The Bays Mountain Astronomy Club Newsletter

Table of Contents

Table of Contents	2
Cosmic Reflections	3
BMAC Notes	5
Sky News from the Astronomical League	6
Stellar Observations	13
August Delights!	14
The Queen Speaks	26
Happy Birthday Milton Humason	27
The Space Place - NASA Night Sky Network	32
Super Blue Sturgeon Moon	33
BMAC Calendar & More	39
Calendar:	40
Regular Contributors:	43
Connection:	44
Chapter Background Image Credits:	45

Cosmic Reflections

William Troxel - BMAC Chair



reetings fellow BMACers!

Adam here. William was unable to write this month's article, so I'm helping out. I hope those that attended the club picnic had a great time sharing.

StarFest is shaping up. There will be a short delay in releasing the registration forms as we've been overly busy these last many months. You're hearing it here first: The theme is Sky Tales - Telling the stories of the sky through the world's cultures. We've got some great keynote speakers lined up and will have the usual excellence in meals and activities.

The August 4 meeting will be in the planetarium theater and will highlight a planetarium program and also include Show & Tell. If you have something(s) to share, please bring it(them)! Do you have some new goodie? A new book or website you discovered? Maybe you've learned a new technique in taking astrophotos or using your telescope? Please share!

See you soon!

BMAC Notes

Sky News from the Astronomical League

Τ

he Astronomical League has a plethora of educational content to help you learn and enjoy the night sky more. The following inserts are just a tiny

bit of what they provide.

Navigating the mid August Night Sky



Navigating the mid August night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the June evening sky.
- **3** To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- **4** High in the East lies the summer triangle stars of Vega, Altair, and Deneb.

Binocular Highlights

- A: On the western side of the Keystone glows the Great Hercules Cluster.
- B: Between the bright stars Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- **D:** Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift. **E:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
- . The three westernmost stars of Cassiopera's will point south to MST, the Andromeda Galaxy, a fuzzy ova

Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.

Navegando por el cielo nocturno de Agosto



- 1 Haz una línea hacia el norte desde las dos estrellas en la punta de la Osa Mayor. Pasa por Polaris, la estrella polar.
- 2 Siga el arco del mango del tazón de la Osa Mayor, continúa hacia Arturo, luego continúa hacia Espiga.
- 3 Dibuja una línea desde Arturo a Vega. Un tercio del camino se encuentra "La Corona del Norte". Dos tercios de esa distancia llevan a la "piedra angular de Hércules." Se necesita un cielo oscuro para ver estas dos configuraciones estelares tenues.
- **4** En lo alto del este se encuentran las tres estrellas brillantes del Triángulo de verano: Vega, Altair y Deneb.

Puntos destacados con binoculares

A: En el lado occidental de la Piedra Angular brilla el Gran Cúmulo de Hércules. B: Entre las brillantes estrellas Antares y Altair, se esconde un área que contiene muchos cúmulos de estrellas y nebulosas. C: Casi a la mitad de la distancia entre Altair y Vega, Brilla la "Percha," un grupo de estrellas que describe un perchero. D: Recorre la Vía Láctea en busca de un número asombroso de destellos tenues y bahías oscuras, incluido La Gran Grieta. E: Las tres estrellas más occidentales de las "W" de Casiopea apuntan hacia el sur hasta M31, la Galaxia de Andromeda, un óvalo "borroso."



Traducción al español por Dr. Salvador Aguirre

www.astroleague.org/outreach; Duplicación permitida y fomentada para toda distribución gratuita. Liga Astronómica

If you can see only one celestial event this August, see this one.



The full occultation event on Aug. 24 of Antares by the moon occurs for the central part of the US. Both coasts will not see the complete event. For disappearance and reappearance times in your area, visit the International Occultation Timing Association webpage:

http://lunar-occultations.com/iota/bstar/0824zc2366.htm



Start looking in the southwest shortly after sunset on August 24. Watch the moon slowly approach Antares, then suddenly block it. Binoculars will give better view.



Occultations demonstrate the moon's eastward orbital motion as Earth's rotation causes it to move in a westward arc across the night sky.

ASTRONOMICAL LEAGUE Double Star Activity



Encuentra al brillante Altair, el miembro del sureste del Triángulo de Verano. Luego ubique el asterismo "Tetera" de Sagitario. Úsalos para formar un triángulo rectángulo con Beta Capricorni como vértice del ángulo recto.



Alpha Cap

What's Up, Doc? [†] August 2023 (Eastern Daylight Time)

Dr. Aaron B. Clevenson, Observatory Director, Insperity Observatory

This document presents those objects are visible this next month for many Astronomical League Observing Programs. If you are working on a more advanced program, I assume you are tracking where your objects are all the time. It concentrates on the common and starter level programs. This is based on 9 PM Eastern Daylight Time at about 39° North Latitude (Washington DC).

Naked-Eye Clubs

Meteors – any night, any time, anywhere, the darker the sky the better.

Shower	Duration	<u>Maximum</u>	<u>Type</u>
Southern Delta Aquarids	7/21 to 8/23	7/30 after midnight	MAJOR (ZHR: 16)
Perseids	7/13 to 8/26	8/13 @ midnight to 3 AM	MAJOR (ZHR: 100)
Orionids	8/25 to 11/19	10/22 after midnight	MAJOR (ZHR: 15)
Alpha Capricornids	7/8 to 8/10	8/1 & 8/2	Moderate (ZHR: 5)
Aurigids	8/29 to 9/4	9/1	Moderate (ZHR: 6)
Kappa Cygnids	8/6 to 8/31	8/17	minor (ZHR: 3)
July Pegasids	6/30 to 8/3	7/10	weak (ZHR: < 2)
Eta Eridanids	7/31 to 8/17	8/5	weak (ZHR: < 2)
Beta Perseids	7/24to 8/20	8/7	weak (ZHR: < 2)
Northern Delta Aquarids	8/8 to 9/1	8/20	weak (ZHR: < 2)
August Gamma Cepheids	8/22 to 9/1	8/28	weak (ZHR: < 2)

Constellation Hunter, Northern Skies (and some Southern Skies) – any night, any time, anywhere, the darker the sky the better.

Last Chance this cycle: Ursa Major, Leo Minor, Coma Berenices, Virgo. Transit: Ursa Minor, Draco, Hercules, Corona Borealis, Serpens, Ophiuchus, Scoprius. New arrivals: Lacerta, Cygnus, Pegasus, Capricornus, Sagittarius.

Binocular Clubs

Binocular Messier – Monthly highlights include:

Easy – 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16, 17, 18, 22, 23, 24, 25, 27, 29, 39, 52, 55, 92, 103. Medium – 14, 19, 28, 40, 49, 53, 62, 63, 64, 80, 81, 82, 83, 94. Hard – 9, 26, 51, 54, 56, 71, 75, 97, 101, 104, 106. Big Binoculars – 58, 59, 60, 61, 69, 70, 72, 84, 85, 86, 87, 88, 89, 90, 99, 100, 102, 107, 108, 109.

Deep Sky Binocular – Monthly highlights include (by Astronomical League numbers): 1, 3, 4, 5, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60.

The Astronomical League now offers a total of 9 Binocular Certifications. They include the Solar System and Lunar.

Other Clubs

Messier

In addition to those listed under Binocular Messier, check out: 21, 57, 73, 91, 98.

Caldwell

1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 26, 27, 29, 30, 32, 33, 34, 35, 36, 37, 38, 42, 45, 47, 52, 55, 57, 66, 68, 69, 75, 76, 78, 81, 82.

Double Star (by Astronomical League numbers):

1, 4, 7, 9, 10, 12, 13, 14, 15, 17, 18, 22, 26, 29, 31, 35, 36, 37, 38, 39, 41, 43, 44, 45, 46, 47, 48, 50, 51, 52, 54, 56, 57, 58, 60, 62, 63, 64, 66, 67, 68, 69, 70, 71, 72, 74, 84, 86, 87, 88, 90, 91, 93, 94, 96, 97.

Other Clubs (of the Solar System)

Solar System – These are the tasks that can be done this month:

Sun – Any clear day is a good time to get those sunspots.

Sunset is 2003 mid-month.

Venus, Jupiter, and Uranus are too close to the Sun or are morning objects.

Moon:

The Maria requirement can be done any time the moon is visible. Look before 8/8, and after 8/22 for the fullest views.

The Highlands requirement can be done at the same time.

The Crater Ages requirement is best done on 8/21 or 8/22.

The Scarps requirement is best done on 8/23.

Occultations occur all the time, the bright ones can be found on the internet. Objects disappear on the East side of the moon.

Mercury is in Leo and sets at 2123 at mid-month.

Mars is in Leo and sets at 2240 at mid-month.

Asteroids – Course Plotting and Measuring Movement requirements can be done at any time on any asteroid. Ceres is in Virgo and is up all evening mid-month.

Saturn is in Aquarius and rises at 2255 at mid-month. All requirements can be done when Saturn is visible: markings, moons, etc.

Neptune is in Pisces and rises at 2334 mid-month.

Pluto is in Sagittarius and is up all evening mid-month.

Lunar

Key timings are indicated below:

New, 8/15 4 days, 8/19 7 days, 8/22 10 days, 8/25 14 days, 8/29 Old moon in new moons arms – before 0038 on 8/19, ~10 % illuminated. (72 hr > New) New moon in old moons arms – after 0038 on 8/13, ~10 % illuminated. (72 hr < New) Waxing Crescent – before 0038 on 8/18, ~4 % illuminated. (48 hr > New) Waning Crescent – after 0038 on 8/14, ~4 % illuminated. (48 hr < New)

Astronomical Events this Month:

- 8/2 Lunar Perigee
- 8/6 Jupiter at Western Quadrature
- 8/8 Eta Eridanids Meteor Shower
- 8/9 Mercury at Greatest Eastern Elongation
- 8/9 Mercury at Dichotomy
- 8/13 Perseid Meteor Shower
- 8/13 Venus at Inferior Conjunction

- 8/15 Uranus at Western Quadrature
- 8/16 Lunar Apogee
- 8/17 Kappa Cygnids Meteor Shower
- 8/22 Mercury is Stationary
- 8/27 Saturn at Opposition
- 8/28 Uranus is Stationary
- 8/30 Lunar Perigee
- * Although these clubs are not detailed in this "What's Up Doc?" handout, you can get information on many of their objects by using the "What's Up Tonight, Doc?" spreadsheet (version 4.1). To get your copy, talk to the Doc, Aaron Clevenson, by sending an email to aaron@clevenson.org. It is also available on the club website.

⁺ - "What's Up Doc?" is used with permission from Warner Bros. Entertainment Inc.

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Insperity Observatory, 2505 S. Houston Avenue, Humble, TX: www.humbleisd.net/observatory

Stellar Observations

Greg Penner

August Delights!



fter an early summer of smoky skies due to Canadian wildfires, August brings with it the promise of celestial wonders to enjoy! If you are able to get to some dark skies, some of this month's sights will be even better appreciated. The August highlights include the summer version of the Milky Way galaxy riding high in the sky, the annual Perseid meteor shower, an occultation of the bright star Antares

by the Moon and the return of Saturn to the night sky.

This month nightfall is coming about 30 minutes sooner than mid-summer, so by 9:30p you can begin scanning the sky with binoculars or a telescope to enjoy the objects visible within the plane of the Milky Way high overhead. If you have large aperture binoculars (or a telescope with at least a 3 degree field of view) and a fairly dark sky, you might be able to see the North America Nebula (NGC 7000) and Pelican Nebula (IC 5070) located just east of Deneb in the constellation Cygnus. An Ultra-High Contrast filter might help the nebulae pop into view.

These nebulae are the visible portions of one large hydrogen cloud separated by a dark band of dust. The ESA's Gaia spacecraft measured a distance to the nebula of about 2,590 light-years, which is about twice as far away as the Orion Nebula.



Cygnus with N. America Nebula noted - from Stellarium

 NGC 7000 (North America Nebula), IC 5067/5070 (Pelican Nebula), and LDN 935

 AUG 05, 2008 • 06:00 UT

 15 X 70 Oberwerk Binoculars

 Sketch by Jeremy Perez © 2008

Sketch illustrating N. America Nebula view in binoculars - by Jeremy Perez

Moving south along the Milky Way, you will find the distinctive shape of Scorpius, the Scorpion. The hooked tail of Scorpius is a prominent feature with numerous deep sky objects, but since it is fairly low on the horizon, these objects can be difficult to see due to atmospheric interference.



Scorpius - Stellarium image with objects annotated

Higher up in the head of Scorpius, we can find some interesting targets to view. The bright star Antares (Alpha Scorpii) is known as "the heart of the Scorpion" due to its bright red appearance. Only about 1 degree to the west of Antares is the impressive globular cluster M4. At only 7,200 light years away, M4 is the nearest globular cluster to Earth. Viewing this cluster with a telescope at a high enough magnification to keep Antares out of the field of view should give a fine view as a fuzzy ball of light with many individual stars visible.



M4 - by ESO Imaging Survey

About halfway between Antares and Beta Scorpii is another globular cluster that provides a good contrast to M4. M80 is a much more distant globular at about 32,000 light years distant. Viewing these two objects through the telescope eyepiece should provide an interesting comparison of a nearby vs. more distant globular cluster.



M80 - by HST

After viewing M80, continue on to the beautiful double-star Beta Scorpii. This bright blue-white pair is composed of a +2.6 magnitude primary separated by 14 arcseconds from the +4.5 magnitude secondary.



Beta Scorpii - from Stellarium

Just over 1 degree to the east of Beta Scorpii is Nu Scorpii, a multiple star system composed of a pair of tight double stars. The AB pair is separated from the CD pair by 41 arcseconds. A and B are separated by only 1.3 arcseconds, while C and D are separated by 2.4 arcseconds. Steady seeing and high magnification will be required to separate the components of these tight pairs!



Nu Scorpii - sketch by D. Blane showing high magnification view through telescope

On the night of August 24th, direct your attention back to Antares to watch the Moon occult this bright star fairly low toward the southwest horizon around 10:45p. The view should be fascinating to see such a bright star apparently wink out of existence as the dark edge of the half lit Moon covers it up! Antares will reemerge from behind the bright limb of the Moon around 11:40p very low on the horizon about 30 minutes before setting. Since this event occurs fairly low in the sky, how viewable the entire event is will be very dependent on local sky conditions such as haze/clouds, high ridges and trees and light pollution. Scouting out a good location on a previous night would be a good idea.

The other big event in August will be the annual Perseid meteor shower. This year the peak is expected to be the pre-dawn hours on August 13th. The Moon will not be a concern this year, as it will only be an 8% illuminated crescent rising around 4a. Even though the peak will be early on the morning of the 13th, watching late at night on the 12th should also provide good views. Looking toward the east/northeast will be the best direction for the late night viewing. The Perseid shower is known to produce a good number of fireballs (meteors of magnitude -3 or brighter)! This shower's "parent" is Comet Swift-Tuttle, which is more than three times larger than Halley's Comet. This could explain why there are more fireballs, since larger comets release more large fragments.



Perseid meteor shower radiant - from Sky and Telescope

Finally, throughout the month of August we will see the gradual return to the night sky of everyone's favorite planet, Saturn. The planet reaches opposition on August 27th, by which time the globe will be 19" in diameter, and the rings will be 43". Over the last few years, the tilt of the rings has gradually been narrowing and at opposition they will be tilted at just 9°. By March of 2025 the rings will be edge-on. With the rings becoming less prominent, take the opportunity to view some of Saturn's surface features, such as the North Equatorial Belt and North Polar Region. A 6" telescope will likely be needed to see these features, possibly with the help of a dark blue filter.



Saturn and moons - from Stellarium

August will be a great month for looking up at the night sky with quite a variety of objects and events to see. Hopefully, we will have some clear skies at the right time to enjoy these August delights!

The Queen Speaks

Robin Byrne

-

Happy Birthday Milton Humason



his month, we look at the contributions made by a man who often gets overshadowed by his more famous colleague.

Milton Humason was born at Dodge Center, Minnesota on August 19, 1891. At the age of 14, he was sent to Mount Wilson for summer camp. He managed to convince his parents to give him a year off from school so that he could spend more time there. Humason ended up spending much more than a year at Mount Wilson, and he never returned to school.

In his late teens, Humason got a job as a mule driver for the teams that hauled the materials up to Mount Wilson for the construction of the observatory being built at that location. It was on this job that he met, and eventually married in 1911, the daughter of the observatory's engineer. With the new responsibility of a wife to care for, Humason left the mule team to get a job as a foreman on a ranch. However, his love of Mount Wilson didn't keep him away for long.

In 1917, a job opened up for a janitor at the observatory, which Humason took. He also worked as a busboy in the dining hall for a while. It was clear from the questions he asked of the observatory staff that Humason had a natural intelligence, despite his lack of formal education. Recognizing this, in 1919, George Hale, the Director of the Observatory, appointed Humason to the scientific staff. Humason went on to work at both Mount Wilson and Palomar Observatories from 1919 to 1954.

In 1928, Humason began to work closely with Edwin Hubble. The goal of their research was to establish whether there was a relationship between the redshift of a galaxy (how fast it is moving away from us) and the distance to the galaxy. The problem was that getting a good measure of the redshift from galaxies that were incredibly faint (too faint to be seen with the eye) would not be an easy task. Long exposure photographs of the galaxies gave their positions relative to brighter nearby stars. Humason would center on the bright star, then offset the telescope by just the right amount so that it should be pointed at the galaxy, even though he could not visually confirm it. To produce the spectrum, some galaxies required exposures over several nights. Most of this work fell to Humason.

These observations led to Edwin Hubble's discovery that the distance to a galaxy is directly proportional to the velocity of recession. This relationship is now known as Hubble's Law.

Humason spent most of his career measuring the red shift of over 1,000 galaxies. He also applied the techniques he developed for photographing faint galaxy spectra to recording the spectra of supernovae, faint blue stars, and to old, faint novae. In 1947, Humason was given the position of Secretary of the Observatories, which included working with public relations, and taking care of some of the administrative duties. In 1950, Humason was awarded an honorary PhD by the University of Lund in Sweden. Milton Humason died in Mendocino, California on June 18, 1972.



Milton Humason. Credit: Image courtesy of the Observatories of the Carnegie Institution for Science Collection at the Huntington Library

It is a shame that Hubble's Law is only named after Edwin Hubble. Although it was Hubble that proposed the series of observations that confirmed his theory, it would not have been possible to have conclusive proof without the meticulous observations made by Milton Humason. Often it is the case that great discoveries would not have been made were it not for an outstanding assistant. So let's honor all the unsung scientific heroes as we say, Happy Birthday Milton Humason!

References:

Humason, Milton Lasell (1891-1972) by David Darling

<u>The Lake County Astronomical Society Web Page Article by Jay</u> <u>Bitterman</u>

SAO/NASA Astrophysics Data System; Milton Laser Humason Obituary

The Space Place MASA Nigh Network

Vivian White

Super Blue Sturgeon Moon



n August 1st, catch a full Moon rising in the east just 30 minutes after sunset. We are seeing the entire sunlit side of the Moon as it is nearly (but not quite)

in line with the Sun and Earth. The Farmers' Almanac calls this month's Moon the "Sturgeon Moon," for the time of year when this giant fish was once abundant in the Great Lakes. Cultures around the world give full Moons special names, often related to growing seasons or celebrations.

As the Moon rises later and later each night after full, the bright sunlit part appears to get smaller or "wane" - we call this a waning gibbous Moon. About a week later, on August 8th, we see only one half of the Moon alight. At this phase, the Moon rises around midnight and sets around noon. Have you ever seen the Moon in the daytime? You may notice this phase towards the southwest in the morning sky. Hold up a ball or egg beside it and see how the Sun lights up the same part.



Image of waning crescent Moon shown next to a ball on a stick that is lit by the Sun on the same side as the Moon, with trees and a blue sky in the background. Try this with an egg or any round object when you see the Moon during the day! Credit: Vivian White

By August 16th, the Moon has gone through its waning crescent phase and is now only showing its dark side towards the Earth. Did you know the dark side and the far side of the Moon are different? The Moon always shows the same face towards Earth due to the gravitational pull of Earth [Ed.: Tidal interactions and drag between both the Earth and the Moon during the Moon's first few thousand years], so the far side of the Moon was only viewed by humans for the first time in 1968 with the Apollo 8 mission. As the Moon orbits the Earth, the sunlit side changes slowly until the full dark side is facing us during a new Moon. When the Moon is just a small crescent, you can sometimes even see the light of an Earthshine reflecting off Earth and lighting up the dark side of the Moon faintly.

Then as the Moon reappears, making a waxing (or "growing") crescent Moon, best seen in the afternoons. By the time it reaches first quarter on August 24th, we see the other half of the Moon lit up. At this point, the Moon passes through Earth's orbit and marks the spot where the Earth was just 3 hours prior. It takes the Earth about 3 hours to move the distance between the Moon and Earth.



Earthshine as seen from the International Space Station with the sun just set -Astronaut Photograph ISS028-E-20073 was taken on July 31, 2011, and is provided by the ISS Crew Earth Observations Facility and the Earth Science and Remote Sensing Unit, Johnson Space Center The Moon on August 30th is referred to as a "Blue Moon." Blue moons are not actually blue in color of course; it refers to the second full Moon in any month. Since it takes 29.5 days to complete the cycle from full to new and back to full, most months will see only one. But occasionally, you'll fit two into one month, hence the phrase "once in a Blue Moon." We see a Blue Moon about once every 3 years on average - the next one will be in May 2026. In addition, this full Moon appears [ever so slightly] larger in the sky than any other full Moon this year - an unofficial supermoon. A supermoon appears larger than average because it is closer in its slightly elliptical orbit. The difference in apparent size between the smallest and largest full Moon is about the size difference between a quarter and a nickel held at arm's length. Even at its largest, you can always cover the whole Moon with your pinky extended at arm's length.

Follow the Moon with us this month and keep a Moon journal if you like - you may be surprised what you discover!

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 <u>nightsky</u> to find local clubs, events, and more!

BMAC Calendar & More

Calendar:



MAC Meetings:

- Friday, August 4, 2023 7p Planetarium program and Show & Tell.
- Friday, September 1, 2023 7p Topic TBA.
- Friday, October 6, 2023 7p BMACer Robin Byrne will present "Vera Rubin: The Woman and the Observatory."
- Friday, December 1, 2023 7p Topic TBA.
- Friday, February 2, 2024 7p Topic TBA.
- Friday, March 1, 2024 7p Topic TBA.
- Friday, April 5, 2024 7p Topic TBA.
- Friday, May 3, 2024 7p Topic TBA.
- Friday, June 7, 2024 7p Topic TBA.
- Friday, August 2, 2024 7p Topic TBA.



- Every clear Saturday & Sunday 3p-3:30p March-October By the Dam
 - View the Sun safely with a white-light 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:

- October 7 & 14, 2023 7:30p
- October 21, 28 & November 4, 2023 7p
- November 11, 18 & 25, 2023 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.





• StarFest 2023 - November 3, 4 & 5, 2023

- Our 38th annual astronomy convention / star gathering for the Southeast United States. Three days of astronomy fun, 5 meals, 3 keynote speakers, unique T-shirt and more!
- Pre-registration by Oct. 13, 2023 with full payment is mandatory for attendance. Sorry, no walk-ins nor "visits."
- Link for all the StarFest info including registration and hotel reservation links.

• BMAC Dinner - January 2024 - Day & Time TBD

• Look for an e-mail with the latest information.

• Astronomy Day - May 18, 2024 - 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 2024

 Date and 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.

Regular Contributors:



William Troxel



Greg Penner



Robin Byrne



Adam Thanz



obin 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).

reg Penner is a semi-retired architect living in the Tri-Cities area since 2018. He G 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.



dam 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:

B ays Mountain Astronomy Club:

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



- Dues are highly 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 Member (which incurs a separate, additional fee), then a 50% reduction in BMAC dues are applied.
- Dues can be paid in many ways. The easiest way is to pay via the CivicRec online portal. If you are a current member, please log in with your e-mail address and reset your password if you have not already done so. You can then update your membership. Here's the direct <u>link</u>. If you want to add family members, then add them via the internal link. You can also pay at the gift shop, by mail or over the phone.

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 2022.
- 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.