ANTELOPE VALLEY ASTRONOMY CLUB, INC.

Desert Sky Observer

Volume 35 *Antelope Valley Astronomy Club Newsletter* **April 2015**

Up-Coming Events

April 8: Quarterly Board Meeting
April 10: Club Meeting*
April 11: AVAC Beginner´s Astronomy Class
April 11: Prime Desert Moon Walk
April 18-19: Poppy Festival
April 22: Acton Library Astronomy Lecture Series
April 24: Youth/Teen Star Party for Edwards AFB

* 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

"All hands on deck! All hands on deck!"

That's the AVAC call of duty for the California Poppy Festival at Lancaster City Park on April 18th and 19th. As has been the AVAC tradition for as long as I can remember, we'll have a booth with interpretive displays and handouts of literature and astronomy and space related goodies. We'll also have a selection of telescopes showing views of the sun in white light and h-alpha and possibly Venus too. We have a core group of people who usually setup, takedown, and support two days of this event and they could sure use some help. Please consider helping out, or stopping by if only for a little while, to give them a little break or just to visit.

In spite of the threat of bad weather, we had a wonderful Messier Marathon on March 21. As is usual for Saddleback Butte State Park, it was windy at first, and clouds on the horizon threatened, but the wind died down to virtually nothing after dark and the clouds stayed away till around 1:00am. We had a decent turnout with around 15 club members (and a few guests) but the impressive part is that I think we had about ten telescopes. We didn't have a formal BBQ and picnic, though we had a grill on which folks could cook burgers and dogs and we still ended up with a potluck as everyone who came seemed to bring extra food and drink to share. The clouds stayed away long enough for Matt Leone to cook up the traditional midnight bacon snack as well.

Though we didn't promote it, it really turned out to be a great public outreach event as the campground hosts had been telling everyone in the park that we were going to be there. There was a 16 member Boy Scout troop camping and they all came over to look through the telescopes for a long time, as did dozens of other campers. Groups of campers, small and large, kept trickling in and out of our camp. A couple from Surrey, England, just RVing in the California desert, hung with Darrell Bennett and I for the longest time. A few of us shared views of many of the bigger and brighter Messier objects, as well as Jupiter with the

public while others went about the task of finding the objects on their Messier lists. Darrell shared views of the comet Lovejoy with the public much to their delight.

We have a near total lunar eclipse coming up for us in the early morning hours of Saturday April 4. I expect that we will be setting up to view this from the parking lot at the SAGE Planetarium. Details will be emailed to the membership and posted on the website and facebook page. Please check them for confirmation. Information on the eclipse is as follows if viewing from Los Angeles.

- Penumbral Eclipse begins at 2:03 am.
- Partial Eclipse begins at 3:17 am.
- Totality (or in our case maximum eclipse as it won't quite be total) begins at 5:00 am. Totality lasts for only 4-5 minutes.
- Moonset is at 6:41 am.
- The Partial Eclipse ends at 6:44 am....after moonset.

April is a busy month for us with other events including an Executive Board Meeting on Wednesday April 8, the regular AVAC General Meeting at the SAGE Planetarium on Friday April 10, a Beginner's Astronomy Class at the SAGE on Saturday April 11 at 2:00 pm, and a Prime Desert Woodland Preserve Moonwalk at 7:45 pm on April 11 as well.

We're putting on a Star Party for the youth of Edwards Air Force Base during their annual "Lock In" event on the night of Friday April 24 and could use as much help as we can get. Because it's on the base, we have special sign ups which are being handled by Kevin Reilly and Rose Moore. See them if you can help.

Remember, April is "Global Astronomy Month" and I invite every one of us to share our passion for astronomy with friends, family, neighbors, and the public in general. The "Global Star Party", in support of Global Astronomy Month, is scheduled for Saturday April 25. Because of our event at Edwards AFB on April 24, we're not going to also try to do something on April 25 so either come out to Edwards on the 24th, or have your own star party on the 25th and invite everyone you know to participate.

Vice President

Don Bryden

Our speaker for this month is Mark Brewer, a Research Technician for Caltech/Jet Propulsion Laboratory's Light Detection and Ranging (LIDAR) group at Table Mountain Facility. Mark is a student, studying Applied Physics at California State University, San Bernardino. He is also the Vice President and the Outreach Officer for the High Desert Astronomical Society (HiDAS). Mark hosts the Apple Valley Double Star Workshop, and co-hosts an event for eighth grade students called the Vanguard Double Star Workshop, as well as a team assistant for High Desert Research Initiative.

Mark will be talking about last year's double star workshop and have info on the upcoming 2015 workshop so come on out on April 10th and join us for a night at the SAGE with Frank, Jeremy and all the gang!

We have a lot of things going on this month as well. Most notably, we'll be out at the AV Poppy Festival once again during the weekend of April 18th and 19th. Please come by the booth and say "hi" or signup to work one or both days.

Although we won't really have a dark sky star party this month (du to the poppy festival) we will be out at Edwards AFB just before first quarter to have an outreach star party with the base youth group on the 24th. Just a few days before, the Lyrids meteor shower will peak so there should be a few bright ones that night as well. Other than the Lunar eclipse (which will have occurred just as or before you read this) there will be a nice conjunction of Venus and the Pleiades on the 11th of April. Luckily, this is the night of our Prime Desert Moonwalk so come out and look for an interloper among the seven sisters!

Secretary

Rose Moore

For those members who have signed up to support the event at Edwards AFB/Teen Star Party: at April's meeting there will be a special sign up sheet for the information that Kevin Reilly needs for you to get onto the base. Please come prepared to fill out the necessary information for Kevin, so that he can obtain clearance for base access. He will need: Driver's License or Gov't ID number, Visitor's Social Security number, and date of birth.

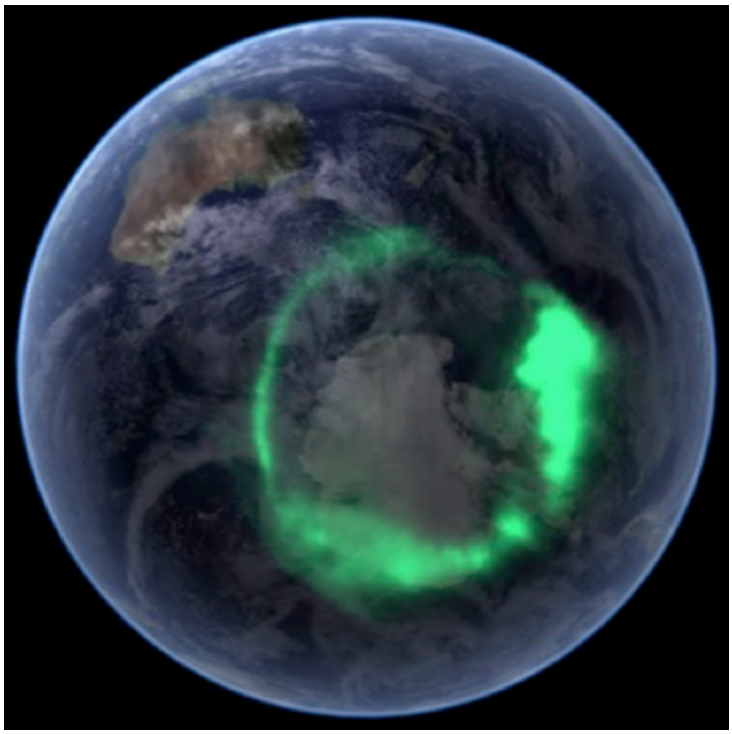
The EAFB Teen Star Party is scheduled for Friday, April 24th. Set up time is anytime from 6pm to dusk, and the star party starts just after sunset. There is an estimate for 50-60 teens at this time.

The Poppy Festival is this month, on April 18 & 19th, if you haven't signed but would like to, please sign up at April's meeting or let me know by phone or email!

Space Place

The Cold Never Bothered Me Anyway

By Ethan Siegel



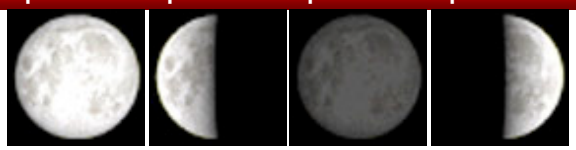
Auroral overlays from the IMAGE spacecraft.
Image credit: NASA Earth Observatory (Goddard Space Flight Center) / Blue Marble team.

For those of us in the northern hemisphere, winter brings long, cold nights, which are often excellent for sky watchers (so long as there's a way to keep warm!) But there's often an added bonus that comes along when conditions are just right: the polar lights, or the Aurora Borealis around the North Pole. Here on our world, a brilliant green light often appears for observers at high northern latitudes, with occasional, dimmer reds and even blues lighting up a clear night.

We had always assumed that there was some connection between particles emitted from the Sun and the aurorae, as particularly intense displays were observed around three days after a solar storm occurred in the direction of Earth. Presumably, particles originating from the Sun—ionized electrons and atomic nuclei like protons and alpha particles—make up the vast majority of the solar wind and get funneled by the Earth's magnetic field into a circle around its magnetic poles. They're energetic enough to knock electrons off atoms and molecules at various layers in the upper atmosphere—particles like molecular nitrogen, oxygen and atomic hydrogen. And when the electrons fall back either onto the atoms or to lower energy levels, they emit light of varying but particular wavelengths—oxygen producing the most common green signature, with less common states of oxygen and hydrogen producing red and the occasional blue from nitrogen.

But it wasn't until the 2000s that this picture was directly confirmed! NASA's Imager for Magnetopause-to-Aurora Global Exploration (IMAGE) satellite (which ceased operations in December 2005) was able to find out how the magnetosphere responded to solar wind changes, how the plasmas were energized, transported and (in some cases) lost, and many more properties of our magnetosphere. Planets without significant magnetic fields such as Venus and Mars have much smaller, weaker aurorae than we do, and gas giant planets like Saturn have aurorae that primarily shine in the ultraviolet rather than the visible. Nevertheless, the aurorae are a spectacular sight in the evening, particularly for observers in Alaska, Canada and the Scandinavian countries. But when a solar storm comes our way, keep your eyes towards the north at night; the views will be well worth braving the cold!

April Sky Data



Best time for deep sky observing this month:
April 7 through April 22

Mercury passes behind the Sun (superior conjunction) on the 10th of April, so cannot be seen until later in the month. By the 19th, shining at magnitude -1.4, it should become visible very low in the west-northwest about 45 minutes after the Sun has set.

Venus,is shining brightly at magnitude ~-4 all month and rises higher in the western sky after sunset as the month progresses. A telescope will show its angular size increasing from 14 to 16 arc seconds whilst it illuminated phase shrinks from 78% to 68%

Mars is now finally sinking down into the Sun's glare. It will lie close to, far brighter, Mercury around the 19th to 24th of the month. With an angular size of just 4 arc seconds, no details will be seen on its, near fully illuminated, salmon pink surface.

Jupiter is now two months past opposition and but this is still a good month to observe it - high in the south-western sky during the evening Its brightness falls slightly from magnitude -2.3 to -2.1 while its angular size drops from 41.5 to 38 arc seconds. Jupiter spends the month in Cancer, hardly moving as it ends its retrograde motion westwards on the 11th of the month and slowly begins its eastwards progress towards Leo.

Saturn now rises in the evening. Shining at magnitude +0.3 and brightening to +0.1 during the month it lies in Scorpius very close to the left hand star of the 'fan' that marks its head. Its diameter increases from 17.8 to 18.4 arc seconds as April progresses. The beautiful ring system has now opened out to ~25 degrees - virtually as open as they ever become.

The annual Lyrid **meteor shower** is active each year from about April 16 to 25. The peak of this shower – which tends to come in a burst and usually lasts for less than a day – will fall on the morning of April 22 or 23, with the nod going to the later date. The greatest number of meteors should fall during the few hours before dawn on either date. A waxing crescent moon will set in the evening on the days around the Lyrids' peak, leaving a dark for watching meteors.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
4/1/2015	17:01	05:06	06:38	19:13
4/5/2015	21:37	08:16	07:33	20:16
4/10/2015	01:19	11:55	07:26	20:20
4/15/2015	05:13	17:13	07:20	20:24
4/20/2015	08:49	22:50	07:13	20:28
4/25/2015	13:13	02:18	07:08	20:32
4/30/2015	17:41	05:10	07:02	20:36

Planet Data

Apr 1

	Rise	Transit	Set	Mag
Mercury	06:21	12:27	18:35	-1.1
Venus	08:13	15:15	22:17	-4.0
Mars	07:24	14:07	20:48	1.4
Jupiter	14:13	21:12	04:11	-2.4
Saturn	23:09	04:22	09:34	0.3

Apr 15

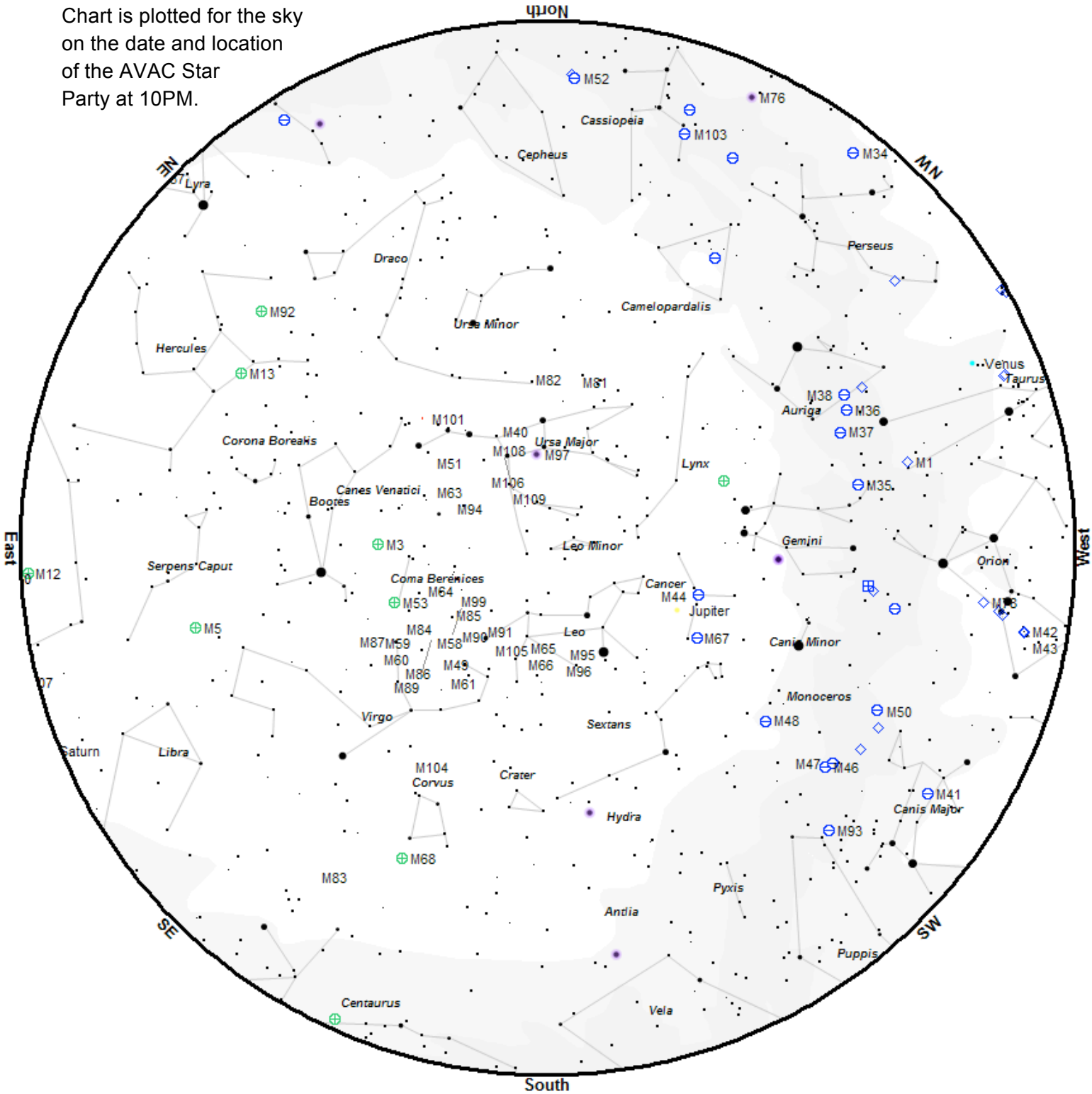
	Rise	Transit	Set	Mag
Mercury	06:33	13:15	20:00	-1.7
Venus	08:11	15:27	22:44	-4.1
Mars	06:58	13:51	20:43	1.4
Jupiter	13:18	20:17	03:16	-2.3
Saturn	22:11	03:24	08:37	0.2

Apr 31

	Rise	Transit	Set	Mag
Mercury	06:50	14:05	21:22	-0.3
Venus	08:16	15:42	23:10	-4.1
Mars	06:32	13:36	20:37	1.4
Jupiter	12:22	19:21	02:19	-2.2
Saturn	21:08	02:22	07:35	0.1

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 Saturday night closest to the new moon. 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	Best	End	Difficulty
IC 2395	Open	Vel	08h42m30.0s	-48°06'48"	4.6	20:33	20:43	20:59	detectable
NGC 2451	Open	Pup	07h45m23.0s	-37°57'21"	3.7	20:32	20:46	21:15	easy
NGC 2477	Open	Pup	07h52m10.0s	-38°31'48"	5.7	20:33	20:47	21:14	easy
NGC 2439	Open	Pup	07h40m45.0s	-31°41'36"	7.1	20:34	20:50	21:25	detectable
NGC 2546	Open	Pup	08h12m15.0s	-37°35'42"	5.2	20:40	20:50	21:04	difficult
M 93	Open	Pup	07h44m30.0s	-23°51'24"	6.5	20:35	20:54	21:55	easy
NGC 2571	Open	Pup	08h18m56.0s	-29°45'00"	7.4	20:35	20:54	21:53	detectable
NGC 2360	Open	CMa	07h17m43.0s	-15°38'30"	9.1	20:36	20:55	22:00	challenging
NGC 2440	PNe	Pup	07h41m55.4s	-18°12'31"	11.5	20:41	20:55	21:35	difficult
NGC 1746	Open	Tau	05h03m50.0s	+23°46'12"	6.1	20:43	20:56	21:23	detectable
M 50	Open	Mon	07h02m42.0s	-08°23'00"	7.2	20:38	20:56	21:04	detectable
NGC 2423	Open	Pup	07h37m06.0s	-13°52'18"	7.0	20:36	20:56	21:10	easy
M 1	Neb	Tau	05h34m30.0s	+22°01'00"	8.4	20:46	20:57	21:11	difficult
NGC 2169	Open	Ori	06h08m24.0s	+13°57'54"	7.0	20:35	20:57	21:26	obvious
NGC 2237	Neb	Mon	06h32m02.0s	+04°59'10"	5.5	20:37	20:57	21:24	challenging
NGC 2301	Open	Mon	06h51m45.0s	+00°27'36"	6.3	20:37	20:57	21:28	easy
NGC 2353	Open	Mon	07h14m30.0s	-10°16'00"	5.2	20:35	20:56	21:07	easy
M 47	Open	Pup	07h36m35.0s	-14°29'00"	4.3	20:35	20:56	21:07	obvious
M 46	Open	Pup	07h41m46.0s	-14°48'36"	6.6	20:39	20:57	21:09	detectable
NGC 2264	Open	Mon	06h40m58.0s	+09°53'42"	4.1	20:36	20:58	21:46	easy
NGC 1528	Open	Per	04h15m23.0s	+51°12'54"	6.4	20:39	20:58	22:03	easy
NGC 2129	Open	Gem	06h01m07.0s	+23°19'20"	7.0	20:35	20:58	21:41	obvious
NGC 2506	Open	Mon	08h00m01.0s	-10°46'12"	8.9	20:44	20:58	21:37	difficult
NGC 1664	Open	Aur	04h51m06.0s	+43°40'30"	7.2	20:39	20:59	21:15	easy
M 38	Open	Aur	05h28m40.0s	+35°50'54"	6.8	20:41	20:59	21:35	detectable
M 36	Open	Aur	05h36m18.0s	+34°08'24"	6.5	20:37	20:59	21:39	easy
M 37	Open	Aur	05h52m18.0s	+32°33'12"	6.2	20:37	20:59	21:52	easy
M 35	Open	Gem	06h09m00.0s	+24°21'00"	5.6	20:39	20:59	21:50	easy
NGC 2175	Open	Ori	06h09m39.0s	+20°29'12"	6.8	20:41	20:59	21:43	detectable
NGC 1502	Open	Cam	04h07m50.0s	+62°19'54"	4.1	20:33	21:00	21:16	obvious
NGC 2355	Open	Gem	07h16m59.0s	+13°45'00"	9.7	20:44	21:00	21:50	difficult
NGC 2392	PNe	Gem	07h29m10.8s	+20°54'42"	8.6	20:32	21:01	23:03	obvious
NGC 2393	Gal	Gem	07h30m04.6s	+34°01'40"	14.6	20:33	21:02	23:33	not visible
M 67	Open	Cnc	08h51m18.0s	+11°48'00"	7.4	20:41	21:05	23:00	detectable
M 44	Open	Cnc	08h40m24.0s	+19°40'00"	3.9	20:36	21:05	23:55	easy
NGC 3132	PNe	Vel	10h07m01.8s	-40°26'11"	8.2	20:33	21:13	22:55	easy
NGC 3132	PNe	Vel	10h07m01.8s	-40°26'11"	8.2	20:33	21:13	22:55	easy
M 82	Gal	UMa	09h55m52.4s	+69°40'47"	9.0	20:39	21:19	03:01	detectable

ID	Cls	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Difficulty
M 81	Gal	UMa	09h55m33.1s	+69°03'56"	7.8	20:39	21:19	02:42	detectable
NGC 3201	Glob	Vel	10h17m37.0s	-46°24'42"	6.9	20:36	21:22	22:34	not visible
NGC 3228	Open	Vel	10h21m22.0s	-51°43'42"	6.4	20:42	21:26	22:12	challenging
NGC 3227	Gal	Leo	10h23m30.6s	+19°51'54"	11.5	20:41	21:29	00:30	difficult
NGC 3242	PNe	Hya	10h24m46.1s	-18°38'32"	8.6	20:30	21:29	23:25	obvious
M 97	PNe	UMa	11h14m47.7s	+55°01'09"	9.7	20:40	22:19	02:39	detectable
M 65	Gal	Leo	11h18m55.7s	+13°05'32"	10.1	20:39	22:23	01:45	detectable
M 66	Gal	Leo	11h20m14.9s	+12°59'30"	9.7	20:40	22:24	01:46	detectable
M 106	Gal	CVn	12h18m57.6s	+47°18'13"	9.1	20:44	23:22	03:21	detectable
Coll 256	Open	Com	12h25m06.0s	+26°06'00"	2.9	20:39	23:28	03:44	easy
M 84	Gal	Vir	12h25m03.9s	+12°53'12"	10.1	20:45	23:29	02:43	detectable
M 86	Gal	Vir	12h26m12.2s	+12°56'44"	9.8	20:50	23:30	02:27	detectable
3C 273.0	QSO	Vir	12h29m06.7s	+02°03'08"	12.8	20:39	23:33	02:54	difficult
3C 273.0	QSO	Vir	12h29m06.7s	+02°03'08"	12.8	20:39	23:33	02:54	difficult
M 49	Gal	Vir	12h29m46.8s	+08°00'01"	9.3	20:46	23:33	02:46	detectable
M 87	Gal	Vir	12h30m49.2s	+12°23'29"	9.6	20:45	23:35	02:49	detectable
NGC 4565	Gal	Com	12h36m20.8s	+25°59'15"	10.1	20:49	23:40	02:52	difficult
M 68	Glob	Hya	12h39m28.0s	-26°44'36"	7.3	21:42	23:43	01:44	detectable
M 104	Gal	Vir	12h39m59.3s	-11°37'22"	9.1	21:04	23:44	02:24	detectable
M 94	Gal	CVn	12h50m53.1s	+41°07'12"	8.7	20:40	23:54	04:18	detectable
M 64	Gal	Com	12h56m43.8s	+21°41'00"	9.3	20:45	00:01	03:43	detectable
NGC 5128	Gal	Cen	13h25m27.7s	-43°01'07"	7.8	22:59	00:30	01:59	challenging
NGC 5139	Glob	Cen	13h26m46.0s	-47°28'36"	3.9	00:00	00:31	01:01	challenging
M 51	Gal	CVn	13h29m52.3s	+47°11'40"	8.7	20:43	00:33	04:53	easy
NGC 5195	Gal	CVn	13h29m59.6s	+47°15'58"	10.5	20:51	00:33	04:31	detectable
M 83	Gal	Hya	13h37m00.8s	-29°51'56"	7.8	22:38	00:41	02:44	detectable
M 3	Glob	CVn	13h42m11.0s	+28°22'42"	6.3	20:50	00:45	04:46	easy
M 101	Gal	UMa	14h03m12.4s	+54°20'53"	8.4	21:08	01:07	04:49	detectable
M 5	Glob	Ser	15h18m34.0s	+02°05'00"	5.7	22:58	02:22	05:00	easy
M 13	Glob	Her	16h41m41.0s	+36°27'36"	5.8	23:14	03:45	05:05	easy
M 92	Glob	Her	17h17m07.0s	+43°08'12"	6.5	23:41	04:16	05:04	easy
NGC 6543	PNe	Dra	17h58m33.4s	+66°37'59"	8.3	22:44	04:27	05:13	obvious

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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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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