

Volume 44.7

July 2024

Desert Sky Observer

Antelope Valley Astronomy Club



Desert Sky Observer

www.avastronomyclub.org

July 2024

Upcoming Events

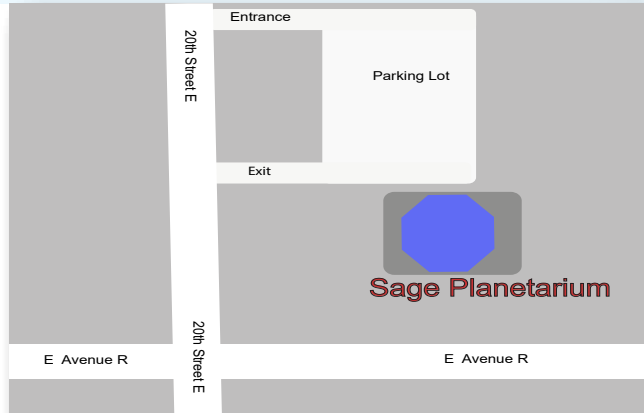
July 6: DSSP at Mt Pinos
July 12: Club Meeting
July ??: Moonwalk @ Prime Desert Woodland

Every clear night: Personal Star Party

August 3: DSSP at Mt Pinos
August 9: Club Meeting
August 10: Lunar Club @ Matt's house
August 17: Moonwalk @ Prime Desert Woodland
August 31: DSSP @ Chuchupate



AVAC Calendar



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Club Historian: vacant
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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 Reflector -- the publication of the Astronomical League.
- The AVAC Membership Manual.
- To borrow club equipment, books, videos, and other items.

AVAC

PO Box 8545

Lancaster, CA 93539-8545

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

www.instagram.com/av_astronomyclub



www.avastronomyclub.org

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

The AVAC is a Sustaining Member of The Astronomical League and the International Dark-Sky Association



President's Message

By Phil Wriedt

Hi There!

Our next scheduled event, a Dark Sky Star Party, is planned to be on the Saturday/Sunday the 6th/7th of July, at Mt. Pinos. Matt will be there on Friday. The weather seems to be cooperating lately, so there is a good chance there will be good weather. There will be a new moon that will set about 8:50 pm. Astronomical twilight ends at 9:53. If you miss this one we will be back at Mt Pinos on August 3rd/4th.

Our next Club Meeting is on Friday, the 12th. Matt has curated a number of videos of Dr Becky, an astrophysicist from Oxford who does research on supermassive black holes. I can't wait to see what he picks.

I have suggested to Jeremy a number of dates I thought would be good dates for Moonwalks. It's up to the City of Lancaster, Art Department (they run the museums) and they can't seem to wrap their heads around the needs of astronomy. It's up to Jeremy to convince them that they need us. More will be announced at the meeting, and by email. Moonwalks are our main Public Outreach, so we really need members with telescopes at these events.

For the next few months you might want to look out for: *T Coronae Borealis*. This is a recurrent nova in Corona Borealis. It is a binary system normally of mag. 10. The last time it went nova was February 9, 1946. It's due again between March and September of this year. It's peak mag. of about 2.5 ± 0.5 . Look for it on the southern border between C. Borealis and Serpens Caput, at 15h 59m, 25°55'. During July it will be near zenith.

Keep Looking Up, Phil

On The Cover

Please note: North is 25.3° right of vertical RA: 12h 21' 55.33" DEC: 4° 28' 26.94" (Virgo)

The luminous heart of the galaxy M61 dominates this image, framed by its winding spiral arms threaded with dark tendrils of dust. As well as the usual bright bands of stars, the spiral arms of M61 are studded with ruby-red patches of light. Tell-tale signs of recent star formation, these glowing regions lead to M61's classification as a starburst galaxy.

Though the gleaming spiral of this galaxy makes for a spectacular sight, one of the most interesting features of M61 lurks unseen at the centre of this image. As well as widespread pockets of star formation, M61 hosts a supermassive black hole more than 5 million times as massive as the Sun.

M61 appears almost face-on, making it a popular subject for astronomical images, even though the galaxy lies more than 52 million light-years from Earth. This particular astronomical image incorporates data from not only Hubble, but also the FORS camera at the European Southern Observatory's Very Large Telescope, together revealing M61 in unprecedented detail. This striking image is one of many examples of telescope teamwork — astronomers frequently combine data from ground-based and space-based telescopes to learn more about the Universe.

Credit:

ESA/Hubble & NASA, ESO, J. Lee and the PHANGS-HST Team

From the Secretary

By Rose Moore

Members:

First I would like to thank Matt for writing a post about the recent passing of our former member, Doug Drake. I believe Doug was one of the founding members of our club. Thank you Matt!

To in begin July, we have a dark sky star party up at Mt. Pinos on Saturday July 6th. There may be other clubs and people there from the July 4th holiday (for a really long weekend!). Our club overnight star party is for Saturday. Weather permitting, please check the weather before going up to Mt. Pinos. There will be an email sent a few days before the event. Bring your own food/snacks and enough to drink. Dress appropriately. Be aware of the altitude - 8300 ft at the parking lot. Remember there are no bathroom facilities at the parking lot. During warmer months the nearest restrooms (pit toilets) are a ¼ mile walk in the Chula Vista Campground. Cell phone reception can be absent or sketchy. Mt. Pinos is a great place to observe, and there are usually a lot of telescopes for members to look through!

Our club meeting is on Friday July 12th at 7pm. We are trying to get speakers. Emails have been sent out, and we are waiting on responses. Work on the planetarium has been delayed until October.

Jeremy has submitted dates to the people at Prime Desert Woodlands, but has not heard back as of yet. We are still waiting on approval for the dates and will let you know.

We have a date for the Tehachapi Airport Star Party, and that will be on Saturday, October 5th. More details coming later!

Clear skies, Rose

Vice President's Report

By Matt Leone

We have a great month for you, starting July 5-7 there will be a star party at Mt. Pinos. Hope to see you there, with Saturn coming up a little late but spectacular. Had a great star party on June 8 at Lockwood Valley [Chuchupate], thank you for coming out we had a great time that night. August 2-4 we will again be at Mt. Pinos observing the sky so please join us.

We are also doing our best to find speakers, so for now we will have zoom speakers or recent videos on what is going on in space. On July 12, Dr Becky from England will be our speaker talking about some of the new telescopes in space and future ones up and running and those about to go up and what they do. On August 9, world renowned speaker, Matthew Leone will be speaking on Galaxy's and how they tick.

Looking to the sky, Comet Tsuchinshan-ATLAS will be in Leo early in the night for all of July. July 30, an hour before sunrise the moon, Jupiter, Mars and Uranus will all be about a degree or so apart in Taurus and near the Pleiades. What will be cool you will see two red planets except one will be Aldebaran, the other Mars.

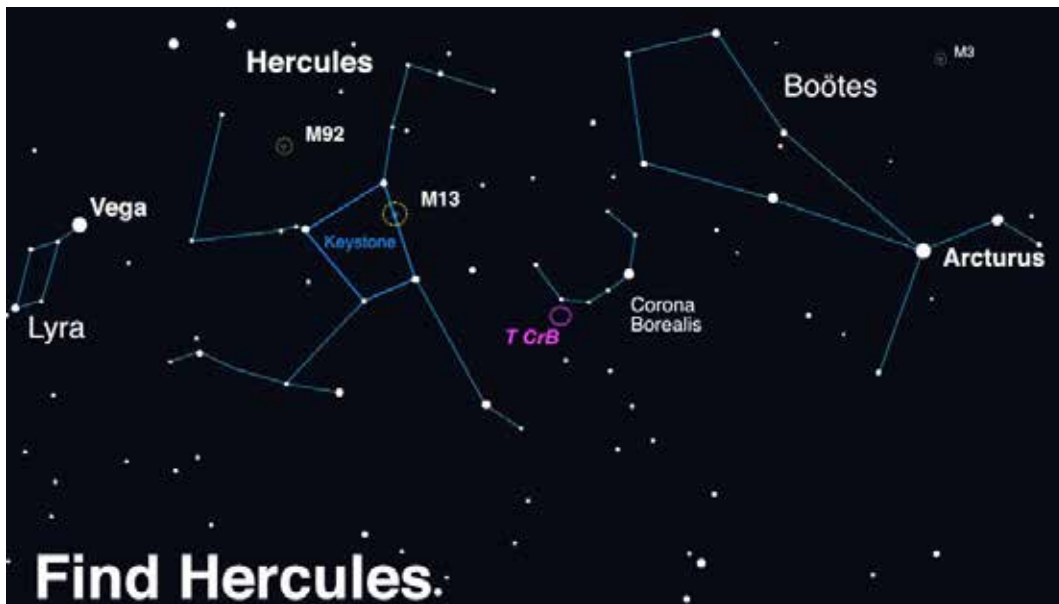
Soon we will have Moonwalks again, hopefully by the meeting we will have a list for you.

So look to the sky and hope to see you in the dark, over and out, Matthew Leone.

July's Night Sky Notes: A Hero, a Crown, and Possibly a Nova!

by Vivian White, Astronomy Society of the Pacific, NASA Night Sky Network

High in the summer sky, the constellation Hercules acts as a centerpiece for late-night stargazers. At the center of Hercules is the "Keystone," a near-perfect square shape between the bright stars Vega and Arcturus that is easy to recognize and can serve as a guidepost for some amazing sights. While not the brightest stars, the shape of the hero's torso, like a smaller Orion, is nearly directly overhead after sunset. Along the edge of this square, you can find a most magnificent jewel - the Great Globular Cluster of Hercules, also known as [Messier 13](#).



Look up after sunset during summer months to find Hercules! Scan between Vega and Arcturus, near the distinct pattern of Corona Borealis. Once you find its stars, use binoculars or a telescope to hunt down the globular clusters M13 (and a smaller globular cluster M92). If you enjoy your views of these globular clusters, you're in luck - look for another great globular, M3, in the nearby constellation of Boötes. Image created with assistance from Stellarium: stellarium.org

Globular clusters are a tight ball of very old stars, closer together than stars near us. These clusters orbit the center of our Milky Way like tight swarms of bees. One of the most famous short stories, [Nightfall](#) by Isaac Asimov, imagines a civilization living on a planet within one of these star clusters. They are surrounded by so many stars so near that it is always daytime except for once every millennium, when a special alignment (including a solar eclipse) occurs, plunging their planet into darkness momentarily. The sudden night reveals so many stars that it drives the inhabitants mad.

Back here on our home planet Earth, we are lucky enough to experience [skies full of stars](#), a beautiful [Moon](#), and regular [eclipses](#). On a clear night this summer, take time to look up into the Keystone of Hercules and follow this sky chart to the Great Globular Cluster of Hercules. A pair of binoculars will show a faint, fuzzy patch, while a small telescope will resolve some of the stars in this globular cluster.

Additional Skywatching Resources

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



A red giant star and white dwarf orbit each other in this animation of a nova similar to T Coronae Borealis. The red giant is a large sphere in shades of red, orange, and white, with the side facing the white dwarf the lightest shades. The white dwarf is hidden in a bright glow of white and yellows, which represent an accretion disk around the star. A stream of material, shown as a diffuse cloud of red, flows from the red giant to the white dwarf. When the red giant moves behind the white dwarf, a nova explosion on the white dwarf ignites, creating a ball of ejected nova material shown in pale orange. After the fog of material clears, a small white spot remains, indicating that the white dwarf has survived the explosion. NASA/Goddard Space Flight Center

Bonus! Between Hercules and the ice-cream-cone-shaped Boötes constellation, you'll find the small constellation Corona Borealis, shaped like the letter "C." Astronomers around the world are watching T Coronae Borealis, also known as the "Blaze Star" in this constellation closely because it is [predicted to go nova sometime this summer](#). There are only 5 known nova stars in the whole galaxy. It is a rare observable event and you can take part in the fun! The Astronomical League has issued a [Special Observing Challenge](#) that anyone can participate in. Just make a sketch of the constellation now (you won't be able to see the nova) and then make another sketch once it goes nova.

Tune into our mid-month article on the Night Sky Network page, as we prepare for the Perseids!
Keep looking up!

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

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

Space News

News from around the Net

Scientists Use Heart And Lung Model To Calculate Potential Health Threats Facing Future Space Tourists In Microgravity

Space exploration has always captivated our imagination, offering the promise of discovering new worlds and pushing the boundaries of human capability. As commercial space travel becomes more accessible, individuals with various underlying health conditions—including heart failure—may soon be among those venturing beyond Earth’s atmosphere. This raises critical questions about the impact of space travel on humans with potential underlying health problems. Recent research, “Computational modeling of heart failure in microgravity transitions,” delves into this issue, offering insights that could shape the future of space travel. . . . (continued at <https://phys.org/news/2024-06-scientists-heart-lung-potential-health.html>)



‘1st Of Its Kind’: NASA Spots Unusually Light-Colored Boulder On Mars That May Reveal Clues Of The Planet’s Past

NASA’s Perseverance rover has spotted an unusually light-colored rock in Mars’ Jezero Crater — the likes of which has never been seen on the Red Planet before. According to project researchers, the strange boulder may hint at new details about Mars’ ancient past. The rock, dubbed “Atoko Point” after a similarly light-colored feature of the Grand Canyon, is “in a league of its own,” clearly standing out amidst all the darker boulders dotting the search area near the crater’s Mount Washburn, the team wrote in a NASA statement. Scientists caught their first glimpse of the rock as part of an 18-image mosaic taken on May 27. . . . (continued at <https://www.livescience.com/space/mars/1st-of-its-kind-nasa-spots-unusually-light-colored-boulder-on-mars-that-may-reveal-clues-of-the-planets-past>)



Giant Magellan Telescope Enclosure Ready For Construction

The Giant Magellan Telescope and IDOM has announced that the telescope’s enclosure, set to be one of the world’s largest astronomical facilities, passed its final design review and is now ready for construction in Chile. The review marks a major milestone for the telescope, which is now 40% under construction and on track to be operational by the early 2030s. “A team of 10 international subject matter experts validated two years of design work by IDOM and the Giant Magellan Telescope. The final design of the enclosure is unique and an important feat of technical management, design, and engineering. We are very grateful for the committee’s professional assessment as we proceed towards construction,” . . . (continued at <https://phys.org/news/2024-06-giant-magellan-telescope-enclosure-ready.html>)



New Research Challenges Black Holes As Dark Matter Explanation

The gravitational wave detectors LIGO and Virgo have detected a population of massive black holes whose origin is one of the biggest mysteries in modern astronomy. According to one hypothesis, these objects may have formed in the very early universe and may include dark matter, a mysterious substance filling the universe. . . . (continued at <https://phys.org/news/2024-06-black-holes-dark-explanation.html>)



The Hubble Telescope Has Shifted Into One-Gyro Mode After Months Of Technical Issues

Imagine keeping a laser beam trained on a dime that’s 200 miles away. Now imagine doing that continuously for 24 hours, while riding a merry-go-round. Does it seem difficult? Well, that’s basically what the Hubble Space Telescope does. After months of technical issues, NASA announced on June 4 that Hubble would shift into one-gyroscope mode. This essentially means that the telescope will have to rely on just one of the several gyroscopes—devices that measure an object’s orientation in space—it normally uses to track and follow objects in space. . . .(continued at <https://phys.org/news/2024-06-hubble-telescope-shifted-gyro-mode.html>)



Space News

News from around the Net

How Boeing's Starliner Can Bring Its Astronauts Back To Earth

Problems with Boeing's Starliner capsule, still docked at the International Space Station (ISS), have upended the original plans for its return of its two astronauts to Earth, as last-minute fixes and tests draw out a mission crucial to the future of Boeing's (BA.N), opens new tab space division. NASA has rescheduled the planned return three times, and now has no date set for it. Since its June 5 liftoff, the capsule has had five helium leaks, five maneuvering thrusters go dead and a propellant valve fail to close completely, prompting the crew in space and mission managers in Houston to spend more time than expected pursuing fixes mid-mission. . . . (continued at <https://www.reuters.com/technology/space/how-boeings-starliner-can-bring-its-astronauts-back-earth-2024-06-24/>)



How Long Has Jupiter's Great Red Spot Really Been Around?

A new study follows two lines of research to suggest that that Great Red Spot we see today has not, in fact, been going for as long as we thought. "Jupiter's Great Red Spot Is Not the Same One Cassini Observed in 1600s," announces a release written about work recently published in Geophysical Research Letters. How can they possibly know that? The study, from a team of atmospheric scientists led by Agustín Sanchez-Lavega (University of the Basque Country, Spain), looks at the history of Great Red Spot observations and then models some ways the anticyclone could have formed. . . . (continued at <https://skyandtelescope.org/astronomy-news/how-long-has-jupiters-great-red-spot-really-been-around/>)



Dwarf Star Caught Speeding; Could Escape The Galaxy

Citizen scientists discovered a star speeding through the Milky Way. Now, astronomers are trying to track down its origins. Citizen scientists and professional astronomers have teamed up to spot a rare hypervelocity star racing through our Milky Way Galaxy. At its current speed and trajectory, it's possible it could one day escape from the galaxy forever. The discovery was only possible thanks to the legions of volunteers who lend their time to the Backyard Worlds: Planet 9 project. These volunteers assist astronomers by poring over 14 years' worth of data from NASA's Wide-field Infrared Survey Explorer (WISE) mission, looking for objects that move between images. Astronomers can then follow up on interesting finds to learn more. . . . (continued at <https://skyandtelescope.org/astronomy-news/dwarf-star-caught-speeding-could-escape-the-galaxy/>)



Not-So-Static Fire: Private Chinese Rocket Accidentally Launches During Test

A private Chinese rocket took an unscheduled flight over the weekend. The Beijing-based company Space Pioneer conducted a "static fire" test with the first stage of its new Tianlong-3 rocket on Sunday (June 30) in Gongyi, a city of about 800,000 people in the central Chinese province of Henan. Space Pioneer briefly ignited the stage's engines while the vehicle remained anchored to the launch pad. That's how it was supposed to work, anyway. . . . (continued at <https://www.space.com/space-pioneer-tianlong-3-rocket-accidental-launch>)



NASA Releases Hubble Image Taken In New Pointing Mode

NASA's Hubble Space Telescope has taken its first new images since changing to an alternate operating mode that uses one gyro. The spacecraft returned to science operations June 14 after being offline for several weeks due to an issue with one of its gyroscopes (gyros), which help control and orient the telescope. This new image features NGC 1546, a nearby galaxy in the constellation Dorado. The galaxy's orientation gives us a good view of dust lanes from slightly above and backlit by the galaxy's core. This dust absorbs light from the core, reddening it and making the dust appear rusty-brown. . . . (continued at <https://phys.org/news/2024-06-nasa-hubble-image-mode.html>)

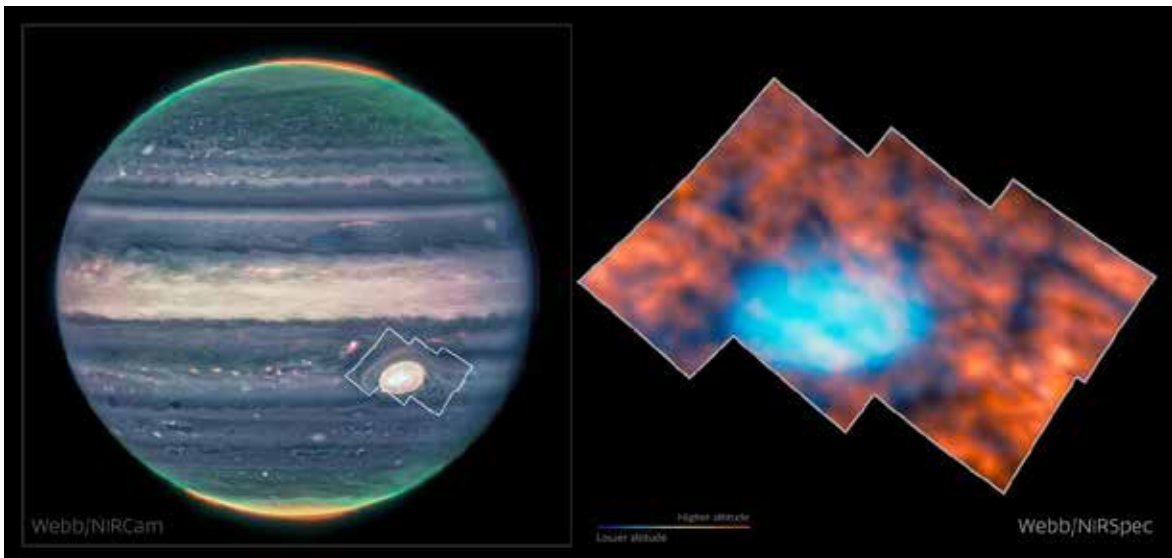


Astronomers Find Surprising Shapes In Jupiter's Upper Atmosphere

25 June 2024 [weic2419](#) — [Science Release](#)

Using the NASA/ESA/CSA James Webb Space Telescope, scientists observed the region above Jupiter's iconic Great Red Spot to discover a variety of previously unseen features. The region, previously believed to be unremarkable in nature, hosts a variety of intricate structures and activity.

Jupiter is one of the brightest objects in the night sky, and it is easily seen on a clear night. Aside from the bright northern and southern lights at the planet's polar regions, the glow from Jupiter's upper atmosphere is weak and is therefore challenging for ground-based telescopes to discern details in this region. However, Webb's infrared sensitivity allows scientists to study Jupiter's upper atmosphere above the infamous Great Red Spot with unprecedented detail.



The upper atmosphere of Jupiter is the interface between the planet's magnetic field and the underlying atmosphere. Here, the bright and vibrant displays of northern and southern lights can be seen, which are fuelled by the volcanic material ejected from Jupiter's moon Io. However, closer to the equator, the structure of the planet's upper atmosphere is influenced by incoming sunlight. Because Jupiter receives only 4% of the sunlight that is received on Earth, astronomers predicted this region to be homogeneous in nature.

The Great Red Spot of Jupiter was observed by Webb's Near-InfraRed Spectrograph ([NIRSpec](#)) in July 2022, using the instrument's Integral Field Unit capabilities. The team's Early Release Science observations sought to investigate if this region was in fact dull, and the region above the iconic Great Red Spot was targeted for Webb's observations. The team was surprised to discover that the upper atmosphere hosts a variety of intricate structures, including dark arcs and bright spots, across the entire field of view.

"We thought this region, perhaps naively, would be really boring," shared team leader Henrik Melin of the University of Leicester in the United Kingdom. "It is in fact just as interesting as the northern lights, if not more so. Jupiter never ceases to surprise."

Although the light emitted from this region is driven by sunlight, the team suggests there must be another mechanism altering the shape and structure of the upper atmosphere.

continued on next page

“One way in which you can change this structure is by gravity waves - similar to waves crashing on a beach, creating ripples in the sand,” explained Melin. “These waves are generated deep in the turbulent lower atmosphere, all around the Great Red Spot, and they can travel up in altitude, changing the structure and emissions of the upper atmosphere.”

The team explains that these atmospheric waves can be observed on Earth on occasion, however they are much weaker than those observed on Jupiter by Webb. They also hope to conduct follow-up Webb observations of these intricate wave patterns in the future to investigate how the patterns move within the planet’s upper atmosphere and to develop our understanding of the energy budget of this region and how the features change over time.

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

These observations were taken as part of the Early Release Science programme [#1373](#): ERS Observations of the Jovian System as a Demonstration of JWST’s Capabilities for Solar System Science (Co-PIs: I. de Pater, T. Fouchet).

“This ERS proposal was written back in 2017,” shared team member Imke de Pater of the University of California, Berkeley. “One of our objectives had been to investigate why the temperature above the Great Red Spot appeared to be high, as at the time recent observations with the NASA Infrared Telescope Facility had revealed. However, our new data showed very different results.”

These results have been published in *Nature Astronomy*.

More information

Webb is the largest, most powerful telescope ever launched into space. Under an international collaboration agreement, ESA provided the telescope’s launch service, using the Ariane 5 launch vehicle. Working with partners, ESA was responsible for the development and qualification of Ariane 5 adaptations for the Webb mission and for the procurement of the launch service by Arianespace. ESA also provided the workhorse spectrograph NIRSpec and 50% of the mid-infrared instrument MIRI, which was designed and built by a consortium of nationally funded European Institutes (The MIRI European Consortium) in partnership with JPL and the University of Arizona.

Webb is an international partnership between NASA, ESA and the Canadian Space Agency (CSA).

Image Credit: ESA/Webb, NASA & CSA, Jupiter ERS Team, J. Schmidt, H. Melin, M. Zamani

Links

[Science paper](#), [Release on ESA website](#)

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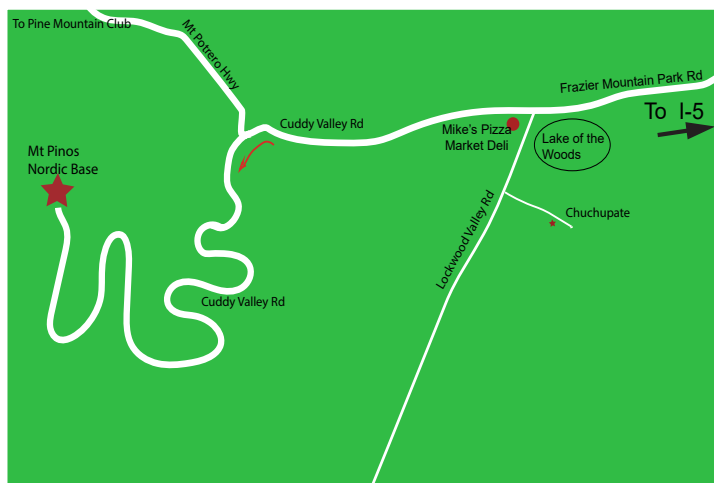
ESA Newsroom and Media Relations Office

Email: media@esa.int

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.

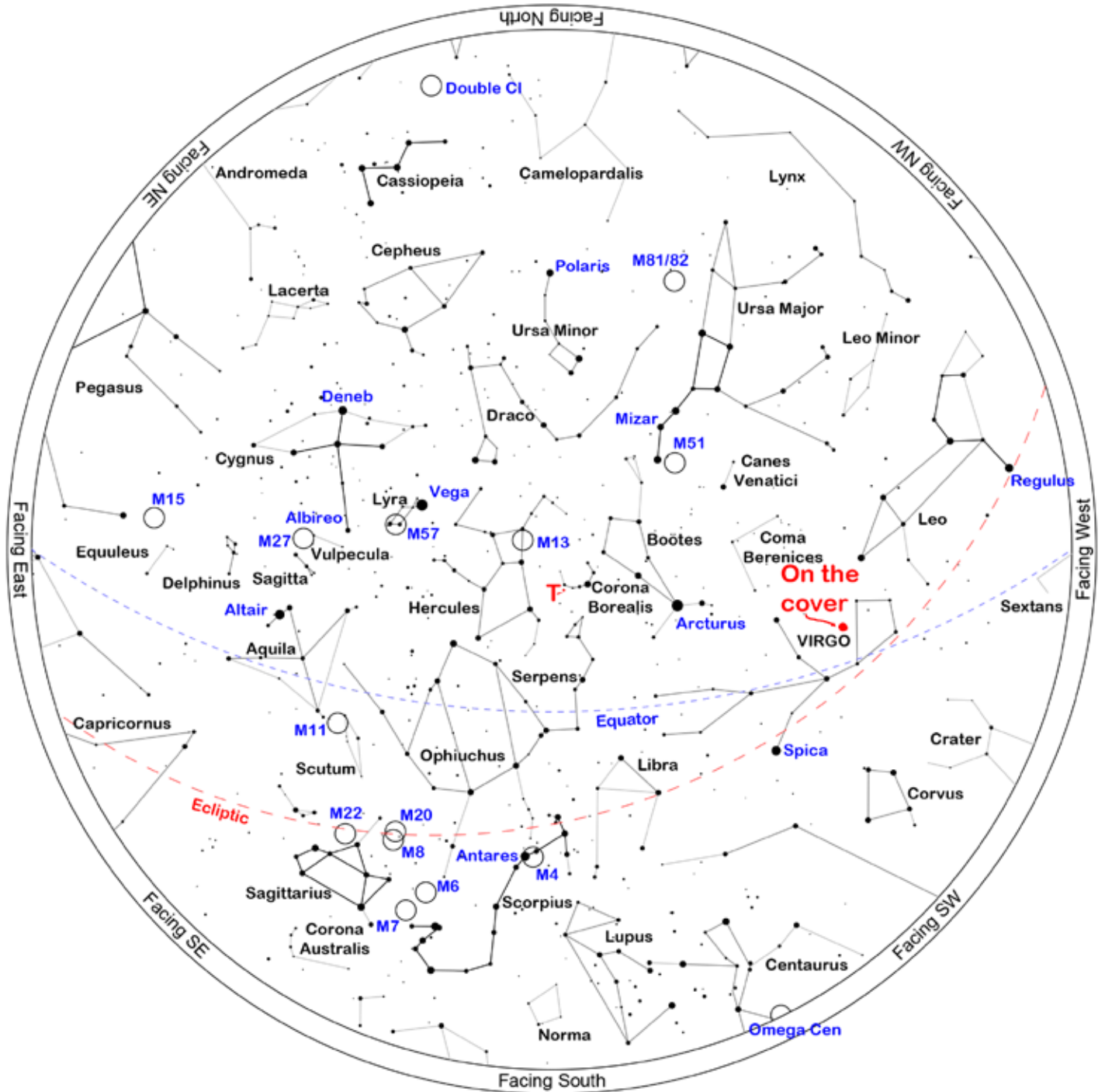


Mt Pinos is a parking lot at 8350 feet for the “Mt Pinos Nordic Base.” There is a vault toilet 300 yds to the east in the Chula Vista campground.

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.

Sky Chart



Location: Set from geolocation service
Latitude: 34° 39' N, longitude: 118° 10' W
Time: 2024 July 6, 22:00 (UTC -07:00)

Powered by: Heavens-Above.com

Solar System Summary

The **Sun** starts the month in Gemini, ending the month in central Cancer.

The Planets

Mercury starts the month 18° east of the Sun at mag. -0.5. By the 18th it reaches Greatest Eastern Elongation which starts journey back to the Sun.

Venus is still close to the setting Sun slowly separating itself. On the 1st the separation is 7.5° and on the 31st it's 15°. On the 17th Venus passes right through M44, at sunset. . .

Mars, still an early riser, starts the month in Aries, and by the end of the month it is in Taurus seemingly chasing after Jupiter, at mag 0.9.

Jupiter also an early riser continues moving east in Taurus. Jupiter at 32° is separating itself of the Sun, and will remain in Taurus till next June.

Saturn on the 1st starts it's retrograde motion in Aquarius, that will last till mid-November. On the afternoon of the 24th Moon occults Saturn(at 2 pm).

Uranus continues moving east in Taurus, at mag 5.8, where it will remain till the end of the year. On the 15th Mars slides past ½° south. Both less than 6° below the Pleiades.

Neptune is moving west near the southern border of Pisces at 7.9.

Dwarf Planets

134340 Pluto spends the month, in retrograde, in western Capricorn moving east at mag 14.4. On the 21st the full Moon is 1¼° south.

1 Ceres at mag 7.4 spends the month in central Sagittarius making a retrograde loop. On the 19th the almost full Moon passes by 1⅓° north.

2 Pallas just past its encounter with T Corona Borealis, resumes normal motion passing through the northern portion of Serpens Caput at 9.8.

3 Juno at mag 11, near the back foot of Leo, continues moving east just north of the ecliptic. By the end of month it is at mag 11, in the head of Virgo.

4 Vesta starts the month in central Cancer just north of M44. On the 23rd, at mag 8.3, Venus passes by 1½° south, at month's end coming to rest in western Leo.

Moon Phases



First Qtr Jul 13 Full Jul 21 Third Qtr Jul 27 New Jul 5

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
7/1/2024	01:57	16:19	05:43	20:09
7/5/2024	05:08	20:33	05:45	20:09
7/10/2024	10:16	23:15	05:48	20:07
7/15/2024	15:02	00:51	05:51	20:05
7/20/2024	20:05	04:44	05:54	20:03
7/25/2024	22:58	10:43	05:58	19:59
7/30/2024	01:16	16:29	06:01	19:55

Planet Data*

July 1

	Rise	Transit	Set	Mag	Phase%
Mercury	07:07	14:17	21:26	-0.49	76.3
Venus	06:17	13:29	20:42	-3.91	99.1
Mars	02:21	09:09	15:57	0.98	90.5
Jupiter	03:36	10:39	17:43	-2.05	99.5
Saturn	23:48	05:33	11:22	2.45	99.7

July 15

	Rise	Transit	Set	Mag	Phase%
Mercury	07:59	14:45	21:31	0.22	54.1
Venus	06:45	13:47	20:49	-3.91	97.9
Mars	01:58	08:54	15:50	0.95	89.8
Jupiter	02:51	09:56	17:01	-2.10	99.5
Saturn	22:52	04:37	10:26	3.11	99.8

July 30

	Rise	Transit	Set	Mag	Phase%
Mercury	08:08	14:32	20:56	0.99	29.6
Venus	07:16	14:02	20:48	-3.91	96.2
Mars	01:34	08:38	15:41	0.89	89.1
Jupiter	02:03	09:09	16:15	-2.16	99.3
Saturn	21:52	03:36	09:24	1.38	99.9

*All time mentioned are local and approximate.

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

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July 2024

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 July 6, 2024. The list is sorted by the transit time of the object.

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M81	Bode's Galaxy	Galaxy	UMa	09h 55m 33s	+69° 03.9'	7.8	Circ	15:54	Circ
M82	Cigar Galaxy	Galaxy	UMa	09h 55m 53s	+69° 40.8'	9.2	Circ	15:54	Circ
M95	NGC3351	Galaxy	Leo	10h 43m 58s	+11° 42.2'	10.6	10:06	16:42	23:18
M96	NGC3368	Galaxy	Leo	10h 46m 46s	+11° 49.2'	10.1	10:09	16:45	23:21
M105	NGC3379	Galaxy	Leo	10h 47m 50s	+12° 34.9'	10.5	10:07	16:46	23:25
M108	NGC3556	Galaxy	UMa	11h 11m 31s	+55° 40.4'	10.6	Circ	17:10	Circ
M97	Owl Nebula	P Neb	UMa	11h 14m 48s	+55° 01.1'	12.0	Circ	17:13	Circ
M65	Leo Triplet	Galaxy	Leo	11h 18m 56s	+13° 05.5'	10.1	10:37	17:17	23:57
M66	Leo Triplet	Galaxy	Leo	11h 20m 15s	+12° 59.4'	9.7	10:39	17:18	23:58
M109	NGC3992	Galaxy	UMa	11h 57m 36s	+53° 22.4'	10.6	07:05	17:56	04:47
M98	NGC4192	Galaxy	Com	12h 13m 48s	+14° 54.0'	10.9	11:26	18:12	00:58
M99	Virgo Cluster	Galaxy	Com	12h 18m 50s	+14° 25.0'	10.4	11:33	18:17	01:01
M106	NGC4258	Galaxy	CVn	12h 18m 58s	+47° 18.2'	9.1	08:55	18:17	03:39
M61	Swelling Spiral	Galaxy	Vir	12h 21m 55s	+04° 28.3'	10.1	12:05	18:20	00:35
M40	Winnecke 4	Dbl+Asterism	UMa	12h 22m 12s	+58° 05.0'	8.7	Circ	18:20	Circ
M100	Mirror of M99	Galaxy	Com	12h 22m 55s	+15° 49.3'	10.1	11:33	18:21	01:09
M84	NGC4374	Galaxy	Vir	12h 25m 04s	+12° 53.2'	10.2	11:44	18:23	01:03
M85	NGC4382	Galaxy	Com	12h 25m 24s	+18° 11.4'	10.0	11:28	18:24	01:19
M86	NGC4406	Galaxy	Vir	12h 26m 12s	+12° 56.7'	9.9	11:45	18:24	01:04
M49	NGC4472	Galaxy	Vir	12h 29m 47s	+08° 00.0'	9.3	12:03	18:28	00:53
M87	Smoking Gun	Galaxy	Vir	12h 30m 49s	+12° 23.4'	9.6	11:51	18:29	01:07
M88	NGC4501	Galaxy	Com	12h 31m 59s	+14° 25.2'	10.2	11:46	18:30	01:14
M91	Missing Messier Object	Galaxy	Com	12h 35m 27s	+14° 29.7'	10.9	11:49	18:34	01:18
M89	NGC4552	Galaxy	Vir	12h 35m 40s	+12° 33.3'	10.9	11:55	18:34	01:12
M90	NGC4569	Galaxy	Vir	12h 36m 50s	+13° 09.7'	10.2	11:55	18:35	01:15
M58	NGC4579	Galaxy	Vir	12h 37m 44s	+11° 49.1'	10.4	12:00	18:36	01:12
M68	NGC4590	Globular	Hya	12h 39m 28s	-26° 44.5'	9.0	13:56	18:38	23:19
M104	Sombrero Galaxy	Galaxy	Vir	12h 39m 59s	-11° 37.3'	9.2	13:08	18:38	00:08
M59	NGC4621	Galaxy	Vir	12h 42m 02s	+11° 38.7'	10.7	12:04	18:40	01:16
M60	NGC4649	Galaxy	Vir	12h 43m 40s	+11° 33.1'	9.8	12:06	18:42	01:17
M94	Croc's Eye Galaxy	Galaxy	CVn	12h 50m 53s	+41° 07.1'	8.9	10:15	18:49	03:23
M64	Black Eye Galaxy,	Galaxy	Com	12h 56m 44s	+21° 41.0'	9.3	11:48	18:55	02:02
M53	NGC5024	Globular	Com	13h 12m 55s	+18° 10.1'	8.5	12:15	19:11	02:07
M63	Sunflower Galaxy	Galaxy	CVn	13h 15m 49s	+42° 01.7'	9.3	10:34	19:14	03:54
NGC5139	Omega Centauri	Globular	Cen	13h 26m 48s	-47° 29.0'	3.6	16:36	19:25	22:14
NGC5169		Galaxy	CVn	13h 28m 10s	+46° 40.3'	14.0	10:10	19:26	04:42
NGC5204		Galaxy	UMa	13h 29m 36s	+58° 25.1'	11.3	Circ	19:28	Circ

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July 2024

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M51	Whirlpool Galaxy	Galaxy	CVn	13h 29m 52s	+47° 11.7'	8.9	10:07	19:28	04:49
Arp85	M51B	Galaxy	CVn	13h 29m 58s	+47° 16.0'	9.6	10:07	19:28	04:50
NGC5182		Galaxy	Hya	13h 30m 41s	-28° 09.0'	13.0	14:53	19:29	00:05
NGC5214		Galaxy	CVn	13h 32m 49s	+41° 52.3'	14.0	10:52	19:31	04:10
M83	Southern Pinwheel Galaxy	Galaxy	Hya	13h 37m 00s	-29° 51.8'	8.0	15:06	19:35	00:05
HR5144	1 Boo	Triple	Boo	13h 40m 40s	+19° 57.3'	5.8	12:37	19:39	02:40
NGC5283		Galaxy	Dra	13h 41m 06s	+67° 40.3'	14.0	Circ	19:39	Circ
M3	NGC5272	Globular	CVn	13h 42m 11s	+28° 22.5'	7.0	12:09	19:40	03:12
NGC5286	C84	Globular	Cen	13h 46m 24s	-51° 22.0'	7.6	17:38	19:45	21:52
NGC5292		Galaxy	Cen	13h 47m 40s	-30° 56.4'	14.0	15:21	19:46	00:11
NGC5356		Galaxy	Vir	13h 54m 59s	+05° 20.0'	14.0	13:35	19:53	02:11
NGC5363		Galaxy	Vir	13h 56m 07s	+05° 15.2'	10.2	13:37	19:54	02:12
NGC5447	III-787	Neb	UMa	14h 02m 29s	+54° 16.3'		08:38	20:01	07:24
M101	Pinwheel Galaxy	Galaxy	UMa	14h 03m 13s	+54° 20.9'	8.2	08:34	20:01	07:28
NGC5461	III-788	Neb	UMa	14h 03m 42s	+54° 19.0'		08:37	20:02	07:27
NGC5485		Galaxy	UMa	14h 07m 11s	+55° 00.0'	11.5	Circ	20:05	Circ
NGC5460		Open	Cen	14h 07m 27s	-48° 20.6'	5.6	17:25	20:06	22:47
NGC5500		Galaxy	Boo	14h 10m 15s	+48° 32.7'	14.0	10:34	20:08	05:43
IC991		Galaxy	Vir	14h 17m 48s	-13° 52.3'	13.0	14:53	20:16	01:39
HR5362	HD125383	Dbl	Lup	14h 20m 10s	-43° 03.5'	5.6	16:55	20:18	23:41
IC4406	Retina Nebula	P Neb	Lup	14h 22m 26s	-44° 09.0'	11.0	17:05	20:21	23:36
HR5409	Phi Vir, 105 Vir	Triple	Vir	14h 28m 12s	-02° 13.6'	4.8	14:30	20:26	02:23
NGC5669		Galaxy	Boo	14h 32m 44s	+09° 53.4'	12.0	14:00	20:31	03:02
NGC5689		Galaxy	Boo	14h 35m 30s	+48° 44.5'	11.9	10:57	20:34	06:10
M102	Spindle Galaxy (duplicate of M101?)	Galaxy	Dra	15h 06m 30s	+55° 45.7'	10.8	Circ	21:05	Circ
NGC5875		Galaxy	Boo	15h 09m 13s	+52° 31.6'	13.0	10:36	21:07	07:39
NGC5907	Splinter Galaxy	Galaxy	Dra	15h 15m 54s	+56° 19.7'	11.4	Circ	21:14	Circ
NGC5882		P Neb	Lup	15h 16m 50s	-45° 38.9'	11.0	18:11	21:15	00:19
NGC5897		Globular	Lib	15h 17m 24s	-21° 00.6'	8.6	16:14	21:16	02:17
M5	NGC5904	Globular	Ser	15h 18m 33s	+02° 04.9'	7.0	15:08	21:17	03:25
Barnard228	B228	DkNeb	Lup	15h 44m 00s	-34° 30.0'		17:33	21:42	01:52
IC4593	White Eyed Pea	P Neb	Her	16h 11m 44s	+12° 04.3'	11.0	15:33	22:10	04:47
IC4592	Jabbah	Neb	Sco	16h 11m 59s	-19° 27.4'		17:04	22:10	03:16
M80	NGC6093	Globular	Sco	16h 17m 03s	-22° 58.5'	8.5	17:21	22:15	03:10
IC4601		Neb	Sco	16h 20m 18s	-20° 04.9'		17:14	22:18	03:23
Abell38		P Neb	Sco	16h 23m 17s	-31° 44.9'	11.7	18:00	22:21	02:43
M4	Cat's Eye	Globular	Sco	16h 23m 35s	-26° 31.5'	7.5	17:40	22:22	03:04
IC4603	Rho Ophiuchi Complex [1]	Neb	Oph	16h 25m 24s	-24° 28.0'		17:34	22:24	03:13

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July 2024

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
IC4604	Rho Ophiuchi Complex [2]	Neb	Oph	16h 25m 33s	-23° 26.5'		17:31	22:24	03:17
NGC6124	C75	Open	Sco	16h 25m 36s	-40° 40.0'	5.8	18:46	22:24	02:02
Abell39		P Neb	Her	16h 27m 33s	+27° 54.5'	12.9	14:56	22:26	05:56
IC4605		Neb	Sco	16h 30m 12s	-25° 06.8'		17:41	22:28	03:16
NGC6153		P Neb	Sco	16h 31m 31s	-40° 15.2'	12.0	18:49	22:30	02:10
NGC6181		Galaxy	Her	16h 32m 21s	+19° 49.5'	11.9	15:29	22:31	05:32
NGC6171		Globular	Oph	16h 32m 32s	-13° 03.1'	8.1	17:05	22:31	03:56
NGC6178		Open	Sco	16h 35m 47s	-45° 38.6'	7.2	19:30	22:34	01:38
NGC6193	C82	Open	Ara	16h 41m 18s	-48° 46.0'	5.2	20:03	22:39	01:16
M13	Great Hercules Cluster	Globular	Her	16h 41m 41s	+36° 27.5'	7.0	14:32	22:40	06:47
NGC6210	Turtle P Nebula	P Neb	Her	16h 44m 30s	+23° 48.0'	9.0	15:28	22:43	05:57
Barnard44a	B44a	DkNeb	Sco	16h 44m 45s	-40° 20.0'		19:03	22:43	02:23
NGC6204		Open	Ara	16h 46m 09s	-47° 01.0'	8.2	19:51	22:44	01:37
M12	Gumball Globular	Globular	Oph	16h 47m 14s	-01° 56.8'	8.0	16:48	22:45	04:43
NGC6231	Table of Scorpius	Open	Sco	16h 54m 00s	-41° 48.0'	2.6	19:21	22:52	02:23
IC4628	Prawn Nebula	Neb	Sco	16h 56m 58s	-40° 27.3'		19:16	22:55	02:34
NGC6254		Globular	Oph	16h 57m 09s	-04° 05.9'	6.6	17:04	22:55	04:47
Barnard47	B47	DkNeb	Oph	16h 59m 42s	-22° 38.0'		18:02	22:58	03:54
M62	Flickering Globular	Globular	Oph	17h 01m 13s	-30° 06.7'	8.0	18:31	22:59	03:28
M19	NGC6273	Globular	Oph	17h 02m 38s	-26° 16.0'	8.5	18:18	23:01	03:44
Barnard51		DkNeb	Oph	17h 04m 44s	-22° 15.0'		18:06	23:03	04:00
IC4637		P Neb	Sco	17h 05m 10s	-40° 53.1'	14.0	19:27	23:03	02:40
Barnard56		DkNeb	Sco	17h 08m 48s	-32° 05.0'		18:47	23:07	03:27
Barnard59	Pipe Nebula	DkNeb	Oph	17h 11m 23s	-27° 29.0'		18:31	23:10	03:48
NGC6302	Bug Nebula	P Neb	Sco	17h 13m 42s	-37° 06.0'	9.6	19:15	23:12	03:09
Barnard251		DkNeb	Oph	17h 13m 48s	-20° 09.0'		18:08	23:12	04:16
Barnard63		DkNeb	Oph	17h 16m 00s	-21° 28.0'		18:15	23:14	04:14
M92	NGC6341	Globular	Her	17h 17m 07s	+43° 08.1'	7.5	14:28	23:15	08:03
M9	NGC6333	Globular	Oph	17h 19m 12s	-18° 31.0'	9.0	18:08	23:17	04:27
NGC6326		P Neb	Ara	17h 20m 46s	-51° 45.2'	12.0	21:17	23:19	01:21
Barnard256	B256	DkNeb	Oph	17h 22m 12s	-28° 49.0'		18:47	23:20	03:54
Barnard67a	B67a	DkNeb	Oph	17h 22m 30s	-21° 53.0'		18:22	23:21	04:19
Barnard71	B71	DkNeb	Oph	17h 23m 02s	-24° 00.0'		18:30	23:21	04:12
NGC6357	Lobster Nebula	Neb	Sco	17h 24m 43s	-34° 12.1'		19:12	23:23	03:34
IC4651		Open	Ara	17h 24m 52s	-49° 56.5'	6.9	20:59	23:23	01:47
Abell41		P Neb	Ser	17h 29m 04s	-15° 13.3'	13.9	18:08	23:27	04:47
Abell42		P Neb	Oph	17h 31m 31s	-08° 19.1'	14.6	17:50	23:30	05:09
Barnard78	B78	DkNeb	Oph	17h 32m 00s	-25° 35.0'		18:45	23:30	04:16
NGC6388		Globular	Sco	17h 36m 17s	-44° 44.1'	6.9	20:23	23:34	02:46

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July 2024

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M14	NGC6402	Globular	Oph	17h 37m 36s	-03° 14.7'	9.5	17:42	23:36	05:29
Barnard276	B276	DkNeb	Oph	17h 39m 39s	-19° 49.0'		18:33	23:38	04:43
M6	Butterfly Cluster	Open	Sco	17h 40m 20s	-32° 15.2'	4.5	19:19	23:38	03:58
NGC6397	C86	Globular	Ara	17h 40m 42s	-53° 40.0'	5.6	22:09	23:39	01:08
NGC6426		Globular	Oph	17h 44m 55s	+03° 10.1'	11.2	17:31	23:43	05:55
Barnard83a	B83a	DkNeb	Sgr	17h 45m 18s	-20° 00.0'		18:39	23:43	04:48
IC4665		Open	Oph	17h 46m 30s	+05° 39.0'	4.2	17:26	23:45	06:03
NGC6445	Crescent Nebula	P Neb	Sgr	17h 49m 15s	-20° 00.6'	13.0	18:43	23:47	04:52
NGC6503		Galaxy	Dra	17h 49m 27s	+70° 08.6'	10.2	Circ	23:48	Circ
NGC6441		Globular	Sco	17h 50m 13s	-37° 03.0'	7.4	19:51	23:48	03:46
Barnard283	B283	DkNeb	Sco	17h 51m 00s	-33° 52.0'		19:37	23:49	04:02
Barnard285	B285	DkNeb	Ser	17h 51m 32s	-12° 52.0'		18:23	23:50	05:16
M7	Ptolemy's Cluster	Open	Sco	17h 53m 51s	-34° 47.6'	3.5	19:44	23:52	04:00
IC4670		Neb	Sgr	17h 55m 07s	-21° 44.6'		18:55	23:53	04:52
NGC6501		Galaxy	Her	17h 56m 04s	+18° 22.3'	12.3	16:58	23:54	06:51
M23	NGC6494	Open	Sgr	17h 57m 04s	-18° 59.1'	6.0	18:48	23:55	05:03
NGC6543	Cat Eye Nebula	P Neb	Dra	17h 58m 36s	+66° 38.0'	8.1	Circ	23:57	Circ
NGC6496		Globular	Sco	17h 59m 04s	-44° 16.0'	9.2	20:43	23:57	03:12
Barnard291	B291	DkNeb	Sgr	17h 59m 43s	-33° 53.0'		19:45	23:58	04:10
Barnard292	B292	DkNeb	Sgr	18h 00m 34s	-33° 20.0'		19:44	23:59	04:14
Barnard293	B293	DkNeb	Sgr	18h 01m 12s	-35° 20.0'		19:54	23:59	04:05
M20	The Clover	Open+D Neb	Sgr	18h 02m 42s	-22° 58.2'	5.0	19:06	00:01	04:55
M8	Lagoon Nebula	Open+D Neb	Sgr	18h 03m 41s	-24° 22.7'	5.0	19:12	00:02	04:52
M21	NGC6531	Open	Sgr	18h 04m 13s	-22° 29.3'	7.0	19:06	00:02	04:59
NGC6530		Open	Sgr	18h 04m 31s	-24° 21.5'	4.6	19:13	00:03	04:52
NGC6528		Globular	Sgr	18h 04m 50s	-30° 03.3'	9.5	19:34	00:03	04:32
IC4684		Neb	Sgr	18h 09m 08s	-23° 26.1'		19:14	00:07	05:00
IC4685		Neb	Sgr	18h 09m 18s	-23° 59.2'		19:16	00:07	04:59

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
Sel - Sculptor
Sco - Scorpius
Sct - Scutum
Ser - Serpens
Sex - Sextans

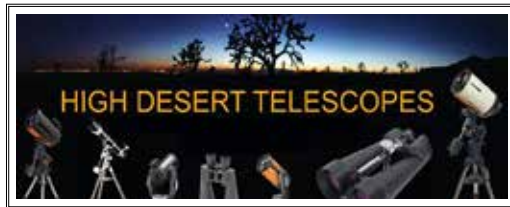
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Sgr - Sagittarius
Tau - Taurus
Tel - Telescopium
TrA - Triangulum Australe
Tri - Triangulum
Tuc - Tucana
UMa - Ursa Major
UMi - Ursa Minor
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Vir - Virgo
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