



Desert Sky Observer

Volume 35

Antelope Valley Astronomy Club Newsletter

September 2015

Up-Coming Events

- September 11: Club Meeting*
- September 12: [Dark Sky Star Party](#)
- September 19: [Prime Desert Moon Walk](#)
- September 27: [Lunar Eclipse](#)

* 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

Greetings fellow star huggers, Our apologies if this newsletter reaches you a few days late this month but we had Steve hold off on publication while we were working out a few details for a few events this month.

I guess we should just jump right into the biggest one, As I assume most of you know, there is a Total Lunar Eclipse occurring the night of Sunday September 27, It's been hard to miss in the media since many "news" outlets have been hyping this with words like, "Super Blood Moon", etc, While I don't go along with much of what they publish what is "super" about this event is that the moon will already be partially eclipsed as it rises above the horizon, To accommodate for this, and to ensure that our view of the moonrise is not blocked by buildings or trees, we will be having our public outreach and eclipse viewing event at the Palmdale Learning Plaza (Division St & Avenue R) in lieu of at the SAGE Planetarium, We have had an event here in the past and it provides for a clear view to the east and south.

The spectacular moonrise will be occurring at approximately 6:39 PM with the moon already partially eclipsed (Sunset is at 6:43 pm). By 7:11 PM the moon will appear almost totally red. The peak of the eclipse, with the moon closest to the center of the Earth's shadow, will occur at approximately 7:47 with totality ending at approximately 8:23 PM. The Partial Eclipse will end at approximately 9:27 PM by which time we expect most of the public to have folded up their lawn chairs and headed for home. The penumbral eclipse will end at 10:22 PM.

Arrival time for telescope setup should be about 5:30 PM or earlier depending on how long it takes you to setup. Some of us (me included) will be arriving earlier to setup for solar observing before the eclipse event and to ensure we have the telescope field and traffic patterns clearly delineated. We will have access to restrooms and the club will be providing water, beverages, coffee, and snacks. This will be an "All Hands on Deck" type event for club members as we will be promoting it in local media and Facebook. We will be providing more details via email as the date approaches. In the meantime, information on the eclipse can be found here: <http://www.timeanddate.com/eclipse/in/usa/los-angeles>

Another club event will be a Dark Star Party on the night of Saturday September 12 at the Chuchupate observing site near Frazier Park. My apologies to those who may have gone up on August 15, and not found any of our club regulars there. Several of our dedicated astronomers were under the weather and the memorial service for my children's maternal grandfather (my ex-wife's dad) was held at the Bakersfield National Cemetery that day. I then had to take my daughter Hannah to LAX for her flight back to Portland, OR on Sunday, I will be at Chuchupate on the 12th with Ollie, the best behaved of our dogs, I think at least a few others will as well so come on up and see the stars....with or without telescope.

Also of interest to members will be that the Starlight Festival, formerly held at Big Bear in conjunction with RTMC, will be held at Oak Canyon Community Park in Oak Park, CA (Ventura County) on Saturday September 19 from 3:00 PM till 10:00 PM. This is sponsored, in large part, by AVAC sponsor Woodland Hills Camera and Telescopes and will feature exhibits by vendors and manufacturers as well as speakers, a BIG RAFFLE, and a public star party, Information can be found here: http://oakcanyonastro.com/starlight_festival.html

I want to thank you all of you who turned out for our event at the Exotic Feline Breeding Compound in Rosamond. It was a great success both for the AVAC as well as for the EFBC and their inaugural "Red Light Tour". 97 people toured the facility that night and we had even more who didn't take the "Cat House" tour but just came to see the stars. The viewing conditions were great and even with a first quarter moon we were able to show many deep sky objects. I had a great time and I hope everyone else who came out did as well.

Finally, and perhaps most importantly, the club meeting on Friday October 9 will be our Annual Business Meeting and Board Election. We really need YOU to come out for this meeting and participate in the governance of YOUR club. We really need YOU to consider serving in a board position and accepting if you are nominated for one, self-nominations are more than welcome. We need your nominations for members to serve in board positions. Most of the current board members have been serving for a very long time. Some have said they will not serve another term, and some may not live in the area in the ensuing year. Please consider doing your part.



Vice President

Don Bryden

If you came out to our star party at the Exotic Feline Breeding Compound then you may have met our speaker for this month. Nancy Vandermey has worked as a systems engineer at Edwards AFB and now works at JPL on the Cassini mission. She was also a Systems Engineer for the Sequence team on Galileo. Come out to the SAGE Planetarium on September 11th and hear Nancy speak!

The EFBC star party was a success to be sure although I think folks were most impressed with the twilight tours of the compound. Meanwhile, at the scopes, we could hear the big cats chuffing and roaring. It was very impressive. The stars weren't too bad either even with the first quarter moon.

Finally, make plans to come out Sunday the 27th of September to see an eclipsed moon rising. We'll be at the Palmdale Learning Center (unless we're at the SAGE or Poppy Reserve – stay tuned!) so come out with your scope and share the view with the public!

Space Place

Solar Wind Creates—and Whips—a Magnetic Tail Around Earth

By Ethan Siegel

As Earth spins on its axis, our planet's interior spins as well. Deep inside our world, Earth's metal-rich core produces a magnetic field that spans the entire globe, with the magnetic poles offset only slightly from our rotational axis. If you fly up to great distances, well above Earth's surface, you'll find that this magnetic web, called the magnetosphere, is no longer spherical. It not only bends away from the direction of the sun at high altitudes, but it exhibits some very strange features, all thanks to the effects of our parent star.

The sun isn't just the primary source of light and heat for our world; it also emits an intense stream of charged particles, the solar wind, and has its own intense magnetic field that extends much farther into space than our own planet's does. The solar wind travels fast, making the 150 million km (93 million mile) journey to our world in around three days, and is greatly affected by Earth. Under normal circumstances, our world's magnetic field acts like a shield for these particles, bending them out of the way of our planet and protecting plant and animal life from this harmful radiation.

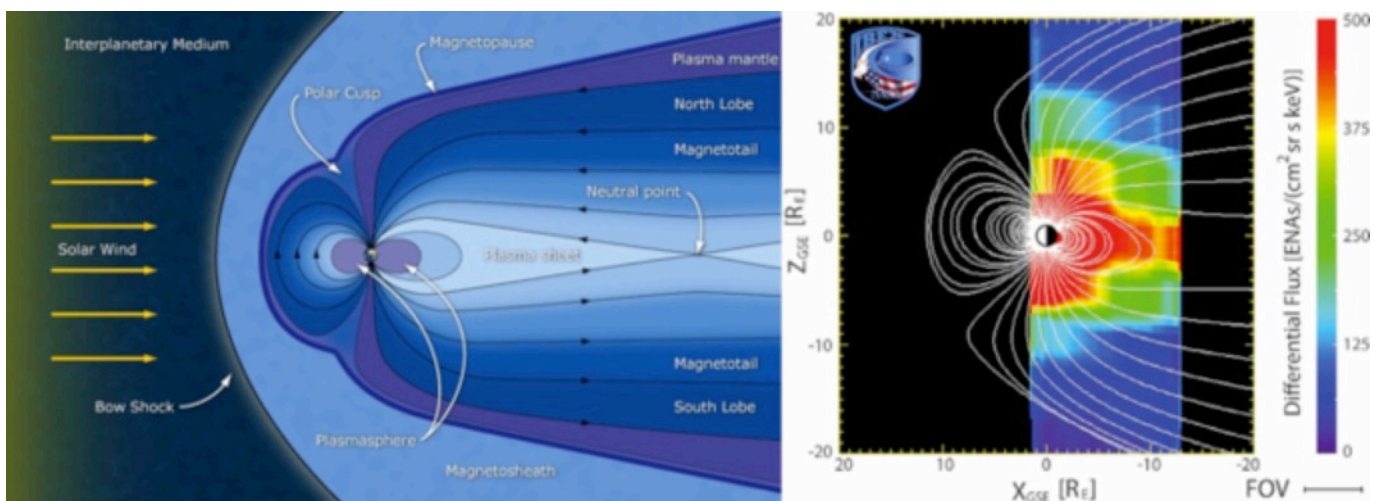


Image credit: ESA / C. T. Russell (L), of Earth's magnetic tail and its cause: the solar wind; Southwest Research Institute / IBEX Science Team (R), of the first image of the plasma sheet and plasmasphere created around Earth by the solar wind.

But for every action, there's an equal and opposite reaction: as our magnetosphere bends the solar wind's ions, these particles also distort our magnetosphere, creating a long magnetotail that not only flattens and narrows, but whips back-and-forth in the onrushing solar wind. The particles are so diffuse that collisions between them practically never occur, but the electromagnetic interactions create waves in Earth's magnetosphere, which grow in magnitude and then transfer energy to other particles. The charged particles travel within the magnetic field toward both poles, and when they hit the ionosphere region of Earth's upper atmosphere, they collide with ions of oxygen and nitrogen causing aurora. Missions such as the European Space Agency and NASA Cluster mission have just led to the first accurate model and understanding of equatorial magnetosonic waves, one such example of the interactions that cause Earth's magnetotail to whip around in the wind like so.

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The shape of Earth's magnetic field not only affects aurorae, but can also impact satellite electronics. Understanding its shape and how the magnetosphere interacts with the solar wind can also lead to more accurate predictions of energetic electrons in near-Earth space that can disrupt our technological infrastructure. As our knowledge increases, we may someday be able to reach one of the holy grails of connecting heliophysics to Earth: forecasting and accurately predicting space weather and its effects. Thanks to the Cluster Inner Magnetosphere Campaign, Van Allen Probes, Mars Odyssey Thermal Emission Imaging System, Magnetospheric Multiscale, and Heliophysics System Observatory missions, we're closer to this than ever before.

Kids can learn about how solar wind defines the edges of our solar system at NASA Space Place. <http://spaceplace.nasa.gov/interstellar>

Astrophoto of The Month



M33 by Don Bryden

LRGB taken Aug 15-19 from Two Goats Observatory with a Stellarvue SV-105 scope and a SBIG ST10-XME.

News Headlines

At Saturn, One of These Rings is not like the Others

When the sun set on Saturn's rings in August 2009, scientists on NASA's Cassini mission were watching closely. It was the equinox -- one of two times in the Saturnian year when the sun illuminates the planet's enormous ring system edge-on. The event provided an extraordinary opportunity for the orbiting Cassini spacecraft to observe short-lived changes in the rings that reveal details about their nature.

http://www.jpl.nasa.gov/news/news.php?feature=4709&utm_source=iContact&utm_medium=email&utm_campaign=NASAJPL&utm_content=daily20150902-3

NASA Soil Moisture Radar Ends Operations, Mission Science Continues

Mission managers for NASA's Soil Moisture Active Passive (SMAP) observatory have determined that its radar, one of the satellite's two science instruments, can no longer return data. However, the mission, which was launched in January to map global soil moisture and detect whether soils are frozen or thawed, continues to produce high-quality science measurements supporting SMAP's objectives with its radiometer instrument.

http://www.jpl.nasa.gov/news/news.php?feature=4710&utm_source=iContact&utm_medium=email&utm_campaign=NASAJPL&utm_content=daily20150902-3

Two Senators Seek GAO Review of NASA Commercial Cargo Contracts

Senators Cory Gardner (R-CO) and David Vitter (R-LA) are asking the Government Accountability Office (GAO) to undertake a "full review" of NASA's commercial cargo contracts. Both contractors, Orbital ATK and SpaceX, are recovering from launch failures that affected resupply of the International Space Station (ISS).

<http://www.spacepolicyonline.com/news/two-senators-seek-gao-review-of-nasa-commercial-cargo-contracts#.VeejG3jetGA.facebook>

The Curiosity rover spotted a 'floating spoon' on Mars

You've probably read about [the supposed woman on Mars](#), spotted in photos from NASA's rovers. Well, I've been over here rolling my eyes so hard they're in danger of falling out, because that's totally ridiculous. But have you heard about [the floating spoon](#)?

<http://www.washingtonpost.com/news/speaking-of-science/wp/2015/09/01/the-curiosity-rover-spotted-a-floating-spoon-on-mars/>

Question of the Day!

What is an X-ray telescope? How does it differ from other types of telescopes?

Answer! X-rays do not reflect off mirrors the same way that visible light does. Because of their high-energy, X-ray photons that strike a mirror directly will penetrate into the mirror in much the same way that bullets aimed directly at a surface will bury themselves in it. Likewise, just as a bullets can ricochet off a surface when they hit it at a grazing angle, so too will X-rays ricochet off mirrors if they hit at very shallow angles, like a stone skipping across the surface of a pond. These properties mean that X-ray telescopes must be very different from optical telescopes

http://chandra.harvard.edu/xray_astro/reflect/reflect.html

September Sky Data

Last Qtr Sep 5 New Sep 12 First Qtr Sep 21 Full Sep 27



**Best time for deep sky observing this month:
September 4 through September 16**

Mercury can be seen just above the western horizon for the first few days of the month. It will be a challenging object and will be lost in the twilight by mid-month before it passes in front of the Sun on the 30th.

Venus rises in the east-northeast in the pre-dawn sky an hour and a half before the Sun at the start of September but this increases to four hour by month's end as Venus moves further away in angle from the Sun. Shining at a magnitude which reaches -4.8 during the third week of the month it will show a thin crescent, 9% lit, with the phase increasing to 35% by months end.

Mars is a pre-dawn object; shining at magnitude +1.8 its disk is just 3.8 arc seconds across so no details will be seen of its surface. Seen best towards the end of the month, it will then rise around 3 hours before the Sun.

Having passed behind the Sun on the 26th of August, **Jupiter** is now a morning object rising shortly before the Sun at the beginning of September but increasingly earlier as the month progresses. So it will be best seen at month's end when it will lie some 18 degrees above the northeast horizon at sunrise.

Saturn can be seen after sunset low in the southwest. One hour after sunset at the start of the month it will lie just 10 degrees above the horizon so the atmosphere will limit our view. By month's end it will only be a few degrees elevation at this time so early this month is really our last chance to observe it for a month or so as it passes behind the Sun. The ring system, which has now opened out to 24.3 degrees to the line of sight, should still be seen along with Titan, its largest satellite.

There are no major **meteor-showers** in September, though there are various minor showers producing a few meteors an hour from radiants in Cassiopeia, Auriga, Aquarius and Pisces. But this is generally a good time of the year for seeing sporadic meteors, which may appear at any time, in any part of the sky.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
9/1/2015	22:29	10:42	07:24	20:18
9/5/2015	-----	14:56	07:27	20:13
9/10/2015	05:12	18:40	07:30	20:05
9/15/2015	09:40	21:22	07:34	19:58
9/20/2015	14:09	00:46	07:38	19:51
9/25/2015	18:12	04:49	07:41	19:44
9/30/2015	21:50	10:38	07:45	19:37

Planet Data

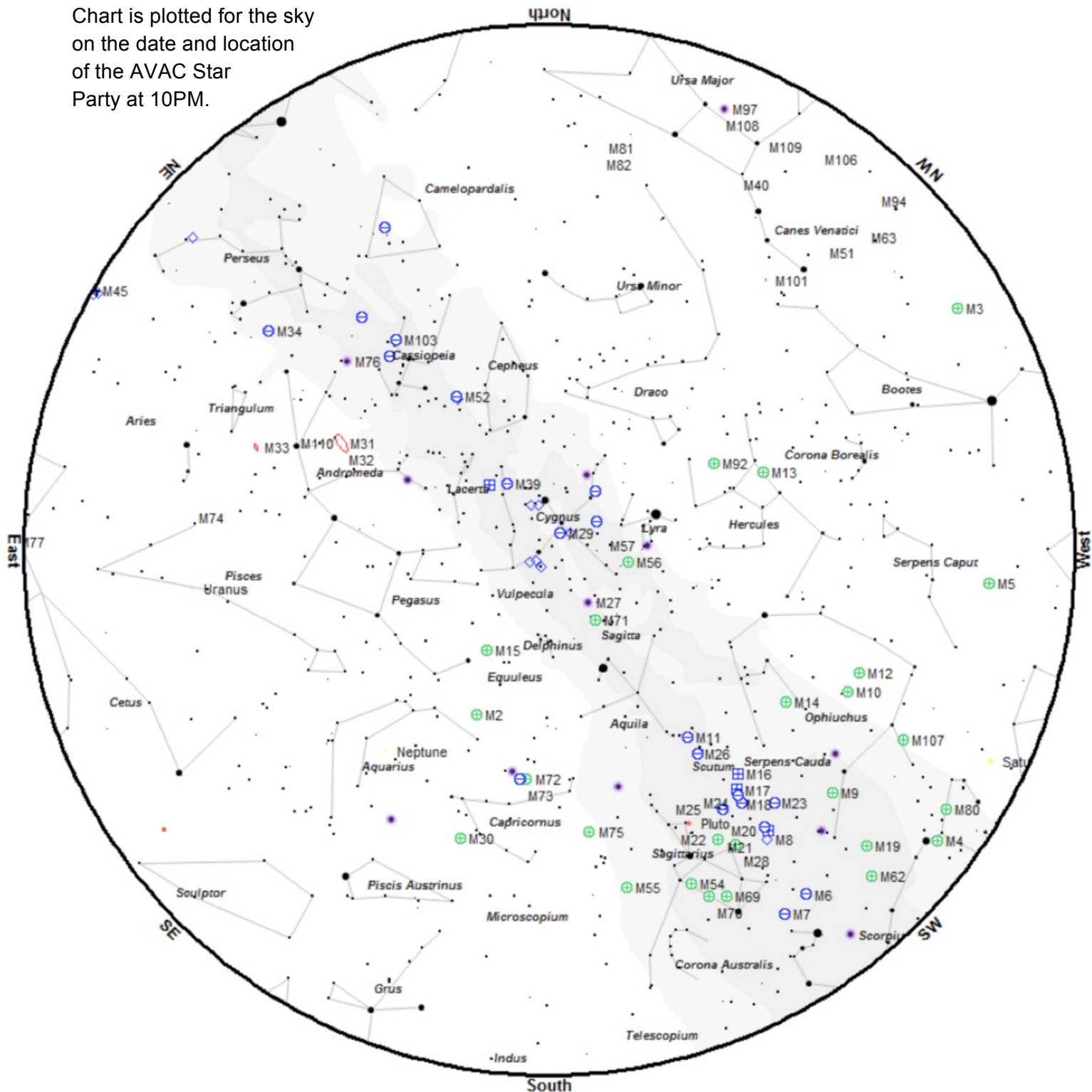
	Sep 1			
	Rise	Transit	Set	Mag
Mercury	08:33	14:33	20:32	0.2
Venus	04:36	11:10	17:48	-4.4
Mars	04:27	11:25	18:24	1.8
Jupiter	06:00	12:41	19:20	-1.7
Saturn	12:40	18:02	23:24	0.6

	Sep 15			
	Rise	Transit	Set	Mag
Mercury	08:22	14:10	19:56	0.8
Venus	03:45	10:24	17:05	-4.5
Mars	04:15	11:05	17:56	1.8
Jupiter	05:19	11:54	18:33	-1.7
Saturn	11:45	17:10	22:32	0.6

	Sep 31			
	Rise	Transit	Set	Mag
Mercury	06:36	12:41	18:38	5.1
Venus	03:21	10:00	16:39	-4.5
Mars	04:01	10:42	17:24	1.8
Jupiter	04:35	11:07	17:43	-1.8
Saturn	10:51	16:16	21:37	0.6

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.



<p>Star Magnitudes</p> <p>● ● ● ● ● ●</p> <p>0 1 2 3 4 5</p>	<p>Galaxy</p> <p>Open Cluster</p> <p>Globular Cluster</p> <p>Cluster+Nebulosity</p>	<p>Nebula</p> <p>Bright Nebula</p> <p>Planetary Nebula</p>
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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	Best	End	Difficulty
NGC 6322	Open	Sco	17h18m25.0s	-42°56'00"	6.5	20:12	20:28	21:14	easy
NGC 6388	Glob	Sco	17h36m17.0s	-44°44'06"	6.8	20:17	20:29	20:56	detectable
NGC 6541	Glob	CrA	18h08m02.0s	-43°42'54"	6.3	20:17	20:33	21:17	detectable
M 62	Glob	Oph	17h01m13.0s	-30°06'48"	6.4	20:17	20:33	21:23	detectable
M 19	Glob	Oph	17h02m38.0s	-26°16'06"	6.8	20:18	20:34	21:24	detectable
M 5	Glob	Ser	15h18m34.0s	+02°05'00"	5.7	20:19	20:35	21:24	easy
NGC 6383	Open	Sco	17h34m48.0s	-32°34'00"	5.4	20:15	20:35	21:52	easy
M 6	Open	Sco	17h40m20.0s	-32°15'12"	4.6	20:14	20:36	22:07	easy
M 7	Open	Sco	17h53m51.0s	-34°47'36"	3.3	20:14	20:35	22:01	easy
M 9	Glob	Oph	17h19m12.0s	-18°31'00"	7.8	20:20	20:37	21:01	detectable
M 101	Gal	UMa	14h03m12.4s	+54°20'53"	8.4	20:22	20:38	21:05	detectable
M 12	Glob	Oph	16h47m14.0s	-01°56'48"	6.1	20:17	20:38	21:45	easy
M 10	Glob	Oph	16h57m09.0s	-04°06'00"	6.6	20:18	20:38	21:48	detectable
M 21	Open	Sgr	18h04m13.0s	-22°29'24"	7.2	20:17	20:39	21:14	detectable
M 20	Open	Sgr	18h02m42.0s	-22°58'18"	5.2	20:15	20:39	21:08	easy
M 8	Neb	Sgr	18h04m02.0s	-24°23'14"	5.0	20:16	20:39	20:53	easy
M 14	Glob	Oph	17h37m36.0s	-03°14'48"	7.6	20:18	20:39	22:31	detectable
M 13	Glob	Her	16h41m41.0s	+36°27'36"	5.8	20:17	20:40	23:11	easy
M 23	Open	Sgr	17h57m04.0s	-18°59'06"	5.9	20:16	20:40	21:35	detectable
M 18	Open	Sgr	18h19m58.0s	-17°06'06"	7.5	20:13	20:41	22:10	easy
M 28	Glob	Sgr	18h24m33.0s	-24°52'12"	6.9	20:17	20:41	21:06	detectable
NGC 6572	PNe	Oph	18h12m06.4s	+06°51'12"	8.0	20:04	20:41	23:36	obvious
IC 4665	Open	Oph	17h46m18.0s	+05°43'00"	5.3	20:18	20:42	22:42	detectable
M 16	Open	Ser	18h18m48.0s	-13°48'24"	6.5	20:12	20:42	22:27	obvious
M 17	Open	Sgr	18h20m47.0s	-16°10'18"	7.3	20:20	20:41	22:16	detectable
M 22	Glob	Sgr	18h36m24.0s	-23°54'12"	5.2	20:17	20:42	21:30	detectable
M 70	Glob	Sgr	18h43m13.0s	-32°17'30"	7.8	20:16	20:42	22:24	detectable
M 92	Glob	Her	17h17m07.0s	+43°08'12"	6.5	20:15	20:42	23:56	easy
M 25	Open	Sgr	18h31m47.0s	-19°07'00"	6.2	20:17	20:42	22:08	detectable
NGC 6633	Open	Oph	18h27m15.0s	+06°30'30"	5.6	20:13	20:44	23:50	easy
M 54	Glob	Sgr	18h55m03.0s	-30°28'42"	7.7	20:20	20:44	22:26	difficult
NGC 6723	Glob	Sgr	18h59m33.0s	-36°37'54"	6.8	20:16	20:44	22:29	detectable
IC 4756	Open	Ser	18h39m00.0s	+05°27'00"	5.4	20:16	20:45	23:55	easy
NGC 6543	PNe	Dra	17h58m33.4s	+66°37'59"	8.3	20:07	20:46	01:26	obvious
NGC 6716	Open	Sgr	18h54m34.0s	-19°54'06"	7.5	20:16	20:46	22:26	detectable
M 11	Open	Set	18h51m05.0s	-06°16'12"	6.1	20:17	20:46	23:34	detectable
M 57	PNe	Lyr	18h53m35.1s	+33°01'45"	9.4	20:12	20:48	01:15	easy
M 56	Glob	Lyr	19h16m36.0s	+30°11'06"	8.4	20:17	20:55	00:30	detectable

ID	Cls	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Difficulty
M 55	Glob	Sgr	19h40m00.0s	-30°57'42"	6.3	20:19	21:10	23:26	detectable
NGC 6818	PNe	Sgr	19h43m57.8s	-14°09'12"	10.0	20:09	21:14	23:51	easy
M 71	Glob	Sge	19h53m46.0s	+18°46'42"	8.4	20:14	21:24	01:42	easy
M 27	PNe	Vul	19h59m36.3s	+22°43'16"	7.3	20:14	21:29	01:51	easy
NGC 6871	Open	Cyg	20h05m59.0s	+35°46'36"	5.8	20:14	21:36	02:18	easy
NGC 6910	Open	Cyg	20h23m12.0s	+40°46'42"	7.3	20:14	21:53	02:52	easy
M 29	Open	Cyg	20h23m57.0s	+38°30'30"	7.5	20:15	21:53	02:41	easy
NGC 7009	PNe	Aqr	21h04m10.9s	-11°21'48"	8.3	20:09	22:34	01:26	obvious
M 15	Glob	Peg	21h29m58.0s	+12°10'00"	6.3	20:17	22:59	02:55	easy
M 39	Open	Cyg	21h31m48.0s	+48°26'00"	5.3	20:16	23:02	04:23	easy
M 2	Glob	Aqr	21h33m27.0s	-00°49'24"	6.6	20:19	23:03	02:32	detectable
IC 1396	Neb	Cep	21h39m06.0s	+57°30'00"		20:17	23:09	04:42	challenging
M 30	Glob	Cap	21h40m22.0s	-23°10'42"	6.9	21:37	23:10	00:43	detectable
IC 5146	Neb	Cyg	21h53m24.0s	+47°16'00"	10.0	20:16	23:22	04:36	challenging
NGC 7160	Open	Cep	21h53m40.0s	+62°36'12"	6.4	20:11	23:23	05:13	obvious
NGC 7243	Open	Lac	22h15m08.0s	+49°53'54"	6.7	20:22	23:45	04:16	detectable
NGC 7293	PNe	Aqr	22h29m38.5s	-20°50'14"	6.3	22:06	23:59	01:53	detectable
M 52	Open	Cas	23h24m48.0s	+61°35'36"	8.2	20:38	00:54	05:10	detectable
NGC 7789	Open	Cas	23h57m24.0s	+56°42'30"	7.5	21:16	01:27	05:16	detectable
NGC 7790	Open	Cas	23h58m24.0s	+61°12'30"	7.2	20:17	01:28	05:30	obvious
M 110	Gal	And	00h40m22.3s	+41°41'09"	8.9	22:09	02:10	05:22	detectable
M 31	Gal	And	00h42m44.3s	+41°16'07"	4.3	21:24	02:12	05:28	easy
M 32	Gal	And	00h42m41.8s	+40°51'58"	8.9	21:21	02:12	05:28	easy
NGC 457	Open	Cas	01h19m35.0s	+58°17'12"	5.1	21:09	02:49	05:31	obvious
NGC 559	Open	Cas	01h29m31.0s	+63°18'24"	7.4	21:07	02:59	05:32	easy
M 103	Open	Cas	01h33m23.0s	+60°39'00"	6.9	21:18	03:02	05:33	obvious
M 33	Gal	Tri	01h33m50.9s	+30°39'36"	6.4	23:00	03:03	05:27	detectable
M 76	PNe	Per	01h42m19.9s	+51°34'31"	10.1	22:40	03:11	05:27	detectable
NGC 637	Open	Cas	01h43m04.0s	+64°02'24"	7.3	21:21	03:12	05:34	obvious
NGC 663	Open	Cas	01h46m09.0s	+61°14'06"	6.4	21:30	03:16	05:31	easy
NGC 752	Open	And	01h57m41.0s	+37°47'06"	6.6	00:56	03:27	05:18	challenging
NGC 869	Open	Per	02h19m00.0s	+57°07'42"	4.3	22:10	03:48	05:34	obvious
NGC 884	Open	Per	02h22m18.0s	+57°08'12"	4.4	22:13	03:51	05:34	obvious
NGC 957	Open	Per	02h33m21.0s	+57°33'36"	7.2	22:24	04:02	05:31	easy
Heart Neb	Neb	Cas	02h33m52.0s	+61°26'50"	6.5	00:57	04:03	05:19	challenging
M 34	Open	Per	02h42m05.0s	+42°45'42"	5.8	23:35	04:11	05:29	easy
NGC 1027	Open	Cas	02h42m40.0s	+61°35'42"	7.4	23:21	04:12	05:26	detectable
NGC 1245	Open	Per	03h14m42.0s	+47°14'12"	7.7	02:17	04:42	05:20	challenging

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

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