



Desert Sky Observer

Volume 39

Antelope Valley Astronomy Club Newsletter

December 2019

Up-Coming Events

December 7: Christmas Party

December 14: [Prime Desert Moon Walk](#)

* 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*

Secretary

Rose Moore

On Saturday Dec 7th is our annual Christmas Party. It is being held at Gino's Restaurant in the Lancaster Marketplace, starting at 6pm. Please look over the previously sent emails regarding the event. If you have any questions, please contact one of the Board members.

On Saturday Dec. 14th is our last Prime Desert Moon Walk for 2019. Start time is 5:30pm and set up time is approximately 1 hr prior. We'll need members with telescopes. Weather permitting. Moon rise is 7:18pm, and sunset is 4:42pm. Venus and Saturn will be down just before 7pm.

Our first meeting of 2020 will be on Friday January 10th at 7pm. Further info to follow.

We have a Prime Desert Moon Walk for Saturday January 11th at 5:30pm. Weather permitting.

Thank you to all that came out for Tom Hames' astronomy painting class in November! We all had a great time and were able to take home our fabulous paintings!! Thank you Tom!!

Some members have already asked about a trip to Mt. Wilson for 2020. I have already emailed Shelly, our contact person. Like last year, they will not open the calendar until March 1st. So we won't know what days are going to be open until that time. They will have many dates already grayed out for their special events. So members, keep that in mind, and start looking at some dates that are new moon, or with a late rising moon!

Come on out and support your club this year, even just one or two events can make a difference! Matt and Darrell need your help as they both work full time and long hours. This club can not be successful if members don't come out and show some support!!

Merry Christmas and Happy New Year to all! Happy Hanukkah (Dec. 22-30th) and Happy Kwanzaa (Dec. 26-Jan1). Have a happy and healthy holiday season no matter how you celebrate!

Space Place

The Orion Nebula: Window Into a Stellar Nursery

By David Prosper

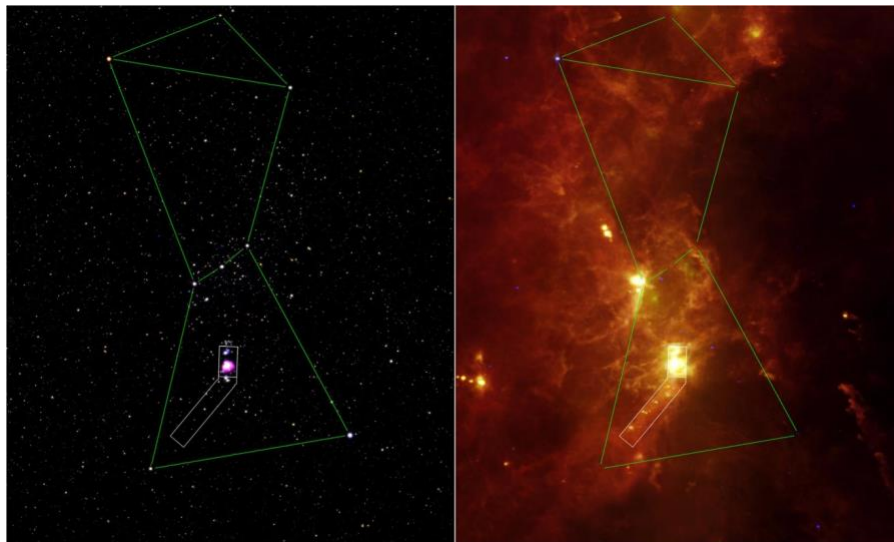
Winter begins in December for observers in the Northern Hemisphere, bringing cold nights and the return of one of the most famous constellations to our early evening skies: Orion the Hunter!

Orion is a striking pattern of stars and is one of the few constellations whose pattern is repeated almost unchanged in the star stories of cultures around the world. Below the three bright stars of Orion's Belt lies his sword, where you can find the famous Orion Nebula, also known as M42. The nebula is visible to our unaided eyes in even moderately light-polluted skies as a fuzzy "star" in the middle of Orion's Sword. M42 is about 20 light years across, which helps with its visibility since it's roughly 1,344 light years away! Baby stars, including the famous "Trapezium" cluster, are found inside the nebula's whirling gas clouds. These gas clouds also hide "protostars" from view: objects in the process of becoming stars, but that have not yet achieved fusion at their core.

The Orion Nebula is a small window into a vastly larger area of star formation centered around the constellation of Orion itself. NASA's Great Observatories, space telescopes like Hubble, Spitzer, Compton, and Chandra, studied this area in wavelengths we can't see with our earthbound eyes, revealing the entire constellation alight with star birth, not just the comparatively tiny area of the nebula. Why then can we only see the nebula? M42 contains hot young stars whose stellar winds blew away their cocoons of gas after their "birth," the moment when they begin to fuse hydrogen into helium. Those gas clouds, which block visible light, were cleared away just enough to give us a peek inside at these young stars. The rest of the complex remains hidden to human eyes, but not to advanced space-based telescopes.

We put telescopes in orbit to get above the interference of our atmosphere, which absorbs many wavelengths of light. Infrared space telescopes, such as Spitzer and the upcoming James Webb Space Telescope, detect longer wavelengths of light that allow them to see through the dust clouds in Orion, revealing hidden stars and cloud structures. It's similar to the infrared goggles firefighters wear to see through smoke from burning buildings and wildfires.

Learn more about how astronomers combine observations made at different wavelengths with the Night Sky Network activity, "The Universe in a Different Light," downloadable from bit.ly/different-light-nsn. You can find more stunning science and images from NASA's Great Observatories at nasa.gov.



This image from NASA's Spitzer missions shows Orion in a different light – quite literally! Note the small outline of the Orion Nebula region in the visible light image on the left, versus the massive amount of activity shown in the infrared image of the same region on the right. Image Credit: NASA/JPL-Caltech/IRAS /H. McCallon. From bit.ly/SpitzerOrion

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.org to find local clubs, events, and more!

News Headlines

SpaceX Starlink Satellites Are Causing a Headache for Astronomers

Astronomers at a Chilean observatory were rudely interrupted earlier this week when a SpaceX satellite train consisting of 60 Starlink satellites drifted overhead, in what scientists are apparently going to have to accept as the new normal. Launched into orbit on November 11, the Starlink smallsat train took five minutes to pass over the Cerro Tololo Inter-American Observatory in Chile...

<https://bit.ly/2D8FFT7>

New Horizons Kuiper Belt Object Officially Named 'Arrokoth'

In a fitting tribute to the farthest flyby ever conducted by spacecraft, the Kuiper Belt object 2014 MU69 has been officially named Arrokoth, a Native American term meaning "sky" in the Powhatan/Algonquian language. Arrokoth is one of the thousands of known small icy worlds in the Kuiper Belt, It was discovered in 2014 by a New Horizons team ...using the powerful Hubble Space Telescope.

<http://pluto.jhuapl.edu/News-Center/News-Article.php?page=20191112>

NASA's Mars 2020 Rover Heads Into the Test Chamber

In this time-lapse video, taken on Oct. 9, 2019, at NASA's Jet Propulsion Laboratory in Pasadena, California, bunny-suited engineers move the Mars 2020 rover from a high bay in the Spacecraft Simulator Building into the facility's large vacuum chamber for testing in Mars-like environmental conditions. After chamber testing, the 2020 rover was moved back to JPL's Spacecraft Assembly Facility where it is undergoing radio-emissions testing. Mars 2020 will launch from Cape Canaveral Air Force Station in Florida in July 2020. It will land at Jezero Crater on Feb. 18, 2021.

<https://go.nasa.gov/2qsKzb7>

The First Global Geologic Map of Titan Completed

The first map showing the global geology of Saturn's largest moon, Titan, has been completed and fully reveals a dynamic world of dunes, lakes, plains, craters and other terrains. Titan is the only planetary body in our solar system other than Earth known to have stable liquid on its surface. But instead of water raining down from clouds and filling lakes and seas as on Earth, on Titan what rains down is methane and ethane - hydrocarbons that we think of as gases but that behave as liquids in Titan's frigid climate.

<https://go.nasa.gov/37yl2ho>

December Sky Data

First Qtr Dec 3 Full Dec 11 Last Qtr Dec 18 New Dec 25



Planet Summary

Mercury can be seen in the pre-dawn sky low in the southeast at the start of December. On the 1st it will have an elevation of some 9 degrees before being lost in the Sun's glare. It will then fall back towards the Sun and be lost from view by the middle of the month.

Venus may just be glimpsed in the south-west at the start of the month, but will be difficult to see due to the fact that the ecliptic is at a shallow angle to the horizon and so Venus will have a very low elevation. As the month progresses, it will rise higher in the sky and on the 31st will have reached an elevation of 14 degrees as darkness falls.

Mars can be seen towards the southeast in the pre-dawn sky at the start of its new apparition. It rises some two and a half hours before the Sun at the start of the month and will have an elevation of ~15 degrees before it is lost in the Sun's glare. It then has a magnitude of +1.9 and a 3.9 arc second, salmon-pink, disk. By month's end it will be seen further round towards the south before dawn and its magnitude will have increased slightly to +1.8.

Jupiter can be seen very low in the southwest as darkness falls at the start of December but, soon after, will be lost in the Sun's glare. Jupiter lies in the southeastern part of Ophiuchus and is heading towards the southernmost part of the ecliptic so, as it appears in the twilight, will only have an elevation of ~6 degrees.

Saturn will be seen west of south as darkness falls at the start of the month. Its disk is ~16 arc seconds across and its rings - which are nicely tilted from the line of sight - spanning some 36 arc seconds across. Sadly, it is at the lowest point of the ecliptic and will only have an elevation of ~12 degrees after sunset.

The famous Geminid **meteor shower** will sling bright shooting stars this winter, though a just-past-full moon will make all but the brightest hard to see. The shower will peak on Dec. 13-14, according to NASA meteor expert Bill Cooke. Even after the peak, bright meteors may be visible for the next few days.

Sun and Moon Rise and Set

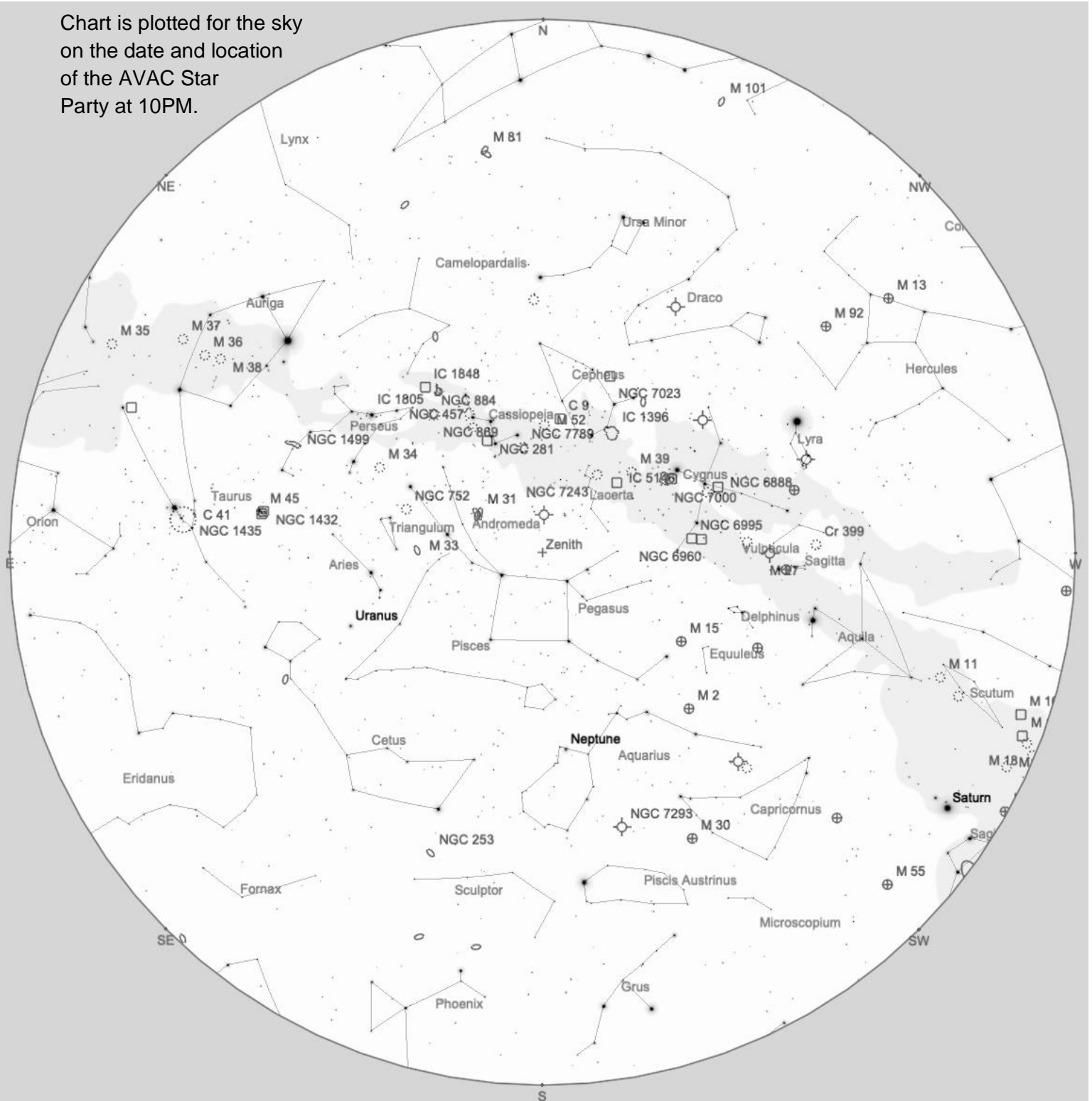
Date	Moonrise	Moonset	Sunrise	Sunset
12/1/2019	11:10	21:38	06:40	16:41
12/5/2019	13:20	00:25	06:44	16:41
12/10/2019	15:55	05:08	06:48	16:41
12/15/2019	20:31	10:01	06:52	16:43
12/20/2019	00:57	13:12	06:54	16:44
12/25/2019	06:25	16:37	06:57	16:47
12/31/2019	10:50	22:16	06:59	16:51

Planet Data

	Dec 1			
	Rise	Transit	Set	Mag
Mercury	05:04	10:24	15:44	-0.4
Venus	08:53	13:44	18:34	-3.4
Mars	04:12	09:37	15:03	1.9
Jupiter	08:17	13:12	18:08	-1.4
Saturn	09:33	14:32	19:31	1.6
	Dec 15			
	Rise	Transit	Set	Mag
Mercury	05:46	10:48	15:50	-0.5
Venus	09:08	14:04	19:00	-3.4
Mars	04:02	09:19	14:36	1.8
Jupiter	07:35	12:31	17:26	-1.4
Saturn	08:43	13:43	18:43	1.6
	Dec 31			
	Rise	Transit	Set	Mag
Mercury	06:40	11:31	16:22	-0.6
Venus	09:12	14:23	19:34	-3.4
Mars	03:51	08:59	14:07	1.8
Jupiter	06:48	11:44	16:40	-1.4
Saturn	07:47	12:48	17:48	1.6

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

Chart is plotted for the sky on the date and location of the AVAC Star Party at 10PM.



To use the chart, go outside within an hour or so of the time listed and hold it up to the sky. Turn the chart so the direction you are looking is at the bottom of the chart. If you are looking to the south then have 'South horizon' at the lower edge.

Suggested Observing List

The list below contains objects that will be visible on the night of the AVAC Star Party, or the weekend closest to the new moon if there is on star party scheduled.. The list is sorted by the transit time of the object.

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC7662	P Neb	And	23h 25m 54s	+42°32'06"	9.0	11:53	20:31	05:09
NGC7686	Open	And	23h 30m 07s	+49°08'00"	5.6	11:03	20:35	06:07
NGC7762	Open	Cep	23h 50m 01s	+68°02'18"	10.0	Circum	20:55	Circum
NGC7822	Neb	Cep	00h 03m 36s	+67°09'00"		Circum	21:09	Circum
NGC40	P Neb	Cep	00h 13m 01s	+72°31'19"	11.0	Circum	21:18	Circum
NGC55	Gal	Scl	00h 15m 08s	-39°13'12"	8.0	17:30	21:20	01:11
NGC129	Open	Cas	00h 30m 00s	+60°13'06"	6.5	Circum	21:35	Circum
NGC209	Gal	Cet	00h 39m 04s	-18°36'31"	14.0	16:34	21:44	02:55
NGC189	Open	Cas	00h 39m 35s	+61°05'06"	8.8	Circum	21:45	Circum
M31	Gal	And	00h 42m 44s	+41°16'08"	4.3	13:18	21:48	06:18
NGC232	Gal	Cet	00h 42m 46s	-23°33'41"	14.0	16:53	21:48	02:42
NGC246	P Neb	Cet	00h 47m 03s	-11°52'19"	8.0	16:22	21:52	03:22
NGC253	Gal	Scl	00h 47m 33s	-25°17'18"	7.1	17:04	21:53	02:41
NGC288	Glob	Scl	00h 52m 45s	-26°35'01"	8.1	17:14	21:58	02:42
NGC426	Gal	Cet	01h 12m 49s	-00°17'26"	14.0	16:16	22:18	04:20
NGC457	Open	Cas	01h 19m 35s	+58°17'12"	6.4	Circum	22:25	Circum
M33	Gal	Tri	01h 33m 51s	+30°39'37"	6.2	15:01	22:39	06:17
NGC613	Gal	Scl	01h 34m 18s	-29°25'08"	10.0	18:06	22:39	03:13
M76	P Neb	Per	01h 42m 18s	+51°34'15"	12.0	12:45	22:47	08:50
NGC637	Open	Cas	01h 43m 04s	+64°02'24"	8.2	Circum	22:48	Circum
NGC684	Gal	Tri	01h 50m 14s	+27°38'46"	13.0	15:29	22:55	06:22
NGC752	Open	And	01h 57m 41s	+37°47'06"	5.7	14:52	23:03	07:13
NGC744	Open	Per	01h 58m 33s	+55°28'24"	7.9	Circum	23:04	Circum
NGC869	Open	Per	02h 19m 00s	+57°07'42"	4.0	Circum	23:24	Circum
NGC884	Open	Per	02h 22m 18s	+57°08'12"	4.0	Circum	23:27	Circum
NGC896	Neb	Cas	02h 25m 28s	+62°01'09"		Circum	23:31	Circum
NGC956	Open	And	02h 32m 30s	+44°35'37"	9.0	14:45	23:38	08:30
NGC1003	Gal	Per	02h 39m 17s	+40°52'20"	11.5	15:17	23:44	08:12
M34	Open	Per	02h 42m 05s	+42°45'42"	6.0	15:08	23:47	08:27
NGC1027	Open	Cas	02h 42m 40s	+61°35'42"	6.7	Circum	23:48	Circum
NGC1079	Gal	For	02h 43m 45s	-29°00'12"	11.4	19:13	23:49	04:24
NGC1261	Glob	Hor	03h 12m 16s	-55°12'57"	8.4	23:06	00:17	01:29
NGC1333	Neb	Per	03h 29m 20s	+31°24'56"		16:53	00:34	08:15
NGC1401	Gal	Eri	03h 39m 22s	-22°43'28"	13.0	19:47	00:44	05:42
NGC1417	Gal	Eri	03h 41m 57s	-04°42'21"	12.0	18:57	00:47	06:37
NGC1432	Neb	Tau	03h 45m 50s	+24°22'06"		17:36	00:51	08:05
NGC1435	Neb	Tau	03h 46m 10s	+23°45'54"		17:39	00:51	08:04
M45	Open	Tau	03h 47m 30s	+24°07'00"	1.6	17:39	00:53	08:06

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC1444	Open	Per	03h 49m 25s	+52°39'30"	6.6	14:35	00:55	11:14
NGC1491	Neb	Per	04h 03m 14s	+51°18'57"		15:10	01:08	11:07
NGC1499	Neb	Per	04h 03m 14s	+36°22'00"		17:05	01:08	09:12
NGC1501	P Neb	Cam	04h 06m 59s	+60°55'14"	13.0	Circum	01:12	Circum
NGC1502	Open	Cam	04h 07m 50s	+62°19'54"	5.7	Circum	01:13	Circum
NGC1514	P Neb	Tau	04h 09m 17s	+30°46'33"	10.0	17:36	01:14	08:53
NGC1513	Open	Per	04h 09m 57s	+49°30'54"	8.4	15:39	01:15	10:51
NGC1535	P Neb	Eri	04h 14m 16s	-12°44'22"	10.0	19:52	01:19	06:47
NGC1579	Neb	Per	04h 30m 14s	+35°16'47"		17:37	01:35	09:33
NGC1664	Open	Aur	04h 51m 06s	+43°40'30"	7.6	17:10	01:56	10:42
NGC1700	Gal	Eri	04h 56m 56s	-04°51'54"	11.0	20:12	02:02	07:52
NGC1788	Neb	Ori	05h 06m 53s	-03°20'27"		20:18	02:12	08:06
NGC1807	Open	Tau	05h 10m 43s	+16°31'18"	7.0	19:27	02:16	09:05
NGC1851	Glob	Col	05h 14m 07s	-40°02'46"	7.3	22:33	02:19	06:05
NGC1857	Open	Aur	05h 20m 05s	+39°19'30"	7.0	18:06	02:25	10:44
M79	Glob	Lep	05h 24m 11s	-24°31'29"	8.5	21:38	02:29	07:21
M38	Open	Aur	05h 28m 40s	+35°50'54"	7.0	18:33	02:34	10:35
NGC1952	Neb	Tau	05h 34m 32s	+22°00'52"	8.4	19:33	02:40	09:46
NGC1973	Neb	Ori	05h 35m 05s	-04°43'55"		20:50	02:40	08:30
NGC1981	Open	Ori	05h 35m 09s	-04°25'54"	4.6	20:50	02:40	08:31
NGC1977	Neb	Ori	05h 35m 16s	-04°49'15"		20:51	02:40	08:30
M42	D Neb	Ori	05h 35m 16s	-05°23'25"	4.0	20:52	02:40	08:29
NGC1975	Neb	Ori	05h 35m 18s	-04°41'05"		20:50	02:40	08:30
NGC1980	Neb	Ori	05h 35m 25s	-05°54'54"		20:54	02:41	08:27
M43	D Neb	Ori	05h 35m 31s	-05°16'03"	9.0	20:52	02:41	08:29
NGC1990	Neb	Ori	05h 36m 13s	-01°12'07"		20:42	02:41	08:41
NGC1999	Neb	Ori	05h 36m 25s	-06°42'57"		20:57	02:42	08:26
NGC2023	Neb	Ori	05h 41m 38s	-02°15'33"		20:50	02:47	08:43
NGC2024	Neb	Ori	05h 41m 42s	-01°51'24"		20:49	02:47	08:45
NGC2022	P Neb	Ori	05h 42m 06s	+09°05'13"	12.0	20:20	02:47	09:15
NGC2064	Neb	Ori	05h 46m 18s	+00°00'21"		20:49	02:51	08:54
NGC2067	Neb	Ori	05h 46m 31s	+00°07'54"		20:49	02:52	08:55
M78	D Neb	Ori	05h 46m 45s	+00°04'48"	8.0	20:49	02:52	08:55
NGC2071	Neb	Ori	05h 47m 07s	+00°17'39"		20:49	02:52	08:56
NGC2126	Open	Aur	06h 02m 32s	+49°52'00"	10.0	17:27	03:08	12:48
NGC2141	Open	Ori	06h 02m 55s	+10°26'48"	9.4	20:37	03:08	09:39
NGC2149	Neb	Mon	06h 03m 31s	-09°43'50"		21:32	03:09	08:45
NGC2170	Neb	Mon	06h 07m 32s	-06°23'57"		21:27	03:13	08:58
NGC2169	Open	Ori	06h 08m 24s	+13°57'54"	5.9	20:32	03:14	09:55
M35	Open	Gem	06h 09m 00s	+24°21'00"	5.5	20:00	03:14	10:29
NGC2174	Neb	Ori	06h 09m 24s	+20°39'34"		20:12	03:14	10:17
NGC2182	Neb	Mon	06h 09m 31s	-06°19'35"		21:29	03:15	09:00
NGC2183	Neb	Mon	06h 10m 47s	-06°12'43"		21:30	03:16	09:02
NGC2185	Neb	Mon	06h 11m 00s	-06°13'36"		21:30	03:16	09:02
NGC2215	Open	Mon	06h 20m 49s	-07°17'00"	8.4	21:43	03:26	09:09

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC2232	Open	Mon	06h 28m 01s	-04°50'48"	3.9	21:44	03:33	09:23
NGC2236	Open	Mon	06h 29m 39s	+06°49'48"	8.5	21:13	03:35	09:56
NGC2244	Open	Mon	06h 31m 56s	+04°56'35"	4.8	21:21	03:37	09:53
NGC2245	Neb	Mon	06h 32m 41s	+10°09'24"		21:07	03:38	10:08
NGC2247	Neb	Mon	06h 33m 05s	+10°19'17"		21:07	03:38	10:09
NGC2250	Open	Mon	06h 33m 49s	-05°05'06"	9.0	21:50	03:39	09:28
NGC2242	P Neb	Aur	06h 34m 07s	+44°46'38"	14.0	18:46	03:39	12:33
NGC2251	Open	Mon	06h 34m 38s	+08°22'00"	7.3	21:14	03:40	10:05
NGC2261	Neb	Mon	06h 39m 10s	+08°44'40"		21:18	03:44	10:11
NGC2264	Open	Mon	06h 40m 58s	+09°53'42"	3.9	21:16	03:46	10:16
M41	Open	CMA	06h 46m 01s	-20°45'24"	5.0	22:47	03:51	08:55
NGC2282	Neb	Mon	06h 46m 51s	+01°18'56"		21:46	03:52	09:58
NGC2256	Gal	Cam	06h 47m 14s	+74°14'11"	14.0	Circum	03:52	Circum
NGC2286	Open	Mon	06h 47m 40s	-03°08'54"	7.5	21:59	03:53	09:47
NGC2281	Open	Aur	06h 48m 17s	+41°04'42"	5.4	19:24	03:53	12:22
NGC2298	Glob	Pup	06h 48m 59s	-36°00'15"	9.4	23:48	03:54	08:00
NGC2316	Neb	Mon	06h 59m 41s	-07°46'39"		22:23	04:05	09:46
M50	Open	Mon	07h 02m 42s	-08°23'00"	7.0	22:28	04:08	09:48
NGC2331	Open	Gem	07h 06m 59s	+27°15'42"	9.0	20:47	04:12	11:37
NGC2343	Open	Mon	07h 08m 06s	-10°37'00"	6.7	22:40	04:13	09:47
NGC2353	Open	Mon	07h 14m 30s	-10°16'00"	7.1	22:45	04:20	09:54
NGC2359	Neb	CMA	07h 18m 30s	-13°13'36"		22:57	04:24	09:50
NGC2362	Open	CMA	07h 18m 41s	-24°57'18"	4.1	23:34	04:24	09:14
NGC2367	Open	CMA	07h 20m 06s	-21°52'54"	7.9	23:25	04:25	09:25
NGC2383	Open	CMA	07h 24m 40s	-20°56'54"	8.4	23:27	04:30	09:33
NGC2384	Open	CMA	07h 25m 10s	-21°01'18"	7.4	23:27	04:30	09:33
NGC2371	P Neb	Gem	07h 25m 34s	+29°29'17"	13.0	20:57	04:31	12:04
NGC2392	P Neb	Gem	07h 29m 11s	+20°54'42"	10.0	21:31	04:34	11:37
M47	Open	Pup	07h 36m 35s	-14°29'00"	4.5	23:19	04:42	10:04
NGC2419	Glob	Lyn	07h 38m 08s	+38°52'54"	10.4	20:27	04:43	13:00
NGC2420	Open	Gem	07h 38m 23s	+21°34'24"	8.3	21:38	04:43	11:49
NGC2438	P Neb	Pup	07h 41m 50s	-14°44'07"	10.0	23:25	04:47	10:09
NGC2440	P Neb	Pup	07h 41m 55s	-18°12'31"	11.0	23:35	04:47	09:59
NGC2451	Open	Pup	07h 45m 15s	-37°58'00"	2.8	00:54	04:50	08:47
NGC2452	P Neb	Pup	07h 47m 26s	-27°20'07"	13.0	00:11	04:53	09:34
NGC2453	Open	Pup	07h 47m 35s	-27°11'42"	8.3	00:11	04:53	09:35
NGC2455	Open	Pup	07h 49m 01s	-21°18'06"	10.0	23:52	04:54	09:56
NGC2477	Open	Pup	07h 52m 10s	-38°31'48"	5.8	01:03	04:57	08:51
NGC2467	Open	Pup	07h 52m 26s	-26°26'12"	7.0	00:13	04:58	09:42
NGC2479	Open	Pup	07h 55m 06s	-17°42'36"	10.0	23:47	05:00	10:13
NGC2482	Open	Pup	07h 55m 12s	-24°15'30"	7.3	00:08	05:00	09:53
NGC2483	Open	Pup	07h 55m 39s	-27°53'42"	7.6	00:21	05:01	09:40
NGC2489	Open	Pup	07h 56m 15s	-30°03'48"	7.9	00:30	05:01	09:33
NGC2509	Open	Pup	08h 00m 48s	-19°03'06"	9.0	23:57	05:06	10:15
NGC2527	Open	Pup	08h 04m 58s	-28°08'48"	6.5	00:32	05:10	09:49

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC2547	Open	Vel	08h 10m 09s	-49°12'54"	4.7	02:35	05:15	07:56
M48	Open	Hya	08h 13m 43s	-05°45'00"	5.5	23:32	05:19	11:06
NGC2571	Open	Pup	08h 18m 56s	-29°45'00"	7.0	00:52	05:24	09:57
NGC2587	Open	Pup	08h 23m 25s	-29°30'30"	9.0	00:55	05:29	10:02
NGC2610	P Neb	Hya	08h 33m 23s	-16°08'57"	14.0	00:21	05:38	10:56
NGC2626	Neb	Vel	08h 35m 31s	-40°40'18"		01:58	05:41	09:23
NGC2627	Open	Pyx	08h 37m 15s	-29°57'18"	8.0	01:11	05:42	10:14
M44	Open	Cnc	08h 40m 24s	+19°40'00"	4.0	22:47	05:46	12:44
NGC2659	Open	Vel	08h 42m 37s	-44°59'00"	8.6	02:32	05:48	09:03
NGC2792	P Neb	Vel	09h 12m 27s	-42°25'41"	14.0	02:45	06:18	09:50
NGC2804	Gal	Cnc	09h 16m 50s	+20°11'54"	14.0	23:21	06:22	13:23
NGC2910	Open	Vel	09h 30m 30s	-52°55'06"	7.2	04:40	06:36	08:32
NGC2955	Gal	LMi	09h 41m 17s	+35°52'59"	12.7	22:45	06:46	14:47
NGC3061	Gal	Dra	09h 56m 12s	+75°51'57"	14.0	Circum	07:01	Circum
NGC3132	P Neb	Vel	10h 07m 02s	-40°26'11"	8.0	03:28	07:12	10:56
NGC3169	Gal	Sex	10h 14m 15s	+03°28'02"	10.5	01:07	07:19	13:31
NGC3168	Gal	UMa	10h 16m 23s	+60°14'05"	14.0	Circum	07:21	Circum
NGC3147	Gal	Dra	10h 16m 53s	+73°24'02"	10.7	Circum	07:22	Circum
NGC3201	Glob	Vel	10h 17m 37s	-46°24'45"	6.8	04:18	07:23	10:27
NGC3228	Open	Vel	10h 21m 22s	-51°43'42"	6.0	05:14	07:26	09:39
NGC3242	P Neb	Hya	10h 24m 46s	-18°38'34"	9.0	02:20	07:30	12:40
NGC3338	Gal	Leo	10h 42m 08s	+13°44'49"	10.8	01:06	07:47	14:28
NGC3425	Gal	Leo	10h 51m 25s	+08°34'01"	14.0	01:30	07:57	14:23
NGC3486	Gal	LMi	11h 00m 24s	+28°58'30"	10.3	00:34	08:05	15:37
NGC3492	Gal	Leo	11h 00m 57s	+10°30'22"	14.0	01:34	08:06	14:38
NGC3513	Gal	Crt	11h 03m 46s	-23°14'40"	12.0	03:13	08:09	13:04
NGC3521	Gal	Leo	11h 05m 49s	-00°02'10"	8.9	02:08	08:11	14:14
M97	P Neb	UMa	11h 14m 48s	+55°01'08"	12.0	20:57	08:20	19:42
NGC3607	Gal	Leo	11h 16m 55s	+18°03'06"	10.0	01:28	08:22	15:16
NGC3609	Gal	Leo	11h 17m 50s	+26°37'30"	14.0	01:00	08:23	15:45
NGC3614	Gal	UMa	11h 18m 21s	+45°44'51"	12.0	23:22	08:23	17:25
NGC3631	Gal	UMa	11h 21m 03s	+53°10'11"	10.4	21:57	08:26	18:55
NGC3640	Gal	Leo	11h 21m 07s	+03°14'06"	10.3	02:15	08:26	14:38
NGC3710	Gal	Leo	11h 31m 07s	+22°46'04"	14.0	01:27	08:36	15:45
NGC3763	Gal	Crt	11h 36m 30s	-09°50'49"	13.0	03:06	08:42	14:17
NGC3872	Gal	Leo	11h 45m 49s	+13°46'00"	11.7	02:10	08:51	15:32
NGC3897	Gal	UMa	11h 48m 59s	+35°00'57"	14.0	00:57	08:54	16:51
NGC3960	Open	Cen	11h 50m 33s	-55°40'24"	8.3	07:58	08:56	09:53
NGC3913	Gal	UMa	11h 50m 39s	+55°21'13"	13.0	21:06	08:56	20:45
NGC3926	Gal	Leo	11h 51m 27s	+22°01'39"	14.0	01:50	08:57	16:03
NGC3938	Gal	UMa	11h 52m 49s	+44°07'14"	10.4	00:09	08:58	17:47
NGC4024	Gal	Crv	11h 58m 31s	-18°20'48"	13.0	03:52	09:04	14:15
NGC4111	Gal	CVn	12h 07m 03s	+43°03'57"	10.8	00:31	09:12	17:54
NGC4116	Gal	Vir	12h 07m 37s	+02°41'28"	11.9	03:03	09:13	15:23
NGC4123	Gal	Vir	12h 08m 11s	+02°52'41"	11.2	03:03	09:13	15:24

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC4145	Gal	CVn	12h 10m 02s	+39°52'57"	11.0	00:53	09:15	17:37
NGC4147	Glob	Com	12h 10m 06s	+18°32'30"	10.3	02:20	09:15	16:11
NGC4214	Gal	CVn	12h 15m 39s	+36°19'38"	9.7	01:18	09:21	17:24
NGC4216	Gal	Vir	12h 15m 54s	+13°08'59"	10.0	02:42	09:21	16:00
NGC4224	Gal	Vir	12h 16m 34s	+07°27'42"	11.8	02:59	09:22	15:45
NGC4233	Gal	Vir	12h 17m 08s	+07°37'26"	11.9	02:59	09:22	15:46
NGC4230	Open	Cen	12h 17m 09s	-55°17'12"	9.0	08:13	09:22	10:32
NGC4235	Gal	Vir	12h 17m 10s	+07°11'28"	11.6	03:00	09:22	15:45
NGC4242	Gal	CVn	12h 17m 30s	+45°37'08"	11.0	00:22	09:23	18:23
NGC4274	Gal	Com	12h 19m 51s	+29°36'51"	10.4	01:51	09:25	16:59
NGC4277	Gal	Vir	12h 20m 04s	+05°20'29"	13.5	03:08	09:25	15:42
NGC4293	Gal	Com	12h 21m 13s	+18°22'58"	11.0	02:31	09:26	16:21
NGC4298	Gal	Com	12h 21m 33s	+14°36'23"	11.4	02:43	09:27	16:10
NGC4302	Gal	Com	12h 21m 42s	+14°35'55"	11.6	02:43	09:27	16:10
NGC4312	Gal	Com	12h 22m 31s	+15°32'17"	11.8	02:41	09:28	16:14
NGC4339	Gal	Vir	12h 23m 35s	+06°04'54"	11.4	03:09	09:29	15:48
NGC4340	Gal	Com	12h 23m 35s	+16°43'22"	11.0	02:39	09:29	16:18
NGC4350	Gal	Com	12h 23m 58s	+16°41'36"	11.1	02:39	09:29	16:19
NGC4361	P Neb	Crv	12h 24m 31s	-18°47'06"	10.0	04:20	09:30	14:39
NGC4371	Gal	Vir	12h 24m 55s	+11°42'14"	10.8	02:55	09:30	16:05
NGC4379	Gal	Com	12h 25m 15s	+15°36'26"	11.7	02:44	09:30	16:17
NGC4373	Gal	Cen	12h 25m 18s	-39°45'38"	11.1	05:43	09:30	13:18
NGC4388	Gal	Vir	12h 25m 47s	+12°39'42"	11.1	02:53	09:31	16:09
NGC4421	Gal	Com	12h 27m 03s	+15°27'41"	11.6	02:46	09:32	16:18
NGC4435	Gal	Vir	12h 27m 40s	+13°04'45"	10.9	02:54	09:33	16:12
NGC4448	Gal	Com	12h 28m 15s	+28°37'14"	11.1	02:03	09:33	17:03
M49	Gal	Vir	12h 29m 47s	+08°00'01"	9.3	03:10	09:35	15:59
NGC4477	Gal	Com	12h 30m 02s	+13°38'11"	10.4	02:55	09:35	16:16
NGC4478	Gal	Vir	12h 30m 17s	+12°19'42"	11.2	02:59	09:35	16:12
M87	Gal	Vir	12h 30m 49s	+12°23'27"	9.6	02:59	09:36	16:13
NGC4489	Gal	Com	12h 30m 52s	+16°45'30"	13.0	02:46	09:36	16:26
NGC4494	Gal	Com	12h 31m 24s	+25°46'29"	9.9	02:17	09:37	16:56
NGC4496	Gal	Vir	12h 31m 39s	+03°56'23"	12.0	03:23	09:37	15:50
M88	Gal	Com	12h 31m 59s	+14°25'12"	10.2	02:54	09:37	16:20
NGC4503	Gal	Vir	12h 32m 06s	+11°10'35"	11.1	03:04	09:37	16:11
NGC4517	Gal	Vir	12h 32m 46s	+00°06'49"	10.5	03:35	09:38	15:41
NGC4526	Gal	Vir	12h 34m 03s	+07°41'58"	9.6	03:15	09:39	16:03
NGC4527	Gal	Vir	12h 34m 08s	+02°39'11"	10.4	03:29	09:39	15:49

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.

- 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...

- Desert Sky Observer—monthly newsletter.
- The Reflector – the publication of the Astronomical League.
- The A.V.A.C. Membership Manual.
- To borrow club equipment, books, videos and other items.

AVAC

**P.O. BOX 8545,
LANCASTER, CA 93539-8545**

Visit the Antelope Valley Astronomy Club website at www.avastronomyclub.org/

The Antelope Valley Astronomy Club, Inc. is a 501(c)(3) Non-Profit Corporation.

The A.V.A.C. is a Sustaining Member of The Astronomical League and the International Dark-Sky Association.

Board Members

President:

Darrell Bennett
president@avastronomyclub.org

Vice-President:

Matt Leone (661) 713-1894
vice-president@avastronomyclub.org

Secretary:

Frank & Rose Moore (661) 972-1953
secretary@avastronomyclub.org

Treasurer:

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

Director of Community Development:

Robert Lynch, Jr.
community@avastronomyclub.org

Appointed Positions

Newsletter Editor:

Steve Trotta (661) 269-5428
dso@avastronomyclub.org

Equipment & Library:

Vacant
library@avastronomyclub.org

Club Historian:

Tom Koonce (661) 943-8200
history@avastronomyclub.org

Webmaster:

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

Astronomical League Coordinator:

Frank Moore (661) 972-4775
al@avastronomyclub.org

Our Sponsors

Thank you to our sponsors for your generous support!

Cosmos Level Sponsors

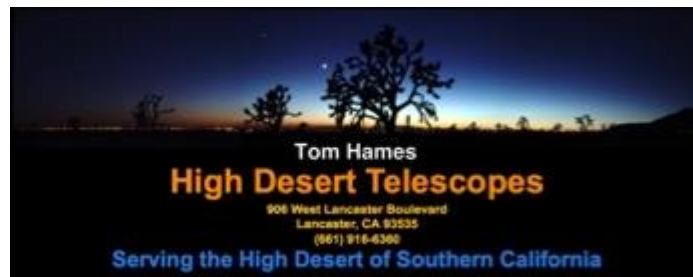


Woodland Hills Camera

5348 Topanga Canyon Blvd., Woodland Hills
888-427-8766.

www.telescopes.net

Universe Level Sponsors



Galaxy Level Sponsors



Al's Vacuum and Sewing

904 West Lancaster Blvd., Lancaster
(661) 948-1521