

Volume 45.2

February 2025

# Desert Sky Observer

Antelope Valley Astronomy Club



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www.avastronomyclub.org

February 2025

## Upcoming Events

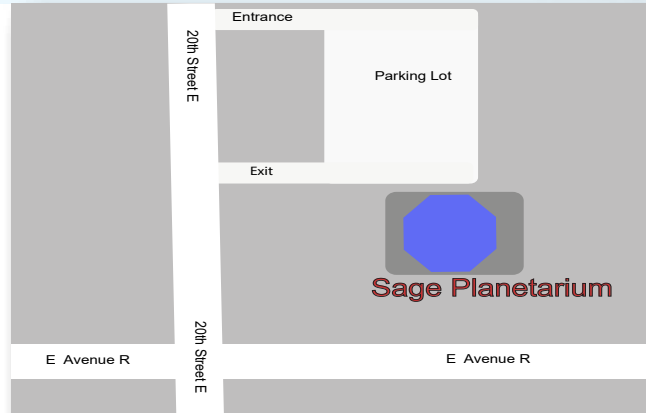
February 14: Club Meeting  
February 22: Moonwalk @ PDW 6:30 pm

Every clear night: Personal Star Party

March 8: Moonwalk @ PDW 6:30 pm  
March 14: Club Meeting  
March 29: DSSP/Messier Marathon  
@ Red Cliffs



AVAC Calendar



## Board Members

**President:** Phil Wriedt (661) 917-4874  
[president@avastronomyclub.org](mailto:president@avastronomyclub.org)

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

**Secretary:** Rose Moore (661) 972-1953  
[secretary@avastronomyclub.org](mailto:secretary@avastronomyclub.org)

**Treasurer:** Rod Girard (661) 803-7838  
[treasurer@avastronomyclub.org](mailto:treasurer@avastronomyclub.org)

**Director of Community Development:**  
Christian Amaya (661) 972-0091  
[community@avastronomyclub.org](mailto:community@avastronomyclub.org)

## Appointed Positions

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

**Equipment & Library:**  
vacant  
[library@avastronomyclub.org](mailto:library@avastronomyclub.org)

**Club Historian:** vacant  
[history@avastronomyclub.org](mailto:history@avastronomyclub.org)

**Webmaster:** Steve Trotta (661) 269-5428  
[webmaster@avastronomyclub.org](mailto:webmaster@avastronomyclub.org)

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

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



## Monthly Meetings

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

## Membership

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

The Club has three categories of membership.

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

Membership entitles you to ...

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

AVAC  
PO Box 8545  
Lancaster, CA 93539-8545



www.avastronomyclub.org

Visit the Antelope Valley Astronomy Club website at [www.avastronomyclub.org/](http://www.avastronomyclub.org/)  
[www.instagram.com/av\\_astronomyclub](https://www.instagram.com/av_astronomyclub)

The Antelope Valley Astronomy Club, Inc. is a  
26 USC §503(c)(3) California Non-Profit Corporation.

## President's Message

By Phil Wriedt

Hey y'all,

It was so good to see so many members at the Astronomy Day at Enterprise Elementary school on Friday the 31st of January. The official count by the school was 216. I think that was the number of students. Including the parents, I really think the number was closer to 300. This is our Club's purpose: "to promote, through education, a knowledge and appreciation of astronomy." This is why we do Moonwalks every month. To light that spark of wonder and curiosity in the minds of kids and adults. I hope this will be a continuing occurrence.

Our next meeting is on the 14th; come join us at the SAGE and learn what we have in mind for this next year. At the October meeting in the parking lot, there were so many great suggestions for the coming year. When asked for any suggestions, please don't be afraid to blurt out a idea. If you know of a great place for a Dark Sky Star Party, say something. We are going to act on those ideas and make them come to life.

I can't think of a reason why it will be clear or any warmer (it's still winter) on our next Moonwalk on the 22nd, but I'm hoping. If you have a telescope bring it, or if not, just come join the party at Prime Desert Woodland. Don't forget warm clothes, jackets, gloves, etc. Sunset is at 5:42 pm and nautical dusk is late at 6:37 pm. Get there early so you can setup in daylight. Saturn will be up till 6:49 pm and this will probably be the last time to see the northern side of the rings till 2039. The more members there, the better it will be.

It's time to renew your membership once again. After 25 years of preparing taxes I noticed that people came in to get their taxes done on almost the same day year after year. Please, don't keep procrastinating, just get around to renewing. We haven't allowed inflation to influence the price of dues. The amount for dues has been the same for at least the last 24 years.

Keep Looking Up, Phil

## On The Cover

Note: North is 34.4° right of vertical RA: 12h 18' 56.97" DEC: 47° 18' 40.73" Dist: 20 mly ( Canes Venatici )

*This image combines Hubble observations of Messier 106 with additional information captured by amateur astronomers Robert Gendler and Jay GaBany. Gendler combined Hubble data with his own observations to produce this stunning colour image.*

*Messier 106 is a relatively nearby spiral galaxy, a little over 20 million light-years away.*

*Credit:*

*NASA, ESA, the Hubble Heritage Team (STScI/AURA), and R. Gendler (for the Hubble Heritage Team).*

*Acknowledgment: J. GaBany*

## From the Secretary

By Rose Moore

Members:

We have a club meeting on Friday February 14th at 7pm. We do not have a speaker at this time, so Jeremy will show a new video for us, followed by a planetarium show. We do have speakers for March and April's meetings, hopefully we will have our Planetarium seats installed when we arrive! [ They are installed.]

Our speaker for March will be Rémy Morgan, and for April will be David Watanabe; topics to be announced. Sue's astronomy paint class will be in May.

There will be a Prime Desert Moon Walk with Jeremy on Saturday, February 22nd. We will need members with telescopes for this event, weather permitting.

On March 1st, we will be signing up for a date for a Mt. Wilson trip, so stay tuned!

The Board needs some input from the membership as to what they want in a summer picnic, and the details; so please try to attend out next meeting to give your thoughts for a club picnic. Or should we have one?

We have dates for the Lunar Club meetings for the year. They will be added to the calendar soon.

Welcome to all our new members!

Rose

## Vice President's Report

By Matt Leone

Hello fellow Lunies,

I have four new dates, for the Lunar Club, to give you; May 31, August 2, August 30, and October 25. We are trying to have the Lunar Club at Prime Desert Woodland Park this year; we'll let you know if that will work out. We will be doing the Messier Marathon at Red Cliff on March 29. Suzie will be doing her Painting class May 9 in the gym/cafeteria, starting early at 6:30.

On the evening of February 5th from 10 pm till 2am, the (62%) Moon and the Pleiades will be in each other's lap. Hopefully, we will get some great pictures.

I'm planning on going to The Grand Canyon Star party in June. I will be giving more details at the next meeting.

See you soon and have a dark night when looking at the Stars.

Matt

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

## AVAC Membership Renewal

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

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

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

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

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

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

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

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

Thank you,  
Rod Girard AVAC Treasurer

## Space News

News from around the Net

### **Observe The Dark Side Of The Famous Orion Nebula**

Many know the Great Orion Nebula (M42) in Orion's Sword as a bright diffuse nebula — a glowing cloud of cosmic gas illuminated by the Trapezium star cluster. But the Orion Nebula also has a dark side, formed by its lanes and clouds of dust. They frequently avoid scrutiny, as the surrounding brightness tends to steal the show. But you can easily train the eye to reverse the view. It's an illuminating experience that reveals a dark dimension to this familiar object. M42 is the closest massive star-forming region to Earth, making visual studies of its intricate play of light and dark available to even small telescope users. . . (continued at <https://www.astronomy.com/observing/how-to-spot-the-dark-nebula-in-orion/> )



### **Why Aren't The Constellations Always Drawn The Same Way?**

Imagining familiar images in the sky has always been an easy way to track the annual progress of the stars. Around the second century C.E., the Greek astronomer Claudius Ptolemy listed 48 "official" constellations in his book Almagest. No original copy of Almagest has survived, so we don't know how he connected the stars to form shapes. By the 16th century, European explorers were adding new constellations to fill in their charts. In the late 1670s, Edmond Halley, of comet fame, placed a large oak tree on one of his charts to honor Charles II . . . (continued at <https://www.astronomy.com/observing/why-arent-the-constellations-drawn-the-same-way/> )



### **Major Telescope Makers Hit By Class Action Lawsuit Over Alleged Price Fixing**

Skywatchers who purchased telescopes from leading suppliers may be entitled to a payment from a \$32 million class action settlement. The settlement is a result of a lengthy legal saga involving telescope manufacturers controlled by Chinese family firms Synta Technologies and Ningbo Sunny, which, according to allegations in available documents, actively conspired to monopolize and divide up the U.S. amateur telescope market to fix prices and push out competitors. The brands covered in the class action include the popular Celestron, Meade, Olivon and Sky-Watcher telescopes, which have for years been a mainstay of the U.S. amateur astronomer essential toolkit. . . . (continued at <https://www.space.com/stargazing/major-telescope-makers-hit-by-class-action-lawsuit-over-alleged-price-fixing> )



### **Space Itself May Have Created Galaxies**

According to new research, the earliest seeds of structures may have been laid down by gravitational waves sloshing around in the infant universe. Cosmologists strongly suspect that the extremely early universe underwent a period of exceptionally rapid expansion. Known as inflation, this event expanded the universe by a factor of at least  $10^{60}$  in less than a second. Powering this event was a new ingredient in the cosmos known as the inflaton, a strange quantum field that ramped up, drove inflation, and then faded away. . . (continued at <https://phys.org/news/2025-01-space-galaxies.html> )



### **NASA Is Building A Space Telescope To Observe Exoplanet Atmospheres**

The exoplanet census continues to grow. Currently, 5,819 exoplanets have been confirmed in 4,346 star systems, while thousands more await confirmation. The vast majority of these planets were detected in the past twenty years, owing to missions like the Kepler Space Telescope, the Transiting Exoplanet Survey Satellite (TESS), the venerable Hubble, the Convection, Rotation and planetary Transits (CoRoT) mission, and more. Thousands more are expected as the James Webb Space Telescope continues its mission and is joined by the Nancy Grace Roman Space Telescope (RST). . . . (continued at <https://www.universetoday.com/170469/nasa-is-building-a-space-telescope-to-observe-exoplanet-atmospheres/> )



## Space News

News from around the Net

### **Astronauts' Eyes Weaken During Long Space Missions, Raising Concerns For Mars Travel**

The low levels of gravity (microgravity) in space cause significant changes in astronauts' eyes and vision after six to 12 months aboard the International Space Station (ISS), according to a study published in the IEEE Open Journal of Engineering in Medicine and Biology. Université de Montréal ophthalmologist Santiago Costantino found that at least 70% of astronauts on the ISS have been affected by spaceflight-associated neuro-ocular syndrome, or SANS. . . . ( continued at <https://phys.org/news/2025-01-astronauts-eyes-weaken-space-missions.html> )



### **NASA JPL Prepping For Full Year Of Launches, Mission Milestones**

With 2024 receding into the distance, NASA's Jet Propulsion Laboratory is already deep into a busy 2025. Early in the new year, the Eaton Fire came close to JPL, destroying the homes of more than 200 employees, but work has continued apace to maintain mission operations and keep upcoming missions on track. Several missions managed by NASA JPL are prepping for launch this year. Most have been years in the making and launches are, of course, only part of the bigger picture. . . . (continued at <https://phys.org/news/2025-01-nasa-jpl-prepping-full-year.html> )



### **Green Hydrogen Project Threatens Pristine Paranal Skies In Chile**

A proposed massive hydrogen-fuel production project in Chile has astronomers galvanized in concern and opposition. One astronomer calls the possible Chilean facility a "nightmare" for the Paranal Observatory's dark skies. One study has found that Paranal, located in Chile's Atacama Desert, has the darkest skies of any major astronomical research site. That would change if the plant, called INNA, is built. The European Southern Observatory (ESO), which operates Paranal's astronomical instruments, released news of the hydrogen-plant proposal recently. The project — . . . — would cover some 3,000 hectares, or more than 11 square miles (28.5 square kilometers). It would only be between 3 to 7 miles (5 to 11 km) from the Paranal telescopes . . . . (continued at <https://www.avastronomy.com/science/green-hydrogen-project-threatens-pristine-paranal-skies-in-chile/> )



### **Us Military Practices Rescuing Astronauts From The Sea**

A U.S. military joint task force did some training recently off the Florida coast to help with astronaut splashdowns. "Space travel is expected to increase, so the search and rescue alert is going to increase, and we will be ready to answer that call," Maj. Ryan Schieber, lead planner for Human Space Flight Support (HSFS) in the U.S. Air Force's 315th Operations Support Squadron, said in a statement. So, as the U.S. sees an uptick in crewed spaceflight operations, the military wants to make sure it can support astronaut retrieval at sea if needed. . . .(continued at <https://www.space.com/space-exploration/missions/us-military-practices-rescuing-astronauts-from-the-sea-photos> )



### **The Vera C. Rubin Observatory Will Detect Millions Of Exploding Stars**

Measuring distances across the universe is much more challenging than measuring distances on Earth. Is a brighter star closer to Earth than another, or is it just emitting more light? To make confident distance measurements, scientists rely on objects that emit a known amount of light, like Type Ia supernovae. These spectacular explosions, among the brightest to ever be recorded in the night sky, result from the violent deaths of white dwarf stars and provide scientists with a reliable cosmic yardstick. Their brightness and color, combined with information about their host galaxies, allow scientists to calculate their distance and how much the universe expanded while their light made its journey to us. With enough Type Ia supernovae observations, scientists can measure the universe's expansion rate and whether it changes over time. . . .(continue at <https://phys.org/news/2025-01-vera-rubin-observatory-millions-stars.html> )



## February Night Sky Notes: How Can You Help Curb Light Pollution?

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



*Before and after pictures of replacement lighting at the 6th Street Bridge over the Los Angeles River. The second picture shows improvements in some aspects of light pollution, as light is not directed to the sides and upwards from the upgraded fixtures, reducing skyglow. However, it also shows the use of brighter, whiter LEDs, which is not generally ideal, along with increased light bounce back from the road. Image Credit: [The City of Los Angeles](#)*

Light pollution has long troubled astronomers, who generally shy away from deep sky observing under full Moon skies. The natural light from a bright Moon floods the sky and hides views of the Milky Way, dim galaxies and nebula, and shooting stars. In recent years, human-made light pollution has dramatically surpassed the interference of even a bright full Moon, and its effects are now noticeable to a great many people outside of the astronomical community. Harsh, bright white LED streetlights, while often more efficient and long-lasting, often create unexpected problems for communities replacing their older streetlamps. Some notable concerns are increased glare and light trespass, less restful sleep, and disturbed nocturnal wildlife patterns. There is increasing awareness of just how much light is too much light at night. You don't need to give in to despair over encroaching light pollution; you can join efforts to measure it, educate others, and even help stop Light pollution has long troubled astronomers, who generally shy away from deep sky observing or reduce the effects of light pollution in your community.

Amateur astronomers and potential citizen scientists around the globe are invited to participate in the [Globe at Night \(GaN\)](#) program to measure light pollution. Measurements are taken by volunteers on a few scheduled days every month and submitted to their database to help create a comprehensive map of light pollution and its change over time. GaN volunteers can take and submit measurements using multiple methods ranging from low-tech naked-eye observations to high-tech sensors and smartphone apps.

Globe at Night citizen scientists can use the following methods to measure light pollution and submit their results:

- Their own smartphone camera and dedicated app
- Manually measure light pollution using their own eyes and detailed charts of the constellations
- A dedicated light pollution measurement device called a Sky Quality Meter (SQM).
- The free GaN [web app](#) from any internet-connected device (which can also be used to
- submit their measurements from an SQM or printed-out star charts)

Night Sky Network members joined a telecon with Connie Walker of Globe at Night in 2014 and had a lively discussion about the program's history and how they can participate. The audio of the telecon, transcript, and links to additional resources can be found on their [dedicated resource page](#).

The [International Dark-Sky Association](#) (IDA) has long been a champion in the fight against light pollution and a proponent of smart lighting design and policy. Their website provides many resources for amateur astronomers and other like-minded people to help communities understand the negative impacts of light pollution and how smart lighting policies can not only help bring the stars back to their night skies but also make their streets safer by using smarter lighting with less glare. Communities and individuals find that their nighttime lighting choices can help save considerable sums of money when they decide to light their streets and homes “smarter, not brighter” with shielded, directional lighting, motion detectors, timers, and even choosing the proper “temperature” of new LED light replacements to avoid the harsh “pure white” glare that many newstreetlamps possess. Their pages on [community advocacy](#) and on [how to choose dark-sky-friendly lighting](#) are extremely helpful and full of great information. There are even [local chapters of the IDA](#) in many communities made up of passionate advocates of dark skies.



*Light pollution has been visible from space for a long time, but new LED lights are bright enough that they stand out from older streetlights, even from orbit. Astronaut Samantha Cristoforetti took the above photo from the ISS cupola in 2015. The newly installed white LED lights in the center of the city of Milan are noticeably brighter than the lights in the surrounding neighborhoods. Image Credit: [NASA/ESA](#)*

The IDA has notably helped usher in “[Dark Sky Places](#)”, areas around the world that are protected from light pollution. “[Dark Sky Parks](#)”, in particular, provide visitors with incredible views of the Milky Way and are perfect places to spot the wonders of a meteor shower. These parks also perform a very important function, showing the public the wonders of a truly dark sky to many people who may have never before even seen a handful of stars in the sky, let alone the full glorious spread of the Milky Way.

More research into the negative effects of light pollution on the [health of humans](#) and the [environment](#) is being conducted than ever before. Watching the nighttime light slowly increase in your neighborhood, combined with reading so much bad news, can indeed be disheartening! However, as awareness of light pollution and its negative effects increases, more people are becoming aware of the problem and want to be part of the solution. There is even an episode of PBS Kid’s [SciGirls](#) where the main characters help mitigate light pollution in their neighborhood!

Astronomy clubs are uniquely situated to help spread awareness of good lighting practices in their local communities to help mitigate light pollution. Take inspiration from [Tucson, Arizona](#), and other dark sky-friendly communities that have adopted good lighting practices. Tucson even reduced its skyglow by 7% (as of 2018) after its own [citywide lighting conversion](#), proof that communities can bring the stars back with smart lighting choices.

*Originally posted by Dave Prosper: November 2018  
Last Updated by Kat Troche: January 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](https://nightsky.jpl.nasa.gov) to find local clubs, events, and more!

## Extreme Supersonic Winds Measured On Planet Outside Our Solar System

European Southern Observatory Press Release [eso2502](#) 21 January 2025

Astronomers have discovered extremely powerful winds pummeling the equator of WASP-127b, a giant exoplanet. Reaching speeds up to 33 000 km/h, the winds make up the fastest jetstream of its kind ever measured on a planet. The discovery was made using the European Southern Observatory's Very Large Telescope (ESO's VLT) in Chile and provides unique insights into the weather patterns of a distant world.

Tornados, cyclones and hurricanes wreak havoc on Earth, but scientists have now detected planetary winds on an entirely different scale, far outside the Solar System. Ever since its discovery in 2016, astronomers have been investigating the weather on WASP-127b, a giant gas planet located over 500 light-years from Earth. The planet is slightly larger than Jupiter, but has only a fraction of its mass, making it 'puffy'. An international team of astronomers have now made an unexpected discovery: supersonic winds are raging on the planet.

*"Part of the atmosphere of this planet is moving towards us at a high velocity while another part is moving away from us at the same speed,"* says Lisa Nortmann, a scientist at the University of Göttingen, Germany, and lead author of the study. *"This signal shows us that there is a very fast, supersonic, jet wind around the planet's equator."*

At 9 km per second (which is close to a whopping 33 000 km/h), the jet winds move at nearly six times the speed at which the planet rotates [1]. *"This is something we haven't seen before,"* says Nortmann. It is the fastest wind ever measured in a jetstream that goes around a planet. In comparison, the fastest wind ever measured in the Solar System was found on Neptune, moving at 'only' 0.5 km per second (1800 km/h).

The team, whose research was published today in *Astronomy & Astrophysics*, mapped the weather and make-up of WASP-127b using the CRIRES+ instrument on ESO's VLT. By measuring how the light of the host star travels through the planet's upper atmosphere, they managed to trace its composition. Their results confirm the presence of water vapour and carbon monoxide molecules in the planet's atmosphere. But when the team tracked the speed of this material in the atmosphere, they observed — much to their surprise — a double peak, indicating that one side of the atmosphere is moving towards us and the other away from us at high speed. The researchers conclude that powerful jetstream winds around the equator would explain this unexpected result.

Further building up their weather map, the team also found that the poles are cooler than the rest of the planet. There is also a slight temperature difference between the morning and evening sides of WASP-127b. *"This shows that the planet has complex weather patterns just like Earth and other planets of our own System,"* adds Fei Yan, a co-author of the study and a professor at the University of Science and Technology of China.

The field of exoplanet research is rapidly advancing. Up until a few years ago, astronomers could measure only the mass and the radius of planets outside the Solar System. Today, telescopes like ESO's VLT already allow scientists to map the weather on these distant worlds and analyse their atmospheres. *"Understanding the dynamics of these exoplanets helps us explore mechanisms such as heat redistribution and chemical processes, improving our understanding of planet formation and potentially shedding light on the origins of our own Solar System,"* says David Cont from the Ludwig Maximilian University of Munich, Germany, and a co-author of the paper.

Interestingly, at present, studies like this can only be done by ground-based observatories, as the instruments currently on space telescopes do not have the necessary velocity precision. ESO's [Extremely Large Telescope](#) — which is under construction close to the VLT in Chile — and its [ANDES instrument](#) will allow researchers to delve even deeper into the weather patterns on far-away planets. "This means that we can likely resolve even finer details of the wind patterns and expand this research to smaller, rocky planets," Nortmann concludes.

### Notes

[1] While the team hasn't measured the rotation speed of the planet directly, they expect WASP-127b to be tidally locked, meaning the planet takes as long to rotate around its own axis as it does to orbit the star. Knowing how big the planet is and how long it takes to orbit its star, they can infer how fast it's rotating.

## More information

This research was presented in the paper, “CRIRES+ transmission spectroscopy of WASP-127b. Detection of the resolved signatures of a supersonic equatorial jet and cool poles in a hot planet”, published today in *Astronomy & Astrophysics* (doi: 10.1051/0004-6361/202450438).

The team is composed of L. Nortmann (Institut für Astrophysik und Geophysik, Georg-August-Universität, Göttingen, Germany [IAG]), F. Lesjak (IAG), F. Yan (Department of Astronomy, University of Science and Technology of China, Hefei, China), D. Cont (Universitäts-Sternwarte, Fakultät für Physik, Ludwig-Maximilians-Universität München, Germany; Exzellenzcluster Origins, Garching, Germany), S. Czesla (Thüringer Landessternwarte Tautenburg, Germany [TLS]), A. Lavail (Institut de Recherche en Astrophysique et Planétologie, Université de Toulouse, France), A. D. Rains (Department of Physics and Astronomy, Uppsala University, Sweden [Uppsala University]), E. Nagel (IAG), L. Boldt-Christmas (Uppsala University), A. Hatzes (TLS), A. Reiners (IAG), N. Piskunov (Uppsala University), O. Kochukhov (Uppsala University), U. Heiter (Uppsala University), D. Shulyak (Instituto de Astrofísica de Andalucía, Glorieta de la Astronomía, Spain), M. Rengel (Max-Planck-Institut für Sonnensystemforschung, Göttingen, Germany), and U. Seemann (European Southern Observatory, Garching, Germany).

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 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](#)
- [World’s darkest and clearest skies at risk from industrial megaproject](#)

## 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.



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

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

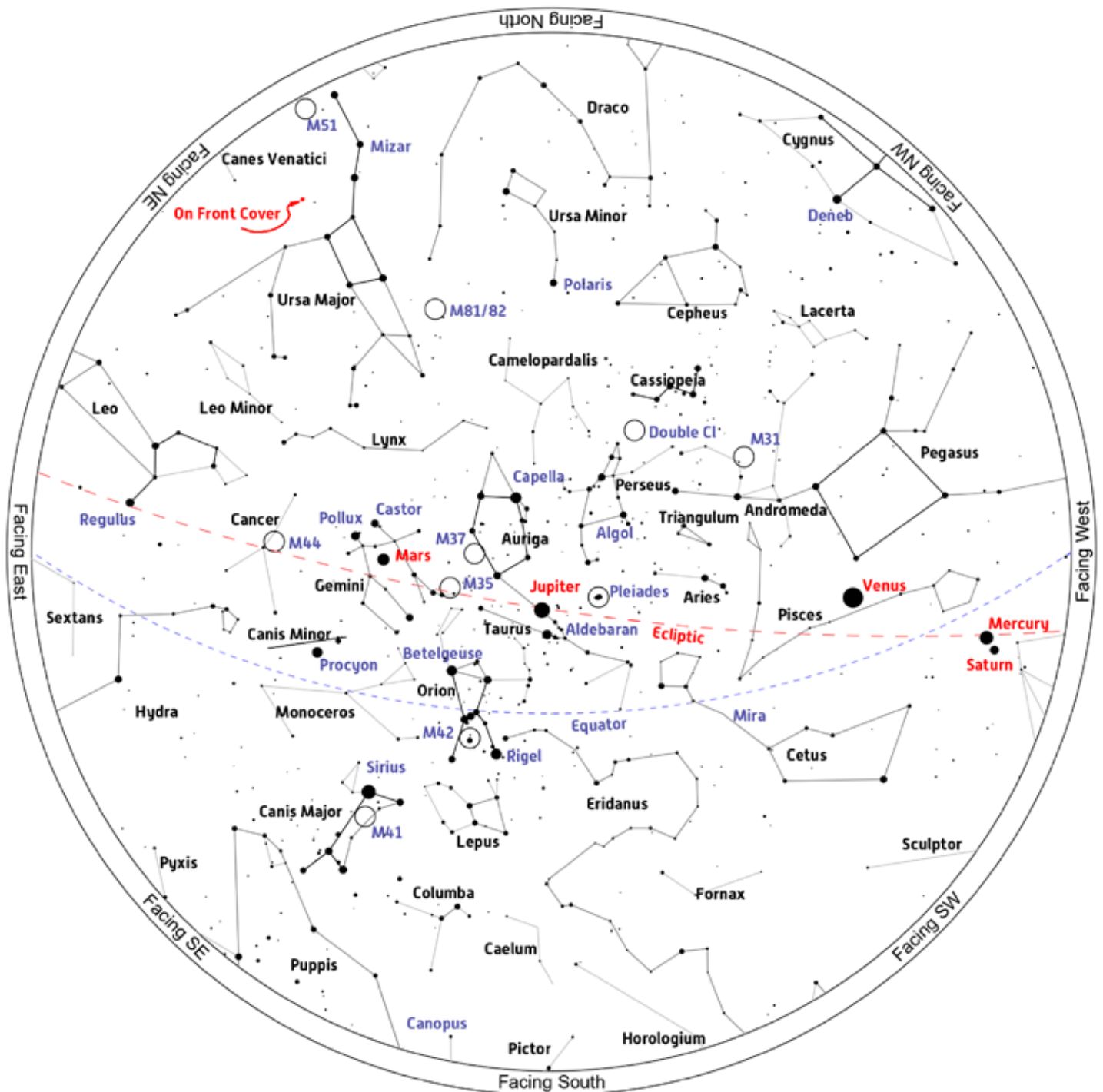
Note: The entire drive from I-5 is uphill.

**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.



## Sky Chart



Location: Palmdale, CA 93551  
Latitude: 34° 36' N, longitude: 118° 11' W  
Time: 2025 February 25, 18:00 (UTC -08:00)

Powered by: Heavens-Above.com

## Solar System Summary

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

### The Planets

**Mercury** starts the month rising before the Sun, ready for its superior conjunction on the 9th of February. On the 24th passes by Saturn that is falling towards the Sun in the evening..

**Venus** continues to remains prominent in the evening sky. Greatest illuminated extent(-4.7) is achieved on the 14th. On the 1st the 15% waxing Moon passes by.

**Mars** starts the month in Gemini but continues its retrograde motion between the twins until the end of the month when it begins moving in normal motion again.

**Jupiter** finishes its retrograde motion on the 2nd, just north of the Hyades, and thereafter resumes normal motion.

**Saturn** still moving normally in Aquarius and getting closer to the solar conjunction in mid-March. By the end of the month it is just 9° east of the Sun.

**Uranus** is continues moving eastward in Aries, at mag 5.7, at the end of the month is on the border with Taurus.

**Neptune** is moving in normal motion near the southern border in Pisces at 7.9.

### Dwarf Planets

**134340 Pluto** spends the month in normal motion, on the western edge of Capricorn, at mag 14.5.

**1 Ceres** spends the month moving east from central Capricorn and then into Aquarius at mag 9,

**2 Pallas** is in normal motion passing through northern Aquila at magnitude 10.4.

**3 Juno** is moving east from Libra to Scopus, at mag 11.

**4 Vesta** spends the month moving east in Virgo until it winds up Libra in March.

## Moon Phases



First Qtr Feb 5      Full Feb 12      Third Qtr Feb 20      New Feb 27

## Sun and Moon Rise and Set\*

Date	Moonrise	Moonset	Sunrise	Sunset
2/1/2025	08:53	21:13	06:50	17:22
2/5/2025	11:00	00:43	06:47	17:26
2/10/2025	15:46	05:48	06:42	17:31
2/15/2025	20:49	08:12	06:37	17:35
2/20/2025	00:41	10:30	06:32	17:40
2/25/2025	05:10	15:19	06:28	17:45
2/28/2025	06:51	18:54	06:22	17:48

## Planet Data\*

February 1

	Rise	Transit	Set	Mag	Phase%
Mercury	06:48	11:46	16:51	-0.96	98.6
Venus	08:48	14:58	20:59	-4.58	37.7
Mars	15:11	22:32	05:58	-1.05	98.6
Jupiter	12:36	19:42	02:51	-2.57	99.3
Saturn	08:37	14:20	20:03	1.11	99.9

February 15

	Rise	Transit	Set	Mag	Phase%
Mercury	07:00	12:29	17:58	-1.43	98.6
Venus	08:07	14:28	20:49	-4.64	26.9
Mars	14:03	21:25	04:50	-0.67	96.2
Jupiter	11:42	18:47	01:57	-2.47	99.1
Saturn	07:46	13:31	19:16	1.14	99.9

February 28

	Rise	Transit	Set	Mag	Phase%
Mercury	07:03	13:02	19:02	-1.05	77.7
Venus	07:15	13:46	20:17	-4.57	15.2
Mars	13:12	20:32	03:56	-0.30	93.9
Jupiter	10:53	17:59	01:10	-2.37	99.0
Saturn	06:59	12:46	18:32	1.14	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 February 25, 2025. The list is sorted by the transit time of the object.

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M52	The Scorpion	Open	Cas	23h 24m 48s	+61° 35.6'	8.0	Circ	13:12	Circ
NGC7662	Blue Snowball	P Neb	And	23h 25m 54s	+42° 33.0'	8.3	04:30	13:13	21:57
NGC7686		Open	And	23h 30m 07s	+49° 08.0'	5.6	03:36	13:18	22:59
IC5332		Galaxy	Scl	23h 34m 27s	-36° 06.0'	10.6	09:20	13:22	17:24
NGC7785		Galaxy	Psc	23h 55m 19s	+05° 54.9'	11.6	07:23	13:43	20:02
HR9071	Sig Cas	Triple	Cas	23h 59m 01s	+55° 45.3'	4.9	Circ	13:46	Circ
NGC7822		Neb	Cep	00h 03m 36s	+67° 09.0'		Circ	13:51	Circ
NGC55	C72	S Gal	Scl	00h 14m 54s	-39° 11.0'	7.9	10:16	14:02	17:49
NGC129		Open	Cas	00h 30m 00s	+60° 13.1'	6.5	Circ	14:17	Circ
NGC133		Open	Cas	00h 31m 19s	+63° 21.0'	9.0	Circ	14:19	Circ
NGC146		Open	Cas	00h 33m 03s	+63° 18.0'	9.1	Circ	14:20	Circ
NGC147	C17	E Gal	Cas	00h 33m 12s	+48° 30.0'	9.3	04:47	14:21	23:55
NGC190		Galaxy	Psc	00h 38m 55s	+07° 03.7'	14.0	08:04	14:26	20:49
M110	Satellite Of Andromeda Galaxy	Galaxy	And	00h 40m 22s	+41° 41.1'	8.9	05:50	14:28	23:06
NGC210		Galaxy	Cet	00h 40m 35s	-13° 52.3'	10.9	09:05	14:28	19:51
NGC206	V-36	Neb	And	00h 40m 36s	+40° 44.0'		05:56	14:28	23:00
Arp168	M32	Galaxy	And	00h 42m 41s	+40° 51.0'	9.0	05:58	14:30	23:02
M32	Satellite Of Andromeda Galaxy	Galaxy	And	00h 42m 42s	+40° 51.9'	9.1	05:58	14:30	23:03
M31	Andromeda Galaxy	Galaxy	And	00h 42m 44s	+41° 16.1'	4.3	05:55	14:30	23:05
NGC246	C56	P Neb	Cet	00h 47m 00s	-11° 53.0'	10.9	09:05	14:34	20:04
NGC254		Galaxy	Scl	00h 47m 28s	-31° 25.2'	11.8	10:12	14:35	18:58
NGC288		Globular	Scl	00h 52m 45s	-26° 35.0'	8.1	09:58	14:40	19:22
NGC281	PacMan Nebula	Open	Cas	00h 52m 54s	+56° 37.4'	7.0	Circ	14:40	Circ
IC59	Gamma Cassiopeiae Nebula	Neb	Cas	00h 57m 29s	+61° 08.6'		Circ	14:45	Circ
IC63	Gamma Cassiopeiae Nebula	Neb	Cas	00h 59m 29s	+60° 54.7'		Circ	14:47	Circ
C51	IC1613	IrrGal	Cet	01h 04m 48s	+02° 07.0'	9.3	08:44	14:52	21:01
NGC474		Galaxy	Psc	01h 20m 07s	+03° 24.9'	11.1	08:55	15:08	21:20
NGC485		Galaxy	Psc	01h 21m 28s	+07° 01.0'	14.0	08:46	15:09	21:31
M103	NGC581	Open	Cas	01h 33m 23s	+60° 39.0'	7.0	Circ	15:21	Circ
NGC598	Pinwheel Galaxy	Galaxy	Tri	01h 33m 51s	+30° 39.6'	5.7	07:40	15:21	23:02
NGC604	III-150	Neb	Tri	01h 34m 33s	+30° 47.0'		07:41	15:22	23:03
M74	The Phantom	Galaxy	Psc	01h 36m 42s	+15° 47.0'	9.8	08:36	15:24	22:12
M76	Little Dumbbell Nebula	P Neb	Per	01h 42m 18s	+51° 34.2'	12.0	05:15	15:30	01:44
NGC651	Apple Core Nebula [2]	P Neb	Per	01h 42m 21s	+51° 34.1'	12.2	05:16	15:30	01:44
NGC637		Open	Cas	01h 43m 04s	+64° 02.4'	8.2	Circ	15:30	Circ
NGC654		Open	Cas	01h 44m 00s	+61° 53.0'	6.5	Circ	15:31	Circ

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ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC720		Galaxy	Cet	01h 53m 00s	-13° 44.3'	10.2	10:17	15:40	21:04
NGC780		Galaxy	Tri	02h 00m 35s	+28° 13.5'	14.0	08:17	15:48	23:19
NGC784		Galaxy	Tri	02h 01m 17s	+28° 50.2'	11.8	08:15	15:49	23:22
NGC821		Galaxy	Ari	02h 08m 21s	+10° 59.6'	10.8	09:22	15:56	22:30
Baily191	NGC884	Open	Per	02h 22m 18s	+57° 08.1'	4.0	Circ	16:10	Circ
IC1795		Neb	Cas	02h 26m 32s	+62° 02.4'		Circ	16:14	Circ
NGC936		Galaxy	Cet	02h 27m 37s	-01° 09.3'	10.1	10:16	16:15	22:15
NGC943	Arp309	Galaxy	Cet	02h 29m 09s	-10° 49.0'	11.4	10:44	16:17	21:49
NGC956		Open	And	02h 32m 30s	+44° 35.6'	9.0	07:22	16:20	01:18
IC1805	Heart Nebula	Open	Cas	02h 32m 47s	+61° 27.6'	6.5	Circ	16:20	Circ
NGC1052		Galaxy	Cet	02h 41m 05s	-08° 15.3'	10.6	10:49	16:29	22:08
M34	Spiral Cluster	Open	Per	02h 42m 05s	+42° 45.6'	6.0	07:45	16:30	01:14
M77	Cetus A	Galaxy	Cet	02h 42m 41s	-00° 00.8'	9.7	10:27	16:30	22:33
NGC1084		Galaxy	Eri	02h 46m 00s	-07° 34.6'	10.6	10:52	16:33	22:15
IC1848	Soul Nebula	Open	Cas	02h 51m 18s	+60° 24.4'	6.5	Circ	16:39	Circ
NGC1156		Galaxy	Ari	02h 59m 42s	+25° 14.2'	11.7	09:27	16:47	00:07
NGC1201		Galaxy	For	03h 04m 08s	-26° 04.1'	10.6	12:08	16:52	21:35
NGC1175		Galaxy	Per	03h 04m 32s	+42° 20.3'	12.8	08:10	16:52	01:34
HR963	Fornacis	Dbl	For	03h 12m 04s	-28° 59.2'	3.9	12:27	16:59	21:32
NGC1316	Fornax A	Galaxy	For	03h 22m 42s	-37° 12.4'	8.9	13:13	17:10	21:07
Barnard202	B202	DkNeb	Ari	03h 25m 38s	+30° 16.0'		09:34	17:13	00:52
Barnard204	B204	DkNeb	Ari	03h 28m 29s	+30° 11.0'		09:37	17:16	00:55
NGC1350		Galaxy	For	03h 31m 08s	-33° 37.7'	10.5	13:05	17:19	21:32
Barnard1	B1	DkNeb	Per	03h 32m 57s	+31° 09.0'		09:37	17:20	01:03
Barnard2	B2	DkNeb	Per	03h 33m 31s	+32° 19.0'		09:33	17:21	01:09
Barnard3	B3	DkNeb	Per	03h 40m 01s	+31° 58.0'		09:41	17:27	01:14
NGC1407		Galaxy	Eri	03h 40m 12s	-18° 34.8'	9.8	12:19	17:28	22:37
IC347		Galaxy	Eri	03h 42m 32s	-04° 17.9'	13.0	11:39	17:30	23:21
NGC1448		Galaxy	Hor	03h 44m 32s	-44° 38.6'	11.0	14:20	17:32	20:44
IC348		Open	Per	03h 44m 34s	+32° 09.7'	7.3	09:45	17:32	01:19
M45	Seven Sisters	Open	Tau	03h 47m 30s	+24° 07.0'	1.6	10:19	17:35	00:51
NGC1461		Galaxy	Eri	03h 48m 27s	-16° 23.5'	11.7	12:20	17:36	22:52
IC353		Neb	Tau	03h 53m 00s	+25° 48.0'		10:19	17:40	01:02
IC2003		P Neb	Per	03h 56m 22s	+33° 52.5'	13.0	09:49	17:44	01:39
NGC1499	California Nebula	Neb	Per	04h 03m 14s	+36° 22.0'		09:44	17:51	01:58
NGC1515		Galaxy	Dor	04h 04m 03s	-54° 06.0'	11.0	16:31	17:51	19:11
NGC1496		Open	Per	04h 04m 32s	+52° 39.7'	10.0	07:18	17:52	04:26
NGC1502		Open	Cam	04h 07m 50s	+62° 19.8'	5.7	Circ	17:55	Circ

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ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
IC360		Neb	Tau	04h 09m 00s	+26° 06.0'		10:34	17:56	01:19
NGC1514	Crystal Ball Nebula	P Neb	Tau	04h 09m 17s	+30° 46.5'	10.0	10:15	17:57	01:38
NGC1513		Open	Per	04h 09m 57s	+49° 30.8'	8.4	08:12	17:57	03:43
IC359		Neb	Tau	04h 12m 28s	+27° 42.1'		10:31	18:00	01:29
NGC1535		P Neb	Eri	04h 14m 16s	-12° 44.3'	10.0	12:35	18:02	23:28
Barnard10		DkNeb	Tau	04h 18m 41s	+28° 16.0'		10:35	18:06	01:37
NGC1545		Open	Per	04h 20m 57s	+50° 15.2'	6.2	08:13	18:08	04:03
NGC1569		Galaxy	Cam	04h 30m 49s	+64° 50.8'	11.2	Circ	18:18	Circ
Barnard18		DkNeb	Tau	04h 31m 13s	+24° 21.0'		11:02	18:19	01:35
NGC1582		Open	Per	04h 31m 53s	+43° 49.0'	7.0	09:27	18:19	03:12
NGC1560		Galaxy	Cam	04h 32m 48s	+71° 52.7'	11.5	Circ	18:20	Circ
Barnard19		DkNeb	Tau	04h 33m 00s	+26° 16.0'		10:57	18:20	01:44
Barnard20		DkNeb	Per	04h 37m 04s	+50° 58.0'		08:20	18:24	04:29
Barnard22		DkNeb	Tau	04h 38m 00s	+26° 03.0'		11:03	18:25	01:48
Barnard14		DkNeb	Tau	04h 39m 59s	+25° 44.0'		11:06	18:27	01:49
IC2087		Neb	Tau	04h 40m 00s	+25° 44.5'		11:06	18:27	01:49
Barnard23		DkNeb	Tau	04h 40m 33s	+29° 52.0'		10:50	18:28	02:06
NGC1624		Open	Per	04h 40m 36s	+50° 27.6'	10.4	08:30	18:28	04:26
NGC1640		Galaxy	Eri	04h 42m 14s	-20° 26.0'	11.7	13:27	18:30	23:33
NGC1647		Open	Tau	04h 45m 55s	+19° 06.8'	6.4	11:35	18:33	01:32
IC2118	Witch Head Nebula	Neb	Eri	05h 04m 54s	-07° 15.0'		13:10	18:52	00:35
NGC1851		Globular	Col	05h 14m 06s	-40° 03.0'	7.3	15:20	19:02	22:43
IC405	Flaming Star Nebula	Neb	Aur	05h 16m 29s	+34° 21.3'		11:07	19:04	03:01
M79	NGC1904	Globular	Lep	05h 24m 11s	-24° 31.4'	8.5	14:22	19:12	00:01
M38	Starfish Cluster	Open	Aur	05h 28m 40s	+35° 50.8'	7.0	11:12	19:16	03:21
M1	Crab Nebula	SNR	Tau	05h 34m 32s	+22° 00.8'	8.4	12:14	19:22	02:30
M42	Great Orion Nebula	Open+D Neb	Ori	05h 35m 16s	-05° 23.4'	4.0	13:35	19:23	01:10
M43	De Mairan's Nebula	D Neb	Ori	05h 35m 31s	-05° 16.0'	9.0	13:35	19:23	01:11
M36	Pinwheel Cluster	Open	Aur	05h 36m 18s	+34° 08.3'	6.5	11:27	19:24	03:20
M78	NGC2068	D Neb	Ori	05h 46m 45s	+00° 04.8'	8.0	13:31	19:34	01:37
M37	Salt-and-pepper Cluster	Open	Aur	05h 52m 18s	+32° 33.2'	6.0	11:51	19:40	03:29
M35	NGC2168	Open	Gem	06h 09m 00s	+24° 21.0'	5.5	12:40	19:56	03:13
M41	Little Beehive	Open	CMa	06h 46m 01s	-20° 45.3'	5.0	15:31	20:33	01:35
M50	Heart-shaped Cluster	Open	Mon	07h 02m 42s	-08° 23.0'	7.0	15:11	20:50	02:29
M47	NGC2422	Open	Pup	07h 36m 35s	-14° 29.0'	4.5	16:02	21:24	02:46
M46	NGC2437	Open	Pup	07h 41m 46s	-14° 48.6'	6.5	16:09	21:29	02:50
M93	NGC2447	Open	Pup	07h 44m 30s	-23° 51.4'	6.5	16:40	21:32	02:23
M48	NGC2548	Open	Hya	08h 13m 43s	-05° 45.0'	5.5	16:14	22:01	03:48
M44	Beehive Cluster	Open	Cnc	08h 40m 24s	+19° 40.0'	4.0	15:27	22:28	05:28

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ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M67	King Cobra	Open	Cnc	08h 51m 18s	+11° 48.0'	7.5	16:02	22:39	05:15
M81	Bode's Galaxy	Galaxy	UMa	09h 55m 33s	+69° 03.9'	7.8	Circ	23:43	Circ
M82	Cigar Galaxy	Galaxy	UMa	09h 55m 53s	+69° 40.8'	9.2	Circ	23:43	Circ
M95	NGC3351	Galaxy	Leo	10h 43m 58s	+11° 42.2'	10.6	17:55	00:31	07:07
M96	NGC3368	Galaxy	Leo	10h 46m 46s	+11° 49.2'	10.1	17:58	00:34	07:10
M105	NGC3379	Galaxy	Leo	10h 47m 50s	+12° 34.9'	10.5	17:57	00:35	07:14
M108	NGC3556	Galaxy	UMa	11h 11m 31s	+55° 40.4'	10.6	Circ	00:59	Circ
M97	Owl Nebula	P Neb	UMa	11h 14m 48s	+55° 01.1'	12.0	Circ	01:02	Circ
M65	Leo Triplet	Galaxy	Leo	11h 18m 56s	+13° 05.5'	10.1	18:26	01:06	07:46
M66	Leo Triplet	Galaxy	Leo	11h 20m 15s	+12° 59.4'	9.7	18:28	01:08	07:47
M109	NGC3992	Galaxy	UMa	11h 57m 36s	+53° 22.4'	10.6	14:54	01:45	12:36
M98	NGC4192	Galaxy	Com	12h 13m 48s	+14° 54.0'	10.9	19:16	02:01	08:47
M99	Virgo Cluster Pinwheel	Galaxy	Com	12h 18m 50s	+14° 25.0'	10.4	19:22	02:06	08:50
M106	NGC4258	Galaxy	CVn	12h 18m 58s	+47° 18.2'	9.1	16:45	02:06	11:28
M61	Swelling Spiral	Galaxy	Vir	12h 21m 55s	+04° 28.3'	10.1	19:54	02:09	08:25
M40	Winnecke 4	Dbl+Asterism	UMa	12h 22m 12s	+58° 05.0'	8.7	Cirm	02:10	Circ
M100	Mirror of M99	Galaxy	Com	12h 22m 55s	+15° 49.3'	10.1	19:22	02:10	08:59
M84	NGC4374	Galaxy	Vir	12h 25m 04s	+12° 53.2'	10.2	19:33	02:12	08:52
M85	NGC4382	Galaxy	Com	12h 25m 24s	+18° 11.4'	10.0	19:17	02:13	09:09
M86	NGC4406	Galaxy	Vir	12h 26m 12s	+12° 56.7'	9.9	19:34	02:14	08:53
M49	NGC4472	Galaxy	Vir	12h 29m 47s	+08° 00.0'	9.3	19:52	02:17	08:42
M87	Smoking Gun,	Galaxy	Vir	12h 30m 49s	+12° 23.4'	9.6	19:40	02:18	08:56
M88	NGC4501	Galaxy	Com	12h 31m 59s	+14° 25.2'	10.2	19:35	02:19	09:03
M91	Missing Messier Object	Galaxy	Com	12h 35m 27s	+14° 29.7'	10.9	19:39	02:23	09:07
M89	NGC4552	Galaxy	Vir	12h 35m 40s	+12° 33.3'	10.9	19:45	02:23	09:02
M90	NGC4569	Galaxy	Vir	12h 36m 50s	+13° 09.7'	10.2	19:44	02:24	09:05
M58	NGC4579	Galaxy	Vir	12h 37m 44s	+11° 49.1'	10.4	19:49	02:25	09:01
M68	NGC4590	Globular	Hya	12h 39m 28s	-26° 44.5'	9.0	21:46	02:27	07:08
M104	Sombrero Galaxy	Galaxy	Vir	12h 39m 59s	-11° 37.3'	9.2	20:57	02:27	07:57

And - Andromeda	Cep - Cepheus	Cyg - Cygnus	Leo - Leo	Pav - Pavo	Sge - Sagitta
Ant - Antlia	Cet - Cetus	Del - Delphinus	Lep - Lepus	Peg - Pegasus	Sgr - Sagittarius
Aps - Apus	Cha - Chamaeleon	Dor - Dorado	Lib - Libra	Per - Perseus	Tau - Taurus
Aql - Aquila	Cir - Circinus	Dra - Draco	LMi - Leo Minor	Phe - Phoenix	Tel - Telescopium
Aqr - Aquarius	CMA - Canis Major	Equ - Equuleus	Lup - Lupus	Pic - Pictor	TrA - Triangulum
Ara - Ara	CMi - Canis Minor	Eri - Eridanus	Lyn - Lynx	PsA - Pisces Austrinus	Australe
Ari - Aries	Cnc - Cancer	For - Fornax	Lyr - Lyra	Psc - Pisces	Tri - Triangulum
Aur - Auriga	Col - Columba	Gem - Gemini	Men - Mensa	Pup - Puppis	Tuc - Tucana
Boo - Bootes	Com - Coma Berenices	Gru - Grus	Mic - Microscopium	Pyx - Pyxis	UMa - Ursa Major
Cae - Caelum	CrA - Corona Australis	Her - Hercules	Mon - Monoceros	Ret - Reticulum	UMi - Ursa Minor
Cam - Camelopardis	CrB - Corona Borealis	Hor - Horologium	Mus - Musca	Scl - Sculptor	Vel - Vela
Cap - Capricornus	Crt - Crater	Hya - Hydra	Nor - Norma	Sco - Scorpius	Vir - Virgo
Car - Carina	Cru - Crux	Hyi - Hydrus	Oct - Octans	Sct - Scutum	Vol - Volans
Cas - Cassiopeia	Crv - Corvus	Ind - Indus	Oph - Ophiuchus	Ser - Serpens	Vul - Vulpecula
Cen - Centaurus	CVn - Canes Venatici	Lac - Lacerta	Ori - Orion	Sex - Sextans	

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