

The ECLIPSE

October
2019

The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:

October 16, 2019, 7:30 pm

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Topic:

*Dr. David Weintraub -
Life On Mars:
What to Know Before We Go*

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From the President

I am on the road for business, so I will keep this letter very short.

I hope you have been enjoying the clearer nights that we have been enjoying. This change in the seasons has offered some cloudless to partly cloudy nights and it seems like it has been a while with that many nights available for observing.

October is the time of the year when we start considering board nominations for the next round of members. We have a couple of at-large positions opening up so if you know of someone or you are interested in serving on the board, let us know! You can get with any of the current board members or you can email info@bsasnashville.com if you are interested.

Clear skies and have a great month!

Keith Rainey



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Sept. 25, 2019- Expedition 60 Flight Engineer Christina Koch photographed the Soyuz MS-15 crew ship ascending into space after its launch from Kazakhstan. The Soyuz would dock a few hours later to the International Space Station. Credit: [NASA](#)

Upcoming Star Parties

Friday October 4 7:30 to 9:30 pm	BSAS Public Star Party Bells Bend Outdoor Center
Saturday October 26	BSAS Private Star Party Natchez Trace Parkway mile marker 412 (Water Valley Overlook)
Saturday November 2 6:30 to 8:30 pm	BSAS Public Star Party Edwin Warner Park



Oct 27
Nov 26



Oct 5
Nov 4



Oct 13
Nov 12

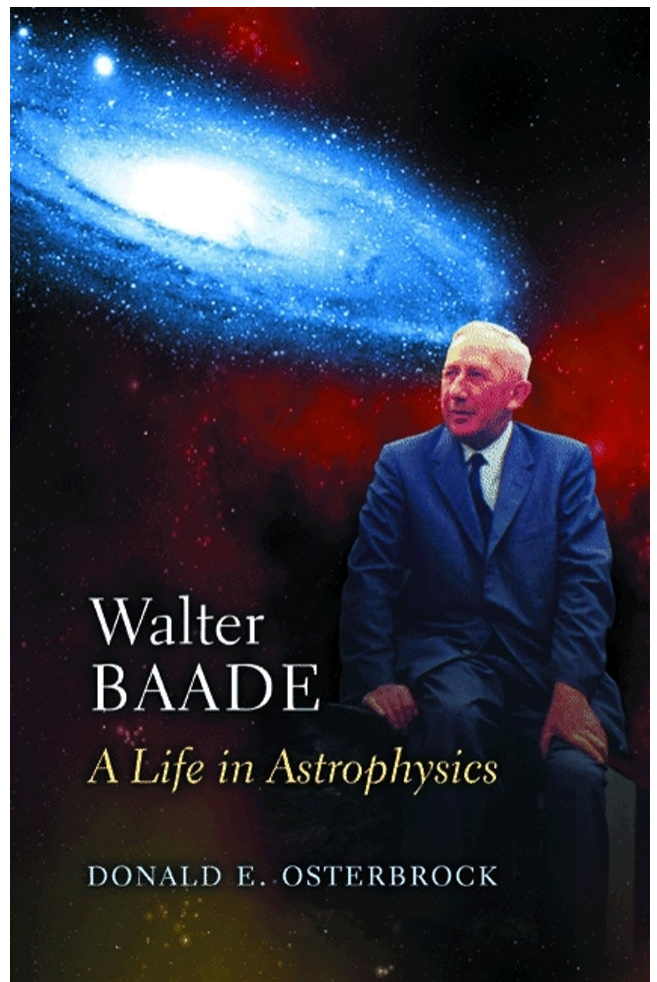


Oct 21
Nov 19

**Book Review: Walter Baade A Life in Astrophysics
reviewed by Robin Byrne**

Sometimes it pays off to have eclectic taste. At the last Southern Star Astronomy Conference, there were many door prizes, but the one that caught my fancy was a book titled *Walter Baade A Life in Astrophysics* by Donald Osterbrock. I excitedly put my name in. Turns out I was the only one who wanted it, so I was the de facto winner! And I truly was a winner to have the opportunity to read this book.

I've taught my Astronomy 2 students about Walter Baade for ages, but this book gave me a more complete picture of the man and his accomplishments. The story begins with his early life in Germany and college career. From the beginning he was interested in studying stars. This would be a theme throughout his career. Baade also developed his exceptional observational skills while in Germany.



It didn't take long for Baade to become known outside of his home country. Between his publications and a trip across the United States to visit various observatories, Baade made himself known to several influential astronomers. It was through these connections that he was offered the opportunity to work on the staff of Mount Wilson Observatory. At the same time, Baade was offered the position of director of an observatory in Germany. While the directorship was tempting, the lure of larger telescopes under much clearer skies was too much of a draw, so Baade moved to the U.S. with his wife. The timing turned out to be serendipitous. A few years later, Hitler and Naziism rose to power.

During World War II, because Baade was still a German citizen, he could not join his Mount Wilson colleagues to work on war-related projects. Instead, Baade had almost exclusive access to the Mount Wilson telescopes. He made good use of that time,

Book review, continued

setting the groundwork for his most famous discovery. It was during this time that Baade began to notice different characteristics between stars in the halo of the Milky Way compared to those in the disk. This was the beginning of his classification system of halo star as Population II and disk stars as Population I. It would take many more years, and collaboration with many other astronomers, before it became clear why they were different. Stars in the halo are first generation stars, made primarily of hydrogen and helium. Stars in the disk are later generation stars, enriched with heavier elements created by the previous generations of stars. This discovery influenced research not only into stellar evolution, but also into the formation and structure of galaxies. Most of Baade's career was spent refining his discoveries and studying other galaxies, such as Andromeda and the Magellanic Clouds, to better understand the processes behind the stars' characteristics.

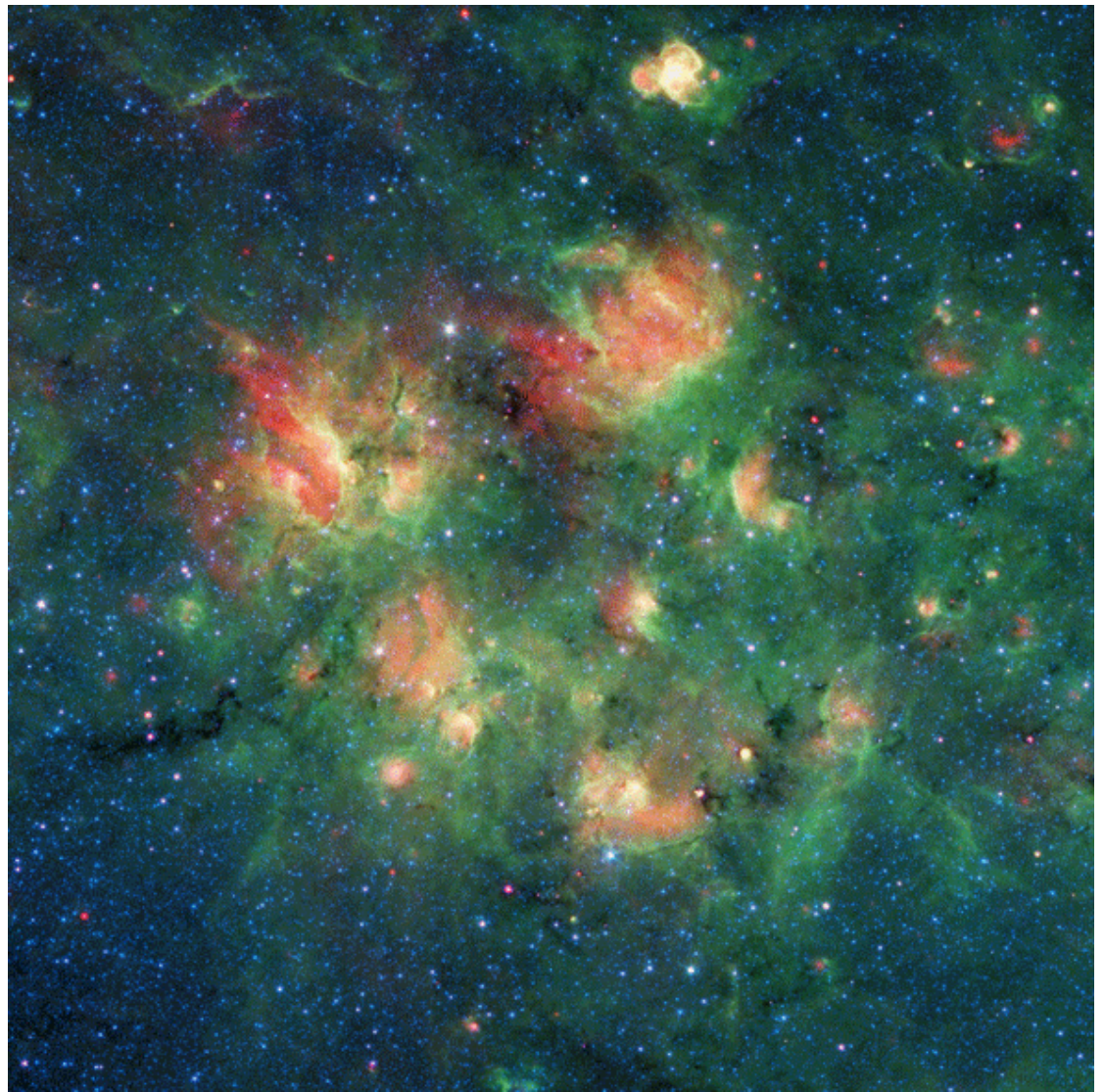
As we learn about Baade and his life, we also meet other astronomers who worked with Baade. Such names as Hubble, Zwicky, Sandage, and Bok all appear in Baade's life at different times. Included in that list is the book's author, who began working with Baade in the 1950's and was a close friend. I don't know if that friendship influenced how Baade was portrayed, but Baade definitely came off looking better than many of his colleagues. He was described as a great story-teller who inspired many young astronomers both during his presentations at conferences and through informal conversations. Because Baade's position was with the observatory, he didn't have a formal teaching position, but he did serve as a PhD advisor for two students during his time in Pasadena.

Osterbrock's writing style throughout the book was very readable and enjoyable. I will say that he seems to assume a certain level of knowledge of astronomy above the average lay-person. He definitely wrote for a target audience of people who know astronomy and who have heard of Baade. But even an introductory college course in astronomy should be enough to prepare a reader for *Walter Baade A Life in Astrophysics*. So don't be afraid, you'll enjoy it.

References:

Walter Baade A Life in Astrophysics by Donald E. Osterbrock; Princeton University Press, 2001.

This [infrared image](#) from NASA's Spitzer Space Telescope shows a cloud of gas and dust full of bubbles, which are inflated by wind and radiation from young, massive stars. Each bubble is filled with hundreds to thousands of stars, which form from dense clouds of gas and dust.

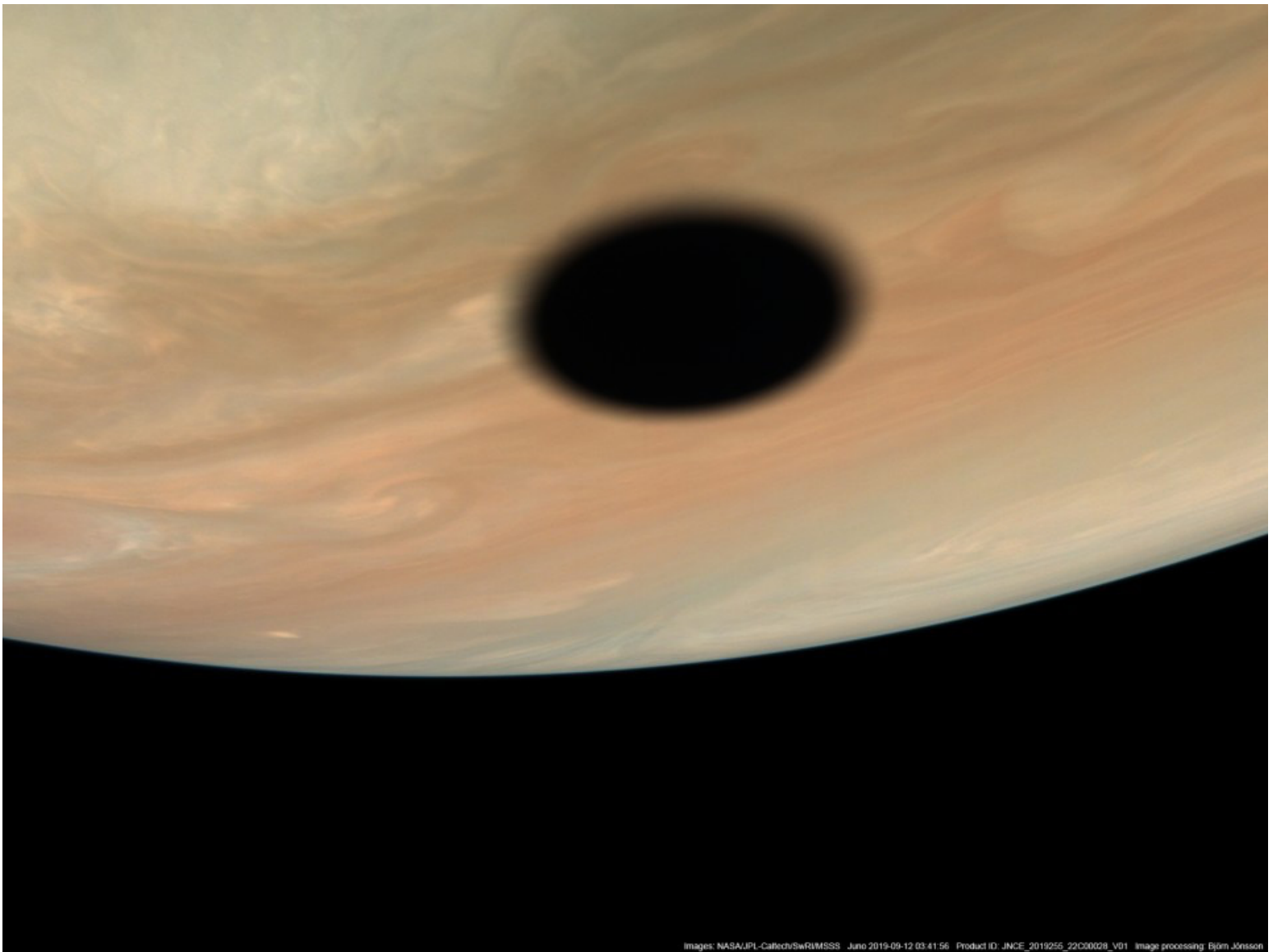


The bubbles are estimated to be 10 to 30 light-years across, based on what astronomers know about them and other cosmic bubbles. However, determining the exact sizes of individual bubbles can be difficult, because their distance from Earth is challenging to measure and objects appear smaller the farther away they are.

Flows of particles emitted by the stars, called stellar winds, as well as the pressure of the light the stars produce, can push the surrounding material outward, sometimes creating a distinct perimeter.

This active region of star formation is located within the Milky Way galaxy, in the constellation Aquila (also known as the Eagle). Black veins running throughout the cloud are regions of especially dense cold dust and gas where even more new stars are likely to form.

Spitzer's primary mission lasted five-and-a-half years and ended when it ran out of the liquid helium coolant necessary to operate two of its three instruments. But its passive-cooling design has allowed part of its third instrument to continue operating for more than 10 additional years. The mission is scheduled to end on [Jan. 30, 2020](#).



Images: NASA/JPL-Caltech/SwRI/MSSS Juno 2019-09-12 03:41:56 Product ID: JNCE_2019255_22C0028_V01 Image processing: Björn Jónsson

Io's Shadow: Simulating the View From a Consumer Type Camera:

When Juno acquired its highest resolution images of Io's shadow it was very close to Jupiter. The altitude above the cloud tops was less than 8,000 km whereas Jupiter's equatorial diameter is about 143,000 km. As a result you wouldn't be able to see all of Jupiter huge globe at the same time from this altitude. To see all of it you would need to look around you in different directions. For the same reason it would be impossible to capture all of Jupiter in a single image with a 'typical' camera unless a special type of lens was used (a fisheye lens).

This approximately true color/contrast image shows what Jupiter and Io's shadow might have looked like to a typical consumer type camera (or even a phone) from Juno's location when JunoCam image PJ22_28 was obtained. The field of view is roughly comparable to the result from a typical consumer camera when no zoom is used. North is to the upper left. The distance to the center of Io's shadow is about 12,000 km.

Credit : NASA / JPL-Caltech / SwRI / MSSS / Björn Jónsson © CC NC SA

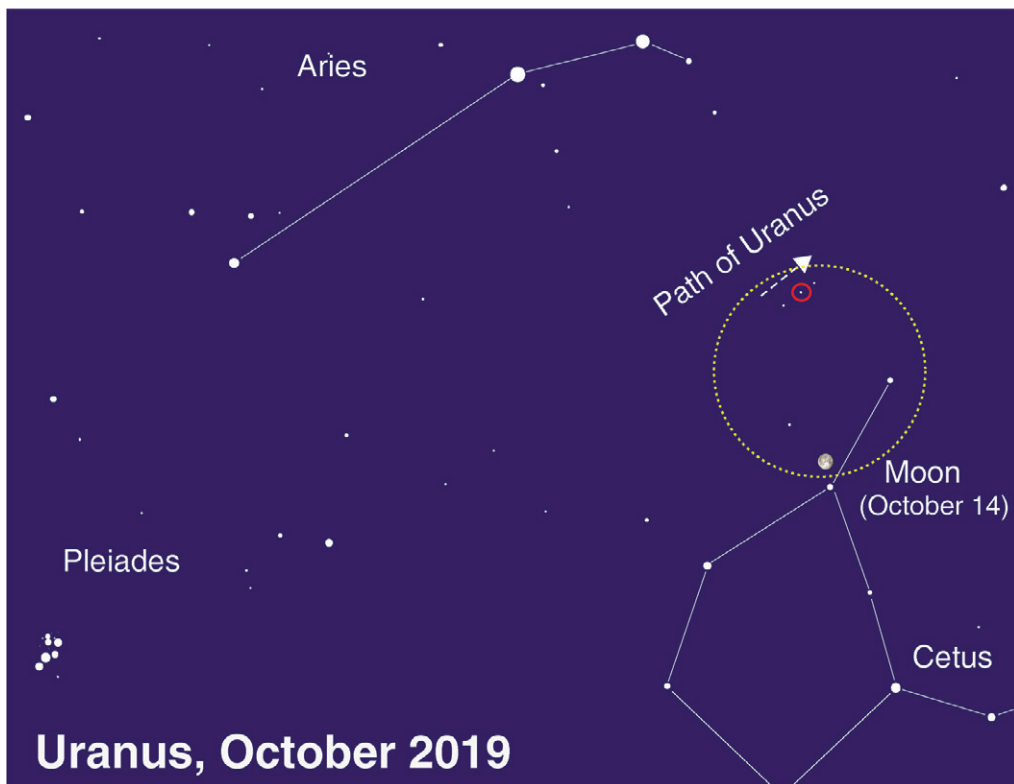
Find Strange Uranus in Aries by David Prosper

Most of the planets in our solar system are bright and easily spotted in our night skies. The exceptions are the ice giant planets: Uranus and Neptune. These worlds are so distant and dim that binoculars or telescopes are almost always needed to see them. A great time to search for Uranus is during its opposition on October 28, since the planet is up almost the entire night and at its brightest for the year.

Search for Uranus in the space beneath the stars of Aries the Ram and above Cetus the Whale. These constellations are found west of more prominent Taurus the Bull and Pleiades star cluster. You can also use the Moon as a guide! Uranus will be just a few degrees north of the Moon the night of October 14, close enough to fit both objects into the same binocular field of view. However, it will be much easier to see dim Uranus by

moving the bright Moon just out of sight. If you're using a telescope, zoom in as much as possible once you find Uranus; 100x magnification and greater will reveal its small greenish disc, while background stars will remain points.

Try this observing trick from a dark sky location. Find Uranus with your telescope or binoculars, then look with your unaided eyes at the patch of sky where your equipment is aimed. Do you see a faint star where Uranus should be? That's not a star; you're actually seeing Uranus with your naked eye! The ice giant is just bright enough near opposition -



Caption: The path of Uranus in October is indicated by an arrow; its position on October 14 is circled. The wide dashed circle approximates the field of view from binoculars or a finderscope. Image created with assistance from Stellarium.

Uranus, continued

magnitude 5.7 - to be visible to observers under clear dark skies. It's easier to see this ghostly planet unaided after first using an instrument to spot it, sort of like "training wheels" for your eyes. Try this technique with other objects as you observe, and you'll be amazed at what your eyes can pick out.

By the way, you've spotted the first planet discovered in the modern era! William Herschel discovered Uranus via telescope in 1781, and Johan Bode confirmed its status as a planet two years later. NASA's Voyager 2 is the only spacecraft to visit this strange world, with a brief flyby in 1986.

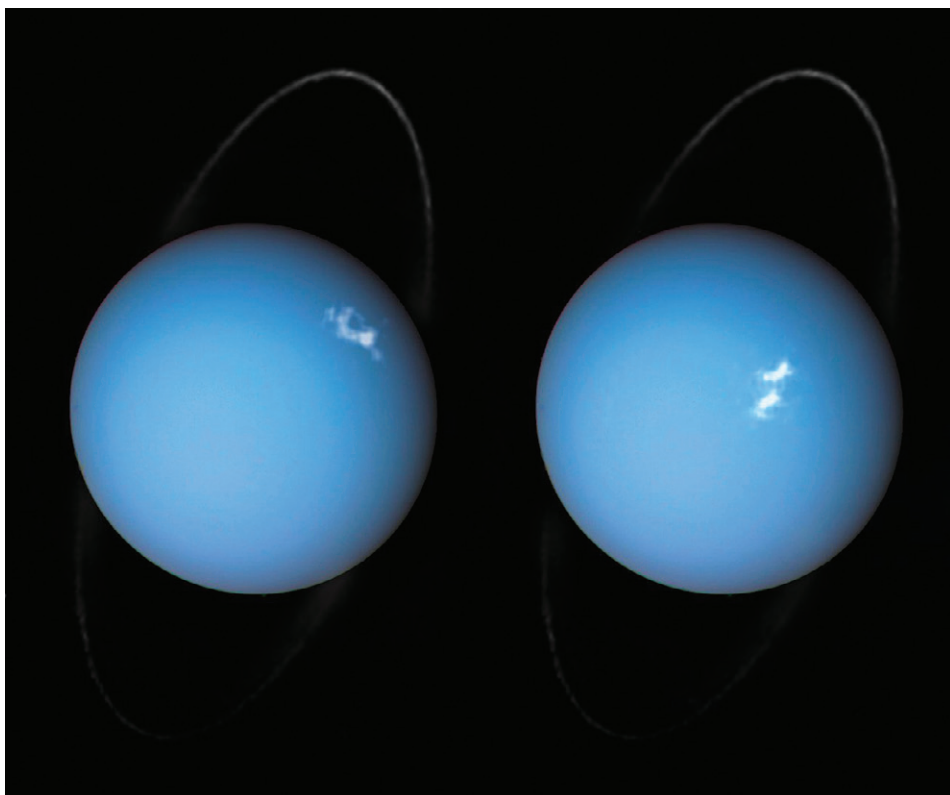
It revealed a strange, severely tilted planetary system possessing faint dark rings, dozens of moons, and eerily featureless cloud tops. Subsequent observations of Uranus from powerful telescopes like Hubble and Keck showed its blank face was temporary, as powerful storms were spotted, caused by dramatic seasonal changes during its 84-year orbit. Uranus's wildly variable seasons result from a massive collision billions of years ago that tipped the planet to its side.

Discover more about NASA's current and future missions of exploration of the distant solar system and beyond at nasa.gov.

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!



Composite images taken of Uranus in 2012 and 2014 by the Hubble Space Telescope, showcasing its rings and auroras.
Credit: ESA/Hubble & NASA, L. Lamy / Observatoire de Paris



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
Minutes of a Regular Meeting of the Board of Directors
Held On Wednesday, September 4, 2019

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held May 1, 2019, at the Girl Scouts Center, 4522 Granny White Pike, Nashville, TN 37204. Present were Tom Beckermann, Chip Crossman, Bud Hamblen, Todd Nannie, Keith Rainey, Andy Reeves and Theo Wellington. A quorum being present, Keith called the meeting to order at 7:30 PM and asked for a motion to approve the minutes of the August 7, 2019, meeting as printed in the September edition of the Eclipse. Todd so moved, Tom seconded, and the minutes were adopted by unanimous voice vote. Theo reported that there was \$9,471.62 in the bank account and \$138.97 in the PayPal account, and that 22 posters have been sold. Tom reported that there are 135 members.

Upcoming meetings were discussed. Dr Spencer Buckner will present “All I Want for Christmas” in November and the telescope workshop is scheduled for January. Greg Neaveill will be asked to present his extremely portable reflector. A “What’s Up” will be scheduled for March.

Discussion of the upcoming outreach events: September 7 at Cornelia Fort Air Park, September 15 at Belmont University, and September 22 at the Cheekwood Japanese Lunar Festival. Station Camp Elementary School, Hendersonville, has asked for a star party. Heather at the Warner Park Nature Center has asked for assistance on October 9 from 10 to 11 AM. Theo and Gary plan to be there.

Chip got the 10” goto dob.

There being no further business, Keith asked for a motion to adjourn and the meeting was adjourned at 8:30 PM.

Respectfully submitted,

Bud Hamblen
Secretary

**Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, September 18, 2019**

The Barnard-Seyfert Astronomical Society held its monthly meeting at the Girl Scout Center, Nashville, Tennessee, on Wednesday, September 18, 2019. Twenty-five members and guests signed in. Keith Rainey called the meeting to order at 7:30 PM and asked for a motion to approve the minutes of the August 21, 2019, meeting. Spencer Buckner so moved, Chip Crossman seconded, and the minutes were approved by a unanimous voice vote. Theo reported that there was \$9,471.62, in the bank account and \$138.97 in the PayPal account. Keith reported there were 134 members. Keith announced events at the Belmont University Humanities Symposium on Sunday, September 15, from 8 to 9:30, the Warner Park Full Moon Pickin' Party, also on September 15, the Cheekwood Japanese Lunar Festival on September 22, a BSAS members' star party at Natchez Trace Mile Marker 435.3 on September 28, a public star party at Bells Bend Outdoor Center on October 4 from 7:30 to 9:30 PM and an event at Warner Park Nature Center on October 9 from 10 to 11 AM.

Charlie Warren, editor of Amateur Astronomy Magazine, presented "25 Years of Amateur Astronomy."

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

Respectfully submitted,

Bud Hamblen
Secretary

**Next BSAS meeting
October 16, 2019, 7:30 pm**

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Topic: *Dr. David Weintraub -
Life On Mars: What to Know Before We Go*



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.