Volume 42.8 August 2022

Desert Sky Observer

Antelope Valley Astronomy Club

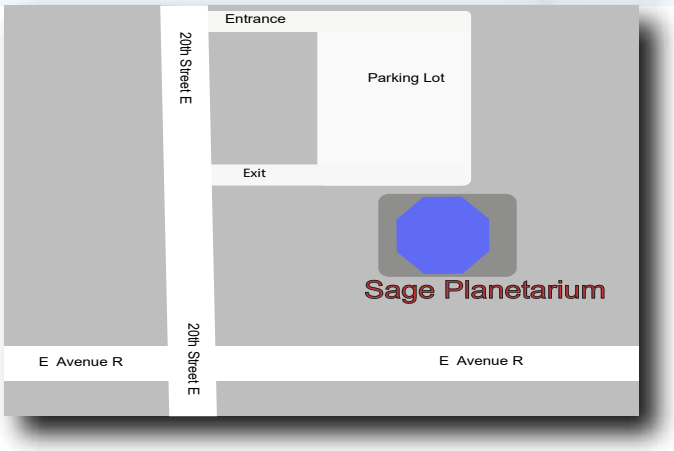
Upcoming Events

August 12: Club Meeting -- Painting Class
August 20: Moonwalk 8:00 pm @ PDW
August 27: DSSP @ Mt Pinos

AVAC Calendar

Every clear night: Personal Star Party

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



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

www.avastronomyclub.org

Visit the Antelope Valley Astronomy Club website at 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!

Let's all welcome Christian Amaya, Veronica Gutierrez and family, and Christian Ruiz and family, our newest members. Please welcome them at the next event.

On July 23rd, we had another Moonwalk at Prime Desert Woodland. There were 5 telescopes, at least 7 members, and about 186 members of the public. I honestly think there were more than that, closer to 250, but like Jeremy said "it's easy to loose count in the dark."

The next Moonwalk will be on August 20th at 8 PM. The crowd favorite, Saturn, should be visible in the southeastern sky. Everyone bring your telescope or binoculars. Let's hope California doesn't go up in smoke by then.

Our next club meeting on the 12th is going to be a special event. It will a continuation of tradition, I believe was created by our late member,Tom Hames, who was both astronomer and artist, we will have an astronomy art painting class taught by Sue Leone. The meeting will be starting at **6:30p.m.** This is earlier than usual, so make plans to come early. Please let Rose know if you will participate.

Our August dark sky star party will be on the 27th at Mt Pinos Nordic Base. We haven't gone there in a while. The last time I went, I got there late (an hour before sundown) couldn't find a parking spot and drove back down the hill till I found a wide spot in the road and set up in the dark. This is not the optimal plan. Mt Pinos gets busy on summer weekends, especially at New Moon. You have to get there early, set up in the middle of the lot , as there are 50-60 foot trees around the parking lot. I hope I'll see you there!

Keep Looking Up, Phil

On The Cover

The constellation Sagittarius (the Archer), home to the globular cluster M22, is one of the best known constellations in the sky. Sagittarius contains a large number of famous nebulae and star clusters due to the presence of some of the richest star fields of the Milky Way. The very centre of the Milky Way lies in the direction of Sagittarius. Some of the brighter stars in Sagittarius are known as the Teapot, the shape of which is indicated by the lines here (handle to the left, spout to the right).

The constellation Sagittarius (the Archer), home to the globular cluster M22 (in the centre), is one of the best known constellations in the sky. Sagittarius contains a large number of famous nebulae and star clusters due to the presence of some of the richest star fields of the Milky Way. The very centre of the Milky Way lies in the direction of Sagittarius. Some of the brighter stars in Sagittarius are known as the Teapot.

Credit:
ESA, NASA & Akira Fujii

From the Secretary

By Rose Moore

Members:

We have a special meeting on Friday August 12th at 6:30pm. We are having an astronomy paint class given by Sue Leone. This will be held in the SAGE Academy next door to the SAGE Planetarium. You may pay at the meeting. The cost is $15 per member and $25 per non member. This will be opened to the public a week or so before the meeting. The club will be supplying the canvases, brushes, paints, cleaning rags, and table covers. Please contact me prior to the meeting to reserve your spot if you want to attend the paint class!!

Our Prime Desert Woodland Preserve Moon Walk is on Saturday August 20th at 8pm. Free and open to the public. We need members with telescopes, or you may come out and take the walk with Jeremy. Weather permitting.

The Dark Sky Star Party this month is on Saturday August 27th, at Mt. Pinos. You may arrive anytime during the day. Weather permitting. There are no toilets at the main parking area, and the nearest restrooms (pit toilets) are a 1/4 mile walk to the Chula Vista Campground. The altitude is 8300 feet. More info coming in an email prior to the event.

Other news: Rod has booked Gino's Restaurant as our venue for our 2022 Christmas Party, info coming this fall; the Antelope Valley College will be resuming their Science Olympiad in February 2023 and the AVAC have been invited.

Stay cool! Rose

Setting up for the Moonwalk on July 23. Members Darrell, Phil, Rose and Rod are getting ready for the public to arrive. Ed and Rodger arrived with a telescope after this picture was taken. Judy was also helping out. It should be noted that Rose bought this scope especially for Moonwalks.

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>

Artemis 1: A Trip Around the Moon – and Back!

by David Prosper, NASA Night Sky Network

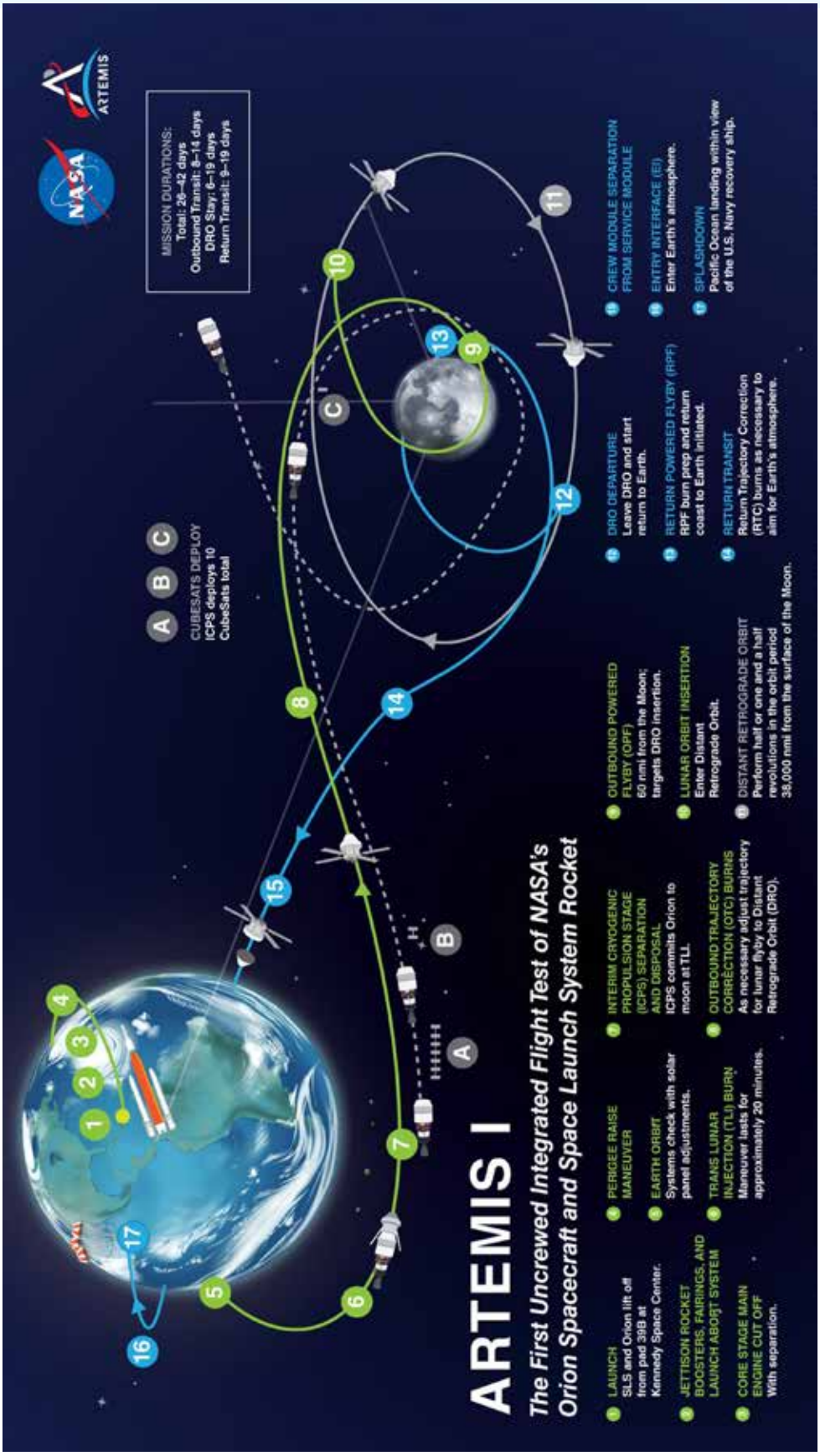
We are returning to the Moon - and beyond! Later this summer, NASA's Artemis 1 mission will launch the first uncrewed flight test of both the Space Launch System (SLS) and Orion spacecraft on a multi-week mission. Orion will journey thousands of miles beyond the Moon, briefly entering a retrograde lunar orbit before heading back to a splashdown on Earth.

The massive rocket will launch from Launch Complex 39B at the Kennedy Space Center in Florida. The location's technical capabilities, along with its storied history, mark it as a perfect spot to launch our return to the Moon. The complex's first mission was Apollo 10 in 1968, which appropriately also served as a test for a heavy-lift launch vehicle (the Saturn V rocket) and lunar spacecraft: the Apollo Command and Service Modules joined with the Lunar Module. The Apollo 10 mission profile included testing the Lunar Module while in orbit around the Moon before returning to the Earth. In its "Block-1" configuration, Artemis 1's SLS rocket will take off with 8.8 million pounds of maximum thrust, even greater than the 7.6 millions pounds of thrust generated by the legendary Saturn V, making it the most powerful rocket in the world!

Artemis 1 will serve not only as a test of the SLS and the Orion hardware, but also as a test of the integration of ground systems and support personnel that will ensure the success of this and future Artemis missions. While uncrewed, Artemis-1 will still have passengers of a sort: two human torso models designed to test radiation levels during the mission, and "Commander Moonikin Campos," a mannequin named by the public. The specialized mannequin will also monitor radiation levels, along with vibration and acceleration data from inside its mission uniform: the Orion Crew Survival Suit, the spacesuit that future Artemis astronauts will wear. The "Moonikin" is named after Arturo Campos, a NASA electrical engineer who played an essential role in bringing Apollo 13's crew back to Earth after a near-fatal disaster in space.

The mission also contains other valuable cargo for its journey around the Moon and back, including CubeSats, several space science badges from the Girl Scouts, and microchips etched with 30,000 names of workers who made the Artemis-1 mission possible. A total of 10 CubeSats will be deployed from the Orion Stage Adapter, the ring that connects the Orion spacecraft to the SLS, at several segments along the mission's path to the Moon. The power of SLS allows engineers to attach many secondary "ride-along" mission hardware like these CubeSats, whose various missions will study plasma propulsion, radiation effects on microorganisms, solar sails, Earth's radiation environment, space weather, and of course, missions to study the Moon and even the Orion spacecraft and its Interim Cryogenic Propulsion Stage (ICPS)!

If you want to explore more of the science and stories behind both our Moon and our history of lunar exploration, the Night Sky Network's Apollo 11 at 50 Toolkit covers a ton of regolith: bit.ly/nsnmoon! NASA also works with people and organizations around the world coordinating International Observe the Moon Night, with 2022's edition scheduled for Saturday, October 1: moon.nasa.gov/observe. Of course, you can follow the latest news and updates on Artemis 1 and our return to the Moon at nasa.gov/artemis-1 .



Follow along as Artemis 1 journeys to the Moon and back! A larger version of this infographic is available from NASA at: nasa.gov/image-feature/artemis-i-map

Full Moon over Artemis-1 on July 14, 2022, as the integrated Space Launch System and Orion spacecraft await testing. Photo credit: NASA/Cory Huston Source: https://www.nasa.gov/image-feature/a-full-moon-over-artemis/

Space News

News from around the Net

101 Must-See Cosmic Objects: The Double Cluster

Known since the earliest days of naked-eye astronomy, the Double Cluster in Perseus appears in the star catalog of Greek astronomer Hipparchus in 130 B.C. The two clusters are now designated h and Chi (χ) Persei (NGC 869 and NGC 884, respectively) and look like nebulous 4th-magnitude stars. One of astronomy history's real mysteries is why Charles Messier listed the Pleiades (M45) and the Beehive (M44) clusters, but not the Double Cluster, in his catalog of non-cometary objects — oops!. . . (continued at https://astronomy.com/magazine/news/2022/07/101-must-see-cosmic-objects-the-double-cluster)

Evidence That Buckyballs And Carbon Nanotubes Form From The Dust And Gas Of Dying Stars

Astronomers at the University of Arizona have developed a theory to explain the presence of the largest molecules known to exist in interstellar gas. The team simulated the environment of dying stars and observed the formation of buckyballs (carbon atoms linked to three other carbon atoms by covalent bonds) and carbon nanotubes (rolled up sheets of single-layer carbon atoms). . . (continued at https://phys.org/news/2022-07-evidence-buckyballs-carbon-nanotubes-gas.html)

101 Must-See Cosmic Objects: The Bubble Nebula

William Herschel first observed NGC 7635 in 1787 as a glow around the magnitude 8.7 star SAO 20575 (cataloged earlier as BD+60°2522). In a telescope, the Bubble Nebula looks more like a comma because the full extent of its spherical shell is so faint that it was only discovered through photography. This emission nebula, which is composed of ionized hydrogen energized by an O-type star, is part of a larger complex of glowing gases.. . . (continued at https://astronomy.com/magazine/news/2022/07/101-must-see-cosmic-objects-the-bubble-nebul)

Giant Black Holes Make Tiny, Ghost-Like Particles

When the Large Hadron Collider first turned on, there were some who feared it might make black holes that would swallow Earth whole. Amusing to think of, when you consider that the universe can generate subatomic particles with a million times more energy than what humans and their machines are capable of. But what in the universe is capable of imbuing these tiny particles, dubbed cosmic rays, with such incredible energy? . . .(continued at https://skyandtelescope.org/astronomy-news/giant-black-holes-make-tiny-ghost-like-particles/)

Asteroid Bennu Almost Swallowed Spacecraft Whole

Rubble piles in space aren't like the solid ones that gravity holds on the ground. New analysis shows that NASA's OSIRIS-REX probe punched right through the surface of rubble-pile asteroid 101955 Bennu while on its way to collect a sample. If the probe hadn't been programmed to lift itself back into orbit a few seconds after landing, . . . (continued at https://skyandtelescope.org/astronomy-news/asteroid-bennu-almost-swallowed-spacecraft-whole/)

How Artificial Intelligence Is Changing Astronomy

When most people picture an astronomer, they think of a lone person sitting on top of a mountain, peering into a massive telescope. Of course, that image is out of date: Digital cameras have long since done away with the need to actually look though a telescope.. . .(continued at https://astronomy.com/news/2022/07/how-artificial-intelligence-is-changing-astronomy)

Space News

News from around the Net

Russia Will Quit The International Space Station After 2024

The first piece of the International Space Station (ISS) was launched back in 1998. That initial segment, called the Zarya Control Module (meaning "Sunrise" in English), was funded by the U.S. but built and launched by Russia. Coming just seven years after the breakup of the Soviet Union, the historical launch marked the beginning of a multi-decade partnership between the two previously bitter Cold War rivals. . . . (Continued at https://astronomy.com/news/2022/07/russia-leaving-iss-early)

New Method To Map The Surface Of The Moon Increases Accuracy To Unprecedented Levels

Topography: The surface of the moon and rocky planets, Mars in particular, are of huge interest to anyone trying to explore our solar system. The surface must be known in as much detail as possible, for missions to land safely, or for any robotic vessel to drive across the surface. But until now, the methods to analyze images . . . (Continued at https://www.sciencedaily.com/releases/2022/07/220721132032.htm)

Why Jupiter Doesn't Have Rings Like Saturn

Because it's bigger, Jupiter ought to have larger, more spectacular rings than Saturn has. But new UC Riverside research shows Jupiter's massive moons prevent that vision from lighting up the night sky. "It's long bothered me why Jupiter doesn't have even more amazing rings that would put Saturn's to shame," . . . (Continued at https://www.sciencedaily.com/releases/2022/07/220721101508.htm)

The First Telescope Of Its Kind Will Hunt For Sources Of Gravitational Waves

A brand new telescope will be the first to hunt for colliding black holes and neutron stars in a bid to find sources of gravitational waves. Gravitational waves, the ripples in spacetime caused by the most energetic collisions known to the universe, were first detected in 2015 by the Laser Interferometer Gravitational-Wave Observatory (LIGO) . . . (Continued at https://www.space.com/goto-telescope-sources-gravitational-waves)

Perseid Meteor Shower 2022: When, Where & How To See It

The Perseid meteor shower (also known as The Perseids) is perhaps the most popular meteor shower of the year, visible between July and August. With clear skies, you could see what some consider the most spectacular cosmic light show. American spectators can expect to see the greatest number of meteors during the shower's peak between Aug. 11-12 this year, according to the American Meteor Society (AMS) . . . .(Continued at https://www.space.com/32868-perseid-meteor-shower-guide.html)

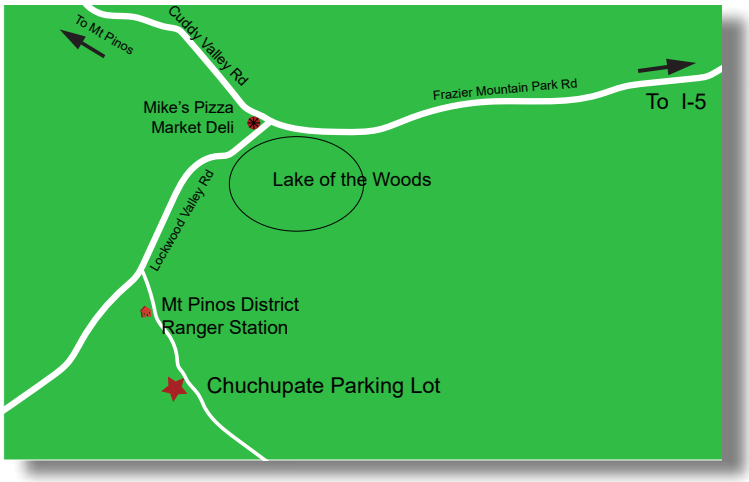
US Postal Service To Launch James Webb Space Telescope 'Forever' Stamp

The United States Postal Service (USPS) is celebrating NASA's revolutionary James Webb Space Telescope (JWST) with a new "Forever" stamp. The new James Webb Space Telescope Forever stamps will be available for preorder on Aug. 8 through the USPS's online stamp store, and will open for general sale on Sept. 8. The stamp commemorates the start of the telescope's science mission and depicts the James Webb Space Telescope's iconic golden honeycomb mirror and its large sunshields . . . (Continued at https://www.space.com/james-webb-space-telescope-forever-stamps-us-postal-service)

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.

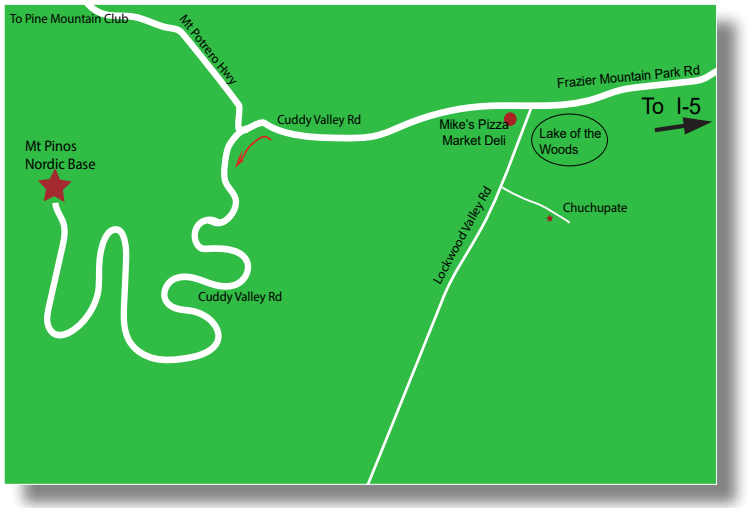


The Red Cliffs Natural Area is part of **Red Rock Canyon State Park** is a day use area and is not for use by the public after dark. The Club gets a special permit for a star party and pays a fee.

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 August in mid-Cancer and is between Leo's feet by months end .

Mercury starts the month in western Leo hard to see against the setting Sun. On the 3rd it is about 46 arc-mins north of Regulus. Achieves greatest elongation east of the year at 27° on the 27th, in Virgo, when is shines at mag +0.2.

Venus begins the month in Gemini. Gradually becoming even less conspicuous in the dawn sky, as its elongation from the Sun shrinks from 22° to 14° by end of month.

Mars begins the month in conjunction with Uranus(1.4° north) in eastern Aries as it is continuing to rise in prominence brightening from +0.2 to -0.1 during the month as it moves into Taurus.

Jupiter spends August stuck almost stationary moving in retrograde in a corner of Cetus. The 84% waning Moon passes by on the 15th, 2° to the south

Saturn begins the month in its retrograde motion near the tail of Capricorn. On the 12th the full Moon passes some 4.5° to south.

Uranus is almost stationary in central Aries at mag 5.8. On the 18st the 55% waning Moon will be 6 arc-mins north (at 8 am.)

Neptune on the western edge of Pisces is slowly moving west into Aquarius. The 91% waning Moon flies past 3° south on the 14th.

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

Ceres (mag 8.6) starts the month in Cancer and 4° north of the ecliptic ending in Leo 5 ⅔° north of the ecliptic.

Pallas (mag 9.2) spends the month in Orion starting at about Dec. -3° moving east below his sword and ending at Dec -7°.

Juno (mag 9) in Pisces, 5° north of the ecliptic ending about 2.5° north of the ecliptic.

Vesta (mag 6.3) is in Aquarius starts the month 7⅔° south and ending 9.5° south of the ecliptic.

Moon Phases

First Qtr Aug 5 | Full Aug 11 | Third Qtr Aug 18 | New Aug 27

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
8/1/2022	09:39	22:26	06:03	19:54
8/5/2022	13:50	23:25	06:05	19:50
8/10/2022	19:19	04:11	06:09	19:45
8/15/2022	22:12	10:08	06:13	19:40
8/20/2022	00:18	15:13	06:17	19:34
8/25/2022	04:33	19:03	06:20	19:28
8/30/2022	09:34	21:22	06:24	19:21

Planet Data*

August 1

	Rise	Transit	Set	Mag	Phase%
Mercury	07:21	14:05	20:49	-0.58	85.7
Venus	04:19	11:29	18:38	-3.91	92.6
Mars	00:29	07:18	14:05	0.20	84.7
Jupiter	22:35	04:47	10:54	-2.72	99.2
Saturn	20:33	01:52	07:15	0.36	99.9

August 15

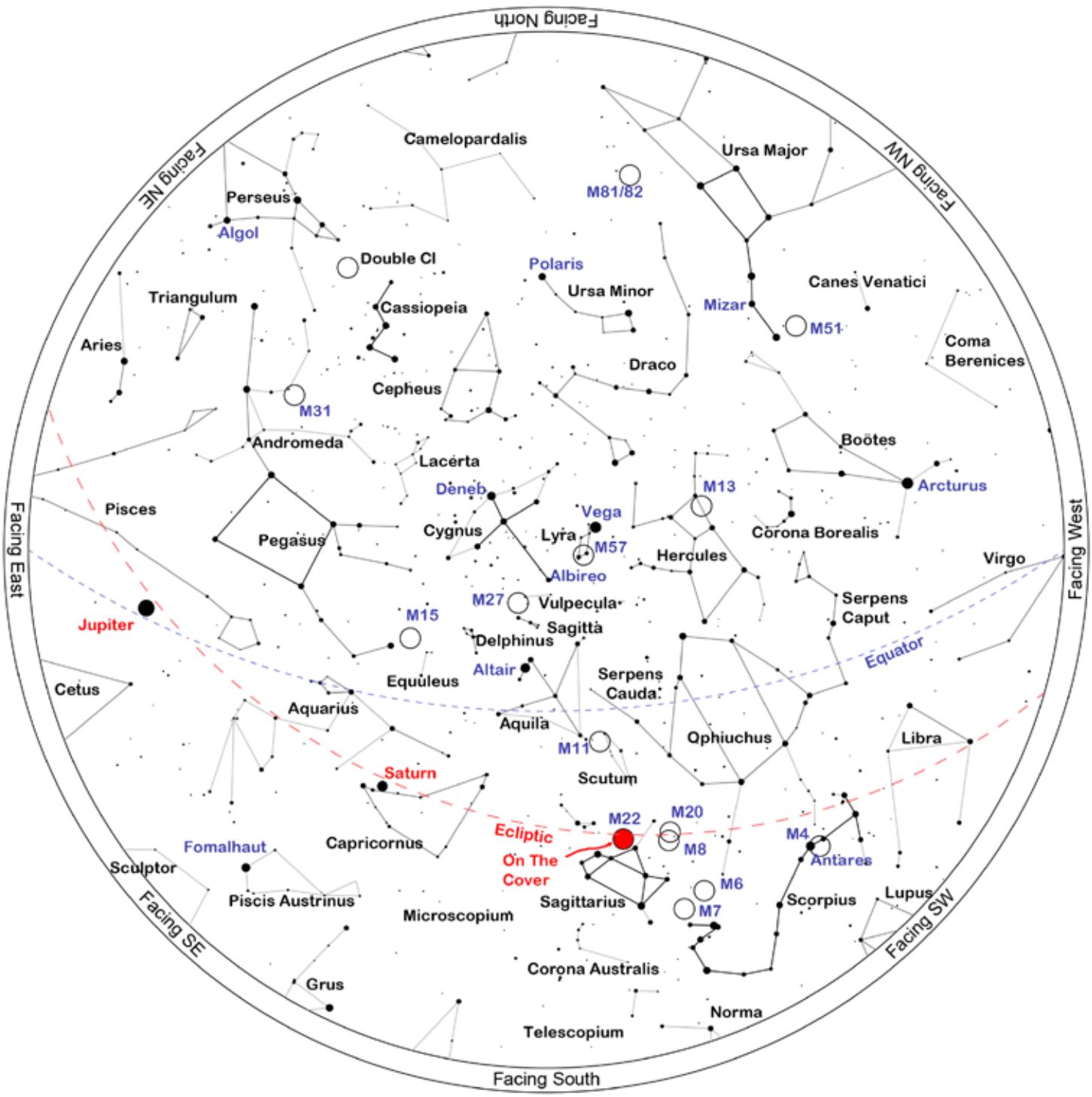
	Rise	Transit	Set	Mag	Phase%
Mercury	08:14	14:30	20:45	0.01	69.4
Venus	04:45	11:46	18:46	-3.91	94.9
Mars	00:02	06:58	13:56	0.06	84.7
Jupiter	21:39	03:50	09:57	-2.81	99.4
Saturn	19:35	00:53	06:14	0.28	100

August 30

	Rise	Transit	Set	Mag	Phase%
Mercury	08:38	14:28	20:19	0.36	48.6
Venus	05:16	12:01	18:46	-3.92	96.9
Mars	23:32	06:34	13:35	-0.11	85.0
Jupiter	20:37	02:47	08:52	-2.88	99.7
Saturn	18:32	23:49	05:10	0.33	99.9

*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 August 27, 22:00 (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 August 27, 2022. The list is sorted by the transit time of the object.

ID	Common Name	Type		RA	Dec	Mag	Rise	Transit	Set
NGC5907	Splinter Galaxy	Galaxy	Dra	15h 15m 54s	+56° 19.7'	11.4	Circ	17:51	Circ
NGC5882		P Neb	Lup	15h 16m 50s	-45° 38.9'	11.0	14:48	17:52	20:56
NGC5897		Globular	Lib	15h 17m 24s	-21° 00.6'	8.6	12:51	17:53	22:54
M5	NGC5904	Globular	Ser	15h 18m 33s	+02° 04.9'	7.0	11:45	17:54	00:02
Barnard228	B228	DkNeb	Lup	15h 44m 00s	-34° 30.0'		14:10	18:19	22:29
IC4593	White Eyed Pea	P Neb	Her	16h 11m 44s	+12° 04.3'	11.0	12:10	18:47	01:24
IC4592	Jabbah	Neb	Sco	16h 11m 59s	-19° 27.4'		13:41	18:47	23:53
M80	NGC6093	Globular	Sco	16h 17m 03s	-22° 58.5'	8.5	13:58	18:52	23:47
IC4601		Neb	Sco	16h 20m 18s	-20° 04.9'		13:51	18:55	00:00
Abell38		P Neb	Sco	16h 23m 17s	-31° 44.9'	11.7	14:37	18:58	23:20
M4	Cat's Eye, NGC6121	Globular	Sco	16h 23m 35s	-26° 31.5'	7.5	14:17	18:59	23:41
IC4603	Rho Ophiuchi Complex [1]	Neb	Oph	16h 25m 24s	-24° 28.0'		14:11	19:01	23:50
IC4604	Rho Ophiuchi Complex [2]	Neb	Oph	16h 25m 33s	-23° 26.5'		14:08	19:01	23:54
NGC6124	C75	Open	Sco	16h 25m 36s	-40° 40.0'	5.8	15:23	19:01	22:39
Abell39		P Neb	Her	16h 27m 33s	+27° 54.5'	12.9	11:33	19:03	02:33
IC4605		Neb	Sco	16h 30m 12s	-25° 06.8'		14:18	19:05	23:53
NGC6153		P Neb	Sco	16h 31m 31s	-40° 15.2'	12.0	15:26	19:07	22:47
NGC6181		Galaxy	Her	16h 32m 21s	+19° 49.5'	11.9	12:06	19:08	02:09
NGC6171		Globular	Oph	16h 32m 32s	-13° 03.1'	8.1	13:42	19:08	00:33
NGC6178		Open	Sco	16h 35m 47s	-45° 38.6'	7.2	16:07	19:11	22:15
NGC6193	C82	Open	Ara	16h 41m 18s	-48° 46.0'	5.2	16:40	19:16	21:53
M13	Hercules Globular Cluster	Globular	Her	16h 41m 41s	+36° 27.5'	7.0	11:09	19:17	03:25
NGC6210	Turtle Planetary Nebula	P Neb	Her	16h 44m 30s	+23° 48.0'	9.0	12:05	19:20	02:34
Barnard44a	B44a	DkNeb	Sco	16h 44m 45s	-40° 20.0'		15:40	19:20	23:00
NGC6204		Open	Ara	16h 46m 09s	-47° 01.0'	8.2	16:28	19:21	22:14
M12	Gumball Globular	Globular	Oph	16h 47m 14s	-01° 56.8'	8.0	13:25	19:22	01:20
NGC6231 C76	Table of Scorpius	Open	Sco	16h 54m 00s	-41° 48.0'	2.6	15:58	19:29	23:00
IC4628	Prawn Nebula	Neb	Sco	16h 56m 58s	-40° 27.3'		15:53	19:32	23:11
NGC6254		Globular	Oph	16h 57m 09s	-04° 05.9'	6.6	13:41	19:32	01:24
Barnard47	B47	DkNeb	Oph	16h 59m 42s	-22° 38.0'		14:39	19:35	00:31
M62	Flickering Globular, NGC6266	Globular	Oph	17h 01m 13s	-30° 06.7'	8.0	15:08	19:36	00:05
M19	NGC6273	Globular	Oph	17h 02m 38s	-26° 16.0'	8.5	14:55	19:38	00:21
Barnard51	B51	DkNeb	Oph	17h 04m 44s	-22° 15.0'		14:43	19:40	00:37
IC4637		P Neb	Sco	17h 05m 10s	-40° 53.1'	14.0	16:04	19:40	23:17

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
Barnard56	B56	DkNeb	Sco	17h 08m 48s	-32° 05.0'		15:24	19:44	00:04
Barnard59	B59,Pipe Nebula	DkNeb	Oph	17h 11m 23s	-27° 29.0'		15:08	19:47	00:25
NGC6302	C69,Bug Nebula	P Neb	Sco	17h 13m 42s	-37° 06.0'	9.6	15:52	19:49	23:46
Barnard251	B251	DkNeb	Oph	17h 13m 48s	-20° 09.0'		14:45	19:49	00:53
Barnard63	B63	DkNeb	Oph	17h 16m 00s	-21° 28.0'		14:52	19:51	00:51
M92	NGC6341	Globular	Her	17h 17m 07s	+43° 08.1'	7.5	11:05	19:52	04:40
M9	NGC6333	Globular	Oph	17h 19m 12s	-18° 31.0'	9.0	14:45	19:54	01:04
NGC6326		P Neb	Ara	17h 20m 46s	-51° 45.2'	12.0	17:54	19:56	21:58
Barnard256	B256	DkNeb	Oph	17h 22m 12s	-28° 49.0'		15:24	19:57	00:31
Barnard67a	B67a	DkNeb	Oph	17h 22m 30s	-21° 53.0'		14:59	19:58	00:56
Barnard71	B71	DkNeb	Oph	17h 23m 02s	-24° 00.0'		15:07	19:58	00:49
NGC6357	Lobster Nebula	Neb	Sco	17h 24m 43s	-34° 12.1'		15:49	20:00	00:11
IC4651		Open	Ara	17h 24m 52s	-49° 56.5'	6.9	17:36	20:00	22:24
Abell41		P Neb	Ser	17h 29m 04s	-15° 13.3'	13.9	14:45	20:04	01:24
Abell42		P Neb	Oph	17h 31m 31s	-08° 19.1'	14.6	14:27	20:07	01:46
Barnard78	B78	DkNeb	Oph	17h 32m 00s	-25° 35.0'		15:22	20:07	00:53
NGC6388		Globular	Sco	17h 36m 17s	-44° 44.1'	6.9	17:00	20:11	23:23
M14	NGC6402	Globular	Oph	17h 37m 36s	-03° 14.7'	9.5	14:19	20:13	02:07
Barnard276	B276	DkNeb	Oph	17h 39m 39s	-19° 49.0'		15:10	20:15	01:20
M6	Butterfly Cluster	Open	Sco	17h 40m 20s	-32° 15.2'	4.5	15:56	20:16	00:35
NGC6397	C86	Globular	Ara	17h 40m 42s	-53° 40.0'	5.6	18:46	20:16	21:45
NGC6426		Globular	Oph	17h 44m 55s	+03° 10.1'	11.2	14:09	20:20	02:32
Barnard83a	B83a	DkNeb	Sgr	17h 45m 18s	-20° 00.0'		15:16	20:20	01:25
IC4665		Open	Oph	17h 46m 30s	+05° 39.0'	4.2	14:03	20:22	02:40
NGC6445	Crescent Nebula	P Neb	Sgr	17h 49m 15s	-20° 00.6'	13.0	15:20	20:24	01:29
NGC6503		Galaxy	Dra	17h 49m 27s	+70° 08.6'	10.2	Circ	20:25	Circ
NGC6441		Globular	Sco	17h 50m 13s	-37° 03.0'	7.4	16:28	20:25	00:23
Barnard283	B283	DkNeb	Sco	17h 51m 00s	-33° 52.0'		16:14	20:26	00:39
Barnard285	B285	DkNeb	Ser	17h 51m 32s	-12° 52.0'		15:00	20:27	01:53
M7	Ptolemy's Cluster	Open	Sco	17h 53m 51s	-34° 47.6'	3.5	16:21	20:29	00:37
IC4670		Neb	Sgr	17h 55m 07s	-21° 44.6'		15:32	20:30	01:29
NGC6501		Galaxy	Her	17h 56m 04s	+18° 22.3'	12.3	13:35	20:31	03:28
M23	NGC6494	Open	Sgr	17h 57m 04s	-18° 59.1'	6.0	15:25	20:32	01:40
NGC6543	C6,Cat Eye Nebula	P Neb	Dra	17h 58m 36s	+66° 38.0'	8.1	Circ	20:34	Circ
NGC6496		Globular	Sco	17h 59m 04s	-44° 16.0'	9.2	17:20	20:34	23:49
Barnard291	B291	DkNeb	Sgr	17h 59m 43s	-33° 53.0'		16:22	20:35	00:47

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
Barnard292	B292	DkNeb	Sgr	18h 00m 34s	-33° 20.0'		16:21	20:36	00:51
Barnard293	B293	DkNeb	Sgr	18h 01m 12s	-35° 20.0'		16:31	20:36	00:42
M20	Trifid Nebula, The Clover	Open+D Neb	Sgr	18h 02m 42s	-22° 58.2'	5.0	15:43	20:38	01:32
M8	Lagoon Nebula, Dragon Nebula	Open+D Neb	Sgr	18h 03m 41s	-24° 22.7'	5.0	15:49	20:39	01:29
Barnard295	B295	DkNeb	Sgr	18h 04m 05s	-31° 09.0'		16:15	20:39	01:03
M21	NGC6531	Open	Sgr	18h 04m 13s	-22° 29.3'	7.0	15:43	20:39	01:36
NGC6530		Open	Sgr	18h 04m 31s	-24° 21.5'	4.6	15:50	20:40	01:30
NGC6528		Globular	Sgr	18h 04m 50s	-30° 03.3'	9.5	16:11	20:40	01:09
IC4684		Neb	Sgr	18h 09m 08s	-23° 26.1'		15:51	20:44	01:37
IC4685		Neb	Sgr	18h 09m 18s	-23° 59.2'		15:53	20:44	01:36
Barnard303	B303	DkNeb	Sgr	18h 09m 28s	-23° 59.0'		15:54	20:45	01:36
IC1274		Neb	Sgr	18h 09m 51s	-23° 38.8'		15:53	20:45	01:37
IC1275		Neb	Sgr	18h 10m 07s	-23° 45.7'		15:53	20:45	01:37
NGC6572		P Neb	Oph	18h 12m 06s	+06° 51.2'	9.0	14:25	20:47	03:09
NGC6567		P Neb	Sgr	18h 13m 45s	-19° 04.5'	12.0	15:42	20:49	01:56
IC4701		Neb	Sgr	18h 16m 36s	-16° 38.0'		15:37	20:52	02:07
Barnard93	B93	DkNeb	Sgr	18h 16m 53s	-18° 03.0'		15:41	20:52	02:03
IC1284		Neb	Sgr	18h 17m 39s	-19° 40.3'		15:47	20:53	01:58
M24, NGC6603	Small Sagittarius Star Cloud, ,	Open	Sgr	18h 18m 26s	-18° 24.3'	4.5	15:44	20:54	02:03
M16	Star Queen Nebula, The Ghost	Open+D Neb	Ser	18h 18m 48s	-13° 48.3'	6.5	15:30	20:54	02:18
Barnard308	B308	DkNeb	Sgr	18h 19m 08s	-22° 14.0'		15:57	20:54	01:51
M18	Black Swan, NGC6613	Open	Sgr	18h 19m 58s	-17° 06.1'	8.0	15:42	20:55	02:09
M17	Omega Nebula, 9Horseshoe Nebula	Open+D Neb	Sgr	18h 20m 47s	-16° 10.3'	7.0	15:40	20:56	02:12
HR6923	39 Dra	Mult	Dra	18h 23m 54s	+58° 48.0'	5.0	Circ	20:59	Circ
M28	NGC6626	Globular	Sgr	18h 24m 33s	-24° 52.1'	8.5	16:12	21:00	01:48
Barnard95	B95	DkNeb	Sct	18h 25m 35s	-11° 44.0'		15:31	21:01	02:30
Barnard97	B97	DkNeb	Sct	18h 29m 05s	-09° 55.0'		15:29	21:04	02:39
Abell44		P Neb	Sgr	18h 30m 11s	-16° 45.4'	12.6	15:51	21:05	02:20
NGC6637		Globular	Sgr	18h 31m 23s	-32° 20.8'	7.7	16:47	21:07	01:26
IC1287		Neb	Sct	18h 31m 26s	-10° 47.7'		15:34	21:07	02:39
M25	M25	Open	Sgr	18h 31m 42s	-19° 07.0'	6.5	16:00	21:07	02:14
IC4725		Open	Sgr	18h 31m 48s	-19° 06.7'	4.6	16:00	21:07	02:14
NGC6642		Globular	Sgr	18h 31m 54s	-23° 28.5'	8.8	16:14	21:07	02:00
NGC6644		P Neb	Sgr	18h 32m 35s	-25° 07.7'	12.0	16:21	21:08	01:55
NGC6647		Open	Sgr	18h 32m 49s	-17° 13.6'	8.0	15:55	21:08	02:21

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
IC4732		P Neb	Sgr	18h 33m 55s	-22° 38.6'	13.0	16:13	21:09	02:05
NGC6656	Crackerjack Cluster	Globular	Sgr	18h 36m 24s	-23° 54.2'	5.1	16:20	21:12	02:03
IC4756		Open	Ser	18h 38m 54s	+05° 27.0'	5.0	14:56	21:14	03:32
NGC6681		Globular	Sgr	18h 43m 12s	-32° 17.4'	8.1	16:59	21:18	01:38
NGC6694		Open	Sct	18h 45m 18s	-09° 23.0'	8.0	15:44	21:20	02:57
IC4776		P Neb	Sgr	18h 45m 51s	-33° 20.5'	12.0	17:06	21:21	01:36
Barnard318	B318	DkNeb	Sct	18h 49m 42s	-06° 23.0'		15:40	21:25	03:10
M11	Wild Duck Cluster, NGC6705	Open	Sct	18h 51m 05s	-06° 16.1'	7.0	15:41	21:26	03:12
M57	Ring Nebula	P Neb	Lyr	18h 53m 35s	+33° 01.7'	9.5	13:38	21:29	05:20
Barnard117	B117	DkNeb	Sct	18h 53m 43s	-07° 24.0'		15:47	21:29	03:11
NGC6715		Globular	Sgr	18h 55m 03s	-30° 28.7'	7.7	17:03	21:30	01:57
NGC6717	III-143	Globular	Sgr	18h 55m 06s	-22° 42.0'	9.2	16:35	21:30	02:26
Barnard122	B122	DkNeb	Sct	18h 56m 48s	-04° 45.0'		15:42	21:32	03:22
Barnard123	B123	DkNeb	Sct	18h 57m 39s	-04° 43.0'		15:43	21:33	03:22
NGC6723		Globular	Sgr	18h 59m 33s	-36° 37.9'	7.3	17:35	21:35	01:34
Barnard128	B128	DkNeb	Aql	19h 01m 40s	-04° 34.0'		15:47	21:37	03:27
NGC6729	C68	BrNeb	CrA	19h 01m 54s	-36° 57.0'		17:39	21:37	01:35
Barnard326	B326	DkNeb	Aql	19h 03m 00s	-00° 23.0'		15:36	21:38	03:40
NGC6749		Globular	Aql	19h 05m 15s	+01° 54.0'	11.1	15:32	21:40	03:48
Barnard329	B329	DkNeb	Aql	19h 06m 59s	+03° 11.0'		15:31	21:42	03:54
NGC6760		Globular	Aql	19h 11m 12s	+01° 01.8'	9.1	15:41	21:46	03:52
Abell56		P Neb	Aql	19h 13m 07s	+02° 52.8'	12.4	15:38	21:48	03:59
NGC6772		P Neb	Aql	19h 14m 36s	-02° 42.4'	14.0	15:55	21:50	03:45
Barnard138	B138	DkNeb	Aql	19h 16m 00s	+00° 13.0'		15:48	21:51	03:55
M56	NGC6779	Globular	Lyr	19h 16m 36s	+30° 11.0'	9.5	14:13	21:52	05:31
NGC6778		P Neb	Aql	19h 18m 25s	-01° 35.7'	13.0	15:55	21:54	03:52
Abell61		P Neb	Cyg	19h 19m 10s	+46° 14.5'	13.0	12:42	21:54	07:06
Barnard140	B140	DkNeb	Aql	19h 19m 49s	+05° 13.0'		15:38	21:55	04:12

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