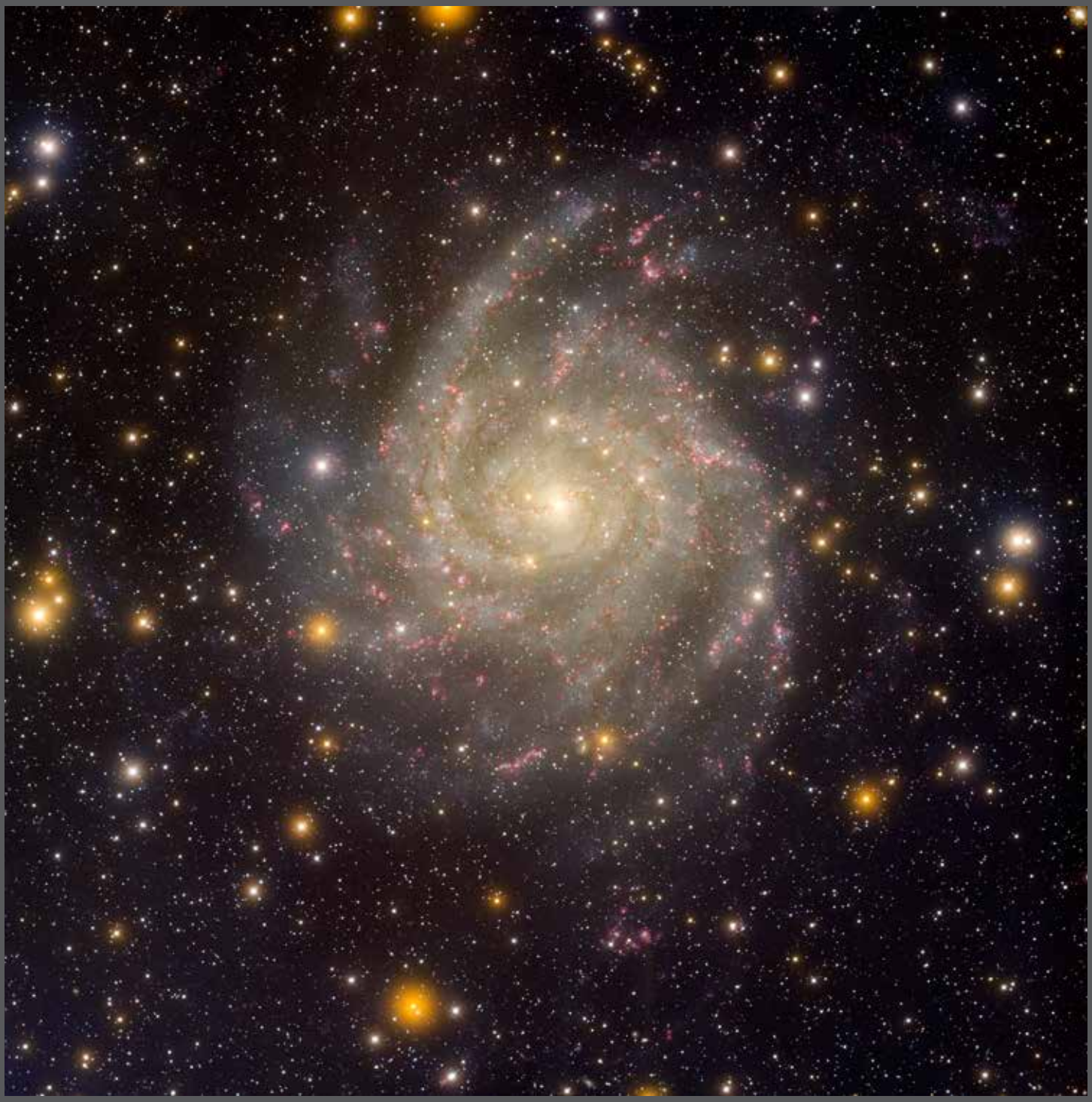
Volume 45.8 August 2025

Desert Sky Observer

Antelope Valley Astronomy Club



Upcoming Events

August 2: Lunar Club @ PDW
August 8: Club Meeting
August 16: Moonwalk @ PDW @ 8:00 pm
August 23: DSSP @ Mt Pinos

Every clear night: Personal Star Party

September 12: Club Meeting
September 13: Moonwalk@PDW
September 20: DSSP @ Chuchupate
September 27: Lunar Club @ PDW

AVAC Calendar

Board Members

President: Phil Wriedt (661) 917-4874
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Vice-President: Matt Leone (661) 713-1894
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Secretary: Rose Moore (661) 972-1953
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Treasurer: Rod Girard (661) 803-7838
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Director of Community Development:
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Appointed Positions

Newsletter Editor: Phil Wriedt (661) 917-4874
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Equipment & Library:
vacant
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Club Historian: vacant
history@avastronomyclub.org

Webmaster: Steve Trotta (661) 269-5428
webmaster@avastronomyclub.org

Night Sky Coordinator:
Rose Moore (661) 972-1953

Astronomical League Coordinator:
Phil Wriedt (661) 917-4874
al@avastronomyclub.org

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 20th 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

Visit the Antelope Valley Astronomy Club website at www.avastronomyclub.org/
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

Hi there,

Last weekend, July 26/27th, we had a Dark Sky Star Party at Mt Pinos. After 5 or 6 years of putting off climbing all the way to the top of the hill, I finally made it back. It would have been good to get out under the dark sky again, but there was a layer of clouds interfering. I wasn't the last to arrive, but I was at least 1½ hours later than I planned. The clouds finally parted around 11, when the dew started to settle.

Our next Dark Sky Star Party will be on the 23rd/24th of August at Mt Pinos; the Sun sets at 7:29 pm, and the less then 2 day old Moon will set at 8:20 pm. Mt. Pinos is at 8300 ft and the temperature is colder than Chuchupate (at 540 ft). Get there early, set up in daylight. Like with Moonwalks, the weather will rule what happens, with some luck, it will cloudless, windless and without smoke. I know it's August, but nights still get cold at 8300 feet (in July it got down to 38°) so don't forget warm clothes, food, water and toilet paper.

Our next Moonwalk is on August 16th. Sunset is at 8:05pm and astronomical dusk is late at 9:47 pm. The only planet visible will be Mars, up till 9:30pm. The 66% Moon won't rise till 11:42 pm; get there early so you can set up in daylight. If you have a telescope bring it, or if not, just come join the party at Prime Desert Woodland; the more members there, the better it will be. We had 54 visitors on the Walk last month. Don't forget warm clothes, jackets, gloves, etc., well, maybe not in August, but be prepared. There is still a non-zero chance that a cold front could come through. Hopefully it will be a cloudless night.

For those of you that want to use your phone camera for more than just taking pictures of more than your receipts, our next Club Meeting on the 8th, will be for you! Sam Groth, from western Colorado will make a presentation via Zoom about astrophotography with your phone.

If anybody knows or has an idea where we can get a speaker, please contact Rose or Matt.

On September 27th the Lunar Club will meet again. There will be a 6⅓ day Moon. It will be at Prime Desert Woodland again. In October, on the 24th (the day before the Scary Science Moonwalk) we will participate in the College of the Canyons Fall Star Party.

Please come to these events, join the crowd! The more the merrier!

Keep Looking Up, Phil

On The Cover

Note: North is 90.2° left of vertical RA: 3h 47' 20.604.55" DEC: 68° 11' 36.18" Dist: 11 Mly AMag: 9.1(Camelopardalics)

Spiral Galaxy IC 342 (aka Caldwell 5) is located roughly 11 million light-years from Earth in the constellation Camelopardalis, "the giraffe." Its face-on appearance in the sky — as opposed to our tilted and edge-on views of many other nearby galaxies, such as the large spiral galaxy Andromeda (M31) — makes IC 342 a prime target for studies of star formation and astrochemistry. The image, obtained in late 2006, was taken using the 64-megapixel Mosaic-1 digital imager on the Mayall 4-meter telescope. This image is the subject of NOAO press release 07-03.

Credit: NOIRLab/NSF/AURA/T.A. Rector (NSF NOIRLab/University of Alaska Anchorage) & H. Schweiker (WIYN/NSF NOIRLab

From the Secretary

By Rose Moore

Members:

Thank you to all the members who came out supporting the Club's events in July!

Starting off our club events in August is a Lunar observing session at Prime Desert Woodlands. Location: 43201 35th St W, Lancaster, CA 93536. This event will be open to the public. Weather permitting we hope to see you there. Moon will be a waxing gibbous about 57%. Sunset is at 7:56pm. Start time to be announced in email prior to event. We'll need telescopes to support this event, or just come to check out the Moon!

We have a club meeting at the Planetarium on Friday August 8th at 7pm. This will be a Zoom presentation with astrophotographer, Sam Groth. Sam is a photographer in western Colorado. He will be speaking on astrophotography including how to take photos using your phone; this is free and open to the public. Come to the meeting to enjoy this presentation!

On Saturday August 16th at 8pm we will have a Prime Desert Moon Walk; once again weather permitting. This event is free and open to the public. We will need members with telescopes to help out at this event. Set up time is 30-60 minutes prior to event; or you may come to take the walk with Jeremy. Location: 43201 35th St W, Lancaster, CA 93536.

Our dark sky star party is on Saturday August 23rd at Mt. Pinos. Most members arrive on Saturday, but you may arrive anytime; again weather permitting. Further information coming in an email prior to the event.

Upcoming events include our meetings, including our Business Meeting in October; Moonwalks, Dark Sky Star Parties, a possible Fall Star Party at College of the Canyons, and our Christmas Party in December!

See you there! Rose

Space News

News from around the Net

NSF–DOE Vera C. Rubin Observatory Launches Orbitviewer App

NSF–DOE Vera C. Rubin Observatory is thrilled to introduce Orbitviewer, a groundbreaking new web app that brings the dynamic movement of objects in our Solar System to life. Using real data from Rubin Observatory analyzed by the Minor Planet Center, Orbitviewer provides an unprecedented way to explore the structure of our cosmic backyard in three dimensions and in real time. Orbitviewer is designed to showcase the incredible number of Solar System objects revealed by Rubin Observatory. . . .(continued at https://noirlab.edu/public/announcements/ann25014/?lang)

Light Pollution: What Is Brightening Our Night Skies?

If you've noticed your night sky becoming brighter over recent years, you're not imagining things: Studies from the ground suggest that the amount that artificial light spills into the atmosphere is increasing by 10% year over year. We were supposed to see the opposite effect. Yet conversion of streetlights to energy-efficient LEDs, often fully shielded to direct light toward the ground, somehow weren't doing the trick. Using a simple app — and the help of hundreds of citizen scientists — a research group led by Christopher Kyba (Ruhr University) has found out the cause of this discrepancy. . . . .(continued at https://skyandtelescope.org/astronomy-news/light-pollution-what-is-brightening-our-night-skies/)

Betelgeuse's Long-Lost Companion Emerges From The Shadows

On July 21, 2025, NSF NOIRLab issued a press release stating that astronomers had detected a long-anticipated companion star to the red supergiant Betelgeuse. The team of astrophysicists, led by Steve Howell, senior research scientist at NASA's Ames Research Center, observed Betelgeuse's companion using 'Alopeke, a speckle imager mounted on the Gemini North Telescope located atop Maunakea in Hawai'i. Betelgeuse is one of the most iconic stars in the night sky, famed not only for its ruddy hue and position at Orion's shoulder, but also for its turbulent and unpredictable nature. Located about 650 light-years away, the star is a true giant, spanning nearly 700 times the Sun's radius. Though only 10 million years old, Betelgeuse is already nearing the end of its life. . . . (continued at https://www.astronomy.com/science/betelgeuses-long-lost-companion-emerges-from-the-shadows/)

Rare Interstellar Comet Buzzes Solar System

Interstellar comet 3I/ATLAS is streaking across the solar system at more than 220,000 kilometers per hour as you read this. With a little luck, it might just turn up in your telescope this fall. On July 1st, the 0.5-m f/2 Schmidt reflector at Rio Hurtado, Chile captured images of an apparent 18th magnitude asteroid during the course of the Asteroid-Terrestrial-Impact Last Alert System (ATLAS) near-Earth object search program. When bigger telescopes were brought to bear on the newcomer, they revealed a faint bit of fuzz around the "star" that extended into a teardrop shape — clear evidence that it was in fact a comet. It received the preliminary designation C/2025 N1 (ATLAS).. . . . (continued at https://skyandtelescope.org/astronomy-news/rare-interstellar-comet-buzzes-solar-system/)

Swirling Nebula Of Two Dying Stars Revealed In Spectacular Detail In New Webb Telescope Image

The day before my thesis examination, my friend and radio astronomer Joe Callingham showed me an image we'd been awaiting for five long years—an infrared photo of two dying stars we'd requested from the Very Large Telescope in Chile. I gasped—the stars were wreathed in a huge spiral of dust, like a snake eating its own tail. We named it Apep, for the Egyptian serpent god of destruction. Now, our team has finally been lucky to use NASA's James Webb Space Telescope (JWST) to look at Apep. Right before they die as supernovae, the universe's most massive stars violently shed their outer hydrogen layers, leaving their heavy cores exposed. . . . .(continued at https://phys.org/news/2025-07-swirling-nebula-dying-stars-revealed.html)

Space News

News from around the Net

Perseid Meteor Shower 2025: All You Need To Know

We've now entered the Perseid meteor stream in space. So you might see a Perseid anytime now. The 2025 Perseid meteor shower will be plagued by bright moonlight at its peak. Full moon will fall early on August 9, just as the Perseids are beginning to peak (their peak mornings are August 11, 12 and 13). Best bet for meteor-watching this year: watch in the wee hours – between midnight and dawn – from late July until the days before full moon. You'll see Perseid meteors, not as many as at the peak, but some! Plus you should see a scattering of Delta Aquariid meteors. And of course you can try watching in moonlight at the peak.. . . (continued at https://earthsky.org/astronomy-essentials/everything-you-need-to-know-perseid-meteor-shower/)

Scientists And Engineers Craft Radio Telescope Bound For The Moon

The U.S. Department of Energy's (DOE) Brookhaven National Laboratory has completed the "major item of equipment" phase for the Lunar Surface Electromagnetics Experiment-Night (LuSEE-Night), a moon-based radio telescope set to make history. Comprising the overall design of the telescope as well as the procurement and construction of its components, this project phase was a significant undertaking. Scientists, engineers, and technicians were tasked with developing a one-of-a-kind scientific instrument with strict, and often competing, mass and energy consumption limits for each component. The successful completion of the phase marks a substantial scientific and engineering achievement—and a key milestone for the entire LuSEE-Night project. . . . (continued at https://phys.org/news/2025-07-scientists-craft-radio-telescope-bound.html)

Astronauts' Hearts Stay Healthy Years After Space Missions

Space travel takes quite a toll on the human body. Astronauts experience muscle weakness, bone loss, vision changes, and cardiovascular shifts during their time in microgravity. While scientists understand many of the immediate effects of spaceflight, questions have long been asked about whether these changes cause lasting damage, particularly to the heart and blood vessels. A new study published in the Journal of Applied Physiology provides encouraging answers to the previous concerns. The researcher team followed 13 NASA astronauts for up to five years after their return from the International Space Station, monitoring their cardiovascular health through detailed medical examinations and ultrasound imaging of key arteries. . . . (continued at https://www.universetoday.com/articles/astronauts-hearts-stay-healthy-years-after-space-missions)

How Satellites Are Silencing The Universe

Picture trying to listen to a whispered conversation while standing next to a construction site. That's essentially what radio astronomers face today as thousands of internet satellites flood Earth's orbit, accidentally jamming the faint signals used to unlock the secrets of the universe. A groundbreaking study from Curtin University reveals that the quest for global connectivity is creating an unexpected obstacle to our greatest scientific discoveries, from understanding dark matter to testing Einstein's theories. The promise of high speed internet anywhere on Earth has led companies like SpaceX . . . (continued at https://www.universetoday.com/articles/how-satellites-are-silencing-the-universe)

Webb Reveals More Than One Star Contributes To The Irregular Shape Of Planetary Nebula NGC 6072 Since the discovery of planetary nebulae in the late 1700s, astronomers have learned that these expanding shells of glowing gas expelled by low-intermediate mass stars late in their lives can come in all shapes and sizes. Most planetary nebulae present as circular, elliptical, or bi-polar, but some stray from the norm, as seen in new high-resolution images of the planetary nebula NGC 6072 by the NASA/ESA/CSA James Webb Space Telescope. In Webb's NIRCam (Near-Infrared Camera) view of the object, it's readily apparent that this nebula is multi-polar. .. . . (continued at https://phys.org/news/2025-07-webb-reveals-star-contributes-irregular.html)

August's Night Sky Notes: The Great Rift

By: Dave Prosper Updated Kat Troche, Astronomy Society of the Pacific, NASA Night Sky Network

Summer skies bring glorious views of our own Milky Way galaxy to observers blessed with dark skies. For many city dwellers, their first sight of the Milky Way comes during trips to rural areas - so if you are traveling away from city lights, do yourself a favor and look up!

To observe the Milky Way, you need clear, dark skies and enough time to adapt your eyes to the dark. Photos of the Milky Way are breathtaking, but they usually show far more detail and color than the human eye can see – that's the beauty and quietly deceptive nature of long exposure photography. For Northern Hemisphere observers, the most prominent portion of the Milky Way rises in the southeast as marked by the constellations Scorpius and Sagittarius. Take note that, even in dark skies, the Milky Way isn't easily visible until it rises a bit above the horizon, and the thick, turbulent air obscures the view. The Milky Way is huge, but it is also rather faint, and our eyes need time to truly adjust to the dark and see it in any detail. Avoid bright lights as they will ruin your night vision. It's best to attempt to view the Milky Way when the Moon is at a new or crescent phase; a full Moon will wash out any potential views.

Keeping your eyes dark-adapted is especially important if you want to not only see the haze of the Milky Way, but also the dark lane cutting into that haze, stretching from the Summer Triangle to Sagittarius. This dark detail is known as the Great Rift, and is seen more readily in very dark skies, especially dark, dry skies found in high desert regions. What exactly is the Great Rift? You are looking at massive clouds of galactic dust lying between Earth and the interior of the Milky Way.

The Vera C. Rubin Observatory, located at Cerro Pachón, Chile, under the Milky Way. The bright halo of gas and stars on the left side of the image highlights the very center of the Milky Way galaxy. The dark path that cuts through this center is known as the Great Rift, because it gives the appearance that the Milky Way has been split in half. Image Credit: RubinObs/NOIRLab/SLAC/NSF/DOE/AURA/B. Quint

Yacana the Llama

Other "dark nebulae" of cosmic clouds pepper the Milky Way, including the famed Coalsack, found in the Southern Hemisphere constellation of Crux. Many cultures celebrate these dark clouds in their traditional stories along with the constellations and the Milky Way. One such story tells of a Yacana the Llama, and her baby, wandering along a river that crossed the sky – the Milky Way. The bright stars Alpha and Beta Centauri serve as the llama's eyes, with the dark sections representing the bodies of mother and baby, with the baby below the mother, nursing.

Where exactly is our solar system within the Milky Way? Is there a way to get a sense of scale? The "Our Place in Our Galaxy" activity can help you do just that, with only birdseed, a coin, and your imagination. You can also discover the amazing science NASA is doing to understand our galaxy – and our place in it - in the Galaxies section of NASA's Universe page.

In the activity, "Our Place In Our Galaxy", if the Milky Way were shrunk down to the size of North America, our solar system would be about the size of a quarter. At that scale, Polaris - which is about 433 light years distant from us - would be 11 miles away. Image Credit: Astronomical Society of the Pacific

ADDITIONAL LINKS:
Activity - Our Place in Our Galaxy: https://nightsky.jpl.nasa.gov/news/388/
The Coalsack Nebula: https://science.nasa.gov/mission/hubble/science/explore-the-night-sky/hubble-caldwell-catalog/caldwell-99/
Great Rift Stories: https://americanindian.si.edu/inkaroad/ancestors/creationstories/milky-way.html
NASA Universe: https://science.nasa.gov/universe/

IMAGE CREDITS:
Vera Rubin Observatory: https://noirlab.edu/public/images/noirlab2322d/
Milky Way-North America Comparison: https://i.imgur.com/aXYJUVh.jpeg
BONUS IMAGE - Yacana the Llama: https://americanindian.si.edu/inkaroad/img/ancestors/creationstories/milkyway-llamas-final.jpg

Originally posted by Dave Prosper: June 2021 Last Updated by Kat Troche: July 2025

Additional Skywatching Resources

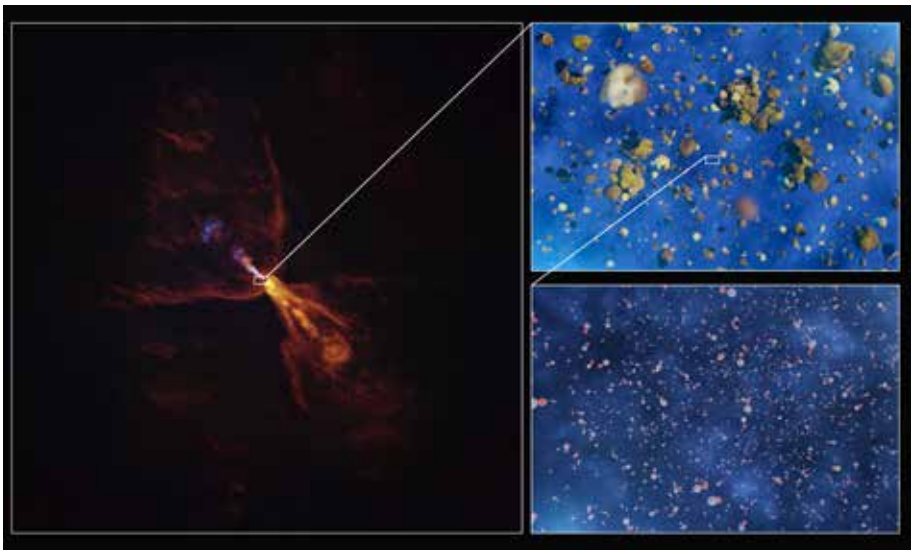
Plan your skywatching with help from our planner page, featuring daily stargazing tips courtesy EarthSky monthly sky maps, and videos from NASA/JPL. You can even find out how to spot the International Space Station! Both Astronomy and Sky and Telescope magazines offer regular stargazing guides to readers, 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!

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 to find local clubs, events, and more!

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)

For the first time, astronomers witness the dawn of a new solar system

weic2512 — Press Release 16 July 2025



These images illustrate how hot gas condenses into solid minerals around the baby star HOPS-315. The image to the left was taken with the Atacama Large Millimeter/submillimeter Array (ALMA), in which ESO is a partner. Two insets show artist's impressions of molecules of silicon monoxide condensing into solid silicates Credit: SO/L. Calçada/ALMA(ESO/NAOJ/NRAO)/M. McClure et al.

International researchers have, for the first time, pinpointed the moment when planets began to form around a star beyond the Sun. Using the ALMA telescope, in which the European Southern Observatory (ESO) is a partner, and the James Webb Space Telescope, they have observed the creation of the first specks of planet-forming material — hot minerals just beginning to solidify. This finding marks the first time a planetary system has been identified at such an early stage in its formation and opens a window to the past of our own Solar System.

"For the first time, we have identified the earliest moment when planet formation is initiated around a star other than our Sun," says Melissa McClure, a professor at Leiden University in the Netherlands and lead author of the new study, published today in Nature.

Co-author Merel van 't Hoff, a professor at Purdue University, USA, compares their findings to "a picture of the baby Solar System", saying that "we're seeing a system that looks like what our Solar System looked like when it was just beginning to form."

This newborn planetary system is emerging around HOPS-315, a 'proto' or baby star that sits some 1300 light-years away from us and is an analogue of the nascent Sun. Around such baby stars, astronomers often see discs of gas and dust known as 'protoplanetary discs', which are the birthplaces of new planets. While astronomers have previously seen young discs that contain newborn, massive, Jupiter-like planets, McClure says, "we've always known that the first solid parts of planets, or 'planetesimals', must form further back in time, at earlier stages."

In our Solar System, the very first solid material to condense near Earth's present location around the Sun is found trapped within ancient meteorites. Astronomers age-date these primordial rocks to determine when the clock started on our Solar System's formation. Such meteorites are packed full of crystalline minerals that contain silicon monoxide (SiO) and can condense at the extremely high temperatures present in young planetary discs. Over time, these newly condensed solids bind together, sowing the seeds for planet formation as they gain both size and mass. The first kilometre-sized planetesimals in the Solar System, which grew to become planets such as Earth or Jupiter's core, formed just after the condensation of these crystalline minerals.

With their new discovery, astronomers have found evidence of these hot minerals beginning to condense in the disc around HOPS-315. Their results show that SiO is present around the baby star in its gaseous state, as well as within these crystalline minerals, suggesting it is only just beginning to solidify. "This process has never been seen before in a protoplanetary disc — or anywhere outside our Solar System," says co-author Edwin Bergin, a professor at the University of Michigan, USA.

These minerals were first identified using the James Webb Space Telescope, a joint project of the US, European and Canadian space agencies. To find out where exactly the signals were coming from, the team observed the system with ALMA, the Atacama Large Millimeter/submillimeter Array, which is operated by ESO together with international partners in Chile's Atacama Desert.

With these data, the team determined that the chemical signals were coming from a small region of the disc around the star equivalent to the orbit of the asteroid belt around the Sun. "We're really seeing these minerals at the same location in this extrasolar system as where we see them in asteroids in the Solar System," says co-author Logan Francis, a postdoctoral researcher at Leiden University.

Because of this, the disc of HOPS-315 provides a wonderful analogue for studying our own cosmic history. As van 't Hoff says, "this system is one of the best that we know to actually probe some of the processes that happened in our Solar System." It also provides astronomers with a new opportunity to study early planet formation, by standing in as a substitute for newborn solar systems across the galaxy.

ESO astronomer and European ALMA Programme Manager Elizabeth Humphreys, who did not take part in the study, says: "I was really impressed by this study, which reveals a very early stage of planet formation. It suggests that HOPS-315 can be used to understand

how our own Solar System formed. This result highlights the combined strength of JWST and ALMA for exploring protoplanetary discs."

More information

This research was presented in the paper "Refractory solid condensation detected in an embedded protoplanetary disk" (doi:10.1038/s41586-025-09163-z) to appear in Nature.

The team is composed of M. K. McClure (Leiden Observatory, Leiden University, The Netherlands [Leiden]), M. van 't Hoff (Department of Astronomy, The University of Michigan, Michigan, USA [Michigan] and Purdue University, Department of Physics and Astronomy, Indiana, USA), L. Francis (Leiden), Edwin Bergin (Michigan), W.R. M. Rocha (Leiden), J. A. Sturm (Leiden), D. Harsono (Institute of Astronomy, Department of Physics, National Tsing Hua University, Taiwan), E. F. van Dishoeck (Leiden), J. H. Black (Chalmers University of Technology, Department of Space, Earth and Environment, Onsala Space Observatory, Sweden), J. A. Noble (Physique des Interactions Ioniques et Moléculaires, CNRS, Aix Marseille Université, France), D. Qasim (Southwest Research Institute, Texas, USA), E. Dartois (Institut des Sciences Moléculaires d'Orsay, CNRS, Université Paris-Saclay, France.)

The Atacama Large Millimeter/submillimeter Array (ALMA), an international astronomy facility, is a partnership of ESO, the U.S. National Science Foundation (NSF) and the National Institutes of Natural Sciences (NINS) of Japan in cooperation with the Republic of Chile. ALMA is funded by ESO on behalf of its Member States, by NSF in cooperation with the National Research Council of Canada (NRC) and the National Science and Technology Council (NSTC) in Taiwan and by NINS in cooperation with the Academia Sinica (AS) in Taiwan and the Korea Astronomy and Space Science Institute (KASI). ALMA construction and operations are led by ESO on behalf of its Member States; by the National Radio Astronomy Observatory (NRAO), managed by Associated Universities, Inc. (AUI), on behalf of North America; and by the National Astronomical Observatory of Japan (NAOJ) on behalf of East Asia. The Joint ALMA Observatory (JAO) provides the unified leadership and management of the construction, commissioning and operation of ALMA.

The European Southern Observatory (ESO) enables scientists worldwide to discover the secrets of the Universe for the benefit of all. We design, build and operate world-class observatories on the ground — which astronomers use to tackle exciting questions and spread the fascination of astronomy — and promote international collaboration for astronomy. Established as an intergovernmental organisation in 1962, today ESO is supported by 16 Member States (Austria, Belgium, Czechia, Denmark, France, Finland, Germany, Ireland, Italy, the Netherlands, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom), along with the host state of Chile and with Australia as a Strategic Partner. ESO's headquarters and its visitor centre and planetarium, the ESO Supernova, are located close to Munich in Germany, while the Chilean Atacama Desert, a marvellous place with unique conditions to observe the sky, hosts our telescopes. ESO operates three observing sites: La Silla, Paranal and Chajnantor. At Paranal, ESO operates the Very Large Telescope and its Very Large Telescope Interferometer, as well as survey telescopes such as VISTA. Also at Paranal ESO will host and operate the Cherenkov Telescope Array South, the world's largest and most sensitive gamma-ray observatory. Together with international partners, ESO operates ALMA on Chajnantor, a facility that observes the skies in the millimetre and submillimetre range. At Cerro Armazones, near Paranal, we are building "the world's biggest eye on the sky" — ESO's Extremely Large Telescope. From our offices in Santiago, Chile we support our operations in the country and engage with Chilean partners and society.

Links

- Research paper
- Photos of ALMA
- For journalists: subscribe to receive our releases under embargo in your language
- For scientists: got a story? Pitch your research
- New ESO analysis confirms severe damage from industrial complex planned near Paranal

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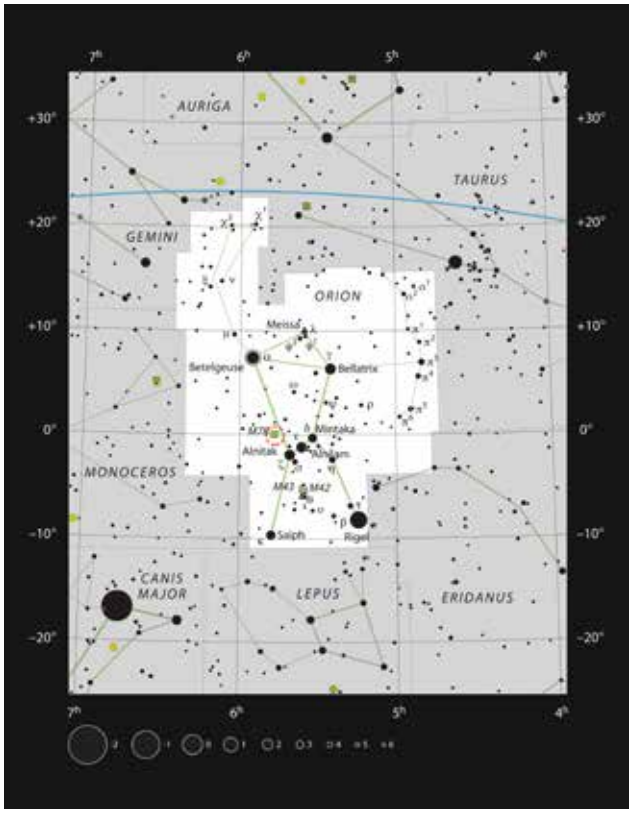
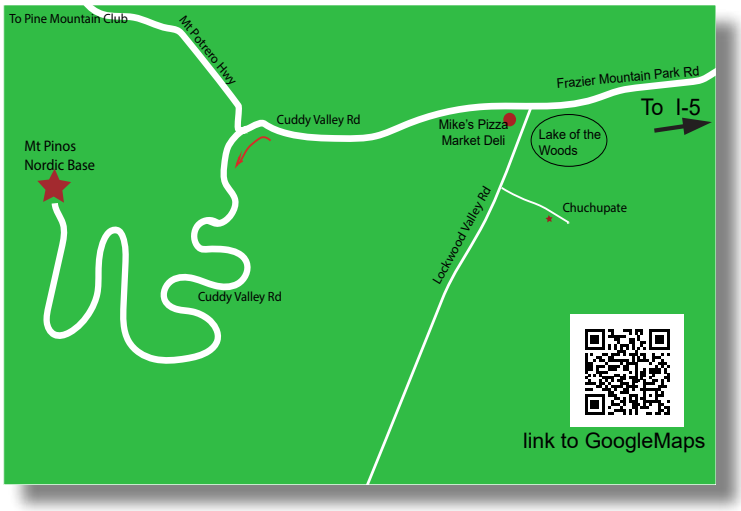


The baby star HOPS-315 in the constellation Orion
Credit: SkyandTelescope

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) RX3R+3F, Frazier Park, CA 93225



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.

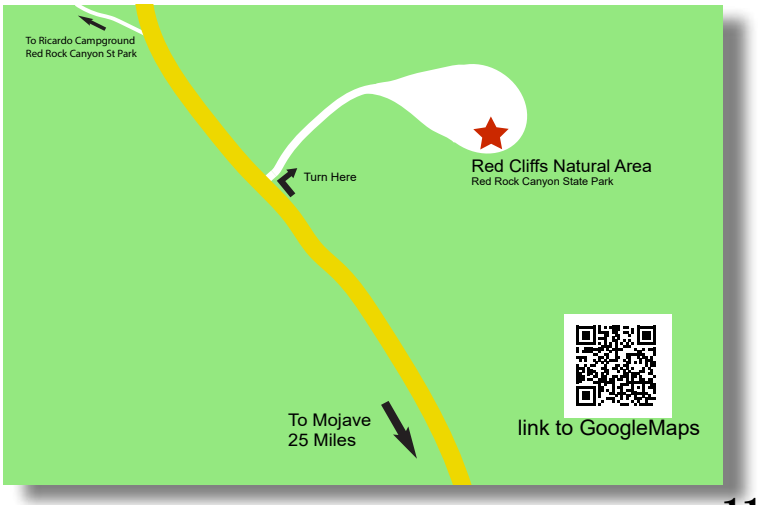
To get there: From I-5, get off at Frazier Mountain Park Rd and drive west about 7 miles to Mike's Pizza/ Market Deli at Lockwood Valley Rd. Keep on the main roadway (don't turn left to go to Chuchupate). Continue past Mike's Pizza on Cuddy Valley Rd (the road's new name) about 5 miles. Continue straight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

Note: Almost the entire drive from I-5 is uphill.

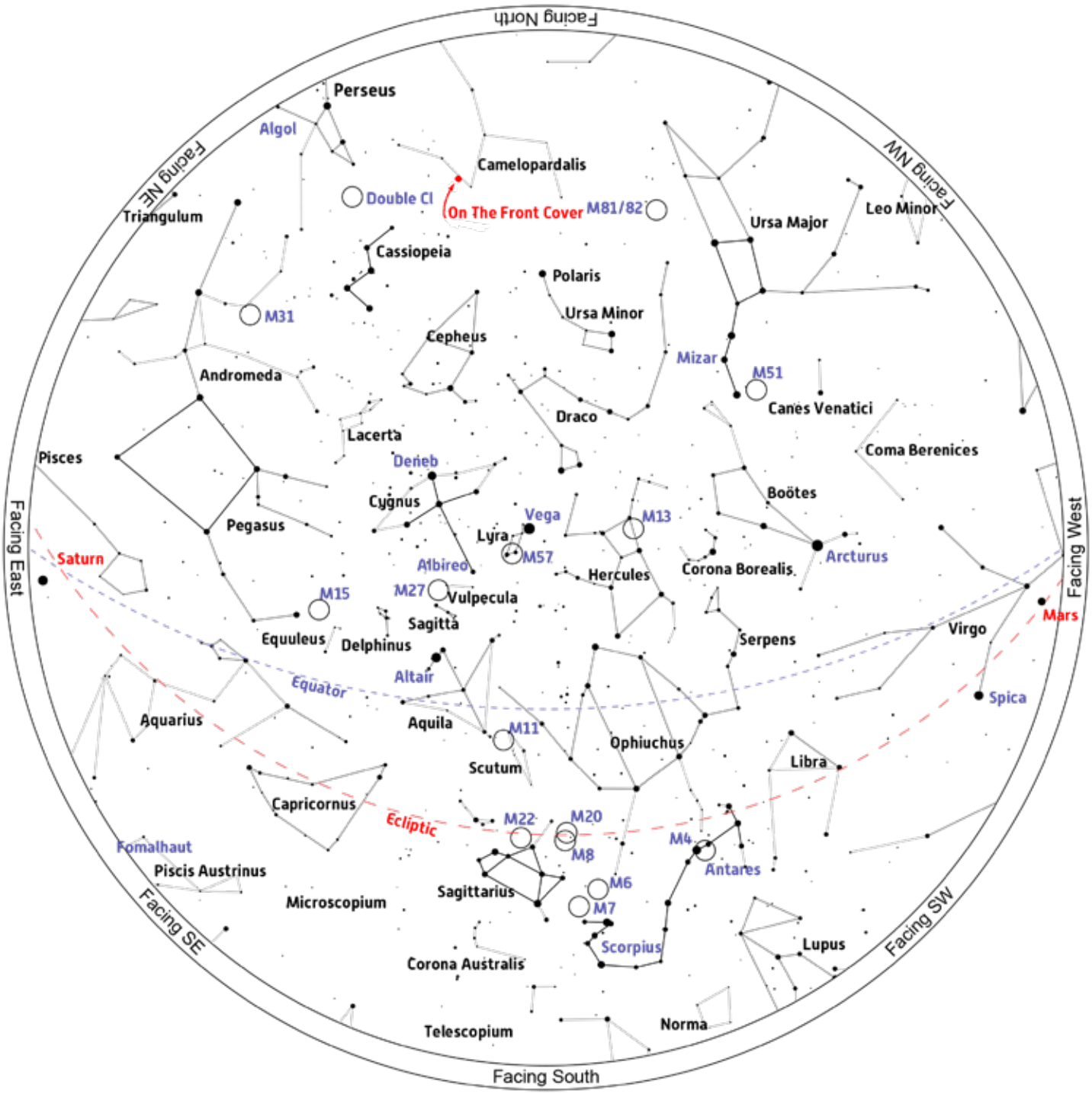
RV7F+FF Frazier Park, California (link to GoogleMaps)

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). 926F+X5 Ricardo, California



Sky Chart



Location: Palmdale, CA 93551
Latitude: 34° 36' N, longitude: 118° 11' W
Time: 2025 August 23, 21:00 (UTC -07:00)

Powered by: Heavens-Above.com

Solar System Summary

The **Sun** starts the month in central Cancer ending the month in central Leo.

The Planets

Mercury having passed inferior conjunction on the 1st, slowly becoming visible in the morning twilight. On the 19th it achieves greatest elongation west of 19°.

Venus spends the mornings moving normally from Taurus, passing across the whole of Gemini to the edge of Cancer. Venus zips by Jupiter on the 12th, less than 1°of separation.

Mars starts the month on the eastern edge of Virgo and by the end of the month makes it only to the center of Virgo. On the early morning of the 26th, a couple of hours before Mars-rise, the 10% waxing Moon passes by 2¾° south.

Jupiter continues it's normal motion heading east across Gemini stuck in the morning twilight for the next few weeks.

Saturn rising before midnight moving in retrograde in Pisces at mag 0.8 staying close 1.5° south of Neptune for most of the month.

Uranus continues moving normally at mag 5.7 in eastern Taurus, about 4⅓° south of the Pleiades.

Neptune is moving in retrograde in southern Pisces at mag 7.8, spending the month pacing Saturn less than 1° to the south. The 88% waning Moon passes by on the evening of the 12th.

Dwarf Planets

134340 Pluto spends the month, again, in retrograde, still in western Capricorn, at mag 14.4. The almost full Moon passes by ½° south at 10pm on the 7th.

1 Ceres spends the month making a u-turn in Cetus starting a 4 month retrograde movement at mag 8.4.

2 Pallas continues it's retrograde motion making a big loop through eastern Delphinus at magnitude 9.4.

3 Juno begins it's normal motion leaving Serpens Caput in the review mirror as it drifts through Libra , at mag 11.1.

4 Vesta in normal moving about half way across Libra at mag 7.5.

Moon Phases

First Qtr Aug 1, 30 | Full Aug 9 | Third Qtr Aug 15 | New Aug 22

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
8/1/2025	13:47	23:03	06:03	19:54
8/5/2025	17:39	02:08	06:06	19:50
8/10/2025	20:49	07:30	06:09	19:45
8/15/2025	23:26	13:15	06:13	19:40
8/20/2025	03:20	18:21	06:17	19:34
8/25/2025	08:41	20:44	06:21	19:27
8/30/2025	13:34	23:12	06:24	19:21

Planet Data*

August 1

	Rise	Transit	Set	Mag	Phase%
Mercury	06:09	12:48	19:27	4.68	1.2
Venus	03:10	10:18	17:26	-4.00	75.5
Mars	09:52	15:59	22:06	1.59	94.4
Jupiter	03:53	11:02	18:12	-1.93	99.8
Saturn	22:20	04:21	10:19	0.80	99.8

August 15

	Rise	Transit	Set	Mag	Phase%
Mercury	04:53	11:44	18:36	0.61	29.3
Venus	03:27	10:34	17:40	-3.97	79.9
Mars	09:38	15:36	21:33	1.61	95.2
Jupiter	03:11	10:20	17:28	-1.97	99.6
Saturn	21:23	03:24	09:21	-0.97	99.9

August 30

	Rise	Transit	Set	Mag	Phase%
Mercury	05:21	12:06	18:51	-1.20	85.1
Venus	03:52	10:50	17:47	-3.95	84.1
Mars	09:25	15:12	20:58	1.61	96.0
Jupiter	02:25	09:33	16:40	-2.03	99.4
Saturn	20:22	02:22	08:17	-0.67	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 August 23, 2025. The list is sorted by the transit time of the object.

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M106	NGC4258	Galaxy	CVn	12h 18m 58s	+47°18.2'	9.1	05:45	15:05	00:26
M61	Swelling Spiral	Galaxy	Vir	12h 21m 55s	+04°28.3'	10.1	08:53	15:08	21:24
M40	Winnecke 4	Dbl+Asterism	UMa	12h 22m 12s	+58°05.0'	8.7	Circ	15:09	Circ
M100	Mirror of M99	Galaxy	Com	12h 22m 55s	+15°49.3'	10.1	08:21	15:09	21:57
M84	NGC4374	Galaxy	Vir	12h 25m 04s	+12°53.2'	10.2	08:32	15:12	21:51
M85	NGC4382	Galaxy	Com	12h 25m 24s	+18°11.4'	10.0	08:16	15:12	22:07
M86	NGC4406	Galaxy	Vir	12h 26m 12s	+12°56.7'	9.9	08:33	15:13	21:52
M49	NGC4472	Galaxy	Vir	12h 29m 47s	+08°00.0'	9.3	08:51	15:16	21:41
M87	Smoking Gun	Galaxy	Vir	12h 30m 49s	+12°23.4'	9.6	08:40	15:17	21:55
M88	NGC4501	Galaxy	Com	12h 31m 59s	+14°25.2'	10.2	08:35	15:18	22:02
M91	Missing Messier Object	Galaxy	Com	12h 35m 27s	+14°29.7'	10.9	08:38	15:22	22:06
M89	NGC4552	Galaxy	Vir	12h 35m 40s	+12°33.3'	10.9	08:44	15:22	22:00
M90	NGC4569	Galaxy	Vir	12h 36m 50s	+13°09.7'	10.2	08:43	15:23	22:03
M58	NGC4579	Galaxy	Vir	12h 37m 44s	+11°49.1'	10.4	08:48	15:24	22:00
M68	NGC4590	Globular	Hya	12h 39m 28s	-26°44.5'	9.0	10:44	15:26	20:08
M104	Sombrero Galaxy	Galaxy	Vir	12h 39m 59s	-11°37.3'	9.2	09:56	15:26	20:57
M59	NGC4621	Galaxy	Vir	12h 42m 02s	+11°38.7'	10.7	08:53	15:29	22:04
M60	NGC4649	Galaxy	Vir	12h 43m 40s	+11°33.1'	9.8	08:55	15:30	22:05
M94	Croc's Eye Galaxy	Galaxy	CVn	12h 50m 53s	+41°07.1'	8.9	07:04	15:37	00:10
M64	Sleeping Beauty Galaxy	Galaxy	Com	12h 56m 44s	+21°41.0'	9.3	08:36	15:43	22:50
M53	NGC5024	Globular	Com	13h 12m 55s	+18°10.1'	8.5	09:04	15:59	22:55
M63	Sunflower Galaxy	Galaxy	CVn	13h 15m 49s	+42°01.7'	9.3	07:24	16:02	00:41
NGC5139	Omega Centauri	Globular	Cen	13h 26m 48s	-47°29.0'	3.6	13:23	16:13	19:04
NGC5169		Galaxy	CVn	13h 28m 10s	+46°40.3'	14.0	07:00	16:15	01:29
NGC5204		Galaxy	UMa	13h 29m 36s	+58°25.1'	11.3	Circ	16:16	Circ
M51	Whirlpool Galaxy,	Galaxy	CVn	13h 29m 52s	+47°11.7'	8.9	06:57	16:16	01:35
Arp85	M51B	Galaxy	CVn	13h 29m 58s	+47°16.0'	9.6	06:57	16:16	01:36
NGC5182		Galaxy	Hya	13h 30m 41s	-28°09.0'	13.0	11:41	16:17	20:54
NGC5214		Galaxy	CVn	13h 32m 49s	+41°52.3'	14.0	07:42	16:19	00:57
M83	Southern Pinwheel Galaxy	Galaxy	Hya	13h 37m 00s	-29°51.8'	8.0	11:54	16:24	20:53
HR5144	1 Boo	Triple	Boo	13h 40m 40s	+19°57.3'	5.8	09:26	16:27	23:28
NGC5283		Galaxy	Dra	13h 41m 06s	+67°40.3'	14.0	Circ	16:28	Circ
M3	NGC5272	Globular	CVn	13h 42m 11s	+28°22.5'	7.0	08:58	16:29	00:00
NGC5286	C84	Globular	Cen	13h 46m 24s	-51°22.0'	7.6	14:24	16:33	18:42
NGC5292		Galaxy	Cen	13h 47m 40s	-30°56.4'	14.0	12:08	16:34	21:00
NGC5356		Galaxy	Vir	13h 54m 59s	+05°20.0'	14.0	10:24	16:41	22:59

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC5447	III-787	Neb	UMa	14h 02m 29s	+54°16.3'		05:34	16:49	04:04
M101	Pinwheel Galaxy	Galaxy	UMa	14h 03m 13s	+54°20.9'	8.2	05:31	16:50	04:08
NGC5461	III-788	Neb	UMa	14h 03m 42s	+54°19.0'		05:33	16:50	04:07
NGC5485		Galaxy	UMa	14h 07m 11s	+55°00.0'	11.5	Circ	16:54	Circ
NGC5460		Open	Cen	14h 07m 27s	-48°20.6'	5.6	14:11	16:54	19:37
NGC5500		Galaxy	Boo	14h 10m 15s	+48°32.7'	14.0	07:24	16:57	02:29
IC991		Galaxy	Vir	14h 17m 48s	-13°52.3'	13.0	11:41	17:04	22:28
HR5362	SAO224838	Dbl	Lup	14h 20m 10s	-43°03.5'	5.6	13:43	17:07	20:31
IC4406	Retina Nebula	P Neb	Lup	14h 22m 26s	-44°09.0'	11.0	13:52	17:09	20:26
HR5409	Phi Vir	Triple	Vir	14h 28m 12s	-02°13.6'	4.8	11:18	17:15	23:11
NGC5669		Galaxy	Boo	14h 32m 44s	+09°53.4'	12.0	10:49	17:19	23:50
NGC5689		Galaxy	Boo	14h 35m 30s	+48°44.5'	11.9	07:47	17:22	02:57
M102	Spindle Galaxy (duplicate of M101?)	Galaxy	Dra	15h 06m 30s	+55°45.7'	10.8	Circ	17:53	Circ
NGC5875		Galaxy	Boo	15h 09m 13s	+52°31.6'	13.0	07:28	17:56	04:24
NGC5907	Splinter Galaxy	Galaxy	Dra	15h 15m 54s	+56°19.7'	11.4	Circ	18:02	Circ
NGC5882		P Neb	Lup	15h 16m 50s	-45°38.9'	11.0	14:58	18:03	21:09
NGC5897		Globular	Lib	15h 17m 24s	-21°00.6'	8.6	13:02	18:04	23:05
M5	NGC5904	Globular	Ser	15h 18m 33s	+02°04.9'	7.0	11:57	18:05	00:14
IC4593	White Eyed Pea	P Neb	Her	16h 11m 44s	+12°04.3'	11.0	12:21	18:58	01:35
IC4592	Jabbah	Neb	Sco	16h 11m 59s	-19°27.4'		13:52	18:58	00:05
M80	NGC6093	Globular	Sco	16h 17m 03s	-22°58.5'	8.5	14:09	19:04	23:59
IC4601		Neb	Sco	16h 20m 18s	-20°04.9'		14:02	19:07	00:11
Abell38		P Neb	Sco	16h 23m 17s	-31°44.9'	11.7	14:47	19:10	23:32
M4	Cat's Eye	Globular	Sco	16h 23m 35s	-26°31.5'	7.5	14:27	19:10	23:53
IC4603	Rho Ophiuchi Complex	Neb	Oph	16h 25m 24s	-24°28.0'		14:22	19:12	00:02
IC4604	Rho Ophiuchi Complex	Neb	Oph	16h 25m 33s	-23°26.5'		14:19	19:12	00:05
NGC6124	C75	Open	Sco	16h 25m 36s	-40°40.0'	5.8	15:33	19:12	22:51
Abell39		P Neb	Her	16h 27m 33s	+27°54.5'	12.9	11:45	19:14	02:43
IC4605		Neb	Sco	16h 30m 12s	-25°06.8'		14:29	19:17	00:04
NGC6153		P Neb	Sco	16h 31m 31s	-40°15.2'	12.0	15:37	19:18	22:59
NGC6181		Galaxy	Her	16h 32m 21s	+19°49.5'	11.9	12:18	19:19	02:20
NGC6171		Globular	Oph	16h 32m 32s	-13°03.1'	8.1	13:53	19:19	00:45
NGC6178		Open	Sco	16h 35m 47s	-45°38.6'	7.2	16:17	19:22	22:28
NGC6193	C82	Open	Ara	16h 41m 18s	-48°46.0'	5.2	16:49	19:28	22:06
M13	Great Hercules Cluster	Globular	Her	16h 41m 41s	+36°27.5'	7.0	11:21	19:28	03:35
NGC6210	Turtle Planetary Nebula	P Neb	Her	16h 44m 30s	+23°48.0'	9.0	12:17	19:31	02:45
Barnard44a	B44a	DkNeb	Sco	16h 44m 45s	-40°20.0'		15:50	19:31	23:12
NGC6204		Open	Ara	16h 46m 09s	-47°01.0'	8.2	16:38	19:33	22:27

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M12	Gumball Globular	Globular	Oph	16h 47m 14s	-01°56.8'	8.0	13:36	19:34	01:31
NGC6231	Table of Scorpius	Open	Sco	16h 54m 00s	-41°48.0'	2.6	16:08	19:41	23:13
IC4628	Prawn Nebula	Neb	Sco	16h 56m 58s	-40°27.3'		16:03	19:43	23:24
NGC6254		Globular	Oph	16h 57m 09s	-04°05.9'	6.6	13:52	19:44	01:35
Barnard47	B47	DkNeb	Oph	16h 59m 42s	-22°38.0'		14:50	19:46	00:42
M62	Flickering Globular	Globular	Oph	17h 01m 13s	-30°06.7'	8.0	15:19	19:48	00:17
M19	NGC6273	Globular	Oph	17h 02m 38s	-26°16.0'	8.5	15:06	19:49	00:33
Barnard51	B51	DkNeb	Oph	17h 04m 44s	-22°15.0'		14:54	19:51	00:49
IC4637		P Neb	Sco	17h 05m 10s	-40°53.1'	14.0	16:14	19:52	23:29
Barnard56	B56	DkNeb	Sco	17h 08m 48s	-32°05.0'		15:34	19:55	00:16
Barnard59	B59,Pipe Nebula	DkNeb	Oph	17h 11m 23s	-27°29.0'		15:19	19:58	00:37
NGC6302	C69,Bug Nebula	P Neb	Sco	17h 13m 42s	-37°06.0'	9.6	16:02	20:00	23:58
Barnard251	B251	DkNeb	Oph	17h 13m 48s	-20°09.0'		14:56	20:00	01:05
Barnard63	B63	DkNeb	Oph	17h 16m 00s	-21°28.0'		15:02	20:03	01:03
M92	NGC6341	Globular	Her	17h 17m 07s	+43°08.1'	7.5	11:17	20:04	04:50
M9	NGC6333	Globular	Oph	17h 19m 12s	-18°31.0'	9.0	14:56	20:06	01:15
NGC6326		P Neb	Ara	17h 20m 46s	-51°45.2'	12.0	18:03	20:07	22:11
Barnard256	B256	DkNeb	Oph	17h 22m 12s	-28°49.0'		15:35	20:09	00:43
Barnard67a	B67a	DkNeb	Oph	17h 22m 30s	-21°53.0'		15:10	20:09	01:08
Barnard71	B71	DkNeb	Oph	17h 23m 02s	-24°00.0'		15:18	20:10	01:01
NGC6357	Lobster Nebula	Neb	Sco	17h 24m 43s	-34°12.1'		15:59	20:11	00:23
IC4651		Open	Ara	17h 24m 52s	-49°56.5'	6.9	17:45	20:11	22:38
Abell41		P Neb	Ser	17h 29m 04s	-15°13.3'	13.9	14:56	20:16	01:35
Abell42		P Neb	Oph	17h 31m 31s	-08°19.1'	14.6	14:38	20:18	01:58
Barnard78	B78	DkNeb	Oph	17h 32m 00s	-25°35.0'		15:33	20:19	01:04
NGC6388		Globular	Sco	17h 36m 17s	-44°44.1'	6.9	17:10	20:23	23:35
M14	NGC6402	Globular	Oph	17h 37m 36s	-03°14.7'	9.5	14:30	20:24	02:18
Barnard276	B276	DkNeb	Oph	17h 39m 39s	-19°49.0'		15:21	20:26	01:32
M6	Butterfly Cluster	Open	Sco	17h 40m 20s	-32°15.2'	4.5	16:07	20:27	00:47
NGC6397	C86	Globular	Ara	17h 40m 42s	-53°40.0'	5.6	18:54	20:27	22:00
NGC6426		Globular	Oph	17h 44m 55s	+03°10.1'	11.2	14:20	20:31	02:43
Barnard83a	B83a	DkNeb	Sgr	17h 45m 18s	-20°00.0'		15:27	20:32	01:37
IC4665		Open	Oph	17h 46m 30s	+05°39.0'	4.2	14:15	20:33	02:51
NGC6445	Crescent Nebula	P Neb	Sgr	17h 49m 15s	-20°00.6'	13.0	15:31	20:36	01:41
NGC6503		Galaxy	Dra	17h 49m 27s	+70°08.6'	10.2	Circ	20:36	Circ
NGC6441		Globular	Sco	17h 50m 13s	-37°03.0'	7.4	16:38	20:37	00:35
Barnard283	B283	DkNeb	Sco	17h 51m 00s	-33°52.0'		16:24	20:38	00:51
Barnard285	B285	DkNeb	Ser	17h 51m 32s	-12°52.0'		15:11	20:38	02:05

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M7	Ptolemy's Cluster	Open	Sco	17h 53m 51s	-34°47.6'	3.5	16:31	20:40	00:49
IC4670		Neb	Sgr	17h 55m 07s	-21°44.6'		15:43	20:42	01:41
NGC6501		Galaxy	Her	17h 56m 04s	+18°22.3'	12.3	13:47	20:43	03:39
M23	NGC6494	Open	Sgr	17h 57m 04s	-18°59.1'	6.0	15:36	20:44	01:52
NGC6543	Cat Eye Nebula	P Neb	Dra	17h 58m 36s	+66°38.0'	8.1	Circ	20:45	Circ
NGC6496		Globular	Sco	17h 59m 04s	-44°16.0'	9.2	17:30	20:46	00:01
Barnard291	B291	DkNeb	Sgr	17h 59m 43s	-33°53.0'		16:33	20:46	00:59
Barnard292	B292	DkNeb	Sgr	18h 00m 34s	-33°20.0'		16:31	20:47	01:03
Barnard293	B293	DkNeb	Sgr	18h 01m 12s	-35°20.0'		16:41	20:48	00:54
M20	Trifid Nebula	Open+D Neb	Sgr	18h 02m 42s	-22°58.2'	5.0	15:54	20:49	01:44
M8	Lagoon Nebula	Open+D Neb	Sgr	18h 03m 41s	-24°22.7'	5.0	16:00	20:50	01:40
M21	NGC6531	Open	Sgr	18h 04m 13s	-22°29.3'	7.0	15:54	20:51	01:47
NGC6530		Open	Sgr	18h 04m 31s	-24°21.5'	4.6	16:01	20:51	01:41
NGC6528		Globular	Sgr	18h 04m 50s	-30°03.3'	9.5	16:22	20:51	01:21
IC4684		Neb	Sgr	18h 09m 08s	-23°26.1'		16:02	20:56	01:49
IC4685		Neb	Sgr	18h 09m 18s	-23°59.2'		16:04	20:56	01:47
Barnard303	B303	DkNeb	Sgr	18h 09m 28s	-23°59.0'		16:04	20:56	01:48
IC1274		Neb	Sgr	18h 09m 51s	-23°38.8'		16:04	20:56	01:49
IC1275		Neb	Sgr	18h 10m 07s	-23°45.7'		16:04	20:57	01:49
NGC6572		P Neb	Oph	18h 12m 06s	+06°51.2'	9.0	14:37	20:59	03:20
NGC6567		P Neb	Sgr	18h 13m 45s	-19°04.5'	12.0	15:53	21:00	02:08
IC4701		Neb	Sgr	18h 16m 36s	-16°38.0'		15:48	21:03	02:18
Barnard93	B93	DkNeb	Sgr	18h 16m 53s	-18°03.0'		15:52	21:03	02:14
IC1284		Neb	Sgr	18h 17m 39s	-19°40.3'		15:58	21:04	02:10
M24	Small Sagittarius Star Cloud	Open	Sgr	18h 18m 26s	-18°24.3'	4.5	15:55	21:05	02:15
M16	Eagle Nebula,	Open+D Neb	Ser	18h 18m 48s	-13°48.3'	6.5	15:42	21:05	02:29
M18	Black Swan	Open	Sgr	18h 19m 58s	-17°06.1'	8.0	15:53	21:06	02:20
M17	Omega Nebula	Open+D Neb	Sgr	18h 20m 47s	-16°10.3'	7.0	15:51	21:07	02:24
M28	NGC6626	Globular	Sgr	18h 24m 33s	-24°52.1'	8.5	16:23	21:11	02:00

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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