

The Observer

The Official Publication of the Lehigh Valley Amateur Astronomical Society

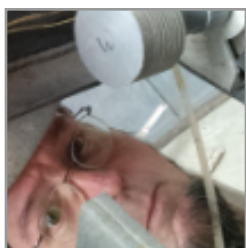
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October 2016

Volume 56 Issue 10



ad astra*****

I remember my first visit to LVAAS, a General Meeting I attended a few years ago when Rob Teeter of Teeter's Telescopes (<http://www.teeterstelescopes.com/>) presented the features of his large, custom-built Dobsonians. I think I enjoyed his return visit, at our September General Meeting, even more. Although he did not bring an instrument with him to show off this time, he did take us through the process of creating one of his masterpieces, from accepting the order to delivering the completed product. I'm one of those guys who could watch *How It's Made* for hours, so I was definitely into this, and I took in the photos of his shop and all the work in progress with considerable satisfaction.

Rob makes truss-tube Dobsonians up to 22" diameter, and his attention to detail in the design and construction are evident in the fit and finish of his instruments. They look good, they are designed to perform well and to be fun and easy to use, and I'm sure they offer spectacular views of our favorite celestial targets.

Our October meeting will feature our own Sandy Mesics! Her topic will be "The Long and Winding Road: A brief history of the Schlegel Observatory" and I am eagerly looking forward to it. She has teased members of the Board with hints of some of the fascinating history that she has unearthed of LVAAS' most ambitious project.

Events like a Meteor Shower

LVAAS has been busy lately. Just look at the list of events that your club has held or participated in during a recent 1-month span:

- 8/26 Special event at Pulpit Rock for Tilden Township Planning Commission
- 8/28 Board of Governors Meeting
- 9/09 Lunatics and Stargazers Night
- 9/10 Star Party
- 9/11 Festival of Art, Science, and Technology
- 9/11 General Meeting
- 9/15 Astroimaging Group Meeting
- 9/16 Boy Scouts at Pulpit Rock
- 9/21 Scouting event at South Mountain
- 9/22 Planetarium show for Muhlenberg students
- 9/24 Work Party at Pulpit Rock
- 9/25 BOG meeting

That is an average of one event every 2.5 days! We don't do this all the time. We can't! We are all volunteers, we all have lives and some of us have jobs. But when the times call for it, we are able to rise to the occasion, thanks to the dedication of our involved members.

In addition to the above list, we have the work parties for maintenance at South Mountain almost every Saturday morning, frequent visits to Pulpit Rock by individual members or small groups for everything from mowing the lawn to refurbishing the restroom, and efforts on behalf of LVAAS by individual members at other locations or in their own homes, plus probably some activities that I am forgetting. Great job everybody!

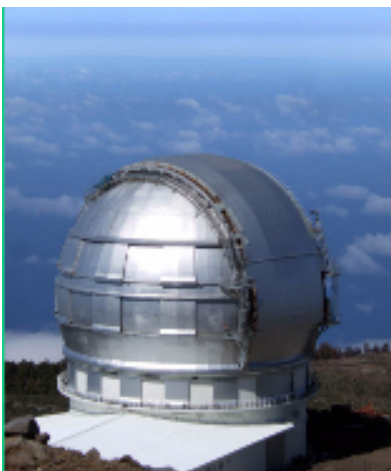
Aperture Fever

The latest telescope in the news is FAST, the Five-hundred-meter Aperture Spherical radio Telescope which recently completed construction and began testing in southwestern China. At 500 meters diameter, it has more than twice the area for collecting faint radio signals than the previous record holder, the famous radio telescope in Arecibo.

FAST is now the largest single-aperture telescope in the world, and it has a number of innovative design features, including a deformable mirror. The suspension holding the half-kilometer reflector is anchored to the ground with over 2,000 robotic winches, that can selectively pull the panels down to form a steerable parabolic curve, while 1,000 lasers check the shape of the reflecting surface from above. <https://goo.gl/vjHQBv>



FAST under construction, just over a year ago. <https://goo.gl/pob61o>, scaled; license <https://goo.gl/G3iXEc>



GTC (<https://goo.gl/ZS3RCz>, license <https://goo.gl/G3iXEc>)

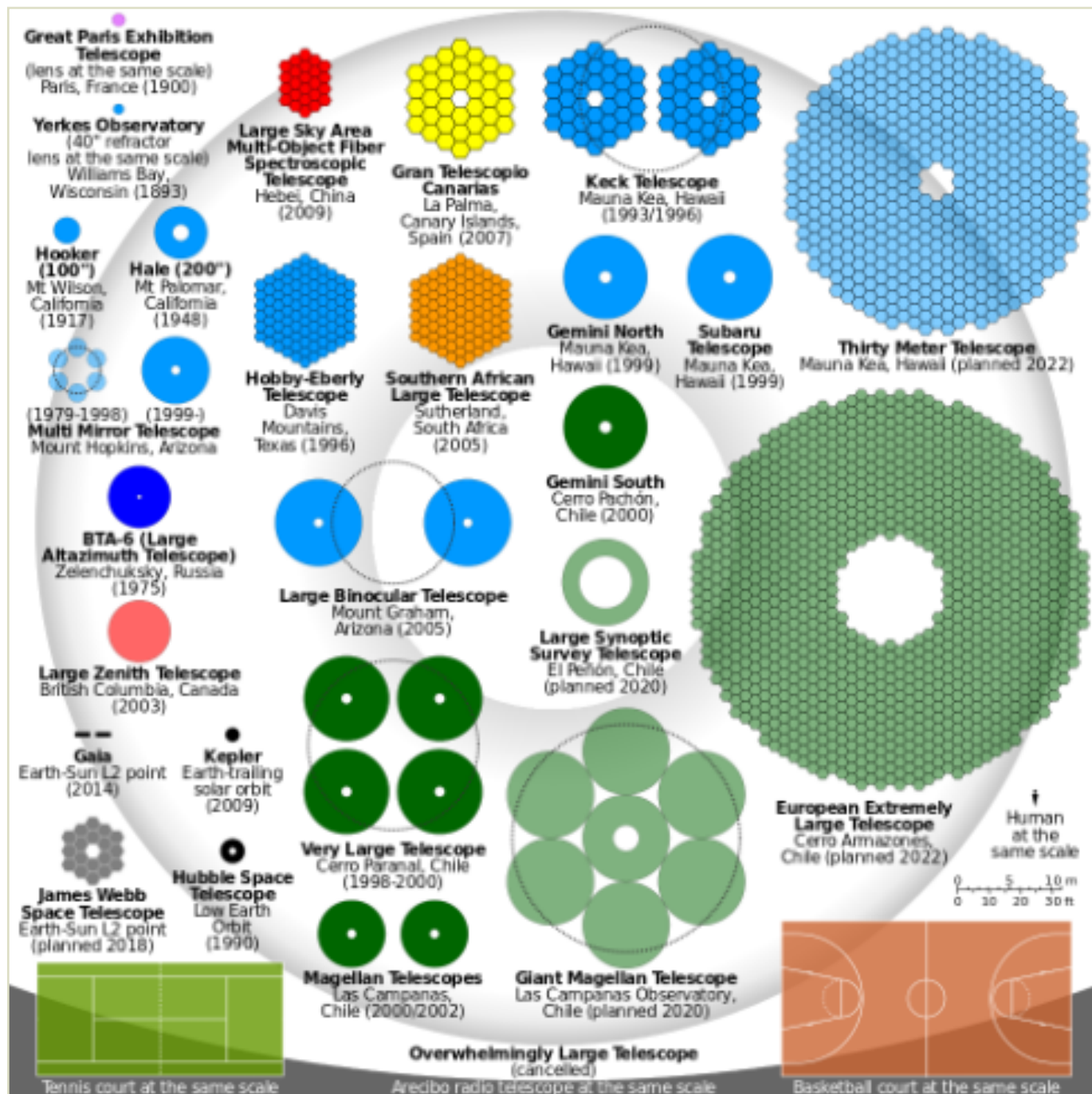
In optical telescopes, the largest single-aperture instrument currently in operation is the Gran Telescopio Canarias, or Grand Canary Telescope, built by several institutions from Spain and Mexico as well as the University of Florida. The GTC's 410-inch main mirror is composed of 36 hexagonal segments that are controlled by an active optics system, and it has been in operation since 2009.

Even larger optical telescopes are under construction. The Giant Magellan Telescope is being built at Las Campanas Observatory in Chile by the United States in partnership with Australia, Brazil, and Korea. Its seven-segment mirror will have a collecting power equivalent to a 22-meter (or 866 inch) circular mirror, with an even higher resolving power. Construction was begun on the Thirty Meter Telescope in Hawaii, but has been halted due to protests over the construction permits, on land considered sacred to native Hawaiians. And the European Extremely Large Telescope, also under construction in Chile, but at ESO, will have a mirror of 798 hexagonal segments and an overall diameter of 39.3m (1547").

In amateur telescopes, the largest is probably this 70" Dobsonian built by Mike Clements in Utah (<https://goo.gl/mGsY5T>), using a surplus mirror from the U.S. spy satellite program. There are quite a few large Dobsonians built by amateurs, mostly in the U.S. and Europe. I would not be surprised if there are some really impressive projects in the former Soviet Union, or perhaps other countries outside the U.S. and Western Europe, but I was unable to find any mention of them online.

I am also unable to find any reports of large, equatorially mounted telescopes built by amateurs. I could be wrong about this, but for now I think LVAAS' own Schlegel Observatory will be the king of this category when it is completed. It's a race to the record book. Ad Astra!

—Rich Hogg



The primaries of the largest telescopes in the world, existing and planned. LVAAS' Schlegel Observatory Cassegrain system will be the same size as the Yerkes Observatory (which is a refractor), in the upper left. <https://goo.gl/rvg3dO>, license <https://goo.gl/G3iXEc>

ELECTIONS ANNOUNCEMENT

A business meeting will be convened and the election of LVAAS officers for 2017 will take place during our regular general meeting on **October 9th**. Candidates for the position of director, assistant director, treasurer and secretary were announced at the September 11th general meeting. The nomination process is now closed in accordance with society bylaws. The nominations for officers are as follows:

Director - Richard Hogg

Assistant Director - Sandra Mesics

Treasurer – Gwyn Fowler

Secretary - Ron Kunkel

Newly elected officers will assume responsibility December 1, 2016 and continue until midnight November 30, 2017.

Kudos to our outgoing treasurer, Scott Fowler, who has served as treasurer for the past two years and fulfilled his term limit.

We hope you can attend to vote, and then welcome and show your appreciation to the officers of the LVAAS!

Regards,
Dave Binder, Nominating Committee Chairman
Bill Dahlenburg, Assistant

General Meeting at South Mountain Sunday, October 9, 7 p.m.



The Long and Winding Road: A brief history of the Schlegel Observatory

LVAAS has been in existence for almost 60 years. For the past 30 years, LVAAS has been trying to complete its most ambitious project: The Schlegel Observatory and the 40-inch Cassegrain telescope. Join us as we take the long and winding road from conception to where the project is presently.

Minutes for the LVAAS General Meeting of 11 September 2016

The September General Meeting was held at our South Mountain headquarters in Allentown, PA. The meeting started at 7:00 p.m. and, due to the absence of the speaker, Director Rich Hogg proceeded with the information session.

First, Rich conducted LVAAS Membership interviews. There were no first readings conducted for new members. There was a second reading conducted for Krittanon Sirorattanakul (aka Pond.) Pond is now a full LVAAS member.

Rich then called on Dave Binder, chairman of the Nominating Committee, for his report. Dave stated that Director Rich Hogg, Assistant Director Sandy Mesics, and Secretary Ron Kunkel, were all eligible for a second term, and that each had agreed to run for a second term. He also stated that Treasurer Scott Fowler has completed his second term, and thus is not eligible to run again. He reported that Gwyn Fowler has agreed to run for Treasurer. He then opened the floor for additional nominations for the last time, but there was none. The official slate of candidates for 2017 offices will thus be as just presented. The elections will be held at the October 9th General Meeting.

About 7:10, the speaker, Rob Teeter of Teeter's Telescopes, arrived and after a very short setup began his program, titled "From Concept to Cosmic Time Machine." Rob began making telescopes in 1998 and has been operating as a business since 2002. He is located in Rockaway, New Jersey. He designs, sells, builds, and delivers custom-built telescopes, optimized for either planetary, deep sky, or combination viewing. His most popular telescope is the combination version in the range of F/4.1 to F/5.9 focal ratio. The presentation generated lots of questions and the program lasted until 8:43 p.m.

After the presentation, Director Rich Hogg declared a break until 9:00 p.m. at which time a formal business meeting would be held for the membership to consider the Fiscal 2017 LVAAS Budget.

At 9:00 p.m. Director Rich Hogg regrouped the membership for the business meeting. He called on Treasurer Scott Fowler for the 2017 Budget presentation. Scott presented details for revenue of \$18,200 and expenses of \$22,480. Scott stated that the proposed 2017 budget was again a deficit budget, similar to the 2016 budget, with a projected deficit of \$4,280. But since revenue was conservatively projected and expenses liberally projected, it would likely become a break-even budget as was the case for 2016.

The 2017 LVAAS Budget passed unanimously on a motion by Dave Binder and second by Tom Duff. The formal business meeting was then adjourned on a motion by Gwyn Fowler and second by Gary Robinson.

Rich then called on Tom Duff for a report on the upcoming MegaMeet, scheduled for September 30 to October 2 at our Pulpit Rock Astronomical Park. Tom reported that drinks and a gas grill would be provided by the Society. Guests were to bring their own food for preparation, using the grill if desired. A combination lock will be installed on the gate and members and guests without a key will be given the combination for access to the site as required for the duration of the event. The lock will be painted fluorescent red for ease of identification.

Rich also informed the members of our upcoming meetings: October 9th would be the General Meeting for the election of 2017 officers. The program will be a presentation on the history of the 40" project. The November 13th program will be Josh Pepper speaking on Tabby's Star. That meeting will be at South Mountain but will begin at 2:00 p.m. The December 10th meeting will be the annual Holiday Party with a trivia contest as the program. That meeting will also begin at 2:00 p.m. on Saturday at Grace Community Church. The meetings for January, February, and March will all begin at 2:00 p.m. and be held at Muhlenberg College.

The meeting adjourned at 9:30 PM.

Minutes prepared and submitted by Ron Kunkel, Secretary.

HELP WANTED: No Experience Necessary. Operate/manage small retail establishment. Manage inventory and purchasing of beverages, snacks, hot dogs, custom-branded apparel and SWAG, and astronomy-related curiosities and media. Staff retail counter at Star Parties and General Meetings, or coordinate volunteers to do same. Procure and distribute beverages at Christmas Party, same plus additional staples at annual Picnic. Account for revenue, expenses, and profits, and report to owning organization. * * * The Red Shift needs a new proprietor!!! * * * Position opening in December. Apply in person or by e-mail to director@lvaas.org



LOOK GOOD WHILE LOOKING!

Your Red Shift Store at South Mountain is now fully stocked with clothing merchandise that you just must have for yourself or others.

What better way to show off the organization that you belong to than by wearing apparel with one of the LVAAS Logos?

Ball Caps (one size fits all) in Navy Blue or Natural/Royal Blue

T-Shirts from size small to 2x large in Athletic Heather, Navy Blue or Black

Polo Shirts from size medium to 2x large in Black or Celadon Blue

And for the not-so-adults:

T-shirts from size small to large in California Blue, Pink, Neon Green, Island Yellow

And for those cooler months soon to come:

Fleece Jacket (real great windbreaker) from size medium to 4xxx large in Blue Glacier

Beanie (alright, call it a stocking cap) in Navy Blue

Sweatshirt from size small to 2x large in Navy Blue or Ash

Denim Shirt from size medium to 2x large in Light Blue

All this clothing merchandise is available now at the Red Shift store on Star Party nights and General Meeting nights.

Stop by, and we thank you for visiting the Lehigh Valley Amateur Astronomical Society's (LVAAS) Red Shift store. LVAAS is a 59-year-old 501(c)3 non-profit educational institution. Your purchase will help us carry out our mission of bringing astronomy to the public. Thank you for shopping, and for your support!

Contributed by Chuck and Donna Bradbury, Member Services

LVAAS Astrophotography Calendar 2017

2017 LVAAS Astrophotography Calendar deadline reminder: The deadline for submissions is 12 noon on October 28th. Submissions are open to members, nonmembers, novice, and advanced. There is no limit to the number of images you may submit. Image size should be 3531 x 2354 or larger at 300 dpi resolution submitted to lvaascalendar@gmail.com which is also listed on the Contact Us page on the LVAAS website.

Please include a description of the object and the equipment used. If you don't want to include a description we may add one. We are always in need of facility images too, if you happen to have some to share. Large group photos may be considered as well. We are excited and looking forward to publishing your images. Thanks in advance for all your hard work!

We also want to take this opportunity to welcome Tom Duff as the new Astroimaging group coordinator and thank Mike Tapper for his years of service to keep this venue going. The next meeting will take place at South Mountain on October 13 th at 7:00 pm. You are welcome to attend and submit ideas for discussion. Tom Duff can be contacted via the Contact Us page on the LVAAS website. We look forward to seeing you there!

Sandra Repash – Calendar editor



Above Calendar Cover Photo Credits: **Gary A. Becker**, (L) upper: Pulpit Rock Astronomical Park and (R) lower: the Brooks Observatory at South Mountain Headquarters. **Dave M. Moll**, (R) upper: Sunrise at Pulpit Rock. **Rae Klahr**, (L) lower: Sunset over South Mountain Headquarters LVAAS.



The waning crescent moon, 41.9% illuminated on September 23, 2016. Photograph taken using an iPhone 6 Plus with telescope adapter on a StellarVue 102ED Refractor 4" F7. -editor.

Ron's Ramblings

Ron's Ramblings is a monthly series of articles describing some recent or otherwise important event in astronomy. The ramblings will attempt to describe both the astronomical event and its significance. Obviously, the description will be that of a rambling amateur astronomer.



LIGO Detection and Primordial Black Holes

A few of my recent articles have dealt with LIGO's detection of gravitational waves. This detection is of extreme significance as regards the validation of the theory of General Relativity which predicted the very existence of gravitational waves. This month's article now looks at another aspect of this detection, namely its potential impact on cosmology's Big Bang Theory and its prediction of the existence of primordial black holes. Primordial black holes are thought to have formed in the first few thousandths of a second after the Big Bang. And the real kicker here is that these primordial black holes might even be the elusive dark matter of the universe.

On September 14, gravitational waves produced by a pair of merging black holes 1.3 billion light-years away were captured by the Laser Interferometer Gravitational-Wave Observatory (LIGO) facilities in Hanford, Washington, and Livingston, Louisiana. This event, GW150914, marked the first-ever direct detection of gravitational waves, as well as the first direct detection of black holes. The signal provided LIGO scientists with information about the masses of the individual black holes, which were 29 and 36 times the sun's mass. These values were both unexpectedly large and surprisingly similar. Additionally, in the same LIGO observational run, one other black hole merger (GW151226) has now been confirmed, this one with merging black holes of 8 and 14 times the mass of the sun. Additionally there is yet another third unconfirmed detection. The apparent prevalence and sizes of these black holes was quite unexpected and has scientists scrambling to explain the results.

In a paper published May 24 in The Astrophysical Journal Letters, Alexander Kashlinsky, an astrophysicist at NASA Goddard, analyzes what might have happened if dark matter consisted of a population of black holes similar to those detected by LIGO. Previously in 2005, Kashlinsky led a team of astronomers using NASA's Spitzer Space Telescope to explore the background glow of infrared light, cosmic infrared background (CIB), in one part of the sky. The researchers reported excessive patchiness in the CIB glow and concluded it was likely caused by the aggregate light of the first sources to illuminate the universe more than 13 billion years ago. In 2013, another study compared how the cosmic X-ray background (CXB) detected by NASA's Chandra X-ray Observatory compared to the CIB in the same area of the sky.

The first stars emitted mainly optical and ultraviolet light, which today is stretched into the infrared by the expansion of space, so they should not contribute significantly to the CXB. Yet the irregular glow of low-energy X-rays in the CXB matched the patchiness of the CIB quite well.

The only object known to be sufficiently luminous across this wide energy range is a black hole. The research team concluded that primordial black holes must have been abundant among the earliest stars, making up about at least one out of every five of the sources contributing to the CIB.

The nature of dark matter remains one of the most important unresolved issues in astrophysics. Scientists currently favor theoretical models that explain dark matter as an exotic massive particle, but so far extensive searches have failed to turn up any evidence that these hypothetical particles actually exist. This failure to find dark matter particles has led to renewed interest in studying how well primordial black holes -- black holes formed in the universe's first fraction of a second -- could work as dark matter.

Physicists have outlined several ways in which the hot, rapidly expanding universe could produce primordial black holes in the first thousandths of a second after the Big Bang. The older the universe is when these mechanisms take hold, the larger the black holes can be. And because the window for creating them lasts only a tiny fraction of the first second, scientists expect primordial black holes would exhibit a narrow range of masses. Depending on the mechanism at work, primordial black holes could have properties very similar to what LIGO detected according to Kashlinsky.

Kashlinsky's study is an effort to bring together a broad set of ideas and observations to test how well they fit, and the fit is surprisingly good. If this is correct, then all galaxies, including our own, are embedded within a vast sphere of black holes each about 30 times the sun's mass. "Future LIGO observing runs will tell us much more about the universe's population of black holes, and it won't be long before we'll know if the scenario outlined is either supported or ruled out," Kashlinsky said.

References

Reddy, Francis; NASA Scientist Suggests Possible Link Between Primordial Black Holes and Dark Matter; NASA, 24 May 2016, Web, 19 September 2016.

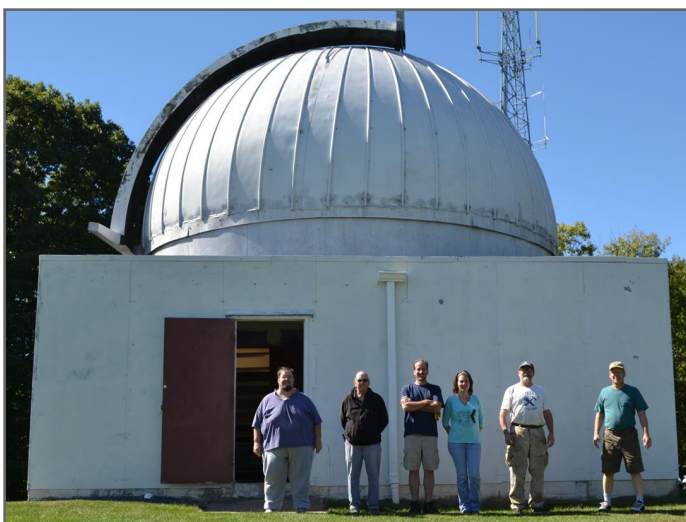
<http://www.nasa.gov/feature/goddard/2016/nasa-scientist-suggests-possible-link-between-primordial-black-holes-and-dark-matter>



The end of my ramblings until next month. Ron Kunkel

What's Happening at Pulpit Rock

LVAAS's many observatories and grounds at Pulpit Rock and South Mountain require rigorous maintenance, and many renovations are currently being planned and executed. Members willing to devote their time and energy to help keep our facilities in top working order, please watch for e-mail announcements, and watch this space for updates on work in progress or being planned. Per ardua ad astra! Photo of Pulpit Rock Astronomical Park by Gary A. Becker.



Sept. 24 Pulpit Rock work crew: (L-R) LVAAS Director Rich Hogg, Dave Green, Mike and Tara Leonard, Preston Smith, Pulpit Rock Observatories Director Frank Lyter. Photos courtesy Frank Lyter.

Work Agenda for September 24, 2016

- Removal of the drywall on the wall with the electric breaker panel
- Routing of the armored cable from area of the service panel to the bathroom area (do not plan to hook up)
- Replacement of the damaged plywood on the observation deck (repair of the underlying joists has been completed)
- Clearing of staples and nails in the overhead rafters in the main meeting room
- Removal of low voltage boxes
- Installation of new boxes on the observation deck
- Assembling material list for electrical outlet boxes, switch boxes etc planned for the building
- Removal of material / equipment no longer needed at Pulpit Rock

by Gary A. Becker



Wedding Crasher

It was the Perseid meteor shower that made me do it, crash a wedding in NW Montana this past August. It was just too good a “thing” to let pass—a beautiful lodge by Flathead Lake, incredibly dark skies, a cooperating moon, and a meteor shower that was predicted to be much stronger than average because Jupiter’s gravity had perturbed several strands of dross from previous passages of its parent comet, P109/Swift-Tuttle, into Earth’s path. Pete, my friend with whom I was traveling, also happened to be best man, and I ‘did’ know the groom as a teenager. So maybe it wasn’t a crash as much as an awkward landing, but it was fun. Pete said that he had never seen anyone “crash” a wedding so gracefully. I’ll take that as a compliment. My hosts were also gracious. I got plenty of free meals, plenty of free drinks, and saw plenty of fine Perseids on two nights of consecutive observing.

Montana weather can be a little tricky. While dry and partly cloudy to mostly clear on the majority of summer evenings, it can also be responsible for three to four consecutive days of cloudy, rainy weather, and that’s what we thought we were going to experience over the best Perseid mornings of August 12 and 13. However, it cleared just after midnight on the 12th, and did those Perseids fly! They were brighter during the first several hours of watching with uncorrected visual rates of 30 to 45 meteors per hour.

The most impressive part of the shower was the way the Perseids bunched. This may be due to a single larger particle breaking up and its daughter particles separating very slowly over the intervening centuries. The result creates bursts of meteors occurring within a 10 to 30-second interval. We witnessed several bunching episodes where five meteors singed the air in a 30-second period, and one where I saw six Perseids in about 15 seconds. WOW, the adrenaline was really pumping! I saw 184 meteors on the first night and 99 on the second (August 13), my best two consecutive nights that I have ever experienced.

© Gary A. Becker – beckerg@moravian.edu or garyabecker@gmail.com

Moravian College Astronomy - astronomy.org



I was called a most gracious wedding crasher, but how could I resist with Glacier Camp Lodge looking onto Flathead Lake surrounded by some of the darkest skies in Montana during the height of the Perseid meteor shower. It was just a forgone conclusion that I had to crash this wedding. Photo by Gary A. Becker, weddingcrashers.com...



“To tell you the truth, I think I’m getting just a little bit nervous” was the low-toned comment of **Ryan M. Hannahoe** (left) during the fitting for his wedding. “Not to fear,” retorted best man, **Peter K. Detterline**. “I’ve been married three times and divorced four. Let’s share a beer and I’ll tell you all about it.”

Photo: Gary A. Becker, weddingcrashers.com...



Flathead Lake in northwestern Montana was the backdrop for **former LVAAS member, Ryan Hannahoe’s** wedding. Talk about a place where you could drown your sorrows; this was it.

Photo by Gary A. Becker, weddingcrashers.com...

Comments from **Peter Detterline**, the best man: *"Nicely done, but I see you skipped the part where your loud talking kept the bride up on her wedding night, and then how you argued with her at 3:30 in the morning because she was being "annoying," and how you fought off that skunk that attacked you on the basketball court, and how even though you weren't invited to the wedding, guests kept coming into your room to talk with you, and how you drove your red Jeep behind the bride and groom as they were getting married, and how you secretly burned a hole in the groom's plastic eyepiece adapter of his telescope, and how you wouldn't let the groom go to the bathroom during his bachelor's party. And you STILL crashed the wedding gracefully. Good times Buddy."*

In a subsequent conversation with Pete Detterline, it was suggested that I start a business and build my own website which would be named, weddingcrashers.com. I checked and that domain name it is still available. Hmm, and I’ve got a lot of business majors in my Monday/Wednesday class. Sounds like the basis for a reality TV show, doesn't it?



From the LVAAS Archives:

A Major Project Commences

By Sandy Mesics

Fifty years ago, LVAAS came into possession of Pulpit Rock. In the November, 1966 Observer, Joe Grady, Chairman of the Ways and Means Committee, summarized LVAAS's attempts to find a dark sky site:



“For the past 2-1/2 years, members have been looking for a suitable site for the purpose of building an observatory to house the 20” telescope that our society is building and a place that we can hold all-night field meets. We were hoping to find a site within a radius of 50 miles. We were confronted with prices of \$300 to \$1200 an acre and problems such as legal fees, surveying fees, deed fees, the cost of purchasing the property, the construction of a road and the observatory, bringing this project to a cost of \$20,000 to \$30,000.

“Our dreams of ever accomplishing a project of this size seemed impossible until a man by the name of Mr. Henry Kawecki joined our society. Mr. Kawecki lives in Lenhartsville, a forty-minute drive from Bethlehem. He owns some 430 acres of land. Mr. Kawecki had an observatory built, consisting of a 16-foot dome housing a 12-1/2” Cassegrain telescope with clock drive and a 3-1/2 kilowatt power supply. All this is located on top of a mountain elevation of over 1600 feet called Pulpit Rock. Mr. Kawecki is giving to our society the use of all the facilities on top of Pulpit Rock. He has invested about \$30,000 in the buildings and equipment plus a crude roadway leading to the observatory. A pleasure car is unable to navigate on the present road, as some of our members will testify.

“The only thing that Mr. Kawecki asks of our Society in return for all this is that we use the facilities, and help to pay some of the costs to improve the road to the observatory. Mr. Kawecki and our society have received a written contract from a Mr. Althouse, a road building contractor, to do the job at a cost of \$6,500. Mr. Kawecki has offered to pay 2/3 of the cost of building the road, leaving the sum of \$2,500 for our society to finance. Our Director, Bill Ference, has appointed a Ways and Means Committee, consisting of the following men: Roland Lovejoy, George Lewis, Harry Meck, Preston Smith and myself as chairman of the committee. It has been our job to recommend to our members a ways and means of raising the sum of \$2,500.

“The Ways and Means Committee does hereby recommend the following proposal for financing the Pulpit Rock Project:

1. Have our society make a loan in the sum of 3 to 4 thousand dollars from a bank, the amount to be determined by the Board. This loan would be for a period of 36 months.

<h1 style="margin: 0;">Proposal</h1> <div style="display: flex; justify-content: space-between; font-size: 0.8em;"> REVISED TO CONTRACT Page No. <u>1</u> </div>		
<h2 style="margin: 0;">R & B ALTHOUSE</h2> <p style="margin: 0;">Kempton, R. D. No. 2, Pa. 19529 Kempton: 756-4841</p>		
COPY TO Mr. Kawechi		of <u>1</u> Pages
PROPOSAL SUBMITTED TO:	PHONE:	DATE: October 13, 1966
NAME: Lehigh Valley Amateur Astronomical Society Inc.	JOB NAME: Road to Pulpit Rock	
STREET: East Rock Road	STREET:	
CITY: Allentown, Pa.	CITY:	STATE:
STATE:	ARCHITECT:	DATE OF PLANS:
<p>We hereby submit specifications and estimates for: Intended procedure to build road to Pulpit Rock.</p> <p>Widen road to 12 feet, haul accessible fill to cover rocks. Make road passable for a pleasure car. We will not guarantee that they can climb the incline. Tree stumps and rocks will be pushed aside. Construction will include ditches along road to provide drainage in event of heavy rain. Any necessary underground crossovers will be an extra charge. We will follow Mr. Kawechi's road that he uses, we will not be responsible if it should happen to go over a boundary line, also to be allowed to get fill where we dug for tests. If weather conditions make it impossible to finish the job this fall, we will finish it in spring.</p> <p>Any work done other than above stated will be charged extra.</p> <p>Contract revised as requested by Mr. Kawechi.</p>		
<p style="font-size: 0.8em;">We hereby propose to furnish labor and materials — complete in accordance with the above specifications, for the sum of:</p> <p>Six thousand five hundred dollars (\$ <u>6,500.00</u>) with payment to be made as follows:</p> <p>When work is half finished or weather stoppage of job we will accept \$3,00.00 as partial payment.</p> <p style="font-size: 0.7em;">All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra costs, will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workmen's Compensation Insurance.</p>		
Authorized Signature <u>Ralph Althouse</u>		
<small>NOTE: This proposal may be withdrawn by us if not accepted within _____ days.</small>		
<h3>Acceptance of Proposal</h3> <p>The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.</p>		
Accepted:	Signature <u>Bob M. Rolan</u>	
Date _____	Signature _____	

2. Contact each member to see how much he or she would be willing to invest in this project. A member wishing to invest would be given a time period in which to support this project.”

LVAAS was able to raise the funds with a fund drive, and did not have to take out a loan for road construction. At the November 14th 1966 BOG meeting, the board members pledged \$925 toward the Pulpit Rock Road. On November 7, 1966, the Board met with the Hamburg City Council, and obtained permission to put the route through the Hamburg Municipal Water Authority.

The contract with R&B Althouse in Kempton to build the Pulpit Rock

road was signed on October 13th. At the time this was signed, the access route was still not determined. It is also interesting that Mr. Althouse did not guarantee a car could make the incline.

The Pulpit Rock road has been both a benefit and a high-maintenance liability to LVAAS. Of course, it allows members access to the site, and one can argue that hikers have discovered LVAAS by occasionally using the road to the summit rather than the Appalachian Trail, increasing LVAAS membership. The lease of the right-of-way to FirstEnergy has provided much-needed funding for the Society over the years. But maintaining it has been a real challenge. The bridge over the creek had been a major project to build and maintain, and the road itself needs constant attention. We have been fortunate to have dedicated volunteers over the years like Bob Shandor, Ron Kunkel, and many others to maintain the roadway. As one member remarked recently, “The road has never been this good.”



LVAAS was represented at the **Festival of Art, Science, and Technology** at PPL Center in Allentown on Sept. 11. The Festival had over 4,200 visitors, and many stopped by our booth to play the Planet Game or look through our tabletop Orion telescope at Saturn, which was taped to a light fixture down the hallway a bit. With a Lunatics night on Sept. 9, a Star Party on Sept. 10, and a General Meeting as well as FAST on Sept. 11, it made for a very busy weekend for LVAAS! Many thanks to Tom Applebach, Blaine Easterwood, James Farrand, Priscilla Jacobsen, Ron Kunkel, John LaShell, Eric Loch, Judy Parker, Earl Pursell, and Somesh Rahul for volunteering to spend time at the festival and help to man our exhibit.



Top left: Astronomy lovers crowd the displays at FAST. Bottom left: LVAAS members (L-R) Ron Kunkel, Earl Pursell, Rich Hogg and Blaine Easterwood point out the wonders of astronomy to visitors at the Festival of Art, Science, and Technology at PPL Center September 11, 2016. Photos courtesy Tom Applebach.

by Gary A. Becker



Dying: A Different Perspective

As an Episcopalian, I position myself to the far left with lots of liberal ideas and fewer concrete answers than I would like. As an astronomy educator and someone interested in the sciences his entire life, I find the divisiveness between science and some religious values to be annoying, pitting one against the other as evidenced in the thinking of far right conservatives. Global warming comes to mind immediately. Even if our heating planet is not a function of our carbon footprint, and I seriously doubt this is true, wouldn't it be prudent to unite and consider viable options to this problem, simply because it is a proven fact that the Earth is warming!

In astronomy, I believe that a lot of the public's interest stems not from an innate concern about the facts, but our place in the universe and where we go after death. We look into the heavens for a spiritual solution to ease our angst about dying. I'm personally against a non-corporeal existence, but can find no way of avoiding it.

Discussing this conundrum many years ago with Nick Knisely, a quantum physicist who was called to God and became rector of Trinity Episcopal Church in Bethlehem, PA, a solution was advanced. Quantum physicists, those who deal in the physics of atoms, believe that the four-dimensional universe of Einstein is more diverse. We live in a universe, in fact a multiverse with perhaps a dozen or more dimensions. Many of these are extremely small, embedded deep within the structure of atoms, but others, such as the "bulk," surround what we perceive as our own four-dimensional universe of space and time. There may be bulk beings walking through the room in which you are sitting while you are reading this small article, and you would have no idea that they were watching you. In their universe they may see us, but we cannot see them. In short, it was Knisely's contention that dying was simply a transitional phase of an eternal existence, a rite of passage from one set of dimensions into another. Death is still a scary proposition for most of us, but nonetheless, Happy Halloween!

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Moravian College Astronomy - astronomy.org



One Incredible Galaxy Cluster Yields Two Types of Gravitational Lenses

by Ethan Siegel

There is this great idea that if you look hard enough and long enough at any region of space, your line of sight will eventually run into a luminous object: a star, a galaxy or a cluster of galaxies. In reality, the universe is finite in age, so this isn't quite the case. There are objects that emit light from the past 13.7 billion years—99 percent of the age of the universe—but none before that. Even in theory, there are no stars or galaxies to see beyond that time, as light is limited by the amount of time it has to travel. But with the advent of large, powerful space telescopes that can collect data for the equivalent of millions of seconds of observing time, in both visible light and infrared wavelengths, we can see nearly to the edge of all that's accessible to us.

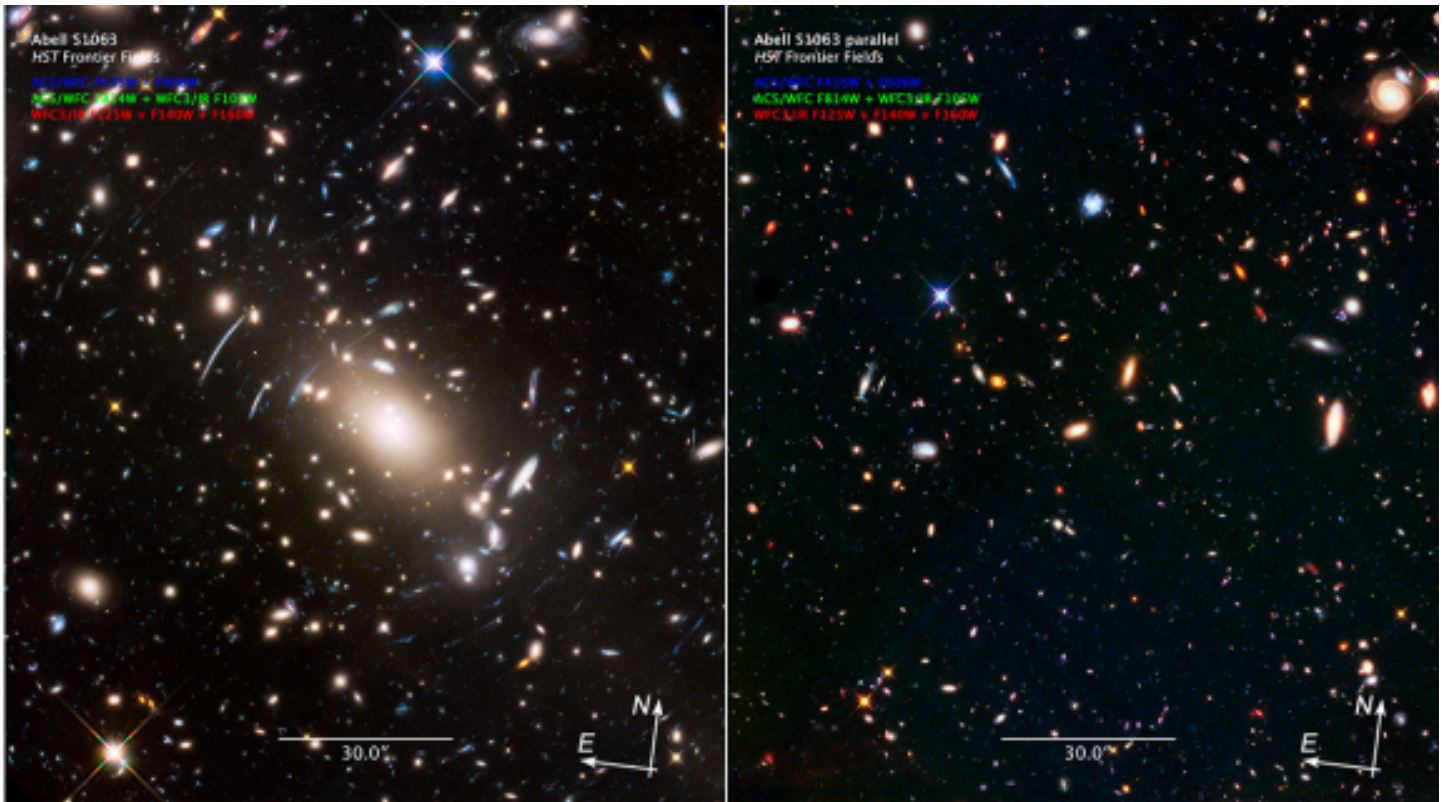
The most massive compact, bound structures in the universe are galaxy clusters that are hundreds or even thousands of times the mass of the Milky Way. One of them, Abell S1063, was the target of a recent set of Hubble Space Telescope observations as part of the Frontier Fields program. While the Advanced Camera for Surveys instrument imaged the cluster, another instrument, the Wide Field Camera 3, used an optical trick to image a parallel field, offset by just a few arc minutes. Then the technique was reversed, giving us an unprecedentedly deep view of two closely aligned fields simultaneously, with wavelengths ranging from 435 to 1600 nanometers.

With a huge, towering galaxy cluster in one field and no comparably massive objects in the other, the effects of both weak and strong gravitational lensing are readily apparent. The galaxy cluster—over 100 trillion times the mass of our sun—warps the fabric of space. This causes background light to bend around it, converging on our eyes another four billion light years away. From behind the cluster, the light from distant galaxies is stretched, magnified, distorted, and bent into arcs and multiple images: a classic example of strong gravitational lensing. But in a subtler fashion, the less optimally aligned galaxies are distorted as well; they are stretched into elliptical shapes along concentric circles surrounding the cluster.

A visual inspection yields more of these tangential alignments than radial ones in the cluster field, while the parallel field exhibits no such shape distortion. This effect, known as weak gravitational lensing, is a very powerful technique for obtaining galaxy cluster masses independent of any other conditions. In this serendipitous image, both types of lensing can be discerned by the naked eye. When the James Webb Space Telescope launches in 2018, gravitational lensing may well empower us to see all the way back to the very first stars and galaxies.



If you're interested in teaching kids about how these large telescopes “see,” be sure to see our article on this topic at the NASA Space Place: <http://spaceplace.nasa.gov/telescopemirrors/en/>



Galaxy cluster Abell S1063 (left) as imaged with the Hubble Space Telescope as part of the Frontier Fields program. The distorted images of the background galaxies are a consequence of the warped space due to Einstein's general relativity; the parallel field (right) shows no such effects. Image credit: NASA, ESA and Jennifer Lotz (STScI)

Oh, Snap!



Left : A flag commemorating the 150th anniversary of Cedar Crest College waves in front of a vibrant sunset on the evening of September 20, 2016.

Lower left: Sundog on the line at Vultee St. Allentown, September 14 2016.

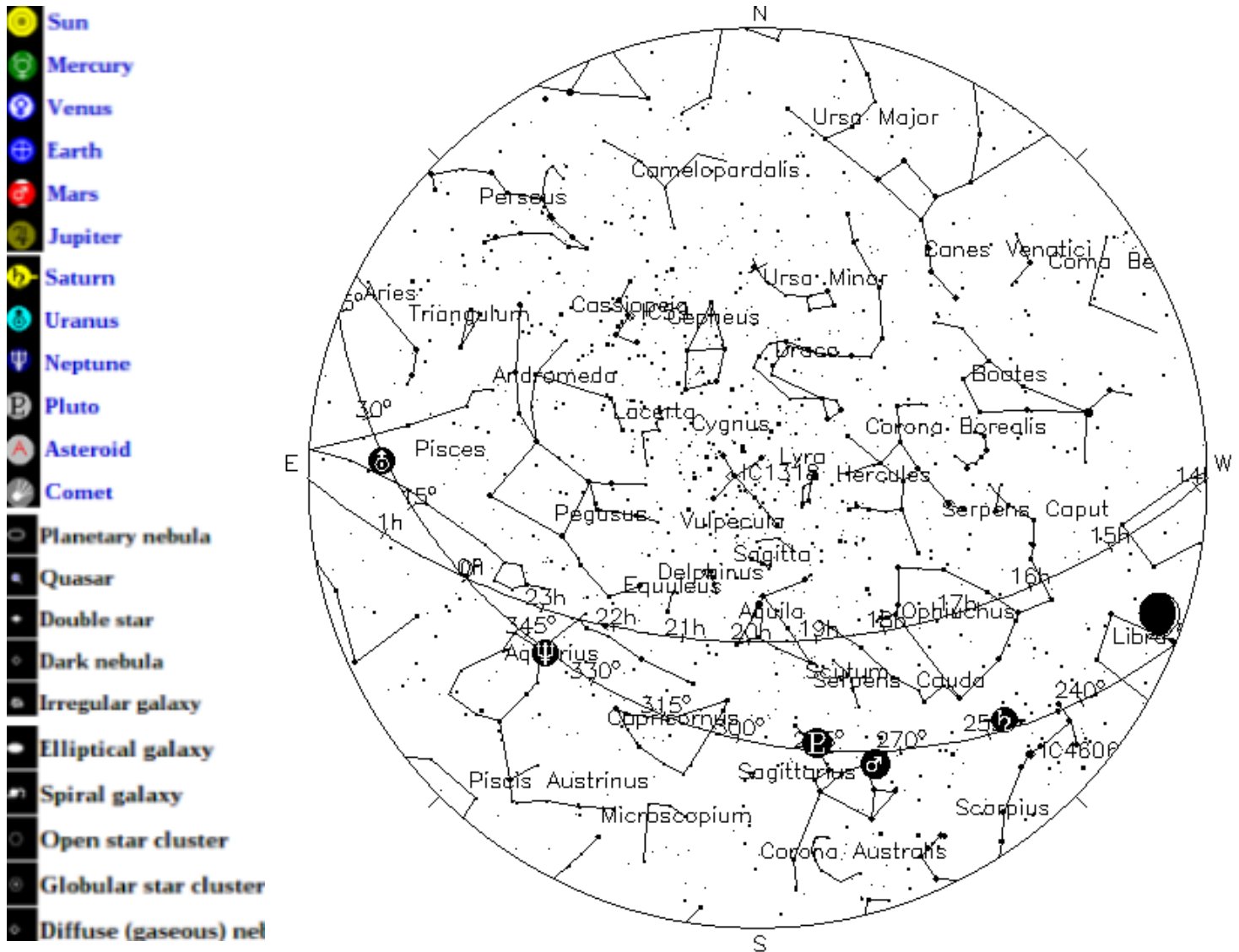
Lower right: Another view of the sunset September 20.

Photos courtesy of Dave Raker.



Oh, Snap! is a monthly feature of LVAAS members' astronomy and celestial works which have been generously shared for the enjoyment of our readers. Kindly submit your original photos, videos or other material to editorlvaas@gmail.com

Sky above 40°33'58"N 75°26'5"W at 2016 Oct 4 0:00 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 [mgardi@watdscu.waterloo.edu].

Lempel-Zim compression based on "compress".

Modified by Marcel Wijkstra [wijkstra@fwi.uva.nl]

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Check out additional features of **Your Sky** at : <http://www.fourmilab.ch/yoursky/>

OCTOBER 2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						01 MegaMeet
02 MegaMeet	03	04 Muhlenberg College Spectroscopy Lab	05	06 Muhlenberg College Spectroscopy Lab	07 Star gazers and Lunatics Night	08 Star Party
09 First Quarter Moon General Meeting - South Mountain	10	11	12	13 Astro Imaging	14	15
16 Full Moon	17	18	19	20	21	22 Last Quarter Moon
23	24	25	26	27	28	29
30 New Moon LVAAS Board of Governors Meeting	31					

NOVEMBER 2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		01	02	03	04 Astronomy Merit Badge - Pulpit Rock	05 Astronomy Merit Badge - Pulpit Rock Star Party
06 Astronomy Merit Badge - Pulpit Rock	07 First Quarter Moon	08	09	10	11	12
13 General Meeting - 2:00 PM South Mountain	14 Full Moon	15	16	17 Astro Imaging	18	19
20	21 Last Quarter Moon	22	23	24	25	26
27 LVAAS Board of Governors Meeting	28	29 New Moon	30			

2016 LVAAS Event Calendar

2016 LVAAS Event Calendar												
	Sundays			Thursday	Saturdays		Mondays	Multi-Day Weekends	Moon Phase			
	General Meeting	Board meeting		Astro-Imaging		Star Parties	Scouts at S. Mountain	Scouts at Pulpit R.	New	First	Full	Last
January	2:00 PM 10-m	31		21		no mtg		no camping	9	16	23	2 31
February	2:00 PM 14-m	28		25		13		no camping	8	15	22	
March	13	20		24		19		no camping	8	15	23	1 31
April	10	24		21		16		22-24	7	14	22	29
May	15	22		19		14		20-22	6	13	21	29
June	12	26		no mtg		11		24-26	4	12	20	27
July	05:00 PM 9-s	31		no mtg		16		15-17	4	11	19	26
August	13-sp	28		no mtg		6		19-21	2	10	18	24
September	11	25		15		10		16-18	1 30	9	16	23
October	9	30		13		8		14-16	30	9	16	22
November	2:00 PM 13	27		17		5		11-13	29	7	14	21
December	2:00 PM 10-sc	18		15		3		no camping	29	7	13	20

(-s) = Saturday meetings - Rain date on Sunday
 (-m) = Muhlenburg College
 (-sp) = Saturday meeting at Pulpit Rock
 (-sc) = Saturday Holiday Party at Grace Community Church
All meetings 7:00 PM unless noted otherwise

Contributed by Bill Dahlenburg

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 astro-images), with an online tool such as

<http://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 (LVAAS) Inc., 620-B East Rock Road, Allentown, PA, 18103 and as of June 2016, is available for public viewing. Frances A. Kopy, editorlvaas@gmail.com

Members please use above email address for submissions.

Society members who would like to submit an article or photo for publication should kindly do so by the Sunday before the monthly meeting of the BOG (please see calendar on website) for the article to appear in the upcoming month's issue. PDF format is preferred. Early submission are greatly appreciated. Articles may be edited for publication. Your comments and suggestions are invited.

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To update LVAAS information or to make member contact changes or corrections, please email LVAAS Director Rich Hogg at theotherplanb@gmail.com or Assistant Director Sandy Mesics at astrosandy@gmail.com.