



Desert Sky Observer

Volume 33

Antelope Valley Astronomy Club Newsletter

February 2013

Up-Coming Events

- February 2:** Prime Desert Woodlands Moon Walk @ [Prime Desert Woodlands](#)
February 8: Club Meeting*
February 9: Dark Sky Star Party @ [Lee's Church Site/Lee's Flats](#)
February 27: Acton Library Astronomy Lecture Series @ [Acton Library](#)

* Monthly meetings are held at the S.A.G.E. Planetarium on the Cactus School campus 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

Don Bryden

I'd like to start out by welcoming our new board and committee members. Frank Moore is your new Vice President and Pam Grove has replaced him as Secretary. Thanks also to Gin Reed and Rose Moore for continuing in their roles as Treasurer and Director of Community Development. I'd like to thank the continued support of our committee chairs:

Deb Eaves is heading up the "Youth Exploring Astronomy" essay contest while Matt Leone is our Lunar Club leader. Bill Grove is also continuing in the role of Librarian. Big thanks, too, to our webmaster and DSO editor, Steve Trotta! Steve puts this newsletter together each month and gives us an awesome presence on the web. Thanks to all!

Next, I'd like to draw your attention to the calendar. It's filling up fast so plan ahead and join us for some moonwalks or dark sky star parties. Most notably we have a star party at Lee's Flats (60th west and Rosamond Blvd.) on Saturday, the 9th of February and our third Prime Desert Woodlands Moonwalk on the 2nd of March. Some dates to save include April 6th – our annual Messier Marathon and April 20-21 – the Poppy Festival.

Speaking of the Messier Marathon, we'll be out at Saddleback Butte once again. We have the group site from Saturday the 6th of April through the next day. We'll have a little cookout, too, so come out and have a bite to eat and look for some faint fuzzies. Anyone who makes it past midnight will get bacon!

So bundle up and head outside. I hope to see you all out among the stars!



Vice President

Frank Moore

I don't know how others feel, but I thoroughly enjoyed Jeff Zweerink's presentation on the "Multiverse" at the last AVAC meeting. Still trying to wrap your head around it? I know I am.

Which theory do you lean toward? The "Ginormous Universe" theory where there are other regions the same size as our observable universe, and governed by the same laws of physics we use, that are beyond what any instrument can see? What amazes me, is that we will never be able to see beyond the Observable Universe, no matter how advanced our instruments, because light hasn't had time to travel any farther than what our most advanced instruments can already see. The "Narnian Theory", where there are other universes inside bubbles where inflation ceased and which may have other physical laws? What about the "Quantum Mechanical Multiverse" (ala "Back to The Future") where there are other universes generated by the different possible outcomes of each quantum mechanical event? What about the "Everything's Possible" multiverse that encompasses "all of the above" and then some?

Judging by the questions, it stirred up the intellectual juices in the minds in a lot of our members and guests. Speaking of guests, I want to thank you all for the great turnout we had and Lee Bush in particular for bringing so many guests. It was wonderful to see so many full, and so few empty, seats at the SAGE Planetarium.

Unfortunately, I have nothing to report in regard to a guest speaker for the February meeting. I have at least a dozen requests in the wind to various public and private organizations, agencies, and aerospace firms but no commitments for February at this time. If we don't have an outside speaker, we'll probably tap into the knowledge of someone within our own group or see what dome show delights Jeremy may be able to show us. I'll follow up with an email as soon as I know for sure. As I noted at the meeting, we have Mike Simmons, the President of Astronomers Without Borders on tap for the May 10 meeting.

On January 31, the next [Globe At Night](#) observing period begins running till February 9. I encourage everyone to participate since the map they generate gives a real view of the night sky conditions, and level of light pollution, across many regions of globe. As I said at the meeting, even if you have terrible conditions at home, with a street light across the street or shopping center around the corner, please report your readings of YOUR night sky conditions to Globe At Night. Knowledge is power and the knowledge gained will empower various organizations in their quest to preserve, and even improve, Dark Skies throughout our region and the world.



Director of Community Development

Rose Moore

Remember, at this time of year if coming out to any star parties or outreach, to dress in layers, stay warm, and stay hydrated!

February starts with a Prime Desert Moon Walk with Jeremy starting at 6:30pm on Saturday February 2nd. Come out and share looking through the telescopes with the public, or take the Moon Walk. Dress warm!!

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On Wednesday, February 27th, is an Acton Library Lecture series with Jeremy on 'The Care and Feeding of Your Telescope' at 6:30pm. You may bring your own telescope or just attend the lecture for some helpful information!

Coming up on Saturday, March 2nd is another PDW Moon Walk with Jeremy at 6:30 pm. Bring telescopes for observing!

Other events coming up are the Messier Marathon April 6th, more Moon Walks, Space Day April 19th, the Poppy Festival April 20-21st, and more dark sky star parties! Stay tuned for any additions to the calendar such as school or other outreach events!

Stay warm!

Space Place

The Art of Space Imagery

By Diane K. Fisher



This image of M101 combines images from four different telescopes, each detecting a different part of the spectrum. Red indicates infrared information from Spitzer's 24-micron detector, and shows the cool dust in the galaxy. Yellow shows the visible starlight from the Hubble telescope. Cyan is ultraviolet light from the Galaxy Evolution Explorer space telescope, which shows the hottest and youngest stars. And magenta is X-ray energy detected by the Chandra X-ray Observatory, indicating incredibly hot activity, like accretion around black holes.

When you see spectacular space images taken in infrared light by the Spitzer Space Telescope and other non-visible-light telescopes, you may wonder where those beautiful colors came from? After all, if the telescopes were recording infrared or ultraviolet light, we wouldn't see anything at all. So are the images "colorized" or "false colored"?

No, not really. The colors are translated. Just as a foreign language can be translated into our native language, an image made with light that falls outside the range of our seeing can be "translated" into colors we can see. Scientists process these images so they can not only see them, but they can also tease out all sorts of information the light can reveal. For example, wisely done color translation can reveal relative temperatures of stars, dust, and gas in the images, and show fine structural details of galaxies and nebulae.

Spitzer's Infrared Array Camera (IRAC), for example, is a four-channel camera, meaning that it has four different detector arrays, each measuring light at one particular wavelength. Each image from each detector array resembles a grayscale image, because the entire detector array is responding to only one wavelength of light. However, the relative brightness will vary across the array.

So, starting with one detector array, the first step is to determine what is the brightest thing and the darkest thing in the image. Software is used to pick out this dynamic range and to re-compute the value of each pixel. This process produces a grey-scale image. At the end of this process, for Spitzer, we will have four grayscale images, one for each for the four IRAC detectors.

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Matter of different temperatures emit different wavelengths of light. A cool object emits longer wavelengths (lower energies) of light than a warmer object. So, for each scene, we will see four grayscale images, each of them different.

Normally, the three primary colors are assigned to these gray-scale images based on the order they appear in the spectrum, with blue assigned to the shortest wavelength, and red to the longest. In the case of Spitzer, with four wavelengths to represent, a secondary color is chosen, such as yellow. So images that combine all four of the IRAC's infrared detectors are remapped into red, yellow, green, and blue wavelengths in the visible part of the spectrum.

Download a new Spitzer poster of the center of the Milky Way. On the back is a more complete and colorfully-illustrated explanation of the "art of space imagery." Go to spaceplace.nasa.gov/posters/#milky-way.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Astrophoto of The Month



The Moon and Jupiter by Don Bryden.

Snapped on Monday 1/21/2013. Nikon D300 at prime focus through a Stellarvue SV-105 refractor. 1/200 second exposure, ISO 200.

News Headlines

NASA's Veteran Mars Rover Ready to Start 10th Year

NASA's Mars Exploration Rover Opportunity, one of the twin rovers that bounced to airbag-cushioned safe landings on Mars nine years ago this week, is currently examining veined rocks on the rim of an ancient crater. Opportunity has driven 22.03 miles (35.46 kilometers) since it landed in the Meridiani Planum region of Mars on Jan. 24, 2004, PST (Jan. 25, Universal Time). Its original assignment was to keep working for three months, drive about 2,000 feet (600 meters) and provide the tools for researchers to investigate whether the area's environment had ever been wet.

<http://www.jpl.nasa.gov/news/news.php?release=2013-030>

Astronomers discover largest known structure in the universe

Astronomers have discovered the largest known structure in the universe - a group of quasars so large it would take 4 billion years to cross it while traveling at speed of light. The immense scale also challenges Albert Einstein's Cosmological Principle, the assumption that the universe looks the same from every point of view, researchers said.

<http://news.yahoo.com/astronomers-discover-largest-known-structure-universe-011926696.html>

NASA's Kepler telescope finds 461 potential new planets

NASA's Kepler mission Monday announced the discovery of 461 new planet candidates. Four of the potential new planets are less than twice the size of Earth and orbit in their sun's "habitable zone," the region in the planetary system where liquid water might exist on the surface of a planet. Based on observations conducted from May 2009 to March 2011, the findings show a steady increase in the number of smaller-size planet candidates and the number of stars with more than one candidate.

<http://www.jpl.nasa.gov/news/news.php?release=2013-005>

Approaching comet may outshine the moon

A comet blazing toward Earth could outshine the full moon when it passes by at the end of next year - if it survives its close encounter with the sun. The recently discovered object, known as comet ISON, is due to fly within 1.2 million miles (1.9 million km) from the center of the sun on Nov. 28, 2013 said astronomer Donald Yeomans, head of NASA's Near Earth Object Program at the Jet Propulsion Laboratory in Pasadena, Calif.

<http://www.reuters.com/article/2012/12/28/space-comet-idUSL1E8NS5AL20121228>

Baffling pulsar leaves astronomers in the dark

New observations of a highly variable pulsar using the European Space Agency's (ESA) XMM-Newton are perplexing astronomers. Monitoring this pulsar simultaneously in X-rays and radio waves, astronomers have revealed that this source, whose radio emission is known to switch on and off periodically, exhibits the same behavior, but in reverse, when observed at X-ray wavelengths.

<http://www.astronomy.com/en/News-Observing/News/2013/01/Baffling%20pulsar%20leaves%20astronomers%20in%20the%20dark.aspx>

NASA'S Webb Telescope Team Completes Optical Milestone

Engineers working on NASA's James Webb Space Telescope met another milestone recently with they completed performance testing on the observatory's aft-optics subsystem at Ball Aerospace & Technologies Corp's facilities in Boulder, Colo. Ball is the principal subcontractor to Northrop Grumman for the optical technology and lightweight mirror system. "Completing Aft Optics System performance testing is significant because it means all of the telescope's mirror systems are ready for integration and testing," said Lee Feinberg.

http://www.nasa.gov/mission_pages/webb/news/aft-optics.html

February Sky Data

Last Qtr Feb 3 New Feb 9 First Qtr Feb 17 Full Feb 25

**Best time for deep sky observing this month:
February 1 through February 13**



Mercury reaches eastern elongation on the 17th and will provide us with our best evening views of the planet this year. As the month begins, it shines at magnitude -1.1 but still hard to spot in the twilight. As the month progresses its brightness will fall to +1.5.

Venus is now passing behind the Sun and, with an elevation of just 3 degrees as the Sun sets on February 1st will be almost impossible to spot. It will reach superior conjunction, when it lies directly behind the Sun, on the 30th of March, so will not be visible again until towards the end of May.

Mars, having just moved into Aquarius, is still visible low in the west after sunset. It can just be seen at an elevation of about 6 degrees in the southwest 45 minutes after sunset on Feb 1st but, by month's end, will have been lost in the Sun's glare.

Jupiter, in the constellation of Taurus, the Bull, is now high in the southern sky after sunset and crosses the meridian at 07:45 UT. By month's end it will transit at sunset so will be just west of south as darkness falls. When due south, it will lie some 60 degrees above the horizon.

Saturn, lying in Libra, rises at 01:00 UT as February begins and by 11:30 UT by month's end and will transit before dawn at an elevation of 25 degrees. Its magnitude remains almost constant at +0.5. As February begins, Saturn will be at ~90 degrees in angle from the Sun and so will then be side-lit and showing the shadow of the planet on the rings

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
2/1/2013	23:15	09:42	06:49	17:21
2/5/2013	02:28	12:51	06:46	17:25
2/10/2013	06:37	18:21	06:41	17:30
2/15/2013	09:33	23:23	06:36	17:35
2/20/2013	13:13	02:47	06:31	17:40
2/25/2013	17:59	06:00	06:25	17:44
2/28/2013	21:07	07:44	06:21	17:47

Planet Data

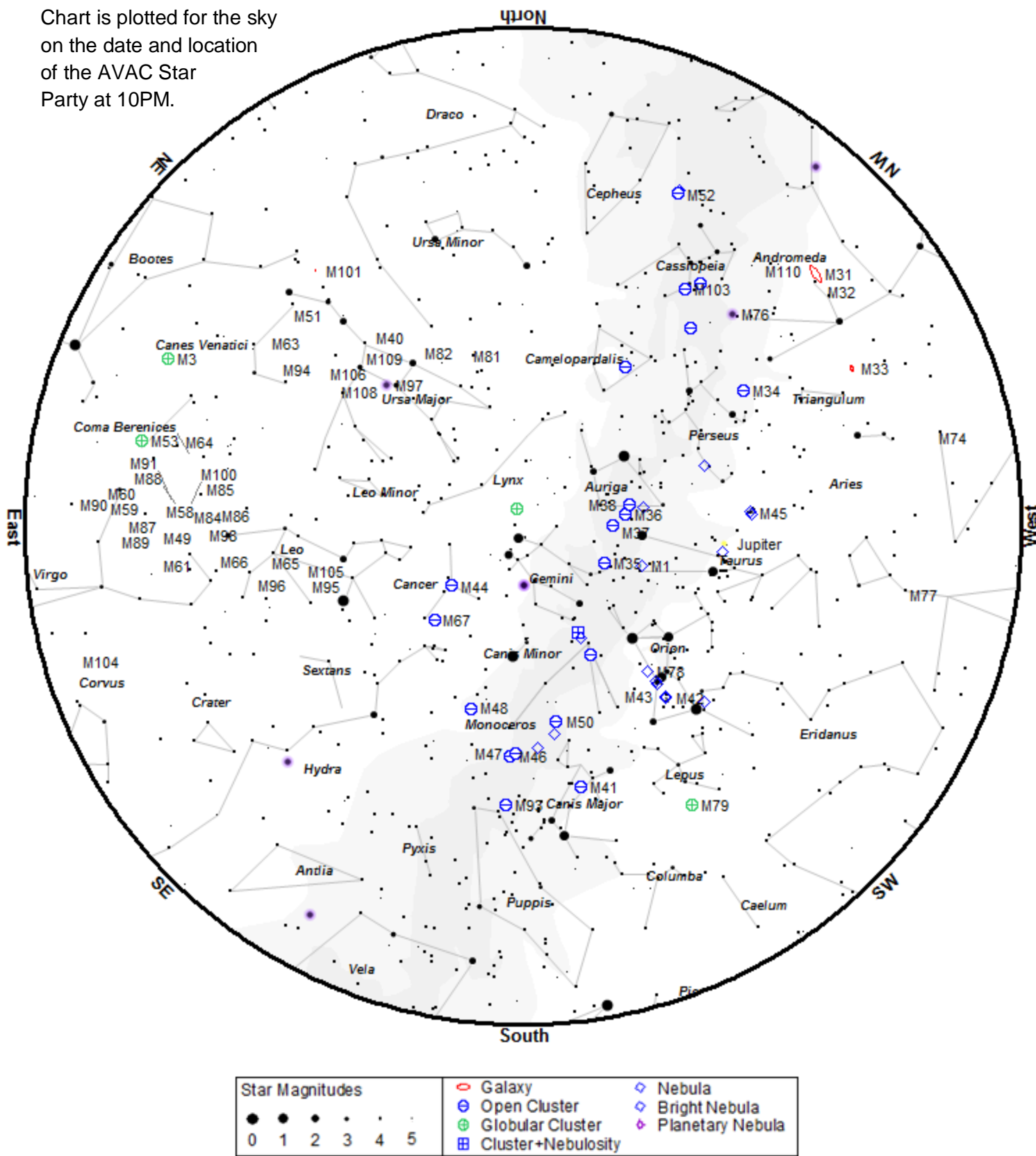
	Feb 1			
	Rise	Transit	Set	Mag
Mercury	07:24	12:48	18:13	-1.1
Venus	06:03	11:12	16:18	-3.9
Mars	07:38	13:12	18:44	1.2
Jupiter	12:11	19:20	02:28	-2.6
Saturn	00:08	05:38	11:09	0.5

	Feb 15			
	Rise	Transit	Set	Mag
Mercury	07:17	13:12	19:06	-0.6
Venus	06:07	11:28	16:48	-3.9
Mars	07:12	12:58	18:42	1.2
Jupiter	11:14	18:26	01:35	-2.4
Saturn	23:14	04:44	10:15	0.5

	Feb 28			
	Rise	Transit	Set	Mag
Mercury	06:17	12:25	18:26	3.3
Venus	06:04	11:40	17:15	-3.9
Mars	06:47	12:45	18:40	1.2
Jupiter	10:26	17:39	00:49	-2.4
Saturn	22:22	03:53	09:23	0.4

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 best time to observe the object. The difficulty column describes how difficult it is to observe the object from the current location on a perfect night in a 6 inch Newtonian telescope.

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
NGC 7790	Open	7.2	Cas	23h58m24.0s	+61°12'30"	18:31	18:54	20:29	easy
NGC 7789	Open	7.5	Cas	23h57m24.0s	+56°42'30"	18:38	18:54	19:52	difficult
M 110	Gal	8.9	And	00h40m22.3s	+41°41'09"	18:38	18:54	20:03	detectable
M 32	Gal	8.9	And	00h42m41.8s	+40°51'58"	18:35	18:54	20:25	easy
M 31	Gal	4.3	And	00h42m44.3s	+41°16'07"	18:35	18:55	20:28	easy
M 33	Gal	6.4	Tri	01h33m50.9s	+30°39'36"	18:38	18:56	20:26	detectable
M 77	Gal	9.7	Cet	02h42m40.8s	-00°00'48"	18:36	18:56	20:34	detectable
M 103	Open	6.9	Cas	01h33m23.0s	+60°39'00"	18:29	18:57	22:01	obvious
NGC 457	Open	5.1	Cas	01h19m35.0s	+58°17'12"	18:31	18:57	21:41	easy
M 76	PNe	10.1	Per	01h42m19.9s	+51°34'31"	18:35	18:57	20:58	detectable
NGC 752	Open	6.6	And	01h57m41.0s	+37°47'06"	18:43	18:57	19:39	challenging
NGC 559	Open	7.4	Cas	01h29m31.0s	+63°18'24"	18:32	18:57	22:06	easy
NGC 637	Open	7.3	Cas	01h43m04.0s	+64°02'24"	18:29	18:58	22:21	obvious
NGC 663	Open	6.4	Cas	01h46m09.0s	+61°14'06"	18:32	18:58	22:15	easy
M 34	Open	5.8	Per	02h42m05.0s	+42°45'42"	18:33	18:58	21:50	detectable
Heart	Neb	6.5	Cas	02h33m52.0s	+61°26'50"	18:32	18:59	23:04	challenging
NGC 957	Open	7.2	Per	02h33m21.0s	+57°33'36"	18:32	18:59	22:43	easy
NGC 884	Open	4.4	Per	02h22m18.0s	+57°08'12"	18:30	18:59	22:41	obvious
NGC 869	Open	4.3	Per	02h19m00.0s	+57°07'42"	18:28	18:59	22:37	obvious
NGC 1027	Open	7.4	Cas	02h42m40.0s	+61°35'42"	18:37	19:00	21:57	detectable
NGC 1245	Open	7.7	Per	03h14m42.0s	+47°14'12"	18:33	19:00	22:46	challenging
NGC 1342	Open	7.2	Per	03h31m38.0s	+37°22'36"	18:33	19:01	22:20	detectable
M 45	Open	1.5	Tau	03h47m00.0s	+24°07'00"	18:29	19:01	22:53	obvious
NGC 1444	Open	6.4	Per	03h49m25.0s	+52°39'30"	18:27	19:03	23:57	obvious
NGC 1502	Open	4.1	Cam	04h07m50.0s	+62°19'54"	18:26	19:07	00:41	obvious
NGC 1528	Open	6.4	Per	04h15m23.0s	+51°12'54"	18:32	19:07	23:56	easy
Hyades	Open	0.8	Tau	04h26m54.0s	+15°52'00"	18:32	19:08	23:11	easy
NGC 1647	Open	6.2	Tau	04h45m55.0s	+19°06'54"	18:36	19:18	22:36	detectable
NGC 1664	Open	7.2	Aur	04h51m06.0s	+43°40'30"	18:31	19:22	00:18	easy
NGC 1746	Open	6.1	Tau	05h03m50.0s	+23°46'12"	18:36	19:35	23:02	detectable
M 38	Open	6.8	Aur	05h28m40.0s	+35°50'54"	18:34	19:59	00:07	detectable
M 1	Neb	8.4	Tau	05h34m30.0s	+22°01'00"	18:45	20:05	21:58	challenging
M 43	Neb	9.0	Ori	05h35m30.0s	-05°16'00"	18:33	20:06	23:16	challenging
M 42	Neb	4.0	Ori	05h35m18.0s	-05°23'00"	18:31	20:06	23:15	easy
M 36	Open	6.5	Aur	05h36m18.0s	+34°08'24"	18:30	20:07	00:58	easy
M 78	Neb	8.0	Ori	05h46m48.0s	+00°05'00"	18:33	20:17	23:48	challenging
M 37	Open	6.2	Aur	05h52m18.0s	+32°33'12"	18:31	20:22	01:05	easy
NGC 2129	Open	7.0	Gem	06h01m07.0s	+23°19'20"	18:28	20:31	01:06	obvious

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
NGC 2169	Open	7.0	Ori	06h08m24.0s	+13°57'54"	18:29	20:39	00:49	obvious
NGC 2175	Open	6.8	Ori	06h09m39.0s	+20°29'12"	18:35	20:40	00:18	detectable
M 35	Open	5.6	Gem	06h09m00.0s	+24°21'00"	18:33	20:39	00:55	easy
NGC 2237	Neb	5.5	Mon	06h32m02.0s	+04°59'10"	18:33	21:02	00:46	challenging
NGC 2264	Open	4.1	Mon	06h40m58.0s	+09°53'42"	18:33	21:11	01:12	easy
NGC 2301	Open	6.3	Mon	06h51m45.0s	+00°27'36"	18:34	21:22	00:53	easy
M 50	Open	7.2	Mon	07h02m42.0s	-08°23'00"	18:45	21:33	00:28	detectable
NGC 2353	Open	5.2	Mon	07h14m30.0s	-10°16'00"	18:57	21:45	00:32	easy
NGC 2355	Open	9.7	Gem	07h16m59.0s	+13°45'00"	19:07	21:47	00:27	difficult
NGC 2360	Open	9.1	CMa	07h17m43.0s	-15°38'30"	20:26	21:48	23:09	challenging
NGC 2392	PNe	8.6	Gem	07h29m10.8s	+20°54'42"	18:29	22:00	02:27	obvious
M 47	Open	4.3	Pup	07h36m35.0s	-14°29'00"	19:43	22:06	00:32	obvious
NGC 2423	Open	7.0	Pup	07h37m06.0s	-13°52'18"	19:38	22:07	00:34	easy
M 46	Open	6.6	Pup	07h41m46.0s	-14°48'36"	19:50	22:12	00:33	detectable
NGC 2506	Open	8.9	Mon	08h00m01.0s	-10°46'12"	20:37	22:30	00:24	challenging
M 44	Open	3.9	Cnc	08h40m24.0s	+19°40'00"	19:08	23:10	03:13	easy
M 67	Open	7.4	Cnc	08h51m18.0s	+11°48'00"	20:32	23:21	02:11	detectable
M 82	Gal	9.0	UMa	09h55m52.4s	+69°40'47"	18:45	00:26	05:32	detectable
M 81	Gal	7.8	UMa	09h55m33.1s	+69°03'56"	18:49	00:26	05:30	detectable
NGC 3227	Gal	11.5	Leo	10h23m30.6s	+19°51'54"	21:58	00:53	03:48	difficult
M 97	PNe	9.7	UMa	11h14m47.7s	+55°01'09"	21:27	01:44	05:28	detectable
M 65	Gal	10.1	Leo	11h18m55.7s	+13°05'32"	22:32	01:48	05:06	detectable
M 66	Gal	9.7	Leo	11h20m14.9s	+12°59'30"	22:28	01:50	05:11	detectable
M 106	Gal	9.1	CVn	12h18m57.6s	+47°18'13"	22:48	02:49	05:33	detectable
Col 256	Open	2.9	Com	12h25m06.0s	+26°06'00"	22:33	02:54	05:38	easy
M 84	Gal	10.1	Vir	12h25m03.9s	+12°53'12"	23:41	02:55	05:31	detectable
M 86	Gal	9.8	Vir	12h26m12.2s	+12°56'44"	23:57	02:56	05:28	detectable
M 49	Gal	9.3	Vir	12h29m46.8s	+08°00'01"	23:45	02:59	05:32	detectable
M 87	Gal	9.6	Vir	12h30m49.2s	+12°23'29"	23:44	03:00	05:33	detectable
NGC 4565	Gal	10.1	Com	12h36m20.8s	+25°59'15"	00:01	03:06	05:29	difficult
M 104	Gal	9.1	Vir	12h39m59.3s	-11°37'22"	00:29	03:09	05:31	detectable
M 94	Gal	8.7	CVn	12h50m53.1s	+41°07'12"	22:55	03:20	05:36	detectable
M 64	Gal	9.3	Com	12h56m43.8s	+21°41'00"	23:44	03:26	05:36	detectable
NGC 5195	Gal	10.5	CVn	13h29m59.6s	+47°15'58"	00:03	03:59	05:35	detectable
M 51	Gal	8.7	CVn	13h29m52.3s	+47°11'40"	23:17	03:59	05:38	easy
M 3	Glob	6.3	CVn	13h42m11.0s	+28°22'42"	00:08	04:11	05:38	detectable
M 101	Gal	8.4	UMa	14h03m12.4s	+54°20'53"	00:35	04:32	05:35	detectable
M 5	Glob	5.7	Ser	15h18m34.0s	+02°05'00"	02:22	05:09	05:37	easy
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	02:27	05:13	05:38	easy
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	02:45	05:15	05:38	easy
NGC 6543	PNe	8.3	Dra	17h58m33.4s	+66°37'59"	02:11	05:16	05:46	obvious
M 12	Glob	6.1	Oph	16h47m14.0s	-01°56'48"	03:54	05:16	05:37	easy
M 10	Glob	6.6	Oph	16h57m09.0s	-04°06'00"	04:12	05:17	05:34	detectable

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.

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