The ECLIPSE

October 2021

The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:

October 20, 7:30 pm
Online meeting

Link will be posted on
bsasnashville.com

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BSAS
Barnard-Seyfert Astronomical Society
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BSAS
Barnard-Seyfert Astronomical Society

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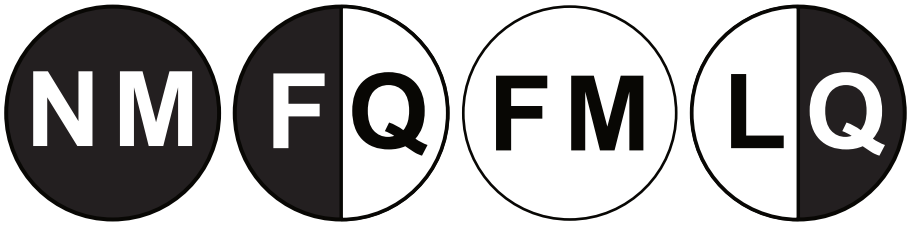
The joint European-Japanese BepiColombo mission captured this view of Mercury on 1 October 2021 as the spacecraft flew past the planet for a gravity assist maneuver.

The image was taken at 23:44:12 UTC by the Mercury Transfer Module's Monitoring Camera 2, when the spacecraft was about 2418 km from Mercury. Closest approach of about 199 km took place shortly before, at 23:34 UTC. In this view, north is towards the lower right. The cameras provide black-and-white snapshots in 1024 x 1024 pixel resolution.

The gravity assist maneuver was the first at Mercury and the fourth of nine flybys overall. During its seven-year cruise to the smallest and innermost planet of the Solar System, BepiColombo makes one flyby at Earth, two at Venus and six at Mercury to help steer on course for Mercury orbit in 2025. Credit: ESA/BepiColombo/MTM



Oct 6 Oct 12 Oct 20 Oct 28
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Happy Birthday Mae Jemison
by Robin Byrne

This month we celebrate the life of a woman who is an inspiration to many. Mae Carol Jemison was the third child born to Charlie and Dorothy Jemison on October 17, 1956 in Decatur, Alabama. When Mae was a couple years old, her family moved to Chicago, Illinois, and she would consider Chicago to be her hometown.

Having a mother who taught elementary school math, it's not surprising that Mae would have an interest in the STEM fields, especially nature and human physiology. One of her early inspirations was seeing Nichelle Nichols portraying Lieutenant Uhura on Star Trek. Here was a black woman exploring space! Mae wanted to do the same. However, the Apollo missions, while exciting, did cause disappointment for Mae, saying, "everybody was thrilled about space, but I remember being really really irritated that there were no women astronauts."

In addition to her interest in science, Mae also developed a love for dance at an early age, studying ballet at the age of 9, later expanding her repertoire to include jazz, modern, African, and Japanese dance styles. In high school, she joined the Modern Dance Club.

Mae graduated from high school in 1973 at the age of 16 and began her college career at Stanford University. While her young age would seem like a hindrance, that was nothing compared to being one of the few black students in her science classes and the discrimination she received from her professors. But Mae described herself as being naive and stubborn, and that combination helped her to face these obstacles. She joined the Black Student Union, eventually becoming head of the Union. Meanwhile, Mae continued to pursue her joy of dance, even choreographing a school musical. Mae graduated in 1977 with a B.S. degree in Chemical Engineering, and a B.A. degree in African and African-American Studies.

The next challenge Mae faced was choosing what career path to take after college: medical school or professional dance? Mae chose medical school, attending the Cornell Medical School, but dance wasn't forgotten - she took classes at the Alvin Ailey American Dance Theater while working on her medical degree. During medical school, Mae had the opportunity to travel the world while receiving her training, working in Cuba, Cambodia, and East Africa. Dr. Jemison graduated in 1982 and began her medical career as a general practitioner.

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Her experiences of practicing medicine in impoverished parts of the world inspired Mae to join the Peace Corps in 1983. It didn't hurt that she is fluent in Russian, Japanese, and Swahili. Mae worked for two years in Africa as a medical officer, being stationed in both Liberia and Sierra Leone. Among her duties, Mae provided medical care, wrote self-care manuals, ran a pharmacy, and set up guidelines related to health and safety issues.

In 1985, Dr. Jemison went into private practice in Los Angeles, California. At the same time, she began taking graduate level engineering courses. The Space Shuttle program, which began in 1981, was the first time NASA began recruiting women and black astronaut candidates. Mae applied to the astronaut training program in 1985, but the Challenger explosion in 1986 put all recruiting on hold. In 1987, Mae applied again. Approximately 2000 people had applied for this round, but Mae Jemison was among the 15 people chosen to be part of Astronaut Group 12. As is always the case for astronaut candidates, Mae began her NASA career with a mix of training and working in various capacities on the ground. In Mae's case, she provided launch support at the Kennedy Space Center, as well as working on the computer software in the Shuttle Avionics Integration Laboratory.

Two years after starting at NASA, Mae was selected to be part of the crew of STS-47, serving as a Mission Specialist. Three years of training for the mission would take place before the actual trip into space would occur. On September 12, 1992, aboard the space shuttle Endeavor, Mae Jemison became the first African-American woman to go into space. This joint mission with Japan was also the 50th shuttle mission. As an homage to her inspiration, Nichelle Nichols, Mae would begin her shift's communications with ground control by saying, "Hailing frequencies open." The main payload on this mission was the Spacelab Japan module, which included life sciences and materials processing experiments. Mae worked with Japanese astronaut Mamoru Mohri on an experiment testing techniques to help ease the symptoms of motion sickness, anxiety, and stress disorders. Dr. Jemison also performed tests of a system designed to produce water to be used for saline solutions. Other experiments she participated in studied bone cells, as well as how tadpoles develop in weightlessness. After a little over 190 hours, on September 20, 1992, Dr. Mae Jemison completed her only trip into space.

In 1993, Mae resigned from NASA to found her own company, The Jemison Group. The consulting firm studies how technological advancements impact society and culture. She also founded the Dorothy Jemison Foundation for Excellence in honor of her mother. This organization has the goal of encouraging young teens who have an interest in science, including offering science camps, not just in the United States, but around the world.

When Levar Burton learned that Mae was such a big fan of Star Trek, he invited her to be in an episode of The Next Generation. Mae was thrilled to appear as Lieutenant

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Palmer in the episode titled “Second Chances.” She also has the distinction of being the first real astronaut to appear in a Star Trek episode.

From 1995 to 2002, Dr. Jemison was a member of the faculty at Dartmouth College as a professor of environmental studies. While here, she continued to encourage minority students to pursue careers in the sciences. She established the Jemison Institute for Advanced Technology in Developing Countries at Dartmouth to assist impoverished nations with the use of technology.

Dr. Mae Jemison is also the author of several books written for children. Her first book, Find Where the Wind Goes, was an autobiography, while the series of A True Book titles explored various science topics.

Dr. Jemison now devotes much of her time to public speaking. Her message is one of promoting science, technology, and the need for better health care in developing countries. “Having been an astronaut gives me a platform,” says Jemison, “but I’d blow it if I just talked about the Shuttle.” She is also in charge of the 100 Year Starship project. This program, which is through the United States Defense Advanced Research Projects Agency (DARPA) has the goal of developing the technology needed for a person to travel to another star within the next 100 years.

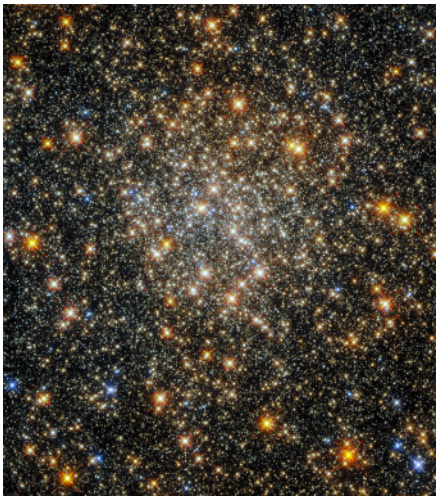
We’ve entered an era where private citizens are venturing into space, eventually opening up the possibility of everyone becoming an astronaut (at least if they have enough money). That doesn’t come close to diminishing the accomplishments of this month’s honoree. Mae Jemison is many things - dancer, engineer, doctor, astronaut, role model, advocate - but first and foremost, Dr. Mae Jemison is an inspiration for all.

References:

Mae Jemison - Wikipedia

Alexander, Kerri Lee. “Mae Jemison.” National Women’s History Museum. 2019

Mae C. Jemison Biographical Data Lyndon B. Johnson Space Center



On the cover: This sparkling starfield, captured by the NASA/ESA Hubble Space Telescope’s Wide Field Camera 3 and Advanced Camera for Surveys, contains the globular cluster ESO 520-21 (also known as Palomar 6). A densely packed, roughly spherical collection of stars, it lies close to the centre of the Milky Way, where interstellar gas and dust absorb starlight and make observations more challenging.

This absorption by interstellar material affects some wavelengths of light more than others, changing the colours of astronomical objects and causing them to appear redder than they actually are. Astronomers call this process “reddening”, and it makes determining the properties of globular clusters close to the galactic centre — such as ESO 520-21 — particularly difficult. ESO 520-21 lies in the constellation Ophiuchus, near the celestial equator.

Credit: ESA/Hubble and NASA, R. Cohen

Weird Ways to Observe the Moon
By David Prosper

International Observe the Moon Night is on October 16 this year– but you can observe the Moon whenever it's up, day or night! While binoculars and telescopes certainly reveal incredible details of our neighbor's surface, bringing out dark seas, bright craters, and numerous odd fissures and cracks, these tools are not the only way to observe details about our Moon. There are more ways to Observe the Moon than you might expect, just using common household materials.

Sun Funnels in action! Starting clockwise from the bottom left, a standalone Sun Funnel; attached to a small refractor to observe the transit of Mercury in 2019; attached to a large telescope in preparation for evening lunar observing; projection of the Moon on a funnel from a medium-size scope (5 inches).

Safety tip: NEVER use a large telescope with a Sun Funnel to observe the Sun, as they are designed to project the Sun using small telescopes only. Some eager astronomers have melted their Sun Funnels, and parts of their own telescopes, by pointing them at the Sun - large telescopes create far too much heat, sometimes within seconds! However, large instruments are safe and ideal for projecting the much dimmer Moon. Small telescopes can't gather enough light to decently project the Moon, but larger scopes will reveal more detail.

Put on a pair of sunglasses, especially polarized sunglasses! You may think this is a joke, but the point of polarized sunglasses is to dramatically reduce glare, and so they allow your eyes to pick out some lunar details! Surprisingly, wearing sunglasses even helps during daytime observations of the Moon.

One unlikely tool is the humble plastic bottle cap! John Goss from the Roanoke Valley Astronomical Society shared these directions on how to make your own bottle cap lunar viewer, which was suggested to him by Fred Schaaf many years ago as a way to also view the thin crescent of Venus when close to the Sun:

"The full Moon is very bright, so much that details are overwhelmed by the glare. Here is an easy way to see more! Start by drilling a 1/16-inch (1.5 mm) diameter hole in a plastic soft drink bottle cap. Make sure it is an unobstructed, round hole. Now look through the hole at the bright Moon. The image brightness will be much dimmer than normal – over 90% dimmer – reducing or eliminating any lunar glare. The image should also be much sharper because the bottle cap blocks light from entering the outer portion of your pupil, where imperfections of the

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eye's curving optical path likely lie." Many report seeing a startling amount of lunar detail!

You can project the Moon! Have you heard of a "Sun Funnel"? It's a way to safely view the Sun by projecting the image from an eyepiece to fabric stretched across a funnel mounted on top. It's easy to make at home, too – directions are here: bit.ly/sunfunnel. Depending on your equipment, a Sun Funnel can view the Moon as well as the Sun– a full Moon gives off more than enough light to project from even relatively small telescopes. Large telescopes will project the full Moon and its phases, with varying levels of detail; while not as crisp as direct eyepiece viewing, it's still an impressive sight! You can also mount your smartphone or tablet to your eyepiece for a similar Moon-viewing experience, but the funnel doesn't need batteries.

Of course, you can join folks in person or online for a celebration of our Moon on October 16, with International Observe the Moon Night – find details at moon.nasa.gov/observe. NASA has big plans for a return to the Moon with the Artemis program, and you can find the latest news on their upcoming lunar explorations at nasa.gov.

Next page: You can download and print NASA's observer's map of the Moon for International Observe the Moon Night! This map shows the view from the Northern Hemisphere on October 16 with the seas labeled, but you can download both this map and one of for Southern Hemisphere observers, at: bit.ly/moonmap2021 The maps contain multiple pages of observing tips, not just this one!

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 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!

Next BSAS Membership Meeting:

Wednesday, October 20, 7:30 pm Central
online on Zoom

Topic: Dr Henry Ferguson - James Webb Space Telescope

Zoom link will be posted to bsasnashville.com

OBSERVE the MOON

International OBSERVE THE MOON NIGHT 2021

SATURDAY OCTOBER 16TH

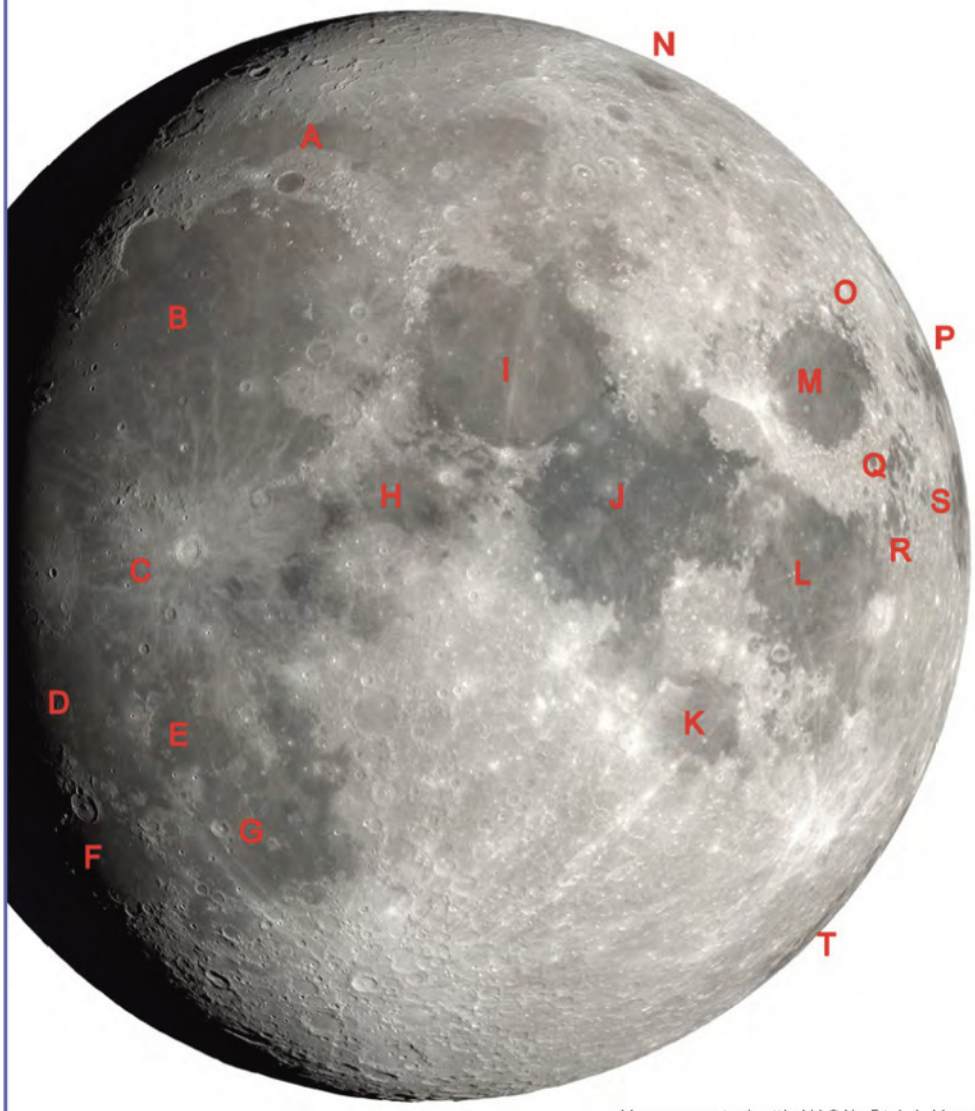
NORTHERN HEMISPHERE MOON MAP WITH LUNAR MARIA (SEAS OF BASALT)

Moon Map

This map was created for International Observe the Moon Night 2021. It depicts the Moon as it will appear from the northern hemisphere at approximately 11:00 PM EDT on October 16, 2021 (3:00 AM UTC on October 17).

Lunar Maria (Seas of Basalt)

You can see a number of maria tonight. Once thought to be seas of water, these are actually large, flat plains of solidified basaltic lava. They can be viewed in binoculars or even with the unaided eye. Tonight, you may be able to identify 18 maria on the Moon. This includes four seas along the eastern edge that are often hard to see. Because of libration, a slight apparent wobble by the Moon in its orbit around Earth, tonight we get to peek slightly around the northeast edge of the Moon, glimpsing a sliver of terrain normally on the Moon's far side.



Map generated with NASA's Dial-A-Moon (https://svs.gsfc.nasa.gov/4874)

A. Mare Frigoris (Sea of Cold)
B. Mare Imbrium (Sea of Rains)
C. Mare Insularum (Sea of Isles)
D. Oceanus Procellarum (Ocean of Storms)
E. Mare Cognitum (Known Sea)
F. Mare Humorum (Sea of Moisture)
G. Mare Nubium (Sea of Clouds)
H. Mare Vaporum (Sea of Vapors)
I. Mare Serenitatis (Sea of Serenity)
J. Mare Tranquillitatis (Sea of Tranquility)
K. Mare Nectartis (Sea of Nectar)
L. Mare Fecunditatis (Sea of Fertility)
M. Mare Crisium (Sea of Crises)
N. Mare Humboldtianum (Humboldt's Sea)
O. Mare Anguis (Serpent Sea)
P. Mare Marginis (Border Sea)
Q. Mare Undarum (Sea of Waves)
R. Mare Spumans (Sea of Foam)
S. Mare Smythii (Smyth's Sea)
T. Mare Australe (Southern Sea)

Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Wednesday, September 1, 2021

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held September 1, 2021, online. Logged in were Tom Beckermann, Tony Drinkwine, Bud Hamblen, Keith Rainey, Andy Reeves and Theo Wellington. A virtual quorum being present, Keith called the meeting to order at 7:30 PM.

2021 August 4 Minutes:

Keith asked for a motion to adopt the minutes of the board meeting on August 1, 2021, as printed in the September, 2021, issue of the Eclipse. Andy so moved, Tom seconded and the minutes were adopted unanimously.

Treasurer's Report:

Theo reported $11,067.85 in the SunTrust account and $515.32 in the PayPal account.

Membership:

Keith reported 202 members.

Meetings:

Drew Gilmore has reported that the Adventure Science wanted $300 per month for the use of the planetarium as well as the club participating on-site for two star parties during the course of the year. Because the fee would exceed our normal cash flow, this is no longer a viable offer. Alternative sites for in-person meetings include the Shelby Bottoms Nature Center. Other possiblities would include a church parish hall or fellowsip hall. The September membership meeting will be on Zoom and include a "What's Up." The October meeting will include a presentation on the James Webb space telescope. November will be the "All I Want for Christmas" presentation. The December meeting is open.

Equipment:

Chris Crossman had custody of the goto Dob.

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Social Media:

Theo reported that the May 22 virtual star party has had 372 views so far. The Facebook page has 1960 likes and 2,093 followers. The Twitter feed has 275 followers.

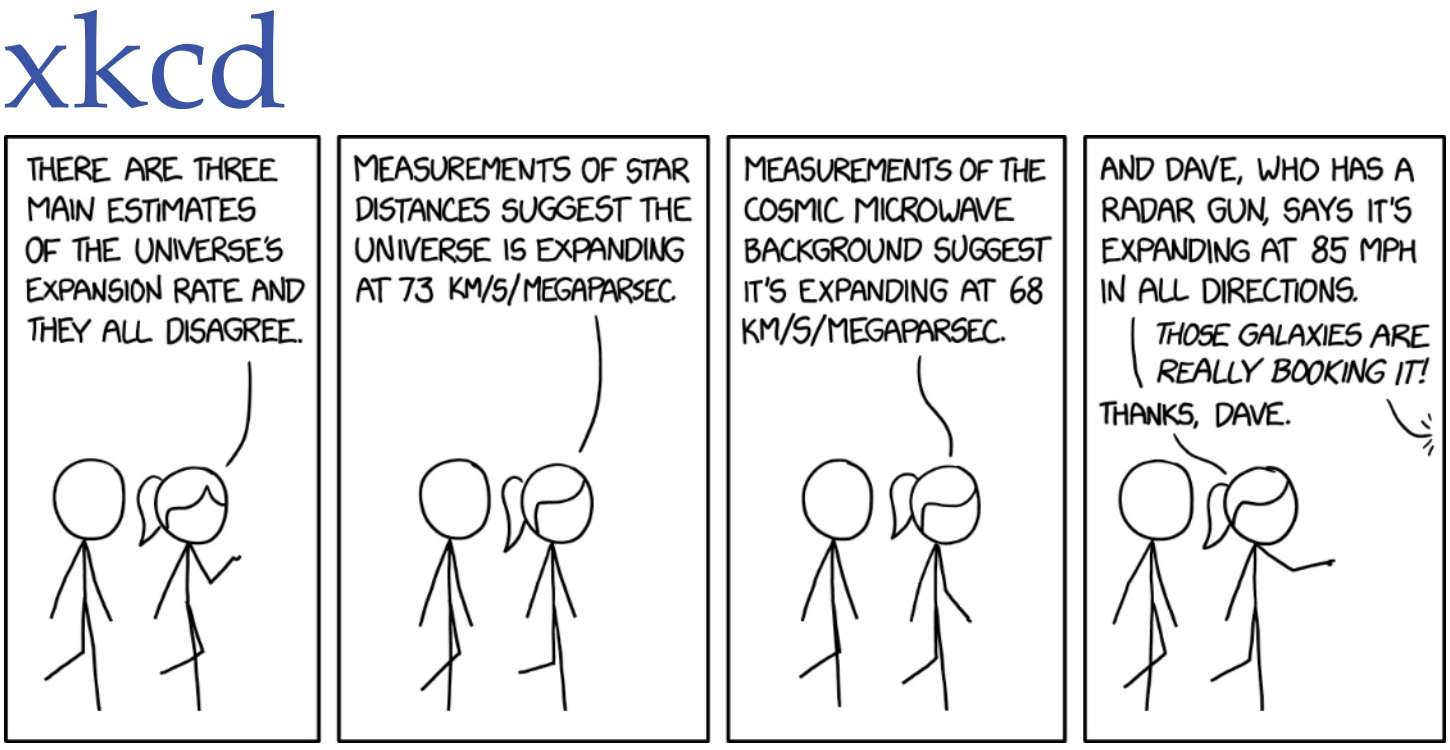
Star Parties:

Theo reported that the Perseid Watch party with Dyer Observatory and Warner Park Nature Center had 61 people. A few meteors were visible. Participants also got views of Venus, the Moon and Jupiter.

Star parties are planned in November at Warner Park and in December at Shelby Bottoms.

There being no further business, Keith asked for a motion to adjourn. Theo so moved, Keith seconded, and the meeting adjourned at 9:00 PM.
Respectfully submitted,

Bud Hamblen
Secretary



Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, September 15, 2021

Because monthly in-person meetings are suspended due to the COVID-19 epidemic, the Barnard-Seyfert Astronomical Society held an on-line meeting via Zoom on Wednesday, September 15, 2021. 17 participants zoomed in.

Keith Rainey called the meeting to order at about 7:30 PM. Marty Perlmutter made a motion to adopt the minutes of the August 18, 2021, meeting. Theo Wellington seconded and the minutes were adopted by a virtual show of hands.

Treasurer's report: Theo reported that the Suntrust bank balance was $11,067.85 and that the PayPal balance was $ 585.05.

Membership: Keith reported 204 members.

Social media: The May 22 Virtual Star Party has had 393 views to date. The club Facebook page is liked by 1960 and followed by 2093. Twitter has 275 followers.

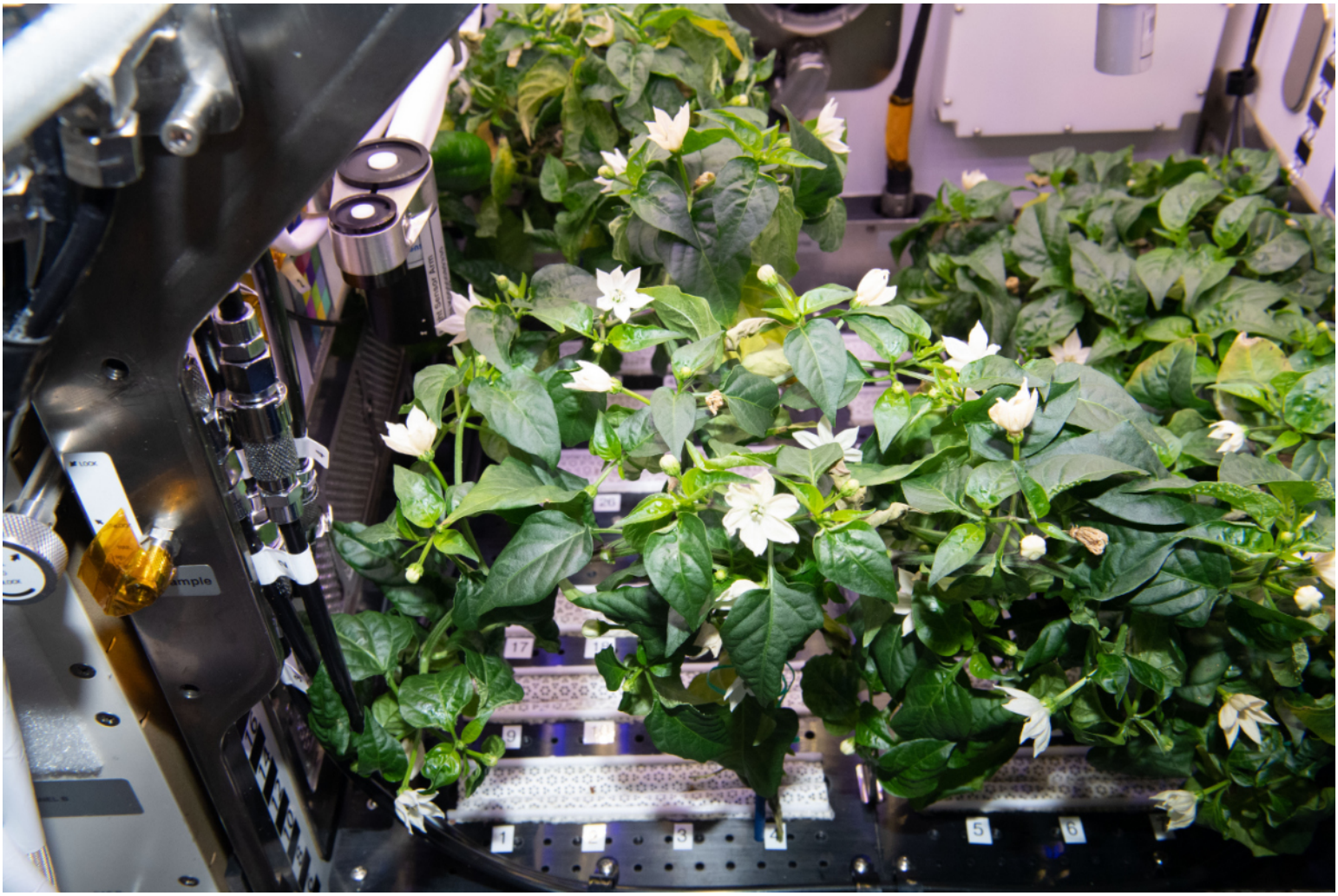
Outreach and Star Parties: The Perseid Watch party with Dyer and Warner Park had 61 people in the wet field. A few meteors were seen, a few views of Venus, the Moon, and Jupiter. Planned star parties are in November at Warner Park and December at Shelby Bottoms.

Meetings: Oz Gonzalez confirmed that Dr Henry Ferguson will make a presentation on the James Webb Space Telescope at the October 20 membership meeting.

Dr. Terry Reeves presented "What's Up?", a guide to finding some interesting objects in the night sky this Fall.

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

Bud Hamblen
Secretary



Hatch Green Chile plants are pictured growing in the Advanced Plant Habitat aboard the International Space Station (ISS). The Microgravity Growth of New Mexico Hatch Green Chile as a Technical Display of Advanced Plant Habitat's Capabilities (Plant Habitat-04) demonstrates using the Advanced Plant Habitat (APH) by growing peppers in space for the first time. Credit: NASA/JSC

In honor of the club's 90th anniversary we partnered with Hatch Show Print to create a unique poster that would honor the achievement of the club. For those who don't know Hatch Show has been making posters for a variety of events and concerts for 140 years. In all that time we are their first astronomy club.

On the poster at the center is the moon. This was made from a wood grained stencil that the shop has used for over 50 years. To contrast that the telescope that the people are using is a brand new stencil made for our poster. The poster has three colors. First the pale yellow color of the moon was applied. Next the small stars, circles, and figures at the bottom were colored in metallic gold. The third color is a blue for the night sky. Where it overlaps with the metallic gold it creates a darker blue leaving the figures at the bottom looking like silhouettes. This was a one time printing so the 100 that we have are all that will be printed.

The prints are approximately 13 3/4” x 22 1/4” and are available for $20 at our membership meetings, or $25 with shipping by ordering through bsasnashville.com. Frame not included.

Barnard-Seyfert Astronomical Society

Become a Member of BSAS! Visit bsasnashville.com to join online.

All memberships have a vote in BSAS elections and other membership votes. Also included are subscriptions to the BSAS and Astronomical League newsletters.

Annual dues:

Regular: $25
Family: $35
Senior/Senior family: $20
Student*: $15

* To qualify as a student, you must be enrolled full time in an accredited institution or home schooled.

About BSAS

Organized in 1928, the Barnard-Seyfert Astronomical Society is an association of amateur and professional astronomers who have joined to share our knowledge and our love of the sky.

The BSAS meets on the third Wednesday of each month at the Cumberland Valley Girl Scout Building at the intersection of Granny White Pike and Harding Place in Nashville. Experienced members or guest speakers talk about some aspect of astronomy or observing. Subjects range from how the universe first formed to how to build your own telescope. The meetings are informal and time is allotted for fellowship. You do not have to be a member to attend the meetings.

Membership entitles you to subscriptions to Astronomy and Sky & Telescope at reduced rates; the club's newsletter, the *Eclipse*, is sent to members monthly. BSAS members also receive membership in the Astronomical League, receiving their quarterly newsletter, the Reflector, discounts on all astronomical books, and many other benefits.

In addition to the meetings, BSAS also sponsors many public events, such as star parties and Astronomy Day; we go into the schools on occasion to hold star parties for the children and their parents. Often the public star parties are centered on a special astronomical event, such as a lunar eclipse or a planetary opposition.

Most information about BSAS and our activities may be found at bsasnashville.com. If you need more information, write to us at info@bsasnashville.com.

Free Telescope Offer

Did someone say free telescope? Yes, you did read that correctly. The BSAS Equipment & Facilities Committee has free telescopes ranging in size from 2.6" to 8" that current members can actually have to use for up to 60 days at a time. We also have some other items in the loaner program such as a photometer, H-alpha solar telescope, educational CDs, tapes, DVDs, and books. Some restrictions apply. A waiting list is applicable in some cases. The BSAS Equipment Committee will not be held responsible for lost sleep or other problems arising from use of this excellent astronomy gear. For information on what equipment is currently available, contact info@bsasnashville.com.