

# The Observer

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

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

April 2021

Volume 61 Issue 4





## ad astra \*\*\*\*\*

As mentioned in March's Ad Astra, we are currently working on revisions to the LVAAS By-Laws. As of March 28th, several members of the Board of Governors (BOG) have made suggestions for changes. At the Board of Governors meeting on March 28th, the concept of each of these suggestions was discussed; some were accepted, and others rejected. This is only the first step in the process.

Now a subgroup of the BOG will take these concepts and put them into a draft document. The draft will then be presented to the entire BOG and voted on. The final step is that, once approved by the BOG, the changes will be presented to the membership for a vote at a General Meeting. If the changes are rejected at any point, we will go back to square one and start over.

As you can see, this is not a simple process and sometimes results in very spirited discussion. Our hope is that any changes have been sufficiently vetted and will result in stronger governance for LVAAS. All I can say at this point is that I will keep you posted as to our progress.

Recently, Eric Loch gave a presentation about Cherry Springs State Park, so I'd like to update you with some new information about the park. Despite the pandemic, Cherry Springs continues to move forward with improvements. The Master Plan consists of a multi-phased project designed to preserve the dark sky and improve viewing conditions. Implementation of these changes is scheduled to begin during 2021. Some of these changes include:

- The elimination of the adjacent entrances between the Overnight Astronomy Field and the Night Sky Public Viewing Area. This newly designed parking lot entrance and exit with strategic plantings is intended to reduce the headlight pollution from the Night Sky Viewing Area.
- Additionally, they will install a manned contact station and new signage on the north side of Route 44 to help provide information about the different areas of the park.
- Lastly, the parks educators will remind the public of the uniqueness of the park and the necessity of reducing light pollution.

For those deciding to use the Cherry Spring Facility, I thought I would point out some things. Even though the park opened late due to the pandemic, it still managed to surpass its total annual attendance by August. Apparently, the pandemic has moved many people to pursue the astronomy hobby since it is done mostly outdoors. The park managers are expecting attendance this year to double last year's.

Also, I wanted to mention a bargain that can be obtained as far as cost when using the Overnight Astronomy Field. The cost for using the field is \$15 per night, but you can obtain a Galaxy Pass for \$65 for the whole year. If you expect to go to the park for more than 4 nights during the year you can save yourself some money by contacting the Lyman Run Park Office and purchasing a Galaxy Pass. The number is limited, so do not delay if you are interested.

Ad Astra!

Thomas Duff

## Minutes from the LVAAS General Meeting – March 14, 2021

The March 2021 LVAAS General Meeting was conducted electronically using an on-line service in an effort to adhere to the social distancing guidelines with regard to the COVID-19 pandemic.

Approximately 35 people were in attendance.

Director Tom Duff opened the meeting at 7:00 p.m.

The General Meeting's presentation was An Introduction to Deep Sky Observing by Bill Murray. The talk discussed nebulae, star clusters, dying stars and galaxies that are all visible in amateur telescopes, and gave some bright and easy to find examples as well as some practical tips for beginning deep sky observers.

An amateur astronomer for more than 50 years, Bill Murray was employed as a software engineer in the electron optics division of the David Sarnoff Research Center in Princeton for 18 years. More recently he has taught high school mathematics and physics at Trenton Catholic Academy in Hamilton, NJ and is currently employed as planetarium technician at the New Jersey State Museum Planetarium in Trenton, NJ. A long time, 36 years, member of the AAAP Bill has held the posts of Observatory Chairman, Secretary, Program Chairman, Assistant Director and Director in the club.

### Treasurers Report: Gwyn Fowler

The General Fund balance at the last meeting was \$39,991.38. Income to the General Fund since then was \$2,577.84 and expense was \$619.84. The new General Fund balance increased to \$41,949.38. Here is a summary of the General Fund account.

### **Fund Activity Since Last Meeting (amounts in dollars).**

	14 Feb 2021	Income	Expense	14 Mar 2021
General	39,991.38	2,577.84	619.84	41,949.38

The General Fund income this fiscal year from members is \$8,292.00. Members have donated an additional \$260.00 to either the 40-inch Fund or the South Mountain Roof Fund.

The Board approved a \$150.00 increase to this year's budget to cover the 1-year cost of a Zoom account for on-line meetings. Here is a summary of the current budget.

## **FY 2021 General Find Budget (amounts in dollars).**

	Budget	Actual
Income	20,000.00	8,626.25
Expense	26,565.00	3,301.76
Net	-6,565.00	+5,324.49

Membership: Gwyn Fowler

2<sup>nd</sup> Readings:

- J.P. Neubert
- Logan Kramer

1<sup>st</sup> Readings:

- Kris Warren
- Robert Dreisbach

### General Comments

A donation/payment tutorial was presented. A link for donation/payment will soon be available on the LVAAS website.

NEAF will not be in person this year; it will be a virtual event.

There is no official update regarding Cherry Springs. As of now it is still working under the Pennsylvania social distancing guidelines with regard to the COVID-19 pandemic.

### Next General Meeting

The next General Meeting will be Sunday, April 11<sup>th</sup>, 2021 and may be conducted as an in person/online hybrid meeting. Please check the website to verify meeting format and start time.

The March General Meeting was recorded.

The meeting was adjourned at approximately 8:25 p.m.



# New Member Application

## **LEHIGH VALLEY AMATEUR ASTRONOMICAL SOCIETY**



**Make checks payable to: LVAAS**

Mail your completed application(s), with your dues to:

**LVAAS MEMBERSHIP  
c/o Gwyn Fowler  
97 Yeager Road  
Lenhartsville, PA 19534**

Name: \_\_\_\_\_ Are you age 18 or older? Yes \_\_\_\_ No \_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_ Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Occupation (Optional): \_\_\_\_\_

Where did you first hear about LVAAS? \_\_\_\_\_

Specific Astronomical Interests: \_\_\_\_\_

Are you a member of other Astronomical Societies? \_\_\_\_\_

Please list any astronomical instruments owned: \_\_\_\_\_

Experience in Astronomy (circle one):    **Novice**    **Amateur**    **Advanced Amateur**    **Professional**

Type of Membership (circle one):

**Full-time student: \$15 Individual: \$45 Family: \$65 Junior: \$15 Sustaining: \$90 Life: \$675**

*If you are a full time student over the age of 18, you will need to show proof (class schedule, school ID) to the membership director via email or at a meeting. Students under 18, should apply for Junior membership if they are not a part of a family membership.*

Are you a part of a Family Membership?:            Yes: \_\_\_\_            No: \_\_\_\_

*(Note: Each family member must have a completed application regardless of age)*

### **Donations are greatly appreciated!**

Would you like to give an additional donation? If so, please list the amount. If you want it to be designated please specify (e.g. roof, Prod, 40" telescope). **Donation:** \_\_\_\_\_

#### **Committee Use Only:**

Dues: \_\_\_\_\_ Donation: \_\_\_\_\_ Total: \_\_\_\_\_ Check #: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1<sup>st</sup> Reading: \_\_\_\_/\_\_\_\_/\_\_\_\_ 2<sup>nd</sup> Reading: \_\_\_\_/\_\_\_\_/\_\_\_\_ Card Issued: \_\_\_\_/\_\_\_\_/\_\_\_\_ To Treasurer: \_\_\_\_/\_\_\_\_/\_\_\_\_

## **Via Sandy Mesics, Programs Director: Speakers Needed!**

Speakers are still needed for our **July 10th** and **December 12th** general meetings. If you have knowledge on a topic you would like to share with our membership, please step up! You can email me your interest, and we'll take it from there! [astrosandy@gmail.com](mailto:astrosandy@gmail.com) Thank you!

## **Via Ron Kunkel: Discussion on Black Holes April 9**

All, If you click on the link below, there is information for a talk on black holes by Penn State professor Ruth Daly to be given April 9; both on Zoom and in person:

<https://news.psu.edu/story/653088/2021/03/30/public-events/berks-physics-professor-discuss-black-holes-part-losoncy>

## **Benefit from giving to LVAAS through your IRA!**

If you are 70 1/2 or older, you can make a charitable gift directly from your IRA to LVAAS without paying income tax on the withdrawal. State laws about Qualified Charitable Deductions (QCDs) and how QCDs are handled vary. If interested, please consult an adviser so you can help LVAAS today! Click this link for more information at the LVAAS website:

[https://lvaas.org/page.php?page=using\\_rmd\\_to\\_support\\_lvaas](https://lvaas.org/page.php?page=using_rmd_to_support_lvaas)

## **Via Earl Pursell, UACNJ Liason: Presentations April-October 2021**

UACNJ provides FREE public programs at our Observatory in Jenny Jump State Forest from April through October on Saturday evenings. For the safety of the public and our volunteers, we will be operating the observatory much as we did last year: the entire event will be held outdoors with masks and social distancing required. Weather permitting, an astronomy presentation begins at 8 p.m. As you will be outdoors, please bring a chair or blanket to sit on and be prepared for cool weather. The presentation is followed by some stargazing and we will have screens set up to show live video from the observatory's telescopes until 10:30 p.m. These public programs are free but donations are appreciated. Note admission is limited and by reservation ONLY. For more information and free registration see our website: <http://www.uacnj.org/index.php>. Reservations for the following week's program go on sale Sunday at 12 noon. Here are our speakers and topics for April:

4/3/2021 What's Up in the April Sky? by Lonny Buinis, RVCC

4/10/2021 Astronomy for Beginners by Ken Taylor, NWJAA

4/17/2021 Celestial Wanderings: Photographing the Earth and Sky by Stan Honda, AAA

4/24/2021 "Anatomy of a Star" by Paul Fisher, NWJAA

Please join us or watch our presentations online by subscribing: [youtube.com/UACNJ](https://youtube.com/UACNJ)



### ***Cover image by LVAAS member Joe Zitarelli***

Imaged from Center Valley on February 25, 2021

Skywatcher ED 100 f/9

Camera: ZWO ASI1600 MM Pro with matched RGB filters

30 mS exposures, gain 300

Lucking Imaging Technique, using ASI Studio

AutoStakkert using 38 images each color

Photoshop Merge to combine the colors

# LVAAS General Meeting

**Sunday, April 11 at 7 p.m.**

**- Meeting will be \*online only -**

## Van de Kamp's Phantom Worlds — The Case of the Disappearing Exoplanets

*It seemed sensational — two planets outside our solar system, in the second nearest star system to ours. It sparked talks of interstellar missions and more. But behind the scenes, there was so much more going on with the planets Peter van de Kamp proposed to the world.*



**John Wenz**

John Wenz is currently science editor at ***Inverse***, where he leads a team of space and technology reporters at the cutting edge of current research. Prior to that role, he was a digital producer at ***Knowable Magazine***, an associate editor at ***Astronomy Magazine***, a news writer and contributing editor at ***Popular Mechanics***, and a long-time freelancer. His book ***The Lost Planets: Peter van de Kamp and the Vanishing Exoplanets around Barnard's Star*** was released by MIT Press in fall 2019.

**\*Members will receive an invitation to the on-line meeting by email. Prospective new members who wish to attend should contact [membership@lvaas.org](mailto:membership@lvaas.org) to arrange to receive an invitation.**





Do you remember the last time you visited this wonderful place? For many of us it has been over a year, and we're more than ready to leap back into our favorite pastime and enjoy the company of other star gazers with gusto. With the vaccine program in full swing, hopefully we'll not need to stay away from our South Mountain headquarters, or our Pulpit Rock dark sky location for too much longer.

We owe much to our former director, now current assistant director Rich Hogg, as well as Scott and Gwyn Fowler and their many roadies who worked tirelessly to enable hybrid meetings using Zoom technology. These devoted members enabled some careful souls to enjoy observing and attending from Pulpit Rock while employing COVID restrictions recommended by CDC and PA state officials. Overcoming many technical and logistical difficulties, they persisted to make the connection to the stars that we so desperately crave. Also a big thanks to programs director, Sandy Mesics for working with the many speakers who have risen and met the challenge, presenting to us via Zoom.

"Per aspera ad Astra" (a quote by Lucius Annaeus Seneca that translates "Through difficulties to the stars" is a tenet of astronomers who, although often thwarted by temperamental equipment, last minute weather glitches and a myriad of other challenges, persist undaunted in their journeys through the heavens. I suspect many others have also overcome many challenges just to feed their families and pay their rents or mortgages during this pandemic. We will all hopefully be stronger for it.

Thank you, Jim Thoma, for the photograph of SM above, looking for all the world like the sleepy castle under a spell cast by evil Maleficent in *Sleeping Beauty*. May you awaken to us soon. ~ editor





# Night Sky Notebook for *April* by Peter Detterline





*"It was a fun evening with good people and an interesting presenter for our monthly meeting, with some of us attending at Pulpit Rock. It was also a perfect evening for imaging and/or observing! Here's my collation of about 200 shots into a composite star trails image using the Tinsley Dome as the focal point." Mike Waddell November 2020*







*From the LVAAS Archives:*

# John L. Hershey, Where Are You?

by

**Sandy Mesics**

Dr. John L. Hershey from Sproul Observatory, Swarthmore College, spoke at the April 1971 general meeting. At that time, Dr. Peter van de Kamp was the head of the Astronomy department at Swarthmore and was at the height of his fame for his astounding announcement of the discovery of the first extrasolar planets, particularly around Barnard's Star and Luyten's Star. The work was done with high-precision astrometry of photographic plates taken with the 24-inch long-focus Sproul refractor. Because of "wobbles" in the motion of these stars, the conclusion Van de Kamp's team arrived at was that unseen planets were "tugging" on the stars, causing these perturbations in their position. When Hershey spoke at LVAAS, he was part of the team doing this work.



John Hershey

Before coming to Swarthmore, Hershey was interim director of the M.T. Brackbill Planetarium in the Suter Science Center at Eastern Mennonite University in Harrisonburg Virginia from 1958-1960. In 1966 he earned his Master's in Astronomy from the University of Virginia. His thesis was "Internal motion of 35 stars in Praesepe." He completed his doctorate at University of Virginia in 1969. His doctoral thesis was "Model atmospheres and strong-line profiles for late-type dwarfs."

Hershey came to Swarthmore as an assistant professor of astronomy in 1968. His early work at Swarthmore focused on the star CC 1213, which showed a perturbation in position that could be caused by a planetary body or dim stellar source. At the time Hershey spoke at LVAAS, he had just received tenure at Swarthmore.

Inadvertently Hershey would make a discovery that would undo decades of research work done at Swarthmore, particularly Peter van de Kamp's "discovery" of extrasolar planets. When Hershey was examining old photographic plates, he observed shifts in the position of star Gliese 793 in 1949 and again in 1957. These dates coincided with adjustments to the objective lens of the Sproul 24-inch refractor. Once those errors were accounted for, there was no movement of Gliese 793. These adjustments also affected the position of Barnard's Star. When Hershey looked at plates of Barnard's Star taken at other observatories, no movement was seen. Hershey concluded that the lens adjustments had introduced "one or more sudden small changes" in the apparent position of several stars. The positional shifts that van de Kamp had attributed to planets, it seemed, might therefore have a more mundane explanation.

**LAST MONTH'S MEETING:** Dr. John Hershey of Swarthmore College began his presentation with color slides that he took on his visits to Kitt Peak National Observatory. Following this he discussed some models for atmospheres of late type dwarf stars on the main sequence of the HR diagram. By assuming a suitable profile for the atmosphere as a function of the calculated distance from the surface of the star, it was shown how the calculated properties could be made to match those that were observed. Such theoretical studies as this, requires the use of an electronic computer and must be programmed by a person with a sophisticated knowledge of plasma physics.

In the early 1980s, Hershey became the interim Director of Sproul Observatory. By the end of 1983 Hershey had moved on to a position at the Naval Observatory. In the 1990s, Hershey worked with data from the Hubble Space Telescope, looking for brown dwarfs and low-mass binary objects. He assisted in the discovery of the object around Proxima Centauri. He split his Hubble work between searching for brown dwarfs or extrasolar planets with study of the planet Neptune.

In the late 1990s-early 2000s, he was at Science Programs, Computer Sciences Corporation Space Telescope Science Institute (STScI). There he has worked with data from the Hubble Space Telescope looking at binary stars, brown dwarfs, and extrasolar planets. He also did considerable research on the planet Neptune and its satellites.

Hershey's last publication was "Hubble Space Telescope BVI photometry of Triton and Proteus." This followed some of his other publications on astrometric observations and orbital motion corrections for the inner satellites of Neptune. Author John Wenz, in doing research for his 2019 book "The Lost Planets" was unable to find the whereabouts of Hershey. "No one I have spoken to quite knows where John Hershey is – not his colleagues at the Space Telescope Institute nor anyone at Swarthmore. ... he's stayed largely out of the public eye since then – if he's alive."

## References

The Observer, May 1971.

Wenz, John "The Lost Planets: Peter van de Kamp and the Vanishing Exoplanets Around Barnard's Star."

(2019) The MIT Press.



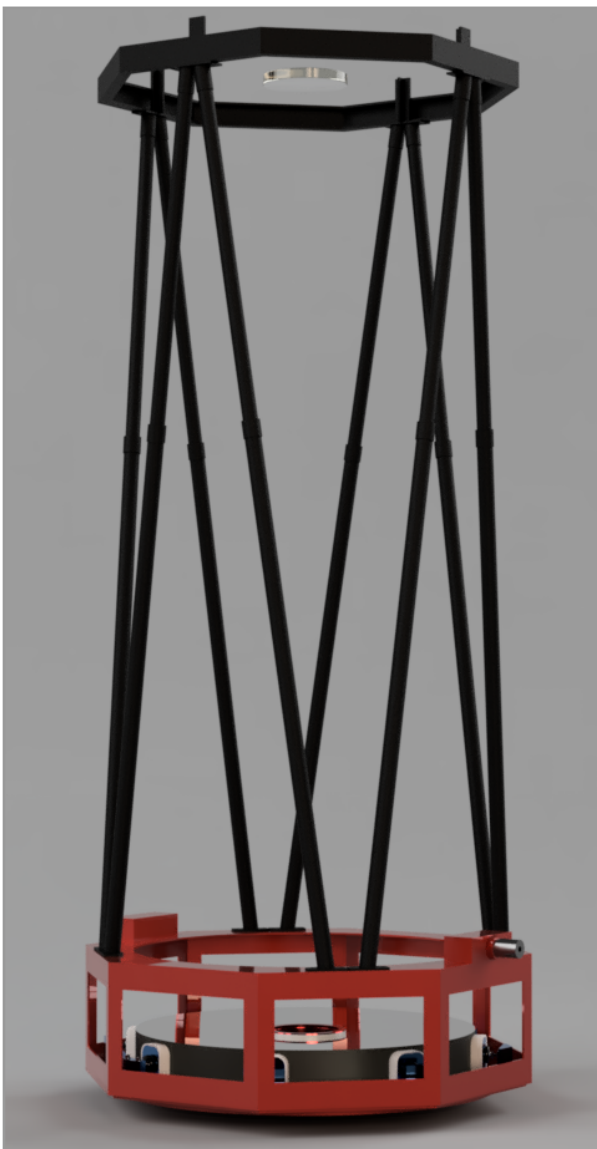
# Schlegel Observatory Report

by Rich Hogg – April 2021



As planned, I've added more components to the Fusion 360 CAD model of the 40-inch telescope. You can check out a rendering of the current model below.

Obviously, there are some pieces missing. The secondary mirror is floating magically in its proper location, without the benefit of a spider and a housing to hold it there. It would actually not be visible



from this view of the 'scope, instead hidden behind a cone-shaped baffle that is also not yet in the model, as is the tubular primary baffle that will extend up through the central hole.

Also missing are the mirror covers and the door panels to cover the openings in the primary frame (the red part.) And, the model currently "ends" at the declination stub axles on either side of the primary frame (one of which can be seen poking out on the right side, at the top of the red part.)

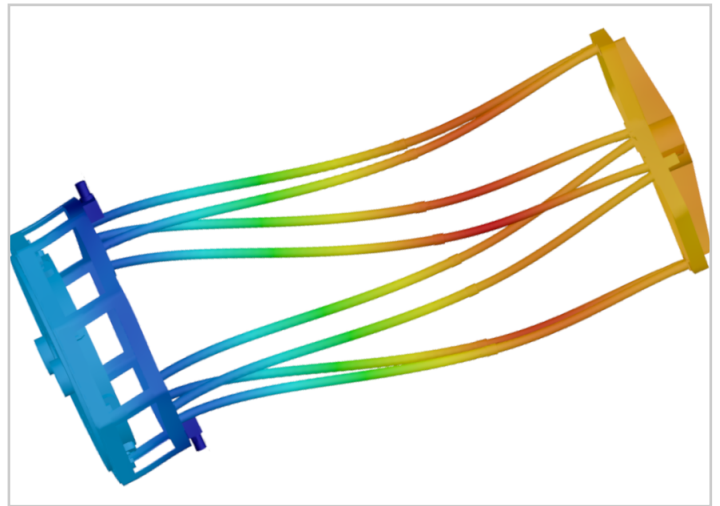
This, by the way, is the basic color scheme we are currently leaning towards, red for the back or bottom and black for the front or top. The black will be as dark and flat as we can get, but the red might be a snazzy candy-apple or metal-flake sort of thing, and we might stick on some printed vinyl accents.

Also by the way — "stub axle" is a term that I just started using in writing this piece. I have been calling them "half-axes" but I never liked that, and about 20 minutes ago "stub axle" popped into my head, so now we are going with that.

We are not doing a great job of agreeing on the names of the parts and sticking to them, but I'm trying to come up with something sensible; something that unambiguously denotes each part while also being comfortable to say out loud (which was my problem with "half-axle"). The big red octagon is the "primary frame" and the black octagon at the top is the "spider frame." And I am thinking maybe we should weld the two plates that cover the bottom of the telescope together into one "bottom plate" so I can stop worrying about what to name the other one.

In order to do a mechanical simulation of this, I created a temporary model of the spider and a not-very-realistic secondary housing. Then I asked Fusion 360 to calculate the center of mass of the assembly, and figured out that I would need to add about 50 pounds of counterweights to the "other bottom plate" in order to align the CoM with the stub axles, to balance it. That made it possible to do a deformation simulation.

The result is shown at right, and it actually looks great, with no surprises. In this simulation the telescope is tilted at an angle 25 degrees above the horizon, and gravity is pulling all of the parts slightly out of alignment. The output from the software shows the amount of



displacement of each element from its nominal coordinate with a color code, and also renders the model with the displacement vastly exaggerated. This allows us to see that it's mostly a parallel shift of the secondary mirror relative to the primary, which is what we want. The actual amount of shift predicted by the software is on the order of 1/64", well within the tolerances we have decided are acceptable.

I'm also pleased to see that the predicted displacements of the different parts of the primary frame are very small, on the order of a couple of thousandths. Intuitively, it always looked and felt as if it would be strong enough and rigid enough, but it's good to have some engineering analysis to reinforce that. Now I will be getting busy with defining the rest of the parts so they can be fabricated.

by Gary A. Becker

## Moravian's Sky Deck Refurbished



Back in 1978, when friend, Peter Detterline first observed the winter heavens from the Sky Deck with his brother, Jim, who graduated from Moravian that same year, the two had to climb an icy, 16-foot vertical ladder to gain access to the observing space. No wonder, Dr. Joseph Gerencher, who envisioned the area for astronomical and meteorological instruction, kept telescope gear very portable. The space was also used by Jim Detterline and friends as a high spot for repelling because it had no railings surrounding it. Those were the “good old days” when life was less litigious, and one never thought about taking someone to court if a mistake resulted in a fall from a four-story height.

Over the intervening 30 years before I came onboard in 2010, Joe did a spectacular job of creating a sanctuary under the urban heavens upon the highest accessible location to students on campus. A safe, metal stairway was constructed; a wrought iron railing was installed around its perimeter, and the deck was padded to preserve the flat roof. Joe installed concrete stanchions (blocks) on which the telescope piers were encased and storage containers for the telescopes and mounts when not in use. Through outright purchases and donations of equipment from the local astronomy community, the College continued to enhance the number of telescopes available.

One of the most innovative aspects of what was then called the Collier Rooftop Observatory was Joe’s design and construction of two enclosed aluminum caps that pivoted off a small platform on which the telescopes were mounted. These were secure against the unique high wind conditions that sometimes plagued the deck which was above the campus tree line. Because of their variety, the telescopes made the Sky Deck’s use very teacher-centered, with students being mostly observers, queuing behind the eyepiece. In addition, campus and Bethlehem light pollution increased, making the sky more devoid of stars, and more difficult to find astronomical objects manually. In 2015, David Fisherowski of Boyertown came to Moravian’s rescue by donating a series of telescopes and computerized mounting systems that all functioned in a similar manner. This allowed me to teach students how to operate these mounts in a more efficient manner. Learners became active participants in conquering the heavens.

Chair, Kelly Kriebel, also opened up the Physics Department's coffers to help to purchase more used equipment so that only four students would be assigned to each scope. In addition, \$20,000 was raised through public donations to support improvements on the Sky Deck space. • Initially, students had to transport all of their equipment from my basement lab, set up and align the telescopes to Polaris, then calibrate their scopes to six reference stars before beginning to observe. That was very time-consuming. As Moravian acquired heftier mounting systems, telescopes were tarped and remained on the Sky Deck through the temperate months. Unfortunately, a few were blown over in spring windstorms that saw gusts in excess of 70 mph rake the rooftop. This past summer, the old piers were removed from their stanchions, and new ones fabricated and installed. Larger telescopes now remain secured and tarped ready for use on any clear night throughout most of the spring and fall semesters. • Today, when I take my students on their first visit to the Sky Deck, I show them one of the vertical ladders that is still present on another nearby roof structure. There are always expressions of disbelief that just 40 years ago the conditions here were so primitive, that this observing space was accessible only to the intrepid. Pictures can be found [here](#).

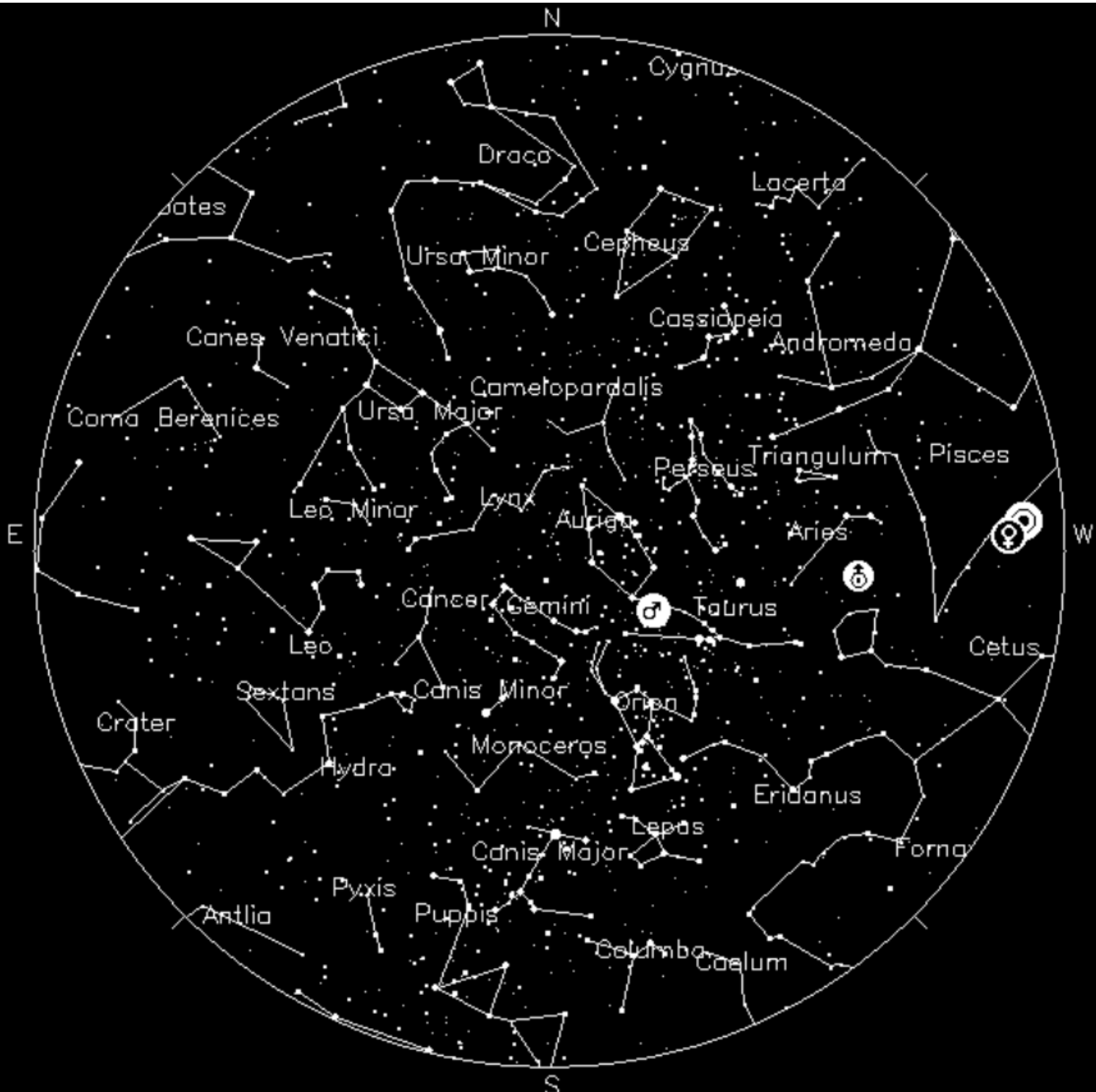


Students began using the Sky Deck in earnest in the fall of 2015. In this spring 2018 image, Moravian students set up their telescopes in in sunlight and then went back to their classroom for a lesson. As the sky darkened after sundown, everyone came back upstairs to calibrate their telescope mounts before beginning to observe. After the session ended, students disassembled and transported all equipment back to their lab for reassembly. Cody Yarnell, my teaching assistant for three years, was instrumental in the success story of this phase of the development of the Sky Deck. Gary A. Becker image.

©Gary A. Becker for StarWatch

[beckerg@moravian.edu](mailto:beckerg@moravian.edu) [garyabecker@gmail.com](mailto:garyabecker@gmail.com)  
[astronomy.org](http://astronomy.org) [facebook.com/StarWatchAstro/](https://facebook.com/StarWatchAstro/)





*Your Sky was implemented* by John Walker in January and February of 1998. The calculation and display software was adapted from Home Planet for Windows. The GIF output file generation is based upon the ppmtogif module of Jef Poskanzer's pbmplus toolkit, of which many other components were used in creating the images you see here.

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

Based on GIFENCOD by David Rowley

Lempel-Zim compression based on "compress"

Modified by Marcel Wijkstra

Copyright © 1989 by Jef Poskanzer.

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

## APRIL 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				<a href="#">01</a>	<a href="#">02</a>	<a href="#">03</a>
<a href="#">Last Quarter Moon</a> <a href="#">04</a> Easter	<a href="#">05</a>	<a href="#">06</a>	<a href="#">07</a>	<a href="#">08</a>	<a href="#">09</a>	<a href="#">10</a>
<a href="#">New Moon</a> <a href="#">11</a> General Meeting - 7:00 PM	<a href="#">12</a>	<a href="#">13</a>	<a href="#">14</a>	<a href="#">15</a>	<a href="#">16</a>	<a href="#">17</a>
<a href="#">Deadline for submissions to the Observer</a> <a href="#">18</a>	<a href="#">19</a>	<a href="#">First Quarter Moon</a> <a href="#">20</a>	<a href="#">21</a>	<a href="#">22</a>	<a href="#">23</a>	<a href="#">24</a>
<a href="#">LVAAS Board of Governors Meeting</a> <a href="#">25</a>	<a href="#">Full Moon</a> <a href="#">26</a>	<a href="#">27</a>	<a href="#">28</a>	<a href="#">29</a>	<a href="#">30</a>	

## MAY 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						<a href="#">01</a>
<a href="#">General Meeting - 7:00 PM</a> <a href="#">02</a>	<a href="#">Last Quarter Moon</a> <a href="#">03</a>	<a href="#">04</a>	<a href="#">05</a>	<a href="#">06</a>	<a href="#">07</a>	<a href="#">08</a>
<a href="#">Mothers Day</a> <a href="#">09</a>	<a href="#">10</a>	<a href="#">New Moon</a> <a href="#">11</a>	<a href="#">12</a>	<a href="#">13</a>	<a href="#">14</a>	<a href="#">15</a>
<a href="#">Deadline for submissions to the Observer</a> <a href="#">16</a>	<a href="#">17</a>	<a href="#">18</a>	<a href="#">First Quarter Moon</a> <a href="#">19</a>	<a href="#">20</a>	<a href="#">21</a>	<a href="#">22</a>
<a href="#">LVAAS Board of Governors Meeting</a> <a href="#">23</a>	<a href="#">24</a>	<a href="#">25</a>	<a href="#">Full Moon</a> <a href="#">26</a>	<a href="#">27</a>	<a href="#">28</a>	<a href="#">29</a>
<a href="#">30</a>	<a href="#">Memorial Day</a> <a href="#">31</a>					

## 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 at [editorlvaas@gmail.com](mailto: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](mailto:editorlvaas@gmail.com).

No permission is required for non-profit educational use of the material in this publication. Please send a link to, or copy of the publication containing the reprinted material to the editor at the above address. ***Some material in this publication may be copyrighted.***

To become a member of LVAAS, please complete and submit an application form, which can be downloaded at [https://lvaas.org/filemgmt\\_data/files/LVAAS\\_New\\_Member\\_Form.pdf](https://lvaas.org/filemgmt_data/files/LVAAS_New_Member_Form.pdf)

Existing members please update your LVAAS profile information by emailing the membership director at [membership@lvaas.org](mailto:membership@lvaas.org)

Copyright 2021 LVAAS, Inc.