

Volume 45.1

January 2025

# Desert Sky Observer

Antelope Valley Astronomy Club



# Desert Sky Observer

www.avastronomyclub.org

January 2025

## Upcoming Events

January 10: Club Meeting

January 25: Moonwalk @ PDW 6:30 pm

Every clear night: Personal Star Party

February 14: Club Meeting

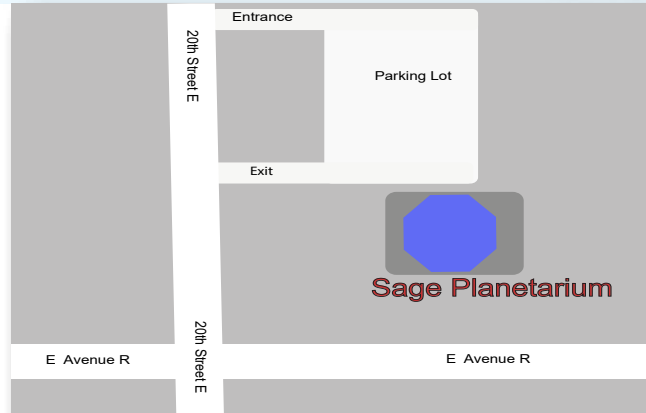
February 22: Moonwalk @ PDW 6:30 pm

March 8: Moonwalk @ PDW 6:30 pm

March 14: Club Meeting



AVAC Calendar



## Board Members

**President:** Phil Wriedt (661) 917-4874

[president@avastronomyclub.org](mailto:president@avastronomyclub.org)

**Vice-President:** Matt Leone (661) 713-1894

[vice-president@avastronomyclub.org](mailto:vice-president@avastronomyclub.org)

**Secretary:** Rose Moore (661) 972-1953

[secretary@avastronomyclub.org](mailto:secretary@avastronomyclub.org)

**Treasurer:** Rod Girard (661) 803-7838

[treasurer@avastronomyclub.org](mailto:treasurer@avastronomyclub.org)

**Director of Community Development:**

Christian Amaya (661) 972-0091

[community@avastronomyclub.org](mailto:community@avastronomyclub.org)

## Appointed Positions

**Newsletter Editor:** Phil Wriedt (661) 917-4874

[dso@avastronomyclub.org](mailto:dso@avastronomyclub.org)

**Equipment & Library:**

vacant

[library@avastronomyclub.org](mailto:library@avastronomyclub.org)

**Club Historian:** vacant

[history@avastronomyclub.org](mailto:history@avastronomyclub.org)

**Webmaster:** Steve Trotta (661) 269-5428

[webmaster@avastronomyclub.org](mailto:webmaster@avastronomyclub.org)

**Night Sky Coordinator:**

Rose Moore (661) 972-1953

**Astronomical League Coordinator:**

Phil Wriedt (661) 917-4874

[al@avastronomyclub.org](mailto:al@avastronomyclub.org)

[www.avastronomyclub.org](http://www.avastronomyclub.org)



**ANTELOPE VALLEY  
ASTRONOMY CLUB, INC.**

## Monthly Meetings

Monthly meetings are held at the **S.A.G.E. Planetarium** in Palmdale, the second Friday of each month except December. The meeting location is at the northeast corner of Avenue R and 20<sup>th</sup> Street East. Meetings start at 7 p.m. and are open to the public. *Please note that food and drink are not allowed in the planetarium.*

## Membership

Membership in the Antelope Valley Astronomy Club is open to any individual or family.

The Club has three categories of membership.

- Family membership at \$30.00 per year.
- Individual membership at \$25.00 per year.
- Junior membership at \$15.00 per year.

Membership entitles you to ...

- The Desert Sky Observer -- monthly newsletter
- The AVAC Membership Manual.
- To borrow club equipment, books, videos, and other items.

AVAC

PO Box 8545

Lancaster, CA 93539-8545



[www.avastronomyclub.org](http://www.avastronomyclub.org)

Visit the Antelope Valley Astronomy Club

website at [www.avastronomyclub.org/](http://www.avastronomyclub.org/)

[www.instagram.com/av\\_astronomyclub](https://www.instagram.com/av_astronomyclub)

The Antelope Valley Astronomy Club, Inc. is a

26 USC §503(c)(3) California Non-Profit Corporation.

## President's Message

By Phil Wriedt

Happy New Year!

It was so good to see so many at the Christmas Party. I hope a good time was had by all. Congratulations to all of the raffle winners.

Our next meeting is on the 10th. Come join us at the Sage and learn what we have in mind for this next year. At the October meeting in the parking lot, there were so many great suggestions for the coming year. When asked for any suggestions, please don't be afraid to blurt out a idea. If you know of a great place for a Dark Sky Star Party, say something. We are going to act on those ideas and make them come to life.

I want to repeat my thanks to all of those members who came to the last Moonwalk in November. It was a clear night, no wind, and it was very cold. I can't think of a reason why it will be any warmer on our next Moonwalk on the 25th, but I'm hoping. If you have a telescope bring it, or if not, just come join the party at Prime Desert Woodland. Don't forget warm clothes, jackets, gloves, etc. Sunset is at 5:15 pm and nautical dusk is late at 6:12 pm. Get there early so you can setup in daylight. Saturn will be up till 8:15 pm and this will probably be the last time to see the northern side of the rings till 2039. The more members there, the better it will be.

It's renewal season again. We haven't allowed inflation to influence the price of dues. The amount for dues has been the same for at least the last 24 years.

Lastly, I want to thank Nabil Radi who donated \$500 to the club. He's not a member, he doesn't want be recognized as a sponsor, he just wanted to donate to our Astronomy Club. Thank You so much, it is very much appreciated.

Keep Looking Up, Phil

## On The Cover

Note: North is 11.6° right of vertical RA: 16h 28' 3.89" DEC: 51° 46' 34.39" Dist: not listed ( Draco )

This new NASA/ESA Hubble Space Telescope image shows ghostly green filaments, lying within galaxy Mrk 1498 (aka PGC58223). This filament was illuminated by a blast of radiation from a quasar — a very luminous and compact region that surrounds the supermassive black hole at the centre of its host galaxy.

Its bright green hue is a result of ionised oxygen, which glows brightly at green wavelengths.

Credit:

NASA, ESA, W. Keel (University of Alabama, USA)

## From the Secretary

By Rose Moore

Members:

I hope all of you had a happy holiday season! We had a wonderful Christmas Party at Gino's Restaurant, with lots of raffle prizes. Congratulations to the winners!

We have a few regular events coming up, plus we're hoping to add a couple of events like a trip to Mt. Wilson this year. Astronomer Rémy Morgan will be returning as our speaker for our March meeting, topic to be announced. Sue Leone's Astronomy Paint Class will be held at our April meeting. We may also have a public event at the SAGE for the eclipse on Thursday March 13th, starting just before 9pm. We'll keep you posted!

On Friday, January 10th, we have a club meeting starting at 7:00 pm. We are working on speakers for this and future meetings; hopefully the Planetarium update will be done by our meeting. The meeting is free and open to the public. There are no food or snacks allowed in the Planetarium.

We have our first Prime Desert Moon Walk for 2025 on Saturday, January 25th at 6:30pm, weather permitting; this is free and open to the public. We will have telescopes available for viewing if weather permits. Members with telescopes are needed to help out at this event.

We will be passing out Night Sky Network certificates and pins, as well as AVAC certificates for 2024 at our January meeting.

Welcome to all our new members!

Rose

On the 21st of December the Club received a donation of \$500 from Nabil Radi.

We owe him a big **Thank You**. We all appreciate it.

For sale: 4 inch Celestron Equatorial telescope. Includes mount, solar filter, finder scope, eyepieces, two inch diagonal, carrying bag. Few scratches on finish. Price: \$250. Email either Duane (gurba1826@gmail.com) or Rose (rmorion1@bak.rr.com)

## AVAC Membership Renewal

It is that time year again, time to renew your AVAC Membership and HOORAY!!!. We are back in the newly cleaned and refurbished Sage Planetarium for our monthly meetings. We have had in person meetings for many months now that we are past Covid and it has been great. The Sage Planetarium is one of the club's most rewarding benefits.

It is very gratifying to see the early membership renewals. In these times of financial uncertainty our members are more than ever the lifeblood for the AVAC. That said, please worry not, financially the club is still solvent and we are able to meet all our obligations while providing for future club events and guest speakers etc.

Please remember that our meetings are open to the public and all will be welcome. So, if for any reason you are unable to renew your membership you are still welcome to attend and we look forward to seeing you all again.

For administrative reasons we encourage members to renew their membership in January. For myself the easiest way to renew my membership was through the AVAC website via our PayPal account. However you can renew at our monthly club meetings with good old cash or by check.

For those unable to attend our monthly meeting you can renew your membership through the mail by sending a check to the club's Post Office Box:

Antelope Valley Astronomy Club  
PO BOX 8545  
Lancaster, CA 93539-8545

For members less familiar with the club's website, it is actually fairly simple:

- Google Antelope Valley Astronomy Club and then open on the link.
- Click on MEMBER and then click on LOGIN.
- The default Member Name will be your Membership Number.
- If you had Signed Up on line you would have created a Password, but if you have forgotten it, use the Forgot Password link.
- Once you have Logged In, under Member click on Profile.
- Under Profile click on Membership.
- Under Your Current Membership click on Renew Now.
- You will have the choice of paying with a PayPal account or with a Credit Card.
- If you choose Credit Card PayPal will allow you to pay as a Guest

Thank you,  
Rod Girard AVAC Treasurer

## January's Night Sky Notes: The Red Planet

By Kat Troche, Astronomy Society of the Pacific, NASA Night Sky Network

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*

### 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.

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

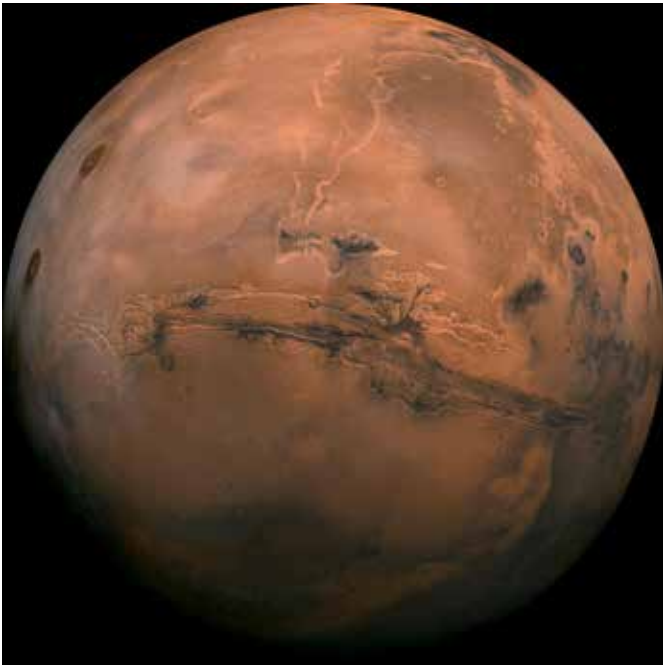
As you observe Mars this month to track its retrograde movement, you will notice that it will increase in brightness. This is because Mars will reach opposition by the evening of January 18th. Opposition happens when a planet is directly opposite the Sun, as seen from Earth. You don't need to be in any 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

### Additional Skywatching Resources

Plan your skywatching with help from our planner page, featuring daily stargazing tips courtesy EarthSky monthly sky maps, and videos from NASA/JPL. You can even find out how to spot the International Space Station! Both Astronomy and Sky and Telescope magazines offer regular stargazing guides to readers, both in print and online. Want to join a group of folks for a star party? Find clubs and astronomy events near you, and may you have clear skies!

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



*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](#).

This article is distributed by NASA Night Sky Network  
The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach.  
Visit [nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov) to find local clubs, events, and more!

## Space News

News from around the Net

### **NASA Probe Makes Closest Ever Pass By The Sun**

NASA's pioneering Parker Solar Probe made history Tuesday, flying closer to the sun than any other spacecraft, with its heat shield exposed to scorching temperatures topping 1,700 degrees Fahrenheit (930 degrees Celsius). Launched in August 2018, the spaceship is on a seven-year mission to deepen scientific understanding of our star and help forecast space-weather events that can affect life on Earth. . . "Right now, Parker Solar Probe is flying closer to a star than anything has ever been before," at 3.8 million miles (6.1 million kilometers) away, . . . (continued at <https://phys.org/news/2024-12-nasa-probe-closest-sun.html> )



### **NASA's New Deep Space Network Antenna Has Its Crowning Moment**

Deep Space Station 23's 133-ton reflector dish was recently installed, marking a key step in strengthening NASA's Deep Space Network. NASA's Deep Space Network, an array of giant radio antennas, allows agency missions to track, send commands to, and receive scientific data from spacecraft venturing to the moon and beyond. NASA is adding a new antenna, bringing the total to 15, to support increased demand for the world's largest and most sensitive radio frequency telecommunication system. . . (continued at <https://phys.org/news/2024-12-nasa-deep-space-network-antenna.html> )



### **Smallest Main-Belt Asteroids Ever Detected Found Hiding In JWST Data**

Over the past 200 years, astronomers have cataloged over a million asteroids in the solar system's main belt, down to the size of around a kilometer in diameter. But smaller asteroids were elusive — until recently, when a team of scientists utilized data from the James Webb Space Telescope (JWST) to spot some tiny asteroids as small as 33 feet (10 meters) across — no bigger than a school bus. Decameter asteroids — referring to asteroids tens of meters in size — originate in the main asteroid belt between Mars and Jupiter. . . (continued at <https://www.astronomy.com/science/smallest-main-belt-asteroids-ever-detected-found-hiding-in-jwst-data/> )



### **Webb Observes Protoplanetary Disks That Contradict Models Of Planet Formation**

The James Webb Space Telescope (JWST) was specifically intended to address some of the greatest unresolved questions in cosmology. These include all of the major questions scientists have been pondering since the Hubble Space Telescope (HST) took its deepest views of the Universe: the Hubble Tension, how the first stars and galaxies came together, how planetary systems formed, and when the first black holes appeared. In particular, Hubble spotted something very interesting in 2003 when observing a star almost as old as the Universe itself. . . (continued at <https://www.universetoday.com/170133/webb-observes-protoplanetary-disks-that-contradict-models-of-planet-formation/> )



### **How To Get Started With That New Telescope**

Maybe you just got a shiny new telescope to call your own. Congratulations — you could be on your way to making lifelong friends with stupendous, faraway things in the dark over your roof every night, things you never knew were floating right there waiting for you all along. However, most of them are so far and faint that just finding and identifying them is the challenge — and the accomplishment! . . (continued at [https://skyandtelescope.org/astronomy-resources/stargazing-basics/get-started-with-that-new-holiday-telescope/#google\\_vignette](https://skyandtelescope.org/astronomy-resources/stargazing-basics/get-started-with-that-new-holiday-telescope/#google_vignette) )



### **Io's Magma Ocean May Not Exist After All**

Plenty of worlds in our solar system have oceans — and not all of them are made of water. Io, Jupiter's innermost moon, was purported to have one made of basalt and bits of sulfur just under its surface, powering its volcanic eruptions. But according to a study published in Nature last week, a global magma ocean is not the key to explaining Io's volcanic activity. . . (continued at <https://www.astronomy.com/science/ios-magma-ocean-may-not-exist-after-all/> )



## Space News

News from around the Net

### **NSF NOIRLab Launches 88 Constellations Project**

Today NSF NOIRLab, funded by the U.S. National Science Foundation, in collaboration with ESA/Hubble, is releasing the 88 Constellations project. This complete collection of free, high resolution, downloadable images of all 88 western IAU-recognized constellations serves as an educational archive that can be used on the individual and scholastic levels. The project also includes the release of the largest open-source, freely available all-sky photo of the night sky. The photographer behind this collection of stunning, high-quality images is German astrophotographer Eckhard Slawik. The images were taken on film . . .(continued at <https://noirlab.edu/public/news/noirlab2430/?lang> )



### **Comet ATLAS (C/2024 G3) Kicks Off The New Year — What To Expect**

Comet ATLAS (C/2024 G3) is on its way! Discovered April 5th by the automated Asteroid Terrestrial-impact Last Alert System (ATLAS) when it was magnitude 19 and 4.4 astronomical units from Earth, it's now visible at 8th magnitude in Scorpius at dawn for observers at equatorial and southern latitudes. Hang tight. The future looks bright for this latest visitor from afar. Arriving at perihelion on January 13th, C/2024 G3 will miss the Sun by just 13.5 million kilometers, more than three times closer than Mercury's perihelion distance. Initial orbital calculations implied that the comet was making its first visit from the Oort Cloud. . . (continued at <https://skyandtelescope.org/astronomy-news/comet-atlas-c-2024-g3-kicks-off-the-new-year-what-to-expect/> )



### **M87 Releases A Rare And Powerful Outbursts Of Gamma-Ray Radiation**

In April 2019, the Event Horizon Telescope (EHT) collaboration made history when it released the first-ever image of a black hole. The image captured the glow of the accretion disk surrounding the supermassive black hole (SMBH) at the center of the M87 galaxy, located 54 million light-years away. Because of its appearance, the disk that encircles this SMBH beyond its event horizon (composed of gas, dust, and photons) was likened to a “ring of fire.” . . . (continued at <https://www.universetoday.com/170135/m87-releases-a-rare-and-powerful-outbursts-of-gamma-ray-radiation/> )



### **On This Day In Space! Dec. 27, 1984: Famed Allan Hills Mars Meteorite Found In Antarctica**

On Dec. 27, 1984, one of the most famous Mars meteorites was found in Antarctica. The meteorite, known as Allan Hills 84001, was found in Allan Hills, which is a group of hills in Antarctica. It was found by an American team of meteorite hunters from a National Science Foundation program called ANSMET, which stands for the Antarctic Search for Meteorites. . . .(continued at <https://www.space.com/39251-on-this-day-in-space.html> )



### **Two Stars May Be Orbiting Each Other Near A Supermassive Black Hole In Our Milky Way Galaxy**

Scientists have spotted what appear to be two stars whipping around each other near the supermassive black hole at the center of our Milky Way galaxy. Nearly every large galaxy has a supermassive black hole at its heart. The one in the middle of the Milky Way, called Sagittarius A (with an asterisk denoting star), is about 4 million times more massive than our sun and is relatively quiet, occasionally swallowing gas or dust that comes its way. Scientists know stars can form near and even orbit these black hole behemoths, but they've never seen a pair of stars survive so close by. . . (continued at <https://phys.org/news/2024-12-stars-orbiting-supermassive-black-hole.html> )



### **Perseverance Reaches Rim of Jezero Crater**

It's been a long upward climb for NASA's premier rover. But the commanding view — and the geology — were worth it. On December 10th, after nearly 4 years on Mars, NASA's Perseverance rover reached the rim of Jezero Crater. From a place on the rim dubbed “Lookout Hill,” its view stretched as far as 60 kilometers (40 miles) across the Martian surface. The rim crest also marks a geologic transition from rocks that fell inside the crater after it formed 3.9 million years . . . (continued at <https://skyandtelescope.org/astronomy-news/perseverance-reaches-rim-of-jezero-crater/> )



## Celebrating 20 Years: Night Sky Network

By Vivian White and Kat Troche, Astronomy Society of the Pacific, NASA Night Sky Network

NASA's Night Sky Network is one of the most successful and longstanding grassroots initiatives for public engagement in astronomy education. Started in 2004 with the PlanetQuest program out of the Jet Propulsion Laboratory and currently supported by NASA's Science Activation, the Night Sky Network (NSN) is critical in fostering science literacy through astronomy. By connecting NASA science and missions to support amateur astronomy clubs, NSN leverages the expertise and enthusiasm of club members, who bring this knowledge to schools, museums, observatories, and other organizations, bridging the gap between NASA science and the public. Now in its 20th year, NSN supports over 400 astronomy clubs dedicated to bringing the wonder of the night sky to their communities across the U.S. and connecting with 7.4 million people across the United States and its territories since its inception.



*International Observe the Moon Night, September 2024.  
Credit: Oklahoma City Astronomy Club/Dave Huntz*

### Humble Beginnings

It all started with an idea – astronomy clubs already do significant outreach, and club members know a lot about astronomy (shown definitively by founder Marni Berendsen's research), and they love to talk with the public. How could NASA support these astronomy clubs in sharing current research and ideas through informal activities designed for use in the places where amateur astronomers conduct outreach? Thanks to funding through NASA JPL's PlanetQuest public engagement program, the Night Sky Network was born in 2004, with more than 100 clubs joining in the first year.

*Raynham Public Observing Night, February 2004.  
Credit: Astronomical Society of Southern New England/Mark Gibson*



continued on next page

As quoted from the first NSN news article, “NASA is very excited to be working closely with the amateur astronomy community,” said Michael Greene, current Director of Communications and Education and former head of public engagement for JPL’s Navigator Program and PlanetQuest initiatives. “Amateurs want more people to look at the sky and understand astronomy, and so do we. Connecting what we do with our missions to the sense of wonder that comes when you look up at the stars and the planets is one of our long-term objectives. We have a strong commitment to inspiring the next generation of explorers. Lending support to the energy that the amateur astronomy community brings to students and the public will allow NASA to reach many more people.” Taking off like a rocket, Night Sky Network had over 100 clubs registered on their website within the first year.

## The Toolkits

Outreach Toolkits were developed to assist clubs with their endeavors. These kits include educational materials, hands-on activities, and guides for explaining topics in an accessible way. So far, 13 toolkits have been created on topics ranging from the scale of the universe to how telescopes work. To qualify for these free Toolkits, clubs must be active in their communities, hosting two outreach events every three months or five outreach events within a calendar year. Supplemental toolkits were also created based on special events like the solar eclipses and the 50th anniversary of Apollo’s Moon landing. A new toolkit is being developed to teach audiences about solar science, and NSN is on track to support clubs well into the future.



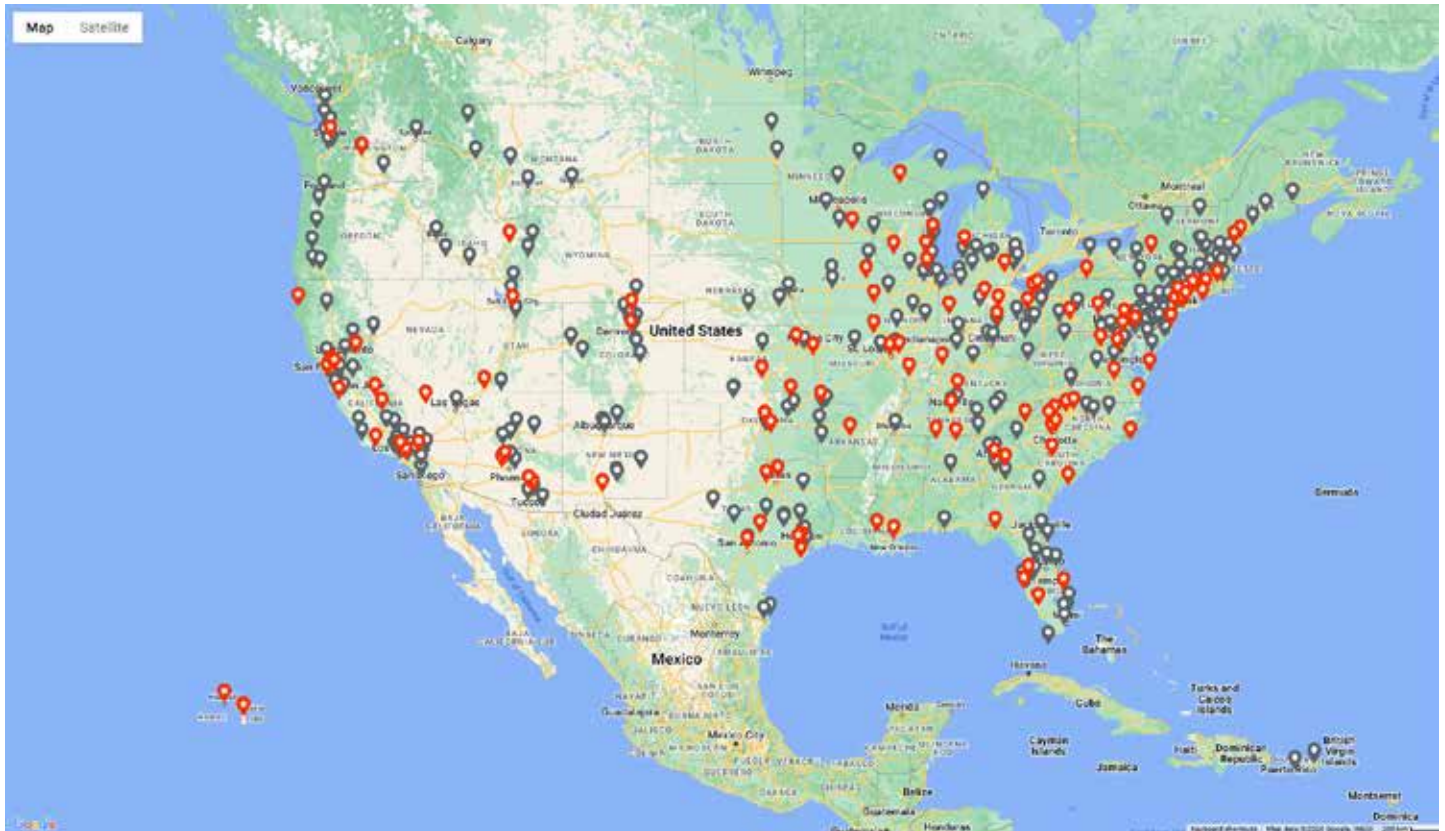
Rye Science Day, October 2014.  
Credit: Southern Colorado Astronomical Society/Malissa Pacheco

NSN also hosts archived video trainings on these toolkits and other topics via its YouTube channel and a [monthly webinar series](#) with scientists from various institutions worldwide. Lastly, a monthly segment called [Night Sky Notes](#) is produced for clubs to share with their audiences via newsletters and mailing lists.

## Sharing the Universe

In 2007, a National Science Foundation grant funded further research into astronomy club needs. From that came three club resources: the [Growing Your Astronomy Club](#) and Getting Started with Outreach video series, an updated website with a national calendar, and club and event coordination. Now, you can find [hundreds of monthly events](#) nationwide, including virtual events you can join from anywhere.

## Night Sky Network: Current and Future



*Map of Night Sky Network clubs within the United States as of November 2024*

As of November 2024, NSN has over 400 clubs as far north as Washington State, west as Hawaii, and south as far as Puerto Rico. Astronomy clubs worldwide share the wonder of the day and night sky with their communities, and the Night Sky Network is happy to support US clubs with public engagement tools. Through their outreach efforts, member clubs have reached more than 7 million people to date, and the community is still going strong. Find an upcoming star party near you on our [new public website](#).

Humot:

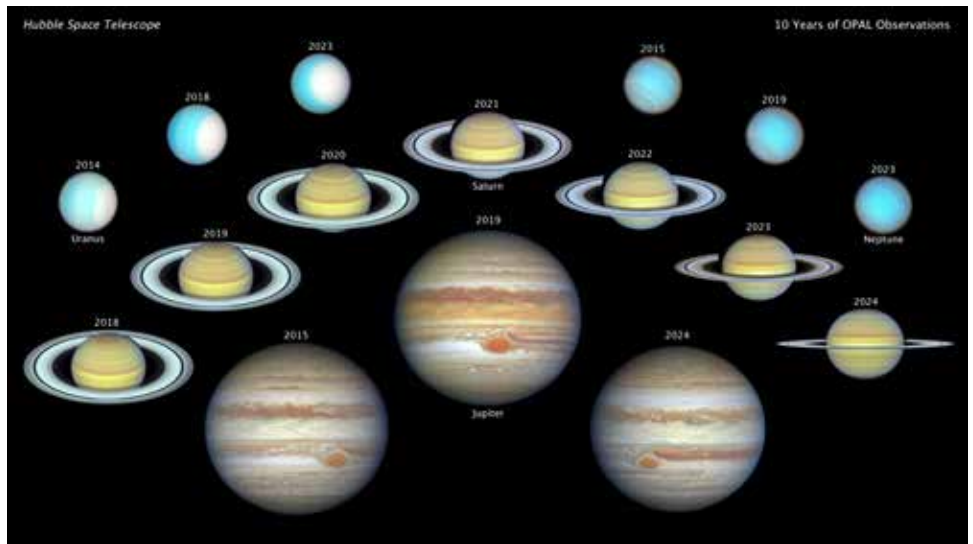


Beep ... Beep!

## Hubble Celebrates A Decade Of Tracking The Outer Planets

9 December 2024 [heic2416](#) — [Photo Release](#)

From 2014 to 2024, the NASA/ESA Hubble Space Telescope has been studying the outer planets under a program called OPAL (Outer Planet Atmospheres Legacy) to obtain long-time baseline observations of Jupiter, Saturn, Uranus, and Neptune in order to understand their atmospheric dynamics and evolution. Hubble is the only telescope that can provide high spatial resolution and image stability for global studies of cloud coloration, activity, and atmospheric motion on a consistent time basis to help constrain the underlying mechanics of weather and climate systems.



All four of the outer planets have deep atmospheres and no solid surfaces. Their churning atmospheres have their own unique weather systems, some with colorful bands of multicolored clouds, and with mysterious, large storms that pop up or linger for many years. Each also has seasons lasting many years as they revolve around the Sun.

Following the complex behavior is akin to understanding Earth's dynamic weather as followed over many years, as well as the Sun's influence on the solar system's weather. The four wonder-worlds also serve as proxies for understanding the weather and climate on similar planets orbiting other stars.

Planetary scientists realized that any one year of data from Hubble, while interesting in its own right, doesn't tell you the full story on the outer planets. Hubble's OPAL program has routinely visited the planets once a year when they are closest to the Earth, an alignment called opposition. This has yielded a huge archive of data that has led to a string of remarkable discoveries to share with planetary astronomers around the world.

Highlights of the OPAL team's decade of discovery is provided below.

### Jupiter

Jupiter's bands of clouds present an ever-changing kaleidoscope of shapes and colors. There is always stormy weather on Jupiter: cyclones, anticyclones, wind shear, and the largest storm in the solar system, the Great Red Spot (GRS). Jupiter is covered with largely ammonia ice-crystal clouds on top of an atmosphere that's tens of thousands of miles deep.

Hubble's sharp images track clouds and measure the winds, storms, and vortices, in addition to monitoring the size, shape and behavior of the GRS. Hubble follows as the GRS continues shrinking in size, but is still large enough to swallow Earth. OPAL data recently measured how often mysterious dark ovals—visible only at ultraviolet wavelengths—appeared in the "polar hoods" of stratospheric haze. Unlike Earth, Jupiter is only inclined three degrees on its axis (Earth is 23.5 degrees). Seasonal changes might not be expected, except that Jupiter's distance from the Sun varies by roughly 64 million kilometres over its 12-year-long orbit, and so OPAL closely monitors the atmosphere for seasonal effects. Another Hubble advantage is that ground-based observatories can't continuously view Jupiter for two Jupiter rotations, because that adds up to 20 hours. During that time, an observatory on the ground would have gone into daytime and Jupiter would no longer be visible until the next evening.

OPAL's findings may also support ESA's Jupiter Icy Moons Explorer, Juice, which was launched on 14 April 2023. Juice will make detailed observations of Jupiter and its three large ocean-bearing moons — Ganymede, Callisto and Europa — with a suite of remote sensing, geophysical and in situ instruments. The mission will characterise these moons as both planetary objects and possible habitats, explore Jupiter's complex environment in depth, and study the wider Jupiter system as an archetype for gas giants across the Universe.

## Saturn

Saturn takes more than 29 years to orbit the Sun, and so OPAL has followed it for approximately one quarter of a Saturnian year (picking up in 2018, after the end of the Cassini mission). Because Saturn is tilted 26.7 degrees, it goes through more profound seasonal changes than Jupiter. Saturnian seasons last approximately seven years. This also means Hubble can view the spectacular ring system from an oblique angle of almost 30 degrees to see the rings tilted edge-on. Edge-on, the rings nearly vanish because they are relatively paper-thin. This will happen again in 2025.

OPAL has followed changes in colors of Saturn's atmosphere. The varying color was first detected by the Cassini orbiter, but Hubble provides a longer baseline. Hubble revealed slight changes from year-to-year in color, possibly caused by cloud height and winds. The observed changes are subtle because OPAL has covered only a fraction of a Saturnian year. Major changes happen when Saturn progresses into the next season.

Saturn's mysteriously dark ring spokes, which slice across the ring plane, are transient features that rotate along with the rings. Their ghostly appearance only persists for two or three rotations around Saturn. During active periods, freshly formed spokes continuously add to the pattern. They were first seen in 1981 by Voyager 2. Cassini also saw the spokes during its 13-year-long mission, which ended in 2017. Hubble shows that the frequency of spoke apparitions is seasonally driven, first appearing in OPAL data in 2021. Long-term monitoring shows that both the number and contrast of the spokes vary with Saturn's seasons.

## Uranus

Uranus is tilted on its side so that its spin axis almost lies in the plane of the planet's orbit. This results in the planet going through radical seasonal changes along its 84-year-long trek around the Sun. The consequence of the planet's tilt means part of one hemisphere is completely without sunlight, for stretches of time lasting up to 42 years. OPAL has followed the northern pole now tipping toward the Sun.

With OPAL, Hubble first imaged Uranus after the spring equinox, when the Sun was last shining directly over the planet's equator. Hubble resolved multiple storms with methane ice-crystal clouds appearing at mid-northern latitudes as summer approaches the north pole. Uranus' north pole now has a thickened photochemical haze with several little storms near the edge of the boundary. Hubble has been tracking the size of the north polar cap and it continues to get brighter year after year. As the northern summer solstice approaches in 2028, the cap may grow brighter still, and will be aimed directly toward Earth, allowing good views of the rings and north pole. The ring system will then appear face-on.

## Neptune

When Voyager 2 flew by Neptune 1989, astronomers were mystified by a great dark spot the size of the Atlantic Ocean looming in the atmosphere. Was it long-lived like Jupiter's Great Red Spot? The question remained unanswered until Hubble was able to show in 1994 that such dark storms were transitory, cropping up and then disappearing over a duration of two to six years each. During the OPAL program, Hubble saw the end of one dark spot and the full life cycle of a second one – both of them migrating toward the equator before dissipating. The OPAL program ensures that astronomers won't miss another one.

Hubble observations uncovered a link between Neptune's shifting cloud abundance and the 11-year solar cycle. The connection between Neptune and solar activity is surprising to planetary scientists because Neptune is our solar system's farthest major planet. It receives sunlight with about 0.1% of the intensity Earth receives. Yet Neptune's global cloudy weather seems to be influenced by solar activity. Do the planet's four seasons (each lasting approximately 40 years) also play a role? We may find out, if the OPAL program continues running on Hubble until the year 2179!

## More information

The Hubble Space Telescope is a project of international cooperation between ESA and NASA.

**Links** [Release on STScI website](#)

## Contacts

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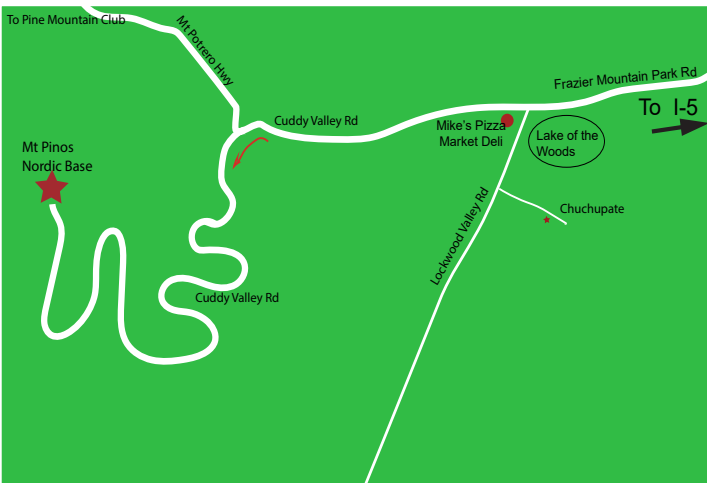
## Dark Sky Observing Sites

**The Chuchupate** parking lot is a half a mile beyond the Mt Pinos ranger station (on some maps The Chuchupate Ranger Sta.), the parking lot is also called Frazier Mountain trailhead.

To get there, take the Frazier Mountain Park RD east about 7 miles from I-5, to Lake Of The Woods, Turn left on Lockwood Valley Rd. ( If you see Mike’s Pizza on your left you missed the turn) In less than a mile there is a road to the left, go past the ranger station, the parking lot is on the right. The Club gathers in the upper end of the lot. The Elevation is 5430 feet. There is a vault toilet.



link to GoogleMaps



**Mt Pinos** is a parking lot at 8350 feet for the “Mt Pinos Nordic Base.” There is a vault toilet 300 yds to the east in the Chula Vista campground.

To get there: From I-5, get off at Frazier Mountain Park Rd and drive west about 7 miles to Mike’s Pizza/Market Deli at Lockwood Valley Rd. Keep on the main roadway (don’t turn left to go to Chuchupate). Continue past Mike’s Pizza on Cuddy Valley Rd (the road’s new name) about 5 miles. Continue straight (do not turn right on to Mil Potrero Hwy) for another 8 1/2 miles to the parking area.

Note: The entire drive from I-5 is uphill.



link to GoogleMaps

**The Red Cliffs Natural Area** is part of **Red Rock Canyon State Park** is a day use area and is not for use by the public after dark. The Club gets a special permit for a star party and pays a fee.

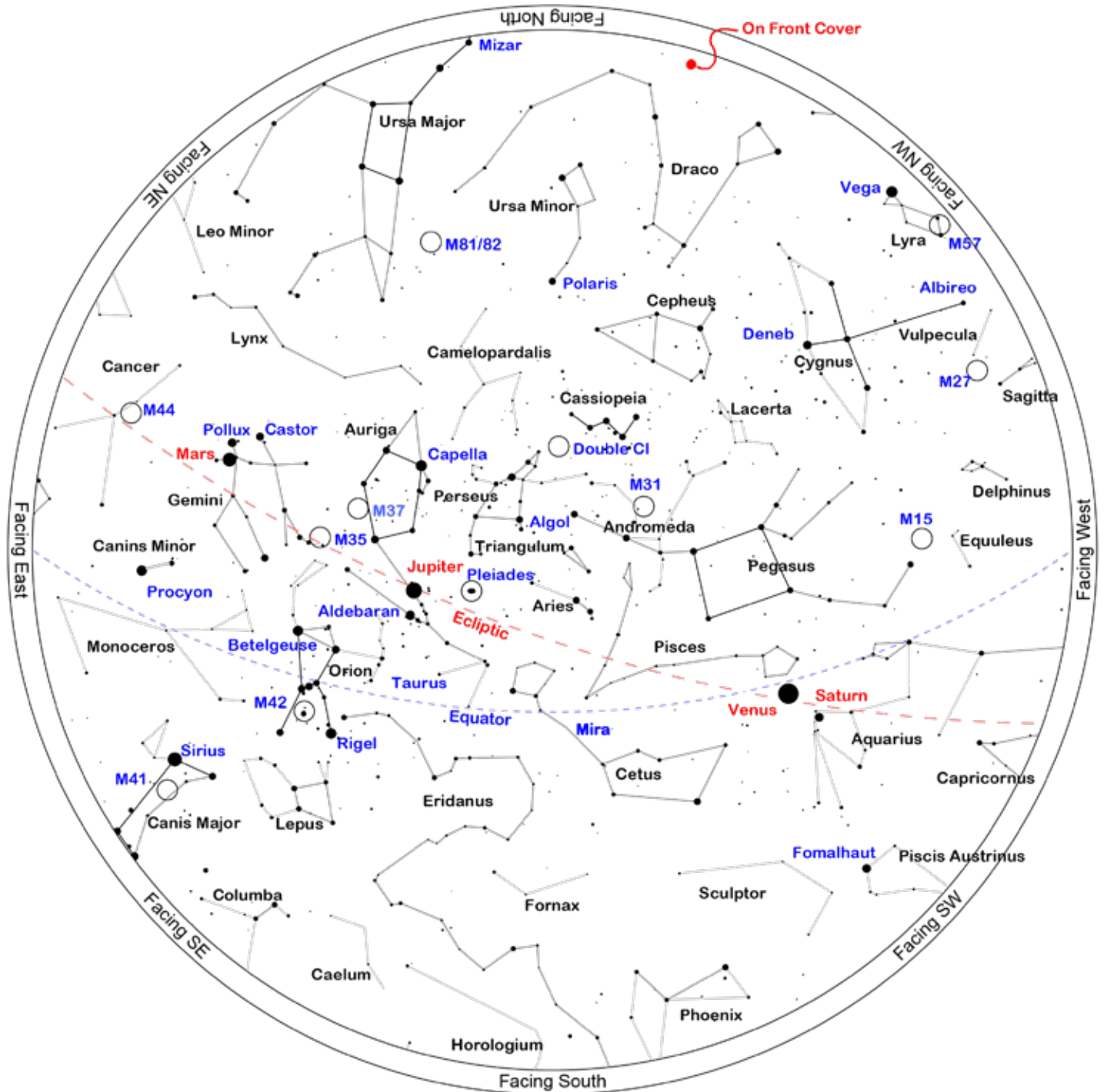
To get there: Take the CA-14 north 25 miles past Mojave. You will see giant red cliffs on the right side and a small sign that says “Red Cliffs Natural Area” and a dirt road. (If you see the large sign for the Ricardo campground, you drove a mile too far). Follow the road to the large parking lot (that hasn’t been graded in a long time). Elevation is 2410 feet. There is a vault toilet.



link to GoogleMaps



## Sky Chart



Location: Palmdale, CA 93551

Latitude: 34° 36' N, longitude: 118° 11' W

Time: 2025 January 25, 18:00 (UTC -08:00)

Powered by: Heavens-Above.com

## Solar System Summary

The **Sun** starts the month in central Sagittarius ending up in the middle of Capricorn.

### The Planets

**Mercury** starts the month rising 1½ hrs before the Sun. Brightens as the month progresses, getting ready for its superior conjunction on the 9th of February.

**Venus** continues to remain prominent in the evening sky. Greatest elongation east(47°) is achieved on the 10th. On the 3rd the 16% waxing Moon passes, on the 18th Saturn passes by.

**Mars** starts the month in Cancer but continues its retrograde motion moving across the board into Gemini. Achieving its closest approach to Earth on the 12th, about the same time as its boarder crossing. Opposition occurs on the 16th, thanks to the asymmetry of its orbit.

**Jupiter** continues moving in retrograde till it stalls on the 2nd of February just north of the Hyades. The 82% Waxing Moon passes right through the Pleiades in the early evening on the 9th, and at midnight the Moon is 4½ ° north.

**Saturn** still moving normally in Aquarius and getting closer to the solar conjunction in mid-March. Earth will pass thru the plane of Saturn's rings on the 23rd of March. The next time we see the northern side of the rings will be in 2039.

**Uranus** is moving in retrograde in Aries, at mag 5.7.

**Neptune** is moving in normal motion near the southern border in Pisces at 7.9. On the 9th it resumes normal motion as the 58% waxing Moon passes ½° north.

### Dwarf Planets

**134340 Pluto** spends the month in normal motion, moving east, on the western edge of Capricorn, at mag 14.4. Solar superior conjunction on the 21st.

**1 Ceres** spends the month moving east in central Capricorn at mag 9, getting close to Solar superior conjunction in mid February.

**2 Pallas** in normal motion passing through northern Serpens Cauda and into Aquila at magnitude 10.35.

**3 Juno** is moving east into Libra, at mag 11.3.

**4 Vesta** spends the month still moving east Virgo in the morning twilight less than 5° north of the ecliptic.

## Moon Phases



First Qtr Jan 6      Full Jan 13      Third Qtr Jan 21      New Jan 29

## Sun and Moon Rise and Set\*

Date	Moonrise	Moonset	Sunrise	Sunset
1/1/2025	08:43	18:50	06:59	16:53
1/5/2025	10:50	23:22	07:00	16:56
1/10/2025	13:48	04:04	07:00	17:00
1/15/2025	19:06	08:27	06:59	17:05
1/20/2025	23:56	10:33	06:57	17:10
1/25/2025	03:56	13:23	06:55	17:15
1/30/2025	07:53	18:54	06:51	17:20

## Planet Data\*

January 1

	Rise	Transit	Set	Mag	Phase%
Mercury	05:28	10:27	15:25	-0.35	79.0
Venus	09:45	15:11	20:37	-4.37	54.9
Mars	18:10	01:28	08:39	-1.21	98.9
Jupiter	14:45	21:51	05:01	-2.75	99.8
Saturn	10:32	16:12	21:51	1.07	99.8

January 15

	Rise	Transit	Set	Mag	Phase%
Mercury	06:05	10:58	15:51	-0.42	91.9
Venus	09:24	15:08	20:52	-4.47	47.8
Mars	16:48	00:10	07:27	-1.38	99.9
Jupiter	13:45	20:51	04:01	-2.68	99.5
Saturn	09:40	15:21	21:02	1.11	99.8

January 30

	Rise	Transit	Set	Mag	Phase%
Mercury	06:39	11:41	16:43	-0.90	98.7
Venus	08:53	14:56	20:59	-4.58	38.5
Mars	15:21	22:42	06:08	-1.08	98.8
Jupiter	12:44	19:50	02:59	-2.58	99.3
Saturn	08:45	14:28	20:11	1.15	99.9

\*All time mentioned are local and approximate.

\*Sun, Moon and Planetary date based on Quartz Hill, CA

## Suggested Observing List

The list below contains objects that will be visible on the night of the AVAC Deep Sky Star Party or the Saturday nearest the New Moon, in this case January 25, 2025. The list is sorted by the transit time of the object.

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6940		Open	Vul	20h 34m 26s	+28° 17.0'	6.3	04:41	12:12	19:43
NGC6960	Filamentary Nebula	Neb	Cyg	20h 45m 58s	+30° 35.6'		04:43	12:24	20:04
IC5068		Neb	Cyg	20h 50m 29s	+42° 28.6'		03:45	12:28	21:11
NGC6979	II-206	Neb	Cyg	20h 51m 00s	+32° 09.0'	11.0	04:42	12:29	20:16
IC5070	Pelican Nebula [2]	Neb	Cyg	20h 51m 00s	+44° 24.1'		03:32	12:29	21:26
NGC6981		Globular	Aqr	20h 53m 28s	-12° 32.2'	9.4	07:04	12:31	17:59
IC5076		Neb	Cyg	20h 55m 33s	+47° 23.7'		03:11	12:33	21:56
IC1340		Neb	Cyg	20h 56m 08s	+31° 02.8'		04:51	12:34	20:16
NGC6992	Cirrus Nebula [2]	Neb	Cyg	20h 56m 19s	+31° 44.6'		04:49	12:34	20:20
NGC6996	VIII-58	Open	Cyg	20h 56m 30s	+44° 38.0'	10.0	03:36	12:34	21:33
NGC6997		Open	Cyg	20h 56m 39s	+44° 37.9'	10.0	03:36	12:34	21:33
Barnard352		DkNeb	Cyg	20h 57m 10s	+45° 53.0'		03:26	12:35	21:44
Barnard354		DkNeb	Cep	20h 58m 00s	+58° 09.0'		Circ	12:36	Circ
NGC7000	C20	BrNeb	Cyg	20h 58m 48s	+44° 20.0'		03:40	12:37	21:33
M73	NGC6994	Open+Asterism	Aqr	20h 58m 56s	-12° 38.1'	9.0	07:10	12:37	18:04
NGC7006	C42	Globular	Del	21h 01m 30s	+16° 11.0'	10.6	05:50	12:39	19:29
NGC7009	Saturn Nebula	P Neb	Aqr	21h 04m 12s	-11° 22.0'	8.0	07:11	12:42	18:13
NGC7027		P Neb	Cyg	21h 07m 02s	+42° 14.1'	10.0	04:03	12:45	21:26
Barnard151	B151	DkNeb	Cep	21h 08m 13s	+56° 19.0'		Circ	12:46	Circ
IC1369		Open	Cyg	21h 12m 09s	+47° 46.1'	6.8	03:24	12:50	22:16
Barnard153	B153	DkNeb	Cep	21h 21m 03s	+56° 26.0'		Circ	12:59	Circ
NGC7076		Neb	Cep	21h 26m 24s	+62° 53.5'		Circ	13:04	Circ
NGC7078	Great Pegasus Cluster	Globular	Peg	21h 29m 58s	+12° 10.0'	6.4	06:30	13:08	19:45
M39	NGC7092	Open	Cyg	21h 31m 42s	+48° 25.0'	5.5	03:36	13:10	22:43
M2	NGC7089	Globular	Aqr	21h 33m 27s	-00° 49.3'	7.5	07:11	13:11	19:12
NGC7090		Galaxy	Ind	21h 36m 28s	-54° 33.4'	11.0	12:06	13:14	14:23
IC1396	Elephant Trunk	Open	Cep	21h 38m 58s	+57° 29.3'	3.5	Circ	13:17	Circ
NGC7099		Globular	Cap	21h 40m 22s	-23° 10.7'	7.5	08:24	13:18	18:12
NGC7128		Open	Cyg	21h 43m 57s	+53° 42.9'	9.7	02:21	13:22	00:23
NGC7142		Open	Cep	21h 45m 09s	+65° 46.5'	9.3	Circ	13:23	Circ
NGC7139	III-696	P Neb	Cep	21h 46m 08s	+63° 47.5'	13.3	Circ	13:24	Circ
Barnard166	B166	DkNeb	Cep	21h 51m 05s	+60° 05.0'		Circ	13:29	Circ
Barnard168	B168	DkNeb	Cyg	21h 53m 20s	+47° 16.0'		04:10	13:31	22:53
IC5146	Cocoon Nebula	Open	Cyg	21h 53m 29s	+47° 16.0'	7.2	04:10	13:31	22:53
IC1434		Open	Lac	22h 10m 42s	+52° 51.0'	9.0	03:10	13:49	00:27
NGC7245		Open	Lac	22h 15m 11s	+54° 20.6'	9.2	02:26	13:53	01:20

# Desert Sky Observer

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January 2025

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC7232		Galaxy	Gru	22h 15m 38s	-45° 51.0'	13.0	10:51	13:53	16:56
NGC7261		Open	Cep	22h 20m 06s	+58° 03.0'	8.4	Circ	13:58	Circ
NGC7293	Helix Nebula	P Neb	Aqr	22h 29m 36s	-20° 48.0'	7.3	09:06	14:07	19:09
NGC7380		Open	Cep	22h 47m 21s	+58° 07.9'	7.2	Circ	14:25	Circ
C9	ave Nebula	BrNeb	Cep	22h 56m 48s	+62° 37.0'		Circ	14:35	Circ
IC1470		Neb	Cep	23h 05m 10s	+60° 14.6'		Circ	14:43	Circ
NGC7492		Globular	Aqr	23h 08m 27s	-15° 36.6'	11.5	09:28	14:46	20:04
HR8872	34 Cep	Triple	Cep	23h 18m 38s	+68° 06.6'	4.8	Circ	14:56	Circ
IC5308		Galaxy	Gru	23h 19m 21s	-42° 15.4'	12.0	11:29	14:57	18:25
M52	The Scorpion	Open	Cas	23h 24m 48s	+61° 35.6'	8.0	Circ	15:03	Circ
NGC7662	Blue Snowball	P Neb	And	23h 25m 54s	+42° 33.0'	8.3	06:20	15:04	23:47
NGC7686		Open	And	23h 30m 07s	+49° 08.0'	5.6	05:27	15:08	00:49
IC5332		Galaxy	Scl	23h 34m 27s	-36° 06.0'	10.6	11:10	15:12	19:14
NGC7785		Galaxy	Psc	23h 55m 19s	+05° 54.9'	11.6	09:14	15:33	21:52
HR9071	8 Cas	Triple	Cas	23h 59m 01s	+55° 45.3'	4.9	Circ	15:37	Circu
NGC7822		Neb	Cep	00h 03m 36s	+67° 09.0'		Circ	15:41	Circu
NGC55	C72	S Gal	Scl	00h 14m 54s	-39° 11.0'	7.9	12:06	15:53	19:39
NGC129		Open	Cas	00h 30m 00s	+60° 13.1'	6.5	Circ	16:08	Circ
NGC133		Open	Cas	00h 31m 19s	+63° 21.0'	9.0	Circ	16:09	Circ
NGC146		Open	Cas	00h 33m 03s	+63° 18.0'	9.1	Circ	16:11	Circ
NGC147	C17	E Gal	Cas	00h 33m 12s	+48° 30.0'	9.3	06:37	16:11	01:45
NGC190		Galaxy	Psc	00h 38m 55s	+07° 03.7'	14.0	09:54	16:17	22:39
M110	Satellite Of Andromeda Galaxy	Galaxy	And	00h 40m 22s	+41° 41.1'	8.9	07:40	16:18	00:56
NGC210		Galaxy	Cet	00h 40m 35s	-13° 52.3'	10.9	10:55	16:18	21:42
NGC206	V-36	Neb	And	00h 40m 36s	+40° 44.0'		07:47	16:18	00:50
Arp168	M32	Galaxy	And	00h 42m 41s	+40° 51.0'	9.0	07:48	16:21	00:53
M32	Satellite Of Andromeda Galaxy	Galaxy	And	00h 42m 42s	+40° 51.9'	9.1	07:48	16:21	00:53
M31	Andromeda Galaxy	Galaxy	And	00h 42m 44s	+41° 16.1'	4.3	07:46	16:21	00:56
NGC246	C56	P Neb	Cet	00h 47m 00s	-11° 53.0'	10.9	10:56	16:25	21:54
NGC254		Galaxy	Scl	00h 47m 28s	-31° 25.2'	11.8	12:02	16:25	20:48
NGC288		Globular	Scl	00h 52m 45s	-26° 35.0'	8.1	11:49	16:31	21:12
NGC281	PacMan Nebula	Open	Cas	00h 52m 54s	+56° 37.4'	7.0	Circ	16:31	Circ
IC59	Gamma Cassiopeiae Nebula	Neb	Cas	00h 57m 29s	+61° 08.6'		Circ	16:35	Circ
IC63	Gamma Cassiopeiae Nebula	Neb	Cas	00h 59m 29s	+60° 54.7'		Circ	16:37	Circ
C51	IC1613	IrrGal	Cet	01h 04m 48s	+02° 07.0'	9.3	10:34	16:43	22:51
NGC474		Galaxy	Psc	01h 20m 07s	+03° 24.9'	11.1	10:46	16:58	23:10
NGC485		Galaxy	Psc	01h 21m 28s	+07° 01.0'	14.0	10:37	16:59	23:22

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January 2025

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M103	NGC581	Open	Cas	01h 33m 23s	+60° 39.0'	7.0	Circ	17:11	Circ
NGC598	Pinwheel Galaxy	Galaxy	Tri	01h 33m 51s	+30° 39.6'	5.7	09:31	17:12	00:53
NGC604	III-150	Neb	Tri	01h 34m 33s	+30° 47.0'		09:31	17:12	00:54
M74	The Phantom	Galaxy	Psc	01h 36m 42s	+15° 47.0'	9.8	10:26	17:15	00:03
M76	Little Dumbbell Nebula	P Neb	Per	01h 42m 18s	+51° 34.2'	12.0	07:06	17:20	03:34
NGC651	Apple Core Nebula [2]	P Neb	Per	01h 42m 21s	+51° 34.1'	12.2	07:06	17:20	03:34
NGC637		Open	Cas	01h 43m 04s	+64° 02.4'	8.2	Circ	17:21	Circ
NGC654		Open	Cas	01h 44m 00s	+61° 53.0'	6.5	Circ	17:22	Circ
NGC720		Galaxy	Cet	01h 53m 00s	-13° 44.3'	10.2	12:07	17:31	22:55
NGC780		Galaxy	Tri	02h 00m 35s	+28° 13.5'	14.0	10:07	17:38	01:09
NGC784		Galaxy	Tri	02h 01m 17s	+28° 50.2'	11.8	10:06	17:39	01:13
NGC821		Galaxy	Ari	02h 08m 21s	+10° 59.6'	10.8	11:12	17:46	00:20
Baily191	NGC884	Open	Per	02h 22m 18s	+57° 08.1'	4.0	Circ	18:00	Circ
IC1795		Neb	Cas	02h 26m 32s	+62° 02.4'		Circ	18:04	Circ
NGC936		Galaxy	Cet	02h 27m 37s	-01° 09.3'	10.1	12:06	18:05	00:05
NGC943	Arp309	Galaxy	Cet	02h 29m 09s	-10° 49.0'	11.4	12:35	18:07	23:39
NGC956		Open	And	02h 32m 30s	+44° 35.6'	9.0	09:12	18:10	03:09
IC1805	Heart Nebula	Open	Cas	02h 32m 47s	+61° 27.6'	6.5	Circ	18:11	Circ
NGC1052		Galaxy	Cet	02h 41m 05s	-08° 15.3'	10.6	12:39	18:19	23:59
M34	Spiral Cluster	Open	Per	02h 42m 05s	+42° 45.6'	6.0	09:35	18:20	03:05
M77	Cetus A	Galaxy	Cet	02h 42m 41s	-00° 00.8'	9.7	12:18	18:20	00:23
NGC1084		Galaxy	Eri	02h 46m 00s	-07° 34.6'	10.6	12:42	18:24	00:05
IC1848	Soul Nebula	Open	Cas	02h 51m 18s	+60° 24.4'	6.5	Circ	18:29	Circ
NGC1156		Galaxy	Ari	02h 59m 42s	+25° 14.2'	11.7	11:18	18:38	01:57
NGC1201		Galaxy	For	03h 04m 08s	-26° 04.1'	10.6	13:58	18:42	23:26
NGC1175		Galaxy	Per	03h 04m 32s	+42° 20.3'	12.8	10:00	18:42	03:24
HR963	SAO168373	Dbl	For	03h 12m 04s	-28° 59.2'	3.9	14:17	18:50	23:23
NGC1316	Formax A	Galaxy	For	03h 22m 42s	-37° 12.4'	8.9	15:04	19:01	22:57
Bar-nard202	B202	DkNeb	Ari	03h 25m 38s	+30° 16.0'		11:24	19:03	02:43
Bar-nard204	B204	DkNeb	Ari	03h 28m 29s	+30° 11.0'		11:27	19:06	02:45
NGC1350		Galaxy	For	03h 31m 08s	-33° 37.7'	10.5	14:55	19:09	23:23
Barnard1	B1	DkNeb	Per	03h 32m 57s	+31° 09.0'		11:28	19:11	02:54
Barnard2	B2	DkNeb	Per	03h 33m 31s	+32° 19.0'		11:23	19:11	02:59
Barnard3	B3	DkNeb	Per	03h 40m 01s	+31° 58.0'		11:31	19:18	03:04
NGC1407		Galaxy	Eri	03h 40m 12s	-18° 34.8'	9.8	14:09	19:18	00:27
IC347		Galaxy	Eri	03h 42m 32s	-04° 17.9'	13.0	13:30	19:20	01:11
NGC1448		Galaxy	Hor	03h 44m 32s	-44° 38.6'	11.0	16:10	19:22	22:34

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January 2025

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
IC348		Open	Per	03h 44m 34s	+32° 09.7'	7.3	11:35	19:22	03:10
M45	Pleiades	Open	Tau	03h 47m 30s	+24° 07.0'	1.6	12:10	19:25	02:41
Barnard5	B5	DkNeb	Per	03h 47m 53s	+32° 53.0'		11:35	19:26	03:16
NGC1461		Galaxy	Eri	03h 48m 27s	-16° 23.5'	11.7	14:11	19:26	00:42
IC353		Neb	Tau	03h 53m 00s	+25° 48.0'		12:09	19:31	02:53
IC2003		P Neb	Per	03h 56m 22s	+33° 52.5'	13.0	11:39	19:34	03:29
NGC1499	California Nebula	Neb	Per	04h 03m 14s	+36° 22.0'		11:34	19:41	03:48
NGC1515		Galaxy	Dor	04h 04m 03s	-54° 06.0'	11.0	18:22	19:42	21:02
NGC1496		Open	Per	04h 04m 32s	+52° 39.7'	10.0	09:08	19:42	06:17
NGC1502		Open	Cam	04h 07m 50s	+62° 19.8'	5.7	Circ	19:46	Circ
IC360		Neb	Tau	04h 09m 00s	+26° 06.0'		12:24	19:47	03:10
NGC1514	Crystal Ball Nebula	P Neb	Tau	04h 09m 17s	+30° 46.5'	10.0	12:06	19:47	03:28
NGC1513		Open	Per	04h 09m 57s	+49° 30.8'	8.4	10:02	19:48	05:33
IC359		Neb	Tau	04h 12m 28s	+27° 42.1'		12:21	19:50	03:19
NGC1535		P Neb	Eri	04h 14m 16s	-12° 44.3'	10.0	14:25	19:52	01:19
Barnard10	B10	DkNeb	Tau	04h 18m 41s	+28° 16.0'		12:25	19:57	03:28
NGC1545		Open	Per	04h 20m 57s	+50° 15.2'	6.2	10:04	19:59	05:54
NGC1569		Galaxy	Cam	04h 30m 49s	+64° 50.8'	11.2	Circ	20:09	Circ
Barnard18	B18	DkNeb	Tau	04h 31m 13s	+24° 21.0'		12:52	20:09	03:26
NGC1582		Open	Per	04h 31m 53s	+43° 49.0'	7.0	11:17	20:10	05:02
NGC1560		Galaxy	Cam	04h 32m 48s	+71° 52.7'	11.5	Circ	20:11	Circ
Barnard19	B19	DkNeb	Tau	04h 33m 00s	+26° 16.0'		12:47	20:11	03:34
Barnard20	B20	DkNeb	Per	04h 37m 04s	+50° 58.0'		10:10	20:15	06:20
Barnard22	B22	DkNeb	Tau	04h 38m 00s	+26° 03.0'		12:53	20:16	03:39
Barnard14	B14	DkNeb	Tau	04h 39m 59s	+25° 44.0'		12:56	20:18	03:39
IC2087		Neb	Tau	04h 40m 00s	+25° 44.5'		12:56	20:18	03:39
Barnard23	B23	DkNeb	Tau	04h 40m 33s	+29° 52.0'		12:41	20:18	03:56
NGC1624		Open	Per	04h 40m 36s	+50° 27.6'	10.4	10:21	20:18	06:16
NGC1640		Galaxy	Eri	04h 42m 14s	-20° 26.0'	11.7	15:17	20:20	01:23

And - Andromeda  
Ant - Antlia  
Aps - Apus  
Aql - Aquila  
Aqr - Aquarius  
Ara - Ara  
Ari - Aries  
Aur - Auriga  
Boo - Bootes  
Cae - Caelum  
Cam - Camelopardis  
Cap - Capricornus  
Car - Carina  
Cas - Cassiopeia  
Cen - Centaurus

Cep - Cepheus  
Cet - Cetus  
Cha - Chamaeleon  
Cir - Circinus  
CMA - Canis Major  
CMi - Canis Minor  
Cnc - Cancer  
Col - Columba  
Com - Coma Berenices  
CrA - Corona Australis  
CrB - Corona Borealis  
Crt - Crater  
Cru - Crux  
Crv - Corvus  
CVn - Canes Venatici

Cyg - Cygnus  
Del - Delphinus  
Dor - Dorado  
Dra - Draco  
Equ - Equuleus  
Eri - Eridanus  
For - Fornax  
Gem - Gemini  
Gru - Grus  
Her - Hercules  
Hor - Horologium  
Hya - Hydra  
Hyi - Hydrus  
Ind - Indus  
Lac - Lacerta

Leo - Leo  
Lep - Lepus  
Lib - Libra  
LMi - Leo Minor  
Lup - Lupus  
Lyn - Lynx  
Lyr - Lyra  
Men - Mensa  
Mic - Microscopium  
Mon - Monoceros  
Mus - Musca  
Nor - Norma  
Oct - Octans  
Oph - Ophiuchus  
Ori - Orion

Pav - Pavo  
Peg - Pegasus  
Per - Perseus  
Phe - Phoenix  
Pic - Pictor  
PsA - Pisces Austrinus  
Psc - Pisces  
Pup - Puppis  
Pyx - Pyxis  
Ret - Reticulum  
Scl - Sculptor  
Sco - Scorpius  
Sct - Scutum  
Ser - Serpens  
Sex - Sextans

Sge - Sagitta  
Sgr - Sagittarius  
Tau - Taurus  
Tel - Telescopium  
TrA - Triangulum Australe  
Tri - Triangulum  
Tuc - Tucana  
UMa - Ursa Major  
UMi - Ursa Minor  
Vel - Vela  
Vir - Virgo  
Vol - Volans  
Vul - Vulpecula

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