

The Observer



The Official Publication of the Lehigh Valley Amateur Astronomical Society

<https://lvaas.org/>

<https://www.facebook.com/lvaas.astro>

November 2021

Volume 61 Issue 11





ad astra *****

At the October 31st, 2021 Board of Governors meeting, we discussed opening LVAAS up to more activities. Since many people have been vaccinated and the health situation has improved, we have decided the following will occur in 2022:

- The January, February, and March General Meetings will be held in person at Muhlenberg College as has been done in the past. All Muhlenberg restrictions in place at the time of the meetings will need to be met. Additionally, at popular request we will also make these meetings available remotely via Zoom.
- Beginning in March 2022, LVAAS activities like Star Parties, Astro-Imaging meetings, etc. will be held in person and open to the public.

LVAAS has decided to change its Fiscal Year to run from January to December. This change was done to make tracking of our finances easier. To accomplish this the Internal Revenue Service (IRS) is being notified by filing a Form 990-N at the (IRS) for the fiscal year ended September 30, 2021 and another Form 990-N will be filed after the end of the 3-month short tax year, but no later than May 15, 2022. Since Fiscal Year (FY) 2021 ended on September 30th, the board authorized an extension of the existing budget through December 31st. Technically, accounting periods cannot exceed twelve months, so we are now in a short 3-month budget period called Calendar Year 2021 (CY 2021). The budget amounts for this 3-month period are effectively the unspent funds from the FY 2021 budget.

The Rockland Astronomy Club (RAC) has informed me that they had their first Northeast Astronomy Forum (NEAF) meeting in October and are planning on hosting NEAF in 2022. Before they can do it, they need approval from New York State, Rockland County, and Rockland Community College. The dates they are planning for are April 9 & 10, 2022.

The position of Star Party Coordinator still remains open. If anyone is interested in this position, please contact me at director@lvaas.org

Ad Astra!

Thomas Duff

Minutes from the LVAAS General Meeting – October 10, 2021

The October 2021 LVAAS General Meeting General Meeting was conducted electronically using an on-line service.

Approximately 28 people were in attendance.

Director Tom Duff opened the meeting at 7:00 PM.

Tonight's General Meeting's presentation was a pilot screening of the film "Luminous" directed by Sam Smartt, followed by a Q&A session immediately afterward with the director.

Luminous:

Astronomy Professor Larry Molnar believes he can find the unfindable – a star that is about to explode. When Larry and a small team of students stumble across a strange star, they embark on a dramatic journey of scientific discovery, which brings the unlikely team into the international spotlight. But others in the astronomical community are skeptical, and Larry's professional reputation hangs in the balance. In production since 2014, Luminous, a feature documentary by award-winning filmmaker Sam Smartt (Wagonmasters), follows Larry's journey to test his unprecedented prediction, knowing that its success or failure will unfold squarely in the international spotlight.

Treasurers Report: Gwyn Fowler

- There was no Treasurers Report presented at the General Meeting, as Gwyn was unable to attend.

Membership: Rich Hogg

- 2nd readings
 - Mark Poserina
 - Brian Simboli
 - Annie Skoraszewski
 - Tim Skoraszewski
- 1st readings
 - Edward Hayduk Jr.
 - Conor Just
- Rich wanted to take a moment to thank Gwyn Fowler for all of her efforts as Membership Director.
- Congratulations to Rich on becoming a life member.

Elections: Bill Dahlenburg

- Candidates were announced at the September General Meeting. All Candidates are standing for elected office unopposed. The Candidates are as follows:
 - Director – Tom Duff
 - Assistant Director – Rich Hogg
 - Treasurer – Blair Hogg
 - Secretary – Michael Huber
- Since all Candidates are standing for elected office unopposed, the Secretary cast a vote for each Candidate. Elections for 2022 Board of Governors Officers are now final. Next term begins on December 1st, 2021. Congratulations to all the elected Officers.

General Comments:

Astro-imaging: Tom Duff

- The next Astro-imaging meeting is scheduled for Saturday, October 23rd at 7:00 PM. The meeting will be held outdoors at South Mountain. There are no additional Astro-imaging meetings scheduled for this year.

Star Party:

- The Star Party scheduled for Saturday, October 9th, was cancelled due to inclement weather.
- The last Star Party of 2021 is scheduled for Saturday, November 13th. The meeting will be held outdoors at South Mountain

General Meeting:

- The November General Meeting is scheduled for Sunday, November 14th at 7:00 PM. The meeting will be conducted electronically using an on-line service. Jonathan Lunine, Chair of the Astronomy Dept. at Cornell will be speaking on the search for life in the outer solar system.
- The December General Meeting is scheduled for Sunday, December 12th at 7:00 PM. The meeting will be conducted electronically using an on-line service. Larry McHenry will speak on Comets.
- Consideration is being given about having the January, February, and March General Meetings at Muhlenberg, conditional on their rules permitting it at the time. Also being considered is rescheduling the time of the January through March meetings to 2 PM or 3 PM, if Sandy (for our guest speakers)

and Judy Parker (for Muhlenberg) can accommodate the proposed time changes.

Note: These events will be held for LVAAS Members only. Please check the website to verify start dates and times.

Pulpit Rock: Frank Lyter

- Frank mentioned that if anyone had questions about Pulpit Rock, or was looking to get some training on the scopes at Pulpit Rock, or wanted to volunteer for some of the Pulpit Rock work activities, or just see if anyone was interested in going up for a night at Pulpit Rock, that they should use the Pulpit Rock Buzz.
- Frank also mentioned that LVAAS has a great telescope rental program and encouraged all members to take advantage of this great membership benefit.

South Mountain: Bill Dahlenburg

- Bill mentioned that if anyone had questions about South Mountain, or was looking to get some training on the scopes at South Mountain, or wanted to volunteer for some of the South Mountain work activities, he and several others are usually on site Saturday mornings and should feel free to drop in.

UACNJ Representative - Earl Pursell

- Continuing weekly public nights through the end of Oct. Still by reservation (free). Masks optional and public not allowed inside buildings.

The October General Meeting was not recorded.

The meeting was adjourned at approximately 9:15 PM.

=====

Submitted by Dennis Decker, Secretary

LVAAS General Meeting: Online only
Sunday, November 14, 7:00 p.m.

"The Search for Life in the Outer Solar System"

presented by

Jonathan I. Lunine

**David C. Duncan Professor in the Physical Sciences
Chair Department of Astronomy, Cornell University**



Jonathan Lunine is the David C Duncan Professor in the Physical Sciences and Chair of the Department of Astronomy at Cornell University. He is interested in how planets form and evolve, what processes maintain and establish habitability, and what kinds of exotic environments (methane lakes, etc.) might host a kind of chemistry sophisticated enough to be called "life". He pursues these interests through theoretical modeling and participation in spacecraft missions. He is co-investigator on the Juno mission now in orbit at Jupiter, using data from several instruments on the spacecraft, and on the MISE instrument for the Europa Clipper mission. He is on the science team for the James Webb Space Telescope, focusing on characterization of extrasolar planets and Kuiper Belt objects. Lunine has contributed to concept studies for a wide range of planetary and exoplanetary missions. Lunine is a member of the National Academy of Sciences and has participated in or chaired a number of advisory and strategic planning committees for the Academy and for NASA.

LVAAS Members will receive an email with meeting invitation/link.

Prospective new members who wish to attend the meeting should email membership@lvaas.org

Via Sandy Mesics: Upcoming LVAAS General Meeting Speakers

For November, we have **Jonathan Lunine** speaking on **Searching for Life in the Outer Solar System**.

In December, **Larry McHenry** is speaking on **Comet Tails**.

In January, **Paul Halpern** is talking about his book, "**Flashes of Creation**."

In February, **James Chen** will be speaking. Topic TBA

In March, **Felipe Maldonado** from DaVinci Center will likely speak on **The Big Bang**

In April, **Doug Arion** will speak on "**Threats to Astronomy from Ground and Space**."

Via Dave Raker: New Library Material

Books:

Physics: A Contemporary Approach by Judah Landa

Comet Fever by Donald Gropman

Ask The Astronaut by Tom Jones (not the singer!)

DVDs:

SETI talk by Sonia Sheikh

Via Earl Pursell: RASC Observer's Handbook

The 2021 RASC Observer's Handbook is available from the Astronomical League for \$24. Order now- supplies are limited: https://store.astroleague.org/index.php?main_page=index&cPath=12

Via Earl Pursell: Lockheed-Martin Spacemakers Podcast

"We're launching a podcast on Wednesday, Sept. 1, to take YOU behind the scenes of some of the greatest space exploration missions of our time, and to chat with our experts about how these missions are shaping the future of space..." click [here](#)

Also, **Dark Skies** Talk by Douglas Arion: <https://www.youtube.com/watch?v=zf9Lj5bymd4>

Via Earl Pursell, UACNJ Liason: Winter Remote Programs

During the off-season (November through March) UACNJ is now presenting an online astronomy-related presentation that begins at 8 p.m. You can tune in by visiting us at our [YouTube channel](#), or by clicking the name of the program. You can also subscribe to our YouTube channel to get notifications when our presentations go live. The link to the online program page is:

<http://www.uacnj.org/onlineprograms.php>

UACNJ currently has the first Saturday of each month scheduled for "What's Up in This Month's Night Sky."

Benefit from giving to LVAAS through your IRA!

If you are 70 1/2 or older, you can make a charitable gift directly from your IRA to LVAAS without paying income tax on the withdrawal. State laws about Qualified Charitable Deductions (QCDs) and how QCDs are handled vary. If interested, please consult an adviser so you can help LVAAS today!

https://lvaas.org/page.php?page=using_rmd_to_support_lvaas



Cover image: M42 The Orion Nebula. Imaged by Benjamin Long.

Image taken from the Pulpit Rock site with a 150mm F/5 Newtonian reflector and an uncooled zwo asi183mc color camera. 64 minutes of integration time.

From EarthSky: What is the Orion Nebula?

<https://earthsky.org/clusters-nebulae-galaxies/orion-nebula-jewel-in-orions-sword/>



Night Sky Notebook
for
NOVEMBER
by **Peter Detterline**

Night Sky Notebook
what you see when you look up



Peter
Detterline

by Gary A. Becker

beckerg@moravian.edu garyabecker@gmail.com

astronomy.org facebook.com/StarWatchAstro/

©Gary A. Becker for StarWatch



Lunar Eclipse on Tap November 19

Finally after nearly two years of waiting, the East Coast and Americas are back in the groove to witness one very deep partial and two total lunar eclipses during the next 12 months. The first one of the series occurs on November 19, the other two on May 16, 2022 and November 8, 2022. Unfortunately, all three eclipses are intended for insomniacs, for their most colorful sequences all occur after midnight.

Eclipses are named for the object that is being hidden. A lunar eclipse arises when the full moon hides within the shadows of the Earth. As the moon orbits the Earth, it always overtakes Earth's shadow, entering first the penumbra, Earth's secondary shadow, from left to right. The word *penumbra* means *light shade* from the Latin, where an observer on the moon would witness part of the Earth covering part of the sun. As the moon moves deeper into the penumbra, the diminution of light begins to make the moon appear dusky on its leading side. Eventually, if the alignment is precise enough, Luna begins to break into the *umbra*, Latin for *shade*. An astronaut on the moon's surface would see our world completely covering the sun, a total solar eclipse with the sun's crown, the corona, stretching around the Earth, a spectacular sight yet to be witnessed by humans. The limb or circumference of our spherical world would be aglow with all of the possible reddened sunsets visible at the same time.

Watching the sun approach the horizon from the Earth, an observer will notice its colors mellowing into deep yellows, oranges, and sometimes even reds, flooding the landscape with their warm hues. It is the golden hour in cinematography. The denser layers of air that the sunlight must penetrate as it tangentially brushes near to the Earth's surface scatter the shorter wavelengths of light, the blues and the greens, acting like a filter, but allowing more of the longer wavelengths of yellows, oranges, and reds to pass through.

At the same time, some of this reddened sunlight is refracted (bent) into the Earth's shadow as it travels from the emptiness of space through the thicker, denser atmosphere of our planet, caressing the lunar surface with these same spectacular hues that make lunar eclipses such a delight to view. And speaking of viewing, the human eye will easily detect colors across the lunar backdrop during this eclipse. On the other hand, binoculars, or even that rickety old telescope stored away in your basement, will enhance the colors of the eclipse because they will be drinking in perhaps 20-30 times the light that the eye alone can collect.

The November 19 eclipse starts with the moon entering Earth's penumbra at 1:02-09 a.m., EST, a contact that is undetectable to the human eye. Subtract an hour for each time zone to the west. It will be somewhere around 1:45 a.m. before observers will begin to notice a dusky appearance near the north lunar pole on the moon's leading side (upper left). The Earth's umbra is encountered at 2:18-41 a.m. The greatest eclipse coverage happens at 4:02-53 a.m. when 97.42 percent of the moon's diameter will be immersed within the umbra, and Luna is perched at a respectable 30 degrees above the western horizon for the East Coast. It is at this time that the colors on the lunar surface should appear most vibrant. The moon exits Earth's umbra at 5:47-04 a.m., and the penumbra at 7:03-38 a.m., just before it sets and the sun rises. Say a prayer for clear weather on the 19th and have a great eclipse experience. Ad Astra!



The total lunar eclipse of September 27, 2015 was glimpsed for only about half a minute when clouds parted just at the time that the moon became completely immersed in the Earth's shadow. I may have been the only person in the Lehigh Valley to have caught totality.

Image by Gary A. Becker

by Gary A. Becker

beckerg@moravian.edu garyabecker@gmail.com
astronomy.org facebook.com/StarWatchAstro/

©Gary A. Becker for StarWatch



Some Lunar Eclipse Misconceptions

The Americas, but particularly North America including Hawaii, are in for a memorable treat on the morning of November 19 when the moon enters the shadow of the Earth and a nearly total lunar eclipse ensues. The best time to view this eclipse will be at 4 a.m. when 97.42 percent (4:02-53 a.m.) of the moon's diameter will be occulted. At that time the moon will be due west at a respectable altitude of 30 degrees with the southern hemisphere of the moon bright, and the rest of its surface subdued in yellows, oranges, and brownish reds. Binoculars will enhance these different colors because they focus more light into the eyes.

There are a number of misconceptions that are held by the public surrounding lunar eclipses. One of them is most likely driven by a confusion between the two types of eclipses, solar and lunar, that can occur. Eclipses are always named after the object that is being hidden. In a solar eclipse the sun (Sol) is being veiled by the moon. At all times when the sun is visible, the event is dangerous to watch unless Sol is viewed with proper filtration or projected via a pinhole or lens system onto a white screen. In a lunar eclipse, the moon hides in the shadow of the Earth and is perfectly safe to view. Countless parents have forbidden their children from viewing lunar eclipses because of this confusion. If you can look at the full moon with your unprotected eyes, then watching the beauty of a lunar eclipse unfold before you as the full moon pierces and traverses through the shadow of the Earth, is not going to facilitate any retinal damage. I once had the opportunity of viewing the full moon through a telescope with a 25-inch diameter mirror. It was gathering over 4000 times the amount of light that my eye would normally collect. Yes, the moon was very bright, but it was not detrimental to my viewing eye.

The most common misconception about lunar eclipses is that the monthly phases of the moon result from Luna going in and out of the Earth's shadow. Here I usually have up to one third of my students who hold this misconception as the truth. Admittedly, there is a sort of phase progression as the moon enters and leaves the shadow of the Earth, but partial and total lunar eclipses represent rather rare phenomena, usually happening only once each year or less for a given locality. The duration from start to finish is more like six hours for a total lunar eclipse, not the 29.5 days it takes the moon to complete its cycle of phases. What causes the lunar phases is simply the moon orbiting the Earth and our watching its nearside, which always faces us, progress through a day and night cycle as different parts of it are illuminated by the sun.

And finally, to the flat Earthers, the shadow of our planet falling onto the moon during a lunar eclipse will always appear round. Since lunar eclipses can occur in all parts of the sky along its orbital path and at all times of the night on Earth, no one has ever observed a line or bar representative of a disk-shaped Earth falling onto the moon. Oh, well, another theory bites the dust.

From The Field:

Black Forest Star Party at Cherry Springs

by Frank Lyter

Here are some photos from the Black Forest Star Party at Cherry Springs. During the day, solar scopes were showing some of the best prominences that I have seen in years. After sunset the stars and galaxies were out in abundance along with great views of Jupiter & Saturn. Days were nice and warm in the 70's and nights were cool in the upper 30's. There were lots of astronomy folks on hand until the threat of clouds on Saturday sent 80-90% of the folks packing. Ironically, Saturday afternoon was cloudy until dark, then dramatically cleared for some nice views of the heavens throughout the night, until clouds and light rain arrived after daybreak.



Top to bottom, left to right: 1. Mike Waddell, Chris Stieber, Bill Dahlenburg, Kyle Kramm, Nick Krizan, Lynn Krizan, Frank Lyter, Tom Duff. **2.** Sunrise **3.** LVAAS Field of Glass **4.** Mike Waddell **5.** LVAAS Camp and Southern Sky

Next page: T: Andromeda Triangulum Double, **B:** Big Dipper and meteor.

All photos courtesy Frank Lyter





FOR SALE

3.5 " classic Questar telescope



It is a catadioptric apochromatic variable focal length telescope. It comes with two eyepieces (25 mm EFL and 10 mm EFL), a solar filter, legs for forming the tripod, power cord, and the case. The telescope and mirror are in nice shape and the clock drive runs. The number on the base reads 0-9953. I think it is at least 25+ years old.

\$2,000 (price lowered)

If interested or you want to see more photos, contact David Raker at draker@cedarcrest.edu

From the LVAAS Archives: Measuring the Altitude of Meteors

by Sandy Mesics

At the November 1971 meeting, the program featured a talk by Thomas Fetterman, Richard Huber and Kay Sears of S.T.A.R. (Society of Telescopy, Astronomy and Radio) on meteor observing. According to the December 1971 *Observer*, they spoke about their methods of "... photographing meteors and then by triangulation, calculat[ing] their altitude from ignition to extinction.

"In brief, their system consisted of setting up two camera stations with a base line separation of about 20 miles. Each station had a bank of 3 cameras arranged to obtain a coverage of about 25 degrees x 75 degrees of star field. By means of direct telephone lines and radio time signals, all exposures were carefully coordinated. The experiment was conducted during a Perseid meteor shower. Because of sky glow, only the brighter meteors were recorded: four in all. From these films, a careful analysis was made and computations utilizing spherical trig and 7 place log tables were undertaken.



1 Kay Sears 1922-1999

Monmouth, New Jersey. A short notice in the November 1957 issue of *Sky and Telescope* announced the formation of the club and listed its officers as Frank K. Priebe, President; Herbert D. Tanzman, Treasurer; and Mrs. Thomas B. Richey, Secretary. The notice indicated that the club had 33 members.

"One could not help being impressed with the meticulous care taken in these reductions which took some six months of spare time to calculate. Their findings, which are in agreement with general meteor statistics, do suggest interesting variation. The overall project was initially undertaken as a challenge to determine if simple equipment was capable of making altitude measurements of meteor trails. Very little work has been done in this field and only one group in the southwestern part of our country is known to be active in this work."

"On the Saturday night prior to the meeting the meteor cameras were set up at Pulpit Rock and a second station at the Robsons' in Parkerford, Pennsylvania. The night was clear and several meteors were seen; however it will be sometime before any results are known. Our sincere thanks to Tom Fetterman, Kay Sears and Dick Huber for their most informative and cordial presentation."

As mentioned above, the team of Fetterman, Sears and Huber were members of S*T*A*R. This organization formed the same year as LVAAS, in 1957, at Fort

The club's early efforts were mainly devoted to the Project Moonwatch program, which observed artificial satellites. The club registered with the Moonwatch program sometime around July 1957.

Historically, calculating the height and trajectory of meteors visually was described by M. Davidson, in his article for *The Observatory* in 1936, entitled "The accuracy of meteor observations." Fred Whipple described a photographic method of doing this work as early as 1938, and he refined the rotating shutter method in 1957. So while the theory and methods for doing this work were hammered out some years before, there is no evidence that this was a fertile area of astronomical research in the ensuing decades. Fortunately, the work was taken up by Fetterman, Sears and Huber and other members of the



2 Tom Fetterman

S*T*A*R club. This meteor triangulation project was led by Tom Fetterman and Kay Sears. Frank Loso, a longtime S*T*A*R member recalled that Rich Huber contributed to the observations along with Robb Sanderson and Kay's nephew Jeff Mott. The project itself involved photographing a common volume of space from several locations, all in NJ - Kay from his home in Keyport, Tom in South Bound Brook, Rich in Marlboro, and Kay's nephew Jeff Mott in Franklin Lakes.

"The photographs (wide field 35 mm on Tri-X B&W film) were shot through a 'meteor chopper' located in front of the camera lens that interrupted the timed exposures at a known rate. Tom's used a rotating fan blade and Kay's used what I can only describe as a high-speed electro-mechanical metronome blade. This resulted in the recorded meteor trails being chopped into a dashed line. Since the period of the chopper was known, the length of the dashes on the negative could be translated to time and hence apparent speed of the meteor. WWV was used as a time reference for starting and stopping the exposures at the same pre-arranged times at all the locations. For the exposures in which the same meteor was recorded, Tom translated the trail's position on the multiple 2D photos into a 3D position using spherical geometry." Rich Huber recalled that "Tom Fetterman did the data reduction for the triangulation on an HP programmable calculator, which was the closest thing we had to an actual desktop or laptop computer. It was quite a feat of programming and calculating! I remember being very impressed."

Using this equipment and technique, Fetterman and team came up with the altitudes and trajectories of the meteors that were photographed. As Frank Loso recalled, over several nights of observations only a handful of meteors were captured by multiple cameras, but these were successfully reduced to a 3D location in space that showed the speed, altitude and location of the meteor trail.

Tom, Kay and Rich gave a presentation on the project at Stellafane in 1972.



WELCOME TO THE 38th STELLAFANE MEETING ON BREEZY HILL
SPRINGFIELD, VERMONT. SATURDAY AUGUST 5, 1972
"The Birthplace Of Amateur Telescope Making"
1925 - 1972

Contrary to some rumors, there will be a Stellafane Convention this year as usual.

On Friday night at 8:30 there will be a session under the tent which will provide an opportunity to share experiences and slide pictures of the July 10, 1972 Solar Eclipse. This session will be very informal and we also welcome short talks on other projects which would be of general interest to the assemblage.

AFTERNOON PROGRAM

ROGER TUTHILL of Mountainside, New Jersey, will monitor informal talks under the tent from 2:00 P.M. to 4:00 P.M.

"Photographic Meteor Triangulation"

by R. Huber, T. Fetterman, K. Sears (Society Telescopes & Radio; Red Bank, New Jersey)

Triangulation work by the team continued into 1973, and thanks to Frank Loso, we were able to document an interesting event that occurred on October 21, 1973, when the team was observing and photographing the Orionid meteor shower. Four stations were set up across northern New Jersey as usual. Robb Sanderson, one of the team members, wrote about the session in the January 1974 *Cluster* Newsletter. "It was one of those perfectly clear nights where you go out with the telescope, look up into the sky, and it's almost like someone put pin pricks through a black outline. ...I wondered at the marvelous sights of the double cluster in Perseus and the galaxies which seemed to stare me in the face." According to the team's schedule, they would start photographing at midnight and continuing until 5 a.m. At least one of the sites was having problems with heavy dew. Despite the challenges, the team was able to photograph one meteor to triangulate, but that was not the highlight of the session. At 2:25 a.m. all four stations reported an unusual meteor. Here is how it was described in the December 1973 *Cluster* Newsletter:

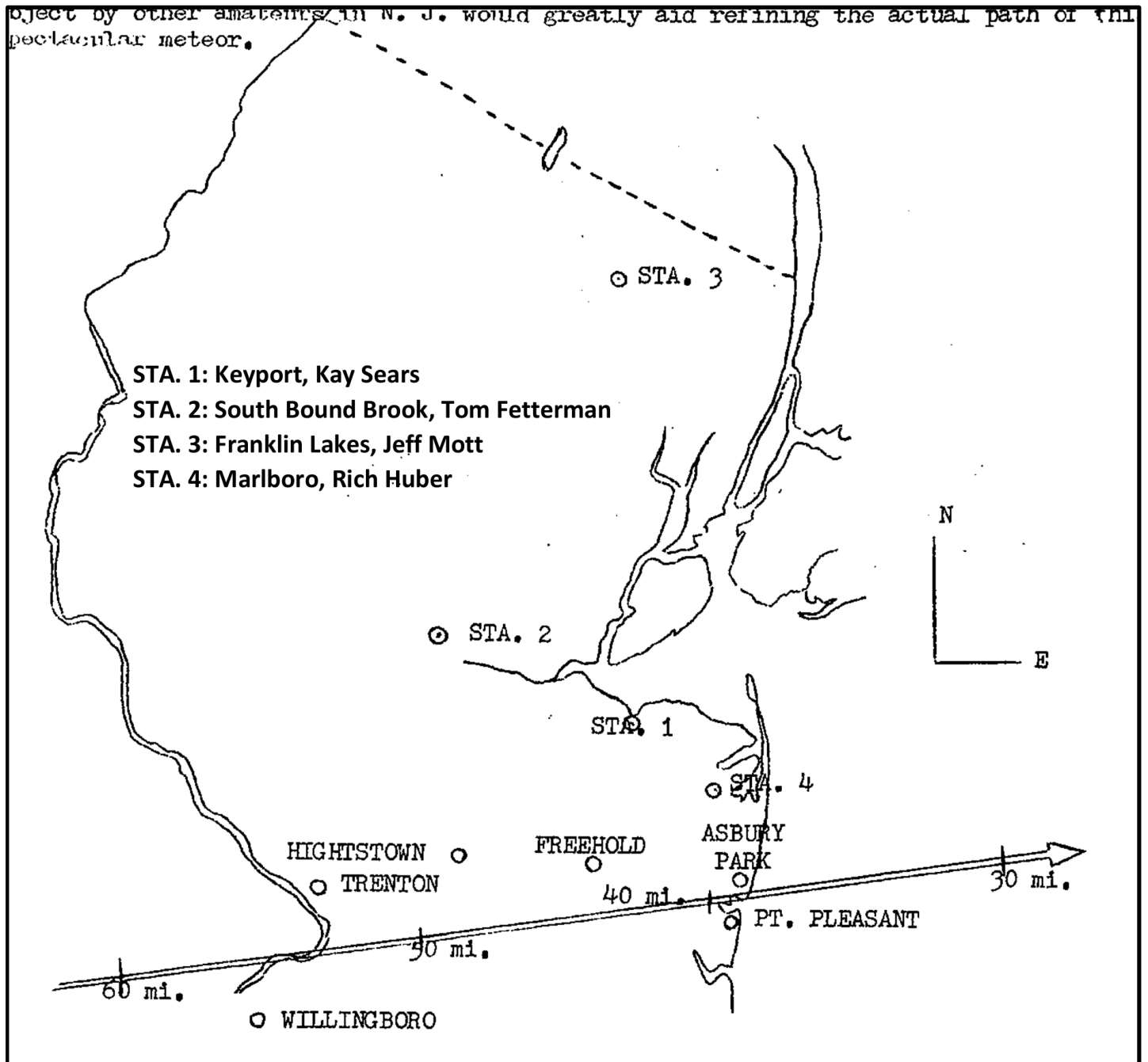
"The brilliant object appeared at 06:26:30 UT (2:25:30 AM) and remained visible for an estimated 10 secs. The meteor moved from west to east, traveling very slowly across the sky. Near the end of its flight, the main body broke up into many smaller luminous globules before fading to invisibility.

"All the triangulation team observers were impressed with the slow angular velocity of the object; most felt the object appeared to float rather than fly. Brightness estimates varied with the distance of the observer from the meteor track. The estimates indicated that this was a bright object close to the flight path; at least as bright as the planet Mars at mag. -2.6. K. Sears at Keyport N.J. reported an apparent magnitude of -4. A preliminary trajectory has been determined from the visual reports of the S*T*A*R members and is plotted below. Sightings of this object by other amateurs in N.J. would greatly aid refining the actual path of this spectacular meteor."

Robb Sanderson wrote, "Then it happened. A rather yellowish bright object, at about magnitude -2.2 came out of the west at 2:25:30 a.m. with breakup through the constellations Pegasus, Perseus, and Taurus, then faded slowly into Gemini. What a sight! It was something to see, for it moved so slowly. Its magnitude didn't vary from my viewpoint at all.

"Later I talked to Tom and Jeff Mott, who manned station #3 in Franklin Lakes, NJ about the sighting. We all agreed that it could have been a chunk of space debris which had drifted out of orbit." There was some speculation that it was the reentry of some Soviet space debris.

Unfortunately, while this bolide meteor was observed from all four stations, it was not photographed. Nevertheless, the group was able to triangulate its height across the path.



While the S*T*A*R team continued to pursue this area of research in the 1970s, there is no documentation that this meteor program continued at LVAAS after this presentation. Ironically, since 1971 the technology available to amateur astronomers to pursue this kind of research is more sophisticated and more readily available. The modern version of using triangulation to determine meteor heights employs video cameras rather than film photography. The mathematics involved in doing the calculations can be done quickly and easily using programs such as MS Excel. Yet despite this, very few individuals or groups seem to be pursuing this type of research. Indeed, the American Meteor Society has no information on doing this work.

One group that is pursuing work on measuring meteor heights is NEMETODE: The Network for Meteor Triangulation and Orbit Determination, based in the British Isles.

Unfortunately, Kay Sears passed away in 1999, and Tom Fetterman passed away on April 26, 2020. ***Many thanks to Frank Loso, Rich Huber, and Steve Walters for information included in this article.***

References

The Observer, December 1971

<http://www.nemetode.org/overview%20and%20history.htm>

http://www.geocities.ws/flnjus/kayart.htm__

<http://www.geocities.ws/flnjus/STARhistory.htm>

Schlegel Observatory Report

by Rich Hogg – November 2021



This month's article is all about conflicting priorities and why there is no progress to report on the 40-inch telescope. In addition, I'm letting you know that for a little while, you may not see a Schlegel Report in *The Observer* unless I have something interesting to report.

I look forward to being fully immersed in the 40-inch project again a few months down the road, but at the moment I've decided that I would like to take a break, and that this is a good time for it. There are a bunch of other considerations that are pulling me away from it, for a bit, as well as diverting other LVAAS members who would normally be eager to help out.

A number of these are other projects at Pulpit Rock that, for the moment, deserve higher priority. The other observatories that we already have in service there have been seeing a lot of use, and they need some attention to keep them safe and to improve their utility.

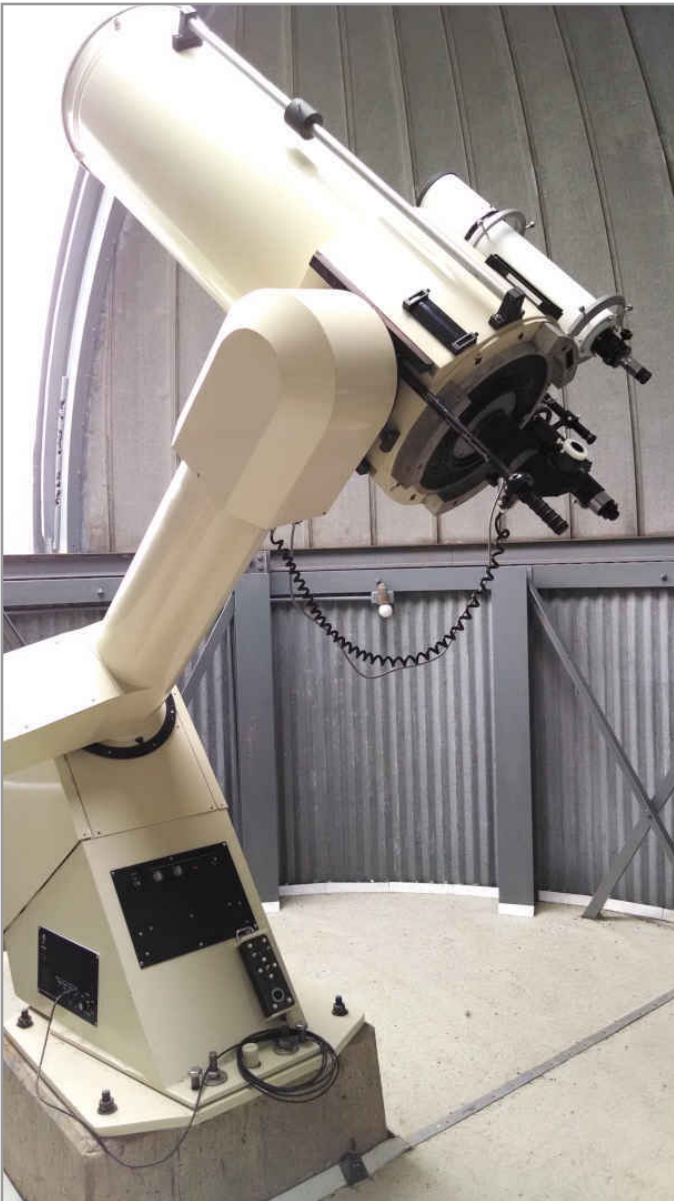
The floor in the Kaweck Observatory (housing the 8" refractor) has deteriorated and needs to be replaced before somebody ends up inadvertently exploring the basement. It hasn't reached the point of being overtly dangerous quite yet, but we don't want to allow it to.

The roof of the Spacek Observatory has some significant holes and needs to be re-covered. Currently, we are protecting the telescope and anything else in the structure with one or two layers of plastic sheet or tarp, but we would like to do a better job of keeping the interior of the building dry.

The Spacek observatory currently houses a 12" Meade Schmidt-Cassegrain telescope that used to live in the trailer with the roll-off roof. We plan to get rid of the trailer, and to use some of the aluminum from its side panels for the Spacek roof repair.

We also have a new observatory in the works! A few years ago an additional 12" Meade was donated to the Society, and this year we took possession of a fiberglass dome structure. The plan is to install the dome around the pier that is in the field between the Spacek and the Schlegel, and make it the new home of this other 12".

The Schlegel-McHugh Observatory, with the 18-inch Tinsley telescope, also needs some work, and I



The 18 inch Tinsley telescope at Pulpit Rock Astronomical Park

want to make this a pet project of my own for a month or two. I spent a lot of time on the Tinsley before I got heavily involved with the 40-inch, and now it is being used more and some of its shortcomings are becoming more evident. First on my list is the Right Ascension tracking motor, which has been buzzing like an angry hornet when it should be purring like a kitten. My theory is that it has not been lubricated since it was installed in the scope over 50 years ago, and that there has been enough wear to allow the axle of the motor to orbit around in its bearing. This motor is not commonly available either used or new, but I've obtained a much newer sample of the same model that is almost identical to ours, the only difference being some gears in the lower-speed gear reduction system.

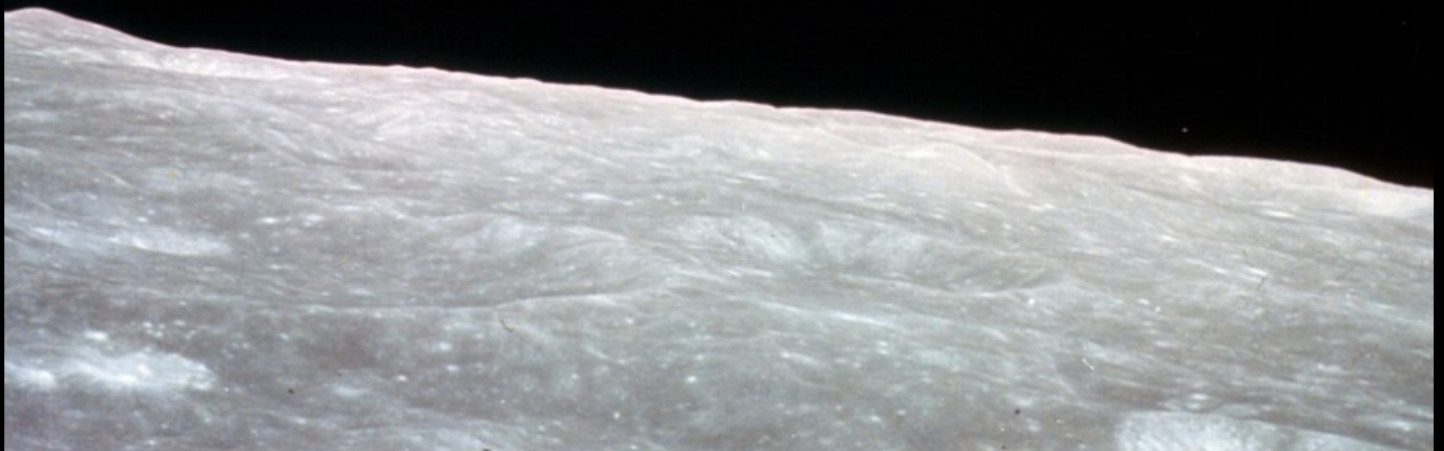
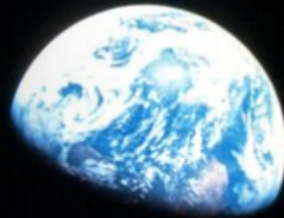
Later this month — ideally, just before the first snowfall forces shutdown of the observatory for the winter — I plan to take the observatory out of service and remove the motor, and then rebuild it using as many parts as possible from the newer unit. That plus an appropriate dose of fresh grease should get us purring again.

Finally, in a completely different area, I have agreed to take over the position of Director of the Membership Committee, which Gwyn Fowler has decided to relinquish after several years of excellent service. I think it makes sense for me to do this for a few reasons. As Technology chairman I've already been taking care of the mailing list, managing membership on our website, and printing membership cards. And I'll need to work with our incoming Treasurer, who happens to be my brother Blair. Once I get up to speed I don't expect my Membership responsibilities to have too great an impact on the telescope work, but right now I am still learning the job.

FILM

Earthrise

Directed by Emmanuel
Vaughan-Lee



Told firsthand by the Apollo 8 astronauts, the Emmy-nominated film *Earthrise* (2018) documents their remarkable voyage to the far side of the Moon, and the importance of the timeless image they captured. Using archive footage and interviews, the filmmaker Emmanuel Vaughan-Lee transports us behind the lens of the 70mm camera that memorialised the moment the spacecraft fell into the shadow of the Moon as Earth rose over the lunar horizon...

Source: *Psyche Magazine*

<https://psyche.co/films/from-the-astronauts-to-humanity-itself-earthrise-has-left-an-indelible-mark>

NOVEMBER 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	01	02	03	New Moon 04	05	06
Daylight saving time ends 07	08	09	10	First Quarter Moon 11	12	Members Only Star Party 13
General Meeting - 7:00 PM 14	15	16	17	18	Full Moon 19	20
Deadline for submissions to the Observer 21	22	23	24	Thanksgiving 25	26	Last Quarter Moon 27
LVAAS Board of Governors Meeting 28	29	30				

DECEMBER 2021

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

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 at editorlvaas@gmail.com. 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 and suggestions are always welcome.

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 editorlvaas@gmail.com.

No permission is required for non-profit educational use of the material in this publication. Please send a link to, or copy of the publication containing the reprinted material to the editor at the above address. Some material in this publication may be copyrighted.

To become a member of LVAAS, please submit an application form, which can found in this publication or downloaded at https://lvaas.org/filemgmt_data/files/LVAAS_New_Member_Form.pdf

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

Copyright 2021 LVAAS, Inc.