

The ECLIPSE

November
2019

The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:

Wednesday November 20, 7:30 pm

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Topic:
All I Want for Christmas

From the President:

That time of year is coming up – what do I get myself for Christmas to support my astronomy hobby (or obsession)? You are in luck! Our annual “All I Want for Christmas” presentation is coming up this month. As the title implies, we will explore different astronomy toys and their costs from beginner level to advanced. If you know of someone that would like to get started in astronomy but doesn’t know where to start, or if someone wants to get a present for a child or grandchild, then don’t miss this presentation.

On the other side of the coin, do you have extra astronomy gear or are looking to lighten the load so to speak? Part of the December meeting is a silent auction to raise money for the club. If you do have some extra gear that you were looking to sell or give away, consider giving them to the club for us to auction off at the meeting. It will help you and the club out so it’s a win-win for everyone.

Finally, with some of the clearer skies out there, we have been able to have some of our public star parties. We usually get one or two members sign up after a star party – they are a great way to grow the club as well as provide outreach to the community. This is certainly a welcome change compared to earlier in the year when it seems everything was canceled due to weather. Another welcome change would be some new faces at the star parties! Consider bringing your scope to set up and share with our community neighbors. If you don’t want to bring your scope, bring yourself and your interest in the hobby. There are lots of questions that can be answered and you don’t have to be a professional to answer them.

Clear skies and have a great month!

Keith Rainey

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BSASNashville.com



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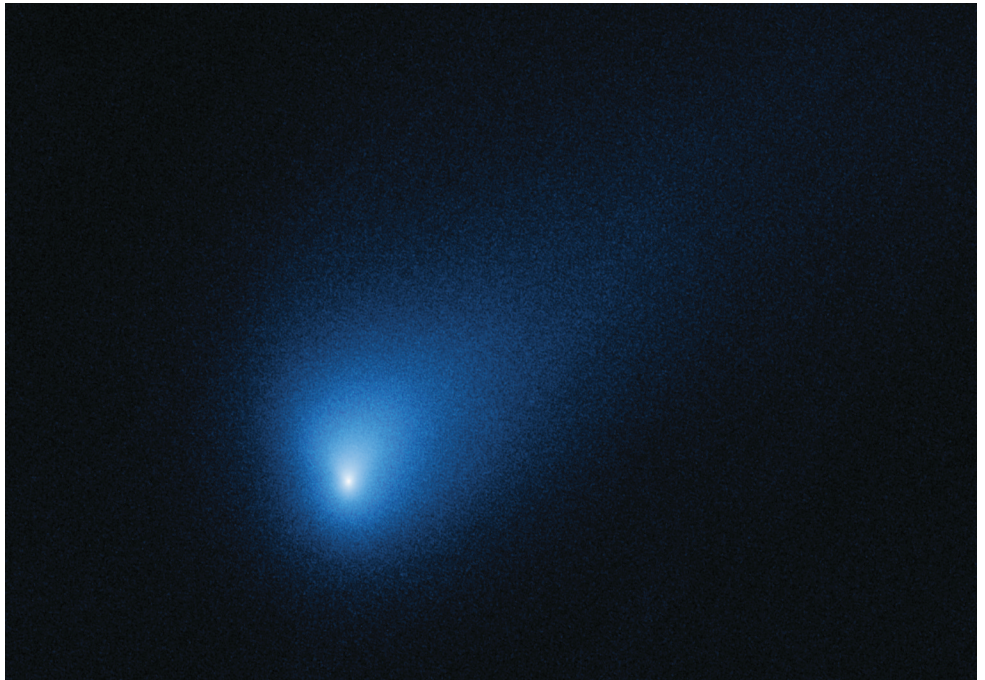
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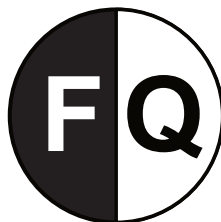
NASA's Hubble Space Telescope has given astronomers their best look yet at an interstellar visitor – comet 2I/Borisov – whose speed and trajectory indicate it has come from beyond our solar system. Hubble photographed the comet at a distance of 260 million miles from Earth. This Hubble image, taken on October 12, 2019, is the sharpest view to date of the comet.
Credit: [NASA](#), [ESA](#), and [D. Jewitt \(UCLA\)](#)

Upcoming Star Parties

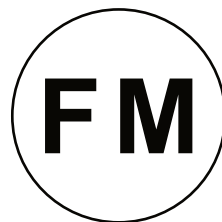
Saturday November 2 6:30 to 8:30 pm	BSAS Public Star Party Edwin Warner Park
Saturday November 23	BSAS Private Star Party Natchez Trace Parkway mile marker 435.3
Saturday November 30 6:00 to 8:30 pm	BSAS Public Star Party Long Hunter State Park
Saturday December 7 6:30 to 8:30 pm	BSAS Public Star Party Shelby Bottoms Nature Center



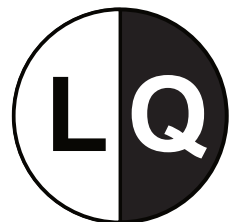
Nov 26
Dec 25



Nov 4
Dec 4



Nov 12
Dec 11



Nov 19
Dec 18

Happy Birthday Edmund Halley by Robin Byrne

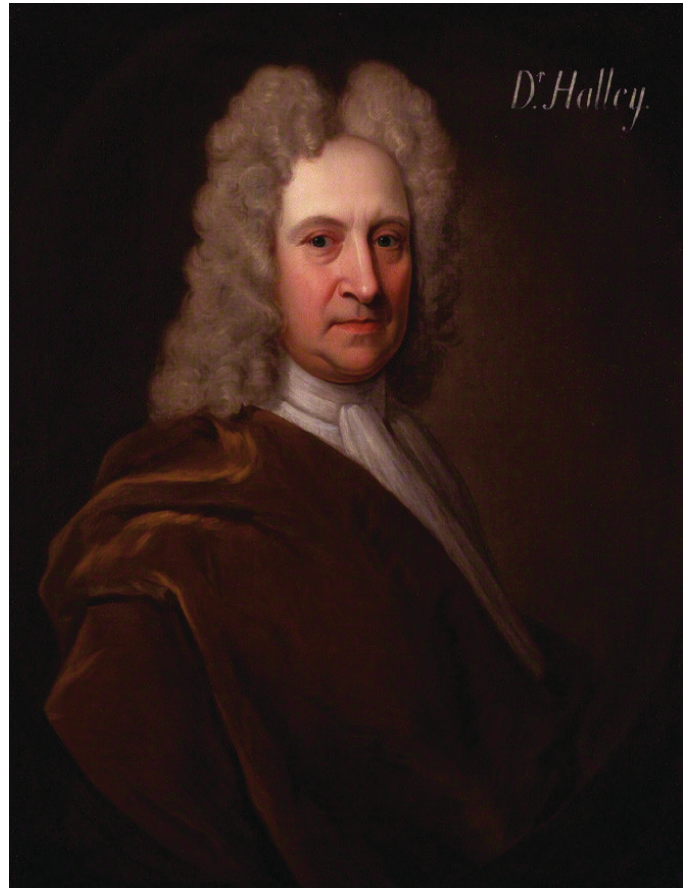
This month marks the 363rd birthday of a man solely associated with comets, but who did so much more. Edmund Halley was born November 8, 1656 in Haggerston, England near London. The son of a wealthy business man, Halley attended St. Paul's School in London. In 1673, Edmund entered Queen's College, Oxford, where he was introduced to John Flamsteed. Unlike many of the people we have honored in this column, Halley actually studied to become an astronomer, partly from Flamsteed's encouragement.

At this time, Flamsteed was compiling a catalog of northern stars. Halley decided to do the same for southern stars. In November of 1676 Halley left school and set sail for St. Helena, Britain's southernmost territory. By January 1678 he had positions of 341 stars. The catalog of these stars was the first to be published containing positions of southern stars determined using a telescope. Halley's reputation was set. Because of his work on the catalog, he was given an MA degree from Oxford, and in 1678 Halley was elected a fellow of the Royal Society.

In 1684, Halley first met Isaac Newton. It was at Halley's insistence that Newton agreed to publish his *Principia*. However, at the time, the Royal Society was having financial troubles, so Halley paid for all the publication costs out of his own pocket.

Halley was involved in many scientific endeavors. In 1686, Halley published the first meteorological chart of prevailing winds around the world. In 1693, he published tables

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Next Membership Meeting:

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Cumberland Valley
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Topic:
All I Want for Christmas

Edmund Halley, continued

relating mortality and age, which set the standard for life insurance actuarial tables. From 1698-1700, Halley commanded the war ship "Paramour Pink" on the first sea voyage devoted solely to science - observing variations in compass readings in the South Atlantic. Halley also noticed the positions of the stars Sirius, Procyon and Arcturus had changed since earlier observations. He had discovered 'proper motion' of stars. Prior to this discovery, it was assumed that the stars were fixed in their positions in the sky.

It wasn't until 1705 that Halley's name became associated with the study of comets. In his book *A Synopsis of the Astronomy of Comets*, Halley described parabolic orbits of 24 comets and showed that 4 comets (from 1456, 1531, 1607, and 1682) were so similar they must be the same comet. He predicted the comet would return in 1758. Many were skeptical of this prediction. Although Halley did not live to see its return (he died in 1742), the comet did return and has continued to return every 76 years.

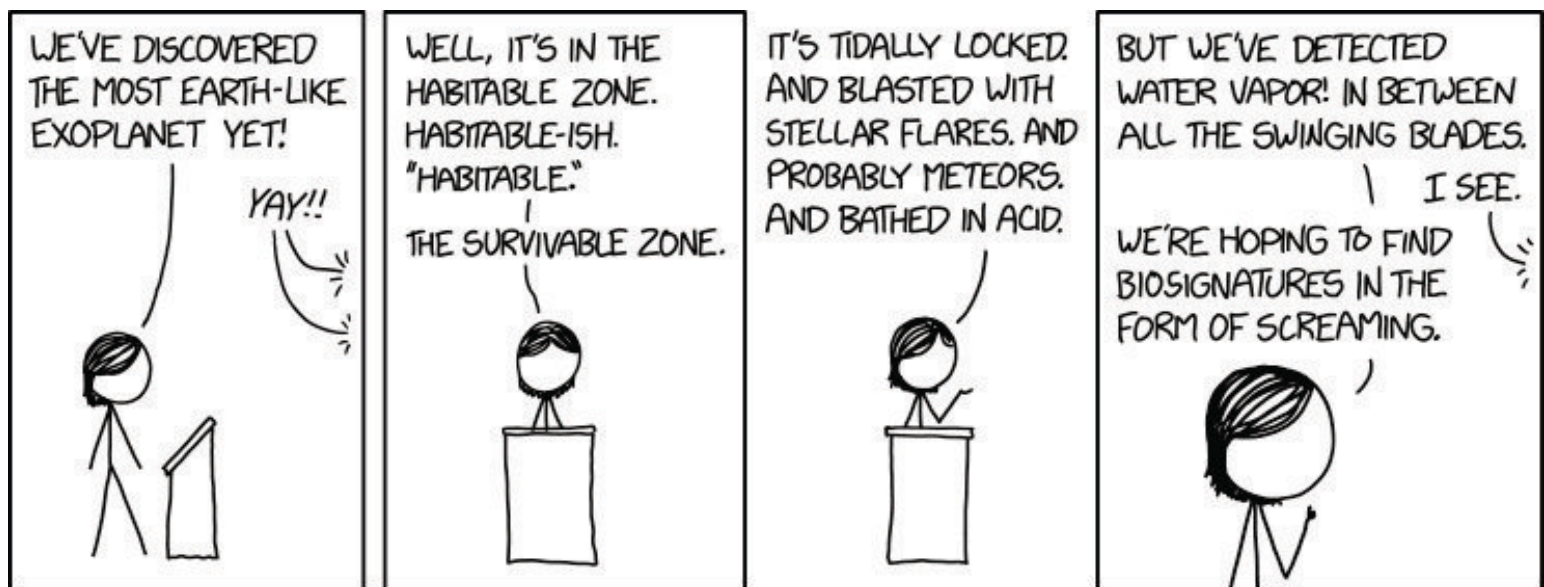
Edmund Halley was responsible for many 'firsts', but it is Halley's Comet that has made his name so well known. It is fitting that each generation has a chance to remember this great astronomer upon the return of 'his' comet.

References:

The New Encyclopedia Britannica

A Biographical Dictionary of Scientists Trevor Williams, Ed.

xkcd



The Messenger Crosses the Sun: Mercury Transit 2019 by David Prosper

Did you know that there are two other objects in our skies that have phases like the Moon? They're the inner planets, found between Earth and the Sun: Mercury and Venus. You can see their phases if you observe them through a telescope. Like our Moon, you can't see the planets in their "new" phase, unless they are lined up perfectly between us Earthlings and the Sun. In the case of the Moon, this alignment results in a solar eclipse; in the case of Mercury and Venus, this results in a transit, where the small disc of the planet travels across the face of the Sun. Skywatchers are in for a treat this month, as Mercury transits the Sun the morning of November 11!

You may have seen the transit of Venus in 2012; you may have even watched it through eclipse glasses! However, this time you'll need a solar telescope to see anything, since eclipse glasses will only reveal the Sun's blank face. Why is that? Mercury is the smallest planet in our solar system, and closer to the Sun (and further away from Earth) during its transit than Venus was in its 2012 transit. This makes Mercury's disc too small to see without the extra power of a telescope. Make absolutely certain that you view the transit via a telescope equipped with a safe solar filter or projection setup. Do NOT combine binoculars with your eclipse glasses; this will instantly burn a hole through the glasses – and your eyes! While most people don't have solar telescopes handy, many astronomy clubs do! Look for clubs hosting Mercury transit observing events near you at bit.ly/findnsn (USA) or at bit.ly/awbtransit (worldwide).



Photo of the May 9, 2016 transit of Mercury. Mercury is the small dot on the center right. Note how tiny it is, even compared to the small sunspot on the center left. Credit: Dave Huntz

What a fun opportunity to see another planet during the day! This transit is expected to last over five hours. Folks on the East Coast will be able to watch the entire transit, weather permitting, from approximately 7:35 am EST until around approximately 1:04 pm EST. Folks located in the middle of North America to the west coast will see the transit already in progress at sunrise. The transit takes hours, so if your weather is cloudy, don't despair;

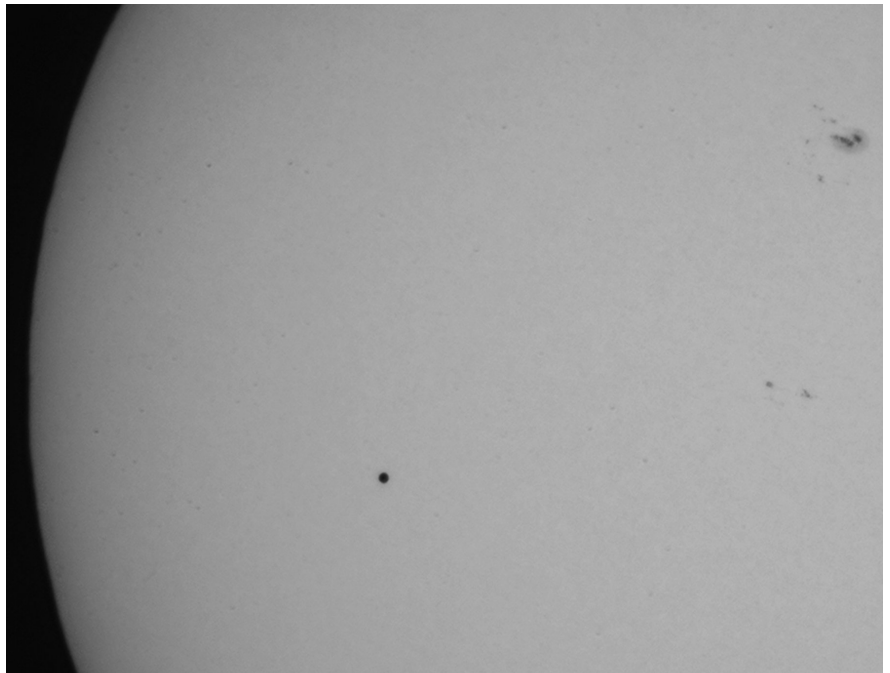
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Mercury Transit 2019, continued

there will be plenty of time for skies to clear! You can find timing details and charts via eclipse guru Fred Espenak's website:
bit.ly/mercurytransit2019

Mercury's orbit is small and swift, and so its position in our skies quickly changes; that's why it was named after the fleet-footed messenger god of Roman mythology. In fact, if you have a clear view of the eastern horizon, you'll be able to catch Mercury again this month! Look for it before dawn during the last week of November, just above the eastern horizon and below red Mars. Wake up early the morning of November 24th to see Mars, the Moon, and Mercury form a loose triangle right before sunrise.

Discover more about Mercury and the rest of our solar system at nasa.gov.



This photo from the same 2016 transit event shows Mercury a bit larger, as it should; it was taken at a higher magnification through a large 16 inch telescope! Credit: J. A. Blackwell

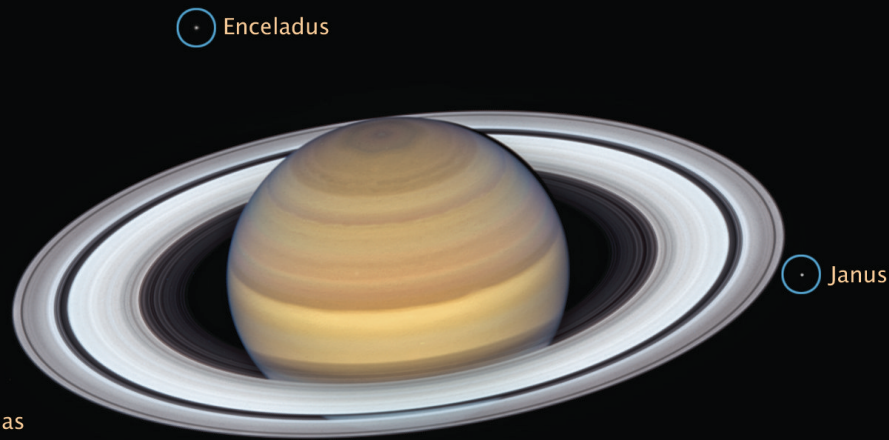
This article is distributed by NASA Night Sky Network.

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!

Saturn
HST - June 20, 2019 14:05 UT
 WFC3/UVIS F395N
 WFC3/UVIS F502N
 WFC3/UVIS F631N



72,000 miles
 116,000 kilometers



HUBBLE'S ANNUAL SNAPSHOTS HELP ASTRONOMERS MONITOR THE RINGED WORLD

Saturn is so beautiful that astronomers cannot resist using the Hubble Space Telescope to take yearly snapshots of the ringed world when it is near its closest distance to Earth.

These images, however, are more than just beauty shots. They reveal a planet with a turbulent, dynamic atmosphere. This year's Hubble offering, for example, shows that a large storm visible in the 2018 Hubble image in the north polar region has vanished. Smaller storms pop into view like popcorn kernels popping in a microwave oven before disappearing just as quickly. Even the planet's banded structure reveals subtle changes in color.

But the latest image shows plenty that hasn't changed. The mysterious six-sided pattern, called the "hexagon," still exists on the north pole. Caused by a high-speed jet stream, the hexagon was first discovered in 1981 by NASA's Voyager 1 spacecraft.

Saturn's signature rings are still as stunning as ever. The image reveals that the ring system is tilted toward Earth, giving viewers a magnificent look at the bright, icy structure. Hubble resolves numerous ringlets and the fainter inner rings.

This image reveals an unprecedented clarity only seen previously in snapshots taken by NASA spacecraft visiting the distant planet. Astronomers will continue their yearly monitoring of the planet to track shifting weather patterns and identify other changes. The second in the yearly series, this image is part of the Outer Planets Atmospheres Legacy (OPAL) project. OPAL is helping scientists understand the atmospheric dynamics and evolution of our solar system's gas giant planets.

CREDITS: NASA, ESA, A. Simon (Goddard Space Flight Center), M.H. Wong (University of California, Berkeley), and the OPAL Team

**Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Wednesday, October 2, 2019.**

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held October 2, 2019, at the Girl Scouts Center, 4522 Granny White Pike, Nashville, TN 37204. Present were Tom Beckermann, Chip Crossman, Gary Eaton, Bud Hamblen, Theo Wellington and Andy Reeves. A quorum being present, Tom called the meeting to order at 7:35 PM. Tom asked for a motion to approve the Board minutes of the September 4, 2019 meeting. Theo so moved, Chip seconded, and the minutes were adopted by unanimous voice vote. Theo reported that there was \$4,578.07 in the savings account, \$4,933.55 in checking, and \$162.94 in PayPal.

Tom discussed a summary of upcoming programs. For the January telescope workshop, we want to make sure to have several telescopes present. We can have the BSAS scopes brought to the meeting. Scheduled a "What's Up" presentation for the March meeting. Theo stated that Station Camp Elementary (Gallatin) requested a star party for their school on Tuesday, November 19th, from 5:30 to 7:00 pm.

Tom and Theo discussed digitizing the BSAS equipment report with photographs, and posting it to our Google Groups page. Chip passed out template ideas for new BSAS name nametags.

Gary is coordinating the dates and locations for the 2020 public and private star parties. The Board also discussed completing the forms for 2020 permits for star parties at Natchez Trace Parkway, and at Long Hunter State Park.

Tom discussed forming a committee for Board member nominations to fill upcoming vacancies on the BSAS Board of Directors.

There being no further business, Tom asked for a motion to adjourn. Gary so moved, Theo seconded, and the meeting was adjourned at 8:55 PM.

Respectfully submitted,

Andy Reeves

At-Large Board Member (Acting Secretary)

**Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held on Wednesday, October 16, 2019.**

The Barnard-Seyfert Astronomical Society held its monthly meeting at the Girl Scout Center, Nashville, Tennessee, on Wednesday, October 16, 2019. Twenty-six members and guests signed in. Tom Beckermann called the meeting to order at 7:30 PM. Tom asked for a motion to approve the minutes of the September 18, 2019, meeting as printed in the October edition of the *Eclipse*. Tony Powers so moved, Johanna Keohane seconded, and the minutes were approved by a unanimous voice vote. Theo Wellington reported that there was \$9,711.62 in the bank account and \$182.06 in the PayPal account. Theo also reported that 24 posters have been sold and that Belmont University sent \$200 for the club's participation in the Humanities Symposium. Tom relayed a report from Keith Rainey that there were 134 members. Tom recognized new members Jerry and Ed, and guests Rob, Ken, Christina and Daniel. Tom reported there were 107 members of the public at the Bells Bend star party on October 4. Upcoming events include a private star party at the Natchez Trace Water Valley Overlook on October 26, and a public star party at the Edwin Warner Park Special Events Field on November 2 from 6:30 to 8:30 PM.

Dr David Weintraub, Vanderbilt University, presented on the possibility of life on Mars and the implications of the exploration of Mars and preserving evidence for life on Mars.

There being no further business, the meeting was adjourned at about 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.



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.