ANTELOPE VALLEY ASTRONOMY CLUB, INC.

Desert Sky Observer

Volume 39 *Antelope Valley Astronomy Club Newsletter* **February 2019**

Up-Coming Events

February 8: Club Meeting*
February 23: Beginner's Class for New Members
February 23: 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*

President

Darrell Bennett

Well I got the first meeting under my belt, so the following one should be easier for me. Our Treasurer, Rod Girad was last month's speaker and did a great job on types of telescopes, followed by Jeremy's star show.

On January 12th we had a PDW, the weather was bad. Jeremy and I both showed up with about 15 people from the public. It was cloudy and cold but we all still went on a short walk and Jeremy had a lot to talk about. Our next PDW is on February 23rd I hope the weather will be better.

On January 20th we had a Lunar Eclipse star party at the Sage Planetarium. We had about 200 people show up for it. Frank Moore came out with his C-11, Rod Girard had his C-91/2 with a CCD camera hook up to his laptop, Jim and Ann brought their DOB and our Vice President Matt Leone showed up with his giant binoculars and I had my Meade Lx90 12 inch. I could not resist playing Pink Floyd's Dark Side of the Moon on my Bluetooth speaker during the eclipse.

I would like to thank Frank and Rose for bringing the coffee and donuts and Rod for bringing the Moon Pies. I do not remember who came with the hot chocolate and marshmallows, but thank you.

On January 25th I went to the Ventura Astronomy Club meeting in Moorpark to see how they ran their meeting and was surprised to see they had 12 board members, we only have 5.

I look forward to seeing everyone at our next meeting on February 8th.

Secretary

Rose Moore

Many thanks to those who attended the Lunar Eclipse event at the SAGE on January 20th. The skies cleared up enough for us to see most of the eclipse. Thank you to those who brought items to eat or drink! I do think that we need to rethink of how to handle snacks at these events, and whether we want to include items for the public. Will be discussing this at our next board meeting.

Coming up at our next club meeting on Feb. 8th, is a presentation by member Tom Hames! Tom will talk to us about his space art, as well as giving us an opportunity to try create our own paintings! We will be heading over to the school's cafeteria with Jeremy after a brief business meeting. Tom will be bringing supplies for this event. The cost to members is free, but if you would like to make a donation, you may do so. **The cost for non-members/public is $5 per person for painting. **IF YOU WILL WANT TO PARTICIPATE IN THE PAINTING PORTION OF THE MEETING, YOU MUST NOTIFY ME BY EMAIL OR LEAVE ME A VOICE MAIL!! THIS IS SO TOM WILL HAVE AN IDEA OF HOW MANY SUPPLIES TO PURCHASE AND BRING.

On Saturday February 23rd there will be a Beginner's Class at the SAGE Planetarium. This is open to new members who would like to be able to sign out books or take out one of the simpler telescopes. Time to be announced. Stay tuned!!

Also on Saturday Feb. 23rd at 6:30pm is a Prime Desert Moon Walk with Jeremy. We'll need members with scopes. Set up time is about 1 hour prior to start time. Weather permitting!

Coming up in March: Lunar Club meeting on Saturday March 9th (more info to follow); a Prime Desert Moon Walk on Saturday March 23rd at 7:30pm; our Messier Marathon will be on Saturday March 30th at Saddleback State Park (more info to follow).

I will be contacting Mt. Wilson on March 1st for possible dates for our clubs to visit. That is when they are opening up the calendar. Again, more info to follow!

We have speakers for our April and May meetings! Both speakers are from UCLA's astronomy department.

Keep Warm! Rose

Member Scope for Sale:

Member Duane Lewis is selling his 9.25 inch Celestron CGEM OTA with the tripod, CGE mount, counterweights, one 1.25" 20 mm Plossl eyepiece, a 1.25" diagonal and a 2" diagonal, telrad mount, and a Denkmeier (unknown model) binocular viewer. The OTA was tuned up by member Don Bryden before he moved. It has not been used since. Price is $1500. Duane is unable to have this set up for viewing because of lack of space. So arrangements will have to be made for viewing the scope and accessories. For more info please contact Duane by email only: gurba1826@gmail.com - or contact Rose by email only: rmorion1@bak.rr.com.

Space Place

Hexagon at Night, Quartet in the Morning

David Prosper

The stars that make up the **Winter Hexagon** asterism are some of the brightest in the night sky and February evenings are a great time to enjoy their sparkly splendor. The Winter Hexagon is so large in size that the six stars that make up its points are also the brightest members of six different constellations, making the Hexagon a great starting point for learning the winter sky. Find the Hexagon by looking southeast after sunset and finding the bright red star that forms the "left shoulder" of the constellation Orion: **Betelgeuse**. You can think of Betelgeuse as the center of a large irregular clock, with the Winter Hexagon stars as the clock's hour numbers. Move diagonally across Orion to spot its "right foot," the bright star **Rigel.** Now move clockwise from Rigel to the brightest star in the night sky: **Sirius** in Canis Major. Continue ticking along clockwise to **Procyon** in Canis Minor and then towards **Pollux,** the brighter of the Gemini twins. Keep moving around the circuit to find **Capella** in Auriga, and finish at orange **Aldebaran**, the "eye" of the V-shaped face of Taurus the Bull.

Two naked-eye planets are visible in the evening sky this month. As red **Mars** moves across Pisces, NASA's InSight Mission is readying its suite of geological instruments designed to study the Martian interior. InSight and the rest of humanity's robotic Martian emissaries will soon be joined by the Mars 2020 rover. The SUV-sized robot is slated to launch next year on a mission to study the possibility of past life on the red planet. A conjunction between Mars and **Uranus** on February 13 will be a treat for telescopic observers. Mars will pass a little over a degree away from Uranus and larger magnifications will allow comparisons between the small red disc of dusty Mars with the smaller and much more distant blue-green disc of ice giant Uranus.

Speedy **Mercury** has a good showing this month and makes its highest appearance in the evening on February 27; spot it above the western horizon at sunset. An unobstructed western view and binoculars will greatly help in catching Mercury against the glow of evening twilight.

The morning planets put on quite a show in February. Look for the bright planets **Venus**, **Jupiter**, and **Saturn** above the eastern horizon all month, at times forming a neat lineup. A crescent **Moon** makes a stunning addition on the mornings of February 1-2, and again on the 28th. Watch over the course of the month as Venus travels from its position above Jupiter to below dimmer Saturn. Venus and Saturn will be in close conjunction on the 18th; see if you can fit both planets into the same telescopic field of view. A telescope reveals the brilliant thin crescent phase of Venus waxing into a wide gibbous phase as the planet passes around the other side of our Sun. The Night Sky Network has a simple activity that helps explain the nature of both Venus and Mercury's phases at bit.ly/venusphases

You can catch up on all of NASA's current and future missions at nasa.gov

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

Rover Team Beaming New Commands to Opportunity on Mars
Engineers at NASA's Jet Propulsion Laboratory in Pasadena, California, have begun transmitting a new set of commands to the Opportunity rover in an attempt to compel the 15-year-old Martian explorer to contact Earth. The new commands, which will be beamed to the rover during the next several weeks, address low-likelihood events that could have occurred aboard Opportunity, preventing it from transmitting.
https://www.jpl.nasa.gov/news/news.php?feature=7318

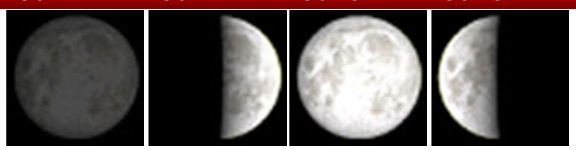
Space Calendar 2019: Launches, Sky Events & More
LAST UPDATED Jan. 29: These dates are subject to change, and will be updated throughout the year as firmer dates arise. Launch dates collected from NASA, ESA, Roscosmos, SpaceFlightNow and others.
https://www.space.com/32286-space-calendar.html

The latest picture of Ultima Thule reveals a remarkably smooth face
The closest-yet image of the ancient Kuiper Belt object, captured as the New Horizons spacecraft flew by January 1, shows a relatively smooth face unmarred by impact craters. That lack of impact scars suggests that the Kuiper Belt, a reservoir of ancient space rocks beyond the orbit of Neptune, has fewer small objects than scientists expected. If true, that could mean that the precursors to planets grew up fast, without leaving many protoplanetary crumbs behind.
https://bit.ly/2TkjIHh

All Systems Go As Parker Solar Probe Begins Second Sun Orbit
On Jan. 19, 2019, just 161 days after its launch from Cape Canaveral Air Force Station in Florida, NASA's Parker Solar Probe completed its first orbit of the Sun, reaching the point in its orbit farthest from our star, called aphelion. The spacecraft has now begun the second of 24 planned orbits, on track for its second perihelion, or closest approach to the Sun, on April 4, 2019.
https://go.nasa.gov/2UqdohI

SpaceX Demo-1 Launch Update
NASA and SpaceX are continuing to work on the activities leading toward the Demo-1, uncrewed flight test to the International Space Station. NASA and SpaceX are now targeting no earlier than February for the launch of Demo-1.
https://go.nasa.gov/2GajRJA

February Sky Data



Planet Summary

Mercury passed through Superior conjunction at the end of January and will not become visible in the evening twilight until around the 12th of the month having a magnitude of -1.0. During March's second half it dims to magnitude 0.1 but, by its end, sets some one and a half hours after the Sun.

Venus begins February with a magnitude of -3.8. with its angular size reducing from 19 to 16 arc seconds during the month as it moves away from the Earth. However, at the same time, the percentage illuminated disk (its phase) increases from 62% to 72% - which is why the brightness only reduces from -3.8 to -3.6 magnitudes.

Mars, though fading from +1.1 to +1.4 magnitudes during the month, remains prominent in the south western sky after sunset. Its angular size falls from 6 arc seconds to less than 5 and a half arc seconds during the month.

Jupiter starts the month rising around 3:15 a.m. and brightens from magnitude -1.5 to -1.6 as the month progresses while its angular size increases slightly from 33.6 to 36.1 arc seconds. By month's end it rises by ~2 am so will be higher in the sky before dawn.

Saturn, shining with a magnitude of +1.6, rises one and a half hours before the Sun at the start of the month some 85 minutes after Venus. Its disk is ~16 arc seconds across and its rings - which are still 24 degrees from the line of sight - spanning 35 arc seconds across.

There are no significant **meteor-showers** in February, and it is generally a quiet time for sporadic meteors too.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
2/1/2019	04:35	14:52	06:51	17:22
2/5/2019	07:27	18:23	06:48	17:25
2/10/2019	10:01	22:59	06:44	17:30
2/15/2019	13:29	03:05	06:39	17:35
2/20/2019	19:14	07:31	06:33	17:39
2/25/2019	n/a	10:37	06:28	17:44
2/28/2019	02:31	12:48	06:24	17:47

Planet Data

Feb 1

	Rise	Transit	Set	Mag
Mercury	07:09	12:20	17:31	-1.1
Venus	03:55	08:58	14:02	-3.8
Mars	10:01	16:27	22:54	1.1
Jupiter	03:17	08:16	13:15	-1.5
Saturn	05:14	10:13	15:13	1.6

Feb 15

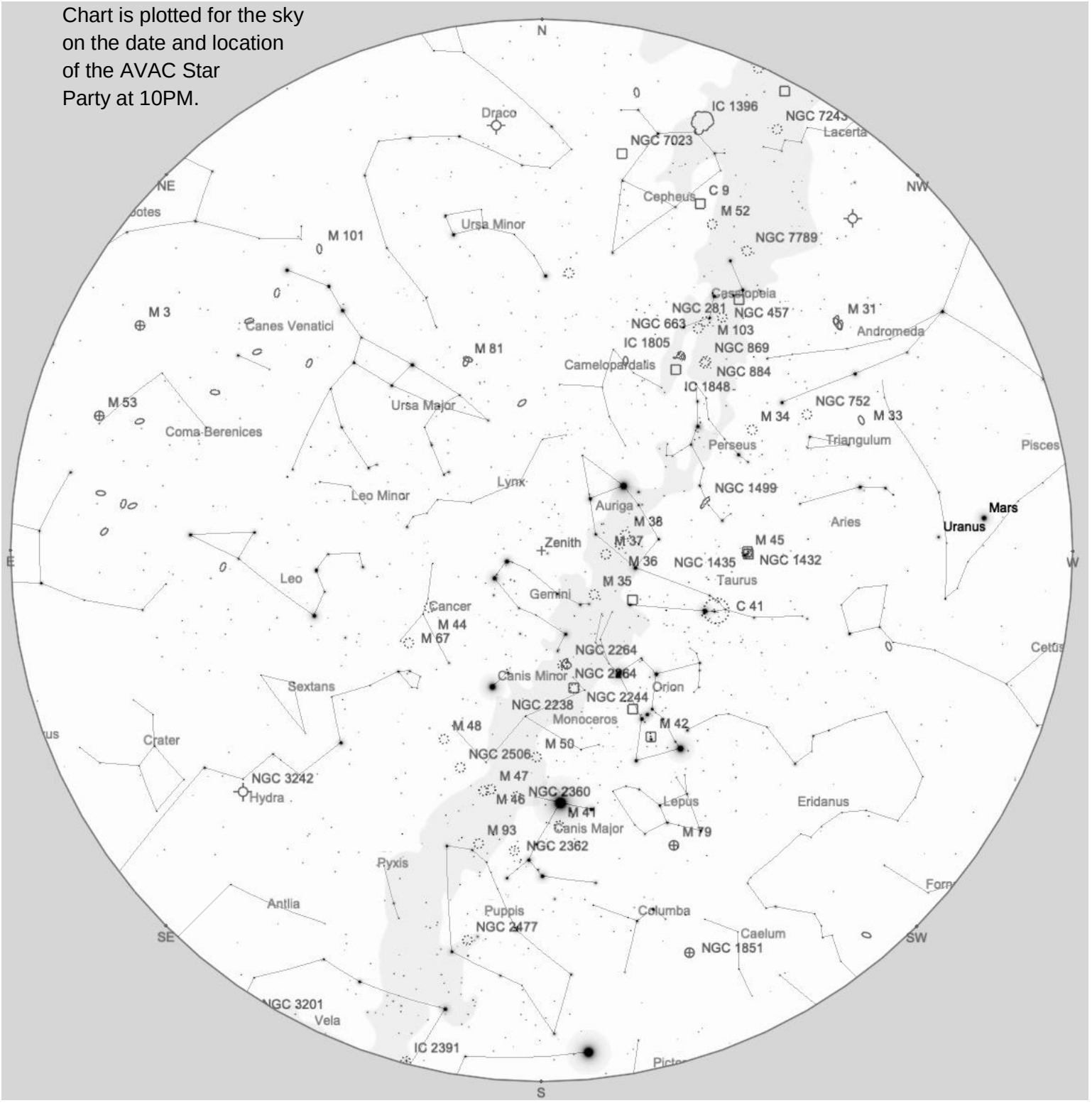
	Rise	Transit	Set	Mag
Mercury	07:21	13:00	18:39	-1.0
Venus	04:10	09:12	14:15	-3.7
Mars	09:31	16:08	22:44	1.2
Jupiter	02:32	07:30	12:29	-1.5
Saturn	04:25	09:24	14:24	1.7

Feb 28

	Rise	Transit	Set	Mag
Mercury	07:06	13:11	19:16	0.1
Venus	04:19	09:26	14:33	-3.6
Mars	09:05	15:50	22:36	1.4
Jupiter	01:49	06:46	11:44	-1.6
Saturn	03:38	08:38	13:38	1.7

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. The list is sorted by the transit time of the object.

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC1145	Gal	Eri	02h 54m 33s	-18°38'09"	13.0	12:46	17:56	23:06
NGC1156	Gal	Ari	02h 59m 42s	+25°14'17"	11.7	10:44	18:01	01:19
NGC1261	Glob	Hor	03h 12m 16s	-55°12'57"	8.4	17:02	18:14	19:25
NGC1245	Open	Per	03h 14m 42s	+47°14'12"	8.4	09:02	18:16	03:30
NGC1302	Gal	For	03h 19m 51s	-26°03'38"	11.0	13:35	18:21	23:07
NGC1309	Gal	Eri	03h 22m 06s	-15°24'01"	11.6	13:04	18:24	23:44
NGC1333	Neb	Per	03h 29m 20s	+31°24'56"		10:50	18:31	02:12
NGC1353	Gal	Eri	03h 32m 03s	-20°49'06"	11.4	13:30	18:33	23:37
NGC1399	Gal	For	03h 38m 29s	-35°27'01"	9.9	14:31	18:40	22:49
NGC1415	Gal	Eri	03h 40m 57s	-22°33'50"	12.0	13:45	18:42	23:40
NGC1421	Gal	Eri	03h 42m 29s	-13°29'19"	11.4	13:18	18:44	00:09
NGC1432	Neb	Tau	03h 45m 50s	+24°22'06"		11:33	18:47	02:02
NGC1435	Neb	Tau	03h 46m 10s	+23°45'54"		11:35	18:48	02:00
M45	Open	Tau	03h 47m 30s	+24°07'00"	1.6	11:35	18:49	02:03
NGC1482	Gal	Eri	03h 54m 39s	-20°30'10"	14.0	13:52	18:56	00:01
NGC1491	Neb	Per	04h 03m 14s	+51°18'57"		09:06	19:05	05:03
NGC1499	Neb	Per	04h 03m 14s	+36°22'00"		11:01	19:05	03:08
NGC1501	P Neb	Cam	04h 06m 59s	+60°55'14"	13.0	Circum	19:08	Circum
NGC1502	Open	Cam	04h 07m 50s	+62°19'54"	5.7	Circum	19:09	Circum
NGC1514	P Neb	Tau	04h 09m 17s	+30°46'33"	10.0	11:32	19:11	02:49
NGC1513	Open	Per	04h 09m 57s	+49°30'54"	8.4	09:35	19:11	04:48
NGC1535	P Neb	Eri	04h 14m 16s	-12°44'22"	10.0	13:48	19:16	00:43
NGC1545	Open	Per	04h 20m 57s	+50°15'12"	6.2	09:37	19:22	05:07
NGC1596	Gal	Dor	04h 27m 38s	-55°01'36"	11.0	18:13	19:29	20:45
NGC1579	Neb	Per	04h 30m 14s	+35°16'47"		11:34	19:32	03:30
NGC1600	Gal	Eri	04h 31m 40s	-05°05'15"	11.1	13:44	19:33	01:22
NGC1605	Open	Per	04h 34m 53s	+45°16'12"	10.7	10:39	19:36	04:34
NGC1624	Open	Per	04h 40m 36s	+50°27'42"	10.4	09:55	19:42	05:30
NGC1642	Gal	Tau	04h 42m 55s	+00°37'06"	14.0	13:40	19:44	01:49
NGC1788	Neb	Ori	05h 06m 53s	-03°20'27"		14:15	20:08	02:02
NGC1778	Open	Aur	05h 08m 04s	+37°01'24"	7.7	12:03	20:09	04:16
NGC1807	Open	Tau	05h 10m 43s	+16°31'18"	7.0	13:23	20:12	03:01
NGC1817	Open	Tau	05h 12m 15s	+16°41'24"	7.7	13:24	20:14	03:03
NGC1851	Glob	Col	05h 14m 07s	-40°02'46"	7.3	16:30	20:16	00:01
M79	Glob	Lep	05h 24m 11s	-24°31'29"	8.5	15:34	20:26	01:17
NGC1907	Open	Aur	05h 28m 05s	+35°19'30"	8.2	12:31	20:30	04:28
NGC1952	Neb	Tau	05h 34m 32s	+22°00'52"	8.4	13:29	20:36	03:42
NGC1973	Neb	Ori	05h 35m 05s	-04°43'55"		14:47	20:37	02:26
NGC1981	Open	Ori	05h 35m 09s	-04°25'54"	4.6	14:46	20:37	02:27

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC1977	Neb	Ori	05h 35m 16s	-04°49'15"		14:47	20:37	02:26
M42	D Neb	Ori	05h 35m 16s	-05°23'25"	4.0	14:49	20:37	02:25
NGC1975	Neb	Ori	05h 35m 18s	-04°41'05"		14:47	20:37	02:27
NGC1980	Neb	Ori	05h 35m 25s	-05°54'54"		14:50	20:37	02:24
M43	D Neb	Ori	05h 35m 31s	-05°16'03"	9.0	14:48	20:37	02:25
NGC1990	Neb	Ori	05h 36m 13s	-01°12'07"		14:38	20:38	02:37
M36	Open	Aur	05h 36m 18s	+34°08'24"	6.5	12:45	20:38	04:31
NGC1999	Neb	Ori	05h 36m 25s	-06°42'57"		14:53	20:38	02:22
NGC2023	Neb	Ori	05h 41m 38s	-02°15'33"		14:46	20:43	02:40
NGC2024	Neb	Ori	05h 41m 42s	-01°51'24"		14:45	20:43	02:41
NGC2022	P Neb	Ori	05h 42m 06s	+09°05'13"	12.0	14:16	20:44	03:11
NGC2064	Neb	Ori	05h 46m 18s	+00°00'21"		14:45	20:48	02:50
NGC2067	Neb	Ori	05h 46m 31s	+00°07'54"		14:45	20:48	02:51
M78	D Neb	Ori	05h 46m 45s	+00°04'48"	8.0	14:45	20:48	02:51
NGC2071	Neb	Ori	05h 47m 07s	+00°17'39"		14:45	20:49	02:52
NGC2129	Open	Gem	06h 01m 06s	+23°19'18"	6.7	13:52	21:03	04:13
NGC2139	Gal	Lep	06h 01m 08s	-23°40'22"	11.7	16:08	21:03	01:57
NGC2149	Neb	Mon	06h 03m 31s	-09°43'50"		15:29	21:05	02:41
NGC2158	Open	Gem	06h 07m 25s	+24°05'48"	8.6	13:55	21:09	04:22
NGC2170	Neb	Mon	06h 07m 32s	-06°23'57"		15:24	21:09	02:54
NGC2169	Open	Ori	06h 08m 24s	+13°57'54"	5.9	14:28	21:10	03:51
M35	Open	Gem	06h 09m 00s	+24°21'00"	5.5	13:56	21:10	04:25
NGC2174	Neb	Ori	06h 09m 24s	+20°39'34"		14:09	21:11	04:13
NGC2182	Neb	Mon	06h 09m 31s	-06°19'35"		15:25	21:11	02:57
NGC2175	Open	Ori	06h 09m 40s	+20°29'15"	6.8	14:10	21:11	04:13
NGC2183	Neb	Mon	06h 10m 47s	-06°12'43"		15:26	21:12	02:58
NGC2185	Neb	Mon	06h 11m 00s	-06°13'36"		15:27	21:12	02:58
NGC2186	Open	Ori	06h 12m 07s	+05°27'30"	8.7	14:56	21:14	03:31
NGC2204	Open	CMa	06h 15m 33s	-18°39'54"	8.6	16:07	21:17	02:27
NGC2232	Open	Mon	06h 28m 01s	-04°50'48"	3.9	15:40	21:29	03:19
NGC2236	Open	Mon	06h 29m 39s	+06°49'48"	8.5	15:10	21:31	03:52
NGC2244	Open	Mon	06h 31m 56s	+04°56'35"	4.8	15:17	21:33	03:50
NGC2245	Neb	Mon	06h 32m 41s	+10°09'24"		15:03	21:34	04:05
NGC2247	Neb	Mon	06h 33m 05s	+10°19'17"		15:03	21:35	04:06
NGC2242	P Neb	Aur	06h 34m 07s	+44°46'38"	14.0	12:42	21:36	06:29
NGC2254	Open	Mon	06h 35m 49s	+07°40'24"	9.7	15:14	21:37	04:01
NGC2261	Neb	Mon	06h 39m 10s	+08°44'40"		15:14	21:41	04:07
NGC2264	Open	Mon	06h 40m 58s	+09°53'42"	3.9	15:13	21:42	04:12
NGC2266	Open	Gem	06h 43m 19s	+26°58'12"	10.0	14:21	21:45	05:08
M41	Open	CMa	06h 46m 01s	-20°45'24"	5.0	16:44	21:47	02:51
NGC2282	Neb	Mon	06h 46m 51s	+01°18'56"		15:42	21:48	03:55
NGC2258	Gal	Cam	06h 47m 46s	+74°28'54"	13.0	Circum	21:49	Circum
NGC2281	Open	Aur	06h 48m 17s	+41°04'42"	5.4	13:21	21:50	06:19
NGC2298	Glob	Pup	06h 48m 59s	-36°00'15"	9.4	17:44	21:50	01:57
NGC2302	Open	Mon	06h 51m 55s	-07°05'00"	8.9	16:10	21:53	03:37

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC2304	Open	Gem	06h 55m 11s	+17°59'18"	10.0	15:03	21:57	04:50
NGC2316	Neb	Mon	06h 59m 41s	-07°46'39"		16:20	22:01	03:43
NGC2325	Gal	CMa	07h 02m 40s	-28°41'53"	11.2	17:28	22:04	02:41
NGC2345	Open	CMa	07h 08m 18s	-13°11'36"	7.7	16:43	22:10	03:36
NGC2354	Open	CMa	07h 14m 10s	-25°41'24"	6.5	17:28	22:16	03:03
NGC2355	Open	Gem	07h 16m 59s	+13°45'00"	10.0	15:37	22:18	04:59
NGC2360	Open	CMa	07h 17m 43s	-15°38'30"	7.2	17:00	22:19	03:38
NGC2359	Neb	CMa	07h 18m 30s	-13°13'36"		16:54	22:20	03:46
NGC2362	Open	CMa	07h 18m 41s	-24°57'18"	4.1	17:30	22:20	03:10
NGC2374	Open	CMa	07h 23m 56s	-13°15'48"	8.0	16:59	22:25	03:52
NGC2384	Open	CMa	07h 25m 10s	-21°01'18"	7.4	17:24	22:27	03:29
NGC2371	P Neb	Gem	07h 25m 34s	+29°29'17"	13.0	14:54	22:27	06:00
NGC2392	P Neb	Gem	07h 29m 11s	+20°54'42"	10.0	15:28	22:31	05:34
NGC2414	Open	Pup	07h 33m 12s	-15°27'12"	7.9	17:15	22:35	03:54
NGC2421	Open	Pup	07h 36m 13s	-20°36'42"	8.3	17:34	22:38	03:42
M47	Open	Pup	07h 36m 35s	-14°29'00"	4.5	17:15	22:38	04:01
NGC2423	Open	Pup	07h 37m 06s	-13°52'18"	6.7	17:14	22:39	04:03
NGC2419	Glob	Lyn	07h 38m 08s	+38°52'54"	10.4	14:23	22:40	06:56
NGC2432	Open	Pup	07h 40m 53s	-19°04'36"	10.0	17:33	22:42	03:51
M46	Open	Pup	07h 41m 46s	-14°48'36"	6.5	17:21	22:43	04:05
NGC2438	P Neb	Pup	07h 41m 50s	-14°44'07"	10.0	17:21	22:43	04:05
NGC2440	P Neb	Pup	07h 41m 55s	-18°12'31"	11.0	17:32	22:43	03:55
M93	Open	Pup	07h 44m 30s	-23°51'24"	6.5	17:52	22:46	03:39
NGC2451	Open	Pup	07h 45m 15s	-37°58'00"	2.8	18:50	22:47	02:43
NGC2452	P Neb	Pup	07h 47m 26s	-27°20'07"	13.0	18:07	22:49	03:30
NGC2455	Open	Pup	07h 49m 01s	-21°18'06"	10.0	17:49	22:50	03:52
NGC2477	Open	Pup	07h 52m 10s	-38°31'48"	5.8	19:00	22:54	02:47
NGC2467	Open	Pup	07h 52m 26s	-26°26'12"	7.0	18:09	22:54	03:39
NGC2479	Open	Pup	07h 55m 06s	-17°42'36"	10.0	17:43	22:57	04:10
NGC2489	Open	Pup	07h 56m 15s	-30°03'48"	7.9	18:26	22:58	03:29
NGC2527	Open	Pup	08h 04m 58s	-28°08'48"	6.5	18:28	23:06	03:45
NGC2547	Open	Vel	08h 10m 09s	-49°12'54"	4.7	20:31	23:12	01:52
M48	Open	Hya	08h 13m 43s	-05°45'00"	5.5	17:28	23:15	05:02
NGC2567	Open	Pup	08h 18m 32s	-30°38'24"	7.4	18:51	23:20	03:49
NGC2580	Open	Pup	08h 21m 28s	-30°18'00"	10.0	18:53	23:23	03:53
NGC2610	P Neb	Hya	08h 33m 23s	-16°08'57"	14.0	18:17	23:35	04:53
NGC2626	Neb	Vel	08h 35m 31s	-40°40'18"		19:55	23:37	03:19
M44	Open	Cnc	08h 40m 24s	+19°40'00"	4.0	16:43	23:42	06:41
NGC2659	Open	Vel	08h 42m 37s	-44°59'00"	8.6	20:29	23:44	02:59
NGC2658	Open	Pyx	08h 43m 27s	-32°39'30"	9.0	19:24	23:45	04:06
NGC2670	Open	Vel	08h 45m 30s	-48°48'00"	7.8	21:03	23:47	02:31
NGC2665	Gal	Hya	08h 46m 01s	-19°18'11"	13.0	18:39	23:47	04:56
NGC2669	Open	Vel	08h 46m 22s	-52°56'54"	6.1	21:52	23:48	01:43
NGC2633	Gal	Cam	08h 48m 05s	+74°05'56"	11.9	Circum	23:50	Circum
NGC2738	Gal	Cnc	09h 04m 00s	+21°58'04"	14.0	16:59	00:05	07:12

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC2781	Gal	Hya	09h 11m 28s	-14°49'00"	11.5	18:51	00:13	05:35
NGC2792	P Neb	Vel	09h 12m 27s	-42°25'41"	14.0	20:42	00:14	03:46
NGC2748	Gal	Cam	09h 13m 43s	+76°28'32"	11.7	Circum	00:15	Circum
NGC2787	Gal	UMa	09h 19m 19s	+69°12'11"	10.8	Circum	00:21	Circum
NGC2888	Gal	Pyx	09h 26m 20s	-28°02'09"	12.5	19:49	00:28	05:07
NGC2903	Gal	Leo	09h 32m 10s	+21°30'04"	8.9	17:29	00:34	07:38
NGC2925	Open	Vel	09h 33m 11s	-53°23'54"	8.0	22:46	00:35	02:23
NGC3047	Gal	Sex	09h 54m 32s	-01°17'30"	14.0	18:57	00:56	06:55
NGC3105	Open	Vel	10h 00m 39s	-54°47'18"	9.7	23:40	01:02	02:24
NGC3132	P Neb	Vel	10h 07m 02s	-40°26'11"	8.0	21:25	01:08	04:52
NGC3201	Glob	Vel	10h 17m 37s	-46°24'45"	6.8	22:14	01:19	04:24
NGC3228	Open	Vel	10h 21m 22s	-51°43'42"	6.0	23:10	01:23	03:35
NGC3242	P Neb	Hya	10h 24m 46s	-18°38'34"	9.0	20:16	01:26	06:36
NGC3412	Gal	Leo	10h 50m 53s	+13°24'44"	10.6	19:12	01:52	08:32
NGC3414	Gal	LMi	10h 51m 16s	+27°58'30"	10.8	18:25	01:53	09:20
NGC3403	Gal	Dra	10h 53m 55s	+73°41'23"	13.0	Circum	01:55	Circum
NGC3489	Gal	Leo	11h 00m 19s	+13°54'04"	10.3	19:20	02:02	08:43
M97	P Neb	UMa	11h 14m 48s	+55°01'08"	12.0	14:54	02:16	13:39
NGC3621	Gal	Hya	11h 18m 16s	-32°48'50"	10.0	21:59	02:20	06:40
NGC3680	Open	Cen	11h 25m 38s	-43°14'36"	7.6	23:00	02:27	05:54
NGC3716	Gal	Leo	11h 31m 41s	+03°29'15"	14.0	20:21	02:33	08:45
NGC3735	Gal	Dra	11h 35m 57s	+70°32'07"	12.0	Circum	02:37	Circum
NGC3945	Gal	UMa	11h 53m 14s	+60°40'33"	10.6	Circum	02:55	Circum
NGC3955	Gal	Crt	11h 53m 57s	-23°09'53"	11.9	22:00	02:55	07:51
NGC3962	Gal	Crt	11h 54m 40s	-13°58'29"	10.6	21:32	02:56	08:20
NGC3998	Gal	UMa	11h 57m 56s	+55°27'13"	10.6	Circum	02:59	Circum
NGC4036	Gal	UMa	12h 01m 27s	+61°53'44"	10.6	Circum	03:03	Circum
NGC4038	Gal	Crv	12h 01m 53s	-18°52'07"	10.7	21:54	03:03	08:13
NGC4123	Gal	Vir	12h 08m 11s	+02°52'41"	11.2	20:59	03:10	09:20
NGC4144	Gal	UMa	12h 09m 59s	+46°27'25"	12.0	18:04	03:11	12:18
NGC4147	Glob	Com	12h 10m 06s	+18°32'30"	10.3	20:16	03:12	10:07
NGC4146	Gal	Com	12h 10m 18s	+26°25'51"	14.0	19:50	03:12	10:34
M98	Gal	Com	12h 13m 48s	+14°54'01"	10.9	20:31	03:15	10:00
NGC4236	Gal	Dra	12h 16m 43s	+69°27'50"	9.7	Circum	03:18	Circum
NGC4261	Gal	Vir	12h 19m 23s	+05°49'30"	10.3	21:02	03:21	09:39
NGC4361	P Neb	Crv	12h 24m 31s	-18°47'06"	10.0	22:16	03:26	08:36
NGC4394	Gal	Com	12h 25m 56s	+18°12'50"	10.9	20:33	03:27	10:22
NGC4414	Gal	Com	12h 26m 27s	+31°13'22"	10.3	19:48	03:28	11:08
NGC4449	Gal	CVn	12h 28m 11s	+44°05'38"	9.4	18:41	03:30	12:18
NGC4485	Gal	CVn	12h 30m 31s	+41°41'59"	12.0	18:59	03:32	12:05
NGC4494	Gal	Com	12h 31m 24s	+25°46'29"	9.9	20:13	03:33	10:52
M89	Gal	Vir	12h 35m 40s	+12°33'23"	10.9	21:00	03:37	10:15
M58	Gal	Vir	12h 37m 44s	+11°49'06"	10.4	21:04	03:39	10:14
M68	Glob	Hya	12h 39m 28s	-26°44'32"	9.0	22:57	03:41	08:25
NGC4606	Gal	Vir	12h 40m 58s	+11°54'42"	11.9	21:07	03:42	10:18

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC4651	Gal	Com	12h 43m 43s	+16°23'36"	10.7	20:56	03:45	10:34
NGC4685	Gal	Com	12h 47m 11s	+19°27'51"	14.0	20:50	03:49	10:47
NGC4696	Gal	Cen	12h 48m 49s	-41°18'42"	10.7	00:12	03:50	07:29
NGC4712	Gal	Com	12h 49m 34s	+25°28'12"	13.0	20:33	03:51	11:09
NGC4725	Gal	Com	12h 50m 27s	+25°30'03"	9.2	20:33	03:52	11:10
NGC4753	Gal	Vir	12h 52m 22s	-01°12'00"	9.9	21:54	03:54	09:53
NGC4799	Gal	Vir	12h 55m 16s	+02°53'47"	14.0	21:46	03:57	10:07
NGC4830	Gal	Vir	12h 57m 28s	-19°41'29"	13.0	22:52	03:59	09:06
NGC5014	Gal	CVn	13h 11m 31s	+36°16'56"	13.0	20:10	04:13	12:16
M53	Glob	Com	13h 12m 55s	+18°10'07"	8.5	21:20	04:14	11:09
NGC5053	Glob	Com	13h 16m 27s	+17°41'52"	9.8	21:25	04:18	11:11
NGC5054	Gal	Vir	13h 16m 58s	-16°38'05"	11.0	23:02	04:18	09:35
NGC5077	Gal	Vir	13h 19m 32s	-12°39'25"	11.5	22:53	04:21	09:49
NGC5139	Glob	Cen	13h 26m 47s	-47°28'53"	3.7	01:32	04:28	07:24
NGC5172	Gal	Com	13h 29m 19s	+17°03'06"	11.9	21:40	04:31	11:22
NGC5203	Gal	Vir	13h 32m 13s	-08°47'10"	14.0	22:55	04:34	10:12
NGC5223	Gal	CVn	13h 34m 25s	+34°41'26"	14.0	20:40	04:36	12:31
NGC5240	Gal	CVn	13h 35m 55s	+35°35'16"	14.0	20:38	04:37	12:37
M3	Glob	CVn	13h 42m 11s	+28°22'35"	7.0	21:15	04:44	12:13
NGC5286	Glob	Cen	13h 46m 27s	-51°22'30"	7.6	02:31	04:48	07:05
NGC5308	Gal	UMa	13h 47m 00s	+60°58'23"	11.3	Circum	04:48	Circum
NGC5307	P Neb	Cen	13h 51m 03s	-51°12'20"	12.0	02:33	04:52	07:11
NGC5354	Gal	CVn	13h 53m 27s	+40°18'09"	11.5	20:31	04:55	13:19
NGC5367	Neb	Cen	13h 57m 43s	-39°58'42"		01:13	04:59	08:45
NGC5440	Gal	CVn	14h 03m 01s	+34°45'26"	13.0	21:09	05:04	13:00
NGC5445	Gal	CVn	14h 03m 31s	+35°01'30"	14.0	21:08	05:05	13:02
NGC5466	Glob	Boo	14h 05m 28s	+28°31'57"	9.1	21:37	05:07	12:36
NGC5460	Open	Cen	14h 07m 27s	-48°20'36"	5.6	02:20	05:09	07:57
NGC5493	Gal	Vir	14h 11m 29s	-05°02'39"	11.5	23:24	05:13	11:02
NGC5533	Gal	Boo	14h 16m 08s	+35°20'38"	11.8	21:19	05:18	13:16
NGC5614	Gal	Boo	14h 24m 08s	+34°51'33"	11.7	21:29	05:26	13:22
NGC5634	Glob	Vir	14h 29m 37s	-05°58'37"	9.6	23:45	05:31	11:18
NGC5689	Gal	Boo	14h 35m 30s	+48°44'31"	11.9	20:09	05:37	15:05
NGC5694	Glob	Hya	14h 39m 37s	-26°32'18"	10.2	00:57	05:41	10:25
NGC5713	Gal	Vir	14h 40m 11s	-00°17'25"	11.4	23:40	05:42	11:44
NGC5749	Open	Lup	14h 48m 53s	-54°29'54"	9.0	04:22	05:50	07:19
NGC5824	Glob	Lup	15h 03m 59s	-33°04'07"	9.0	01:46	06:05	10:25
NGC5822	Open	Lup	15h 04m 21s	-54°23'48"	7.0	04:35	06:06	07:36
NGC5823	Open	Cir	15h 05m 30s	-55°36'12"	7.9	05:07	06:07	07:07
NGC5873	P Neb	Lup	15h 12m 51s	-38°07'30"	13.0	02:18	06:14	10:10
NGC5882	P Neb	Lup	15h 16m 50s	-45°38'56"	11.0	03:08	06:18	09:29
NGC5897	Glob	Lib	15h 17m 24s	-21°00'37"	8.6	01:16	06:19	11:22
M5	Glob	Ser	15h 18m 33s	+02°04'57"	7.0	00:12	06:20	12:28

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

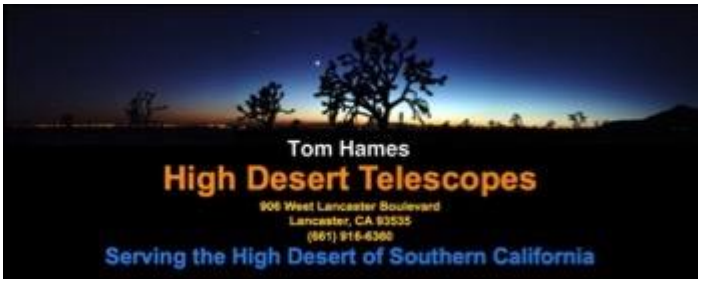
Thank you to our sponsors for your generous support!

Cosmos Level Sponsors

LOCKHEED MARTIN
We never forget who we're working for™

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

Universe Level Sponsors



Galaxy Level Sponsors

ASTRO-TOM.COM

ActonAstro

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