

The Observer

The Official Publication of the Lehigh Valley Amateur Astronomical Society

<https://lvaas.org/>

610-797-3476

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

November, 2018

Volume 58 Issue 11



ad astra*****

Carol Kiely, our Director, has had to travel suddenly to her family home in the U.K. to be with her father, who is gravely ill. Please consider her and her family in your thoughts and prayers.

If you missed our October General Meeting, you also missed a great presentation by Prof. Gary DeLeo of Lehigh University: an exciting review of mankind's exploration of the Solar System, concentrating on the early missions. No matter how familiar a topic seems, I am always pleasantly surprised to learn something new when I attend a live presentation about it, and Dr. DeLeo's was dynamic and captivating.

Having Gary DeLeo as a presenter at an LVAAS meeting is a long overdue occurrence. He should probably be considered the champion of astronomy outreach in the Lehigh Valley, and he has already spoken at almost every astronomy club in New Jersey. Meanwhile, we have welcomed numerous other speakers from among the Lehigh faculty and graduate student cadre (and at least one undergraduate,) so it's about time we had Gary talk at one of our meetings, and I hope he will do so again in the next year or two.

Getting ahead of the curve

By the time the next Observer is in your hands, the following information will probably be in the process of being thrashed to death on all of the news channels, websites, and social forums, so I will take this opportunity to try to be the first to bring it to your attention. In mid-December, it looks very promising for us to have a naked-eye comet in our skies. Comet 46P/Wirtanen will make a very close approach to Earth on Dec. 16th, at 1.15×10^{10} meters — one of the 10 closest-approaching comets of the space age. It is looking good to reach 3rd magnitude. Visit <http://www.aerith.net/comet/catalog/0046P/2018.html> for all the relevant data.

BOG news items

Our new Director of Education, Blaine Easterwood, has been busy. Blaine is eager to get started developing and organizing new educational events for LVAAS, beginning with some "market research" to determine what types of programs our members want or need.

Please help Blaine by pointing your browser to <https://www.surveymonkey.com/r/HP5P8VZ> and completing his brief survey. It is only 7 questions and will only take a few moments of your time.

Rhonda Young has served as Director of Member Services for two years, and she is relinquishing the post effective at the end of this year. I hope everyone will join me in showing appreciation to Rhonda for taking good

care of this important job since December 2016. Thank you, Rhonda!

Our Star Parties are the public face of LVAAS. They are the flagship of our outreach program, very popular with the public, and a lot of fun for our member volunteers. And the Red Shift gift and snack shop is an important element in an LVAAS Star Party. Our guests enjoy the opportunity to buy snacks, drinks, and LVAAS apparel during their visits, and our volunteers often need a few calories to keep them going or a hot beverage to warm them up. In addition, the Red Shift brings in some dollars to help fund LVAAS activities.

Please help me to find volunteers to keep this important function going. We need a new Member Services Director to organize the Red Shift and a few related activities, and we need some assistants to spread the workload and help to cover the events. If you are interested in being part of the LVAAS team, whether by helping with the Red Shift or in some other capacity, please get in touch with me! And if you know someone who might be thinking of volunteering but may be on the fence, don't be afraid to give them a little nudge. It is a worthwhile cause, as well as a lot of fun.

The clear/cloudy asymmetry

I recently listened to a Freakonomics Radio [podcast](#) about the "[headwind/tailwind asymmetry](#)," or our tendency to emphasize the importance of obstacles and disadvantages in our lives. This is probably because they command our attention, whereas we blithely sail forward taking our advantages for granted. It seems that as astronomers, we likewise devote a lot more conversation to the miseries of the cloudy nights than to the delights of the clear.

At the October Star Party, we were delightfully surprised by a few hours of clear skies that were not predicted by the weather forecasters. Take advantage of those opportunities, and appreciate them! Ad Astra.

— *Rich Hogg*

Everyone loves a survey!

Well, maybe not, but we need your help. We want your feedback to help us guide future educational activities. Please take a few minutes to complete our survey. It is 7 questions short. Many thanks! - Blaine Easterwood, Director of Education

<https://www.surveymonkey.com/r/HP5P8VZ>

LVAAS General Meeting: Open To The Public

Sunday, November 11, 7:00 p.m.

LVAAS South Mountain Headquarters
620B East Rock Road Allentown PA 18103

LVAAS member and Astroimager
DAVE MOLL

presents

"Video Astronomy: The CMOS Revolution"



LVAAS member and astroimager Dave Moll will present a program explaining the new trend in astronomy cameras: fast, low-noise, high-sensitivity CMOS "video" cameras that excel at both traditional imaging and "video astronomy." Video astronomy is a great way to share our hobby with others, especially those with "older" eyes, children who sometimes have difficulty lining up the image in an eyepiece, and others with mild to moderate visual impairment. It is a great way to discuss astronomical objects while viewing a live feed with groups large and small. In addition to their usefulness in video astronomy, the new wave of CMOS cameras, along with amazing new support hardware and software, makes astroimaging of deep sky and solar system objects attainable and relatively affordable to many who may have previously been discouraged in this pursuit. Dave will be showing his ZWO system, and he will be joined by fellow LVAAS member Eric Loch, who will show his Atik system. Please join us for this informative and timely talk.

What's the (LVAAS) Buzz?



by Rich Hogg
LVAAS Technology Director

Our website <https://lvaas.org> has a feature called "Forums" that was intended to allow us to keep each other in the loop about various topics related to astronomy and LVAAS. The problem is that not many of us bother with Forums these days. As far as I know, few LVAAS members check the forums or receive notifications when forum messages are posted, and even fewer ever post a message, perhaps figuring that almost no one will see it.

For a few years now the Board has been using an email-based service to keep in touch, and earlier this year, after Frank Lyter asked for a better way to communicate with members about Pulpit Rock activities such as observing sessions and work parties, we decided to try an email-based solution. And so, the Buzz was born!

You should sign up for the **Pulpit Rock Buzz** if you are interested in observing sessions, helping at work parties, or other activities at Pulpit Rock.

You should sign up for the **South Mountain Buzz** if you are interested in observing sessions, helping at work parties, or other activities at South Mountain.

If you are planning or considering anything at either site, you should send a message to the appropriate Buzz to let others know. Please keep in mind that since the Buzz is new and is not mandatory, it is always possible that you will find someone using the facilities without posting on the Buzz. That's OK! We're all friends in LVAAS, and while we are usually happy to let each other know what we're planning, we also welcome unplanned, spontaneous visits to our facilities.

Subscribing to the Buzz is easy! You can get the process started either by sending an email to pulpitrock-join@buzz.lvaas.org and/or southmountain-join@buzz.lvaas.org, **or** visit the sign-up page at <http://buzz.lvaas.org/listinfo.cgi/pulpitrock-lvaas.org/> and/or <http://buzz.lvaas.org/listinfo.cgi/southmountain-lvaas.org/>

Please use the same email address that you use for other LVAAS purposes.

After you do this, the system will send you an email to confirm that you really want to subscribe. You must either reply to this email, or click the link you will find in it. Then, an administrator will need to confirm your subscription. **The Buzz is limited to LVAAS members.**

Sending a message to the Buzz is easy! After you subscribe, just send an email to pulpitrock@buzz.lvaas.org or southmountain@buzz.lvaas.org. **For complete instructions:** see <https://lvaas.org/staticpages/index.php?page=thebuzz> (you must first be signed in to the website.)

CATCH THE BUZZ!

Minutes for the LVAAS General Meeting - October 14, 2018

The October 2018 LVAAS General Meeting was held on October 14, 2018 at the LVAAS facility on South Mountain in Lower Saucon Twp. The meeting was opened by Carol Kiely, Director, at 7:00 p.m. There were approximately 51 people in attendance.

The talk for the evening was "Reaching the Outer Limits: Exploration of the Solar System" by Gary DeLeo. Dr. DeLeo is the Associate Chair of the Dept. of Physics at Lehigh University and has been involved in over 800 outreach events. He began with a discussion of the Moon, the only solar system body that men have actually set foot on (other than Earth.) Galileo, using a telescope, turned the Moon from a disk into a world, showing it had craters, mountain ranges, etc. We began sending robotic spacecraft in the late 1950s. The first ones simply crashed into the Moon, taking photos on the way down. The Russian Luna 3 was the first to send back photos of the far side of the Moon. Many early craft failed, but space agencies persevered and most later craft were successful. The first lunar orbiters took photos on film, developed them, then scanned them and transmitted them back to Earth. The Russian Luna 9 made the first soft landing in 1966. Although the Soviets did not publicly announce their missions, observers in the U.K. figured out what they were doing, intercepted the transmitted images, and published them before the Soviets announced their results!

Later robotic missions, and early human flybys, scouted the surface for potential landing sites. Project Gemini (two men per mission) demonstrated skills in Earth's orbit that would be needed to go to the Moon: Long duration (min 6 days round trip,) Spacewalks (EVA,) and Rendezvous/Docking. Project Apollo (three men per mission) eventually landed 6 missions (12 men total) on the Moon, using a system of staged rockets, a disposable lunar lander (LEM), and a return module (CM) that orbited, but never touched, the Moon.

Beyond the Moon, our presence has been exclusively robotic. We sent Mariner to orbit and Messenger to land on Mercury, which is difficult to see from Earth due to its proximity to the Sun. Venus and Mars are the closest to the Earth and were thought to be the most likely to harbor life. Venus was cloudy, so it was initially imagined to be a tropical jungle, but spectroscopic studies detected no water. The Russian Venera B probe landed, but didn't last long due to the 900° temperature and atmospheric pressure that is 100x that of Earth.

Mars is similar to Earth in many ways: the day's length and axial tilt are similar to Earth's, there are seasons, but a pressure suit would still be needed to survive on the surface due to the thin atmosphere (2/1000th that of Earth.) Initial orbiters showed craters, etc. on a dead but interesting world, 15 mile tall volcanic peaks and dry river beds, suggesting that liquid water had existed on the surface sometime in its history. Landers confirmed that the planet resembled deserts on Earth. The discovery of microbial fossils on Mars would be an incredible discovery. The outer planets are all giants: Jupiter, Saturn, Uranus, and Neptune. Moons of the outer planets are amazing and very interesting. Europa may have frozen/liquid water on its surface. Io has active volcanoes.

Titan has an atmosphere 1.5x denser than Earth's made of nitrogen and methane, with rivers and lakes of liquid methane. We have identified over 100,000 asteroids in our solar system and have visited several with robotic spacecraft. One (691 Lehigh) is actually named for Lehigh University. We have also intercepted and/or landed on a few comets. Pluto and Charon were the subject of a fly-by of the New Horizon spacecraft. They are icy, with many details yet to be explained. The talk was followed by a Q&A that ended at 8:11 p.m. and was followed by a 15 minute break. The business meeting began at 8:30 p.m., with about 36 attendees.

Carol gave the recently released film "First Man," about Neil Armstrong and the first mission to land a man on the Moon, a glowing review and noted that the film was based on a book that is available for those interested in more detail about the events covered in the film. She reported that the next Star Party will be October 20th, International Observe The Moon Night. Pete Deterline will give both planetarium shows and Carol will give a talk about the Moon.

Scott Fowler, Membership Chair, reported that there were five first readings: Daniel Jackson, a PhD in Physics, teaching at PSU, LV; Rowan Winch, a senior at Emmaus H.S.; Gary Shoemaker, a retiree, getting back into astronomy; Nick Hershelman, an engineer at B. Braun, and Alan Midkiff, past member of LVAAS, and founder of NWJAA (like LVAAS, a member club of UACNJ.)

Scott reported that there were four second readings: Dr. Mike Yaddell, rejoining, last having been here 40 years ago! He recently purchased a 4" refractor; Rachel and Gabe Noska (husband and wife) just beginning, having only a pair of binoculars, so far; Josh Kochan, another former member looking to rejoin. He has an old Meade LX-90 he is hoping to get running. Also, his grandfather, John Frisch, was one of the original founding members of LVAAS.

There was also an introduction of some of the officers and committee chairpersons: Carol Kiely (Director,) Bill Dahlenberg (South Mountain Maintenance,) Ron Kunkel (Pulpit Rock Maintenance,) and Tom Duff (Keymaster.) Scott also reminded everyone that membership renewals are due by the end of the year, and that 40% of our annual revenue is from membership dues.

Gwyn Fowler, Treasurer, gave a brief report: The club's fiscal year ended at the end of Sept, and we should be about \$5000 in the black (against budget.)

Dave Raker, Librarian, reported that we have two new books, one by Jill Jarter on SETI, and another concerning astrophotography (details in October newsletter.) There are also books for sale, plus a wide selection of books (>900) available for loan. Additionally, members are encouraged to forward any suggestions for new acquisitions of books, DVDs, etc. to Dave.

Bill Dahlenberg, South Mountain Maintenance - Siding on back wall of main building was replaced and painted (1st coat). The repair of the mechanism for raising/lowering the planetarium dome is scheduled for January. Members are usually there doing maintenance Saturday mornings from 9:00 AM to Noon, so new members needing check-outs on club scopes, keys, or help with their own equipment can stop by then. Contact Bill (see website) to be sure someone will be there.

Ron Kunkel , Pulpit Rock Maintenance reported that he is sill mowing a lot of grass, but is hoping that will stop soon. New members needing tours of facilities should contact Ron (see website) to arrange times. There is a locked gate about 2 miles from the observatories. Members can get a key to the gate after completing an orientation.

Holiday Party: Carol reported that the previous location is no longer available, so she has reserved the Lower Macungie Community Center, which should be acceptable. More details to be provided later.

Election of Officers: Bill Dahlenburg reported that the following nominees (nominations closed at the end of the September General Meeting) are:

Office	2019 Candidate	Current Officer 2018
Director	Rich Hogg	Carol Kiely
Assistant Director	Tom Duff	Rich Hogg
Treasurer	Scott Fowler	Gwyn Fowler
Secretary	Earl Pursell	Earl Pursell

Dave Binder asked for a round of applause for the outgoing officers for their service. He also made a motion to cast a combined ballot to elect all 4 officers. The motion was seconded by Bill Dahlenberg and passed unanimously by the members present.

It is noted that Gwyn Fowler will be taking over Membership Chairperson duties from Scott Fowler.

The next meeting will be Sunday, November 11, 2018, 7:00 p.m. at South Mountain. Dave Moll will give a presentation on video astronomy.

The meeting was adjourned at 8:57 p.m.

Dave Moll took several members on a tour of the 6" refractor and observatory after the meeting adjourned.

Submitted by Earl Pursell, Secretary.

M63, the Sunflower Galaxy in Canes Venatici



This was imaged July 7/8/9 2018 from my backyard in Northern Lehigh County with my Celestron C9.25 Schmidt-Cassegrain, ZWO ASI071MC color CMOS camera, iOptron iEQ45-Pro mount, and SX Lodestar guider on a 60mm secondary scope. The exposures are 30X3-minute subs, for total exposures of 90 minutes each. Collected & pre-processed in Nebulosity4, final process in PhotoShop CC. Courtesy Dave Moll

Exciting new Live-Action Game!!!



RED SHIFT REVENUE



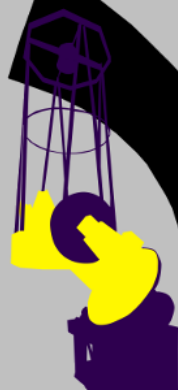
- **Operate an Astronomy Club Gift Shop!**
- **Optimize product lines!**
- **Purchase inventory!**
- **Manage production!**
- **Complete sales!**
- **Report revenue and expenses to the Board!**
- **Help a great organization do a valuable public service!**

As LVAAS Member Services Director, you will enjoy the challenge of operating the Red Shift gift shop at Public Star Parties. The only way to lose is to not play!

Contact director@lvaas.org to sign up

Schlegel Observatory Report

by Rich Hogg – November 2018



It's been a good time to try to take advantage of the nicer days for doing some work at Pulpit Rock, and doing a bunch of engineering at home when it's been rainy and cold.

Collimation Stage

I just decided that this is the official name for the subsystem that I have been designing for collimating the secondary mirror. The word "stage" applies in two ways. First, like a stage in a rocket, it is designed as a cylindrical assembly that will be part of a stack of assemblies attached to the spider. Other "stages" or elements in the stack will include the secondary mirror itself, a cone-shaped baffle, and a suspension system to support the mirror without distortion in its generally inverted orientation.

The second reason that the term "stage" is appropriate is because it is a "motion stage." This is a term that I have seen used for so long that I know what it means, but that I have not been able to find a definition of, so I guess I will make something up. It's a piece of hardware that you use to attach some thing to some other thing that generates precise, controlled motion between the two. In our case, we want to attach the secondary mirror to the spider in a way that allows us to adjust the tilt and offset of the mirror.

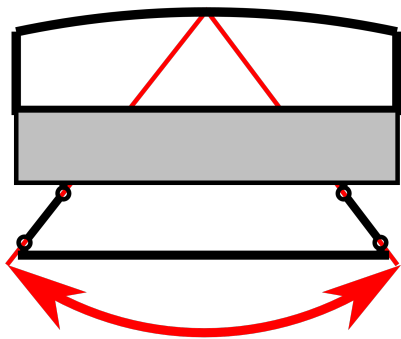
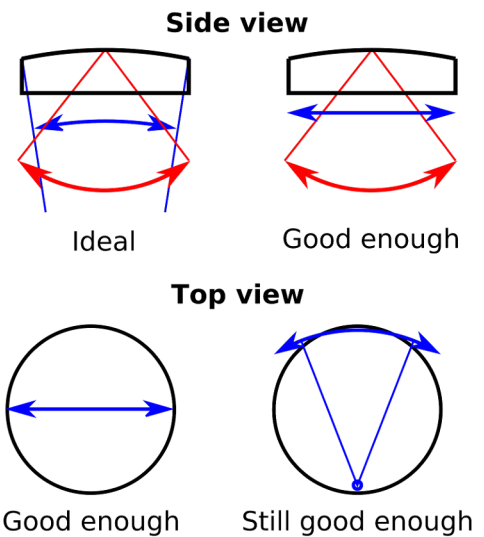
I explained last month that we want to control these four degrees of freedom – tilt in two directions, and offset in two directions – in a manner that allows us to quickly converge on the proper adjustment. We will be checking the adjustment by shining a laser beam along the optical axis of the telescope, observing where it strikes the secondary mirror surface, and then where it goes from there. Ideally, we would like one set of adjustments to allow us to shift the mirror without changing the reflection angle, rotating the system about the center of the mirror's center of curvature. Also, we would like to be able to change the reflection angle without changing the strike point, by rotating around the apex of the mirror.

I've decided that a reasonable approximation is probably our best approach. The radius of curvature of the mirror surface is about 94 inches, or almost eight feet, and I believe that a linear motion (equivalent to rotation about an infinitely remote point) is a good enough approximation for the offset motion. Furthermore, I've decided that rotation about an axis parallel to the optical axis, just inside the circumference of the mirror, is a good enough approximation to this linear motion, since it introduces

only a small amount of rotation in a direction in which the mirror should be symmetrical (bearing in mind that we will only move it a few tenths of an inch,) and should be easier than true linear motion. Here (on the right) is an illustration of these two approximations.

Also, I've looked at a number of ways of implementing the tilt motion. It's easy to envision something involving fancy, curved dovetails that would require a lot of precision machining. There are some ways of doing it that might be achievable using 3-D printing. However, after some consideration I now think that another approximation, using a linkage system, would be the best approach (as shown below.)

Collimation Stage Approximations



It's a 4-arm linkage in the shape of a trapezoid, with the parallel arms formed by the suspension stage (shown as a gray box, attached to the mirror) and the base of the secondary mirror cell, attached to the spider. The short arms are arranged to both be aligned with the desired rotation point. This provides a close approximation of the desired rotation, as long as we stay close to the center, which we will.

These approximations are fine because the desired degrees of motional freedom do not need to be perfect. They need to be sufficiently independent so that we can achieve very good alignment in both offset and tilt, and we would like them to be mostly decoupled in their effect on the laser strike point and reflection angle so that we can converge quickly on the alignment.

Of course, each of the motions shown must be implemented on two axes, perpendicular to each other and to the optical axis. A complete 3-D design rendering would show all four degrees of freedom.

I actually have a design mostly worked out, but I'm not ready to share it yet. Maybe next month.

Truss Update

I have news that Frank Lyter has completed a fixture to hold the parts of each truss element properly aligned so that they can be permanently bonded into a single element that is straight and rigid. By the time you read this, the first one will probably be completed and, assuming we are satisfied with the results, we will be firming up our plans to complete the truss rebuild.

Odd Jobs

Opportunities to work at the site have mostly involved working on the electrical wiring. I traced out

some existing wiring, including figuring out how 110V power originally got to the dust cover motor circuit that I "hot-wired" last month, and I've partially restored it. I also cleaned up a bit in the electronics boxes, so they don't look like a spilled bowl of rainbow-colored spaghetti every time I open the cover.

We had a chance to cross a couple of items off the list involving an important sub-system, one afternoon when both Ron Kunkel and I were available to spend some time. We also had some extra help, thanks to a surprise visit from Jim Farrand, on-and-off LVAAS member for many years. He had never been to Pulpit Rock, but he subscribes to the Buzz and just decided to stop by. Without planning, he managed to arrive at the intersection of Mountain Road and Reservoir Road at the exact same time I did (I had the right-of-way, so he had to stop at the stop sign for me.) Jim brought his Porsche Boxster up top and helped us with the project.



We tackled a couple of items involving the bicycle-wheel system. This ingenious arrangement, contrived by our predecessors long before I got involved, provides a way to have unbroken wiring between the telescope base and the fork, while still allowing it to rotate through several turns in Right Ascension. As it turns, the wire on the fork side unwinds from a wooden drum and descends into the pit, where it loops around a 15" bicycle wheel, and then comes back up to a fixed anchor point on the base. A weight hangs from the bicycle wheel (how much weight? Not sure, but take an old two-pound can of coffee, remove the coffee and replace with lead; that much) to keep everything straight.



For probably about two years, we have wanted to replace the rubber rim strip that protects the wire from the top ends of the spokes, as well as to fit a red plastic rope clamp to the loop holding the fixed end of the wire. To do this, we had to haul the lead weight out of the pit, and then lower it back into position when we were done. This was definitely a job for four hands, rather than two, and it was even better to have six. (Ron even got his toe into the action at the end.)

Current Status and Activities: We are moving forward with the truss, the wiring, and the secondary mirror cell design, and have completed fixes to the bicycle wheel system.





From the LVAAS Archives:

A Pulpit Rock Mystery

By Sandy Mesics

There was an intriguing item in the November 1968 edition of The Observer:

Possible Evidence of a Meteor Crater Found Near Pulpit Rock

As a result of publicity received from our public field meet at Pulpit Rock, we were contacted by an amateur geologist who lives in the Lenhartsville area who reported that he had discovered some evidence of a large meteor crater a few years ago. The location of the formation is within a mile of our observing site at Pulpit Rock. His evidence includes some specimens from the area and an aerial photograph of the area. A follow-up has been started to check this out and if results look positive, the organization of a "dig" would be in order to search for specimens that could be verified as meteoric in origin.

The verification of iron bearing meteorites is made by first polishing a surface of the specimen and then etching this with some acid. A genuine meteorite will show a characteristic crystalline structure that is peculiar to meteoric iron. It is believed that these types of iron crystals can be formed only by cooling molten iron at an extremely slow rate -- something on the order of a few degrees per 100 years.

Below are two aerial photographs of Pulpit Rock taken circa 1974. Unfortunately, they don't cover a one mile radius from the site.



"Aerial Photo of Pulpit Rock Astronomical Park of LVAAS INC."



A perusal of *The Observers* in 1968 and 1969 did not reveal any follow-up to this supposed impact crater. Neither was it referred to in any board meeting or general meeting minutes. This “find” will remain a mystery for now, unless one of our readers has some information!

Reference

The Observer, November 1968

StarWatch

by Gary A. Becker



Moravian's BloomSky Looking Sweet

For weather aficionados, I wanted to bring to your attention a wonderful application for Apple and Android phones called BloomSky Weather. If you want to see the current conditions at any ground location in the world which possesses a BloomSky, you can download the app on your smart phone.

Moravian College Astronomy has a unit located on the Sky Deck of the Collier Hall of Science which looks across the PPHAC Commons with the HUB and Martin Tower in the background. It was donated to the College by David Fisherowski of Boyertown, PA, who has played a pivotal role in bringing MoCo Astronomy into the 21st century. On your iPhone or Android device, go to your App Store (Apple) or Google Play (Android) and search for BloomSky Weather. Install the application. Open the app and go to "Explore" which can be found at the bottom of the application and tap. In the search tab which opens at the top of your screen, type "MoravianCollege, Bethlehem" exactly as seen. Tap on the light blue dot that will appear in the middle of your screen. You'll see Moravian College's site shown as a small image on the lower left of your screen. Tap on that image to view a full-sized picture. Scroll down to the bottom of the app and tap on the "star" icon found on the lower right of the screen. That will make Moravian College a favorite, and you'll be able to view the daytime weather by simply bringing up the BloomSky application.

Above the star you can see loops that will show you time-lapse videos of the weather over Moravian College during the last five days. Search for MoCo-Wx1 on YouTube, and you'll be able to view the weather every day that our BloomSky was in operation. You can also search for "MDRS, Hanksville" and follow the same procedure to see the robotic observatory in which Moravian has a 25 percent timeshare. Thanks to Moravian's IT team and particularly to Chris Laird for keeping our unit operational on campus. If you would like to follow the weather on a national scale, visit Moravian College Astronomy, my website, www.astronomy.org. When the page loads, click on "Weather Links" and then to "Local National" when the weather page displays, or simply follow this link, <http://astronomy.org/weather/Weather.html#2>. You can go to a number of products that will show you animated weather conditions for the entire US. As an example, click on The National Center for Atmospheric Research (<http://weather.rap.ucar.edu/satellite/>).

During the day, leave the preference at “Visible (false color)” and input a loop duration of three hours. You’ll see the whole continental US jump into action, allowing you to observe cloud conditions all over the US. If it's nighttime, preference “Infrared.” Here cloudiness is registered by the temperature which is translated into different colors. If the skies are clear and the ground is radiating high amounts of heat (infrared energy) the landscape will appear red, but if there are clouds overhead, where the atmosphere is much cooler, the colors will range from yellows (thin clouds,) to greens (mostly cloudy to cloudy,) to blues, usually indicating areas of precipitation. My other favorite “Go To” site for weather information is https://radar.weather.gov/ridge/Conus/full_loop.php (the National Weather Service Enhanced Radar Image Loop) where you can observe the precipitation activities occurring over the entire country. By clicking on any part of the US, you can pull up a more detailed and current radar loop for that area.

With winter on the horizon, it’s always fun to predict whether “weather” conditions will cancel school. The excitement among college students isn’t any different than from my high school teaching days. Here’s for a snowy winter!

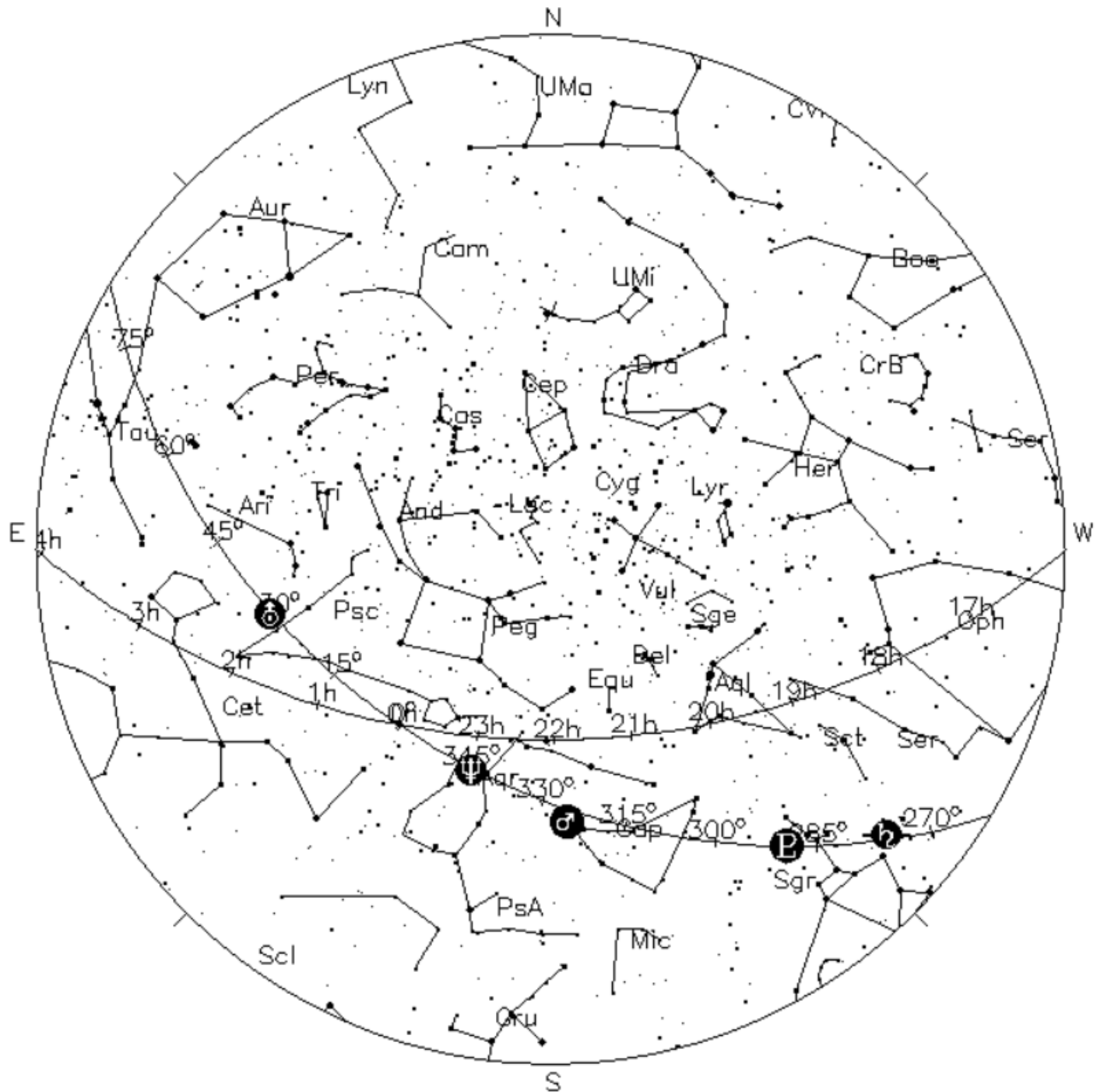
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Moravian College Astronomy - astronomy.org



What's Up for November 2018



Sky above 40°33'58"N 75°26'5"W Wednesday 2018 Nov 7 0:00:00 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/>

OCTOBER 2018

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

NOVEMBER 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				01	02	03
04 Daylight Savings Ends	05	06 Election Day	07 New Moon	08	09 LVAAS Scout Group - South Mountain	10
11 Veterans' Day General Meeting - 7:00 PM South Mountain	12	13	14	15 First Quarter Moon	16	17 Star Party
18 Deadline for submissions to the Observer	19	20	21	22 Thanksgiving	23 Full Moon	24
25 LVAAS Board of Governors Meeting	26	27	28	29 Last Quarter Moon Astro Imaging 7:00 PM	30	

2018 LVAAS Event Calendar

2018 LVAAS Event Calendar												
	Sundays			Thursday	Friday	Saturday	Mondays	Multi-Day Weekends	Moon Phase			
	General Meeting time	location	Board meeting	Astro-Imaging	Lunatics and Stargazers	Star Parties	Scouts at S. Mountain	Scouts at Pulpit R.	New	First	Full	Last
January	2:00 PM	14 Muhlenberg	28	4		no mtg		no camping	16	24	1 31	8
February	2:00 PM	11 Muhlenberg	25	1		no mtg		no camping	15	23		7
March	2:00 PM	11 Muhlenberg	25	1		24		30-31-1	17	24	1 31	9
April		8 S.M.	29	5		21		27-28-29	15	22	29	8
May		6 S.M.	20	3		19		25-26-27	15	21	29	7
June		10 S.M.	24	no mtg		23		29-30-1	13	20	28	6
July	5:00 PM	7 S.M.	29	no mtg		21		27-28-29	12	19	27	6
August	7:00 PM	11 Pulpit	26	no mtg		18		24-25-26	11	18	26	4
September		9 S.M.	30	27		15		21-22-23	9	16	24	2
October		14 S.M.	28	25		20		26-27-28	8	16	24	2 31
November	7:00 PM	11 S.M.	25	29		17		no camping	7	15	23	29
December	1:30 PM	8	30	20		no mtg		no camping	7	15	22	29

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 at Lower Macungie Community Center

NEAF
Cherry Springs
Stellafane
Black Forest
MegaMeet

April 21-22
June 14-17
August 9-12
September 7-9
July 13-15

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.

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