ANTELOPE VALLEY ASTRONOMY CLUB, INC.

Desert Sky Observer

Volume 36 | **Antelope Valley Astronomy Club Newsletter** | **March 2016**

Up-Coming Events

March 5: Dark Sky Star Party
March 11: Club Meeting*
March 26: Prime Desert Moonwalk

* 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

El Nino…wherefore art though?

Even though it sometimes messes with our astronomy events, somebody needs to bump that high pressure ridge out of the way so we can get some more rain around here. We started off with a bang but kind of petered out and we still need drought relief.

For those who missed it, Jeremy Amarant showed off some neat new technologies at our meeting at the SAGE Planetarium on February 12. Evans & Sutherland, the make of the Digistar 5 system in use at the SAGE planetarium, now has a "Cloud" service that allows Digistar users to post, download, and share content created for their planetarium shows. It's like having access to dozens of planetariums and planetarium directors online. Jeremy showed us content created by planetariums from across the country. Perhaps the neatest was a show on the history of the constellations featuring wonderful musical compositions by the astronomer and narrator himself. It was a great history and tour of the constellations in their various forms and by various illustrators. I look forward to seeing many more of these shows.

Another new capability for the SAGE is the ability to receive and host lectures, including with a question and answer session, via Skype. Jeremy has installed a camera in the front of the dome that will allow distant guest speakers to see and hear the audience in the planetarium and take their questions.

On February 13 we once again had an outreach presence at the Los Angeles County Science Olympiad at Antelope Valley College. We had the Coronado hydrogen-solar telescope set up through which we shared views of some great solar prominences that grew better and better, and bigger and more prolific, as the day progressed. We also had our C-11 set up through which shared views of sunspots and, later, the 34% waxing crescent moon. We knew Venus was out there but, try as we might, we could not find it in the daylight that day. We also had the display board set up with updated and current content for that day which answered some questions about what the kids were seeing and, more importantly, elicited even more questions. The exclamation of the day came from a five year old who squealed, "That's really weird" while viewing the moon in daylight. In celebration of Valentine's Day the next day, she was sucking on a big, pink heart, sucker. Later, she came back with her mom to show mom the "weird" daytime view of the moon. Thank you to Don Bryden who set up and manned the Sunspotter throughout the day, Judy Fuentes and her grandson Mauricio , Darrell Bennett, and Ann C for helping out and hanging out with us.

We also had a great turnout of members with telescopes for the Prime Desert Woodland Moonwalk on Saturday February 27. Rose and I had our C-11, Darrell Bennett had his 12" Meade LX-90, Bob Ayres had his 10" Meade SCT, Ellen Mahler had her 6" Orion dob, Robert Lynch had his 12" Orion dob, and Matt Leone had his 16" dobsonian telescope aka "Mr. Water Heater". Tom Hames made the rounds answering questions and helping out with all of the telescopes. As a candidate for the annual, "Making the best out a bad situation award", Matt Leone forgot the hinge pins which hold his dobsonian mount together and he used….golf tees in their place. The weather kind of sucker punched on this one. We had some scattered clouds at dusk, it cleared off just as Jeremy started the walk, but then started to cloud over just as the walk ended. Still, we were able to share the Andromeda Galaxy, the Orion Nebula, The Pleiades, a few clusters, and Jupiter with the public before we lost the sky. In typical fashion, it cleared off entirely just as we started breaking down and packing up. The next Prime Desert Woodland Moonwalk will be on Saturday March 26 and the schedule for the rest of the year is as follows:

March 26 @ 7:30 p.m
April 23 @ 8 p.m
May 14 @ 8 p.m
June 4 @ 8:30 p.m
July 23 @ 8:30 p.m
August 27 @ 8 p.m,
September 17 @ 7:30 p.m
October 22 @ 6:30 p.m
November 19 @ 6 p.m
December 3 @ 5:30 p.m.

Don't forget to save Saturday April 2 for the Messier Marathon at Chuchupate (Lockwood Valley). If you haven't been there yet, you really owe it to yourself to check it out since it's not as far as Mt. Pinos, almost as dark, and has wide open horizons. It's a great spot for observing through telescopes or just kicking back and looking at the stars and Milky Way.

Vice President

Bill Schebeck

So much is going on; magnetic waves have been detected, NASA gave a million dollar grant to the folks in the physics department at UC Santa Barbara to develop a new propulsion system that may allow us to send a probe to Mars in three days, Jupiter will be in opposition on March 8th. Wow!!

If the weather stays warm and the sky clear, it will be a good time to check the position Jupiter's moons on a nightly basis. The moons will do interesting transits and may be eclipsed by the planet. Jupiter will be bright (magnitude -2.5) so it should be easy to find.

Just a reminder, we are supporting the double star Workshop in Apple Valley March 4-6. This is also our star party for the month. In Astronomy Magazine, Glenn Chapel's column "Observing Basics", he wrote an article "Run a Double Star Marathon" that suggests observing 100 double stars vs a Messier Marathon. There is a list on page 58, but he suggests, many of the double stars are near Messier objects. He claims all one needs s 2.5" scope to observe all the double stars on the list.

See you at the meeting.

Secretary

Rose Moore

After sending out an email to members, we have decided to book a trip to the Mt. Wilson 60 inch! The date is on a Friday, due to many Saturday dates already booked, or conflicts with some of our club schedule. Our date is Friday, September 23rd for a 1/2 night session. Cost will be approximately $35 per person. I will be bringing the sign up sheet starting at the next meeting for those who would like to sign up in the available slots, or be on the standby list.

We finally heard from the City of Lancaster with regards to the Poppy Festival. This is scheduled for the weekend of April 16th and 17th. However, I have sent Nicole an email with several questions. Her email stated: 'The aerospace vendors are going to be in our Adventure Zone, which we are turning into a hands-on, interactive experience for kids. It is one of our most populated areas! Please note that your set-up will be on grass.' So this means we will not be in our usual area. I explained to her that our telescopes are not 'hands on'. And I expressed concern that, because most of those who look through our scopes are adults, we may be missing a lot of adults stopping by. I asked her for clarification on some issues such as: will we have ample area to set up our scopes, will we have an area to park our trailer where we store our scopes Saturday night, etc. I will keep you all informed as to her answers and our status.

Clear skies!

Space Place

The Closest New Stars To Earth

By Ethan Siegel

When you think about the new stars forming in the Milky Way, you probably think of the giant star-forming regions like the Orion Nebula, containing thousands of new stars with light so bright it's visible to the naked eye. At over 400 parsecs (1,300 light years) distant, it's one of the most spectacular sights in the night sky, and the vast majority of the light from galaxies originates from nebulae like this one. But its great luminosity and relative proximity makes it easy to overlook the fact that there are a slew of much closer star-forming regions than the Orion Nebula; they're just much, much fainter.

If you get a collapsing molecular cloud many hundreds of thousands (or more) times the mass of our sun, you'll get a nebula like Orion. But if your cloud is only a few thousand times the sun's mass, it's going to be much fainter. In most instances, the clumps of matter within will grow slowly, the neutral matter will block more light than it reflects or emits, and only a tiny fraction of the stars that form—the most massive, brightest ones—will be visible at all. Between just 400 and 500 light years away are the closest such regions to Earth: the molecular clouds in the constellations of Chamaeleon and Corona Australis. Along with the Lupus molecular clouds (about 600 light years distant), these dark, light-blocking patches are virtually unknown to most sky watchers in the northern hemisphere, as they're all southern hemisphere objects.

In visible light, these clouds appear predominantly as dark patches, obscuring and reddening the light of background stars. In the infrared, though, the gas glows brilliantly as it forms new stars inside. Combined near-infrared and visible light observations, such as those taken by the Hubble Space Telescope, can reveal the structure of the clouds as well as the young stars inside. In the Chameleon cloud, for example, there are between 200 and 300 new stars, including over 100 X-ray sources (between the Chamaeleon I and II clouds), approximately 50 T-Tauri stars and just a couple of massive, B-class stars. There's a third dark, molecular cloud (Chamaeleon III) that has not yet formed any stars at all.

While the majority of new stars form in large molecular clouds, the closest new stars form in much smaller, more abundant ones. As we reach out to the most distant quasars and galaxies in the universe, remember that there are still star-forming mysteries to be solved right here in our own backyard.

Image credit: NASA and ESA Hubble Space Telescope. Acknowledgements: Kevin Luhman (Pennsylvania State University), and Judy Schmidt, of the Chamaeleon cloud and a newly-forming star within it—HH 909A—emitting narrow streams of gas from its poles. (click image for a larger view)

News Headlines

Gravitational Waves Detected 100 Years After Einstein's Prediction
For the first time, scientists have observed ripples in the fabric of spacetime called gravitational waves, arriving at the earth from a cataclysmic event in the distant universe. This confirms a major prediction of Albert Einstein's 1915 general theory of relativity and opens an unprecedented new window onto the cosmos.
https://www.ligo.caltech.edu/news/ligo20160211

2016 RTMC Astronomy Expo is coming!! May 26-30, 2016
The theme this year is "Fun With Our Sun," celebrating the observation and science of our nearest star. We will have speakers on solar science and solar telescopes to view the sun in various wave-lengths. Our Beginners' Corner activities will involve the family in safe solar observation and, of course, we have our Beginners' Star Party at night.
http://www.rtmcastronomyexpo.org/general.html

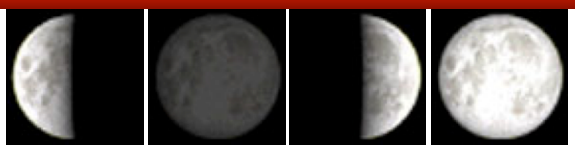
NASA Astronaut Scott Kelly Returns Safely to Earth after One-Year Mission
NASA astronaut and Expedition 46 Commander Scott Kelly and his Russian counterpart Mikhail Kornienko returned to Earth Tuesday after a historic 340-day mission aboard the International Space Station. They landed in Kazakhstan at 11:26 p.m. EST. "Scott Kelly's one-year mission aboard the International Space Station has helped to advance deep space exploration and America's Journey to Mars," said NASA Administrator Charles Bolden. "Scott has become the first American astronaut to spend a year in space, and in so doing, helped us take one giant leap toward putting boots on Mars."
http://www.nasa.gov/press-release/nasa-astronaut-scott-kelly-returns-safely-to-earth-after-one-year-mission

Radio burst from a remote galaxy
For the first time, astronomers have identified the location of a mysteriously fast radio burst: it is located in an elliptical galaxy, approx. six billion light years away. In addition, the signal delay allowed the team – including scientists from the Max Planck Institute for Radio Astronomy – to conduct a measurement of matter in the universe. Their findings confirm current cosmological models.
http://www.mpg.de/10325398/host-galaxy-radio-burst?filter_order=LT&research_topic=PA-A_PA-AP

SpaceX launches SES-9 satellite to GEO; but booster landing fails
SpaceX on Friday blasted off its Falcon 9 rocket carrying a communications satellite to a distant orbit, before attempting to land the first stage of the rocket on an ocean platform.
However, SpaceX said it failed again Friday to land its Falcon 9 rocket on an ocean platform after launch, following a successful mission to propel a communications satellite to a distant orbit.
http://www.spacedaily.com/reports/SpaceX_launches_SES_9_satellite_to_GEO_999.html

China to Relocate Thousands for World's Largest Radio Telescope
China is building the world's largest radio telescope, and will have to move almost 10,000 people from the vicinity to guarantee the telescope's effectiveness. The telescope, called the Five-hundred-meter Aperture Spherical Telescope (FAST), will be completed in September, 2016. At 500 meters in diameter, it will surpass the workhorse Arecibo radio observatory in Puerto Rico, which is 305 meters in diameter.
http://www.universetoday.com/127451/china-to-relocate-thousands-for-worlds-largest-radio-telescope/

March Sky Data



Best time for deep sky observing this month:
March 1 through March 11

Mercury passes behind the Sun (superior conjunction) on the 23rd so this is not a good month to observe it.

Venus rises in the east-southeast about an hour before sunrise as March begins but only about 25 minutes by month's end. It magnitude stays steady at -3.9 as it slips into the sun' glare. A low horizon will be needed to spot it before it becomes hidden behind the Sun in April.

Mars is best seen due south before dawn but will be only ~19 degrees above the horizon. It increases in magnitude from +0.2 to -0.5 during the month as the angular size of its disk increases from 8.7 up to 11.7 arc seconds. Given good seeing some features on the disk should now be visible.

Jupiter reaches opposition on the 8th of March, so this is a superb month to observe it. It starts March shining at at magnitude -2.5, dropping slightly to -2.4 as the month progresses. The size of its disk falls slightly from 44.4 to 43.7 arc seconds as March progresses.

Saturn rises around midnight and will be high enough in the south-south-east before dawn to make out the beautiful ring system which has now opened out to ~26 degrees - virtually as open as they ever become. Its diameter increases from 16.5 to 17.4 arc seconds during the month as its magnitude increases from +0.5 to +0.4.

There are no major **meteor-showers** in March, but we may see a handful of meteors from the Virginid shower, which is usually active during March and April; they appear to radiate outwards from the constellation of Virgo.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
3/1/2016	00:12	10:57	06:19	17:48
3/5/2016	03:39	14:29	06:14	17:51
3/10/2016	07:17	20:08	06:08	17:56
3/15/2016	12:11	01:29	07:01	19:00
3/20/2016	16:50	05:20	06:54	19:03
3/25/2016	21:19	08:05	06:47	19:07
3/31/2016	01:40	12:17	06:39	19:12

Planet Data

Mar 1

	Rise	Transit	Set	Mag
Mercury	05:36	11:02	16:25	-0.4
Venus	05:08	10:30	15:51	-3.9
Mars	23:41	04:55	10:09	0.2
Jupiter	18:09	00:31	06:54	-2.5
Saturn	01:02	06:08	11:14	0.5

Mar 15

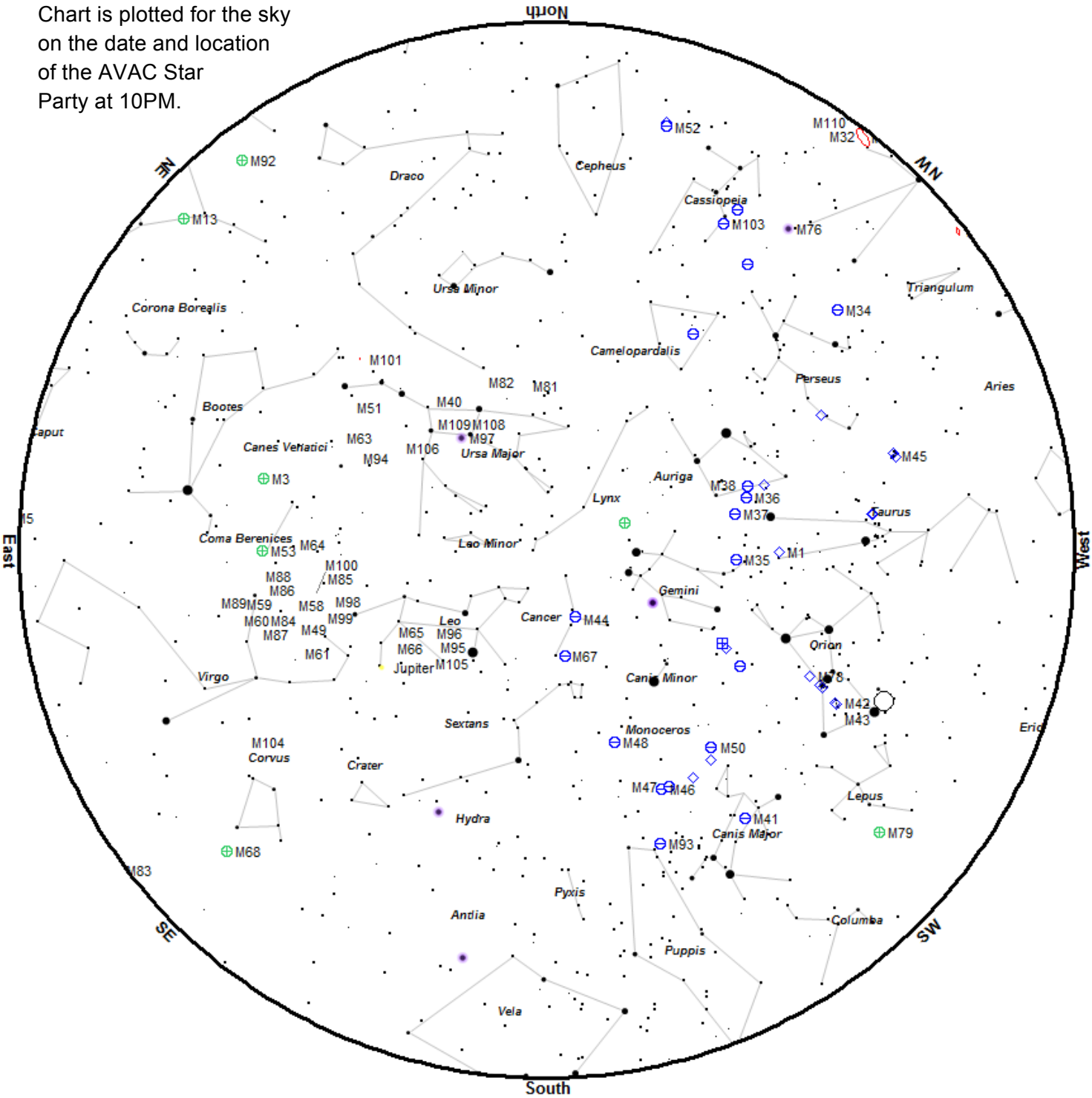
	Rise	Transit	Set	Mag
Mercury	07:46	13:36	19:27	-1.1
Venus	07:05	12:43	18:19	-3.9
Mars	01:09	06:20	11:31	-0.1
Jupiter	19:05	01:30	07:54	-2.5
Saturn	02:08	07:14	12:21	0.4

Mar 31

	Rise	Transit	Set	Mag
Mercury	07:57	14:26	20:58	-1.5
Venus	06:55	12:54	18:51	-3.9
Mars	00:26	05:33	10:41	-0.5
Jupiter	17:53	00:20	06:46	-2.4
Saturn	01:05	06:12	11:18	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.



Star Magnitudes		
0 1 2 3 4 5	Galaxy	Nebula
	Open Cluster	Bright Nebula
	Globular Cluster	Planetary Nebula
	Cluster+Nebulosity	

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	Con	RA 2000	Dec 2000	Mag	Begin	Optimum	Best	Difficulty
NGC 1851	Glob	Col	05h14m06.0s	-40°02'48"	7.1	19:00	19:13	19:40	difficult
M 77	Gal	Cet	02h42m40.8s	-00°00'48"	9.7	19:01	19:16	19:50	detectable
M 33	Gal	Tri	01h33m50.9s	+30°39'36"	6.4	19:03	19:17	19:21	detectable
NGC 7790	Open	Cas	23h58m24.0s	+61°12'30"	7.2	18:58	19:17	21:01	easy
M 76	PNe	Per	01h42m19.9s	+51°34'31"	10.1	19:03	19:19	20:14	detectable
NGC 752	Open	And	01h57m41.0s	+37°47'06"	6.6	18:59	19:19	19:59	challenging
NGC 559	Open	Cas	01h29m31.0s	+63°18'24"	7.4	18:58	19:20	20:30	easy
M 103	Open	Cas	01h33m23.0s	+60°39'00"	6.9	18:57	19:20	20:27	obvious
NGC 457	Open	Cas	01h19m35.0s	+58°17'12"	5.1	18:58	19:20	20:08	obvious
NGC 637	Open	Cas	01h43m04.0s	+64°02'24"	7.3	18:55	19:21	20:48	obvious
NGC 663	Open	Cas	01h46m09.0s	+61°14'06"	6.4	18:59	19:21	20:42	easy
M 34	Open	Per	02h42m05.0s	+42°45'42"	5.8	19:01	19:21	20:54	easy
NGC 957	Open	Per	02h33m21.0s	+57°33'36"	7.2	19:00	19:21	21:19	easy
NGC 884	Open	Per	02h22m18.0s	+57°08'12"	4.4	18:56	19:21	21:07	obvious
NGC 869	Open	Per	02h19m00.0s	+57°07'42"	4.3	18:56	19:21	21:04	obvious
NGC 1027	Open	Cas	02h42m40.0s	+61°35'42"	7.4	19:03	19:22	21:14	detectable
Heart Neb	Neb	Cas	02h33m52.0s	+61°26'50"	6.5	19:08	19:22	20:06	challenging
NGC 1245	Open	Per	03h14m42.0s	+47°14'12"	7.7	18:59	19:22	21:36	challenging
NGC 1342	Open	Per	03h31m38.0s	+37°22'36"	7.2	19:01	19:22	21:14	detectable
M 45	Open	Tau	03h47m00.0s	+24°07'00"	1.5	18:57	19:22	21:19	obvious
NGC 1444	Open	Per	03h49m25.0s	+52°39'30"	6.4	18:54	19:23	22:24	obvious
NGC 1647	Open	Tau	04h45m55.0s	+19°06'54"	6.2	19:02	19:23	21:17	detectable
NGC 1528	Open	Per	04h15m23.0s	+51°12'54"	6.4	18:59	19:24	22:36	easy
M 43	Neb	Ori	05h35m30.0s	-05°16'00"	9.0	19:06	19:24	20:45	difficult
NGC 1746	Open	Tau	05h03m50.0s	+23°46'12"	6.1	19:01	19:24	21:37	detectable
NGC 1502	Open	Cam	04h07m50.0s	+62°19'54"	4.1	18:52	19:25	23:07	obvious
NGC 1664	Open	Aur	04h51m06.0s	+43°40'30"	7.2	18:58	19:25	22:52	easy
M 42	Neb	Ori	05h35m18.0s	-05°23'00"	4.0	19:00	19:25	21:41	easy
M 1	Neb	Tau	05h34m30.0s	+22°01'00"	8.4	19:04	19:26	21:17	difficult
M 78	Neb	Ori	05h46m48.0s	+00°05'00"	8.0	19:06	19:26	20:57	difficult
M 38	Open	Aur	05h28m40.0s	+35°50'54"	6.8	18:59	19:27	22:41	detectable
M 36	Open	Aur	05h36m18.0s	+34°08'24"	6.5	18:56	19:27	23:26	easy
M 37	Open	Aur	05h52m18.0s	+32°33'12"	6.2	18:56	19:28	23:29	easy
NGC 2129	Open	Gem	06h01m07.0s	+23°19'20"	7.0	18:54	19:29	23:32	obvious
NGC 2169	Open	Ori	06h08m24.0s	+13°57'54"	7.0	18:54	19:29	23:15	obvious
M 35	Open	Gem	06h09m00.0s	+24°21'00"	5.6	18:57	19:30	23:23	easy
NGC 2175	Open	Ori	06h09m39.0s	+20°29'12"	6.8	18:59	19:30	22:48	detectable
NGC 2237	Neb	Mon	06h32m02.0s	+04°59'10"	5.5	19:08	19:35	21:25	challenging

ID	Cls	Con	RA 2000	Dec 2000	Mag	Begin	Optimum	Best	Difficulty
NGC 2264	Open	Mon	06h40m58.0s	+09°53'42"	4.1	18:56	19:40	23:37	easy
M 41	Open	CMa	06h46m01.0s	-20°45'24"	5.0	18:58	19:42	21:18	easy
NGC 2301	Open	Mon	06h51m45.0s	+00°27'36"	6.3	18:58	19:47	23:18	easy
M 50	Open	Mon	07h02m42.0s	-08°23'00"	7.2	19:00	19:57	22:54	detectable
NGC 2353	Open	Mon	07h14m30.0s	-10°16'00"	5.2	18:55	20:09	22:57	easy
NGC 2360	Open	CMa	07h17m43.0s	-15°38'30"	9.1	19:11	20:12	21:37	challenging
NGC 2355	Open	Gem	07h16m59.0s	+13°45'00"	9.7	19:04	20:12	22:53	difficult
NGC 2392	PNe	Gem	07h29m10.8s	+20°54'42"	8.6	18:53	20:24	00:53	obvious
NGC 2423	Open	Pup	07h37m06.0s	-13°52'18"	7.0	18:59	20:32	23:01	easy
M 47	Open	Pup	07h36m35.0s	-14°29'00"	4.3	18:57	20:32	22:57	obvious
NGC 2439	Open	Pup	07h40m45.0s	-31°41'36"	7.1	19:01	20:35	22:44	detectable
M 46	Open	Pup	07h41m46.0s	-14°48'36"	6.6	19:00	20:37	23:00	detectable
NGC 2440	PNe	Pup	07h41m55.4s	-18°12'31"	11.5	19:04	20:37	22:36	detectable
M 93	Open	Pup	07h44m30.0s	-23°51'24"	6.5	19:42	20:39	21:36	easy
NGC 2451	Open	Pup	07h45m23.0s	-37°57'21"	3.7	19:03	20:40	22:33	easy
NGC 2477	Open	Pup	07h52m10.0s	-38°31'48"	5.7	19:06	20:47	22:33	easy
NGC 2506	Open	Mon	08h00m01.0s	-10°46'12"	8.9	19:12	20:54	22:50	difficult
NGC 2547	Open	Vel	08h10m09.0s	-49°12'54"	5.0	20:38	21:05	21:32	challenging
NGC 2546	Open	Pup	08h12m15.0s	-37°35'42"	5.2	19:58	21:07	22:15	difficult
NGC 2571	Open	Pup	08h18m56.0s	-29°45'00"	7.4	19:09	21:13	23:27	detectable
M 44	Open	Cnc	08h40m24.0s	+19°40'00"	3.9	18:59	21:35	01:38	easy
M 67	Open	Cnc	08h51m18.0s	+11°48'00"	7.4	19:09	21:46	00:41	detectable
M 81	Gal	UMa	09h55m33.1s	+69°03'56"	7.8	19:02	22:50	04:30	detectable
M 82	Gal	UMa	09h55m52.4s	+69°40'47"	9.0	19:01	22:51	04:46	detectable
NGC 3132	PNe	Vel	10h07m01.8s	-40°26'11"	8.2	21:15	23:01	00:47	easy
NGC 3228	Open	Vel	10h21m22.0s	-51°43'42"	6.4	22:28	23:16	00:04	challenging
NGC 3227	Gal	Leo	10h23m30.6s	+19°51'54"	11.5	20:12	23:18	02:23	difficult
NGC 3242	PNe	Hya	10h24m46.1s	-18°38'32"	8.6	21:24	23:19	01:14	obvious
M 97	PNe	UMa	11h14m47.7s	+55°01'09"	9.7	19:45	00:09	04:29	detectable
M 65	Gal	Leo	11h18m55.7s	+13°05'32"	10.1	20:48	00:13	03:38	detectable
M 66	Gal	Leo	11h20m14.9s	+12°59'30"	9.7	20:51	00:14	03:39	detectable
M 106	Gal	CVn	12h18m57.6s	+47°18'13"	9.1	21:10	01:13	04:55	detectable
M 84	Gal	Vir	12h25m03.9s	+12°53'12"	10.1	22:03	01:19	04:31	detectable
M 86	Gal	Vir	12h26m12.2s	+12°56'44"	9.8	22:21	01:20	04:19	detectable
M 49	Gal	Vir	12h29m46.8s	+08°00'01"	9.3	22:09	01:24	04:36	detectable
M 87	Gal	Vir	12h30m49.2s	+12°23'29"	9.6	22:07	01:25	04:39	detectable
NGC 4565	Gal	Com	12h36m20.8s	+25°59'15"	10.1	22:16	01:30	04:41	difficult
M 68	Glob	Hya	12h39m28.0s	-26°44'36"	7.3	23:31	01:33	03:36	detectable
M 104	Gal	Vir	12h39m59.3s	-11°37'22"	9.1	22:54	01:34	04:14	detectable
M 94	Gal	CVn	12h50m53.1s	+41°07'12"	8.7	21:19	01:45	05:02	detectable
M 64	Gal	Com	12h56m43.8s	+21°41'00"	9.3	22:07	01:51	04:59	detectable
M 51	Gal	CVn	13h29m52.3s	+47°11'40"	8.7	21:43	02:23	05:05	easy
NGC 5195	Gal	CVn	13h29m59.6s	+47°15'58"	10.5	22:23	02:24	05:00	detectable
M 3	Glob	CVn	13h42m11.0s	+28°22'42"	6.3	22:29	02:35	05:04	easy
M 101	Gal	UMa	14h03m12.4s	+54°20'53"	8.4	22:52	02:57	05:01	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.

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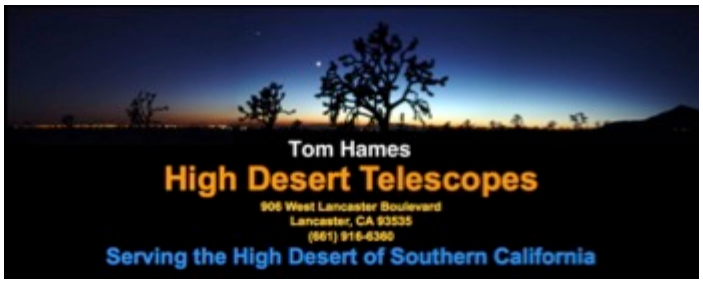

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