

Volume 43.9

October 2023

# Desert Sky Observer

Antelope Valley Astronomy Club



# Desert Sky Observer

[www.avastronomyclub.org](http://www.avastronomyclub.org)

October 2023

## Upcoming Events

October 13: Club Business Meeting  
October 14: Annular Solar Eclipse 8:30am -10am  
October 14: DSSP @ Chuchupate  
October 21: Lunar Club 7 PM @ Matt's house  
October 28: Scary Science @ 3:30 PM;  
Moonwalk at PDW @ 6:30 PM [AVAC Calendar](#)  
Every clear night: Personal Star Party



November 3: College of the Canyons- Fall Star party  
November 10: Club Meeting  
November 18: Moonwalk @PDW 5:00 PM

December 9: Christmas Party

## Board Members

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

**Vice-President:** Navin Arjuna 661-789-7927  
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**Secretary:** Rose Moore (661) 972-1953  
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**Treasurer:** Rod Girard (661) 803-7838  
[treasurer@avastronomyclub.org](mailto:treasurer@avastronomyclub.org)

## Appointed Positions

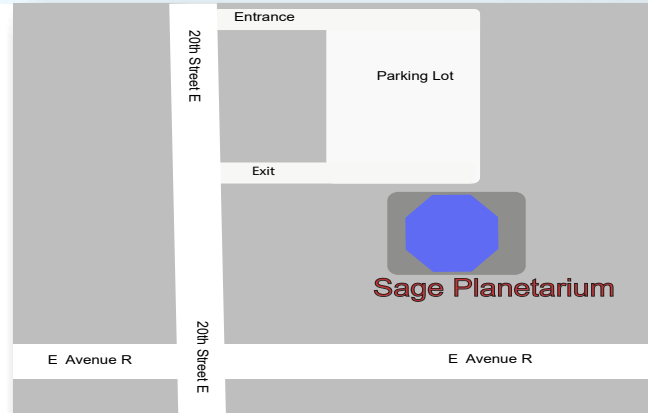
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**Astronomical League Coordinator:**  
Phil Wriedt (661) 917-4874  
[al@avastronomyclub.org](mailto:al@avastronomyclub.org)



## 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 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/](http://www.avastronomyclub.org/).



[www.avastronomyclub.org](http://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!

On October 13th we will have our annual Business Meeting. I know members stay away thinking that they won't be talked into becoming a Club Officer. This won't happen. We need a minimum of 10 voting members at the Business Meeting to make the minimum quorum to vote for a new Board. We need to know what direction you want the Club to go. So, come make your vote and voice count.

There is an Annular Eclipse Saturday the morning of the 14th beginning about 8:30 am. Sunrise is at 6:57, and when the eclipse starts, the Sun (and Moon ) will be about 20° above the horizon.

Later that day (on the 14th) we have a Dark Sky Star party at Chuchupate. It's no longer summer, so be prepared, bring warm clothes as the weather can change quickly. Don't forget toilet paper, food, water and other essentials like jumper cables?

We have a Moonwalk on the 28th at Prime Desert Woodland. Earlier in the day Jeremy will be doing his Scary Science demo in the PDW Center building at 3:30PM, everyone is invited. Sunset is at 6:03 pm, and the Full Moon rises at 6:02PM. The Moonwalk will start about 6:45 pm, plan to get there by about 5:00 pm to setup in daylight. Jupiter will rise about 6:19 and will be 2.5° below the Moon (yay?!), Saturn will transit about 8:37. This is your chance to impress the public and pass along your knowledge. Come, bring your telescope, binoculars, star chart, and of course enthusiasm. See You There!

On November 3rd, the College of the Canyons will host a Star Party. This is a great way to meet the public and meet other amateur astronomers. Bring your telescope or come and listen to the speaker.

Keep Looking Up, Phil

P.S. Don't forget about the Lunar Club at Matt's house on the 21st. Watch for Rose's email for time and directions!

## On The Cover

Please note: North is 14.8° left of vertical RA: 23h 36 11.54" DEC: 2° 8' 40.54" ( Pisces )

NGC 7714 is a spiral galaxy 100 million light-years from Earth — a relatively close neighbour in cosmic terms.

The galaxy has witnessed some violent and dramatic events in its recent past. Tell-tale signs of this brutality can be seen in NGC 7714's strangely shaped arms, and in the smoky golden haze that stretches out from the galactic centre — caused by an ongoing merger with its smaller galactic companion NGC 7715, which is out of the frame of this image.

Credit: ESA, NASA

Acknowledgement: A. Gal-Yam (Weizmann Institute of Science)

## From the Secretary

By Rose Moore

Members:

Thanks to Rod, Ed, and Roger for showing up at PDW for September. We were unable to set up scopes due to weather/clouds. Jeremy still conducted his astronomy walk and talk!

We have quite a few events this month, come on out and participate!

We have our AVAC Annual Business Meeting on Friday October 13th at 7pm. Please attend as we need enough club members to vote on incoming Executive Board members. Reminder that one Family Membership is one vote. We also need members to come and discuss new business, and old and ongoing business. This is the time for you to speak up and voice your suggestions to improve the club! We will also have club badges for the newer members.

On Saturday October 14th we have a public event hosted by Jeremy for the annular eclipse! Weather permitting. This will occur in the morning, and will not be held at the SAGE due to construction. Jeremy will be updating us on the information regarding the place and time soon. We'll need members with solar scopes, or those with white light filters for their scopes to participate. Information to follow.

Also on the same date, Saturday October 14th, will be our dark sky star party for the month. This will be held at Chuchupate, and arrival time is anytime on Saturday. Always check the weather prior to attending. Further information will be sent out in an email a few days before the event.

On Saturday October 21st, we have a Lunar Club meeting at Matt Leone's home. Weather permitting. Arrival time and directions will be emailed out a few days before the event.

Jeremy will be hosting 'Scary Science' for the public once again inside the Clifford Center at the Prime Desert Woodland Preserve on Saturday October 28th starting at 3:30pm. This is open to children and adults. Rain or shine.

Beginning at 6:30pm on Saturday October 28th, we have a PDW Moon Walk with Jeremy! Weather permitting. We'll need members with telescopes to set up prior to the event. Set up time is 30-60 minutes prior to event. It will be a full Moon, and Jupiter and Saturn will be up. Further info to be emailed.

And coming up on Friday November 3rd from 7pm to 10pm, we have the College of the Canyons Star Party! This is being held a week late due to the full moon. Further info to follow regarding the speaker, etc. We will need members with telescopes for this event!

Happy Halloween!! Rose

## From Galileo to Clipper, Exploring Jupiter's Moons

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



*"...We, too, are made of wonders, of great and ordinary loves, of small invisible worlds, of a need to call out through the dark." From In Praise of Mystery: A Poem for Europa by Ada Limon*

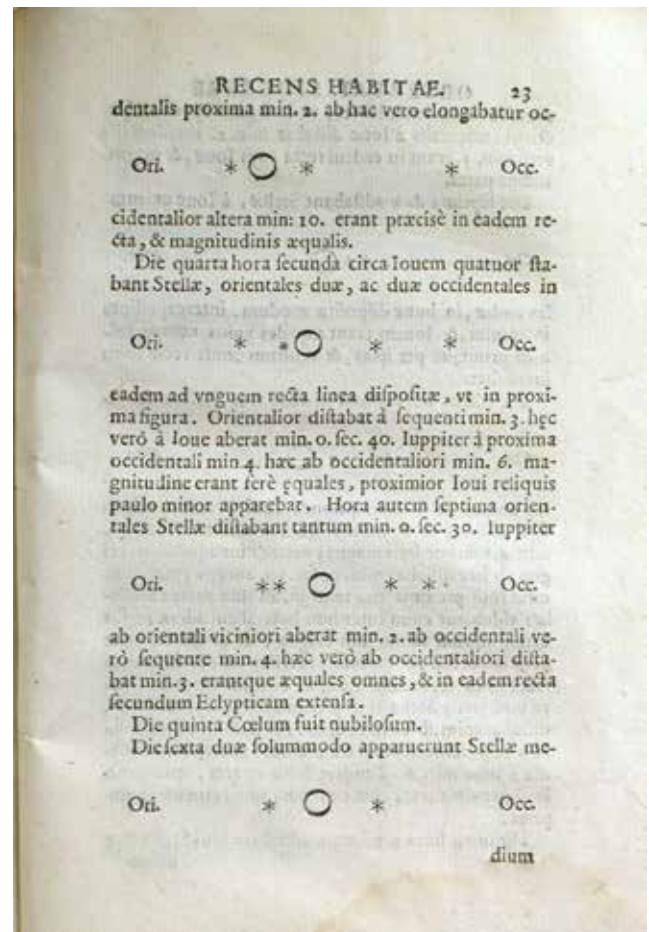
As autumn begins, if you're up late, you may notice a bright point of light rising in the east. Look a bit closer, with a pair of binoculars, and you'll notice it's not a star at all. While stars look point-like no matter how big your backyard telescope, this light appears as a circle under closer examination. Even

more curious, you will likely see a line of smaller dots on one or both sides. Congratulations! You've rediscovered the king of the planets - majestic Jupiter - and its four largest moons.

Galileo famously chronicled the four moving dots near Jupiter and surmised that they were orbiting the distant world. While Jupiter has well over 80 discovered moons as of September 2023, these brightest four are called the "Galilean Moons" - Io, Europa, Ganymede, and Callisto. (Great mnemonics exist to remember these in order of distance from Jupiter, such as "I Eat Green Caterpillars") You can follow these like Galileo did, using stargazing apps or the handy image below. A favorite beginning observing challenge is to track the movement of the Galilean Moons over the course of many nights. Even within a few hours, you will notice them moving in relation to Jupiter, just as Galileo did.

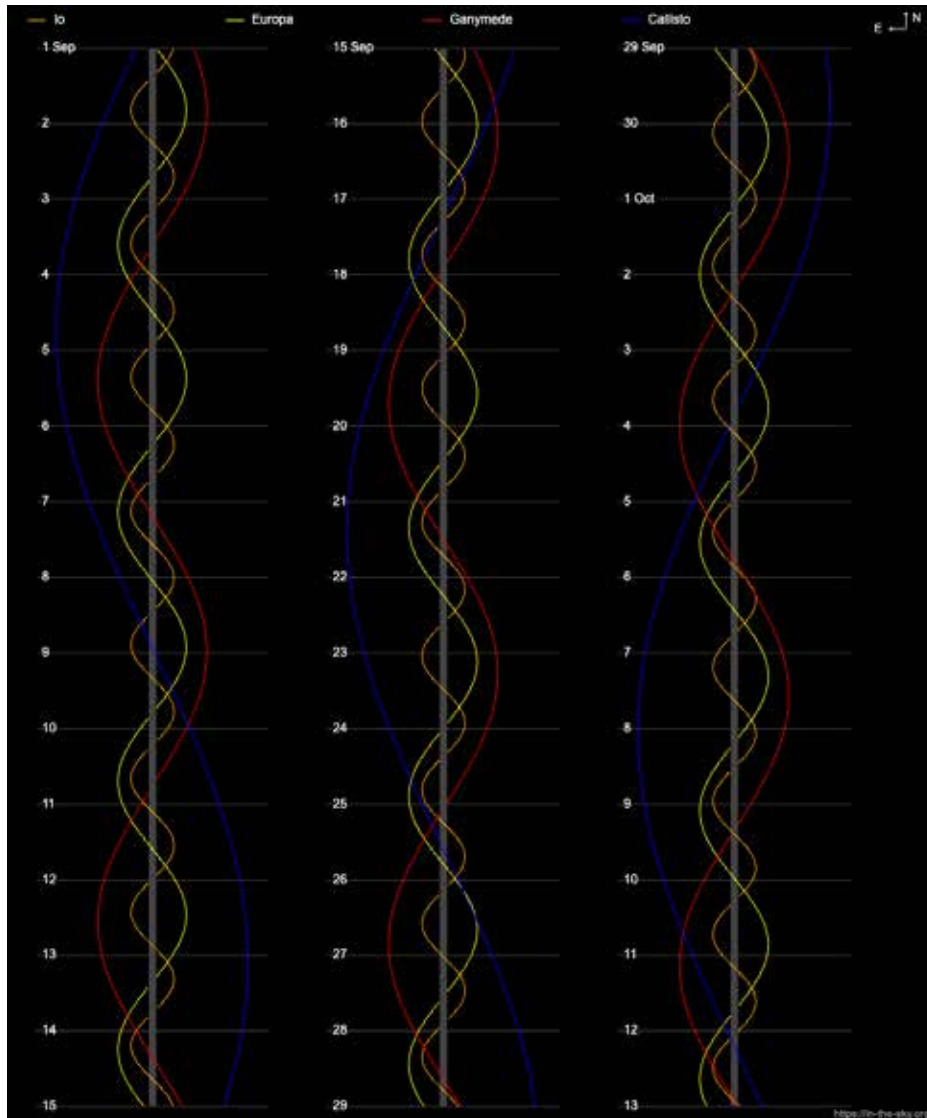
Fast forward 414 years, and NASA will be sending

*Galileo's drawings of Jupiter and its Medicean Stars from Sidereus Nuncius. Image courtesy of the History of Science Collections, University of Oklahoma Libraries.*



### 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 position of the Galilean Moons of Jupiter in October 2023:*

<https://in-the-sky.org/jupiter.php>

a robotic mission to investigate the surface of one of these distant worlds. The Europa Clipper Mission is launching to the cold, icy moon in 2024, to begin orbiting in 2030. With its salty oceans covered by ice, Europa was chosen as an excellent location to continue the search for life outside of Earth. Clipper will be the largest spacecraft ever sent to another planet, designed to withstand Jupiter's punishing radiation. Once it arrives at Jupiter in 2030, NASA plans to do about 50 flybys of Europa, mapping almost the entire surface of this watery world.

What was once only dreamed of in the small telescope of Galileo, or in great works of fiction, NASA is turning our wildest imagination into reality. One of the celebrated quotes from the classic 2010: Odyssey Two warns, "All these worlds are yours, except Europa. Attempt no landing there." Science fiction fans can feel relieved knowing that writer Arthur C. Clarke gave his blessing for the Europa Clipper mission.

Join the Europa Message in a Bottle Campaign to send your name with the spacecraft, hear the rest of the poem by the US Poet Laureate, and learn more about the wonders of space travel with the Clipper Mission: <https://europa.nasa.gov/participate>

Watch a wonderful Clipper webinar with Dr. Cynthia Phillips, planetary geologist with the mission: <https://www.youtube.com/live/nnLJBLRBCA?feature=shared&t=269>

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!

## Space News

News from around the Net

### **Stunningly Perfect ‘Einstein Ring’ Snapped By James Webb Telescope Is Most Distant Gravitationally Lensed Object Ever Seen**

Photos snapped by the James Webb Space Telescope (JWST) have revealed the farthest-ever example of an “Einstein ring.” The record-breaking halo of warped light, which is a whopping 21 billion light-years away, is unusually perfect and surrounds a mysteriously dense galaxy. An Einstein ring is an extremely rare type of gravitationally lensed object that was first predicted by Albert Einstein’s theory of relativity. . . . (continued at <https://www.livescience.com/space/astronomy/stunningly-perfect-einstein-ring-snapped-by-james-webb-telescope-is-most-distant-gravitationally-lensed-object-ever-seen> )



### **Scientists Snap Photo Of Intriguing Solar System Using A Colossal Telescope**

Astronomers spotted a curiosity in deep space. Using the powerful Very Large Telescope facility atop the high Chilean desert, scientists captured an image of a star system, which you can see below. This system, called HIP 81208, has a massive central star, which is orbited by another star called a brown dwarf (a much smaller “failed star”). What’s more, yet another small star orbits much farther away, and researchers have just identified “a never-before-seen hidden gem” . . . (continued at <https://mashable.com/article/solar-system-planet-discovery-space> )



### **The Giant Magellan Telescope’s Final Mirror Fabrication Begins**

The Giant Magellan Telescope begins the four-year process to fabricate and polish its seventh and final primary mirror, the last required to complete the telescope’s 368 square meter light collecting surface, the world’s largest and most challenging optics ever produced. Together, the mirrors will collect more light than any other telescope in existence, allowing humanity to unlock the secrets of the universe by providing detailed chemical analyses of celestial objects and their origin. Last week, the University of Arizona Richard F. Caris Mirror Lab closed the lid on nearly 20 tons of the purest optical glass inside a one-of-a-kind oven. . . . (continued at <https://phys.org/news/2023-09-giant-magellan-telescope-mirror-fabrication.html> )



### **Study Hints At The Existence Of The Closest Black Holes To Earth In The Hyades Star Cluster**

A paper published in the journal Monthly Notices of the Royal Astronomical Society hints at the existence of several black holes in the Hyades cluster -- the closest open cluster to our solar system -- which would make them the closest black holes to Earth ever detected. The study results from a collaboration between a group of scientists led by Stefano Torniamenti, from the University of Padua (Italy), with the significant participation of with Mark Gieles, ICREA professor at the Faculty of Physics, . . . (continued at <https://www.sciencedaily.com/releases/2023/09/230908130001.htm> )



### **NASA’s Chandra Rewinds Story Of Great Eruption Of The 1840s**

Using snapshots taken over 20 years with NASA’s Chandra X-ray Observatory, astronomers have learned important new details about an eruption from Eta Carinae witnessed on Earth in the mid-19th century. Chandra data spanning decades has been combined into a new movie that contains frames of Eta Carinae from 1999, 2003, 2009, 2014, and 2020. Astronomers used the Chandra observations, along with data from ESA’s (European Space Agency’s) XMM-Newton, to watch as the stellar eruption from 180 years ago continues to expand into space at speeds up to 4.5 million miles per hour. . . . (continued at <https://phys.org/news/2023-09-nasa-chandra-rewinds-story-great.html> )



## Space News

News from around the Net

### **To Catch Beads Of Sunlight, Here's Where You Should Head For October 14th's Annular Eclipse**

The annular solar eclipse coming to the U.S. on Saturday, October 14th, is popularly known as the “ring of fire.” The main event is the appearance of a ring of light around the Moon, something that results from the Moon being far from Earth, near its monthly apogee, as the Moon crosses the face of the Sun. That aesthetically pleasing annulus will only be seen from within a path that's 200 kilometers (125 miles) wide. To see it for the longest time (up to 4 minutes 52 seconds on the Texas coast) the observer will need to be towards the centerline of that path. . . . (continued at <https://skyandtelescope.org/astronomy-news/to-catch-beads-of-sunlight-heres-where-you-should-head-for-october-14ths-annular-eclipse/> )



### **Black Holes Eat Faster Than Previously Expected: New Finding Might Explain Why Quasars Flare And Fade So Quickly**

A new Northwestern University-led study is changing the way astrophysicists understand the eating habits of supermassive black holes. While previous researchers have hypothesized that black holes eat slowly, new simulations indicate that black holes scarf food much faster than conventional understanding suggests. The study, titled “Nozzle shocks, disk tearing and streamers drive rapid accretion in 3D GRMHD simulations of warped thin disks,” is published in The Astrophysical Journal. . . . (continued at <https://phys.org/news/2023-09-black-holes-faster-previously-quasars.html> )



### **Osiris-Rex Capsule Returns Samples Of Asteroid Bennu To Earth**

It's been a long time coming, but after more than seven years and a journey of 4.4 billion-miles (7.1 billion kilometers), NASA's Origins, Spectral Interpretation, Resource identification, Security, Regolith Explorer (Osiris-REX) spacecraft has accomplished its primary mission: It has returned its sample capsule to Earth, containing material grabbed from asteroid 101955 Bennu. The return happened over the U.S. Department of Defense's Utah Test and Training Range. . . . (continued at <https://skyandtelescope.org/astronomy-news/osiris-rex-capsule-returns-samples-of-asteroid-bennu-to-earth/> )



### **Comet C/2023 P1 (Nishimura) Brightening With Nice Tail**

Comet C/2023 P1 (Nishimura) is shining at around magnitude +6 as it zeros-in on closest approach to Earth, at distance of around 125.3 million kilometres (0.838 AU) on 12 September. It's closest to the Sun (perihelion passage) on 17 September, at a distance of 32.9 million kilometres (0.22 AU). Currently it lies low in the pre-dawn sky in Leo and it's slipping further into the twilight mire each morning as it gets ever closer to the Sun. However, it's brightening steadily. (continued at <https://astronomynow.com/2023/09/04/comet-c-2023-p1-nishimura-brightening-with-nice-tail/> )



### **JWST Views Supernova 1987A**

The James Webb Space Telescope (JWST) recently imaged Supernova 1987A (also called SN 1987A), revealing a keyhole structure at its center. The supernova resides within the Large Magellanic Cloud (LMC), about 168,000 light-years from Earth, and was first noticed when researchers saw a new source of light in the LMC created by the death of a massive star. (The star initially exploded in 165,000 B.C. but its light did not arrive at Earth until 1987.) Supernovae and their remnants are also known as “pollinators of the universe” — these chaotic explosions spew elements like iron, calcium, carbon, and more, which are ultimately incorporated into future stars and planets. SN 1987A's new portrait kicks off JWST's observations of the renowned supernova. . . . (continued at <https://www.astronomy.com/science/jwst-views-supernova-1987a/> )



## 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.



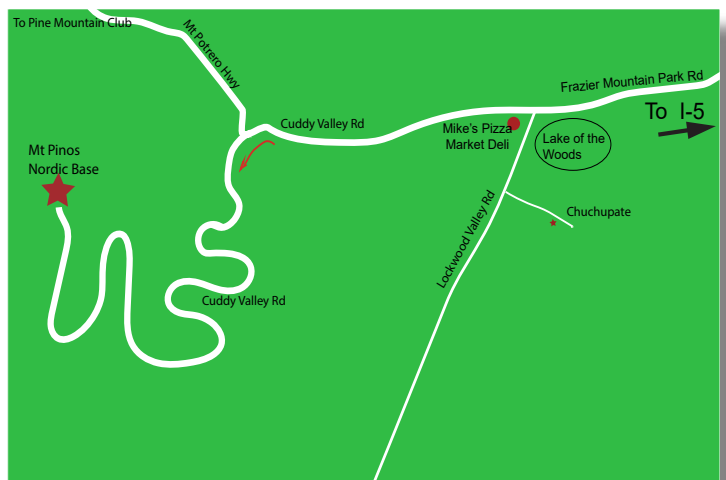
**The Red Cliffs Natural Area** is part of **Red Rock Canyon State Park** is a day use area and is not for use by the public after dark. The Club gets a special permit for a star party and pays a fee.

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.

**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.



## Solar System Summary

The **Sun** moves from the middle of Virgo and lands on the western edge of Libra at the end of the month. On the Saturday the 14th starting about 8:45 am an 80% annular eclipse. The partial **Lunar** eclipse on the 28th will be visible from the eastern hemisphere.

### The Planets

**Mercury** begins the month in the morning twilight quickly diving toward the Sun, achieving superior conjunction on the 20th

**Venus** is now very prominent in the morning sky. Starting the month on the eastern edge of Leo, ends the month on the western edge.

**Mars** stuck in the evening twilight just too close to the Sun to be seen.

**Jupiter** spends the month in retrograde in southern Aries. On the 1st the 90% waning Moon is  $2\frac{1}{2}^{\circ}$  north.

**Saturn** spends the month slowly moving retrograde in central Aquarius at mag 0.6. The 75% waxing Moon passes  $2\frac{1}{2}^{\circ}$  south on the evening of the 24th.

**Uranus** continues its retrograde motion in eastern Aries at mag 5.7. On the 2nd the 85% waning Moon passes  $2^{\circ}$  north.

**Neptune** is moving in retrograde in southern Pisces at 7.8. On the 25th the 90% waxing Moon passes less than  $2^{\circ}$  to the south.

### Dwarf Planets

**134340 Pluto** spends the month on the eastern edge of Sagittarius in retrograde till the 20th when it starts moving forward again at mag 14.4 just south of M75.

**1 Ceres** spends the month in Libra (mag 8.7), heading southeast getting ready to pass behind the Sun in mid-November

**2 Pallas** at mag 9.0 continues moving east in Virgo. As the month progresses it rises in the morning twilight separating itself from the Sun.

**3 Juno** at mag 10.1, a few degrees south of Venus, moves east from southern Leo, cutting across the tip of Hydra coming to rest in northern Sextans at month's end.

**4 Vesta** at mag 8.1, spends the month moving east from Orion's club, coming to rest between the feet of the twins, at mag 7.7.

## Moon Phases



First Qtr  
Oct 21

Full  
Oct 28

Third Qtr  
Oct 6

New  
Oct 14

## Sun and Moon Rise and Set\*

| Date       | Moonrise | Moonset | Sunrise | Sunset |
|------------|----------|---------|---------|--------|
| 10/1/2023  | 20:07    | 09:20   | 06:47   | 18:36  |
| 10/5/2023  | 23:09    | 13:41   | 06:50   | 18:31  |
| 10/10/2023 | 03:03    | 16:48   | 06:54   | 18:24  |
| 10/15/2023 | 07:52    | 18:51   | 06:58   | 18:17  |
| 10/20/2023 | 13:10    | 22:40   | 07:02   | 18:11  |
| 10/25/2023 | 16:31    | 03:25   | 07:06   | 18:06  |
| 10/30/2023 | 19:17    | 09:17   | 07:11   | 18:00  |

## Planet Data\*

October 1

|         | Rise  | Transit | Set   | Mag   | Phase% |
|---------|-------|---------|-------|-------|--------|
| Mercury | 05:40 | 11:54   | 18:08 | -1.07 | 84.6   |
| Venus   | 03:21 | 09:54   | 16:17 | -4.50 | 37.3   |
| Mars    | 07:59 | 13:37   | 19:16 | 1.66  | 99.4   |
| Jupiter | 20:15 | 03:02   | 09:46 | -2.84 | 99.7   |
| Saturn  | 17:00 | 22:26   | 03:57 | 0.55  | 99.9   |

October 15

|         | Rise  | Transit | Set   | Mag   | Phase% |
|---------|-------|---------|-------|-------|--------|
| Mercury | 06:42 | 12:29   | 18:14 | -1.38 | 99.6   |
| Venus   | 03:20 | 09:46   | 16:12 | -4.43 | 46.3   |
| Mars    | 07:49 | 13:18   | 18:46 | 1.61  | 99.7   |
| Jupiter | 19:15 | 02:02   | 08:44 | -2.89 | 99.9   |
| Saturn  | 16:03 | 21:29   | 02:59 | 0.62  | 99.8   |

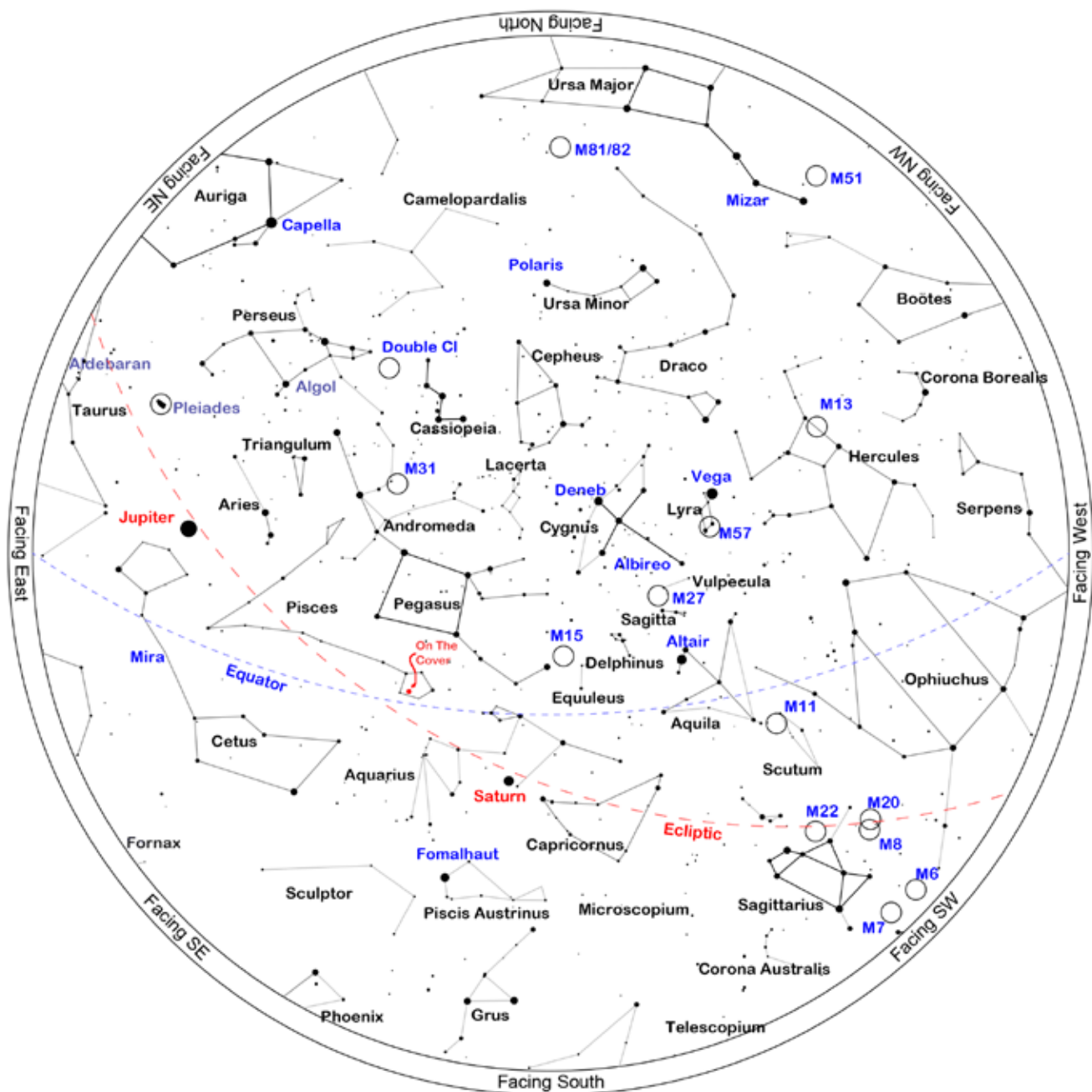
October 30

|         | Rise  | Transit | Set   | Mag   | Phase% |
|---------|-------|---------|-------|-------|--------|
| Mercury | 07:45 | 13:02   | 18:19 | -0.80 | 98.3   |
| Venus   | 03:30 | 09:44   | 15:58 | -4.34 | 54.3   |
| Mars    | 07:40 | 12:49   | 18:17 | 1.53  | 99.9   |
| Jupiter | 18:10 | 00:51   | 07:36 | -2.92 | 100.   |
| Saturn  | 15:03 | 20:29   | 01:58 | 0.69  | 99.8   |

\*All time mentioned are local and approximate.

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

## Sky Chart



Location: Set from geolocation service  
Latitude: 34° 39' N, longitude: 118° 10' W  
Time: 2023 October 14, 21:00 (UTC -07:00)

Powered by: Heavens-Above.com

# Desert Sky Observer

www.avastronomyclub.org

October 2023

## 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 October 14, 2023. The list is sorted by the transit time of the object.

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

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| ID         | Common Name                   | Type       | Const | RA          | Dec        | Mag  | Rise  | Transit | Set   |
|------------|-------------------------------|------------|-------|-------------|------------|------|-------|---------|-------|
| M7         | Scorpion's Tail               | Open       | Sco   | 17h 53m 51s | -34° 47.6' | 3.5  | 12:07 | 16:16   | 20:25 |
| IC4670     |                               | Neb        | Sgr   | 17h 55m 07s | -21° 44.6' |      | 11:18 | 16:17   | 21:16 |
| NGC6501    |                               | Galaxy     | Her   | 17h 56m 04s | +18° 22.3' | 12.3 | 09:22 | 16:18   | 23:14 |
| M23        | NGC6494                       | Open       | Sgr   | 17h 57m 04s | -18° 59.1' | 6.0  | 11:11 | 16:19   | 21:27 |
| NGC6543    | Cat Eye Nebula                | P Neb      | Dra   | 17h 58m 36s | +66° 38.0' | 8.1  | Circ  | 16:21   | Circ  |
| NGC6496    |                               | Globular   | Sco   | 17h 59m 04s | -44° 16.0' | 9.2  | 13:06 | 16:21   | 19:37 |
| M20        | Trifid Nebula                 | Open+D Neb | Sgr   | 18h 02m 42s | -22° 58.2' | 5.0  | 11:30 | 16:25   | 21:20 |
| M8         | Lagoon Nebula                 | Open+D Neb | Sgr   | 18h 03m 41s | -24° 22.7' | 5.0  | 11:36 | 16:26   | 21:16 |
| M21        | NGC6531                       | Open       | Sgr   | 18h 04m 13s | -22° 29.3' | 7.0  | 11:30 | 16:26   | 21:23 |
| NGC6530    |                               | Open       | Sgr   | 18h 04m 31s | -24° 21.5' | 4.6  | 11:36 | 16:27   | 21:17 |
| NGC6528    |                               | Globular   | Sgr   | 18h 04m 50s | -30° 03.3' | 9.5  | 11:58 | 16:27   | 20:56 |
| IC4684     |                               | Neb        | Sgr   | 18h 09m 08s | -23° 26.1' |      | 11:38 | 16:31   | 21:25 |
| IC4685     |                               | Neb        | Sgr   | 18h 09m 18s | -23° 59.2' |      | 11:40 | 16:31   | 21:23 |
| Barnard303 |                               | DkNeb      | Sgr   | 18h 09m 28s | -23° 59.0' |      | 11:40 | 16:32   | 21:23 |
| IC1274     |                               | Neb        | Sgr   | 18h 09m 51s | -23° 38.8' |      | 11:39 | 16:32   | 21:25 |
| IC1275     |                               | Neb        | Sgr   | 18h 10m 07s | -23° 45.7' |      | 11:40 | 16:32   | 21:24 |
| NGC6572    |                               | P Neb      | Oph   | 18h 12m 06s | +06° 51.2' | 9.0  | 10:12 | 16:34   | 22:56 |
| NGC6567    |                               | P Neb      | Sgr   | 18h 13m 45s | -19° 04.5' | 12.0 | 11:28 | 16:36   | 21:44 |
| IC4701     |                               | Neb        | Sgr   | 18h 16m 36s | -16° 38.0' |      | 11:23 | 16:39   | 21:54 |
| IC1284     |                               | Neb        | Sgr   | 18h 17m 39s | -19° 40.3' |      | 11:34 | 16:40   | 21:46 |
| M24        | Small Sagittarius Star Cloud, | Open       | Sgr   | 18h 18m 26s | -18° 24.3' | 4.5  | 11:31 | 16:41   | 21:50 |
| M16        | Eagle Nebula,                 | Open+D Neb | Ser   | 18h 18m 48s | -13° 48.3' | 6.5  | 11:17 | 16:41   | 22:05 |
| Barnard308 |                               | DkNeb      | Sgr   | 18h 19m 08s | -22° 14.0' |      | 11:44 | 16:41   | 21:39 |
| M18        | Black Swan,                   | Open       | Sgr   | 18h 19m 58s | -17° 06.1' | 8.0  | 11:28 | 16:42   | 21:56 |
| M17        | Omega Nebula                  | Open+D Neb | Sgr   | 18h 20m 47s | -16° 10.3' | 7.0  | 11:26 | 16:43   | 22:00 |
| HR6923     | HD170073                      | Mult       | Dra   | 18h 23m 54s | +58° 48.0' | 5.0  | Circ  | 16:46   | Circ  |
| M28        | NGC6626                       | Globular   | Sgr   | 18h 24m 33s | -24° 52.1' | 8.5  | 11:58 | 16:47   | 21:35 |
| Abell44    |                               | P Neb      | Sgr   | 18h 30m 11s | -16° 45.4' | 12.6 | 11:37 | 16:52   | 22:07 |
| NGC6637    |                               | Globular   | Sgr   | 18h 31m 23s | -32° 20.8' | 7.7  | 12:34 | 16:54   | 21:13 |
| IC1287     |                               | Neb        | Sct   | 18h 31m 26s | -10° 47.7' |      | 11:21 | 16:54   | 22:26 |
| M25        | M25                           | Open       | Sgr   | 18h 31m 42s | -19° 07.0' | 6.5  | 11:46 | 16:54   | 22:01 |
| IC4725     |                               | Open       | Sgr   | 18h 31m 48s | -19° 06.7' | 4.6  | 11:46 | 16:54   | 22:01 |
| NGC6642    |                               | Globular   | Sgr   | 18h 31m 54s | -23° 28.5' | 8.8  | 12:01 | 16:54   | 21:47 |
| NGC6644    |                               | P Neb      | Sgr   | 18h 32m 35s | -25° 07.7' | 12.0 | 12:07 | 16:55   | 21:42 |
| NGC6647    |                               | Open       | Sgr   | 18h 32m 49s | -17° 13.6' | 8.0  | 11:42 | 16:55   | 22:08 |
| IC4732     |                               | P Neb      | Sgr   | 18h 33m 55s | -22° 38.6' | 13.0 | 12:00 | 16:56   | 21:52 |
| NGC6656    | Crackerjack Cluster           | Globular   | Sgr   | 18h 36m 24s | -23° 54.2' | 5.1  | 12:07 | 16:59   | 21:50 |
| IC4756     |                               | Open       | Ser   | 18h 38m 54s | +05° 27.0' | 5.0  | 10:43 | 17:01   | 23:19 |

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| ID         | Common Name                | Type     | Const | RA          | Dec        | Mag  | Rise  | Transit | Set   |
|------------|----------------------------|----------|-------|-------------|------------|------|-------|---------|-------|
| NGC6681    |                            | Globular | Sgr   | 18h 43m 12s | -32° 17.4' | 8.1  | 12:45 | 17:05   | 21:25 |
| NGC6694    |                            | Open     | Sct   | 18h 45m 18s | -09° 23.0' | 8.0  | 11:31 | 17:07   | 22:44 |
| IC4776     |                            | P Neb    | Sgr   | 18h 45m 51s | -33° 20.5' | 12.0 | 12:53 | 17:08   | 21:23 |
| Barnard318 |                            | DkNeb    | Sct   | 18h 49m 42s | -06° 23.0' |      | 11:27 | 17:12   | 22:57 |
| M11        | Wild Duck Cluster          | Open     | Sct   | 18h 51m 05s | -06° 16.1' | 7.0  | 11:28 | 17:13   | 22:59 |
| M57        | Ring Nebula                | P Neb    | Lyr   | 18h 53m 35s | +33° 01.7' | 9.5  | 09:25 | 17:16   | 01:06 |
| Barnard117 |                            | DkNeb    | Sct   | 18h 53m 43s | -07° 24.0' |      | 11:34 | 17:16   | 22:58 |
| NGC6715    |                            | Globular | Sgr   | 18h 55m 03s | -30° 28.7' | 7.7  | 12:50 | 17:17   | 21:45 |
| NGC6717    | III-143                    | Globular | Sgr   | 18h 55m 06s | -22° 42.0' | 9.2  | 12:21 | 17:17   | 22:13 |
| NGC6760    |                            | Globular | Aql   | 19h 11m 12s | +01° 01.8' | 9.1  | 11:28 | 17:33   | 23:39 |
| Abell56    |                            | P Neb    | Aql   | 19h 13m 07s | +02° 52.8' | 12.4 | 11:24 | 17:35   | 23:46 |
| NGC6772    |                            | P Neb    | Aql   | 19h 14m 36s | -02° 42.4' | 14.0 | 11:41 | 17:37   | 23:32 |
| Barnard138 |                            | DkNeb    | Aql   | 19h 16m 00s | +00° 13.0' |      | 11:35 | 17:38   | 23:41 |
| M56        | NGC6779                    | Globular | Lyr   | 19h 16m 36s | +30° 11.0' | 9.5  | 10:00 | 17:39   | 01:17 |
| NGC6778    |                            | P Neb    | Aql   | 19h 18m 25s | -01° 35.7' | 13.0 | 11:42 | 17:41   | 23:39 |
| Abell61    |                            | P Neb    | Cyg   | 19h 19m 10s | +46° 14.5' | 13.0 | 08:30 | 17:41   | 02:52 |
| Barnard140 |                            | DkNeb    | Aql   | 19h 19m 49s | +05° 13.0' |      | 11:25 | 17:42   | 23:59 |
| NGC6790    |                            | P Neb    | Aql   | 19h 22m 57s | +01° 30.8' | 10.0 | 11:38 | 17:45   | 23:52 |
| NGC6803    |                            | P Neb    | Aql   | 19h 31m 16s | +10° 03.3' | 11.0 | 11:22 | 17:53   | 00:24 |
| NGC6804    |                            | P Neb    | Aql   | 19h 31m 35s | +09° 13.5' | 12.0 | 11:25 | 17:54   | 00:22 |
| Abell62    |                            | P Neb    | Aql   | 19h 33m 18s | +10° 37.0' | 13.0 | 11:23 | 17:55   | 00:28 |
| NGC6807    |                            | P Neb    | Aql   | 19h 34m 34s | +05° 41.0' | 14.0 | 11:38 | 17:57   | 00:15 |
| M55        | NGC6809                    | Globular | Sgr   | 19h 40m 00s | -30° 57.7' | 7.0  | 13:37 | 18:02   | 22:28 |
| NGC6813    |                            | Neb      | Vul   | 19h 40m 22s | +27° 18.5' |      | 10:35 | 18:02   | 01:30 |
| NGC6820    |                            | Neb      | Vul   | 19h 42m 28s | +23° 05.2' |      | 10:53 | 18:05   | 01:16 |
| Barnard338 |                            | DkNeb    | Aql   | 19h 43m 02s | +07° 27.0' |      | 11:42 | 18:05   | 00:29 |
| NGC6818    | Little Gem                 | P Neb    | Sgr   | 19h 43m 58s | -14° 09.1' | 10.0 | 12:43 | 18:06   | 23:29 |
| NGC6826    | Blinking Planetary         | P Neb    | Cyg   | 19h 44m 48s | +50° 31.0' | 8.8  | 08:10 | 18:07   | 04:03 |
| Abell65    |                            | P Neb    | Sgr   | 19h 46m 34s | -23° 08.2' | 13.1 | 13:14 | 18:09   | 23:03 |
| NGC6838    |                            | Globular | Sge   | 19h 53m 46s | +18° 46.6' | 8.3  | 11:18 | 18:16   | 01:13 |
| NGC6842    |                            | P Neb    | Vul   | 19h 55m 02s | +29° 17.3' | 14.0 | 10:42 | 18:17   | 01:52 |
| HR7619     | Psi Cyg                    | Mult     | Cyg   | 19h 55m 38s | +52° 26.3' | 4.9  | 07:51 | 18:18   | 04:45 |
| Abell66    |                            | P Neb    | Sgr   | 19h 57m 32s | -21° 36.6' | 14.1 | 13:20 | 18:20   | 23:19 |
| Barnard144 | Fish on the platter nebula | DkNeb    | Cyg   | 19h 58m 00s | +35° 20.0' |      | 10:19 | 18:20   | 02:21 |
| NGC6853    | Dumbbell Nebula            | P Neb    | Vul   | 19h 59m 36s | +22° 43.2' | 8.1  | 11:11 | 18:22   | 01:32 |
| NGC6857    | III-144                    | Neb      | Cyg   | 20h 02m 48s | +33° 31.4' | 11.4 | 10:32 | 18:25   | 02:18 |
| IC4954     |                            | Neb      | Vul   | 20h 04m 45s | +29° 15.1' |      | 10:52 | 18:27   | 02:01 |
| M75        | NGC6864                    | Globular | Sgr   | 20h 06m 05s | -21° 55.3' | 9.5  | 13:30 | 18:28   | 23:27 |
| Barnard342 | B342                       | DkNeb    | Cyg   | 20h 09m 30s | +41° 12.0' |      | 09:58 | 18:32   | 03:05 |

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| ID         | Common Name           | Type          | Const | RA          | Dec        | Mag  | Rise  | Transit | Set   |
|------------|-----------------------|---------------|-------|-------------|------------|------|-------|---------|-------|
| NGC6885    | 20 Vulpeculae Cluster | Open          | Vul   | 20h 12m 00s | +26° 29.0' | 5.9  | 11:10 | 18:34   | 01:58 |
| NGC6891    |                       | P Neb         | Del   | 20h 15m 09s | +12° 42.2' | 12.0 | 11:59 | 18:37   | 01:16 |
| NGC6894    |                       | P Neb         | Cyg   | 20h 16m 24s | +30° 33.9' | 14.0 | 10:59 | 18:39   | 02:18 |
| IC4997     |                       | P Neb         | Sge   | 20h 20m 09s | +16° 43.9' | 12.0 | 11:51 | 18:42   | 01:33 |
| Barnard345 |                       | DkNeb         | Cyg   | 20h 21m 00s | +46° 33.0' |      | 09:30 | 18:43   | 03:57 |
| NGC6913    | Cooling Tower         | Open          | Cyg   | 20h 23m 57s | +38° 30.5' | 6.6  | 10:28 | 18:46   | 03:04 |
| Abell70    |                       | P Neb         | Aql   | 20h 31m 33s | -07° 05.3' | 14.3 | 13:11 | 18:54   | 00:37 |
| Barnard348 | B348                  | DkNeb         | Cyg   | 20h 34m 00s | +42° 05.0' |      | 10:17 | 18:56   | 03:36 |
| NGC6940    |                       | Open          | Vul   | 20h 34m 26s | +28° 17.0' | 6.3  | 11:26 | 18:57   | 02:27 |
| NGC6960    | Filamentary Nebula    | Neb           | Cyg   | 20h 45m 58s | +30° 35.6' |      | 11:28 | 19:08   | 02:48 |
| IC5068     |                       | Neb           | Cyg   | 20h 50m 29s | +42° 28.6' |      | 10:31 | 19:13   | 03:55 |
| IC5070     | Pelican Nebula [2]    | Neb           | Cyg   | 20h 51m 00s | +44° 24.1' |      | 10:17 | 19:13   | 04:09 |
| NGC6979    | II-206                | Neb           | Cyg   | 20h 51m 00s | +32° 09.0' | 11.0 | 11:26 | 19:13   | 03:00 |
| NGC6981    |                       | Globular      | Aqr   | 20h 53m 28s | -12° 32.2' | 9.4  | 13:48 | 19:16   | 00:43 |
| IC5076     |                       | Neb           | Cyg   | 20h 55m 33s | +47° 23.7' |      | 09:56 | 19:18   | 04:39 |
| IC1340     |                       | Neb           | Cyg   | 20h 56m 08s | +31° 02.8' |      | 11:36 | 19:18   | 03:00 |
| NGC6992    | Cirrus Nebula [2]     | Neb           | Cyg   | 20h 56m 19s | +31° 44.6' |      | 11:34 | 19:18   | 03:03 |
| NGC6996    | VIII-58               | Open          | Cyg   | 20h 56m 30s | +44° 38.0' | 10.0 | 10:21 | 19:19   | 04:16 |
| NGC6997    |                       | Open          | Cyg   | 20h 56m 39s | +44° 37.9' | 10.0 | 10:21 | 19:19   | 04:16 |
| NGC7000    | Gulf of Mexico        | BrNeb         | Cyg   | 20h 58m 48s | +44° 20.0' |      | 10:26 | 19:21   | 04:16 |
| M73        | NGC6994               | Open+Asterism | Aqr   | 20h 58m 56s | -12° 38.1' | 9.0  | 13:54 | 19:21   | 00:48 |
| NGC7006    | C42                   | Globular      | Del   | 21h 01m 30s | +16° 11.0' | 10.6 | 12:34 | 19:24   | 02:13 |
| NGC7009    | C55,Saturn Nebula     | P Neb         | Aqr   | 21h 04m 12s | -11° 22.0' | 8.0  | 13:55 | 19:26   | 00:57 |
| NGC7027    |                       | P Neb         | Cyg   | 21h 07m 02s | +42° 14.1' | 10.0 | 10:49 | 19:29   | 04:10 |
| M39        | NGC7092               | Open          | Cyg   | 21h 31m 42s | +48° 25.0' | 5.5  | 10:22 | 19:54   | 05:25 |
| M2         | NGC7089               | Globular      | Aqr   | 21h 33m 27s | -00° 49.3' | 7.5  | 13:55 | 19:56   | 01:56 |
| NGC7090    |                       | Galaxy        | Ind   | 21h 36m 28s | -54° 33.4' | 11.0 | 18:46 | 19:59   | 21:11 |
| IC1396     | Elephant Trunk        | Open          | Cep   | 21h 38m 58s | +57° 29.3' | 3.5  | Circ  | 20:01   | 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  
Australis  
Tri - Triangulum  
Tuc - Tucana  
UMa - Ursa Major  
UMi - Ursa Minor  
Vel - Vela  
Vir - Virgo  
Vol - Volans  
Vul - Vulpecula

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