The Bays Mountain Astronomy Club Newsletter

July 2022

Kingsport, TN

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Cosmic Reflections

William Troxel - BMAC Chair

Greetings fellow BMACers. Believe it or not, it's already July 2022! I want to thank everyone for coming out to the in-person meeting in June. Not only did we get to meet in our old room downstairs in the Nature Center, we had an awesome turnout. I think we had a great meeting. It was Games Night. I decided to break out Astronomy Jeopardy and an astronomy word search puzzle. I have included a picture of the winners and bragging rights for the June meeting. Give a big shoutout to Jason, Olivia and Greg.

Astronomy Jeopardy was the game I was telling you about several months ago that I was trying to find that did not require access to the internet for us to bring into the club games cabinet. Everyone that shared their opinions about the meeting seem pleased with it. I heard some say that they liked it because the questions were harder. I liked this format because I felt that we could add questions and maybe even adapt it for a future meeting. Thank you everyone for playing and being at the meeting.

The Games Night winners: Greg, Olivia & Jason. Image by William Troxel.

I have set up the details for the July 2022 Club Picnic. This is a club members (and their families) only event and the details will be sent to each member personally. When you get the information and you still have any questions, I will be happy to answer one to one.

Again, thank you for coming out and I hope you enjoyed the meeting. Be on the lookout for the info on the July picnic.

Until Next time, Clear Skies.

BMAC Notes

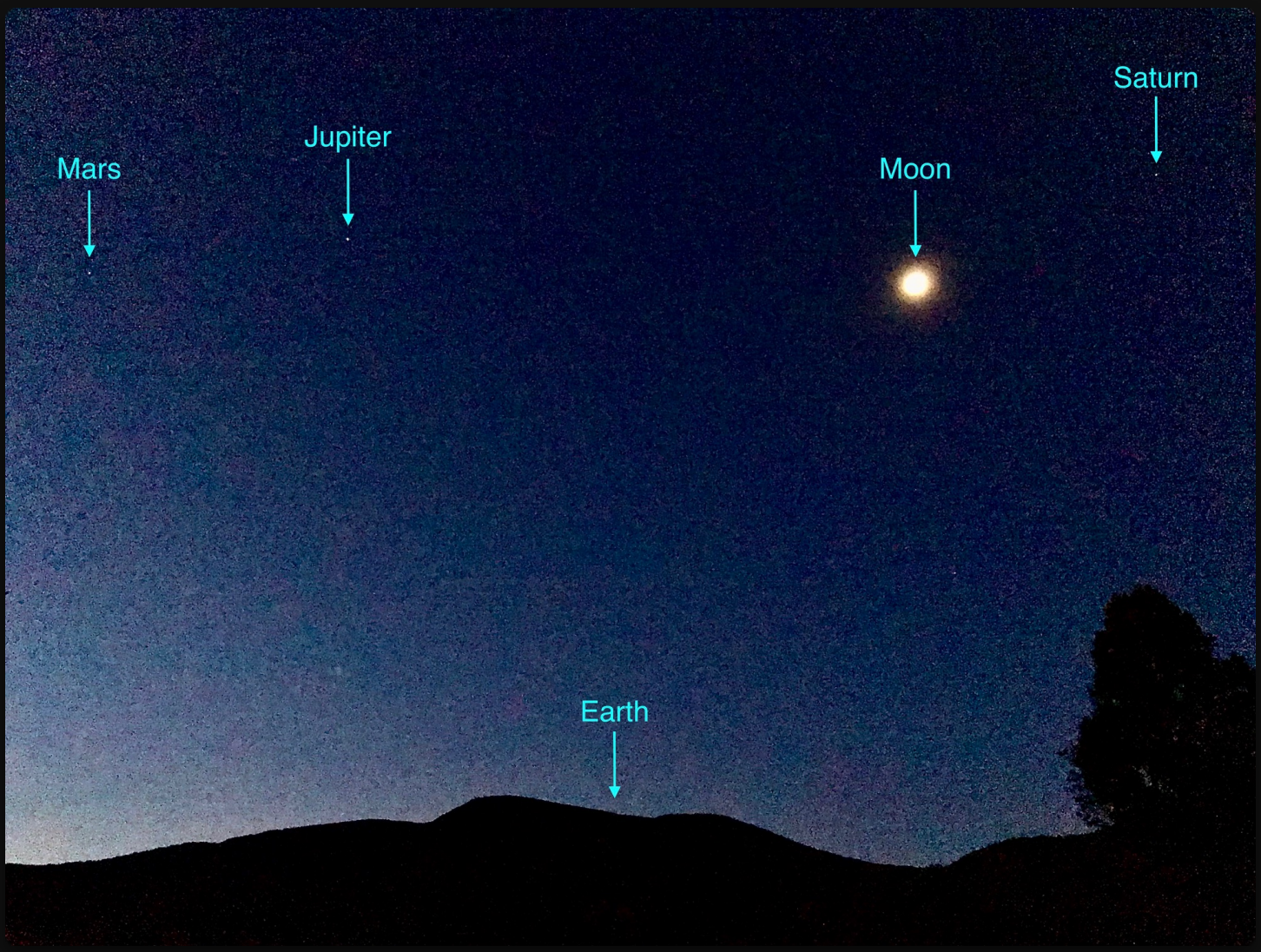
Astrophotos

Here's the first photo submission from planetarian intern Kallie Walker. She's currently an entering freshman at ETSU.

The Moon shot through a telescope and captured with a cell phone.

Planetary Lineup by Robin Byrne

Here are two images of the semi-rare apparition of seeing all the visible planets (and Moon) at one time and in order from the Sun! The two hardest parts were spotting Mercury whilst in trees and waking up at 5a to see this! Both images from an aged iPhone. Annotations by Robin.


Saturn
Jupiter
Mars
Moon
Earth

Nebulae by Jim Williams

I celebrated the first night of summer by getting a pretty good photo of the North American and Pelican Nebulae and Deneb in Cygnus.

A Canon 60D with a light pollution filter was used along with an 135 millimeter lens riding a SkyGuiderPro star tracker. Also used was a Neewer intervalometer to control the camera and took 300 exposures of 30 seconds each, stacked them in Deep Sky Stacker, and processed them in Photoshop. Image by Jim Williams.

Stellar Observations

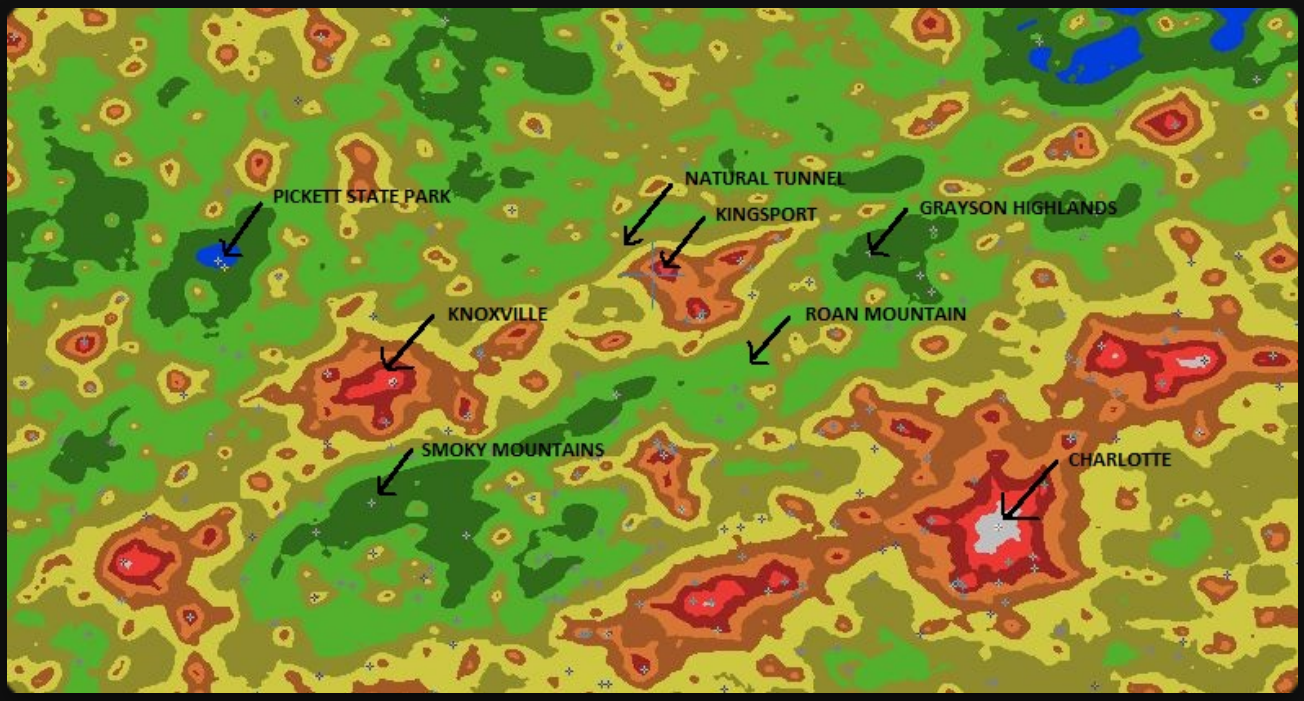
Greg Penner

Celestial Drifting

We have come to the time of year when our own Milky Way galaxy takes center stage in the night sky. This is a great time to take in the view of the entire Milky Way as it spans the summer sky. The problem that most of us face is the ever increasing light pollution creeping out into our rural areas. If we really want to appreciate the spectacular view of our home galaxy, we need to head out to some dark-sky locations. Let's take a look at some potential places that are not too far away from the Tri-Cities of East Tennessee.

My first go-to resource to find dark-sky observing sights are the clear sky charts at cleardarksky.com. At the Clear Sky Chart home page, I go to the map for Tennessee as a starting point. Since the Tri-Cities is so close to the borders of Virginia and North Carolina, I also check out the maps for those states. Familiarity with the light pollution color coding system is required to determine dark-sky locations. The color system goes from most light polluted sky to darkest sky using the colors

white, gray, various shades of red, green, blue and finally black for the darkest skies. In order to have a really nice view of the Milky Way, you should try to go somewhere at least in the greenish category. In the eastern U.S. finding a location in the black category would be difficult, but finding a blue observing site is still possible. A location in the greenish category should allow you to see structure in the Milky Way overhead and partially down toward the horizon. If you can observe in a blue location, you should be able to see the Milky Way from horizon to horizon.



*Light Pollution Map from the cleardarksky **website** and annotations by the author.*

Taking a look at the Tennessee and Virginia maps, a location in the greenish category that is publicly accessible is nearby. Natural Tunnel State Park just across the border in Virginia is in the sort of "pea-green" color, which should allow brilliant views of the Milky Way overhead and somewhat washed out down toward the horizon. Looking at the website for the park, a program called "Touring the Galaxy" is presented every other Saturday night. In this program, astronomy volunteers point out features of the night sky. Natural Tunnel is only about 30 minutes north of Kingsport and offers a nice opportunity to view the Milky Way without having to make too much of a journey. If you're feeling a little more adventurous, you could head up into some of the parks in the Appalachian mountain range like Roan Mountain in Tennessee, Grayson Highlands in Virginia, or the Great Smoky Mountains National Park. All of these locations should provide outstanding views of the Milky Way.

One Tennessee state park in particular is high on my list of dark-sky sites I would like to visit. Pickett CCC Memorial State Park and Pogue Creek Canyon State Natural Area have been

named Silver-tier International Dark Sky Parks by the International Dark-sky Association. Pickett/Pogue has a color designation in the blue category and is only about a 3½ hour drive from the Kingsport area. According to the park website, they have an Astronomy Field that is available for use by the public year round.

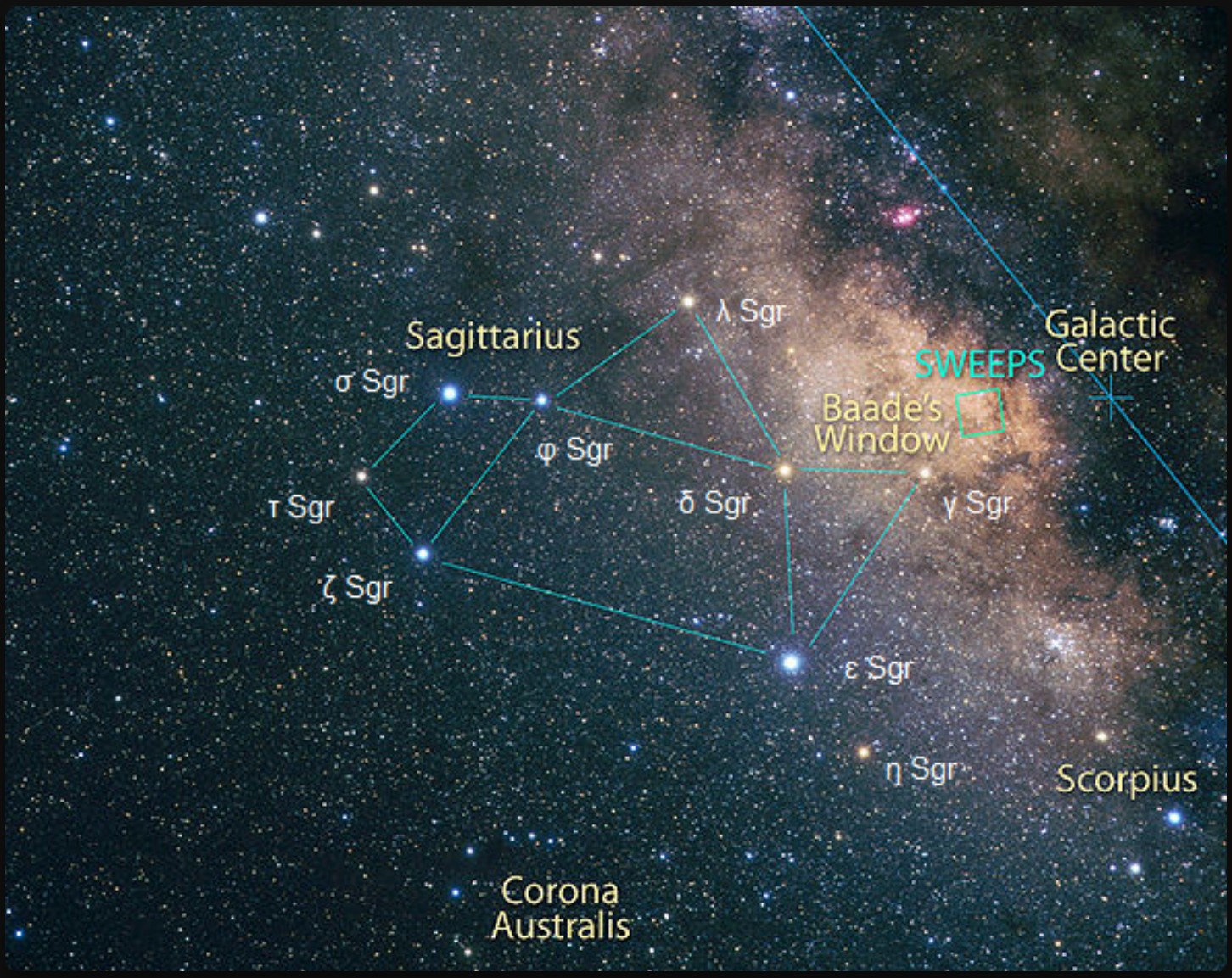
Before you head out to your chosen dark-sky location, you still need to check on your sky condition. The clear sky charts give information regarding cloud cover, seeing conditions, and transparency. Also, sometimes wildfires can cause smoky or hazy conditions. And of course, you want to go at a time that bright moonlight will not interfere. Very early in July will be your first opportunity. The Moon is just past new, but the Milky Way is not very high overhead until midnight - 1 a.m. The last week of July the Moon will once again be in its new phase, and the Milky Way will be higher in the sky before midnight.

Summer Milky Way - from Stellarium with annotations by the author.

Great Rift - NASA image in public domain (found on Wikipedia)

Once you are at your dark-sky location gazing up at the splendor of the Milky Way, you can try to identify some distinguishing features of our galaxy. Almost directly overhead you should be able to identify Cygnus the Swan, also known as the Northern Cross. A noticeable dark patch should be running through the Milky Way in the direction that the swan is "flying." This dark patch is the Great Rift, interstellar dust that is hiding the light of stars beyond it. If you have binoculars, use them to sweep down this dark lane as it passes by the bright star Altair, and soon you will come to a bright concentration of stars known as the Scutum Star Cloud. As you are scanning the myriad stars in this cluster with your binoculars, you should notice a particularly bright concentration of stars forming a V shape. This is the Wild Duck Cluster or M11, discovered by Charles Messier in 1764. Continue scanning with your naked eye down the "river of stars" toward the horizon, and you should notice the Teapot asterism, which is part of the constellation Sagittarius. You can imagine steam coming out of the spout of the teapot, which in reality is the Large Sagittarius Star Cloud. In this direction of the

sky, you are looking toward the very center of our galaxy. If you use your binoculars, you will see a mind-blowing number of stars and nebulae including the Lagoon Nebula and Trifid Nebula.



Large Sagittarius Star Cloud - NASA image in public domain (found on Wikipedia)

The vast majority of people in the United States no longer have any view of the Milky Way. Hopefully, this summer you will make your way to a dark sky location and gaze upon the wonder of our home galaxy and then share your enthusiasm with friends and family so they might also re-connect with the night sky.

The Queen Speaks

Robin Byrne

Book Review: Sputnik - The Shock of the Century

My latest selection from the bookshelf archive is Sputnik - The Shock of the Century by Paul Dickson. As the title implies, the book chronicles the launch of the first Sputnik satellite and the reaction of the world.

If the early days of space exploration are new territory for you, the book does a very thorough job of discussing all aspects related to the early satellites. Starting with the global cooperation surrounding the International Geophysical Year (IGY), which provided the incentive to put scientific satellites into Earth orbit, through to the launch of Sputnik, the reaction of the world, on to Sputnik 2, and, finally, the successful satellite launches by the U.S.

For someone like me, who has read a lot of books about the history of both the U.S. and Soviet space programs, there wasn't much in this book that was new. One part I found interesting,

because I hadn't seen much about it before, was related to President Eisenhower and his priorities related to the space program. He was much more interested in satellites as a means of spying on the Soviets, rather than as scientific instruments. He also didn't want anyone to know about his spy satellite plans. This is why he was so set upon keeping the rockets being developed for military purposes (like spying) separate from those being used for the civilian satellite program - a decision that led to the Soviets being the first to put a satellite into orbit.

Another section that was surprising dealt with how the scientific community reacted to the launch. Sputnik went into orbit at the same time that an international conference related to the IGY was taking place. When the announcement was made at the conference of the launch, everyone applauded and congratulated the Soviet scientists for their success. Even outside of the scientific community, most people were just impressed with the achievement, rather than scared. It wasn't until some time had passed, and the news media began to relate alarmist messages, that the full repercussions began to

sink in. Only then did people started to worry about what the Soviets could do from the vantage point of space.

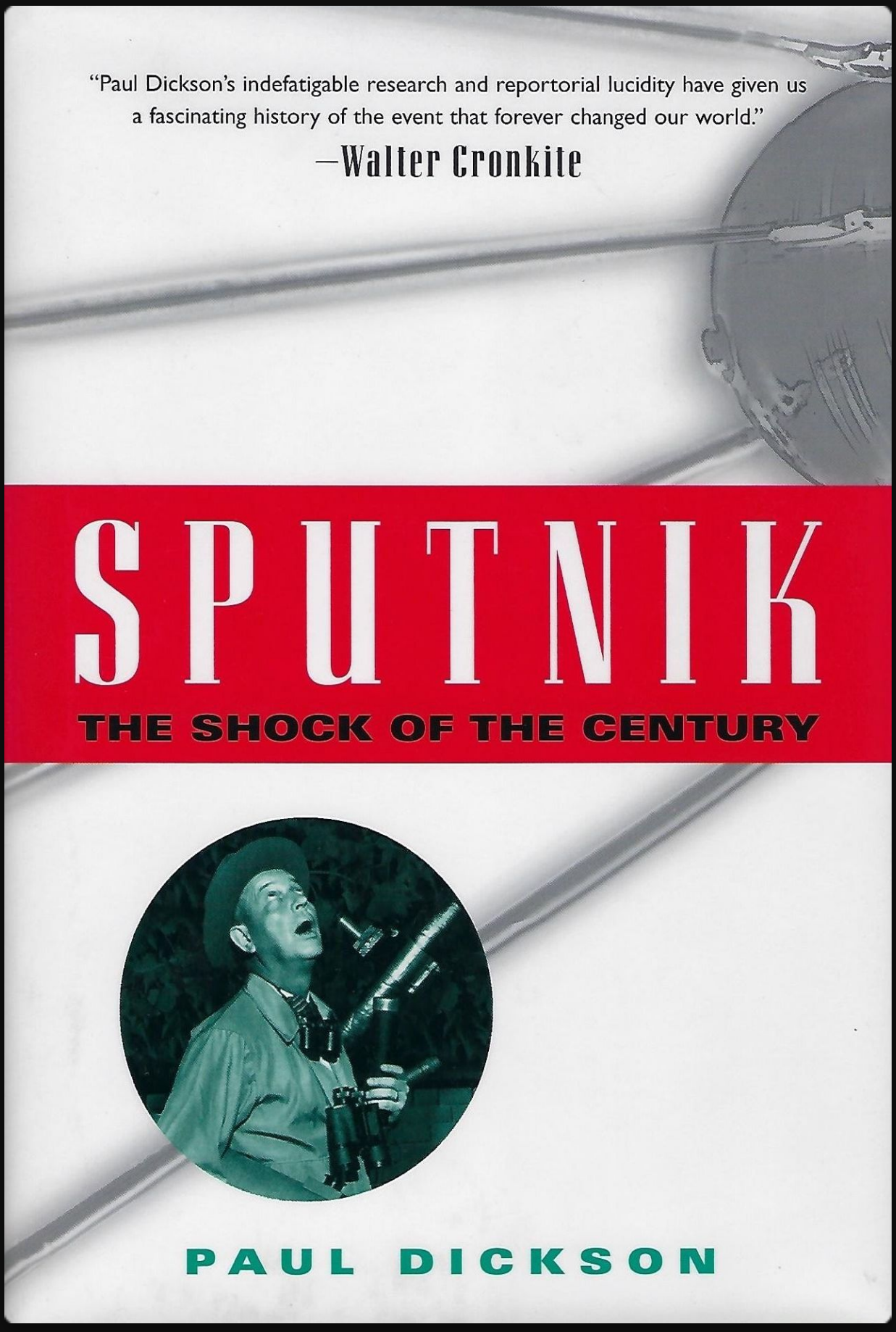
Sputnik being assembled.

Paul Dickson clearly researched this topic thoroughly. That approach ended up being both a pro and a con. On the positive side, the book is incredibly informative, with many quotes and examples for every subject area discussed. However, it also made for some tedious reading. For me, this type of book is usually a quick, fun read. Unfortunately, I found Sputnik - The Shock of the Century to be a bit of a slog, despite being very educational.

In my final analysis, I would say that if you are looking for a good source for researching the topic of first satellites, then Sputnik - the Shock of the Century by Paul Dickson is a good choice. However, if you are looking for an entertaining, fun book to read, sadly, I would suggest passing this one up.

References:

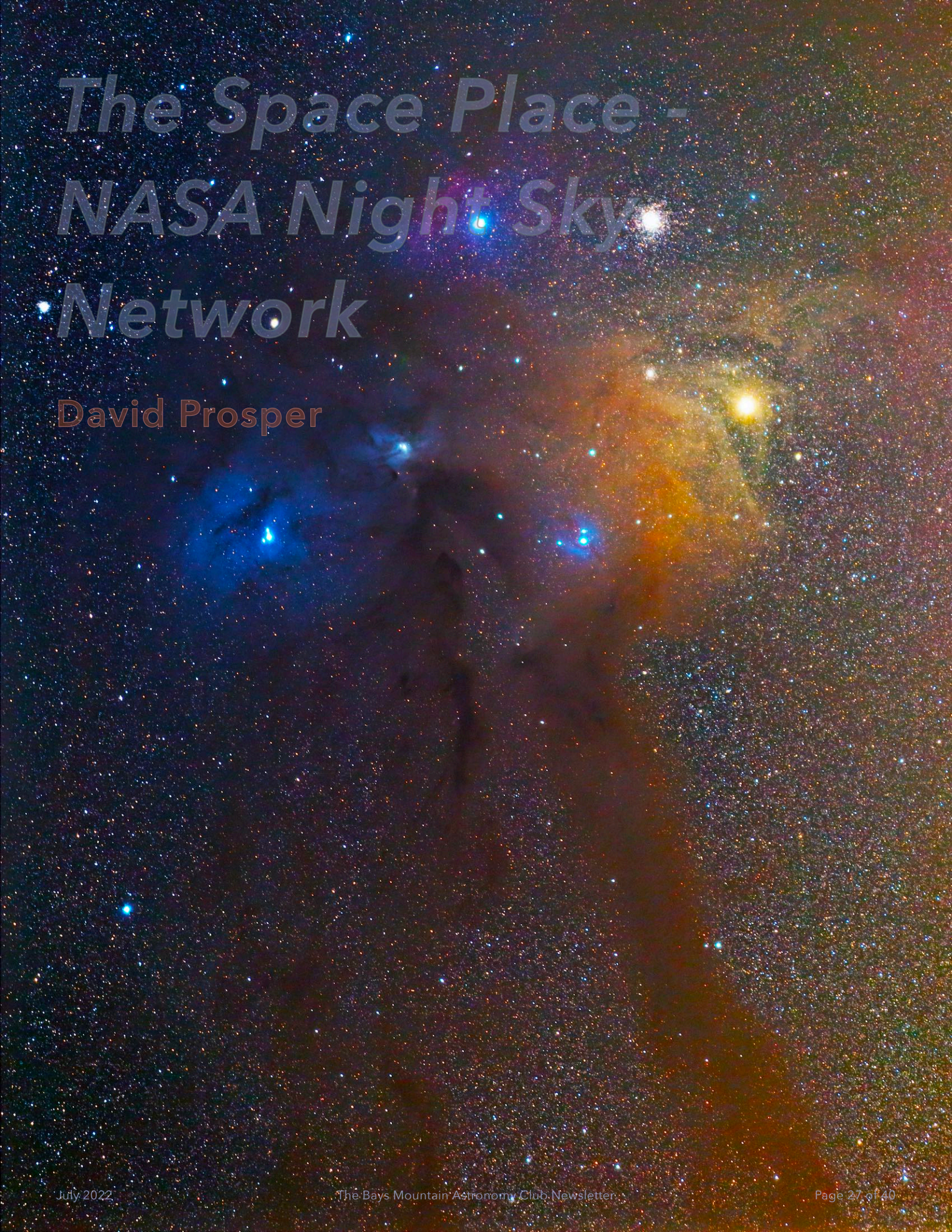
Sputnik - The Shock of the Century by Paul Dickson, Walker Publishing Company, 2001



The cover to Sputnik - The Shock of the Century by Paul Dickson

The Space Place - NASA Night Sky Network

David Prosper



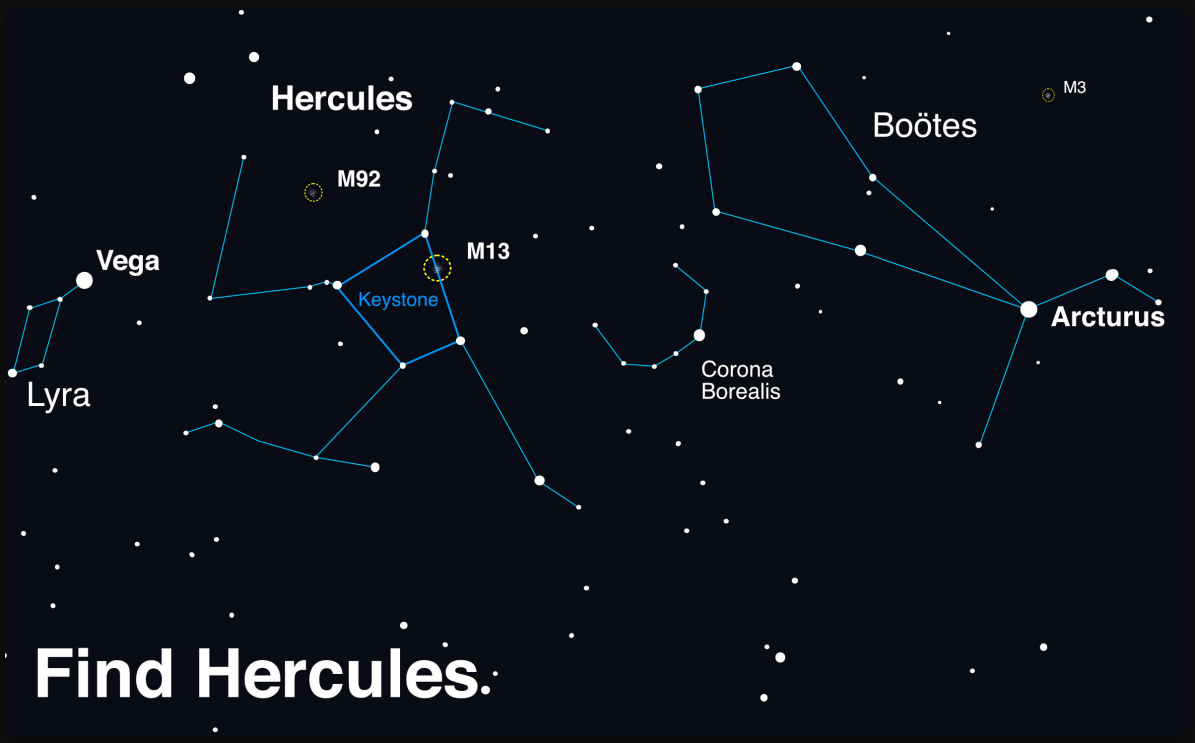
Find Hercules and His Mighty Globular Clusters

ercules is one of the standout heroes of Greek mythology, but his namesake constellation can be surprisingly hard to find - despite being one of the largest star patterns in our night skies! Once you find the stars of Hercules, look deeper; barely hidden in the space around his massive limbs and “Keystone” asterism are two beautiful globular star clusters: M13 and M92!

Since the constellation itself is relatively dim but bordered by brighter constellations, you can find the stars of Hercules by looking between the bright stars Vega and Arcturus. They are fairly easy to identify, and we have tips on how to do so in previous articles. Vega is the brightest star in the constellation Lyra and one of the three stars that make up the Summer Triangle (See the June 2020 article: Summer Triangle Corner: Vega). Arcturus is the brightest star in the constellation Boötes, and can be found by “arcing to Arcturus” from the handle of the

Big Dipper (See the May 2021 article: Virgo's Galactic Harvest). You may be able to find Hercules's "Keystone" asterism first; this distinct pattern of four stars is traditionally shown as the torso of the great hero, though some illustrators prefer marking the Keystone as the head of Hercules. What pattern do you see in the stars of Hercules?

Sky Map: Find Hercules



Look up after sunset during summer months to find Hercules! Scan between Vega and Arcturus, near the distinct pattern of Corona Borealis. Once you find its stars, use binoculars or a telescope to hunt down the globular clusters M13 and M92. If you enjoy your views of these globular clusters, you're in luck - look for another great globular, M3, in the nearby constellation of Boötes. Image created with assistance from ***Stellarium****.*

Globular star clusters appear “fluffy,” round, and dense with stars, similar to a dandelion gone to seed, in contrast to the more scattered and decentralized patterns of open clusters. Open clusters are generally made up of young stars that are gradually spreading apart and found inside our Milky Way galaxy, while globular clusters are ancient clusters of stars that are compact, billions of years old, bound to each other and orbit around our galaxy. Due to their considerable distance, globular clusters are usually only visible in telescopes, but one notable exception is M13, also known as the Great Cluster or the Hercules Cluster. During very clear dark nights, skilled observers may be able to spot M13 without optical aid along the border of the Keystone, in between the stars Zeta and Eta Herculis - and a bit closer to Eta. Readily visible as a fuzzy “star” in binoculars, in telescopes M13 explodes with stars and can fill up an eyepiece view with its sparkling stars, measuring a little over half the diameter of a full Moon in appearance! When viewed through small telescopes, globular clusters can appear orb-like and without discernible member stars, similar in

appearance to the fuzzy comae of distant comets. That's why comet hunters Edmund Halley and Charles Messier discovered and then catalogued M13, in 1714 and 1764 respectively, marking this faint fuzzy as a "not-comet" so as to avoid future confusion.

While enjoying your view of M13, don't forget to also look for M92! This is another bright and bold globular cluster, and if M13 wasn't so spectacular, M92 would be known as the top celestial sight in Hercules. M92 also lies on the edge of naked-eye visibility, but again, binoculars and especially a telescope are needed to really make it "pop." Even though M92 and M13 appear fairly close together in the sky, in actuality they are rather far apart: M13's distance is estimated at about 25,000 light years from Earth, and M92's at approximately 27,000 light years distant. Since M13 and M92 appear so close together in our skies and relatively easy to spot, switching between these two clusters in your scope makes for excellent star-hopping practice. Can you observe any differences between these two ancient clusters of stars?

M92 by Hubble

Composite image of the dense starry core of M92 imaged in multiple wavelengths. While your own views of these globular clusters won't be nearly as crisp and detailed, you might be able to count some of its member stars. How far into their dense cores can you count individual stars? Credits: ***ESA/ Hubble & NASA; Acknowledgment: Gilles Chapdelaine.***

Globular clusters are closely studied by astronomers for hints about the formation of stars and galaxies. The clusters of Hercules have even been studied by NASA's space telescopes to reveal the secrets of their dense cores of hundreds of thousands of stars. Find their latest observations of globular clusters - and the Universe - at **nasa.gov**.

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!

BMAC Calendar & More

Calendar:

MAC Meetings:

- Friday, August 5, 2022 - 7p - Discovery Theater - Topic TBA.
- Friday, September 2, 2022 - 7p - Discovery Theater - Topic TBA.
- Friday, October 7, 2022 - 7p - Discovery Theater - Topic TBA.
- Friday, December 2, 2022 - 7p - Discovery Theater - Topic TBA.

SunWatch:

- **Cancelled until further notice. Soon to return.**
- Every clear Saturday & Sunday - 3p-3:30p - March-October - On the Dam
  - View the Sun safely with a white-light & Hα 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.

StarWatch:

- October 1 & 8, 2022 - 7:30p
- October 15, 22, 29 & November 5, 2022 - 7p
- November 12, 19 & 26, 2022 - 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:

- **Annual Club Picnic - July 2022**
  - 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 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 Association 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 **link**. If you want to add family members, then add them via the internal link. 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 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.**