



Desert Sky Observer

Volume 39

Antelope Valley Astronomy Club Newsletter

January 2019

Up-Coming Events

January 11: Club Meeting*

January 12: [Prime Desert Moon Walk](#)

January 20: [Total Lunar Eclipse](#)

January 26: [LA County Science Olympiad](#)

* 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

Frank Moore

Happy New Year Antelope Valley Astronomy Club members.

I hope you all had a joyous Christmas and wonderful holiday season that was filled with family, friends and celebration.

As for celebrations, we had a big one on the night of December 8 when many AVAC members, friends and family got together for our annual Christmas party at Gino's Italian Ristorante in the Lancaster Marketplace. The food was great, the fellowship was fantastic, and once again Rose created a festive atmosphere with her "Astronomy mug centerpieces" and decorations. Plus, and once again, Gino's sent us home with the leftovers. How good is that?

As is our custom, we awarded certificates and awards for outreach and service to the club and the public at the Christmas party. Darrell Bennet, who was the recipient of the club's very first Holland Fountain Award, was also the recipient of the award this year as we recognized him for his faithfulness and dedication to outreach even in the midst of health issues and open heart bypass surgery. Through it all, Darrell missed only one outreach event in all of 2018. Congratulations and THANK YOU Darrell.

The recipient of the Keith Lawson Award, for outstanding service to the AVAC in 2018, was Judy Fuentes. Besides being a stalwart of service to the club, who has always been ready and willing to help out at any event, Judy hosted our Lunar Observing events at her property in Antelope Acres where, at her invitation, the events were often attended by more of her neighborhood friends and family members than club members. When we had our lunar observing event and Mexican food fest in September, Judy made her famous taquitos and her friends and family brought a feast of everything from salsas, to tamales to enchiladas. Congratulations and THANK YOU Judy.

In what was a total surprise to us, the incoming board presented Rose and I with plaques representing a special "Guiding Star Award" for our years of service on the AVAC board. The beautiful plaque, which features the Little Dipper (Ursa Minor) and the North Star Polaris, is particularly poignant to me, and anyone who has ever been at a star party or outreach event with me, since I am usually the first to spot Polaris after sunset for my polar alignment. Rose and I are extremely grateful to all of you for your thoughtfulness.

Over the next few weeks we'll be meeting to make the transition to the board and to start planning our observing, education and outreach events for 2019. In the absence of anyone elected to the Secretary's

position, Rose and I will continue to serve in that capacity, and assist with the board transition, until someone else steps up and into the position. How about you?

The first meeting of 2019 will be on Friday January 11. Please... make every effort to come out and support Darrell Bennett and Matt Leone at their first meeting as President and Vice President and to help them plan a big 2019 for the Antelope Valley Astronomy Club. Do you have a special venue of event at which you'd like to see the club participate? Let them know and we'll see what we can do.

As for events, don't forget that the first event of 2019 is for the Total Lunar Eclipse of January 20. On January 20 we'll be setting up in the parking lot at the SAGE Planetarium with coffee, cocoa, donuts and other treats in the lobby. The penumbral eclipse begins at 6:36 pm, totality starts at 8:41 pm and the eclipse ends at 11:48 pm. We hope to have a lot of public participation so bring out a telescope, binoculars, or just yourself and enjoy the spectacle.

Finally folks, remember that this is the time of year for membership renewals.

The Antelope Valley Astronomy Club's annual dues are due on January 1st and must be received before January 31 to remain current.

Payment is very easy. Log in to the club website at <http://www.avastronomyclub.org/member/login.html>. Your password is your last name if you haven't changed it. If you have forgotten your password, click on the link that says "Forgot login?" and follow the directions to recover your password.

Once you have logged in, go to the "Member Profile" page, listed under the Membership menu, click on the Membership tab in your profile and then click on the "Renew Now" button. You will be taken to a form where you can verify your information and choose your payment type, either PayPal or Offline (cash or check).

If you select PayPal, you will be directed to the PayPal site to complete your payment.

If you select Offline, you will be taken to a page to print out your application. Once you have printed your application, you may mail it to the club with your payment (check only) to:

AVAC
P.O. Box 8545
Lancaster, CA 93539-8545

Of course, you may also renew at any meeting.

Vice President

Rose Moore

Happy New Year! We have a few AVAC events already lining up. Our first club meeting is on Friday January 11th.

On Saturday January 12th is our first Prime Desert Moon Walk of the year. Start time is 6pm, set up time is about 1 hour prior to start time. The Sun goes down at 17:02, and the Moon will be a waxing crescent about 36%. Mars will be up next to the Moon, as well as Neptune and Uranus. Weather permitting.

On Sunday January 20th we will be having a public event for the Lunar Eclipse at the SAGE Planetarium. We will need members with scopes for this event. Stay tuned for more info!

Also, scheduled on Saturday January 26th is the LA County Science Olympiad at AV College. We will need members with scopes and solar filters to view the Sun. We can also use help from members to hand out

our club and NSN handouts, and talk to the public. The Moon and the following planets will be up at various times in the morning and early afternoon: Jupiter, Mars, Saturn, and Venus. Depending on viewing conditions and their angle from the Sun will determine if we will be able to see these during the day.

Please come out this year to support your new Board, your club meetings and outreach events! As always, we appreciate any suggestions and help in keeping the AVAC successful!

Space Place

January's Evening Eclipse and Morning Conjunctions

By David Prosper

Observers in the Americas are treated to an evening **total lunar eclipse** this month. Early risers can spot some striking morning conjunctions between **Venus**, **Jupiter**, and the **Moon** late in January.

A **total lunar eclipse** will occur on **January 20th** and be visible from start to finish for observers located in North and South America. This eclipse might be a treat for folks with early bedtimes; western observers can even watch the whole event before midnight. Lunar eclipses takes several hours to complete and are at their most impressive during total eclipse, or totality, when the Moon is completely enveloped by the umbra, the darkest part of Earth's shadow. During totality the color of the Moon can change to a bright orange or red thanks to the sunlight bending through the Earth's atmosphere - the same reason we see pink sunsets. The eclipse begins at 10:34 pm Eastern Standard Time, with totality beginning at 11:41 pm. The total eclipse lasts for slightly over an hour, ending at 12:43 am. The eclipse finishes when the Moon fully emerges from Earth's shadow by 1:51 am. Convert these times to your own time zone to plan your own eclipse watching; for example, observers under Pacific Standard Time will see the eclipse start at 7:34 pm and end by 10:51 pm.

Lunar eclipses offer observers a unique opportunity to judge how much the Moon's glare can interfere with stargazing. On eclipse night the Moon will be in **Cancer**, a constellation made up of dim stars. How many stars you can see near the full Moon before or after the eclipse? How many stars can you see during the total eclipse? The difference may surprise you. During these observations, you may spot a fuzzy cloud of stars relatively close to the Moon; this is known as the "**Beehive Cluster**," **M44**, or **Praesepe**. It's an open cluster of stars thought to be about 600 million year old and a little under 600 light years distant. Praesepe looks fantastic through binoculars.

Mars is visible in the evening and sets before midnight. It is still bright but has faded considerably since its closest approach to Earth last summer. Watch the red planet travel through the constellation Pisces throughout January.

Venus makes notable early morning appearances beside both **Jupiter** and the **Moon** later this month; make sure to get up about an hour before sunrise for the best views of these events. First, Venus and Jupiter approach each other during the third full week of January. Watch their conjunction on the 22nd, when the planets appear to pass just under 2 ½ degrees of each other. The next week, observe Venus in a close conjunction with a crescent Moon the morning of the 31st. For many observers their closest pass - just over half a degree apart, or less than a thumb's width held at arm's length - will occur after sunrise. Since Venus and the Moon are so bright you may still be able to spot them, even after sunrise. Have you ever seen Venus in the daytime?

If you have missed **Saturn** this winter, watch for the ringed planet's return by the end of the month, when it rises right before sunrise in Sagittarius. See if you can spot it after observing Venus' conjunctions!

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



Have you ever wondered how eclipses occur? You can model the Earth-Moon system using just a couple of small balls and a measuring stick to find out! The “**yardstick eclipse**” model shown here is set up to demonstrate a lunar eclipse. The “Earth” ball (front, right) casts its shadow on the smaller “Moon” ball (rear, left). You can also simulate a solar eclipse just by flipping this model around. You can even use the Sun as your light source! Find more details on this simple eclipse model at bit.ly/yardstickeclipse

News Headlines

All About Ultima: New Horizons Flyby Target is Unlike Anything Explored in Space

Ultima, as the flyby target is affectionately called by the New Horizons team, is orbiting in the heart of our solar system's Kuiper Belt, far beyond Neptune. The Kuiper Belt — a collection of icy bodies ranging in size from dwarf planets like Pluto to smaller planetesimals like Ultima Thule (pronounced "ultima toolee") and even smaller bodies like comets — are believed to be the building blocks of planets.

<http://pluto.jhuapl.edu/News-Center/News-Article.php?page=20181226>

NASA's InSight Places First Instrument on Mars

NASA's InSight lander has deployed its first instrument onto the surface of Mars, completing a major mission milestone. New images from the lander show the seismometer on the ground, its copper-colored covering faintly illuminated in the Martian dusk. It looks as if all is calm and all is bright for InSight, heading into the end of the year.

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

Holiday Asteroid Imaged with NASA Radar

The December 2018 close approach by the large, near-Earth asteroid 2003 SD220 has provided astronomers an outstanding opportunity to obtain detailed radar images of the surface and shape of the object and to improve the understanding of its orbit.

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

NASA's Voyager 2 Probe Enters Interstellar Space

For the second time in history, a human-made object has reached the space between the stars. NASA's [Voyager 2](#) probe now has exited the heliosphere - the protective bubble of particles and magnetic fields created by the Sun

<https://www.jpl.nasa.gov/news/news.php?feature=7301>

January 20, 2019, Total Lunar Eclipse – Palmdale timeline

Stages and times of the January 20 total lunar eclipse are outlined in the linked page. All times are local time (PST) for [Palmdale](#).

<https://www.timeanddate.com/eclipse/in/usa/palmdale>

January Sky Data

New Jan 5 First Qtr Jan 13 Full Jan 20 Last Qtr Jan 27



Planet Summary

Mercury might just be glimpsed very low in the southeast just before sunrise shining at magnitude -0.4 in the first few days of the month. Binoculars could well be needed to reduce the background glare, but please do not use them after the Sun has risen.

Venus reaches greatest elongation west some 47 degrees away from the Sun on January 6th so dominates the eastern sky rising some 3 hours before the Sun. It begins January with a magnitude of -4.1. Its angular size reduces from 26.3 to 19.4 arc seconds during the month as it moves away from the Earth but, at the same time, the percentage its phase increases from 47% to 62%.

Mars, though fading from +0.6 to +1.1 magnitudes during the month, remains prominent in the southern sky after sunset. Its angular size falls from 7.5 arc seconds to 6 arc seconds during the month so one will not be able to spot any details on its salmon-pink surface.

Jupiter starts the month rising around 5 a.m., and brightens from magnitude -1.3 to -1.4 as the month progresses while its angular size increases slightly from 31.8 to 33.6 arc seconds.

Saturn passes behind the Sun on the 2nd of January so will not be visible in the pre-dawn eastern sky until around the third week of the month shining with a magnitude of +1.6. With a disk of ~15 arc seconds across and with rings spanning over twice this, it will rise some one and a half hours before the Sun by month's end.

The Quadrantids **meteor shower** is usually active between the end of December and the second week of January, and peaks around January 3-4. Unlike other meteor showers that tend to stay at their peak for about two days, the peak period of the Quadrantids only lasts a few hours. The shower owes its name to the now-defunct constellation Quadrans Muralis. The Quadrantids are associated with asteroid 2003 EH1. The asteroid takes about 5.5 years to orbit around the Sun.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
1/1/2019	02:53	14:01	07:00	16:53
1/5/2019	06:38	16:55	07:00	16:56
1/10/2019	09:59	21:23	07:00	17:00
1/15/2019	12:35	01:08	06:59	17:05
1/20/2019	16:55	06:27	06:58	17:10
1/25/2019	22:42	10:16	06:56	17:15
1/31/2019	03:42	14:03	06:52	17:20

Planet Data

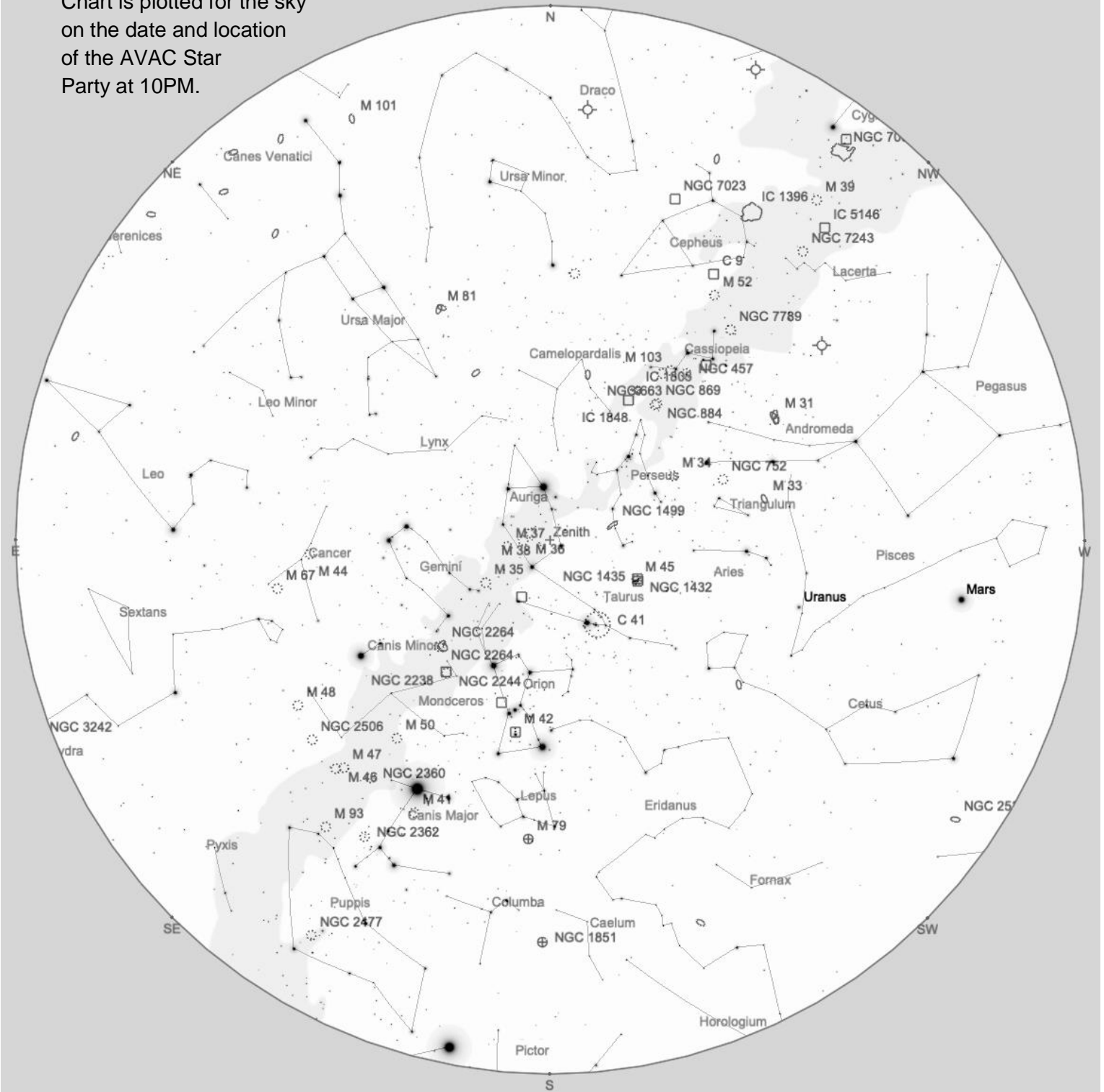
	Jan 1			
	Rise	Transit	Set	Mag
Mercury	05:54	10:50	15:45	-0.3
Venus	03:22	08:42	14:02	-4.1
Mars	11:11	17:13	23:15	0.6
Jupiter	04:52	09:53	14:54	-1.3
Saturn	07:02	12:00	16:58	1.5

	Jan 15			
	Rise	Transit	Set	Mag
Mercury	06:34	11:28	16:21	-0.5
Venus	03:36	08:46	13:57	-4.0
Mars	10:39	16:52	23:05	0.8
Jupiter	04:10	09:10	14:10	-1.4
Saturn	06:14	11:12	16:11	1.6

	Jan 31			
	Rise	Transit	Set	Mag
Mercury	07:08	12:17	17:26	-1.1
Venus	03:54	08:58	14:01	-3.8
Mars	10:03	16:29	22:54	1.1
Jupiter	03:20	08:19	13:18	-1.4
Saturn	05:18	10:17	15:16	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 Saturday closest to the new moon if there is no star party scheduled. The list is sorted by the transit time of the object.

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC189	Open	Cas	00h 39m 35s	+61°05'06"	8.8	Circum	17:35	Circum
M31	Gal	And	00h 42m 44s	+41°16'08"	4.3	09:08	17:39	02:09
NGC225	Open	Cas	00h 43m 39s	+61°46'30"	7.0	Circum	17:39	Circum
NGC246	P Neb	Cet	00h 47m 03s	-11°52'19"	8.0	12:13	17:43	23:13
NGC188	Open	Cep	00h 47m 28s	+85°15'18"	8.1	Circum	17:43	Circum
NGC253	Gal	Scl	00h 47m 33s	-25°17'18"	7.1	12:55	17:43	22:32
NGC288	Glob	Scl	00h 52m 45s	-26°35'01"	8.1	13:04	17:49	22:33
NGC281	Open	Cas	00h 52m 54s	+56°37'29"	7.0	Circum	17:49	Circum
NGC313	Gal	Psc	00h 57m 46s	+30°21'59"	12.0	10:17	17:54	01:30
NGC429	Gal	Cet	01h 12m 57s	-00°20'44"	14.0	12:07	18:09	00:11
NGC436	Open	Cas	01h 15m 58s	+58°48'42"	8.8	Circum	18:12	Circum
NGC467	Gal	Psc	01h 19m 10s	+03°18'02"	11.9	12:03	18:15	00:27
NGC474	Gal	Psc	01h 20m 07s	+03°24'55"	11.1	12:04	18:16	00:28
NGC493	Gal	Cet	01h 22m 09s	+00°56'46"	12.5	12:13	18:18	00:23
NGC517	Gal	Psc	01h 24m 44s	+33°25'46"	13.0	10:31	18:20	02:10
M33	Gal	Tri	01h 33m 51s	+30°39'37"	6.2	10:52	18:30	02:08
NGC636	Gal	Cet	01h 39m 06s	-07°30'45"	11.3	12:53	18:35	00:17
M76	P Neb	Per	01h 42m 18s	+51°34'15"	12.0	08:36	18:38	04:40
NGC637	Open	Cas	01h 43m 04s	+64°02'24"	8.2	Circum	18:39	Circum
NGC676	Gal	Psc	01h 48m 57s	+05°54'26"	11.0	12:26	18:45	01:04
NGC752	Open	And	01h 57m 41s	+37°47'06"	5.7	10:43	18:53	03:04
NGC869	Open	Per	02h 19m 00s	+57°07'42"	4.0	Circum	19:15	Circum
NGC883	Gal	Cet	02h 19m 05s	-06°47'29"	13.0	13:31	19:15	00:59
NGC884	Open	Per	02h 22m 18s	+57°08'12"	4.0	Circum	19:18	Circum
NGC896	Neb	Cas	02h 25m 28s	+62°01'09"		Circum	19:21	Circum
NGC953	Gal	Tri	02h 31m 10s	+29°35'19"	14.0	11:53	19:27	03:01
NGC988	Gal	Cet	02h 35m 28s	-09°21'25"	11.0	13:54	19:31	01:08
NGC1027	Open	Cas	02h 42m 40s	+61°35'42"	6.7	Circum	19:38	Circum
NGC1058	Gal	Per	02h 43m 30s	+37°20'28"	11.5	11:31	19:39	03:47
NGC1209	Gal	Eri	03h 06m 03s	-15°36'41"	11.4	14:42	20:02	01:21
NGC1261	Glob	Hor	03h 12m 16s	-55°12'57"	8.4	18:57	20:08	21:19
NGC1289	Gal	Eri	03h 18m 50s	-01°58'24"	14.0	14:17	20:15	02:12
NGC1325	Gal	Eri	03h 24m 25s	-21°32'40"	11.6	15:19	20:20	01:21
NGC1333	Neb	Per	03h 29m 20s	+31°24'56"		12:44	20:25	04:06
NGC1342	Open	Per	03h 31m 38s	+37°22'36"	6.7	12:19	20:27	04:36
NGC1380	Gal	For	03h 36m 28s	-34°58'33"	11.0	16:21	20:32	00:43
NGC1385	Gal	For	03h 37m 29s	-24°30'07"	11.2	15:42	20:33	01:25
NGC1398	Gal	For	03h 38m 52s	-26°20'15"	9.7	15:50	20:35	01:20

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC1432	Neb	Tau	03h 45m 50s	+24°22'06"		13:27	20:42	03:56
NGC1435	Neb	Tau	03h 46m 10s	+23°45'54"		13:30	20:42	03:54
M45	Open	Tau	03h 47m 30s	+24°07'00"	1.6	13:30	20:43	03:57
NGC1491	Neb	Per	04h 03m 14s	+51°18'57"		11:00	20:59	06:58
NGC1499	Neb	Per	04h 03m 14s	+36°22'00"		12:56	20:59	05:02
NGC1515	Gal	Dor	04h 04m 03s	-54°06'01"	11.0	19:24	21:00	22:36
NGC1496	Open	Per	04h 04m 32s	+52°39'42"	10.0	10:41	21:00	07:20
NGC1501	P Neb	Cam	04h 06m 59s	+60°55'14"	13.0	Circum	21:03	Circum
NGC1502	Open	Cam	04h 07m 50s	+62°19'54"	5.7	Circum	21:04	Circum
NGC1514	P Neb	Tau	04h 09m 17s	+30°46'33"	10.0	13:27	21:05	04:43
NGC1535	P Neb	Eri	04h 14m 16s	-12°44'22"	10.0	15:42	21:10	02:38
NGC1528	Open	Per	04h 15m 23s	+51°12'54"	6.4	11:14	21:11	07:08
NGC1579	Neb	Per	04h 30m 14s	+35°16'47"		13:28	21:26	05:24
NGC1569	Gal	Cam	04h 30m 49s	+64°50'53"	11.2	Circum	21:27	Circum
NGC1604	Gal	Eri	04h 31m 59s	-05°22'13"	14.0	15:40	21:28	03:16
NGC1560	Gal	Cam	04h 32m 48s	+71°52'48"	11.5	Circum	21:29	Circum
NGC1605	Open	Per	04h 34m 53s	+45°16'12"	10.7	12:33	21:31	06:28
NGC1624	Open	Per	04h 40m 36s	+50°27'42"	10.4	11:49	21:36	07:24
NGC1637	Gal	Eri	04h 41m 28s	-02°51'28"	10.9	15:42	21:37	03:32
NGC1662	Open	Ori	04h 48m 27s	+10°56'12"	6.4	15:11	21:44	04:17
NGC1664	Open	Aur	04h 51m 06s	+43°40'30"	7.6	13:01	21:47	06:33
NGC1741	Gal	Eri	05h 01m 38s	-04°15'31"	13.4	16:06	21:57	03:49
NGC1746	Open	Tau	05h 03m 50s	+23°46'12"	6.0	14:47	22:00	05:12
NGC1788	Neb	Ori	05h 06m 53s	-03°20'27"		16:09	22:03	03:56
NGC1832	Gal	Lep	05h 12m 03s	-15°41'18"	11.4	16:49	22:08	03:27
NGC1851	Glob	Col	05h 14m 07s	-40°02'46"	7.3	18:24	22:10	01:56
M79	Glob	Lep	05h 24m 11s	-24°31'29"	8.5	17:29	22:20	03:11
NGC1924	Gal	Ori	05h 28m 02s	-05°18'39"	13.0	16:35	22:24	04:12
NGC1907	Open	Aur	05h 28m 05s	+35°19'30"	8.2	14:26	22:24	06:22
NGC1952	Neb	Tau	05h 34m 32s	+22°00'52"	8.4	15:24	22:30	05:37
NGC1973	Neb	Ori	05h 35m 05s	-04°43'55"		16:41	22:31	04:21
NGC1981	Open	Ori	05h 35m 09s	-04°25'54"	4.6	16:40	22:31	04:22
NGC1977	Neb	Ori	05h 35m 16s	-04°49'15"		16:41	22:31	04:21
M42	D Neb	Ori	05h 35m 16s	-05°23'25"	4.0	16:43	22:31	04:19
NGC1975	Neb	Ori	05h 35m 18s	-04°41'05"		16:41	22:31	04:21
NGC1980	Neb	Ori	05h 35m 25s	-05°54'54"		16:44	22:31	04:18
M43	D Neb	Ori	05h 35m 31s	-05°16'03"	9.0	16:43	22:31	04:20
NGC1990	Neb	Ori	05h 36m 13s	-01°12'07"		16:32	22:32	04:31
NGC1999	Neb	Ori	05h 36m 25s	-06°42'57"		16:48	22:32	04:17
NGC2023	Neb	Ori	05h 41m 38s	-02°15'33"		16:41	22:37	04:34
NGC2024	Neb	Ori	05h 41m 42s	-01°51'24"		16:40	22:37	04:35
NGC2022	P Neb	Ori	05h 42m 06s	+09°05'13"	12.0	16:10	22:38	05:05
NGC2064	Neb	Ori	05h 46m 18s	+00°00'21"		16:39	22:42	04:45
NGC2067	Neb	Ori	05h 46m 31s	+00°07'54"		16:39	22:42	04:45
M78	D Neb	Ori	05h 46m 45s	+00°04'48"	8.0	16:40	22:43	04:45

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC2071	Neb	Ori	05h 47m 07s	+00°17'39"		16:39	22:43	04:46
M37	Open	Aur	05h 52m 18s	+32°33'12"	6.0	15:02	22:48	06:34
NGC2149	Neb	Mon	06h 03m 31s	-09°43'50"		17:23	22:59	04:35
NGC2158	Open	Gem	06h 07m 25s	+24°05'48"	8.6	15:50	23:03	06:17
NGC2170	Neb	Mon	06h 07m 32s	-06°23'57"		17:18	23:03	04:49
NGC2169	Open	Ori	06h 08m 24s	+13°57'54"	5.9	16:23	23:04	05:46
M35	Open	Gem	06h 09m 00s	+24°21'00"	5.5	15:50	23:05	06:19
NGC2174	Neb	Ori	06h 09m 24s	+20°39'34"		16:03	23:05	06:07
NGC2182	Neb	Mon	06h 09m 31s	-06°19'35"		17:20	23:05	04:51
NGC2183	Neb	Mon	06h 10m 47s	-06°12'43"		17:21	23:07	04:52
NGC2185	Neb	Mon	06h 11m 00s	-06°13'36"		17:21	23:07	04:53
NGC2204	Open	CMa	06h 15m 33s	-18°39'54"	8.6	18:01	23:11	04:21
NGC2215	Open	Mon	06h 20m 49s	-07°17'00"	8.4	17:34	23:17	05:00
NGC2232	Open	Mon	06h 28m 01s	-04°50'48"	3.9	17:34	23:24	05:13
NGC2236	Open	Mon	06h 29m 39s	+06°49'48"	8.5	17:04	23:25	05:47
NGC2244	Open	Mon	06h 31m 56s	+04°56'35"	4.8	17:12	23:28	05:44
NGC2245	Neb	Mon	06h 32m 41s	+10°09'24"		16:58	23:28	05:59
NGC2247	Neb	Mon	06h 33m 05s	+10°19'17"		16:58	23:29	06:00
NGC2242	P Neb	Aur	06h 34m 07s	+44°46'38"	14.0	14:36	23:30	08:24
NGC2261	Neb	Mon	06h 39m 10s	+08°44'40"		17:08	23:35	06:02
NGC2264	Open	Mon	06h 40m 58s	+09°53'42"	3.9	17:07	23:37	06:07
NGC2272	Gal	CMa	06h 42m 41s	-27°27'33"	11.9	18:57	23:38	04:19
M41	Open	CMa	06h 46m 01s	-20°45'24"	5.0	18:38	23:42	04:45
NGC2282	Neb	Mon	06h 46m 51s	+01°18'56"		17:36	23:43	05:49
NGC2286	Open	Mon	06h 47m 40s	-03°08'54"	7.5	17:49	23:43	05:38
NGC2281	Open	Aur	06h 48m 17s	+41°04'42"	5.4	15:15	23:44	08:13
NGC2298	Glob	Pup	06h 48m 59s	-36°00'15"	9.4	19:39	23:45	03:51
NGC2311	Open	Mon	06h 57m 47s	-04°36'42"	10.0	18:03	23:54	05:44
NGC2316	Neb	Mon	06h 59m 41s	-07°46'39"		18:14	23:55	05:37
M50	Open	Mon	07h 02m 42s	-08°23'00"	7.0	18:19	23:58	05:38
NGC2324	Open	Mon	07h 04m 07s	+01°02'42"	8.4	17:54	00:00	06:05
NGC2335	Open	Mon	07h 06m 49s	-10°01'42"	7.2	18:27	00:03	05:38
NGC2331	Open	Gem	07h 06m 59s	+27°15'42"	9.0	16:38	00:03	07:28
NGC2353	Open	Mon	07h 14m 30s	-10°16'00"	7.1	18:36	00:10	05:45
NGC2359	Neb	CMa	07h 18m 30s	-13°13'36"		18:48	00:14	05:41
NGC2362	Open	CMa	07h 18m 41s	-24°57'18"	4.1	19:25	00:14	05:04
NGC2374	Open	CMa	07h 23m 56s	-13°15'48"	8.0	18:54	00:20	05:46
NGC2371	P Neb	Gem	07h 25m 34s	+29°29'17"	13.0	16:48	00:21	07:55
NGC2395	Open	Gem	07h 27m 12s	+13°36'30"	8.0	17:42	00:23	07:03
NGC2276	Gal	Cep	07h 27m 16s	+85°45'17"	11.4	Circum	00:23	Circum
NGC2392	P Neb	Gem	07h 29m 11s	+20°54'42"	10.0	17:22	00:25	07:28
M47	Open	Pup	07h 36m 35s	-14°29'00"	4.5	19:10	00:32	05:55
NGC2419	Glob	Lyn	07h 38m 08s	+38°52'54"	10.4	16:18	00:34	08:50
NGC2420	Open	Gem	07h 38m 23s	+21°34'24"	8.3	17:29	00:34	07:39
NGC2439	Open	Pup	07h 40m 45s	-31°41'36"	6.9	20:12	00:37	05:01

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC2432	Open	Pup	07h 40m 53s	-19°04'36"	10.0	19:28	00:37	05:46
M46	Open	Pup	07h 41m 46s	-14°48'36"	6.5	19:16	00:38	05:59
NGC2438	P Neb	Pup	07h 41m 50s	-14°44'07"	10.0	19:16	00:38	06:00
NGC2440	P Neb	Pup	07h 41m 55s	-18°12'31"	11.0	19:26	00:38	05:49
NGC2451	Open	Pup	07h 45m 15s	-37°58'00"	2.8	20:44	00:41	04:38
NGC2452	P Neb	Pup	07h 47m 26s	-27°20'07"	13.0	20:02	00:43	05:25
NGC2453	Open	Pup	07h 47m 35s	-27°11'42"	8.3	20:01	00:43	05:25
NGC2477	Open	Pup	07h 52m 10s	-38°31'48"	5.8	20:54	00:48	04:42
NGC2479	Open	Pup	07h 55m 06s	-17°42'36"	10.0	19:38	00:51	06:04
NGC2482	Open	Pup	07h 55m 12s	-24°15'30"	7.3	19:59	00:51	05:43
NGC2483	Open	Pup	07h 55m 39s	-27°53'42"	7.6	20:12	00:51	05:31
NGC2506	Open	Mon	08h 00m 01s	-10°46'12"	7.6	19:23	00:56	06:29
NGC2547	Open	Vel	08h 10m 09s	-49°12'54"	4.7	22:26	01:06	03:46
NGC2539	Open	Pup	08h 10m 37s	-12°49'06"	6.5	19:39	01:06	06:34
M48	Open	Hya	08h 13m 43s	-05°45'00"	5.5	19:22	01:09	06:57
NGC2567	Open	Pup	08h 18m 32s	-30°38'24"	7.4	20:45	01:14	05:43
NGC2571	Open	Pup	08h 18m 56s	-29°45'00"	7.0	20:42	01:15	05:47
NGC2579	Open	Pup	08h 20m 53s	-36°13'00"	7.5	21:11	01:17	05:22
NGC2610	P Neb	Hya	08h 33m 23s	-16°08'57"	14.0	20:11	01:29	06:47
NGC2626	Neb	Vel	08h 35m 31s	-40°40'18"		21:49	01:31	05:14
NGC2627	Open	Pyx	08h 37m 15s	-29°57'18"	8.0	21:01	01:33	06:05
M44	Open	Cnc	08h 40m 24s	+19°40'00"	4.0	18:37	01:36	08:35
NGC2660	Open	Vel	08h 42m 38s	-47°12'00"	8.8	22:40	01:38	04:37
NGC2658	Open	Pyx	08h 43m 27s	-32°39'30"	9.0	21:18	01:39	06:00
NGC2639	Gal	UMa	08h 43m 38s	+50°12'20"	11.8	15:55	01:39	11:24
NGC2670	Open	Vel	08h 45m 30s	-48°48'00"	7.8	22:57	01:41	04:26
M67	Open	Cnc	08h 51m 18s	+11°48'00"	7.5	19:12	01:47	08:22
NGC2681	Gal	UMa	08h 53m 33s	+51°18'49"	10.3	15:51	01:49	11:48
NGC2699	Gal	Hya	08h 55m 49s	-03°07'41"	13.0	19:57	01:52	07:46
NGC2742	Gal	UMa	09h 07m 34s	+60°28'46"	11.7	Circum	02:03	Circum
NGC2775	Gal	Cnc	09h 10m 20s	+07°02'16"	10.3	19:44	02:06	08:28
NGC2792	P Neb	Vel	09h 12m 27s	-42°25'41"	14.0	22:36	02:08	05:40
NGC2782	Gal	Lyn	09h 14m 05s	+40°06'50"	11.5	17:47	02:10	10:33
NGC2818	Open	Pyx	09h 16m 01s	-36°37'37"	8.2	22:09	02:12	06:15
NGC2797	Gal	Cnc	09h 16m 22s	+17°43'38"	14.0	19:19	02:12	09:05
NGC2824	Gal	Cnc	09h 19m 02s	+26°16'10"	14.0	18:54	02:15	09:36
NGC2865	Gal	Hya	09h 23m 30s	-23°09'39"	11.4	21:23	02:19	07:15
NGC2910	Open	Vel	09h 30m 30s	-52°55'06"	7.2	00:30	02:26	04:22
NGC3057	Gal	Dra	10h 05m 39s	+80°17'07"	14.0	Circum	03:01	Circum
NGC3132	P Neb	Vel	10h 07m 02s	-40°26'11"	8.0	23:19	03:03	06:47
NGC3166	Gal	Sex	10h 13m 45s	+03°25'30"	10.6	20:58	03:10	09:22
NGC3144	Gal	Dra	10h 15m 32s	+74°13'13"	14.0	Circum	03:11	Circum
NGC3201	Glob	Vel	10h 17m 37s	-46°24'45"	6.8	00:09	03:13	06:18
NGC3242	P Neb	Hya	10h 24m 46s	-18°38'34"	9.0	22:10	03:21	08:31
NGC3215	Gal	Dra	10h 28m 41s	+79°48'46"	14.0	Circum	03:24	Circum

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC3310	Gal	UMa	10h 38m 46s	+53°30'10"	10.9	16:59	03:35	14:10
NGC3344	Gal	LMi	10h 43m 31s	+24°55'20"	10.0	20:23	03:39	10:56
M108	Gal	UMa	11h 11m 31s	+55°40'26"	10.6	Circum	04:07	Circum
M97	P Neb	UMa	11h 14m 48s	+55°01'08"	12.0	16:48	04:11	15:33
NGC3599	Gal	Leo	11h 15m 27s	+18°06'36"	11.9	21:17	04:11	11:05
NGC3610	Gal	UMa	11h 18m 25s	+58°47'11"	10.8	Circum	04:14	Circum
M66	Gal	Leo	11h 20m 15s	+12°59'26"	9.7	21:37	04:16	10:55
NGC3704	Gal	Crt	11h 30m 05s	-11°32'48"	14.0	22:55	04:26	09:57
NGC3726	Gal	UMa	11h 33m 21s	+47°01'43"	10.4	19:17	04:29	13:41
NGC3810	Gal	Leo	11h 40m 59s	+11°28'18"	10.8	22:02	04:37	11:11
NGC3929	Gal	Leo	11h 51m 43s	+21°00'09"	14.0	21:44	04:47	11:51
NGC3991	Gal	UMa	11h 57m 31s	+32°20'14"	13.2	21:08	04:53	12:38
NGC4147	Glob	Com	12h 10m 06s	+18°32'30"	10.3	22:10	05:06	12:01
NGC4155	Gal	Com	12h 10m 46s	+19°02'26"	14.0	22:10	05:07	12:03
NGC4179	Gal	Vir	12h 12m 52s	+01°17'58"	10.9	23:02	05:09	11:15
NGC4233	Gal	Vir	12h 17m 08s	+07°37'26"	11.9	22:49	05:13	11:36
NGC4278	Gal	Com	12h 20m 07s	+29°16'50"	10.2	21:43	05:16	12:48
NGC4299	Gal	Vir	12h 21m 41s	+11°30'04"	12.5	22:43	05:17	11:52
NGC4361	P Neb	Crv	12h 24m 31s	-18°47'06"	10.0	00:10	05:20	10:30
M84	Gal	Vir	12h 25m 04s	+12°53'12"	10.2	22:42	05:21	11:59
M85	Gal	Com	12h 25m 24s	+18°11'27"	10.0	22:27	05:21	12:15
NGC4395	Gal	CVn	12h 25m 49s	+33°32'49"	10.2	21:31	05:22	13:12
NGC4457	Gal	Vir	12h 28m 59s	+03°34'14"	10.8	23:12	05:25	11:37
NGC4526	Gal	Vir	12h 34m 03s	+07°41'58"	9.6	23:06	05:30	11:54
NGC4540	Gal	Com	12h 34m 51s	+15°33'03"	12.0	22:44	05:31	12:17
NGC4564	Gal	Vir	12h 36m 27s	+11°26'21"	11.1	22:58	05:32	12:06
NGC4570	Gal	Vir	12h 36m 53s	+07°14'48"	10.9	23:10	05:33	11:55
M68	Glob	Hya	12h 39m 28s	-26°44'32"	9.0	00:52	05:35	10:19
M60	Gal	Vir	12h 43m 40s	+11°33'08"	9.8	23:05	05:39	12:14
NGC4689	Gal	Com	12h 47m 46s	+13°45'45"	10.9	23:03	05:44	12:24
NGC4762	Gal	Vir	12h 52m 56s	+11°13'49"	10.2	23:15	05:49	12:22
NGC4809	Gal	Vir	12h 54m 51s	+02°39'10"	14.0	23:41	05:51	12:01
NGC4856	Gal	Vir	12h 59m 21s	-15°02'32"	10.4	00:34	05:55	11:16
NGC4915	Gal	Vir	13h 01m 28s	-04°32'45"	11.9	00:07	05:57	11:48
NGC4995	Gal	Vir	13h 09m 41s	-07°50'00"	11.0	00:24	06:05	11:47
M53	Glob	Com	13h 12m 55s	+18°10'07"	8.5	23:14	06:09	13:03
NGC5026	Gal	Cen	13h 14m 14s	-42°57'41"	13.0	02:41	06:10	09:39
NGC5047	Gal	Vir	13h 15m 49s	-16°31'08"	13.0	00:55	06:12	11:28
NGC5053	Glob	Com	13h 16m 27s	+17°41'52"	9.8	23:19	06:12	13:05
NGC5139	Glob	Cen	13h 26m 47s	-47°28'53"	3.7	03:27	06:23	09:19

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

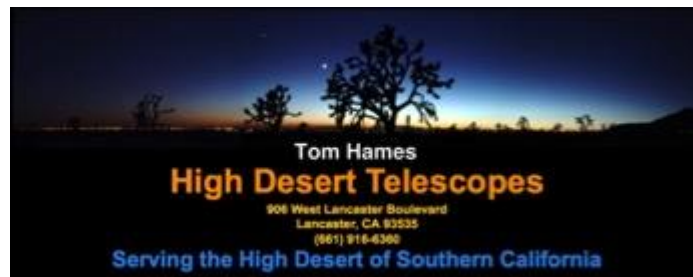


Woodland Hills Camera

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