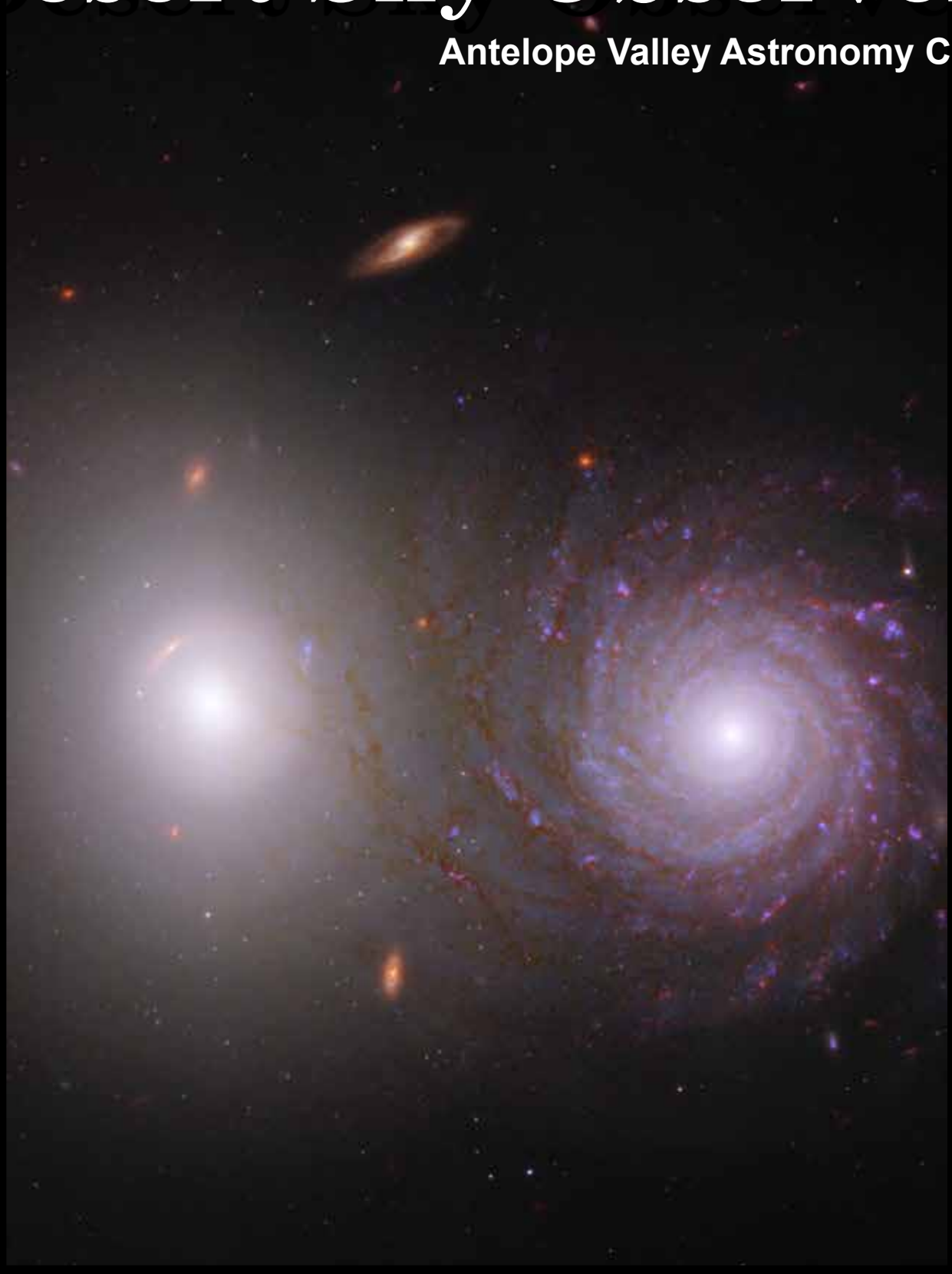
Volume 44.6 June 2024

# Desert Sky Observer

Antelope Valley Astronomy Club



## Upcoming Events

June 8: DSSP at Chuchupate
June 14: Club Meeting
June 15: Moonwalk @ Prime Desert Woodland
Sunset @ 8:08 pm

Every clear night: Personal Star Party

July 6: DSSP at Mt Pinos
July 12: Club Meeting
July 27: Moonwalk @ Prime Desert Woodland
Sunset @ 8:04 pm

AVAC Calendar


## Board Members

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

**Vice-President:** Matt Leone (661) 713-1894
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**Secretary:** Rose Moore (661) 972-1953
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**Director of Community Development:**
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## Appointed Positions

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**Club Historian:** vacant
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**Webmaster:** Steve Trotta (661) 269-5428
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**Night Sky Coordinator:**
Rose Moore (661) 972-1953

**Astronomical League Coordinator:**
Phil Wriedt (661) 917-4874
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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 8th/9th of June, at Chuchupate. The weather seems to be cooperating lately, so there is a good chance there will be good weather for once. There will be a two day moon (5%) that will set about 10:41 pm, but will disappear behind Mt Pinos a lot sooner. Astronomical twilight ends at 9:49.

Our next Club Meeting is on Friday, the 14th, and I'd like to say we have a speaker, but I don't know yet. I'm not even sure what room the meeting will be held in. The planetarium is due to get the dome scrubbed and new seating installed "late June or early July;" anybody whose hired a contractor can interpret that how they wish - so, if we don't meet in the planetarium then we'll meet in the multipurpose room

I suggested to Jeremy that on Saturday the 15th we resume holding a Moonwalk at Prime Desert Woodland park. It's up to Jeremy if this happens. 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 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 June and July it will be near zenith.

Keep Looking Up, Phil

## On The Cover

Please note: North is 117.0° right of vertical RA: 13h 48' 22.01" DEC: 25° 40' 37.62" ( Bootes )

By combining data from the NASA/ESA/CSA James Webb Space Telescope and the NASA/ESA Hubble Space Telescope, researchers were able to trace light that was emitted by the large white elliptical galaxy at left through the spiral galaxy at right and identify the effects of interstellar dust in the spiral galaxy. This image of galaxy pair VV 191 includes near-infrared light from Webb, and ultraviolet and visible light from Hubble.

Webb's near-infrared data also show us the galaxy's longer, extremely dusty spiral arms in far more detail, giving them an appearance of overlapping with the central bulge of the bright white elliptical galaxy on the left. Although the two foreground galaxies are relatively close astronomically speaking, they are not actively interacting.

Don't overlook the background scenery! Like many Webb images, this image of VV 191 shows many galaxies that lie great distances away. For example, two patchy spirals to the upper left of the elliptical galaxy have similar apparent sizes, but show up in very different colors. One is likely very dusty and the other very far away, but researchers need to obtain data known as spectra to determine which is which.

Note: This image highlights Webb's science in progress, which has not yet been through the peer-review process.

Credit:
NASA, ESA, CSA, Rogier Windhorst (ASU), William Keel (University of Alabama), Stuart Wyithe (University of Melbourne), JWST PEARLS Team, Alyssa Pagan (STScI)

## From the Secretary

By Rose Moore

Members:

Thank you to members who attended the Lunar Club at Matt's and those who attended the Moon 'walk' at the SAGE Planetarium!

We don't have dates for Prime Desert Moon Walks just yet. Jeremy will be receiving some dates from PDW for future walks soon; they'll be put up on our calendar as soon as available.

We start off June with a dark sky star party, at Chuchupate, on Saturday June 8th; weather permitting. Please check the weather before leaving home! The Moon will be a waxing crescent about 3.7%, and will set at 10:42pm. Sunset is at 8:06pm. All planets will below the horizon until very early morning hours. You may arrive anytime on Saturday for this overnight star party. If you are not staying overnight, please park your vehicle facing the exit, and exit slowly with your parking lights on. Turn on your lights when you have arrived at the exit of the parking lot and are facing away from astronomers. Some are there doing astrophotography. Further info to follow in an email.

Dates for future dark sky star parties will be posted soon on our website.

Our club meeting will be on Friday June 14th. We are still trying to get speakers!

Clear skies, Rose

## Vice President's Report

By Matt Leone

It is with great sadness that the astronomy world lost a great pioneer who was taken from us to be home with the Lord. Doug Drake, father, navy fighter pilot, jet test pilot, astronomer, wonderful friend, president of the astronomy club and a man who would give you the shirt off his back if you needed it. Passed away May 24, 2024, reported to us from his loving daughter.

Doug lived a very full life; he not only flew navy fighter jets for our protection, he was one of the main F35 engine developers. He wanted to tell us for years but it was top secret. When he could, he invited us over to his home to watch the video on the jet's test engine. Doug was one of the great people to help me understand what an astronomer is and navigate the sky. I can remember when I showed everyone my 16-inch scope. Doug came over to me, with a glow in his eyes, with his mouth opened wide and a huge smile on his face and said: "wow you have a great scope." Doug named my scope "The hot water heater" along with Terry's[Pedroza] dad. He taught classes on how to observe planets. I can still see him looking through his scope and drawing what he saw, with patience. He loved to draw what he saw through the scope. One day, he showed me binders of his drawings of planets, galaxies, nebula's, star clusters, and brilliant stars. God, I will miss him. I feel part of the night sky has been torn from me. Rest in peace Doug and enjoy observing the universe with the Great Astronomer. You are missed!

Matthew Leone

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)

# Constant Companions: Circumpolar Constellations, Part III

by Katherine Troche, Astronomy Society of the Pacific, NASA Night Sky Network

*This stunning Hubble image was assembled using observations in visible and infrared light. The galaxy's spiral arms, which wind all the way down into its nucleus, are made up of young, bluish, hot stars formed in the past few million years. NASA, ESA and the Hubble Heritage Team (STScI/AURA)*

**In our final installment** of the stars around the North Star, we look ahead to the summer months, where depending on your latitude, the items in these circumpolar constellations are nice and high. Today, we'll discuss **Cepheus, Draco, and Ursa Major**. These objects can all be spotted with a medium to large-sized telescope under dark skies.

*From left to right: Ursa Major, Draco, and Cepheus. Credit: Stellarium Web*

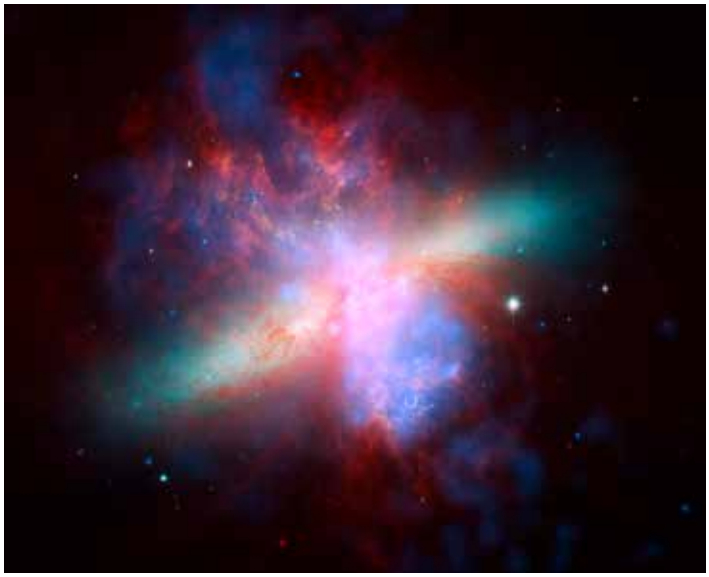
• **Herschel's Garnet Star**: Mu Cephei is a deep-red hypergiant known as The Garnet Star, or Erakis. While the star is not part of the constellation pattern, it sits within the constellation boundary of Cepheus, and is more than 1,000 times the size of our Sun. Like its neighbor Delta Cephei, this star is variable, but is not a reliable Cepheid variable. Rather, its brightness can vary anywhere between 3.4 to 5.1 in visible magnitude, over the course of 2-12 years.

**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!

• **The Cat's Eye Nebula:** Labeled a planetary nebula, there are no planets to be found at the center of this object. Observations taken with NASA's Chandra X-ray Observatory and Hubble Space Telescopes give astronomers a better understanding of this complex, potential binary star, and how its core ejected enough mass to produce the rings of dust. When searching for this object, look towards the 'belly' of Draco with a medium-sized telescope.

*This composite of data from NASA's Chandra X-ray Observatory and Hubble Space Telescope gives astronomers a new look for NGC 6543, better known as the Cat's Eye nebula. This planetary nebula represents a phase of stellar evolution that our sun may well experience several billion years from now. Credit: X-ray: NASA/CXC/SAO; Optical: NASA/STScI*



*The Cigar Galaxy.*
*Credit: NASA, ESA, CXC, and JPL-Caltech*

• **Bode's Galaxy and the Cigar Galaxy:** Using the arrow on the star map, look diagonal from the star Dubhe in Ursa Major. There you will find Bode's Galaxy (Messier 81) and the Cigar Galaxy (Messier 82). Sometimes referred to as Bode's Nebula, these two galaxies can be spotted with a small to medium-sized telescope. Bode's Galaxy is a classic spiral shape, similar to our own Milky Way galaxy and our neighbor, Andromeda. The Cigar Galaxy, however, is known as a starburst galaxy type, known to have a high star formation rate and incredible shapes. This image composite from 2006 combines the power of three great observatories: the Hubble Space Telescope imaged hydrogen in orange, and visible light in yellow green; Chandra X-Ray Observatory portrayed X-ray in blue; Spitzer Space Telescope captured infrared light in red.

Up next, we celebrate the solstice with our upcoming mid-month article on the Night Sky Network page through NASA's website!

# Space News

News from around the Net

**Cosmic "Hand" Reaches For The Stars**

Stars are not born brilliant but obscured, cocooned in piles of dust and gas called Bok globules. Astronomers have worked for the past century to understand how infant stars emerge from these cocoons. This image, from the Dark Energy Camera (DECam) on the Víctor M. Blanco 4-meter Telescope at Cerro Tololo Inter-American Observatory in Chile, helps shed light on that process. DECam captures one of these globules, named Cometary Globule 4 ("cometary" comes from its tail-like appearance), which appears in the image as a giant, outstretched hand. CG 4 is 1,300 light-years away in the southern constellation Puppis. . . .(continued at https://skyandtelescope.org/astronomy-news/cosmic-hand-reaches-for-the-stars/ )

**Euclid Space Telescope Unveils New Images Of The Cosmos**

A mind-boggling number of shining galaxies, a purple and orange star nursery and a spiral galaxy similar to our Milky Way: new images were revealed from Europe's Euclid space telescope on Thursday. It is the second set of images released by the European Space Agency since Euclid launched last year on the first-ever mission to investigate the mysteries of dark matter and dark energy. Scientific results were also published for the first time in the six-year mission, which aims to use its wide view to chart two billion galaxies across a third of the sky. ( continued at https://phys.org/news/2024-05-euclid-space-telescope-unveils-images.html )

**Stargazing In Broad Daylight: How A Multi-Lens Telescope Is Changing Astronomy**

Astronomers at Macquarie University have pioneered a new technique for observing celestial objects during the day, potentially allowing around-the-clock visual monitoring of satellites and greatly improving safety on Earth and in space. Their technique uses the University's Huntsman Telescope, a unique array of 10 camera lenses working in parallel, originally designed for ultra-sensitive night sky observations. In a paper published in Publications of the Astronomical Society of Australia on 20 May, the researchers demonstrate the Huntsman's ability to accurately measure stars, satellites and other targets when the sun is high overhead, despite astronomers traditionally only observing at night. . . . (continued at https://phys.org/news/2024-05-stargazing-broad-daylight-multi-lens.html )

**Intriguing nearby world sized between Earth, Venus**

Using observations by NASA's TESS (Transiting Exoplanet Survey Satellite) and many other facilities, two international teams of astronomers have discovered a planet between the sizes of Earth and Venus only 40 light-years away. Multiple factors make it a candidate well-suited for further study using NASA's James Webb Space Telescope. TESS stares at a large swath of the sky for about a month at a time, tracking the brightness changes of tens of thousands of stars at intervals ranging from 20 seconds to 30 minutes. .(continued at https://www.sciencedaily.com/releases/2024/05/240523153445.htm )

**NASA's Europa Clipper Makes Cross-Country Flight To Florida**

NASA's Europa Clipper, a spacecraft designed to investigate Jupiter's icy moon Europa and its potential to support life, arrived in Florida on Thursday, May 23. The spacecraft, assembled at NASA's Jet Propulsion Laboratory in Southern California, landed aboard a United States Air Force C-17 Globemaster III aircraft at the Launch and Landing Facility at NASA's Kennedy Space Center. The mission aims to gather detailed measurements of the moon's surface, interior, and space environment by performing approximately 50 close flybys, some as low as 16 miles (25 kilometers) from the surface of Europa, which holds a global ocean underneath its ice shell. . . . (continued at https://www.jpl.nasa.gov/news/nasas-europa-clipper-makes-cross-country-flight-to-florida )

# Space News

News from around the Net

**Look Up To See The Parade Of Planets In June's Pre-Dawn Sky (And Bring Binoculars)**
There's a major planetary lineup coming to the early-morning sky, with the Moon joining in several times in June. First, though, let's look at why such lineups occur. If you were to turn our solar system on its side and look at it edge-on, you'd notice that all the planets orbit in a relatively flat plane around the Sun. We call this plane the ecliptic, which is defined specifically by Earth's orbit around our star. So, Earth's orbit is tilted 0° from the ecliptic because it defines the ecliptic. All the other planets' orbits are inclined somewhat from the ecliptic, but not much — Mercury's inclination is the highest, and it's just 7° . . . (continued at https://www.astronomy.com/observing/how-to-see-six-planets-line-up-in-june/ )

**NASA's Lucy Mission Reveals Asteroid's Strange Moon**
When NASA's Lucy mission passed within 430 kilometers (270 miles) of asteroid 152830 Dinkinesh last November, Hal Levison (Southwest Research Institute) expected it to be "just a rock in space." It turned out to be more than that. The Lucy team had diverted the spacecraft not for science but because its orbit in the inner main belt made it a good place to test the spacecraft's tracking and range-finding system on its way to scientific targets among Jupiter's Trojan asteroids. But Levison, Lucy's principal investigator, says that once the team saw a contact binary moon orbiting 720-meter Dinkinesh, what had started out as routine "was anything but boring.". . . (continued at https://skyandtelescope.org/astronomy-news/nasas-lucy-mission-reveals-asteroids-strange-moon/ )

**South Korea Is Planning To Send A Mission To Mars By 2045**
It is truly wonderful to see so many nations aspiring to space exploration and trips to the Moon. Earlier this week on the 27th May, South Korea innaugurated its new space agency, the Korea AeroSpace Administration otherwise known as KASA. The group is headed up by former professor of aerospace engineering Yoon Young-bin. Whilst the group has yet to announce detailed plans for their upcoming missions Young-bin has stated they hope to land on the Moon by 2032 and to get to Mars by 2045. . . . (continued at https://www.universetoday.com/167205/south-korea-is-planning-to-send-a-mission-to-mars-by-2045/ )

**New Technique Offers More Precise Maps Of The Moon's Surface**
A new study by Brown University researchers may help redefine how scientists map the surface of the Moon, making the process more streamlined and precise than ever before. Published in the Planetary Science Journal, the research by Brown scholars Benjamin Boatwright and James Head describes enhancements to a mapping technique called shape-from-shading. The technique is used to create detailed models of lunar terrain, outlining craters, ridges, slopes and other surface hazards. By analyzing the way light hits different surfaces of the Moon, it allows researchers to estimate the three-dimensional .. . (continued at https://www.sciencedaily.com/releases/2024/05/240529144027.htm )

**The Comet Highlight Of The Year Is Yet To Come. Here's How To Find And Observe C/2023 A3 Tsuchinshan-Atlas In June** There were a number of binocular- and small-telescope-bright comets at the start of 2024. However, the comet highlight event for the year is yet to come, in the form of C/2023 A3 Tsuchinshan–ATLAS, which reaches perihelion (its closest point to the Sun) on 27 September. Around this time, C/2023 A3 is expected to brighten above the naked-eye threshold. Although it'll be challengingly-placed for observing around perihelion from the UK, it's predicted to remain above the naked-eye threshold when it re-emerges into our evening sky during October. At this time, it may also have the potential to become something rather special – although, as ever with comets, there are no guarantees. . . .(continued at https://www.skyatnightmagazine.com/advice/how-locate-c-2023-a3-tsuchinshan-atlas )

# Webb Cracks Case Of Inflated Exoplanet

*20 May 2024 — ESA/Hubble Science Release weic2414*

Data collected using the NASA/ESA/CSA James Webb Space Telescope, combined with earlier observations from the NASA/ESA Hubble Space Telescope, show surprisingly little methane (CH4) in the atmosphere of WASP-107 b, indicating that the interior of the planet must be significantly hotter and the core much more massive than previously estimated.

Why is the warm gas-giant exoplanet WASP-107 b so puffy? Two independent teams of researchers have an answer.

The unexpectedly high temperature is thought to be a result of tidal heating caused by the planet's slightly non-circular orbit, and can explain how WASP-107 b can be so inflated without resorting to extreme theories of how it formed.

The results, which were made possible by Webb's extraordinary ability to measure light passing through exoplanet atmospheres, may explain the puffiness of dozens of low-density exoplanets, helping to solve a long-standing mystery in exoplanet science.

**The problem with WASP-107 b**

At more than three-quarters the volume of Jupiter but less than one-tenth the mass, the 'warm Neptune' exoplanet WASP-107 b is one of the least dense planets known. While puffy planets are not uncommon, most are hotter and more massive, and therefore easier to explain.

"Based on its radius, mass, and age , we thought WASP-107 b had a very small, rocky core surrounded by a huge mass of hydrogen and helium," explained Luis Welbanks from Arizona State University (ASU), lead author of a paper published today in Nature. "But it was hard to understand how such a small core could sweep up so much gas, and then stop short of growing fully into a Jupiter-mass planet."

If WASP-107 b instead has more of its mass in the core, the atmosphere should have contracted as the planet cooled in the time since it formed. Without a source of heat to re-expand the gas, the planet should be much smaller. Although WASP-107 b has an orbital distance of just 5 million miles (one-seventh of the distance between Mercury and the Sun), it doesn't receive enough energy from its star to be so inflated.

"WASP-107 b is such an interesting target for Webb because it's significantly cooler and more Neptune-like in mass than many of the other low-density planets, the hot Jupiters, we've been studying," said David Sing from the Johns Hopkins University (JHU), lead author of a parallel study also published today in Nature. "As a result, we should be able to detect methane and other molecules that can give us information about its chemistry and internal dynamics that we can't get from a hotter planet."

**A wealth of previously undetectable molecules**

WASP-107 b's giant radius, extended atmosphere, and edge-on orbit make it ideal for transmission spectroscopy, a method used to identify the various gases in an exoplanet atmosphere based on how they affect starlight.

Combining observations from Webb's NIRCam (Near-Infrared Camera) and MIRI (Mid-Infrared Instrument), and Hubble's WFC3 (Wide Field Camera 3), Welbanks's team was able to build a broad spectrum of 0.8- to 12.2-micron light absorbed by WASP-107 b's atmosphere. Using Webb's NIRSpec (Near-Infrared Spectrograph), Sing's team built an independent spectrum covering 2.7 to 5.2 microns .

The remarkable precision of the data makes it possible to not just detect, but actually measure the abundances

continued on next page

of a wealth of molecules, including water vapour (H2O), methane (CH4), carbon dioxide (CO2), carbon monoxide (CO), sulphur dioxide (SO2), and ammonia (NH3).

“With Webb’s NIRSpec spectroscopy we get direct insights into the chemistry of WASP-107 b”, said Stephan Birkmann of the European Space Agency and the Principal Investigator of the study’s NIRSpec observations. “The NIRSpec spectroscopy lets us probe the atmospheric composition of the planet, and neatly complements the MIRI and NIRCam observations.”

Roiling gas, hot Interior, and massive core

Both spectra show a surprising lack of methane in WASP-107 b’s atmosphere: one-thousandth of the amount expected based on its assumed temperature.

“This is evidence that hot gas from deep in the planet must be mixing vigorously with the cooler layers higher up,” explained Sing. “Methane is unstable at high temperatures. The fact that we detected so little, even though we did detect other carbon-bearing molecules, tells us that the interior of the planet must be significantly hotter than we thought.”

A likely source of WASP-107 b’s extra internal energy is tidal heating caused by its slightly elliptical orbit. With the distance between the star and planet changing continuously over the 5.7-day orbit, the gravitational pull is also changing, stretching the planet and heating it up.

Researchers had previously proposed that tidal heating could be the cause of WASP-107 b’s puffiness, but until the Webb results were in, there was no evidence.

Once they established that the planet has enough internal heat to thoroughly churn up the atmosphere, the teams realised that the spectra could also provide a new way to estimate the size of the core.

“If we know how much energy is in the planet, and we know what proportion of the planet is heavier elements like carbon, nitrogen, oxygen, and sulphur, versus how much is hydrogen and helium, we can calculate how much mass must be in the core,” explained Daniel Thorngren from JHU.

It turns out that the core is at least twice as massive as originally estimated, which makes more sense in terms of how planets form.

Altogether, it turns out that WASP-107 b is not as mysterious as it once appeared.

“The Webb data tell us that planets like WASP-107 b didn’t have to form in some odd way with a super-small core and a huge gassy envelope,” explained Mike Line from ASU. “Instead, we can take something more like Neptune, with a lot of rock and not as much gas, just dial up the temperature, and poof it up to look the way it does.”

**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.

continued on next page

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

Image Credit: NASA, ESA, CSA, R. Crawford (STScI)

**Links**

Science paper (L. Welbanks, et al.)
Science paper (D. Sing, et al.)
Science paper (A. Dyrek, et al.)
Release on STScI website

**Contacts**

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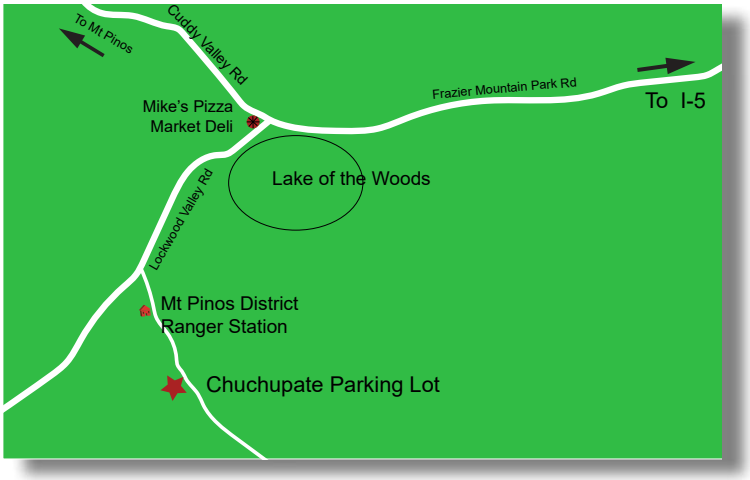
Email: Bethany.Downer@esawebb.org

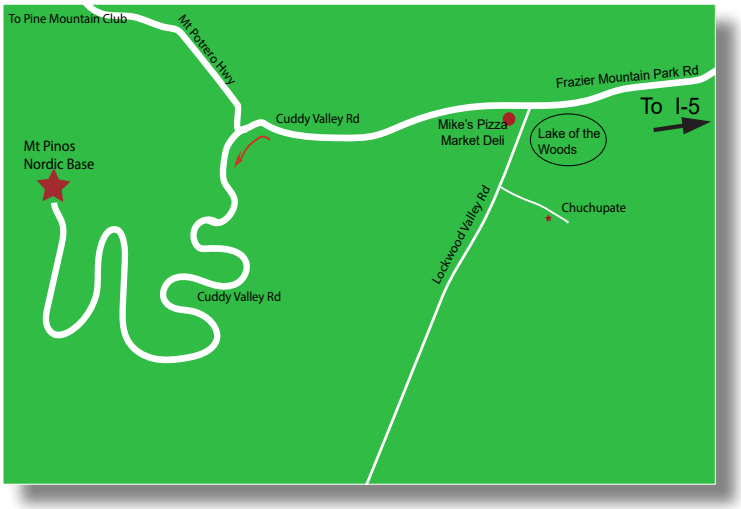
Ninja Menning
ESA Newsroom and Media Relations Office
Email: media@esa.int

## 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.

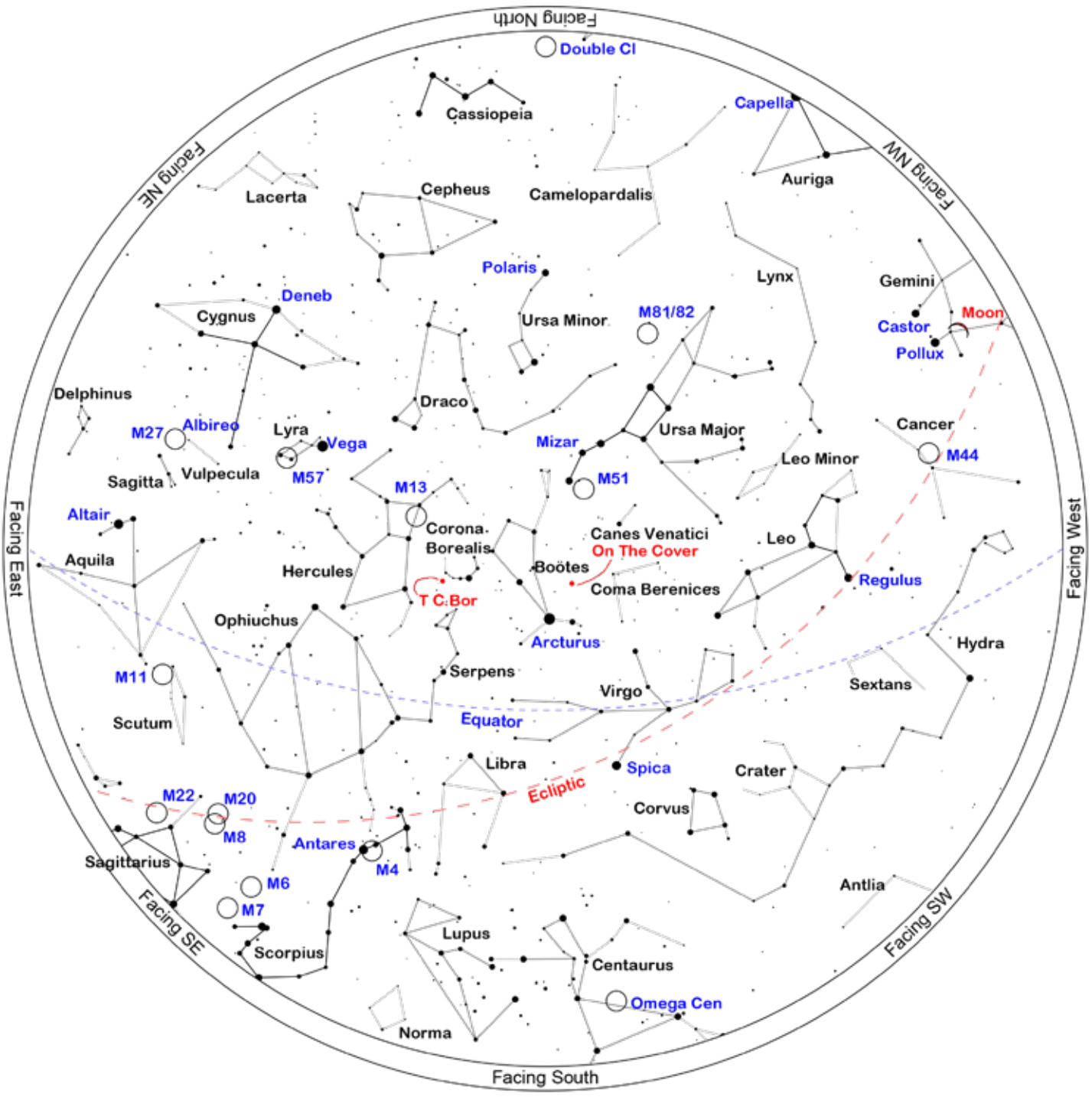



**Mt Pinos** is a parking lot at 8350 feet for the "Mt Pinos Nordic Base." There is a vault toilet 300 yds to the east in the Chula Vista campground.

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 June 8, 22:00 (UTC -07:00)

Powered by: Heavens-Above.com

## Solar System Summary

The **Sun** starts the month in central Taurus, ending the month between the twins of Gemini.

### The Planets

**Mercury** starts the month in Taurus. In the morning twilight it continues it's fall back toward the Sun, passing Jupiter 15 arcmins south on the morning of the 4th. On the 14th cross behind the Sun

**Venus** is way too close to the Sun to be seen. It achieves superior conjunction on the 4th and will be occulted by the Sun.

**Mars** starts the month in Pisces, and by the end of the month is in Aries, at mag 1. On the 2nd, the 16% waning Moon passes by 2° north.

**Jupiter** continues moving east in Taurus. After last month's solar conjunction Jupiter is rapidly separating itself from the Sun, and will remain in Taurus till next June.

**Saturn** is moving slowly east in Aquarius. On the morning of the 27th Moon occults Saturn(at 9am).

**Uranus** now in the morning glare continues moving east in Taurus, at mag 5.8, where it will remain till the end of the year.

**Neptune** is moving east near the southern border of Pisces at 7.9. The 57% wanning Moon drifts by on the 28th ⅔° south (an hour after Moonset).

### Dwarf Planets

**134340 Pluto** spends the month, in retrograde, in western Capricorn moving east at mag 14.5. On the 24th the 94% waning Moon is 2.5° south.

**1 Ceres** at mag 7.9 spends the month in central Sagittarius making a retrograde loop.

**2 Pallas** at mag 9.2 moving east in retrograde from Corona Borealis. On 23rd thru 25th passes ¼°south of the recurrent nova T Corona Borealis.

**3 Juno** at mag 10.6, continues moving east just north of the ecliptic in southern Leo, by the end of month is at mag 11 .

**4 Vesta** is at mag 8.5, moves parallel to the ecliptic from central Gemini into central Cancer during the month.

## Moon Phases

First Qtr June 13 | Full June 21 | Third Qtr June 28 | New June 6

## Sun and Moon Rise and Set*

| Date | Moonrise | Moonset | Sunrise | Sunset |
|---|---|---|---|---|
| 6/1/2024 | 02:24 | 15:00 | 05:40 | 20:00 |
| 6/5/2024 | 04:38 | 19:44 | 05:39 | 20:03 |
| 6/10/2024 | 09:30 | 23:56 | 05:39 | 20:05 |
| 6/15/2024 | 14:18 | 01:35 | 05:39 | 20:07 |
| 6/20/2024 | 19:26 | 04:06 | 05:40 | 20:08 |
| 6/25/2024 | 23:29 | 09:25 | 05:41 | 20:09 |
| 6/30/2024 | 01:25 | 15:09 | 05:43 | 20:09 |

## Planet Data*

June 1

| | Rise | Transit | Set | Mag | Phase% |
|---|---|---|---|---|---|
| Mercury | 04:54 | 11:50 | 18:47 | -0.92 | 84.0 |
| Venus | 05:40 | 12:48 | 19:56 | -3.91 | 99.9 |
| Mars | 03:17 | 09:42 | 16:08 | 1.05 | 92.1 |
| Jupiter | 05:09 | 12:09 | 19:08 | -2.00 | 99.9 |
| Saturn | 01:43 | 07:28 | 13:17 | 1.44 | 99.7 |

June 15

| | Rise | Transit | Set | Mag | Phase% |
|---|---|---|---|---|---|
| Mercury | 05:41 | 13:00 | 20:18 | -2.10 | 99.6 |
| Venus | 05:52 | 13:07 | 20:21 | -3.91 | 99.8 |
| Mars | 02:50 | 09:27 | 16:03 | 1.02 | 91.4 |
| Jupiter | 04:26 | 11:27 | 18:29 | -2.02 | 99.8 |
| Saturn | 00:50 | 06:35 | 12:24 | 1.56 | 99.7 |

June 30

| | Rise | Transit | Set | Mag | Phase% |
|---|---|---|---|---|---|
| Mercury | 07:02 | 14:13 | 21:24 | -0.55 | 78.1 |
| Venus | 06:15 | 13:28 | 20:41 | -3.91 | 99.2 |
| Mars | 02:23 | 09:10 | 15:57 | 0.99 | 90.5 |
| Jupiter | 03:39 | 10:42 | 17:36 | -2.05 | 99.7 |
| Saturn | 23:52 | 05:37 | 11:26 | 2.30 | 99.7 |

*All time mentioned are local and approximate.
*Sun, Moon and Planetary date based on Quartz Hill, CA

## Suggested Observing List

The list below contains objects that will be visible on the night of the AVAC Deep Sky Star Party or the Saturday nearest the New Moon, in this case June 8, 2024. The list is sorted by the transit time of the object.

| ID | Common Name | Type | Const | RA | Dec | Mag | Rise | Transit | Set |
|---|---|---|---|---|---|---|---|---|---|
| NGC6503 | | Galaxy | Dra | 17h 49m 27s | +70° 08.6' | 10.2 | Circ | 01:38 | Circ |
| NGC6441 | | Globular | Sco | 17h 50m 13s | -37° 03.0' | 7.4 | 21:41 | 01:39 | 05:36 |
| M7 | Scorpion's Tail | Open | Sco | 17h 53m 51s | -34° 47.6' | 3.5 | 21:34 | 01:42 | 05:51 |
| IC4670 | | Neb | Sgr | 17h 55m 07s | -21° 44.6' | | 20:45 | 01:44 | 06:42 |
| NGC6501 | | Galaxy | Her | 17h 56m 04s | +18° 22.3' | 12.3 | 18:48 | 01:45 | 08:41 |
| M23 | NGC6494 | Open | Sgr | 17h 57m 04s | -18° 59.1' | 6.0 | 20:38 | 01:46 | 06:53 |
| NGC6543 | Cat Eye Nebula | P Neb | Dra | 17h 58m 36s | +66° 38.0' | 8.1 | Circ | 01:47 | Circ |
| NGC6496 | | Globular | Sco | 17h 59m 04s | -44° 16.0' | 9.2 | 22:33 | 01:48 | 05:02 |
| M20 | Trifid Nebula | Open+D Neb | Sgr | 18h 02m 42s | -22° 58.2' | 5.0 | 20:57 | 01:51 | 06:46 |
| M8 | Lagoon Nebula | Open+D Neb | Sgr | 18h 03m 41s | -24° 22.7' | 5.0 | 21:03 | 01:52 | 06:42 |
| Barnard295 | B295 | DkNeb | Sgr | 18h 04m 05s | -31° 09.0' | | 21:28 | 01:53 | 06:17 |
| M21 | NGC6531 | Open | Sgr | 18h 04m 13s | -22° 29.3' | 7.0 | 20:57 | 01:53 | 06:49 |
| NGC6530 | | Open | Sgr | 18h 04m 31s | -24° 21.5' | 4.6 | 21:03 | 01:53 | 06:43 |
| NGC6528 | | Globular | Sgr | 18h 04m 50s | -30° 03.3' | 9.5 | 21:25 | 01:53 | 06:22 |
| IC4684 | | Neb | Sgr | 18h 09m 08s | -23° 26.1' | | 21:05 | 01:58 | 06:51 |
| IC4685 | | Neb | Sgr | 18h 09m 18s | -23° 59.2' | | 21:07 | 01:58 | 06:49 |
| IC1274 | | Neb | Sgr | 18h 09m 51s | -23° 38.8' | | 21:06 | 01:58 | 06:51 |
| IC1275 | | Neb | Sgr | 18h 10m 07s | -23° 45.7' | | 21:07 | 01:59 | 06:51 |
| NGC6572 | | P Neb | Oph | 18h 12m 06s | +06° 51.2' | 9.0 | 19:39 | 02:01 | 08:23 |
| NGC6567 | | P Neb | Sgr | 18h 13m 45s | -19° 04.5' | 12.0 | 20:55 | 02:02 | 07:10 |
| IC4701 | | Neb | Sgr | 18h 16m 36s | -16° 38.0' | | 20:50 | 02:05 | 07:20 |
| Barnard93 | B93 | DkNeb | Sgr | 18h 16m 53s | -18° 03.0' | | 20:55 | 02:05 | 07:16 |
| IC1284 | | Neb | Sgr | 18h 17m 39s | -19° 40.3' | | 21:01 | 02:06 | 07:12 |
| M24 | Sm Sagittarius Star Cloud | Open | Sgr | 18h 18m 26s | -18° 24.3' | 4.5 | 20:58 | 02:07 | 07:16 |
| M16 | Eagle Nebula | Open+D Neb | Ser | 18h 18m 48s | -13° 48.3' | 6.5 | 20:44 | 02:07 | 07:31 |
| Barnard308 | B308 | DkNeb | Sgr | 18h 19m 08s | -22° 14.0' | | 21:11 | 02:08 | 07:05 |
| M18 | Black Swan | Open | Sgr | 18h 19m 58s | -17° 06.1' | 8.0 | 20:55 | 02:09 | 07:22 |
| M17 | Omega Nebula | Open+D Neb | Sgr | 18h 20m 47s | -16° 10.3' | 7.0 | 20:53 | 02:09 | 07:26 |
| HR6923 | 39 Dra | Mult | Dra | 18h 23m 54s | +58° 48.0' | 5.0 | Circ | 02:12 | Circ |
| M28 | NGC6626 | Globular | Sgr | 18h 24m 33s | -24° 52.1' | 8.5 | 21:25 | 02:13 | 07:01 |
| Barnard95 | | DkNeb | Sct | 18h 25m 35s | -11° 44.0' | | 20:44 | 02:14 | 07:44 |
| Barnard97 | | DkNeb | Sct | 18h 29m 05s | -09° 55.0' | | 20:43 | 02:18 | 07:53 |
| Abell44 | | P Neb | Sgr | 18h 30m 11s | -16° 45.4' | 12.6 | 21:04 | 02:19 | 07:33 |
| NGC6637 | | Globular | Sgr | 18h 31m 23s | -32° 20.8' | 7.7 | 22:01 | 02:20 | 06:39 |
| IC1287 | | Neb | Sct | 18h 31m 26s | -10° 47.7' | | 20:48 | 02:20 | 07:52 |
| M25 | | Open | Sgr | 18h 31m 42s | -19° 07.0' | 6.5 | 21:13 | 02:20 | 07:27 |
| IC4725 | | Open | Sgr | 18h 31m 48s | -19° 06.7' | 4.6 | 21:13 | 02:20 | 07:28 |

| ID | Common Name | Type | Const | RA | Dec | Mag | Rise | Transit | Set |
|---|---|---|---|---|---|---|---|---|---|
| NGC6642 | | Globular | Sgr | 18h 31m 54s | -23° 28.5' | 8.8 | 21:28 | 02:20 | 07:13 |
| NGC6644 | | P Neb | Sgr | 18h 32m 35s | -25° 07.7' | 12.0 | 21:34 | 02:21 | 07:08 |
| NGC6647 | | Open | Sgr | 18h 32m 49s | -17° 13.6' | 8.0 | 21:08 | 02:21 | 07:35 |
| IC4732 | | P Neb | Sgr | 18h 33m 55s | -22° 38.6' | 13.0 | 21:27 | 02:22 | 07:18 |
| NGC6656 | Crackerjack Cluster | Globular | Sgr | 18h 36m 24s | -23° 54.2' | 5.1 | 21:34 | 02:25 | 07:16 |
| IC4756 | | Open | Ser | 18h 38m 54s | +05° 27.0' | 5.0 | 20:09 | 02:27 | 08:45 |
| NGC6681 | | Globular | Sgr | 18h 43m 12s | -32° 17.4' | 8.1 | 22:12 | 02:32 | 06:51 |
| NGC6694 | | Open | Sct | 18h 45m 18s | -09° 23.0' | 8.0 | 20:57 | 02:34 | 08:10 |
| IC4776 | | P Neb | Sgr | 18h 45m 51s | -33° 20.5' | 12.0 | 22:20 | 02:34 | 06:49 |
| Barnard318 | | DkNeb | Sct | 18h 49m 42s | -06° 23.0' | | 20:53 | 02:38 | 08:23 |
| M11 | Wild Duck Cluster | Open | Sct | 18h 51m 05s | -06° 16.1' | 7.0 | 20:54 | 02:40 | 08:25 |
| M57 | Ring Nebula | P Neb | Lyr | 18h 53m 35s | +33° 01.7' | 9.5 | 18:51 | 02:42 | 10:33 |
| Barnard117 | | DkNeb | Sct | 18h 53m 43s | -07° 24.0' | | 21:00 | 02:42 | 08:24 |
| NGC6715 | | Globular | Sgr | 18h 55m 03s | -30° 28.7' | 7.7 | 22:17 | 02:44 | 07:11 |
| NGC6717 | III-143 | Globular | Sgr | 18h 55m 06s | -22° 42.0' | 9.2 | 21:48 | 02:44 | 07:39 |
| Barnard122 | | DkNeb | Sct | 18h 56m 48s | -04° 45.0' | | 20:56 | 02:45 | 08:35 |
| Barnard123 | | DkNeb | Sct | 18h 57m 39s | -04° 43.0' | | 20:57 | 02:46 | 08:36 |
| NGC6723 | | Globular | Sgr | 18h 59m 33s | -36° 37.9' | 7.3 | 22:49 | 02:48 | 06:48 |
| Barnard128 | | DkNeb | Aql | 19h 01m 40s | -04° 34.0' | | 21:00 | 02:50 | 08:40 |
| NGC6729 | C68 | BrNeb | CrA | 19h 01m 54s | -36° 57.0' | | 22:53 | 02:50 | 06:48 |
| Barnard326 | | DkNeb | Aql | 19h 03m 00s | -00° 23.0' | | 20:50 | 02:52 | 08:53 |
| NGC6749 | | Globular | Aql | 19h 05m 15s | +01° 54.0' | 11.1 | 20:46 | 02:54 | 09:02 |
| Barnard329 | | DkNeb | Aql | 19h 06m 59s | +03° 11.0' | | 20:44 | 02:56 | 09:07 |
| NGC6760 | | Globular | Aql | 19h 11m 12s | +01° 01.8' | 9.1 | 20:54 | 03:00 | 09:05 |
| Abell56 | | P Neb | Aql | 19h 13m 07s | +02° 52.8' | 12.4 | 20:51 | 03:02 | 09:12 |
| NGC6772 | | P Neb | Aql | 19h 14m 36s | -02° 42.4' | 14.0 | 21:08 | 03:03 | 08:58 |
| Barnard138 | B138 | DkNeb | Aql | 19h 16m 00s | +00° 13.0' | | 21:01 | 03:05 | 09:08 |
| M56 | NGC6779 | Globular | Lyr | 19h 16m 36s | +30° 11.0' | 9.5 | 19:26 | 03:05 | 10:44 |
| NGC6778 | | P Neb | Aql | 19h 18m 25s | -01° 35.7' | 13.0 | 21:09 | 03:07 | 09:05 |
| Abell61 | | P Neb | Cyg | 19h 19m 10s | +46° 14.5' | 13.0 | 17:56 | 03:08 | 12:20 |
| NGC6790 | | P Neb | Aql | 19h 22m 57s | +01° 30.8' | 10.0 | 21:05 | 03:12 | 09:18 |
| NGC6803 | | P Neb | Aql | 19h 31m 16s | +10° 03.3' | 11.0 | 20:49 | 03:20 | 09:51 |
| NGC6804 | | P Neb | Aql | 19h 31m 35s | +09° 13.5' | 12.0 | 20:51 | 03:20 | 09:49 |
| Abell62 | | P Neb | Aql | 19h 33m 18s | +10° 37.0' | 13.0 | 20:49 | 03:22 | 09:55 |
| NGC6807 | | P Neb | Aql | 19h 34m 34s | +05° 41.0' | 14.0 | 21:04 | 03:23 | 09:42 |
| M55 | NGC6809 | Globular | Sgr | 19h 40m 00s | -30° 57.7' | 7.0 | 23:04 | 03:29 | 07:53 |
| NGC6813 | | Neb | Vul | 19h 40m 22s | +27° 18.5' | | 20:01 | 03:29 | 10:56 |
| NGC6820 | | Neb | Vul | 19h 42m 28s | +23° 05.2' | | 20:19 | 03:31 | 10:43 |
| NGC6818 | Little Gem | P Neb | Sgr | 19h 43m 58s | -14° 09.1' | 10.0 | 22:10 | 03:33 | 08:55 |

| ID | Common Name | Type | Const | RA | Dec | Mag | Rise | Transit | Set |
|---|---|---|---|---|---|---|---|---|---|
| NGC6826 | Blinking Planetary | P Neb | Cyg | 19h 44m 48s | +50° 31.0' | 8.8 | 17:35 | 03:33 | 13:32 |
| Abell65 | | P Neb | Sgr | 19h 46m 34s | -23° 08.2' | 13.1 | 22:41 | 03:35 | 08:29 |
| NGC6838 | | Globular | Sge | 19h 53m 46s | +18° 46.6' | 8.3 | 20:45 | 03:42 | 10:40 |
| NGC6842 | | P Neb | Vul | 19h 55m 02s | +29° 17.3' | 14.0 | 20:08 | 03:44 | 11:19 |
| HR7619 | Psi Cyg | Mult | Cyg | 19h 55m 38s | +52° 26.3' | 4.9 | 17:14 | 03:44 | 14:14 |
| Abell66 | | P Neb | Sgr | 19h 57m 32s | -21° 36.6' | 14.1 | 22:47 | 03:46 | 08:45 |
| Barnard 144 | Fish on the platter nebula | DkNeb | Cyg | 19h 58m 00s | +35° 20.0' | | 19:45 | 03:47 | 11:49 |
| NGC6853 | Apple Core Nebula | P Neb | Vul | 19h 59m 36s | +22° 43.2' | 8.1 | 20:37 | 03:48 | 10:59 |
| NGC6857 | III-144 | Neb | Cyg | 20h 02m 48s | +33° 31.4' | 11.4 | 19:58 | 03:51 | 11:45 |
| IC4954 | | Neb | Vul | 20h 04m 45s | +29° 15.1' | | 20:18 | 03:53 | 11:28 |
| M75 | NGC6864 | Globular | Sgr | 20h 06m 05s | -21° 55.3' | 9.5 | 22:57 | 03:55 | 08:53 |
| Barnard 342 | | DkNeb | Cyg | 20h 09m 30s | +41° 12.0' | | 19:23 | 03:58 | 12:33 |
| NGC6885 | 20 Vulpeculae Cluster | Open | Vul | 20h 12m 00s | +26° 29.0' | 5.9 | 20:36 | 04:01 | 11:25 |
| NGC6891 | | P Neb | Del | 20h 15m 09s | +12° 42.2' | 12.0 | 21:25 | 04:04 | 10:43 |
| NGC6894 | | P Neb | Cyg | 20h 16m 24s | +30° 33.9' | 14.0 | 20:24 | 04:05 | 11:45 |
| IC4997 | | P Neb | Sge | 20h 20m 09s | +16° 43.9' | 12.0 | 21:18 | 04:09 | 11:00 |
| Barnard345 | | DkNeb | Cyg | 20h 21m 00s | +46° 33.0' | | 18:55 | 04:10 | 13:24 |
| NGC6913 | Cooling Tower | Open | Cyg | 20h 23m 57s | +38° 30.5' | 6.6 | 19:54 | 04:13 | 12:31 |
| Abell70 | | P Neb | Aql | 20h 31m 33s | -07° 05.3' | 14.3 | 22:37 | 04:20 | 10:03 |
| Barnard348 | | DkNeb | Cyg | 20h 34m 00s | +42° 05.0' | | 19:42 | 04:23 | 13:03 |
| NGC6940 | | Open | Vul | 20h 34m 26s | +28° 17.0' | 6.3 | 20:52 | 04:23 | 11:54 |
| NGC6960 | Lace-work Nebula | Neb | Cyg | 20h 45m 58s | +30° 35.6' | | 20:54 | 04:35 | 12:15 |
| IC5068 | | Neb | Cyg | 20h 50m 29s | +42° 28.6' | | 19:56 | 04:39 | 13:22 |
| IC5070 | Pelican Nebula [2] | Neb | Cyg | 20h 51m 00s | +44° 24.1' | | 19:43 | 04:40 | 13:36 |
| NGC6979 | II-206 | Neb | Cyg | 20h 51m 00s | +32° 09.0' | 11.0 | 20:52 | 04:40 | 12:27 |
| NGC6981 | | Globular | Aqr | 20h 53m 28s | -12° 32.2' | 9.4 | 23:15 | 04:42 | 10:09 |
| IC5076 | | Neb | Cyg | 20h 55m 33s | +47° 23.7' | | 19:21 | 04:44 | 14:07 |
| IC1340 | | Neb | Cyg | 20h 56m 08s | +31° 02.8' | | 21:02 | 04:45 | 12:27 |
| NGC6992 | Cirrus Nebula [2] | Neb | Cyg | 20h 56m 19s | +31° 44.6' | | 20:59 | 04:45 | 12:30 |
| NGC6996 | VIII-58 | Open | Cyg | 20h 56m 30s | +44° 38.0' | 10.0 | 19:46 | 04:45 | 13:44 |
| NGC6997 | | Open | Cyg | 20h 56m 39s | +44° 37.9' | 10.0 | 19:46 | 04:45 | 13:44 |
| Barnard352 | B352 | DkNeb | Cyg | 20h 57m 10s | +45° 53.0' | | 19:37 | 04:46 | 13:55 |
| Barnard354 | B354 | DkNeb | Cep | 20h 58m 00s | +58° 09.0' | | Circ | 04:47 | Circ |
| NGC7000 | Gulf of Mexico | BrNeb | Cyg | 20h 58m 48s | +44° 20.0' | | 19:51 | 04:47 | 13:44 |
| M73 | NGC6994 | Open+Asterism | Aqr | 20h 58m 56s | -12° 38.1' | 9.0 | 23:20 | 04:47 | 10:14 |
| NGC7006 | C42 | Globular | Del | 21h 01m 30s | +16° 11.0' | 10.6 | 22:01 | 04:50 | 11:40 |
| NGC7009 | Saturn Nebula | P Neb | Aqr | 21h 04m 12s | -11° 22.0' | 8.0 | 23:22 | 04:53 | 10:23 |
| NGC7027 | | P Neb | Cyg | 21h 07m 02s | +42° 14.1' | 10.0 | 20:14 | 04:56 | 13:37 |
| IC1369 | | Open | Cyg | 21h 12m 09s | +47° 46.1' | 6.8 | 19:34 | 05:01 | 14:27 |

| ID | Common Name | Type | Const | RA | Dec | Mag | Rise | Transit | Set |
|---|---|---|---|---|---|---|---|---|---|
| NGC7076 | | Neb | Cep | 21h 26m 24s | +62° 53.5' | | Circ | 05:15 | Circ |
| NGC7078 | Great Pegasus Cluster | Globular | Peg | 21h 29m 58s | +12° 10.0' | 6.4 | 22:41 | 05:19 | 11:56 |
| M39 | NGC7092 | Open | Cyg | 21h 31m 42s | +48° 25.0' | 5.5 | 19:47 | 05:20 | 14:53 |
| M2 | NGC7089 | Globular | Aqr | 21h 33m 27s | -00° 49.3' | 7.5 | 23:22 | 05:22 | 11:22 |
| NGC7090 | | Galaxy | Ind | 21h 36m 28s | -54° 33.4' | 11.0 | 04:17 | 05:25 | 06:33 |
| IC1396 | Elephant Trunk | Open | Cep | 21h 38m 58s | +57° 29.3' | 3.5 | Circ | 05:28 | Circ |
| NGC7099 | | Globular | Cap | 21h 40m 22s | -23° 10.7' | 7.5 | 00:35 | 05:29 | 10:23 |
| NGC7128 | | Open | Cyg | 21h 43m 57s | +53° 42.9' | 9.7 | 18:31 | 05:33 | 16:34 |
| NGC7142 | | Open | Cep | 21h 45m 09s | +65° 46.5' | 9.3 | Circ | 05:34 | Circ |
| NGC7139 | III-696 | P Neb | Cep | 21h 46m 08s | +63° 47.5' | 13.3 | Circ | 05:35 | Circ |
| IC5146 | Cocoon Nebula | Open | Cyg | 21h 53m 29s | +47° 16.0' | 7.2 | 20:21 | 05:42 | 15:04 |
| IC1434 | | Open | Lac | 22h 10m 42s | +52° 51.0' | 9.0 | 19:21 | 05:59 | 16:38 |
| NGC7245 | | Open | Lac | 22h 15m 11s | +54° 20.6' | 9.2 | 18:37 | 06:04 | 17:31 |
| NGC7232 | | Galaxy | Gru | 22h 15m 38s | -45° 51.0' | 13.0 | 03:01 | 06:04 | 09:07 |
| NGC7261 | | Open | Cep | 22h 20m 06s | +58° 03.0' | 8.4 | Circ | 06:09 | Circ |
| NGC7293 | Helix Nebula | P Neb | Aqr | 22h 29m 36s | -20° 48.0' | 7.3 | 01:16 | 06:18 | 11:20 |
| NGC7380 | | Open | Cep | 22h 47m 21s | +58° 07.9' | 7.2 | Circ | 06:36 | Circ |
| C9 | Cave Nebula | BrNeb | Cep | 22h 56m 48s | +62° 37.0' | | Circ | 06:45 | Circ |
| IC1470 | | Neb | Cep | 23h 05m 10s | +60° 14.6' | | Circ | 06:54 | Circ |
| NGC7492 | | Globular | Aqr | 23h 08m 27s | -15° 36.6' | 11.5 | 01:39 | 06:57 | 12:15 |
| HR8872 | Omi Cep | Triple | Cep | 23h 18m 38s | +68° 06.6' | 4.8 | Circ | 07:07 | Circ |
| IC5308 | | Galaxy | Gru | 23h 19m 21s | -42° 15.4' | 12.0 | 03:40 | 07:08 | 10:36 |
| M52 | The Scorpion | Open | Cas | 23h 24m 48s | +61° 35.6' | 8.0 | Circ | 07:13 | Circ |
| NGC7662 | Blue Snowball | P Neb | And | 23h 25m 54s | +42° 33.0' | 8.3 | 22:31 | 07:14 | 15:58 |
| NGC7686 | | Open | And | 23h 30m 07s | +49° 08.0' | 5.6 | 21:38 | 07:19 | 17:00 |
| IC5332 | | Galaxy | Scl | 23h 34m 27s | -36° 06.0' | 10.6 | 03:21 | 07:23 | 11:25 |
| NGC7785 | | Galaxy | Psc | 23h 55m 19s | +05° 54.9' | 11.6 | 01:25 | 07:44 | 14:03 |
| HR9071 | Sig Cas | Triple | Cas | 23h 59m 01s | +55° 45.3' | 4.9 | Circ | 07:48 | Circ |

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

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