The Observer

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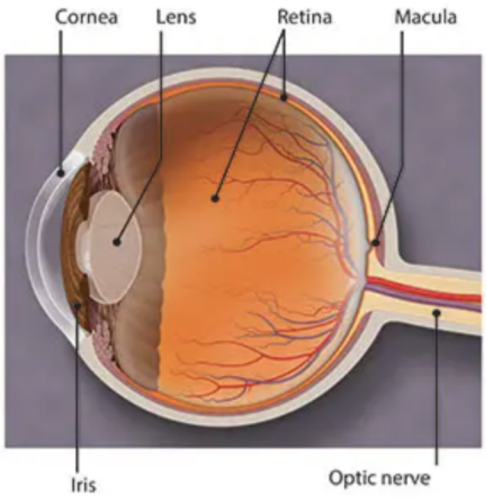
The first thing I would like to talk about is a correction I need to make from my previous article on safely observing the Sun. I talked about the lens of the eye and the cornea as if they were the same thing. This is not correct. It is the lens of the eye that is replaced with an artificial version during cataracts surgery, not the cornea. The diagram below should clear up any confusion regarding the anatomy of the eye.



Now on to this month's article.

Recently I acquired an old astronomy text book from 1913 and read through some of it. Obviously, it is old enough to predate any satellite, space telescope, or mission away from Earth (manned or otherwise). Less obvious was that it also predates Edwin Hubble's observations of the expansion of the Universe or Einstein's theory of General Relativity, which would not be published for another 2 years (and even longer to gain broad acceptance in the scientific community).

The dawn of the 20th century marked a significant epoch in human understanding of the universe. As we look back to 1913, astronomy was on the precipice of groundbreaking discoveries and paradigm

shifts that would alter our cosmic perspective. The field, at this point, was characterized by painstaking observations, innovative theories, and the first steps towards understanding the scale and nature of the cosmos.

The Milky Way and Beyond

In 1913, the prevalent cosmological model suggested that the Milky Way Galaxy, our cosmic home, made up the entire universe. A prevalent school of thought among astronomers held that the various nebulae - faint, cloud-like structures observable in the night sky - were merely distant objects contained within the boundaries of the Milky Way. Certain ones, such as the spiral nebula M33, were even thought to be the birth of new star systems. However, this perception was about to face a significant challenge.

On the threshold of this crucial period, the seeds of change were being sown by astronomers like Vesto Slipher. Working at Lowell Observatory, Slipher had started his work on the spectrographic study of the light from these nebulae, and in 1912, he had made the first measurements of their velocities, discovering that most were moving away from us at high speeds. These measurements would later form a cornerstone of extragalactic astronomy and cosmology, setting the stage for the revelation that the universe was much larger than the Milky Way and that it was expanding, an idea that would be fully realized with Edwin Hubble's observations in the 1920s.

Stellar Evolution and Nuclear Fusion

Our understanding of the processes powering the stars was also rather limited in 1913. While the concept of stellar evolution and nuclear fusion was still underdeveloped, the pieces were starting to come together. In 1901, Ernest Rutherford and Frederick Soddy had laid the foundation of radioactivity, hinting at the vast energy stored within atoms. It wouldn't be until the 1920s and 1930s that scientists like Arthur Eddington would propose and substantiate the theory that nuclear fusion processes powered stars, giving a comprehensive explanation for their immense and enduring luminosity. Until then, the prevailing theory of where the Sun’s energy came from was that it converted potential energy into thermal energy as the gasses that make up the sun slowly collapsed towards the center, heating up in the process (recall the Ideal Gas Law PV=nRT).

The Solar System

The solar system's layout was fairly well established by 1913, with all the planets known today already discovered - Neptune being the last identified in 1846. Pluto, once considered our ninth planet, was not discovered until 1930, and was eventually reclassified as a dwarf planet in 2006.

In 1913, however, the mystery of the solar system was not so much in its layout but in its formation. The currently accepted model of solar system formation, the nebular hypothesis, had been proposed in different forms by philosophers and scientists like Immanuel Kant and Pierre-Simon Laplace in the 18th century. However, it wasn't until the latter half of the 20th century that the model was significantly refined and widely accepted.

Mars

In 1913 the changes in the Martian season were well documented with detailed sketches by many astronomers. The landscape and geography seemed to change fairly consistently with the seasons. As Martian summer approached, dark features would slowly migrate from the poles towards the equator and along regular paths.

It was known that it must have been very cold on the red planet and with the low pressure from a thinner atmosphere the probability for the existence of liquid water was miniscule at best. However, despite this, the author admits that the most probable explanation for the observations was the presence of an intelligent civilization that would use a canal system to direct water from the polar ice caps as they melted during the summer to irrigate vegetation.

Einstein's Theory of Relativity and Its Implications

In 1913, Albert Einstein was working intensively on his groundbreaking theory of General Relativity, a radical new description of gravity which he would not publish until 1915. This theory would later be confirmed by observations of starlight bending around the sun during a solar eclipse in 1919.

Einstein's theory would fundamentally reshape our understanding of the universe, leading to predictions and discoveries of phenomena such as black holes, gravitational waves, and the expansion of the universe. However, in 1913, these concepts were still on the horizon, waiting to alter forever our understanding of the cosmos.

Conclusion

The year 1913 was a period of transition in the field of astronomy. The discipline was on the brink of a scientific revolution, with new tools, theories, and observations poised to challenge existing cosmological paradigms. The early 20th century would ultimately see an astronomical renaissance, expanding our vision of the universe from a single galaxy to an ever-expanding cosmic sea of galaxies, and from a static universe to one where space and time were interwoven and malleable.

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Society news tidbit: I will be ordering a new batch of business cards for the society. If you would like to grab a few for outreach or to hand to people (friends, family, coworkers, etc.) please feel free to do so.

Ad Astra!

Mike Huber

Lehigh Valley Amateur Astronomical Society (LVAAS)

MEGAMEET

Pulpit Rock Astronomical Park

August 11-13, 2023

We may re-schedule depending on weather; please check lvaas.org for updates

EVENT INFORMATION

MegaMeet is LVAAS's annual barebones star party without vendors, speakers, or registration fees. Members in good standing of regional amateur astronomy clubs are invited to attend. MegaMeet attendees can either come for the evening observing sessions or tent camp for the weekend. Access to the site, behind a locked gate, is via 2 miles of some rather steep gravel mountain road. The road is in good shape and is readily accessible for cars and light trucks. Trailers should not attempt to access the site. Camping is encouraged, but space is limited. Due to limited capacity at the site **LVAAS nonmembers will be required to register for this event**. You can register for the event by emailing duffmeister@rcn.com with your name, and number of people in your party, indicating if you plan to camp or just observe. Questions can be directed to the same email address.

SITE INFORMATION

Pulpit Rock Astronomical Park, or as it is commonly called, "The Rock," is a 4.3-acre mountaintop site near Hamburg, Pa that sits 1,600 feet above sea level on the Appalachian Trail. The installations and equipment at Pulpit Rock offer the serious amateur or the novice an opportunity to contribute meaningful scientific information to the astronomical community, or to simply view the splendors of the heavens from our several acres of landscaped grounds. The site was founded in the 1960's by Henry Kawecki, an industrialist from Berks County, who built the first observatory.

DIRECTIONS AND SITE ACCESS

Directions to the site can be viewed at the LVAAS website. For LVAAS nonmembers or members without keys **the locked gate will be attended on Friday August 11 from 4:00 p.m. to 7:00 p.m. and Saturday August 12 from 4:00 p.m. to 7:00 p.m.** Upon access to the site, you will receive the combination to the special gate lock used for this event and will be free to come and go until 12:00 noon on Sunday.

FOOD SERVICE

There is **no food service and no potable water** so please plan on bringing your own food and water. If you do plan on bringing your own food and cooking it yourself, you must use either a charcoal or gas grill for cooking as no open fires are permitted on site.

FACILITIES

There are **no shower facilities;** however, there is electricity and a flush toilet available on site. Please visit the LVAAS website for information on Pulpit Rock Astronomical Park.

Submitted by Tom Duff, Astroimaging Director

Via Sandy Mesics, Programs Chairperson

Upcoming LVAAS General Meeting Speakers

July: Gary A. Becker and Peter Detterline will speak on "Eclipse 2024."
August: (Pulpit Rock) Sandy Mesics will speak on the History of Pulpit Rock.
September: Charles Bracken will speak on Astroimaging.
October: John Conrad will speak on the Osiris Mission.
November; author Dava Sobel will speak topic TBA.
December (Holiday Party) Speaker is still needed for this event.
Please contact astrosandy@gmail.com if you have ideas for speakers, or would like to volunteer yourself!

Via Claudio Stabile, Scouting Activities Coordinator

Update on Claudio T's Eagle Scout project: After his project was approved by Minsi Trails Council, June was dedicated to fundraising with a $3,000 goal. Weather canceled 2 of the 4 Star Party fundraisers. The first one on June 10 brought in $360. The next one scheduled for Thursday June 29th is also forecasted with thunderstorms. Thankfully, his project has attracted a lot of support from LVAAS members, members of the community, a flea market sale and auction of his mom's bass guitar, my social media network, a grant from the Joe Sommer Memorial Golf Committee (thanks to Tom Duff's contact), and a sponsorship from the Charlie Bates Solar Astronomy Project granting him a monetary contribution and a 90mm SolarMax III solar telescope with an AVX mount, bringing his total fundraising efforts to $3,425.74. He meets with Polk Township on Monday June 26th to provide an update and request a building permit. He has also applied for a Certificate of Insurance with BSA. Thank you LVAAS members for your support!

Via Mike Huber, Society Director

Muhlenburg College is seeking applications for the role of Adjunct Professor (CTE) for the course "Introduction to Astronomy" left vacant upon the passing of our dear Judy Parker last September. Anyone interested please contact Mike for details.

Via Dave Raker, Society Librarian

Our library will be open during inventory this summer. Why not stop by and check out our new books and DVDs!

BOOKS

Fire and Ice by Natalie Starkey
The First Galaxies In The Universe by A. Loeb
The Universe Explained Heather Couper
The Last Stargazers by Emily Levesque
Fire In The Sky by Gordon Dillow
The Sirens of Mars by Sarah Johnson
Discover the Stars by Richard Berry

DVDs

Joshua Pepper*: The New Landscape of Exoplanet Discovery*
Joe Zitarelli*: Optics: Bringing Photons to Your Retina Since 1610*
Ascent: Commemorating the Space Shuttle
Journey to the Stars w/ Whoopi Goldberg
Voyager Interstellar Record

Via Earl Pursell, UACNJ Liason

UACNJ provides free public programs on-site at our Observatory in Jenny Jump State Forest, New Jersey from April through October on Saturday evenings. To view the program line-up please visit uacnj.org.

Cover Image: **M104 The Sombrero Galaxy - Imager: Thomas Duff**

This image was captured at Cherry Springs State Park, Coudersport, PA, in June, 2019.
Mount: IOptron CEM 60
Telescope: Stellarvue SVX130T
Camera: QSI 6120 12 Megapixel CCD
Processing Software: PixInsight, Adobe Photoshop, Topaz Photo AI
more

Minutes from the LVAAS General Meeting June 11, 2023

The June 2023 LVAAS General Meeting was conducted electronically using an on-line service and at our South Mountain headquarters. Approximately 55 people were in attendance.

Programs Director Sandy Mesics opened the meeting at 7:00 p.m.

Tonight's General Meeting's presentation, entitled *Optics: Bringing Photons to your Retina Since 1610* was given by society member Joe Zitarelli. Joe started the talk by discussing some basic terms, then went on to present basic anatomy and physiology of the human eye, including how this affects what we are able to see. Following this he went on to discuss how we measure apparent magnitudes as a measure of how bright objects appear to us, before moving on to a discussion of what defines absolute magnitude. He then discussed the Bortle scale of light pollution and how this affects what we can see in the night sky.

Joe then briefly talked about binoculars, the nomenclature that describes their optical characteristics, and what characteristics to consider when purchasing a pair of binoculars. He then began speaking of the different types of telescopes including refractors, reflectors and catadioptric telescopes, as well as the associated optical aberrations, as there is no perfect optical system. He went on to discuss the Airy disk, chromatic aberrations, coma, field curvature, astigmatism and spherical aberration, as well as how these aberrations are controlled or corrected. He then discussed eyepieces, their different properties, and what to consider when purchasing eyepieces.

Joe then switched to a discussion of light transmission and how it particularly applies to astroimaging. This includes what goes into the final signal sensed, what noise is, and how each part of the signal has its own inherent noise, and how this noise can be minimized. He then went into the topic of resolution, how it is defined, what factors limit resolution, and finally determining the optimal pixel size of the camera based on equipment and conditions.

After answering questions, there was a break taken at 8:25 p.m. If you missed the meeting, you're in luck; the June 2023 General Meeting was recorded and the DVD is available in our library.

The informational meeting resumed at 8:40 p.m. with committee reports.

Membership: Rich Hogg

- The following members completed their Second Readings and are now Full Members:
  Daniel Batchelor
  Louie Stine
- The following members completed their First Readings:
  William Amtmann
  Kari Fobe and Ryan Jones (family membership)
  Andy and Tori Hernandez (family membership)
  Bob Lewis
  Cedric A. Lumsden
  Kevin Patterson
  Frank Romano
  Nino Soberon
- The following members have previously completed a First Reading and are still eligible to complete a Second Reading to become full members:
  Jonathan Cuadra
  Karen Houser
  Steve and Linda Zieniewicz (family membership)
  Robert Lehman
  Michael Vila
  Chris Webb (family membership with son Johnny)
- We now have almost 400 members which is believed to be the most ever.

General Comments - Sandy Mesics

- Stargazers Meeting is held the second Friday of each month at 7 p.m. at SM. New members are encouraged to bring their equipment and a list of topics they would like to discuss.
- Our Annual Picnic and General Meeting combination is scheduled for Saturday, July 8 at 5 p.m. Volunteers are needed to help out. There will also be a swap meet where members can offer equipment for sale. The Society will provide the basics such as hamburgers, hot dogs and sodas or water. Members are asked to bring side dishes, snacks or desserts. Rain date for the meeting is Sunday July 9 at 5 p.m. Contact Bill Dahlenburg if you are willing to help.
- We still need someone to take over as Star Party Coordinator, and also someone to take over the Red Shift - our store and snack bar. Please contact director Mike Huber if you can help.

Education – Blaine Easterwood

- The book club plans to meet in the next month to discuss *Sun, Moon, Earth* in preparation for the upcoming eclipses. If members are interested they should contact Blaine.

Astro-Imaging Group – Tom Duff

- The last meeting of the group was held last night with the next meeting in 4 weeks. Meetings are held at South Mountain at 7 p.m. Check the calendar on the website for the date.
- If interested, members should join the Astroimaging discussion group on groups.io. There is a link on the Buzz page on the website. This page has been particularly active lately.
- Similarly, if you are interested in activities at Cherry Springs, members are encouraged to join the Cherry Springs io group.

Library & History – Dave Raker

- Members were reminded that there are books for sale: hardcover books are $4, softcover books are $2 and textbooks are $5.
- There are multiple DVDs available to be checked out, including the monthly presentations dating back to 2008.
- There are a pair of Darth Vader socks and an 80mm refractor telescope for sale as well.

South Mountain Maintenance – Bill Dahlenburg

- Maintenance at SM is usually done on Saturday mornings. Earl, Pete, Mike and Bill can always use help if any members are available. They will assist members needing help with equipment.

South Mountain Observatories – Mike Clark

- There is an opportunity on Saturday mornings to get trained on telescopes, and there are multiple telescopes available to rent. Contact Mike or Bill before going to SM.
- There are plans being made to have a silent auction of telescopes that have been donated at the July meeting and picnic.

Planetarium – Earl Pursell

- If any members are interested in giving Planetarium shows, let Earl know. Training takes about 90 minutes and there are premade scripts available to help.

UACNJ Representative - Earl Pursell

- The United Astronomy Clubs of NJ have Star Parties weekly on Saturday nights in NJ subject to weather. Check out their website at www.uacnj.org if interested. Talks are given at 8 p.m.

Programs For General Meetings – Sandy Mesics

- In July, Peter Detterline and Gary Becker will speak on "Eclipse 2024"
- At this time, we don't have anyone to give a talk at the August General Meeting to be held at Pulpit Rock. If no one volunteers, Sandy will give a talk on the history of Pulpit Rock.

Mega-Meet – Tom Duff

- Our annual Mega Meet, a weekend-long Star Party, was moved to Friday, August 11 through Sunday, August 13. This will be held in conjunction with the Stargazers Meeting on Friday and the Monthly General Meeting on Saturday.

Pulpit Rock Maintenance & Observatories – Frank Lyter & Ron Kunkel

- We are at the beginning of what looks to be a very active summer. Work parties, solar viewing and training on the telescopes will be available. Members are encouraged to join the groups.io for PR if interested. Please see our website for how-to.
- Getting involved with the Meteor Camera Project is encouraged. Cost is under $200. Contact Frank Lyter if you are interested.
- Ron gleefully reported that the deer poop problem seems to be under control.

Star Party Coordinator – Bill Dahlenburg

- The next Star Party is Saturday, June 24 starting at 6 p.m.
- New members are particularly encouraged to help out.

Next General Meeting:

- The July General Meeting will be the annual picnic on Saturday, July 8 at 5 p.m. with the presentation to be at 7 p.m. Rain date is Sunday, June 9 at 5 p.m.

The meeting was adjourned at approximately 9:05 p.m.

Submitted by Joe Zitarelli, Secretary

Stargazers Group

Come join the Stargazers Group!

All members are welcome regardless of experience!

New members are welcome to learn how to operate their telescopes

Experienced members can share their knowledge and socialize in a casual, relaxed atmosphere

The group's goal is to give everyone a chance to develop their night skills together regardless of experience level!

Take this opportunity to use the library and receive training on the club's scopes

Meetings will be on the 2nd Friday of every month at South Mountain Headquarters at 7 p.m. rain or shine, except for December, January, and February

If you need help with equipment please arrive before dark so there is time to work on it

We all love the night sky and look forward to sharing that with you!

Kyle Kramm

Kman10274@gmail.com

LVAAS General Meeting ~ Members' Night

Saturday, July 8 at 5 p.m. Rain date July 9 at 5 p.m.

Grady Planetarium, South Mountain Headquarters, *and on Zoom*

"ECLIPSE MANIA"

presented by

Gary A. Becker and Peter Detterline

Gary A. Becker has had a lifelong passion for astronomy, photography, and sky watching. As director for 38 years of the award-winning Allentown (PA) School District Planetarium, and currently Adjunct Professor of Astronomy at Moravian University in Bethlehem, PA, Gary has taught astronomy from the preschool to the graduate level under the electronic as well as the natural sky. An ardent traveler, Gary has hosted tours to observe and photograph comets and eclipses and has taken urban students to the Southwest to view the heavens from some of the...
*full bio at **lvaas.org***

Peter Detterlineis an avid astronomer whose interests cover a wide range of the astronomical spectrum. For thirty-five years he was the Director of the Boyertown Planetarium, where he gave programs to over half a million people. He is a recipient of the Thomas Brennan award from the Astronomical Society of the Pacific for exceptional achievement related to teaching high school astronomy. He teaches an astronomy course at Montgomery County Community College, and for teachers through the Montana Learning Center. In research he has coauthored numerous papers on eclipsing...
*full bio at **lvaas.org***

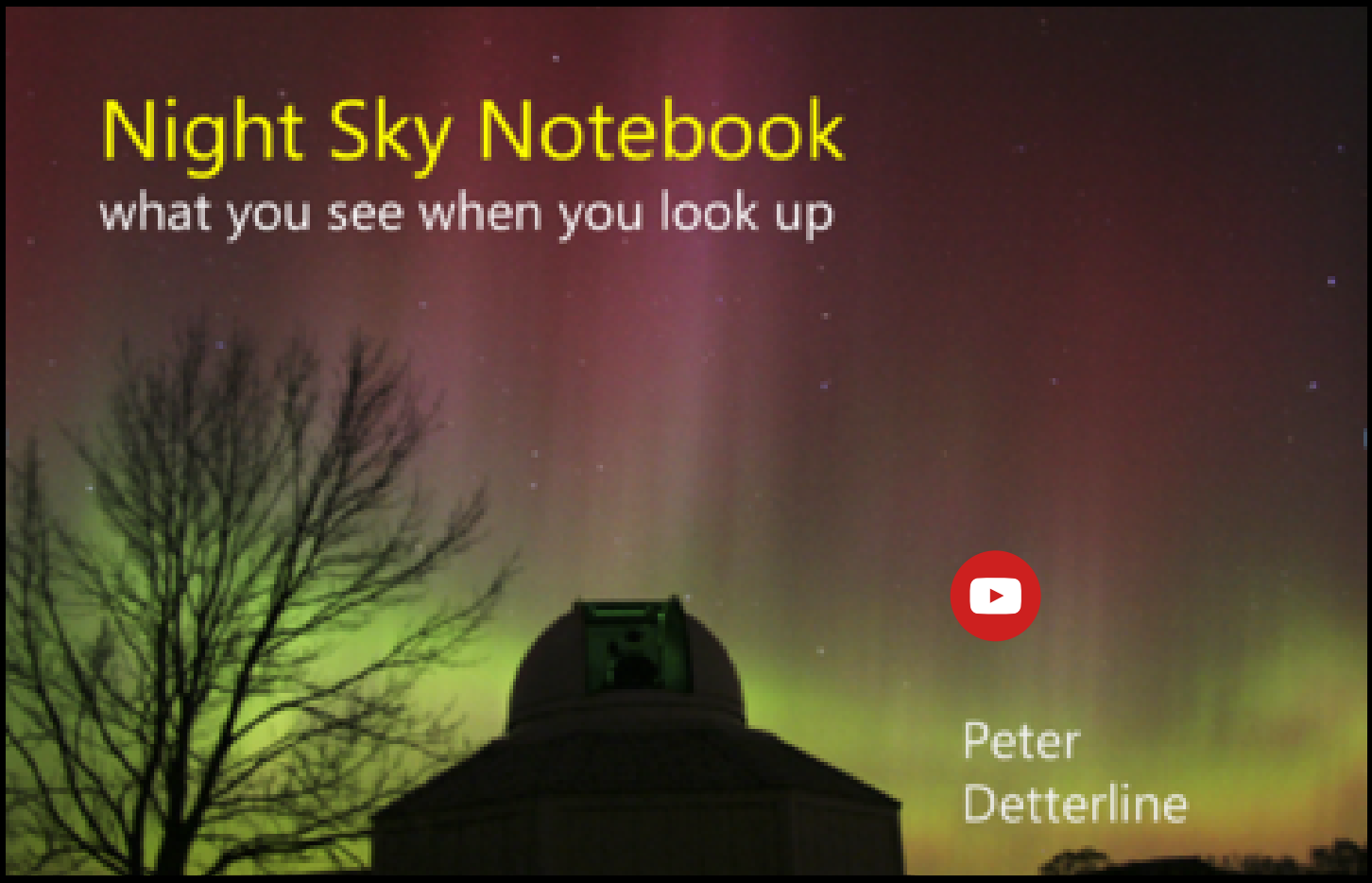
If you have ever wanted to see a total solar or annular eclipse, the next eight months present the opportunity of a lifetime for seeing one of each. An annular or ringed eclipse skirts across the Southwestern US on Saturday, October 14, and the path of a total solar eclipse passes just 300 miles west of the Lehigh Valley on Monday, April 8, 2024. Both of these events will be visible as partial solar eclipses from this area.

Join veteran eclipse chasers and astronomy educators, Gary A. Becker and Peter K. Detterline, who recently returned from the North West Coast of Australia after successfully viewing the hybrid solar eclipse of April 20 onboard the P&O *Pacific Explorer*. They will not only discuss the Australian eclipse, but how they plan to view and photograph the upcoming American eclipses. Equipment, techniques, and weather prospects will be considered as well as how you can also prepare to enjoy nature's most awe-inspiring spectacle. Be prepared to become an umbraphile (shadow lover) by joining Peter and Gary on Members' Night, July 8 (July 9 rain date), to learn more about these spectacular upcoming events.

Peter Detterline's

Night Sky Notebook

JULY 2023



The Inkspot Nebula (B86 & NGC 6520) Peter Detterline, Imager
Located in Sagittarius, this is visible low in the northern hemisphere, however it gets close to the zenith in Australia. The dark nebula has well defined edges with some stars visible in the nebula. It is very dark. The open cluster (NGC 6520), is small and contains stars of about the same brightness. With the backdrop of the stars in the Milky Way, this is a real treasure.

StarWatch

Antarctic Australia

Three cheers for the Australian Bureau of Meteorology! They have their issues just like our own National Weather Service. Meteorologists in Oz can also forecast to an accuracy of 50 percent and still retain their jobs. Try that in education or the medical profession. * Night one was clear at our dark observing site, Franklin River, in the southern part of Western Australia. I collapsed around 3 a.m. The second evening was mostly cloudy except for a few hours after sundown, so I got some needed rest. The third night was supposed to be cloudy as an advancing and deepening low pressure system (cyclone) approached from the south across the Indian Ocean, but it turned out to be mostly clear, especially after midnight. In fact, it was possibly one of the most transparent nights that I have ever witnessed. The sea air had been cleansed for thousands of miles in its journey towards the Australian continent making the stars appear so bright that you felt as if you could reach out and simply touch them. * That would have been nice because what we did not expect was the bitter cold. Yes, it was about the same time of the year Down Under as we experience at Halloween, but the normal nighttime lows should have bottomed in the upper 40's to low 50's, not in the upper 30's. Afterall, Australia is closer to the equator than the States. Yes, Western Australia was having a "cold snap," as some of the locals had pointed out. In addition, our house that we rented for six nights, which was very clean and beautiful, had no central heating. It had a typical corrugated metal roof that is found in rural Australian homes, but so were its walls with definitely no insulation in between them. Our house was equipped with a wooden stove with plenty of wood for a fire, but we did not use it because the smoke and heat emanating from the chimney would have possibly distorted the air through which our images outside were being taken. As a result, we left the house get cold at night. On a sunny day it heated up nicely, into the low 70's, but by 4 a.m. it was just as cold as the outside temperature, minus the wind which had been pretty tame by some Australian standards. * Pete and I had planned to climb 7,812-foot Mt. Kosciuszko in Kosciuszko National Park, about 350 km (217 mi) south of Sydney, so we took with us enough winter gear to be successfully warm in our ascent. That never happened. The day of our climb was the wettest 24 hours of our trip. * What we did not imagine was that we would be wearing all of our winter gear inside our home after sundown. I remember around 2 a.m. looking out at the stars while sitting shivering by large, multiple, heat-releasing window panes in our dining room. Thinking he would warm me up, Pete snuck up behind me throwing a heavy woolen blanket over me. It felt as if it had just arrived from frigid Antarctica making me feel even colder as my body heat retreated to warm the covering (second law of thermodynamics) before its insulating effects started to be noticed. However, then it was outside into the frosty night air again to tend to my camera needs to start a new series of exposures, releasing every calorie of warmth that my body had generated and the blanket had stored. * The clouds did return for good around 4 a.m. but the Bureau of Meteorology blew the forecast again. Instead of getting up to an inch of rain, we just had a few passing sprinkles through the early morning hours. * I took a long, hot shower, and by 5 a.m. I was wearily crawling into a cold, icy bed topped with four woolen blankets, a quilt, and bed sheet that nurtured me into a deep sleep. Okay, the Melatonin didn't hurt either. The next day it poured, followed by a cloudy night, then a mostly clear night, with overcast conditions the subsequent day, as we departed Franklin River and headed back to Perth for our flight to Sydney. See more images **here**. Ad Astra!

©Gary A. Becker -- beckerg@moravian.edu or garyabecker@gmail.com
Moravian University Astronomy - astronomy.org also facebook.com/StarWatchAstro/

Join

Franklin River was a great place to do astrophotography ... From top to bottom: The property that we stayed at for 6 nights had no central heating...

The narrow roadway speed was an incredible 110 km/hr (68 mph). Peter Detterline is all bundled up on the coldest day of our trip with his astrophotography setup on the last evening of our stay. Gary A. Becker had a much simpler arrangement for astrophotography.

Gary A. Becker images except for Peter's photo of me.

Waxing Crescent Moon and Venus

What appears to be a waning crescent is actually a waxing crescent moon as seen from the Southern Hemisphere. The 'star' above the moon in the picture is the planet Venus.

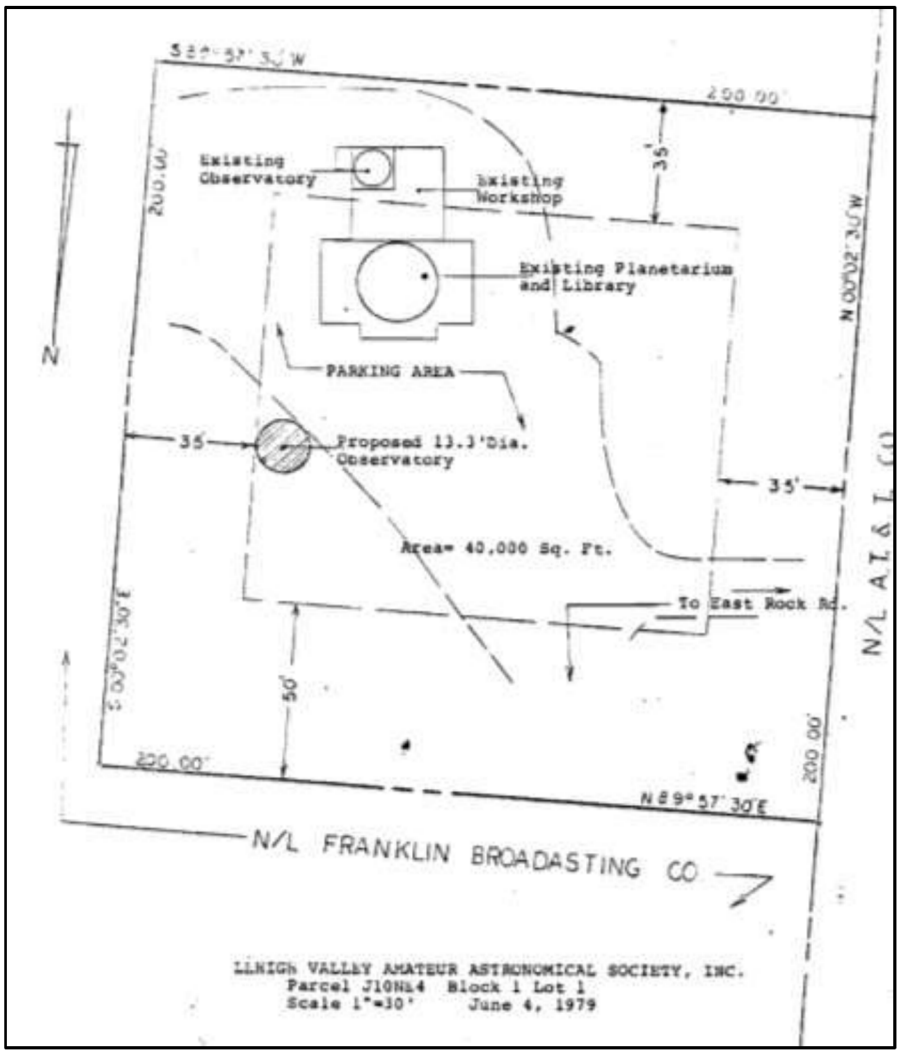
Gary A. Becker image from Franklin River, Western Australia

A History of the Brooks Observatory

by George H. Maurer (1998) revised by Sandy Mesics (2023)

The construction of the Brooks Observatory was facilitated by the fact that the 12.5-inch Cassegrain telescope that had originally been in the Kawecki Observatory at Pulpit Rock was available. This scope had been replaced by the 8-inch Spacek refractor that is still housed in the Kawecki Observatory.

Ralph Schlegel proposed to build this observatory at our South Mountain facility where it would not only add another telescope for the members' use but also allow the variable star observing program with Villanova University that was underway in 1978 to continue during the winter months.



Site Plan for the Brooks Observatory

By careful planning, the observatory could be completed with our own labor for a cost of less than $1,500. Heavy steel sheets were available surplus at a very reasonable cost and by bending these and bolting them into a twelve (sixteen) sided shape, they would create a sturdy and quickly assembled base to support the dome above. With the approval of the membership, the project was accepted along with initiating a fund drive to cover costs. (Note that our operating budget for the entire year of 1979 was just $4,850, with little reserve!)

The official groundbreaking ceremony took place on Sunday afternoon, July 8th, 1979, following the general meeting. Over that summer, the trees and brush were cleared away and the concrete footings and base were laid out and cast. Between fifteen to twenty members participated in this work during the summer and the construction moved along at a steady pace. Peter Brooks was a prime mover on this job by providing his truck to transport the needed materials and assuring that everything needed was on the job for the crews to work with.

Groundbreaking for the Brooks Observatory

Footings in place.

Over the summer months the electrical lines were installed, the steel sheets were formed, painted, and bolted into place, and the pier was firmly installed. Finally, the base ring for the dome was secured just before the work for the year ended as the winter closed in. As an added feature, provision was made in the base for the installation of a seismograph with a chart recorder.

Work was resumed in March 1980, and it was noted in *The Observer* that the dome was being installed and the work to follow would be to complete the shutter. Extensive metal work and specialty work was handled primarily by Peter Brooks along with Ralph Schlegel. By May 1980, the basic building had been completed and painted inside and out. The work of completing the electrical controls for the dome and telescope was begun and followed by the installation of the telescope.

Final checkout and critical adjustments were satisfactorily completed by late October 1980. It was decided to have the formal dedication of the observatory at our annual Holiday celebration on December 7th, 1980, and name the facility “The Brooks Observatory” in recognition of Pete’s conscientious effort of bring this project to a successful finish.

The ceremony was conducted by the Rev. Ernest Andrews as everyone braved the blustery cold of that afternoon. But all were in high spirits at the conclusion as we escaped from the cold into our warm building to celebrate and enjoy both refreshments and social exchanges.

Clyde Tombaugh, left, visits the observatory, with Ralph Schlegel, center, and Rev. Ernie Andrews

The Brooks Observatory has been a good performer over the years. In the late 1990s electrical problems developed and it was found necessary to completely rewire the building and update the equipment to a standard that would be easier to maintain and provide a more modern operating system. This chore was undertaken by our own electrical technician, Karl Buesgen, who had everything back in operation by the Fall of 1998. On November 8, 1998, the Brooks Observatory was rededicated following this refurbishment. The upgrades included rewiring, fresh paint inside and out, a new dome slit drive, and digital setting circles for the scope.

Regarding our proposed seismograph, in trial tests it was found that the nearby radio towers produced a very low frequency ground vibration in the wind, similar to seismic movement, and this registered on the chart. Since such indications would not be valid earthquakes, this project had to be abandoned.

The observatory was repainted again in Summer, 2006 by Bob & Kathy Weiss. Also, in 2006 we received a 14-inch Meade LX-200 telescope with go-to capabilities. There was considerable debate by the Board of Governors as to where to place the scope; either at Pulpit Rock or at South Mountain. An ad-hoc committee began working on placing the 14-inch SCT somewhere at South Mountain. On Saturday, December 21, 2013, the Meade telescope was installed in the Brooks Observatory. The scope had sat in its original box at Pulpit Rock since 2006. The scope sat atop a very

LVAAS crew removing the old scope to make room for the Meade 14" SCT.

Pete Brooks supervises the work of installing the Meade telescope.

sturdy Milburn Wedge. In spring 2014, the scope was polar aligned, and members began training on the scope.

Overall, the building of the Brooks Observatory remains as an example of the membership of the society performing at its best. With the careful planning and materials at hand, the members rose to the occasion with their financial support and labor. Their united performance resulted in a magnificent observatory virtually sprouting like a mushroom from the forest in a mere 14 months. With occasional updates like those of 2014, the observatory should continue to serve LVAAS for many years to come.

ASTRO-QUILTING

THE ART OF QUILTING GOES TO OUTER SPACE!

By Carol S. Moll

Were you aware that one of NASA's astronauts is a quilter, and actually did quilting during her time at the International Space Station? An article published in the May 2023 issue of *American Quilter* (AQ) magazine tells the story of astronaut Karen Nyberg, who made her first trip to space on the Space Shuttle Discovery (STS-124) which flew to the ISS in May 2008. On her second spaceflight, Expedition 36/37 (Soyuz TMA-09M), in 2013, she lived and worked at the ISS for 166 days. During this mission, she crafted the first quilt block made in space! At the same time, she worked with NASA to invite quilters around the world to join her in the "Astronomical Quilts Block Challenge." The Challenge garnered over 2,400 blocks from quilters in 30 different countries. These blocks have been assembled into 28 king-size quilts which are now part of a permanent collection at the Briscoe Center for American History on the Austin campus of the University of Texas.

Along with making her quilt block and her other ISS duties, Karen took many photographs of the earth, making an effort to photograph identifiable areas such as Lake Nasser and the Nile River. In the years following her return to earth, she consulted with a "talent incubator," the Hipsetter Group, to determine how to combine her experience in space with her quilting interests to create a marketable product. The result was an agreement with Robert Kaufman Fabrics to design a fabric line based on her photographs from the ISS, a collection called "Earth Views." The Earth Views fabric designs are artistic renditions of cloud, land, and water formations. Some are very abstract, but others are quite recognizable.

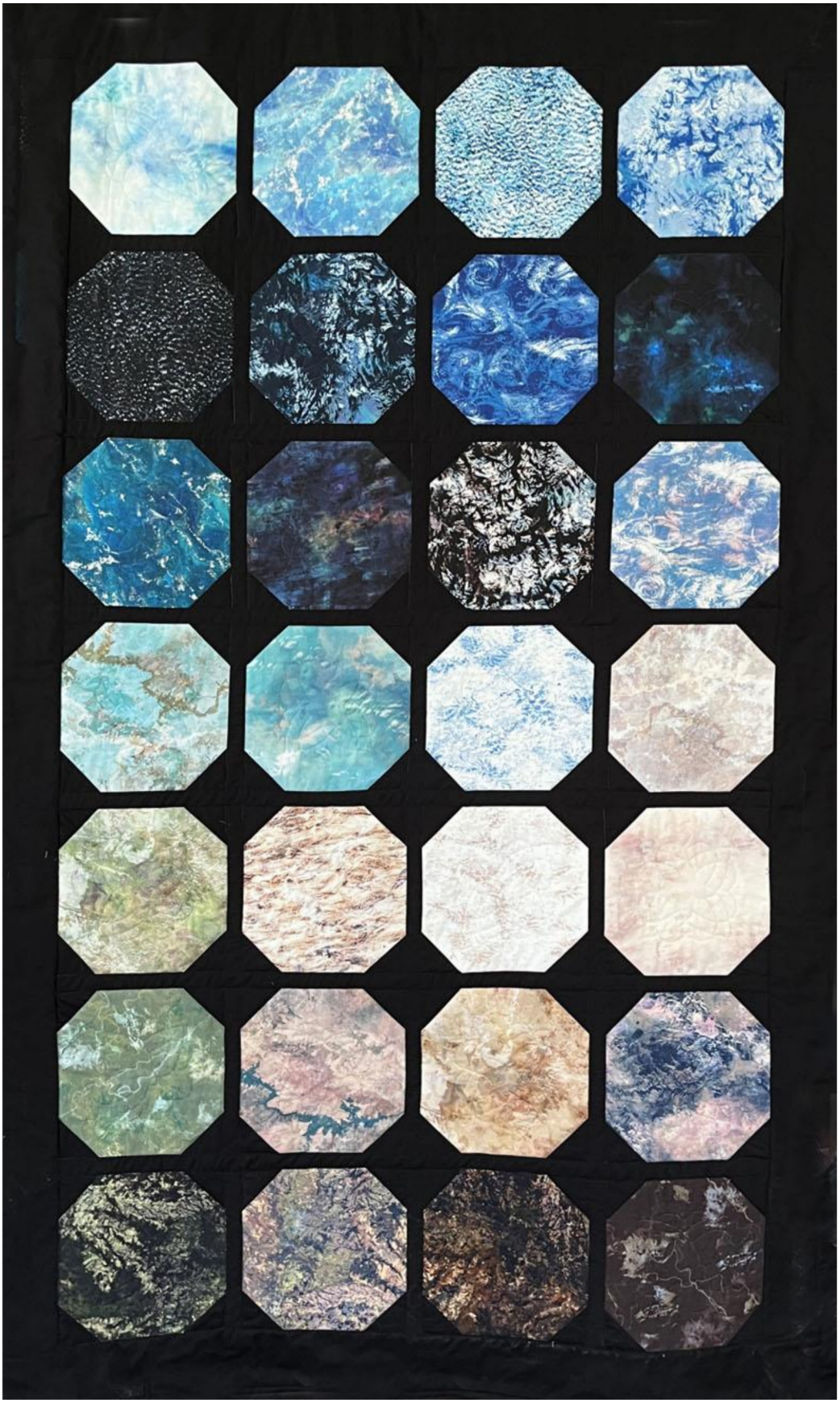
When my husband Dave (long-time astronomy afficionado and LVAAS member) read the article and saw the fabric collection, he felt compelled to order a "fat quarter" pack of all 30 different fabrics (a fat quarter measures 18" x 22"). Then the issue became for me – how to use all that material to produce a quilt that showed all the beautiful designs? AQ magazine included a pattern with the article, but it cut up the fabric too much. So, I had to design the quilt from scratch. Fortunately, "there is an app for that." In this case I used a Windows quilt design program called EQ8 to lay out a simple block that would finish to 10" square, with small triangles of black fabric at each of the 4 corners, and 2" black "sashing" between the blocks. I then imported images of the fabrics and inserted them into the squares on the computer screen. From there you can change the position and size of the blocks to reach a pleasing arrangement. After some discussion, Dave and I settled on a 4-block X 7-block arrangement, as we wanted to use the quilt to cover a fold-up rolling bed that we purchased recently.

Then the only thing left was to make the quilt!

Cutting, sewing, and assembling the blocks was the easy part of the project. Then the quilting commenced. Using a clear polyester thread, I "stitched in the ditch" by sewing machine along all the horizontal and vertical seams, as well as across the triangular corners of each 10" block. I had purchased a quilt stencil titled "Galaxy" that had been recommended to me by my local quilt shop, and I used that to quilt each of the 10" blocks. Finally, I trimmed and bound the edges.

And, voila! We have a finished quilt - and a great appreciation of the lady who took her hobby to space and shared it with the rest of the world.

Carol Moll is an accomplished quilter and member of the AQS, Colonial Quilters Guild, and Sew What Quilt Guild. She also teaches occasional classes in various quilting techniques and is a frequent denizen of quilt shops and quilt shows near and far.



Astro-Quilt: Earth Views from Space

by Carol Moll

Thanks to Karen Nyberg and American Quilter magazine, whose information was used in writing this article.

FOR SALE!

ZWO ASI533MC Pro

with optional dew heater upgrade already installed

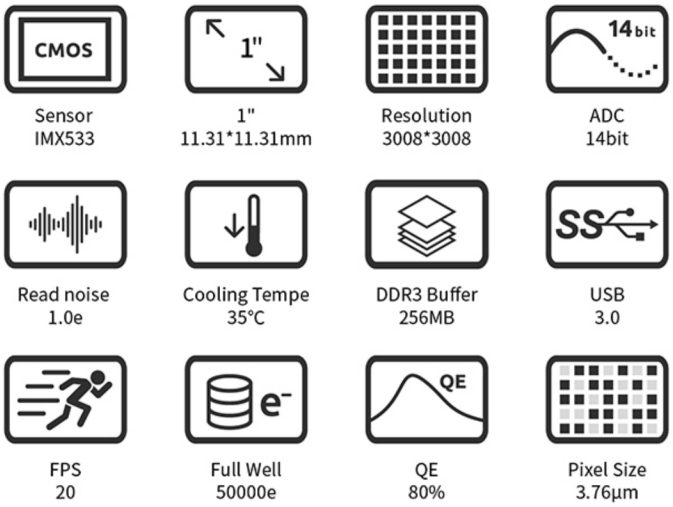
Comes with DC Y splitter cable to power both camera

and dew heater with one plug

Asking $600

Brand new is $820

Sells used on CloudyNights for $650-$700



Email Mike Huber if interested: m.huber614@gmail.com

FOR SALE

Orion Short Tube 80 mm Refractor Telescope

I have this Orion ShortTube refracting telescope for sale that has an 80 mm objective and a 6x30 finderscope with dove tail mount. I do not have eyepieces or a diagonal for the telescope. The scope can mount on most camera tripods. The telescope comes with a box and was hardly used.

$95

Contact David Raker at **draker@cedarcrest.edu** if interested. I can email more photos if needed. I will bring the telescope to July's members picnic.

FOR SALE! LIGHTLY USED CELESTRON TELESCOPE/MOUNT SYSTEM

Celestron Advanced VX Mount (purchased 2017)
-Many features for star finding (>40,000 objects)
- Autoguider to keep object centered
- See https://www.celestron.com
Celestron C102-HD Refractor Telescope (purchased ~1997)
- 102 mm dia, 1000 mm focal length
- Finders scopes
  - Orion 9x50 Right Angle, Correct Image
  - Telrad Reflex Sight
Many Eyepieces:
- Orion Stratus Wide Field 1.25"/2"
- Meade Plossl: 5.5, 12.5, 20, 25 mm
- Filters: Moon, Polarizer, Cel. No. 8
- Thousand Oaks Optical 4 Channel Dew Heater control and heating straps
Orion Carrying Case for eyepieces +
Golf outer bag for holding everything
Total retail value about $2000
Asking $1100
Will sell mount and telescope (with original manual equatorial mount) separately
- Call for separate pricing

Jim Farrand
610-216-3438
jcmafarrand@gmail.com
If not sold, will bring to society picnic July 8.

JULY

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						01
02	Full Moon 03	Independence Day 04	05	06	07	General Meeting/Picnic - 5:00 PM 08
Last Quarter Moon 09 General Meeting (rain date) - 7:00 PM	10	11	12	13	Stargazers Group Meeting 14	Astroimaging Meeting - 7:00 PM 15
16	New Moon 17	18	19	20	21	Star Party 22
Deadline for submissions to the Observer 23	24	First Quarter Moon 25	26	27	28	29
LVAAS Board of Governors Meeting 30	31					

AUGUST

		Full Moon 01	02	03	04	05
06	07	Last Quarter Moon 08	09	10	MegaMeet at PR 11 Stargazers Group Meeting	MegaMeet at PR 12 General Meeting Pulpit Rock - 7:00 PM
MegaMeet at PR 13 General Meeting (rain date) - 7:00 PM	14	15	New Moon 16	Stellafane Convention 17	Stellafane Convention 18	Stellafane Convention 19 Astroimaging Meeting - 7:00 PM
Stellafane Convention 20 Deadline for submissions to the Observer	21	22	23	First Quarter Moon 24	25	Star Party 26
LVAAS Board of Governors Meeting 27	28	29	Full Moon 30	31		

Sky Above 40°33'58"N 75°26'5"W Wednesday July 5 2023 00:00 UTC

Your Sky was implemented by John Walker in January and February of 1998. The calculation and display software was adapted from Home Planet for Windows. The GIF output file generation is based upon the ppmtogif module of Jef Poskanzer's pbmplus toolkit, of which many other components were used in creating the images you see here.

ppmtogif.c - read a portable pixmap and produce a GIF file

Based on GIFENCOD by David Rowley

Lempel-Zim compression based on "compress"

Modified by Marcel Wijkstra

Customize *Your Sky at* http://www.fourmilab.ch/yoursky/

2023 LVAAS EVENT CALENDAR

Contributed by Bill Dahlenburg

2023 LVAAS Event Calendar												
	Sundays				Saturday		Multi-Day Weekends	Moon Phase			
	General Meeting time	location	Board meeting	Astro-Imaging	Star Parties	Scouts at S. Mountain	Scouts at Pulpit R.	New	1st	Full	3rd
January	8	3:00 PM Muhlenberg	29	no meeting	no meeting		no camping	21	28	6	14
February	5	3:00 PM Muhlenberg	26	no meeting	no meeting		no camping	20	27	5	13
March	12	3:00 PM Muhlenberg	26	no meeting	25		no camping	21	28	7	14
April	2	7:00 PM S.M.	30	22	29			20	27	6	13
May	7	7:00 PM S.M.	21	20	27			19	27	5	12
June	11	7:00 PM S.M.	25	10	24			18	26	3	10
July	8	5:00 PM S.M.	30	15	22			17	25	3	9
August	12	7:00 PM Pulpit	27	19	26			16	24	1 & 30	8
September	10	7:00 PM S.M.	24	9	23			14	22	29	6
October	8	7:00 PM S.M.	29	14	21			14	21	28	6
November	12	2:00 PM S.M.	26	11	18			13	20	27	5
December	9	2:00 PM ?	17	16	no meeting		no camping	12	19	26	5

July, Aug & Dec are Saturday meetings with rain date on Sunday
Jan, Feb & March meetings are at Muhlenberg College
August meeting is at Pulpit Rock
December meeting / Holiday Party (TBD)

NEAF	4/15 – 4/16
MEGA MEET	8/11-- 8/13
CSSP	6/15 – 6/18
Stellafane	8/17 – 8/20
BFSP	9/15 – 9/17 ??

Publishing images is a balancing act!

When preparing your images for publication in The Observer, please consider the following guidelines:

Put the quality in:

- Considering the "print" size of the image, make sure you have at least 150 pixels/inch.
- Use a reasonably good quality for the JPEG compression ratio.

But watch the "waistline"!

- Don't go too much above 200 pixels/inch max.
- Use the lowest JPEG quality that still looks good!
- Shoot for <300KB for a 1/2 page image or <600KB for a full page.

Tip: If you're not Photoshop-savvy, you can re-size and compress undemanding images ("human interest" not astroimages), with an online tool such as: https://www.ivertech.com/freeOnlineImageResizer/freeOnlineImageResizer.aspx. It will also tell you the pixel size and file size of your original, even if you don't download the processed copy.

The Observer is the official monthly publication of the Lehigh Valley Amateur Astronomical Society, Inc. (LVAAS), 620-B East Rock Road, Allentown, PA, 18103, and as of June 2016 is available for public viewing. Society members who would like to submit articles or images for publication should kindly do so by emailing *The Observer* editor, France Kopy, at observer@g.lvaas.org

No images of people under 18 years of age will be accepted for publication at this time. Articles submitted prior to the Sunday before the monthly meeting of the board of governors (please see calendar on website) will appear in the upcoming month's issue. PDF format is preferred. Early submissions are greatly appreciated. Articles may be edited for publication. Comments are always welcome. Document proofread by Rich Hogg on a monthly basis.

LVAAS members please feel free to submit ads for astronomy equipment you have for sale, and additionally you may sponsor a maximum of three ads from non-members per year. Please submit your finished ad as a PDF, with pictures and text**.** Every attempt will be made to include submissions in a timely manner.

Every effort will be made to properly credit the sources of the material used in this publication. If additional credit is required, please notify the editor at observer@g.lvaas.org

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Existing members please update your LVAAS profile information by emailing the membership director at membership@lvaas.org .