Volume 42.9 September 2022

Desert Sky Observer

Antelope Valley Astronomy Club

Upcoming Events

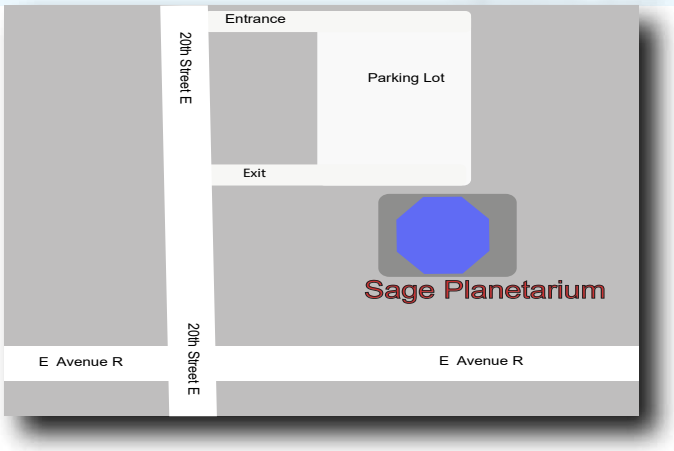
September 9: Club Meeting
September 17: Moonwalk 7:30 pm @ PDW
September 24: DSSP at Chuchupate

September 23 - October 2: AV Fair & Alfalfa Festival

Every clear night: Personal Star Party

AVAC Calendar

October 14: Club Meeting
October 15-16: Edwards AFB Air Show..
October 22: DSSP at Red Cliffs
October 29: Scary Science 3 pm;
Moonwalk 6:30 Pm @ PDW



Board Members

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

Vice-President: Gail Lofdahl 661-722-5833
vice-president@avastronomyclub.org

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

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

Appointed Positions

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

Equipment & Library:
John Van Evera 661-754-1819
library@avastronomyclub.org

Club Historian: vacant
history@avastronomyclub.org

Webmaster: Steve Trotta (661) 269-5428
webmaster@avastronomyclub.org

Astronomical League Coordinator:
Frank Moore (661) 972-4775
al@avastronomyclub.org

www.avastronomyclub.org
ANTELOPE VALLEY
ASTRONOMY CLUB, INC.

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.avastronomyclub.org

The Antelope Valley Astronomy Club, Inc. is a §503(c)(3) 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!

Every month this year, we have been adding new members; we are almost back to the number of members from before the Covid crisis started. This month let's all welcome our newest members, Navin, Juan, Nubia, Vance, Artur and all of their families. Please welcome one and all at the next meeting.

On August 20th, we had another Moonwalk at Prime Desert Woodland. There were 5 telescopes, at least 7 members, and about 162 members of the public. The next Moonwalk will be on September 17th at 7:30 PM. The crowd favorite, Saturn, will be closer to it's zenith and Jupiter will be about where Saturn was last month. Everyone bring your telescope or binoculars.

Our last club meeting on August 12th was a special event. I want to thank Matt and Sue Leone for organizing and teaching the painting class. I'm sure Tom Hames would have been happy that something he started continued. I just wished that my painting looked more like a scene from space. I guess that's why its called "art."

Our next meeting will be on September 9th. The speaker will be Chris Butler from Orange County Astronomers. Yes he will be appearing by way of Zoom, but, Chris is a great speaker, and we will learn from him.

Our August dark sky star party was on the 27th at Mt Pinos Nordic Base. I hope those members who made it, had a great night. As for me, the spirit was willing, but the body said. . "NO!" The next DSSP will be at Chuchupate on the 24th. I intend to be there, I hope you will be there too.

Keep Looking Up, Phil

Setting up for Moonwalk 8/20/22

On The Cover

Please note: Cover Art is rotated 90° clockwise from original as described below

Webb's Mid-InfraRed Instrument (MIRI) shows never-before-seen details of Stephan's Quintet, a visual grouping of five galaxies, in this image. MIRI pierced through dust-enshrouded regions to reveal huge shock waves and tidal tails, gas and stars stripped from the outer regions of the galaxies by interactions. It also unveiled hidden areas of star formation. The new information from MIRI provides invaluable insights into how galactic interactions may have driven galaxy evolution in the early universe. This image was released as part of the first set of images from the NASA/ESA/CSA James Webb Space Telescope on 12 July 2022 (for a full array of Webb's first images and spectra, including downloadable files, please visit this page).

This image contains one more MIRI filter than was used in the NIRCam-MIRI composite picture. The image processing specialists at the Space Telescope Science Institute in Baltimore opted to use all three MIRI filters and the colours red, green and blue to most clearly differentiate the galaxy features from each other and the shock waves between the galaxies.

In this image, red denotes dusty, star-forming regions, as well as extremely distant, early galaxies and galaxies enshrouded in thick dust. Blue point sources show stars or star clusters without dust. Diffuse areas of blue indicate dust that has a significant amount of large hydrocarbon molecules. For small background galaxies scattered throughout the image, the green and yellow colours represent more distant, earlier galaxies that are rich in these hydrocarbons as well.

From the Secretary

By Rose Moore

Members:

Our meeting for September 9th will have a guest speaker via Zoom. We will be having astronomer and artist Chris Butler from the Orange County Astronomers. Chris is a well know artist, speaker, writer, and educational producer. His topic will be 'Under the Southern Stars'.

We have a Prime Desert Moon Walk with Jeremy on Saturday September 17th at 7:30pm, weather permitting. This event is free and open to the public. We need members with telescopes, or you may come out and take the walk with Jeremy and the public. There will be a last quarter Moon, rising later at 11:39pm. Saturn, Jupiter and Neptune will be up.

The dark sky party for September will be at Chuchupate, Saturday September 24th. You may arrive anytime on Saturday during the day. Weather permitting, more info to follow as we get closer to the event.

October brings our annual business meeting on Friday October 14th. Please attend so that you can discuss the focus of the club, changes you might want to see, and to vote for new officers for the Executive Board. We will also be starting the sign up for the club Christmas Party, which will be on Saturday Dec. 10th at Gino's Restaurant in the Lancaster Marketplace. More information will be at our club meeting and in the upcoming DSO's and emails.

Also in October will be the College of the Canyons Star Party. We don't have an exact date yet. I would like to see if we'll have enough members to attend before committing the club to the event.

We would like to give a big shout out and thank you to Matt and Sue Leone for organizing the paint class for our meeting in August! Thank you Sue for teaching the class, and helping and encouraging everyone! It was a big success and I think Tom Hames would be proud that we want to continue this event!

Rose

On The Cover ... continued

Stephan's Quintet's topmost galaxy – NGC 7319 – harbours a supermassive black hole 24 million times the mass of the Sun. It is actively accreting material and puts out light energy equivalent to 40 billion Suns. MIRI sees through the dust surrounding this black hole to unveil the strikingly bright active galactic nucleus.

As a bonus, the deep mid-infrared sensitivity of MIRI revealed a sea of previously unresolved background galaxies reminiscent of Hubble's Deep Fields.

Together, the five galaxies of Stephan's Quintet are also known as the Hickson Compact Group 92 (HCG 92). Although called a "quintet," only four of the galaxies are truly close together and caught up in a cosmic dance. The fifth and leftmost galaxy, called NGC 7320, is well in the foreground compared with the other four. NGC 7320 resides 40 million light-years from Earth, while the other four galaxies (NGC 7317, NGC 7318A, NGC 7318B, and NGC 7319) are about 290 million light-years away. This is still fairly close

For Sale

Oculus Quest Meta Headset with 256 GB and hand controllers in a black carrying case. It also includes a cable that goes from a PC to a slot in the headset. Price: $250 for everything. This includes a headset charging unit and connection for a cell phone. It has been rarely used. It was bought in April of this year. Contact Duane Lewis by email only for further info: Duane Lewis <gurba1826@gmail.com>

The Summer Triangle's Hidden Treasures

by David Prosper, NASA Night Sky Network

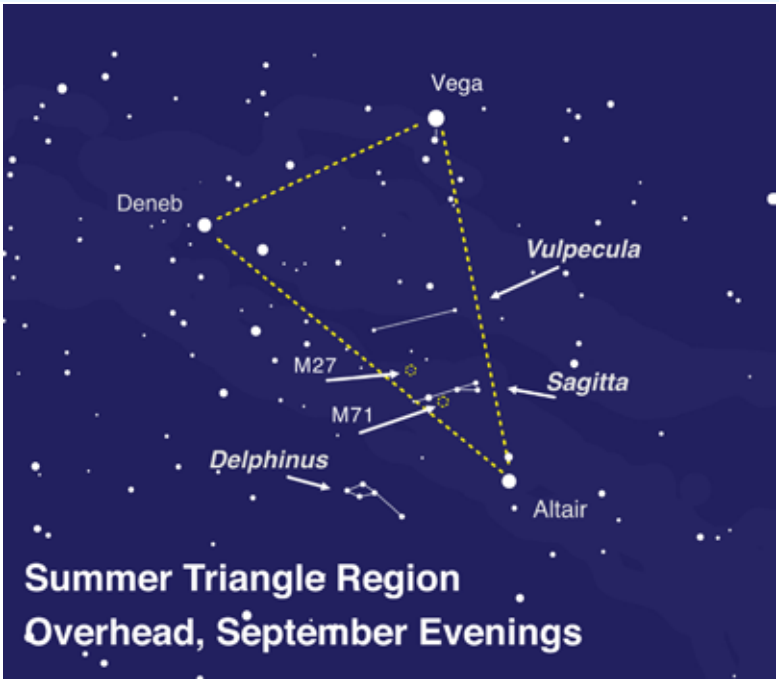
September skies bring the lovely **Summer Triangle** asterism into prime position after nightfall for observers in the Northern Hemisphere. Its position high in the sky may make it difficult for some to observe its member stars comfortably, since looking straight up while standing can be hard on one's neck! While that isn't much of a problem for those that just want to quickly spot its brightest stars and member constellations, this difficulty can prevent folks from seeing some of the lesser known and dimmer star patterns scattered around its informal borders. The solution? Lie down on the ground with a comfortable blanket or mat, or grab a lawn or gravity chair and sit luxuriously while facing up. You'll quickly spot the major constellations about the Summer Triangle's three corner stars: Lyra with bright star Vega, Cygnus with brilliant star Deneb, and Aquila with its blazing star, Altair. As you get comfortable and your eyes adjust, you'll soon find yourself able to spot a few constellations hidden in plain sight in the region around the Summer Triangle: **Vulpecula the Fox, Sagitta the Arrow,** and **Delphinus the Dolphin**! You could call these the Summer Triangle's "hidden treasures" – and they are hidden in plain sight for those that know where to look!

Vulpecula the Fox is located near the middle of the Summer Triangle, and is relatively small, like its namesake. Despite its size, it features the largest planetary nebula in our skies: M27, aka the Dumbbell Nebula! It's visible in binoculars as a fuzzy "star" and when seen through telescopes, its distinctive shape can be observed more readily - especially with larger telescopes. Planetary nebulae, named such because their round fuzzy appearances were initially thought to resemble the disc of a planet by early telescopic observers, form when stars similar to our Sun begin to die. The star will expand into a massive red giant, and its gasses drift off into space, forming a nebula. Eventually the star collapses into a white dwarf – as seen with M27 - and eventually the colorful shell of gasses will dissipate throughout the galaxy, leaving behind a solitary, tiny, dense, white dwarf star. You are getting a peek into our Sun's far-distant future when you observe this object!

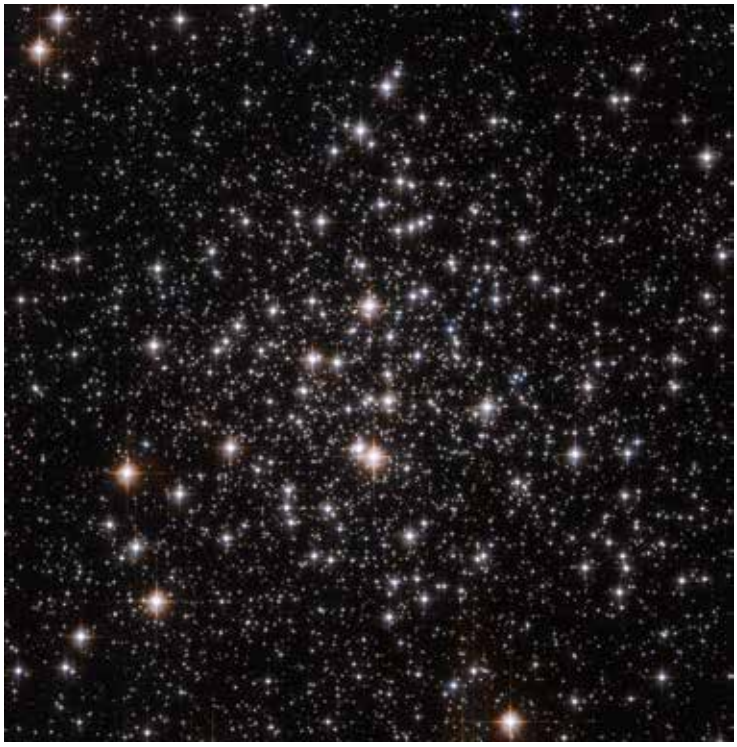
Sagitta the Arrow is even smaller than Vulpecula – it's the third smallest constellation in the sky! Located between the stars of Vulpecula and Aquila the Eagle, Sagitta's stars resemble its namesake arrow. It too contains an interesting deep-sky object: M71, an unusually small and young globular cluster whose lack of a strong central core has long confused and intrigued astronomers. It's visible in binoculars, and a larger telescope will enable you to separate its stars a bit more easily than most globulars; you'll certainly see why it was thought to be an open cluster!

Delicate **Delphinus the Dolphin** appears to dive in and out of the Milky Way near Aquilla and Sagitta! Many stargazers identify Delphinus as a herald of the fainter water constellations, rising in the east after sunset as fall approaches. The starry dolphin appears to leap out of the great celestial ocean, announcing the arrival of more wonderful sights later in the evening.

Want to hunt for more treasures? You'll need a treasure map, and the Night Sky Network's "Trip Around the Triangle" handout is the perfect guide for your quest! Download one before your observing session at bit.ly/TriangleTrip. And of course, while you wait for the Sun to set - or skies to clear - you can always find out more about the objects and 2science hidden inside these treasures by checking out NASA's latest at nasa.gov.



Search around the Summer Triangle to spot some of its hidden treasures! To improve readability, the lines for the constellations of quilla, Lyra, and Cygnus have been removed, but you can find a map which includes them in our previous article, Spot the Stars of the Summer Triangle, from August 2019. These aren't the only wonderful celestial sights found around its borders; since the Milky Way passes through this region, it's littered with many incredible deep-sky objects for those using binoculars or a telescope to scan the heavens.
Image created with assistance from Stellarium: stellarium.org



M71 as seen by Hubble. Your own views very likely won't be as sharp or close as this. However, this photo does show the cluster's lack of a bright, concentrated core, which led astronomers until fairly recently to classify this unusual cluster as an "open cluster" rather than as a "globular cluster." Studies in the 1970s proved it to be a globular cluster after all – though an unusually young and small one!
Credit ESA/Hubble and NASA.
Source: https://www.nasa.gov/feature/goddard/2017/messier-71

Additional Skywatching Resources

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

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

Space News

News from around the Net

What Are Wormholes? An Astrophysicist Explains These Shortcuts Through Space-Time
Imagine two towns on two opposite sides of a mountain. People from these towns would probably have to travel all the way around the mountain to visit one another. But, if they wanted to get there faster, they could dig a tunnel straight through the mountain to create a shortcut. That's the idea behind a wormhole. . . . (continued at https://astronomy.com/news/astro-for-kids/2022/08/what-are-wormholes-an-astrophysicist-explains-these-shortcuts-through-space-time)

NASA's Webb Detects Carbon Dioxide In Exoplanet Atmosphere
NASA's James Webb Space Telescope has captured the first clear evidence for carbon dioxide in the atmosphere of a planet outside the solar system. This observation of a gas giant planet orbiting a Sun-like star 700 light-years away provides important insights into the composition and formation of the planet. The finding, accepted for publication in Nature, offers evidence that in the future Webb may be able to detect and measure carbon dioxide in the. . . . (continued at https://www.sciencedaily.com/releases/2022/08/220825115944.htm)

NASA Schedules PUNCH Mission To Launch In 2025
PUNCH, which consists of four suitcase-sized satellites, will study the Sun's outer atmosphere, the corona, and how it generates the solar wind. This continuous supersonic stream of charged particles fills the solar system, forming the bubble-like region of space known as our heliosphere. The spacecraft also will track coronal mass ejections . . . .(continued at https://www.sciencedaily.com/releases/2022/08/220823135707.htm)

Scientists Help Probe Dark Energy By Testing Gravity
Could one of the biggest puzzles in astrophysics be solved by reworking Albert Einstein's theory of gravity? A new study co-authored by NASA scientists says not yet. The universe is expanding at an accelerating rate, and scientists don't know why. This phenomenon seems to contradict everything researchers understand about gravity's effect on the cosmos: It's as if you threw an apple in the air and it continued upward, faster and faster. . . . .(continued at https://phys.org/news/2022-08-scientists-probe-dark-energy-gravity.html)

Surprising Details Leap Out In Sharp New James Webb Space Telescope Images Of Jupiter
The latest images of Jupiter from the James Webb Space Telescope (JWST) are stunners. Captured on July 27, the infrared images—artificially colored to make specific features stand out—show fine filigree along the edges of the colored bands and around the Great Red Spot and also provide an unprecedented view of the auroras over the north and south poles. One wide-field image presents a unique lineup of the planet, its faint rings and two of Jupiter's smaller satellites . . . (continued at https://phys.org/news/2022-08-sharp-james-webb-space-telescope.html)

NASA's Insight Lander Finds Tropical Mars Is Dry
Hardly any traces of the vanished oceans of Mars remain in the Red Planet's tropics. The velocity of seismic waves recorded by the seismometer in NASA's InSight lander reveal few traces of the subsurface ice that has been found at higher latitudes, says oceanographer Vashan Wright . . . . (continued at https://skyandtelescope.org/astronomy-news/nasas-insight-lander-finds-tropical-mars-is-dry/)

Space News

News from around the Net

Open Cluster Messier 37 Hosts A Planetary Nebula, Study Finds

Astronomers have performed an astro-photometric study of an open cluster known as Messier 37. One of the main results of this research is the finding that Messier 37 hosts a large and evolved planetary nebula. The study was detailed in a paper published August 12 on the arXiv.org pre-print repository. Planetary nebulae (PNe) are expanding shells of gas and dust that have been ejected from a star during the process of its evolution . . . .(continued at https://phys.org/news/2022-08-cluster-messier-hosts-planetary-nebula.html)

Mysterious Radio Bursts From Space Detected

Astronomers using the U.S. National Science Foundation's Karl G. Jansky Very Large Array, or VLA, as well as other powerful telescopes have found the second known highly active, repeating fast radio burst, or FRB, raising more questions about the nature of these little-understood objects and the role they play in intergalactic space. The object, in the outskirts of a dwarf galaxy nearly 3 billion light-years from Earth called FRB 190520, . . . (continued at https://beta.nsf.gov/news/mysterious-radio-bursts-space-detected)

Lightning Strikes Artemis 1 Launch Pad 2 Days Before Liftoff

Lightning crackled today (Aug. 27) over Launch Pad 39B at NASA's Kennedy Space Center in Florida, which will host the highly anticipated liftoff of the agency's Artemis 1 moon mission on Monday morning (Aug. 29). The bolts came close to the Artemis 1 stack — a Space Launch System (SLS) megarocket topped by an Orion crew capsule — . . . (continued at https://www.space.com/nasa-artemis-1-moon-mission-lightning-strike)

Saturn V Was Loud But Didn't Melt Concrete

The Saturn V carried man to the moon and remains the most powerful rocket to successfully launch to orbit. It captures the imagination -- but sometimes, it might capture a bit too much imagination. Abundant internet claims about the acoustic power of the rocket suggest that it melted concrete and lit grass on fire over a mile away. Such ideas are undeniably false. In The Journal of the Acoustical Society of America, published on behalf of the Acoustical Society of America . . . . (continued at https://www.sciencedaily.com/releases/2022/08/220823115615.htm)

On The Cover ... continued

in cosmic terms, compared with more distant galaxies billions of light-years away. Studying these relatively nearby galaxies helps scientists better understand structures seen in a much more distant universe.

This proximity provides astronomers a ringside seat for witnessing the merging of and interactions between galaxies that are so crucial to all of galaxy evolution. Rarely do scientists see in so much exquisite detail how interacting galaxies trigger star formation in each other, and how the gas in these galaxies is being disturbed. Stephan's Quintet is a fantastic "laboratory" for studying these processes fundamental to all galaxies.

Tight groups like this may have been more common in the early universe when their superheated, infalling material may have fueled very energetic black holes called quasars. Even today, the topmost galaxy in the group – NGC 7319 – harbours an active galactic nucleus, a supermassive black hole that is actively pulling in material.

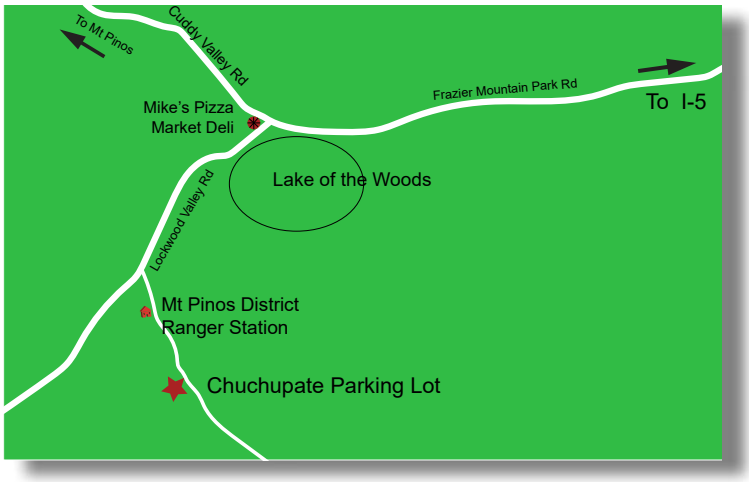
MIRI was contributed by ESA and NASA, with the instrument designed and built by a consortium of nationally funded European Institutes (The MIRI European Consortium) in partnership with JPL and the University of Arizona.

Credit:
NASA, ESA, CSA, and STScI

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.

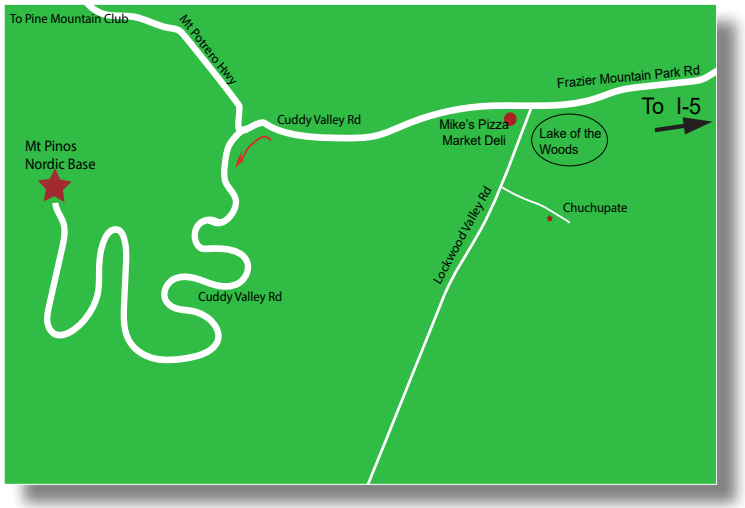


The Red Cliffs Natural Area is part of **Red Rock Canyon State Park** is a day use area and is not for use by the public after dark. The Club gets a special permit for a star party and pays a fee.

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.



Planet Summary

The **Sun** starts September between Leo's feet in mid-Virgo by months end .

Mercury starts the month in western Virgo some 26° east of the Sun. Inferior conjunction happens on the 23rd. At the end of the month it lands at the boarder of Virgo and Leo.

Venus begins the month in Leo west of Regulus. Gradually diving toward the Sun ending the month 6° west of the Sun. Superior conjunction on Oct 21.

Mars rising before midnight, spends the month in Taurus. Starting the month at mag -0.16 brightening to -0.6 by month's end.

Jupiter spends the month moving in retrograde in southern corner of Pisces. The full Moon passes by in the morning of the 11th, 2° to the south

Saturn begins the month in its retrograde motion near the tail of Capricorn. On the 8th the almost full Moon passes some 4.2° to south.

Uranus is creeping west in southeastern Aries at mag 5.7. On the 14th the 79% waning Moon will occult (at 4 pm.)

Neptune starts September on the eastern most edge of Aquarius. Achieves opposition on the 16th at 4.0 light-hours (28.9 au) from Earth mag +7.8 with a 2.3" disk.

Pluto spends the month slowing moving west on the eastern edge of Sagittarius at mag 14.3.

Asteroids

Ceres (mag 8.6) starts the month in Leo and moves southeast through Leo roughly parallel to the ecliptic. The 7% waning Moon passes 3° south on the 22nd.

Pallas (mag 9.1) starts the month in Orion starting near Saiph and makes a bee-line for Sirus in Canis Major, arriving Oct 9 passing by 6' to the north.

Juno (mag 8) starts the month in Pisces, 2.5° north of the ecliptic, crossing Sept 24th ending about 0.3° south of the ecliptic in Aquarius.

Vesta (mag 6.0) starts the month in southwestern corner of Aquarius and ending in Capricorn at mag 6.8.

Moon Phases

First Qtr Sept 3 | Full Sept 10 | Third Qtr Sept 17 | New Sept 25

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
9/1/2022	11:42	22:24	06:25	19:18
9/5/2022	11:13	00:46	06:28	19:13
9/10/2022	19:42	06:41	06:32	19:06
9/15/2022	22:14	12:03	06:35	18:59
9/20/2022	01:24	16:26	06:38	18:53
9/25/2022	06:23	18:58	06:43	18:44
9/30/2022	11:52	21:47	06:46	18:37

Planet Data*

September 1

	Rise	Transit	Set	Mag	Phase%
Mercury	08:37	14:25	120413	0.43	45.0
Venus	05:20	12:03	18:45	-3.92	97.2
Mars	23:28	06:31	13:32	-0.14	85.1
Jupiter	20:29	02:38	08:43	-2.89	99.7
Saturn	18:24	23:41	05:01	0.34	99.9

September 15

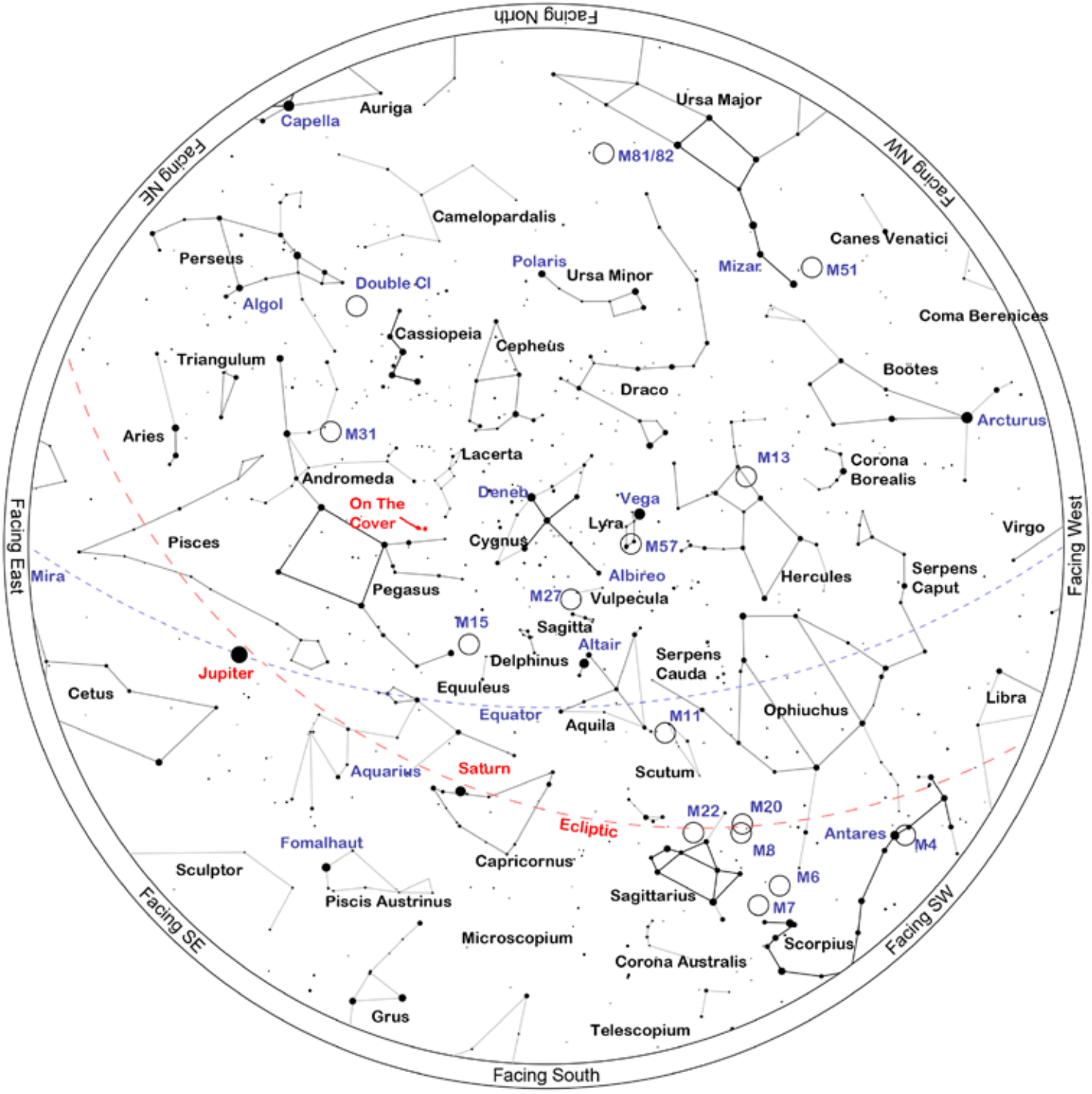
	Rise	Transit	Set	Mag	Phase%
Mercury	07:51	13:33	19:16	2.06	12.5
Venus	05:49	12:14	18:39	-3.92	98.5
Mars	22:58	06:05	13:11	-0.33	85.9
Jupiter	19:30	01:37	07:40	-2.93	99.9
Saturn	17:26	22:42	04:02	0.41	99.9

September 30

	Rise	Transit	Set	Mag	Phase%
Mercury	05:47	11:54	18:00	1.61	14.1
Venus	06:19	12:24	18:28	-3.93	99.4
Mars	22:21	05:32	12:41	-0.58	87.5
Jupiter	18:26	00:27	06:32	-2.94	99.9
Saturn	16:25	21:41	03:00	0.48	99.8

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

Sky Chart



Location: Palmdale, CA 93551
Latitude: 34° 36' N, longitude: 118° 11' W
Time: 2022 September 24, 21:00 (UTC -07:00)

Powered by: Heavens-Above.com

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 September 24, 2022. The list is sorted by the transit time of the object.

ID	Common Name	Type		RA	Dec	Mag	Rise	Transit	Set
IC4593	White Eyed Pea	P Neb	Her	16h 11m 44s	+12° 04.3'	11.0	10:19	16:57	23:34
IC4592	Jabbah	Neb	Sco	16h 11m 59s	-19° 27.4'		11:51	16:57	22:03
M80	NGC6093	Globular	Sco	16h 17m 03s	-22° 58.5'	8.5	12:07	17:02	21:56
IC4601		Neb	Sco	16h 20m 18s	-20° 04.9'		12:01	17:05	22:09
Abell38		P Neb	Sco	16h 23m 17s	-31° 44.9'	11.7	12:46	17:08	21:30
M4	Cat's Eye, NGC6121	Globular	Sco	16h 23m 35s	-26° 31.5'	7.5	12:26	17:08	21:50
IC4603	Rho Ophiuchi Complex [1]	Neb	Oph	16h 25m 24s	-24° 28.0'		12:21	17:10	22:00
IC4604	Rho Ophiuchi Complex [2]	Neb	Oph	16h 25m 33s	-23° 26.5'		12:17	17:10	22:03
NGC6124	C75	Open	Sco	16h 25m 36s	-40° 40.0'	5.8	13:33	17:10	20:48
Abell39		P Neb	Her	16h 27m 33s	+27° 54.5'	12.9	09:43	17:12	00:42
IC4605		Neb	Sco	16h 30m 12s	-25° 06.8'		12:28	17:15	22:02
NGC6153		P Neb	Sco	16h 31m 31s	-40° 15.2'	12.0	13:36	17:16	20:57
NGC6181		Galaxy	Her	16h 32m 21s	+19° 49.5'	11.9	10:16	17:17	00:18
NGC6171		Globular	Oph	16h 32m 32s	-13° 03.1'	8.1	11:52	17:17	22:43
NGC6178		Open	Sco	16h 35m 47s	-45° 38.6'	7.2	14:16	17:21	20:25
NGC6193	C82	Open	Ara	16h 41m 18s	-48° 46.0'	5.2	14:49	17:26	20:03
M13	Hercules Globular Cluster, Great Hercules Cluster	Globular	Her	16h 41m 41s	+36° 27.5'	7.0	09:19	17:26	01:34
NGC6210	Turtle Planetary Nebula	P Neb	Her	16h 44m 30s	+23° 48.0'	9.0	10:15	17:29	00:44
Barnard44a	B44a	DkNeb	Sco	16h 44m 45s	-40° 20.0'		13:50	17:30	21:09
NGC6204		Open	Ara	16h 46m 09s	-47° 01.0'	8.2	14:38	17:31	20:24
M12	Gumball Globular	Globular	Oph	16h 47m 14s	-01° 56.8'	8.0	11:35	17:32	23:29
NGC6231	C76,Table of Scorpius	Open	Sco	16h 54m 00s	-41° 48.0'	2.6	14:08	17:39	21:10
IC4628	Prawn Nebula	Neb	Sco	16h 56m 58s	-40° 27.3'		14:03	17:42	21:21
NGC6254		Globular	Oph	16h 57m 09s	-04° 05.9'	6.6	11:51	17:42	23:33
Barnard47	B47	DkNeb	Oph	16h 59m 42s	-22° 38.0'		12:49	17:44	22:40
M62	Flickering Globular, NGC6266	Globular	Oph	17h 01m 13s	-30° 06.7'	8.0	13:18	17:46	22:14
M19	NGC6273	Globular	Oph	17h 02m 38s	-26° 16.0'	8.5	13:04	17:47	22:30
IC4637		P Neb	Sco	17h 05m 10s	-40° 53.1'	14.0	14:13	17:50	21:27
NGC6302	C69,Bug Nebula	P Neb	Sco	17h 13m 42s	-37° 06.0'	9.6	14:01	17:58	21:56
M92	NGC6341	Globular	Her	17h 17m 07s	+43° 08.1'	7.5	09:14	18:02	02:49
M9	NGC6333	Globular	Oph	17h 19m 12s	-18° 31.0'	9.0	12:55	18:04	23:13
NGC6326		P Neb	Ara	17h 20m 46s	-51° 45.2'	12.0	16:04	18:06	20:07
NGC6357	Lobster Nebula	Neb	Sco	17h 24m 43s	-34° 12.1'		13:58	18:10	22:21
IC4651		Open	Ara	17h 24m 52s	-49° 56.5'	6.9	15:45	18:10	20:34
Abell41		P Neb	Ser	17h 29m 04s	-15° 13.3'	13.9	12:55	18:14	23:33
Abell42		P Neb	Oph	17h 31m 31s	-08° 19.1'	14.6	12:37	18:16	23:56

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6388		Globular	Sco	17h 36m 17s	-44° 44.1'	6.9	15:10	18:21	21:32
M14	NGC6402	Globular	Oph	17h 37m 36s	-03° 14.7'	9.5	12:29	18:22	00:16
Barnard276	B276	DkNeb	Oph	17h 39m 39s	-19° 49.0'		13:19	18:24	23:29
M6	Butterfly Cluster	Open	Sco	17h 40m 20s	-32° 15.2'	4.5	14:06	18:25	22:45
NGC6397	C86	Globular	Ara	17h 40m 42s	-53° 40.0'	5.6	16:56	18:25	19:55
NGC6426		Globular	Oph	17h 44m 55s	+03° 10.1'	11.2	12:18	18:30	00:41
Barnard83a	B83a	DkNeb	Sgr	17h 45m 18s	-20° 00.0'		13:26	18:30	23:35
IC4665		Open	Oph	17h 46m 30s	+05° 39.0'	4.2	12:13	18:31	00:50
NGC6445	Crescent Nebula	P Neb	Sgr	17h 49m 15s	-20° 00.6'	13.0	13:30	18:34	23:38
NGC6503		Galaxy	Dra	17h 49m 27s	+70° 08.6'	10.2	Circ	18:34	Circ
NGC6441		Globular	Sco	17h 50m 13s	-37° 03.0'	7.4	14:38	18:35	22:32
M7	Scorpion's Tail, Ptolemy's Cluster	Open	Sco	17h 53m 51s	-34° 47.6'	3.5	14:30	18:39	22:47
IC4670		Neb	Sgr	17h 55m 07s	-21° 44.6'		13:41	18:40	23:39
NGC6501		Galaxy	Her	17h 56m 04s	+18° 22.3'	12.3	11:44	18:41	01:37
M23	NGC6494	Open	Sgr	17h 57m 04s	-18° 59.1'	6.0	13:34	18:42	23:50
NGC6543	C6,Cat Eye Nebula	P Neb	Dra	17h 58m 36s	+66° 38.0'	8.1	Circ	18:43	Circ
NGC6496		Globular	Sco	17h 59m 04s	-44° 16.0'	9.2	15:29	18:44	21:58
Barnard291	B291	DkNeb	Sgr	17h 59m 43s	-33° 53.0'		14:32	18:45	22:57
Barnard292	B292	DkNeb	Sgr	18h 00m 34s	-33° 20.0'		14:30	18:45	23:00
Barnard293	B293	DkNeb	Sgr	18h 01m 12s	-35° 20.0'		14:40	18:46	22:52
M20	Trifid Nebula, The Clover	Open+D Neb	Sgr	18h 02m 42s	-22° 58.2'	5.0	13:53	18:47	23:42
M8	Lagoon Nebula, Dragon Nebula	Open+D Neb	Sgr	18h 03m 41s	-24° 22.7'	5.0	13:59	18:48	23:38
M21	NGC6531	Open	Sgr	18h 04m 13s	-22° 29.3'	7.0	13:53	18:49	23:45
NGC6530		Open	Sgr	18h 04m 31s	-24° 21.5'	4.6	13:59	18:49	23:39
NGC6528		Globular	Sgr	18h 04m 50s	-30° 03.3'	9.5	14:21	18:50	23:18
IC4684		Neb	Sgr	18h 09m 08s	-23° 26.1'		14:01	18:54	23:47
IC4685		Neb	Sgr	18h 09m 18s	-23° 59.2'		14:03	18:54	23:45
Barnard303	B303	DkNeb	Sgr	18h 09m 28s	-23° 59.0'		14:03	18:54	23:45
IC1274		Neb	Sgr	18h 09m 51s	-23° 38.8'		14:02	18:55	23:47
IC1275		Neb	Sgr	18h 10m 07s	-23° 45.7'		14:03	18:55	23:47
NGC6572		P Neb	Oph	18h 12m 06s	+06° 51.2'	9.0	12:35	18:57	01:19
NGC6567		P Neb	Sgr	18h 13m 45s	-19° 04.5'	12.0	13:51	18:59	00:06
IC4701		Neb	Sgr	18h 16m 36s	-16° 38.0'		13:46	19:01	00:16
IC1284		Neb	Sgr	18h 17m 39s	-19° 40.3'		13:57	19:02	00:08
M24	NGC6603,Delle Caustiche	Open	Sgr	18h 18m 26s	-18° 24.3'	4.5	13:54	19:03	00:13

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M16	Eagle Nebula	Open+D Neb	Ser	18h 18m 48s	-13° 48.3'	6.5	13:40	19:04	00:27
Barnard308	B308	DkNeb	Sgr	18h 19m 08s	-22° 14.0'		14:07	19:04	00:01
M18	Black Swan, NGC6613	Open	Sgr	18h 19m 58s	-17° 06.1'	8.0	13:51	19:05	00:18
M17	Omega Nebula,	Open+D Neb	Sgr	18h 20m 47s	-16° 10.3'	7.0	13:49	19:06	00:22
HR6923	HD170073	Mult	Dra	18h 23m 54s	+58° 48.0'	5.0	Circ	19:09	Circ
M28	NGC6626	Globular	Sgr	18h 24m 33s	-24° 52.1'	8.5	14:21	19:09	23:57
Abell44		P Neb	Sgr	18h 30m 11s	-16° 45.4'	12.6	14:00	19:15	00:30
NGC6637		Globular	Sgr	18h 31m 23s	-32° 20.8'	7.7	14:57	19:16	23:35
IC1287		Neb	Sct	18h 31m 26s	-10° 47.7'		13:44	19:16	00:49
M25	M25	Open	Sgr	18h 31m 42s	-19° 07.0'	6.5	14:09	19:16	00:24
IC4725		Open	Sgr	18h 31m 48s	-19° 06.7'	4.6	14:09	19:17	00:24
NGC6642		Globular	Sgr	18h 31m 54s	-23° 28.5'	8.8	14:24	19:17	00:10
NGC6644		P Neb	Sgr	18h 32m 35s	-25° 07.7'	12.0	14:30	19:17	00:04
NGC6647		Open	Sgr	18h 32m 49s	-17° 13.6'	8.0	14:04	19:18	00:31
IC4732		P Neb	Sgr	18h 33m 55s	-22° 38.6'	13.0	14:23	19:19	00:14
NGC6656	Crackerjack Cluster	Globular	Sgr	18h 36m 24s	-23° 54.2'	5.1	14:30	19:21	00:13
IC4756		Open	Ser	18h 38m 54s	+05° 27.0'	5.0	13:06	19:24	01:42
NGC6681		Globular	Sgr	18h 43m 12s	-32° 17.4'	8.1	15:09	19:28	23:47
NGC6694		Open	Sct	18h 45m 18s	-09° 23.0'	8.0	13:54	19:30	01:07
IC4776		P Neb	Sgr	18h 45m 51s	-33° 20.5'	12.0	15:16	19:31	23:45
Barnard318	B318	DkNeb	Sct	18h 49m 42s	-06° 23.0'		13:50	19:34	01:19
M11	Wild Duck Cluster, NGC6705	Open	Sct	18h 51m 05s	-06° 16.1'	7.0	13:51	19:36	01:21
M57	Ring Nebula	P Neb	Lyr	18h 53m 35s	+33° 01.7'	9.5	11:47	19:38	03:30
Barnard117	B117	DkNeb	Sct	18h 53m 43s	-07° 24.0'		13:56	19:39	01:21
NGC6715		Globular	Sgr	18h 55m 03s	-30° 28.7'	7.7	15:13	19:40	00:07
NGC6717	III-143	Globular	Sgr	18h 55m 06s	-22° 42.0'	9.2	14:44	19:40	00:35
Barnard122	B122	DkNeb	Sct	18h 56m 48s	-04° 45.0'		13:52	19:42	01:31
Barnard123	B123	DkNeb	Sct	18h 57m 39s	-04° 43.0'		13:53	19:42	01:32
NGC6723		Globular	Sgr	18h 59m 33s	-36° 37.9'	7.3	15:45	19:44	23:44
Barnard128	B128	DkNeb	Aql	19h 01m 40s	-04° 34.0'		13:56	19:46	01:36
NGC6729	C68	BrNeb	CrA	19h 01m 54s	-36° 57.0'		15:49	19:47	23:45
Barnard326	B326	DkNeb	Aql	19h 03m 00s	-00° 23.0'		13:46	19:48	01:49
NGC6749		Globular	Aql	19h 05m 15s	+01° 54.0'	11.1	13:42	19:50	01:58
NGC6760		Globular	Aql	19h 11m 12s	+01° 01.8'	9.1	13:50	19:56	02:02
Abell56		P Neb	Aql	19h 13m 07s	+02° 52.8'	12.4	13:47	19:58	02:09
NGC6772		P Neb	Aql	19h 14m 36s	-02° 42.4'	14.0	14:04	19:59	01:55
M56	NGC6779	Globular	Lyr	19h 16m 36s	+30° 11.0'	9.5	12:22	20:01	03:40
NGC6778		P Neb	Aql	19h 18m 25s	-01° 35.7'	13.0	14:05	20:03	02:02

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
Abell61		P Neb	Cyg	19h 19m 10s	+46° 14.5'	13.0	10:52	20:04	05:16
NGC6790		P Neb	Aql	19h 22m 57s	+01° 30.8'	10.0	14:01	20:08	02:15
NGC6803		P Neb	Aql	19h 31m 16s	+10° 03.3'	11.0	13:45	20:16	02:47
NGC6804		P Neb	Aql	19h 31m 35s	+09° 13.5'	12.0	13:48	20:16	02:45
Abell62		P Neb	Aql	19h 33m 18s	+10° 37.0'	13.0	13:45	20:18	02:51
NGC6807		P Neb	Aql	19h 34m 34s	+05° 41.0'	14.0	14:01	20:19	02:38
M55	NGC6809	Globular	Sgr	19h 40m 00s	-30° 57.7'	7.0	16:00	20:25	00:50
NGC6813		Neb	Vul	19h 40m 22s	+27° 18.5'		12:58	20:25	03:53
NGC6820		Neb	Vul	19h 42m 28s	+23° 05.2'		13:15	20:27	03:39
Barnard338	B338	DkNeb	Aql	19h 43m 02s	+07° 27.0'		14:04	20:28	02:51
NGC6818	Little Gem	P Neb	Sgr	19h 43m 58s	-14° 09.1'	10.0	15:06	20:29	01:51
NGC6826	C15,Blinking Planetary	P Neb	Cyg	19h 44m 48s	+50° 31.0'	8.8	10:31	20:30	06:28
Abell65		P Neb	Sgr	19h 46m 34s	-23° 08.2'	13.1	15:37	20:31	01:25
NGC6838		Globular	Sge	19h 53m 46s	+18° 46.6'	8.3	13:41	20:39	03:36
NGC6842		P Neb	Vul	19h 55m 02s	+29° 17.3'	14.0	13:05	20:40	04:15
HR7619	HD189037	Mult	Cyg	19h 55m 38s	+52° 26.3'	4.9	10:11	20:40	07:10
Abell66		P Neb	Sgr	19h 57m 32s	-21° 36.6'	14.1	15:43	20:42	01:41
Barnard144	Fish on the platter nebula	DkNeb	Cyg	19h 58m 00s	+35° 20.0'		12:41	20:43	04:45
NGC6853	Dumbbell Nebula	P Neb	Vul	19h 59m 36s	+22° 43.2'	8.1	13:34	20:44	03:55
NGC6857	III-144	Neb	Cyg	20h 02m 48s	+33° 31.4'	11.4	12:54	20:48	04:41
IC4954		Neb	Vul	20h 04m 45s	+29° 15.1'		13:14	20:50	04:25
M75	NGC6864	Globular	Sgr	20h 06m 05s	-21° 55.3'	9.5	15:53	20:51	01:49
Barnard342	B342	DkNeb	Cyg	20h 09m 30s	+41° 12.0'		12:20	20:54	05:29
NGC6885	20 Vulpeculae Cluster	Open	Vul	20h 12m 00s	+26° 29.0'	5.9	13:32	20:57	04:21
NGC6891		P Neb	Del	20h 15m 09s	+12° 42.2'	12.0	14:21	21:00	03:39
NGC6894		P Neb	Cyg	20h 16m 24s	+30° 33.9'	14.0	13:21	21:01	04:42
IC4997		P Neb	Sge	20h 20m 09s	+16° 43.9'	12.0	14:14	21:05	03:56
NGC6913	Cooling Tower	Open	Cyg	20h 23m 57s	+38° 30.5'	6.6	12:50	21:09	05:27

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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