The Observer

The Official Publication of the Lehigh Valley Amateur Astronomical Society

http://www.lvaas.org

610-797-3476

http://www.facebook.com/lvaas.astro

May 2017

Volume 57 Issue 05

ad astra**********

It seemed as if Dr. David Klassen was speaking in code, at our April meeting, when he described his technique for separating the clouds from the ground in images of Mars. In actuality, he was just avoiding the use of confusing jargon while providing a fascinating account of his research. What he described was something that I thought I recognized, the technique of Principal Component Analysis, and it was fun to confirm it with him during the Q&A.

(After the meeting, we talked about it at the Sunrise Diner. Earl Pursell, a microbiologist in his profession and our LVAAS delegate to UACNJ, has actually used PCA in his work, so he knows even more about it than I do.)

Our May meeting will feature our own Gary Becker and Peter Detterline, on the subject of the Total Eclipse of the Sun coming up in August. Since this could be considered the observing opportunity of a lifetime, I am glad we are dedicating a session to getting ready for it. We are planning another session to recap our experiences in September.

From the balcony coming into NEAF, you need a telescope to see all of the telescopes. Photo by Tom Duff

Approximately one out of every ten LVAAS members made the short journey to Suffern, NY for this year's North East Astronomy Forum. This was my first NEAF, and it reminded me a lot of the computer shows in the 1980's, the early years of the PC revolution. I think there were almost as many computer screens at the

astronomy show as there were at the computer shows, but there were a lot more tripods holding tubes with eyepieces pointed in all different directions.

There were also some great talks, with continuous conference tracks running simultaneously in 4 different rooms. Several of us attended one presentation in the main track which was about the Dragonfly telescope, an array of 48 (and growing) sensitive Atik astro-cameras mounted to expensive Canon telephoto lenses, at a cost of about $15,000 each. This innovative system is able to image in the regime of ultra-low surface brightness, better than any other instrument in existence, either on Earth or in space. It was interesting to learn that the limiting factor in reaching 30 mag/arcsec^2 and beyond is not aperture or even dark skies; it is scattering within the instrument, and these Canon lenses with their proprietary coatings offer low-scattering performance that is unsurpassed.

Another great talk was by Dr. Mario Motta, in the Pro/Am conference, describing his work in observing the breakup of asteroids orbiting a distant White Dwarf. Although his photometry data was instrumental to the science, I really enjoyed the account of his visual observing. At the eyepiece of his 32-inch, he could watch the brightness of the star vary in real time, while knowing that it was due to occultation by orbiting debris around the star! The idea gives me chills and I look forward to having that experience with our 40-inch when it is operational. Exoplanet research is a huge new frontier for amateur astronomers to help the professionals.

So Hey! to Ron, Bill, Chuck, Tom, Dave G, Rhonda and Tristen, Carol, Chris, Earl, Frank, Len, Steve, Gary, Peter, Preston, the other Bill, Lynn, Julia and Ethan, Kyle, and John — it was fun seeing everybody at NEAF this year, and I look forward to doing it again next year. (Apologies to anybody I missed.)

Wrapping Up

I want to thank Planetarium Director Fred Bomberger for his donation of Astronomy Magazine to the LVAAS Library. Thanks, Fred!

Don't forget that Megameet is early this year! At least, it will be if we have decent weather. The event is scheduled for May 25-27, but we just might try to choose another date if it doesn't look like it will be a good observing weekend. (August is not an option, though — Eclipse Eclipse Eclipse! In August there's going to be this National UltraHyperGigameet along a path from Oregon all the way to South Carolina. And in case you haven't noticed, it too is scheduled at the time of the New Moon.)

In the meantime, there is plenty of great observing, or imaging, or building to do. So, whatever your astronomical passion, clear skies, nice round stars, and tight screws until then. Ad Astra!

— Rich Hogg

Drive Key Upgrade Program

We have had some new Drive Keys made up that have been re-cut to be a better match for the key switches on our telescopes, and we would like to get everyone to switch to the new key in order to cut down on the wear and tear on our switches. So, if you have been issued a Drive Key, and in particular if you use it frequently, please plan to bring it to an LVAAS event in the near future to trade it in for an upgraded key.

General Meeting Minutes of April 9, 2017 held at South Mountain, Allentown

Director Rich Hogg brought the meeting into session at 7:07 p.m. The meeting venue has now shifted back to the South Mountain campus, our normal venue for meetings. He then presented the agenda for the meeting, namely the speaker, a short break, then to be followed by the usual information session to include the introduction of new members and a brief treasurer's report. He then turned the meeting over to Sandy Mesics who introduced Dr. David Klassen, our speaker for today.

Dr. Klassen is a Professor and Chair of Physics and Astronomy from Rowen University, which is located in New Jersey. He is a leading researcher specializing in remote sensing for climate modeling of Mars. His topic was titled, "Remote Sensing to Measure Water Content in Clouds on Mars." He uses both ground-based and spacecraft data in his research. One interesting point of his talk illustrated just how dry it is on Mars. A cloud in Earth's atmosphere would condense into about 2 cm of water. But a cloud on Mars would condense into only a few microns of water. Dr. Klassen's talk was both humorous and educational.

After the talk a short break followed and the meeting resumed about 8:35 p.m. with Rich calling on Treasurer Gwyn Fowler. Gwyn reported income for the month of $1,010.19 and expenses of $1,261.40. Rich next called on Membership Director Scott Fowler for a report. Scott called for second readings, but there were none. Scott then conducted first readings for Lou Spikol and John Katinis, who introduced themselves to the membership.

Sandy Mesics then informed the membership of the upcoming programs: May's topic will be members Gary Becker and Peter Detterline speaking on the upcoming August Solar Eclipse. Topics for June and July are yet to be determined. August's topic will be an update on the 40" project, and that meeting will be held at our Pulpit Rock site. September will then be a panel hosted by Gary and Peter on their experiences from the solar eclipse. November's speaker will be Agnes Kim speaking on white dwarfs seismology, and the December meeting will of course be the annual Holiday Party, the topic yet to be determined.

Rich then mentioned the continued planning underway for the 60th Anniversary Banquet. The Woods Dining Room at Lehigh University has been reserved for November 3, 2017. Additional details, such as meal, speaker, and pricing were being worked on and would be forthcoming.

He then called on various facilities Directors and Coordinators for updates. Bill Dahlenburg mentioned that the leaking cistern at South Mountain had been repaired through the efforts of Peter Brooks, Earl Pursell, Mike Clark, and himself. The rented porta potty will now be removed from the site. Tom Duff mentioned that MegaMeet was scheduled for May 26-28. Tom also mentioned that the next meeting of the Astroimaging Group would be held this coming Thursday, April 13th.

Lastly, Rich mentioned that the next public star party would be held May 6th and the next General Meeting would be held May 7th, 7:00 p.m. at the South Mountain headquarters.

The meeting adjourned at 9:00 p.m.

Minutes were prepared and submitted by Secretary, Ron Kunkel.

Public Star Party: Saturday, May 6

Grady Planetarium, LVAAS Headquarters

620B East Rock Rd., Allentown PA 18103

"How To Land On A Comet"

Featuring Dr. Bonnie J. Buratti

Bonnie Buratti, originally from Bethlehem, leads the Asteroids, Comets, and Satellites Group at NASA's Jet Propulsion Laboratory. She is the U.S. Project Scientist on the Rosetta comet mission.

7 p.m. -free admission- limited seating, first come, first served

8 p.m. planetarium show

6 p.m. planetarium show for kids

~~~~~~

General Meeting: Open to the Public

Sunday, May 7, 2017 at 7 p.m.

Grady Planetarium

"Getting Ready for the Great American Eclipse"

Featuring Peter K. Detterline and Gary A. Becker

The Great American Eclipse will highlight the parameters which go into understanding total solar eclipses and then focus on the August 21, 2017 coast to coast event. Peter K. Detterline (right, above) and Gary A. Becker (center, above), both veteran eclipse chasers, will describe their efforts last summer, over a total of five days, to follow the path of totality of the August 21 event from central Nebraska to central Idaho.
~~~~~~

Schlegel Observatory Report

by Rich Hogg

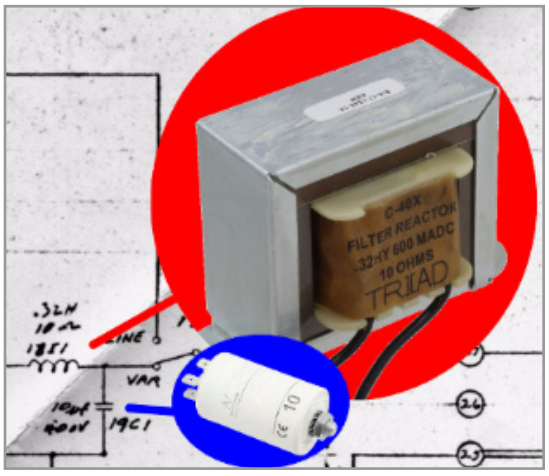
May, 2017

18" Update - as I am writing this, I am building the circuit to upgrade the RA motor driver on the 18" telescope at Pulpit Rock, and I will be planning to install it within the next week. So by the time you read these words, the scope should be back up to snuff, ready for Megameet and the rest of the observing season.

That's the good news. The bad news is that this is Plan C for this project, Plan A and Plan B having both been flung onto the trash heap. It's been a long time since I had to go to Plan C for anything, and it doesn't feel great.

I delved into the fate of Plan A and the details of Plan B last month. The outcome of Plan B was that Goldilocks could not be satisfied. No matter how carefully I cooked the "porridge" from the precision timing chip, I was unable to feed it to the EG8010 controller chip without causing it to barf and shut down within a few minutes. After a couple of weeks, on and off, of fighting with this problem, I realized that I would never feel comfortable that it would continue to work reliably in the field, even if I could get it working in the lab.

Plan C is about as simple as you can get: we'll just beef up the voltage that is supplied to the existing low-frequency inverter circuit, and add some old-school heavy-iron filtering to smooth out the waveform a bit. (I took another look at the original Tinsley Laboratories manual for the instrument, and discovered that there was such a filter in the original design. I don't know what became of it; I suspect it failed somewhere along the line and someone just removed it to get the drive working again. But now I have the necessary parts and I will put it back in.)



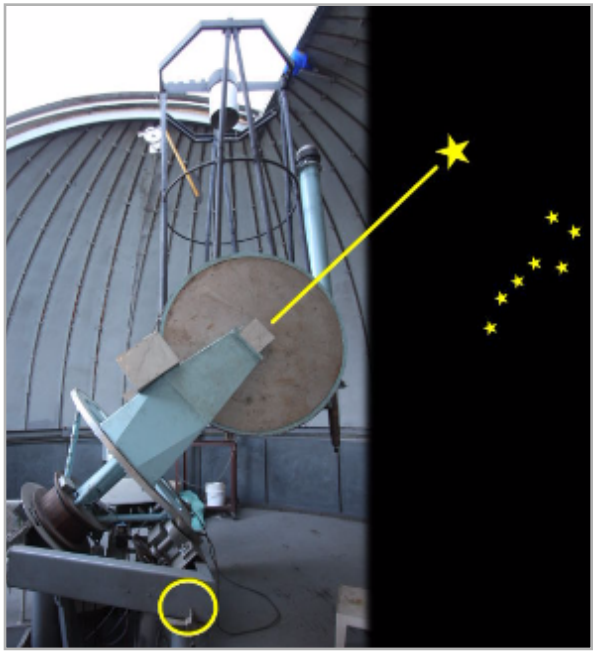
Old-school heavy-iron power-line filtering

I don't think there is much that can go wrong with Plan C (knock on low-expansion glass), and it will feel good to get this project behind me and move on to something else.

Tube Flexure **-** there has been an ongoing discussion about the structure of the 40" optical tube assembly, mostly driven by parties that are not actively involved in the project at present (and one not even a member of LVAAS.) The concern is that the mechanical design of the tube is not stiff enough to hold the secondary mirror in alignment with the primary and the eyepiece, as the telescope is pointed in various directions. My attitude has been that, yes, this is a problem we might have, but there are many problems we might have with this instrument, and I have faith that we'll be able to fix them. This is an ambitious project and it would be an act of astonishing hubris to think that we could anticipate all of the potential problems, and inefficient, really, to try. It's not as if we are going to put this instrument on top of an Ariane 5 and send it off to the second Lagrange point for however many decades of service with no possibility of adjustment or repair. Instead, we are going finish the build, and then probably scratch our heads and figure out why it isn't working, and fix something and try again. Lather, rinse, repeat until we have a usable instrument. It will be a better use of our time and resources to fix the problems that we actually encounter, rather than to try to anticipate every problem we might.

But, OK, fair enough: the concerns about tube flexure are potentially valid, and easy enough to evaluate ahead of time; and it might be easier to fix it ahead of time rather than after the fact. So, as of now, the plan of record is to test the rigidity of the tube later on this summer, once we have the slew motors working again and are able to point the telescope.

I think the obvious way to do this is to put a laser collimator in the eyepiece tube, and mark a little X on a stand-in for the secondary mirror (since the real one is in Illinois, waiting to be figured) and see how much the laser moves from the X as we point the tube in various directions. I actually have a more sophisticated idea in mind, but before I share it I would like to hear ideas from other LVAAS members. So, if you have any cool ideas on how to test the tube for flexure, please send me an email.



Mounting hole inside circle (hidden behind frame) needs to be enlarged in order to achieve polar alignment.

Polar Alignment **-** it might seem odd to worry about polar alignment of the mount this early in the game, but we do need to do a preliminary alignment this summer also. The reason is that we are pretty sure that the mount cannot be aligned as it currently exists, and that we'll need to enlarge one of the mounting holes so that it can be rotated to the correct azimuth. This will require use of a die grinder, which will generate a lot of highly abrasive dust, so it is definitely something we want to get out of the way before the optical set gets anywhere near it.

Documentation repository **-** speaking of the Plan of Record, all of LVAAS' observatories and other projects require a lot of documentation, and we have been working on getting

them all in one place. Right now, that place is Google Drive, a free service of the famous search-engine company that allows storing documents, sharing them with different team members with various permissions, and even working on some documents right in the web browser. It is a good match for our requirements, but we might want to move to something else in the future.

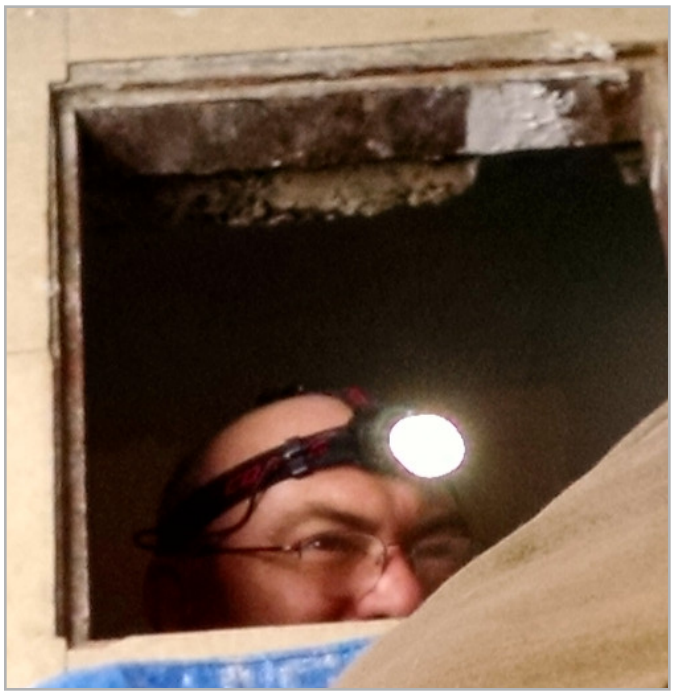
To serve as a permanent anchor point, I have created a URL on our server that points to the documentation repository: http://lvaas.org/docs. If we decide to move the files at any time in the future, we can just update the link. Not much is there yet, but as time goes on we will use it as a central location to gather and organize all of the technical information about our facilities and projects. And, it is being backed up to another location, in case Google ever decides to sweep it out from under us.

Mirror Update - Mike Lockwood, our optician for the 4" project, reported that he and John Pratte have constructed a new crate for the primary mirror. Its immediate purpose was to enable them to safely flip the mirror over so they can work on completing the coring, and they have started removing the plaster which was used to fill the kerf from the earlier partial coring. When the mirror is ready for coating, the new crate can be used to transport it to the coating vendor, and then back to its home when it is ready.

Current Status and Activities: The eighteen-incher should be repaired by the time you read this. Next, I am planning to get back to installing new power supplies and wiring for the drive system, and restoring the ability to point the instrument in various directions. Completion of the mirror coring is underway, and we have created a repository for project and system documentation at http://lvaas.org/docs.

Meanwhile, at South Mountain....

LVAAS members Bill Dahlenburg...



(you've heard of "Overboard"- here Bill is "Underboards")

...Pete Brooks...

...Earl Pursell and Mike Clark (both not pictured) stepped er...'up' to repair the leaking cistern at LVAAS headquarters. A successful mission, by all accounts! Thank You, Guys.

Photos courtesy of Rich Hogg, upper right, and Frank Lyter, all others.

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.

The Number of Observable Galaxies in the Universe

Determining how many galaxies exist in the observable universe is a fundamental quest of astronomical research. Based on Hubble telescope and other telescope images gathered over the last 20 years, the number of galaxies in the universe is estimated to be around 100 – 200 billion galaxies. But only about 10% of these galaxies have been studied using current technologies, as bigger and better telescopes are required to study the remaining 90% of them. Now a team of international researchers, lead by Christopher Conselice from the University of Nottingham, UK has completed a study that claims the universe contains at least 2 trillion galaxies, fully ten times more than previously thought.

The University of Nottingham's lead study is the culmination of 15 years' work. Researchers converted images of deep space from Hubble and other telescopes into 3-D maps that allowed them to calculate the density of galaxies in a given volume of space for successive epochs of time. From the densities they determined how many galaxies were missed as a function of distance. Their study found that significantly more galaxies existed at a given epoch in time than what were actually detected in the images. In fact, there appears to be ten times more galaxies in the early epoch--at a few billion years of age of the universe--as there exists in the same region of space in the current epoch.

An implication of this study's finding is that a significant amount of evolution must have occurred in the course of 13.7 billion years of existence of the universe to greatly reduce the number of galaxies through extensive mergers of galactic systems.

References:

C. Conselice et al. (2016, October 11). "The Evolution of Galaxy number density at Z<8 and its implications" Retrieved from https://arxiv.org/pdf/1607.03909v2.pdf.

The end of my ramblings until next month-
Ron Kunkel

StarWatch

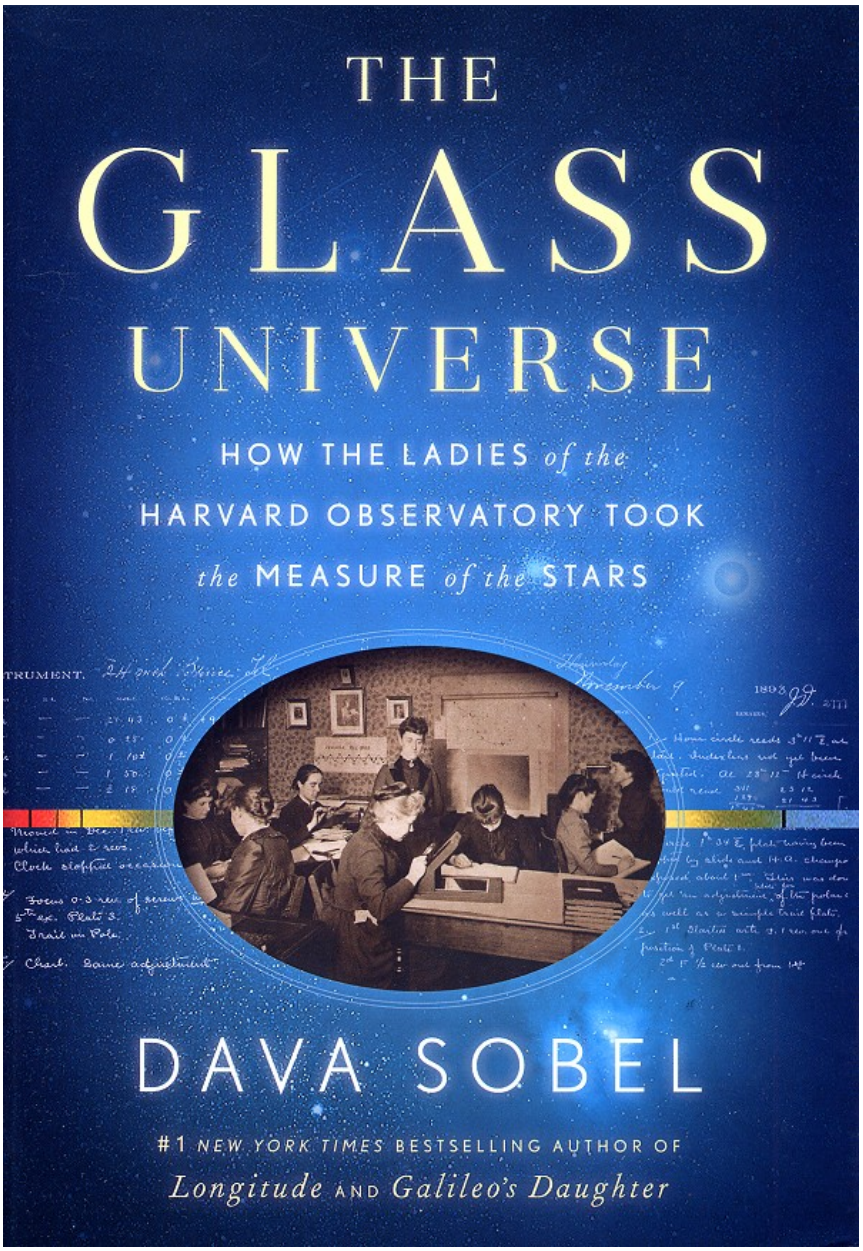
by Gary A. Becker

The Glass Universe

I recommend reading Dava Sobel's ***The Glass Universe: How the Ladies of the Harvard Observatory Took the Measure of the Stars***, Viking, 2016, as a sobering and scholarly work about how the women calculators of Harvard Observatory influenced and guided early 20th century research in astronomy. They were called "Pickering's Harem," and for a long time, I felt as if they were more of an ornament to the routine of the observatory, when in fact, these women were its soul.

Edward Pickering, director of the cash-strapped facility between 1877 and 1919, at a time when it was divorced from Harvard's money, encouraged the hiring of talented women calculators for many reasons. They were paid less than their male contemporaries, but they were also meticulous in their work habits, even-tempered, and were willing to embrace with enthusiasm the mundane tasks of reducing the information gleaned on the hundreds of thousands of photographic glass plates taken in Cambridge and Arequipa, Peru. This was accelerated in no small part by two great benefactors of the fledgling Harvard facility, wealthy New York heiresses, Anna Palmer Draper and Catherine Wolfe Bruce, who kept the wheels greased by contributing yearly stipends to Pickering, while encouraging him to continue hiring women to augment his staff.

Sobel, however, does not cast Pickering in any disparaging light, considering him well ahead of his time with regards to women's rights, nurturing their efforts, and championing their successes to the worldwide astronomical community. And contribute they did! Our magnitude system for quantifying the brightnesses of stars resulted from the work of Harvard's female calculators. Annie Jump Cannon and Antonia Maury created the majority of the system in use today to classify stars. Cannon ordered the spectra of stars via a temperature sequence, OBAFGKM, hot to cool, and Maury understood that similar spectral classifications could yield dissimilar luminosities, i.e., red giants (bright) and red dwarfs (faint), as examples. Finally, Henrietta Leavitt discovered the period-luminosity relationship of classical Cepheid variables, providing her male contemporaries with the ammunition to prove that the Milky Way was just one of many galaxies in our cosmos.



Jacket design by Evan Gaffney. *Jacket photographs: (ladies) Pickering's Harem, c. 1890; (background) from archives of the Harvard College Observatory.*

From the LVAAS Archives:

May, 1967. The Road to Pulpit Rock and the Building that Never Was

by Sandy Mesics

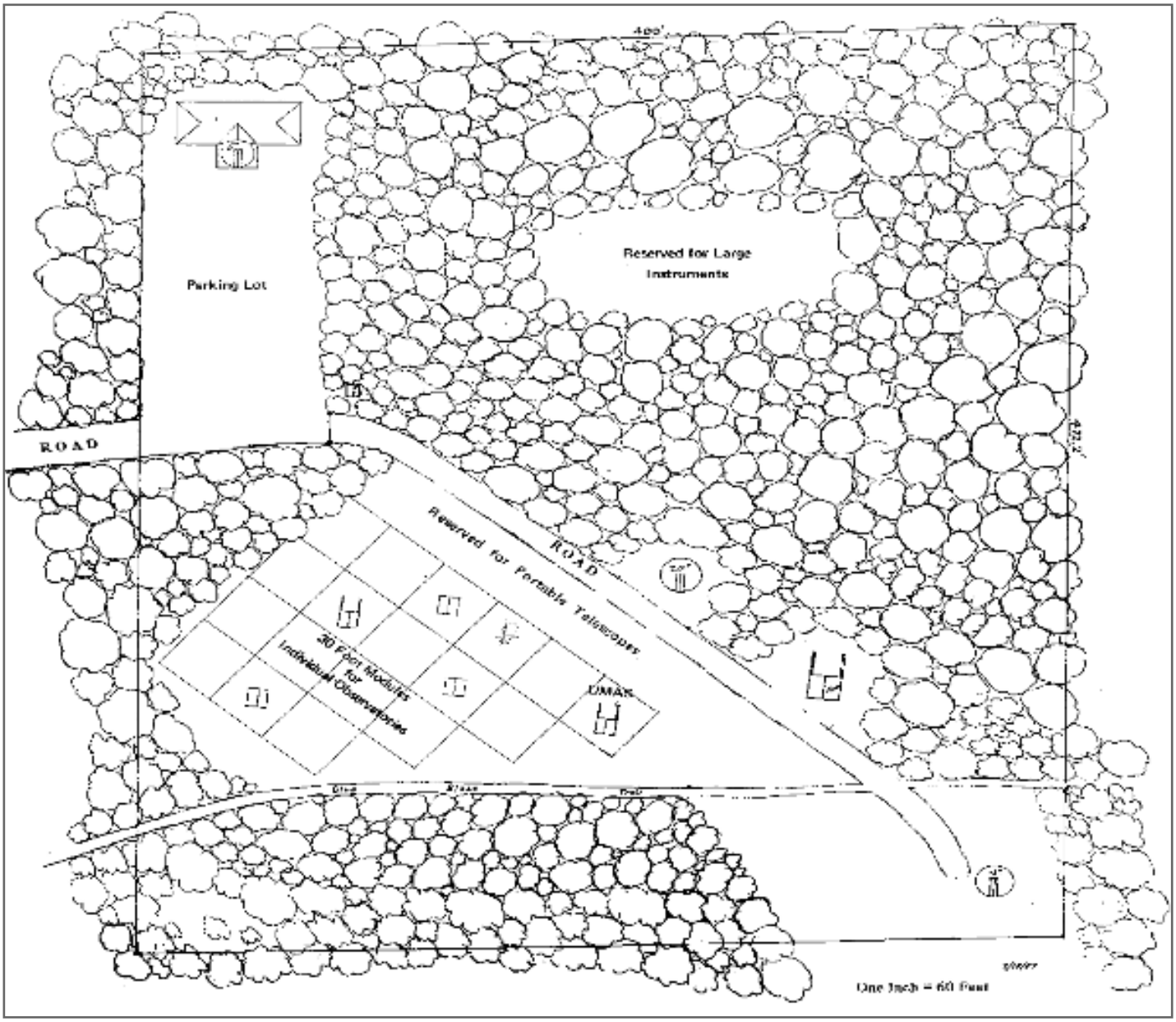
Construction of the road through the Hamburg watershed to Pulpit Rock started on Saturday, April 30, 1967. An unusually high number of rainy days for that time of year (including snow on April 29) managed to delay construction. Other factors also added to the hold-up. For example, the cylinder shaft of the 1957 'dozer cracked (at a replacement cost of $1,300 to the contractor.) Despite these setbacks, the most difficult section of the road-bed had been opened and was awaiting its shale topping and drainage ditches. The contractor was confident that the road would be completed by June 1. Ralph Schlegel, and Marion and Ernie Robson flew over the site in Henry Kawecki's helicopter to help in the sightings, and also helped to finalize road markings and the western boundaries of the site.

In the June, 1967 Observer, author George Maurer reported, "On Sunday, May 21, more than 17 members made the climb to our site at Pulpit Rock to scout and examine the area and plan for its use. It is hoped that these plans can be reviewed at the next general meeting. The rough grading of our road has progressed to the end of the Hamburg water property and, while the first stretch of the road near the bottom appears to leave much to be desired, our contractor has assured us that the finished road will be negotiable with any automobile – barring snow drifts."

By June 1967, the Board of Governors was discussing how to put a gate across the road.

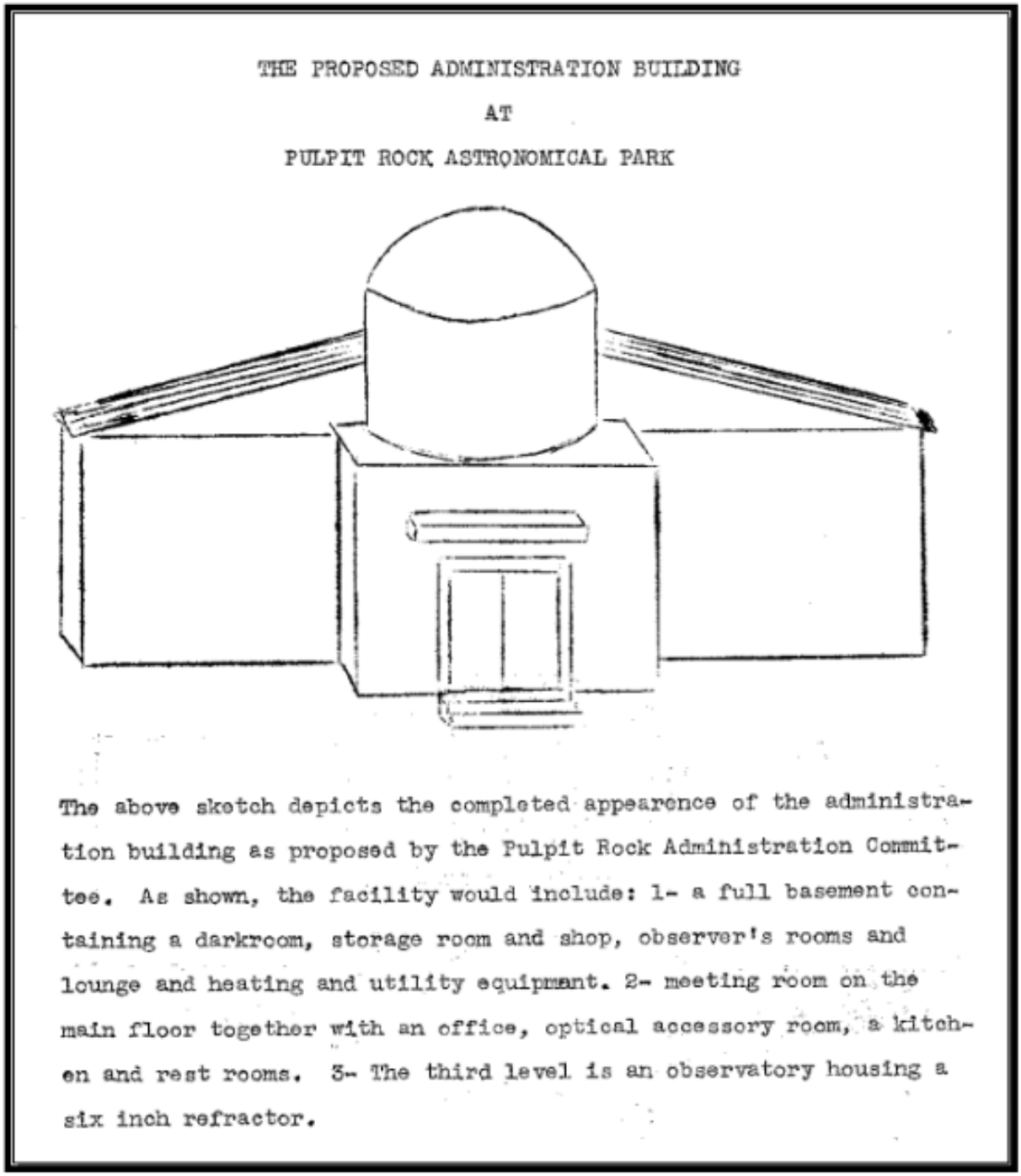
Work begins on the road to Pulpit Rock

At the same time the road work was progressing, a foundation pit for the administration building was being excavated. There were several plans for this building, each slightly different, but the essential elements were the same. The building would house sleeping quarters, restrooms, a kitchen, meeting room, shop, and a darkroom. The building would also house an observatory with a 6-inch refractor.



1. Pulpit Rock site ca. 1967. Kawecki Observatory at lower right. Schlegel-Mchugh Observatory center, and proposed Administration Building a top left.

Also, at this time, the Schlegel-McHugh Observatory was well along in the planning stage. The optics were nearing completion, and the plans for the building were approved by the Board. This project had priority over the administration building, but in a fundraising brochure published by LVAAS at that time, it was thought that both facilities could be completed for about $50,000.


THE PROPOSED ADMINISTRATION BUILDING

AT

PULPIT ROCK ASTRONOMICAL PARK

The above sketch depicts the completed appearence of the administration building as proposed by the Pulpit Rock Administration Committee. As shown, the facility would include: 1- a full basement containing a darkroom, storage room and shop, observer's rooms and lounge and heating and utility equipment. 2- meeting room on the main floor together with an office, optical accessory room, a kitchen and rest rooms. 3- The third level is an observatory housing a six inch refractor.

2. Rough sketch of the proposed Administration Building at Pulpit Rock from 1967.

Over the years, other projects came along for Pulpit Rock, such as a meteor observing platform, a roll-off observatory that became the Spacek Observatory, the Andrews Observatory dob shed, and the Schlegel Observatory. In fact, the Schlegel observatory incorporated some of the facilities that were originally planned for the administration building, such as a meeting room, a shop, and ultimately a restroom. The administration building fell “off the radar,” literally, as there is no reference in the LVAAS archives about resurrecting that project to this day.

In 2013, the pit that was excavated in 1967 was still faintly visible behind the electrical shed adjacent to the trailer observatory. This pit has since been filled in, so now no trace of the proposed Pulpit Rock administration building remains.

3. The pit for the basement of the Administration Building taken in 2013 by Sandy Mesics.

Perhaps some time in the future this will be revisited. When LVAAS signed an agreement with the National Park Service, LVAAS retained the right to replace any existing building as well as the right to construct one new building. An administration building would be an asset to the Society: a comfortable place to get warm, or even to cool off in the summer, a place to nap, have a quick meal or wash up, or a comfortable space to wait out the clouds during an observing run. This type of facility has worked well for the United Astronomy Clubs of New Jersey at their Jenny Jump site. Maybe it would work for LVAAS as well. At least they thought so in 1967!

*This article is provided by **NASA Space Place.** With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!*

NOAA's Joint Polar Satellite System (JPSS) to monitor Earth as never before

By Ethan Siegel

Later this year, an ambitious new Earth-monitoring satellite will launch into a polar orbit around our planet. The new satellite—called JPSS-1—is a collaboration between NASA and NOAA. It is part of a mission called the Joint Polar Satellite System, or JPSS.

At a destination altitude of only 824 km, it will complete an orbit around Earth in just 101 minutes, collecting extraordinarily high-resolution imagery of our surface, oceans and atmosphere. It will obtain full-planet coverage every 12 hours using five separate, independent instruments. This approach enables near-continuous monitoring of a huge variety of weather and climate phenomena.

JPSS-1 will improve the prediction of severe weather events and will help advance early warning systems. It will also be indispensable for long-term climate monitoring, as it will track global rainfall, drought conditions and ocean properties.

The five independent instruments on board are the main assets of this mission:

- The Cross-track Infrared Sounder (CrIS) will detail the atmosphere’s 3D structure, measuring water vapor and temperature in over 1,000 infrared spectral channels. It will enable accurate weather forecasting up to seven days in advance of any major weather events.
- The Advanced Technology Microwave Sounder (ATMS) adds 22 microwave channels to CrIS’s measurements, improving temperature and moisture readings.
- Taking visible and infrared images of Earth’s surface at 750 meter resolution, the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument will enable monitoring of weather patterns, fires, sea temperatures, light pollution, and ocean color observations at unprecedented resolutions.
- The Ozone Mapping and Profiler Suite (OMPS) will measure how ozone concentration varies with altitude and in time over every location on Earth's surface. This can help us understand how UV light penetrates the various layers of Earth’s atmosphere.
- The Clouds and the Earth’s Radiant System (CERES) instrument will quantify the effect of clouds on Earth’s energy balance, measuring solar reflectance and Earth’s radiance. It will greatly reduce one of the largest sources of uncertainty in climate modeling.

The information from this satellite will be important for emergency responders, airline pilots, cargo ships, farmers and coastal residents, and many others. Long and short term weather monitoring will be greatly enhanced by JPSS-1 and the rest of the upcoming satellites in the JPSS system.

Want to teach kids about polar and geostationary orbits? Go to the NASA Space Place: https://spaceplace.nasa.gov/geo-orbits/

Ball and Raytheon technicians integrate the VIIRS Optical and Electrical Modules onto the JPSS-1 spacecraft in 2015. The spacecraft will be ready for launch later this year. Image Credit: Ball Aerospace & Technologies Corp.

Cloud 'rainbows' celebrate the ending of the day

iPhone panorama, sunset, April 5, 2017 from Neffs, PA. D. M. Moll photo.

Carl Sagan - Pale Blue Dot

“From this distant vantage point, the Earth might not seem of particular interest. But for us, it's different. Consider again that dot. That's here, that's home, that's us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. The aggregate of our joy and suffering, thousands of confident religions, ideologies, and economic doctrines, every hunter and forager, every hero and coward, every creator and destroyer of civilization, every king and peasant, every young couple in love, every mother and father, hopeful child, inventor and explorer, every teacher of morals, every corrupt politician, every "superstar," every "supreme leader," every saint and sinner in the history of our species lived there – on a mote of dust suspended in a sunbeam.

The Earth is a very small stage in a vast cosmic arena. Think of the rivers of blood spilled by all those generals and emperors so that, in glory and triumph, they could become the momentary masters of a fraction of a dot. Think of the endless cruelties visited by the inhabitants of one corner of this pixel on the scarcely distinguishable inhabitants of some other corner, how frequent their misunderstandings, how eager they are to kill one another, how fervent their hatreds.

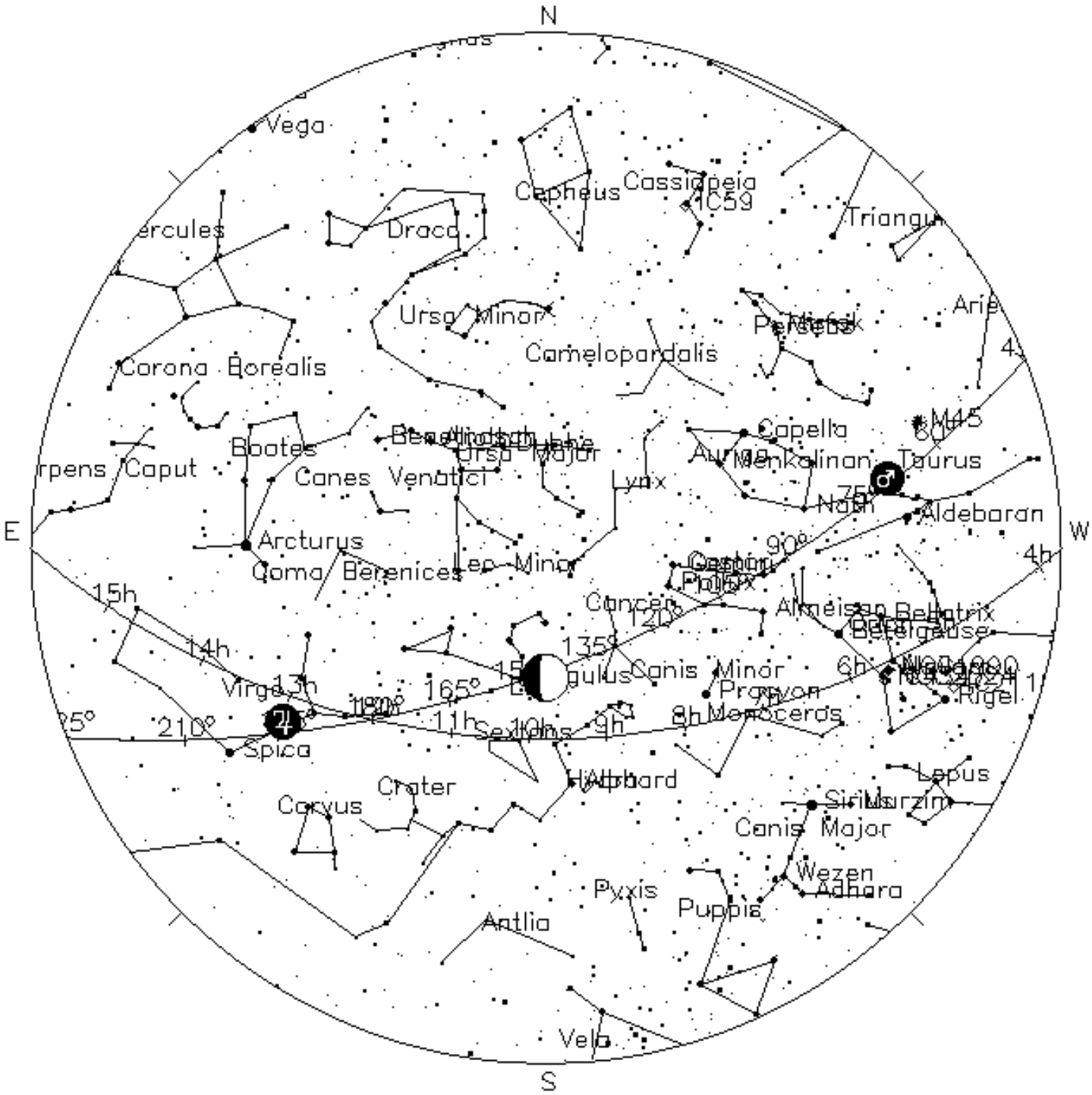
https://www.youtube.com/watch?v=p86BPM1GV8M&app=desktop

Our posturings, our imagined self-importance, the delusion that we have some privileged position in the Universe, are challenged by this point of pale light. Our planet is a lonely speck in the great enveloping cosmic dark. In our obscurity, in all this vastness, there is no hint that help will come from elsewhere to save us from ourselves.

The Earth is the only world known so far to harbor life. There is nowhere else, at least in the near future, to which our species could migrate. Visit, yes. Settle, not yet. Like it or not, for the moment the Earth is where we make our stand.
It has been said that astronomy is a humbling and character-building experience. There is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly with one another, and to preserve and cherish the pale blue dot, the only home we've ever known.”

Carl Sagan, Pale Blue Dot: A Vision of the Human Future in Space

Sky above 40°33'58"N 75°26'5"W at Thu 2017 May 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]

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

Please visit lvaas.org for up-to-the-minute calendar information

MAY 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01	02 First Quarter Moon	03 LVAAS Scout Group - East Hills Moravian Church	04	05	06 Star Party
07 General Meeting - South Mountain 7:00 PM (early due to Mothers Day)	08	09	10 Full Moon LVAAS Scout Group - East Hills Moravian Church	11 Astro Imaging 7:00 PM	12	13
14	15	16	17	18 Last Quarter Moon LVAAS Scout Group - Homeschool Group	19	20
21 Deadline for submissions to the Observer LVAAS Board of Governors Meeting (early due to Memorial Day)	22	23	24	25 New Moon	26 MegaMeet	27 MegaMeet
28 MegaMeet	29	30	31 LVAAS Scout Group - Cub Scout Pack 50			

JUNE 2017

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

2017 LVAAS Event Calendar

*** Lunatics and Stargazers has been discontinued until further notice**

2017 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 8	Muhlenberg	29	12	no mtg	no mtg		no camping	27	5	12	19
February	2:00 PM 12	Muhlenberg	26	9	no mtg	no mtg		no camping	26	3	10	18
March	2:00 PM 12	Muhlenberg	26	9	3 & 31	4		no camping	27	5	12	20
April	9	S.M.	30	13	no mtg	1		7 – 9	26	3	11	19
May	7	S.M.	21	11	5	6		19 – 21	25	2	10	18
June	11	S.M.	25	no mtg	2	3		9 – 11	23	1 30	9	17
July	05:00 PM 8	S.M.	30	no mtg	28	29		14 – 16	23	30	9	16
August	12	Pulpit	27	no mtg	25	26		4 – 6	21	29	7	14
September	10	S.M.	24	7	29	30		8 – 10	20	27	6	13
October	8	S.M.	29	5	27	28		6 – 8	19	27	5	12
November	2:00 PM 12	S.M.	26	2	no mtg	25		3 – 5	18	26	4	10
December	2:00 PM 9	Grace Community	17	7	no mtg	no mtg		no camping	18	26	3	10

MegaMeet May 26th to 28th

July, Aug & Dec are Saturday meetings with rain date on Sunday
Jan., Feb., and March meetings are at Muhlenberg College
August meeting is at Pulpit Rock
December meeting / Holiday Party is at at Grace Community Church
All meetings 7 P.M. unless otherwise noted

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 astroimages), 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 articles or images 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 submissions are greatly appreciated. Articles may be edited for publication. Your comments and suggestions are welcome.

Every effort is made to properly credit the sources of the material used in this publication. If additional credit is required, please notify editorlvaas@gmail.com with the required information for a timely correction.

To become a member of LVAAS, please follow the directions on the application form, which can be downloaded at: http://lvaas.org/filemgmt_data/files/LVAAS2017MembershipRenewalForm.pdf.

For existing members to update LVAAS information, or to make member contact changes or corrections, please email the membership director membership@lvaas.org.