

The ECLIPSE

June
2019

The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:

June 16, 2019, 7:30 pm

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Topic:
*Electronically Assisted
Astronomy – Outreach to the
World*

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From the President

I would like to start off by thanking KC, Drew, Thomas, and everyone at the planetarium for their hard work in putting together last month's What's Up presentation. I think it went over really well and we all learned a little or a lot about the Spring sky. It was nice to be able to see a night sky with no clouds or rain. I hope we can do it again soon.

My email inbox has been steadily receiving requests for volunteers with telescopes to help out with various functions/ events around middle Tennessee. I wish that I could attend them all, but my work and family life usually prevent me from going to many star parties or events. We are very fortunate to have a pretty dedicated group of people that regularly step up and volunteer their time and telescopes for the club. However, I am sure they would like to see some new faces and scopes out there with them. Even if you don't have a telescope but are interested in outreach we can use you. You can even borrow a club telescope if you want. Please consider volunteering if you can. Thank you very much.

Finally, our big gas giant friends are nearing opposition and are getting pretty bright when we can see them. Jupiter and Saturn are positioned well, albeit a little low with the summer ecliptic being where it is. Grab some binoculars or a small scope and see what you can see. If you want, take some pictures or video and share it with the group on our Google group. We would love to see what you get regardless of your level of astrophotography experience.

Thanks for reading and I hope to see you at this month's meeting where John Kramer will present on "Electronically Assisted Astronomy – Outreach to the World".

Keith



Officers

Keith Rainey
President

Keith.Rainey@gmail.com

Tom Beckermann
Vice President

tmbeckermann@gmail.com

Bud Hamblen
Secretary

wrhamblen@comcast.net

Theo Wellington
Treasurer

tmwellington@comcast.net

Gary Eaton
Ex-officio

gceaton@comcast.net

Directors at Large

Chip Crossman

chipcrosman@gmail.com

Drew Gilmore

eclipse@bsasnashville.com

K.C. Katalbas

hazeykc@gmail.com

Johana Keohane

jorkeohane@gmail.com

Todd Nannie

toddn_us@yahoo.com

Andy Reeves

reevesaf@gmail.com



To keep JWST's spacecraft element and its sensitive instruments contaminant free, technicians and engineers enclose it in a protective clamshell that serves as a mobile clean room while in transport.

Credits: [NASA's Goddard Space Flight Center/Chris Gunn](#)

Upcoming Star Parties

Saturday June 1	BSAS Private Star Party Natchez Trace Parkway mile marker 435.3
Friday June 7 9:00 to 11:00 pm	BSAS Public Star Party Bowie Nature Park (Fairview)
Saturday June 29	BSAS Private Star Party Natchez Trace Parkway mile marker 412 (Water Valley Overlook)
Friday July 5 9:00 to 11:00 pm	BSAS Public Star Party Bells Bend Outdoor Center



June 3
July 2, 31



June 10
July 9



June 17
July 16



June 25
July 24

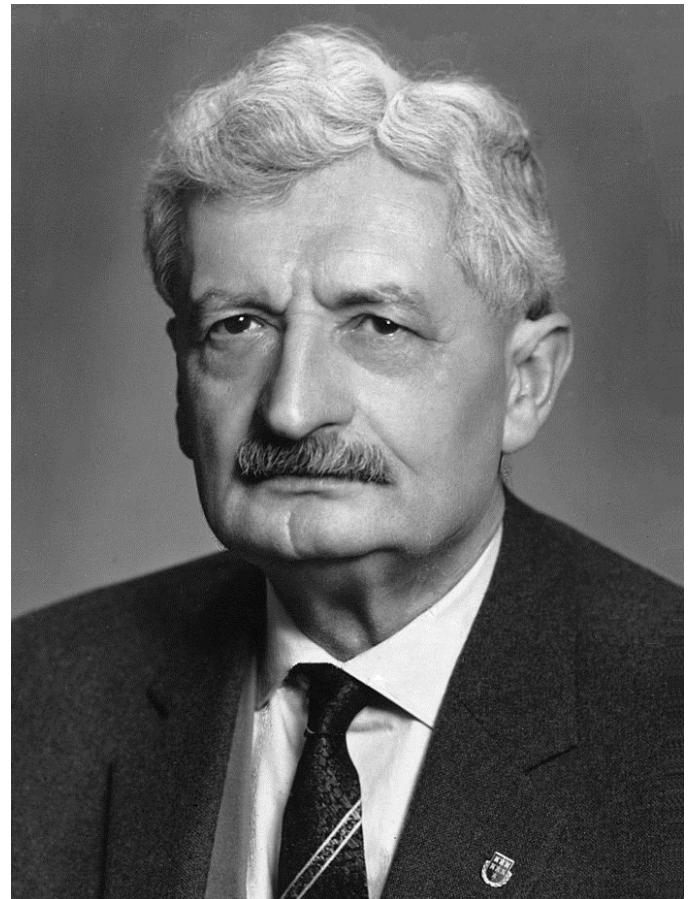
Happy Birthday Hermann Oberth by Robin Byrne

Continuing in the theme of honoring people and events leading up to the moon landing anniversary, this month we celebrate the life of one of the three men considered the father of modern rocketry. Hermann Julius Oberth was born June 25, 1894 in what was then known as Hermannstadt, Transylvania, but is now Sibiu, Romania.

At the age of 11, Oberth contracted scarlet fever. He was sent to Italy to recover, and he took along with him two of Jules Verne's books: "From the Earth to the Moon" and "Around the Moon." He read both books so many times, it was said that he had memorized them. As his interest in rocketry grew, he studied the books in more depth and realized that Verne's stories weren't only fiction. Oberth found that the ideas were mathematically practical. By the age of 14, Oberth had built his first rocket. He was already thinking about space travel, envisioning a "recoil rocket" that could be propelled by the gasses pushed out of the exhaust. It was also at this time that he began thinking of liquid-fueled rockets.

With his ideas about rockets becoming more complex, Oberth had to teach himself the mathematics necessary to fulfill his dreams. His first discovery was that by increasing the ratio of fuel to rocket mass, you can increase the speed of the rocket. The problem was that as the fuel is used, the ratio will decrease. Oberth came up with the idea of a multi-stage rocket, jettisoning each section as the fuel is used to lighten the rocket's weight. Writing about this idea, Oberth said, "If there is a small rocket on top of a big one, and if the big one is jettisoned and the small one is ignited, then their speeds are added."

When it was time to enter college at the age of 18, Oberth's father, a doctor, wished for his son to follow in his footsteps. So, in 1912, Oberth travelled to Munich, Germany to study medicine at the University of Munich. However, shortly after starting college, World War I began, and Oberth was drafted into the Imperial German Army. Initially, he was assigned to an infantry battalion at the Eastern Front against Russia. In 1915, he was transferred to a medical unit in Romania. It was here that he discovered that he most definitely did not want to be a doctor. Instead, he used his spare time to conduct experiments with weightlessness. By 1917, he had complete designs for a rocket using liquid propellant that could travel up to 180 miles, which he showed to the Prussian Minister of War. After the war, Oberth



Hermann Oberth, continued

returned to school to study physics and math.

On July 6, 1918, Oberth married Mathilde Hummel. Over the years, they would have four children. Two of his children died during World War II: a son while engaged in a battle, and a daughter in an industrial accident at the liquid oxygen plant where she worked.

For his PhD thesis in 1922, Oberth wrote about the future of rocket science. His dissertation committee rejected it as “utopian.” They wanted him to work on something more practical. Oberth refused, and later said, “I refrained from writing another one [thesis], thinking to myself: Never mind, I will prove that I am able to become a greater scientist than some of you, even without the title of Doctor.” Criticizing the German approach to education which led to the dismissal of his thesis, Oberth said, “Our educational system is like an automobile which has strong rear lights, brightly illuminating the past. But looking forward, things are barely discernible.” So, instead, in 1923 Oberth took his thesis and had it privately published as a book titled “The Rocket into Interplanetary Space.” In 1929, Oberth worked as a technical adviser to the director Fritz Lang while he was filming “Girl in the Moon.” During the filming, Oberth conducted an unsuccessful experiment, which resulted in the loss of sight in his left eye. Oberth designed the rocket shown in the film, and, as part of the publicity for the premier, built and launched a rocket. The film helped further popularize rocketry and space exploration. That same year, he expanded his thesis from the 92-page version, that had been published, to a whopping 429 pages. It was titled “Ways to Spaceflight,” which he dedicated to Fritz Lang. In the expanded version, he showed how a rocket could escape Earth’s gravity. This brought Oberth world-wide attention.

Oberth’s book inspired others to pursue amateur rocketry, which led to the creation of *Verein für Raumschiffahrt* (VfR) – the “Spaceflight Society.” Oberth joined the group, becoming a mentor to many of the members, including Wernher von Braun, who had become fascinated with rockets after reading Oberth’s book. Meanwhile, during the the 1920’s and 1930’s, the Depression years, Oberth faced the same problem as many, and couldn’t find much work, despite his accomplishments. He made do with a job teaching physics and math at a high school. In 1929, Oberth performed a static firing test of his first rocket motor that was liquid-fueled. Assisting him was 18-year old Wernher von Braun. Oberth received a patent for his design, and the first fully-functional rocket was successfully launched May 7, 1931, thanks to the help of many members of VfR, including von Braun.

During World War II, Wernher von Braun led the team developing rockets for warfare. In 1941, Oberth joined von Braun’s team in Peenemünde, Germany to help design and develop the V2 rocket. In August 1943, while working there, the facility was attacked by British air forces targeting German factories. Oberth survived the attack and was awarded the War Merit Cross 1st Class for courageous behavior. Toward the end of the war, Oberth worked on solid-propellant anti-aircraft rockets in Wittenberg. Ultimately, he and his family moved to Nuremberg just in time for American forces to occupy it. In

Hermann Oberth, continued

1948, Oberth was allowed to leave, so he moved to Switzerland to work as a writer and consultant.

In 1950, Oberth moved to Italy to develop anti-aircraft rockets for the Italian Navy. In 1953, he returned to Germany and published another book: "Man into Space." In this book, Oberth proposed ideas for placing telescopes in Earth orbit, building space stations, and designing spacesuits for working in the vacuum of space. During the 1950's and 1960's, Oberth proved that even the most intelligent of people can have wacky ideas. In his case, Oberth believed that UFO's were alien spacecraft visiting Earth. Oberth wrote several articles for popular magazines promoting the reality of aliens and UFO's. In 1958, Oberth returned to more realistic themes and published articles describing designs for a lunar rover vehicle, among other ideas.

In 1960, Oberth moved to the United States to work with his former protege, Wernher von Braun, in Huntsville, Alabama. Oberth assisted von Braun in the development of the Atlas rocket that was used during the Mercury missions to put men into orbit for the first time. Originally built as an ICBM, Atlas became the rocket of choice for launching various unmanned spacecraft for exploring the solar system.

After three years of working in Huntsville, Oberth retired and returned to Germany. He made a trip back to the U.S. to witness the launch of Apollo 11 on its historic mission to the Moon. His last trip to America was in 1985 to watch the launch of the Space Shuttle Challenger on STS 61-A, which carried a Spacelab mission funded and supervised by West Germany. It was Challenger's last successful launch. On December 29, 1989, Hermann Oberth died in a Nuremberg hospital at the age of 95.

When studying the history of rocketry, three names are always mentioned: Konstantin Tsiolkovsky (USSR), Robert Goddard (USA), and Hermann Oberth. All three men independently developed important ideas about rockets, so all three are considered fathers of modern rocketry, with each developing vital pieces of the puzzle that fit together to make the rockets we use today. Von Braun said of him: "Hermann Oberth was the first, who when thinking about the possibility of spaceships,

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**Next BSAS meeting
June 19, 2019, 7:30 pm**

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Topic:

John Kramer: Electronically Assisted Astronomy – Outreach to the World

Hermann Oberth, continued

grabbed a slide-rule and presented mathematically analyzed concepts and designs.... I, myself, owe to him not only the guiding-star of my life, but also my first contact with the theoretical and practical aspects of rocketry and space travel. A place of honor should be reserved in the history of science and technology for his ground-breaking contributions in the field of astronautics.”

As we get closer to celebrating the Apollo moon landing's 50th anniversary, it is important to remember that we never would have gotten to the Moon without reliable rockets. The Saturn V that carried men to the Moon was developed by Wernher von Braun. If von Braun hadn't been inspired by Hermann Oberth, how much longer would it have been before that milestone was reached? So many people played important roles in our trip to the Moon, and Hermann Oberth was definitely a major contributor to that historic flight.

References:

[Hermann Oberth - Wikipedia](#)

[Hermann Oberth - NASA](#)

[Hermann Oberth: Father of Space Travel by Christiaan Stange](#)

[Hermann Oberth: Nazi Germany](#)



NASA's Spitzer Captures Stellar Family Portrait

A mosaic by NASA's Spitzer Space Telescope of the Cepheus C and Cepheus B regions. This image combines data from Spitzer's IRAC and MIPS instruments.

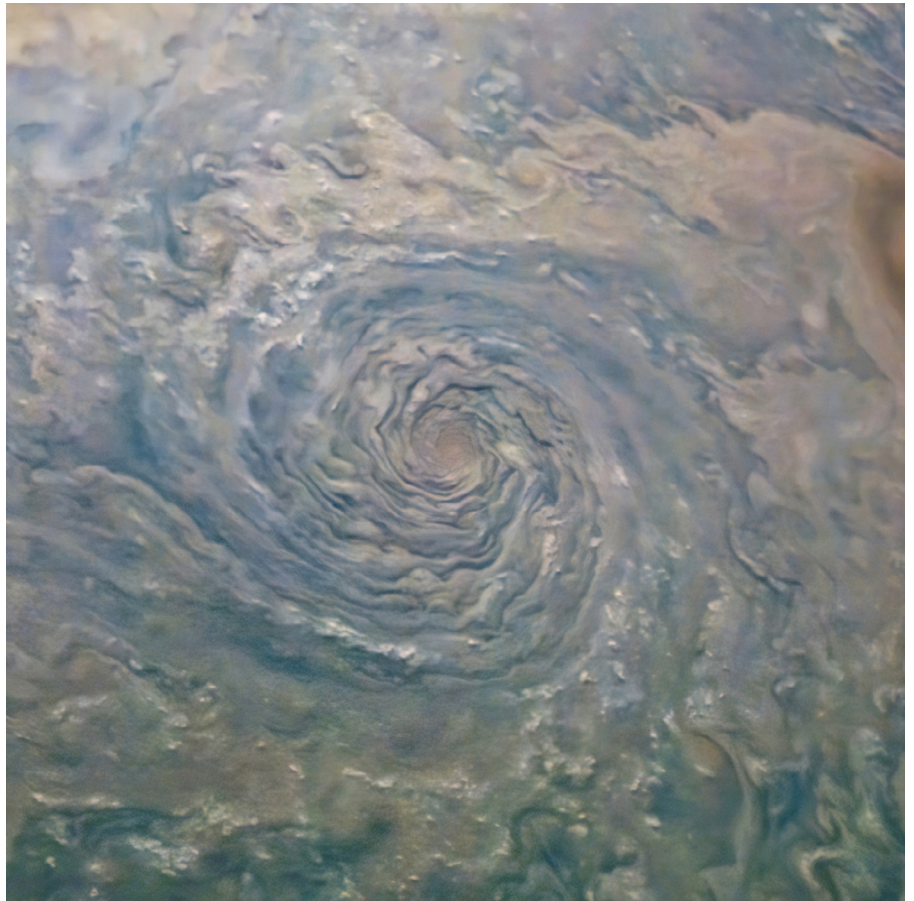
Credits: [NASA/JPL-Caltech](#)

Jupiter Shines in June by David Prosper

Jupiter stakes its claim as the king of the planets in June, shining bright all night. Saturn trails behind Jupiter, and the Moon passes by both planets mid-month. Mercury puts on its best evening appearance in 2019 late in the month, outshining nearby Mars at sunset.

Jupiter is visible almost the entire evening this month. Earth will be between Jupiter and the Sun on June 10, meaning Jupiter is at opposition. On that date, Jupiter rises in the east as the Sun sets in the west, remaining visible the entire night. Jupiter will be one of the brightest objects in the night sky, shining at magnitude -2.6. Its four largest moons and cloud bands are easily spotted with even a small telescope.

What if your sky is cloudy or you don't have a telescope? See far more of Jupiter than we can observe from Earth with NASA's Juno mission! Juno has been orbiting Jupiter since 2016, swooping mere thousands of miles above its cloud tops in its extremely elliptical polar orbits, which take the probe over 5 million miles away at its furthest point! These extreme orbits minimize Juno's exposure to Jupiter's powerful radiation as it studies the gas giant's internal structure, especially its intense magnetic fields. Juno's hardy JunoCam instrument takes incredible photos of Jupiter's raging storms during its flybys. All of the images are available to the public, and citizen scientists are doing amazing things with them. You can too! Find out more at bit.ly/JunoCam.



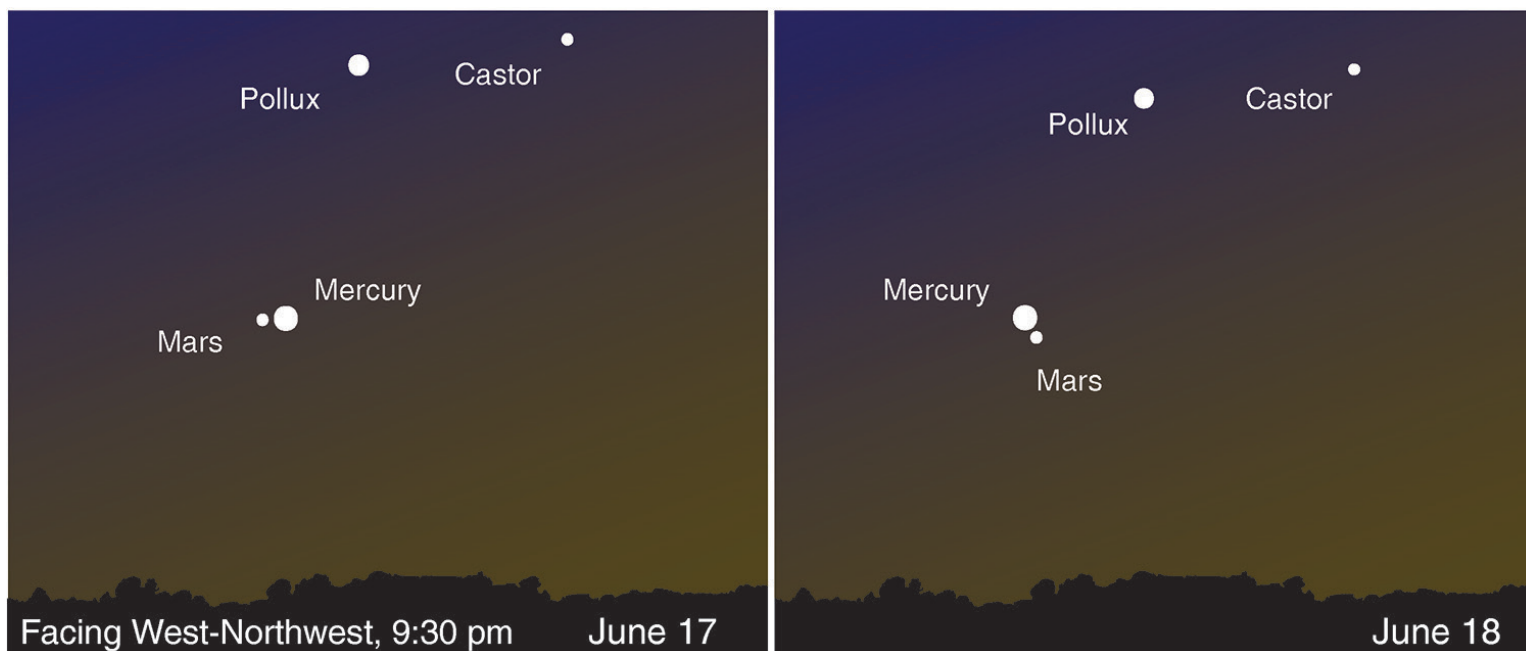
A giant storm in Jupiter's north polar region, captured by JunoCam on February 4, 2019. Image processing performed by citizen scientists Gerald Eichstädt and Seán Doran. Source: bit.ly/JupiterSpiral

Saturn rises about two hours after Jupiter and is visible before midnight. The ringed planet rises earlier each evening as its own opposition approaches in July. The Moon appears near both gas giants mid-

Jupiter Shines in June, continued

month. The Moon's tour begins on June 16 as it approaches Jupiter, and its visit ends on June 19 after swinging past Saturn.

Mercury is back in evening skies and will be highest after sunset on June 23, just two days after the summer solstice! Spot it low in the western horizon, close to the much dimmer and redder Mars. This is your best chance this year to spot Mercury in the evening, and nearly your last chance to see Mars, too! The two smallest planets of our solar system pass close to each other the evenings of June 17-18, coming within just $\frac{1}{4}$ degree, or half the width of a full Moon, making for a potentially great landscape photo at twilight.



Mars and Mercury after sunset the evenings of June 17-18, 2019.
Image created with assistance from Stellarium.

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!



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, May 1, 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, Gary Eaton, Drew Gilmore, Bud Hamblen, KC Katalbas, Todd Nannie, Keith Rainey and Andy Reeves. A quorum being present, Keith called the meeting to order at 7:30 PM. Keith asked for a motion to approve the minutes of the April 3, 2019, meeting as printed in the May edition of the Eclipse. Gary so moved, Todd seconded, and the minutes were adopted by unanimous voice vote. Theo Wellington had reported to Keith that there was \$8,377.11 in the bank account and \$330.00 in the PayPal account. Two posters had been sold since the last meeting. Also, mailing boxes were now available for the posters. Keith reported that there are 115 paid up members out of a total of 121.

KC is scheduled to present a "What's Up" at the May general meeting at the adventure science center. The MTSEF winner may be available in June. One of the Adventure Science Center's interns may be available to present at the July meeting.

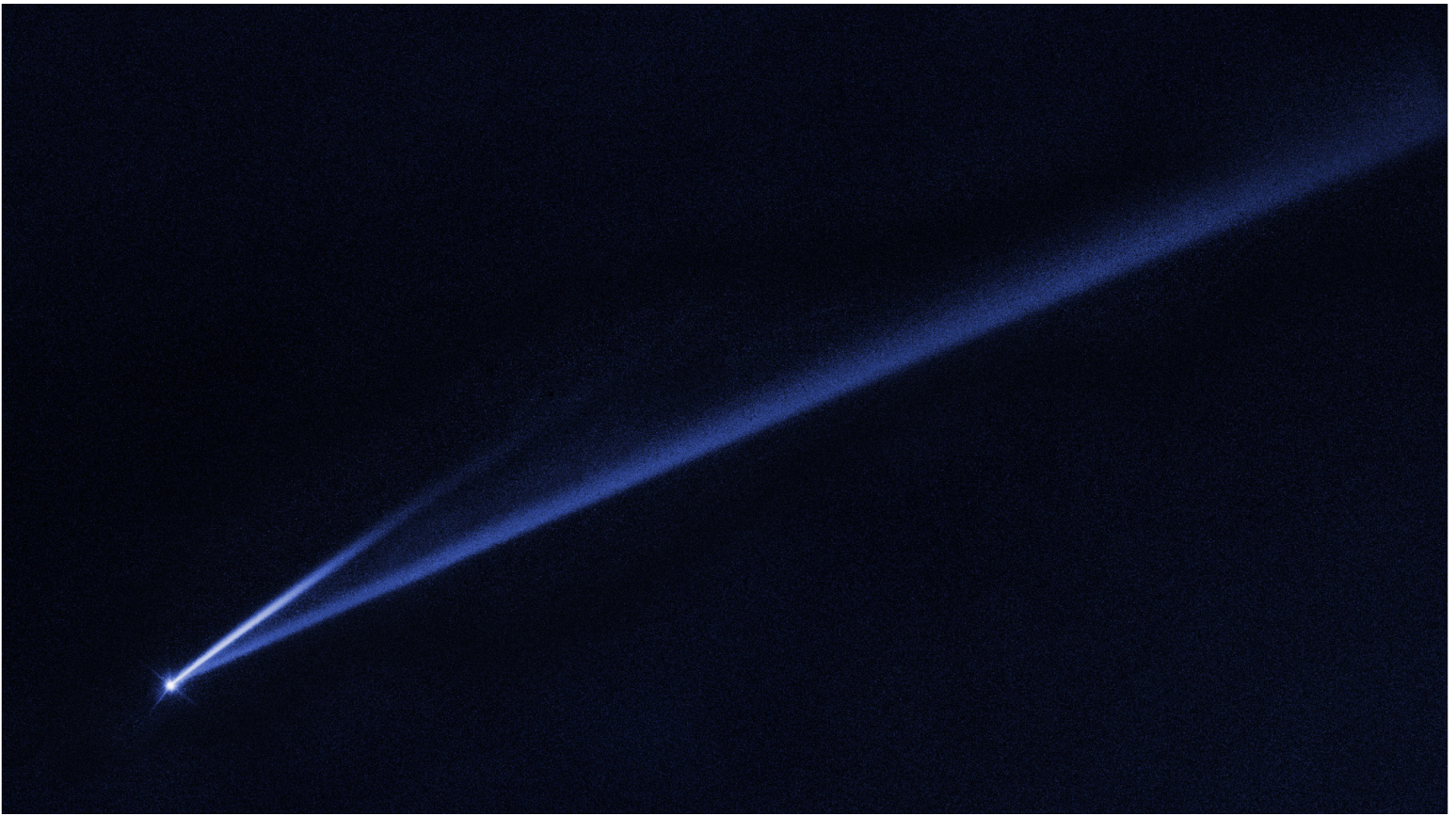
KC reported that the BSAS has about 1,500 followers on Facebook, and that there is activity on Instagram.

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

Todd is getting on-line the list of equipment available for loan. Keith has the inventory stickers.

Respectfully submitted,

Bud Hamblen
Secretary



Hubble Witnesses Asteroid Coming Unglued

This Hubble Space Telescope image reveals the gradual self-destruction of an asteroid, whose ejected dusty material has formed two long, thin, comet-like tails. The longer tail stretches more than 500,000 miles (800,000 kilometers) and is roughly 3,000 miles (4,800 kilometers) wide. The shorter tail is about a quarter as long. The streamers will eventually disperse into space.

These unusual, transient features are evidence that the asteroid, known as (6478) Gault, is beginning to come apart by gently puffing off material in two separate episodes. Hubble's sharp view reveals that the tails are narrow streamers, suggesting that the dust was released in short bursts, lasting anywhere from a few hours to a few days.

The first tail was spotted on Jan. 5, 2019; the second in mid-January. An analysis of both tails suggests the two dust releases occurred around Oct. 28 and Dec. 30, 2018.

Astronomers think the tiny asteroid, only 2.5 miles wide, is disintegrating due to the long-term subtle effects of sunlight, which can slowly speed up its spin until it begins to shed material. In fact, the self-destruction may have been started more than 100 million years ago. Pressure from sunlight very slowly began spinning up the diminutive asteroid at an estimated rate of 1 second every 10,000 years. The asteroid is located 214 million miles from the Sun, between the orbits of Mars and Jupiter.

Credit: [NASA](#), [ESA](#), [K. Meech](#) and [J. Kleyna](#) (University of Hawaii), and [O. Hainaut](#) (European Southern Observatory)

**Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, May 15, 2019**

The Barnard-Seyfert Astronomical Society held its monthly meeting in the Sudekum Planetarium, Nashville, Tennessee, on Wednesday, May 15, 2019. Seventy-one 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 April 17, meeting, and the minutes were approved by a unanimous voice vote. Keith reported that there were approximately 120 members. Bud Hamblen reported that as of May 1, 2019, there was \$8,377.11 in the bank account and \$330.00 in the PayPal account. Keith announced upcoming star parties through July 5, 2019, and mentioned requests for outreach assistance from the Williamson County Public Library and Belmont University. Chuck Schlemm announced outreach activities at the Full Moon Pickin' Party and at Montgomery Bell State Park.

Keith further reported astronomical phenomena and breaking news for May and June.

KC Katalbas presented "What's Up" in the night sky for this Spring and early Summer, using the star projector.

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

Respectfully submitted,

Bud Hamblen
Secretary

xkcd

SIZE COMPARISON:
THE M87 BLACK HOLE
AND
OUR SOLAR SYSTEM

EHT BLACK HOLE IMAGE
SOURCE: NSF





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.