

amateur ASTRONOMER



sharing the wonder and science of astronomy



At Starry Nights Ranch in Basinger FL (Bortle 3), where it was clear but cold, Dan Stern captured this beautiful composition of the Flame & Horsehead nebulae.

Dan used a Takahashi TOA-130NFB with a ZWO ASI2600MC camera. He took 71 x 300 seconds subs for a total exposure of nearly 6 hours.

NINA was used for the Data acquisition and the image was processed using Pix-Insight.

PLAN ON IT!

Feb. 1 (7:30 pm) Astrophotography Workshop on-line Zoom meeting (see events calendar on website for link)

Feb. 3 (7:00 pm) In-person General Meeting at Radnor Township Building. Dr. Amber Stuver of Villanova University will be discussing Astronomy with Gravitational Waves.

Feb. 20 New Moon. Dark Sky Observing — for the brave, the foolhardy, the well-prepared, and the cold-tolerant.

Feb. 25 (1:30-3:00 pm) Observing with Sky Safari at Radnor Township Building. [More info](#)

Feb. 25 (3:00-4:30 pm) Collimating Your Reflecting Telescope at Radnor Township Building. [More info](#)

Mar. 1 (7:30 pm) Astrophotography Workshop on-line Zoom meeting (see events calendar on website for link)

Mar. 3 (7:00 pm) In-person General Meeting at Radnor Township Building. Dr Dylan Pare of Villanova University will discuss the Galactic Center.

Mar. 4 (1:30-4:30 pm) Astrophotography Clinic at Radnor Township Building. [More info](#)

Mar. 21 New Moon. Dark Sky Observing

Mar. 25 (7:00 pm) Public Star Party at Valley Forge National Historical Park model airplane field.

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

CONTENTS:

Club News & Events
PAGES 2, 13

Comet 2022/E3 (ZTF)
PAGE 3-4

Pictures from the January Workshops
Jan Rush
PAGES 5

You Can't Get There from Here
Harold Goldner
PAGES 6

Seeing in the Bright
Tom Nolasco
PAGE 7-8

The January Monthly Meeting
Jeremy Carlo
PAGES 9-10

Western Astro-Imaging Adventure
Mark Firary
PAGES 11-12

A Beautiful Lunar & Planetary Alignment
PAGE 14

Indoor Workshops: Observing & Astrophotography
Jan Rush
PAGE 15

Recent DVAA Astrophotography Images
PAGES 16-19

Spot the King of Planets: Observe Jupiter
David Prosper
PAGES 20-21

DVAA Night at the Mallon Planetarium
PAGE 22

Mallon Planetarium Shows
PAGE 23

Telescope Rentals
PAGE 24

Welcome New DVAA Members!

John Ficke (Collegeville, PA)
 John Leimgruber (Philadelphia, PA)
 Mike Montalbano (Philadelphia, PA)
 Theo Montalbano (Philadelphia, PA)
 Rita Pang (Media, PA)
 Maura Smith-Mitsky (Camp Hill, PA)
 Katrina Richter (Philadelphia, PA)
 Matthew N Tones (Philadelphia, PA)

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	Jan Rush	president@dvaa.org
Vice-President	Tom Nolasco	veep@dvaa.org
Secretary	George Keighton	secretary@dvaa.org
Treasurer & Astronomical League Coordinator	Scott Vanaman	treasurer@dvaa.org
Members-at-Large	Tracey Trapuzzano John Gaskill Jeff Miller	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	lpollution@dvaa.org
Observing		observing@dvaa.org
Outreach	Jan Rush	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, February 3, 2023: *Details on page 13.*

Monthly Meetings are held at 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): February 3; March 3; April 14; May 5; June 2; July 7; August 25; September 22; October 20; November 17; December 15

2023 Public Star Parties

DVAA public star parties are held at Valley Forge National Historical Park on the Model Airplane Field. ([Google Maps](#)).

Public Star Party dates for 2023 (all Saturday evenings):
Mar. 25 (7:00), **Apr. 29** (8:00), **May 27** (8:30), **Jun. 24** (8:30), **Jul. 22** (8:30), **Aug 26** (8:00), **Sep. 23** (7:00), **Oct. 21** (6:00), **Nov. 18** (4:30).

New this year: Backup dates will be designated the Sunday following each date above. Check your email or the website, 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.

Tom Nolasco is the lead editor for February.

Follow the DVAA on Facebook and YouTube!



DVAA [Facebook](#) group
 DVAA [Photo Enthusiasts](#)
[YouTube Channel](#)



Comet C/2022 E3 (ZTF)

Tom Nolasco [email](#)

First a reality check. Some recent headlines would have you believe that this is a visually bright green comet easily seen streaking across the sky, but let's not get too far over our skis here. Don't get me wrong, this Oort cloud refugee will probably be the best comet of 2023 but it will most likely only be faintly visible with the naked eye from a very dark site and it certainly will not appear green to the naked eye. Okay, that's the bad news.

Now the good news. This comet is still bright, by comet standards, and it will be a lot of fun to watch it fly past the Earth with the aid of binoculars or telescope. The fan-like dust tail should be easily seen with optical aid and possibly the longer narrow ion tail. And yes, photographically it is quite green.

Another cool thing to watch is the large motion in the sky the comet will make from night to night. This is especially true from January 29th through February 4th when its apparent motion will be booking along to the tune of 6 degrees per day. That's equivalent to 15 seconds of arc per minute. At high magnification, its movement across the sky may be visually apparent through a telescope. Now that doesn't happen every day. Closest approach to the Earth occurs on February 2nd passing within 0.28 astronomical units of the Earth (42 million km). You can use the link below to keep tabs on the brightness and location of comet ZTF throughout the month and remember that the darker the sky you can travel to, the better the view of the comet will be had.

<https://theskylive.com/c2022e3-info>

One more thing, on Feb 11th look roughly 1 degree to the west of Mars to see the comet passing by the red planet. Mars should provide an easy landmark to find the comet even if you have been struggling to locate it in the sky. This will be a great binocular and wide field telescopic event. If it's clear, don't miss it.



Image of Comet C2022 E3 taken by Gary Trapuzzano on the night of Jan. 27, 2023 with a TV-85 with a 0.8x focal reducer, IR filter and ZWO ASI2600MC-P camera. Gary took 33x1 minute exposures for 33 mins of total exposure. Image was Processed with PixInsight and Photoshop



Image of Comet C2022 E3 taken by Mark Firary on Jan. 15, 2023 using a Celestron 9.25 EdgeHD SCT with ASI2600MC Pro camera and ASIAirPlus. Mark took 112x60s frames for a total exposure of 112 minutes.

Comet C/2022 E3 (ZTF) (continued)



Image of Comet C2022 E3 taken through a small "sucker hole" by Tom Nolasco on Jan. 24, 2023. He used a homemade 8 inch F/4 reflector with a ASI174mm camera. Tom took 44x3s frames for a total exposure of 132 seconds.



On Jan. 25th, Joe Lamb and his wife Anne travelled to Assateague Island State Park, MD to capture this beautiful image of Comet C2022 E3 under clear skies. This image nicely displays the comets dust, long straight ion and anti-tail. The image above was taken at 1am using a modified Canon 6D with a 200mm telephoto lens. With the ISO set at 1600, Joe took 8X1 minute exposures with the Canon 6D mounted on a LighTrack II tracker. The 8 frames were stacked in Nebulosity and processed in Photoshop CS4.

Pictures from the January Workshops

Celestial Objects for Small and Medium Telescopes



Some of DVAA's newer members attended one of the January workshops on celestial objects. (left to right) Brian Kelly, Bill Montgomery, Dave Hogue, Dotty Hogue, Ken Koeplinger, Samuel Chernak, John Mangano (standing, in back), Susan Brereton, Patty Kelly, Kristy Walsh, Michael Harris, John Leimgruber, Kristin May, and Lyle May (off-camera).
Photo Credit: Jan Rush

Telescope Workshop for Kids and Teens



Al Lamperti and Joe Lamb help kids and parents aim and focus a telescope. (left to right) Al Lamperti, Elliot Wassel (at telescope) with his grandfather William Wassel, Joe Lamb (back to camera), Kristin May and son Lyle.
Photo Credit: Jan Rush

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.

"IF THERE WERE A MILLION PEOPLE WITH TELESCOPES WILLING TO LET A FEW THOUSAND OTHER PEOPLE LOOK THROUGH THEM, IT IS POSSIBLE THAT EVERYONE WHO WALKS THIS EARTH, WITH EYES TO SEE, MIGHT SEE THE UNIVERSE" John Dobson, (September 14th, 1915 – January 15th, 2014).

You Can't Get There from Here

(Well, I guess you can, but it will take an awfully long time.)

Harold Goldner [email](#)



One of my favorite Hubble images is of the top of the Cone Nebula. I even put it on my personal business cards. The actual size of this object blows my mind. The entire nebula is 7 light years long and $2\frac{1}{2}$ light years across at the "top." Our entire solar system could fit on top and there would still be room for lots more. By more, I don't mean a large screen TV (larger than 90"). What I mean is that the distance across the top is only halfway to Alpha Centauri, our nearest neighboring star.

Contemplating this enormous distance reminds me that the Andromeda Galaxy is hurtling towards our Milky Way Galaxy from more than $2\frac{1}{2}$ million light years distant. That's a million times wider than the top of the Cone Nebula. There is so much distance between objects within our galaxy and objects within the Andromeda Galaxy that when Andromeda "strikes" our galaxy, it is extremely unlikely that any two objects, whether stars, black holes, interstellar objects previously opined by a certain Harvard astronomer to be products of other intelligent beings, will ever collide.

It is even more amazing that the DART mission managed to make a direct hit on an asteroid. I have enough trouble getting a pickleball ball to go where I want it to go and yet these guys can send an object millions of miles into space and hit something the size of a barn. Okay, well, more like a football field (278.87 feet for those readers who are sticklers for those sorts of details).

The distances between objects in space are unimaginable. They are unfathomable. Large numbers just befuddle our brains. That's why we are told things like "a stack of \$100 bills totaling a million dollars would be 43 inches tall." Oh great. NOW I understand how much money that is. NOT. Or, "if every human in the world were stacked head to toe it would reach 30 times further into space than the moon." We'd even reach past the moon lying on top of each other, but we wouldn't enjoy it. Not one minute. And, boy, do I feel for the person on the bottom.

There are more than 8,000 man made objects in orbit around the earth and we are tracking upwards of 13,000 objects, including pieces of other man-made objects, tools, nuts, bolts, and countless more bits of plastic, paint chips, all hurtling through space at nearly 16,000 miles per hour. Imagine going that fast on the Schuylkill Expressway! I do not believe that even those changeable



Photo credit: Hubble Legacy Archive, NASA, ESA; Processing & license Judy Schmidt.

speed limit signs west of Belmont Avenue could manage that speed. Yet, for the most part, these 13,000 objects don't collide. Elon Musk keeps dumping more satellites into space which somehow do not create more collisions --- yet. His boosters go up, come back down (which I still enjoy watching), and don't seem to hit anything on the way.

Space is real big. Its "bigness" is beyond our comprehension. Yet, we find ourselves frustrated when a pandemic-consumed public insists upon "social distancing." Even now, waiting in line is an interesting experience as some people keep their distance, others pretend nothing ever happened. I'm not sure which extreme makes me more uncomfortable -- or comfortable.

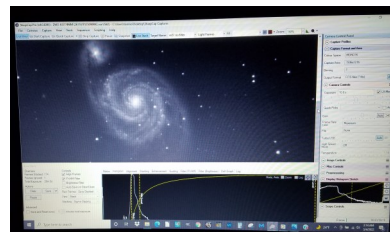
These distances prove that humanity is inconceivably distant from anything else in the sky. We are certainly distant from any other intelligent life wherever it may be (sometimes possibly including this planet. Exhibit A: TikTok). We need to live our lives here on earth, not as though we were on opposite ends atop the Cone Nebula. The Voyager vehicles will not approach another star for nearly 40,000 years. We can't wait that long to learn how to live as close together as we are on Earth. We are all we've got for millions and millions and millions of miles.

Seeing in the Bright

Tom Nolasco [email](#)



You may have read Timothy Ferris's excellent book "Seeing in the Dark," which I highly recommend, but what about seeing in the bright? This is where Electronically Assisted Astronomy, or EAA, comes in. EAA is the combination of your telescope, an astronomical camera and a computer. This combination allows the user to enhance deep sky objects by stacking short exposure images, in "real time", and displaying them on your PC screen, electronic eyepiece, phone or tablet. The object you are viewing grows slightly brighter and less noisy as each new exposure is added to the stack of previous images. It is this stacking of images and the stretching of the stacked image that brings out the faint object you want to see from the bright sky it was buried in.



There is nothing like being at a dark sky site visually viewing the heavens directly with one's own eyes and having the photons that have traveled tens, hundreds, thousands, millions or more years in space striking your retina directly. But then again, what about those times when there is a bright moon in the sky or you are not at a dark site? Does that mean your deep sky observing is suspended, it doesn't have to be. Even if you live at a reasonably dark site, why only observe that comet, nebula or galaxy on moonless dark nights. This is where EAA comes in. Disclaimer, you can't go crazy here and pick deep sky objects (DSO's) next to a bright moon. You can however get reasonably good results as long as you chose objects that are not close to a bright Moon. It is also good to save the brighter deep sky objects on your target list for the moonlit nights.

Let's look at 3 common flavors of EAA:

The first flavor is a camera with a small dedicated monitor. If you already own a telescope, especially one with a GoTo mount, than the modestly priced Revolution Imager II (~\$300) might be a good starting point to dip your toe in the EAA pool. The Revolution Imager II includes a video camera, 1 1/4" nose-piece, 0.5x focal reducer, UV/IR filter, hand-held camera remote, 7 inch LCD monitor, battery, charger and the necessary cables. The imager plugs into where an eyepiece would normally go and the user looks at the 7 inch screen to view the object. One limitation is that the longest exposure is approximately 5.12 seconds and you can only stack up to 6 images in your stack. This means you may be limited to the brighter DSO's as your maximum total exposure is limited to 30 seconds. I have no personal experience with the Revolution Imager II but the reviews I have read are mostly positive, but your mileage may vary. For more information visit: <https://www.revolutionimager.com/>



The second flavor, at the opposite end of the spectrum, is the smart telescope where you aren't dipping your toe in the EAA pool but doing a full cannonball. The huge advantage of smart telescopes is their ease of setup and use. Unistellar sells a couple of out-of-the-box solutions. The first is the Unistellar eVscope 2 which incorporates an electronic eyepiece through which the observer can view the enhanced image of the celestial target. The second is the eQuinox 2 which doesn't have an integrated electronic eyepiece but rather all images are viewed on your smart phone or tablet. These scopes come with a price tag in the \$2,000 to \$4900 range depending on the model. Both scopes have a 4.5" mirror as the main telescope objective. I recently attended a talk where the speaker, who purchased one of these scopes, was singing its praises. She uses it for her outreach efforts under bright skies near Baltimore and regularly shows the guests galaxies, star clusters and nebulae. The scopes come with plate solving for accurate object locating & centering, a database of over 5000 objects and smart light pollution reduction software. For more information visit their website can be found at: <https://help.unistellar.com/hc/en-us/articles/4406616411922-Compare-our-products-eQuinox-VS-eVscope-2>



Two other entries in the smart telescope space are from Vaonis. They are Stellina and Vespera. Stellina comes with an ~\$4000 price tag and Vespera at ~\$2500. Both are small and lightweight using 60 and 50mm lenses for the main telescope objectives. Despite their small objectives, both of these scopes pack big performance. The telescopes are controlled through an app on your smart phone or tablet. The Vaonis units also use plate solving to automatically locate targets the user chooses through the app. One of our members, Sylvie Stonberg, owns one of these scopes and has taken some amazing images through it. Sylvie would be a good person to contact if your curious about these innovative scopes. You can also visit the Vaonis website at: <https://vaonis.com/vespera>



Seeing in the Bright (continued)

The third flavor, the most popular one and the one that I use, is mounting an astronomical camera in the focuser of your existing telescope that has GoTo mount and connecting the camera, via a USB cable, to your laptop. Most astronomical cameras come with a 1 ¼ inch nose-piece allowing the camera to be inserted into the focuser instead of an eyepiece. I don't use special cooled deep sky cameras but rather ZWO mono and color planetary cameras. The planetary cameras work very well for EAA deep sky live stacking of images and are less expensive than the cooled cameras. Additionally, the planetary cameras are great for the Sun, Moon and planets when I am not Live Stacking. ZWO provides live stacking software with their cameras but I prefer to use SharpCap for my deep sky live stacking. SharpCap also has plate solving software to accurately center your target in seconds. Note, I typically use a mono camera, for my EAA because it is much more sensitive than my color camera allowing me to see more in less time and also closer mimics a visual experience where color is typically not seen when viewing a DSO.



I take very short exposures for EAA, usually in the 10 second or less range. That way, I can watch my target grow brighter and smoother quickly. Telescopes with an f/ratio of f/6 or faster work particularly well for EAA, providing a brighter image in a shorter period of time but almost any scope can be used. My go to scope for EAA is my 8inch f/4 reflector. It gives me a nice balance of speed and image scale.

I do not use special narrow band astrophotography filters. When targeting nebula, I found that using my UHC filter, which I normally use for visual observing, increases the contrast significantly but use no filtering on galaxies or star clusters.

Since I am not looking through the eyepiece doing EAA, I don't need to be outside with the scope. This is particularly advantageous during the colder winter months. I run the mount controller cable, camera USB cable and focuser cable the 25 feet from my telescope into my warm sun porch where I comfortably "observe" often with a snack and a warm drink.

The Messier objects and brighter NGC objects appear on my screen quite quickly and with much longer live stacking times, of say, 20 minutes or so I've been able to see 17th magnitude galaxies from my backyard. Also, when I finish viewing my target I can save an image as a souvenir.

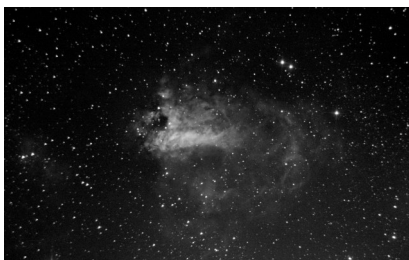
EAA might not be for everyone but then again it might be worth giving it a try. To get more information on the experiences of others you can visit the Cloudy Nights EAA forum at:
<https://www.cloudynights.com/forum/73-electronically-assisted-astronomy-eaa/>

If you wish to take a deeper dive into EAA, visit :<https://agenaastro.com/articles/adena-beginners-guide-to-choosing-equipment-for-deep-sky-eaa.html>

I thought you might be interested in a few images captured exactly as seen on my laptop screen in a relatively short time period from my rather bright Bortle 7 backyard. No processing, except for real-time histogram stretching in SharpCap, was applied to these images.



Globular Cluster M22 - 30 seconds



M17 - The Swan nebula 60 seconds



Galaxy NGC891 12 minutes

The January Monthly Meeting

Jeremy P. Carlo [email](#)



The DVAA January 2023 meeting was opened by Jan Rush, in her first meeting as DVAA President. Jan introduced the current slate of DVAA officers, including the elected VP Tom Nolasco, Secretary George Keighton, Treasurer Scott Vanaman, Members-At-Large Tracey Trapuzzano, John Gaskill, and Jeff Miller, and the “permanent” (???) appointed committee chairs, Welcoming Chair Brian Lee and Programs Chair Jeremy Carlo.

Jan announced that some indoor winter observing workshops would be held on January 7, February 25, and March 4; more information about these can be found elsewhere in the newsletter or on the DVAA website. There will be a “DVAA Night” at the Mallon Planetarium on March 16 at 7:00 PM; again, details available elsewhere here or on the website. The DVAA will also be arranging a trip to see a “Star Talk Live” by Neil deGrasse Tyson on April 27. Finally, Jan introduced the “outreach captains” who will each spearhead outreach activities in their own local areas.

Moving on to committee reports, Welcoming Chair Brian Lee welcomed 9 (!) new members to the DVAA. Treasurer Scott Vanaman reminded members that it’s now time to renew their membership using the DVAA website. Camping Czar (Tsar?) Bill McGeeney gave a brief overview of DVAA camping events scheduled for this year, including a trip to the Cherry Springs area on April 21-23 and to Blue Mountain Vista Observatory for the mid-October new moon period. Astrophotography Chair Lou Varvarezis gave a plug for the monthly Zoom astrophotography meetings, which have been well-attended, and for which recordings are available on the DVAA YouTube site.

With committee reports complete, Programs Chair Jeremy Carlo then introduced the evening’s invited speaker, Lou Ruh. Lou is a meteorologist, long-time weather aficionado, seasoned 20+ year storm chaser, and National Weather Service training coordinator for eastern Pennsylvania. His topic for the evening was “Weather Forecasting for Astronomy.”

Lou started with every astronomer’s favorite topic, clouds. How do they form? What type of clouds exist? How can we forecast their presence? Clouds are, of course, made of water, which can be in either liquid or solid form, and can be either thick or thin, and form when the moisture level has reached saturation. They usually form when there is rising motion in air, which can occur when a frontal boundary approaches, through differential heating, convection, or can be orographic (i.e. caused by terrain of changing height). Common

cloud types include the puffy cumulus, wispy high-altitude cirrus, and blanket-like stratus. To forecast clouds, we need to know where the moisture is, where the lift is, and where existing clouds are and which way they’re heading.

There are several different types of data which can be used to forecast clouds. Surface data comes from weather stations mounted at or near ground level. These can be quite densely spaced in populated areas, but quite sparse in more desolate areas, which leaves obvious gaps in coverage. Each station can only tell us what’s going on at ground level in its immediate vicinity, and include private weather monitoring stations, “mesonets” typically arranged along highways, airport weather monitoring systems. This data is available via a system called MADIS (Meteorological Assimilation Data Ingest System).

To complement ground-based data, high-altitude balloons can be launched. These are typically launched every 12 hours from 92 locations in the US, and can travel up to 125 miles, in whichever way the wind carries them, and can reach altitudes of 100,000 feet, relaying data back to a ground station the entire time. They collect data on temperature, moisture, air pressure, wind speed and direction, and altitude. Lou showed some examples of balloon data; it’s certainly not for the faint of heart, so luckily we have meteorologists able to interpret it for us! Occasionally airplane pilots will chime in with reports, known as “pireps,” although these are few and far between but can be requested from a pilot in a specific area if need be.

The final leg of the “weather triad” (to adopt a phrase frequently heard in other contexts) comes from satellites. These can provide broad views, although they lack the granularity of ground and balloon sensors. Satellites include low-earth orbiting satellites a few hundred miles above the earth’s surface, and geostationary satellites providing much wider views of the same region from a height of about 20,000 miles. Currently there are two geostationary satellites – GOES-EAST and GOES-WEST, and some number of low-earth orbiting “birds.” These provide both visible imagery and infrared images at several wavelengths to gauge moisture content at various heights in the atmosphere.

Cloud forecasting is typically issued as a percentage of cloud cover from 0 to 100%. These are frequently binned up into more friendly terms like “mostly cloudy” and “partly cloudy” for dissemination to the general public. Lou noted that there are several different weather forecasting models (including the so-called “North

The January Monthly Meeting (continued)

American” and “European” models, although these are more properly known by their alphabet-soup acronyms), and it is important to never rely entirely on just one. That’s why it’s a good idea to look over several different forecasting sites – especially if you know they use different models!

To check current conditions, you can consult the National Weather Service’s site for our area at <https://www.weather.gov/phi/>. You can also check out data from the [ASOS \(Automated Surface Observing Systems\)](#) site, as well as real-time satellite imagery at [Satrad](#) and [Nighttime Microphysics](#). Of course, there are also several astronomy-specific forecasting sites, including the well-known [Clear Sky Chart](#), [Astrospheric](#), and [Clear Outside](#), which provide weather forecasts focusing on issues of importance to astronomers, including cloud cover, transparency, seeing, and the presence of high clouds often ignored in the conventional TV weather forecast. Several of these also have iPhone or Android apps, in addition to the web-based interface (convenient for use in the field).

Lou then talked about some other weather phenomena of interest to astronomers. In recent years, smoke from wildfires has been significant in the late summer and fall. While these fires generally occur out west, where dry and dusty conditions make fires more likely, the prevailing winds carry the smoke and particulates over our area, causing dramatic reductions in transparency even when it is supposedly “clear.” Haze occurs when miniscule pollution particles make their way into the atmosphere, and is particularly bad after hot days in the summer.

Lou also talked briefly about something which is typically not mentioned at all in general forecasts, and that is astronomical seeing. Generally, “bad seeing,” which makes it difficult to resolve fine details in the telescope, results from atmospheric turbulence. Turbulence, it turns out, is extremely difficult to predict. But it tends to be more likely if you’re located underneath or slightly on the cold (north) side of the jet stream, or if there is a lot of convection in the atmosphere (e.g. near cumulus clouds or thunderstorms).

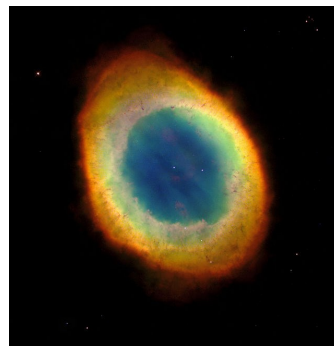
Lou briefly discussed “atmospheric optics.” Rainbows, as we all know, are caused by liquid water droplets dispersing sunlight by color, resulting in the famous “ROYGBIV” halo. Solid water, in the form of ice, typically results in whitish halos with a dimension of 22 degrees due to scattering off of the ice crystals. These include phenomena such as sundogs.

Lou closed with a brief discussion of his efforts surveying storm damage in the area. For example, a tornado spawned by Hurricane Ida struck the area of Fort Washington State Park in September 2021, only a few weeks after the DVAA meeting was held there (which Lou also attended!) Lou showed some photos taken of the area, showing wind damage to trees, and how this damage can be used to estimate the type of weather disturbance which caused them, and how their severity can be rated.

Many thanks to Lou Ruh for an accessible yet thorough overview of the topic of weather forecasting!



Immediately following the January meeting, on Weather & Atmospheric Affects, Mitch Berger looked up and was inspired to take this image of the moon surrounded by a halo which reminded him of the famous Ring nebula in Lyra.



M57 Ring Nebula photo by the Hubble Space Telescope

Western Astro-Imaging Adventure

Between Oct 13th and Nov 3rd of last year, DVAA member Mark Firary went on an Astro-imaging road trip through the Western states setting up camp in Colorado, Utah, California, Arizona and Texas. Mark imaged 23 objects during this trip collecting over 147 hours of light frames and driving over 7000 miles.

Here are the five dark sky campsites where Mark set up shop along with an Astro image Mark took at that campsite. All sites were Bortle 1 except Colorado which was Bortle 2.

Stagecoach State Park in Colorado (2205m elevation)



M33 Pinwheel Galaxy No Filter, 123 frames x120 secs each



Hamburger Rock Campground in Utah (1544m elevation)



IC2118_Witch Head Nebula No Filter, 62 frames x180 secs each



Western Astro-Imaging Adventure (continued)

Stovepipe Wells in Death Valley California (0m elevation)



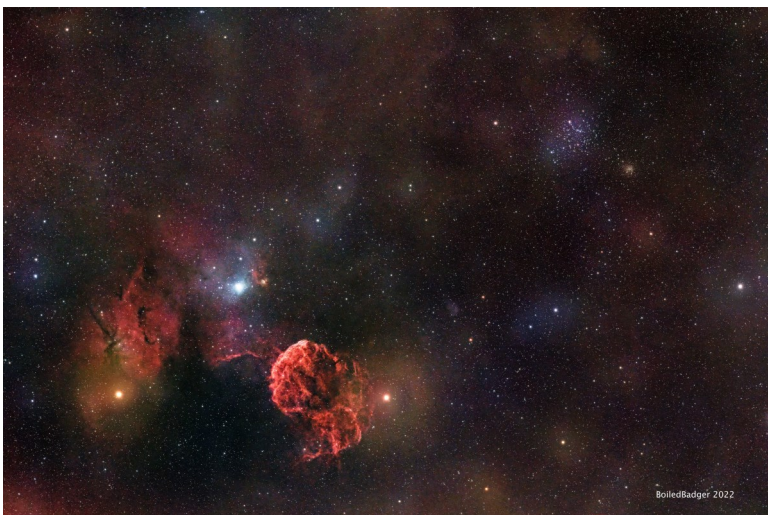
IXPer NGC1333 & LBW749 No Filter, 60 frames x180 secs each



Kaibab National Forest in Arizona (2656m elevation)



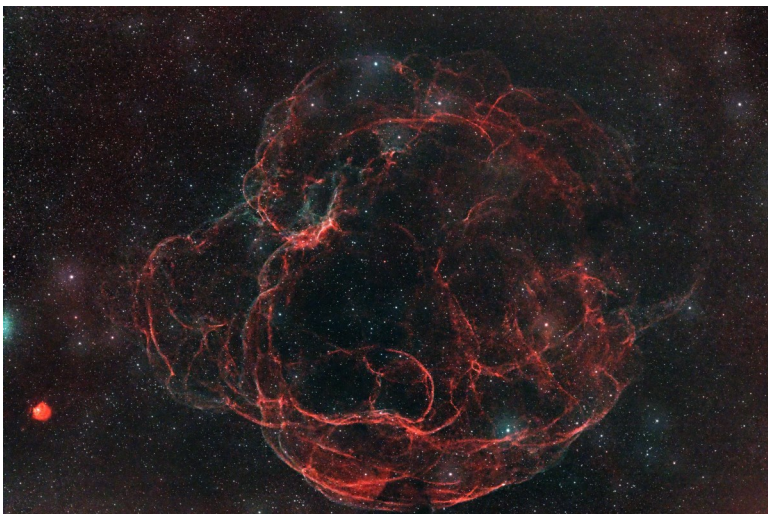
IC443 Jellyfish nebula No Filter, 14 frames x180 secs each



Remote campsite north of Terlingua Texas (outside Big Bend National Park) (978m elevation)



Sh2_240 Spaghetti Nebula LX, 22 frames x 300 secs each



Next Monthly Meeting: Feb 3, 2023

"Astronomy with Gravitational Waves " - Dr. Amber Stuver

Dr. Amber Stuver is an assistant professor of physics at Villanova University and is an expert in gravitational wave. Dr. Stuver has been an active member of the LIGO Scientific Collaboration since 1999. Her research focuses on the computational search for gravitational waves buried in detector noise; she also works to improve the data quality of the detector for data analysis purposes. Dr. Stuver is also an expert in communicating science to the public with 10 years of experience working at the LIGO Science Education Center at the Livingston Observatory in Louisiana.



The LIGO-Virgo-KAGRA collaboration will be starting its first observing run near the end of May 2023 after an early shutdown caused by the pandemic. This run is slated to last 18 months with detections expected on the order of several times a week. This multitude of detections will lead to a large catalog of coalescing binary systems from which to study stellar/black hole evolution, and potentially entirely new classes of gravitational waves not seen before. In this talk, I will discuss the basics of what a gravitational wave is, how they are detected, and highlight some of the most interesting detections made to date.

Prior to Dr. Stuver's talk, DVAA member Sylvie Stonberg will have a short presentation on observing with the Vespera Electric telescope.

A Special Thanks

A celestial globe has been donated to the DVAA by fellow member Prasad Agrahar. This device accurately portrays motions in the celestial sphere, including stars, the Sun and the Moon.

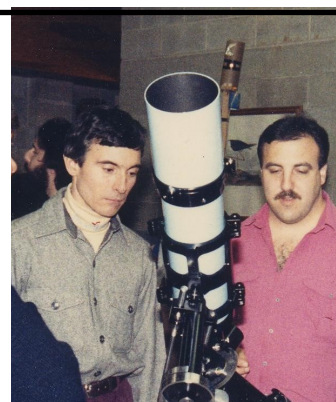
Prasad used this globe extensively at one time for educational purposes; and now, it will be used to assist us in our outreach efforts. Many thanks, Prasad.



In Memoriam:

Long time member Barry Landis passed away in early January at his home in North Wales, PA.. Indications are that he died alone while exercising. Those of us who knew Barry would agree that he was soft spoken, mild mannered and quite friendly with a great curiosity about telescopes and astronomy. He often attended meetings and it was a pleasure to discuss mutual interests with him. His being a member was a credit to the club.

Barry, on the left, is seen here along with Bart Fried in a picture taken by Barry Johnson back in the 1980's.



A Beautiful Lunar & Planetary Alignment

45 minutes after sunset on February 22nd, step outside, even if just for a minute, to see the beautiful alignment of Venus, Jupiter and the 2 day old crescent Moon. This will be a stunning sight and worth the look. If you have a pair of binoculars bring them with you outside as well. The binoculars will make the bright earthshine really pop with the lunar crescent. Take a moment to soak in the sight and beautiful of our solar system.



Go outside again, at the same, time the following evening, on the 23rd, The Moon will have moved eastward and is higher in the sky forming a beautiful line with Jupiter and Venus.



The star fields were captured from Stellarium, the free planetarium software available for download at www.stellarium.org.

Indoor Workshops: Observing & Astrophotography

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 Feb. 25, and March 4. The workshops are open for registration!

Observing with SkySafari

Saturday, February 25, 2023, 1:30 PM until 3:00 PM

SkySafari is the most popular family of apps for amateur astronomers, and the intermediate version, known as SkySafari Plus, has many features useful to both visual astronomers and astroimagers. If you are already using SkySafari Plus, this workshop will help you maximize your use of all of its features. If you have never used SkySafari, but would like to understand its capabilities before purchasing, this workshop is also for you.

Register [here](#). We need at least 8 registrants in order to hold the workshop. *Attendees under age 18 must be accompanied by a parent or responsible adult.*

Collimating Your Reflector Telescope

Saturday, February 25, 2023, 3:00 PM until 4:30 PM

If you own a reflector telescope, you need this workshop even if you didn't realize it! Featuring hands-on practice with your own telescope or our demo scopes. Careful collimating ensures that you are enjoying the maximum view that your telescope can deliver!

Register [here](#). We need at least 8 registrants in order to hold the workshop. *Attendees under age 18 must be accompanied by a parent or responsible adult.*

Astrophotography

Saturday, March 4 2023, 1:30 PM until 4:30 PM

This workshop is for anyone who is thinking about giving astrophotography a try or someone who has tried but is struggling a bit and needs a helping hand. Whether your interest is in widefield images of the constellations, taking images of the Moon, Sun or planets, or perhaps learning more about taking images of deep sky objects we are here to help you get started on your astrophotography journey.

Register [here](#). We need at least 8 registrants in order to hold the workshop.

It's Renewal Season Again!

It's time for members to renew annual memberships for access to another great year of DVAA programming and activities. Renewal is easily accomplished.

If you have a renewal due you should have already received an email titled "Delaware Valley Amateur Astronomers - Membership Renewal." Simply click on the link in the body of the email. Alternatively, you can login to the website then click on your name in the upper-right hand corner of the site. If you have a Renewal or Payment due there will be a red refresh icon or dollar sign to the left of your name. After clicking on your name, a drop-down menu will be displayed where you can click on a "Renew" and/or "Payment Due" link. Clicking on either one of these links will bring up a series of web forms for you to (a) verify your contact info and (b) enter membership and/or payment info. If you were a new member in 2022 and joined in September, October, November, or December, your membership will not expire until December 31, 2023.

If you have any problems with the online process, or if you would like to have your renewal processed manually, please reach out to Jan Rush (president@dvaa.org) or to our treasurer Scott Vanaman (treasurer@dvaa.org).

Your membership dollars support the club by paying for professional speakers, Astronomical League fees, website fees, insurance, members-only events, etc. Check out the [Benefits](#) page for more info.

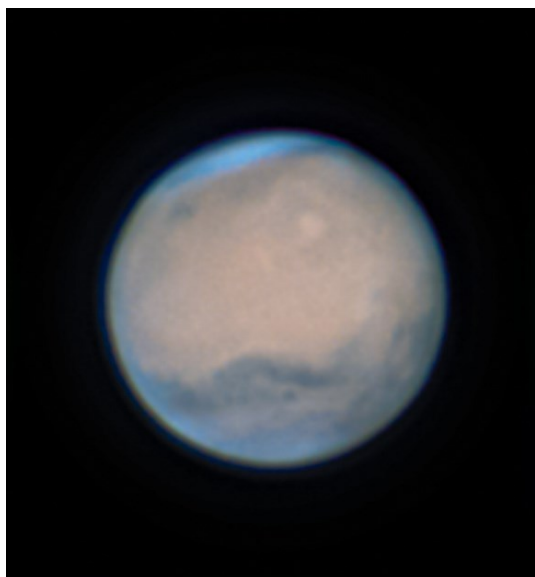
Finally, thanks for being a DVAA member. We are members of the best astronomy club around, and we can't wait to kick off another great year!

Jan Rush, President DVAA

Recent Images by DVAA Members



Gary Trapuzzano captured this jaw-dropping, nearly 6 hour, image of M45, The Pleiades. Gary captured the image over three separate nights from mid-November to mid-December. The deep rusty reds on the right side of the image are rarely so easily seen in images of the Pleiades. The telescope used was a TV-85 with a 0.8x focal reducer with a ZWO ASI2600MC-Pro camera. PixInsight and Photoshop were used for post processing.



Lou Varvarezis did a nice job practicing his planetary image processing on a Mars data set sent to him from Agapios Elia after the December Astro imagers meeting. Agapios used a C9.25 SCT to capture his data set.

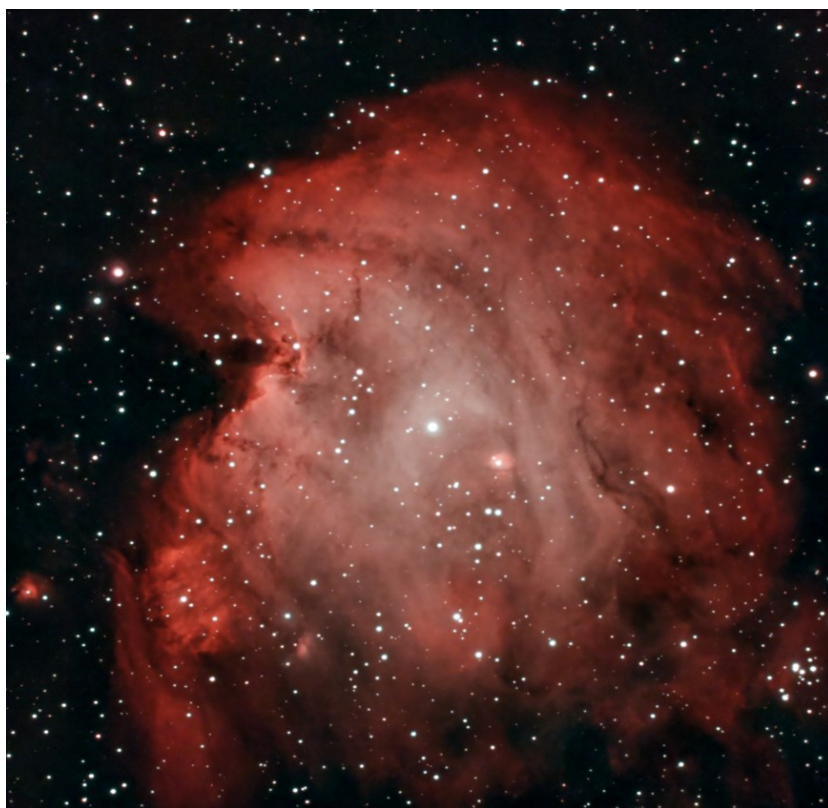
(Continued on next page)

Recent Images by DVAA Members (continued)



This fine image of NGC281, the Pac Man nebula, was captured with a Celestron C6 SCT using a f/6.3 focal reducer, an ASlair Plus, Ha/OIII filter and a ZWO ASI533MC Pro camera. One hundred 120 second subs were taken for a total exposure of 200 minutes. The image was processed using PixInsight and Adobe LightRoom.

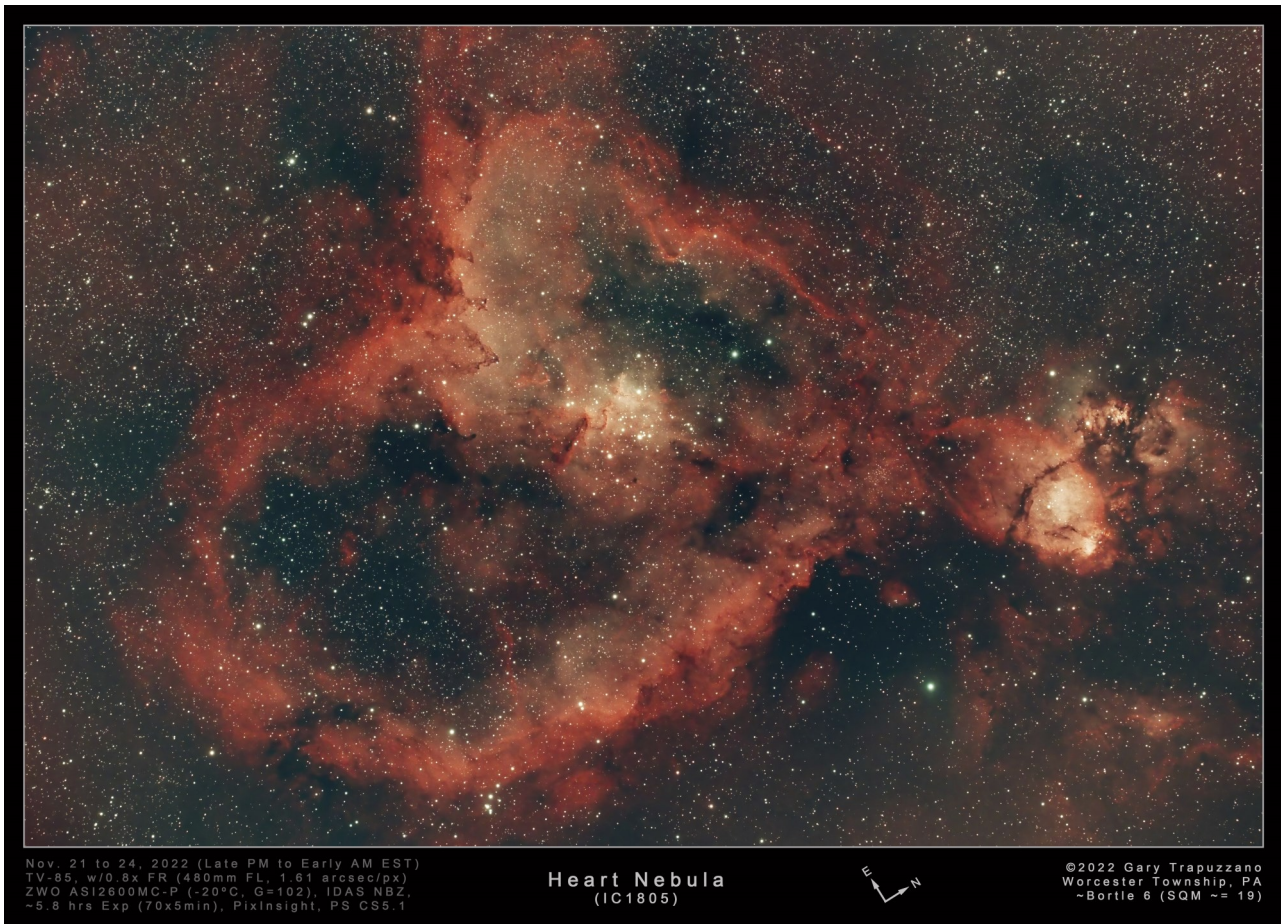
Photo credit: Steve Haas



This outstanding image of NGC2174, the Monkey Head nebula, was captured with a Celestron C6 SCT using a f/6.3 focal reducer, an ASlair Plus, Ha/OIII filter and a ZWO ASI533MC Pro camera. There were 171 two minute subs taken for a total exposure of 5 hours and 42 minutes. The image was processed using PixInsight and Adobe LightRoom.

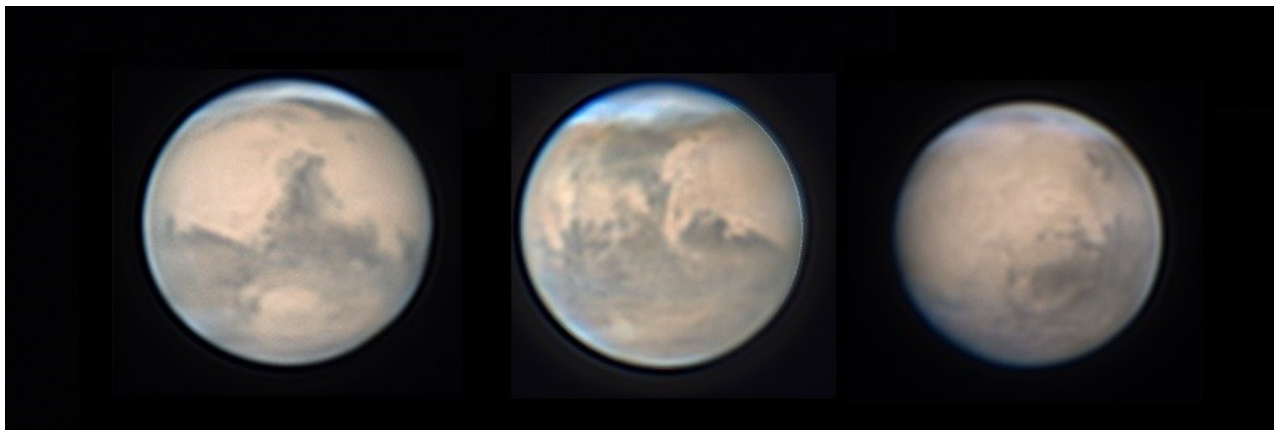
Photo credit: Steve Haas

Recent Images by DVAA Members (continued)



This beautiful image of IC1805, the Heart Nebula (Valentine's day is this month after all), was taken under Bortle 6 skies in Worcester Twp. between Nov. 21st and Nov. 24th 2022. The telescope used was a TV-85 with a 0.8x focal reducer. Using a ZWO ASI2600MC-Pro camera, 70 x 5 min exposures were taken for a total exposure of ~ 5.8 hours. PixInsight and Photoshop were used for post processing.

Photo credit: Gary Trapuzzano



The faces of Mars 2022 . These images were taken through a homemade 10 inch F8.62 reflector with a 3x Barlow, IR cut-off filter and ZWO Atmospheric Dispersion Corrector using a ZWO ASI462mc color camera.

Photo Credit: Tom Nolasco

(Continued on next page)

Recent Images by DVAA Members (continued)

Both of these images were taken at Starry Nights Ranch in Basinger FL, a Bortle 3 site.



This fascinating and deep image of the Running Man nebula was taken with a Takahashi TOA-130NFB and a ZWO ASI2600MC camera. 57 x 300 seconds subs were taken or a total exposure of 4 hours and 45 minutes.

NINA was used for the Data acquisition and the image was processed using Pixinsight.

This image was chosen as the Amateur Astronomy Photo of the Day on Jan 23, 2023.

<https://www.aapod2.com/blog/Ngc1975>

Photo credit: Dan Stern



This striking image of the Rosette nebula was taken with a Takahashi TOA-130NFB and a ZWO ASI2600MC camera. 68 x 300 seconds subs were taken or a total exposure of 5 hours and 40 minutes.

NINA was used for the Data acquisition and the image was processed using Pixinsight.

Photo credit: Dan Stern

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

Spot the King of Planets: Observe Jupiter

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 night-sky.jpl.nasa.gov to find local clubs, events, and more!

Jupiter is our solar system's undisputed king of the planets! Jupiter is bright and easy to spot from our vantage point on Earth, helped by its massive size and banded, reflective cloud tops. Jupiter even possesses moons the size of planets: Ganymede, its largest, is bigger than the planet Mercury. What's more, you can easily observe Jupiter and its moons with a modest instrument, just like Galileo did over 400 years ago.

Jupiter's position as our solar system's largest planet is truly earned; you could fit 11 Earths along Jupiter's diameter, and in case you were looking to fill up Jupiter with some Earth-size marbles, you would need over 1300 Earths to fill it up – and that would still not be quite enough! However, despite its awesome size, Jupiter's true rule over the outer solar system comes from its enormous mass. If you took all of the planets in our solar system and put them together they would still only be half as massive as Jupiter all by itself. Jupiter's mighty mass has shaped the orbits of countless comets and asteroids. Its gravity can fling these tiny objects towards our inner solar system and also draw them into itself, as famously observed in 1994 when Comet Shoemaker-Levy 9, drawn towards Jupiter in previous orbits, smashed into the gas giant's atmosphere. Its multiple fragments slammed into Jupiter's cloud tops with such violence that the fireballs and dark impact spots were not only seen by NASA's orbiting Galileo probe, but also observers back on Earth!

Jupiter is easy to observe at night with our unaided eyes, as well-documented by the ancient astronomers who carefully recorded its slow movements from night to night. It can be one of the brightest objects in our nighttime skies, bested only by the Moon, Venus, and occasionally Mars, when the red planet is at opposition. That's impressive for a planet that, at its closest to Earth, is still over 365 million miles (587 million km) away. It's even more impressive that the giant world remains very bright to Earthbound observers at its furthest distance: 600 million miles (968 million km)!

While the King of Planets has a coterie of around 75 known moons, only the four large moons that Galileo originally observed in 1610 – Io, Europa, Ganymede, and Calisto – can be easily observed by Earth-based observers with very modest equipment. These are called, appropriately enough, the *Galilean moons*. Most telescopes will show the moons as faint star-like objects neatly lined up close to bright Jupiter. Most binoculars will show at least one or two moons orbiting the planet. Small telescopes will show all four of the Galilean moons if they are all visible, but sometimes they can pass behind or in front of Jupiter, or even each other. Telescopes will also show details like Jupiter's cloud bands and, if powerful enough, large storms like its famous Great Red Spot, and the shadows of the Galilean moons passing between the Sun and Jupiter. Sketching the positions of Jupiter's moons during the course of an evening - and night to night – can be a rewarding project! You can download an activity guide from the Astronomical Society of the Pacific at bit.ly/drawjupitermoons

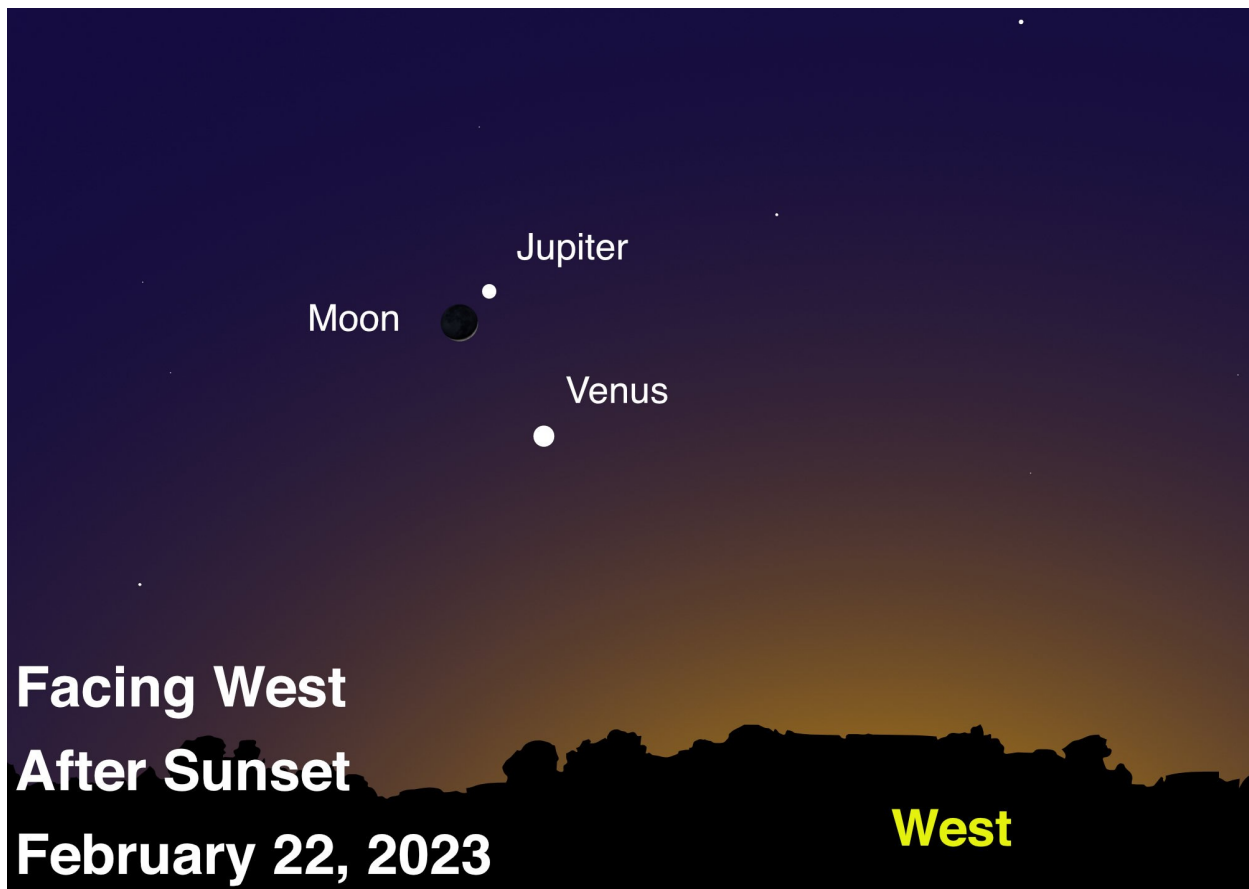
NASA's Juno mission currently orbits Jupiter, one of just nine spacecraft to have visited this awesome world. Juno entered Jupiter's orbit in 2016 to begin its initial mission to study this giant world's mysterious interior. The years have proven Juno's mission a success, with data from the probe revolutionizing our understanding of this gassy world's guts. Juno's mission has since been extended to include the study of its large moons, and since 2021 the plucky probe, increasingly battered by Jupiter's powerful radiation belts, has made close flybys of the icy moons Ganymede and Europa, along with volcanic Io. In 2024 NASA will launch the Europa Clipper mission to study this world and its potential to host life inside its deep subsurface oceans in much more detail. Find the latest discoveries from Juno and NASA's missions at nasa.gov.

Spot the King of Planets: Observe Jupiter (continued)



This stunning image of Jupiter's cloud tops was taken by NASA's Juno mission and processed by Kevin M. Gill. You too can create amazing images like this, all with publicly available data from Juno. Go to missionjuno.swri.edu/junocam to begin your image procession journey – and get creative!

Full Image Credit: NASA/JPL-Caltech/SwRI/MSSS; Processing: Kevin M. Gill, license: CC BY 2.0) <https://creativecommons.org/licenses/by/2.0/> Source: <https://apod.nasa.gov/apod/ap201123.html>



Look for Jupiter as it forms one of the points of a celestial triangle, along with Venus and a very thin crescent Moon, the evening of February 22, 2023. This trio consists of the brightest objects in the sky – until the Sun rises! Binoculars may help you spot Jupiter's moons as small bright star-like objects on either side of the planet. A small telescope will show them easily, along with Jupiter's famed cloud bands. How many can you count? Keep watching Jupiter and Venus as the two planets will continue to get closer together each night until they form a close conjunction the night of March 1. Image created with assistance from Stellarium

Save the Date

Thursday, March 16th @ 7:00 pm



DVAA Night at the Mallon Planetarium

Planetarium Director and DVAA member Adam Chantry presents a show just for the DVAA

"Moons: Worlds of Mystery" - about Earth's moon and the fascinating moons of our planets

Arcola Intermediate School, Eagleville, PA (Methacton School District)

Spitz Sci-Dome HD with ATM-4 Automation, Spitz Full Dome Player, Starry Night Planetarium Software, Layered Earth Geology

No entrance fee; donations will be accepted to benefit the DVAA. Register at www.dvaa.org

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 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!

Methacton SCHOOL DISTRICT

PRESENTS:

Mallon Planetarium Community Shows



Wednesday, January 11th

5:30 - Celestial Highlights & Faster Than Light (4th Grade through Adult)

7:00 - Celestial Highlights & Calendars & How We Keep Track of Time (6th Grade through Adult)

Wednesday, February 15th

5:30 - Celestial Highlights & Follow The Drinking Gourd (3rd Grade through Adult)

7:00 - Celestial Highlights & We Are Stars (4th Grade through Adult)

February 17th - 25th

Laser Light Shows Return to the Mallon Planetarium. Dark Side of the Moon 50th Anniversary

www.methacton.org/laser for details

Wednesday, March 15th

5:30 - Celestial Highlights & The Little Star That Could (Pre-K through 3rd Grade)

7:00 - Celestial Highlights & Preparing for Solar Eclipse 2024 (4th Grade through Adult)

Saturday April 29th

Free Community Star Party

Visit Planetarium Web Site for Details: www.methacton.org/planetarium

www.methacton.org/Planettix for Tickets

Adults: \$8

Children/Students/Seniors: \$6

**Arcola Intermediate School
4001 Eagleville Road
Eagleville, PA 19403**

[Click Here to Purchase Tickets](#)

DVAA Telescope Rentals

Celestron NexStar 5SE



Orion 6" Dossonian



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](https://www.youtube.com).

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: Scott Vanaman 327 Laurel Drive, Collegeville, PA 19426 or for more information contact treasurer@dvaa.org.

