

# The Observer

*The Official Publication of the Lehigh Valley Amateur Astronomical Society*

<http://lvaas.org/>

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

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## ad astra \*\*\*\*\*

Well here it is, December 2020, time to wrap up an interval of time in a neat little package, and get ready for a new one to start. I could be talking about many things, such as this calendar year that we have come to associate with many unusual challenges that we all faced together, or a contentious administration in our national politics that is about to end.

It's not yet time to celebrate the end of a historic worldwide health crisis, although there is light at the end of the tunnel. But it is the end of my term as Director of LVAAS. This will be my last Ad Astra column, and I am glad to welcome Tom Duff as our new Director, a position he will have officially assumed by the time you read this.

LVAAS has not been as active in many ways as we usually are, this year. We only had one Star Party, and it already seems as far in the past as my fourth-grade Birthday party. I vaguely remember a few details, like the freezer being stocked with enough hot dogs and buns left over from the last Star Party of 2019, so I did not do any shopping. I closed up thinking that I would definitely need to get some supplies for the April Star Party. And then the April Star Party never came.

The change in circumstance has allowed our Star Party Coordinator, Carol Kiely, and her husband Chris to take a break from their efforts on behalf of LVAAS, but I don't want us to forget Carol's dedication to having great Star Parties in the years before. Thank you Carol! And thank you Chris for helping out also. We are certainly hoping to have you back with us when it becomes safe to resume in 2021. (By the way, there is an action still being carried along in the Board agenda, to make the Star Party Coordinator a Board position. You may expect to see a Bylaws amendment submitted to the membership sometime soon.)

A few other LVAASers' roles were cut back due to the pandemic. I want to once again thank Rose Bachik for helping out in the Red Shift several times last year. I know Rose is eager to come back as soon as we start having events at South Mountain again. (And don't forget, we are still looking for a new Member Services Director to take over operating responsibility for the gift shop!)

Fred Bomberger also got to take some time off as Planetarium Director, since we only had one planetarium show this year, ironically right after outfitting the planetarium projector with a brand new arc lamp last year. Best laid plans, I guess. But let's thank Fred for his efforts before the crisis put a halt to them.

Tom Duff canceled meetings of the Astroimaging Group starting in March, as was appropriate, but he has signed up for more responsibility next year by becoming our new Director. In addition to thanking Tom for all his past contributions, I want to ask everyone to support him in his new role.

Tom has also been taking care of our key distribution and records (again, thanks, Tom!) but he has relinquished that role to make room in his schedule for his new job. I really want to thank David Moll for re-committing himself wholeheartedly to his position as Director of Risk Management. I've been working with Dave on a few things during the lockdown, such as reviewing our insurance situation and inventorying our building contents, and fixing a couple of minor issues with our locks and keys. Earl Pursell and Frank Lyter have agreed to help with key distribution for South Mountain and Pulpit Rock, respectively, and we are currently working a process to audit what keys are actually "out there." (Please respond to your key audit inquiry as soon as possible.) I'd like to thank Earl and Frank as well as Ron Kunkel, Bill Dahlenburg, Pete Brooks and Mike Clark for helping with the contents inventory.



Our Library saw reduced use this year, which was a relief to David Raker since his teaching career became significantly more challenging. Still, he continued to look after our collection, and completed the annual inventory as usual. Thank you David!

At the other end of the spectrum, Membership Director Gwyn Fowler has had an unusually busy year with LVAAS activities. We welcomed a lot of new members this year! Gwyn also took the lead in organizing an outdoor section for three of our membership meetings at Pulpit Rock, pretty much the only opportunities for our members to get together in 2020. She had a lot of help from her Dad and our Treasurer, Scott Fowler, and I think maybe some help from her brother, Ian. The Pulpit Rock meetings came with planning, logistical, and technical challenges, and Gwyn's initiative and leadership made it happen. And Gwyn will be our Treasurer next year! A very big Thank You to Gwyn, Scott, and Ian for everything they have done and are doing for LVAAS.

Dennis and Kelly Decker have ably served their first term as LVAAS Secretary (Dennis is the official office holder), and I'm really glad they have agreed to do it for another year. I was hoping we would get to know Dennis and Kelly better at our membership and Board meetings, but the circumstances of the pandemic and our remote meeting arrangements have slowed that down a bit. (Interestingly, at least to me the video remote meeting format seems to make less of a difference with other members of the team whom I've already spent a lot of time with, but with Dennis and Kelly having just recently joined the team when the lockdown hit, it seems to be more of a hindrance.) Anyway, thank you Dennis and Kelly for your work recording our meetings, and for agreeing to give us another year! I hope we will get to see you face-to-face again soon.

For some members of our team, it was business as usual, but not quite the same as usual. I'm thinking of Ron Kunkel, who is still doing a superb job as Maintenance Director of our Pulpit Rock site. We did not try to have Mega Meet this year, reducing usage of the site in one instance; but then we had not one, but three membership meetings at The Rock! (And on Zoom, thanks to Gwyn and Scott.) As for non-LVAAS hikers visiting Pulpit Rock, for a time the site was off-limits by order of Hamburg Borough, but when it was open it seemed busier than ever. Through it all, Ron has remained dedicated, resourceful, and adaptable. Thank you Ron!

Observatory Director Frank Lyter modified his approach due to the circumstances. We did not schedule any major indoor projects this year, and only did a few small tasks on the 40-inch as required for the engineering work I've been doing. Instead, Frank organized a number of projects that could be completed outdoors, including repainting and "snake-proofing" the "Dob shed" (officially the Andrews Observatory), preparing the Shlegel-McHugh Observatory for repainting, and installing a new conduit to bring power to the observing pier installed in the field. In addition, Frank led some observing sessions for Comet NEOWISE in Kempton. Thanks, Frank!

I'd also like to acknowledge again some LVAAS members (and some Kunkel family members) who showed up to help Ron and Frank with these projects. Chris Kunkel and his excavator were invaluable on the conduit project, while Dylan and Colton Kunkel did a great job operating the mini dump trucks. Also, Cindy Kunkel, Earl Pursell, Joe Zitarella, Jim Farrand, Kyle Kramm, Andy Heilman, Sam Borso, Carol Stager, Terry Roszhart and his son Mike, Maurice Conner, Bob Weiss, and Jim and Karen Blandford chipped in on various projects at various times. (Jim and Karen have been a valuable friends of LVAAS and friends to Pulpit Rock visitors for many years, and I am glad to welcome him as a new member this year.)

Meanwhile at South Mountain, the site saw reduced utilization, but still required taking care of; Maintenance Director Bill Dahlenburg and Observatory Director Mike Clark have kept busy, with regular or frequent help

from Pete Brookes, Earl Pursell, and Paula Clark. We now have a new roof over the rear addition to the building, and significant repairs and fresh paint on portions of all of the buildings. Also, let's thank Mike and Pete for taking care of our fleet of rental telescopes.

Although we've switched to a mostly-remote format, we've continued to have monthly General Meetings, with a guest speaker or some kind of program each month. Programs Director Sandy Mesics has remained instrumental in keeping that going, and I'm happy I've been able to help a bit by bringing in some speakers that I've met here and there. In addition, Sandy regularly contributes a really great column about the history of LVAAS to our newsletter. Thank you Sandy!

Speaking of the newsletter, if you've gotten this far you are probably a regular reader and you know how great it is. Let's all offer our Publications Director Frances Kopy a giant Thank You for her efforts, to bring in great content every month and assemble it into this excellent publication. Please make sure that all of your friends inside and outside of LVAAS know how much you enjoy The Observer! (It is available to the public, in case you didn't know, under the "Newsletter" link on our web page.) Thank you very much, Frances!

Behind-the-scenes members of our Board, and chairs of some of our Special Committees, have kept busy to varying degrees. The health crisis has put a hold on our scouting programs, although Chris Smith did represent us in a presentation to Minsi Trails Council. Chris's programs for cub scouts and girl scouts were very active through the years up to 2019, and I am sure he is eager to resume when it is safe. The same goes for Ron with respect to the Pulpit Rock camping program, and we should thank Claudio Stabile for volunteering to help this year, although he didn't get much of a chance to follow through on that offer. Meanwhile, Eric Loch continues to field inquiries about outreach events, as well as helping me handle incoming calls on our organization's phone number, and he has recently taken on a role managing our Facebook page. Thank you Eric and Chris and Ron and Claudio!

As Development Director, Mike Waddell helps me field inquiries from folks who want to help us with fund-raising. Mike has held off on serious fund-raising efforts to allow our Strategic Planning process to play out, and we owe a big Thank You for that to Preston Smith! Preston offered to lend his expertise in organizational strategic planning to LVAAS, and as a result we have our first Board-approved Strategic Plan. Thank you Preston and Mike!

Another behind-the-scenes roll is held by someone I've already mentioned, Earl Pursell, our delegate to United Astronomy Clubs of New Jersey. Unlike LVAAS, UACNJ has continued to have public Star Parties at their location in Jenny Jump State Park, in addition to which they have regular Board meetings and other activities that Earl attends and regularly reports on. Thanks, Earl!

We appointed one new Committee Chair/Director this year. Bill Malkames agreed to come on board as our Director of Light Pollution Abatement, and has begun making contacts with others in the Lehigh Valley with similar roles. Thank you Bill!

Blaine Easterwood is our Director of Education, and he got a neat thing started with the LVAAS Book Club. Unfortunately, Blaine's job kind of buried him this year, so his activities have been on hold for a bit. Before the book club, he served as our liaison to Da Vinci Science Center (and his son worked there), another great contribution. Thanks, Blaine! I am sure he is looking forward to a chance to dive back into being involved with LVAAS at a higher level again.



Speaking of Da Vinci Science Center, we should thank them for supporting our public program to view the Transit of Mercury, and for providing a venue for our 2019 Holiday Party! I hope the great partnership between LVAAS and Da Vinci Center blooms anew once it becomes safe to have large gatherings again.

I'd like to thank a few long-time members and former officers and Board members who continue to help LVAAS in many different ways, whenever we call on them. Bob Mohr, Gary Becker, and Peter Detteline have helped (and continue to help) LVAAS in a variety of capacities. Thank you Bob, Gary, and Peter!

I would also like to thank Dr. Judy Parker for her efforts on behalf of LVAAS. She has been a reliable volunteer at our Star Parties, and in 2020 and previous years she also made very valuable arrangements for us to have a winter meeting place at Muhlenberg College. Thank you Judy! (Obviously the health situation prevents us from returning to Muhlenberg this winter.)

I also want to mention some of the names of companies and individuals who have donated equipment or funds to LVAAS. Thank you again to Dreamhost and Backblaze, to Eve Ormsby, to Verizon, to Dr. Jeffrey Gryn, to Luther Crest Senior Living Community, to Doug Johnson, to the family of Priscilla Jacobsen, to Autodesk, Inc., and to Lee and Howie Simpson. I would also like to thank incidental donors whose names I don't know or who donated anonymously.

Finally, I want to mention Priscilla Jacobsen one last time. Priscilla was an enthusiastic LVAAS member and contributor to our maintenance efforts, as well as many outreach events, who sadly succumbed to acute leukemia this year. We hosted her family and friends for a memorial service at our South Mountain headquarters in August. Thanks also to Carol, Bill, and Earl for attending and helping with the memorial, and Mike and Paula for helping prepare the site.

And, I want to say Thank you, and apologize, to everyone who has furthered the cause of LVAAS over the past two years, who I've failed to mention by name. I'm sure I've left out some names, and I'm really sorry! I did my best to remember everyone but I have little doubt that I failed, and I'm sure that there are members who do things for the club that I don't even know about.

Finally, I would like to thank everyone at LVAAS for the opportunity to serve as your Director for the past two years! It is a great organization and filling this position has been a high honor and a lot of fun.

Ad Astra!

— *Rich Hogg*

## **Minutes from the LVAAS General Meeting – November 8, 2020**

The November 2020 LVAAS General Meeting was held both outdoors at the Pulpit Rock dark sky site as well as utilizing an on-line service.

Approximately 45 people were in attendance both online and at Pulpit Rock.

Director Rich Hogg and Membership Director Gwyn Fowler opened the meeting at 7:20 PM.

The meeting started with LVAAS business.

### Treasurers Report: Scott Fowler

This is an FY 2020 summary report

Income	\$25,703.33
Expenses	\$24,450.90
Net	\$1,252.43

There was an expense of \$1,387.57 for a new arc lamp for the planetarium projector that was paid from the Core Fund because the projected budget deficit prevented the use of additional money from the General Fund. I (Scott) recommended that the Board reverse the decision to use the Core Fund for that purchase and amend the Planetarium budget from \$200 upward by \$1,200 to \$1,400 for FY 2020 to cover the purchase. Motion to reverse the decision to use the Core Fund for the new arc lamp purchase and amend the Planetarium budget by was approved by vote of the members.

### Membership: Gwyn Fowler

#### 2<sup>nd</sup> Readings:

- Arthur Williams Jr.

#### 1<sup>st</sup> Readings:

- Krishan Thakker
- Michael Bleiler
- Cheryl Bleiler

Donations of \$100.00 and \$500.00 were received from lifetime members.

After the LVAAS business concluded, the meeting moved to the evening's presentation. The presentation was entitled "The Life of a Star and How We Figured it Out." by Dr. Mary Lou West Professor Emerita of Mathematical Sciences, Montclair State University.

Mary Lou West has been excited about astronomy for many years. She studied at Cornell and Columbia where she earned a PhD in astrophysics. She retired in 2012 from teaching astronomy and physics for 42 years at Montclair State University in Montclair, NJ. Her research interests are the properties of meteorites, active sunspots and their effect on Earth's ionosphere, spectra, and exoplanets. She has organized the popular weekly Public Telescope Nights at MSU (now paused by COVID-19), and advises the Montclair amateur astronomy club NJAG, and the Cranford astronomy club AAI. Since retirement she has observed the spectrum of Nova Delphini 2013 and supernova 2014J in M82 (the cigar galaxy), and has led a team of amateur astronomers in observing the transits of exoplanet candidates.

After Dr. West's presentation, Rich acknowledged the contributions of many of the attendees in helping LVAAS over the past year. He indicated that he would be repeating these acknowledgements and adding more in his Ad Astra column in the November Observer.

#### Next General Meeting:

The next General Meeting will be Saturday, December 12<sup>th</sup>, 2020 and will be conducted electronically.

There is no link to the November General Meeting since it was not recorded.

The meeting was adjourned at approximately 8:50 PM.

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Submitted by Dennis Decker, Secretary



# LVAAS 2021 Renewal Form

Questions? Contact: [membership@lvaas.org](mailto:membership@lvaas.org)

**2021 Dues (Circle One)**

Type Of Membership	Dues
Individual	\$45.00
Full-time students, over 18	\$15.00
Family	\$65.00
Sustaining	\$90.00
Junior (under 18 as of 1/1/21)	\$15.00
Life	\$675.00

## Donations are greatly appreciated!

Would you like to give an additional donation?  
If so, please list the amount below. If you want it to be designated please specify (e.g. roof, PRoD, 40" telescope, planetarium).

Donation: \_\_\_\_\_

Complete this form and give it, with payment, to the Membership Director (Gwyn Fowler):

- At any membership meeting – cash or check
- via US Mail – check only (payable to LVAAS) – to:

**LVAAS Membership**  
c/o Gwyn Fowler  
97 Yeager Road  
Lenhartsville, PA 19534

**Full members should renew by January 1, 2021, to remain in good standing. If you are not renewing, please arrange to return society keys, library books and rental telescopes.**

**If there are no changes in your information, you may just mail your check. If you want to give an additional donation, just include it with your dues. If you want to designate your donation please specify.**

Individual Membership Renewal	
Name:	
Street Address:	
City/State/Zip:	
Home Phone:	
Cell Phone:	
Email	

Would you like a receipt for payment?

Yes \_\_\_ No \_\_\_

Would you like a membership card?

Yes \_\_\_ No \_\_\_

**Note: If the answer is "yes" to either of these questions please include a stamped/self-addressed envelope with your renewal form to the address listed on the top right of this form. Membership cards will be mailed until we are able to have in person General Meetings.**

Family Membership Renewal	
A Family is 2 Adults + Minor Children (under 18), all living at the same address.	
Adult #1 Name:	
Adult #2 Name:	
Child Name	Age:
Child Name	Age:
Child Name	Age:
Street Address:	
City/State/Zip:	
Home Phone:	
Cell (Adult #1):	
Cell (Adult #2):	
Email (Adult #1):	
Email (Adult #2):	

**Official Use Only:** Dues: \_\_\_\_\_ Donation: \_\_\_\_\_ Total: \_\_\_\_\_ Check#: \_\_\_\_\_ Date Paid: \_\_\_\_\_

Card Issued: \_\_\_\_\_ Receipt: \_\_\_\_\_ Keys/Rentals Notified: \_\_\_\_\_ Cash to Treasurer: \_\_\_\_\_

## New Member Application

### LEHIGH VALLEY AMATEUR ASTRONOMICAL SOCIETY



Make checks payable to: LVAAS

Mail your completed application(s), with your dues to:

LVAAS MEMBERSHIP  
c/o Gwyn Fowler  
97 Yeager Road  
Lenhartsville, PA 19534

Name: \_\_\_\_\_ Are you age 18 or older? Yes \_\_\_\_ No \_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_ Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Occupation (Optional): \_\_\_\_\_ Where did you first hear about LVAAS? \_\_\_\_\_

Specific Astronomical Interests: \_\_\_\_\_

Are you a member of other Astronomical Societies? \_\_\_\_\_

Please list any astronomical instruments owned: \_\_\_\_\_

Experience in Astronomy (circle one):    **Novice**    **Amateur**    **Advanced Amateur**    **Professional**

Type of Membership (circle one):

**Full-time student: \$15 Individual: \$45 Family: \$65 Junior: \$15 Sustaining: \$90 Life: \$675**

*If you are a full time student over the age of 18, you will need to show proof (class schedule, school ID) to the membership director via email or at a meeting. Students under 18, should apply for Junior membership if they are not a part of a family membership.*

Are you a part of a Family Membership?:            Yes: \_\_\_\_            No: \_\_\_\_

*(Note: Each family member must have a completed application regardless of age)*

#### **Donations are greatly appreciated!**

Would you like to give an additional donation? If so, please list the amount. If you want it to be designated please specify (e.g. roof, Prod, 40" telescope, planetarium). **Donation:** \_\_\_\_\_

#### **Committee Use Only:**

Dues: \_\_\_\_\_ Application Fee: \_\_\_\_\_ Donation: \_\_\_\_\_ Total: \_\_\_\_\_ Check #: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1<sup>st</sup> Reading: \_\_\_\_/\_\_\_\_/\_\_\_\_ 2<sup>nd</sup> Reading: \_\_\_\_/\_\_\_\_/\_\_\_\_ Card Issued: \_\_\_\_/\_\_\_\_/\_\_\_\_ To Treasurer: \_\_\_\_/\_\_\_\_/\_\_\_\_

## 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! Click this link for more information at the LVAAS website:

[https://lvaas.org/page.php?page=using\\_rmd\\_to\\_support\\_lvaas](https://lvaas.org/page.php?page=using_rmd_to_support_lvaas)

## Via Earl Pursell, UACNJ Liason: Smartphone Astrophotography

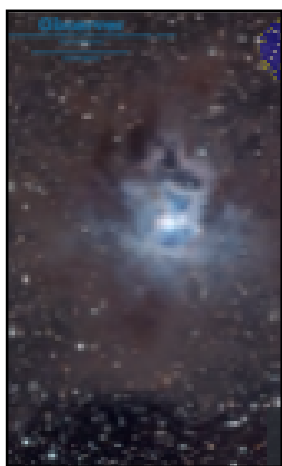
From Dr. Sten Odenwald of the NASA Space Science Education Consortium, FYI. Please share this product announcement with anyone interested...

A Guide to Smartphone Astrophotography has now gone through NASA Product Review and has been recommended for wide distribution. This lavishly-illustrated book features detailed instructions for how to use your smartphone to take photographs of the night sky, and numerous astronomical objects included. Previously, expensive cameras were required, but the advent of smartphones brings this exciting hobby into the hands of students and life-long learners for exciting journeys of exploration. This step-by-step guide written by a professional astronomer will show you how to do it! (189 pages, 185 illustrations, PDF).

Please link to the main SpaceMath@NASA webpage where the document is being featured so that I can keep track of the number of downloads. Download at <http://spacemath.gsfc.nasa.gov>

Send comments to Sten Odenwald at [odenwald@astronomycafe.net](mailto:odenwald@astronomycafe.net)

<https://spacemath.gsfc.nasa.gov/SMBooks/AstrophotographyV1.pdf>



**Cover photo by Lynn Krizan**

***Iris nebula, NGC 7023, Caldwell 4 is a reflection nebula in the constellation Cepheus. The designation NGC 7023 refers to the open cluster within the larger reflection nebula designated LBN 487.***

***Taken at Cherry Springs State Park Sept. 19-20, 2020.***

***Camera - Starlight Xpress Trius sx-694 Pro***

***LRGB filtered acquisition using Astrodon filters***

***Total acquisition time approximately 10 hours***

***Telescope - Astro Physics AP130GTX , working at F4.8 using Astro Physics 0.75x reducer 27TVPH***

***Mount - Astro Physics Mach1***

***Processing done with MaximDL v 6 and Photoshop v 5***



# LVAAS General Meeting

## Saturday, December 12 at 7 p.m.



- Meeting will be online only -

This is traditionally our Holiday Party, and it would be nice to get in the Holiday Spirit together after our program, even though we will only be gathering on-line. Got any great ideas about how to have some virtual Holiday Party fun? If so email [director@lvaas.org](mailto:director@lvaas.org).

## “Pulsars and Gravitational Waves”

*Pulsars are neutron stars that emit beams of light as they rotate, resulting in apparent pulses of light as the beam crosses our line of sight. These pulses are so regular that they can be timed with high enough precision to determine spin, orbital, and other physical properties of a given pulsar. The fastest-spinning pulsars—millisecond pulsars (MSPs), with millisecond spin periods—can be timed with such high precision that they can be used to search for nanohertz-frequency gravitational waves (GWs). Arrays of MSPs called pulsar timing arrays (PTAs) are expected to detect such low-frequency GWs from supermassive binary black holes within several years to a decade, complementing the LIGO detections of smaller black holes at higher frequencies and opening a completely new window for studying the most massive black holes known to exist in the universe. In this talk, I will describe how PTAs, both in the US and internationally, are working toward making the first detection of GWs from supermassive black holes.*



**Dr. Megan DeCesar** grew up in rural PA and became interested in science, especially astronomy, at a young age. She studied astronomy and music in college, and chose to pursue a career in astronomy. She went to graduate school at the University of Maryland, and did much of her thesis work at the NASA Goddard Space Flight Center with a focus on gamma-ray pulsars. After earning her Ph.D., she became a postdoctoral researcher at the University of Wisconsin-Milwaukee, where she shifted her focus to radio pulsars and began to work on pulsar timing arrays (PTAs) for gravitational wave searches. She continued this work in her second postdoctoral position at Lafayette College, where she led the development of the most current PTA dataset. After her second postdoctoral position, she spent a year as an American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellow in the U.S. Department of Energy. She has recently returned to working on pulsars and gravitational waves as a research scientist at George Mason University and the U.S. Naval Research Laboratory.

**Members will receive an invitation to the on-line meeting by email. Prospective new members who wish to attend should contact [membership@lvaas.org](mailto:membership@lvaas.org) to arrange to receive an invitation.**



# Night Sky Notebook for *December*

*by*

**Peter Detterline**



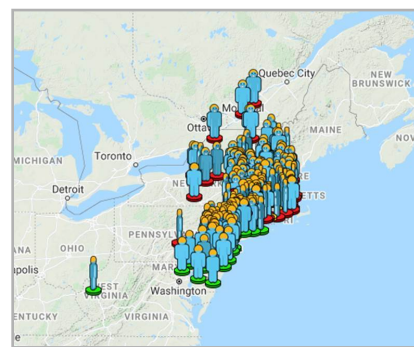


On November 9th around 7:00 p.m. EST, a bright fireball blasted through the night air as seen from Canada through West Virginia. The event was reported by 588 people and captured by 5 videos. Because of the number of the reports and the fireball happening at a "reasonable" hour, news coverage of the event was high. I have a meteor station developed by Mike Hankey through the American Meteor Society that monitors the sky 24/7; the camera recorded the fireball low in the northeast. Analysis of the video shows a second fainter meteor just above it on the video. That isn't a meteor, it's actually an artifact. The fireball was so bright it created a reflection on the acrylic dome that houses the cameras. Analysis of the video (provided by Mike Hankey) shows that it matches up perfectly with the Northern Taurid meteor shower. Along with its slow speed and brightness, it has all of the classic signs of a member from this meteor shower. However, there is some debate from NASA as Bill Cooke claims that their analysis shows that it's very close, but not a Northern Taurid. If you see a fireball you should report it to the American Meteor Society using their fireball form at:

[https://fireball.amsmeteors.org/members/imo/report\\_intro](https://fireball.amsmeteors.org/members/imo/report_intro) There's always something exciting going on in the universe so keep looking up! ~ Peter Detterline



All Sky Meteor Camera



Video and images courtesy of Peter Detterline





sandra repash 2020

This is a close up view of **The Crescent Nebula (NGC 6888)** in the constellation Cygnus located five thousand lightyears from Earth. The giant gaseous shell of this 'emission' nebula was created by powerful winds blowing from the massive star HD 192163 (center of nebula) when it expanded into a red giant. Over the span of two hundred thousand years, winds were forced both inward and outward to create the bubble shell. HD 192163 will likely explode as a supernova in about a hundred thousand years. This image was captured with ninety minutes of exposure using an Atik 414ex monochrome CCD camera, a 5nm Hydrogen Alpha filter and a Stellarvue 102mm triplet refractor telescope. The Soap Bubble Nebula or 'Cygnus Bubble' (out of the field of view in this image but near the Crescent Nebula) is also an interesting 'planetary' nebula discovered in 2007 during post processing by amateur astronomer and astrophotographer Dave Jurasevich.  
**Imaged by Sandra Repash**



*From the LVAAS Archives:*

## A Christmas Comet Becomes A Grinch

by Sandy Mesics

Seventy years ago, Comet Cunningham (Comet 1940 c) was all the sensation in the astronomy world, and the Lehigh Valley Astronomical Society (LVAS) was following it closely. As Eugene Carl Jr. wrote in the minutes of the December 1940 LVAS meeting:

“The big thrill of the evening was the projection of the Comet Cunningham on the screen, photographed by Mr. [Ralph] Schlegel himself. Earlier in the evening its path had been traced on the star map by Mr. [Norman] Bell. In general, the meeting was enjoyed by everyone who attended and following the study of Comet Cunningham was adjourned.”



Figure 1. Leland Cunningham, from *Life Magazine*

Comet Cunningham was discovered by Leland Erskin Cunningham (1904-1989). At the time of discovery, Cunningham was a graduate student at Harvard University. He discovered the comet on a photographic plate he took in August 1940. It became visible to the naked eye in December 1940 and was predicted to become the brightest comet since Haley's Comet in 1910. News of the comet was featured in the December 23, 1940 issue of *Life Magazine*.

Cunningham was born in Maine, the only child of Raymond and Lillian Cunningham. His 19-year-old mother died only three weeks after his birth, and he was raised by his father and his paternal grandmother. He was described as a very bright but very shy and retiring child, always avoiding the limelight. Reportedly, he refused to graduate from high school with the rest of his class because he was expected to give the valedictorian address. Cunningham received an undergraduate degree in 1940 and Ph.D. in 1946, both from Harvard University.

Cunningham received a lot of publicity for his comet discovery. At the time of the discovery, the Ford Motor

Company was introducing their new Mercury Comet automobile. As a publicity stunt, Ford presented a new Comet to Cunningham. Reportedly, Cunningham remained loyal to Ford automobiles for the rest of his life.

During World War II, while pursuing his doctorate at Harvard, Cunningham worked at the Ballistic Research Laboratories at the Aberdeen Proving Ground, where he made early applications of computers to problems of ballistic trajectories. In 1946 he joined the Department of Astronomy at the University of California Berkeley, where he remained until his retirement in 1972. He was considered an authority on orbit theory and the determination of the orbits of comets, asteroids, and satellites, both natural and artificial. He was also an expert in the application of computers to the solution of numerical problems. After his retirement, he remained active in research.

For his entire life, Cunningham remained a shy, quiet, very polite, very private person. His habit was to work alone in his office until very late at night. He died at home in 1989 at age 85 while working at his computer, attempting to establish a more precise orbit of the Earth, than any currently available.



*Figure 2. Cunningham comet, C/1940 R2 (Cunningham), photographed with the 24-inch reflector telescope of Yerkes Observatory. University of Chicago Photographic Archive, [apf digital item number, e.g., apf12345], Special Collections Research Center, Univ. of Chicago.*

Unfortunately, Comet Cunningham did not live up to expectations. Soon after it was discovered its initial surge of brightness inexplicably slowed. By Christmas, 1940 the comet was only one-hundredth as bright as predictions had originally indicated. Despite the disappointment, a fair amount of good research was done on Comet Cunningham. A team of six astronomers led by Cunningham himself followed the comet at the Oak Ridge Station of Harvard University. Every clear night for over a month they took thirty 8 x 10 inch photographs of the comet, many for the first time in the infrared end of the spectrum.

The LVAS archives from 1941 make no further mention of Comet Cunningham. It was last seen on June 17 1941, and because of perturbations in its hyperbolic orbit it has exited the solar system and it will not return.

## References

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# StarWatch

by Gary A. Becker

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[astronomy.org](http://astronomy.org) [facebook.com/StarWatchAstro/](https://facebook.com/StarWatchAstro/)



## Grateful Thanks to Shooting Star's Bill and Johnny

Have you ever wanted to meet someone in the film industry? I had that opportunity in 2010 when former Paramount Pictures director and Bucks County resident, Bill Jacobs, sent me an email asking for advice regarding possible locations for various scenes for a feature film that he had conceived, *When the Moon was Twice as Big*. Bill had moved to the East Coast to avoid the overpriced production costs that were associated with filmmaking in Hollywood. I honestly thought that his missive was a spoof, nearly deleting the correspondence after just reading the salutation in the header. Thank goodness, I didn't. It would have been one of the biggest blunders of my life.

When my wife and I listened to Bill's story over dinner at the Red Lion in Quakertown several weeks later, it became evident that Bill had a dream and a vision far larger than anything I had ever imagined. Bill's warmth and sincerity and his passion for his trade brought me into a world that expanded my appreciation of the art of the possible. Several weeks later, Bill and I took a two-day tour of the astronomical sites in the Lehigh Valley: Kutztown University, the Boyertown Area School District Planetarium, and the Pulpit Rock and South Mountain sites of LVAAS. Boyertown and Pulpit Rock were chosen for major scenes in the motion picture. I was selected as technical advisor for the picture which brought me on set to assist in some of the filming, but it also introduced me to Bill's talented friends and his home at Shooting Star Farm.

The 35-acre, equestrian homestead was named after a brilliant fireball that Bill had witnessed years before while living in Ohio. Besides the farm's well-maintained grounds, two barns, house, and other outbuildings, what impressed me most was how dark the area was and its proximity to Moravian College where I taught astronomy. It took me a full year to muster up the courage to ask Bill if I could bring my students to Shooting Star for a dark sky field experience. I thought I might be taking advantage of our friendship, but again I was wrong. Bill excitedly opened up his grounds to my students, oftentimes mowing the grass on the day of an event.

Help came from friends many of whom were members of the Lehigh Valley Amateur Astronomical Society, returning from a day's work to volunteer their time and energy to help my students gain a better perspective of the heavens through the vistas created through their wonderful telescopes. These were not your ordinary obligations. Shooting Star field experiences involved two nights a semester with numerous inclement weather dates, creating commitments that could last over many weeks.

What made these events so special and the volunteers returning time and time again were the get-togethers that ensued for my friends following the observing sessions. Good food, good conversation, and good camaraderie made those nights under the starry vault of Shooting Star Farm so memorable for all of the participants.

When Bill partnered with Johnny Killwey in 2013, the events became even more festive. Johnny loved the culinary arts and took charge of the oven, and in addition, supplemented his own style of New York wit to the conversations. However, with the feature film nearly completed, Johnny and Bill have purchased a five-acre plot of land in Wellfleet, Cape Cod, Massachusetts. Shooting Star Farm is for sale. LVAAS has invited my Moravian students to share in the excitement of the night sky from Pulpit Rock. I have volunteered to bring the cheese and savory foods, but sheltering in the 40-inch observatory after an event just won't be the same as it was in the Great Room of Shooting Star Farm while warming up around a crackling fire with goodies, discourse, and Bill's big old brass telescope peering through a corner window.

My profound thanks to Bill Jacobs and Johnny Killwey for their unbounded support and generosity to my friends from LVAAS and to my students from Moravian College, who were provided with the opportunity to glimpse the jewels of the heavens from Shooting Star Farm.



Grateful Thanks to Bill Jacobs and Johnny Killwey for opening Shooting Star Farm to friends and members of the Lehigh Valley Amateur Astronomical Society, Inc., and to hundreds of astronomy students from Moravian College over an eight year period. Participants in dozens of events included Marcella and Matt Gustantino, LVAAS members, Bill Dahlenburg, Sandra Mesics, Tom Duff, Ron Kunkel, Rich Hogg, Terry Pundiak, and Joe Zelinski.

Images, Timothy Murphy and Gary A. Becker.









# Schlegel Observatory Report

by Rich Hogg – December 2020



Last month I said that we had a couple of tasks in progress that I was not ready to report on. Now, one of those is complete, and here is the run-down.

This began earlier in the year, when I saw a posting that the item shown at right was on sale. Of course, I rushed to place an order, as I usually do when I hear of anything that goes on sale. I figure I'll save some money by buying it, whatever it is, and then figure out something cool to do with it.

OK, enough stupid jokes. This really started two or three years ago, as we were testing the slew motors on the uncompleted 40-inch telescope, and we squinted upward at the secondary motor housing and the spider and wondered just how close it was to the top of the dome. Short of climbing up on a ladder and doing some kind of *Cirque du Soleil* act with a tape measure, it was impossible to tell, but it did not look like we had a lot of room. I started thinking about attaching something to the front of the scope that would let us see how much clearance we had.



Well, I didn't get around to doing that before we disassembled the scope for re-painting, and I decided I did not want to wait until we put it back together. So, using the gadget shown in the image, a "laser measure" or optical device for measuring distance, seemed like a good approach to getting the required data.

I really like this device, by the way! It works well and I am sure I will find other uses for it. Here is the link, in case you want to get your own: [ACEGMET Laser Measure](#).



Presently, the telescope is entirely disassembled and removed from the fork, so I decided to measure from the center of rotation of the mount. From my measurements and 3-D CAD models of the telescope, I would be able to determine the distance from the C.O.R. to the "nose" of the 'scope, and then a simple subtraction would give me the "dome clearance."



The setup for this is shown in the photo at left. First I took what my Dad would have called "a stick of wood," a 1x6 white pine board from the "lumber yard" (Lowe's), and cut a notch out of one corner to create a narrower finger at the end. The finger is designed to slip into one of the now-empty Declination bearings on the fork of the mount, which (as you can see in the photo) is now stripped down to the red primer. The width of the finger is calculated to place the top of the board at the center of the axis. I did the same thing with another "stick a' wood" to go in the other side, and then clamped them together to create a fixture that securely spanned the fork.

I also ordered a wooden "3-inch split ball" from Amazon, and epoxied it to a leftover section of one of the boards so that it could be clamped to the middle of the fixture, placing the center of the 1.5-inch-radius wooden hemisphere exactly at the center of the declination axis of the fork (or at least within a quarter of an inch, probably better.) It's visible in the photo, overlapping the top edge of the board, held by the black-and-yellow clamp you can see beneath it.

The measurement process consisted of me standing on a stepladder and holding the back end of the laser measure against the ball, and measuring the distance to various points on the interior of the dome. Since I only have two hands, I used a voice-recorder app on my smartphone to record the measurements, all the while reminding myself not to make any sudden moves that would result in my Android device plummeting to the bottom of the pit, bouncing off the telescope's pier all the way down. All of the above was accomplished successfully, and it enabled me to learn the worst-case situation for room at the front of the scope. It is when the metal cover for the gear that opens and shuts the dome shutter is directly north of the instrument. After I reviewed the numbers at home, I decided to second-guess my laser gadget's value on this important measurement.

So, I asked Ron Kunkel, our Pulpit Rock Maintenance Director, to meet me at the observatory one afternoon, and I set up the fixture one more time. Ron brought a second ladder onto the observation deck, and climbed up high enough to hold the end of an actual steel tape measure against the offending gear cover, so I could re-measure the distance to the ball.

And the result, drum roll (after adding the 1.5-inch radius of the ball) is: 112.25 inches!

Why is this important? We know the telescope fit in the dome at one time, before we took it apart. Actually, it could bump into the temporary lifting bar that is mounted across the dome slot, but that will be removed. And, we have changed the configuration of the truss in a way that makes it slightly shorter. But the problem is, we need to complete the design of the mounting arrangement for the secondary mirror, and we also changed the optical design slightly by increasing the spacing between the two mirrors.

The focus of all of this is the blue cylinder shown in the illustration at right, generated from the 3-D CAD model. It is supported by the four black vanes of the "spider" and it in turn supports the secondary mirror, barely visible on its bottom side. It needs to contain an arrangement to evenly support the mirror so that it is not distorted by its own weight, plus some affair to allow the mirror to be adjusted for perfect alignment or "collimation" with the rest of the system.



I'm showing a housing with an overall thickness of 6" and a diameter of 12.5" in this model. The 6" thickness gives us a smidgen over 4 inches of clearance to that pesky gear cover, which seems like a reasonable goal.

Another piece of the system that is not included in this model controls the diameter. A Cassegrain system like this one requires two baffles to prevent stray light from getting to the image plane. The main baffle will protrude up through the center of the primary mirror, while the secondary baffle will surround the smaller secondary mirror. The ideal diameter of the secondary baffle is 12.6", so the blue "hatbox" is allowed to be up to the same diameter without taking anything away from the performance of the scope. (I colored it blue in this illustration for discussion, to make it easy to identify. In reality it will be covered with a matte-black, low-reflectivity flocking material, to prevent it from scattering much light and reducing the contrast of the image produced by the system.)

I'm looking forward to getting to work on the design of what goes into that blue cylinder. The 6" thickness should be enough to accomplish what we need to, but it will take some care and a little cleverness. If we absolutely need to we can expand it by a little bit, reducing the clearance to that gear cover, but I would rather not.



**Exciting, New (?) Live-Action Game!!!!**

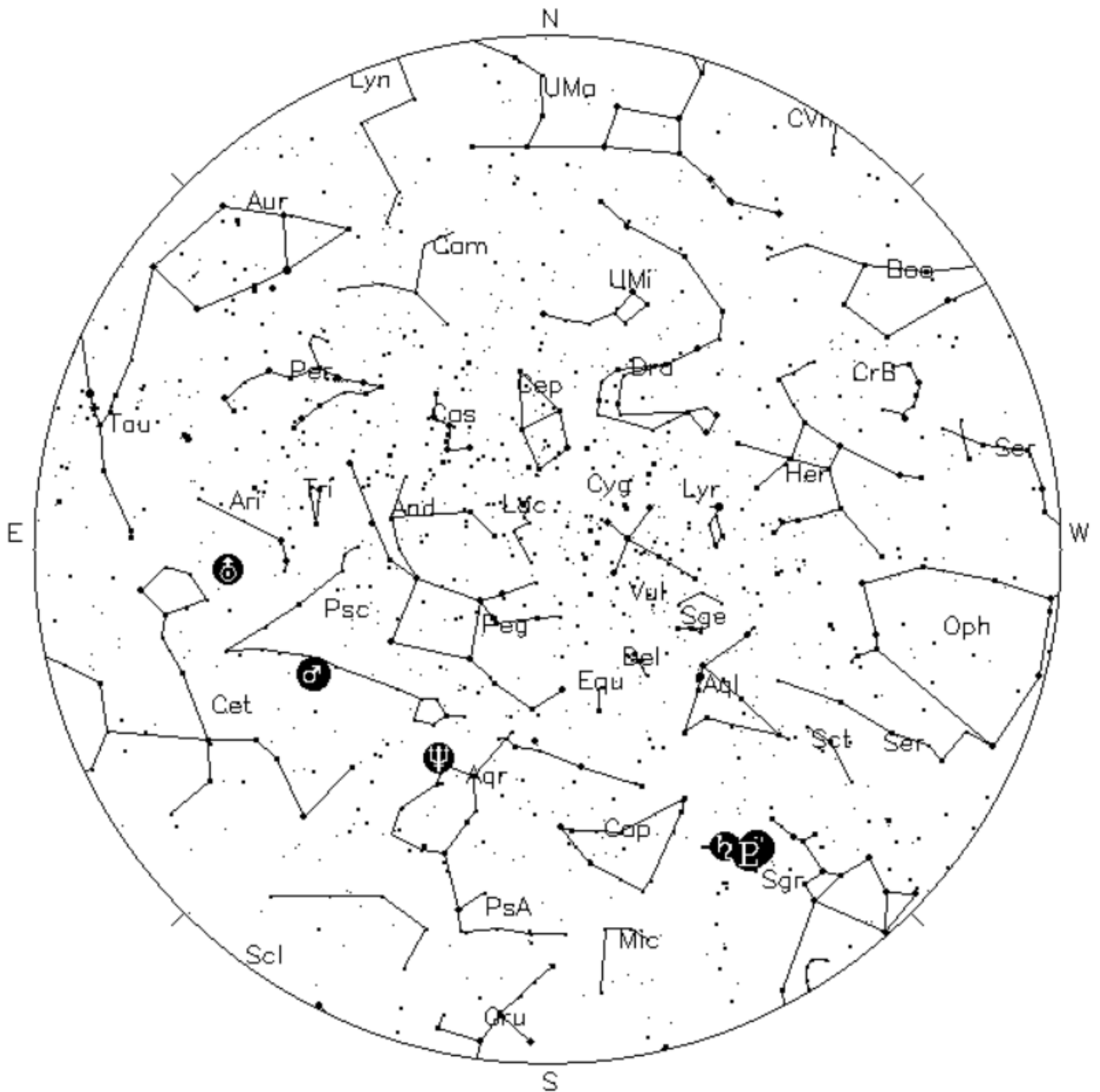
## **RED SHIFT REVENUE**

- **Operate an Astronomy Club Gift Shop!**
- **Optimize product lines!**
- **Purchase inventory!**
- **Manage production!**
- **Complete sales!**
- **Report revenue and expenses to the Board!**
- **Help a great organization do a valuable public service!**

**As our LVAAS Member Services Director, you will enjoy the challenge of operating the Red Shift Gift/Snack Shop at LVAAS Public Star Parties.**

**The only way to lose is to not play!**  
**Contact [director@lvaas.org](mailto:director@lvaas.org) to sign up!**

# Sky Above 40°33'58"N 75°26'5"W Monday Dec 7 2020 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

Copyright © 1989 by Jef Poskanzer.

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



## DECEMBER 2020

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

## JANUARY 2021

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

# 2020 LVAAS Event Calendar

*\* Due to the COVID pandemic, please see the website for updates on all events*

2020 LVAAS Event Calendar												
	Sundays				Thursday	Saturday	Monday	Multi-Day Weekends	Moon Phase			
	General Meeting time	Date/location	Board meeting	Observer submission deadline	Astro Imaging	Star Parties	Scouts at S. Mountain	Scouts at Pulpit R.	New	First	Full	Last
January	2:00 PM	12 Muhlenberg	26	19	16	no mtg		no camping	24	2	10	17
February	2:00 PM	9 Muhlenberg	23	16	13	no mtg		no camping	23	1	9	15
March	2:00 PM	8 Muhlenberg	29	22	12	7		6 – 7 – 8	24	2	9	16
April	7:00 PM	5 S.M.	26	19	18	4		10 – 11 -12	22	1 30	7	14
May	7:00 PM	3 S.M.	31	24	16	2		8 – 9 – 10	22	29	7	14
June	7:00 PM	14 S.M.	28	21	13	27		5 – 6 – 7	21	28	5	13
July	5:00 PM	11 S.M.	26	19	18	25		3 – 4 – 5 31	20	27	5	12
August	7:00 PM	8 Pulpit	30	23	15	22		1 – 2	18	25	3	11
September	7:00 PM	13 S.M.	27	20	12	26		4 – 5 – 6	17	23	2	10
October	7:00 PM	11 S.M.	25	18	15	24		2 – 3 – 4 30 – 31	16	23	1 31	9
November	7:00 PM	8 S.M.	29	22	12	21		1	15	21	30	8
December	**	12	27	20	10	no mtg		no camping	14	21	29	7

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 \*\* check website for time

NEAF  
 Cherry Springs S.P.  
 Stellafane  
 Black Forest S.P.  
 MegaMeet

April 4 – 5  
 June 18 – 21  
 Aug 13 – 16  
 Sept 18 – 20 (not confirmed)  
 May 22-24

## 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, Frances Kopy at [editorlvaas@gmail.com](mailto: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 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. Every attempt will be made to include submissions in a timely manner.

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Existing members please update your LVAAS profile information by emailing the membership director at [membership@lvaas.org](mailto:membership@lvaas.org)

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