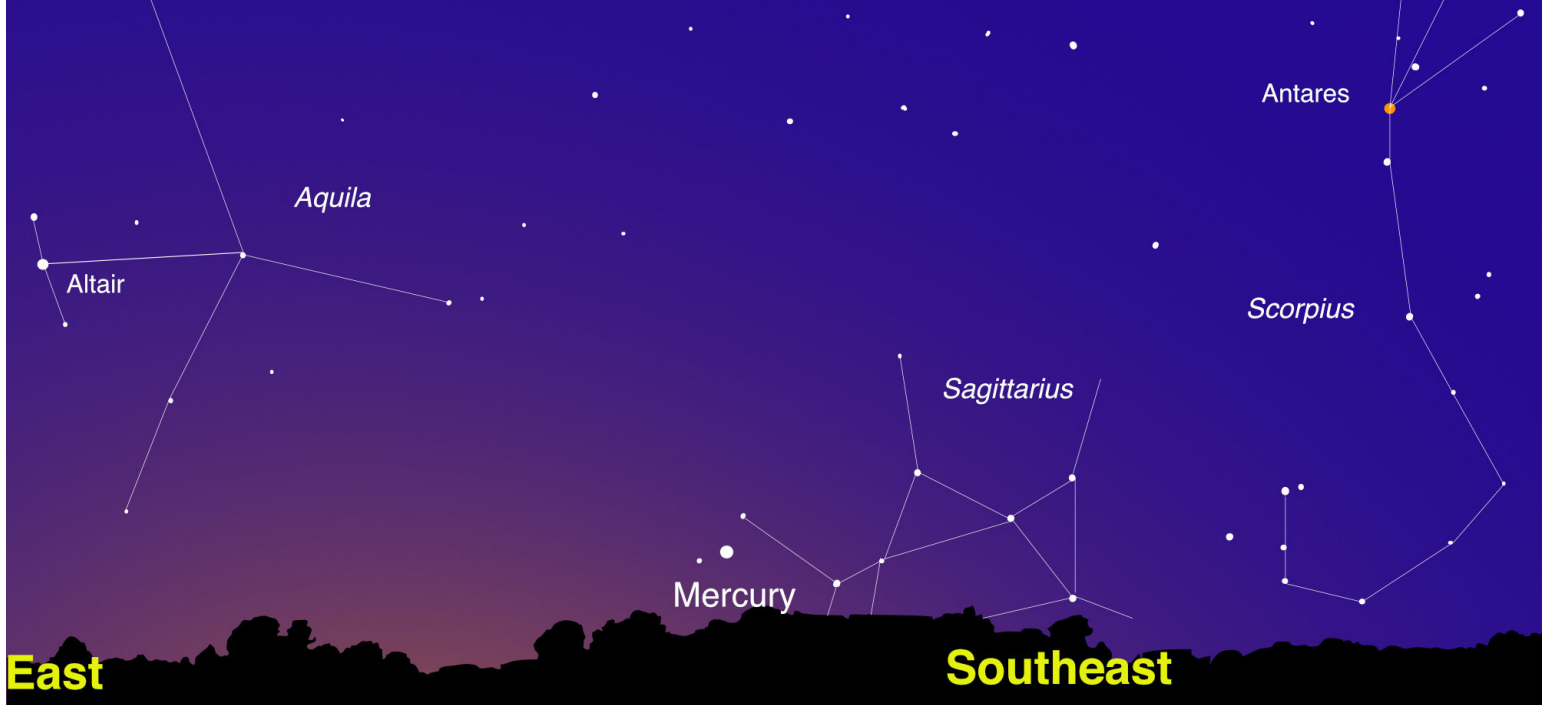


Mercury is hot, small, and heavily cratered across its gray surface, as seen in this image from NASA MESSENGER. Mercury is the most heavily cratered planet in our solar system, since it lacks either a substantial atmosphere or geologic activity to erode surface features like craters, similar in certain aspects to the surface of our own Moon.

Credit: [NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie](#)

a “tiny Moon” in a telescope since, like fellow inner planet Venus, it shows distinct phases when viewed from Earth! Mercury’s small size means a telescope is needed to observe its phases since they can’t be discerned with your unaided eye. Safety warning: If you want to observe Mercury with your telescope during daytime or before sunrise, be extremely careful: you don’t want the Sun to accidentally enter your telescope’s field of view. As you may already well understand, this is extremely dangerous and can not only destroy your equipment, but permanently blind you as well! That risk is why NASA does not allow space telescopes like Hubble or the JWST to view Mercury or other objects close to the Sun, since even the tiniest error could destroy billions of dollars of irreplaceable equipment.

Facing Southeast Before Sunrise January 30, 2023



Mercury reaches maximum western elongation on the morning of January 30, which means that your best chance to spot it is right before sunrise that day! Look for Mercury towards the southeast and find the clearest horizon you can. Observers located in more southern latitudes of the Northern Hemisphere have an advantage when observing Mercury as it will be a bit higher in the sky from their location, but it's worth a try no matter where you live. Binoculars will help pick out Mercury's elusive light from the pre-dawn glow of the Sun. Image created with assistance from Stellarium

Despite being a small and seemingly barren world, Mercury is full of interesting features. It's one of the four rocky (or terrestrial) planets in our solar system, along with Earth, Venus, and Mars. Mercury is the smallest planet in our solar system and also possesses the most eccentric, or non-circular, orbit of any planet as well: during a Mercurian year of 88 Earth days, the planet orbits between 29 million and 43 million miles from our Sun – a 14-million-mile difference! Surprisingly, Mercury is not the hottest planet in our solar system, despite being closest to the Sun; that honor goes to Venus, courtesy its thick greenhouse shroud of carbon dioxide. Since Mercury lacks a substantial atmosphere and the insulating properties a layer of thick air brings to a planet, its temperature swings wildly between a daytime temperature of 800 degrees Fahrenheit (427 degrees Celsius) and -290 degrees Fahrenheit (-179 degrees Celsius) at night. Similar to our Moon, evidence of water ice is present at Mercury's poles, possibly hiding in the frigid permanent shadows cast inside a few craters. Evidence for ice on Mercury was first detected by radar observations from Earth, and followup

observations from NASA's MESSENGER mission added additional strong evidence for its presence. Mercury sports a comet-like tail made primarily of sodium which has been photographed by skilled astrophotographers. The tail results from neutral atoms in its thin atmosphere being pushed away from Mercury by pressure from the nearby Sun's radiation.

NASA's Mariner 10 was Mercury's first robotic explorer, flying by three times between 1974-1975. Decades later, NASA's MESSENGER first visited Mercury in 2008, flying by three times before settling into an orbit in 2011. MESSENGER thoroughly studied and mapped the planet before smashing into Mercury at mission's end in 2015. Since MESSENGER, Mercury was briefly visited by BepiColombo, a joint ESA/JAXA probe, which first flew by in 2021 and is expected to enter orbit in 2025 - after completing six flybys. Need more Mercury in your life? Check out NASA's discoveries and science about Mercury at solarsystem.nasa.gov/mercury/, and visit the rest of the universe at nasa.gov.



On rare occasion, Earthbound observers can observe Mercury, like Venus, transiting the Sun. Mercury frequently travels between Earth and the Sun, but only rarely does the geometry of all three bodies line up to allow observers from Earth to view Mercury's tiny shadow as it crosses our star's massive disc. You can see one such event in this photo taken by Laurie Ansoorge of the Westminster Astronomical Society on November 11, 2019. If you missed it, set a reminder for Mercury's next transit: November 13, 2032

This article is distributed by NASA's Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

**Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Wednesday, December 7, 2022**

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held December 7, 2022, online, Dr. Tom Beckermann presiding. Logged in were Tom Beckermann, Chip Crossman, Osvaldo Gonzales, Bud Hamblen and Theo Wellington.

Tom asked for a review of the minutes of the board meeting on November 2, 2022, as printed in the December, 2022, edition of the Eclipse. No-one objected to the minutes.

Membership Report: Tom reported that there were 225 members.

The Girl Scouts renewed our contract for the meeting room. The fee was \$1200 for 12 meeting dates.

The annual pot luck dinner is scheduled for Wednesday, December 21, 2022, at 6:30 PM, which is an hour earlier than the usual time.

There being no further business, the meeting was adjourned at 8:15.

Respectfully submitted,

Bud Hamblen
Secretary

Next Membership Meeting:

Wednesday, January 18, 7:30 pm
Annual Telescope Workshop

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Barnard-Seyfert Astronomical Society Minutes of the Monthly Membership Meeting Held On Wednesday, December 21, 2022

The Barnard-Seyfert Astronomical Society met at the Girl Scout Center and on-line via Zoom on Wednesday, December 21, 2022, Tom Beckermann presiding. 12 persons attended in person.

Treasurer's Report: The Truist bank balance was \$8,985 after paying the room fee and the zoom fee.

Chip Crossman has new name tags and lanyards.

Social Media: There are about 2,000 followers on Facebook and 320 on Twitter.

Membership report: Keith Rainey reported 210 members.

Equipment Loan: Tom asked for equipment loan feedback.

Outreach and Star Parties: A private star party is scheduled at Natchez Trace Mile Marker 435.3 on January 21, 2023. A public star party is scheduled for January 28, 2023, at the Warner Park Special Events Field.

Upcoming Meetings: The annual Telescope Workshop is scheduled for January 18 at the Girl Scouts Center.

Theo noted that the annular solar eclipse of Saturday, October 14, 2023, will be partial (0.622 magnitude) in Nashville. The total solar eclipse of April 8, 2024, will be a deep partial (0.949 magnitude) in Nashville. Eclipse glasses will be required.

The annual potluck dinner was held beginning at 6:30.

Theo presented a fun talk on astronomy in Tennessee.

The annual silent auction followed the dinner.

There being no further business, the meeting adjourned at 9:00 PM.

Respectfully submitted,

Bud Hamblen
Secretary



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.



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.

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 Cumberland Valley Girl Scout Building at the intersection of Granny White Pike and Harding Place 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.