



Desert Sky Observer

Volume 39

Antelope Valley Astronomy Club Newsletter

August 2019

Up-Coming Events

August 3: [Club Picnic/members only](#)

August 9: Club Meeting*

August 24: [Prime Desert Moon Walk](#)

August 31: [Star Party @ Mt. Pinos](#)

* Monthly meetings are held at the S.A.G.E. Planetarium in Palmdale, the second Friday of each month. 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*

President

Darrell Bennett

Well, July started off with a little shaking but it looks like everyone came out ok.

On July 5th we had our trip to Mt. Wilson to use the 60 inch telescope. We all met at the park and ride off the 14 and Angeles Forest Hwy for the hour long drive up to Mt. Wilson.

Once we arrived, we waited for our tour guide Tim Thompson (he gave a talk on Black Holes at our June Club meeting). Tim came out and opened up the gate so we could drive up to the 60 inch telescope. After everyone used the restroom, we went over to the 100 inch telescope for the start of our tour.

After climbing all the stairs, we sat around the bottom of the 100 inch to listen to Tim's talk about telescopes, Hale and Hubble. After the 100 inch talk we walked over to the 150 foot Solar telescope. As we gathered around the table, where the sun is projected there were no sunspots. As the sun started to set, the mirror of the solar telescope tracked it until the TV antennas came into view then the side of the mountain.

After the solar telescope tour, it was time to walk back to the 60 inch. We were given the safety instructions for what to do and what not to do at the 60 inch. Once we got into the dome, I had everyone pose for a group picture. We then sat down and Tim began his talk about the 60 inch telescope, that's when the earthquake hit at 8:19pm. That old dome rattled a little but nothing fell down and Tim continued talking while the earthquake was shaking the dome. Then the telescope operator got a call that the 100 inch session was canceled. We waited to see if we would get the same call. The phone rang and we were told our session was also canceled.

We were told to be careful on our way home because of falling rocks on the road. There were some on the road but not a lot.

Everyone should have received a refund, except for \$5.00, they charged for the tour.

On July 27th we had our monthly Star Party at Prime Desert Woodlands. Jeremy told me that we had 184 people attend. Jupiter and Saturn were coming in great. Rod had M13 in his scope and I had M3 in mine. I would like to thank Rod, Phil, Kevin and Ellen for coming out to show the night sky with the public.



Secretary

Coming up on Saturday August 3rd is our summer picnic at Brite Lake in Tehachapi. We will need a head count, so please contact me or Darrell by Friday Aug. 2nd. Start time is around 4pm. The club will be supplying the hot dogs, hamburger, buns, utensils, condiments, cheese, charcoal, drinks, ice, plates and chips. If you would like to bring a side dish or a dessert, please bring them to the picnic, but it is not mandatory. There will be a silent auction. Please bring any items you want to auction off to the picnic. They do not have to be astronomy related, as long as they are in good working order and clean. We will have auction sheets to fill out for each item. There will be a public star party after the picnic. Email to come!

Friday August 9th is our club meeting. We will be having a speaker, Dr. Aaron Barth from UC Irvine, Department of Physics and Astronomy. He is an observational astronomer and his presentation will be on Supermassive Black Holes.

We have a Prime Desert Woodland Moon Walk on Saturday August 24th at 8pm. Join the walk or bring your telescope. Weather permitting, free and open to the public.

For Labor Day weekend, we have a dark sky star party at Mt. Pinos. Some members will be arriving on Friday August 30th and staying until Monday morning September 2nd. Members are welcome to come and leave anytime. However, if you do not plan to stay overnight, please park your vehicle facing towards the exit road, if possible, and away from the telescopes. Do not park with your headlights facing the telescope area! Exit slowly and with parking lights only, until you get to the main road. Remember there are no bathroom facilities at the parking lot. You will have to hike down to the campsite area a couple of hundred yards down from the parking area. Please bring your own snacks and drinks for your stay. An email will be coming out with maps and directions prior to the event.

See you at the picnic! Rose

Space Place

Chill Out: Spot an Ice Giant in August

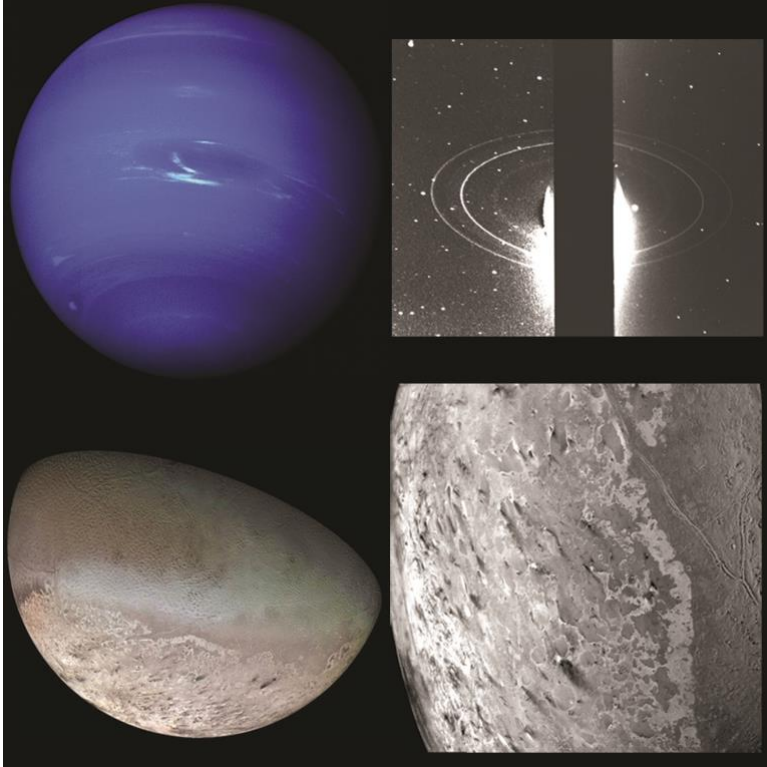
By David Prosper

Is the summer heat getting to you? Cool off overnight while spotting one of the solar system's ice giants: Neptune! It's the perfect way to commemorate the 30th anniversary of Voyager 2's flyby.

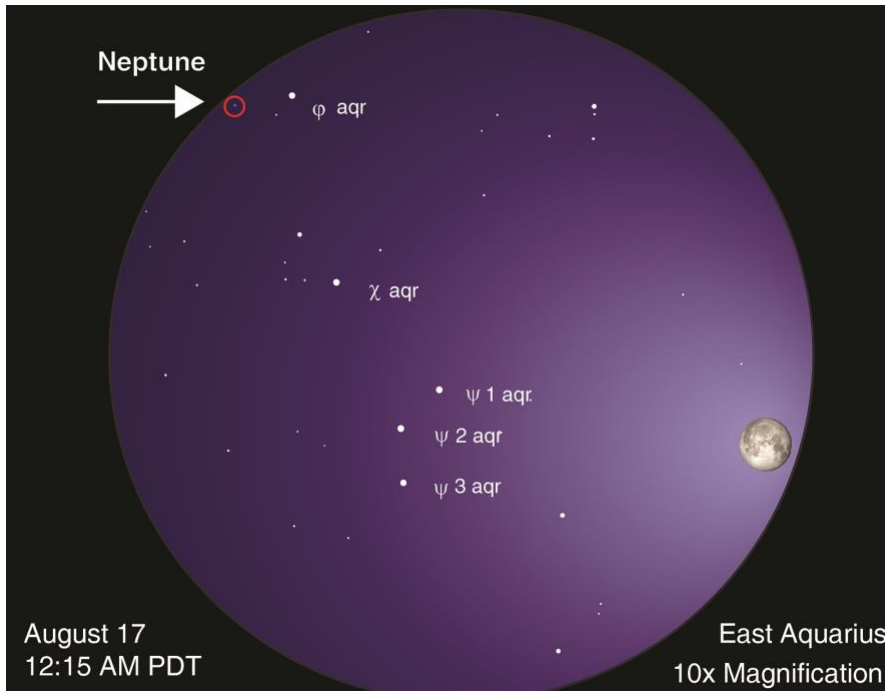
Neptune is too dim to see with your unaided eye so you'll need a telescope to find it. Neptune is at opposition in September, but its brightness and apparent size won't change dramatically as it's so distant; the planet is usually just under 8th magnitude and 4.5 billion kilometers away. You can see Neptune with binoculars but a telescope is recommended if you want to discern its disc; the distant world reveals a very small but discernible disc at high magnification. Neptune currently appears in Aquarius, a constellation lacking in bright stars, which adds difficulty to pinpointing its exact location. Fortunately, the Moon travels past Neptune the night of August 16th, passing less than six degrees apart (or about 12 Moon widths) at their closest. If the Moon's glare overwhelms Neptune's dim light, you can still use the its location that evening to mark the general area to search on a darker night. Another Neptune-spotting tip: Draw an imaginary line from bright southern star Fomalhaut up to the Great Square of Pegasus, then mark a point roughly in the middle and search there, in the eastern edge of Aquarius. If you spot a blue-ish star, swap your telescope's eyepiece to zoom in as much as possible. Is the suspect blue "star" now a tiny disc, while the surrounding stars remain points of white light? You've found Neptune!

Neptune and Uranus are ice giant planets. These worlds are larger than terrestrial worlds like Earth but smaller than gas giants like Jupiter. Neptune's atmosphere contains hydrogen and helium like a gas giant, but also methane, which gives it a striking blue color. The "ice" in "ice giant" refers to the mix of ammonia, methane, and water that makes up most of Neptune's mass, located in the planet's large, dense, hot mantle. This mantle surrounds an Earth-size rocky core. Neptune possesses a faint ring system and 13 confirmed moons. NASA's Voyager 2 mission made a very close flyby on August 25, 1989. It revealed a dynamic, stormy world streaked by the fastest winds in the solar system, their ferocity fueled by the planet's surprisingly strong internal heating. Triton, Neptune's largest moon, was discovered to be geologically active, with cryovolcanoes erupting nitrogen gas and dust dotting its surface, and a mottled "cantaloupe" terrain made up of hard water ice. Triton is similar to Pluto in size and composition, and orbits Neptune in the opposite direction of the planet's rotation, unlike every other large moon in the solar system. These clues lead scientists to conclude that this unusual moon is likely a captured Kuiper Belt object.

Discover more about Voyager 2, along with all of NASA's past, present, and future missions, at nasa.gov



Clockwise from top left: Neptune and the Great Dark Spot traced by white clouds; Neptune's rings; Triton and its famed icy cantaloupe surface; close of up Triton's surface, with dark streaks indicating possible cryovolcano activity. Find more images and science from Voyager 2's flyby at bit.ly/NeptuneVoyager2 Image Credit: NASA/JPL



Finder chart for Neptune. This is a simulated view through 10x50 binoculars (10x magnification). Please note that the sizes of stars in this chart indicate their brightness, not their actual size. Moon image courtesy NASA Scientific Visualization Studio; chart created with assistance from Stellarium.

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

News Headlines

NASA Events Celebrate the 50th Anniversary of Historic Moon Landing

On July 20, 1969, humans walked on another world for the first time in history, achieving the goal that President John F. Kennedy had set in 1961, before Americans had even orbited the Earth. After a landing that included dodging a lunar crater and boulder field just before touchdown, Neil Armstrong and Buzz Aldrin explored the area around their lunar landing site for more than two hours. They collected soil and rock samples, set up experiments, planted an American flag, and left behind medallions honoring the Apollo 11 crew and a plaque saying, "We came in peace for all mankind."

<https://www.nasa.gov/specials/apollo50th/index.html>

NASA Tracked Small Asteroid Before It Broke Up in Atmosphere

When a lightning detector on a NOAA weather satellite detected something that wasn't lightning last Saturday, a scientist at the Center for Near Earth Object Studies at NASA's Jet Propulsion Laboratory in Pasadena, California, did some detective work. Could a tiny, harmless object that broke up in the atmosphere in a bright flash be connected to a just-received automated alert of a potential near-Earth asteroid discovery? Although far below the size that NASA is tasked to detect and track, the event presented an ideal opportunity for NASA planetary defense teams to test their parts of the alert system.

<https://www.jpl.nasa.gov/news/news.php?feature=7438>

Curiosity's Mars Methane Mystery Continues

This week, NASA's Curiosity Mars rover found a surprising result: the largest amount of methane ever measured during the mission - about 21 parts per billion units by volume (ppbv). One ppbv means that if you take a volume of air on Mars, one billionth of the volume of air is methane. The finding came from the rover's Sample Analysis at Mars (SAM) tunable laser spectrometer. It's exciting because microbial life is an important source of methane on Earth, but methane can also be created through interactions between rocks and water.

<https://go.nasa.gov/2Z3xBwb>

VP Pence Sticks With the Plan — Moon in 2024, Then Mars

Vice President Mike Pence celebrated the Apollo 11 50th anniversary at Kennedy Space Center (KSC) today. While President Trump gives the appearance of wavering on the need to return to the Moon before going to Mars, Pence exhibits no such doubts. He again said American astronauts will walk on the Moon in 2024, what is now called the Artemis program. As he spoke, three new crew members were on their way to the International Space Station (ISS) where they will dock this evening. Knowing they were launching on this historic day, they designed their mission patch to commemorate Apollo 11 and tie it to the present (ISS) and future (Artemis).

<https://bit.ly/2Y3A20z>

August Sky Data

First Qtr Aug 7 Full Aug 15 Last Qtr Aug 23 New Aug 30



Planet Summary

By the 4th of August, **Mercury**, shining at magnitude +1.2, will have an elevation of ~5 degrees above the east-north-eastern horizon some 40 minutes before dawn.

Mercury gradually rises higher in the sky and brightens so, by the 13th of the month, reaches an elevation of ~8 degrees some 40 minutes before dawn at ~ 5:00 am when its brightness has increased to -0.4.

Venus passes through superior conjunction on the far side of the Sun on the 14th August so will not become visible again in the evening twilight until late autumn.

For 3 months **Mars**, which passes behind the Sun on September 2nd lies too close to the Sun to be visible. We will have to wait until November to spot it in the pre-dawn sky at the start of its next apparition.

Jupiter, shining on the 1st at magnitude -2.0 and falling to -1.8 during the month, can be seen in the south as darkness falls. Its angular size drops slightly from 42.6 to 39.9 arc seconds as the month progresses. Sadly it is heading towards the southernmost part of the ecliptic so, as it crosses the meridian in twilight, it will only have an elevation of ~14 degrees.

Saturn's disk is ~18.2 arc seconds across and its rings - which are still nicely tilted from the line of sight - spanning some 42.5 arc seconds across. By month's end it will be best seen at around 9:30 pm when lying due south. During the month its brightness falls from magnitude +1.2 to +1.4 while its angular size falls to 17.6 arc seconds. Sadly, it is at the lowest point of the ecliptic and will only reach an elevation of ~14 degrees.

The 2019 Perseid **meteor shower** will probably produce the greatest number of meteors on the mornings of August 11, 12 and 13. Unfortunately, on the peak mornings in 2019, a bright moon will drown many Perseids from view. For those serious about seeing the greatest number of Perseids in 2019, we recommend viewing several mornings in a row, beginning the weekend of Friday, August 9 to Sunday, August 11.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
8/1/2019	06:35	20:46	06:05	19:53
8/5/2019	11:14	23:22	06:07	19:49
8/10/2019	16:27	01:55	06:11	19:45
8/15/2019	20:10	06:16	06:15	19:39
8/20/2019	22:38	10:50	06:18	19:33
8/25/2019	01:08	15:44	06:22	19:27
8/31/2019	07:46	20:40	06:26	19:20

Planet Data

	Aug 1			
	Rise	Transit	Set	Mag
Mercury	05:02	11:55	18:48	1.5
Venus	05:47	12:47	19:47	-3.5
Mars	06:55	13:43	20:32	2.0
Jupiter	16:09	21:08	02:08	-2.0
Saturn	18:23	23:22	04:21	1.2
	Aug 15			
	Rise	Transit	Set	Mag
Mercury	04:51	11:48	18:45	-0.4
Venus	06:16	13:02	19:47	-3.5
Mars	06:43	13:23	20:02	2.0
Jupiter	15:13	20:12	01:12	-1.9
Saturn	17:25	22:23	03:22	1.3
	Aug 31			
	Rise	Transit	Set	Mag
Mercury	06:09	12:44	19:19	-1.5
Venus	06:49	13:14	19:40	-3.4
Mars	06:30	12:58	19:27	2.0
Jupiter	14:13	19:12	00:11	-1.8
Saturn	16:20	21:18	02:16	1.4

Planet, Sun, and Moon data calculated for local time at Lancaster, CA

Suggested Observing List

The list below contains objects that will be visible on the night of the AVAC Star Party. The list is sorted by the transit time of the object.

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6388	Glob	Sco	17h 36m 17s	-44°44'08"	6.9	18:51	22:08	01:25
NGC6396	Open	Sco	17h 37m 36s	-35°01'36"	8.5	17:58	22:09	02:20
NGC6418	Gal	Dra	17h 38m 09s	+58°42'53"	14.0	Circum	22:10	Circum
M6	Open	Sco	17h 40m 20s	-32°15'12"	4.5	17:49	22:12	02:34
NGC6397	Glob	Ara	17h 40m 42s	-53°40'26"	5.7	20:28	22:12	23:56
NGC6416	Open	Sco	17h 44m 19s	-32°21'42"	5.7	17:54	22:16	02:38
NGC6426	Glob	Oph	17h 44m 55s	+03°10'11"	11.2	16:05	22:16	04:28
NGC6425	Open	Sco	17h 47m 01s	-31°31'48"	7.2	17:53	22:18	02:44
NGC6439	P Neb	Sgr	17h 48m 20s	-16°28'44"	14.0	17:03	22:20	03:37
NGC6440	Glob	Sgr	17h 48m 53s	-20°21'39"	9.7	17:15	22:20	03:25
NGC6445	P Neb	Sgr	17h 49m 15s	-20°00'36"	13.0	17:15	22:21	03:27
NGC6441	Glob	Sco	17h 50m 13s	-37°03'03"	7.4	18:20	22:22	02:23
NGC6451	Open	Sco	17h 50m 41s	-30°12'36"	8.0	17:51	22:22	02:53
NGC6453	Glob	Sco	17h 50m 52s	-34°35'54"	9.9	18:10	22:22	02:35
M7	Open	Sco	17h 53m 51s	-34°47'36"	3.5	18:14	22:25	02:37
NGC6504	Gal	Her	17h 56m 06s	+33°12'32"	13.0	14:39	22:28	06:16
NGC6543	P Neb	Dra	17h 58m 33s	+66°37'59"	9.0	Circum	22:30	Circum
NGC6507	Open	Sgr	17h 59m 50s	-17°27'00"	10.0	17:17	22:31	03:45
NGC6517	Glob	Oph	18h 01m 51s	-08°57'32"	10.3	16:55	22:33	04:12
M20	D Neb	Sgr	18h 02m 42s	-22°58'18"	5.0	17:38	22:34	03:31
NGC6520	Open	Sgr	18h 03m 24s	-27°53'18"	8.0	17:55	22:35	03:14
M8	D Neb	Sgr	18h 03m 41s	-24°22'48"	5.0	17:43	22:35	03:27
NGC6535	Glob	Ser	18h 03m 51s	-00°17'51"	10.6	16:33	22:35	04:37
NGC6526	Neb	Sgr	18h 04m 06s	-24°26'30"		17:44	22:36	03:27
NGC6530	Open	Sgr	18h 04m 31s	-24°21'30"	4.6	17:44	22:36	03:28
NGC6528	Glob	Sgr	18h 04m 50s	-30°03'21"	9.5	18:05	22:36	03:08
NGC6539	Glob	Ser	18h 04m 50s	-07°35'11"	9.6	16:54	22:36	04:18
NGC6537	P Neb	Sgr	18h 05m 13s	-19°50'35"	13.0	17:30	22:37	03:43
NGC6544	Glob	Sgr	18h 07m 20s	-24°59'53"	8.3	17:49	22:39	03:29
NGC6541	Glob	CrA	18h 08m 02s	-43°42'57"	6.6	19:16	22:40	02:03
NGC6559	Neb	Sgr	18h 09m 57s	-24°06'23"		17:49	22:41	03:34
NGC6565	P Neb	Sgr	18h 11m 53s	-28°10'41"	13.0	18:05	22:43	03:22
NGC6563	P Neb	Sgr	18h 12m 03s	-33°52'07"	14.0	18:28	22:44	02:59
NGC6572	P Neb	Oph	18h 12m 06s	+06°51'13"	9.0	16:22	22:44	05:05
NGC6568	Open	Sgr	18h 12m 44s	-21°36'18"	9.0	17:43	22:44	03:45
NGC6569	Glob	Sgr	18h 13m 39s	-31°49'35"	8.7	18:21	22:45	03:09
NGC6567	P Neb	Sgr	18h 13m 45s	-19°04'34"	12.0	17:36	22:45	03:54
NGC6578	P Neb	Sgr	18h 16m 16s	-20°27'03"	13.0	17:43	22:48	03:52
M24	Open	Sgr	18h 18m 26s	-18°24'24"	4.5	17:39	22:50	04:01

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6624	Glob	Sgr	18h 23m 41s	-30°21'40"	8.3	18:25	22:55	03:25
NGC6629	P Neb	Sgr	18h 25m 42s	-23°12'10"	12.0	18:01	22:57	03:53
NGC6633	Open	Oph	18h 27m 15s	+06°30'30"	4.6	16:38	22:59	05:19
NGC6638	Glob	Sgr	18h 30m 56s	-25°29'56"	9.2	18:14	23:02	03:50
M69	Glob	Sgr	18h 31m 23s	-32°20'51"	9.0	18:41	23:03	03:25
NGC6642	Glob	Sgr	18h 31m 54s	-23°28'35"	8.8	18:09	23:03	03:58
NGC6644	P Neb	Sgr	18h 32m 35s	-25°07'44"	12.0	18:15	23:04	03:53
NGC6645	Open	Sgr	18h 32m 37s	-16°53'00"	9.0	17:49	23:04	04:20
NGC6647	Open	Sgr	18h 32m 49s	-17°13'42"	8.0	17:50	23:04	04:19
M22	Glob	Sgr	18h 36m 24s	-23°54'17"	6.5	18:14	23:08	04:01
M70	Glob	Sgr	18h 43m 12s	-32°17'27"	9.0	18:52	23:15	03:37
NGC6709	Open	Aql	18h 51m 18s	+10°19'06"	6.7	16:52	23:23	05:54
M57	P Neb	Lyr	18h 53m 35s	+33°01'44"	9.5	15:37	23:25	07:13
NGC6716	Open	Sgr	18h 54m 34s	-19°54'06"	6.9	18:20	23:26	04:32
NGC6723	Glob	Sgr	18h 59m 33s	-36°37'54"	7.3	19:28	23:31	03:34
NGC6738	Open	Aql	19h 01m 21s	+11°36'54"	8.0	16:58	23:33	06:08
NGC6726	Neb	CrA	19h 01m 39s	-36°53'30"		19:31	23:33	03:35
NGC6729	Neb	CrA	19h 01m 55s	-36°57'30"		19:32	23:33	03:35
NGC6741	P Neb	Aql	19h 02m 37s	-00°26'57"	11.0	17:33	23:34	05:36
NGC6749	Glob	Aql	19h 05m 15s	+01°54'02"	11.1	17:29	23:37	05:45
NGC6751	P Neb	Aql	19h 05m 56s	-05°59'31"	13.0	17:51	23:37	05:24
NGC6755	Open	Aql	19h 07m 49s	+04°16'00"	7.5	17:25	23:39	05:54
NGC6772	P Neb	Aql	19h 14m 36s	-02°42'24"	14.0	17:51	23:46	05:41
M56	Glob	Lyr	19h 16m 36s	+30°11'02"	9.5	16:12	23:48	07:24
NGC6778	P Neb	Aql	19h 18m 25s	-01°35'48"	13.0	17:51	23:50	05:48
NGC6781	P Neb	Aql	19h 18m 28s	+06°32'20"	12.0	17:29	23:50	06:10
NGC6790	P Neb	Aql	19h 22m 57s	+01°30'48"	10.0	17:48	23:54	06:01
NGC6803	P Neb	Aql	19h 31m 16s	+10°03'23"	11.0	17:32	00:03	06:33
NGC6804	P Neb	Aql	19h 31m 35s	+09°13'31"	12.0	17:35	00:03	06:31
NGC6807	P Neb	Aql	19h 34m 34s	+05°41'03"	14.0	17:48	00:06	06:24
M55	Glob	Sgr	19h 40m 00s	-30°57'44"	7.0	19:44	00:11	04:39
NGC6813	Neb	Vul	19h 40m 22s	+27°18'34"		16:47	00:12	07:37
NGC6820	Neb	Vul	19h 42m 28s	+23°05'17"		17:04	00:14	07:24
NGC6824	Gal	Cyg	19h 43m 41s	+56°06'34"	11.9	Circum	00:15	Circum
NGC6818	P Neb	Sgr	19h 43m 58s	-14°09'10"	10.0	18:52	00:15	05:39
NGC6826	P Neb	Cyg	19h 44m 48s	+50°31'30"	10.0	14:28	00:16	10:05
NGC6833	P Neb	Cyg	19h 49m 47s	+48°57'40"	14.0	14:51	00:21	09:52
NGC6830	Open	Vul	19h 50m 59s	+23°06'00"	7.9	17:12	00:22	07:33
M71	Glob	Sge	19h 53m 46s	+18°46'42"	8.5	17:29	00:25	07:21
NGC6842	P Neb	Vul	19h 55m 02s	+29°17'20"	14.0	16:54	00:27	07:59
M27	P Neb	Vul	19h 59m 36s	+22°43'15"	7.5	17:22	00:31	07:40
NGC6866	Open	Cyg	20h 03m 55s	+44°09'30"	7.6	15:46	00:35	09:25
NGC6871	Open	Cyg	20h 05m 59s	+35°46'38"	5.2	16:37	00:37	08:38
M75	Glob	Sgr	20h 06m 05s	-21°55'19"	9.5	19:38	00:38	05:37
NGC6884	P Neb	Cyg	20h 10m 24s	+46°27'39"	13.0	15:35	00:42	09:49

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6879	P Neb	Sge	20h 10m 27s	+16°55'22"	13.0	17:52	00:42	07:32
NGC6881	P Neb	Cyg	20h 10m 52s	+37°24'42"	14.0	16:34	00:42	08:51
NGC6883	Open	Cyg	20h 11m 20s	+35°49'55"	8.0	16:42	00:43	08:44
NGC6882	Open	Vul	20h 11m 58s	+26°29'00"	8.1	17:21	00:43	08:05
NGC6888	Neb	Cyg	20h 12m 06s	+38°21'17"		16:30	00:44	08:57
NGC6886	P Neb	Sge	20h 12m 43s	+19°59'22"	12.0	17:44	00:44	07:44
NGC6891	P Neb	Del	20h 15m 09s	+12°42'16"	12.0	18:09	00:47	07:25
NGC6894	P Neb	Cyg	20h 16m 24s	+30°33'55"	14.0	17:10	00:48	08:25
NGC6905	P Neb	Del	20h 22m 23s	+20°06'16"	12.0	17:54	00:54	07:54
M29	Open	Cyg	20h 23m 57s	+38°30'30"	9.0	16:41	00:55	09:10
NGC6914	Neb	Cyg	20h 24m 43s	+42°28'57"		16:18	00:56	09:34
NGC6926	Gal	Aql	20h 33m 06s	-02°01'41"	12.4	19:07	01:05	07:02
NGC6934	Glob	Del	20h 34m 11s	+07°24'17"	8.9	18:43	01:06	07:29
NGC6956	Gal	Del	20h 43m 54s	+12°30'41"	14.0	18:38	01:15	07:53
NGC6960	Neb	Cyg	20h 45m 58s	+30°35'42"		17:40	01:17	08:55
M72	Glob	Aqr	20h 53m 28s	-12°32'14"	10.0	19:57	01:25	06:53
NGC6992	Neb	Cyg	20h 56m 19s	+31°44'36"		17:45	01:28	09:10
NGC6995	Neb	Cyg	20h 57m 10s	+31°14'06"		17:48	01:29	09:09
NGC7000	Neb	Cyg	20h 59m 18s	+44°31'00"		16:39	01:31	10:23
NGC7008	P Neb	Cyg	21h 00m 33s	+54°32'35"	13.0	14:29	01:32	12:35
NGC7023	Open	Cep	21h 01m 36s	+68°10'10"	7.0	Circum	01:33	Circum
NGC7009	P Neb	Aqr	21h 04m 11s	-11°21'50"	8.0	20:04	01:36	07:07
NGC7026	P Neb	Cyg	21h 06m 19s	+47°51'08"	13.0	16:18	01:38	10:57
NGC7027	P Neb	Cyg	21h 07m 02s	+42°14'10"	10.0	17:02	01:39	10:15
NGC7039	Open	Cyg	21h 10m 48s	+45°37'00"	7.6	16:42	01:42	10:42
NGC7048	P Neb	Cyg	21h 14m 15s	+46°17'18"	11.0	16:40	01:46	10:51
NGC7062	Open	Cyg	21h 23m 27s	+46°22'42"	8.3	16:49	01:55	11:01
NGC7067	Open	Cyg	21h 24m 23s	+48°00'36"	9.7	16:35	01:56	11:17
NGC7076	Neb	Cep	21h 26m 24s	+62°53'33"		Circum	01:58	Circum
M15	Glob	Peg	21h 29m 58s	+12°10'02"	7.5	19:25	02:01	08:38
M39	Open	Cyg	21h 31m 42s	+48°25'00"	5.5	16:38	02:03	11:28
M2	Glob	Aqr	21h 33m 27s	-00°49'23"	7.5	20:04	02:05	08:05
NGC7213	Gal	Gru	22h 09m 16s	-47°10'00"	10.5	23:42	02:41	05:39
NGC7226	Open	Cep	22h 10m 27s	+55°23'54"	9.6	Circum	02:42	Circum
NGC7235	Open	Cep	22h 12m 25s	+57°16'16"	7.7	Circum	02:44	Circum
NGC7296	Open	Lac	22h 28m 02s	+52°17'18"	10.0	16:46	03:00	13:13
NGC7303	Gal	Peg	22h 31m 33s	+30°57'22"	13.0	19:24	03:03	10:42
NGC7331	Gal	Peg	22h 37m 04s	+34°24'57"	9.5	19:14	03:09	11:03
NGC7354	P Neb	Cep	22h 40m 20s	+61°17'07"	13.0	Circum	03:12	Circum
NGC7380	Open	Cep	22h 47m 21s	+58°07'54"	7.2	Circum	03:19	Circum
NGC7410	Gal	Gru	22h 55m 01s	-39°39'42"	10.4	23:39	03:26	07:14
NGC7424	Gal	Gru	22h 57m 18s	-41°04'16"	11.0	23:49	03:29	07:09
NGC7457	Gal	Peg	23h 01m 00s	+30°08'41"	10.8	19:57	03:32	11:08
NGC7469	Gal	Peg	23h 03m 16s	+08°52'26"	11.9	21:08	03:35	10:02
NGC7492	Glob	Aqr	23h 08m 27s	-15°36'41"	11.5	22:21	03:40	08:59

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC7538	Neb	Cep	23h 13m 38s	+61°30'42"		Circum	03:45	Circum
NGC7537	Gal	Psc	23h 14m 35s	+04°29'54"	13.2	21:31	03:46	10:01
NGC7562	Gal	Psc	23h 15m 58s	+06°41'15"	11.5	21:26	03:47	10:08
NGC7619	Gal	Peg	23h 20m 15s	+08°12'23"	11.1	21:27	03:52	10:17
NGC7635	Neb	Cas	23h 20m 45s	+61°12'42"		Circum	03:52	Circum
NGC7640	Gal	And	23h 22m 07s	+40°50'43"	10.9	19:26	03:54	12:21
M52	Open	Cas	23h 24m 48s	+61°35'36"	8.0	Circum	03:56	Circum
NGC7662	P Neb	And	23h 25m 54s	+42°32'06"	9.0	19:19	03:57	12:35
NGC7665	Gal	Aqr	23h 27m 15s	-09°23'13"	13.0	22:22	03:59	09:36
NGC7677	Gal	Peg	23h 28m 06s	+23°31'52"	14.0	20:48	04:00	11:11
NGC7686	Open	And	23h 30m 07s	+49°08'00"	5.6	18:29	04:02	13:34
NGC7701	Gal	Psc	23h 34m 31s	-02°51'17"	14.0	22:11	04:06	10:01
NGC7721	Gal	Aqr	23h 38m 49s	-06°31'05"	11.8	22:25	04:10	09:55
NGC7762	Open	Cep	23h 50m 01s	+68°02'18"	10.0	Circum	04:21	Circum
NGC7793	Gal	Scl	23h 57m 50s	-32°35'28"	9.1	00:08	04:29	08:50
NGC7822	Neb	Cep	00h 03m 36s	+67°09'00"		Circum	04:35	Circum
NGC7824	Gal	Psc	00h 05m 06s	+06°55'12"	14.0	22:15	04:37	10:58
NGC24	Gal	Scl	00h 09m 56s	-24°57'52"	11.5	23:52	04:41	09:31
NGC26	Gal	Peg	00h 10m 26s	+25°49'55"	14.0	21:22	04:42	12:02
NGC40	P Neb	Cep	00h 13m 01s	+72°31'19"	11.0	Circum	04:44	Circum
NGC45	Gal	Cet	00h 14m 04s	-23°10'53"	10.4	23:50	04:46	09:41
NGC55	Gal	Scl	00h 15m 08s	-39°13'12"	8.0	00:56	04:47	08:37
NGC64	Gal	Cet	00h 17m 30s	-06°49'31"	14.0	23:05	04:49	10:33
NGC129	Open	Cas	00h 30m 00s	+60°13'06"	6.5	Circum	05:01	Circum
NGC132	Gal	Cet	00h 30m 11s	+02°05'34"	14.0	22:53	05:02	11:10
NGC146	Open	Cas	00h 33m 03s	+63°18'06"	9.1	Circum	05:05	Circum
NGC147	Gal	Cas	00h 33m 12s	+48°30'27"	9.3	19:39	05:05	14:30
NGC189	Open	Cas	00h 39m 35s	+61°05'06"	8.8	Circum	05:11	Circum
M110	Gal	And	00h 40m 22s	+41°41'07"	8.9	20:39	05:12	13:44
M31	Gal	And	00h 42m 44s	+41°16'08"	4.3	20:44	05:14	13:44
NGC225	Open	Cas	00h 43m 39s	+61°46'30"	7.0	Circum	05:15	Circum
NGC246	P Neb	Cet	00h 47m 03s	-11°52'19"	8.0	23:48	05:19	10:49
NGC247	Gal	Cet	00h 47m 08s	-20°45'35"	8.9	00:15	05:19	10:22
NGC188	Open	Cep	00h 47m 28s	+85°15'18"	8.1	Circum	05:19	Circum
NGC253	Gal	Scl	00h 47m 33s	-25°17'18"	7.1	00:30	05:19	10:08
NGC260	Gal	And	00h 48m 35s	+27°41'31"	14.0	21:54	05:20	12:46
NGC278	Gal	Cas	00h 52m 04s	+47°33'02"	10.9	20:07	05:24	14:40
NGC280	Gal	And	00h 52m 30s	+24°21'01"	14.0	22:10	05:24	12:38
NGC288	Glob	Scl	00h 52m 45s	-26°35'01"	8.1	00:40	05:24	10:08
NGC281	Open	Cas	00h 52m 54s	+56°37'29"	7.0	Circum	05:24	Circum
NGC309	Gal	Cet	00h 56m 43s	-09°54'50"	11.8	23:53	05:28	11:04
NGC340	Gal	Cet	01h 00m 35s	-06°52'00"	14.0	23:48	05:32	11:16
NGC404	Gal	And	01h 09m 27s	+35°43'05"	10.1	21:41	05:41	13:41
NGC436	Open	Cas	01h 15m 58s	+58°48'42"	8.8	Circum	05:47	Circum
NGC470	Gal	Psc	01h 19m 45s	+03°24'35"	11.9	23:39	05:51	12:03

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC507	Gal	Psc	01h 23m 40s	+33°15'21"	11.2	22:06	05:55	13:44
NGC514	Gal	Psc	01h 24m 04s	+12°55'02"	11.9	23:17	05:56	12:34
NGC573	Gal	And	01h 30m 49s	+41°15'26"	13.0	21:32	06:02	14:32
NGC584	Gal	Cet	01h 31m 21s	-06°52'05"	10.4	00:19	06:03	11:47
M33	Gal	Tri	01h 33m 51s	+30°39'37"	6.2	22:27	06:05	13:43
NGC613	Gal	Scl	01h 34m 18s	-29°25'08"	10.0	01:32	06:06	10:40
M76	P Neb	Per	01h 42m 18s	+51°34'15"	12.0	20:11	06:14	16:16
NGC637	Open	Cas	01h 43m 04s	+64°02'24"	8.2	Circum	06:15	Circum
NGC654	Open	Cas	01h 44m 00s	+61°53'06"	6.5	Circum	06:15	Circum
NGC663	Open	Cas	01h 46m 09s	+61°14'06"	7.1	Circum	06:18	Circum
NGC672	Gal	Tri	01h 47m 54s	+27°25'59"	10.8	22:54	06:19	13:45
NGC741	Gal	Psc	01h 56m 21s	+05°37'43"	11.3	00:10	06:28	12:46
NGC752	Open	And	01h 57m 41s	+37°47'06"	5.7	22:19	06:29	14:40
NGC746	Gal	And	01h 57m 51s	+44°55'04"	13.0	21:35	06:29	15:24
NGC744	Open	Per	01h 58m 33s	+55°28'24"	7.9	Circum	06:30	Circum
NGC778	Gal	Tri	02h 00m 19s	+31°18'47"	14.0	22:51	06:32	14:12
NGC784	Gal	Tri	02h 01m 17s	+28°50'14"	11.8	23:02	06:33	14:04
NGC809	Gal	Cet	02h 04m 19s	-08°44'07"	14.0	00:57	06:36	12:15
NGC821	Gal	Ari	02h 08m 21s	+10°59'41"	10.8	00:07	06:40	13:13
NGC869	Open	Per	02h 19m 00s	+57°07'42"	4.0	Circum	06:50	Circum
NGC884	Open	Per	02h 22m 18s	+57°08'12"	4.0	Circum	06:54	Circum
NGC891	Gal	And	02h 22m 33s	+42°20'54"	10.0	22:17	06:54	15:31
NGC896	Neb	Cas	02h 25m 28s	+62°01'09"		Circum	06:57	Circum
NGC926	Gal	Cet	02h 26m 07s	-00°19'55"	14.0	00:56	06:58	12:59
NGC974	Gal	Tri	02h 34m 26s	+32°57'15"	14.0	23:18	07:06	14:53
NGC1013	Gal	Cet	02h 37m 50s	-11°30'27"	14.0	01:38	07:09	12:40
NGC1022	Gal	Cet	02h 38m 33s	-06°40'39"	11.4	01:25	07:10	12:55
NGC1003	Gal	Per	02h 39m 17s	+40°52'20"	11.5	22:43	07:11	15:38
NGC1042	Gal	Cet	02h 40m 24s	-08°26'01"	10.9	01:32	07:12	12:52
M34	Open	Per	02h 42m 05s	+42°45'42"	6.0	22:34	07:14	15:53
NGC1073	Gal	Cet	02h 43m 40s	+01°22'33"	11.0	01:09	07:15	13:22
NGC1097	Gal	For	02h 46m 19s	-30°16'29"	9.3	02:47	07:18	11:48
NGC1090	Gal	Cet	02h 46m 34s	-00°14'50"	11.9	01:16	07:18	13:20
NGC1209	Gal	Eri	03h 06m 03s	-15°36'41"	11.4	02:18	07:38	12:57
NGC1249	Gal	Hor	03h 10m 01s	-53°20'10"	12.0	05:52	07:41	09:31
NGC1261	Glob	Hor	03h 12m 16s	-55°12'57"	8.4	06:32	07:44	08:55
NGC1248	Gal	Eri	03h 12m 48s	-05°13'29"	14.0	01:56	07:44	13:33
NGC1245	Open	Per	03h 14m 42s	+47°14'12"	8.4	22:32	07:46	17:00
NGC1291	Gal	Eri	03h 17m 18s	-41°06'29"	8.5	04:09	07:49	11:29
NGC1302	Gal	For	03h 19m 51s	-26°03'38"	11.0	03:05	07:51	12:37
NGC1309	Gal	Eri	03h 22m 06s	-15°24'01"	11.6	02:34	07:54	13:14
NGC1332	Gal	Eri	03h 26m 17s	-21°20'03"	10.3	02:56	07:58	13:00
NGC1344	Gal	For	03h 28m 19s	-31°04'05"	10.3	03:32	08:00	12:27
NGC1333	Neb	Per	03h 29m 20s	+31°24'56"		00:20	08:01	15:42
NGC1365	Gal	For	03h 33m 36s	-36°08'25"	9.5	03:59	08:05	12:11

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC1371	Gal	For	03h 35m 01s	-24°55'59"	11.0	03:17	08:06	12:56
NGC1399	Gal	For	03h 38m 29s	-35°27'01"	9.9	04:01	08:10	12:19
NGC1426	Gal	Eri	03h 42m 49s	-22°06'33"	11.4	03:15	08:14	13:14
NGC1448	Gal	Hor	03h 44m 32s	-44°38'41"	11.0	04:58	08:16	11:34
NGC1432	Neb	Tau	03h 45m 50s	+24°22'06"		01:03	08:17	15:32

A.V.A.C. Information

Membership in the Antelope Valley Astronomy Club is open to any individual or family.

The Club has three categories of membership.

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- Individual membership at \$25.00 per year.
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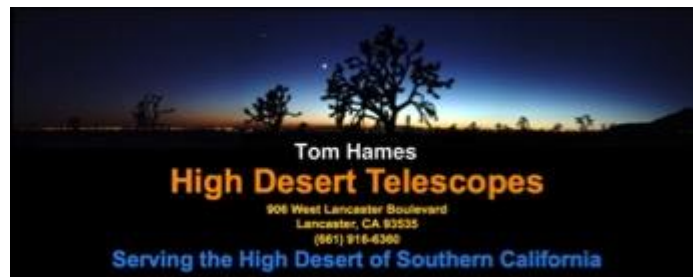


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