Volume 45.11 November 2025

Desert Sky Observer

Antelope Valley Astronomy Club

Upcoming Events

November 2: Daylight Saving Time ends
November 8: Moonwalk @ PDW 5:15 pm
November 13: School Star Party?
November 14: Club Meeting
November 22: DSSP @ TBD ?

Every clear night: Personal Star Party

AVAC Calendar

December 6: Christmas Party
January 9: Club Meeting
January 24: Moonwalk @ PDW 5:30 PM

Board Members

President: Phil Wriedt (661) 917-4874
president@avastronomyclub.org

Vice-President: Matt Leone (661) 713-1894
vice-president@avastronomyclub.org

Secretary: Rose Moore (661) 972-1953
secretary@avastronomyclub.org

Treasurer: Rod Girard (661) 803-7838
treasurer@avastronomyclub.org

Director of Community Development:
Christian Amaya(661) 972-0091
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Appointed Positions

Newsletter Editor: Phil Wriedt (661) 917-4874
dso@avastronomyclub.org

Equipment & Library:
vacant
library@avastronomyclub.org

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,

On the 10th of October, we held our Annual Business Meeting and the election of offices for 2026. Matt Leone declined the nomination for Vice President. A new member, Richard Passmore, volunteered for the job, and he was duly elected, along with the rest of the board being reelected. Matt will continue to shepherd the Lunar Club.

At our last Moonwalk on October 25th we had 36 members of the public, 8 Club members and 6 telescopes. Comet C/2025 A6 (Lemmon) was visible and after Darrell found it the rest of us found it too. Our next Moonwalk is on Saturday the 8th of November. Sunset is at 4:52 pm (Daylight Saving time ends on the 2nd) and astronomical dusk is at 6:18 pm. Saturn will transit at 8:26 pm , and the 86% waning Moon will rise at 7:48 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. Don't forget warm clothes, jackets, gloves, etc., it's November, so be prepared. There is still a fair chance that a cold rain front could come through. Hopefully it will be a cloudless (and smokeless) night.

Our last DSSP was at Red Cliffs on October 18th; there was a pretty good turnout, cloudless, virtually no wind, dark skies, and just a tad bit cold. Our next, and last Dark Sky Star Party of this year is to be on the 22nd/23rd of November at Red Cliffs. Let's face it, winter is coming and the chance of a cloudless night at Chuchupate in the middle of November is pretty slim. Don't forget warm clothes, jackets, gloves, etc., it's November, so be prepared. Watch for the emails or for the text message to know what's happening.

On the 6th of December we will have our Christmas Party at Gino's in the Lancaster Marketplace, like we have for the past 8 years or so. Woodland Hills Camera (one of our sponsors), came through with a ZWO Seestar S50 telescope for the Grand Prize for our Christmas Party on December 6th. More information on the AVAC website.

There is a possibility of a star party at a school on the 13th; watch for the email notice if it materializes.

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

Keep Looking Up, Phil

On The Cover

Note: North is 28.1° left of vertical RA: 17h 17' 7.37" DEC: 43° 8' 11.15" Mag: 6.5 125kly (Hercules)

This striking new NASA/ESA Hubble Space Telescope image shows a glittering bauble named Messier 92. Located in the northern constellation of Hercules, this globular cluster — a ball of stars that orbits a galactic core like a satellite — was first discovered by astronomer Johann Elert Bode in 1777.

Messier 92 is one of the brightest globular clusters in the Milky Way, and is visible to the naked eye under good observing conditions. It is very tightly packed with stars, containing some 330 000 stars in total. As is characteristic of globular clusters, the predominant elements within Messier 92 are hydrogen and helium, with only traces of others. It is actually what is known as an Oosterhoff type II (OoII) globular cluster, meaning that it belongs to a group of metal-poor clusters — to astronomers, metals are all elements heavier than hydrogen and helium.

By exploring the composition of globulars like Messier 92, astronomers can figure out how old these clusters are. As well as being bright, Messier 92 is also old, being one of the oldest star clusters in the Milky Way, with an age almost the same as the age of the Universe.

A version of this image was entered into the Hubble's Hidden Treasures image processing competition by contestant Gilles Chapdelaine.

Gilles Chapdelaine's Hidden Treasures entry on Flickr *Credit: ESA/Hubble & NASA Acknowledgement: Gilles Chapdelaine*

From the Secretary

By Rose Moore

Members:

Thank you to all the members who came out to events this past month! Thank you to Rod, Phil, and Richard for attending the College of the Canyons Star Party!

There may be a dark sky star party in November. We are watching the weather to determine if we'll have one. Stay tuned!

A reminder that we have a Christmas Party on Saturday, December 6th, at Gino's Restaurant in the Lancaster Marketplace. Another email with more information will be coming out shortly. If you are planning to come to the party, but have not notified any Board member, please let one of us know by the club meeting on Friday Nov. 14th. We are committed to a minimum of 30 people for Gino's to accommodate us in the large room, and we would like to make sure we will have enough members and guests.

We have a Prime Desert Moon Walk on Saturday November 8th, starting at 6:30pm; we need members with telescopes for the event. Set up time is 30-45 minutes prior, weather permitting. This will be the last PDW with telescopes for the year, as in December our Christmas Party is the same night as PDW. More info coming in an email.

Jeremy may have a school science/astronomy event coming up the second week of November. We will have more details in an email if this will happen.

Our next club meeting, and the last for the year, will be on Friday November 14th, starting at 7pm. Jeremy is working on getting a speaker. We'll send out an email with information during the week prior to the meeting. Our first meeting of 2026 will be on January 9th.

Rose

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)

Space News

News from around the Net

Harvard Astrophysicist Suggests Mysterious Interstellar Object May Be An Alien Probe

On July 1, astronomers detected a strange, fast-moving object racing toward the Sun. Named 3I/ATLAS, this unusual traveler immediately stood out for one remarkable reason: its orbital path revealed that it had come from beyond our Solar System. This marked only the third time in history that scientists have identified an interstellar visitor entering our cosmic neighborhood. And this one was particularly puzzling. Measurements show that 3I/ATLAS is moving at an incredible 245,000 kilometers per hour, making it the fastest known object ever observed within the Solar System.. . . (continued at https://www.sciencedaily.com/releases/2025/10/251009033128.htm)

Finally! Webb Has Discovered Water Ice Around A Nearby Star Just Like Our Own Solar System

Scientists have found frozen water ice around a star like our Sun, just 155 lightyears away. Astronomers have long suspected that frozen water lurked in systems around distant stars, and now the James Webb Space Telescope has delivered proof. Water is a key ingredient for life as we know it, so the detection could have implications for the likelihood that life could exist beyond our Solar System. It could also tell scientists more about the process of how planets form around stars. What's more, the water ice discovered is the exact type that we find in our own Solar System. . . . (continued at https://www.skyatnightmagazine.com/news/hd-181327-water-webb)

A Star Torn Apart By A Black Hole Lit Up The Universe Twice

The explosion of a massive star locked in a deadly orbit with a black hole has been discovered with the help of artificial intelligence used by an astronomy collaboration led by the University of California, Santa Cruz, that hunts for stars shortly after they explode as supernovae. The blast, named SN 2023zkd, was first discovered in July 2023 with the help of a new AI algorithm designed to scan for unusual explosions in real time. The early alert allowed astronomers to begin follow-up observations immediately -- an essential step in capturing the full story of the explosion. . . . (continued at https://www.sciencedaily.com/releases/2025/08/250819072159.htm)

Hidden In The Sun's Glare, This Asteroid Is Uncomfortably Close To Earth

In the distant past, the solar system was rife with impacts and collisions. Millions of rocky objects zoomed chaotically through the system, smashing into each other in collisional cascades. Over time, many of them eventually became part of the rocky planets. What's left of the space rocks are mostly gathered in the main asteroid belt. But some are otherwise hidden in difficult to observe locations. Unfortunately for life on Earth, some of the most difficult to spot ones are close to us. They're hidden in the sun's glare and are uncomfortably close to our earthly home. . . . .(continued at https://phys.org/news/2025-10-hidden-sun-glare-asteroid-uncomfortably.html)

Black Hole Eats through Star, Explodes it from Within

Astronomers may have witnessed how a black hole ate its way into a star and blew it up from within. This exotic scenario looks like the best explanation for a most unusual gamma-ray burst. The story began some 8 billion years ago, when an explosive event in a distant galaxy produced a tremendously bright burst of gamma-rays. On July 2, 2025, after traversing more than half of the observable universe, those high-energy photons reached Earth, . . . (continued at https://skyandtelescope.org/astronomy-news/black-hole-eats-through-star-explodes-it-from-within/)

How The Mayans Were Able To Accurately Predict Solar Eclipses For Centuries

The Maya Civilization, from Central America, was one of the most advanced ancient civilizations, known for its significant achievements in astronomy and mathematics. This includes accurate calendars and detailed celestial records, but scientists don't fully understand all the details of their calculations. However, new research is shedding light on how they predicted future eclipses with remarkable accuracy. . . . (continued at https://phys.org/news/2025-10-mayans-accurately-solar-eclipses-centuries.html)

Space News

News from around the Net

I've Stargazed All Over the U.S.—and This National Park Has Some of the Country's Best Night Sky Views I become downright euphoric whenever I spot a shooting star, and standing beneath the towering sandstone in Capitol Reef National Park, I spotted dozens of them. It was the last leg of a four-state stargazing road trip—and what a grand finale. While I imagined I'd love Capitol Reef National Park just as much as the numerous other stops on this adventure through the Southwest, I had no idea the less-trodden getaway would become the trip highlight, not to mention my favorite national park for stargazing. . . . (continued at https://www.travelandleisure.com/capitol-reef-national-park-stargazing-11821837)

The Sun's Atmosphere Pulses With Hidden Twisting Waves

For more than half a century, scientists have been puzzled by one of the Sun's unsolved mysteries: why is its outer atmosphere, the corona, millions of degrees hotter than the solar surface below? This superheated crown not only glows brilliantly during total solar eclipses but also spews out the solar wind—a fluctuating stream of charged particles that bathes Earth and the rest of the solar system. The source of the corona's extreme heat and the driving force behind this wind remain among astrophysics' most persistent unanswered questions.. . . (continued at https://nso.edu/blog/the-suns-atmosphere-pulses-with-hidden-twisting-waves/)

4MOST Telescope Facility Captures First Light

On October 18, 2025, the 4-meter Multi-Object Spectroscopic Telescope (4MOST) facility, installed on the VISTA telescope at the European Southern Observatory's (ESO) Paranal Observatory in Chile, obtained its first light. This milestone is a crucial step in the life of any telescope, marking the moment it is ready to begin its scientific journey. Moreover, 4MOST does not simply take images of the sky; it records spectra, capturing the light of each object in every individual color. With this capability, it can unravel the light of 2,400 celestial objects simultaneously into 18,000 color components, allowing astronomers to study their detailed chemical composition and properties.. . . . (continued at https://phys.org/news/2025-10-4most-telescope-facility-captures.html)

Acting NASA Chief Announces More "Shakeups"

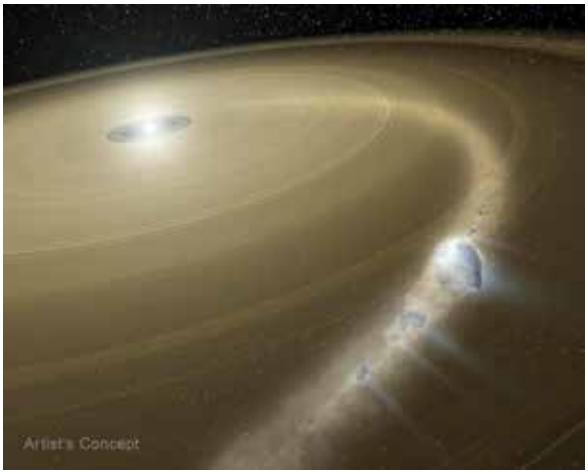
Citing delays, acting NASA chief Sean Duffy announced that the Artemis Program - NASA's plan to return astronauts to the Moon - needs to be shaken up again. The announcement came on Monday (Oct. 22nd) when Duffy, also the Secretary of Transportation, made two television appearances to discuss ongoing problems with the program. This included the development of the Starship Human Landing System (HLS), the lunar lander that will transport astronauts to and from the lunar surface, which NASA contracted to SpaceX in 2021.. . . . .(continued at https://www.universetoday.com/articles/acting-nasa-chief-announces-more-shakeups)

The Tycho Supernova's Hidden Secret

In November 1572, a brilliant new star appeared in the constellation Cassiopeia, shining so brightly that it was visible during the day. Danish astronomer Tycho Brahe carefully documented this celestial phenomenon, and the supernova remnant that bears his name has been studied intensively ever since. Now, a new analysis of recent observations suggests that Tycho's supernova had a more dramatic origin story than previously thought: it exploded not in empty space, but inside the ghostly remains of a planetary nebula. . . .(continued at https://phys.org/news/2025-10-tycho-supernova-hidden-secret.html#google_vignette)

Hubble Sees White Dwarf Eating Piece Of Pluto-Like Object

weic2511 — Science Release 18 September 2025



Artist's impression of a white dwarf and debris disc

In our nearby stellar neighbourhood, a burned-out star is snacking on a fragment of a Pluto-like object. With its unique ultraviolet capability, only the NASA/ESA Hubble Space Telescope could identify that this meal is taking place.

The stellar remnant is a white dwarf about half the mass of our Sun, but that is densely packed into a body about the size of Earth. Scientists think the dwarf's immense gravity pulled in and tore apart an icy Pluto analogue from the system's own version of the Kuiper Belt, an icy ring of debris that encircles our Solar System. The findings were reported on 18 September 2025 in the Monthly Notices of the Royal Astronomical Society.

An international team of astronomers were able to determine this carnage by analysing the chemical composition of the doomed object as its pieces fell onto the white dwarf. In particular, they detected "volatiles" (substances with low boiling points) including carbon, sulphur, nitrogen, and a high oxygen content that suggests the strong presence of water.

"We were surprised," said Snehalata Sahu of the University of Warwick in the United Kingdom. Sahu led the data analysis of a Hubble survey of white dwarfs. "We did not expect to find water or other icy content. This is because the comets and Kuiper Belt-like objects are thrown out of their planetary systems early, as their stars evolve into white dwarfs. But here, we are detecting this very volatile-rich material. This is surprising for astronomers studying white dwarfs as well as exoplanets, planets outside our Solar System."

Only with Hubble

Using Hubble's Cosmic Origins Spectrograph, the team found that the fragments were composed of nearly two thirds water ice. The fact that they detected so much ice meant that the pieces were part of a very massive object that formed far out in the star system's icy Kuiper Belt analogue. Using Hubble data, scientists calculated that the object was bigger than typical comets and may be a fragment of an exo-Pluto.

They also detected a large fraction of nitrogen - the highest ever detected in white dwarf debris systems. "We know that Pluto's surface is covered with nitrogen ices," said Sahu. "We think that the white dwarf accreted fragments of the crust and mantle of a dwarf planet."

Accretion of these volatile-rich objects by white dwarfs is very difficult to detect in visible light. These volatile elements can only be detected with Hubble's unique ultraviolet light sensitivity. In optical light, the white dwarf would appear ordinary.

About 260 light-years away, the white dwarf is a relatively close cosmic neighbor. In the past, when it was a Sun-like star, it would have been expected to host planets and an analogue to our Kuiper Belt.

Like seeing our Sun in the future

Billions of years from now, when our Sun burns out and collapses to a white dwarf, Kuiper Belt objects will be pulled in by the stellar remnant's immense gravity. "These planetesimals will then be disrupted and accreted," said Sahu. "If an alien observer looks into our Solar System in the far future, they might see the same kind of remains we see today around this white dwarf."

The team hopes to use the NASA/ESA/CSA James Webb Space Telescope to detect molecular features of volatiles such as water vapour and carbonates by observing this white dwarf in infrared light. By further studying white dwarfs, scientists can better understand the frequency and composition of these volatile-rich accretion events.

Sahu is also following the recent discovery of the interstellar comet 3I/ATLAS. She is eager to learn its chemical composition, especially its fraction of water. "These types of studies will help us learn more about planet formation. They can also help us understand how water is delivered to rocky planets," said Sahu.

Boris Gänsicke, of the University of Warwick and a visitor at Spain's Instituto de Astrofisica de Canarias, was the principal investigator of the Hubble program that led to this discovery. "We observed over 500 white dwarfs with Hubble. We've already learned so much about the building blocks and fragments of planets, but I've been absolutely thrilled that we now identified a system that resembles the objects in the frigid outer edges of our solar system," said Gänsicke. "Measuring the composition of an exo-Pluto is an important contribution toward our understanding of the formation and evolution of these bodies."

More information

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

Image Credit: T. Pyle (Caltech, NASA's Jet Propulsion Laboratory)

Links

- Release on NASA website
- Science paper

Contacts

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Six Billion Tonnes A Second: Rogue Planet Found Growing At Record Rate

Press Release: eso2516 2 October 2025

Astronomers have identified an enormous 'growth spurt' in a so-called rogue planet. Unlike the planets in our Solar System, these objects do not orbit stars, free-floating on their own instead. The new observations, made with the European Southern Observatory's Very Large Telescope (ESO's VLT), reveal that this free-floating planet is eating up gas and dust from its surroundings at a rate of six billion tonnes a second. This is the strongest growth rate ever recorded for a rogue planet, or a planet of any kind, providing valuable insights into how they form and grow.

This infrared image, taken with ESO's Visible and Infrared Telescope for Astronomy (VISTA) shows the position in the sky of the rogue planet Cha 1107-7626. The planet is a dot located exactly at the centre of the frame. Credit: ESO/Meingast et al.

"People may think of planets as quiet and stable worlds, but with this discovery we see that planetary-mass objects freely floating in space can be exciting places," says Víctor Almendros-Abad, an astronomer at the Astronomical Observatory of Palermo, National Institute for Astrophysics (INAF), Italy and lead author of the new study.

The newly studied object, which has a mass five to 10 times the mass of Jupiter, is located about 620 light-years away in the constellation Chamaeleon. Officially named Cha 1107-7626, this rogue planet is still forming and is fed by a surrounding disc of gas and dust. This material constantly falls onto the free-floating planet, a process known as accretion. However, the team led by Almendros-Abad has now found that the rate at which the young planet is accreting is not steady.

This visible-light image, part of the Digitized Sky Survey 2, shows the position in the sky of the rogue planet Cha 1107-7626. The planet (not visible here) is located exactly at the centre of the frame. Credit: ESO/ Digitized Sky Survey 2

By August 2025, the planet was accreting about eight times faster than just a few months before, at a rate of six billion tonnes per second! "This is the strongest accretion episode ever recorded for a planetary-mass object," says Almendros-Abad. The discovery, published today in The Astrophysical Journal Letters, was made with the X-shooter spectrograph on ESO's VLT, located in Chile's Atacama Desert. The team also used data from the James Webb Space Telescope, operated by the US, European and Canadian space agencies, and archival data from the SINFONI spectrograph on ESO's VLT.

"The origin of rogue planets remains an open question: are they the lowest-mass objects formed like stars, or giant planets ejected from their birth systems?" asks co-author Aleks Scholz, an astronomer at the University of St Andrews, United Kingdom. The findings indicate that at least some rogue planets may share a similar formation path to stars since similar bursts of accretion have been spotted in young stars before. As co-author Belinda Damian, also an astronomer at the University of St Andrews, explains: "This discovery blurs the line between stars and planets and gives us a sneak peek into the earliest formation periods of rogue planets."

By comparing the light emitted before and during the burst, astronomers gathered clues about the nature of the accretion process. Remarkably, magnetic activity appears to have played a role in driving the dramatic infall of mass, something that has only been observed in stars before. This suggests that even low-mass objects can possess strong magnetic fields capable of powering such accretion events. The team also found that the chemistry of the disc around the planet changed during the accretion episode, with water vapour being detected during it but not before. This phenomenon had been spotted in stars but never in a planet of any kind.

Free-floating planets are difficult to detect, as they are very faint, but ESO's upcoming Extremely Large Telescope (ELT), operating under the world's darkest skies for astronomy, could change that. Its powerful instruments and giant main mirror will enable astronomers to uncover and study more of these lonely planets, helping them to better understand how star-like they are. As co-author and ESO astronomer Amelia Bayo puts it: "The idea that a planetary object can behave like a star is awe-inspiring and invites us to wonder what worlds beyond our own could be like during their nascent stages."

More information

This research was presented in a paper titled “Discovery of an Accretion Burst in a Free-Floating Planetary-Mass Object” to appear in The Astrophysical Journal Letters (doi:10.3847/2041-8213/ae09a8).

The team is composed of V. Almendros-Abad (Istituto Nazionale di Astrofisica - Osservatorio Astronomico di Palermo, Italy), Aleks Scholz (School of Physics & Astronomy, University of St Andrews, United Kingdom [St Andrews]), Belinda Damian (St Andrews), Ray Jayawardhana (Department of Physics & Astronomy, Johns Hopkins University, USA [JHU]), Amelia Bayo (European Southern Observatory, Germany), Laura Flagg (JHU), Koraljka Mužić (Instituto de Astrofísica e Ciências do Espaço, Faculdade de Ciências, Universidade de Lisboa, Portugal), Antonella Natta (School of Cosmic Physics, Dublin Institute for Advanced Studies and University College Dublin, Ireland) Paola Pinilla (Mullard Space Science Laboratory, University College London, UK) and Leonardo Testi (Dipartimento di Fisica e Astronomia, Università di Bologna, Italy).

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 south array of the Cherenkov Telescope Array Observatory, 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 the VLT
- Find out more about ESO’s Extremely Large Telescope on our dedicated website and press kit
- For journalists: subscribe to receive our releases under embargo in your language
- For scientists: got a story? Pitch your research
- Analysis confirms severe damage from industrial complex planned near Paranal

Contacts

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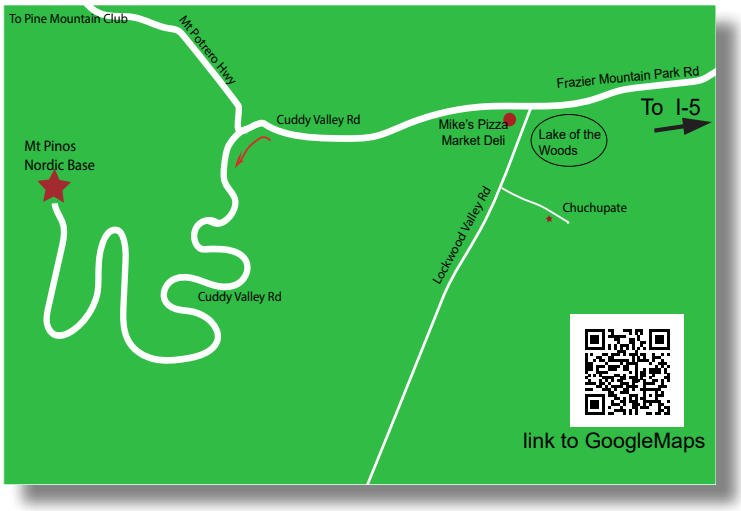
Dark Sky Observing Sites

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) 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.

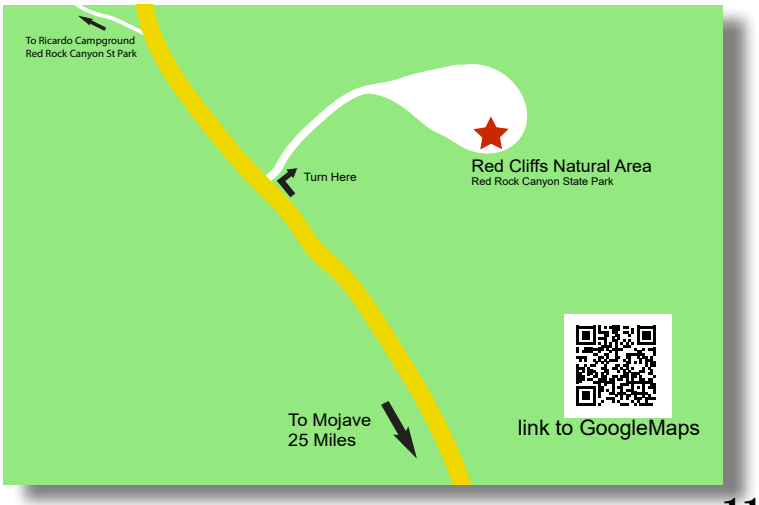
To get there: From I-5, get off at Frazier Mountain Park Rd and drive west about 7 miles to Mike's Pizza/ Market Deli at Lockwood Valley Rd. Keep on the main roadway (don't turn left to go to Chuchupate). Continue past Mike's Pizza on Cuddy Valley Rd (the road's new name) about 5 miles. Continue straight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

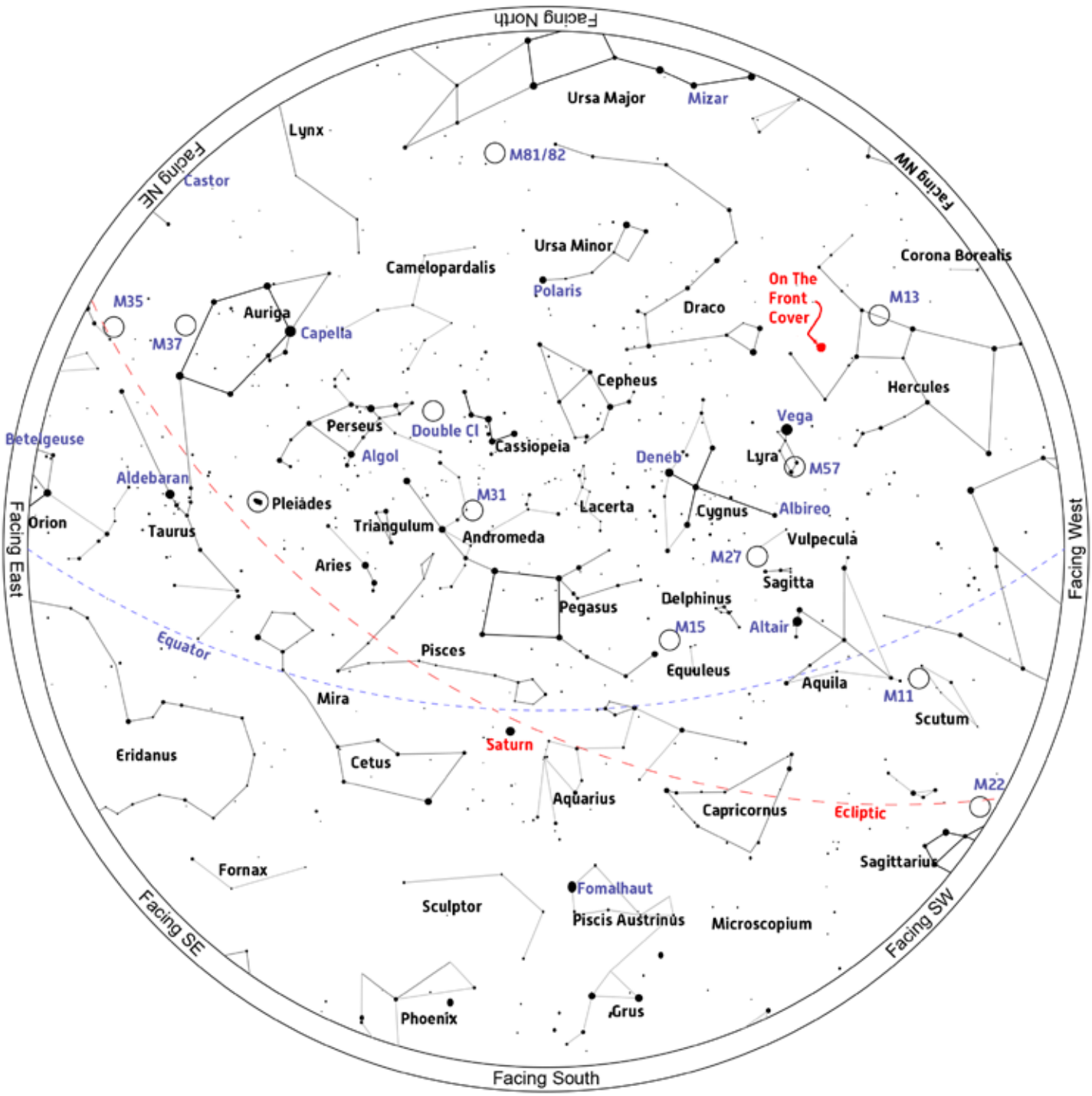
RV7F+FF Frazier Park, California (link to GoogleMaps)

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 November 22, 19:00 (UTC -08:00)

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Solar System Summary

The **Sun** starts the month in eastern Libra ending the month just inside Ophiuchus after passing through Scorpius.

The Planets

Mercury ends it's stay in the evening sky. On the 13th it passes 1¼° south of Mars at mag 1.3. On the 20th it's in inferior conjunction with the Sun, passing into the morning twilight.

Venus in the morning twilight, while still in Virgo, begins its fall back toward the Sun as a nearly full disk. By the end of the month it is 9° west of the Sun.

Mars is increasingly difficult to locate in the evening twilight. On the 13th Mars is in conjunction with Mercury as it passes by, at mag 1.4.

Jupiter in Gemini in normal motion till the 9th when it starts in retrograde and with the Moon less than 4°north.

Saturn in the evening sky moving in retrograde in Aquarius the entire month dimming to mag 1.0 by the end of the month. On the morning of the 29th the 63% waxing Moon passes 2¾° to the north.

Uranus still moving in retrograde motion at mag 5.6 in eastern Taurus, less than 5° south of the Pleiades.

Neptune is moving in retrograde in southern Pisces at mag 7.8. The 67% waxing Moon passes less that 2° north on the 29th. Saturn is about 4° to the SW most of the month.

Dwarf Planets

134340 Pluto moving normally still in western Capricorn, at mag 14.5. On the 25th (at 5 am) it is eclipsed by the 23% waxing Moon.

1 Ceres spends the month moving across Cetus in retrograde at mag 8.5.

2 Pallas moves normally from the eastern wing of Aquila across the border into Aquarius at magnitude 10.4.

3 Juno continues moving normally in southern Ophiuchus at mag 11.2.

4 Vesta moves in normal motion from Ophiuchus till the end of the month, a day away from M22 at mag 8.

Moon Phases

First Qtr Nov 27 | Full Nov 5 | Third Qtr Nov 11 | New Nov 19

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
11/1/2025	15:40	02:43	07:13	17:58
11/5/2025	16:53	06:31	06:17	16:54
11/10/2025	22:09	11:58	06:22	16:50
11/15/2025	02:16	14:20	06:26	16:47
11/20/2025	07:07	16:48	06:31	16:44
11/25/2025	11:10	21:22	06:36	16:43
11/30/2025	13:34	01:39	06:40	16:42

Planet Data*

November 1

	Rise	Transit	Set	Mag	Phase%
Mercury	09:16	14:09	19:02	- 0.07	55.2
Venus	05:55	11:37	17:18	-3.93	96.2
Mars	08:46	13:50	18:54	1.46	98.9
Jupiter	22:48	05:56	13:00	-2.39	99.1
Saturn	16:03	21:54	03:49	0.87	99.8

November 15

	Rise	Transit	Set	Mag	Phase%
Mercury	07:22	12:19	17:16	2.65	6.7
Venus	05:25	10:48	16:12	-3.93	97.8
Mars	07:40	12:37	17:35	1.41	99.3
Jupiter	20:54	04:02	11:06	-2.48	99.3
Saturn	14:07	19:57	01:52	0.96	99.8

November 30

	Rise	Transit	Set	Mag	Phase%
Mercury	05:11	10:30	15:48	0.09	36.8
Venus	05:58	11:05	16:11	-3.93	98.9
Mars	07:33	12:26	17:18	1.34	99.6
Jupiter	19:52	03:00	10:05	-2.57	99.5
Saturn	13:07	18:58	00:52	1.04	99.7

*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 November 22, 2025. The list is sorted by the transit time of the object.

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M92	NGC6341	Globular	Her	17h 17m 07s	+43° 08.1'	7.5	04:21	13:08	21:56
M9	NGC6333	Globular	Oph	17h 19m 12s	-18° 31.0'	9.0	08:01	13:10	18:19
NGC6326		P Neb	Ara	17h 20m 46s	-51° 45.2'	12.0	11:10	13:12	15:14
Barnard256	B256	DkNeb	Oph	17h 22m 12s	-28° 49.0'		08:40	13:13	17:47
Barnard67a	B67a	DkNeb	Oph	17h 22m 30s	-21° 53.0'		08:15	13:14	18:12
Barnard71	B71	DkNeb	Oph	17h 23m 02s	-24° 00.0'		08:23	13:14	18:05
NGC6357	Lobster Nebula	Neb	Sco	17h 24m 43s	-34° 12.1'		09:05	13:16	17:27
IC4651		Open	Ara	17h 24m 52s	-49° 56.5'	6.9	10:52	13:16	15:40
Abell41		P Neb	Ser	17h 29m 04s	-15° 13.3'	13.9	08:01	13:20	18:39
Abell42		P Neb	Oph	17h 31m 31s	-08° 19.1'	14.6	07:43	13:23	19:02
Barnard78	B78	DkNeb	Oph	17h 32m 00s	-25° 35.0'		08:38	13:23	18:09
NGC6388		Globular	Sco	17h 36m 17s	-44° 44.1'	6.9	10:16	13:27	16:39
M14	NGC6402	Globular	Oph	17h 37m 36s	-03° 14.7'	9.5	07:35	13:29	19:22
Barnard276	B276	DkNeb	Oph	17h 39m 39s	-19° 49.0'		08:26	13:31	18:36
M6	Butterfly Cluster	Open	Sco	17h 40m 20s	-32° 15.2'	4.5	09:12	13:31	17:51
NGC6397	C86	Globular	Ara	17h 40m 42s	-53° 40.0'	5.6	12:02	13:32	15:01
NGC6426		Globular	Oph	17h 44m 55s	+03° 10.1'	11.2	07:24	13:36	19:48
Barnard83a	B83a	DkNeb	Sgr	17h 45m 18s	-20° 00.0'		08:32	13:36	18:41
IC4665		Open	Oph	17h 46m 30s	+05° 39.0'	4.2	07:19	13:38	19:56
NGC6445	Crescent Nebula	P Neb	Sgr	17h 49m 15s	-20° 00.6'	13.0	08:36	13:40	18:45
NGC6503		Galaxy	Dra	17h 49m 27s	+70° 08.6'	10.2	Circ	13:41	Circ
NGC6441		Globular	Sco	17h 50m 13s	-37° 03.0'	7.4	09:44	13:41	17:39
Barnard283	B283	DkNeb	Sco	17h 51m 00s	-33° 52.0'		09:30	13:42	17:55
Barnard285	B285	DkNeb	Ser	17h 51m 32s	-12° 52.0'		08:16	13:43	19:09
M7	Ptolemy's Cluster	Open	Sco	17h 53m 51s	-34° 47.6'	3.5	09:37	13:45	17:53
IC4670		Neb	Sgr	17h 55m 07s	-21° 44.6'		08:48	13:46	18:45
NGC6501		Galaxy	Her	17h 56m 04s	+18° 22.3'	12.3	06:51	13:47	20:44
M23	NGC6494	Open	Sgr	17h 57m 04s	-18° 59.1'	6.0	08:41	13:48	18:56
NGC6543	Cat Eye Nebula	P Neb	Dra	17h 58m 36s	+66° 38.0'	8.1	Circ	13:50	Circ
NGC6496		Globular	Sco	17h 59m 04s	-44° 16.0'	9.2	10:36	13:50	17:05
Barnard291	B291	DkNeb	Sgr	17h 59m 43s	-33° 53.0'		09:38	13:51	18:03
Barnard292	B292	DkNeb	Sgr	18h 00m 34s	-33° 20.0'		09:37	13:52	18:07
Barnard293	B293	DkNeb	Sgr	18h 01m 12s	-35° 20.0'		09:47	13:52	17:58
M20	Trifid Nebula	Open+D Neb	Sgr	18h 02m 42s	-22° 58.2'	5.0	08:59	13:54	18:48
M8	Lagoon Nebula	Open+D Neb	Sgr	18h 03m 41s	-24° 22.7'	5.0	09:05	13:55	18:45

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M21	NGC6531	Open	Sgr	18h 04m 13s	-22° 29.3'	7.0	08:59	13:55	18:52
NGC6530		Open	Sgr	18h 04m 31s	-24° 21.5'	4.6	09:06	13:56	18:45
NGC6528		Globular	Sgr	18h 04m 50s	-30° 03.3'	9.5	09:27	13:56	18:25
IC4684		Neb	Sgr	18h 09m 08s	-23° 26.1'		09:07	14:00	18:53
IC4685		Neb	Sgr	18h 09m 18s	-23° 59.2'		09:09	14:00	18:51
Barnard303	B303	DkNeb	Sgr	18h 09m 28s	-23° 59.0'		09:09	14:01	18:52
IC1274		Neb	Sgr	18h 09m 51s	-23° 38.8'		09:09	14:01	18:53
IC1275		Neb	Sgr	18h 10m 07s	-23° 45.7'		09:09	14:01	18:53
NGC6572		P Neb	Oph	18h 12m 06s	+06° 51.2'	9.0	07:41	14:03	20:25
NGC6567		P Neb	Sgr	18h 13m 45s	-19° 04.5'	12.0	08:57	14:05	19:12
IC4701		Neb	Sgr	18h 16m 36s	-16° 38.0'		08:53	14:08	19:23
Barnard93	B93	DkNeb	Sgr	18h 16m 53s	-18° 03.0'		08:57	14:08	19:19
IC1284		Neb	Sgr	18h 17m 39s	-19° 40.3'		09:03	14:09	19:14
M24	Small Sagittarius Star Cloud	Open	Sgr	18h 18m 26s	-18° 24.3'	4.5	09:00	14:10	19:19
M16	Eagle Nebula	Open+D Neb	Ser	18h 18m 48s	-13° 48.3'	6.5	08:46	14:10	19:33
M18	Black Swan, NGC6613	Open	Sgr	18h 19m 58s	-17° 06.1'	8.0	08:58	14:11	19:25
M17	Horseshoe Nebula	Open+D Neb	Sgr	18h 20m 47s	-16° 10.3'	7.0	08:55	14:12	19:28
HR6923	39 Dra	Mult	Dra	18h 23m 54s	+58° 48.0'	5.0	Circ	14:15	Circ
M28	NGC6626	Globular	Sgr	18h 24m 33s	-24° 52.1'	8.5	09:28	14:16	19:04
Barnard95	B95	DkNeb	Sct	18h 25m 35s	-11° 44.0'		08:47	14:17	19:46
Barnard97	B97	DkNeb	Sct	18h 29m 05s	-09° 55.0'		08:45	14:20	19:55
Abell44		P Neb	Sgr	18h 30m 11s	-16° 45.4'	12.6	09:07	14:21	19:36
NGC6637		Globular	Sgr	18h 31m 23s	-32° 20.8'	7.7	10:03	14:22	18:42
IC1287		Neb	Sct	18h 31m 26s	-10° 47.7'		08:50	14:23	19:55
M25	M25	Open	Sgr	18h 31m 42s	-19° 07.0'	6.5	09:16	14:23	19:30
IC4725		Open	Sgr	18h 31m 48s	-19° 06.7'	4.6	09:16	14:23	19:30
NGC6642		Globular	Sgr	18h 31m 54s	-23° 28.5'	8.8	09:30	14:23	19:16
NGC6644		P Neb	Sgr	18h 32m 35s	-25° 07.7'	12.0	09:37	14:24	19:11
NGC6647		Open	Sgr	18h 32m 49s	-17° 13.6'	8.0	09:11	14:24	19:37
IC4732		P Neb	Sgr	18h 33m 55s	-22° 38.6'	13.0	09:29	14:25	19:21
NGC6656	Crackerjack Cluster	Globular	Sgr	18h 36m 24s	-23° 54.2'	5.1	09:36	14:28	19:19
IC4756		Open	Ser	18h 38m 54s	+05° 27.0'	5.0	08:12	14:30	20:48
NGC6681		Globular	Sgr	18h 43m 12s	-32° 17.4'	8.1	10:15	14:34	18:54
NGC6694		Open	Sct	18h 45m 18s	-09° 23.0'	8.0	09:00	14:36	20:13
IC4776		P Neb	Sgr	18h 45m 51s	-33° 20.5'	12.0	10:22	14:37	18:52
Barnard318	B318	DkNeb	Sct	18h 49m 42s	-06° 23.0'		08:56	14:41	20:26
M11	Wild Duck Cluster	Open	Sct	18h 51m 05s	-06° 16.1'	7.0	08:57	14:42	20:27
M57	Ring Nebula	P Neb	Lyr	18h 53m 35s	+33° 01.7'	9.5	06:54	14:45	22:36
NGC6715		Globular	Sgr	18h 55m 03s	-30° 28.7'	7.7	10:19	14:46	19:13

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6717	III-143	Globular	Sgr	18h 55m 06s	-22° 42.0'	9.2	09:51	14:46	19:42
Barnard122	B122	DkNeb	Sct	18h 56m 48s	-04° 45.0'		08:58	14:48	20:37
Barnard123	B123	DkNeb	Sct	18h 57m 39s	-04° 43.0'		08:59	14:49	20:38
NGC6723		Globular	Sgr	18h 59m 33s	-36° 37.9'	7.3	10:51	14:51	18:50
Barnard128	B128	DkNeb	Aql	19h 01m 40s	-04° 34.0'		09:03	14:53	20:43
NGC6729	C68	BrNeb	CrA	19h 01m 54s	-36° 57.0'		10:55	14:53	18:51
Barnard326	B326	DkNeb	Aql	19h 03m 00s	-00° 23.0'		08:52	14:54	20:56
NGC6749		Globular	Aql	19h 05m 15s	+01° 54.0'	11.1	08:48	14:56	21:04
Barnard329	B329	DkNeb	Aql	19h 06m 59s	+03° 11.0'		08:46	14:58	21:10
NGC6760		Globular	Aql	19h 11m 12s	+01° 01.8'	9.1	08:57	15:02	21:08
Abell56		P Neb	Aql	19h 13m 07s	+02° 52.8'	12.4	08:53	15:04	21:15
NGC6772		P Neb	Aql	19h 14m 36s	-02° 42.4'	14.0	09:10	15:06	21:01
Barnard138	B138	DkNeb	Aql	19h 16m 00s	+00° 13.0'		09:04	15:07	21:10
M56	NGC6779	Globular	Lyr	19h 16m 36s	+30° 11.0'	9.5	07:29	15:08	22:47
NGC6778		P Neb	Aql	19h 18m 25s	-01° 35.7'	13.0	09:11	15:10	21:08
Abell61		P Neb	Cyg	19h 19m 10s	+46° 14.5'	13.0	05:58	15:10	00:22
Barnard140	B140	DkNeb	Aql	19h 19m 49s	+05° 13.0'		08:54	15:11	21:28
NGC6790		P Neb	Aql	19h 22m 57s	+01° 30.8'	10.0	09:07	15:14	21:21
NGC6803		P Neb	Aql	19h 31m 16s	+10° 03.3'	11.0	08:51	15:22	21:54
NGC6804		P Neb	Aql	19h 31m 35s	+09° 13.5'	12.0	08:54	15:23	21:51
Abell62		P Neb	Aql	19h 33m 18s	+10° 37.0'	13.0	08:52	15:24	21:57
NGC6807		P Neb	Aql	19h 34m 34s	+05° 41.0'	14.0	09:07	15:26	21:44
M55	NGC6809	Globular	Sgr	19h 40m 00s	-30° 57.7'	7.0	11:06	15:31	19:56
NGC6813		Neb	Vul	19h 40m 22s	+27° 18.5'		08:04	15:31	22:59
NGC6820		Neb	Vul	19h 42m 28s	+23° 05.2'		08:21	15:34	22:46
Barnard338	B338	DkNeb	Aql	19h 43m 02s	+07° 27.0'		09:10	15:34	21:58
NGC6818	Little Gem	P Neb	Sgr	19h 43m 58s	-14° 09.1'	10.0	10:13	15:35	20:58
NGC6826	Blinking Planetary	P Neb	Cyg	19h 44m 48s	+50° 31.0'	8.8	05:37	15:36	01:34
Abell65		P Neb	Sgr	19h 46m 34s	-23° 08.2'	13.1	10:44	15:38	20:32
NGC6838		Globular	Sge	19h 53m 46s	+18° 46.6'	8.3	08:47	15:45	22:43
NGC6842		P Neb	Vul	19h 55m 02s	+29° 17.3'	14.0	08:11	15:46	23:21
HR7619	Psi Cyg	Mult	Cyg	19h 55m 38s	+52° 26.3'	4.9	05:17	15:47	02:17
Abell66		P Neb	Sgr	19h 57m 32s	-21° 36.6'	14.1	10:49	15:49	20:48
Barnard144	Fish on the platter nebula	DkNeb	Cyg	19h 58m 00s	+35° 20.0'		07:47	15:49	23:51
NGC6853	Dumbbell Nebula	P Neb	Vul	19h 59m 36s	+22° 43.2'	8.1	08:40	15:51	23:02
NGC6857	III-144	Neb	Cyg	20h 02m 48s	+33° 31.4'	11.4	08:00	15:54	23:47
IC4954		Neb	Vul	20h 04m 45s	+29° 15.1'		08:21	15:56	23:31
M75	NGC6864	Globular	Sgr	20h 06m 05s	-21° 55.3'	9.5	10:59	15:57	20:55
Barnard342	B342	DkNeb	Cyg	20h 09m 30s	+41° 12.0'		07:26	16:01	00:35

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6885	Vulpeculae Cluster	Open	Vul	20h 12m 00s	+26° 29.0'	5.9	08:39	16:03	23:27
NGC6891		P Neb	Del	20h 15m 09s	+12° 42.2'	12.0	09:27	16:06	22:45
NGC6894		P Neb	Cyg	20h 16m 24s	+30° 33.9'	14.0	08:27	16:07	23:48
IC4997		P Neb	Sge	20h 20m 09s	+16° 43.9'	12.0	09:20	16:11	23:02
Barnard345	B345	DkNeb	Cyg	20h 21m 00s	+46° 33.0'		06:57	16:12	01:27
NGC6913	Cooling Tower	Open	Cyg	20h 23m 57s	+38° 30.5'	6.6	07:56	16:15	00:34
Abell70		P Neb	Aql	20h 31m 33s	-07° 05.3'	14.3	10:40	16:23	22:06
Barnard348	B348	DkNeb	Cyg	20h 34m 00s	+42° 05.0'		07:45	16:25	01:05
NGC6940		Open	Vul	20h 34m 26s	+28° 17.0'	6.3	08:54	16:26	23:57
NGC6960	Filamentary Nebula	Neb	Cyg	20h 45m 58s	+30° 35.6'		08:56	16:37	00:18
IC5068		Neb	Cyg	20h 50m 29s	+42° 28.6'		07:59	16:42	01:25
NGC6979	II-206	Neb	Cyg	20h 51m 00s	+32° 09.0'	11.0	08:55	16:42	00:29
IC5070	Pelican Nebula [2]	Neb	Cyg	20h 51m 00s	+44° 24.1'		07:45	16:42	01:39
NGC6981		Globular	Aqr	20h 53m 28s	-12° 32.2'	9.4	11:17	16:45	22:12
IC5076		Neb	Cyg	20h 55m 33s	+47° 23.7'		07:24	16:47	02:09
IC1340		Neb	Cyg	20h 56m 08s	+31° 02.8'		09:05	16:47	00:30
NGC6992	Cirrus Nebula [2]	Neb	Cyg	20h 56m 19s	+31° 44.6'		09:02	16:47	00:33
NGC6996	VIII-58	Open	Cyg	20h 56m 30s	+44° 38.0'	10.0	07:49	16:48	01:46
NGC6997		Open	Cyg	20h 56m 39s	+44° 37.9'	10.0	07:49	16:48	01:46
Barnard352	B352	DkNeb	Cyg	20h 57m 10s	+45° 53.0'		07:39	16:48	01:57
Barnard354	B354	DkNeb	Cep	20h 58m 00s	+58° 09.0'		Circ	16:49	Circ
NGC7000	Gulf of Mexico	BrNeb	Cyg	20h 58m 48s	+44° 20.0'		07:53	16:50	01:46
M73	NGC6994	Open+Asterism	Aqr	20h 58m 56s	-12° 38.1'	9.0	11:23	16:50	22:17
NGC7006	C42	Globular	Del	21h 01m 30s	+16° 11.0'	10.6	10:03	16:53	23:42
NGC7009	C55,Saturn Nebula	P Neb	Aqr	21h 04m 12s	-11° 22.0'	8.0	11:25	16:55	22:26
NGC7027		P Neb	Cyg	21h 07m 02s	+42° 14.1'	10.0	08:17	16:58	01:39
Barnard151	B151	DkNeb	Cep	21h 08m 13s	+56° 19.0'		Circ	16:59	Circ
IC1369		Open	Cyg	21h 12m 09s	+47° 46.1'	6.8	07:37	17:03	02:30
Barnard153	B153	DkNeb	Cep	21h 21m 03s	+56° 26.0'		Circ	17:12	Circ

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
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