

The Observer

The Official Publication of the Lehigh Valley Amateur Astronomical Society

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April, 2019

Volume 59 Issue 04





ad astra*****

It's been less than two weeks, as I write this, so I'm still adapting my habits to a diminished world. Those times in my routine that when I would pick up the phone and call, are now times to remember that there's no one there to answer. And I remember that my very first Ad Astra, in 2016, included a tribute to my Dad. Now it's time to do it again.

Like everyone else in our family, my Mom was an amateur astronomer. I don't know the extent of her interest before I was around, but she jumped in with both feet when it became one of our family's shared passions. She knew her way around the constellations and usually had an idea where the bright planets were at any given time. She knew how to find M31 and enjoyed looking for it when she was in a dark location.

She loved a starry night sky, though she had a little trouble keeping her balance when staring up into the darkness, a limitation I've come to share. My Mom treasured every time she got to see an aurora — even the time that she fell down and split her head open, at the top of Scranton's West Mountain, because my Dad and I both forgot to hold on to her.

She was an enthusiastic member of the Lackawanna Astronomical Society during my High School years, and enjoyed events at the Everhart Museum and later, the Keystone Junior College Observatory. She also held an Amateur Radio license and for one meteor shower, she instigated an expedition to KJCO to try to match sightings with another "ham" at Kopernik Observatory. At the time I had no idea that you could do this, and I remember being a bit wide-eyed about this scheme of hers. As I recall there were at least one or two meteors that we and the other guy were pretty sure was the same one, seen from two locations 33 miles apart.

My Mom was with me on both of the occasions that I met Carl Sagan, and she was more excited than I was. For her, there were no greater heroes than scientists and astronauts. My Mom and Dad met as employees of Bell Telephone, and when AT&T was in the running for the contract to operate the ground-tracking stations for Project Mercury, they eagerly volunteered to be part of the team, though it might mean relocation to some remote tropical location for a few years.

She was a hard-headed rationalist about almost everything, with the phases of the Moon being one of the exceptions. She thought of herself as a little bit crazy sometimes, imagining that the Pink Floyd song *Brain Damage* was really about her, and she indulged the notion that the Full Moon brought it out. I imagine she noticed the bright moon on her last night, completely aware that it would not be truly full for one more day. I don't think she knew she wouldn't see it.

Janet Hogg left us on March 19 and was reunited with my Dad in whatever comes next, pretty much the only thing she has wanted since he's been gone. I love you, Mom, and we are missing you back here on Planet Earth. Ad Astra.

— Rich Hogg



LVAAS General Meeting - Open to the Public

Sunday, April 14, 7:00 p.m.

South Mountain Headquarters
620B East Rock Road -- Allentown, PA 18103

"Stellar Fingerprints: An Introduction to Spectroscopy"

Spectroscopy is the study of the amount of light from a star as a function of wavelength. As light passes through the star, atoms in the photosphere absorb photons of certain wavelengths, producing spectral features like Balmer lines. In this talk, I will introduce the basics of spectroscopy and explore physical processes that impact the shapes of spectral features. I will also describe my research of measuring the physical parameters of massive stars, like effective temperature, surface gravity, and rotational velocity, by fitting model spectra to observed spectra.



Richard Hanes, Lehigh University

Richard Hanes is a fifth year physics graduate student at Lehigh University studying spectroscopic parameters of massive stars with his advisor, Professor Ginny McSwain. Richard received his Bachelor's degree in Astronomy and Astrophysics from the Pennsylvania State University in 2014 and his Master's degree in Physics from Lehigh University in 2016. He has presented his research at several conferences and meetings, including the 229th AAS meeting in Grapevine, Texas.

Minutes for the LVAAS General Meeting - March 10, 2019

The March 2019 LVAAS General Meeting was held on March 10 in Trumbower Hall at Muhlenberg College in Allentown. Director Rich Hogg opened the meeting at about 2:00 p.m. and then introduced the speaker, Somayeh Khakpash, a graduate student at Lehigh University. Somayeh received her undergraduate degree in Physics from Sharif University of Science and Technology in Tehran, Iran. She is now working with Professor Joshua Pepper researching microlensing exoplanets. Her presentation was entitled: "Deep Into The Curvature Of The SpaceTime To Find Planets." The technique she described, called microlensing, is a variation of gravitational lensing, and allows detection of planets around stars as a stellar-sized object (a single star, a stellar-mass black hole etc.) passes behind them. When gravitational lensing is applied to galaxies, the masses involved produce multiple distorted images of the background galaxy, but the smaller masses involved when dealing with stellar-mass objects results in a very symmetrical variation in the brightness of the star. Somayeh showed simulations of what happens when stars with and without planets pass each other. The gravity of the planet affects the variation in the light, resulting in a smaller side peak on the main peak.

Although interpreting the graph is not always as straightforward as with the simulations, the data can be used to estimate parameters of the planet-star system (e.g. duration of planetary perturbation, time of closest approach, etc.) allowing calculation of the projected separation between the star and its planet and the mass ratio of the star and planet. Searching for planets this way should allow the WFIRST mission (2.4 meter wide field orbital telescope) to detect planets at 0.1 to 100 AU from their stars, and will allow detection of planets more like Earth (Kepler mostly detected large planets orbiting very close to their stars) as well as planets similar in sizes and orbits to Saturn, Jupiter, Uranus, and Neptune, which could not be detected by Kepler. The equations that needed to be solved to use this method were numerous and complicated, so that each observation required days to solve.

Somayeh's research involved a faster method to estimate the parameters so that the entire process takes about a minute. One of the advantages of this method is that it allows detection of planets that do not transit in front of their star, from our point of view. These events only occur once per star, so to maximize possible events, WFIRST will be concentrating on the Milky Way's galactic bulge, where there are many stars. So far, about 50 planets have been discovered this way, mostly using ground-based instruments. After the Q&A period, there was a break beginning at 3:08 p.m.

Rich called the meeting back to order at 3:21 p.m. The next Star Party was scheduled for the following Saturday (3/16/19.) **Carol Kiely** will present the first planetarium show and **Fred Bomberger** will present the second. **Chuck Kunesh** will give the presentation. Carol sent out an e-mail notice.

Membership Report; Scott Fowler (substituting for director Gwyn Fowler):

- **Second Reading:** Arjun Sharma is now a full member of LVAAS, entitled to, among other things, obtain keys to the facilities and be trained on and use club equipment.

First Readings:

- Eric Belcak - Bethlehem native, now residing in Easton; stumbled across Pulpit Rock site while hiking and, after an internet search, decided to attend a meeting
- Joe Zitarelli - Center Valley; his high school had a 20" telescope and a planetarium. His undergraduate degree is in physics and he is interested in dark energy/matter
- Keenan Vitale - Lives close to the East Rock Road site. Has visited, but not during a star party; didn't know he could join the organization.
- Luis Rodriguez - a student of Prof. Easterwood's at LCCC in forensics - also didn't know he could join LVAAS. Interested in efforts to make humans a multiplanet species
- Rachael Hill - While hiking at Pulpit Rock, met and got a tour from Rich Hogg; looking forward to the next Star Party.

Treasurer's Report; Scott Fowler:

Income since last general meeting	\$ 2266.03
Expenses since last general meeting	\$ 2204.98
Net	\$ 61.05
YTD NET	\$ 2133.39

Society Librarian Dave Raker reported that a "Great Courses" unit on astronomy has been ordered. Also, there are still books for sale at the South Mountain HQ.

Pulpit Rock Maintenance Director Ron Kunkel reported that the road up to Pulpit Rock may still be impassable.

South Mountain Maintenance Director Bill Dahlenburg reminded everyone that he will be at South Mountain doing maintenance on Saturday mornings.

Muhlenberg professor Judy Parker reminded everyone that the next General Meeting (April) will be at the South Mountain site.

The speaker will be Richard Hanes, a graduate student at Lehigh University. Topic: TBA.

Astroimaging (Tom Duff) - the next meeting was scheduled for March 21. LVAAS astroimager Dave Moll will demonstrate ASlair, and GMP graphics software.

Ron Kunkel announced that he would be giving presentations at two UACNJ Star Parties at their site in Jenny Jump State Park on April 27 and Aug 31.

Rich Hogg noted that we have another outreach opportunity at the DaVinci Science Center on May 4. Blaine Easterwood is currently finding out how many people they need. Anyone interested should contact Rich or Eric Loch.

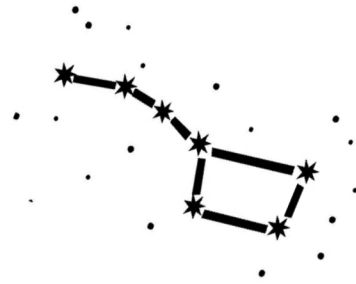
The Northeast Astronomy Forum (NEAF) will take place on the April 6 and 7 in Suffern, NY at the Rockland Community College. It is the largest annual astronomy gathering on the east coast and will feature many vendors and presentations.

The meeting adjourned at about 3:45 p.m., after which we dined at the Muhlenberg cafeteria.

Submitted by Earl Pursell, Secretary



LVAAS Members! If you have a DSLR you can do astroimaging! Mike Waddell will talk about the basics of DSLR astroimaging at the **Thursday, April 18, 7 p.m.** Astroimaging meeting. **BRING YOUR DSLR, LENSES AND A TRIPOD** and we'll do some shooting after the meeting if the weather cooperates.



UACNJ provides free public programs at our Observatory in Jenny Jump State Forest from April through October on Saturday evenings. An astronomy presentation begins at 8 PM in the lecture hall regardless of the weather and is followed by stargazing on the observatory's telescopes until 10:30 PM, weather permitting.

UACNJ Weekly Talks for 2019

April 6	- What's Up in the April Sky?	- Lonny Buinis
April 13	- Size Scales of the Solar System and Beyond	- Jason Kendall
April 20	- Journey to the Stars	- Karl Hricko
April 27	- What Happened to Pluto?	- Ron Kunkel
May 4	- What's Up in the May Sky?	- Lonny Buinis
May 11	- Making Isaac Newton Proud: Modern Newtonian Telescopes	- Rob Teeter
May 18	- Astronomy for Beginners	- Ken Taylor
May 25	- Night Vision and Astronomy	- Earl Pursell
June 1	- What's Up in the June Sky?	- Lonny Buinis
June 8	- How the Stars Got Their Names	- Bill Murray
June 15	- The Life and Death of Stars	- Walt Windish
June 22	- Mars Through the Dust Storm	- Clif Ashcraft
June 29	- Eclipses, Occultations, and Transits	- Gregg Waldron
July 6	- What's Up in the July Sky?	- Lonny Buinis
July 13	- Fly Me to the Moon	- Sean Post
July 20	- New Rides to the Moon	- Dale Skran
July 27	- Let's Go to the Moon	- Karl Hricko
Aug 3	- What's Up in the August Sky?	- Lonny Buinis
Aug 10	- Astronomy for Beginners	- Ken Taylor
Aug 17	- New Horizons Visits Ultima Thule	- Michael Dean Lewis
Aug 24	- You Bought a Telescope, Now What?	- Paul Fischer
Aug 31	- The Milky Way Galaxy - Structure & Evolution	- Ron Kunkel
Sept 7	- What's Up in the September Sky	- Lonny Buinis
Sept 14	- Photographing Night Sky Landscapes	- Stan Honda
Sept 21	- Traveling in Space and Time	- Gary DeLeo
Sept 28	- Northern Lights	- Gregg Waldron
Oct 5	- What's Up in the October Sky?	- Lonny Buinis
Oct 12	- Introduction to Video Astronomy	- Bill Murray
Oct 19	- The Cosmic Distance Ladder	- Jason Kendall
Oct 26	- The Beauty and Power of the Universe	- Walt Windish



Street Address:
333 State Park Road
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More information and alternate directions
can be found through our website

www.uacnj.org





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- **Report revenue and expenses to the Board!**
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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 to sign up!

Programmed to Renew

Your Membership

It's that time of year again, to update your membership with LVAAS! Don't even think about it. Just whip out the checkbook and get your dues in the mail

to:

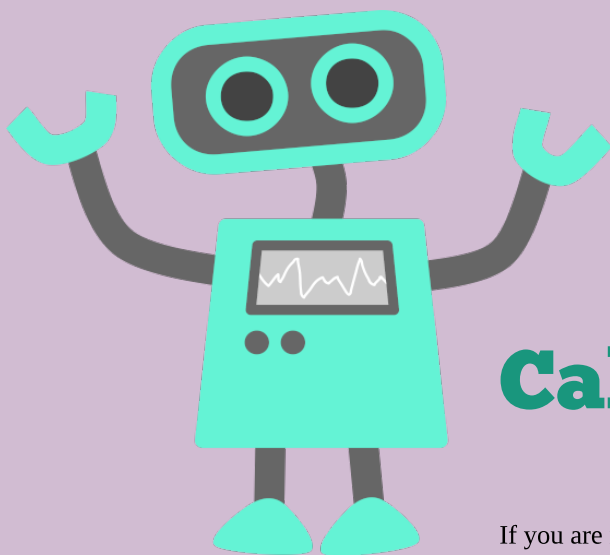
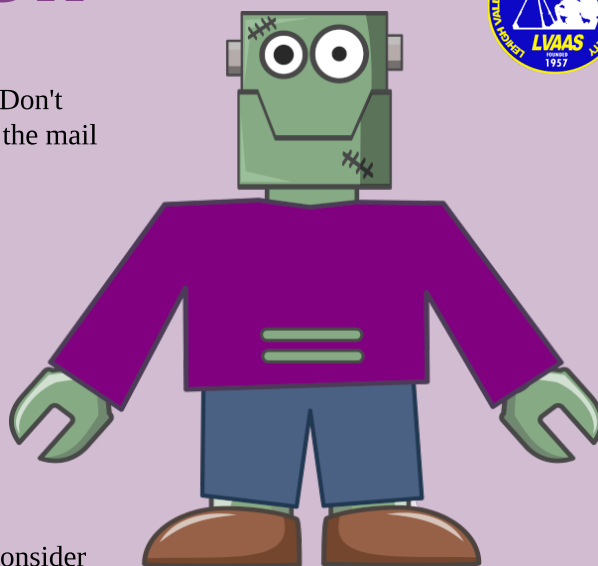
LVAAS MEMBERSHIP
c/o Gwyn Fowler
97 Yeager Rd
Lenhartsville, PA 19534-9798

<i>Regular/Associate</i>	\$45
<i>Junior</i>	\$15
<i>Family</i>	\$65
<i>Sustaining</i>	\$90

And if you need to think about it, it should be an easy decision! Just consider not only the great benefits you receive (access to top-notch facilities and locations) but also the tremendous programs that you support (superb public events, Scouting programs, and educational outreach!)

Please include the renewal form found at

http://lvaas.org/filemgmt_data/files/2019_Membership_Renewal_Form.pdf



Calculate the Benefits

Of Joining

If you are not already a member of LVAAS, please consider becoming one! Your dues will help to fund our highly beneficial programs, and you will become part of a vibrant and friendly community of great people who share your passion for the stars. Send your dues check, plus \$10 initiation, to

LVAAS MEMBERSHIP
c/o Gwyn Fowler
97 Yeager Rd
Lenhartsville, PA 19534-9798

Please include the the form at:

https://lvaas.org/filemgmt_data/files/2017_LVAAS_New_Member_Application_Form.pdf



From the LVAAS Archives:

The Legacy of Joe Grady

by Sandy Mesics

LVAAS was saddened by news of the death of founder Joe Grady fifty years ago in April 1969. Joe was one of the seven founding members of LVAAS, and the society's first director. The first official LVAAS meeting was held on October 6, 1957, in Joe Grady's home on North Street in Bethlehem. At that meeting eight men came together, voted Joe Grady as the first Director of the fledgling club, and unanimously named the club the Lehigh Valley Amateur Astronomical Society.

One of the first LVAAS goals was to find a meeting place and build a planetarium. WFMZ gave the society an acre of ground on South Mountain, and a dedicated group of workers went to work. Joe Grady was the right leader at the right time. He devoted practically every moment of his available time to the headquarters building project, moving forward despite the advice of other amateur astronomers who said that a project of this scope done with volunteer labor and a shoestring budget could not be done. Once the site was obtained, Joe virtually lived there two to three days a week. Joe recruited help in person and by making numerous phone calls.



Figure 1. Joe Grady (left) and Ralph Schlegel (right)

By the end of 1958, the South Mountain headquarters was under roof. Summing up the year (1957- 1958), Director Grady said, "The group began last year when a group of local amateurs decided to form a society and build a planetarium. You might say it grew out of the interest in space that followed the launching of the Russian Sputnik I. We've accomplished a lot this year... we received a charter; we began work on a suitable meeting place and planetarium and we've increased the membership."

Grady served as Director in 1957- 1958, and as Assistant Director in 1959. He is responsible for the LVAAS policy of vetting new members by having "readings" at two meetings: he proposed this policy in December 1958, and the Board accepted it. He suggested the first LVAAS field trip to the Hayden Planetarium in

New York City, and beginning in 1959, he became the coordinator of public astronomy shows, beginning the outstanding educational outreach that continues to this day. He also provided programs for general meetings.

It was natural that Grady was appointed Building Chairperson in 1960. In his role as a board member, Joe implemented many other practices that are in effect to this day: afternoon meetings in the winter, an annual holiday party, utilization of Roberts Rules of Order at BOG meetings, and even purchase of fire extinguishers for the headquarters building. He was instrumental in getting LVAAS a tax exemption from Lehigh County, and

if you have ever seen the large, metal-clad scrapbook in the library, you are looking at Grady's work. In an ironic twist, even though he was a heavy smoker, Grady was responsible for making LVAAS smoke-free in 1962. Beginning in 1961 and continuing for several more years, Grady served as Program Chairperson, bringing astronomy education to the members and to the public. In 1961, he and Elwood Kichline conducted astronomy merit badge classes for 16 boy scouts.

In 1962, Grady was elected Assistant Director. The November 1962 Observer remarked on his election to Assistant Director: "Joe's worth to the LVAAS was well illustrated by the Executive Citation he received in the form of a specially made pin, awarded to him by Director George Maurer on behalf of the society. Officially, the citation recognized Joe's inspiring efforts as our first director, but it also conveyed much of the esteem in which he is held by the members."

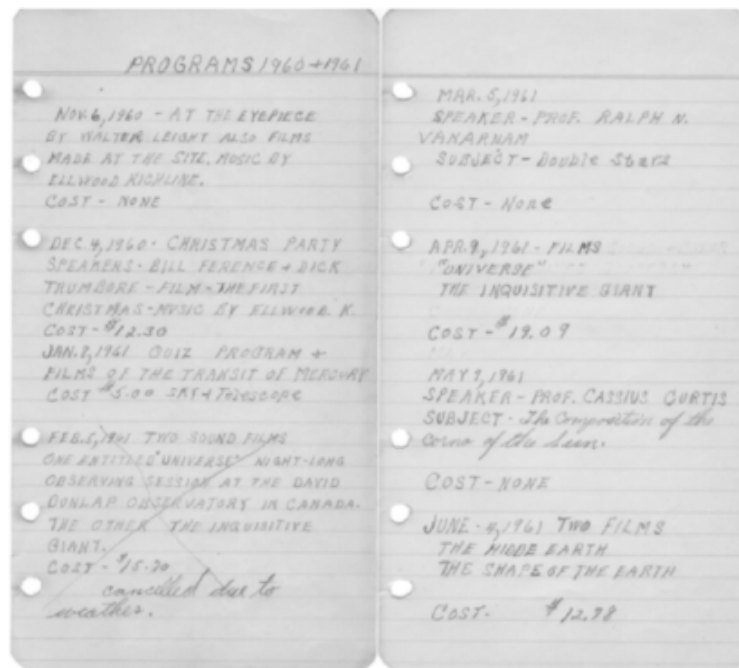


Figure 2. Pages from Grady's notebook



Figure 3. May 1969 Observer Supplement

donated a Crosley-Shelvador refrigerator to LVAAS, and continued to organize work and clean up parties.

As curator in 1963 Joe ran Public Shows. LVAAS hosted 2163 visitors in 41 scheduled shows that year. According to The Observer: "... thanks [go] to Curator Joe Grady and his small band of dedicated assistants. Constantly innovating, this group has slowly developed an interesting format combining a blackboard talk, slide projection and narration and a brief planetarium show, topped off, if the skies permit, with peeks through the society telescopes. Nor are their efforts unappreciated, for the visitors can't seem to get enough."

After his two year stint as Assistant Director, Grady remained on the Board as curator and chair of the awards committee. He regularly attended board meetings in 1964. In January 1964, along with George Maurer and Ralph Schlegel, Grady told the story of the LVAAS to members of the Rittenhouse Astronomical Society in Philadelphia. LVAAS was involved in trying to find a remote observing site since mid-1963. When Pulpit Rock became available in 1966 Grady was appointed to the Ways and Means Committee to find funding in the amount of \$2500 to build a road to Pulpit Rock. But Grady's health began to fail: in September 1965, The Observer reported: "Joe Grady is in Geisinger Medical Center in Danville, PA, for observation." Nevertheless, in October 1965, Grady

Grady served as membership chairperson in 1966-1967 and building chairperson from 1965-1967, but his attendance at board meetings was spotty in during that time. In September, 1968, The Observer reported that Joe had suffered a heart attack but was recuperating at St. Luke's Hospital.

Grady never fully recovered, and passed away in April 1969. After Grady's death, a committee headed by Director Paul Shenkle was formed consisting of all past LVAAS Directors to seek a way in which the society could honor LVAAS's first director "and loyal friend."

According to the May 1969 Board minutes, "Director Shenkle speaking for the temporary committee formed to find a way in which to perpetuate the memory of the late Joseph F. Grady recommended that the funds raised by the Joseph F. Grady Memorial Fund Drive should be used to improve the South Mountain facility. The committee also suggested that the planetarium be named after Mr. Grady (The Joseph F. Grady Planetarium) and a plaque with a likeness of Joe be placed in the foyer. ... The proposal passed unanimously."



Figure 4. Diane Grady and Mary (Grady) Billits at LVAAS in 2004.

Also that month the Board of Governors requested Joe's headquarters keys back from his widow.

In 2002, I made the acquaintance Joe's widow, Mary Billits. She told me some stories about the early days of LVAAS meetings in their home, and how she made pot after pot of coffee for them as well as snacks to keep them fueled for the work they were doing. In July, 2004, she and her daughter, Diane Grady, visited LVAAS for the annual picnic and said a few words to the members there. Mary Billits passed away in February 2013 at the age of 90.

References

Various Observer articles 1959-1969.

Various Board and General Meeting minutes 1959-1969.

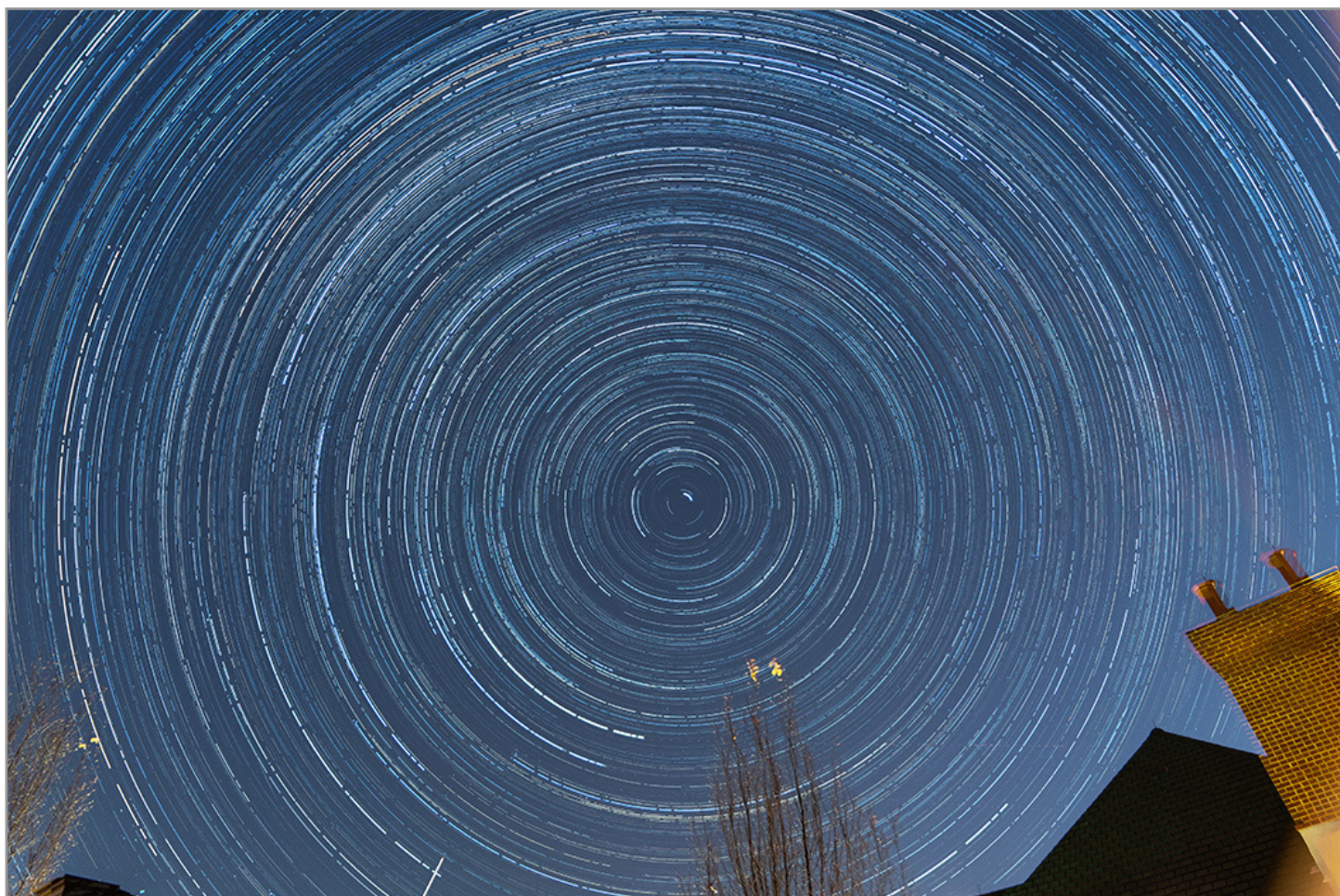


The Orion Nebula: Nikon D5300 tracked using iOptron Skytracker pro; lens 140mm F5.6; ISO 800; Exposure 1 minute; 46 light frames; 45 flat frames; 28 dark frames; processed in Deepskystacker and Photoshop CC. Imager: Jason Zicherman

following page:

The Polaris trails (*upper image*): 359 frames using Nikon D5300 DSLR; ISO 800; Exposure 30 seconds; 14.0 mm f2.8 Rokinon lens; stacked using Starstax freeware. Imager: Jason Zicherman

Orion trails (*lower image*): 300 frames; using Nikon D5300 DSLR; ISO 800; Exposure 30 seconds; 14.0 mm f2.8 Rokinon lens; stacked using Starstax freeware. Imager: Jason Zicherman



FOR SALE: 8" f4 Meade Schmidt-Newtonian Optical Tube Assembly



Meade [08040001](#) Specs

Optical Design	Schmidt-Newtonian reflector
Optical Lens Diameter	8.0" (203mm)
Focal Length	32.0" (812mm)
Focal Ratio	f/4.0
Maximum Useful Magnification	500x
Resolving Power	0.56
Optical Coatings	UHTC Ultra-High Transmission Coatings
Optical Tube Dimensions	10.0 x 29.5" (25.4 x 74.9cm) WxL
Eyepiece Barrel Diameter	1.25"
Finderscope	None
Weight	24.0 lbs (10.9 kg)

This is a fast f4 optical system that gives impressive bright wide-field visual views and can also serve as an entry-level “astrograph” for aspiring imagers. The image cone gives full-field coverage on at least an APS-C sized sensor. It weighs just under 26 lbs as shown.

Always stored indoors and barely used, the scope is in excellent condition. Has both 1.25" and 2" eyepiece holders. Added extras include Vixen rails up & down, mini accessory saddle, JMI MotoFocus, Astro-Zap heated dew shield (controller not included,) Antares 50mm finder, Bob's knobs, and a custom-built carry/travel rack. Asking \$600 E-mail: Polaris41n@outlook.com (Dave Moll)

by Gary A. Becker

Spring has Sprung, Finally!



I have a kind of woodhenge in my backyard. Lots of bare-branched trees near the house and another stand of trees about 100 yards away on an adjoining neighbor's property, including a conifer that sits in a very strategic location. Once the leaves have dropped in late October, all of those trunks and branches act like a calendar, allowing me to witness the southward progression of the sun during late fall, until Sol pauses for several weeks at its winter solstice (sun still) position. Then the sun backtracks and begins to move northward, very slowly at first, in and out of the skeletal framework that graces my east. As January blends into February, and February into March, the sun's northward movement grows faster and faster, maximizing on the day of the vernal equinox, the first day of spring which this year occurred on March 20 at 6:01 p.m., EDT. A day or so before the equinox, the sun rises behind that distant pine tree, almost like a predictive marker, to herald the first moment of spring.

From the winter solstice to the vernal equinox, the sun has moved from being directly overhead on the Tropic of Capricorn in the southern hemisphere to being overhead on the equator. As the sun continues to move northward and Sol climbs higher into the sky each day, its more direct energy rebirths another spring. The first enactment of this process was purely human-made and psychological when we switched seamlessly from Eastern Standard Time to Eastern Daylight Time on Sunday, March 3, our clocks leaping forward as we slept from 2 a.m. to 3 a.m. During that moment it appeared as if we gave ourselves an extra hour of daylight, but we really didn't. Through this little maneuver we simply shifted the daylight hours more to our waking hours. The second act, the sun crossing the vernal equinox (equator,) is real. After the vernal equinox, Sol will rapidly favor the northern hemisphere, exploding the amount of daylight hours against a shrinking night. At 40 degrees north latitude we have already gained three hours of daylight from the winter solstice on December 21 to the vernal equinox on March 20th.

The increase in daylight from the first day of spring to May 1 will be one hour, 48 minutes, giving us a period of nearly 14 hours when the sun will be above the horizon. That is in comparison to 12 hours of daylight at the time of the vernal equinox and 9 hours on the date of winter solstice. Since the winter solstice, the sun has been moving northward, climbing higher into the sky each day. The length of the path of the sun from sunrise to sunset has increased every day since then, but the Earth has continued to rotate at a constant rate causing the sun to be visible for a longer period of time as the months have rolled along.

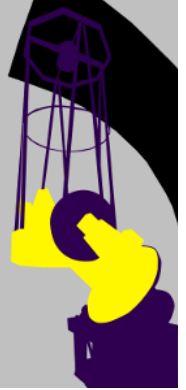
What gets the credit for all of this change? It is the 23.5-degree tilt of the Earth's axis, the imaginary line about which the Earth rotates (spins) to the perpendicular of its orbital plane. Each season the sun changes its noontime altitude by the number of degrees in its axial tilt, upward 23.5 degrees from winter solstice to the vernal equinox, and upward again by 23.5 degrees from the vernal equinox to the summer solstice, a total of 47 degrees from its lowest noontime altitude of 26.5 degrees to a summer solstice high of 73.5 degrees (40 degrees north latitude.) To complement this drastic altitude change, the sun's rising and setting positions must also change, affecting the length of time which the sun remains above the horizon. For the next six months it will be our time to bask in the glory of a more potent sun because its energy will fall more directly upon us. The sun has returned to the northern hemisphere. Spring has sprung, FINALLY!

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Moravian College Astronomy - astronomy.org

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Schlegel Observatory Report

by Rich Hogg – April 2019



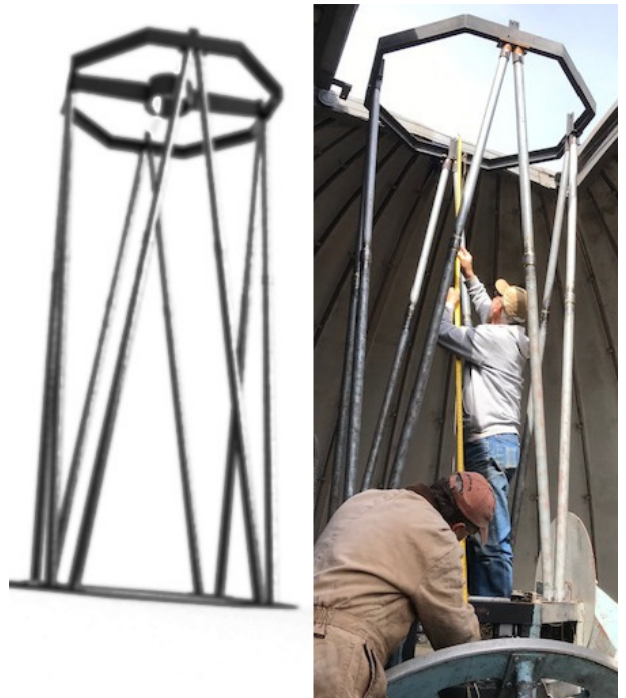
Meanwhile on top of Blue Mountain, the ice has melted, the wind has lost some of its bite, and work has resumed on the 40" Cassegrain Telescope at Pulpit Rock.

Rebuilding - In work parties on three consecutive weekends, we've made good progress in putting the truss back together in its new configuration. We chose a final design that's basically the same as what I showed in previous columns, with the bottoms of the truss members moved in pairs closer to each other, forming a truss made up of 8 wide triangles (where the original design had 4 narrow triangles and 4 trapezoids.) The engineering analysis predicts that the new design will be more than twice as rigid as the original design would have been; we decided to make the improvement since we needed to rebuild the truss anyway, to improve the quality of the joints.

In the final design, we decided to move the bottom ends of the truss elements from the vertices of the octagonal primary cell to the edges. This is the most symmetrical arrangement, keeping the top frame aligned with the mirror cell.

The result looks sturdy, and feels very rigid! The wider stance of the truss just makes it look stronger, and more ready to accept the task of holding the secondary mirror in its proper location. And even though the final welding isn't done, it feels very rigid. When pushing on the end of the tube, perpendicular to the declination axis, I do not perceive any "give" at all — it's like pushing on a solid wall.

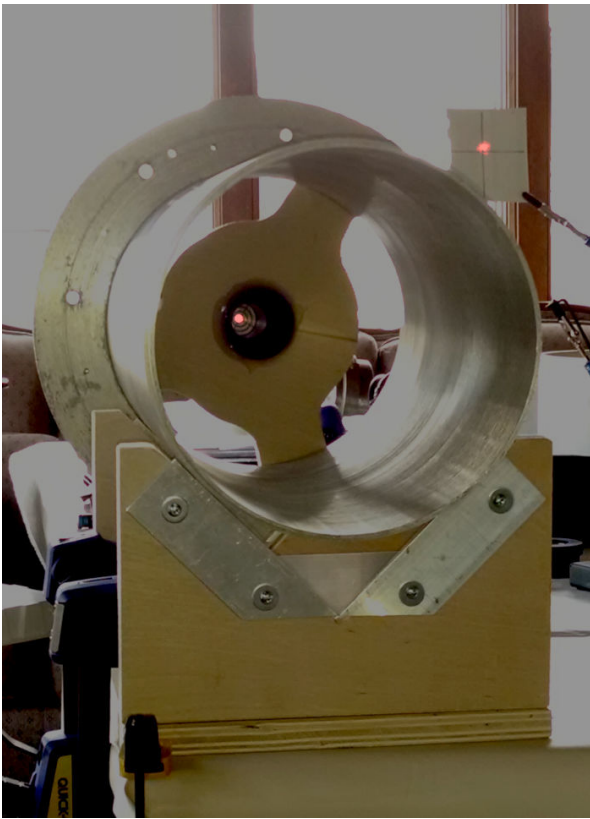
Next, we will need to bring it into correct alignment, so that the spider vanes will be centered on the optical axis and it will be easy to align the secondary. Then we will disassemble it one more time, so that the joints can be welded properly, before final assembly.



Frank Lyter and Ron Kunkel verify that the reconfigured truss matches the digital model. Photo by Terry Roszhart

Disassembling and reassembling such a large structure seems like a huge job, and it helps to have a good-sized crew. The first session this month, on March 17, consisted of myself, Frank Lyter, Ron Kunkel, and Bill Thomas, while on March 24 we had me, Frank, Ron, Andy Heilman, Maurice Connor, Carol Stager, Kyle Kramm, and Terry Roszhart. But even though on yesterday's session, March 30, it was just me and Frank, we were able to reassemble the truss in not much more than an hour, after we finished the drilling and tapping.

Adjustment - For alignment purposes, I'm setting up a system based on a laser collimator mounted into the main baffle, which mounts into the primary mirror cell. This ring-shaped joint,



secured with 8 flat-head machine screws, will be the reference point for the alignment of the rest of the optical system. After verifying that the baffle tube is square to the mounting ring, I built a cradle with two "V-blocks" large enough to hold the baffle, which you can see in the photo at left. The source of the laser can be seen in the center of the baffle tube. The beam bounces off a mirror behind the camera, and returns to hit the target in the upper-right of the photo.

The principle is simple: I can rotate the tube in the V-blocks, and as I do so, the position of the beam should not change. If it does, it means that the beam is not concentric with the tube, and needs to be adjusted.

Stay tuned! Next month I should be able to report that the instrument is properly joined back together, looking like a telescope again. We'll be able to verify that we've achieved the stiffness that we expect, and can then move forward with other parts of the build.

from Frank Lyter, Pulpit Rock Observatories Director, via PR Buzz:

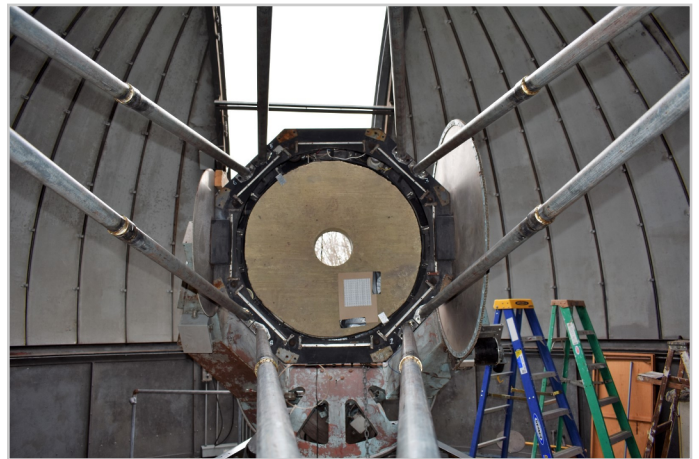
"Yesterday was another nice day on the mountain with Rich Hogg and I completing assembly of the truss tubes and the secondary mirror octagon frame. My dog Duncan assisted by scanning sky and searching for hawks and greeting hikers that stopped in for a visit.

Work included:

1. Drilling and tapping the remaining holes on the main mirror frame.
2. Drilling the holes on the main mirror cell to accommodate the wiring out to the secondary mirror. These are the larger holes shown with an arrow pointing to the location on one of the attached photos.
3. Installing truss tubes and octagon frame.

Next steps include:

1. Adjust the alignment of the secondary frame so it is centered above the main mirror.
2. When alignment is complete, we will complete the welds on the truss tube end connections (currently the welds are only partial welds which allow us to make the alignment adjustments.)
3. Prepping telescope for painting by removing old paint. Photos attached. Regards, Frank"

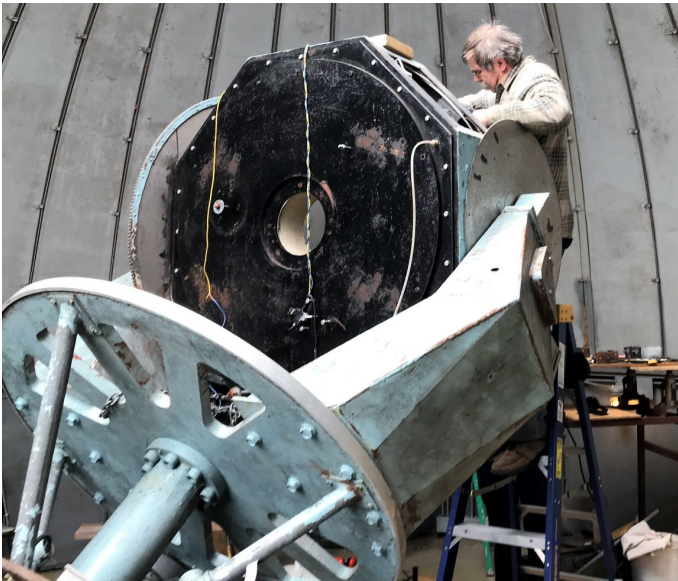
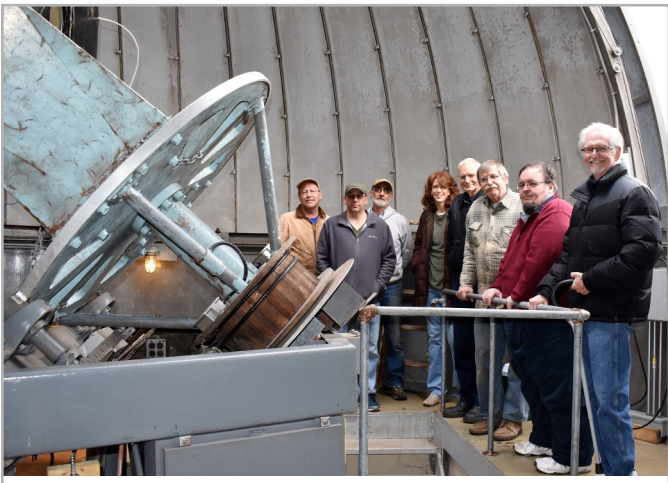




The work crew at Pulpit Rock with the 40-inch telescope. Join the Pulpit Rock Buzz (see website) to be a part of the work parties and help with this exciting project!

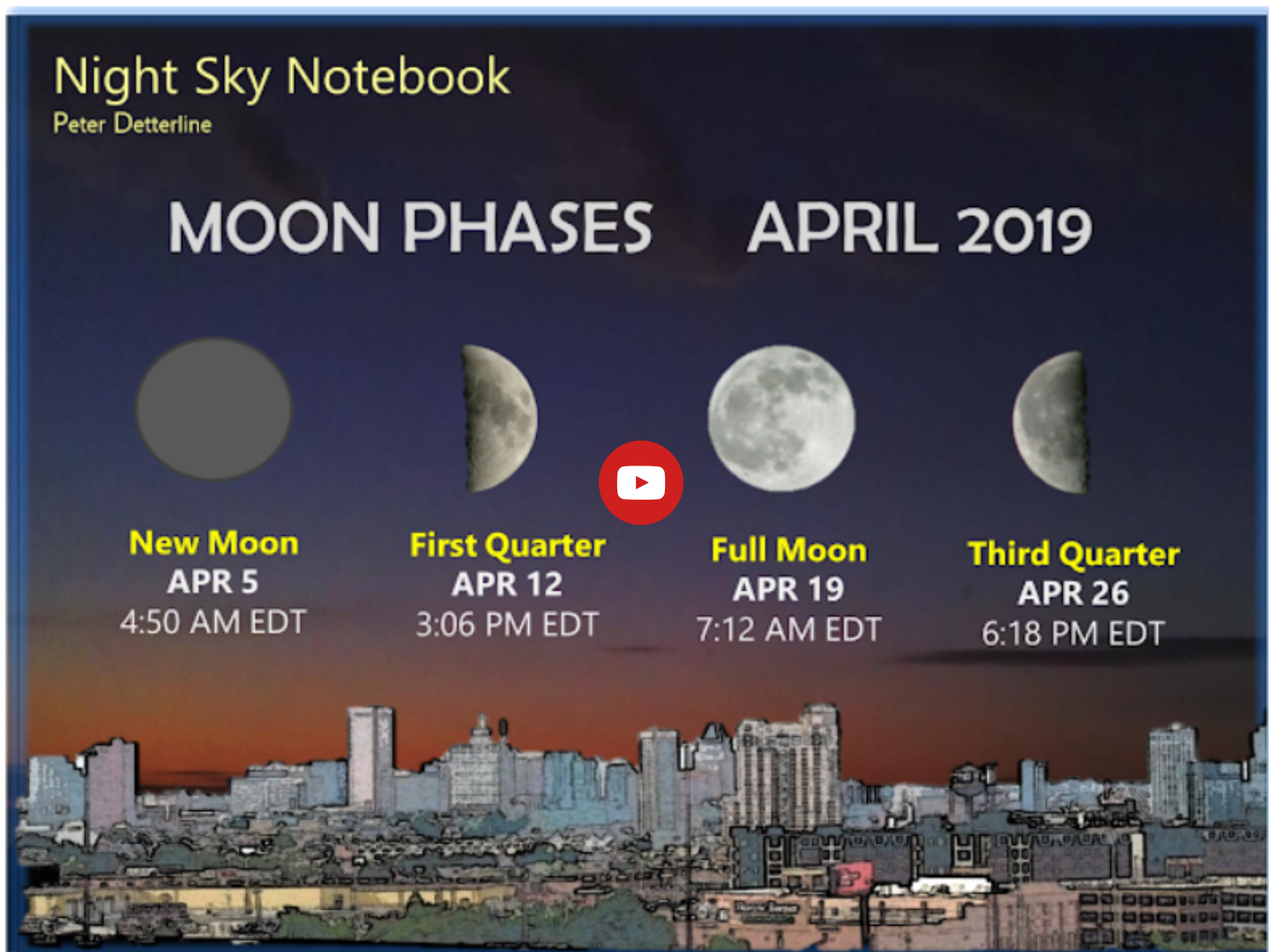
Pictured: Ron Kunkel, Frank Lyter, Carol Stager, Kyle Kramm, Terry Roszhart, Rich Hogg, Andy Heilman, Maurice Conner.
Photos: Terry Roszhart and Frank Lyter.



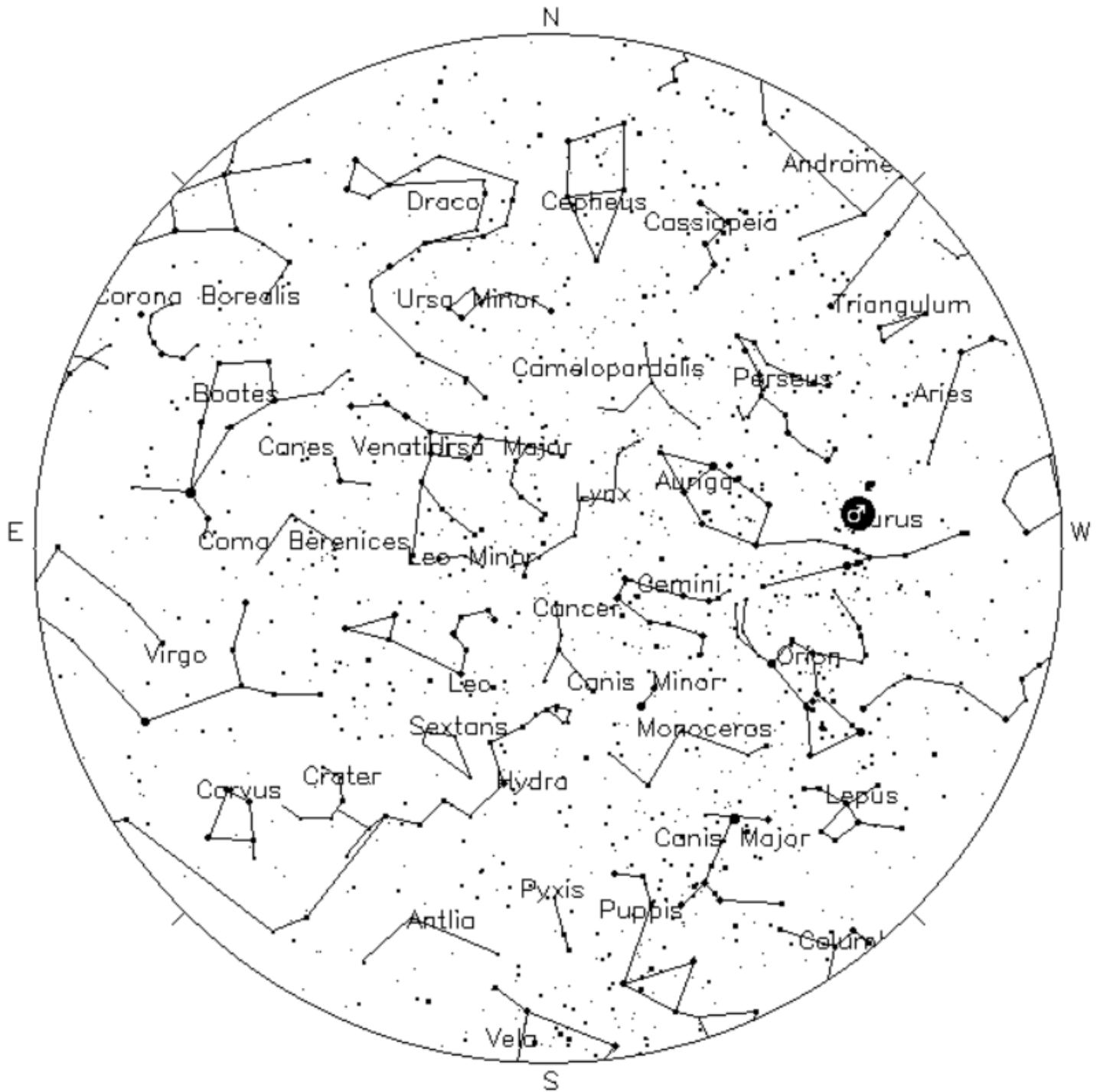


Night Sky Notebook for April

by
Pete Detterline



Sky above 40°33'58"N 75°26'5"W Saturday 2019 April 6 1:00:00 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/>

APRIL 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01	02	03	04 Star Party for Cedar Crest Astronomy Class	05 New Moon	06 NEAF
07 NEAF	08 Astronomy MB Class	09	10	11	12 First Quarter Moon	13 Star Party
14 General Meeting - 7:00 PM	15	16	17	18 Astro Imaging - 7:00 PM	19 Full Moon	20
21 Easter Deadline for submissions to the Observer	22	23	24	25	26 Last Quarter Moon	27 LVAAS Scout Program - GS2786
28 LVAAS Board of Governors Meeting	29	30				

MAY 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			01	02	03 Mega Meet	04 Mega Meet New Moon
05 Mega Meet General Meeting - 7:00 PM	06	07	08	09	10	11 First Quarter Moon Star Party
12 Mothers Day	13	14	15	16 Astro Imaging - 7:00 PM	17 Scouts at Pulpit Rock	18 Full Moon Scouts at Pulpit Rock
19 Scouts at Pulpit Rock Deadline for submissions to the Observer LVAAS Board of Governors Meeting	20	21	22	23	24	25
26 Last Quarter Moon	27 Memorial Day	28 LVAAS Scout Group	29	30 Cherry Springs Star Party	31 Cherry Springs Star Party	

2019 LVAAS Event Calendar

2019 LVAAS Event Calendar												
	<u>Sundays</u>				<u>Thursday</u>	<u>Saturday</u>	<u>Mondays</u>	<u>Multi-Day Weekends</u>	<u>Moon Phase</u>			
	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	13 Muhlenberg	27	20	24	no mtg		no camping	5	14	21	27
February	2:00 PM	10 Muhlenberg	24	17	21	no mtg		no camping	4	12	19	26
March	2:00 PM	10 Muhlenberg	31	24	21	16		22-23-24	6	14	20	28
April	7:00 PM	14 S.M.	28	21	18	13		no camping	5	12	19	26
May	7:00 PM	5 S.M.	19	19	16	11		17-18-19	4	11	18	26
June	7:00 PM	9 S.M.	30	23	no mtg	8		14-15-16	3	10	17	25
July	5:00 PM	13 S.M.	28	21	no mtg	6		19-20-21	2 31	9	16	24
August	7:00 PM	10 Pulpit	25	18	no mtg	3		16-17-18	30	7	15	23
September	7:00 PM	8 S.M.	29	22	12	7		13-14-15	28	5	14	21
October	7:00 PM	13 S.M.	27	20	17	5		11-12-13	27	5	13	21
November	7:00 PM	10 S.M.	24	17	14	2		no camping	26	4	12	19
December	2:00 PM	15	29	22	12	no mtg		no camping	26	4	12	18

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 is at

NEAF
 Cherry Springs S.P.
 Stellafane
 Black Forest S.P.
 Mega Meet

April 6 – 7
 May 30-June 2
 Aug 1 – 4
 Sept 27 – 29
 May 4 – 5

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. 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.

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