The ECLIPSE

January 2025

The Newsletter of the Barnard-Seyfert Astronomical Society

NASA's Perseverance Mars rover took this selfie on July 23, 2024, the 1,218th Martian day, or sol, of the mission. To the left of the rover near the center of the image is the arrowhead-shaped rock nicknamed "Cheyava Falls," which has features that may bear on the question of whether Mars was home to microscopic life in the distant past. The small dark hole in the rock is where Perseverance took a core sample, which is now in a sample tube stored in the rover's belly. The white patch to the right of the hole is where the rover used an abrasion tool to clear away the top surface, allowing science instruments to study the rock's composition.

Measuring 3.2 feet by 2 feet (1 meter by 0.6 meters) and named after a Grand Canyon waterfall, Cheyava Falls lies at the northern edge of Neretva Vallis, an ancient river valley measuring a quarter-mile (400 meters) wide that was carved by water rushing into Jezero Crater long ago.

The selfie is composed of 62 images taken by the WATSON (Wide Angle Topographic Sensor for Operations and eNgineering) camera on the end of the rover's robotic arm. The images were stitched together after being sent back to Earth. WATSON is part of an instrument called SHERLOC (Scanning Habitable Environments with Raman & Luminescence for Organics & Chemicals). WATSON was built by Malin Space Science Systems (MSSS) in San Diego and is operated jointly by MSSS and JPL

BSAS
Barnard-Seyfert Astronomical Society

Officers

Tom Beckermann
President

Steve Hughes
Vice President

Bud Hamblen
Secretary

Theo Wellington
Treasurer

Keith Rainey
Ex-officio

Directors at Large

Cory Brucker

Chip Crossman

Tony Drinkwine

Stephanie Brake

Andy Reeves

Kathy Underwood

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

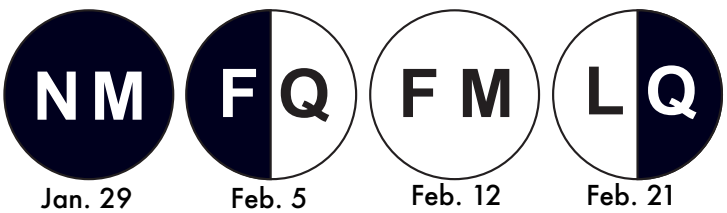
Hi All,

Here is a not-so-wonderful image of the Sun with the Dwarf II. The focus appears to be soft. Further trials are called for. The link to Dwarf Lab's hints on solar imaging is here.

I used a Manfrotto photo tripod to support the Dwarf II as the table top tripod would have put the scope too close the ground for comfort. Prospective borrowers will need to supply their own tripod or table. (The club might consider getting a cheap tripod if we don't have one already in inventory.) Leveling the telescope using the level app on my phone was not difficult, but finding the Sun was not simple. The rounded shape of the telescope means you can't easily use shadows to aim it at the Sun. Trial and mostly error will work.

It can't be over-emphasized that both of the solar filters must be in place before you even think about pointing the Dwarf II at the Sun. Unfiltered sunlight will instantly destroy the telescope and the Furies will pursue you forever.

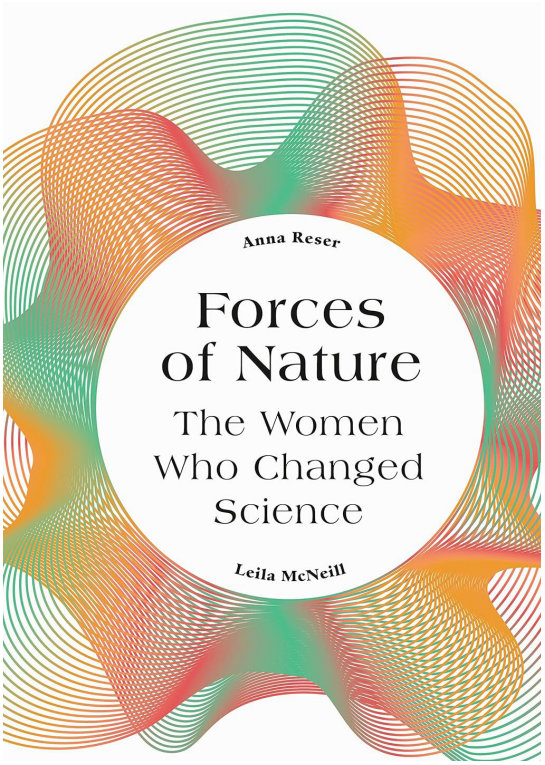
— *Bud Hamblen*



Book Review: Forces of Nature

Reviewed by Robin Byrne

As a lover of the history of science, and of the contributions made by women, I couldn't resist a book titled Forces of Nature: The Women Who Changed Science. The authors, Anna Reser and Leila McNeill, are both professors of the history of science, so the book does have an academic feel to the writing style, but it is still very much an easy, enjoyable read.



I went into this book expecting to read stories of most of the women in science that we are familiar with, so I was surprised to encounter a number of individuals, and groups of women, who are far less known. The book is arranged, roughly, in a chronological order, beginning with women in antiquity through the Middle Ages. This section largely focused on the contributions women made out of necessity, such as assisting in childbirth as midwives, and administering home remedies to the sick. The authors made a point of including women whose names are not known, because of the fact that men were the ones writing the histories, so the contributions of women were not given the same respect as those made by men. This will be a recurring theme throughout the book.

As we move into the Renaissance, we meet lesser known women who made contributions to mathematics and astronomy, such as Maria Gaetana Agnesi, who wrote the first calculus book in Italian, and Nicole-Reine Lepaute, who helped calculate the orbit of Halley's Comet in order to predict its return in 1757. It was in this era that we encounter several women who were either the wife or sister of a scientist, and who worked as an assistant. While officially mere helpers, many of these women made their own contributions to science, as well. In astronomy, the most famous example would be Caroline Herschel, who assisted both her brother, William, and then his son, John, but who also discovered comets on her own.

An interesting section of the book was devoted to women who contributed to science through their art. The science of studying human anatomy was largely pursued by male doctors, but women contributed by illustrating texts with detailed diagrams of the human body, the organs, and bones. One woman, Anna Morandi, sculpted human bodies out of wax, to be used by medical students. Similarly, the field of botany was advanced by women who pursued the "accepted" pastime of gardening. Tending to flowers and plants was something refined women could do without raising eyebrows, but, at the same time,

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Book review, continued

some of the women took this "hobby" farther by making detailed drawings of the parts of plants, and noting the behavior of insects.

By the nineteenth century, women were contributing to science by writing articles for magazines that popularized science, becoming some of the first to share scientific discoveries with the masses through popular media.

During World War I, with the majority of the male population engaged in the war, women were recruited to assist in medical care. This ultimately led to the development of formal training to become nurses, which had not existed prior to this time. Women were at the forefront of both creating the nursing school curricula, as well as teaching the classes. This even led to women becoming doctors, though they had to attend women-only schools.

The early twentieth century also saw women gaining employment as "computers" - literally, women who made mathematical calculations. In astronomy, we are most familiar with the women computers at Harvard Observatory, such as Annie Cannon, Henrietta Leavitt, and Williamina Fleming. But other observatories, including Greenwich, had their own cadre of women making calculations, as well. This role of women computers would continue into the 1960's, up to the point when mechanical computers would replace them.

A subject area that I would not have thought of as a scientific field is home economics. However, the development of ways to efficiently run a home, lay out a kitchen to minimize the number of steps taken, and a focus on cooking nutritious meals all had to be studied and tested to see what worked best. And since this dealt with raising children, cleaning the house, and cooking, it was women who made the most significant advances in this subject area.

World War II saw women moving into many roles previously reserved for men, but the book primarily focused on women who contributed to the development of the atomic bomb. Women worked in a wide variety of capacities in this endeavor, from technicians running equipment to chemists and physicists designing and analyzing the experiments. Post World War II saw a push to return women to the role of homemaker, but one area that was still accepted was related to gardening - caring for the environment. Women conservationists made the analogy between caring for their own home and the need to care for the entire planet. While Rachel Carson is best known among the early female conservationists, she was not alone.

As we near the end of the book, we see the first women to go to space, and some notable female astronomers, such as Vera Rubin and Jocelyn Bell. An interesting point made is that the women who were "first" to do something are the ones we hear about, while the women who continue to make significant contributions in their fields are often

overlooked. The last few pages of the book highlight a wide variety of women who are lesser known, but who are equally deserving to be recognized for the work they have done.

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Forces of Nature: The Women Who Changed Science by Anna Reser and Leila McNeill was a very interesting and thought-provoking book. It expanded my thinking in regard to what constitutes science and what can be considered a contribution to the scientific world. If those ideas interest you, then I would highly recommend reading this book.

References: *Forces of Nature: The Women Who Changed Science by Anna Reser and Leila McNeill, 2021, Frances Lincoln Publishing*

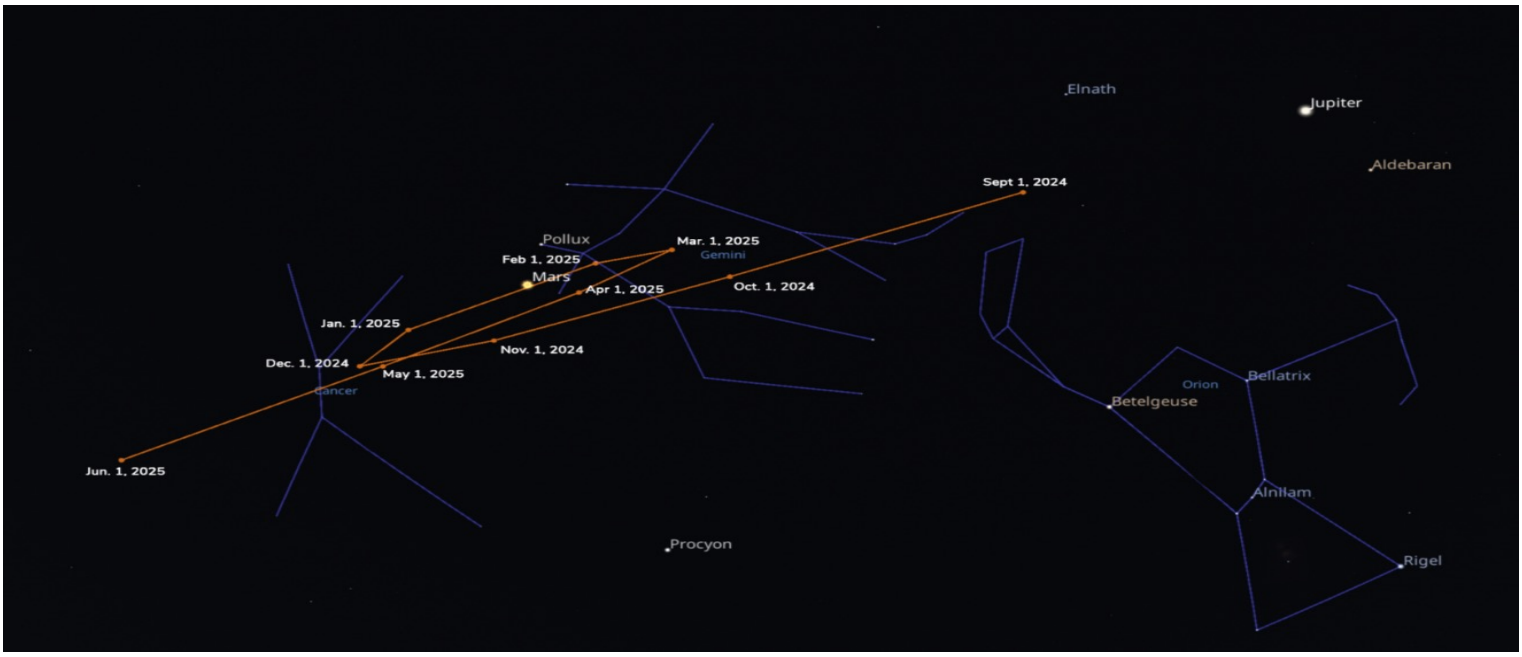
January's Night Sky Notes: The Red Planet

By Kat Troche

Have you looked up at the night sky this season and noticed a bright object sporting a reddish hue to the left of Orion? This is none other than the planet Mars! January will be an excellent opportunity to spot this planet and some of its details with a medium-sized telescope. Be sure to catch these three events this month.

Martian Retrograde

Mars entered retrograde (or backward movement relative to its usual direction) on December 7, 2024, and will continue throughout January into February 23, 2025. You can track the planet's progress by sketching or photographing Mars' position relative to nearby stars. Be consistent with your observations, taking them every few nights or so



as the weather permits. You can use free software like Stellarium or Stellarium Web (the browser version) to help you navigate the night as Mars treks around the sky. You can find Mars above the eastern horizon after 8:00 PM local time.

This mid-January chart shows the path of Mars from September 2024 to June 2025 as it enters and then exits in retrograde motion. Mars appears to change its direction of motion in the sky because Earth is passing the slower-moving Mars in its orbit. Credit: Stellarium

Hide and Seek

On the night of January 13th, you can watch Mars 'disappear' behind the Moon during

an occultation. An occultation is when one celestial object passes directly in front of another, hiding the background object from view. This can happen with planets and stars in our night sky, depending on the orbit of an object and where you are on Earth, similar to eclipses.

A simulated view of the Moon as Mars begins its occultation on January 13, 2025. Credit: Stellarium

Depending on where you are within the contiguous United States, you can watch this event with the naked eye, binoculars, or a small telescope. The occultation will happen for over an hour in some parts of the US. You can use websites like Stellarium Web or the Astronomical League's 'Moon Occults Mars' chart to calculate the best time to see this event.

Closer and Closer

As you observe Mars this month to track its retrograde movement, you will notice that it will increase in brightness. This is because Mars will reach opposition by the evening of January 18th. Opposition happens when a planet is directly opposite the Sun, as seen from Earth. You don't need to be in any specific city to observe this event; you only need clear skies to observe that it gets brighter. It's also when Mars is closest to Earth, so you'll see more details in a telescope.

Want a quick and easy way to illustrate what opposition is for Jupiter, Saturn, Mars, or other outer worlds? Follow the instructions on our Toolkit Hack: Illustrating Opposition

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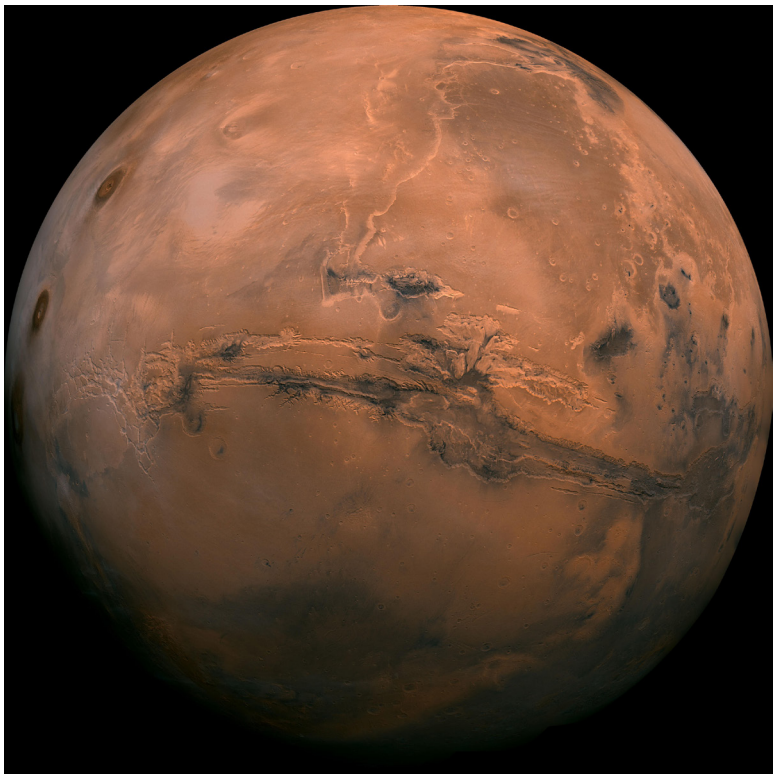
with Exploring the Solar System page using our Exploring Our Solar System activity!



A mosaic of the Valles Marineris hemisphere of Mars projected into point perspective, a view similar to that which one would see from a spacecraft. The mosaic is composed of 102 Viking Orbiter images of Mars. (*Credit: NASA/JPL-Caltech)*

Mars has fascinated humanity for centuries, with its earliest recorded observations dating back to the Bronze Age. By the 17th century, astronomers were able to identify features of the Martian surface, such as its ice caps and darker regions. Since the 1960s, exploration of the Red Planet has intensified with robotic missions from various space organizations.

Currently, NASA has five active missions, including rovers and orbiters, with the future focused on human exploration and habitation. Mars will always fill us with a sense of wonder and adventure as we reach for its soil through initiatives such as the Moon to Mars Architecture and the Mars Sample Return campaign.

This 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!

Barnard-Seyfert Astronomical Society
Minutes — Board of Directors
Dec. 4, 2024

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held December 4, 2024, online, Dr. Tom Beckermann presiding. Logged in were Tom Beckermann, Stef Brake, Tony Drinkwine, Steve Hughes, Keith Rainey, Andy Reeves, and Theo Wellington.

Minutes: Minutes of the board meeting held November 6, 2024, were adopted with the correction of the spelling of Celia Toral's last name.

Membership report: Keith reported 212 members.

Treasurer's report: Theo reported the Truist bank balance to be $8,748.71. Expenses were $17.47 for the Zoom account, $20 for the State of Tennessee business license fee, $315 for liability insurance annual premium, $200 for the Dwarf 2 telescope for the telescope loaner program, $121.96 for a carrier bag and eyepieces for the Celestron 8SE telescope. The PayPal account had $445.76.

Meetings: The annual potluck is scheduled for December 18 at Dyer. The presenter will be Celia Toral, a graduate student at Vanderbilt University, associated with the NANOGrav project. The January 22, 2025, meeting will be a telescope workshop. The meeting on February 19, 2025, will include a presentation on Osiris REX.

Newsletter: Theo reported Joe Morris, Andrea Li, and Scott Bailey have volunteered to run the Eclipse. Thanks, Joe, Andrea, and Scott. Drew Gilmore is awarded a lifetime membership in the BSAS for eleven years of running the newsletter.

Social Media: The Facebook page (https://www.facebook.com/bsasnashville) is liked by 2.3K, and followed by 2.6K. BSAS Nashville on "X" (https://x.com/BSASNashville) has 341 followers. There were 270 followers of BSAS Nashville (https://www.instagram.com/bsasnashville/) on Instagram.

Star Parties and Outreach: The public star party scheduled for November 9 at Edwin Warner Park was canceled due to weather. A public star party is scheduled for December 7 at the Shelby Bottoms Nature Center. The last private star party of the year is scheduled for December 28 on the Natchez Trace. A new permit for 2025 is in the works.

Storage Unit for Loaner Telescopes: Theo reported that a maximum of about $2,700 would be available annually for rental of a storage unit instead of having telescopes scattered among members. A possible facility was discussed.

Board Membership: Candidates for officers are Tom Beckermann, Steve Hughes, Theo Wellington, and Bud Hamblen. Candidates for directors are Chip Crossman (reelected), Gene Matthews, Andy Reeves (reelected), and Donna Burgess. Cory Buckner and Stef Brake are continuing directors.

There being no further business, the meeting was adjourned.
Respectfully submitted,
Bud Hamblen, Secretary

Barnard-Seyfert Astronomical Society
Minutes — Board of Directors
Jan. 8, 2025

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held January 8, 2025, online, Dr. Tom Beckermann presiding. Logged in were Tom Beckermann, Stef Brake, Donna Burgess, Tony Drinkwine, Bud Hamblen, Steve Hughes, Gene Matthews, Keith Rainey, Andy Reeves and Theo Wellington.

Meetings: The January 15, 2025, meeting will be a telescope workshop. The meeting may be postponed to 1/22/25 if the roads are icy. The February 19, 2025, meeting will include a presentation by Dr Jason Dworkin on Osiris REX. The March 19, 2025, meeting will be a "What's Up" oriented toward Messier objects.

Membership report: Night Sky Network, which BSAS uses to manage membership, was off line. NASA JPL, which hosts the NSN, was affected by the wildfires in the Pasadena area.

Minutes: The minutes of the December 4, 2024, board meeting were adopted without discussion.

Social Media: The Facebook page (https://www.facebook.com/bsasnashville) is liked by 2.3K, and followed by 2.6K. BSAS Nashville on "X" (https://x.com/BSASNashville) had 325 followers. BSAS Nashville (https://www.instagram.com/bsasnashville/) on Instgram had 285 followers.

Star Parties and Outreach: Club members participated in an indoor event at the Warner Park Nature Center for the Winter Soltice. Stargazing at the Shelby Bottoms Nature Center was clouded out on January 4. About 25 persons attended the indoor presentation in the Nature Center. About 75 persons had attended the previous event in December, 2024. A members-only event is scheduled at the Natchez Trace Water Valley Overlook on 1/25/25. Hopefully the Park Service will have processed the permit. Another members-only event is scheduled in February at the Natchez Trace Mile Marker 435.3 parking area. Public events are scheduled for 2/1/25 at the Edwin Warner Park Special Events Field, and at the Bells Bend Outdoor Center on 3/1/25. Judges are needed for the Middle Tennessee Science and Engineering Fair in March. The Messier Marathon is coming up in March (New Moon is Saturay, March 29). The Town of Wartrace is planning a star gaze at Winette-Ayers Park on April 26. Wartrace is about an hour's drive from Nashville. The use of Sharp Springs Park in Smyrna as an event site was discussed.

Telescope Loaner Program: The newly acquired Celestron 8SE has been kitted out with eyepieces and a carrying case. The Dwarf II has been loaned out. There was discussion about getting a storage unit to house the loaner telescopes, which are currently scattered among members' garages, and other homes for homeless telescops. There was discussion about deaccessioning telescopes that do not circulate.

Treasurer's Report: The silent auction at the December meeting netted $122.50. The Truist account had a balance of $8,453.79. The PayPal account had a balance of $749.91. Expenses included food for the potluck dinner ($68.34), the Zoom account ($17.47), liability insurance premium, eyepieces and accessories for the telescope loaner program, and a Dwarf II telescope for the telescope loaner program.

There being no further business, the meeting was adjourned.
Respectfully submitted,
Bud Hamblen, Secretary

Barnard-Seyfert Astronomical Society
Minutes — Monthly Membership
Dec. 18 & Jan. 15, 2025

The Barnard-Seyfert Astronomical Society met at Vanderbilt's Dyer Observatory for the annual potluck dinner on Wednesday, December 18, 2024, Dr Tom Beckermann presiding. Thirteen persons signed in at Dyer, although more attended.

Thanks to those who brought food: Stef Brake (Corn Bread Cassarole and pie), Ann and Jim and Jim Meehan (Caesar Salad, Pound Cake, Tea), Kenna and Gary Eaton (Pecan Pie), Connor Hall (45 Ct Nuggets), Bill Taylor (Sweet Potato Chips), Theo Wellington (Sliced Ham and Turkey), Roy Wellington (Cranberry), Danika Wellington (Potato Salad), Javier Garcia (Meat and Cheese), Donna Hummell (Potato Salad and Brownies), Tony Drinkwine (Chicken and Dressing), Bud Hamblen (15 Bean Soup), Melissa Lanz (Spinach, Strawberry and Pecan Salad), and those who didn't sign the sheet.

Celia Toral, Vanderbilt University, presented the NANOGrav project. NANOGrav detects gravity waves by timing the pulses from pulsars. The passing of a gravity wave causes the pulses to arrive slightly early or late, allowing detection.

Meetings: The next general meeting will be at Vanderbilt's Dyer Observatory, 1000 Oman Dr., Brentwood, Tennessee, at 7:00 PM on Wednesday, January 15, 2025. Please note the new starting time, a half-hour earlier than previous meetings. This will be the starting time for general meetings in the future. This will be the annual telescope workshop. If you got a new scope and aren't sure how to use it, then come to this meeting and become enlightened.

Elections for club officers and directors: The new board consists of:

- Tom Beckermann, President
- Steve Hughes, Vice President
- Theo Wellington, Treasurer
- Bud Hamblen, Secretary
- Stef Brake, Director
- Cory Buckner, Director
- Donna Burgess, Director
- Chip Crossmann, Director
- Tony Drinkwine, Director
- Gene Matthews, Director

Election was by acclimation.

Minutes: The minutes for the general meeting of November 20, 2024, were adopted without discussion.

Membership report: Keith reported club roster numbered 212.

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Treasurer's report: Theo reported that the Truist bank balance was $9,430.71 ($3,752.91 in the equipment fund and $4,677.80 in the general fund). The PayPal balance was $493.04. General fund expenses included $17.47 for the Zoom account, $20.00 for the State of Tennessee business registration, and $315.00 for the annual premium for liability insurance. Equipment fund expenses included $121.96 for a carrying bag and eyepieces for the Celestron 8SE loaner scope, and $200 for the Dwarf2 loaner scope.

Upcoming star parties and events: The Warner Parks Nature Center is holding a Winter Solstice event on Friday, December 20. A members-only star party is scheduled for December 28 at Natchez Trace Parkway Mile Marker 435.3 (a copy of the permit is needed). Members are invited to bring telescopes to the event. A public star party is scheduled for January 4, 2025, at the Shelby Bottoms Nature Center.

There being no further business, the meeting adjourned at 9 PM.
Respectfully submitted, Bud Hamblen, Secretary

January 15, 2025

The Barnard-Seyfert Astronomical Society met at Vanderbilt's Dyer Observatory for the regular general meeting on Wednesday, January 15, 2025, Dr Tom Beckermann presiding. There were a number of new members and guests attending.

Meetings: The next general meeting will be at Vanderbilt's Dyer Observatory, 1000 Oman Dr., Brentwood, Tennessee, at 7:00 PM on Wednesday, February 19, 2025. The presenter will be Dr Jason Dworkin with the Osiris-REX project. Tom asked for ideas for presentations for future meetings.

Membership report: Keith Rainey reported 223 members. The Night Sky Network has a bug that causes it to issue a "try again" message when a new member attempts to join BSAS through the NSN. It actually works, so it is not necessary to try again.

Minutes: The minutes for the general meeting on December 18, 2024, were adopted without discussion.

Social Media: Theo Wellington reported the the Facebook page was liked by 2.3K persons, and followed by 2.6K. Twitter has 326 followers.

Star parties and events: Tom asked for help developing new star party locations. A public star party is scheduled for February 1, 2025, at the Warner Park Special Events Field. Members-only star parties are scheduled for January 25, 2025, at the Natchez Trace Water Valley Overlook, and February 22, 2025, at the Natchez Trace Mile Marker 453.5 parking lot.

Treasurer's report: Theo reported $8,430.79 ($4,578.38 in the general fund and $3,875.41 in the equipment fund) in the Truist bank account, and $816.00 in the PayPal account. Expenses since the last general meeting included $68.34 for food at the annual potluck dinner, $17,47 for the Zoom accout, $50.00 for the Natchez Trace permit, $100.00 reward for Drew Gilmore for 11 years running the Eclipse newsletter.

The attendees broke out into groups to mutually aid each other with the use of telescopes. There being no further business, the meeting adjourned at 8:30 p.m. 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.

Next BSAS meeting
Wednesday, Feb. 19, 7:00 pm

Dyer Observatory
1000 Oman Ddr.
Brentwood, TN 37027

Barnard-Seyfert Astronomical Society

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 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.