THE DELAWARE VALLEY
amateur ASTRONOMER
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sharing the wonder and science of astronomy

The Crescent Nebula

As October begins Cygnus the Swan is flying high overhead. Located in the heart of the swan is emission nebula NGC 6888, the Crescent Nebula. The nebula was discovered by William Herschel in 1792 and measures 25 light-years across. The nebula's distance from earth is about 5000 light-years.

The Crescent is best seen visually with the aid of a UHC or O-III filter with a telescope of 8 inches or larger but may be glimpsed with smaller instruments under dark skies.

Photo credit: Steve Haas.

PLAN ON IT!

Oct. 2 (1-4 pm) Fall Harvest and Great Pumpkin Patch. Community event at The Willows in Radnor. Telescope operators needed for solar observing in white light & H-alpha. More info.

Oct. 8 (6:30 pm - 9:30 pm) Public Star Party at Valley Forge National Historical Park model airplane field. Rain/cloud date Oct. 9. More info.

Oct. 11 (7:30 pm) Astrophotography Workshop on Zoom. See p. 5.

Oct. 12 (7-9 pm) Anderson Farm Park Star Party More info. Cloud dates Oct. 13, 14.

Oct. 14 (7:30 pm) In-person General Meeting at Radnor Township Building; will also be livestreamed. See p. 5. More info.

Oct. 15 (5:30 pm) Dark Sky & Telescope Clinic #2 for Beginning and Intermediate Observers at Green Lane State Park. Rain/cloud date Oct. 16. See p. 9. To register go to **www.dvaa.org**.

Oct. 18 (6:15-8:30 pm) Community Star Party Armentrout Preserve in Blue Bell. More info.

Nov. 8 (4:09 am - 6:42 am) Total Lunar Eclipse More info

Nov. 11 (7:30 pm) In-person General Meeting at Radnor Township Building; will also be livestreamed. More info

Nov. 12 (5:00 pm - 8:00 pm) Public Star Party at Valley Forge National Historical Park model airplane field. More info.

FOR ALL EVENTS, SEE THE DVAA WEBSITE www.dvaa.org FOR ADDITIONAL INFORMATION AND UPDATES.

CONTENTS:

Welcome New DVAA Members!

Brody J Carpenter (Royersford)
Stephen Krauchick (Downingtown)
Steven R Peterson (Lansdale)
George Wilkie (Philadelphia)

We welcome all new members to enjoy the most our club has to offer by participating in DVAA activities. You are encouraged to ask questions and pursue your interests in astronomy through the club.

We suggest that new members attend our observing events and special interest group meetings, or volunteer to help with an outreach event or committee. Participation can advance your skills and enjoyment of the hobby and help you get to know your fellow members. New members are entitled to all benefits of membership.

Brian Lee
Welcoming Committee Chair
welcoming@dvaa.org

DVAA Board & Committee Chairs

Title	Name	Email
President	Harold Goldner	president@dvaa.org
Vice-President	Jan Rush	veep@dvaa.org
Secretary	Mike Tucker	secretary@dvaa.org
Treasurer & Astronomical League Coordinator	Louis Berman	treasurer@dvaa.org
Members-at-Large	Barry Johnson Tracey Trapuzzano Scott Vanaman	mbratlarge@dvaa.org
Astrophotography	Lou Varvarezis	astrophotography@dvaa.org
Camping and MSSP	Bill McGeeney	camping@dvaa.org
Door Prizes	Roy Patton	doorprizes@dvaa.org
Newsletter Committee	*(see note at right)*	newsletter@dvaa.org
Night Sky Network	Al Lamperti	nightsky@dvaa.org
Light Pollution Abatement	Barry Johnson	ltpollution@dvaa.org
Observing	Andrew Hitchner	observing@dvaa.org
Outreach	Roy Patton	outreach@dvaa.org
Programs	Jeremy Carlo	programs@dvaa.org
Publicity	Bill McGeeney	publicity@dvaa.org
Scope Rentals	Joe Lamb	rentals@dvaa.org
Website	Louis Berman	website@dvaa.org
Welcoming	Brian Lee	welcoming@dvaa.org
Women of DVAA	Jan Rush	women@dvaa.org

Mark Your Calendars!

Upcoming Monthly Meetings

Friday, October 14, 2022: Dr. Joey Neilsen, from Villanova University on the Shadow of a Sleeping Giant. *Details on p. 5.*

Monthly Meetings have returned to the Radnor Township Building. All are welcome to attend in-person. Meetings will also be livestreamed on YouTube.

Meeting Location: Radnorshire Room
301 Iven Avenue, Radnor, PA 19087

Upcoming Meeting Dates: (all Friday evenings): Oct. 14, Nov. 11, and Dec. 9.

2022 Public Star Parties

DVAA public star parties are held at Valley Forge National Historical Park on the Model Airplane Field. (Google Maps). ***Weather Hotline: 484-367-5278.***

The monthly star party has returned to the traditional public telescope viewing format. The Board will continue to monitor the pandemic status throughout the year. Check the website (www.dvaa.org) for updates.

Public Star Party dates for 2022 (all Saturday evenings): **Oct. 8** (6:30), **Nov. 12** (5:00).

New this year: Backup dates will be designated the Sunday following each date above. Check your email or the website, or dial the hotline, for the final weather call.

Newsletter Editorial Committee: Jeremy Carlo, George Keighton, Tom Nolasco, Dana Priesing, Jan Rush and Barclay Thorn.

If you would be interested in joining us on the Newsletter Committee, or serving as guest editor for one month, just drop us a line at newsletter@dvaa.org — we'd love to have you on board, regardless of your experience level! Online tutorials are available to get you quickly up to speed.

Thanks to Jan Rush for taking the lead for the September issue. Tom Nolasco is the lead editor for October.

Follow the DVAA on Facebook and YouTube!

DVAA Facebook group
DVAA Photo Enthusiasts
YouTube Channel

YouTube

Why You Want to be the Treasurer of DVAA

Harold Goldner email

Power. Glory. Unlimited riches. The undying respect and gratitude of your fellow members. Just four things that you won't get if you are elected Treasurer of the Delaware Valley Amateur Astronomers.

The Annual Business Meeting of DVAA will be held Sunday, December 11th at 2:00 p.m. at my home in Bala Cynwyd. (The Eagles will be playing the Giants at 1 p.m. and I hope the game will be well in hand, but just in case, I'll put the TV on in the den so you can run in and out of our riveting agenda). Any member is invited to attend. There will be donuts, I promise, unlike during those years of "Zoom" Business Meetings. And if every member happens to show up, my wife will kill me, but we'll have a good time, and together we'll plot club strategy for next year.

We will complete club elections for 2023 at that meeting. Having had the privilege of serving as your President for the last 3 years, I am term limited, as is our Former President and current Treasurer Louis Berman. We also have officer openings for Vice President and Members-at-Large, of which the by-laws permit three. Any member for at least a year is eligible to run for an office. Finally, we really volunteers to serve as Observing Chair and Outreach Chair.

The Treasurer keeps track of club funds via Quickbooks. Our website does most of the heavy lifting regarding dues collection, although some members do like to mail or hand in checks (and even cash from time to time). The Treasurer also makes sure that some of our recurring expenses (e.g., insurance) are paid on a timely basis, and that our non-profit "post card" tax return (which is a free online process) is filed. The Treasurer also reimburses members for club-related expenses. It's not glamorous, but it's important if not critical for the club.

The Outreach Chair handles all incoming requests for the club's involvement, such as from townships, libraries, schools, Boy and Girl Scout troops, etc. We have a full compliment of volunteers to staff these events, but somebody needs to take the lead to alert members to the outreach opportunities. The Observing Chair coordinates the Valley Forge Public Star Parties and also often makes a short presentation at our meetings on goings on over our heads or providing observing tips. Unlike Officers, Committee Chairs have no required minimum club tenure.

DVAA has run smoothly and cooperatively for years now. Volunteers provide outreach to the public, answering questions, setting up telescopes at public events, calmly explaining that no, the world is not flat and, the seasons are because of the tilt of the earth's axis, not because we are closer or further from the sun, and patiently outlining all of the proofs we have that the moon landing really happened.

Our monthly meetings are the result of hard work by our volunteer programming chair, and largely unpaid speakers (okay, well, some of them get $250/meeting honoraria, which won't get you anything except perhaps an appetizer at the Capital Grille), who make fascinating presentations on sometimes esoteric, sometimes mainstream astronomy-related topics. Yes, admittedly, some Fridays it is challenging to follow the science, especially when it gets "mathy" or too "physicsy" (not sure those are words), but other times the presentations are completely captivating and the following discussions intriguing.

Volunteers help organize our star parties, and present observing tips each meeting --- that's the role of the Observing Chair. Volunteers take turns editing our award-winning Newsletter. That's right, DVAA's Newsletter editors George Keighton and Tom Nolasco won third prize in the Astronomical League's Mabel Sterns Newsletter Award. Volunteers serve as listserve janitor for our lively Groups.io listserve, and volunteers put on regular Zoom programs covering all levels of astrophotography.

Our members come from all walks of life. Yes, many are retired, but even more are students, physicians, dentists, lawyers, engineers (we do seem to have a lot of engineers), brewers, nurses, architects, bakers, and even candlestick makers. Each of us shares a love of all things celestial (with the possible exception of clouds and rain, and, frankly, I don't care if I never see another snowflake as long as I live, but, as usual, I digress).

Many of us work a full week, then get to take that break at our monthly meetings, or under the skies

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Why You Want to be the Treasurer of DVAA *(cont.)*

Continued from previous page

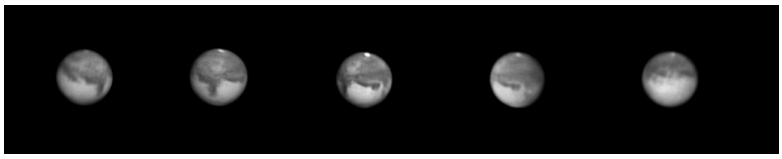
with a fellow member and their observing equipment.

But we can't do this without all those volunteers. We need you for more than your small dues payment. We need you to join us in keeping the DVAA "in business" as a vibrant amateur astronomy club.

So please join us in making DVAA the best astronomy club around (sorry Chesmont, sorry Delaware Astronomical Society, sorry Rittenhouse.) That way I can devote my November and December columns to more esoteric subjects rather than begging. Begging is so unbecoming. You know you want to be treasurer, don't you? Can't you feel it? Come aboard!

Jan Rush (left photo) and George Keighton (right photo) receive Night Sky Network Outreach Awards, presented by President Harold Goldner at the September 2022 DVAA meeting
Photo credit: Mitch Berger.

Get Ready for Mars



The last time Mars passed close to the Earth was in early October 2020 when Mars reached 22.6 arc-seconds in diameter. The next pass by Mars will not be quite so close, with Mars reaching a maximum diameter of only 17.2 arc-seconds in late November through early December of this year On October 1st Mars will have a diameter of 12.0 arc-seconds, large enough to begin making out the subtle shadings or perhaps a polar cap on the Martian surface. Below is a table showing the changes in brightness, size and phase for the month of October:

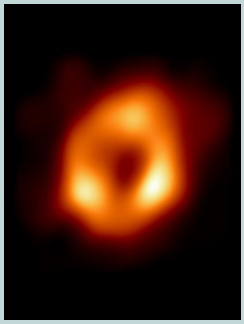
Date	Magnitude	Phase (% illuminated)	Diameter in arc secs
October 1st	-0.6	87.7	12.0
October 6th	-0.7	88.5	12.5
October 11th	-0.8	89.3	13.0
October 16th	-0.9	90.3	13.5
October 21st	-1.0	91.3	14.0
October 26th	-1.1	92.4	14.6
October 31st	-1.2	93.6	15.1

Next Monthly Meeting: Oct 14, 2022

The October meeting will be a joint meeting of both the DVAA and the Southeast Pennsylvania Section of the American Association of Physics Teachers (SEPS-AAPT).

The Shadow of a Sleeping Giant

Dr. Joey Neilsen
Villanova University



Supermassive black holes light up the distant and local universe, but the Milky Way galaxy is remarkably quiet: our supermassive black hole, Sagittarius A* (Sgr A*), is orders of magnitude fainter than its extragalactic counterparts. I will discuss efforts to study this sleeping giant (including work by a recent Villanova grad) culminating the recent discovery of the shadow of the black hole by the Event Horizon Telescope Collaboration.

The meeting will be held in-person at the Radnor Township Building.
Informal gathering at 7:00, program begins at 7:30pm.
The meeting will be live-streamed on the DVAA YouTube Channel:
www.youtube.com/DelawareValleyAmateurAstronomers

Astrophotography Workshop on Zoom

Tuesday, October 11th at 7:30 PM
Zoom Link

This will be an informal open session that will include recent image sharing and discussions about various image stacking software. Anyone who has any questions which they would like addressed can send an email to astroimagers@dvaa.org. Or just show up!

Youtube recordings of past workshops

Moon Watch at Arcadia at Limerick Pointe Residence

About a dozen residents of this retirement community viewed the rising Moon (in Venus's Belt above the Earth's shadow in the photo on the right).

Photo credit: Al Lamperti

Astronomy Course: Main Line School Night

(Adult Continuing Education)

Al Lamperti and Jan Rush will be teaching an introductory astronomy course, “Astronomy: Celestial Wonders.” Three 90-minute sessions on Monday evenings Oct. 10, 17, 24. Registration and more info.

The September Monthly Meeting

Jeremy P. Carlo email

Photo credit: Mitch Berger

The DVAA September 2022 meeting was opened by President Harold Goldner. Harold started by announcing that our newsletter editors Tom Nolasco and George Keighton received 3rd place in the Mabel Sterns Newsletter Award sponsored by the Astronomical League. Congratulations! Harold told attendees about the upcoming York County Star Party, as well as upcoming DVAA elections. In particular, there are openings for the positions of Treasurer and Vice President; Harold outlined the duties of both. In addition, Andrew Hitchner will be stepping away from the position of Observing Chair, so there will be an opening for that appointed position as well. Harold announced the Annual Business Meeting will be held at 2 PM on December 11; location to be announced. Harold updated the club on the status of two large telescopes which had been in its possession, the 8" refractor formerly housed at Colonial Observatory, and an 18" Obsession telescope donated by Tom Sidor. The 8" refractor was sold thanks to the efforts of Barry Johnson, and the 18" was returned to Tom as it was too large to make use of at Valley Forge star parties. Finally, Harold announced that two DVAA members received Night Sky Network awards – Jan Rush and George Keighton for exceptional volunteerism for the STEM-YEA outreach event at Albright College last July. (Editor's note: Joe Lamb also received an award for this activity.)

Moving on to committee reports, DVAA Welcoming Chair Brian Lee welcomed four new members. Treasurer Lou Berman announced the club is currently at 205 members, and reminded attendees that the time for dues renewal will be approaching, as it syncs with the start of the new calendar year. Vice President Jan Rush announced several upcoming events, including an observing clinic for members on October 15 (rain date Oct. 16), and public star parties at Radnor (Oct. 2), Upper Providence (Oct. 12), and Armentrout Preserve (Oct. 18), in addition to the regularly scheduled public star party at Valley Forge on October 8. Al Lamperti then introduced the new DVAA Youth Awards program, which offers prizes in competitions for astronomy-related projects by high school and middle school students. Finally, Astrophotography Chair Lou Varvarezis gave a brief update on his committee's activities, including ongoing monthly Zoom meetings on astrophotography topics.

With committee presentations complete, Programs Chair Jeremy Carlo then introduced the evening's invited speaker, Dr. Dave Goldberg of Drexel University, on "Gravitational Lensing – A View of the Warped Universe." Dave started with a brief explanation of gravitational lensing, showing some images of galaxies whose light has been bent and warped by large masses lying along the line of sight, and gave a plug for his new book, "A Relatively Painless Guide to General Relativity."

But to understand gravitational lensing and what it can tell us about the universe, Dave explained, it's first necessary to understand the basics of gravity. In the early 1600's, Kepler outlined three laws of planetary motion: (1) planets travel in elliptical (as opposed to circular) orbits around the sun; (2) as a planet orbits, it sweeps out equal areas of the orbit in equal times; and (3) the orbital period squared is proportional to the planet's distance from the sun cubed. (Hence Jupiter, which is a little over 5 times further from the sun than the earth, takes about 12 years to orbit the sun, as $5.2^3 \sim 12^2$.) A few decades later, Newton proved Kepler's laws mathematically with his "inverse square law" of gravitational attraction; the gravitational force between two masses is proportional to the inverse square of the distance (i.e. if you double or triple the distance the attractive force goes down by a factor of 4 or 9.)

Newton's finding raised an interesting question. Why is the gravitational force proportional to $1/r^2$? Couldn't it go as $1/r^3$? Or $1/r^{2.73937}$? Why does that exponent seem to be *exactly* 2? This mystery deepens once one goes through the mathematics and shows that stable orbits do not exist for most values other than 2; if we lived in an "inverse cube" universe (or many other possibilities) it would not be possible for the earth to stably orbit the sun. Well, it turns out that it's no accident that the exponent is 2. We live in a three-dimensional universe, and one can imagine the gravitational "tendrils" of a massive object reaching out to larger and larger spheres surrounding it. intensity must drop off equally fast. Hence $1/r^2$.

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The September Monthly Meeting (continued)

With Newton's findings, the foundations of mechanics were laid, and remained firm for several hundred years. But by the late 1800's, a few odd discrepancies were discovered. For example, Mercury's orbit around the sun, which is a distinctly eccentric ellipse, seems to precess around. Most of this precession was understood as a result of interactions with other planets. But even after accounting for all those effects, there was still an anomalous precession amounting to 43 arc-seconds per century. That is, after 100 years, Mercury's orbit shifts by an amount similar to the apparent diameter of Jupiter as seen from a telescope on earth. It's amazing that such a precise measurement could be made, particularly in the 1800's, but the discrepancy was real.

Despite most of these discrepancies being *tiny*, resolution seemed out of grasp, and it fell to none other than Einstein to understand their significance. Einstein reasoned that we must understand gravity in a completely different way. Rather than imagining it as a force between objects suspended in space, gravity is the effect of those objects warping the fabric of spacetime around it! This is the basis of his theory of general relativity, published in 1915. Most of us have seen those depictions of masses bending spacetime around them, like a bowling ball on a trampoline. Dave complained about the limitations of those visualizations, but nonetheless they serve as a visual representation of something which cannot be seen.

Interestingly, under normal conditions, Einstein's GR and Newton's older laws of mechanics predict almost identical outcomes for almost any conceivable experiment. This is why Newton's laws stood for nearly 300 years, and still work very well today (your humble correspondent teaches Newtonian mechanics to university students every week). It's only under the most extreme conditions, or cases where measurements can be made to extraordinary precision, that the differences emerge. Hence the tiny anomalous precession of Mercury being the tiny chink in the armor which brought about a scientific revolution.

The first opportunity to test predictions of Einstein's theory came in 1919, thanks to a total solar eclipse. While both Newton and Einstein predicted that light from a distant star should be bent as it passes by the sun, the two theories differed in their prediction of how much it would bend. The difference was tiny – 1 arc-second, about the limit of seeing on a decent night. Of course, this only happens for light which passes very close to the sun, which unfortunately means the star would be invisible to us. Except, of course, during a total solar eclipse. In 1919 the famed astronomer Arthur Eddington led an expedition to measure the deflection of starlight during a total solar eclipse, and confirmed that Einstein's prediction, and not Newton's, was correct. (There has since been a lot of discussion about how accurately Eddington's team was able to measure those stellar deflections and whether it did indeed definitively confirm Einstein's predictions, but the observation has been repeated in subsequent eclipses to much higher precision, and Einstein's prediction has been confirmed each time.)

Einstein's theory has a number of other significant implications. Among them is the requirement that time ticks at different rates for different observers, known as "time dilation." This can happen because of relative motion (as explained in Einstein's earlier theory of special relativity), or because of the presence of a strong gravitational field. The first experimental test of the latter was conducted at Harvard University by Robert Pound and Glen Rebka in 1959; the Pound-Rebka experiment observed that gamma rays emitted by a radioactive source experienced redshifting (that is, the frequency became lower and the wavelength longer) as the gamma rays traveled upward several floors in the Harvard physics building. This "gravitational time dilation" also means that an astronaut in space ages slightly faster than their identical twin who stays behind on the ground; while this sounds like an obscure hypothetical there is a real-world example of this in the form of astronaut twin brothers Mark and Scott Kelly. (Needless to say, the age difference is so small there would be no way to observe it.)

After this introduction to the bizarre world of gravity, Dave came back to the subject of gravitational lensing. As light passes a massive object, its path bends. This can be a very small bend, as with light passing near the sun, or it can be very large, as with light passing near a black hole. Any mass distribution, however, will cause lensing. In particular, even the presence of dark matter which cannot be seen by our telescopes can be betrayed by the lensing effects they have on background objects. Dave showed the example of the "Bullet Cluster," two galaxy clusters which collided with one another. Interestingly, while a lot of the loose gas became bound up in the center, the dark matter haloes associated with each cluster simply passed through one another and simply kept moving. Of course, we cannot directly see these dark matter haloes, but we can detect their presence by their lensing effects on background objects.

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The September Monthly Meeting (continued)

This gives rise to the notion that we can use lensing to "weigh" the universe, even if those objects cannot be seen.

Dave then briefly discussed some opportunities to continue this research using the James Webb Space Telescope, and of course showed the Webb Deep Field released with the first batch of images, showing a number of galaxies whose light has been bent by foreground objects. Interestingly, Dave pointed out an interesting application of this work, in terms of coming up with better projections for maps; as we all know, it is impossible to display an image of a spherical earth on a flat page without introducing some distortion someplace. Sometimes you never know what applications a field of research will have!

Many thanks to Dave Goldberg for an extremely engaging and accessible introduction to this "heavy" (no pun intended) topic!

September VFNHP Star Party

Photo credit: Mitch Berger

Dark Sky Observing Clinic #2 for Beginning and Intermediate Observers

Green Lane Park
Oct. 15, 2022, 5:30-9:00 pm (Weather backup date Oct. 16)

On August 20th, 11 attendees (9 telescopes) and 7 DVAA staffers were treated to a beautiful dark sky at Green Lane Park. If you missed this clinic, or if you attended on Aug. 20th and would like another dose, we will be offering one more observing clinic for members and their families before the weather turns colder.

Like the previous one, this clinic will be personalized to your level of experience and address your specific questions. Bring your telescope or binoculars and your questions about setup, alignment, viewfinders, eyepieces, observing tools, and celestial targets. Master Observer Al Lamperti will point out the season's constellations and the locations of October's best celestial objects.

Provided the skies cooperate, many of August's celestial targets will still be visible, but we will be adding Jupiter and Mars (maybe even Uranus and Neptune), a better-placed Andromeda galaxy, and the autumn constellations.

The clinic will take place at the field adjacent to Red Trail Parking at Green Lane Park, 2067 Knight Road, Pennsburg PA 18073 (approximately 40 minutes' drive from Radnor). Advance registration for attendees is essential to ensure that we have the right number of DVAA staff on site. During the registration process you will have the opportunity to provide information on any equipment you will be bringing to the clinic to ensure that expert help for your specific scope (or binoculars) will be available. This clinic is open to DVAA members and their immediate family members. Any seasoned DVAA observers who would like to join the staff are welcome; please email veep@dvaa.org if you would like to participate. Please arrive on time by 5:30 pm in order to allow setup during daylight.

We invite newer observers, and any members who would like some individualized telescope time with an expert observer, to join us! To register: ***Telescope Clinic #2***

Below: Last month's dark sky observing clinic at Green Lane Park. Photo credit: Fran Jennings

Recent Images by DVAA Members

This has been a really active time for the astro-imagers in the DVAA. The Sun has become more active in recent months, the planets Saturn & Jupiter are well placed in the night sky and then you have the beautiful nebulas and star clusters that grace the summer and early autumn skies. Below is a gallery of some of the images that were captured in the last few weeks by your fellow DVAA members. If you want to learn more about astrophotography, then consider joining in on the monthly astrophotography group's Zoom meeting.

The Wizard Nebula - NGC7380

C8 XLT Celestron SCT w/focal reducer 6.3 Mounted on an Orion Sirius Pro.

ZWO ASI 1600mm pro mono cooled camera thru ZWO EFW /8 narrow band filters.

120 second exposures per filter (HA & OIII 20 seconds each). Over two days a total of 80 exposures.

Imaged from Apartment's courtyard in Ambler, PA.

Photo credit: Harvey Bass Jr.

The Heart Nebula - IC1805

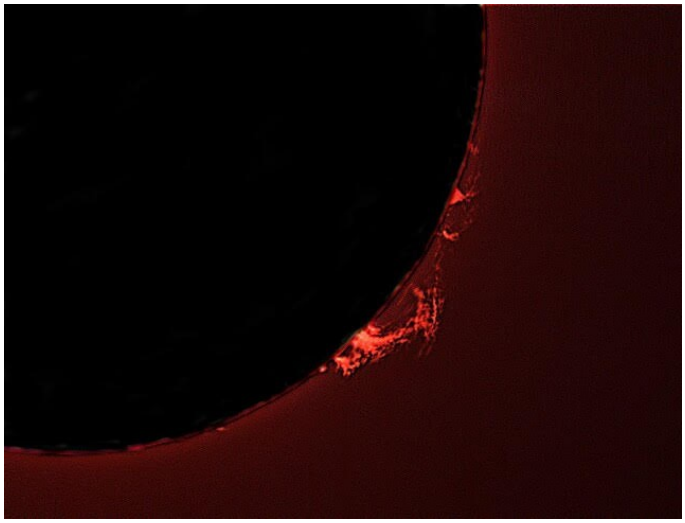
Taken with a William Optics GT71 w/ Flat AIII

ZWO ASI2600 mm

EQ6RPro mount

4 hours total exposure

Photo credit: Garrett Wright



Large Loop Solar Prominence

Taken with a Lunt LS60THa solar scope and a ZWO ASI224mc camera.

SharpCap was used as the capturing software.

25% of the 2000 frame video were stacked using Autostakkert, stacked image was sharpened using Registax wavelets then removed the overexposed parts in GIMP.

Photo credit: Prasad Agrahar

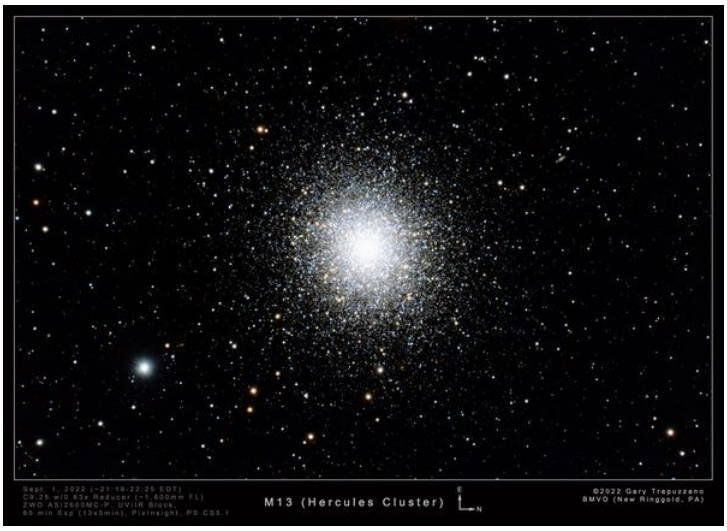
Recent Images by DVAA Members (continued)

NGC 7331 & Stephan's Quintet

Rowe-Ackermann Schmidt Camera
ZWO ASI 2600 (One-shot Color) camera.
85X30 second exposures at 0 Degrees
Processed in Deep Sky Stacker, and Photoshop CS4.

Imaged at Blue Mountain Vista.

Photo credit: Joe Lamb

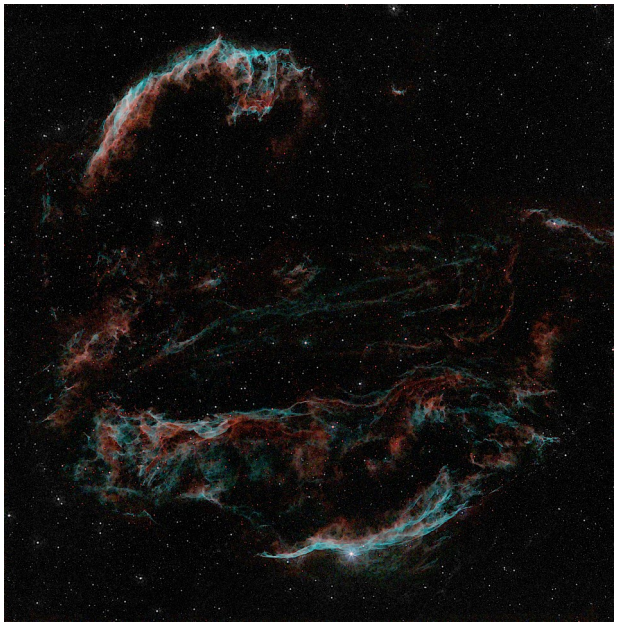


M13 -The Great Hercules Cluster

Celestron C9.25 w/ .063x focal reducer
ZWO ASI2600mc
65 minute total exposure
Imaged at Blue Mountain Vista.

Photo credit: Gary Trapuzzano

Recent Images by DVAA Members (continued)



The Cygnus Loop

Canon F2.8 200mm prime lens stopped down to F/4
ZWO ASI 533MC camera
Total exposure was 160 minutes
Imaged at Hickory Run State Park

Photo credit: Douglas Lentz

M8 & M20 - The Lagoon and Trifid Nebulae

Modified Canon EOS Rebel T6
iOptron mount with iPolar
Manfrotto fluid head
Pentax 200 mm vintage lens

Photo credit: Hari Doraisamy

Saturn

10 inch F8.62 Newtonian Reflector
2x Barlow
ZWO Atmospheric Dispersion Corrector
ZWO ASI462mc

Photo credit: Tom Nolasco

If you would like to participate in DVAA's active astrophotography community, visit the Astrophotography Resource Page on the DVAA website.

Recent Images by DVAA Members (continued)

Cocoon Nebula — IC5146

Celestron C6 SCT w/.63x focal reducer
SkyWatcher AZ-EQ5
ZWO ASI533MC Pro
Total Exposure = 3.3 hours

Photo credit: Steve Haas

North American/Pelican Nebulae—NGC7000

80mm Doublet operating at F/4.9.
Orion StarShoot Pro Deep Space Color Imager (V1)
Total exposure of 65 minutes

Imaged from Penn Valley, PA

Photo credit: Dick Steinberg

The 2022 Fall York County Star Party

Jeremy P. Carlo email

I was able to attend the September 2022 York County Star Party on Friday and Saturday evening, 9/23 and 9/24. The York County Star Party is the descendant of the now-defunct Mason-Dixon Star Party, which was held at a small private airstrip near Dillsburg, PA. The airstrip has since closed, and after floating around between several sites, YCSP has now found a new home, under the leadership of YCSP star party chair Phil DeRosa, as a twice-yearly event at the ball field in Susquehannock State Park. (Despite the star party's name, it's now located in the far western corner of Lancaster County, although that makes it a little bit closer for us to attend.)

The site is easily accessible via paved roads (just watch for Amish buggies in the last couple of miles!). Sky darkness is similar to Blue Mountain Vista, and horizons are relatively clear down, although not super-low, to about 20 degrees in most directions (with a couple of individual trees going up to 30 degrees or so). Flush toilets are available across the road, and there are some hiking trails in the area, as well as a nice scenic overlook called "Hawk Point" about a quarter mile away. While no electrical power is available on the field, there are several outlets in a pavilion adjacent to the field. Interestingly, I had limited cellular service with my Verizon phone, others with AT&T had no problem getting a strong signal; at most other sites I've been to the reverse has been true. (Can you hear me now?)

I arrived just before sundown on Friday. I had hoped to be there a little earlier but Friday afternoon traffic was rather unpleasant. I did a quick setup, inhaled some dinner, and waited for it to get dark. Other attendees told me that Wednesday and Thursday nights both had great observing, although there was some rain on Thursday during the day, and Thursday night was rather windy.

Friday observing started out well, including catching the Io shadow transit across Jupiter, although thin clouds began to roll in after midnight; I packed it in around 1 AM as the clouds thickened and the "sucker holes" became too sparse to bother chasing.

Saturday morning started rather inauspiciously, with a very cloudy sky, and most of us unsure whether we'd stay another night. However, the skies brightened and turned blue by the afternoon, and I decided to stay, since it looked like we might get a few hours before the clouds rolled in again (although no rain was forecast until the late morning or early afternoon of Sunday, by which time I would be gone). It turned out the weather forecast was absolutely right, as clouds rolled in around 9 PM, and by 10 PM it was completely overcast. We called it an early night. I poked my head out every hour or two during the night, but other than occasionally seeing a bright star or two through thinner clouds, it remained overcast. I'll take one and a half observing nights, though!

I didn't have any particularly adventurous observing lists for this trip, so I mostly stuck to the old classics. This includes a tour of the nicest globulars – M13, M92, NGC 6229, M71, M56, M3, M22, M10, M12, M2 and M15. I checked out a number of planetary nebulae, including the Ring Nebula M57, the Dumbbell Nebula M27, the Little Dumbbell M76, NGC 6210 in Hercules, the Cat's Eye NGC 6543, the Emerald Nebula NGC 6572 in Ophiuchus (which has a vivid green color when you look directly at it!), NGC 6905 in Delphinus, NGC 6781 in Aquila, the Blue Snowball NGC 7662, and the Helix Nebula NGC 7293. Somehow I completely skipped over the planetaries in Cygnus. I didn't look at as many open clusters, but spent a good bit of time on M11 in Scutum and several open clusters in Casseiopeia, including M52, NGC 7789, and NGC 457 (the "ET Cluster"), and spent a little time checking out the Pleiades as clouds rolled in on Friday. I also got to see the Lagoon and Trifid Nebulae (M8 and M20), quickly setting in the west at sunset, the Swan Nebula (M17), and the North America Nebula (NGC 7000). In terms of galaxies, I spent some time checking out the M31 system, and some of the other galaxies in Andromeda and Pegasus, including NGC 7331 and NGC 404 (the "Ghost of Mirach," which appears as a faint smudge near Beta Andromedae). I also got to see Jupiter, Saturn, Uranus, and Neptune.

All told, it was a fun weekend, and I look forward to the next YCSP!

Tools for Viewing the Planets

Have you ever wondered, “Is that a star or a moon, and if it’s a moon which one?,” “Can I see the Red Spot on Jupiter tonight?,” or “What features am I seeing on Mars?” Well, if you have, *Sky & Telescope* magazine has several useful tools to answer those questions. These tools listed below will show you the location of the brighter moons for the four outermost planets for any selected date and time. There also is a tool which shows you when Jupiter’s Great Red Spot is on the central meridian, as well as a tool for showing which Martian surface features can be seen at a particular date and time.

Photo credit: Tom Nolasco

Interactive Mars Profiler:
https://skyandtelescope.org/wp-content/plugins/observing-tools/mars_profiler/mars.html

Jupiter’s Great Red Spot central meridian times:
https://skyandtelescope.org/observing/interactive-sky-watching-tools/transit-times-of-jupiters-great-red-spot/

Interactive Jupiter’s moons location tracker:
https://skyandtelescope.org/wp-content/plugins/observing-tools/jupiter_moons/jupiter.html

Interactive Saturn’s moons location tracker:
https://skyandtelescope.org/wp-content/plugins/observing-tools/saturn_moons/saturn.html

Interactive Uranus’s moons location tracker:
https://skyandtelescope.org/wp-content/plugins/observing-tools/uranus_moons/uranian.html

Interactive Neptune’s Triton tracker:
https://skyandtelescope.org/wp-content/plugins/observing-tools/neptune_moons/neptune.html

Would you like to help with this newsletter?

We are currently looking for additional people interested in serving on the editorial board for the award-winning *Delaware Valley Amateur Astronomer.*

Generally this would involve being the “lead editor” for approximately 2 issues per year. (You choose which months!) For the rest of the year, you provide advice/feedback to the lead editor for that month.

Editing is done in Microsoft Publisher (the Club will get you a copy if you don’t have one!), which is similar to Microsoft Word but has some additional features. All distribution is through the club website (no printing / folding / mailing / licking stamps)!

If interested, contact us at newsletter@dvaa.org!

Announcing the DVAA Youth Astronomy Awards for 2022-2023

Cash prizes for elementary, junior high and high school students!

Click on the "Youth Awards" button on the home page. www.dvaa.org.

News from the Astronomical League

New Observing Programs

Two new Observing Programs were recently adopted, and are now live on the Astronomical League Website.

The Solar Neighborhood Observing Program (Marie Lott is the interim Coordinator): This is a program designed to educate the participants about the stars that are the sun's nearest neighbors. https://www.astroleague.org/content/solar-neighborhood-observing-program

Bennett Observing Program (Al Lamperti is the interim Coordinator): This is a program of deep space wonders that is a southern sky equivalent of the Messier Observing Program. It is a complete (107 objects) Observing Program of its own, but it will also be a southern sky alternative to the Messier Observing Program as a requirement for the Master Observer Award. https://www.astroleague.org/content/bennett-observing-program

Program Coordinators Needed

It is once again time to search for Coordinators for some of our Observing Programs. We will begin the selection process in January 2023, but you may submit your name now, noting for which Coordinator roles you are applying. Currently we are looking for members who are interested and willing to help as a Coordinator for the following programs:

- Bennet Observing Program
- Galileo's TOES Certification
- Galileo's TOES-II Certification
- Jupiter Observing Program
- Mentor Award
- NASA Observing Challenge Certification
- Solar Eclipse Special Observing Award - 2024 (planned, not yet approved)
- Solar Neighborhood Observing Program
- And potentially others . . .

Fomalhaut: Not So Lonely After All

David Prosper

This article is distributed by NASA's Night Sky Network (NSN). *The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!*

Fall evenings bring a prominent visitor to southern skies for Northern Hemisphere observers: the bright star **Fomalhaut**! Sometimes called "The Autumn Star," Fomalhaut appears unusually distant from other bright stars in its section of sky, leading to its other nickname: "The Loneliest Star." Since this star appears so low and lonely over the horizon for many observers, is so bright, and often wildly twinkles from atmospheric turbulence, Fomalhaut's brief but bright seasonal appearance often inspires a few startled UFO reports. While definitely out of this world – Fomalhaut is about 25 light years distant from us – it has been extensively studied and is a fascinating, and very identified, stellar object.

Fomalhaut appears solitary, but it does in fact have company. Fomalhaut's entourage includes two stellar companions, both of which keep their distance but are still gravitationally bound. Fomalhaut B (aka TW Piscis Austrini, not to be confused with former planetary candidate Fomalhaut b*), is an orange dwarf star almost a light year distant from its parent star (Fomalhaut A), and Fomalhaut C (aka LP 876-10), a red dwarf star located a little over 3 light years from Fomalhaut A! Surprisingly far from its parent star – even from our view on Earth, Fomalhaut C lies in the constellation Aquarius, while Fomalhaut A and B lie in Piscis Australis, another constellation! – studies of Fomalhaut C confirm it as the third stellar member of the Fomalhaut system, its immense distance still within Fomalhaut A's gravitational influence. So, while not truly "lonely," Fomalhaut A's companions do keep their distance.

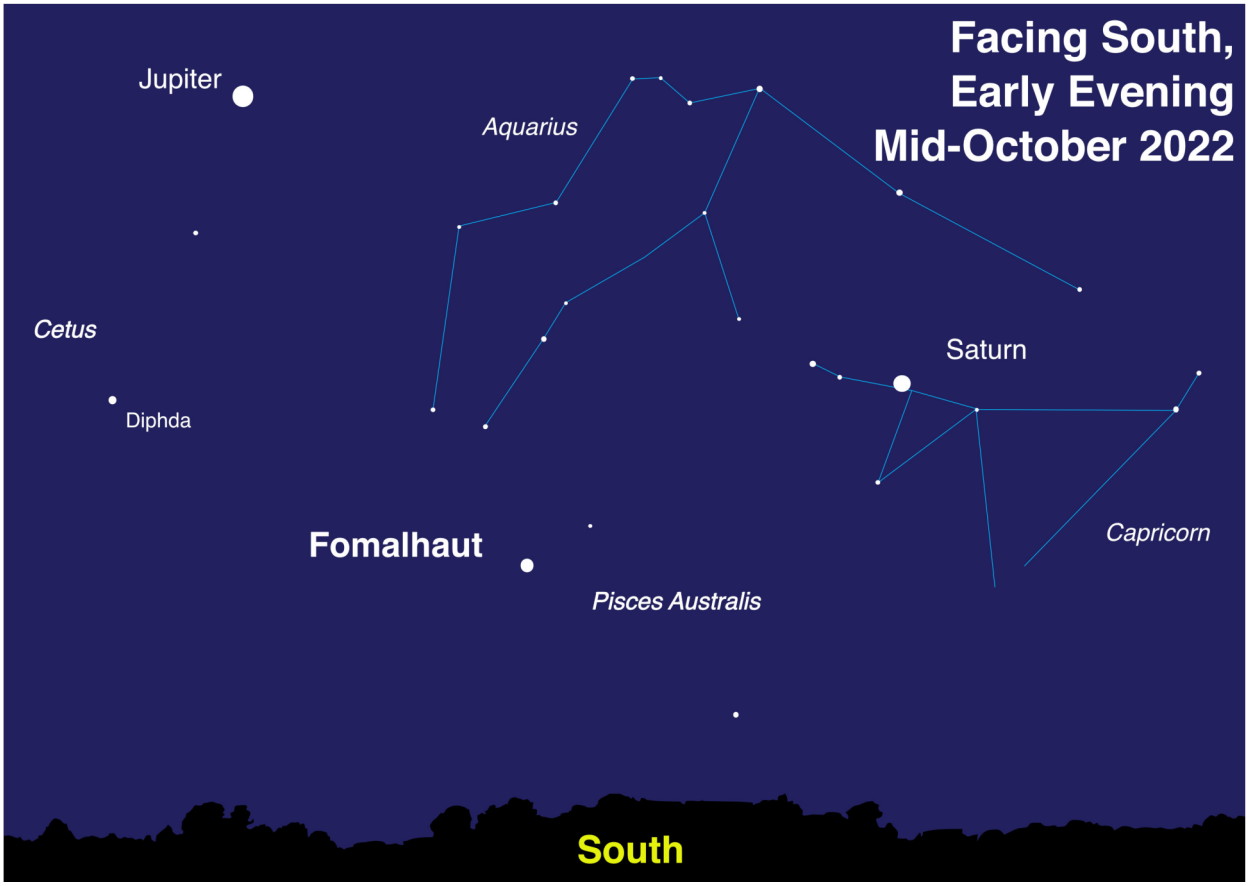
Fomalhaut's most famous feature is a massive and complex disc of debris spanning many billions of miles in diameter. This disc was first detected by NASA's IRAS space telescope in the 1980s, and first imaged in visible light by Hubble in 2004. Studies by additional advanced telescopes, based both on Earth's surface and in space, show the debris around Fomalhaut to be differentiated into several "rings" or "belts" of different sizes and types of materials. Complicating matters further, the disc is not centered on the star itself, but on a point approximately 1.4 billion miles away, or half a billion miles further from Fomalhaut than Saturn is from our own Sun! In the mid-2000s a candidate planetary body was imaged by Hubble and named Fomalhaut b. However, Fomalhaut b was observed to slowly fade over multiple years of observations, and its trajectory appeared to take it out of the system, which is curious behavior for a planet. Scientists now suspect that Hubble observed the shattered debris of a recent violent collision between two 125-mile wide bodies, their impact driving the remains of the now decidedly non-planetary Fomalhaut b out of the system! Interestingly enough, Fomalhaut A isn't the only star in its system to host a dusty disc; Fomalhaut C also hosts a disc, detected by the Herschel Space Observatory

Fomalhaut: Not So Lonely After All *(cont.)*

in 2013. Despite their distance, the two stars may be exchanging material between their discs - including comets! Their co-mingling may help to explain the elliptical nature of both of the stars' debris discs. The odd one out, Fomalhaut B does not possess a debris disc of its own, but may host at least one suspected planet.

While Hubble imaged the infamous "imposter planet" of Fomalhaut b, very few planets have been directly imaged by powerful telescopes, but NASA's James Webb Space Telescope will soon change that. In fact, Webb will be imaging Fomalhaut and its famous disc in the near future, and its tremendous power is sure to tease out more amazing discoveries from its dusty grains. You can learn about the latest discoveries from Webb and NASA's other amazing missions at nasa.gov.

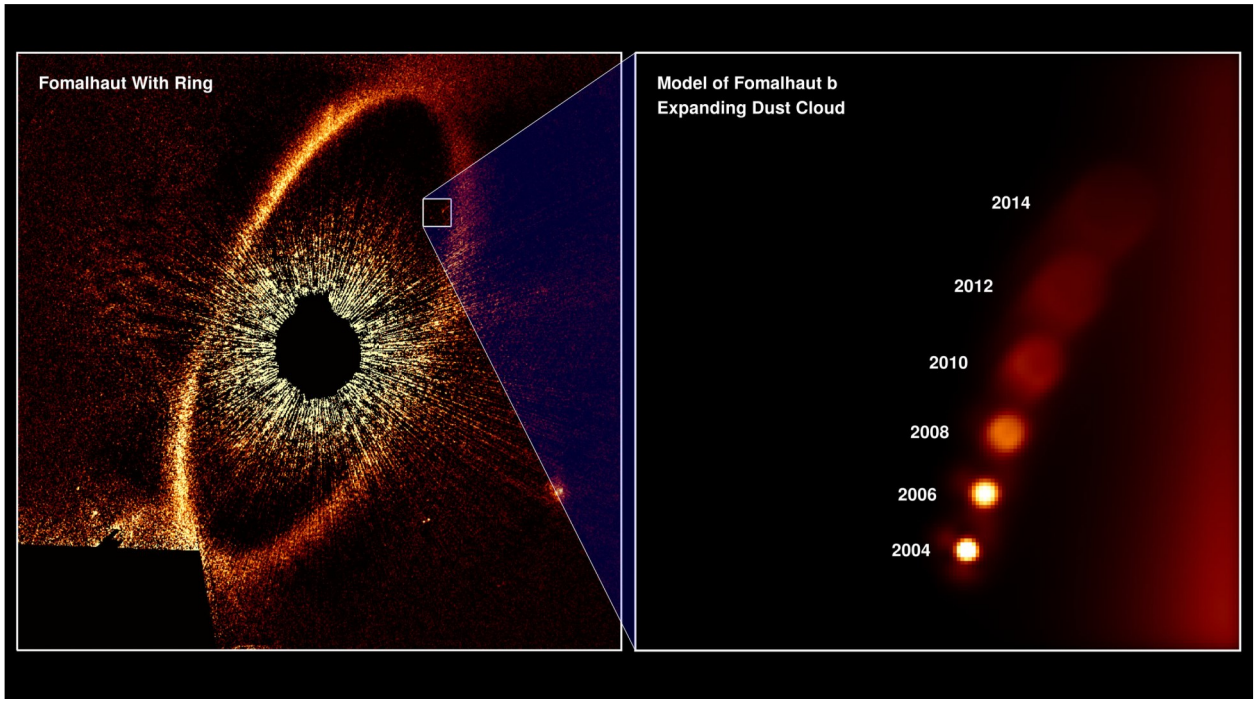
**Astronomers use capital letters to label companion stars, while lowercase letters are used to label planets.*



Sky map of the southern facing sky for mid-latitude Northern Hemisphere observers. With Fomalhaut lying so low for many observers, its fellow member stars in the constellation Piscis Australis won't be easily visible for many without aid due to a combination of light pollution and atmospheric extinction (thick air dimming the light from the stars). Fomalhaut is by far the brightest star in its constellation, and is one of the brightest stars in the night sky. While the dim constellations of Aquarius and Capricorn may also not be visible to many without aid, they are outlined here. While known as the "Loneliest Star," you can see that Fomalhaut has two relatively close and bright visitors this year: Jupiter and Saturn!

Illustration created with assistance from Stellarium.

Fomalhaut: Not So Lonely After All *(cont.)*



The magnificent and complex dust disc of the Fomalhaut system (left) with the path and dissolution of former planetary candidate Fomalhaut b displayed in detail (right).

Image credits: NASA, ESA, and A. Gáspár and G. Rieke (University of Arizona) Source: https://www.nasa.gov/feature/goddard/2020/exoplanet-apparently-disappears-in-latest-hubble-observations

One Last Fall Star Party

The South Jersey Astronomy Club hosts two annual Star Parties.

The 2022 Fall Star Party is scheduled for October 27th – 30th on the recreation field in Belleplain State Forest. This is a rain or shine event.

Mallon Planetarium Shows

Join Mallon Planetarium Director, Adam Chantry, for public shows the **third Wednesday of every month**! The public planetarium show schedule will be released in early September.

SAVE THE DATES

September 21st
October 19th
November 16th
December 21st

SHOWTIMES

5:30pm
7:00pm

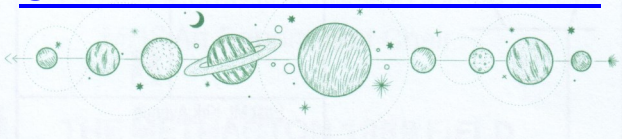
TICKETS

Adults: $8
Students & Senior Citizens: $6

Click Here to Purchase Tickets

LASER LIGHT SHOWS RETURN

Mark your calendars! Mallon Planetarium Laser Shows return in February 2023!



RESERVE YOUR SEATS: www.methacton.org/planettix

Tickets MUST be reserved and paid for in advance via www.methacton.org/planettix to guarantee a seat. Any unreserved seats, will be sold on a first come, first serve basis the evening of the show. ONLY cash or check are accepted at the door for unreserved seats.

ABOUT THE MALLON PLANETARIUM

The Mallon Planetarium is located inside Arcola Middle School (4001-A Eagleville Road, Eagleville, PA 19403) in Methacton School District. Built in 1974, the planetarium has continuously provided unique learning experiences for ALL Methacton students. Our goal, as once stated by the original director and namesake of the planetarium Dr. Gerald Mallon, is to be a laboratory NOT to produce astronomers for the world, but to produce people who are aware of the world around us. The Mallon Planetarium provides co-curricular, extracurricular, and community opportunities for all life-long learners.

+3600 students visit annually
+1230 community members visit annually

SCHEDULE AN ASTRONOMY LESSON!

The Mallon Planetarium offers lessons to Methacton School District classes, outside district school classes, and non-profit community groups. Lessons can be scheduled in our planetarium, in an Arcola building classroom, or just about any location in, and around, Methacton School District. We also offer virtual presentations for groups that meet online.

To get more information on scheduling your group's lesson, please fill out the form at *www.methacton.org/planettix*.

WE'RE ON TWITTER!

@MSDPlanetarium

DVAA Telescope Rentals

Celestron NexStar 5SE

Orion 6” Dosonian

DayStar 60mm Solar Scope

Ioptron Tracker

Orion 6” StarBlast Dobsonian

All scopes include tripod/base, eyepieces, manuals, power, etc. Rental is $10/month with $20 deposit. More info at www.dvaa.org under the OBSERVING tab. To rent one of these scopes, contact Joe Lamb at rentals@dvaa.org.

The Delaware Valley Amateur Astronomers

Since 1976, the **DVAA**, a non-profit corporation, has **shared the wonder and science of astronomy** with thousands of amateur astronomers and the public in the Philadelphia area. Each month we host dark-sky and local star parties, telescope workshops, science & astronomy lectures, educational outreach sessions, and more. To learn more or to join DVAA, please visit **www.dvaa.org**.

Check the schedule for our **free monthly meetings open to the public**, now returning to face-to-face meetings in Radnor, and available on YouTube.

get in on the fun:
JOIN the DVAA TODAY!

Dues are $40 per year for an individual, $60 for a Family Membership, or $10 for a Junior or Student Membership. **Membership benefits** include our monthly newsletter, membership in the Astronomical League (including its publications), access to our dark-sky observing sites, and inexpensive rentals of fine telescopes. You can join or renew online at www.dvaa.org. If paying by mail, include a note stating what you are paying and membership category desired. Make checks payable to “DVAA” and send to our treasurer: Louis Berman, 477 Turner Avenue, Drexel Hill, PA 19026, or for more information contact treasurer@dvaa.org.