



Desert Sky Observer

Volume 32

Antelope Valley Astronomy Club Newsletter

August 2012

Up-Coming Events

August 4: Public Outreach @ [Desert Vineyard Church](#)

August 10: Club Meeting*

August 11: Prime Desert Woodlands Moon Walk @ [Prime Desert Woodlands](#)

August 18: Dark Sky Star Party @ [Mt. Pinos](#)

August 29: Acton Library Star Party @ [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

August already?! Well get ready for a last blast up at Mt. Pinos! Make your plans 'cause there will be a crowd up at the Nordic Ski Base parking lot as our summer dark sky star party will coincide with Clint Whitman's Classic Star Party from Thursday the 16th through Sunday the 19th. And as it's just a week past the Perseids peak, there should be a few nice fireballs shooting our way.

If you missed first light for the LooneyScope, Matt will be there too showing off his brand new 24" dob. And if you did miss first light (Saturn, I believe it was) then you probably missed the picnic. I hope not as it was a great time up on Brite Lake in Tehachapi. Many thanks to Rose and Frank for doing all the legwork to pull off what was a great picnic and star party. The skies were dark and steady – we'll definitely be heading up that way again!

I've been doing a lot of astroimaging in my driveway and it takes more and more to pull me away to another location for star gazing but these two sites are well worth it. And when you get the chance to look at the heavens with two feet of aperture – you can't pass it up! I'm often disappointed when using an OIII filter on my scope. Except for the darkest of sites, it seems that the filter just darkens everything way too much – I never get that extra detail hidden in the Crescent or the dark threads of the Veil. Looking through the LooneyScope on the other hand, blew me away! The Veil just popped right out!

While writing this, I'm listening to Brian Cox's "Wonders of the Solar System". He was reviewing a pamphlet about the dangers of observing at high altitudes while at the VLT in Paranal, Chile in the Atacama Desert. Apart from the usual reasons to call paramedics like "trouble breathing" and "severe headaches" there was one more symptom of which to be aware – "Seeing stars". Hmm, seems like seeing stars while looking through a telescope should be the norm! What can you expect from the creative minds who brought you the VLT. What does it stand for? Something technical like "Virtual Lens Transmission" or perhaps "Visual LASER Triangulation"? No, the geniuses at the ESA came up with the "Very Large Telescope"! I



think that must inspire my new project then - the EAT (Extremely Average Telescope). I'll start on it as soon as I stop seeing all these stars...



Director of Community Development

Rose Moore

Many thanks again to all who came out for the picnic at Brite Lake! Thanks to all those that brought food, helped cook and clean up, and helped out with all that goes with having a picnic!

Our first event for August is on Saturday, August 4th at Desert Vineyard Church in Lancaster. The event starts at 10am and goes until 1pm. We need members with telescopes and/or other astronomy items of interest. This event is for single parents and their children.

On Saturday, August 11th is a Prime Desert Woodlands Moonwalk with Jeremy. This event starts at 8pm. Bring out your telescope or other astronomy items to show the public!

Jeremy will be hosting a star party at the Acton Library, on Wednesday August 29th, at 7:30pm. Come on out and support this great event for the public in the Acton area! Bring your telescope or other astronomy item of interest to show!

The Mt. Wilson trip is coming up for those on the sign up list. Payment is due by our next meeting, August 10th. You may pay at the next meeting, mail in a payment to our club address (to arrive by 8/10), or pay via the PayPal link (before 8/10) that Steve has set up, <http://www.avastronomyclub.org/mtwilson.html>. Payments not received by 8/10 will forfeit your spot and go to someone on the stand-by list. If you are planning not to attend, please let me know ASAP!! Do not wait until the due date! I need to notify people on the stand by list soon!

Also coming up in September is the Pacific Astronomy and Telescope Show, on Sept. 22 & 23, in Pasadena. Cost at the door is \$20. I still have pre-sale tickets that I'm holding for a few more members. If you are not at the August meeting I will have to mail them out. Please pay our Treasurer Virginia for each ticket.

Thanks, and see you there!

Star or Planet -- How Can You Tell? by Paul Derrick

Have you ever seen a bright star and wondered if that "star" might be a planet? Planets and stars are different types of objects, yet they look alike to the naked eye. Indeed, the word planet derives from the Greek word "planetes" which means wanderer, thus planets were considered wandering stars by our ancestors.

So, without using a telescope, how can one tell which is which? One way, of course, is to watch any suspicious object night after night to see if it moves, or wanders, relative to the surrounding stars. But that can take many nights as planets move slowly, and the more distant ones have to be watched for weeks, especially when there are no nearby stars.

For casual observers, there's no foolproof way to pick out the planets from the myriad of stars, but some pointers can help. First, there are only five naked-eye planets - Mercury, Venus, Mars, Jupiter, and Saturn - and they are usually brighter than the vast majority of naked-eye stars. (Technically, Uranus can be seen naked-eye, but it's at the limit of visibility, and seeing it requires good eyes and very dark skies.)

Start by noticing the brightness of the object in question. Venus and Jupiter always outshine all the stars, and the other three are usually brighter than all but the brightest stars. So brightness is the first clue.

Second, perhaps you've heard that "stars twinkle and planets don't" - and this tends to be true, although the difference can be subtle and varying. Twinkling (called scintillation) is caused by turbulence in Earth's atmosphere, so that greater air instability produces more twinkling while steadier air makes for less. So, when the stars are twinkling noticeably, look for any brighter objects that aren't.

Third - and this is quite helpful - look in the right part of the sky. Planets orbit the Sun on nearly the same plane, so they all closely follow the ecliptic - the Sun's path across our sky. And since the Moon orbits the Earth on nearly this same plane, it too travels close to the ecliptic.

Like the Sun and Moon, the planets rise in the east and set in the west, owing to the Earth's west-to-east rotation on its axis. Facing south with your arms outstretched slightly more than 180 degrees, any visible planets will be in front of your arms - never behind you or even straight overhead. All that are above the horizon will be somewhere along the great ecliptic arc beginning in the east (your left), rising and tilting somewhat to the south, and ending in the west (your right).

There are two additional things to know about the ecliptic. The season and time of night affect the ecliptic's exact rising and setting points, making them sometimes a little left or right of due east and west. And, the amount of southerly tilt varies so that sometimes the ecliptic is tilted more than half way down toward the southern horizon while at other times it reaches nearly straight up. Still, knowing the approximate path is useful in identifying planets.

The inner planets, Venus and Mercury, orbit nearer the Sun inside Earth's orbit. Thus, when they are not hidden in the Sun's glare, they are seen only in the evening soon after sunset low in the west or in the morning soon before sunrise low in the east - never real high in the sky and never deep into the night. When visible, Mercury, being so near the Sun, is rarely seen after twilight.

The outer planets, Mars, Jupiter and Saturn, when not passing behind the Sun, might rise or set - and thus may be seen - any time of the night. When they are on the opposite side of Earth from the Sun - a position called opposition - we are at our nearest to them, making them appear at their brightest and largest.

Currently there are great opportunities for identifying four planets among the stars as Saturn and Mars are visible in the evening while Venus and Jupiter are up in the morning.

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Soon after dark Saturn and Mars are less than half way up in the southwest. Saturn is currently less than 5 degrees (one-half fist-width held at arm's length) to the upper right of the star Spica. Almost equally bright, Spica is twinkly white while Saturn shows a steady creamy tint. About 20 degrees (two fist-widths) to their lower right, Mars has a reddish tint with no notably bright stars nearby. Mars is gradually approaching Saturn and Spica, and will pass between them in mid-August.

In the morning before dawn, Venus and Jupiter are very low, rising in the east. "Morning star" Venus vastly outshines all the real stars as does Jupiter, although the king of the planets can't hold a candle to his queen. Venus is near the reddish star Aldebaran, passing within two moonwidths July 8-10, but 1st-magnitude Aldebaran, 14th brightest of all the stars, pales in comparison to Venus. Jupiter, 5 degrees above, is nearly half way between Venus and the lovely Pleiades star cluster. Venus and Jupiter are drifting further apart each morning.

Here's hoping these pointers help you learn to pick out our brighter solar system neighbors from among the seemingly countless background stars.

Astrophoto of The Month



M8a by Don Bryden

15 minutes each of RGB plus 40 minutes each of luminance and Hydrogen alpha taken with an SBIG ST10-XME camera through a Mewlon 250s corrected Dall-Kirkham telescope. Guiding was with an Orion StarShoot autoguider through a Stellarvue SV-105 refractor all on a Losmandy DSBS plate on a Mountain Instruments MI-250 mount. Software was PHD Guiding and MaxiMDL for guiding and image acquisition. Processing was done with CCDStack, FITS Liberator and Photoshop.

Click on the photo to see a full size version or [click here](#) to see all of Don's photos.

News Headlines

Hubble discovers a fifth moon orbiting Pluto

A team of astronomers using NASA's Hubble Space Telescope is reporting the discovery of another moon orbiting the icy dwarf planet Pluto. The moon is estimated to be irregular in shape and 6 to 15 miles (10 to 24 kilometers) across. It is in a 58,000-mile-diameter (93,000 km) circular orbit around Pluto that is assumed to be coplanar with the other satellites in the system.

<http://www.astronomy.com/~link.aspx?id=3295d61c-a026-4a6a-8d3a-51cc82099241>

Dark Galaxies of the Early Universe Spotted for the First Time

For the first time, dark galaxies — an early phase of galaxy formation, predicted by theory but unobserved until now — may have been spotted. These objects are essentially gas-rich galaxies without stars. Using ESO's Very Large Telescope, an international team thinks they have detected these elusive objects by observing them glowing as they are illuminated by a quasar.

<http://www.eso.org/public/news/eso1228/>

Dark matter scaffolding of universe detected for the first time

Scientists have, for the first time, directly detected part of the invisible dark matter skeleton of the universe, where more than half of all matter is believed to reside. The discovery, led by a University of Michigan physics researcher, confirms a key prediction in the prevailing theory of how the universe's current web-like structure evolved.

<http://www.astronomy.com/~link.aspx?id=97fa1d0e-b2c1-40f9-b65b-00590bee62c6>

Astronomers Using the Hubble Space Telescope Report the Earliest Spiral Galaxy Ever Seen

Astronomers have witnessed for the first time a spiral galaxy in the early universe, billions of years before many other spiral galaxies formed. In findings reported July 19 in the journal Nature, the astronomers said they discovered it while using the Hubble Space Telescope to take pictures of about 300 very distant galaxies in the early universe and to study their properties. This distant spiral galaxy is being observed as it existed roughly three billion years after the Big Bang, and light from this part of the universe has been traveling to Earth for about 10.7 billion years.

<http://www.sciencedaily.com/releases/2012/07/120718131746.htm>

A Taste of Solar Maximum

Forecasters say Solar Max is due in the year 2013. When it arrives, the peak of 11-year sunspot cycle will bring more solar flares, more coronal mass ejections, more geomagnetic storms and more auroras than we have experienced in quite some time. On the weekend of July 14, 2012, sky watchers around the world got a taste of things to come.

http://science.nasa.gov/science-news/science-at-nasa/2012/20jul_tasteofsolarmax/

Former Astronaut Sally Ride Dies

Former astronaut and Encino native Sally Ride has died after a 17-month battle with pancreatic cancer. The renowned physicist died peacefully in her sleep on Monday at the age of 61, according to her company, Sally Ride Science.

<http://www.nbclosangeles.com/news/local/Encino-Astronaut-Sally-Ride-Dies-Cancer-163473936.html>

August Sky Data

Full
Aug 1Last Qtr
Aug 9New
Aug 17First Qtr
Aug 24

Best time for deep sky observing this month:
August 11 through August 20

Mercury is at its greatest distance west of the Sun on August 16th, so this elusive little planet could be visible in the south-eastern sky before sunrise. Any day during the week 18th to 25th August, try looking to the north-east around 5 a.m.. The brilliant planet Venus will be conspicuous, well up in the eastern sky. Mercury will be well to the lower left of Venus, nearly 30 degrees away, and very much less bright

Venus is rising in the north-east around 2 am, and by dawn the brilliant "Morning Star" will be well up in the eastern sky. Relative to the stars, Venus is moving rapidly eastwards out of Taurus, through the northern tip of Orion, and most of the way across Gemini by the end of the month.

Mars is very low in the western sky at dusk; it sets only a couple of hours after the Sun sets. The planet Saturn is nearby, and appears a little brighter.

The giant planet **Jupiter** is rising before midnight, and it's high in the eastern sky at dawn. Only the brilliant planet Venus, to its lower left, outshines Jupiter. Relative to the stars, Jupiter is moving eastwards in Taurus, to the upper left of the bright star Aldebaran (though Jupiter is much brighter, and shines with a steadier light).

Saturn is low in the western sky at dusk, and sets before the sky is truly dark. Relative to the stars, it is moving slowly south-eastwards in the constellation of Virgo: the bright star Spica is below it, as is the planet Mars, but both of them are fainter than Saturn.

August brings the well-known Perseid **meteor-shower**. The radiant point is in the constellation of Perseus, which is well up in the north-east during the evening, and high in the east by dawn. Perseid meteors may be seen any time from late July to late August, but the peak this year is expected in the late morning of Sunday August 12th, so the best time to observe will be in the early hours of that morning. Light from the waning Moon may cause some interference, but it will be well below the radiant point.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
8/1/2012	19:35	05:41	06:07	19:59
8/5/2012	21:50	09:52	06:10	19:55
8/10/2012	00:08	14:31	06:14	19:50
8/15/2012	04:22	18:20	06:17	19:44
8/20/2012	09:37	21:17	06:21	19:38
8/25/2012	15:02	00:20	06:25	19:32
8/31/2012	19:17	06:37	06:29	19:24

Planet Data

	Aug 1			
	Rise	Transit	Set	Mag
Mercury	05:31	12:27	19:17	3.9
Venus	02:42	09:47	16:53	-4.4
Mars	11:20	17:09	22:57	1.1
Jupiter	01:30	08:42	15:56	-2.2
Saturn	11:50	17:40	23:27	0.8

	Aug 15			
	Rise	Transit	Set	Mag
Mercury	04:39	11:41	18:42	0.0
Venus	02:38	09:46	16:54	-4.3
Mars	11:06	16:46	22:24	1.1
Jupiter	00:43	07:56	15:12	-2.3
Saturn	10:59	16:48	22:34	0.8

	Aug 31			
	Rise	Transit	Set	Mag
Mercury	05:37	12:19	19:06	-1.4
Venus	02:46	09:52	16:58	-4.2
Mars	10:53	16:21	21:49	1.2
Jupiter	23:48	07:01	14:18	-2.4
Saturn	10:03	15:51	21:35	0.8

Planet, Sun, and Moon data calculated for local time at Lancaster, CA

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 6193	Open	5.4	Ara	16h41m20.0s	-48°45'48"	20:40	20:52	21:23	detectable
NGC 6167	Open	6.6	Nor	16h34m34.0s	-49°46'18"	20:39	20:53	21:14	detectable
NGC 6178	Open	7.2	Sco	16h35m47.0s	-45°38'36"	20:40	20:56	21:30	detectable
NGC 6124	Open	6.3	Sco	16h25m20.0s	-40°39'12"	20:40	20:59	21:53	challenging
NGC 5897	Glob	8.4	Lib	15h17m24.0s	-21°00'36"	20:54	21:04	21:24	difficult
NGC 6322	Open	6.5	Sco	17h18m25.0s	-42°56'00"	20:40	21:04	22:25	easy
NGC 6388	Glob	6.8	Sco	17h36m17.0s	-44°44'06"	20:46	21:06	22:01	difficult
M 80	Glob	7.3	Sco	16h17m02.0s	-22°58'30"	20:47	21:06	22:17	detectable
M 5	Glob	5.7	Ser	15h18m34.0s	+02°05'00"	20:47	21:08	22:02	easy
M 94	Gal	8.7	CVn	12h50m53.1s	+41°07'12"	20:51	21:09	21:10	easy
M 3	Glob	6.3	CVn	13h42m11.0s	+28°22'42"	20:49	21:09	21:34	easy
M 62	Glob	6.4	Oph	17h01m13.0s	-30°06'48"	20:47	21:09	22:32	detectable
M 19	Glob	6.8	Oph	17h02m38.0s	-26°16'06"	20:48	21:10	22:29	detectable
NGC 5195	Gal	10.5	CVn	13h29m59.6s	+47°15'58"	20:52	21:10	22:02	detectable
M 51	Gal	8.7	CVn	13h29m52.3s	+47°11'40"	20:50	21:10	22:02	easy
M 101	Gal	8.4	UMa	14h03m12.4s	+54°20'53"	20:53	21:12	22:38	detectable
NGC 6383	Open	5.4	Sco	17h34m48.0s	-32°34'00"	20:43	21:12	23:09	easy
M 12	Glob	6.1	Oph	16h47m14.0s	-01°56'48"	20:45	21:12	23:15	easy
M 10	Glob	6.6	Oph	16h57m09.0s	-04°06'00"	20:47	21:13	23:16	detectable
M 9	Glob	7.8	Oph	17h19m12.0s	-18°31'00"	20:50	21:13	22:20	detectable
M 6	Open	4.6	Sco	17h40m20.0s	-32°15'12"	20:42	21:13	23:29	easy
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	20:46	21:15	00:38	easy
M 7	Open	3.3	Sco	17h53m51.0s	-34°47'36"	20:44	21:15	23:14	easy
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	20:45	21:18	01:19	easy
M 14	Glob	7.6	Oph	17h37m36.0s	-03°14'48"	20:48	21:17	23:50	detectable
NGC 6541	Glob	6.3	CrA	18h08m02.0s	-43°42'54"	20:48	21:17	22:31	difficult
IC 4665	Open	5.3	Oph	17h46m18.0s	+05°43'00"	20:50	21:19	23:59	detectable
M 23	Open	5.9	Sgr	17h57m04.0s	-18°59'06"	20:46	21:19	22:54	detectable
M 21	Open	7.2	Sgr	18h04m13.0s	-22°29'24"	20:48	21:20	22:25	detectable
M 20	Open	5.2	Sgr	18h02m42.0s	-22°58'18"	20:44	21:20	22:16	easy
M 8	Neb	5.0	Sgr	18h04m02.0s	-24°23'14"	20:44	21:21	21:50	easy
NGC 6572	PNe	8.0	Oph	18h12m06.4s	+06°51'12"	20:33	21:25	01:09	obvious
NGC 6543	PNe	8.3	Dra	17h58m33.4s	+66°37'59"	20:36	21:26	03:19	obvious
M 16	Open	6.5	Ser	18h18m48.0s	-13°48'24"	20:40	21:28	23:52	obvious
M 18	Open	7.5	Sgr	18h19m58.0s	-17°06'06"	20:43	21:29	23:32	easy
M 17	Open	7.3	Sgr	18h20m47.0s	-16°10'18"	20:51	21:30	23:40	difficult
M 28	Glob	6.9	Sgr	18h24m33.0s	-24°52'12"	21:05	21:32	21:55	detectable
NGC 6633	Open	5.6	Oph	18h27m15.0s	+06°30'30"	20:43	21:35	01:23	easy

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 25	Open	6.2	Sgr	18h31m47.0s	-19°07'00"	20:49	21:38	23:28	detectable
M 22	Glob	5.2	Sgr	18h36m24.0s	-23°54'12"	20:51	21:43	22:34	detectable
IC 4756	Open	5.4	Ser	18h39m00.0s	+05°27'00"	20:46	21:45	01:18	easy
M 70	Glob	7.8	Sgr	18h43m13.0s	-32°17'30"	20:48	21:49	23:48	detectable
M 11	Open	6.1	Sct	18h51m05.0s	-06°16'12"	20:48	21:57	01:01	detectable
M 57	PNe	9.4	Lyr	18h53m35.1s	+33°01'45"	20:41	21:59	02:54	easy
NGC 6716	Open	7.5	Sgr	18h54m34.0s	-19°54'06"	20:46	22:00	23:44	detectable
M 54	Glob	7.7	Sgr	18h55m03.0s	-30°28'42"	20:52	22:00	23:48	difficult
NGC 6723	Glob	6.8	Sgr	18h59m33.0s	-36°37'54"	20:51	22:05	23:51	detectable
M 56	Glob	8.4	Lyr	19h16m36.0s	+30°11'06"	20:49	22:22	02:04	detectable
M 55	Glob	6.3	Sgr	19h40m00.0s	-30°57'42"	20:56	22:46	00:50	detectable
NGC 6818	PNe	10.0	Sgr	19h43m57.8s	-14°09'12"	20:39	22:50	01:15	easy
M 71	Glob	8.4	Sge	19h53m46.0s	+18°46'42"	20:45	22:59	03:12	easy
M 27	PNe	7.3	Vul	19h59m36.3s	+22°43'16"	20:45	23:05	03:23	easy
NGC 6871	Open	5.8	Cyg	20h05m59.0s	+35°46'36"	20:46	23:12	03:48	easy
NGC 6910	Open	7.3	Cyg	20h23m12.0s	+40°46'42"	20:47	23:29	04:26	easy
M 29	Open	7.5	Cyg	20h23m57.0s	+38°30'30"	20:47	23:29	04:15	easy
NGC 7009	PNe	8.3	Aqr	21h04m10.9s	-11°21'48"	21:27	00:09	02:52	obvious
M 15	Glob	6.3	Peg	21h29m58.0s	+12°10'00"	20:58	00:35	04:25	easy
M 39	Open	5.3	Cyg	21h31m48.0s	+48°26'00"	20:49	00:37	05:09	easy
M 2	Glob	6.6	Aqr	21h33m27.0s	-00°49'24"	21:17	00:39	04:01	detectable
IC 1396	Neb		Cep	21h39m06.0s	+57°30'00"	20:49	00:44	05:11	challenging
M 30	Glob	6.9	Cap	21h40m22.0s	-23°10'42"	23:39	00:46	01:50	detectable
Cocoon	Neb	10.0	Cyg	21h53m24.0s	+47°16'00"	20:50	00:58	05:10	challenging
NGC 7160	Open	6.4	Cep	21h53m40.0s	+62°36'12"	20:43	00:59	05:17	obvious
NGC 7243	Open	6.7	Lac	22h15m08.0s	+49°53'54"	21:04	01:20	05:04	detectable
NGC 7293	PNe	6.3	Aqr	22h29m38.5s	-20°50'14"	00:00	01:35	03:09	detectable
M 52	Open	8.2	Cas	23h24m48.0s	+61°35'36"	22:05	02:30	05:08	detectable
NGC 7789	Open	7.5	Cas	23h57m24.0s	+56°42'30"	22:58	03:02	05:09	detectable
NGC 7790	Open	7.2	Cas	23h58m24.0s	+61°12'30"	21:04	03:03	05:17	obvious
NGC 55	Gal	8.5	Scl	00h15m08.4s	-39°13'13"	02:02	03:20	04:37	difficult
M 110	Gal	8.9	And	00h40m22.3s	+41°41'09"	23:44	03:45	05:12	detectable
M 32	Gal	8.9	And	00h42m41.8s	+40°51'58"	22:57	03:47	05:16	easy
M 31	Gal	4.3	And	00h42m44.3s	+41°16'07"	22:56	03:48	05:15	easy
NGC 253	Gal	7.9	Scl	00h47m33.1s	-25°17'20"	01:26	03:52	05:13	detectable
NGC 288	Glob	8.1	Scl	00h52m45.0s	-26°35'00"	02:19	03:57	05:04	challenging
NGC 457	Open	5.1	Cas	01h19m35.0s	+58°17'12"	22:33	04:22	05:18	obvious
NGC 559	Open	7.4	Cas	01h29m31.0s	+63°18'24"	22:28	04:27	05:17	easy
M 103	Open	6.9	Cas	01h33m23.0s	+60°39'00"	22:39	04:29	05:19	obvious
NGC 637	Open	7.3	Cas	01h43m04.0s	+64°02'24"	22:41	04:32	05:20	obvious
M 33	Gal	6.4	Tri	01h33m50.9s	+30°39'36"	00:39	04:32	05:14	detectable
NGC 663	Open	6.4	Cas	01h46m09.0s	+61°14'06"	22:51	04:33	05:16	easy
M 76	PNe	10.1	Per	01h42m19.9s	+51°34'31"	00:17	04:33	05:14	detectable
NGC 752	Open	6.6	And	01h57m41.0s	+37°47'06"	02:30	04:39	05:06	challenging
Heart Neb	Neb	6.5	Cas	02h33m52.0s	+61°26'50"	02:47	04:40	05:03	challenging

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
NGC 884	Open	4.4	Per	02h22m18.0s	+57°08'12"	23:37	04:40	05:18	obvious
NGC 869	Open	4.3	Per	02h19m00.0s	+57°07'42"	23:35	04:40	05:20	obvious
NGC 1027	Open	7.4	Cas	02h42m40.0s	+61°35'42"	00:51	04:41	05:12	detectable
NGC 957	Open	7.2	Per	02h33m21.0s	+57°33'36"	23:48	04:41	05:16	easy
M 34	Open	5.8	Per	02h42m05.0s	+42°45'42"	01:04	04:44	05:15	detectable
NGC 1245	Open	7.7	Per	03h14m42.0s	+47°14'12"	03:25	04:45	05:05	challenging
NGC 1502	Open	4.1	Cam	04h07m50.0s	+62°19'54"	01:09	04:46	05:20	obvious
NGC 1444	Open	6.4	Per	03h49m25.0s	+52°39'30"	01:15	04:46	05:21	obvious
NGC 1342	Open	7.2	Per	03h31m38.0s	+37°22'36"	01:53	04:47	05:14	detectable
NGC 1528	Open	6.4	Per	04h15m23.0s	+51°12'54"	01:44	04:47	05:14	easy
M 77	Gal	9.7	Cet	02h42m40.8s	-00°00'48"	02:23	04:47	05:14	detectable
NGC 1664	Open	7.2	Aur	04h51m06.0s	+43°40'30"	02:36	04:49	05:14	easy
M 45	Open	1.5	Tau	03h47m00.0s	+24°07'00"	02:16	04:48	05:17	obvious
M 38	Open	6.8	Aur	05h28m40.0s	+35°50'54"	03:30	04:50	05:12	detectable
Hyades	Open	0.8	Tau	04h26m54.0s	+15°52'00"	03:15	04:50	05:15	easy
M 36	Open	6.5	Aur	05h36m18.0s	+34°08'24"	03:42	04:51	05:14	easy
NGC 1746	Open	6.1	Tau	05h03m50.0s	+23°46'12"	03:40	04:51	05:08	detectable
NGC 1647	Open	6.2	Tau	04h45m55.0s	+19°06'54"	03:38	04:51	05:10	detectable
M 37	Open	6.2	Aur	05h52m18.0s	+32°33'12"	04:02	04:51	05:13	easy
M 1	Neb	8.4	Tau	05h34m30.0s	+22°01'00"	04:08	04:52	05:14	challenging
M 35	Open	5.6	Gem	06h09m00.0s	+24°21'00"	04:36	04:53	05:13	easy
NGC 2129	Open	7.0	Gem	06h01m07.0s	+23°19'20"	04:32	04:53	05:17	obvious
NGC 2175	Open	6.8	Ori	06h09m39.0s	+20°29'12"	04:47	04:53	05:09	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.
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Membership entitles you to...

- Desert Sky Observer—monthly newsletter.
- The Reflector – the publication of the Astronomical League.
- The A.V.A.C. Membership Manual.
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