PAStimes
A Publication of the Phoenix Astronomical Society

Stu's Views

• Stu Brackney, President PAS

Happy New Year, everyone! We have just completed a 584,000,000-mile trip around the Sun going 67,000 miles (about 107,826.05 km) per hour. As they say, time flies.

A few updates; your PAStimes has a new feature this month- a crossword puzzle. Check it out.

The PAStimes is coming to you via email and is also found on our public website www.pasaz.org. Tell your friends about this publication chock full of information, images, and astronomical links. Your Editor Richard Meyers wants me to remind you that this is your publication, so feel free to offer your stories, images and of other items for publication.

I have a solar telescope in my garage. It is yours free to borrow as it is part of our Telescope Loaner Program for members only. Interested: telescope@pasaz.org.

As of December 31, we had 158 members. A historically high number for PAS! Your membership runs for one year, 1 January to 31 Dec., so it is time to renew. Easy as pumpkin pie to do so by visiting our website, www.pasaz.org and go to the link: https://www.pasaz.org/join-our-society. Need help, contact Richardpipkin@pasaz.org.

Ruza Sabelja is our Events Manager. She coordinates our telescope workshops and star parties. She is looking for members to help teach the telescope workshops. If you have a working knowledge of telescopes, please let her know: ruzasabelja@pasaz.org.

Again, Happy New Year everyone as your leadership team is looking forward to a fun filled astronomical year... 2025.

Lecture: January 9th 2025 Chris Ford- How Buzz Lightyear Added Another Dimension to the Universe !"

Now Forming : Astroimaging group see page 2 for details

Workshop: January 23rd 2025 PVCC Main Campus

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Upcoming Events

January 2025

1st - Renew Membership https://www.pasaz.org/join-our-society
9th - Monthly Lecture Series - Chris Ford
23th - Telescope Workshop-PVCC Main Campus

February 2025

1st - Public Star Party- Apache Wash Trailhead Park
6th - Monthly Lecture Series - Auroras
20th - Telescope Workshop-PVCC Main Campus

March 2025

1st -Public Star Party- Apache Wash Trailhead Park
6th - Monthly Lecture Series - TBD
20th - Telescope Workshop-PVCC Main Campus
29th - Public Star Party- Apache Wash Trailhead Park

For more information and to register for these events, go to the PAS Event Calendar and Registration Site . It is important to register for all events. In case of an event change or cancellation, you will be notified via email.

January Lecture Series

January 9th Lecture by Chris Ford , Topic: "How Buzz Lightyear Added Another Dimension to the Universe!"

It is not widely known that for 40 years there has been a profound engagement between Hollywood and astronomy that has elevated visual effects and animation into truly breathtaking spectacles. By harnessing increasingly complex algorithms and computational models rooted in physics and astronomy, modern filmmakers can not only craft visually stunning sequences but also tell stories with greater scientific accuracy and depth.

Passionate about combining astronomy and cutting-edge visual technologies, Chris served as COO of the Astronomical Society of the Pacific, where he also has been President and Interim CEO. With a career spanning leadership roles at Pixar, Prezi, and Autodesk, Chris contributed to groundbreaking CGI innovations, including Maya and RenderMan, earning three Scientific and Technical Academy Awards. A credited contributor to twelve feature films, also an avid astrophotographer, hiker, and science fiction enthusiast.

Now Forming: Astroimaging Special Interest Group(ASIG)!

Are you passionate about capturing the beauty of the cosmos? Whether you're a beginner or an experienced astrophotographer, now is the perfect time to join The Phoenix Astronomical Society's Astroimaging Special Interest Group as we launch this exciting new group!

Astroimaging, also known as astrophotography, is the practice of capturing images of celestial objects like stars, planets, galaxies, and nebulae. It combines photography and astronomy, allowing you to create stunning visuals of the universe while exploring its mysteries.

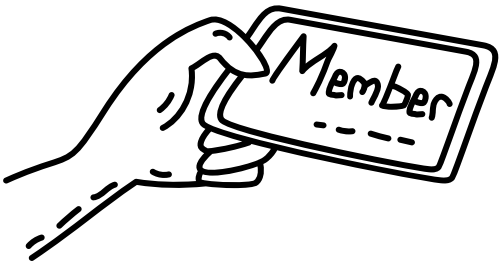
Our mission is to:

✨ Advance the art and science of astroimaging.
🌌 Provide educational opportunities, mentorship, and technical q&a.
📸 Inspire growth through shared experiences, monthly challenges, and interactive discussions.

This is your chance to join a collaborative community of like-minded enthusiasts, explore new techniques, and uncover the wonders of the universe through imaging!

Interested? Drop us an email to sign up for notifications of future events!

EMAIL: editor@pasaz.org subject: “Astroimaging” to sign up to receive notifications for future meetups!



Beat the Rush...[Renew Your Membership Now]

Hi everyone. Great news, your Board of Directors decided not to keep up with inflation. They did not raise your annual dues! More good news is, you can easily renew your membership by going to our public website www.pasaz.org, look on the left index column for the link “Join Our Society,” click on that and there ya go. Your membership runs from 1 January to 31 December or the date you sign up to the end of the year. Our new Membership Manager, Mr. Richard Pipkin will assist you with any questions you may have: richardpipkin@pasaz.org

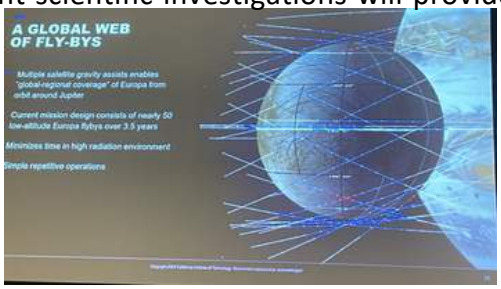
December Lecture Series

From Galileo to Europa Clipper: Exploring an Ocean World

Speaker: Dr. David Williams, Arizona State University
Topic: From Galileo to Europa Clipper: Exploring an Ocean World
Location: PVCC Campus
ASU Professor David Williams began his professional career as a postdoc on the NASA Galileo mission, studying Jupiter’s moons Io and Europa. Now a new era begins with the launch of NASA’s Europa Clipper in October 2024. What will this spacecraft do? Join Dr. Williams for a review of what we know about Europa from Galileo and a look ahead at clipper’s exploration of this Ocean World.

Here's a summary of the key points:

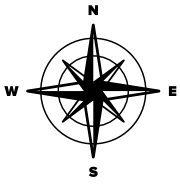
1. Galileo Mission: Dr. Williams discussed the Galileo mission, which provided the first strong evidence of a subsurface ocean on Europa, one of Jupiter's moons. The mission's magnetometer data suggested the presence of a salty ocean beneath Europa's icy crust
2. Europa Clipper Mission: He highlighted the upcoming Europa Clipper mission, set to launch in 2024 and arrive at Jupiter in 2030. This mission aims to conduct detailed flybys of Europa to study its ice shell and subsurface ocean
3. Scientific Goals: The Europa Clipper mission has several scientific objectives, including confirming the existence of the subsurface ocean, determining its depth and salinity, and understanding the processes that exchange materials between the surface and the ocean
4. Technological Advances: Dr. Williams emphasized the technological advancements that will enable the Europa Clipper to perform its investigations, such as magnetic induction, subsurface radar sounding, and tidal deformation measurements
5. Habitability: The ultimate goal of these missions is to assess the habitability of Europa's ocean, which could potentially harbor life. The synergy between different scientific investigations will provide unprecedented insights into Europa's interior



Dr. Williams' talk underscored the importance of these missions in advancing our understanding of ocean worlds and their potential for life.

Sam Insana PAS Student Scholarship Winners

Elvis Garcia proudly accepted the award, presented by Mark Johnston, during the event. Jacqueline Valenzuela-Braunch, unfortunately, could not attend but was equally celebrated for her achievement.



December Outreach Events

Star party at Apache Wash-Richard Meyers

We had a fantastic turnout at the Apache Wash Star Party on November 30th, featuring seven telescopes—an exciting mix of visual and EAA (Electronically Assisted Astronomy) setups—and around 20 enthusiastic participants. We also handed out several cards to curious spectators who stopped by to join the fun. Jupiter and Saturn put on a spectacular show, wowing everyone with their brilliance.

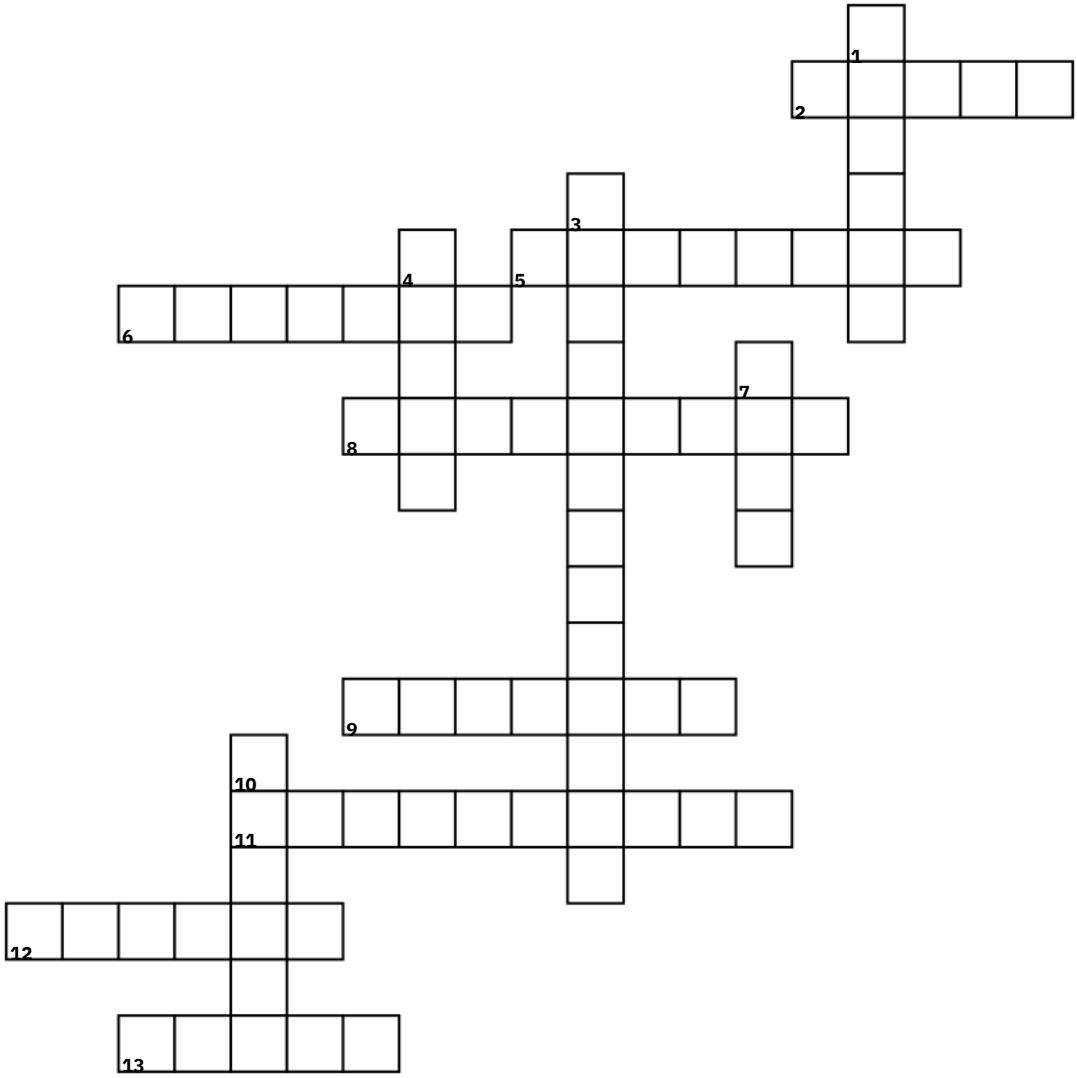
As winter sets in, the temperatures dropped quickly during the evening, so be sure to pack plenty of layers to stay cozy at future events. The night wrapped up around 9:30 PM, leaving us all with unforgettable views and great memories!

TAKE A TOUR

Enjoy your coffee with a crossword puzzle

We’re putting together an astronomy-themed crossword puzzle and would love to include clues and answers contributed by our members! This is a fun way to showcase your unique knowledge and favorite topics within astronomy.

If you’d like to contribute:
Think of an astronomy-related word or concept.
Write a clue for it—make it easy, challenging, or clever! format {Answer-Question}
Submit your word and clue to: **editor@pasaz.org**



Across

[2] A mass of material with a long tail that travels around the Sun
[5] The spinning of the Earth on its axis
[6] The planet closest to the Sun
[8] The distance light travels in one year
[9] The largest planet in our solar system
[11] A scientist who studies stars and planets
[12] Space void of matter
[13] The brightest star in the constellation of Cygnus

Down

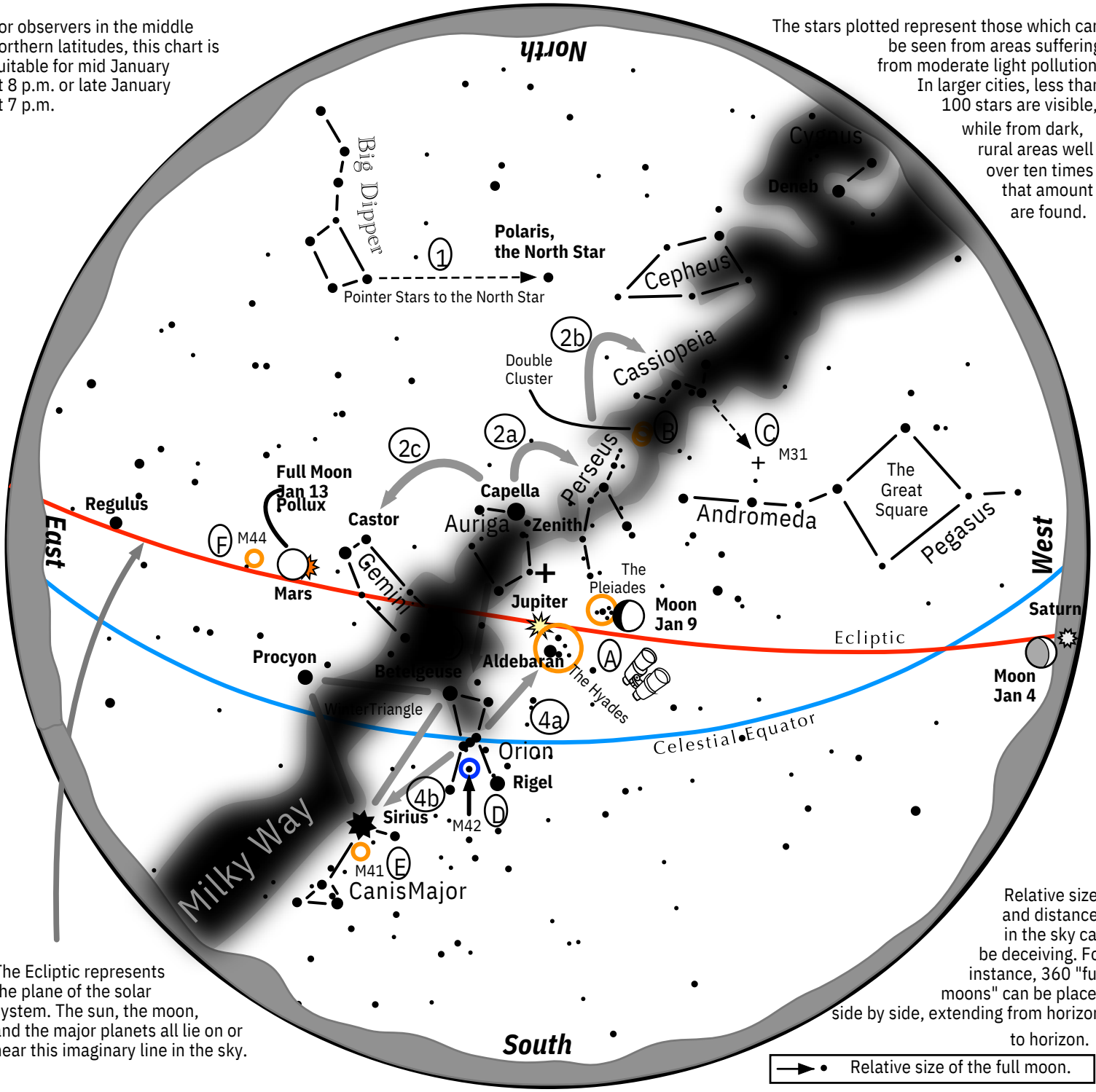
[1] The universe seen as a well-ordered whole
[3] A group of stars with a definite pattern or arrangement
[4] A gravitationally curved path of an object about a point in space
[7] The "Red Planet"
[10] The planet with rings

*Solution on pg16

Navigating the mid January Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid January at 8 p.m. or late January at 7 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

Relative size of the full moon.

Navigating the winter night sky: Simply start with what you know or with what you can easily find.

1. Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
2. Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next Jump southeastward from Capella to the twin stars Castor and Pollux of Gemini.
3. Directly south of Capella stands the constellation of Orion with its three Belt Stars, its bright red star Betelgeuse, and its bright blue-white star, Rigel.
4. Use Orion's three Belt stars to point to the red star Aldebaran, then to the Hyades, and the Pleiades star clusters. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius.

Binocular Highlights

A: Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **B:** Between the "W" of Cassiopeia and Perseus lies the Double Cluster. **C:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. **D:** M42 in Orion is a star forming nebula. **E:** Look south of Sirius for the star cluster M41. **F:** M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.

Member Astro Images

M31-RICHARD SAUERBRUN

MOON-RICHARD MEYERS

M33 -RICHARD SAUERBRUN

WITCH HEAD & ROSETTE -MARK JOHNSTON

7 Telescope Targets

Each month, we feature 7 good targets for small telescopes that should be visible in the evening. For the month of January, the targets are:

1.M42 The Orion Nebula The most spectacular nebula in the northern sky
2.The Trapezium Beautiful box of 6 stars that powers the Orion nebula
3.NGC2169 “XY Cluster” Fascinating star cluster that looks like and “XY” in space
4.Rigel Blue supergiant and an easy double for your telescope
5.Hinds Crimson star Deep red carbon star, looks like a stop light in space
6.M1 the Crab Nebula Nebula is the result of a supernova seen by the Chinese in 1054AD.
7.M35 star cluster Beautiful open cluster in Gemini

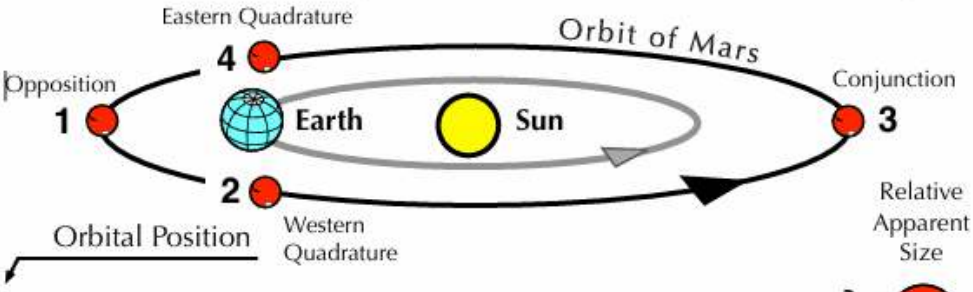
Star Party Targets

- M42, the Orion Nebula, is a bright star-forming region in the constellation Orion, about 1,350 light-years away. Easily visible below Orion’s Belt, it appears as a fuzzy patch to the naked eye and reveals stunning details through telescopes, including the Trapezium Cluster at its core. A massive stellar nursery, M42 is rich in glowing hydrogen gas, where stars and planets are actively forming. It’s best observed during winter, offering a breathtaking view for astronomers and stargazers alike.

- Rigel (Beta Orionis) is a blue supergiant and the brightest star in the constellation Orion, shining with a magnitude of 0.12. Located about 860 light-years away, it’s one of the most luminous stars visible, emitting 120,000 times the Sun’s energy. Part of a multi-star system, Rigel contrasts beautifully with the reddish Betelgeuse. It’s best observed in winter and will eventually end its life as a supernova. Its name comes from Arabic, meaning "the left leg of the giant."

- M1, the Crab Nebula, is a supernova remnant in Taurus, located about 6,500 light-years away. It formed from a supernova recorded in 1054 CE and spans 11 light-years. At its core is the Crab Pulsar, a rapidly spinning neutron star emitting intense radiation. This nebula is a rich mix of ionized gas and high-energy radiation, making it a key target for studying stellar death and astrophysics. Visible through telescopes, it's best observed during winter.

Mars: Orbital Aspects

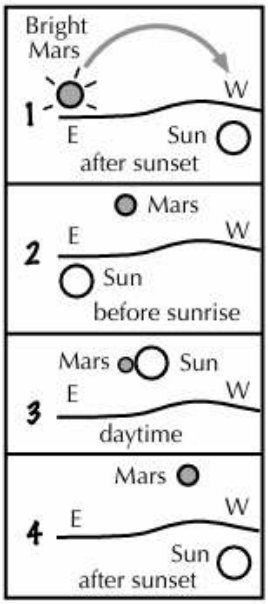


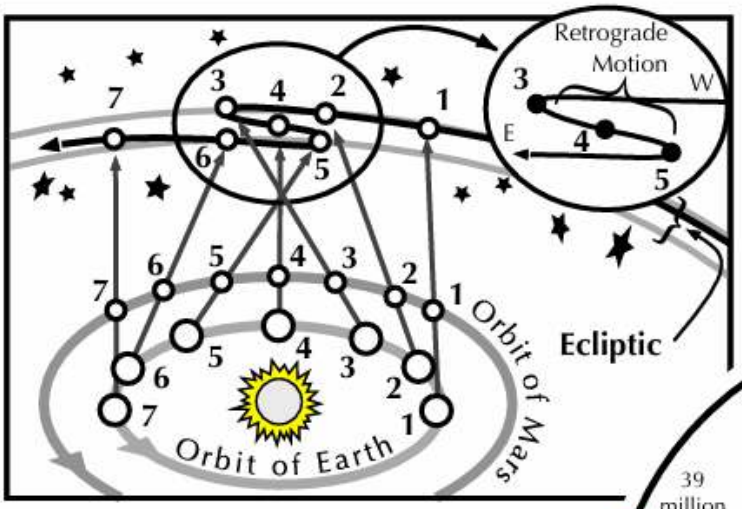
1 When Mars is opposite the sun, it rises near sunset and is visible all night. It is closest to Earth and shines at its brightest. At Opposition.

2 When Mars lies ahead of Earth in their orbits, Mars is seen high in the east before sunrise. It is often said to be a "Morning Star." Mars shows a slight gibbous phase.

3 When Mars moves on the far side of the sun, it appears in the day sky near the sun and can't be seen. At Conjunction with the sun.

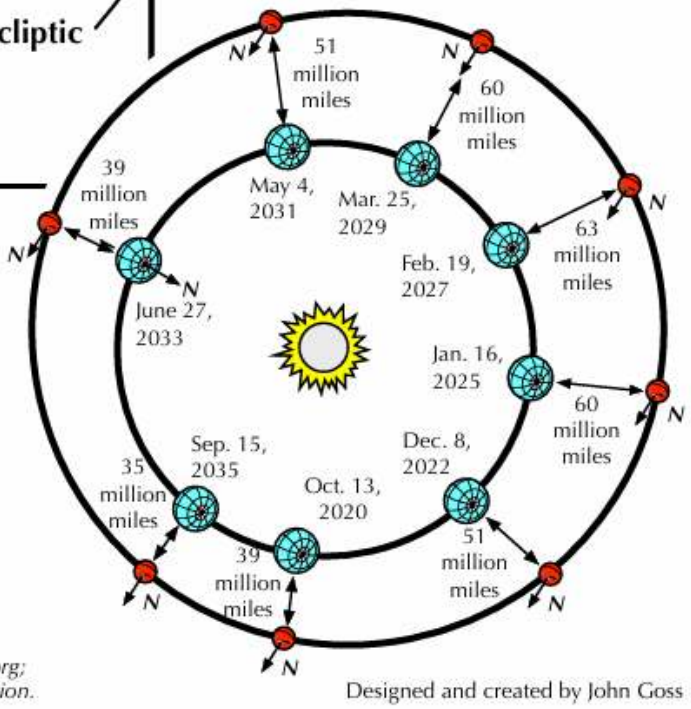
4 When the Earth lies ahead of Mars, it is seen high in the west after sunset and sets around midnight. Mars is often said to be an "Evening Star." It shows a slight gibbous phase.





Retrograde motion of Mars

For most of its orbit, Mars moves west to east in our sky. As seen from Earth, the nightly motion of Mars appears to reverse course for two months when Earth overtakes it. This east to west motion is called "retrograde." Then, it switches back to its original west to east direction.



Oppositions of Mars

Mars' elliptical orbit results in some approaches to Earth being closer than others. During these particularly close oppositions, Mars appears brighter in the sky (and larger in a telescope). Because of the orientation of its orbit, the closest oppositions happen in August and September, and the distant ones occur in February and March.

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Designed and created by John Goss

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!

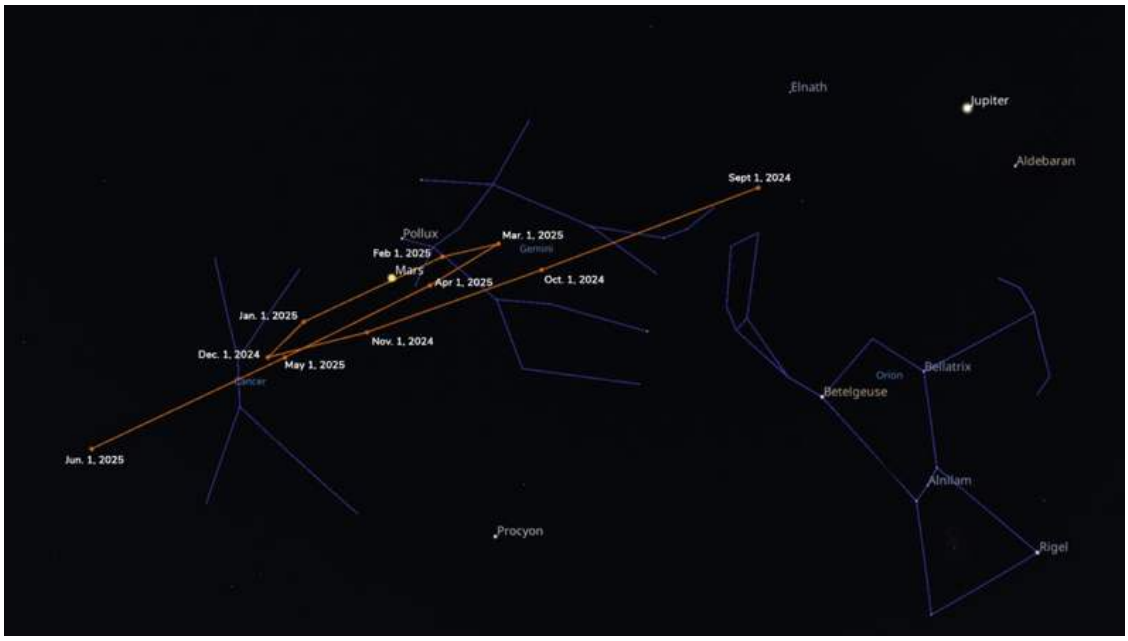
January's Night Sky Notes: The Red Planet

By Kat Troche

Have you looked up at the night sky this season and noticed a bright object sporting a reddish hue to the left of Orion? This is none other than the planet Mars! January will be an excellent opportunity to spot this planet and some of its details with a medium-sized telescope. Be sure to catch these three events this month.

Martian Retrograde

Mars entered retrograde (or backward movement relative to its usual direction) on December 7, 2024, and will continue throughout January into February 23, 2025. You can track the planet's progress by sketching or photographing Mars' position relative to nearby stars. Be consistent with your observations, taking them every few nights or so as the weather permits. You can use free software like Stellarium or Stellarium Web (the browser version) to help you navigate the night as Mars treks around the sky. You can find Mars above the eastern horizon after 8:00 PM local time.



This mid-January chart shows the path of Mars from September 2024 to June 2025 as it enters and then exits in retrograde motion. Mars appears to change its direction of motion in the sky because Earth is passing the slower-moving Mars in its orbit. Credit: Stellarium

(Continued on next page.)

Hide and Seek

On the night of January 13th, you can watch Mars 'disappear' behind the Moon during an occultation. An occultation is when one celestial object passes directly in front of another, hiding the background object from view. This can happen with planets and stars in our night sky, depending on the orbit of an object and where you are on Earth, similar to eclipses.

A simulated view of the Moon as Mars begins its occultation on January 13, 2025. Credit: Stellarium

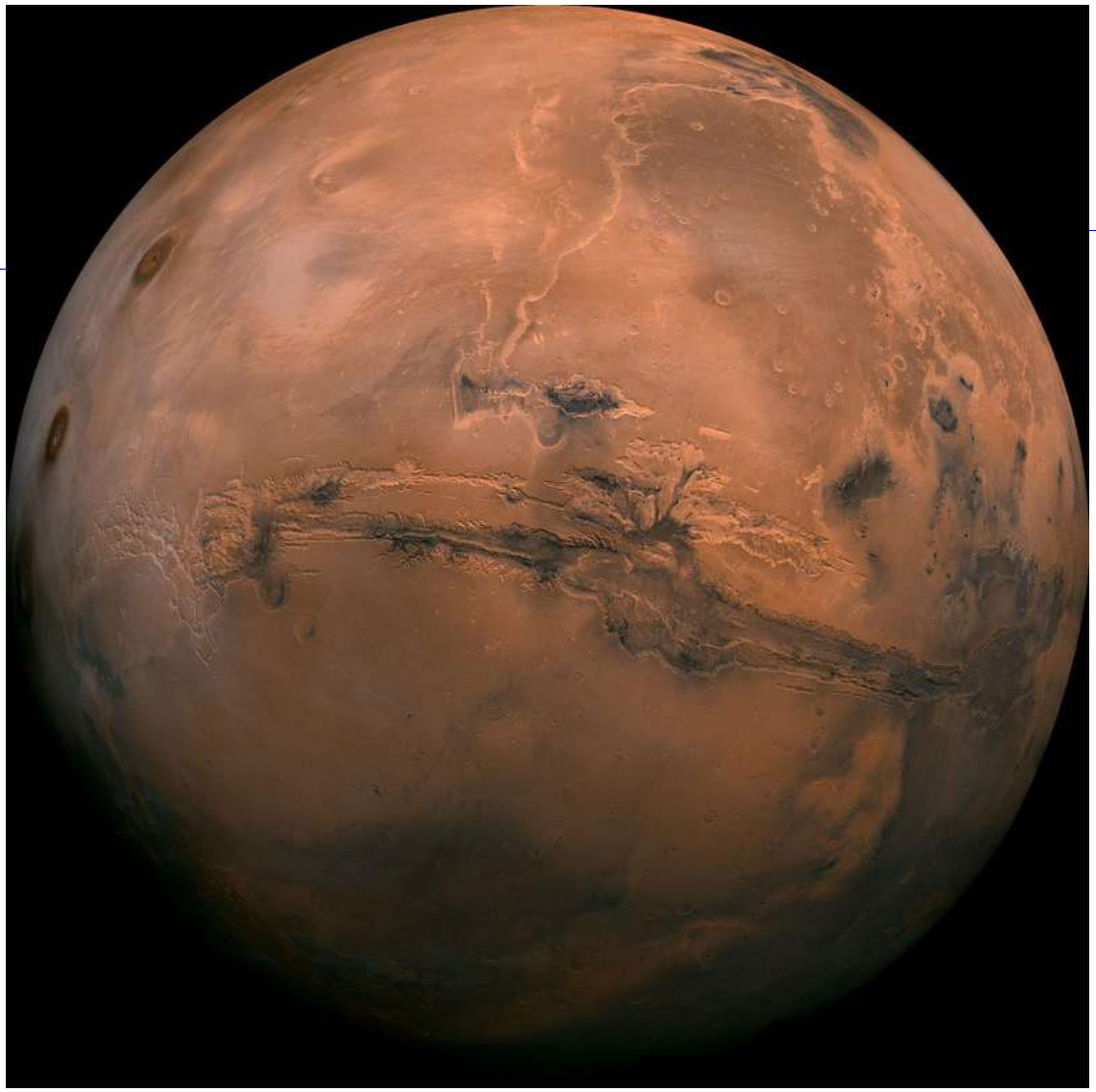
Depending on where you are within the contiguous United States, you can watch this event with the naked eye, binoculars, or a small telescope. The occultation will happen for over an hour in some parts of the US. You can use websites like Stellarium Web or the Astronomical League's 'Moon Occults Mars' chart to calculate the best time to see this event.

Closer and Closer

As you observe Mars this month to track its retrograde movement, you will notice that it will increase in brightness. This is because Mars will reach **opposition** by the evening of January 18th. Opposition happens when a planet is directly opposite the Sun, as seen from Earth. You don't need to be in any specific city to observe this event; you only need clear skies to observe that it gets brighter. It's also when Mars is closest to Earth, so you'll see more details in a telescope.

Want a quick and easy way to illustrate what opposition is for Jupiter, Saturn, Mars, or other outer worlds? Follow the instructions on our Toolkit Hack: Illustrating Opposition with Exploring the Solar System page using our Exploring Our Solar System activity!

(Continued on next page.)



A mosaic of the Valles Marineris hemisphere of Mars projected into point perspective, a view similar to that which one would see from a spacecraft. The mosaic is composed of 102 Viking Orbiter images of Mars. Credit: NASA/JPL-Caltech

Mars has fascinated humanity for centuries, with its earliest recorded observations dating back to the Bronze Age. By the 17th century, astronomers were able to identify features of the Martian surface, such as its ice caps and darker regions. Since the 1960s, exploration of the Red Planet has intensified with robotic missions from various space organizations. Currently, NASA has five active missions, including rovers and orbiters, with the future focused on human exploration and habitation. Mars will always fill us with a sense of wonder and adventure as we reach for its soil through initiatives such as the Moon to Mars Architecture and the Mars Sample Return campaign.

Helpful Astronomy Websites

by Mark Johnston

The following websites are great free resources to help you plan and enjoy your astronomy adventures

Astromart: astromart.com/
This is one of the top two sites for buying and selling used astronomy gear, product reviews, and forums where you can discuss any aspect of astronomy with other enthusiasts. A small fee is required.

Astrometry.net: https://nova.astrometry.net/
This site will take any astronomy image you send it (galaxy, starfield, nebula, etc) and then tell you what it is and where it is in the sky.

Astronomy Tools: astronomy.tools/calculators/field_of_view/
This site has a lot of capabilities but I use it primarily to figure out how a target (e.g. the Helix nebula) will look in my eyepiece or astronomy camera. You pick your scope, camera, eyepiece and target and the site does the rest.

Astrospheric: www.astrospheric.com/
Probably the best short term astronomy weather forecasting tool, providing predictions of clouds, transparency and seeing.

Clear Sky Charts: www.cleardarksky.com/
Excellent source of astronomy seeing conditions forecast. Also a great tool for finding observing sites with lower light pollution.

Cloudynights: www.cloudynights.com/
This is one of the top two sites for buying and selling used astronomy gear, product reviews, and forums where you can discuss any aspect of astronomy with other enthusiasts. Free.

Dark site finder: darksitefinder.com/map/
Great website for finding a dark observing location.

Heavens above: heavens-above.com/
Top site for predicting naked eye observations of satellites. See when the ISS is visible in your neighborhood!

Jupiter transits: shallowsky.com/jupiter/
For anyone with a small telescope, this is a great site. You can find out when the Great Red Spot and Jupiter's satellite transits are visible.

Solar Dynamic Observatory (SDO): https://sdo.gsfc.nasa.gov/data/
Find out how the Sun looks right now, at various wavelengths. If you own a solar telescope, this site coupled with Astrospheric is all you need to plan fabulous solar observing!

Starzonia: https://starizona.com/
Astronomy store located in Tucson, Arizona. They specialize in a wide range of astronomy equipment and accessories, catering to both amateur and professional astronomers. Their offerings include telescopes, cameras, filters, and eyepieces, among other products. Knowledgeable staff and passion for astronomy.

Telescopius: telescopius.com/
This site is very helpful in planning an observing evening. It will tell you when any particular target is rising and setting and when is the best time to observe it. This allows you to sequence your observing in a planned manner.

Used equipment for sale

Duration: Ads run for 3 months and may be renewed if submitted by the deadline and space permits.
Cost: Ads are FREE for members only. Equipment Requirements: All items must be in good working order.

Acceptable items include books, star charts, telescopes, eyepieces, finder scopes, binoculars, lasers, and other astronomy-related gear. Submission Details: Email the following information to **editor@pasaz.org**:

**Make *Model *Description (Under 100 words-include a link to the manufacturer's site if available) *Price *Contact Information *Preferred Contact Method(Email or phone) *Approximate Location*

PAS is not responsible for the ads and does not guarantee the quality of the items for sale. PAS reminds everyone, you purchase at your own risk, so do your research beforehand.

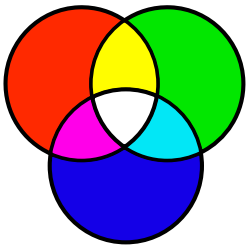
Make: ZWO
Model: EFW-7
Description: https://www.zwoastro.com/product/zwo-efw-5-x-2inch-7-x-2inch/
Price: $325
Contact Information: Richard Sauerbrun
Preferred Contact Method: **richard@sauerbrun.com**
Approximate Location: Scottsdale, AZ

PAS offer:This is a first come, first served offer. Review the list. Decide what you want. Email **stuartbrackney@pasaz.org** what you want. He will set up a day/time for you to come to his location to purchase.
Bring your check payable to Phoenix Astronomical Society or cash … no credit cards please.

Celestron 6" F/4 Newtonian Astrograph Telescope

- Fast 6"-aperture reflector lets you take short exposures with bright, high-resolution results
- Precise 2" dual-speed (10:1) linear-bearing Crayford focuser lies 7" back in the optical tube to block stray light and boost contrast
- Orion-exclusive steel reinforcement plate under focuser eliminates flexure with heavy imaging gear attached
- Compact 22.5" length and light 12.7 lb. assembled weight doesn't require an enormous mount
- Includes two heavy-duty hinged tube rings, 8x50 finder scope, dovetail mounting bar, and more

Member Price: $250 / Non-Member Price: $400



Various Filters – 1.25"

- Red
- Yellow
- Blue
- Green
- Multiple O3 filters

Member Price: $100 / Non-Member Price: $200

Telescope Loan Program

The PAS Telescope Loan Program provides PAS active members access to various donated telescopes and accessories to enhance their learning of visual astronomy as well as astrophotography.

Check-out Process: The entire PAS inventory of telescopes is available for active members to use. Some telescopes require completion of a training program, others do not. Several of the loaner telescopes represent a significant dollar value. In certain cases, the PAS member will be asked to provide credit card information as insurance against potential damage or loss.

A kit of eyepieces and accessories is available for all loaner telescopes if needed. There is also a special kit of advanced 2" eyepieces available for loan as well as advanced finder scopes. Laser collimation tools are also available for loan if needed.

Loan periods are for a maximum of two weeks. However, longer periods may be granted in special cases.

All telescope equipment and accessories must be picked up at the PAS storage facility and delivered back to the facility by the end of the loaner period. If you wish to check out one of PAS's telescopes, send an email to telescope@pasaz.org with the following information:

- Full Name
- Email Address
- Desired Telescope and/or accessory kit
- Check out date
- Check in date
- Additional information as needed

ZWO SeeStar S50
Coronado Personal Solar Telescope (PST)
Orion SkyQuest XT-10 - 10" Dobsonian
Orion Skyquest XT-8 – 8" Dobsonian
Meade ETX-70 Go-To Refractor
Sky-Watcher – 10" Collapsible Motorized Dobsonian
Accessory Kit #4 - Advanced Observing
Accessory Kit #5 – 1.25" Eyepieces & filters



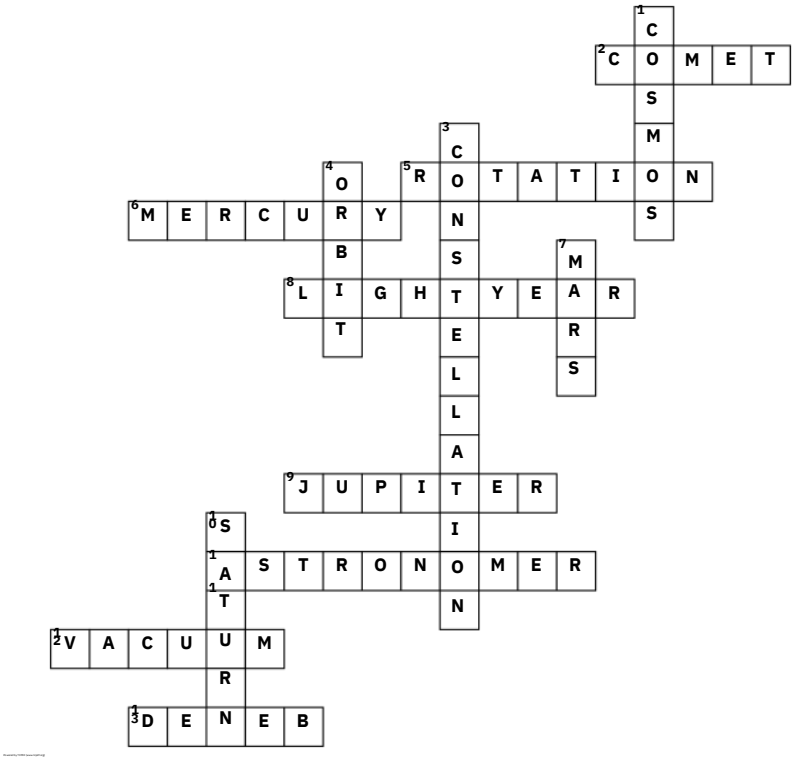








January Crossword Solution



Book Review: The Backyard Astronomer's Guide

By Terence Dickinson & Alan Dyer

The Backyard Astronomer's Guide is a comprehensive and accessible resource for stargazers of all levels. Packed with stunning visuals, practical advice, and up-to-date information on telescopes, astrophotography, and celestial navigation, the book makes astronomy approachable and exciting.

The authors break down complex concepts into clear, engaging explanations, offering tips for everything from choosing equipment to capturing breathtaking images. While some sections may feel detailed for beginners, the organized layout lets readers easily find what they need.

This beautifully illustrated guide is a must-have for anyone passionate about exploring the night sky.

Phoenix Astronomical Society Contact Info

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