

The Bays Mountain Astronomy Club Newsletter

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Cosmic Reflections

William Troxel - BMAC Chair



reetings fellow BMACer's. Let me thank each of you for connecting last month. I hope each of you got to be a part of September's Meeting. If you were unable to attend, you missed a wonderful presentation by our very own Christa as she shared her summer experience at Advanced Space Academy. As a young man growing up, that option was not even open to me. I am showing my age when I share that I sat glued to the black & white TV (Ed.: The broadcast image was B&W) in the basement of my parent's house watching as John Glenn was shot into space to be the first American to fly around the Earth. To be able to go back and have the chance to go to a real space camp would be beyond anything I could imagine. Congrats to you Christa! I encourage you to continue in the study of science. Club members, mark your calendar. One of these days we will look back and be able to say "we knew her when she was a club member of the Bays Mountain Astronomy Club!"

If you have not heard, due to the very high case numbers of COVID-19, StarFest has been cancelled for this year. While I am disappointed, because I really enjoy the weekend and I want to be able to get together with all those like-minded people, I believe it is better to be wise now. This is not the time to take chances. I hope you can understand the reasons behind the decision.

The October meeting will also be online. I will be sending out the link soon. If you are free and can join us, I encourage you to do so. Though the presenter is not finalized at this moment, it should be a good meeting.

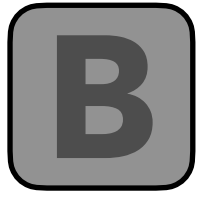
I have written a lot lately about how very proud I am to be the Chairman and the face of this club. You have each and everyone risen to the challenge that the pandemic has forced our club along with the world to find ways to stay together as we try to figure how to stay connected. Please continue to be strong, practice safety and do not give up hope. We will come out of this as a club stronger, I believe with all my heart. I have no way of knowing what our future meetings will look like. One thing I do know is that I believe in each one of you not just because you are members in Bays Mountain Astronomy Club, but because of you as a person. Please stay strong! Until next time....

Clear Skies!

BMAC Notes



Astrophoto Corner



MACer David Reagan has submitted an image of NGC 6888, the Crescent Nebula. He writes: The image also reveals another nebula. It is called the Soap Bubble Nebula (PN G75.5+1.7) and was discovered by amateur astronomer Dave Jurasevich on June 19, 2007. It is a faint bubble-shaped nebula seen at the bottom right of the image with dimensions of 4'20". It is quite faint (the magnitude seems to be undetermined at present) which may explain why it was not identified in the 215 years since William Herschel discovered the Crescent nebula.

This image was taken with a 140mm refractor in his suburban backyard using an AstroPhysics 900 mount, 8.7 hours of 5 minute Ha and OIII subexposures, combined in AstroPixelProcessor as an HOO image and processed in Lightroom and Photoshop.

You will notice it shows up twice as it also provides the header and heralds the start of Greg Penner's monthly column, "Stellar Observations."

Following, you'll see a collection of images from BMAcEr Ryan Carlock! He also shares some of the equipment he used to capture these images and for what he uses for visual studies.

Ed. note to BMAc club members: I hope these images inspire you to send me your images/artwork and even articles to share with each other. I know we have a talented group. By sharing with each other, we all learn!



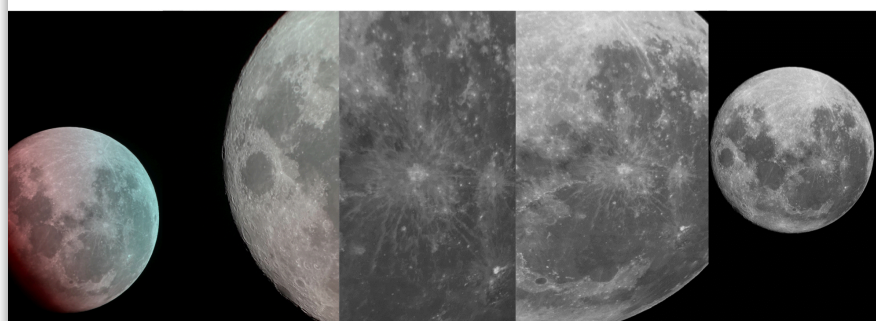
The Crescent Nebula with the Soap Bubble Nebula. Image by David Reagan.

Astrophotography

Ryan Carlock



The Moon



Saturn



Jupiter



Hercules Globular Cluster-NGC6205-M13



Andromeda Galaxy- NGC-224-M31



Filters- 2"
OIII (496-501nm)
UHC-S (400-550, 600-700nm)
Orion:
 2X Barlow, 2"

- Sky-Watcher 250p Dobsonian reflecting telescope.
- D=2547mm, F=1200mm



Stellar Observations

Greg Penner



Double Stars



ouble stars might not be "glamorous" objects such as planets, galaxies, nebulae or star clusters, but observing double and multiple stars can be a rewarding and challenging experience for amateur astronomers of all skill levels. Estimates vary as new data is examined, but anywhere from 50% to 80% of stars are part of a double or multiple star system. Whatever the actual number, there are thousands of targets to seek out and enjoy with all types of instruments at any time of the year! Whereas many of the "faint fuzzy" types of objects need excellent sky conditions to observe, many double stars can be observed in less than ideal conditions such as light polluted skies and bright moonlight. So, once you have decided to hunt down some of these treasures and have one centered in your eyepiece, what exactly should you be noticing? Double and multiple star targets have a number of characteristics such as:

- **brightness contrast**
- **angular separation**
- **position angle**
- **color combinations**

These characteristics can be studied in a way that will sharpen your observing prowess and even teach you new skills.

How do you find double/multiple stars to observe? If you already have a star atlas, you will find the standard symbol for double stars is a star bisected by a thin bar. My favorite resource is the *Cambridge Double Star Atlas*, which highlights nearly 2,400 double and multiple stars including a showpiece list of the best. The Astronomical League has a **double star observing program**, which includes a list of 100 double stars that are especially interesting. You can find this list on their website (bottom of double star observing program page) and download it at no cost. The list is organized by Right Ascension from 00h through 24h, so you will be able to find good targets at any time of year. You don't have to be committed to completing the observing program to download

A detailed star chart of the constellation Auriga. The chart shows various stars labeled with Greek letters (alpha, beta, gamma, etc.) and names like Castor, Pollux, and Wasat. It also includes numerous star clusters and nebulae, such as the Eskimo Nebula and the Ring Nebula. The chart is divided into regions by dashed lines, and a grid of right ascension and declination lines is overlaid. The title 'AURIGA' is prominently displayed at the top.

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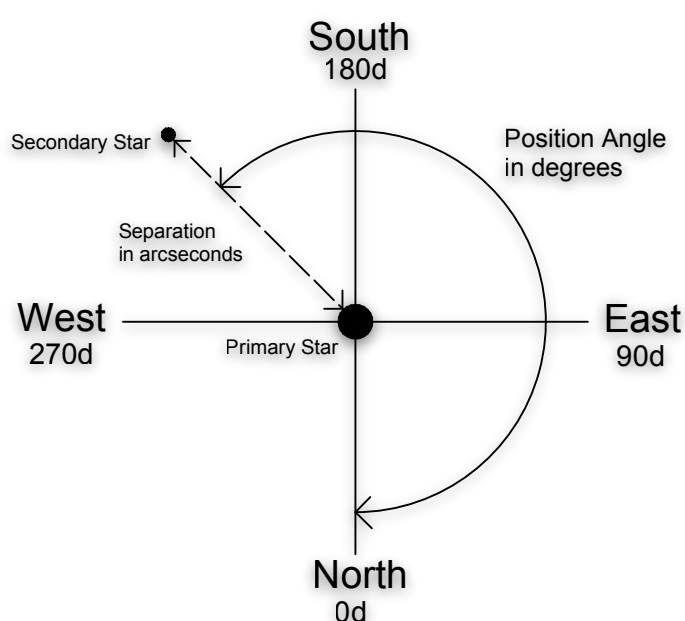
5-9-2020

Latitude & Longitude: 36.53, -82.42

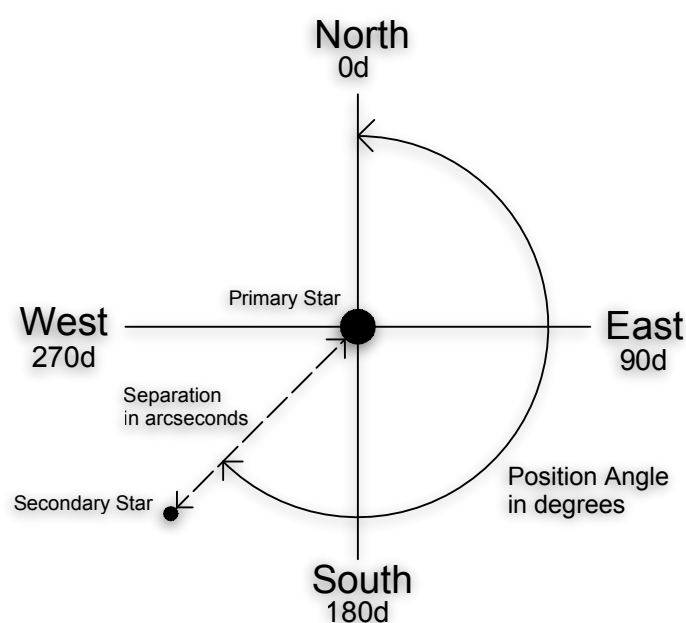
Object: Alpha Leonis (Regulus) Takahashi Sky 90	Seeing: G	Transp: 7 (EDT)	N
Instrument: w/ Extender Q	Power: 33x	Time: 21:40	E
Description: Brilliant white primary, white secondary			
Object: Gamma Leonis Takahashi Sky 90	Seeing: G	Transp: 7 (EDT)	N
Instrument: w/ Extender Q	Power: 89x	Time: 21:50	E
Description: Yellow primary, yellow-orange secondary, Primary only slightly brighter.			
Object: 54 Leonis Takahashi Sky 90	Seeing: G	Transp: 7 (EDT)	N
Instrument: w/ Extender Q	Power: 89x	Time: 22:00	E
Description: Yellow primary, bluish secondary makes a nice contrast			
Object: 24 Comae Berenices Takahashi Sky 90	Seeing: G	Transp: 7 (EDT)	N
Instrument: w/ Extender Q	Power: 89x	Time: 22:20	E
Description: Pale orange primary, blue secondary			
Object: 32 Camelopardalis Takahashi Sky 90	Seeing: G	Transp: 7 (EDT)	N
Instrument: w/ Extender Q	Power: 89x	Time: 22:45	E
Description: Twin yellows, hard to determine primary.			

A page from Greg's observing log.

When noting the various characteristics of double and multiple star systems, the most challenging aspect is learning to determine the position angle. To understand the position angle, imagine a solid line drawn from the primary star to north. Then imagine a dashed line from the primary star to the secondary star. Next, draw an arc from solid line to dashed line from north to east (see illustration). That is the position angle. But how do you determine directions in the view through your telescope? Finding west in the telescope is easy. Turn off any tracking, center a star, and watch it drift out of view. If you don't have a tracking telescope mount, then it's even easier! The drift direction is always west. For a Newtonian reflector, north is 90° counterclockwise from west. For a Schmidt-Cassegrain (SCT) or a refractor and either one is equipped with a typical star diagonal, then north is 90° clockwise from west. This will take some practice, but eventually it should come easily.



Position Angle - view through a Newtonian Reflector



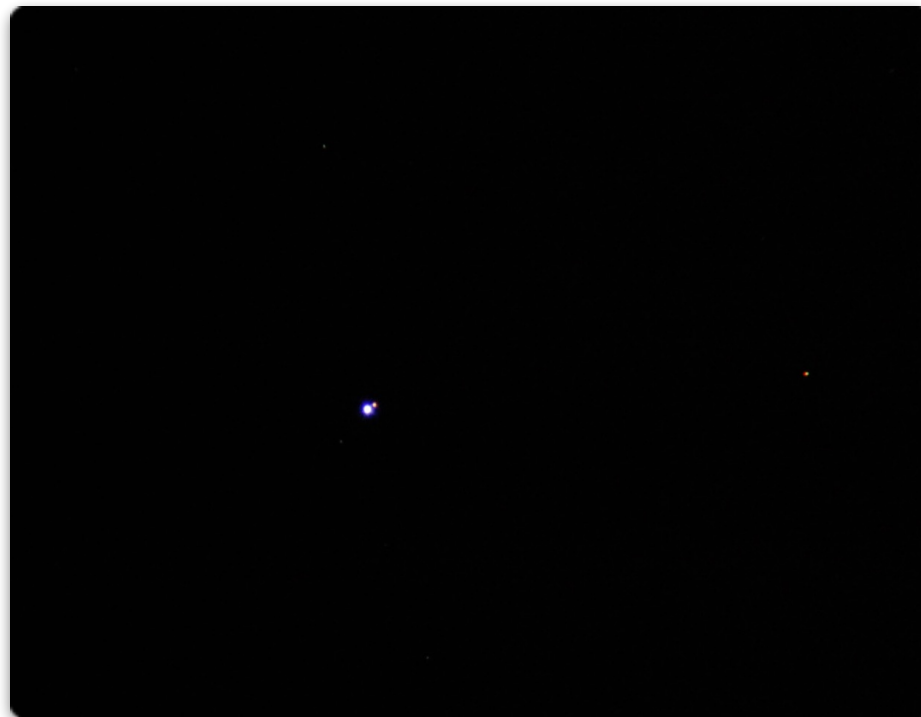
Position Angle - view through a Refractor or Schmidt Cassegrain w/ 90 degree star diagonal

Diagram illustrating position angle. Notice the differences depending on the equipment used.

The double star observing program list includes position angles (PA) for all targets, so you can test your skill against the list. After some practice, you should be able to estimate the PA to within 20 degrees accuracy. The other double star characteristics to note are not so challenging. The most enjoyable aspects are noting the color differences and separation. Many of the targets exhibit beautiful color contrasts with yellow-orange primary stars adjacent to bluish or purple secondaries. Some nice examples of this are Albireo in the constellation Cygnus and Eta Cassiopeia (see images).



Albireo in Cygnus. Image by Greg Penner.

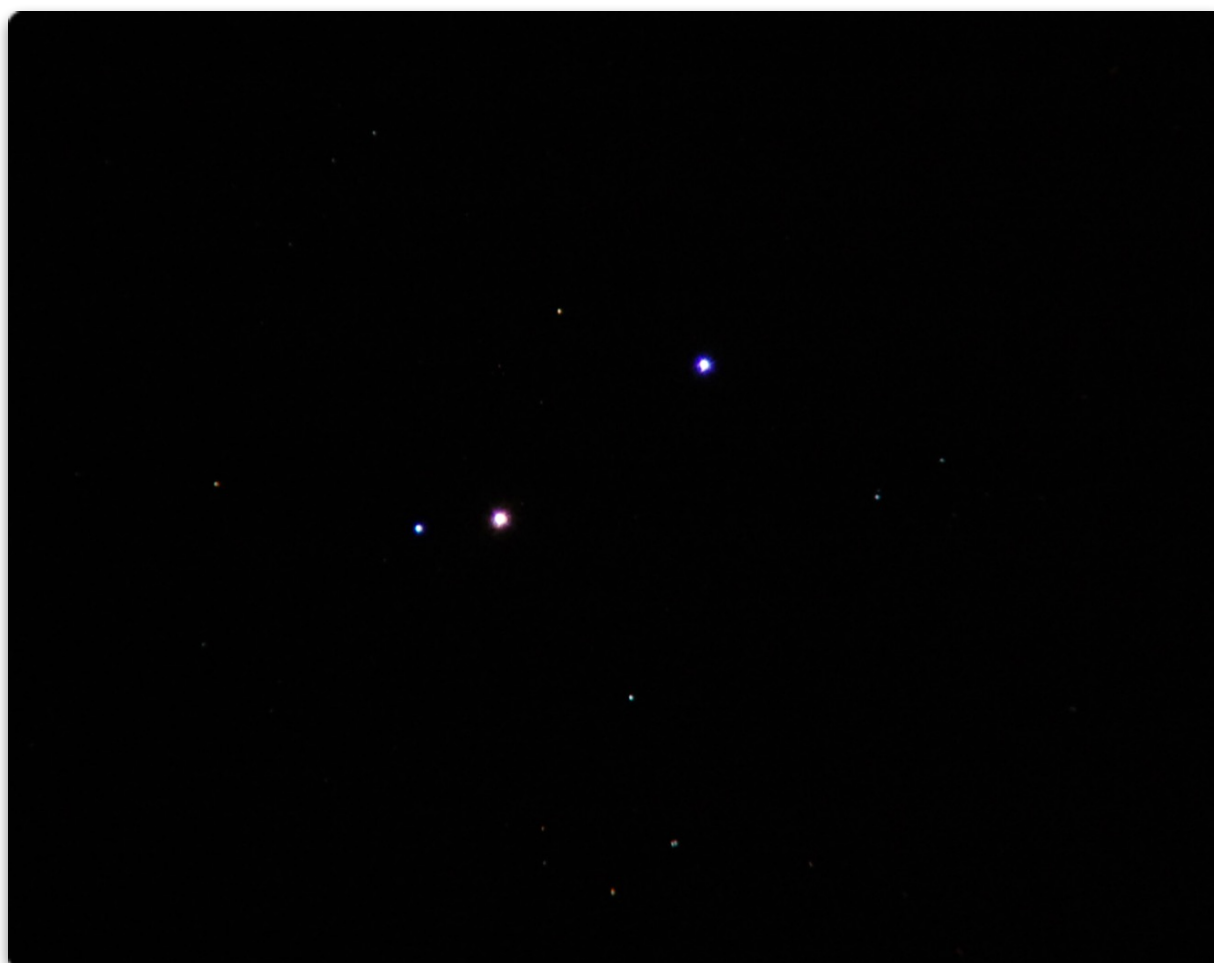


η Cas. Image by Greg Penner.

You might also get some enjoyment from the challenge of seeing distinct separation between very close pairs. This is the one area where good or excellent seeing conditions can make a difference by allowing you to use a high magnification eyepiece to separate an exceptionally close pair. Another area that might require excellent seeing is to observe a close pair of unequal magnitude stars in which the very bright primary makes it difficult to see a very close, but dim secondary. The best example of this is the well-known star Sirius which shines at magnitude -1.5 and has a companion only 7 arcseconds away at magnitude 8.5.



Mizar & Alcor in UMa (where the handle of the Big Dipper bends). Mizar is the brighter one (that is actually a tight double) on the lower right. Image by Greg Penner.



31 Cyg. Image by Greg Penner.

The images I have included in this article were all taken through my 90mm refractor on a partly cloudy night with a waxing crescent Moon. You don't have to have a large telescope with pristine dark skies to view these objects. If you haven't viewed many double stars yet, I hope you will be inspired to take a break from the Messier list and observe these celestial gems.

Ed.: I'd like to take a moment to welcome and thank BMACer Greg Penner for helping us with our club newsletter! Jason is taking a break from his article. Greg will focus (!) on more specific astronomical topics to help all of us understand what's out there for us to observe.

Ed.: An additional double star chart can be downloaded and used for free from **Taki's Star Atlas website**. An example can be seen within this article. There are all sorts of great charts and astro-aids there.

The Queen Speaks

Robin Byrne



Happy Birthday Mae Jemison



his 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.

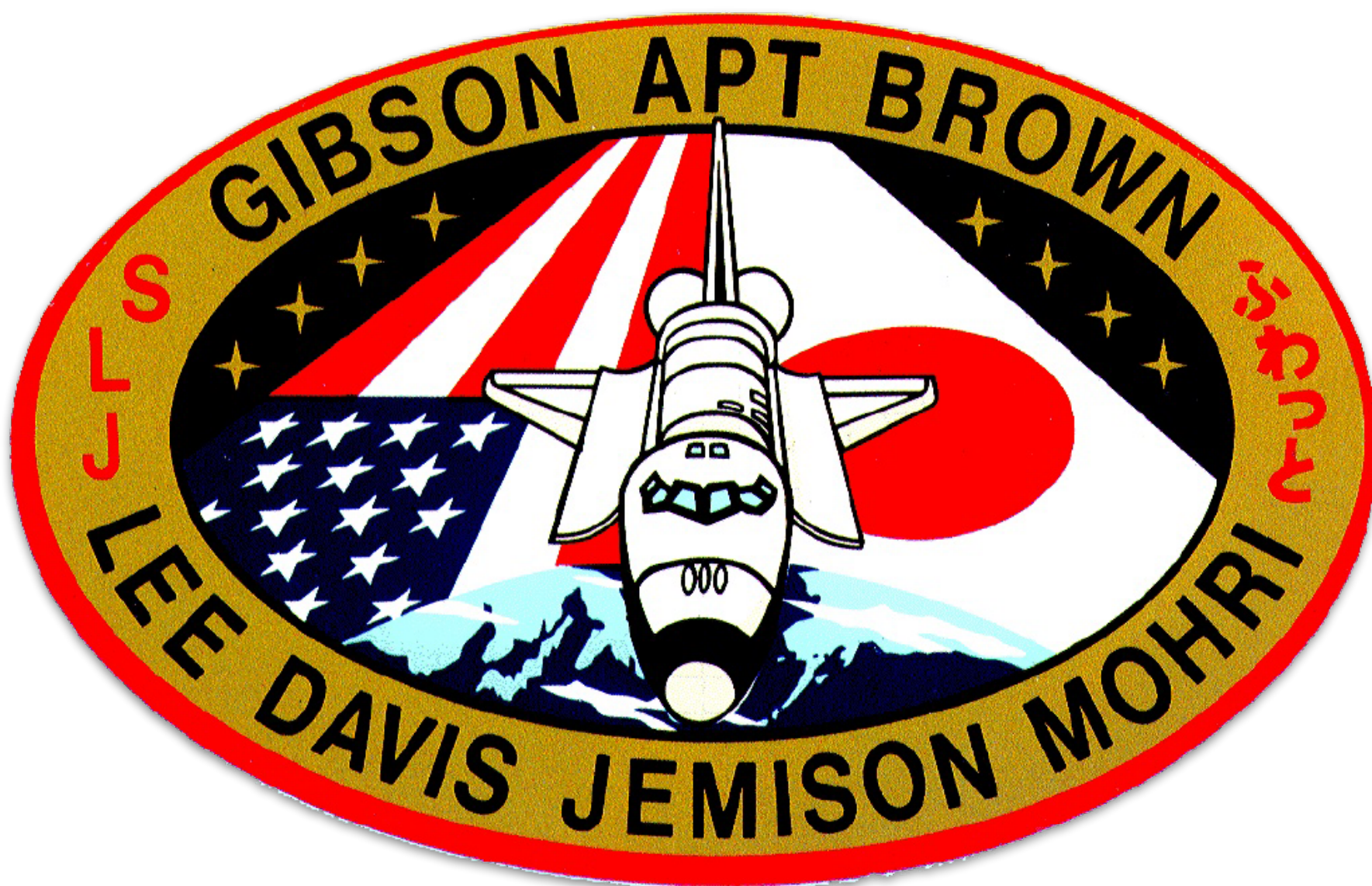
Mae graduated from high school in 1973 at the age of 16 and began her college career at Stanford University. While her young age would seem like a hindrance, that was nothing compared to being one of the few black students in her science classes and the discrimination she received from her professors. 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.



Mae Carol Jemison (born October 17, 1956) is an American engineer, physician and NASA astronaut. She became the first black woman to travel in space when she served as an astronaut aboard the Space Shuttle Endeavour. Taken on 1 July 1992. Image from NASA.

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.

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.



Mission patch for STS-47. Image from NASA.

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 2,000 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.



Mae Jemison is an engineer, physician and former NASA astronaut. In this image, she looks out the aft flight deck ports on Space Shuttle Endeavour's STS-47 mission in 1998. She was the first African American woman in space.

Jemison was selected for the astronaut program in June 1987. On her first flight, she was the science mission specialist on STS-47 Spacelab-J. The mission, which was a cooperative one between the U.S. and Japan, included 44 life science and materials processing experiments. Jemison was a co-investigator on the bone cell research experiment flown on the mission. In completing her first space flight, Jemison logged 190 hours, 30 minutes, 23 seconds in space. Image from NASA.

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 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](#)

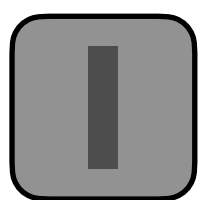
Alexander, Kerri Lee. **"Mae Jemison." National Women's History Museum. 2019.**

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

The Space Place - NASA Night Sky Network

David Prosper

Weird Ways to Observe the Moon



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.

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 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. View the directions [here](#).



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 with a five inch main objective.

Depending on your equipment, a Sun Funnel can project 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.

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.

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**. 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 there.

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** to find local clubs, events, and more!



International OBSERVE
THE **MOON** NIGHT 2021

SATURDAY **OCTOBER 16TH**



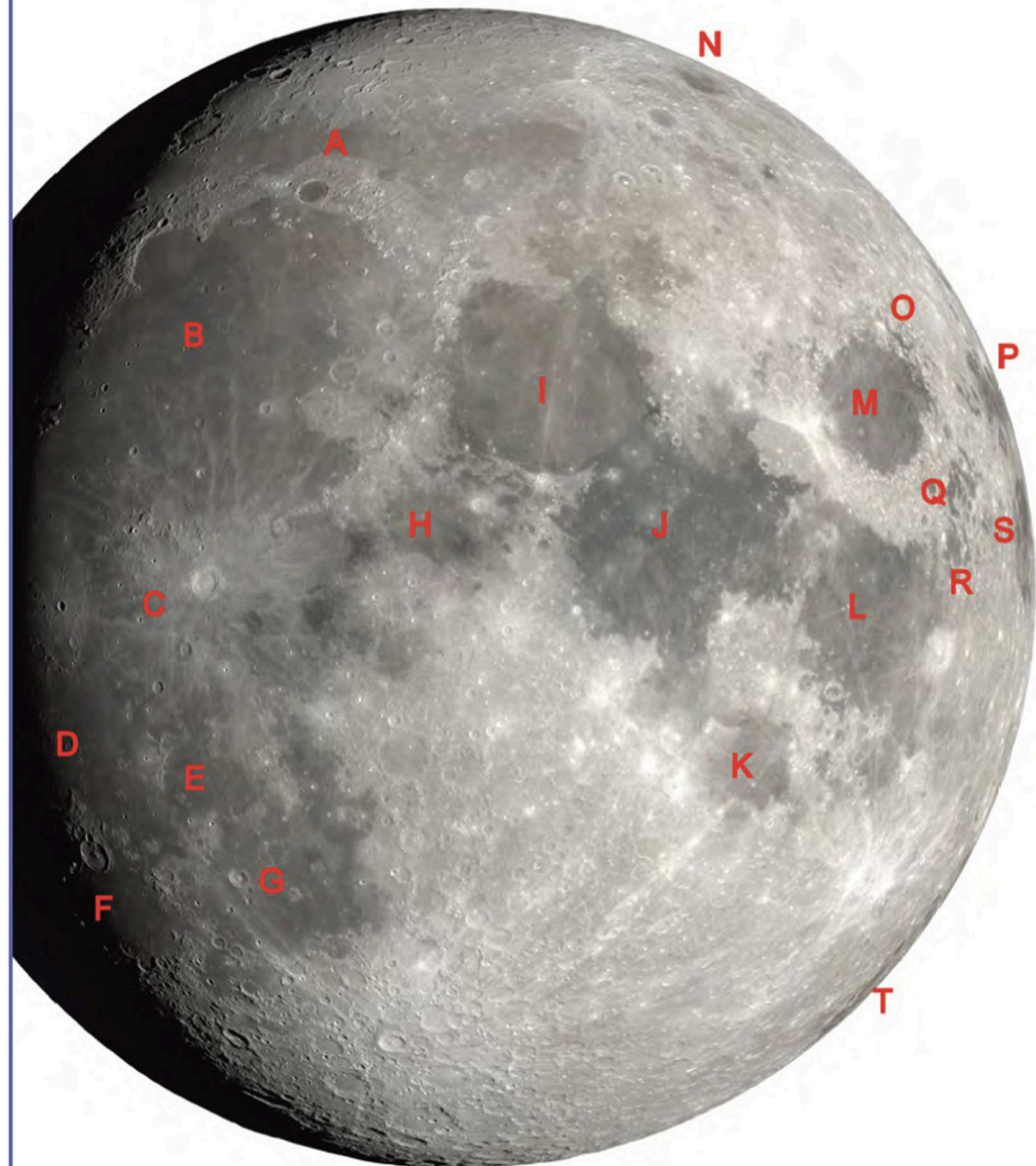
**NORTHERN HEMISPHERE MOON MAP WITH
LUNAR MARIA (SEAS OF BASALT)**

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 Nectaris (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)

MOON.NASA.GOV/OBSERVE

#ObserveTheMoon

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" (maria) labeled, but you can download both this map and one for Southern Hemisphere observers. This image is just page one of the entire document!

BMAC Calendar & More



Calendar:



MAC Meetings:

- **BMAC meetings will be held on Zoom until further notice.**
- Friday, October 1, 2021 - 7p - Via Zoom - Social time 30m before and after meeting. Topic TBA.
- Friday, November 5, 2021 - 7p - Via Zoom? - Social time 30m before and after meeting. Topic TBA.
- Friday, December 3, 2021 - 7p - Via Zoom? - Social time 30m before and after meeting. Topic TBA.
- Friday, February 4, 2022 - 7p - Via Zoom? - Social time 30m before and after meeting. Topic TBA.
- Friday, March 4, 2022 - 7p - Via Zoom? - Social time 30m before and after meeting. Topic TBA.
- Friday, April 1, 2022 - 7p - Via Zoom? - Social time 30m before and after meeting. Topic TBA.
- ? - Friday, May 6, 2022 - 7p - Via Zoom? - Social time 30m before and after meeting. Topic TBA. May be cancelled if we have Astronomy Day 2022.



unWatch:

- **Cancelled until further notice.**
- Every clear Saturday & Sunday - 3p-3:30p - March-October - On the Dam
 - View the Sun safely with a white-light & H α view if clear.; Free.
 - You must have completed the Park Volunteer Program in order to help with the public program. If you have, and have been trained, please show up at least 30 minutes prior to the official start time.



tarWatch:

- **Cancelled until further notice.**
- October 2 & 9, 2021 - 7:30p
- October 16, 23, 30 & November 6, 2021 - 7p
- November 13, 20 & 27 - 6p
 - View the night sky with large telescopes at the observatories. If poor weather, an alternate live tour of the night sky will be held in the planetarium theater.; Free.
 - You must have completed the Park Volunteer Program in order to help with the public program. If you have, and have been trained, please show up at least 30 minutes prior to the official start time.



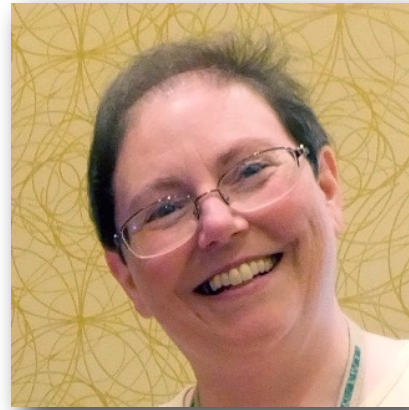
pecial Events:

- **All special events are cancelled until further notice.**
- **BMAC Dinner - January 2022 - Day TBD - 6p?**
 - BMACers gather to have a nice meal at a restaurant.
- **Astronomy Day - May 7, 2022 - 1p-4p; 8:30p-9:30p**
 - Come help share the fun of astronomy with the public. There will be tables with different themed topics plus solar and night viewing.
- **Annual Club Picnic - July 2022 - Day TBD - 6p?**
 - Site location will be sent directly to full BMAC members. BMACers and their families are welcome to enjoy an evening of astronomy-themed games and activities along with a potluck dinner and observing.
 - **Please bring a dish to share and bring your own chair.**
- **StarFest 2022 - November 4, 5 & 6, 2022**
 - Our 37th annual astronomy convention / star gathering for the Southeast United States. Three days of astronomy fun, 5 meals, 4 keynote speakers, unique T-shirt, and more!
 - **Pre-registration by Oct. 14, 2022 with full payment is mandatory for attendance. Sorry, no walk-ins nor "visits."**
 - MeadowView Marriott special hotel rate.
 - **StarFest Link**

Regular Contributors:



William Troxel



Robin Byrne



Greg Penner



Adam Thanz

William is the current chair of the club. He enjoys everything to do with astronomy, including sharing this exciting and interesting hobby with anyone that will listen! He has been a member since 2010.

Robin Byrne has been writing the science history column since 1992 and was chair in 1997. She is an Associate Professor of Astronomy & Physics at Northeast State Community College (NSCC).

Greg Penner is a semi-retired architect living in the Tri-Cities area since 2018. He has enjoyed astronomy since childhood when he received a “department store telescope” and viewed Saturn for the first time. He has been a member since 2018.

Adam Thanz has been the BMAC Newsletter Editor for all but a small number of issues since 1992. He is the Planetarium Director at Bays Mountain Park and an astronomy adjunct instructor at NSCC since 2000.

Connection:

Bays Mountain Astronomy Club:

- 853 Bays Mountain Park Road; Kingsport, TN 37650
- (423) 229-9447 - [Park Site](#) - [Club Site](#)
- Newsletter edited by [Adam Thanz](#)

Dues:

- Dues are supplemented by the Bays Mountain Park Association and volunteerism by the club. As such, our dues are kept at an extremely low cost.
- \$16 / person / year
- \$6 / each additional family member
- Note: if you are a Park Association member (which incurs a separate, additional fee), then a 50% reduction in BMAC dues are applied.
- Dues can be paid in many ways. For renewals, you will be sent an e-mail with an invoice and a direct link to pay online. You can also pay by mail, over the phone or in person at the gift shop.

Chapter Background Image Credits:

- **Cover image of Southern Milky Way by Adam Thanz.**
 - Sony A7ii with Zeiss Batis 2.8/18 lens, f/2.8, 8 sec., ISO 6,400, August 9, 2020.
- **Table of Contents image of Comet NEOWISE (C/2020 F3) by Adam Thanz**
 - Sony A7ii with Sony FE 2.8/90 Macro G OSS lens, f/2.8, 8 sec., ISO 4,000, July 15, 2020.
- **Cosmic Reflections image of the Summer Triangle area of the Milky Way by William Troxel.**
 - Image captured July 23, 2016.
- **BMAC Notes painting of the Moon with moon glow by Christa Cartwright.**
 - Painting based on a photograph of the Moon Christa captured July 2020.
- **Stellar Observations image of Crescent Nebula by David Reagan.**
 - This image was taken with a 140mm refractor in his suburban backyard using an AstroPhysics 900 mount, 8.7 hours of 5 minute Ha and OIII subexposures, combined in AstroPixelProcessor as an HOO image and processed in Lightroom and Photoshop. Image captured in 2021.
- **The Queen Speaks image of a solar halo by Robin Byrne.**
 - iPhone 7, June 8, 2020.
- **The Space Place - NASA Night Sky Network image of the Rho Ophiuchi cloud complex by Brandon Stroupe.**
 - Canon 6D with Canon 2.8/70-200mm lens, f/2.8 @200mm, 20 x 120 sec. exposures, ISO 1,000, stacked in Deepsky Stacker, processed in Adobe Photoshop CC, Skywatcher Star Adventure mount, September 19, 2015.
- **BMAC Calendar & More image of the Moon by Greg Penner.**
 - iPhone shooting through a 9mm eyepiece and 12.5" Truss Tube Dobsonian @212x.
- **All background images used with permission by their authors.**