The ECLIPSE

The Newsletter of the Barnard-Seyfert Astronomical Society

September 2022

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Barnard-Seyfert Astronomical Society

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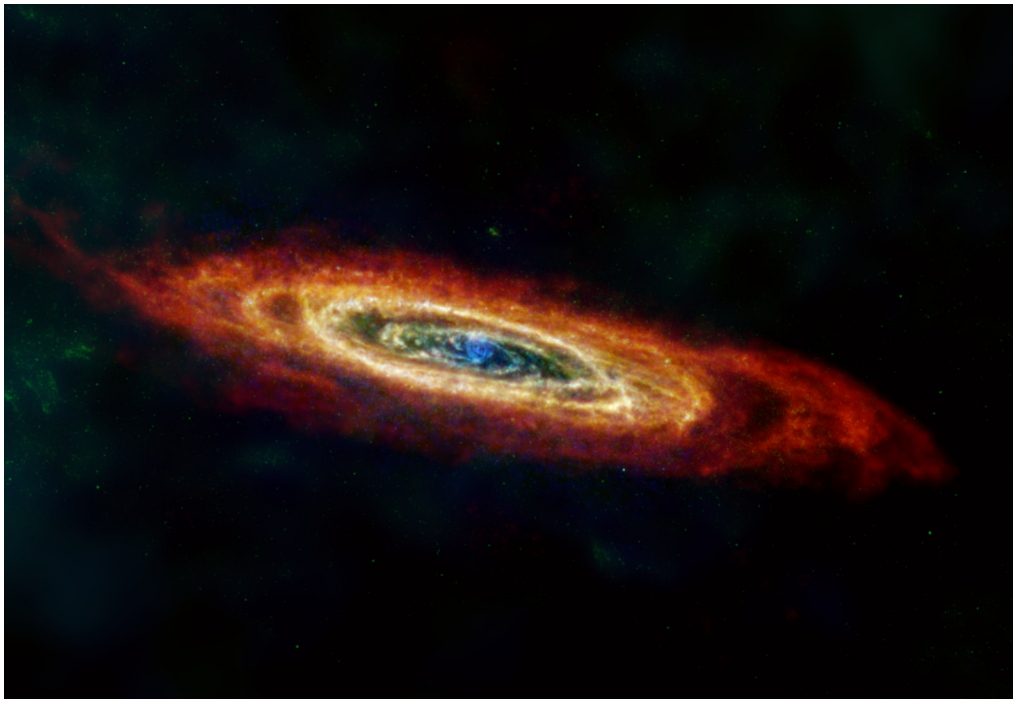
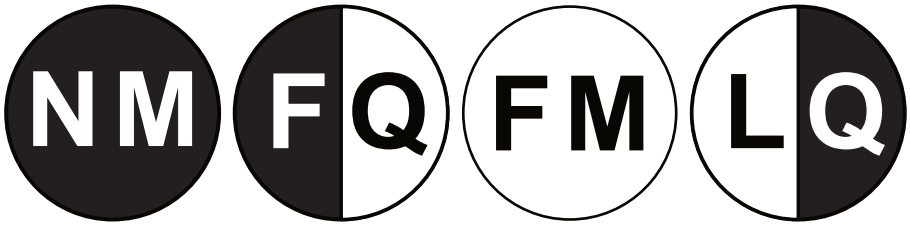


The Andromeda galaxy, or M31, is shown here in far-infrared and radio wavelengths of light. Some of the hydrogen gas (red) that traces the edge of Andromeda's disc was pulled in from intergalactic space, and some was torn away from galaxies that merged with Andromeda far in the past. The image is composed of data from the European Space Agency (ESA) Herschel mission, supplemented with data from ESA's retired Planck observatory and two retired NASA missions: the Infrared Astronomy Survey and Cosmic Background Explorer, as well as the Green Bank Telescope, WRST, and IRAM radio telescopes.

Credit: ESA, NASA, NASA-JPL, Caltech, Christopher Clark (STScI), R. Braun (SKA Observatory), C. Nieten (MPI Radioastronomie), Matt Smith (Cardiff University)



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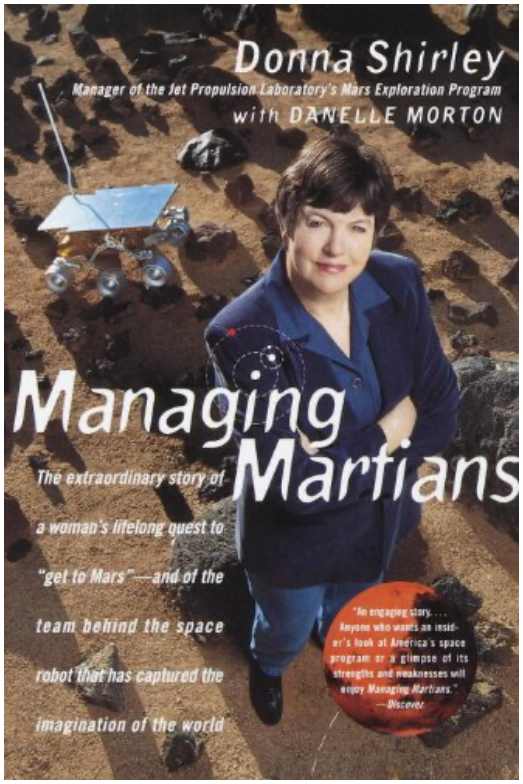
Sep 17
Oct 17

Book Review: Managing Martians
Reviewed by Robin Byrne



Since this summer marked the 25th anniversary of the landing of the first Mars Rover, it seemed appropriate to read a book about the woman who oversaw that mission. "Managing Martians: The Extraordinary Story of a Woman's Lifelong Quest to 'Get to Mars' - and of the Team Behind the Space Robot That Has Captured the Imagination of the World" by Donna Shirley and Danelle Morton is a personal memoire of Shirley's life up to and including the Mars Sojourner mission.

It begins with Shirley's early life in the 1940's and 50's. She was not a stereotypical little girl. Her fascination with airplanes and fictional stories of Mars set her apart. Despite her mother's attempts to make her fit in, even entering her in a local beauty contest, Shirley had her own ideas about who she was and what she wanted to do, including learning to fly an airplane while still a high school student.

In college, Shirley majored in engineering, while still pursuing her love of flying. Not surprisingly for the late 1950's/early 1960's, Shirley was in an extreme minority as a woman in the engineering program. Her male professors were quick to dismiss her, which didn't help. When a relationship affected her grades, Shirley decided to change majors to something easier - journalism. After graduation, she looked for work as a technical writer, in the hopes of combining her writing skills with her enduring love of engineering.

Shirley discovered that she was not satisfied writing about other people's creations. She returned to school, completing her engineering degree, and also studying management. Now, she could finally work as an engineer - or so she thought. Female engineers were still few and far between, and were typically given menial assignments. After several unsatisfying jobs, Shirley was hired by the Jet Propulsion Laboratory (JPL). Finally, she found a place that had exciting opportunities for her. During the 1970's, Shirley participated in many of the missions that sent spacecraft to various planets in our solar system. However, she had yet to be involved in developing the actual hardware that went to space.

It was a classic Catch-22 situation: to move up the ladder at JPL, you had to have experience with actual hardware that went to space, but to work on actual hardware, you needed to be higher up in the system. As a woman, it was that much more difficult to be given the initial break needed to start the process. Finally, though, Shirley was given the assignment to work on a Mars rover. At this point, it was purely speculative, and may never go to space, but it was a start.

As time went on, Shirley found herself managing the development of a small rover that would fit the budget constraints of the new "better, faster, cheaper" mantra of NASA. One of her first

innovations was changing the management structure of the team. She implemented more of a collaborative team of equals, instead of JPL's traditional top-down structure. For those who were accustomed to being the "boss" over their underlings, this egalitarian approach rankled. But Shirley's management style proved to be very successful.

At this point in the book, we learn all about the various iterations in the development of the rover, and all the designs that were considered, as well as the struggles to afford even seeing the project through to completion. Every aspect is discussed, as well as the people responsible for developing the hardware and software that would ultimately become the Sojourner Rover. We also read about the conflict between Shirley's rover team and the team designing the Pathfinder lander that would carry the rover. What looked to the world like a spacecraft duo that was always meant to be together, they were not quite the "match made in Heaven" that they appeared. Thankfully for everyone, the differences were resolved.

After Pathfinder had successfully launched, with Sojourner safely tucked away inside, and was well on its way to Mars, Shirley found herself offered a new position - Manager of the Mars Exploration Program. Shirley was now in charge of not one, but all missions destined for Mars. Her new job included working with the scientists to establish the research goals of the missions. This process led to the "follow the water" theme of the program. This was the beginning of the push to launch spacecraft to Mars roughly every 1.5 years (when Mars is well-placed for a spacecraft to make the journey). The orbiting and roving U.S. spacecraft that have since visited Mars were all developed under Shirley's leadership. Since the book was published in 1998, not long after the conclusion of the Pathfinder mission, most of the subsequent flights had not yet occurred when it was being written.

Reading this book almost 25 years after being published, it was interesting to hear about the push for a Mars sample return mission being discussed as early as the 1990's. It is only now, with the samples being collected by Perseverance, that we may actually see that goal finally come to pass.

Shirley retired from JPL in 1998, eventually taking a position as Associate Dean of Engineering at the University of Oklahoma for three years. She then helped found the Science Fiction Museum in Seattle. In 2004, Shirley founded Managing Creativity, which is a platform she developed to share her innovative management techniques.

"Managing Martians" was a very enjoyable and well-written read. Donna Shirley's personal story is inspiring, and the behind-the-scenes look at how a JPL mission is developed is fascinating. This is a book, despite being a quarter century old, that I would highly recommend reading as a "timely" look at Mars exploration.

References:

"Managing Martians: The Extraordinary Story of a Woman's Lifelong Quest to 'Get to Mars' - and of the Team Behind the Space Robot That Has Captured the Imagination of the World" by Donna Shirley and Danelle Morton; Broadway Books; 1998

Donna Shirley - Wikipedia

Next Membership Meeting:

Wednesday September 21, 7:30 pm

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

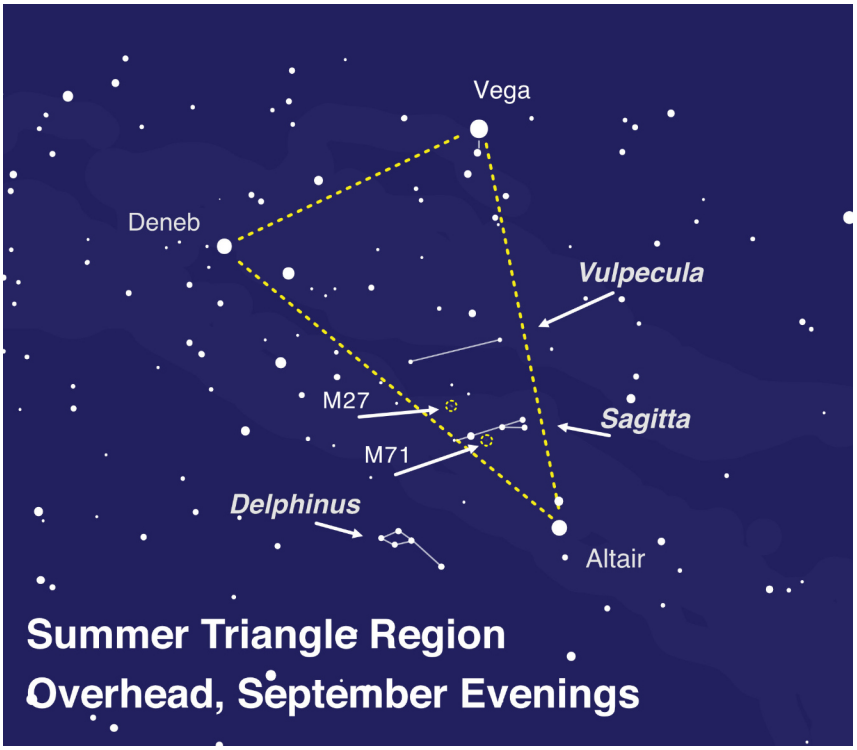
On the Cover: In this mosaic image stretching 340 light-years across, Webb's Near-Infrared Camera (NIRCam) displays the Tarantula Nebula star-forming region in a new light, including tens of thousands of never-before-seen young stars that were previously shrouded in cosmic dust. The most active region appears to sparkle with massive young stars, appearing pale blue. Scattered among them are still-embedded stars, appearing red, yet to emerge from the dusty cocoon of the nebula. NIRCam is able to detect these dust-enshrouded stars thanks to its unprecedented resolution at near-infrared wavelengths.

Credit: NASA, ESA, CSA, STScI, Webb ERO Production Team

xkcd

	UNIVERSE LITE™	UNIVERSE STANDARD®	UNIVERSE PRO®™
PRICE	FREE	$14.95/MONTH	$49.95/MONTH
ADS	YES	YES	NO
NUMBER OF ANGELS THAT CAN DANCE ON THE HEAD OF A PIN	4	64	4,096
FREE WILL OR DETERMINISM	DETERMINISM	FREE WILL	FREE WILL
COSMIC SPEED LIMIT	65 MPH	300,000 KM/S	UNLIMITED
IF A TREE FALLS IN A FOREST AND THERE'S NO ONE THERE TO HEAR...	NO SOUND	SIMPLE BEEP	FULL SOUND
MEANING OF LIFE	UNKNOWABLE	UNCERTAIN	CLEARLY EXPLAINED
SOUND OF ONE HAND CLAPPING	[NONE]	[NONE]	*KAZZAP!*
AGING AND DEATH	MANDATORY	MANDATORY	OPT-IN
DOES GOD PLAY DICE WITH THE UNIVERSE?	YES, AND HE CHEATS	YES	NO
BAD THINGS...	HAPPEN TO GOOD PEOPLE ONLY	HAPPEN TO GOOD AND BAD PEOPLE	DON'T HAPPEN
WHAT HAPPENS TO THOSE WHO SOW THE WIND	REAP THE WHIRLWIND	REAP THE WHIRLWIND	LOTS OF CROPS EVERYWHERE

The Summer Triangle's Hidden Treasures
By David Prosper



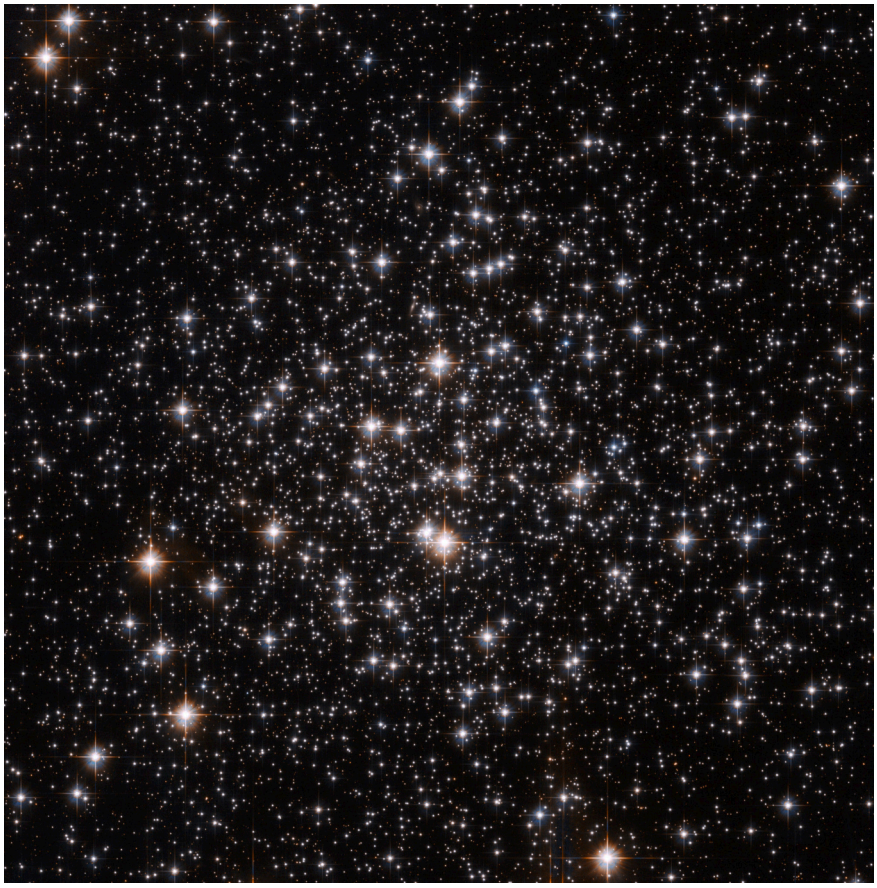
Search around the Summer Triangle to spot some of its hidden treasures! To improve readability, the lines for the constellations of Aquilla, Lyra, and Cygnus have been removed, but you can find a map which includes them in our previous article, Spot the Stars of the Summer Triangle, from August 2019. These aren't the only wonderful celestial sights found around its borders; since the Milky Way passes through this region, it's littered with many incredible deep-sky objects for those using binoculars or a telescope to scan the heavens. Image created with assistance from Stellarium: stellarium.org

September skies bring the lovely Summer Triangle asterism into prime position after nightfall for observers in the Northern Hemisphere. Its position high in the sky may make it difficult for some to observe its member stars comfortably, since looking straight up while standing can be hard on one's neck! While that isn't much of a problem for those that just want to quickly spot its brightest stars and member constellations, this difficulty can prevent folks from seeing some of the lesser known and dimmer star patterns scattered around its informal borders. The solution? Lie down on the ground with a comfortable blanket or mat, or grab a lawn or gravity chair and sit luxuriously while facing up. You'll quickly spot the major constellations about the Summer Triangle's three corner stars: Lyra with bright star Vega, Cygnus with brilliant star Deneb, and Aquila with its blazing star, Altair. As you get comfortable and your eyes adjust, you'll soon find yourself able to spot a few constellations hidden in plain sight in the region around the Summer Triangle: Vulpecula the Fox, Sagitta the Arrow, and Delphinus the Dolphin! You could call these the Summer Triangle's "hidden treasures" – and they are hidden in plain sight for those that know where to look!

Vulpecula the Fox is located near the middle of the Summer Triangle, and is relatively small, like its namesake. Despite its size, it features the largest planetary nebula in our skies: M27, aka the Dumbbell Nebula! It's visible in binoculars as a fuzzy "star" and when seen through telescopes, its distinctive shape can be observed more readily - especially with larger telescopes. Planetary nebulae, named such because their round fuzzy appearances were initially thought to resemble the disc of a planet by early telescopic observers, form when stars similar to our Sun begin to die. The star will expand into a massive red giant, and its gasses drift off into space, forming a nebula. Eventually the star collapses into a white dwarf – as seen with M27 - and eventually the

colorful shell of gasses will dissipate throughout the galaxy, leaving behind a solitary, tiny, dense, white dwarf star. You are getting a peek into our Sun's far-distant future when you observe this object!

Sagitta the Arrow is even smaller than Vulpecula – it's the third smallest constellation in the sky! Located between the stars of Vulpecula and Aquila the Eagle, Sagitta's stars resemble its namesake arrow. It too contains an interesting deep-sky object: M71, an unusually small and young globular cluster whose lack of a strong central core has long confused and intrigued astronomers. It's visible in binoculars, and a larger telescope will enable you to separate its stars a bit more easily than most globulars; you'll certainly see why it was thought to be an open cluster!



M71 as seen by Hubble. Your own views very likely won't be as sharp or close as this. However, this photo does show the cluster's lack of a bright, concentrated core, which led astronomers until fairly recently to classify this unusual cluster as an "open cluster" rather than as a "globular cluster." Studies in the 1970s proved it to be a globular cluster after all – though an unusually young and small one! Credit ESA/Hubble and NASA.

Delicate Delphinus the Dolphin appears to dive in and out of the Milky Way near Aquilla and Sagitta! Many stargazers identify Delphinus as a herald of the fainter water constellations, rising in the east after sunset as fall approaches. The starry dolphin appears to leap out of the great celestial ocean, announcing the arrival of more wonderful sights later in the evening.

Want to hunt for more treasures? You'll need a treasure map, and the Night Sky Network's "Trip Around the Triangle" handout is the perfect guide for your quest! Download one before your observing session at bit.ly/TriangleTrip. And of course, while you wait for the Sun to set - or skies to clear - you can always find out more about the objects and science hidden inside these treasures by checking out NASA's latest at nasa.gov.

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, August 3, 2022

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held August 3, 2022, online, Dr. Tom Beckermann presiding. Logged in were Tom Beckermann, Cory Buckner, Tony Drinkwine, Bud Hamblen, Kathy Underwood and Theo Wellington. An on-line quorum being present, Tom called the meeting to order at 7:30 PM.

Tom asked for a motion to adopt the minutes of the board meeting on July 6, 2022, as printed in the August, 2022, edition of the Eclipse. Theo made the motion, Kathy seconded and the minutes were adopted unanimously.

Treasurer's Report: Theo reported the Truist bank balance is $10,696.26.

Membership report: Tom reported 213 members.

Equipment: There were no new requests for loans of equipment and no new returns of equipment. Theo made a request to buy a white light solar filter for the 8" dob that Chuck Schlemm uses for outreach. The cost would be about $177. Tom made the motion to approve the purchase, Kathy seconded and approval was unanimous.

Name tags: Theo reported that lanyards were available at 25 cents per lanyard for 100 lanyards.

Upcoming star parties: Private on August 27 at Water Valley Overlook. Public on September 10 at Bells Bend Outdoor Center. Private on September 24 at Natchez Trace Mile Marker 435.3. Public ar Warner Park for Astronomy Day / Observe the Moon Day.

There being no further business, the meeting adjourned at 8:30 PM.

Respectfully submitted,

Bud Hamblen
Secretary

Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held on Wednesday, August 17, 2022

The Barnard-Seyfert Astronomical Society met at the Girl Scout Center and on-line via Zoom on Wednesday, August 17, 2022, Tom Beckermann presiding. About 24 persons attended in person and via Zoom.

Treasurer's Report: Theo Wellington reported that the Truist bank balance was $10,502.94, and the PayPal balance was $317.50. A solar filter was bought for the 8" dob that Chuck Schlemm uses for outreach.

Social media report: Theo reported that the Facebook page was liked by 2,055 and followed by 2,197. The twitter feed (@BASANashville) has 312 followers.

Outreach and Star Parties:

Private star parties are scheduled for August 27 at Water Valley Overlook on the Natchez Trace Parkway and for September 24 at Mile Marker 435.3. A copy of the Park Service permit is needed. A PDF is available and you can print out your own copy. A public star party is scheduled for September 24 at the Bells Bend Outdoor Center on September 10, 2022.

Dr. Caitlin Ahrens presented a talk on volcanoes existing on planets and moons within the solar system. Dr. Ahrens is a post-doc fellow at Oak Ridge Associated Universities. She is also a NASA solar system ambassador. She has contributed to recent books: Mars, a Volcanic World (Springer Verlag) and The Pluto System after New Horizons (University of Arizona Press).

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

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 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.