

# The ECLIPSE

March  
2020

*The Newsletter of the Barnard-Seyfert Astronomical Society*

## Next Membership Meeting:

Wednesday March 18, 7:30 pm

Sudekum Planetarium  
Adventure Science Center  
800 Fort Negley Blvd

Topic: *Messier Marathon preview*

## From the President

The sky cleared up and we were able to have a star party at Edwin Warner Park. It was a great time showing people the sky and moon and listening to all of the oohs and aahs. I must admit that I don't get out to as many star parties as I would like, but when I do I always have fun. Even in the cold weather! If you have been wondering about star parties, come on out to one and see what they are like. You don't have to bring a scope, you can just come by yourself and hang out with everyone. If you aren't sure about answering questions, then come out and ask some questions yourself. We aren't here to judge, just to help spread some enthusiasm about our great hobby.

Next up, it's that time of year for our Messier Marathon! It has been a couple of years since we have had a chance to hold one so I am really hoping for some clear weather. For those of you who haven't done a marathon, it is an "all nighter" where we try to find all of the over 100 Messier objects in one night. There is a certain order to follow and it starts right at sunset. You aren't required to stay all night – just come out and have some fun and enjoy some company of fellow enthusiasts. This year, we will have the marathon on the 21st at Ron Ladd's place. More details will be sent out as we get closer to the event.

So what are we going to look for and what's the marathon going to look like? Well, that's what our meeting is about this month. It will be our first meeting this year at the Sudekum Planetarium at the Adventure Science Center. We will get to see

## In this Issue:

|   |    |
|---|----|
| Happy Birthday Heidi Hammel<br>by Robin Byrne   | 3  |
| Dim Delights in Cancer<br>by David Prosper      | 6  |
| BSAS Board Minutes<br>February 5, 2020          | 10 |
| Membership Meeting Minutes<br>February 19, 2020 | 11 |
| Membership Information                          | 13 |



[BSASNashville.com](http://BSASNashville.com)

Continued on page 9



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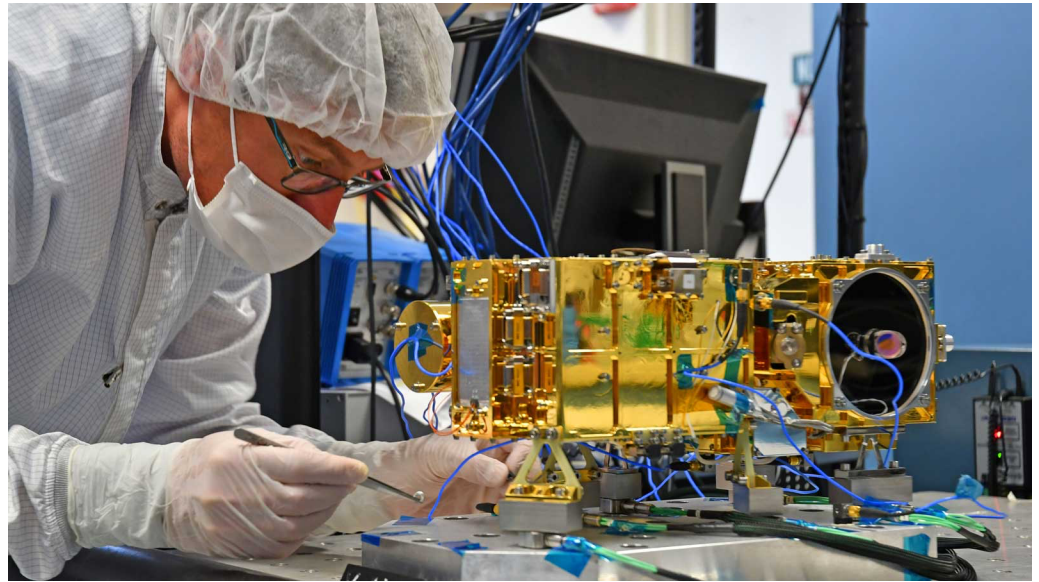
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The Mast Unit for Mars 2020's SuperCam, shown being tested here, will use a laser to vaporize and study rock material on the Red Planet's surface.

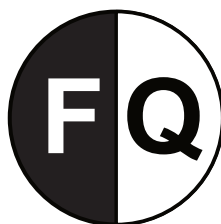
Credit: [Los Alamos National Laboratory \(LANL\)](#)

## Upcoming Star Parties

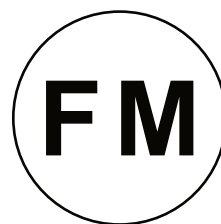
|                                      |  |
|--------------------------------------|--|
| Friday March 6<br>7:30 to 9:30 pm    | BSAS Public Star Party<br><a href="#">Bowie Nature Park (Fairview)</a> |
| Saturday March 21                    | BSAS Private Star Party<br>Messier Marathon                            |
| Saturday March 28                    | BSAS Private Star Party<br>Messier Marathon makeup date                |
| Saturday April 4<br>8:30 to 10:30 pm | BSAS Public Star Party<br><a href="#">Warner Park Nature Center</a>    |



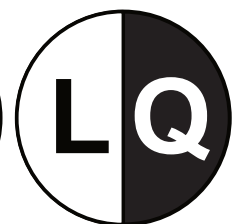
**Mar 24**  
**Apr 22**



**Mar 2**  
**Apr 1, 30**



**Mar 9**  
**Apr 7**



**Mar 16**  
**Apr 14**

## Happy Birthday Heidi Hammel by Robin Byrne

This month, we celebrate the accomplishments of a woman who is still making contributions to astronomy. Heidi Hammel was born March 14, 1960 in California. She went to the Massachusetts Institute of Technology (MIT) for her undergraduate studies, graduating in 1982. Hammel then attended graduate school at the University of Hawaii, studying physics and astronomy. She received her PhD in 1988.

After graduating, Hammel held a post-doctoral position at the Jet Propulsion Laboratory in Pasadena, California before returning to MIT, where she spent nine years in the Department of Earth, Atmospheric, and Planetary Sciences as a Principal Research Scientist. In 1998, Hammel went to work at the Space Science Research Institute in Boulder, Colorado, where she now serves as the co-Director of their Research Branch.



The primary focus of Hammel's research has been the jovian planets, with an emphasis on the planets Uranus and Neptune. In particular, she is interested in studying their atmospheres, but also has made discoveries about their moons and rings. In describing the work she does, Hammel said, "One thing that we all care about is the weather... But what makes weather is gases and clouds, and the reason the weather on the Earth is hard to predict is because we have oceans and continents that interact with our atmosphere... But if you take a planet like Jupiter or Neptune you don't have continents and you don't have oceans. All you have is gas, all you have is atmosphere, and therefore it's a lot easier to model the weather on those planets. But it's the same physical process... Therefore by studying weather on Neptune we learn about weather in general, and that helps us understand the weather on Earth better."

In 1989, Hammel was part of the team that used Voyager 2 to image Neptune. They were the first to see Neptune's Great Dark Spot, which, at the time, was thought to be a permanent storm similar to Jupiter's Great Red Spot. In 1994, Hammel led a team of

**Continued on page 4**

### Heidi Hammel, continued

astronomers who used the Hubble Space Telescope to image Neptune again. That was when it was discovered that the Great Dark Spot had disappeared. Talking about the Great Dark Spot, Hammel said, “So far, it hasn’t come back. We don’t know why. But we did learn something new: that Neptune could change dramatically in just five years. Till then, it was thought that Neptune was more static.”

When the fragments of comet Shoemaker-Levy 9 were discovered to be on a collision course with Jupiter in 1994, Hammel led a team of astronomers who used the Hubble Space Telescope to image Jupiter over the several days the collisions occurred. Their primary interest was how Jupiter’s atmosphere would react to the collisions. Predictions ranged from very dramatic explosions to seeing nothing noticeable at all. Hammel was designated by NASA as the spokesperson who would explain the events to the public. When the first images showed a pitch black spot where the impact occurred, everyone was thrilled. Seeing Hammel popping open a bottle of champagne in celebration is something I’ll never forget, and it put a more human face on scientists, in general.

Since the year 2000, Hammel has been using the Keck telescope in Hawaii to study Uranus. In 2003, her research discovered record winds on the planet, ranging between 240 and 260 miles per hour (107 - 111 meters per second). Hammel, along with her colleague, Imke de Pater, also studied Uranus’ ring system, discovering that the rings are unique from other ring systems by being made of only a single layer of particles. They also found a new ring, closer to Uranus than the rest of its ring system, made of rocky material. In 2006, they found that Uranus has one ring that appears blue, and one that appears red, both of which are very rare.

In 2002, Hammel was chosen to be an interdisciplinary scientist for the James Webb Space Telescope. Once launched in 2021, Hammel’s focus will be on the theme of “Planetary Systems and the Origins of Life.” When asked about Hubble vs. Webb, Hammel replied, “Listen, much as I love Hubble, it’s time to build new tools to see new things... Webb will be able to probe regions of the cosmos that are simply not visible to Hubble. It’s bigger and it will be tuned to wavelengths that Hubble can’t really see. With Webb, we have the potential to answer questions about the origins of just about everything in the universe.”

Hammel was named the executive vice president of the Association of Universities for Research in Astronomy (AURA) in 2011. AURA is a consortium of universities, educational institutions, and non-profits from around the world, all devoted to the study of astronomy. Although Hammel still engages in research, now being the mother of three has changed her main focus: “I made a commitment several years ago to move from the doing of the research to the enabling of the research... I want to

**Continued on page 5**

### Heidi Hammel, continued

make sure that ... young people have the opportunities, with the new tools that we're developing right now, to push the boundaries of science."

Since the Shoemaker-Levy 9 impact of Jupiter, Hammel increasingly became in demand as the public face of astronomy news. In 2002, she was awarded the Carl Sagan Medal, which is given to a scientist who has greatly enhanced the public's knowledge of the solar system. In 2003, she was named one of Discover Magazine's 50 most important women in science. When asked about how she learned to be such a good communicator of science, Hammel explained, "My Uncle Larry was my template. When I was a student, I'd come home on Thanksgiving weekends, and during breaks in his football game he'd go, 'O.K., Heidi, whatcha workin' on?' I knew I had 30 seconds to tell this guy who worked in a Mack truck factory what I did. He just wanted the big picture. I'd quickly say, 'I'm using big telescopes to try to find planets and figure out what they're made of.' Every scientist should be able to do that."

Hammel's enthusiasm for astronomy, coupled with her ability to share her love with the general public, has ensured her place in history. Sure, she has an asteroid named after her, but Hammel's legacy goes well beyond that. From everything she has helped us learn about the outermost planets in our solar system, to her mentoring of the next generation of astronomers, to her outstanding ability to communicate what's so exciting about it all, Hammel will be remembered.

"I think all scientists are like detectives. We are most happy when we find something that doesn't fit our expectations. My work often involves analyzing images of the planets taken by Hubble or made at Earth-based telescopes like the Keck in Hawaii. If I see something that seems out of sync with what's already known, the first thing I do is try to find out what's wrong with the data. Once you've done that, and it still seems wrong, that's when things get interesting. It means you've found something new to understand. So you think about it and go for more data and come up with different models. All real science is like that."

#### References:

[Wikipedia - Heidi Hammel](#)

[James Webb Space Telescope - Meet the Team - Heidi Hammel](#)

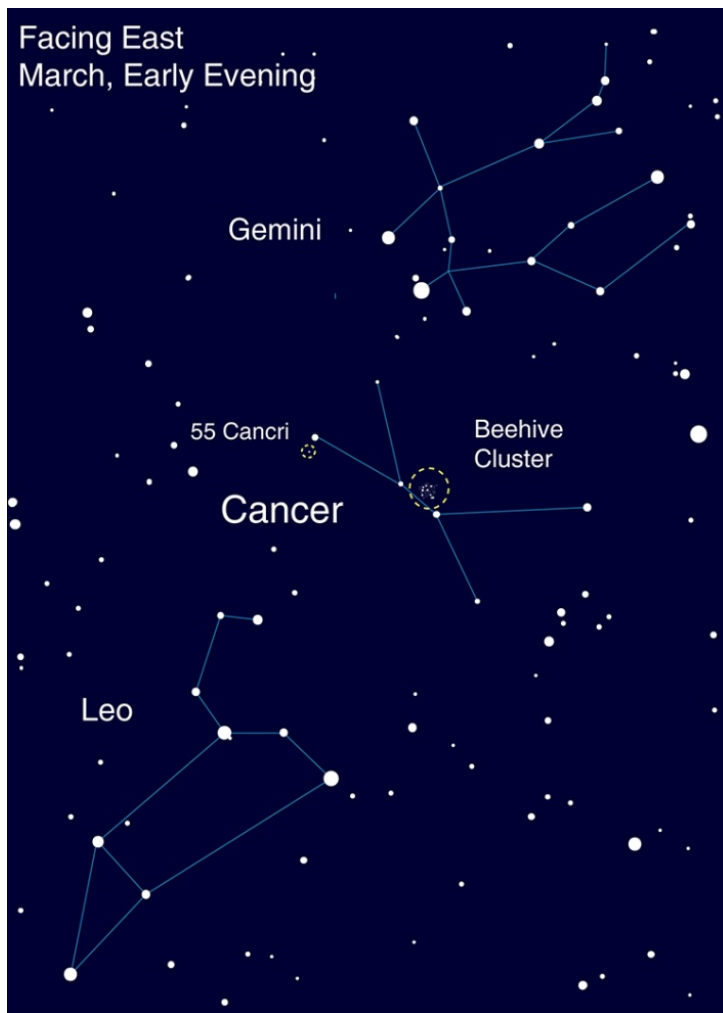
[New York Times, A Conversation With An Astronomer Devoted to the Icy and Far Away by Claudia Dreifus, September 1, 2008](#)

## Dim Delights in Cancer by David Prosper

Cancer the Crab is a dim constellation, yet it contains one of the most beautiful and easy-to-spot star clusters in our sky: the Beehive Cluster. Cancer also possesses one of the most studied exoplanets: the superhot super-Earth, 55 Cancri e.

Find Cancer's dim stars by looking in between the brighter neighboring constellations of Gemini and Leo. Don't get frustrated if you can't find it at first, since Cancer isn't easily visible from moderately light polluted areas. Once you find Cancer, look for its most famous deep-sky object: the Beehive Cluster! It's a large open cluster of young stars, three times larger than our Moon in the sky. The Beehive is visible to unaided eyes under good sky conditions as a faint cloudy patch, but is stunning when viewed through binoculars or a wide-field telescope. It was one of the earliest deep-sky objects noticed by ancient astronomers, and so the Beehive has many other names, including Praesepe, Nubilum, M44, the Ghost, and Jishi qi. Take a look at it on a clear night through binoculars. Do these stars look like a hive of buzzing bees? Or do you see something else? There's no wrong answer, since this large star cluster has intrigued imaginative observers for thousands of years.

55 Cancri is a nearby binary star system, about 41 light years from us and faintly visible under excellent dark sky conditions. The larger star is orbited by at least five planets including 55 Cancri e, (a.k.a. Janssen, named after one of the first telescope makers). Janssen is a "super-earth," a large rocky world 8 times the mass of our Earth, and orbits its star every 18 hours, giving it one of the shortest years of all known planets! Janssen was the first exoplanet to have its atmosphere successfully analyzed. Both the Hubble and recently-retired Spitzer space telescopes confirmed that the hot world is enveloped by an atmosphere of helium and hydrogen with traces of hydrogen cyanide: not a likely place to find life, especially since the surface is



Look for Cancer in between the "Sickle" or "Question Mark" of Leo and the bright twin stars of Gemini. You can't see the planets around 55 Cancri, but if skies are dark enough you can see the star itself. Can you see the Beehive Cluster?

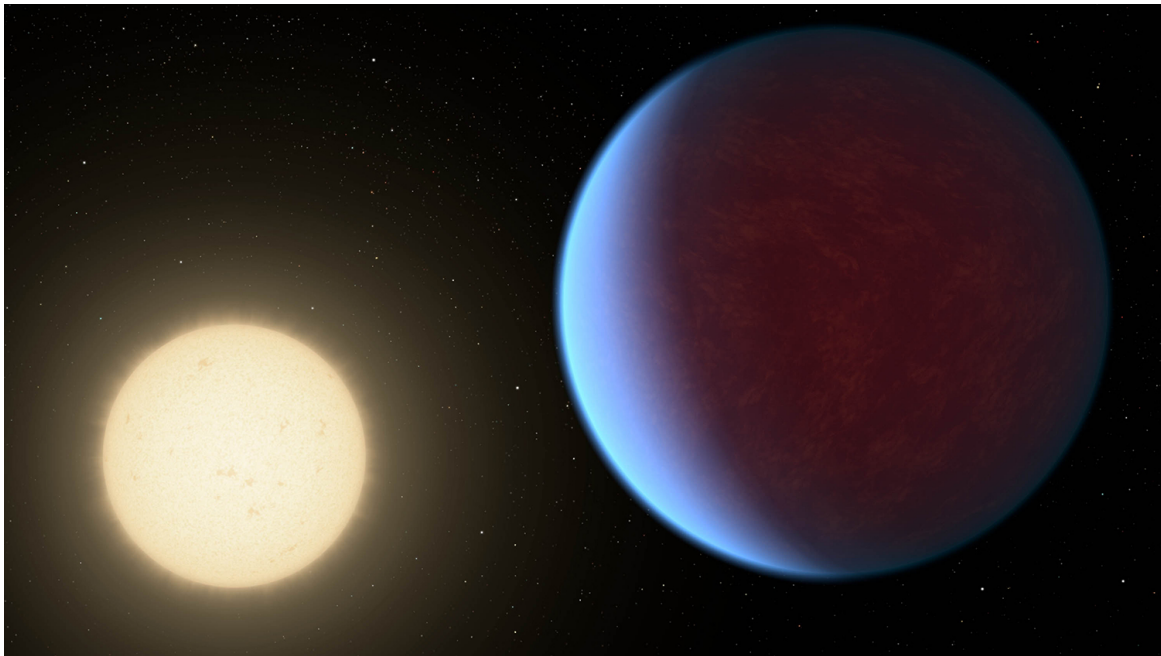
Continued on page 7

## Dim Delights in Cancer, continued

probably scorching hot rock. The NASA Exoplanet Catalog has more details about this and many other exoplanets at [bit.ly/nasa55cancrie](http://bit.ly/nasa55cancrie).

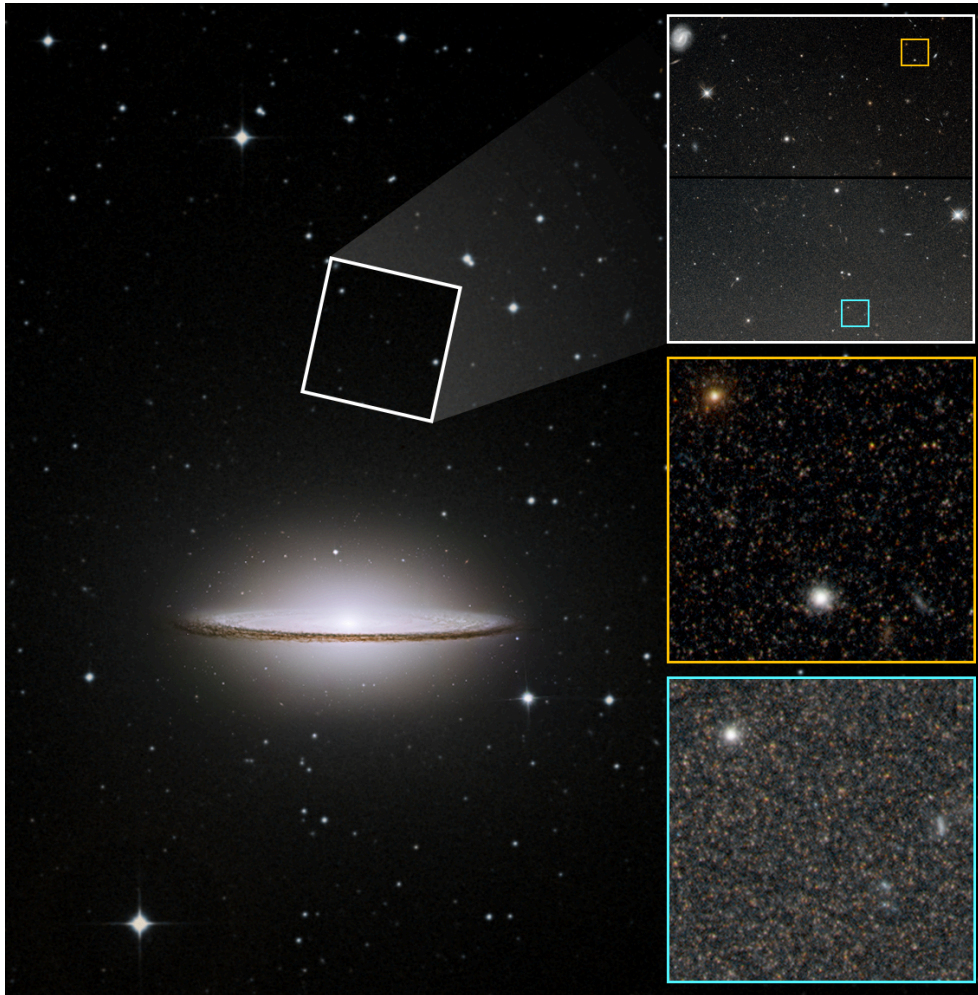
How do astronomers find planets around other star systems? The Night Sky Network's "How We Find Planets" activity helps demonstrate both the transit and wobble methods of exoplanet detection: [bit.ly/findplanets](http://bit.ly/findplanets). Notably, 55 Cancri e was discovered via the wobble method in 2004, and then the transit method confirmed the planet's orbital period in 2011!

Want to learn more about exoplanets? Get the latest NASA news about worlds beyond our solar system at [nasa.gov](http://nasa.gov).



Artist concept of 55 Cancri e orbiting its nearby host star. Find details from the Spitzer Space Telescope's close study of its atmosphere at: [bit.ly/spitzer55cancrie](http://bit.ly/spitzer55cancrie) and the Hubble Space Telescope's observations at [bit.ly/hubble55cancrie](http://bit.ly/hubble55cancrie) Credit: NASA/JPL-Caltech

*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.gov](http://nightsky.jpl.nasa.gov) to find local clubs, events, and more! You can catch up on all of NASA's current and future missions at [nasa.gov](http://nasa.gov). With articles, activities and games NASA Space Place encourages everyone to get excited about science and technology. Visit [spaceplace.nasa.gov](http://spaceplace.nasa.gov) to explore space and Earth science!*



The majestic Sombrero galaxy (M104) is a bright enigma, a hybrid that conforms to neither a spiral nor elliptical structure. It's also alone in the sky, not embedded inside a cluster of other galaxies. How did it get this way? Astronomers used NASA's Hubble Space Telescope to investigate the history of this unusual galaxy, resolving tens of thousands of individual stars in the galaxy's vast halo, and measuring their metallicity – the presence of heavy elements – which can provide forensic clues to the galaxy's origin.

On the left is an image of the entire galaxy that includes a portion of the much fainter halo far outside its bright disk and bulge. Hubble photographed two regions in the halo (one of which is shown by the white box). The images on the right zoom in to show the level of detail Hubble captured. The orange box, a small subset of Hubble's view, contains myriad halo stars. The stellar population increases in density closer to the galaxy's disk (bottom blue box). Each frame contains a bright globular cluster of stars, of which there are many in the Sombrero's halo.

The data gathered by Hubble surprised scientists, upending expectations set by the halos of other massive galaxies. The Sombrero's halo contained more metal-rich stars than expected, but even stranger was

the near-absence of old, metal-poor stars typically found in the halos of massive galaxies. Many of the globular clusters, however, contain metal-poor stars – why were they there, but not in the broader halo? Typically, stars migrate away from their parent clusters as they age. A possible explanation for the Sombrero's perplexing features is that it is the product of the merger of massive galaxies billions of years ago, even though the smooth appearance of the galaxy's disk and halo show no signs of such a huge disruption.

CREDITS: NASA, Digital Sky Survey, P. Goudfrooij (STScI) and The Hubble Heritage Team (STScI/AURA)

Next Page: NASA's Hubble Survey's Gigantic Galaxy

CREDITS: NASA, ESA, and B. Holwerda (University of Louisville)

## Next Membership Meeting:

Wednesday March 18, 7:30 pm

Sudekum Planetarium  
Adventure Science Center  
800 Fort Negley Blvd

Topic: *Messier Marathon* preview



## From the President, continued

samples of what to expect from our very own clear sky site at the planetarium. Even if you aren't planning on attending the marathon on the 21st, come on out and learn some new things about the night sky.

Clear skies and have a great month!

Keith Rainey



xkcd

WELCOME BACK TO STARGAZING. THERE ARE NO NEW STARS SINCE LAST TIME, BUT YOU CAME BACK FOR SOME REASON.



THAT STAR IS VEGA. AT MAGNITUDE 0.03, IT'S THE BRIGHTEST STAR I'M CURRENTLY TALKING ABOUT.

THAT ONE IS POLARIS. IT'S OVER THE NORTH POLE, WHICH IS ALL IT HAS GOING FOR IT.



THAT'S A COMET. SOME OF THEM COME BACK EVERY FEW DECADES, NO MATTER HOW MUCH I YELL AT THEM. BUT STARGAZING ISN'T ALL FUN YELLING. WE FACE A PROBLEM EVEN WORSE THAN COMETS: LIGHT POLLUTION.



THE SKY IS GOING AWAY BECAUSE PEOPLE KEEP SHINING LIGHTS AT IT. THE NEW LED'S ARE EVEN WORSE—THEY'RE TOO BLUE, AND YOU CAN'T TURN THEM OFF BY THROWING ROCKS AT THEM LIKE WITH THE OLD ONES.

LUCKILY, I BROUGHT THESE ASTRONOMY CROSSBOWS.

TAKE ONE, THEN LET'S FAN OUT AND LOOK FOR LAMPS.



**Barnard-Seyfert Astronomical Society  
Minutes of a Regular Meeting of the Board of Directors  
Held On Wednesday, February 5, 2020**

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held February 5, 2020, at the Girl Scouts Center, 4522 Granny White Pike, Nashville, TN 37204. Present were Chip Crossman, Gary Eaton, Drew Gilmore, Bud Hamblen, Keith Rainey and Andy Reeves. A quorum being present, Keith called the meeting to order at 7:30 PM and asked for a motion to adopt the minutes as printed in the February issue of the Eclipse. Andy so moved, Chip seconded and the motion was adopted by unanimous voice vote. Theo reported that there was \$10,542.91 in the bank account and \$1,072.93 in the PayPal account. Keith reported that there were 143 members.

Sadly Greg Neaveill's presentation on his briefcase telescope had to be canceled for health reasons, so the program for the February meeting is still to be determined. March's meeting will be the Messier Marathon edition of "What's Up" at the Adventure Science Center. Rick Houston may be available to make a presentation on the Apollo program in April. Chuck Allen with the Astronomical League will be able to make a presentation in May.

Rick Houston asked for funding for an additional night in the hotel in order to stay over for the BSAS meeting. This was discussed and seen as equitable. Keith asked for a motion, Gary so moved, Chip seconded and the following motion was adopted by unanimous voice vote:

Resolution 2020-02-05: In order for Rick Houston to be available for the April program, the Barnard Seyfert Astronomical Society will reimburse Rick Houston up to \$200 for a hotel room.

The February 1 star party at Shelby Bottoms was canceled due to clouds and the wetness of the telescope field.

Upcoming star parties include: February 15 at Mill Ridge Park with the Friends of Mill Ridge Park. February 22 at Water Valley Overlook (private). February 29 at Edwin Warner Park (public). March 6 at Bowie Nature Park, Fairview.

Chip displayed some sample designs for BSAS name tags.

There being no further business the meeting was adjourned at about 8:45 PM.

Respectfully submitted,

Bud Hamblen  
Secretary

**Barnard-Seyfert Astronomical Society  
Minutes of the Monthly Membership Meeting  
Held on Wednesday, February 19, 2020**

The Barnard-Seyfert Astronomical Society held its annual monthly meeting at the Girl Scout Center, Nashville, Tennessee, on Wednesday, February 19, 2020. Seventeen members signed in. Keith Rainey called the meeting to order at 7:30 PM. Keith then asked for a motion to approve the minutes of the January 15, 2020, meeting as printed in the February issue of the Eclipse. Spencer Buckner made the motion, Theo Wellington seconded, and the minutes were approved by a unanimous voice vote. Theo reported that there was \$11,499.97 in the bank account and \$55.00 in the PayPal account. Keith reported that there were 144 members.

Keith reported that the Shelby Bottoms star party for February 1 had to be canceled because of the wet ground and that the Mill Ridge star party for February 15 was clouded out.

Theo announced that she had available a couple of star part signs to be taken by anyone willing to put out a sign for a public star party.

Keith announced upcoming events. Scheduled star parties include a private star party at Natchez Trace Water Valley Overlook at Mile Marker 412 on Saturday, February 22, a public star party at Shelby Bottoms Nature Center on Saturday, February 29, from 7:00 to 9:00 PM, and a public star party at Bowie Nature Park, Fairview, on Friday, March 6, from 7:30 to 9:30 PM. The Bells Bend Outdoor Festival is scheduled for April 4. The BSAS customarily has a booth at this event. A "Severe Weather Awareness Day" event is next Saturday, February 29, at Trevecca Nazarene University. Dr David Weintraub will make a presentation on Venus at Dyer Observatory on March 19, at 7:00 PM. Tickets are available from Dyer. The Middle Tennessee Science and Engineering Fair is scheduled for March 27-28 at Belmont University. Volunteers are needed to judge astronomy related projects. National Geographic Live presents "View from Above" with former International Space Station Commander Terry Virts at the Schermerhorn Symphony Center on April 7 at 7:00 PM. Tickets are available from the Schermerhorn Symphony Center.

The March meeting will be at the Adventure Science Center, 800 Ft Negley Blvd.

We viewed a recorded presentation by Robert Reeves, "The Moonlover's Guide to the Bright Sky," on observing and imaging the Moon.

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](https://bsasnashville.com). Frame not included.



Become a Member of BSAS!  
Visit [bsasnashville.com](http://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](http://bsasnashville.com). If you need more information, write to us at [info@bsasnashville.com](mailto: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](mailto:info@bsasnashville.com).