

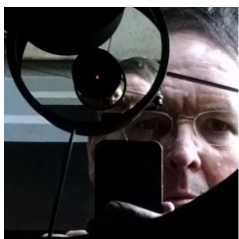
The Observer

The Official Publication of the Lehigh Valley Amateur Astronomical Society
<https://lvaas.org/>

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

November 2020
Volume 60 • Issue 11





ad astra *****

There's this wet rock, this speck of dust, this relatively uninteresting, mostly harmless pale blue dot floating near some commonplace star in a completely boring corner of some random galaxy, this hum-drum planet, and it's infected by a bunch of carbon-based, self-reproducing, energy-harvesting, organized chemical reactions of varying degrees of sophistication. One particular form of these gooey atrocities has become so fancy that it actually thinks about stuff and makes up concepts, one of which it calls "Pride," and it is inordinately proud of itself for having done so. It gave the planet a name, "Earth."

These parasites have managed to organize their survival processes so efficiently that they can waste most of their time doing completely pointless stuff that has nothing to do with surviving, and they have even organized the time-wasting into categories they call "hobbies." Thousands of them! Focused on all kinds of weird obsessions, mostly on goofy things that other members of their species have done that also have nothing to do with surviving, but also a lot of paying attention to other stuff going on around the planet. Out of all of these thousands of hobbies, almost all of them focus exclusively on things happening on the speck of dust! Only one of the hobbies gives any heed to what's going on in the rest of the universe. Any sensible citizen of the Cosmos would regard this as ordinary situational awareness, but the majority of these pests consider it to be a tightly focused obsession, mostly pursued by odd-balls. They call it "Astronomy" and, by and large, they generally do their best to avoid it.

What is Astronomy

The interesting thing about astronomy is that, to be good at it, you have to do almost every other hobby that has ever been invented. It's true, just think about it! Let's make an incomplete list of some of the other hobbies and skills that are required in order to be really into astronomy.

1. Travel and sightseeing, because of all the time you spend looking at stuff, sometimes moving to other places to get a better view.
2. Photography, to take pictures of the stuff you're looking at, and see it better.
3. Reading and learning, so you can understand the stuff you're looking at.
4. Making, so you can build or assemble the tools you need to look at the stuff and take the photos.
5. Shopping, so you can get the tools and parts that you don't want to make yourself.
6. Computerizing, so you can create and use the software you need to control the tools and develop the photos, and also figure out where the stuff is that you want to look at.
7. Orienteering, so you can find the locations on the planet to get the best view, and find the stuff in the sky that you want to look at.
8. Collecting, so you can gather photos and make lists of all the stuff you've seen.
9. Meteorology, so that you can figure out if stuff happening just barely above the surface of the planet will prevent you from seeing the stuff you want to see that's really far above the surface of the planet.
10. Management and logistics, so that you can plan your expeditions to give yourself the best chance of seeing the stuff you want to see.
11. Anger management, so that when you mess up one of the other skills and you don't get to see the stuff you want to see, you can refrain from harming yourself or other people who are into astronomy and are also trying to see the same stuff.

Apparently, these lifeforms evolved from an earlier form that only lived in the oceans of the planet. For most of their existence, the world above the surface of the waves was a complete mystery to them! Then they finally developed the ability to crawl up onto the land, and inhabited a whole new section of their world. The dry part was smaller than the wet part, but being there eventually allowed them to see the vastly larger part of their universe above their heads; and now they are just beginning to extend their awareness and their presence into it.

Is it possible that, once they get established out there, they will realize that there is another level to existence, another plane that is higher still, that they currently have no inkling of? Probably not. But then, in all their millions of years of existence, not one jellyfish ever even suspected that things like galaxies existed, so there might be plenty of things that these so-called humans have no idea about. You just never know.

Outreach

The creatures who are clued in about the world beyond Planet Earth never seem to get tired of telling the rest of the creatures about it. For amoebas, jellyfish, octopuses, dolphins, honeybees, woodpeckers, antelopes, and most of the humans, this is a complete waste of time. But some small fraction of the dominant species are amenable to having their eyes opened to the world beyond their world. They started off a few thousand years ago just making up silly stories about the stuff they see up there, and although the made-up stories have gotten a lot more varied and interesting and weird over the centuries, lately they have been making a small amount of genuine progress in writing down some true facts about the cosmos. In a few hundred more years they might even begin to develop a real clue about it – as long as they keep looking up.

Ad Astra!

— *Rich Hogg*

P.S. We still have a couple of activities in progress on the 40" project, but nothing ready to write about yet. So, for this month there will be no Schlegel Observatory Report.

Minutes from the LVAAS General Meeting October 11, 2020

The October 2020 LVAAS General Meeting was conducted electronically using an on-line service in an effort to adhere to the social distancing guidelines outlined by the State of Pennsylvania with regard to the COVID 19 pandemic and current LVAAS COVID 19 pandemic policy.

The meeting was originally intended to be held both outdoors at the Pulpit Rock dark sky site as well as utilizing an on-line service, but the outdoor portion was canceled due to inclement weather caused by the remnants of hurricane Delta.

Approximately 40 people were in attendance. Director Rich Hogg opened the meeting at 7:10 p.m.

The meeting started with LVAAS business.

Treasurers Report: Scott Fowler

Fiscal 2020 ended at the end of September.

2020

General Fund	\$38,459.72 as of September 12th
Income	\$1,035.84
Expenses	\$(1,361.30)
General Fund Balance	\$38,134.26 as of October 11th

Notable income was \$600.00 for the sale of a scope.

Notable expenses were \$690.00 for insurance costs.

PRoD Fund	\$6,220.96 as of September 12th
Income	\$0.00
Expenses	\$(649.18)
PRoD Fund Balance	\$5,571.78 as of October 11th

Membership: Gwyn Fowler

2nd Readings:	1st Readings:
• Ryan Huber	• Arthur (Art) Williams Jr
• John Folk	• Ron Spross

Change to the dues structure for 2021: Gwyn Fowler

• A motion by Gwyn Fowler to change the dues structure for 2021, which would set the application fee to \$0 for FY 2021 was approved by vote of the members present at the September BOG Meeting and was presented to the Membership for a vote.

o As defined in Article 2, Section 5, Part 3, “The amount of annual membership dues and application fee may be changed at a Business Meeting by a two-thirds vote of Full Members present, providing that the proposed change has been approved by the Board and published in advance in the member’s only section of the Society’s website.”

• Motion was approved by a vote of the members present at the October General Meeting.

Elections for 2021 Board of Governors Officers: Bill Dahlenburg

• Candidates were announced at the September General Meeting. All Candidates are standing for elected office unopposed. The Candidates are as follows:

Director – Tom Duff

Assistant Director – Rich Hogg

Treasurer – Gwyn Fowler

Secretary – Dennis Decker/Kelly Decker

Since all Candidates are standing for elected office unopposed, the Secretary cast a vote for each Candidate. Elections for 2021 Board of Governors Officers are now final. Next term begins on December 1st, 2020. Congratulations to all the elected Officers.

After the LVAAS business concluded, the meeting moved to the evening's presentation "Astro-Image Processing 101" hosted by Warren Keller. Internationally known astrophotographer, author, and teacher, Warren Keller has the ability to reduce the difficult concepts of astro-imaging to the essentials and to effectively teach them to others. His video tutorial business, IP4AP.com (named a Sky & Telescope Hot Product) has given thousands of clients the world over a quick start on taking their own great images. In 2016 and 2018 he wrote the definitive book(s) on PixInsight, Inside PixInsight for Springer Nature (Patrick Moore Practical Astronomy series.) The first edition of the book was Springer's top seller in 2016, and was also named a Hot Product by Sky & Telescope in 2018.

Warren is proud to have been published as an author and photographer in Sky & Telescope, Astronomy, Sky at Night, Astronomy Now, CNA (China), Amateur Astronomy, IDA's Nightscape, and many places on the World Wide Web, most prestigiously, NASA's APOD. Three large format prints were chosen for 2012's *Starstruck: The Fine Art of Astrophotography* traveling exhibit, which opened at Maine's Bates College. He was Atik/QSI Camera's North American representative, and was a consultant to Celestron where he co-designed their AstroFX software. Warren has presented at the Advanced, the North East, the Midwest, RAW, and CAPS astro-imaging conferences, and was host and coordinator of SWAP in 2013 and 2014 in Tucson. In 2015, he was asked to the board of directors of the Advanced Imaging Conference, where he is VP of exhibitor sales. He continues to lead virtual workshops and provides one-on-one training in the art and science of astrophotography. Warren's web links are:

<http://www.BillionsandBillions.com> - Astro artwork

<http://www.IP4AP.com> - Streaming video on astro-imaging

<http://www.easypixinsight.com> - Free tutorials

<http://www.mastersofpixinsight.com> - Virtual workshops

The next General Meeting will be on November 8th, 2020 and will most likely be conducted electronically. If the weather permits, there is a possibility that the meeting will be held both outdoors at the Pulpit Rock dark sky site as well as utilizing an on-line service. A vote was taken to determine if winter meeting hours of 2:00 p.m. start should be utilized in the current meeting environment. The majority of the Membership preferred to retain the 7:00 p.m. start.

The meeting was adjourned at approximately 9:00 p.m.

Submitted by Dennis Decker, Secretary

UACNJ Reminder

LVAAS is a member organization of the **United Astronomy Clubs of New Jersey**, (uacnj.org) which means that LVAAS members may acquire observing privileges at the UACNJ observatories at **Jenny Jump State Park**, near Hope, NJ.

There is a fee of \$50.00 per year, plus a commitment to assist at UACNJ Public Nights. Normally, this commitment is for five Public Nights during the year, but it has been reduced to four this year, due to the shortened observing season. The 2020 Observer Form can be found on their website:

<http://www.uacnj.org/observers/2020ObserverForm.pdf>.

LVAAS liaison is Earl Pursell.

Also check out the **Meteor Shower Calendar** courtesy of Ken Taylor of UACNJ and thrillist:

<https://www.thrillist.com/news/nation/meteor-shower-calendar>



Cover image: NGC7380: The Wizard Nebula (HNSO) by Warren Landis

Imaging telescopes:

ASTRO-TECH AT60ED 60MM F/6 FPL-53 ED DOUBLET > ZWO ASI183MM PRO cooled > Chroma OIII 3nm > ZWO ASI183MM-Cool

ASTRO-TECH AT60ED 60MM F/6 FPL-53 ED DOUBLET > ZWO ASI183MM PRO cooled > Chroma SII 3nm > ZWO ASI183MM-Cool

Willam Optics Zenith 61 apo > ZWO ASI 1600MM-Cool > Chroma Ha 3nm / Chroma NII 3nm
ZWO ASI1600MM-Cool

Mounts: Celestron CGX

Dates: Sept. 6, 2020 , Sept. 7, 2020

Frames:

Chroma Ha 3nm: 18x600" (gain: 84.00) -10C bin 1x1

Chroma NII 3nm: 18x600" (gain: 84.00) -10C bin 1x1

Chroma OIII 3nm: 36x600" (gain: 111.00) -10C bin 1x1

Chroma SII 3nm: 36x600" (gain: 111.00) -10C bin 1x1

LVAAS General Meeting

Sunday, November 8 at 7 p.m.

- Meeting will be online only -

Program:

“The Life of a Star and How We Figured It Out”

It was only in the last 100 years that we even asked if stars could age and die. Now we have figured out their whole life, well mostly. The clues involve unusual stars and common stars, binary pairs and globular clusters, physics and mathematics. In one of the crucial breakthroughs Henry Norris Russell put New Jersey on the international astronomy map.



Dr. Mary Lou West

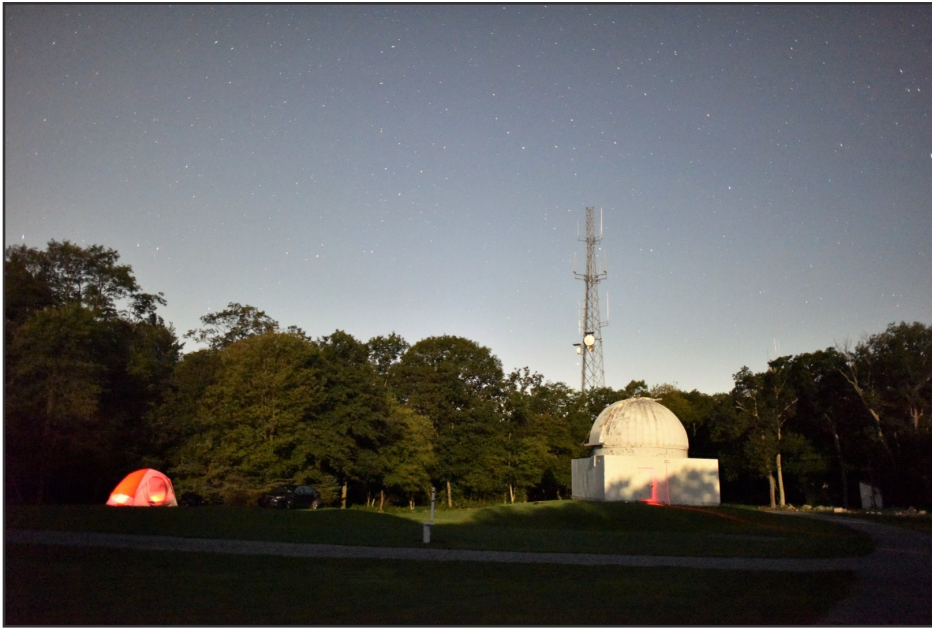
Professor Emerita of Mathematical Sciences, Montclair State University

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

Mary Lou and Roger have two children and three grandchildren, Aurora, Selena, and Ezra.



Pulpit Rock Observatories Director Frank Lyter reminds us with his camera what many of us have been missing during the pandemic. Here's hoping we can all safely return soon.



*Pulpit Rock Astronomical
Park in early September
2020, photographed by
Frank Lyter*





**The Pacman nebula, imaged by
LVAAS astroimager Sandra Repash
from Pulpit Rock Astronomical Park
Sept. 7, 2020.**



From the LVAAS Archives:

Water on Mars?

by Sandy Mesics

Rodger Gordon's monthly column for The Observer in November 1970 speculated on whether water existed on Mars, citing both earth-based spectroscopic data from McDonald Observatory as well as data from Mars probes Mariner 6 & 7. These probes had flown past the Red Planet in July 1969, and forever changed what we knew about Mars.



In 1964, Mariner 4 performed the first successful fly-by of Mars, and its photographs revealed a cratered, seemingly dead world. These grainy first close-up views of Mars largely changed the scientific community's view of the Red Planet. Mariner revealed the Red Planet had a very low atmospheric pressure, very low surface temperature, and no signs of canals or water.

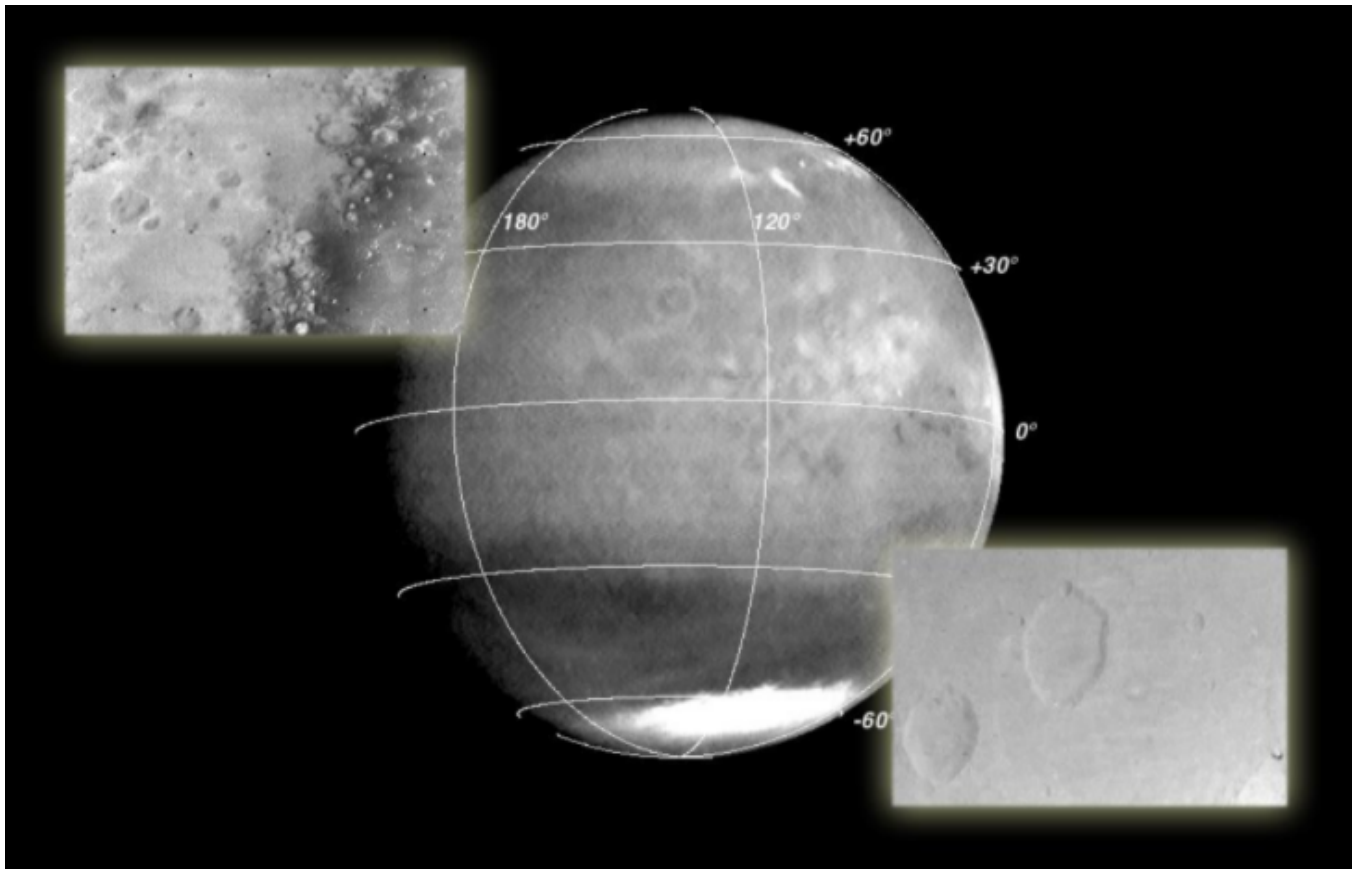
Astronomers had tried for many years to look for evidence of water on Mars from earth-based spectroscopic studies. From the 1920s through the 1940s, researchers at Mount Wilson Observatory tried to identify oxygen and water vapor in the Martian atmosphere, with generally negative results.

In his 1970 Observer article, Rodger Gordon was referring to spectroscopic studies of the Red Planet from 1966 through 1969 using the 82-inch reflector at McDonald Observatory. Results showed a significant amount of water vapor above the North polar cap in Martian summer, and less than half that amount over the South polar cap in winter. The researchers correlated the amount of water vapor with the size of the polar caps, thinking the two findings were related. During Martian mid-summer, water vapor was found to be evenly distributed over the entire disc. These results hinted that water vapor migrated from one pole to the other in a seasonal pattern. These findings were in variance with the findings of Mariner 6 & 7, which flew past Mars in 1969, the year before Gordon wrote this article.



1. McDonald Observatory in the 1970's.

When Mariners 6 & 7 flew past Mars in 1969, they were only able to image about 20 percent of the planet's surface. The imaged areas included some of the dark features long seen from Earth, which were presumed to have the legendary canals. But, of course we know that no canals were found. But before scientists could conclude that there was no water on Mars, Mariner 7 flew over the Martian south pole and its pictures revealed ice-filled craters and icy outlines of the south polar cap. While the infrared radiometer results on board the spacecraft showed that the atmosphere of Mars is composed mostly of carbon dioxide, there was also trace amounts of water on the surface of Mars.



2. Photos of Mars taken from Mariner 6 and 7. NASA photo.

Gordon concluded that the question of whether the predominant composition of the polar caps was carbon dioxide or water vapor was “still undecided.” He thought the results “support what generations of observers have believed – that water vapor does exist and may be the causative agent in the annual changes in color and intensity of the dark areas since these areas do not change their aspects until the polar cap seemingly melts.”

In a way, Gordon was correct: We now know that surface water ice is visible at the north polar ice cap. Water is also present beneath the permanent carbon dioxide ice cap at the Martian south pole and in the shallow subsurface at more temperate conditions. During the northern or southern summer, the carbon dioxide ice in the polar cap tilted toward the sun vaporizes (sublimates) into the atmosphere and the polar cap shrinks, revealing the surface beneath. In the winter the ice is redeposited, and the caps grow again. Some of this sublimated carbon dioxide is also redistributed in the atmosphere toward the equator, and then deposited on the surface when the atmosphere cools or the pressure decreases, leaving a covering of frost in the mid- to high latitudes, and at high elevations at low latitudes. This frost can lead to changes in color and brightness. We also know that global dust storms, which occur every few years and are triggered by seasonal changes in temperature and pressure of the atmosphere, can cause surface brightness changes on Mars.

But there is a trace amount of water vapor in Mars' atmosphere, and it varies seasonally. Mars landers have observed cirrus-type clouds, and it appears that water-ice clouds can form at the top of the planetary boundary layer at night and precipitate back to the surface as ice crystals in the northern polar region. We now know from various Mars probes that with an atmospheric pressure less than 1% of Earth's at sea level, liquid water would rapidly boil or sublimate. So liquid water can't be present on Mars' surface.

If Rodger Gordon had waited until Mariner 9 flew past Mars in 1971, it may have strengthened the case for water on the Red Planet, at least millions of years ago: huge river valleys were found in many areas. Images showed that floods of water broke through dams, carved deep valleys, eroded grooves into bedrock, and traveled thousands of miles. Areas of branched streams, in the southern hemisphere, suggested that rain once fell.



3. These color images were acquired by NASA's Phoenix Mars Lander's Surface Stereo Imager on the 21st and 25th days of the mission, or Sols 20 and 24 (June 15 and 19, 2008.) NASA photo.

The Mars landers that arrived at Mars in the 21st century have all found intriguing evidence: In 2008, Phoenix turned up small chunks of material that disappeared after four days, indicating possible water ice that sublimated in that time frame. Phoenix also detected water vapor in a sample it collected and analyzed, confirming the presence of frozen water on the red planet. The Spirit and Opportunity rovers found traces of water enclosed in rock, and Curiosity has examined a number of rocks that were exposed to liquid water billions of years ago.

So the picture is still unfolding in the years since Rodger Gordon wrote this article. Perhaps the probes launched to Mars in 2020 will continue to shed light on water on Mars.

by Gary A. Becker



Giant Meteor, What?



Great balls of fire! Giant Meteors don't destroy the Earth. Giant meteorites do; but with the end of the year coming into sight, I'll take anything that will give me a little smile, and that is exactly what Pete Detterline did when he surprised me with a similar sign that now graces my front yard.

Meteors and meteorites happen to be two of the most botched up words in astronomy. Sadly, they are even used incorrectly by professional astronomers. In addition, meteoroid, a word that is almost never mentioned in polite astronomical conversations, must also be added to the list. Even the popular rhyme, "A meteor is the flash of light left by a falling meteorite" has to be amended. "Oh no, Mr. Bill! Meteoroid should be substituted for meteorite. Get it right, folks!"

Meteors are the flash of light created by dust entering the Earth's atmosphere. This dross is released from periodic comets as they orbit the sun. When a speck of cometary dust called a meteoroid slams into the Earth's atmosphere traveling at speeds up to nearly 45 miles per second, it forms a cylinder of glowing (ionized) air surrounding the particle as the meteoroid's energy of motion is dissipated into the atmosphere. This is known as the meteor phenomenon.

We don't see the meteoroid "burning"; there is no combustion. Nor do we see the meteoroid glowing; it is far too negligible, the size of a sand grain or smaller, and it could be hundreds of miles distant. The meteoroid is being ablated, ripped apart into less significant particles by the pressure of the air acting upon it, the leftover micrometeorites slowly drifting to the Earth's surface as cosmic dust over many months. Meteorites, those larger meteoroids that make it to the ground, lighting up the sky as a "giant meteor," originate from bits and pieces of the asteroid belt that intersect Earth's orbit. If a rock from outer space hit you, you might scream "ITE" before you died. If the end times are predicted, then the placard better read "Giant Meteorite"; but then it just wouldn't be quite as much fun. The sign stays, but we will have none of that malarkey here in StarWatch.

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astronomy.org facebook.com/StarWatchAstro/



Night Sky Notebook *for* *November*

by

Peter Detterline





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

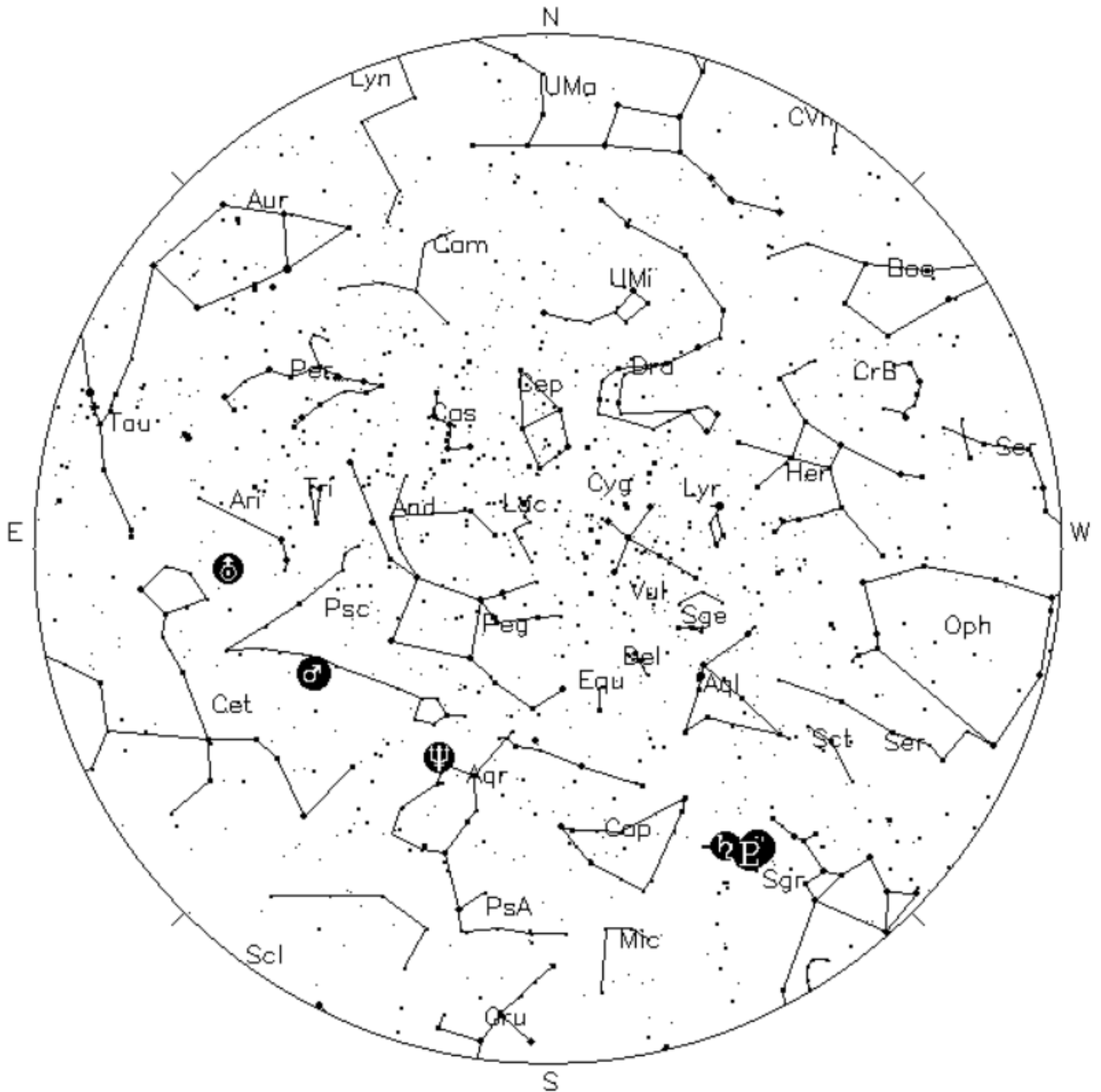
RED SHIFT REVENUE

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

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

The only way to lose is to not play!
Contact director@lvaas.org to sign up!

Sky Above 40°33'58"N 75°26'5"W Thursday Nov 5 2020 00:00 UTC



Your Sky was implemented by John Walker in January and February of 1998. The calculation and display software was adapted from Home Planet for Windows.

The GIF output file generation is based upon the ppmtogif module of Jef Poskanzer's pbmplus toolkit, of which many other components were used in creating the images you see here.

ppmtogif.c - read a portable pixmap and produce a GIF file

Based on GIFENCOD by David Rowley

Lempel-Zim compression based on "compress"

Modified by Marcel Wijkstra

Copyright © 1989 by Jef Poskanzer.

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

NOVEMBER 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
01	02	03	04	05	06	07
Last Quarter Moon General Meeting - on-line 7:00 PM	09	10	11	Astro Imaging - 7:00 PM - CANCELED	13	14
New Moon 15	16	17	18	19	20	First Quarter Moon Star Party CANCELED
Deadline for submissions to the Observer 22	23	24	25	26	27	28
LVAAS Board of Governors Meeting 29	Full Moon 30					

DECEMBER 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		01	02	03	04	05
06	Last Quarter Moon 07	08	09	Astro Imaging - 7:00 PM - CANCELED	11	General Meeting/Holiday Party 12
13	New Moon 14	15	16	17	18	19
Deadline for submissions to the Observer 20	First Quarter Moon 21	22	23	24	25	26
LVAAS Board of Governors Meeting 27	28	Full Moon 29	30	31		
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2020 LVAAS Event Calendar

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

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

July, Aug & Dec are Saturday meetings with rain date on Sunday
 Jan, Feb & March meetings are at Muhlenberg College
 August meeting is at Pulpit Rock
 December meeting / Holiday Party ** check website for time

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

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

Publishing images is a balancing act!

When preparing your images for publication in The Observer, please consider the following guidelines:

Put the quality in:

- ▶ Considering the "print" size of the image, make sure you have at least 150 pixels/inch.
- ▶ Use a reasonably good quality for the JPEG compression ratio.

But watch the "waistline"!

- ▶ Don't go too much above 200 pixels/inch max.
- ▶ Use the lowest JPEG quality that still looks good!
- ▶ Shoot for <300KB for a 1/2 page image or <600KB for a full page.

Tip: If you're not Photoshop-savvy, you can re-size and compress undemanding images ("human interest" not astroimages), with an online tool such as:

<https://www.ivertech.com/freeOnlineImageResizer/freeOnlineImageResizer.aspx>. It will also tell you the pixel size and file size of your original, even if you don't download the processed copy.

The Observer is the official monthly publication of the Lehigh Valley Amateur Astronomical Society, Inc. (LVAAS), 620-B East Rock Road, Allentown, PA, 18103, and as of June 2016 is available for public viewing. Society members who would like to submit articles or images for publication should kindly do so by emailing The Observer editor, Frances Kopy at editorlvaas@gmail.com. Articles submitted prior to the Sunday before the monthly meeting of the board of governors (please see calendar on website) will appear in the upcoming month's issue. PDF format is preferred. Early submissions are greatly appreciated. Articles may be edited for publication. Comments and suggestions are welcome.

LVAAS members please feel free to submit ads for astronomy equipment you have for sale, and additionally you may sponsor a maximum of three ads from non-members per year. Every attempt will be made to include submissions in a timely manner.

Every effort will be made to properly credit the sources of the material used in this publication. If additional credit is required, please notify editorlvaas@gmail.com.

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Existing members please update your LVAAS profile information by emailing the membership director at membership@lvaas.org

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