

amateur ASTRONOMER



sharing the wonder and science of astronomy



Running Man Nebula

Congratulations to Dan Stern on having his image selected as NASA's Astronomy Picture of the Day on Feb 2, 2023!

<https://apod.nasa.gov/apod/ap230202.html>

This image was taken from Starry Nights Ranch in Basinger, FL with a Takahashi TOA-130NFB and a ZWO ASI2600MC camera. 57 x 300 second subs were taken for a total exposure of 4 hours and 45 minutes.

NINA was used for the data acquisition and the image was processed using PixInsight.

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

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

PLAN ON IT!

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

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

Wed. March 8 (7:30 pm) Public Star Party at Anderson Farm Park - Collegeville. [More info](#)

Thurs. March 16 (7:00 - 8:00 pm) DVAA Night at Mallon Planetarium. Arcola Intermediate School- Eagleville. [More info](#)

Tues. March 21 New Moon Dark Sky Observing

Sat. March 25 (7:00 pm) Public Star Party at Valley Forge National Historical Park model airplane field. [More info](#)

Fri. April 14 (7:00 pm) In-person General Meeting at Radnor Township Building.

April 21-23 DVAA Spring Field Trip at Big Dipper Lodge in Coudersport, PA. [More info on website](#) and on page 5.

Sat. April 29 (8:00 pm) Public Star Party at Valley Forge National Historical Park model airplane field. [More info](#)

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

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Welcome New DVAA Members!

Mary Louise Arocena (Broomall, PA)
 Barbara Kelly (Fort Washington, PA)
 John Kelly (Fort Washington, PA)
 Harold Lucas (Philadelphia, PA)
 Sarah Marley (Philadelphia, PA)
 Mark Menser (Wayne, PA)
 Carl Patrizio (Aston, PA)
 Justin Patterson (Broomall, PA)
 Richard Shappell (Chalfont, 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	mbratl@dvaa.org
Astrophotography	Lou Varvarezis	astrophotography@dvaa.org
Camping and MSSP	Bill McGeeney	camping@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	(TBD)	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, March 3, 2023: *Details on page 7.*

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): 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).

We will not be utilizing a telephone hotline this year. Register for the event in order to receive an email (also a text message, if enabled) regarding last-minute updates. The latest weather-related event information is always available at www.dvaa.org.

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.

George Keighton is the lead editor for March. Thanks to Tom Nolasco for taking the lead in January and February!

Follow the DVAA on Facebook and YouTube!



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



The Epic Membership Survey of 2000

Jan Rush [email](#)



DVAA Membership Survey 2000

A. Meetings/Program

1. How many regular monthly DVAA meetings did you attend in the last twelve months?
(Write in a number from 0 to 12)

2. Changes. Consider the following aspects of our meetings...
Should our emphasis on them decrease (-), remain the same (OK), or increase (+)?
(Circle one response [- OK +] on each line)

Welcoming new members/visitors	-	OK	+
President's comments	-	OK	+
Committee reports	-	OK	+
Observing Chair's presentation	-	OK	+
Food and beverages	-	OK	+
Time for socializing	-	OK	+
Outside (paid) speakers	-	OK	+
DVAA members as speakers	-	OK	+
Field Trips on Meeting night	-	OK	+
 Program Topics:			
Beginning Topics	-	OK	+
Advanced Topics	-	OK	+
Technical/research presentations	-	OK	+
Cosmological presentations	-	OK	+
Telescope Observing techniques	-	OK	+
Computer applications	-	OK	+

3. Topics. Can you suggest any topics for future programs?

DVAA maintains a storage unit in King of Prussia which houses DVAA-owned equipment and materials that we don't use often. Over this past summer, I sought to bring some order to the chaos by sorting, scanning, posting, shredding and recycling the paperwork that lived in the securely locked unit. I didn't find anything classified, but there was a very worthwhile payoff – interesting documents detailing our club's history are now available to members at the club website (in the Club Documents folder), rather than living their lives inaccessibly in a box in a storage unit. One of the items I discovered was an ambitious membership survey developed and administered by Observing Chair John Bajtelsmit in 2000. Reading it was an interesting trip down memory lane; although many things have changed, many have of course stayed the same.

Why do I describe this survey as "epic"?

- Included questions on nearly every aspect of DVAA membership and offerings.
- Paper copies were mailed to 180 members.
- Estimated to require 1.5 hours to complete.
- Return rate was 42% (75 surveys)!

Here are a few of the interesting things revealed by the survey:

- Overall, satisfaction with DVAA membership was very high.
- Respondents ranged in age from 27 to 83 years-old, with a mean and median around 50 years.
- Respondents had been interested in astronomy from one to 62 years, with a mean and median around 30 years.
- Sixty-five percent of responders had joined DVAA within the past 5 years.
- Regarding monthly meeting presentation topics, the respondents desired more talks on observing techniques, increased emphasis on welcoming new members, and increased emphasis on "beginner" program topics.
- More emphasis on integration of new members into club activities .
- More telescope clinics, observing lessons, and organizing field trips to dark sky sites.
- Members supported a proposed dues increased from \$20 to \$25.
- DVAA activities rated most highly were: monthly meetings, star parties at Valley Forge National Historical Park, conducting observing lessons and clinics, organizing trips to dark sky sites, and supporting light pollution abatement efforts.
- Three-fourths used astronomy software, the most popular being TheSky and RedShift.
- Over half indicated some involvement with telescope making.
- Eighty-five percent had accessed the DVAA website, and 30% did so weekly.
- One in four members had rented a DVAA telescope.
- An area for improvement was the difficulty of meeting other members, with limited interactions at monthly meetings and other events .

Considering the club now vs. then, the most obvious changes are a greatly increased interest in astrophotography among the current membership, and less emphasis on telescope-making. In the field of amateur astronomy, we now have greater choice and access to

The Epic Membership Survey of 2000 (continued)

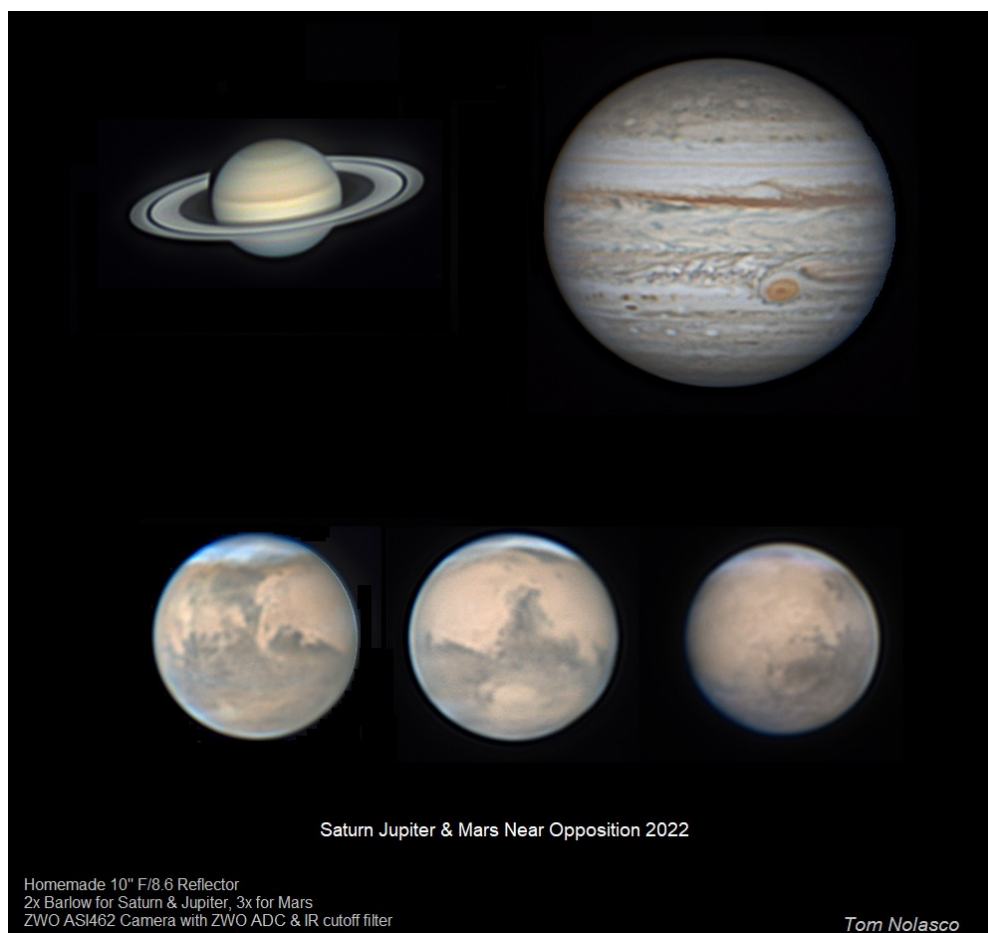
varied and innovative equipment for visual observing and astrophotography, and greatly improved astronomy software. The ubiquitous availability of Wi-Fi and integration of computers into all aspects of astronomy has brought about a transformation of many aspects of the hobby. What hasn't changed at all is the wish for members to belong to a club where they can learn from each other, and share the enjoyment of astronomy with like-minded friends.

The most recent survey of DVAA membership was conducted in 2018 by Member-at-Large Irv Schlanger. Although there was a high level of satisfaction among members, the survey acknowledged an increasingly older membership, with one-third of respondents being retired. Similar to the 2000 survey, many members sought astronomy training as a reason for joining DVAA, especially in the areas of astrophotography, astronomy software, and locating celestial objects. The results of

the 2018 survey brought about major changes in the operation of the club, with an increased emphasis on attracting new and younger members, and providing a path for them to progress in their astronomical journey. In the upcoming months there will be many, many opportunities for astronomy fellowship and learning. Join us!

If you have suggestions regarding how we can improve DVAA for members and non-members, please send them to me at president@dvaa.org.

[Note: DVAA Members have access to the full results of these surveys on the DVAA website. Click the Document pull-down menu, and follow the path Club Docs>>Member Info>>Surveys. Clicking the folder icon expands to make the subfolders visible.]



Tom Nolasco created this composite of Saturn, Jupiter and Mars from images he took while each planet was near opposition last fall. All images were taken using a homebuilt 10-inch F8.6 Newtonian reflector, ZWO Atmospheric Dispersion Corrector (ADC), ZWO IR cutoff filter and a ZWO ASI462mc camera. For Saturn and Jupiter, an Explore Scientific 2x Barlow lens was used. For Mars, a 50+ year old 3x Edmund Scientific Barlow was used.

Spring Trip 2023

4.21.23 • 4.23.23



Join your DVA friends for a tour of Springtime Galaxies!

The DVA rented out Frosty Hollow Big Dipper Lodge! Sitting a mile north of Cherry Springs State Park, the lodge offers a spacious flat field with tree-lined horizons. In mid-April, the leaf count should be low. Should we have a cloudy night, there's even a large community pavilion with a fire place.

The lodge contains 3 bedrooms and 2 bathrooms. One bedroom contains 2 queen beds. One bedroom contains one queen bed. And one bedroom contains one twin bed. The property lists 10 as capacity.

The lodge has a full kitchen. DVA will provide dinners on Friday and Saturday nights. Bring your own breakfasts and lunches.

Where: Big Dipper Lodge
<https://www.frostyhollowbandb.com/>

Price: \$82 (2 nights)

At this time, only members may sign up. Nonmembers including non-member spouses and children may be able to sign up pending leftover spaces. For details and registration, visit [DVA.org](https://www.dva.org).

Civil Rights by Starlight

Bill McGeeney [email](#)

In 1791, a free Black man sent a letter to then Secretary of State, Thomas Jefferson. After spending years in Paris and traveling around the French and Italian Mediterranean, President Washington relied on Jefferson's expertise for navigating the troubled waters of European political giants residing all around them. Jefferson, as the first Secretary of State, retained a special place in Early Republican America. A man of many talents, equal part philosopher, inventor, statesman and architect, his writings echo from our Declaration of Independence to the Rights of Man. Jefferson exemplified the most optimistic Enlightenment thought of his time, something that would later solidify around him as an almost permanent self-caricature.

America, in 1791, remained a restless place. Seven years following the revolution, the nation felt its way to a new identity. In the North, merchants and commerce dominated, as did a preference for close ties to the British. In the South and rural North, folks clung onto what Jefferson would term the "Spirit of 1776," wishing for relatively light, if any, government oversight. Southern states undertook a myriad of activities to softly challenge the new federal system's sovereignty over the states. The frontier remained lawless with settlers pouring in from Europe, often subverting the Federal Government's plan to integrate Native Americans into the new republic, opting to settle disputes by way of slaughter and illegal land grabs. Spurred by religious groups such as the Quakers, the North began enacting anti-slavery laws, including Vermont which set the tone for the North as the first state to ban new instances of slavery. At the same time, a few years removed witnessed the industrial revolution's first major advancement by way of the cotton gin, firmly securing the South's role in cotton production. Whereas Philadelphia was the cosmopolitan capital of the new world, backwater rebels in Pittsburgh and Massachusetts took up arms as they tarred and feathered tax collectors.

It was at this time that our national heroes found their paths diverging. Thomas Jefferson and George Washington, our most famous aristocratic southern landowners, became mired in complex ironies. Washington came into this world Virginia-bred true and through. His concepts of state sovereignty ended during the revolution when the individual states made executing a war so excruciatingly difficult. Washington's concepts on slav-

ery and, what was considered Western expansion, reversed quite dramatically from his early days of carefree endorsement immediately following his marriage to Mary Custis. It may be safe to propose that Washington, now years removed from living day to day in Virginia, influenced by Lafayette, whom he held in highest esteem, gradually began to adopt the moral values more in line with New York City and Philadelphia.

Going the other direction, a young Thomas Jefferson, miles removed from the revolution, attained his philosophical highpoint early. Jefferson romanticized about the most positive of Enlightenment ideas. Absent of the partisan wrangling that he became notorious for instigating, Paris offered him a chance to fully imbibe on the then-popular Parisian aristocratic virtues of freedom, equality and liberty. These early experiences would forever tie him to favor the French in dealings of American policy. Once back in Virginia, no doubt he succumbed to the irresistible pull of Virginia life and politics.

By 1791, Jefferson's mind, which previously swung both ways over the crucible of slavery and Southern agrarianism, began its destined creep toward uneasy entrenchment. And at this exact moment, a free Black man, who happened to have a firm passion for engineering, wrote a letter to the man who codified mankind's "natural rights."

To some, the name Benjamin Banneker might be completely foreign. However, his footnote in history represents not just the opportunities of a passionate thinker during a very curious scientific period, but a very fascinating question of 'what if?'

In my podcast, *Light Pollution News*, where I highlight news stories involving various aspects of light pollution on a monthly basis, I discuss the article, "How Reading the Night Sky Helped Black Americans Survive," by Heather Greenwood Davis in *National Geographic*.

Banneker, the son of a freed slave and a former indentured servant, ascertained a particular fondness for engineering. During his childhood, he designed an irrigation solution for his family's farm. He created a wooden clock that accurately ran for 50 years until his death. He briefly helped survey the new capital city in 1791. Most notably,



Civil Rights by Starlight (continued)

and relevantly to our story, however, Banneker created precise almanacs of the nighttime sky for the commercial marketplace, typically used by fishermen.

Included in his letter to Jefferson was a copy of his almanac, which so impressed Jefferson that he supposedly sent it to his French counterparts. Jefferson, the inventor of so many things, including what could have been the first US metric system, no doubt enjoyed the brief, but intellectual discourse.

In that letter, Banneker hoped for more than a review of the almanac. In actuality, Banneker supplied the almanac to provide indisputable evidence that, per Jefferson's own words, all men were created equal, not just Europeans. For as much as he tried, as Banneker continued to advocate for Black intellectualism and respect, one doesn't have to guess how long Jefferson held onto this correspondence. In the years that followed, the idea of

"white supremacy," already apparent, began to firmly entrench itself in American political thought – spurred almost directly by the rapid expansion of the Southern culture westward, pertinent domestic and international affairs, such as the Haitian revolution, and the ascension of Jefferson's own, Virginian dominated, political party.

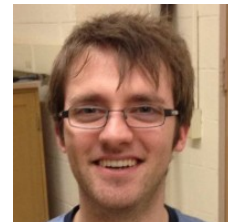
For Banneker, it remained his unobscured view of the nighttime sky that proved to be the great equalizer and common language strong enough to minimize societal gaffes. While writing almanacs wasn't a novel idea in the 1790s, Banneker's diligence in studying the night sky helped him accurately calculate the 1789 solar eclipse. Studious and focused, Banneker made a name for himself that lives on to this day: several schools in New York as well as Washington DC bear his name. Benjamin Banneker (1731 – 1806) was the nation's first African American astronomer and mathematician.

Next Monthly Meeting: March 3, 2023

Dr. Dylan Paré

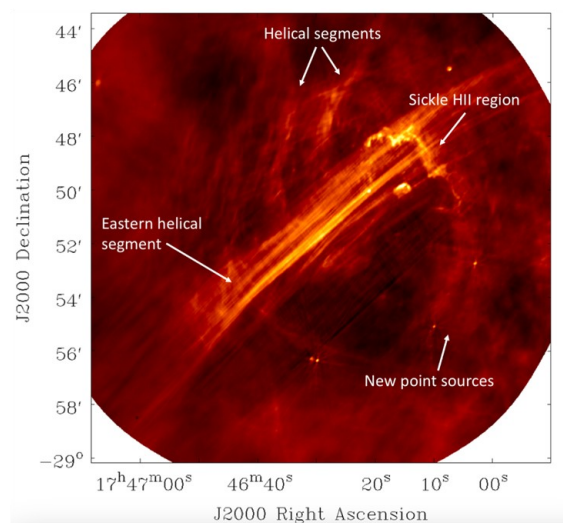
Postdoctoral researcher, Villanova University

"The Extreme Center of the Milky Way: Uncovering the Nature of Magnetic Fields in the Galactic Center "



The center of the Milky Way, known as the Galactic Center (GC), is an extreme region characterized by high densities, temperatures, and magnetic field strengths. Though the GC is obscured by intervening dust at optical wavelengths, it is possible to study the region using radio, infrared, and X-ray wavelengths. Through such studies of this region, we have unveiled a population of thread-like structures that seem to be unique to the GC.

These thread-like structures have come to be known as the non-thermal filaments (NTFs) because their emission is caused by non-thermal, relativistic electrons. This form of emission is produced in the presence of ordered magnetic fields, allowing us to use the emission from the NTFs to study the properties of the magnetic field in the GC. Improving our understanding of cosmic magnetic fields is important because, though they are theorized to play an important role in processes like star and galaxy formation, it remains unclear observationally the extent of their impact. In this talk, I present our current understanding of the NTFs and what we know about the magnetic field in the GC. I also discuss my own work in studying the NTF magnetic field and the magnetic fields as traced by molecular, star-forming regions within the GC.



The February Monthly Meeting

Jeremy P. Carlo [email](#)



The February 2023 DVAA meeting was opened by Vice President Tom Nolasco. Tom started by showing some photos of Comet C/2022 E3 (ZTF), at the time making its way through the night sky at a naked-eye magnitude of 4.5 or so. Tom announced upcoming workshops on February 25 and March 4, with topics including telescope collimation and astrophotography. Tom also announced the 2023 Valley Forge Star Party dates, and the upcoming DVAA Night at the Mallon Planetarium on March 16; see elsewhere in this newsletter for more info on these events.

Moving on to committee reports, Welcoming Chair Brian Lee announced 11 new members. Camping Czar (or Tsar?) Bill McGeeney gave a brief overview of the upcoming Main Sequence Star Party to be held near Cherry Springs on April 21-23. Finally, Astrophotography Chair Lou Varvarezis gave an update on their monthly astrophotography meetings on Zoom.

With regular committee reports complete, Tom introduced the evening's first invited speaker, DVAA member and high school student Sylvie Stonberg, who gave a nice presentation on "Electric Telescopes and Vespera." Some of you may know Sylvie from our Valley Forge Star Parties and a January workshop, where she showed off some of the imaging which can be done with a Vespera telescope. Electronically Assisted Astronomy (EAA) is a rapidly-growing facet of our hobby, in which a camera collects near real-time images (including facilities for stacking and processing) to be displayed on a screen. With this electronic assistance, even a very small telescope under light-polluted skies can produce very nice images of a number of astronomical objects; the Vespera combines all of this into one seamless package, requiring less mixing-and-matching and trial-and-error development on the part of the user. Sylvie showed the telescope in basic operation and how to connect to the Singularity app. Finally, Sylvie showed off a number of recent images, including the Veil and Bubble Nebulae in Cygnus and Cassiopeia, the Moon, the Running Man and Rosette Nebulae in Orion and Monoceros, the Double Cluster in Perseus, the Andromeda Galaxy (M31), the North America Nebula in Cygnus, the star Capella, and Comet C/2022 E3 (ZTF). Many thanks to Sylvie for this very nice presentation!

Next, Programs Chair Jeremy Carlo introduced the evening's main speaker, Prof. Amber Stuver of Villanova University. Dr. Stuver is a member of the LIGO collaboration which detected gravitational waves several years ago and has gone on to observe many more gravitational wave-producing events. She presented to the DVAA a few years ago, and came back by popular demand to share the latest results in gravitational-wave astronomy.

Gravitational waves have been described as "ripples on spacetime." Einstein discovered that massive objects bend spacetime around them, in much the same way that a bowling ball on a trampoline stretches the material around it. When that massive object moves (technically, accelerates), these bends ripple outward, creating waves which could in principle be detected by carefully measuring the distance between objects as the waves pass between them. While these waves were predicted back in 1916, most researchers expected to be so small that even the largest of them would be completely unobservable. And they were completely right, for almost exactly 100 years.

It turns out that the most readily observable gravitational wave sources would be merging black hole or neutron star pairs. These objects would collide with one another at extremely high speeds, and their extremely high masses and rapid accelerations would cause huge gravitational waves. Of course, "huge" in this case means oscillations on the order of $1/1000^{\text{th}}$ the diameter of a proton, by the time the gravitational wave reaches the earth. Hence 100 years went by without any successful observations, despite decades of concerted effort.

Dr. Stuver recounted the story of how the LIGO instrument was turned on for the first time, in its fully operational and sensitive configuration, and the telltale sign of a black hole merger was spotted within hours! Surely, the scientists mused, this must be a joke, as the high-ups were known to inject false signals into the data to test whether their detection algorithms were working, in much the same way that airport security officers or drug-sniffing dogs might be randomly tested to see if they detect a deliberately-planted item. But no, this signal was the real deal, and they just happened to luck out and catch an event within the first day after opening, even though events of this size were only expected to occur once every few weeks to months.

This led to a lively Q+A session in which Dr. Stuver explained many of the details of how LIGO works, and what it's like to work in such a large scientific collaboration. LIGO is a massive engineering project, with two sites in Louisiana and Washington State. Each site consists of a so-called "Michelson interferometer," a device in the shape of an L designed to detect minute changes in the lengths of the two perpendicular legs. While many science majors will remember the Michelson interferometer as a tabletop device, this particular pair of interferometers has legs which are 4 kilometers

The February Monthly Meeting (continued)

(2.5 miles) long! They are so sensitive to vibrations that even things like wind, trucks rolling by on the highway, or distant earthquakes, will completely swamp the detectors. Dr. Stuver's specialty is in data quality assurance – how confident are we that those blips we're seeing actually come from space, and not from the nearby interstate?

Since that initial discovery in September 2015, LIGO's sensitivity has been increased several-fold. While gravitational wave detections were first occurring every few weeks to months, as of 2022 detections were being made on roughly a weekly basis. When LIGO returns from its latest hiatus with even higher sensitivity in Spring 2023, detections may occur as frequently as daily!

While the first discovery was a “one-off” and scientifically remarkable in its own right (earning the three LIGO pioneers the Nobel Prize in Physics the following year, and several thousand LIGO scientists, including Dr. Stuver, the Breakthrough Prize in Physics), now there are so many gravitational wave detections that we can begin to conduct a census of these sorts of events. Much like exoplanet discovery, in which the first few were isolated events but now seem to be discovered by the dozens, we can now assemble data about the population of these objects. In particular, we can ask questions about the frequency of these merger events, the typical masses and mass range of these merging objects, and gather experimental data on the behavior of gravity in the extreme strong-field limit. These questions have relevance for understanding both the origin of the chemical elements on earth (many of which, particularly heavy elements, were produced and released into space through neutron star merger events) to the origin and long-term fate of the universe. We can also test Einstein's prediction that gravitational waves should travel at the speed of light (current experimental data shows that they do, to within 1 part in 10^{15} !) They also provide an indirect measurement of the Hubble constant, independent of measurements of Cepheid variables and Type Ia supernovae. Even more technical questions, such as the origin of so-called “short gamma ray bursts,” can be answered – these can now be definitively identified with, as was suspected for some years, binary neutron star mergers.

As of the time of the talk, a total of 93 merger events have been observed. LIGO is also being joined by several other detectors in other parts of the world, including VIRGO in Italy, KAGRA in Japan, and eventually a detector in India. Expect the “firehose” to open up when the next detection run (named “O4”) starts up later in the spring!

Many thanks to Dr. Amber Stuver for an engaging, interactive, and informative presentation on the burgeoning field of gravitational-wave astronomy!



Dr. Amber Stuver illustrates the L-shaped orientation of the LIGO interferometers.

Photo credit: Mitch Berger

Workshop photos: Collimating Your Reflector Telescope

On February 25, members participated in a collimation workshop at the Radnor Township Municipal Building. The focus for this event was reflector telescopes.

All photos courtesy of Jan Rush.



Clockwise around the foreground dob: Mike Atwell, Mark Scafonas, Dave Hogue, Dottie Hogue, John Leimgruber. Seated in center: Patty Kelly. Tending to the background dob: Rick Kuchan and John Bajtelsmit.



Joe Lamb presents overview of collimation



John Leimgruber and Mike Atwell



Danny Chaing and Tom Nolasco



Rick Kuchan and John Bajtelsmit



Al Lamperti and Tom Kildea

Recent Images by DVAA Members



Above: Dan Stern's image of C/2022 E3 (ZTF) from Starry Nights Ranch in Basinger, FL on January 16.

Takahashi TOA-130NFB

ASI2600MC

60 x 120 seconds

Data acquisition: NINA

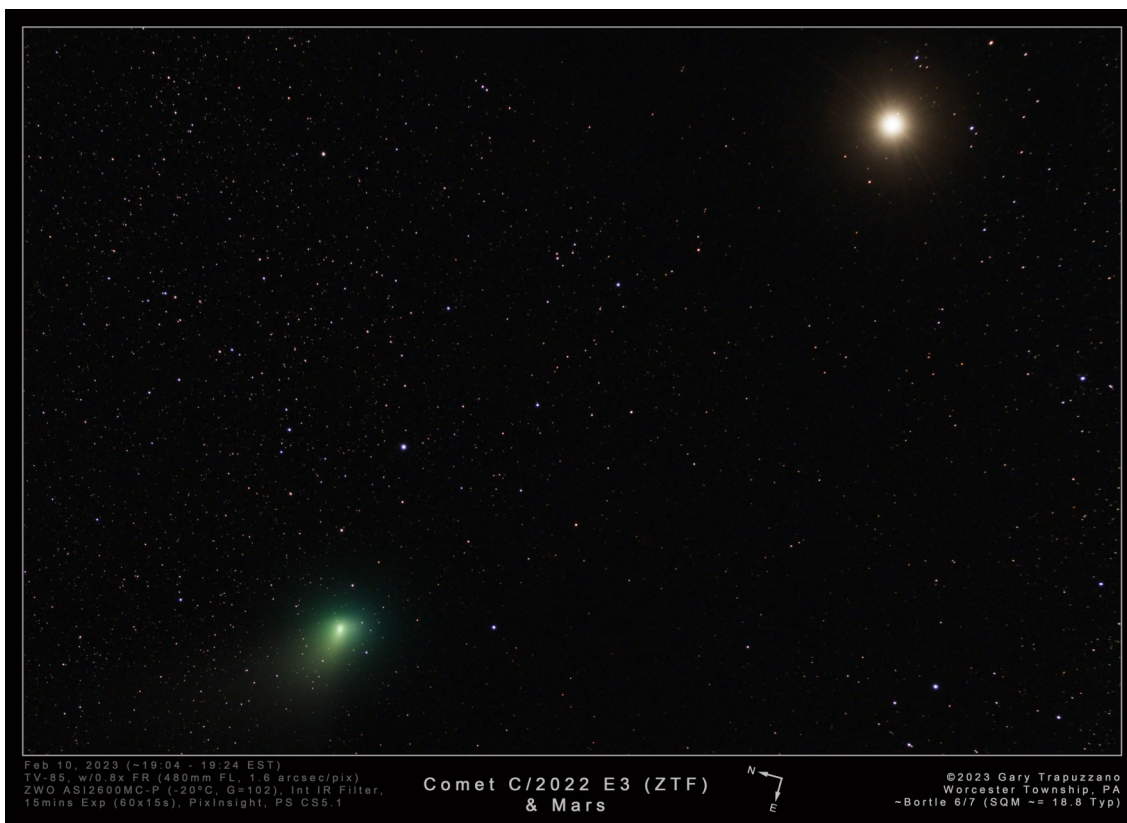
Data processing: Pixinsight

Right: Steve Haas captured this image of the comet from 30 miles South West of Boston on February 9th, using a Celestron C6 SCT f/6.3 with an ASI533MC Pro camera, ASlair Plus for capture, 30 second subs and a total integration time of 55 minutes. Processing was PixInsight with a slight touch up in LightRoom.



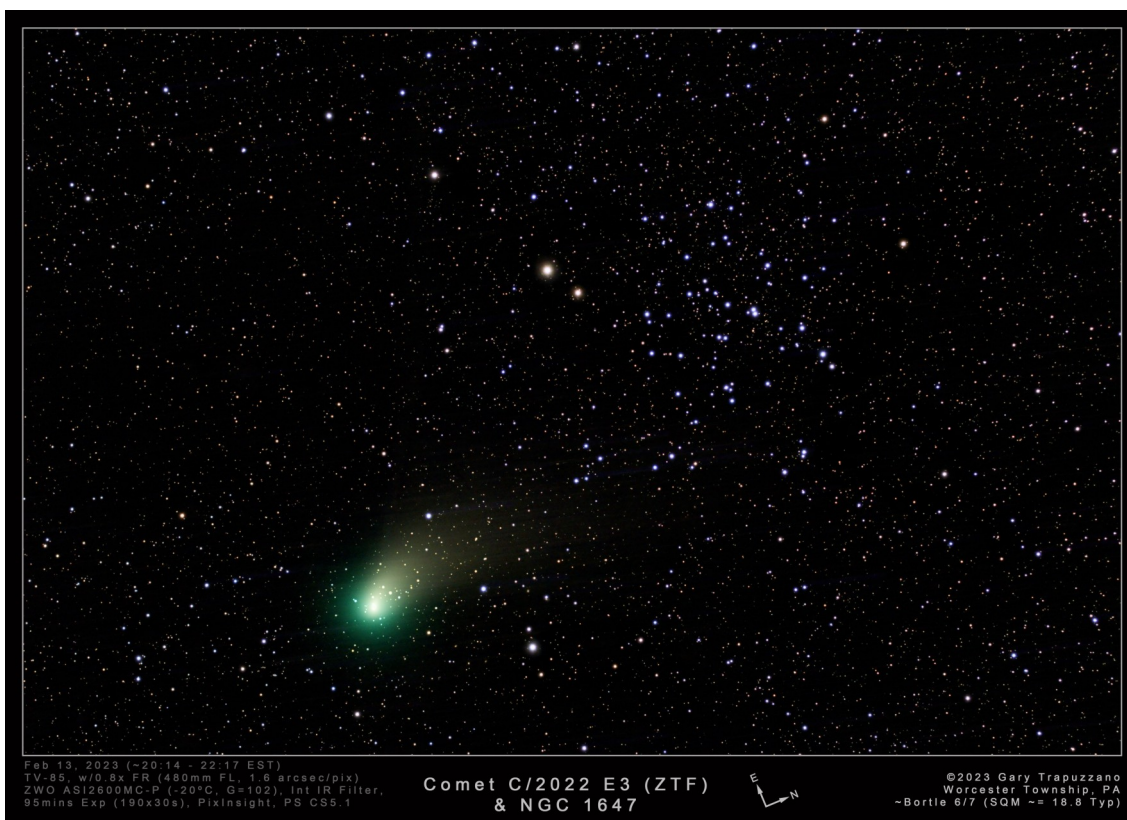
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Recent Images by DVAA Members (continued)



Gary Trapuzzano obtained these two beautiful images of comet C/2022 E3 (ZTF) juxtaposed with Mars (above) and with NGC 1647 (below). [Members: Click here to view an animation of the comet by Gary \(must be logged in to Groups.io\).](#)

Tom Nolasco also made a one-hour GIF showing the comet's movement, [viewable on Groups.io.](#)

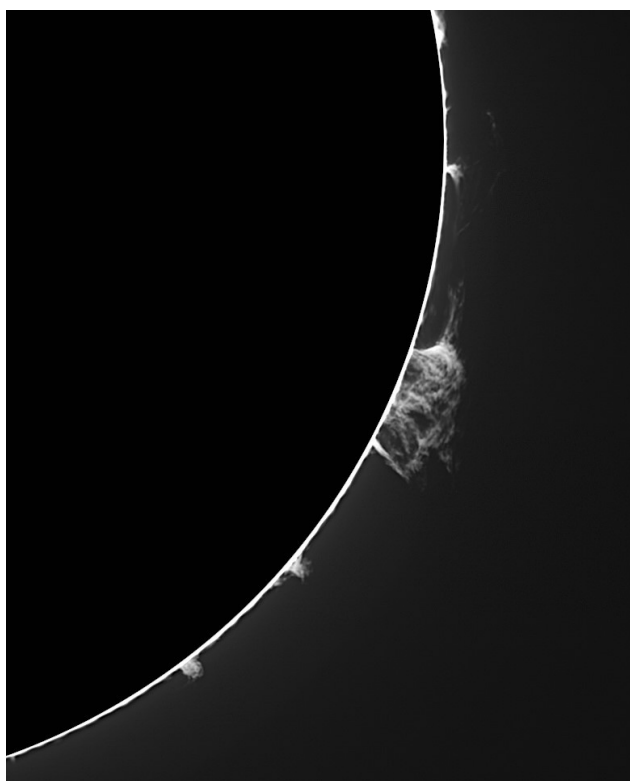
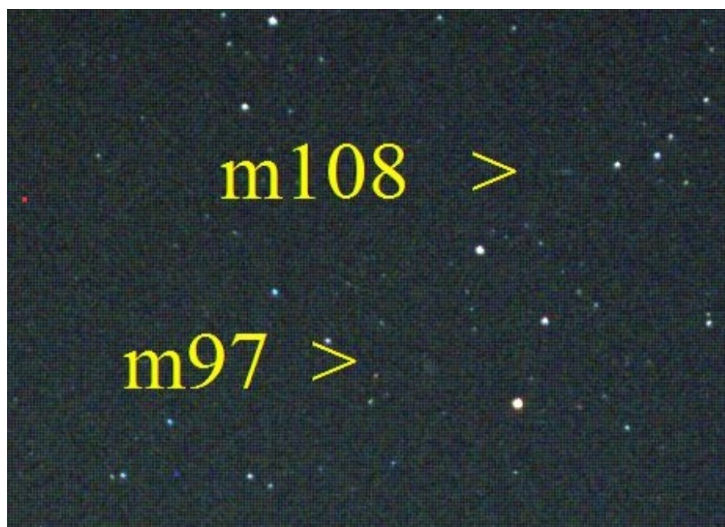


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Recent Images by DVAA Members (continued)



Above: Dick Steinberg took this image of the Big Dipper region with an 85mm Canon-type lens and StarShoot Pro from his home in Penn Valley. A magnified view of the M97/M108 area is displayed to the right.



Left: Tom Nolasco obtained this beautifully detailed shot of a large prominence on the sun on February 23rd. If you are logged into the club's Groups.io, [click here](#) to view an animation of the prominence that Tom took over 80 minutes. Image capture details: Lunt 60mm Ha, 2x Barlow, ASI174mm.

(Continued on next page)

Recent Images by DVAA Members (continued)

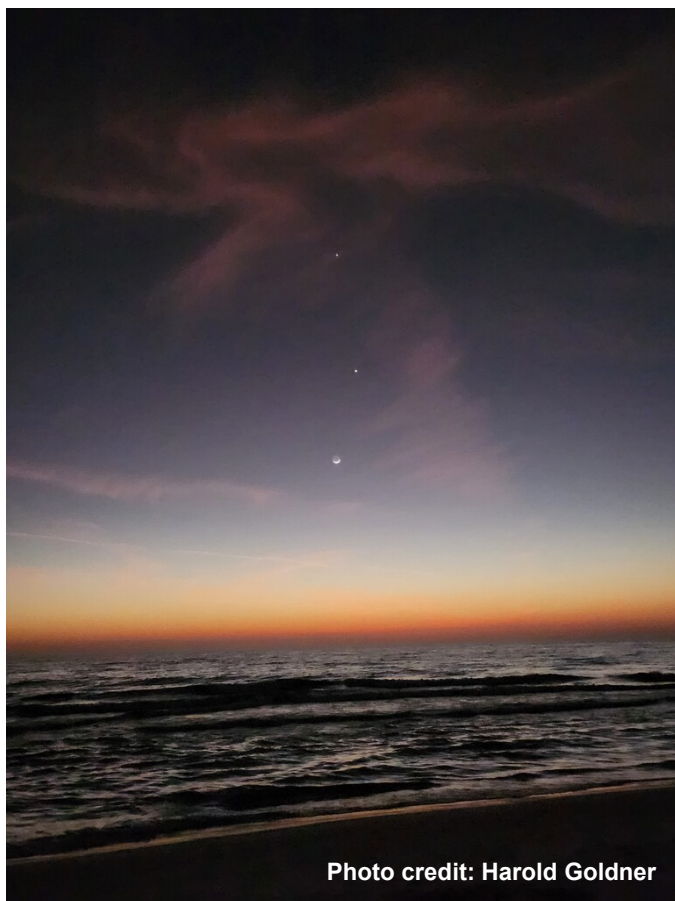


Photo credit: Harold Goldner

A number of members snapped photos of the recent conjunction between Jupiter, Venus and the Moon in late February. More of these shots can be found on the [Groups.io forum](https://groups.io/forum).



Photo credit: Tom Nolasco



Photo credit: Jeff Kahler

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



Photo credit: Mike Tucker

Spot the Morning and Evening Star: Observe Venus

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!

Venus is usually the brightest planet in our skies, and is called "Earth's Twin" due to its similar size to Earth and its rocky composition. However, Venus is a nightmare version of our planet, featuring a thick, crushing atmosphere of acidic clouds, greenhouse gases, howling winds, and intense heat at its surface.

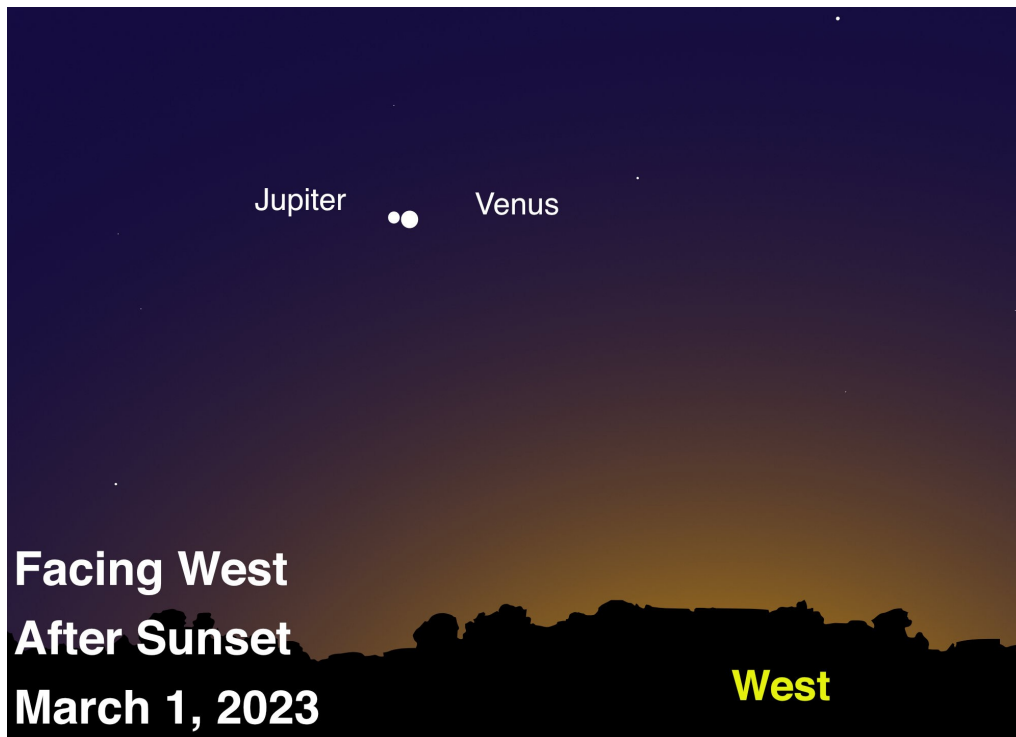
This rocky inner world's orbit brings it closer to Earth than any of the other planets, and is the second closest to the Sun after Mercury. Like Mercury, Venus orbits between our planet and the Sun, so Earth-based observers can observe Venus in the morning before sunrise, or in the evening after sunset – but never high in the sky in the middle of the evening, unlike the outer planets. Since Venus is so striking in its twilight appearances, the planet features heavily in sky mythologies worldwide. Venus's bright morning and evening appearances are the origin for its dual nicknames: the Morning Star, and the Evening Star. Some ancient astronomers never made the connection, and assumed the Evening Star and Morning Star were two unrelated objects! Observers can even spot Venus during the daytime, if the sky is very clear and the planet is bright enough. Venus also has phases, similar to the Moon and Mercury. Galileo's observations of Venus's phases helped turn the astronomy world upside down in the early 1600s, and you can see them yourself using a telescope or even a surprisingly low-power pair of binoculars. **Warning:** Please be very careful when observing Venus with a telescope in the early morning or daytime. Never allow the Sun to enter your instrument's field of view, as you could be permanently blinded.

Venus's other moniker of "Earth's Twin" is a bit misleading. In terms of their surface temperatures and atmospheres, Venus and Earth are extremely different! The surface of Venus is warmer than that of Mercury, despite Mercury being many millions of miles closer to the Sun. While Mer-

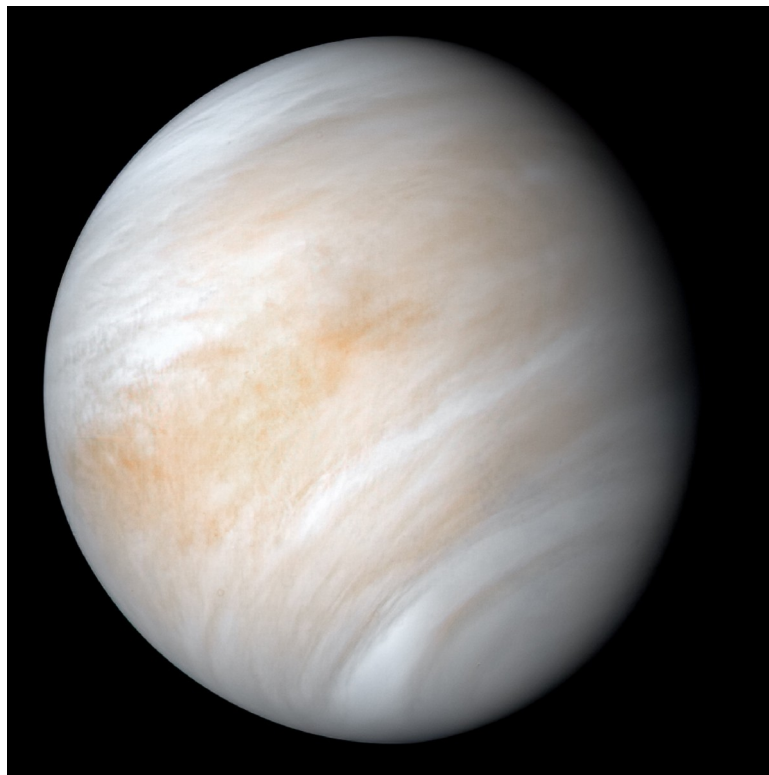
cury is still a scorching 800 degrees Fahrenheit (427 degrees Celsius), Venus is even hotter: 900 degrees Fahrenheit (482 degrees Celsius). The vast amount of carbon dioxide in the thick Venusian atmosphere acts as an insulating blanket that retains much of the Sun's heat, creating the runaway greenhouse effect that dominates its present-day climate. The Venusian surface is a crushing 90 Earth atmospheres on top of its absurd temperatures. These extreme conditions mean that the mission life of any past Venusian robotic landers were measured in **hours** at best – and usually minutes! However, conditions in Venus's upper atmosphere may be much more hospitable, with temperatures and pressures at 30 miles (50 km) above the surface that are much more Earth-like in temperature and pressure. Studies of the Venusian atmosphere, including seasonal appearances of dark streaks and faint signals of suggestive chemistry, intrigue researchers with the possibility that some sort of life may persist in its clouds. But far more evidence is needed to confirm such a claim, since non-biological factors like volcanism and other processes could also be the source for these signals.

Venus's thick sulfuric acid clouds block direct visual observations of its surface from optical telescopes on Earth. Multiwavelength observations from space probes show evidence of active volcanoes and possibly some sort of plate tectonics, but follow-up missions will be needed to confirm the presence of active volcanism, plate tectonics, and any possible signs of life. In order to do so, NASA is sending two new missions to Venus by the end of this decade: the orbiter **VERITAS**, which will map the surface in high detail and study the chemistry of its rocks and volcanoes, and **DAVINCI+**, which will study its atmosphere and possible tectonic surface features via a "descent sphere" that will plunge into Venus's clouds. Follow their development and discover more about Venus at solarsystem.nasa.gov/venus, and of course, continue your exploration of the universe at nasa.gov.

Spot the Morning and Evening Star: Observe Venus (continued)



Venus and Jupiter continue to move closer together in the evening sky this month. Jupiter will continue its descent towards the horizon while Venus will continue to climb and will be visible in the evenings through mid-summer of 2023. It's a great year for Venus fans! *Image created with assistance from Stellarium*



The top layers of Venus's cloud pop in this contrast-enhanced image, reprocessed with modern techniques from Mariner 10 data. *Credit: NASA/JPL-Caltech*

Source: <https://solarsystem.nasa.gov/resources/2524/newly-processed-views-of-venus-from-mariner-10/>

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" Dossinian



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 nonprofit 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.

