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

VOL. 46 NO. 12
DECEMBER 2022

Baby, it's cold outside! How do they do it? Find out at December's monthly meeting: Friday, December 9. Image credit: George Keighton.

PLAN ON IT!

Dec. 2 (5:00 pm) Winter Moon Fireside Tyler Arboretum, Media (for details see PAGE 12)

Dec. 2 (7:00 pm) The Sky Tonight Springfield Township Library, Springfield, PA. Registration required.

Dec. 7 (11:00 pm) Moon & Mars Appulse Less than three arc minutes separation at 11:00 pm.

Dec. 9 (7:00 pm) In-person General Meeting at Radnor Township Building: member night; topic: "Winter Observing" (will also be livestreamed). More info

Dec. 11 (2:00-4:00 pm) Annual Business Meeting (Members Only) More info

Dec. 14 Geminid Meteor Shower Peak

Jan. 2 New Moon. Dark Sky Observing — for the brave, the foolhardy, the well-prepared, and the cold-tolerant

Jan. 6 (7:00 pm) In-person General Meeting at Radnor Township Building. Topic TBD.

Jan. 7 (1:00-2:30 pm) Telescope Workshop for Kids & Teens at Radnor Township Building. More info

Jan. 7 (2:30-4:00 pm) Celestial Objects for Backyard Telescopes at Radnor Township Building. More info

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

CONTENTS:

Welcome New DVAA Members!

Jeffrey Chapman (King of Prussia)
Paul R Curtis (Newtown)
Stephen R Stonberg (Villanova)
Sylvie Stonberg (Villanova)

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, December 9, 2022: *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

Confirmed 2023 Meeting Dates (same location): January 6; February 3; March 3; April 14; May 5; June 2; July 7; August 4; September 22; October 20; November 15; December 15

Public Star Parties

Public star parties will resume in March, and dates for 2023 public star parties will be published early next year.

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.

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.

Dana Priesing is the lead editor for December. Pardon the typos.

Follow the DVAA on Facebook and YouTube!

DVAA Facebook group
DVAA Photo Enthusiasts
YouTube Channel

YouTube

Looking Back

Harold Goldner email

When you look out at the sky, you are looking back in time. The moonlight consists of light which left the moon eight seconds ago. Sunlight is already eight minutes old when it shines down on earth. Light from Sirius left during the last president's term, and light from the Andromeda Galaxy originated before there were humans on the face of the earth.

As I finish my last year as President, I look back on what has been a very easy job because my fellow board members, officers and committee chairs are all deeply committed to the organization and its purposes. So many great things go on around and without me (and sometimes perhaps even in spite of me). It has been an amazing three years, and I am quite certain I will not encounter this level of devotion again in another organization. We faced and overcame huge obstacles, too, created by a global pandemic that made getting together impossible if not risky. I marveled at the creativity with which the club approached star parties as we started to get together in groups again.

Our predecessor officers, board members and committee chairs had the foresight to realize that volunteer organizations constantly need a fresh infusion of participants, and in limiting officers' terms, ensured that nobody could "take over" the DVAA and make it their own private dynasty. That is why I am so pleased that we have a brand-new slate of candidates for office with once new members becoming increasingly engaged and stepping up to help with future administrations of the club.

I cannot say enough about Janet Rush, whose enthusiasm and dedication has often helped me feel like I always had someone to keep me from making a mistake or misstep, and that what had to happen on time did so. She will be a terrific President for DVAA and I hope you are all as excited as I am to see where we go next.

I am sorry that we will lose Mike Tucker and Louis Berman from the board, but I'm sure that when they can, they will continue to contribute, just as many other former Presidents like Joe Lamb, Al Lamperti, and others have continued to serve the members.

I am so very proud of our award-winning newsletter and the great editorial team of Jeremy Carlo, George Keighton, Tom Nolasco, Dana Priesing, Jan Rush and Barclay Thorn. I know even better issues lie ahead, and we should take another shot at the Mabel Stearns Award before long to show them who the best really is. In looking back at my notes from last year, Janet Rush had urged that we hold members-only clinics and in fact we have held several, assisting several members to become more comfortable with their equipment (and even recruiting one or two for the club board!).

I asked Lou Varvarezis to assume the role of Astrophotography Chair. I remember when I was still a new member of the club going out stargazing with Lou one campsite over wrestling with his laptop and trying to figure out imaging. I got such a thrill looking at things through my scope then seeing his images days, weeks or months later of the same thing. It is simply amazing how far his astrophotography has come in such a short time. His most recent images are quite simply breathtaking. He is such a tremendous asset, despite battling his own health issues, yet the Astrophotography Programs this year have been fabulous, even when the subject matter soars way over my head.

I am sorry that the clouds have been so rough on our star parties, and I believe the Friday-as-cloud-date was an interesting idea that did not work in practicality. We should return to Sunday cloud dates for 2023. We do need to figure out a way to staff these star parties, especially if we cannot replace Andrew Hitchner as Observing Chair.

It is wonderful to see that Al Lamperti never tires of showing members and guests the wonders of the night sky, and Barry Johnson is reliably out there fighting the light pollution that threatens our viewing sites. If he could be half as successful against clouds it would be utterly amazing. Joe Lamb has helped reorganize and energize our equipment rental program, and Brian Lee has been especially busy as our membership continues to grow by leaps and bounds.

I'm glad to see that Jeremy Carlo is returning as Programs Chair, especially now that we have returned to fully in-person meetings. We can all look forward to more intriguing presentations from astronomers, cosmologists, and members at upcoming meetings.

Please come join us at the Annual Business Meeting on Sunday, December 11, 2022 at 2:00 p.m. at my home in Bala Cynwyd. Registration is requested and can be done on the DVAA website. There you will have an opportunity to participate in what programs and initiatives the DVAA may undertake in 2023 and beyond. Perhaps you have an idea or program you would like to see ---- come tell us about it.

Finally, as I my term ends, thanks for enduring a few years of my thinking out loud in these pages, and thanks also to every officer, board member, committee chair and club member for making the DVAA the *best* amateur astronomy club in the tri-state area.

Clear skies!

Eleventh Heaven*

Al Lamperti email

[*When I read that Al was selling his Obsession 22" UC, I asked him to write something up describing where it has taken him. - Ed.*]

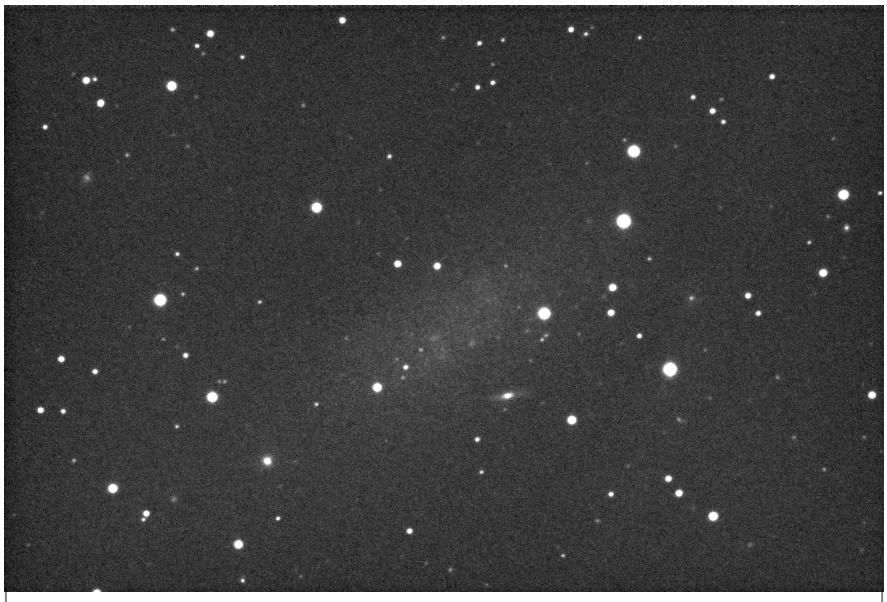
[*Seventh heaven: state of extreme joy; Eleventh heaven: described by the Nahuas (Aztecs) as the **red** region beyond the stars]

Several years ago, I told my astrowidow wife that I was thinking of upgrading my telescope to get more aperture and to see dimmer objects that are deeper into space. Coincidentally, she said that she, too, was thinking of upgrading her sewing machine. We both sold and bought our respective "toys."

Al and his Obsession 22" UC. Photo credit: © Irv Schlanger

I opted for a 22" Obsession Ultra Compact not only for the light grasp and magnifications with my current eyepieces but also for transportability in a minivan. First-light was in **11**/20**11** and for the next **11** years, it gave me some wonderful visual experiences, many off the beaten path. Listed below are **11** of these experiences that were observed from either Blue Mountain Vista (BMV) or Cherry Springs State Park (CSSP).

1. Swept up a large number of Berkeley and King open clusters (*"A Full Deck of Kings,"* S & T 2019).
2. Finished the Southern Arp Peculiar Galaxies Observing Program (OP).
3. Gobs of galaxies in the galaxy cluster Abell 1656 in Coma Berenices as well as Abell planetary nebulae elsewhere.
4. Globular clusters in other galaxies, e.g., Hodge 5 in NGC 185 (from Weston, VT).
5. Dwarf galaxies IC-10, NGC-147, Andromeda I, Pegasus Dwarf (UGC 12613).
6. McNeil's (variable) nebula in Orion in 2013 before its reported disappearance in 2018. At 450x, it was just a hint that something was there.



UGC 12613 in Pegasus. Image credit: Richard Steinberg.

7. 100 asteroids each seen and sketched twice at two different times to show movement relative to background stars to finish the Asteroid OP, 1 of 8 OPs of the Astronomical League finished in this time frame.
8. A host of very unique objects far, far away: quasars (*"Ancient Photons"*; S & T 2018).

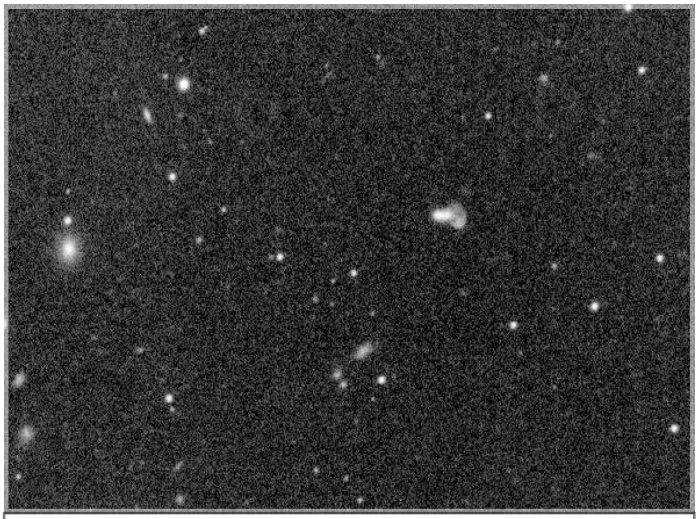
Eleventh Heaven, cont.

9. Observe or reobserve 49 Ring galaxies (result of galactic interactions; 25 showed rings, when detected at optimal elevation at the time of observation, as a haze around the core; in 23 just the cores were seen and in one other, negative, probably too low in sky; tentatively S & T 2024).

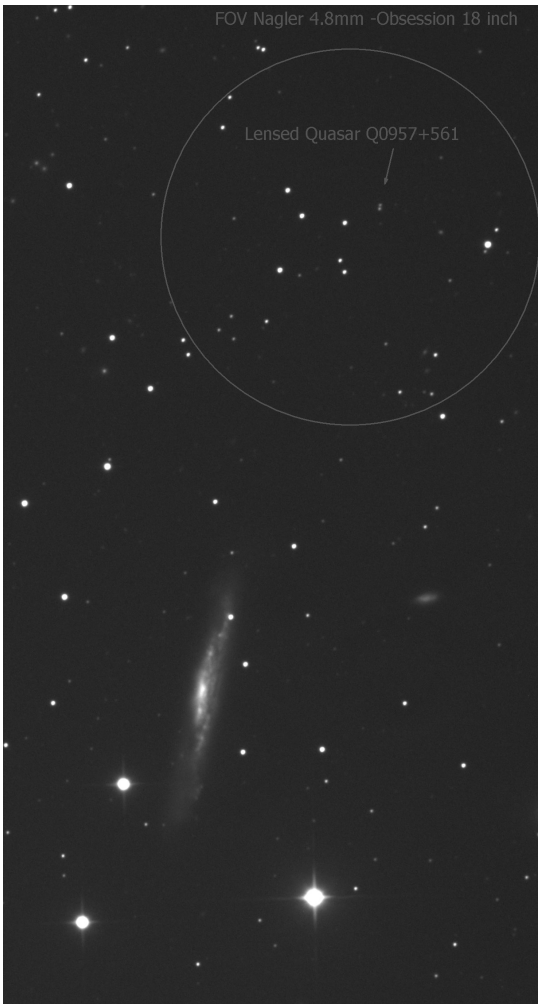
10. Mayall's Object (Arp 148) seen at 450x as two objects touching each other at 500 million light years (ly).

11. Gravitationally lensed quasars: QSO B0957+561 in Ursa Major (looks like a close double star; 8 billion ly); the foreground galaxy (CGCG 378-15, 600 million ly) forming Einstein's Cross in Pegasus (splittable at 450x with steady seeing) also at 8 billion ly and finally, at the top of my list, the deepest, the Parachute quasar in Andromeda J014709+463037 (I only saw 2 of the 4 components from CSSP at 770x at moments of steady seeing). This had a **red**shift value z = 2.377 or **11**.4 billion ly travel time!

Needless to say, the visual experiences will always remain indelible. However, there comes a time when loading and unloading the car, setting up the telescope, tearing down and loading the car and then unloading and storing gear the next day becomes a bit of a chore. So, with some relief and with very many pleasant memories, I have decided to downsize to a more manageable telescope (a used 15" Obsession Classic) with a Zambuto mirror. (The astrowidow approves wholeheartedly too!) So, what was the "first-light" object seen with this telescope? You may have guessed from the theme…… M-**11** in Scutum!



Mayall's Object, Arp 148. Image credit: Richard Steinberg.



QSO B0957+561 in Ursa Major. Image credit: Frank Colosimo

Next Monthly Meeting: December 9, 2022

"Winter Observing" - Member Night Presentations

- ***Winter Observing 101 / Winter Weather Gear*** **- Jeremy Carlo**
- ***The Winter Triangle - Observing in Canis Major & Environs*** **- Al Lamperti**
- ***Stargazing in Hawai'i*** **- Jan Rush**
- ***Winter Astrophotography*** **- Lou Varvarezis & the Astrophotography Committee**

The November Monthly Meeting

Jeremy P. Carlo email

The DVAA November 2022 meeting was held at the Radnor Township Building, and was opened by President Harold Goldner. Harold welcomed a number of new attendees; Welcoming Chair Brian Lee reported 7 new members for the month! Harold announced the Annual Business Meeting, which will be held at his house on December 11 at 2:00 PM. He also gave an update on ongoing elections, as several of our elected positions are term-limited and new candidates will be needed; in particular at the time of the meeting we were looking for candidates to run for Treasurer and Vice President. Treasurer Lou Berman reminded members that the time for dues renewal is upon us. The next Public Star Party at Valley Forge will be held in two days, on Sunday evening (due to inclement weather forecast for Saturday). Astrophotography Chair Lou Varvarezis reported that they have been holding successful monthly Zoom meetings, and that their next meeting on December 7 will feature Agapios Elia, an accomplished astrophotographer from Cyprus, and will focus on the upcoming Mars opposition. Finally, Camping "Czar" (or is it Tsar?) gave a video address discussing possibilities for a return to camping trips in 2023 after a Covid-induced interruption.

With committee reports complete, Programs Chair Jeremy Carlo introduced the evening's invited speaker, Dr. Rick Schwarz. Rick is a DVAA member, and has also been extensively involved in exoplanet research. Rick's talk was entitled "So Many Worlds."

Rick started with a brief overview of the history of exoplanet research. The first planet around another (normal) star was found in 1995 around 51 Pegasi, a sunlike star about 50 light-years away. Named 51 Pegasi B, this planet is a prototypical "hot Jupiter:" a Jupiter-sized gas giant planet with a 4.23 day orbit around its parent star. At this close distance, its surface temperature is estimated to be 1265 Kelvin (1800 Fahrenheit). Since then numerous other planets have been discovered; as of November 10, 2022 there are 5197 confirmed exoplanets! It is estimated that on average there is one planet for each star in the galaxy, and that 1 in 4 sunlike stars has a planet in the so-called Habitable Zone, the region in which liquid water (and hence earth-like life) could possibly exist. This "Habitable Zone" typically ranges from about 0.75 to 1.5 AU from a sunlike star; the earth is at 1.0 AU, while Venus and Mars lie right on the inner and outer edges of the habitable zone, respectively. Much further back in history, Giordano Bruno postulated that there were innumerable suns and infinite earths in the Universe, thoughts which got him burnt at the stake in 1600, although 400 years hence we now know he was pretty much right. Finally, Rick posted a relevant quote from Alfred Lord Tennyson: "So many worlds, So much to do, So little done, Such things to be!"

Nowadays, exoplanet research has four areas of focus. First is "exoplanet demographics" – what is their distribution of mass, radius, orbital characteristics, and so on? Secondly comes "exoplanet characterization" – going a little further than mere discovery and determination of size, now we wish to characterize the atmospheric and surface composition. Thirdly, understanding the formation of exoplanets – how did they come into being and evolve? Finally, the search for habitable exoplanets, which is also predicated on determining what conditions are necessary for a planet to be "habitable" in the first place. And these points lead us back to some rather introspective questions of ourselves: Where did we come from? Are we alone in the universe?

With the basics out of the way, Rick got into the specifics of exoplanet research, and his role in it. The crucial mission here is the Transiting Exoplanet Survey Satellite (TESS), which is a space-based observatory which has been studying millions of stars, looking for telltale dips in their brightness characteristic of those planets passing in front of their parent stars (what we could call a "transit," we we sometimes see from Earth when Mercury or Venus passes in front of the Sun). The TESS team is led by researchers at MIT, Harvard, NASA's Goddard Spaceflight Center and Ames Research Center, as well as staff at Northrop Grumman and the Space Telescope Science Institute (STScI). It was launched in April 2018 aboard a SpaceX Falcon-9. After 3 months achieving its orbit and calibrating, its science mission began. Its primary mission ran from 2018-2020, followed by an extended mission in 2020-2022, and is now on its second extended mission, scheduled to run through 2025. TESS is able to take in so much data because it has four wide-field cameras each covering an area of 24 by 24 degrees. Each camera has a massive CCD detector cooled to -75 degrees, and by slowly rastering across the sky, the whole sky can be covered in two years (hence the 2-year missions).

Rick then gave an overview of how TESS (and other missions such as Kepler, and a number of ground-

(Continued on next page)

The November Monthly Meeting (continued)

based exoplanet searches) works. This is based on the "transit method," which looks for tiny dips in brightness (typically around 0.1% or less) when a planet passes in front of its parent star. Other exoplanets have been discovered by other techniques, such as the Doppler shift technique used to find 51 Pegasi b, but the transit method is used by TESS. Rick explained how the transit method not only detects the existence of exoplanets but can also determine their basic properties. How frequently a transit repeats tells us the orbital period. That, with the mass of the star, tells us how far it is from its parent star. The depth of the eclipse (i.e. what percentage of light is blocked) tells us how large the planet is. The duration of the eclipses, and how long it takes to go in and out of eclipse, tells us more about the planet's orbit. Finally, variations in the timing of these events can be used to detect the existence of other (perhaps unseen) planets which perturb the orbit of the planet whose transits are being observed. In all, as of November 2022, there are just over 6000 planets and planet candidates detected by TESS, and it is anticipated that TESS will eventually find 12-13 thousand, as the extended mission will survey 400 million stars down to magnitude 18.

Despite its advanced capabilities, TESS is a rather small telescope, so despite its ability to survey many stars at once, it cannot provide detailed observations of each. That is where the TESS Follow-Up Observing Program (TFOP) comes in, using larger ground-based telescopes to follow up on promising leads from the TESS satellite. This campaign typically uses meter-size telescopes, divided into several groups. Rick's work is in Subgroup 1, entitled "Seeing-limited Photometry." Other subgroups concentrate on spectroscopy, high-resolution imaging, radial velocity measurements, and space-based photometry.

Rick then discussed some of his accomplishments with the TESS Follow-Up Observing Program. His observations have been reported in 62 publications, including hundreds of other scientists from all seven continents as co-authors. For his work, Rick uses several telescopes in the Las Cumbres Observatory Global Telescope Network (LCOGT). These are fully robotic telescopes at mountaintop sites around the world; remote users enter the parameters for their observations, the system automatically schedules the observation, and the telescope automatically collects the requested data and makes it available to the user online. Sites include Haleakala in the state of Hawai'I, McDonald Observatory in Texas, Teide Observatory in the Canary Islands, Cerro Tololo in South America, Siding Spring in Australia, and observatories in South Africa and Israel; another telescope is currently under construction in the Himalayas in Tibet! Rick has used both 1-meter and 2-meter telescopes, all of the Ritchey-Chretien design.

Rick then discussed several examples of exoplanets he has observed. For example, TOI-1233 is a compact, four-planet system. All four planets orbit well within where Mercury would orbit the sun. The parent star in this case is quite similar to the sun, and is visible in our skies ay magnitude 9.25. TOI-270 is a three-planet system containing one "super earth" and two "sub-Neptunes" orbiting a magnitude 12.6 parent star. TOI-2109 contains an "ultra-hot Jupiter" with a 16-hour orbital period and an estimated temperature of 3600 K (6000 F). Several multi-star systems with planets have been detected; in some cases, the planet orbits one of the two stars, although in so-called "circumbinary" systems, the planet has a wide orbit around both stars! In the case of TOI-455, a planet was found in a triple-star system; the paper describing this system was entitled "Three Red Suns in the Sky."

To conclude, Rick talked about some of the more general findings gleaned from studies of thousands of exoplanets and exoplanet candidates. While the first detected planets were all similar in size to Jupiter, this was only because of limited sensitivity; smaller planets simply could not be detected. Nowadays, planets down to about the size of the earth can be routinely detected, and enough are known that we can make some statements about the distribution of planet sizes. We may recall that in our own solar system there are basically two types of planets – very large "gas giants," and smaller "terrestrial" planets which are rocky in nature. It appears this distinction exists in other solar systems; there are many planets similar in size to the earth, and some which are slightly larger (called "super-earths"), and there are larger planets going down to somewhat smaller in size than Neptune (called "sub-Neptunes"). However, there is a dearth of planets in intermediate size ranges, through the so-called "radius valley" of 1.5 – 2.0 earth radii. This may be the boundary between "terrestrial" and "gas giant" planets – once you get to a certain size, there is a sort of snowball effect which causes more volatile materials (such as gases) to accumulate onto the planet, increasing its size further. A potential complication, though, is that sometimes the larger planets are found closer to their parent star than the smaller ones, which is opposite what we see in our solar system, and also surprising as the higher temperatures closer to a star should make it more difficult to accumulate volatile materials. However, a lot of computational work suggests that planets migrate around in early solar systems, and more recent work has looked at how planetary systems evolve out of protoplanetary disks of gas and dust.

(Continued on next page)

The November Monthly Meeting (continued)

Who could have imagined how much would have been learned in the 27 years since 51 Pegasi b was discovered? Reality, Rick reminded us, is often wilder than our imagination. Shakespeare said in Hamlet that "There are more things in heaven and earth, dear Horatio, than are dreamt of in your philosophy." And Neil deGrasse Tyson said that the universe is under no obligation to make sense to you. What these discoveries do is fill you with a sense of awe, humility, inspiration, and optimism. So many worlds, So much to do, So little done, Such things to be!

Many thanks to Rick Schwarz for an exciting and informative presentation on his latest work in exoplanet research!

IT'S TIME TO VOTE!

It's time again to vote for DVAA officers. Members should have received an email within the past few days with a link to the secure electronic ballot.

Candidates for 2023 Officers:

President:	**Jan Rush**
Vice President:	**Tom Nolasco**
Treasurer:	**Scott Vanaman**
Secretary:	**George Keighton**
Members-at-Large:	**John Gaskill**
	Tracey Trapuzzano

Make your vote count!

Many of you are no doubt fans of Neil deGrasse Tyson and his popular TV show "Star Talk". An upcoming episode is being filmed at the Keswick Theater in Glenside on Thursday, April 27 (8pm). DVAA has acquired a block of 20 tickets for the live audience, which are available to members at the discounted price of $35/ticket. Demand has been brisk, and only a few tickets remain in the DVAA block. If tickets are sold out, you may register for the waiting list in case any current ticket holders are unable to attend. Register for a tickets in the DVAA block at DVAA.org using this suggested procedure:

1. Use a computer not a smart phone
2. Be sure you are logged on to the website www.dvaa.org
3. Click the Events tab
4. Navigate to April 2023 and click on the Neil deGrasse Tyson event
5. Click the Register button and follow the prompts to register and pay by credit card.

You will receive a registration confirmation. Tickets will be distributed electronically after January 1, 2023 to the email address on your DVAA member profile. General admission tickets may also be available through the Keswick Theater.

Indoor Workshops: Telescopes & Observing

Jan Rush email

During the winter months, DVAA will be offering free indoor astronomy workshops at the Radnor Township Municipal Building for members and family on Jan. 7, Feb. 25, and March 4. Two workshops on Jan. 7 are now open for registration!

Telescope Workshop for Kids and Teens

Saturday, January 7, 2023, 1:00 PM until 2:30 PM

DVAA is pleased to announce a new workshop series in 2023 dedicated just to younger astronomy enthusiasts! DVAA is currently privileged to have 7 junior members, 5 family members with children, and no doubt dozens of children and grandchildren of members who are curious about the sky.


Image credit: Nicole Denofa

In this hands-on workshop, we will have different types of scopes set up for you to operate. Attendees who own telescopes can bring their scopes indoors to practice set up, aligning and focusing, and receive hints and pointers on operating the scope and observing the sky. We will have information on astronomy apps, rental scopes, DVAA Youth Astronomy Awards and the Astronomical League's Sky Puppy program. This is a also a chance to meet other kids and teens who are interested in astronomy!

Open to junior DVAA members, family members, and children and grandchildren of regular members. Register here. We will need at least 5 registrants in order to hold the workshop. *Attendees under age 18 must be accompanied by a parent or responsible adult.*

Celestial Objects for Backyard Telescopes

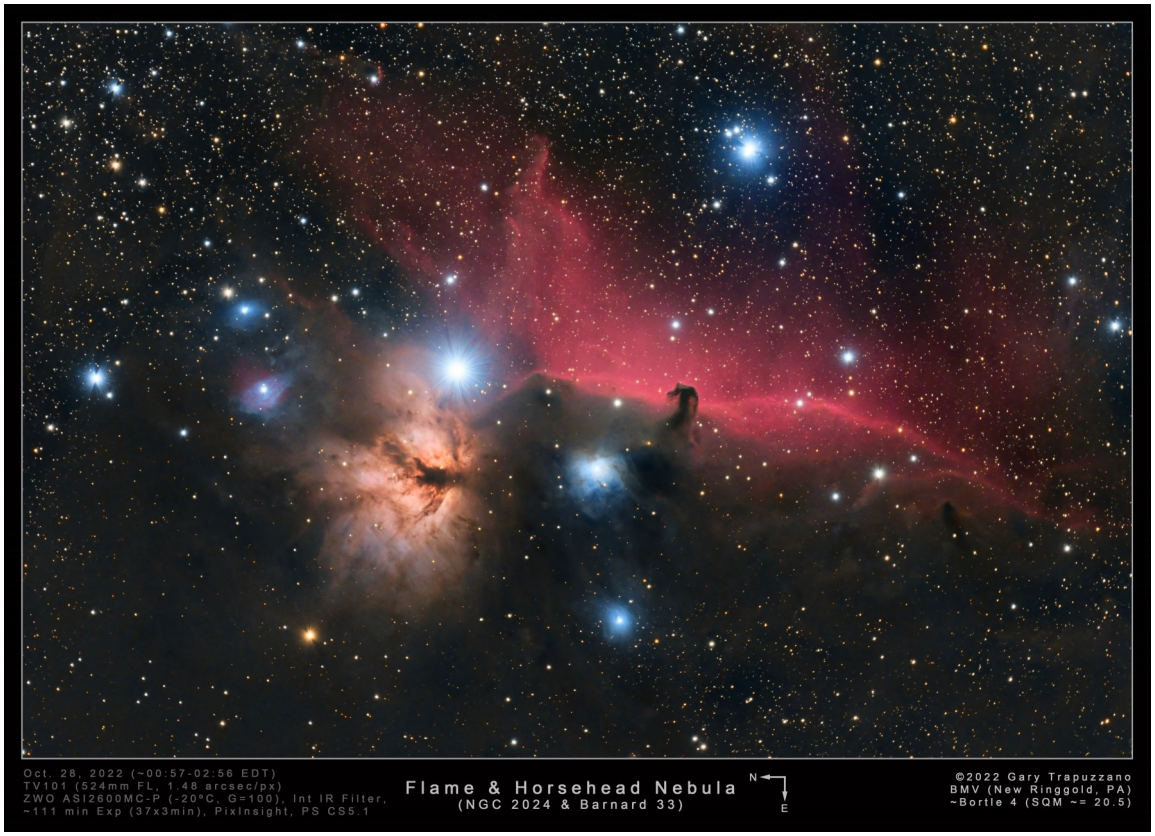
Saturday, January 7, 2023, 2:30 PM until 4:00 PM

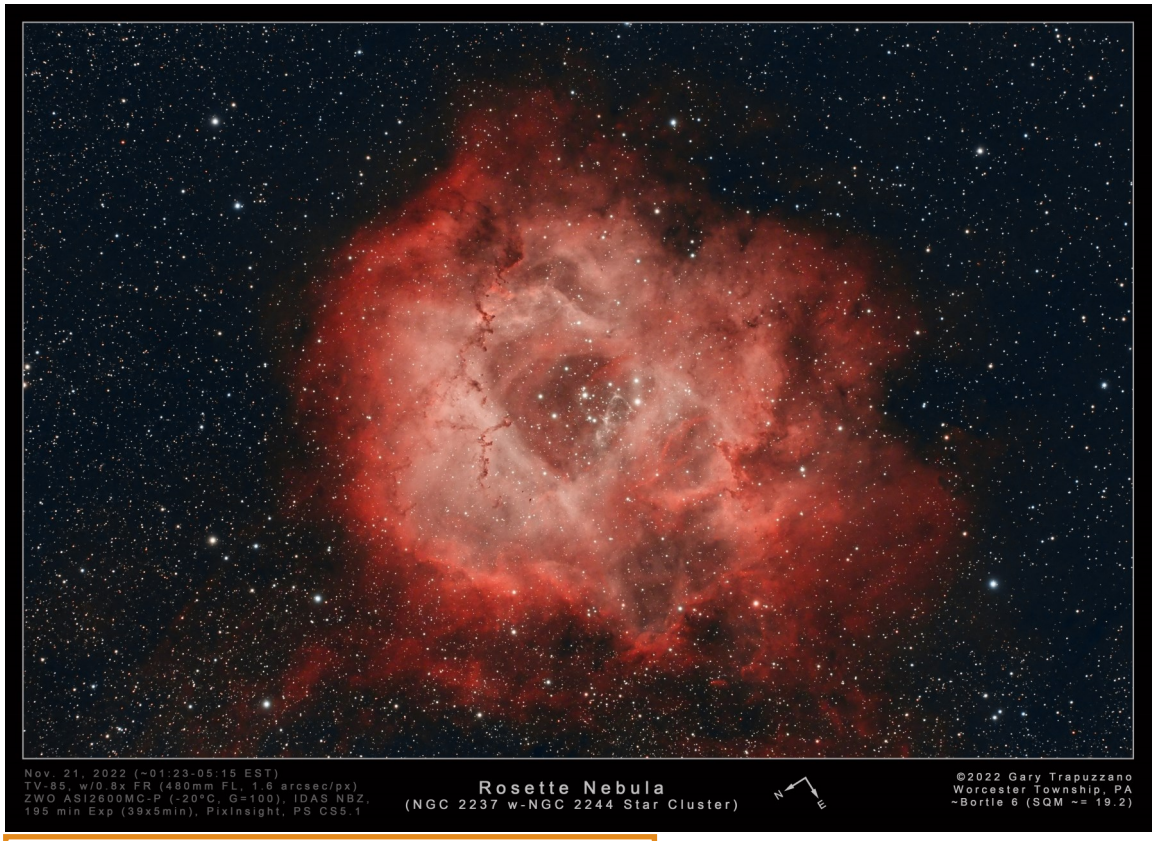

Image credit: Frank Colosimo

This presentation will begin with a lecture/slideshow on visual observing of celestial objects, presented by Master Observer Al Lamperti. If you have ever wondered about the difference between an asterism and an open cluster, or a how to tell a nebula from a galaxy when viewed with a backyard telescope, this presentation will clear up those mysteries. Learn which eyepieces and filters to use to observe various types of objects, and how to describe and categorize what you are observing. After the presentation, small telescopes will be available in the room for any attendees who would like to stay and learn more about types of telescopes and how they are operated.

Register here. Open to anyone nine years and older. We need at least 10 registrants in order to hold the workshop. *Attendees under age 18 must be accompanied by a parent or responsible adult.*

Recent Images by DVAA Members





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

Turn this page sideways to see these two great images by Tom Nolasco: a composite of Mars images, and Jupiter with a Ganymede transit.

Winter Moon Fireside At Tyler Arboretum Jan. 2

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.

From the arboretum:

"The secrets of the night sky have long inspired art, mythology and science. Right now we're at an exciting moment for lunar exploration, with the Artemis missions planning to land people on the moon for the first time in fifty years and the Lunar Codex, which will transport collected arts in a time capsule to the lunar landscape. There's no better time to engage with the wonder and mystery of space. Join us on Friday, December 2 from 5:00 - 8:00 pm for a brand-new event at Tyler: fireside moonlit evening! Winter is the best time for star-gazing and moon watching in Southeastern PA. Join us to take in the beauty of the night sky while enjoying s'mores and hot chocolate fireside in Tyler's Historic Core. This event is free and open to the public."

"On Friday, December 2 from 5:00 - 8:00 pm we will also feature The Legends of the Moon art exhibit in the Tyler Barn showcasing the original works selected for inclusion in the Lunar Codex. You'll meet with the artists, enjoy light refreshments, and listen to the ethereal music of harpist Joanna Marini Dindinger."

[*Note: DVAA is supporting this event. Additional telescopes are welcome. Contact Jan Rush if interested in bringing a telescope.—Ed.*]

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 . . .

Binoculars: A Great First Telescope

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!*

Do you want to peer deeper into the night sky? Are you feeling the urge to buy a telescope? There are so many options for budding astronomers that choosing one can be overwhelming. A first telescope should be easy to use and provide good quality views while being affordable. As it turns out, those requirements make the first telescope of choice for many stargazers something unexpected: a good pair of binoculars!

Binoculars are an excellent first instrument because they are generally easy to use and more versatile than most telescopes. Binoculars can be used for activities like stargazing and birdwatching, and work great in the field at a star party, along the hiking trail, and anywhere else where you can see the sky. Binoculars also travel well, since they easily fit into carry-on luggage – a difficult feat for most telescopes! A good pair of binoculars, ranging in specifications from 7x35 to 10x50, will give you great views of the Moon, large open star clusters like the Pleiades (M45), and, from dark skies, larger bright galaxies like the Andromeda Galaxy (M31) and large nebulae like the Orion Nebula (M42). While you likely won't be able to see Saturn's rings, as you practice your observing skills you may be able to spot Jupiter's moons, along with some globular clusters and fainter nebulae from dark sites, too.

What do the numbers on those binocular specs actually mean? The first number is the magnification, while the second number is the size in millimeters (mm) of the lenses. So, a 7x35 pair of binoculars means that they will magnify 7 times using lenses 35 mm in diameter. It can be tempting to get the biggest binoculars you can find, but try not to get anything much more powerful than a 10x50 pair at first. Larger binoculars with more power often have narrower fields of vision and are heavier; while technically more powerful, they are also more difficult to hold steadily in your hands and "jiggle" quite a bit unless you buy much more expensive binoculars with image stabilization, or mount them to a tripod.

Would it surprise you that amazing views of some astronomical objects can be found not just from giant telescopes, but also from seemingly humble binoculars? Binoculars are able to show a much larger field of view of the sky compared to most telescopes. For example, most telescopes are unable to keep the entirety of the Pleiades or Andromeda Galaxy entirely inside the view of most eyepieces. Binoculars are also a great investment for more advanced observing, as later on they are useful for hunting down objects to then observe in more detail with a telescope.

If you are able to do so, real-world advice and experience is still the best for something you will be spending a lot of time with! Going to an in-person star party hosted by a local club is a great way to get familiar with telescopes and binoculars of all

Want to help with this newsletter?

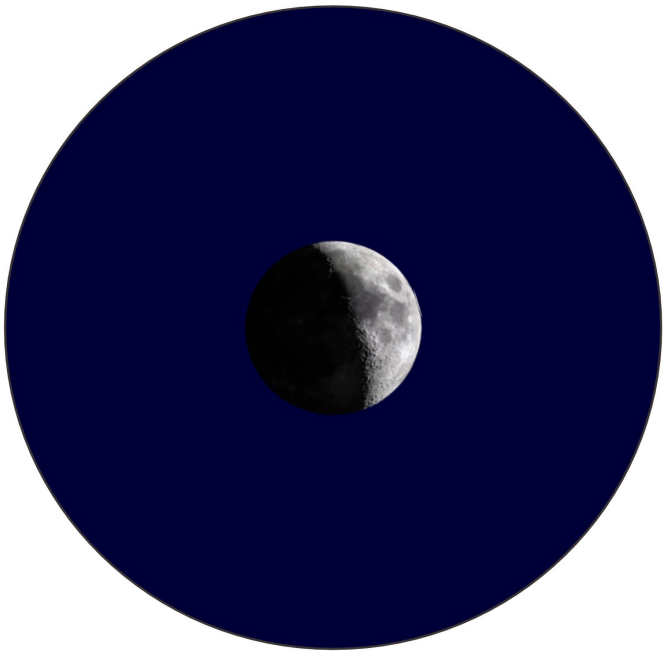
We are looking for additional people interested in serving on the editorial board for the award-winning *Delaware Valley Amateur Astronomer.*

Generally this would involve being the "lead editor" for approximately two 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 simi-

Binoculars, a Great First Scope (cont.)

kinds – just ask permission before taking a closer look! You can find clubs and star parties near you on the Night Sky Network's Clubs & Events page at bit.ly/nsnclubsandevents, and inspire your binocular stargazing sessions with NASA's latest discoveries at nasa.gov.

The two most popular types of binocular designs are shown here: **roof-prism** binoculars (*left*) and **porro-prism** binoculars (*right*). Roof prisms tend to be more compact, lighter, and a bit more portable, while porro-prisms tend to be heavier but often offer wider views and greater magnification. What should you choose? Many birders and frequent fliers often choose roof-prism models for their portability. Many observers who prefer to observe fainter deep-sky objects or who use a tripod with their observing choose larger porro-prism designs. There is no right answer, so if you can, try out both designs and see which works better for you.



A pair of good binoculars can show craters on the Moon around 6 miles (10 km) across and larger. How large is that? It would take you about two hours to hike across a similar-sized crater on Earth. The "Can You See the Flag On the Moon?" handout showcases the levels of detail that different instruments can typically observe on the Moon, available at bit.ly/flagmoon. *Moon image courtesy Jay Tanner*

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.