Volume 42.11 November 2022

Desert Sky Observer

Antelope Valley Astronomy Club

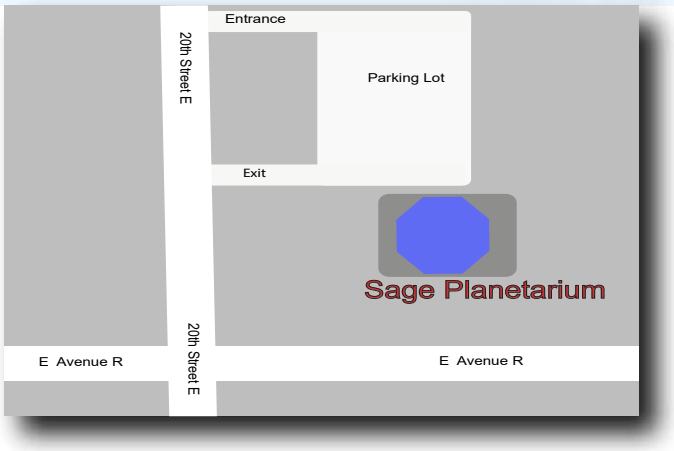
Upcoming Events

November 5: Moonwalk 6:30 pm @ PDW
November 6: Daylight Saving Time Ends
November 8: Early morning Lunar Eclipse at the Sage
November 8: Election Day -- Vote!
November 11: Club Meeting
November 26: DSSP @ Chuchupate (maybe)

AVAC Calendar

Every clear night: Personal Star Party

December 3: Moonwalk 6:00 pm @ PDW
December 10: Christmas Party @ Gino's Restaurant



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

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!

We have a Prime Desert Moon Walk on Saturday November 5th at 6:30pm. Weather permitting. Hopefully it won't be rained out, like our last Moon Walk. There were two members plus Jeremy and about eight or nine members of the public all wanting to see the stars. That would have happened but for the rain.

On Tuesday, November 8th (the same day as Election Day, only many hours before the polls open), starting at 01:00 Jeremy will host a Lunar Party at the Sage Planetarium. The total eclipse will last till about 04:45. There will be telescopes setup for your use.

At our last meeting, our annual Business Meeting, all of 10 members showed up. This was the minimum needed for a quorum. As it was, we managed to hold the elections. There were no nominations from the floor or emailed to the Secretary. I volunteered for another term, as did Rose and Rod. Gail requested not to be included in the slate of prospective officers. A new member, Navin Arjuna, nominated himself for Vice President. Elected by unanimous vote the results of the election are: Phil Wriedt, President; Navin Arjuna, Vice-President; Rose Moore, Secretary; Rod Girard, Treasurer.

Our Christmas Party is coming up on the 10th of December at Gino's Italian Restaurant, the same place it's been held for the past several years. More information will come by emails and at meetings.

Starting in January, Jeremy announced that he will be holding a class on The Telescope on the 2nd Tuesday of the month, and on the 4th Tuesday, there will be a class on Astronomy. Both classes will start at 6:30pm at the Sage Planetarium. More information will come by emails and at meetings.

See you at the next meeting on the 11th.

Keep Looking Up, Phil

On The Cover

Please note: North is 103.8° left of vertical

Although it looks more like an entity seen through a microscope than a telescope, this rounded object, named NGC 2022, is certainly no alga or tiny, blobby jellyfish. Instead, it is a vast orb of gas in space, cast off by an ageing star. The star is visible in the orb's centre, shining through the gases it formerly held onto for most of its stellar life.

When stars like the Sun grow advanced in age, they expand and glow red. These so-called red giants then begin to lose their outer layers of material into space. More than half of such a star's mass can be shed in this manner, forming a shell of surrounding gas. At the same time, the star's core shrinks and grows hotter, emitting ultraviolet light that causes the expelled gases to glow.

This type of object is called, somewhat confusingly, a planetary nebula, though it has nothing to do with planets. The name derives from the rounded, planet-like appearance of these objects in early telescopes.

NGC 2022 is located in the constellation of Orion (The Hunter).

Credit:
ESA/Hubble & NASA, R. Wade

From the Secretary

By Rose Moore

Members:

Thank you to all of our members that came out to support our events for the month of October!

On Saturday November 5th we have a Prime Desert Moon Walk with Jeremy at 6:30pm. Weather permitting. We need members with telescopes to help out with this event; or you are welcome to take the walk with Jeremy and the public. We'll have a waxing gibbous Moon that comes up at 4:40pm. Planets up are Jupiter, Saturn, Neptune, and Uranus.

We have a Moon Walk also on Saturday December 3rd, starting at 6:30pm.

Jeremy will be hosting the Lunar Eclipse at the SAGE Planetarium during the very early morning hours of Tuesday November 8th. This will be approximately a 4 hour event starting around 1am in the parking lot in front of the SAGE. There will be further info as to when you can arrive and eclipse phases in an email. It would be appreciated if any members can attend with telescopes.

The club meeting is scheduled for Friday November 11th at 7pm. We do not have a speaker as yet.

For those who are interested in the club Christmas Party, you may pay either by PayPal (link: http://www.avastronomyclub.org/christmas), or pay at the next meeting on 11/11 with a check or cash. You may also pay by check and mail it to the club's post office box, but please let us know if you are doing so: AVAC, P.O. Box 8545, Lancaster, CA 93539. The buffet will consist of a traditional Italian buffet, as members seem to enjoy the selection: Chicken Parmigiana, Lasagna (meat), Penne Pasta Primavera, Salad, Garlic Bread, Dessert, Ice Tea, Coffee, Soda. Alcoholic drinks will be extra. There will be email reminders sent out over the next few weeks.

Please come out and support some of the club's events!

Thanks, Rose

Cepheus: A House Fit for a King

by David Prosper, NASA Night Sky Network

Sometimes constellations look like their namesake, and sometimes these starry patterns look like something else entirely. That's the case for many stargazers upon identifying the constellation of Cepheus for the first time. These stars represent Cepheus, the King of Ethiopia, sitting on his throne. However, many present-day observers see the outline of a simple house, complete with peaked roof, instead – quite a difference! Astronomers have another association with this northern constellation; inside its borders lies the namesake of one of the most important types of stars in modern astronomy: Delta Cephei, the original **Cepheid Variable**.

Cepheus is a circumpolar constellation for most observers located in mid-northern latitudes and above, meaning it does not set, or dip below the horizon. This means Cepheus is visible all night long and can be observed to swing around the northern celestial pole, anchored by Polaris, the current North Star. Other circumpolar constellations include Cassiopeia, Ursa Major, Ursa Minor, Draco, and Camelopardalis. Its all-night position for many stargazers brings with it some interesting objects to observe. Among them: the "Garnet Star" Mu Cephei, a supergiant star with an especially deep red hue; several binary stars; several nebulae, including the notable reflection nebula NGC 7023; and the "Fireworks Galaxy" NGC 6946, known for a surprising amount of supernovae.

Perhaps the most famous, and certainly the most notable object in Cepheus, is the star **Delta Cephei**. Its variable nature was first discovered by John Goodricke, whose observations of the star began in October 1784. Slightly more than a century later, Henrietta Leavitt studied the variable stars found in the Magellanic Clouds in 1908 and discovered that the type of variable stars represented by Delta Cephei possessed very consistent relationships between their luminosity (total amount of light emitted), and their pulsation period (generally, the length of time in which the star goes through a cycle of where it dims and then brightens). Once the period for a Cepheid Variable (or **Cepheid**) is known, its luminosity can be calculated by using the scale originally developed by Henrietta Leavitt, now called "Leavitt's Law.". So, if a star is found to be a Cepheid, its actual brightness can be calculated versus its observed brightness. From that difference, the Cepheid's distance can then be estimated with a great deal of precision. This revolutionary discovery unlocked a key to measuring vast distances across the cosmos, and in 1924 observations of Cepheids by Edwin Hubble in what was then called the Andromeda Nebula proved that this "nebula" was actually another galaxy outside of our own Milky Way! You may now know this object as the "Andromeda **Galaxy**" or M31. Further observations of Cepheids in other galaxies gave rise to another astounding discovery: that our universe is not static, but expanding!

Because of their importance as a "standard candle" in measuring cosmic distances, astronomers continue to study the nature of Cepheids. Their studies revealed that there are two distinct types of Cepheids: Classical and Type II. Delta Cephei is the second closest Cepheid to Earth after Polaris, and was even studied in detail by Edwin Hubble's namesake telescope, NASA's Hubble Space Telescope, in 2008. These studies, along with others performed by the ESA's Hipparcos mission and other observatories, help to further refine the accuracy of distance measurements derived from observations of Cepheids. What will further observations of Delta Cephei and other Cepheids reveal about our universe? Follow NASA's latest observations of stars and galaxies across our universe at nasa.gov.

The stars of Cepheus are visible all year round for many in the Northern Hemisphere, but fall months offer some of the best views of this circumpolar constellation to warmly-dressed observers. Just look northwards! Image created with assistance from Stellarium: stellarium.org.

This historical diagram from Henrietta Leavitt's revolutionary publication shows the luminosity of a selection of Cepheid Variables on the vertical axis, and the log of their periods on the horizontal axis. The line drawn through these points shows how tight that relationship is between all the stars in the series. From Henrietta Leavitt and Edward Pickering's 1912 paper, "Periods of 25 Variable Stars in the Small Magellanic Cloud," a copy of which can be found at: https://ui.adsabs.harvard.edu/abs/1912HarCi.173....1L/abstract

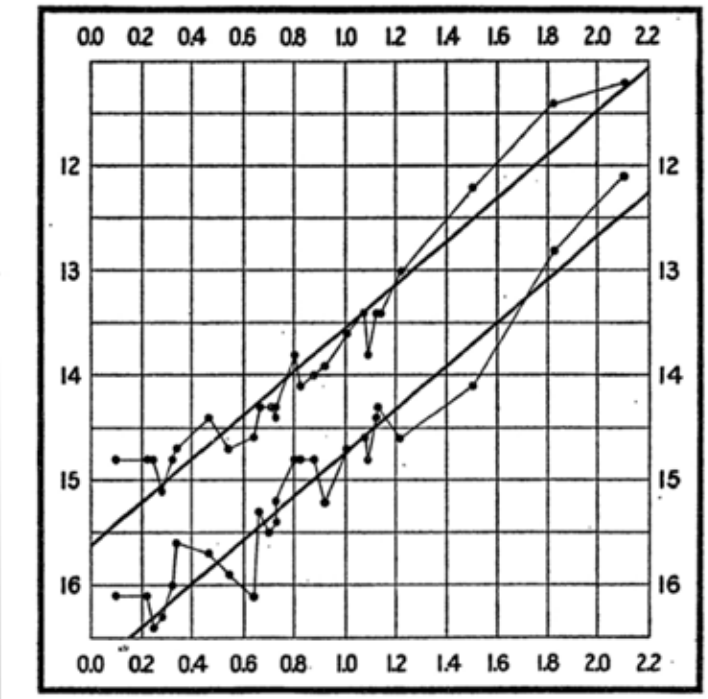


FIG. 2.

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

National Science Foundation Will Not Rebuild Arecibo

When the National Science Foundation announced the establishment of a new educational center at Arecibo in Puerto Rico, the statement sent shock waves through the astronomical community for what the institution would not support. From the statement itself, "The solicitation does not include rebuilding the 305-meter telescope or operational support for current scientific infrastructure, such as the 12-meter radio telescope or Lidar facility." . . . (continued at https://skyandtelescope.org/astronomy-news/national-science-foundation-will-not-rebuild-arecibo/)

All About The Dust — Orionids And Zodiacal Light

Nature fashions beauty with dust. There are few better ways to witness this than watching a meteor shower, when the Earth slams into the debris left behind in a comet's or asteroid's orbital path. Sand-grain to pea-size dross blitzes the atmosphere at tens of thousands of miles per hour. Particles glow hot from the impact, heating and compressing the air to create javelins of ionized light. . . . (continued at https://skyandtelescope.org/astronomy-news/all-about-the-dust-orionids-and-zodiacal-light/)

Why The James Webb Space Telescope's Amazing 'Pillars Of Creation' Photo Has Astronomers Buzzing The James Webb Space Telescope took a breathtaking look inside the "Pillars of Creation," a spectacular dust cloud formation made famous by its predecessor, the Hubble Space Telescope. The image is not only stunningly beautiful but also reveals cosmic processes never before observed with such clarity. Here is what astronomers see behind the sparkling, colorful tapestry. If you want to properly take in the magic of the James Webb Space Telescope's photo of the Pillars of Creation, you have to download the original image from the website of the Space Telescope Science Institute (STScI) in Baltimore, which manages the mission's science operations. (continued at https://www.space.com/james-webb-space-telescope-pillars-creation-excites-astronomer)

How The Gamma-Ray Burst Of The Century Surprised Spacecraft Operators

A fleet of space telescopes unexpectedly detected the record-breaking gamma-ray burst GRB221009A onOct.9, sparking concern among spacecraft operators about the blast's odd signal. The European Space Agency's (ESA) Gaia galaxy mapper sent a strange reading to its controllers on early afternoon, Oct. 9, showing a surprising amount of high-energy particles hitting the spacecraft's detectors. . . . (continued at https://www.space.com/gamma-ray-burst-surprises-satellite-operators)

NASA Confirms Dart Mission Impact Changed Asteroid's Motion In Space

Analysis of data obtained over the past two weeks by NASA's Double Asteroid Redirection Test (DART) investigation team shows the spacecraft's kinetic impact with its target asteroid, Dimorphos, successfully altered the asteroid's orbit. This marks humanity's first time purposely changing the motion of a celestial object and the first full-scale demonstration of asteroid deflection technology. "All of us have a responsibility to protect our home planet. After all, it's the only one we have," said NASA Administrator Bill Nelson. "This mission shows that NASA is trying to be ready for whatever the universe throws at us. NASA has proven we are serious as a defender of the planet. . . .(continued at https://www.sciencedaily.com/releases/2022/10/221011234329.htm)

Space News

News from around the Net

Astronomers Discover A Planetary System With A Neptune-Mass Planet And A Massive Sub-Stellar Object An international team of astronomers reports the detection of a new planetary system by observing a nearby star known as HD 18599 (or TOI-179). It appears that this star is orbited by a Neptune-mass exoplanet and a massive sub-stellar object. The finding was detailed in a paper published October 14 on the arXiv pre-print server. TESS is conducting a survey of about 200,000 of the brightest stars near the sun with the aim of searching for transiting exoplanets. So far, it has identified nearly 6,000 candidate exoplanets (TESS Objects of Interest, or TOI), of which 266 have been confirmed so far. . . . .(continued at https://phys.org/news/2022-10-astronomers-planetary-neptune-mass-planet-massive.html)

Chandra's X-Ray Vision Combined With Jwst Reveals Even More Details About The Universe NASA scientist have released images combining the early data from the James Webb Space Telescope with X-ray data taken with the Chandra Observatory. Besides their beauty, the images offer insights into the inner workings of some of the most complex astrophysical phenomena in the universe. Different wavelengths of light reveal different kinds of information about the cosmos. Each new telescope that we launch into space or open up on the ground offers a new window into processes that we wouldn't otherwise be able to perceive. . . . continued at https://phys.org/news/2022-10-chandra-x-ray-vision-combined-jwst.html)

Hubble Looks At Newly Forming Stars In A Stellar Nursery

When we look at images of star birth regions, they look both placid and active at the same time. That's nowhere more true than in a stellar nursery associated with a so-called "Herbig-Haro" object. A recent image from Hubble Space Telescope zeroed in on two called "HH 1" and "HH 2". It looked at the turbulence associated with a nearby newborn star system. These two glowing clouds of gas and dust lie about 1,250 light-years from us. They're in the direction of the constellation Orion. HH 2 is at the bottom left (in blue) and HH 1 is at the upper right. It's near a bright star that isn't actually part of the action. You can't see it, but the star that's actually making them glow lies between them. .. . .(continued at https://www.universetoday.com/158317/hubble-looks-at-newly-forming-stars-in-a-stellar-nursery/#more-158317)

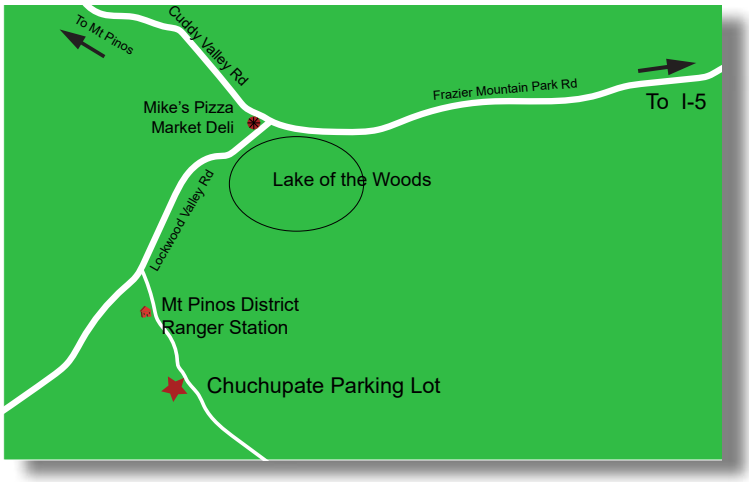
Webb Captures Stunning New View Of 'Pillars Of Creation'

The James Webb Space Telescope has captured a spectacular new view of the "Pillars of Creation" at the heart of the Eagle Nebula, an infrared look at the towering columns of gas and dust in a vast stellar nursery that became one of the Hubble Space Telescope's most iconic photos. Webb's view reveals thousands of previously unseen stars in the translucent interstellar medium surrounding the pillars and a multitude of delicate swirls and eddies sculpted in the columns themselves by embedded protostars. Hubble's view of the pillars, captured in 1995, amazed astronomers and the public alike, an image that became an iconic symbol of the re-paired space telescope's astronomical prowess. As stunning as Hubble's image was, Webb's infrared capability reveals a much more detailed tapestry. . . . (continued at https://astronomynow.com/2022/10/19/webb-captures-stunning-new-view-of-pillars-of-creation/)

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.

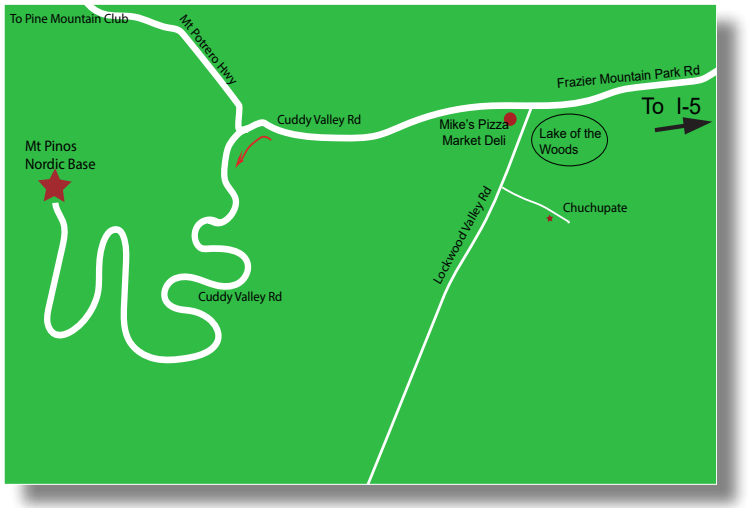


The Red Cliffs Natural Area is part of **Red Rock Canyon State Park** is a day use area and is not for use by the public after dark. The Club gets a special permit for a star party and pays a fee.

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 November on the western edge of Libra moves across the claws of Scorpius and lands on the western edge of Ophiuchus by months end.

The **Moon** experiences a total eclipse on the 8th starting about 01:10 and ending 04:45.

Mercury spends the month in the glare of the Sun reaching superior conjunction on the 8th.

Venus is just too close to the Sun to be seen all month.

Mars rising well before midnight, spends the month traveling in retrograde eastern Taurus. Starting the month at mag -1.2 brightening to -1.8 by months end. The 91% waning Moon passes by less than 3° north on the 11th.

Jupiter spends the month moving in retrograde in southern Pisces. On the 24th Jupiter reverses itself and resumes its eastward march. The 88% waxing Moon passes by on the 4th, 2.5° to the south.

Saturn returns to eastward motion near Iota Capricorn. On the 28th the 34% waxing Moon passes some 5° to south.

Uranus is creeping east in southeastern Aries at mag 5.6. After the Lunar Eclipse on the 8th the Moon passes just 15 arc-minutes north.

Neptune spends November in retrograde at the northeastern edge of Aquarius at mag 7.8.

Pluto spends the month on the eastern edge of Sagittarius slowing moving east at mag 14.4.

Asteroids

Ceres (mag 8.6) starts the month in mid Leo and moves southeast through Leo ending at the southeastern corner of Leo.

Pallas (mag 8.6) starts the month riding the back of Canis Major and at the end of the month is near the tail

Juno (mag 8.8) spends the month in Aquarius moving southeast. On the 3rd the Moon passes 1° to the south.

Vesta (mag 7.5) is moving southwestern corner of Aquarius ending near the center at mag 8.

Moon Phases

First Qtr 10/31 & Nov 30 | Full Nov 8 | Third Qtr Nov 16 | New Nov 23

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
11/1/2022	14:35	00:04	07:13	17:58
11/5/2022	16:38	04:23	07:17	17:55
11/10/2022	18:24	08:37	06:21	16:51
11/15/2022	22:55	12:33	06:26	16:47
11/20/2022	02:54	14:52	06:31	16:45
11/25/2022	08:44	18:22	06:36	16:43
11/30/2022	12:46	00:11	06:40	16:42

Planet Data*

November 1

	Rise	Transit	Set	Mag	Phase%
Mercury	06:52	12:21	17:49	-1.18	90.9
Venus	07:26	12:47	18:08	-3.93	99.9
Mars	20:33	03:51	11:04	-1.24	93.7
Jupiter	16:11	22:08	04:09	-2.83	99.6
Saturn	14:18	19:33	00:48	0.64	99.7

November 15

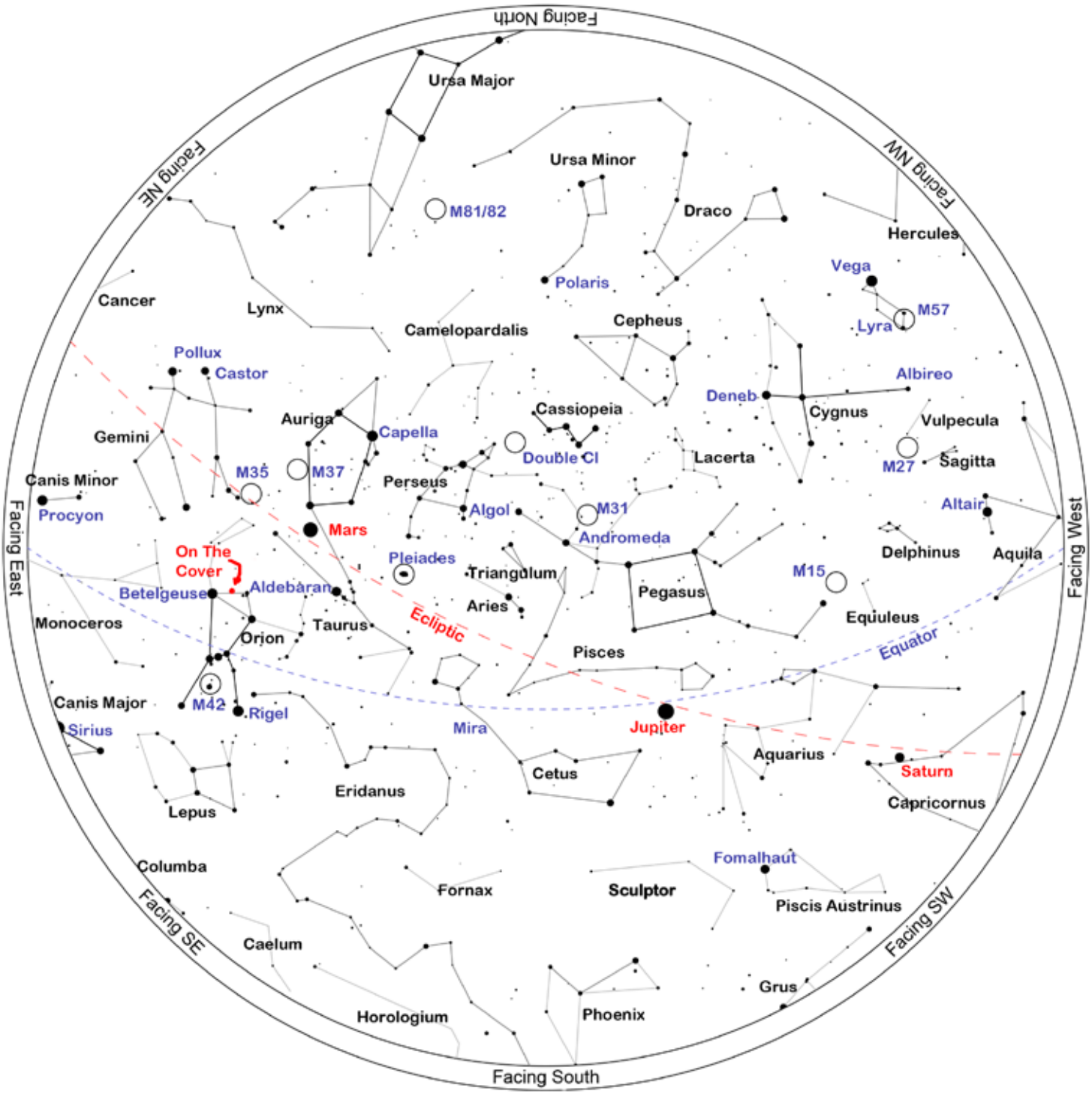
	Rise	Transit	Set	Mag	Phase%
Mercury	06:49	11:54	16:58	-0.98	96.3
Venus	06:57	12:03	17:08	-3.92	15.2
Mars	18:27	01:48	09:03	-1.55	98.5
Jupiter	14:13	20:10	02:11	-2.75	99.2
Saturn	12:24	17:40	22:55	0.70	99.8

November 30

	Rise	Transit	Set	Mag	Phase%
Mercury	07:45	12:34	17:22	-0.59	93.3
Venus	07:29	12:23	17:17	-3.91	98.7
Mars	17:06	00:28	07:44	-1.91	99.6
Jupiter	13:14	19:11	01:12	-2.65	99.1
Saturn	11:28	16:44	22:00	0.75	99.7

*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 November 26, 21:00 (UTC -08:00)

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 November 26, 2022. The list is sorted by the transit time of the object.

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M11	Wild Duck Cluster	Open	Sct	18h 51m 05s	-06° 16.1'	7.0	08:38	14:23	20:09
M57	Ring Nebula	P Neb	Lyr	18h 53m 35s	+33° 01.7'	9.5	06:37	14:26	22:15
Barnard117	B117	DkNeb	Sct	18h 53m 43s	-07° 24.0'		08:44	14:26	20:08
NGC6715		Globular	Sgr	18h 55m 03s	-30° 28.7'	7.7	09:59	14:27	18:56
NGC6717	III-143	Globular	Sgr	18h 55m 06s	-22° 42.0'	9.2	09:31	14:27	19:24
Barnard122	B122	DkNeb	Sct	18h 56m 48s	-04° 45.0'		08:39	14:29	20:19
Barnard123	B123	DkNeb	Sct	18h 57m 39s	-04° 43.0'		08:40	14:30	20:20
NGC6723		Globular	Sgr	18h 59m 33s	-36° 37.9'	7.3	10:30	14:32	18:34
Barnard128	B128	DkNeb	Aql	19h 01m 40s	-04° 34.0'		08:44	14:34	20:24
NGC6729	C68	BrNeb	CrA	19h 01m 54s	-36° 57.0'		10:34	14:34	18:34
Barnard326	B326	DkNeb	Aql	19h 03m 00s	-00° 23.0'		08:34	14:35	20:37
NGC6749		Globular	Aql	19h 05m 15s	+01° 54.0'	11.1	08:30	14:37	20:45
Barnard329	B329	DkNeb	Aql	19h 06m 59s	+03° 11.0'		08:28	14:39	20:51
NGC6760		Globular	Aql	19h 11m 12s	+01° 01.8'	9.1	08:38	14:43	20:49
Abell56		P Neb	Aql	19h 13m 07s	+02° 52.8'	12.4	08:35	14:45	20:56
NGC6772		P Neb	Aql	19h 14m 36s	-02° 42.4'	14.0	08:51	14:47	20:42
Barnard138	B138	DkNeb	Aql	19h 16m 00s	+00° 13.0'		08:45	14:48	20:52
M56	NGC6779	Globular	Lyr	19h 16m 36s	+30° 11.0'	9.5	07:12	14:49	22:26
NGC6778		P Neb	Aql	19h 18m 25s	-01° 35.7'	13.0	08:52	14:51	20:49
Abell61		P Neb	Cyg	19h 19m 10s	+46° 14.5'	13.0	05:43	14:51	23:59
Barnard140	B140	DkNeb	Aql	19h 19m 49s	+05° 13.0'		08:35	14:52	21:09
NGC6790		P Neb	Aql	19h 22m 57s	+01° 30.8'	10.0	08:48	14:55	21:02
NGC6803		P Neb	Aql	19h 31m 16s	+10° 03.3'	11.0	08:33	15:04	21:34
NGC6804		P Neb	Aql	19h 31m 35s	+09° 13.5'	12.0	08:36	15:04	21:32
Abell62		P Neb	Aql	19h 33m 18s	+10° 37.0'	13.0	08:33	15:06	21:38
NGC6807		P Neb	Aql	19h 34m 34s	+05° 41.0'	14.0	08:48	15:07	21:25
M55	NGC6809	Globular	Sgr	19h 40m 00s	-30° 57.7'	7.0	10:46	15:12	19:39
NGC6813		Neb	Vul	19h 40m 22s	+27° 18.5'		07:47	15:13	22:39
NGC6820		Neb	Vul	19h 42m 28s	+23° 05.2'		08:04	15:15	22:26
Barnard338	B338	DkNeb	Aql	19h 43m 02s	+07° 27.0'		08:52	15:15	21:39
NGC6818	Little Gem	P Neb	Sgr	19h 43m 58s	-14° 09.1'	10.0	09:53	15:16	20:39
NGC6826	Blinking Planetary	P Neb	Cyg	19h 44m 48s	+50° 31.0'	8.8	05:25	15:17	01:09
Abell65		P Neb	Sgr	19h 46m 34s	-23° 08.2'	13.1	10:24	15:19	20:14
NGC6838		Globular	Sge	19h 53m 46s	+18° 46.6'	8.3	08:29	15:26	22:23
NGC6842		P Neb	Vul	19h 55m 02s	+29° 17.3'	14.0	07:54	15:27	23:01
HR7619	Psi Cyg	Mult	Cyg	19h 55m 38s	+52° 26.3'	4.9	05:07	15:28	01:49
Abell66		P Neb	Sgr	19h 57m 32s	-21° 36.6'	14.1	10:30	15:30	20:30

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
Barnard144	Fish on the platter nebula	DkNeb	Cyg	19h 58m 00s	+35° 20.0'		07:30	15:30	23:30
NGC6853	Apple Core Nebula	P Neb	Vul	19h 59m 36s	+22° 43.2'	8.1	08:22	15:32	22:41
NGC6857	III-144	Neb	Cyg	20h 02m 48s	+33° 31.4'	11.4	07:44	15:35	23:26
IC4954		Neb	Vul	20h 04m 45s	+29° 15.1'		08:04	15:37	23:10
M75	NGC6864	Globular	Sgr	20h 06m 05s	-21° 55.3'	9.5	10:39	15:38	20:38
Barnard342	B342	DkNeb	Cyg	20h 09m 30s	+41° 12.0'		07:10	15:42	00:13
NGC6885	C37,20 Vulpecu-lae Cluster	Open	Vul	20h 12m 00s	+26° 29.0'	5.9	08:21	15:44	23:07
NGC6891		P Neb	Del	20h 15m 09s	+12° 42.2'	12.0	09:09	15:47	22:26
NGC6894		P Neb	Cyg	20h 16m 24s	+30° 33.9'	14.0	08:10	15:49	23:27
IC4997		P Neb	Sge	20h 20m 09s	+16° 43.9'	12.0	09:02	15:52	22:43
Barnard345	B345	DkNeb	Cyg	20h 21m 00s	+46° 33.0'		06:43	15:53	01:04
NGC6913	Cooling Tower	Open	Cyg	20h 23m 57s	+38° 30.5'	6.6	07:40	15:56	00:12
Abell70		P Neb	Aql	20h 31m 33s	-07° 05.3'	14.3	10:21	16:04	21:47
Barnard348	B348	DkNeb	Cyg	20h 34m 00s	+42° 05.0'		07:29	16:06	00:43
NGC6940		Open	Vul	20h 34m 26s	+28° 17.0'	6.3	08:37	16:07	23:36
NGC6960	Filamentary Nebula	Neb	Cyg	20h 45m 58s	+30° 35.6'		08:39	16:18	23:57
IC5068		Neb	Cyg	20h 50m 29s	+42° 28.6'		07:43	16:23	01:02
IC5070	Pelican Nebula [2]	Neb	Cyg	20h 51m 00s	+44° 24.1'		07:30	16:23	01:17
NGC6979	II-206	Neb	Cyg	20h 51m 00s	+32° 09.0'	11.0	08:38	16:23	00:09
NGC6981		Globular	Aqr	20h 53m 28s	-12° 32.2'	9.4	10:58	16:26	21:54
IC5076		Neb	Cyg	20h 55m 33s	+47° 23.7'		07:10	16:28	01:46
IC1340		Neb	Cyg	20h 56m 08s	+31° 02.8'		08:48	16:28	00:09
NGC6992	Cirrus Nebula [2]	Neb	Cyg	20h 56m 19s	+31° 44.6'		08:45	16:29	00:12
NGC6996	VIII-58	Open	Cyg	20h 56m 30s	+44° 38.0'	10.0	07:34	16:29	01:24
NGC6997		Open	Cyg	20h 56m 39s	+44° 37.9'	10.0	07:34	16:29	01:24
Barnard352	B352	DkNeb	Cyg	20h 57m 10s	+45° 53.0'		07:25	16:29	01:34
Barnard354	B354	DkNeb	Cep	20h 58m 00s	+58° 09.0'		Circ	16:30	Circ
NGC7000	Gulf of Mexico	BrNeb	Cyg	20h 58m 48s	+44° 20.0'		07:38	16:31	01:24
M73	NGC6994	Open+Asterism	Aqr	20h 58m 56s	-12° 38.1'	9.0	11:04	16:31	21:59
NGC7006	C42	Globular	Del	21h 01m 30s	+16° 11.0'	10.6	09:45	16:34	23:22
NGC7009	C55,Saturn Nebula	P Neb	Aqr	21h 04m 12s	-11° 22.0'	8.0	11:05	16:36	22:08
NGC7027		P Neb	Cyg	21h 07m 02s	+42° 14.1'	10.0	08:01	16:39	01:17
Barnard151	B151	DkNeb	Cep	21h 08m 13s	+56° 19.0'		Circ	16:40	Circ
IC1369		Open	Cyg	21h 12m 09s	+47° 46.1'	6.8	07:23	16:44	02:06
Barnard153	B153	DkNeb	Cep	21h 21m 03s	+56° 26.0'		Circ	16:53	Circ
NGC7076		Neb	Cep	21h 26m 24s	+62° 53.5'		Circ	16:59	Circ
NGC7078	Great Pegasus Cluster	Globular	Peg	21h 29m 58s	+12° 10.0'	6.4	10:25	17:02	23:39

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M39	NGC7092	Open	Cyg	21h 31m 42s	+48° 25.0'	5.5	07:36	17:04	02:32
M2	NGC7089	Globular	Aqr	21h 33m 27s	-00° 49.3'	7.5	11:05	17:06	23:06
NGC7090		Galaxy	Ind	21h 36m 28s	-54° 33.4'	11.0	15:49	17:09	18:29
IC1396	Elephant Trunk	Open	Cep	21h 38m 58s	+57° 29.3'	3.5	Circ	17:11	Circ
NGC7099		Globular	Cap	21h 40m 22s	-23° 10.7'	7.5	12:18	17:13	22:08
NGC7128		Open	Cyg	21h 43m 57s	+53° 42.9'	9.7	06:28	17:16	04:04
NGC7142		Open	Cep	21h 45m 09s	+65° 46.5'	9.3	Circ	17:17	Circ
NGC7139	III-696	P Neb	Cep	21h 46m 08s	+63° 47.5'	13.3	Circ	17:18	Circ
Barnard166	B166	DkNeb	Cep	21h 51m 05s	+60° 05.0'		Circ	17:23	Circ
Barnard168	B168	DkNeb	Cyg	21h 53m 20s	+47° 16.0'		08:09	17:26	02:43
IC5146	Cocoon Nebula	Open	Cyg	21h 53m 29s	+47° 16.0'	7.2	08:09	17:26	02:43
IC1434		Open	Lac	22h 10m 42s	+52° 51.0'	9.0	07:14	17:43	04:12
NGC7245		Open	Lac	22h 15m 11s	+54° 20.6'	9.2	06:41	17:47	04:54
NGC7232		Galaxy	Gru	22h 15m 38s	-45° 51.0'	13.0	14:41	17:48	20:54
NGC7261		Open	Cep	22h 20m 06s	+58° 03.0'	8.4	Circ	17:52	Circ
NGC7293	C63,Helix Nebula	P Neb	Aqr	22h 29m 36s	-20° 48.0'	7.3	12:59	18:02	23:05
NGC7380		Open	Cep	22h 47m 21s	+58° 07.9'	7.2	Circ	18:20	Circ
C9	Cave Nebula	BrNeb	Cep	22h 56m 48s	+62° 37.0'		Circ	18:29	Circ
IC1470		Neb	Cep	23h 05m 10s	+60° 14.6'		Circ	18:37	Circ
NGC7492		Globular	Aqr	23h 08m 27s	-15° 36.6'	11.5	13:22	18:41	00:00
HR8872	34 Cep,	Triple	Cep	23h 18m 38s	+68° 06.6'	4.8	Circ	18:51	Circ
IC5308		Galaxy	Gru	23h 19m 21s	-42° 15.4'	12.0	15:20	18:52	22:23
M52	The Scorpion	Open	Cas	23h 24m 48s	+61° 35.6'	8.0	Circ	18:57	Circ
NGC7662	Blue Snowball	P Neb	And	23h 25m 54s	+42° 33.0'	8.3	10:18	18:58	03:38
NGC7686		Open	And	23h 30m 07s	+49° 08.0'	5.6	09:27	19:02	04:38
IC5332		Galaxy	Scl	23h 34m 27s	-36° 06.0'	10.6	15:02	19:07	23:11
NGC7785		Galaxy	Psc	23h 55m 19s	+05° 54.9'	11.6	13:09	19:28	01:47
HR9071	8 Cas	Triple	Cas	23h 59m 01s	+55° 45.3'	4.9	Circ	19:31	Circ
NGC7822		Neb	Cep	00h 03m 36s	+67° 09.0'		Circ	19:36	Circ
NGC55	C72	S Gal	Scl	00h 14m 54s	-39° 11.0'	7.9	15:58	19:47	23:36
NGC129		Open	Cas	00h 30m 00s	+60° 13.1'	6.5	Circ	20:02	Circ
NGC133		Open	Cas	00h 31m 19s	+63° 21.0'	9.0	Circ	20:04	Circ
NGC146		Open	Cas	00h 33m 03s	+63° 18.0'	9.1	Circ	20:05	Circ
NGC147	C17	E Gal	Cas	00h 33m 12s	+48° 30.0'	9.3	10:36	20:05	05:34
NGC190		Galaxy	Psc	00h 38m 55s	+07° 03.7'	14.0	13:49	20:11	02:33
M110	Satellite Of Andromeda Galaxy	Galaxy	And	00h 40m 22s	+41° 41.1'	8.9	11:38	20:13	04:47
NGC210		Galaxy	Cet	00h 40m 35s	-13° 52.3'	10.9	14:49	20:13	01:37
NGC206	V-36	Neb	And	00h 40m 36s	+40° 44.0'		11:44	20:13	04:42
M32	Satellite Of Andromeda Galaxy	Galaxy	And	00h 42m 42s	+40° 51.9'	9.1	11:45	20:15	04:44

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M31	Andromeda Galaxy	Galaxy	And	00h 42m 44s	+41° 16.1'	4.3	11:43	20:15	04:47
NGC246	C56	P Neb	Cet	00h 47m 00s	-11° 53.0'	10.9	14:49	20:19	01:49
NGC254		Galaxy	Scl	00h 47m 28s	-31° 25.2'	11.8	15:55	20:20	00:45
NGC288		Globular	Scl	00h 52m 45s	-26° 35.0'	8.1	15:42	20:25	01:08
NGC281	PacMan Nebula	Open	Cas	00h 52m 54s	+56° 37.4'	7.0	Circ	20:25	Circ
IC59	Cassiopeiae Nebula	Neb	Cas	00h 57m 29s	+61° 08.6'		Circ	20:30	Circ
IC63	Cassiopeiae Nebula	Neb	Cas	00h 59m 29s	+60° 54.7'		Circ	20:32	Circ
C51	IC1613	IrrGal	Cet	01h 04m 48s	+02° 07.0'	9.3	14:28	20:37	02:46
NGC474		Galaxy	Psc	01h 20m 07s	+03° 24.9'	11.1	14:40	20:52	03:04
NGC485		Galaxy	Psc	01h 21m 28s	+07° 01.0'	14.0	14:32	20:54	03:16
M103	NGC581	Open	Cas	01h 33m 23s	+60° 39.0'	7.0	Circ	21:06	Circ
NGC598	Triangulum Pinwheel Galaxy	Galaxy	Tri	01h 33m 51s	+30° 39.6'	5.7	13:27	21:06	04:45
NGC604	III-150	Neb	Tri	01h 34m 33s	+30° 47.0'		13:27	21:07	04:46
M74	The Phantom	Galaxy	Psc	01h 36m 42s	+15° 47.0'	9.8	14:21	21:09	03:56
M76	Little Dumbbell Nebula	P Neb	Per	01h 42m 18s	+51° 34.2'	12.0	11:08	21:15	07:21
NGC651	Apple Core Nebula	P Neb	Per	01h 42m 21s	+51° 34.1'	12.2	11:08	21:15	07:21
NGC637		Open	Cas	01h 43m 04s	+64° 02.4'	8.2	Circ	21:15	Circ
NGC654		Open	Cas	01h 44m 00s	+61° 53.0'	6.5	Circ	21:16	Circ
NGC720		Galaxy	Cet	01h 53m 00s	-13° 44.3'	10.2	16:01	21:25	02:50
NGC780		Galaxy	Tri	02h 00m 35s	+28° 13.5'	14.0	14:03	21:33	05:02
NGC784		Galaxy	Tri	02h 01m 17s	+28° 50.2'	11.8	14:02	21:34	05:05
NGC821		Galaxy	Ari	02h 08m 21s	+10° 59.6'	10.8	15:07	21:41	04:14
Baily191	NGC884	Open	Per	02h 22m 18s	+57° 08.1'	4.0	Circ	21:55	Circ
IC1795		Neb	Cas	02h 26m 32s	+62° 02.4'		Circ	21:59	Circ
NGC936		Galaxy	Cet	02h 27m 37s	-01° 09.3'	10.1	16:00	22:00	03:59
NGC1052		Galaxy	Cet	02h 41m 05s	-08° 15.3'	10.6	16:33	22:13	03:53
M34	Spiral Cluster	Open	Per	02h 42m 05s	+42° 45.6'	6.0	13:33	22:14	06:56
M77	Cetus A	Galaxy	Cet	02h 42m 41s	-00° 00.8'	9.7	16:12	22:15	04:18

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

Our Sponsors

Cosmos Level Sponsors

Woodland Hills Camera & Telescopes TelescopeS.NET
5348 Topanga Canyon Blvd., Woodland Hills
888-427-427-8766 www.telescopes.net

Universe Level Sponsors

Galaxy Level Sponsors

Al's Vacuum and Sewing
904 West Lancaster Blvd., Lancaster
(661) 948-1521