ANTELOPE VALLEY ASTRONOMY CLUB, INC.

Desert Sky Observer

Volume 33 *Antelope Valley Astronomy Club Newsletter* **January 2013**

Up-Coming Events

January 11: Club Meeting*
January 12: Dark Sky Star Party @ Two Goats Observatory

* 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

Happy New Year! We have a lot planned already, too. First, I'd like to welcome our new board: Frank Moore – VP, Rose Moore – DoCD, Gin Reed – Treasurer and a first timer, Pam Grove as Secretary. I'll still be presiding, Bill will still be the Librarian, Steve will still be editing this DSO and running the website and thankfully, Deb will still be running the YEA contest!

Next, come out to Two Goats Saturday, the 12th of January for our first star party of the year. There will be astrophotography as well as a Messier challenge. On April 6th we'll host our annual Messier Marathon with a bar-be-cue and late night bacon! May will bring another RTMC followed by some nice summer days up at Mt. Pinos. We may even have the chance to view through the Hooker Telescope, the 100" scope, at Mt. Wilson!

Of course we'll get together for another great picnic, we'll be out at the Poppy Festival and starting in (possibly) January on the 26th we'll kick of another year of Prime Desert Woodlands Moonwalks.

One last thing, I'd like to congratulate Jeremy Amarant and Robert Lynch who picked up some award hardware at the Christmas Party. The Holland Fountain Award is the club's "most enthusiastic" member award and it went to Robert. Jeremy picked up the Keith Lawson Award as our club's MVP. Congratulations to both you guys!

So come to the meeting or out to a star party. Stop by the Facebook page and give us a like or drop a line and I hope to see you all out among the stars.

Vice President

Frank Moore

You folks should have seen it. The back of our Flex fully loaded for a public outreach event at Amargosa Creek Middle School, with the rear cargo area loaded wall to wall, floor to ceiling, as usual. The only difference was that this time, since Rose and I were

going to be the only presenters at the event, the 12" Lightbridge was strapped into the right rear passenger seat secured with the seat belt and shoulder harness. It looked like R2D2 sitting there and has prompted us to look into getting it decorated like our favorite droid. Someone commented that it looked so "human" that we could use it to drive in the car pool lane.

It turned out to be a wonderful event and, even under light polluted skies, I think the two of us did a great job of showing the approximately 300 attendees some great celestial sites with the Celestron C-11 and 12" Lightbridge. Even though there were always lines waiting to view through the two telescopes, the kids were exceptionally well behaved, curious, interested, and full of great questions. I can't remember when I've had a better time at an educational event. If you haven't made it out to events like this, you owe it yourself to come out and experience the wonder in the eyes of children as they, many for the first time, see planets, galaxies, nebula, and other objects through a telescope.

As we enter 2013, my tenure as the Secretary of the AVAC is coming to an end as I'll be stepping into the Vice President's shoes. As the VP I'll be looking to find new, and interesting, speakers for our monthly meetings and to perhaps have a few old friends back. It's not easy work, and I've already had a few speakers, companies, or organizations turn me down but the search goes on. Prior to leaving the post Doug Drake had already arranged a speaker for January which took a bit of pressure off...at least for a month.

The speaker for the January meeting will be astrophysicist Dr. Jeff Zweerink, from the organization "Reasons to Believe", speaking on the increasingly popular theory of a "multiverse". Jeff has a BS in physics and a PhD in astrophysics from Iowa State University (ISU), where he focused his study on gamma rays - messengers from distant black holes and neutron stars. Jeff taught at Loras College in Dubuque, Iowa and did postdoctoral research at the University of California, Riverside. He still serves part-time on the physics and astronomy research faculty at UCLA. He has conducted research using STACEE and VERITAS gamma-ray telescopes, as well as on GAPS, a balloon experiment seeking to detect dark matter. Jeff has a been a guest speaker for the Antelope Valley Astronomy Club in the past and his presentations are always knowledgeable, insightful, and full of thought provoking information.

I'm looking forward to the upcoming meeting and I think you will enjoy it too.

Director of Community Development

Rose Moore

We had our last 2012 Outreach Star Party for the students and parents at Amargosa Creek Middle School in mid-December, and it was successful! We had approximately 300 attendees, or more, who not only came to look through the telescopes but attended the school's Science Fair. We had the scopes on Jupiter and several dark sky objects during the evening.

Thanks to all who showed up early to start some things up for the Christmas Party! And many thanks to those who attended and made it another success! For those that donated items for the silent auction or raffle: if you did not give your information on your donation to one of the board members, please give the information to Pam or myself so that we can get the donation letters out to you by the end of January!

We do not have any upcoming public outreach events coming up soon, but events will be posted on our calendar, and emails sent out as we schedule them! Please come out and participate and support your club

for some of these events! We need your help in making these outreach events a success! One small core group of people cannot support all of our events!

We also will be working on the Youth Exploring Astronomy Essay Contest! Please help in getting out the word to the public and schools about the event. We will have applications soon to give out to the public as well as the schools. This will be opened to 5th - 8th graders. Debora needs your help!

Hope everyone had a very Happy Holiday!

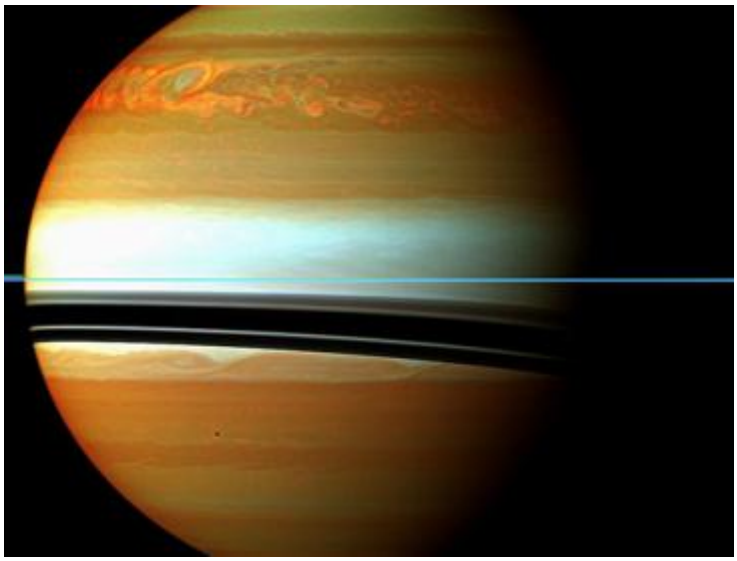
Clear skies and stay warm!

Space Place

Partnering to Solve Saturn's Mysteries

By Diane K. Fisher

From December 2010 through mid-summer 2011, a giant storm raged in Saturn's northern hemisphere. It was clearly visible not only to NASA's Cassini spacecraft orbiting Saturn, but also astronomers here on Earth—even those watching from their back yards. The storm came as a surprise, since it was about 10 years earlier in Saturn's seasonal cycle than expected from observations of similar storms in the past. Saturn's year is about 30 Earth years. Saturn is tilted on its axis (about 27° to Earth's 23°), causing it to have seasons as Earth does.



This false-colored Cassini image of Saturn was taken in near-infrared light on January 12, 2011. Red and orange show clouds deep in the atmosphere. Yellow and green are intermediate clouds. White and blue are high clouds and haze. The rings appear as a thin, blue horizontal line.

But even more surprising than the unseasonal storm was the related event that followed.

First, a giant bubble of very warm material broke through the clouds in the region of the now-abated storm, suddenly raising the temperature of Saturn's stratosphere over 150 °F. Accompanying this enormous "burp" was a sudden increase in ethylene gas. It took Cassini's Composite Infrared Spectrometer instrument to detect it.

According to Dr. Scott Edgington, Deputy Project Scientist for Cassini, "Ethylene [C_2H_4] is normally present in only very low concentrations in Saturn's atmosphere and has been very difficult to detect. Although it is a transitional product of the thermochemical processes that normally occur in Saturn's atmosphere, the concentrations detected concurrent with the big 'burp' were 100 times what we would expect."

So what was going on?

Chemical reaction rates vary greatly with the energy available for the process. Saturn's seasonal changes are exaggerated due to the effect of the rings acting as venetian blinds, throwing the northern hemisphere into shade during winter. So when the Sun again reaches the northern hemisphere, the photochemical

reactions that take place in the atmosphere can speed up quickly. If not for its rings, Saturn's seasons would vary as predictably as Earth's.

But there may be another cycle going on besides the seasonal one. Computer models are based on expected reaction rates for the temperatures and pressures in Saturn's atmosphere, explains Edgington. However, it is very difficult to validate those models here on Earth. Setting up a lab to replicate conditions on Saturn is not easy!

Also contributing to the apparent mystery is the fact that haze on Saturn often obscures the view of storms below. Only once in a while do storms punch through the hazes. Astronomers may have previously missed large storms, thus failing to notice any non-seasonal patterns.

As for atmospheric events that are visible to Earth-bound telescopes, Edgington is particularly grateful for non-professional astronomers. While these astronomers are free to watch a planet continuously over long periods and record their finding in photographs, Cassini and its several science instruments must be shared with other scientists. Observation time on Cassini is planned more than six months in advance, making it difficult to immediately train it on the unexpected. That's where the volunteer astronomers come in, keeping a continuous watch on the changes taking place on Saturn.

Edgington says, "Astronomy is one of those fields of study where amateurs can contribute as much as professionals."

Go to http://saturn.jpl.nasa.gov/ to read about the latest Cassini discoveries. For kids, The space Place has lots of ways to explore Saturn at http://spaceplace.nasa.gov/search/cassini/.

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

Astrophoto of The Month

Rosette Nebula
by Don Bryden

Taken at Two Goats Observatory using an SBIG ST10-XME camera through a Stellarvue SV-105 scope. RGB and Ha filters plus luminance exposures totaling about six hours.

News Headlines

NASA Mars Rover Fully Analyzes First Soil Samples
NASA's Mars Curiosity rover has used its full array of instruments to analyze Martian soil for the first time, and found a complex chemistry within the Martian soil. Water and sulfur and chlorine-containing substances, among other ingredients, showed up in samples Curiosity's arm delivered to an analytical laboratory inside the rover.
http://www.nasa.gov/mission_pages/msl/news/msl20121203.html

NASA Voyager 1 Encounters New Region in Deep Space
NASA's Voyager 1 spacecraft has entered a new region at the far reaches of our solar system that scientists feel is the final area the spacecraft has to cross before reaching interstellar space. Scientists refer to this new region as a magnetic highway for charged particles because our sun's magnetic field lines are connected to interstellar magnetic field lines.
http://voyager.jpl.nasa.gov/news/voyager_1_new_region.html

Astronomers Discover and "Weigh" Infant Solar System
Astronomers have found the youngest still-forming solar system yet seen, an infant star surrounded by a swirling disk of dust and gas more than 450 light-years from Earth in the constellation Taurus. The star currently has about one-fifth the mass of the Sun, but, the scientists say, will likely pull in material from its surroundings to eventually match the Sun's mass. The disk surrounding the young star contains at least enough mass to make seven Jupiters, the largest planet in our Solar System.
http://www.nrao.edu/pr/2012/youngsystem/

Spiral Structure of Disk May Reveal Planets
An international team of astronomers has used HiCIAO (High Contrast Instrument for the Subaru Next Generation Optics) [Note 1] to observe a disk around the young star SAO 206462. They succeeded in capturing clear, detailed images of its disk, which they discovered has a spiral structure with two clearly discernable arms. On the basis of their observations and modeling according to spiral density wave theory, the team suspects that dynamic processes, possibly resulting from planets in the disk, may be responsible for its spiral shape. This research may provide the basis for another indirect method of detecting planets.
http://spaceref.com/extrasolar-planets-1/spiral-structure-of-disk-may-reveal-planets.html

Measurements Hint Why the Universe Is Dominated by Matter, Not Anti-Matter
A collaboration with major participation by physicists at the University of Wisconsin-Madison has made a precise measurement of elusive, nearly massless particles, and obtained a crucial hint as to why the universe is dominated by matter, not by its close relative, anti-matter.
http://www.sciencedaily.com/releases/2012/12/121226153024.htm

Closest single star like our Sun may have habitable planet
An international team of astronomers led by the University of Hertfordshire in the United Kingdom has discovered that Tau Ceti, one of the closest and most Sun-like stars, may host five planets — with one in the star's habitable zone.
http://www.astronomy.com/en/News-Observing/News/2012/12/Closest%20single%20star%20like%20our%20Sun%20may%20have%20habitable%20planet.aspx

January Sky Data

Best time for deep sky observing this month:
January 3 through January 15

Mercury is essentially invisible to the unaided eye all month. On the first of January it can be glimpsed well down the to left of Venus before dawn and, at the very end of the month, down to the lower left of Mars after Sunset.

Venus is now getting closer to the Sun and nearing the end of its morning apparition. It will be just visible in the pre-dawn sky during the early part of the month but by months end will be lost in the glare of the Sun.

Mars is visible low in the west after sunset and visible throughout the month. It shines at magnitude +1.2 while its angular diameter falls from 4.2 to 4.1 arc seconds so it is very unlikly that any surface markings could be seen on its salmon-pink disk.

Jupiter is now well up in the eastern sky after sunset and crosses the meridian, highest in the sky at 21:00 on January 1st and at 19:30 on the 30th. Shining at magnitude -2.7, it starts January lying just 5.25 degrees to the upper right of the star Aldebaran, the eye of the Bull. Jupiter is still moving westwards in the sky in retrograde motion and will do so until the beginning of February.

Saturn rises at 2:30 am as the year begins and by midnight at month's end so will be visible well above the eastern horizon before dawn. The rings have now opened out to just over 19 degrees from the line of sight and will be at their best for 6 years!

The Quadrantids **meteor shower** will be peaking in the very early morning hours of January 3 and are expected to reach a peak rate of around 80 meteors an hour. There will be some moon light present though, so that will cut down somewhat on the number of meteors visible. Unlike many other meteor showers, the Quadrantids only last for a few hours, the early hours of January the 3rd is the only time to see them.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
1/1/2013	21:16	09:24	06:59	16:52
1/5/2013	00:18	11:40	06:59	16:55
1/10/2013	05:43	16:12	06:59	16:59
1/15/2013	09:19	21:45	06:58	17:04
1/20/2013	12:12	01:34	06:56	17:09
1/25/2013	16:16	05:37	06:54	17:14
1/31/2013	22:11	09:06	06:50	17:20

Planet Data

Jan 1

	Rise	Transit	Set	Mag
Mercury	06:20	11:16	16:09	-0.7
Venus	05:24	10:26	15:27	-3.9
Mars	08:26	13:37	18:47	1.2
Jupiter	14:19	21:27	04:36	-2.7
Saturn	02:02	07:34	13:09	0.6

Jan 15

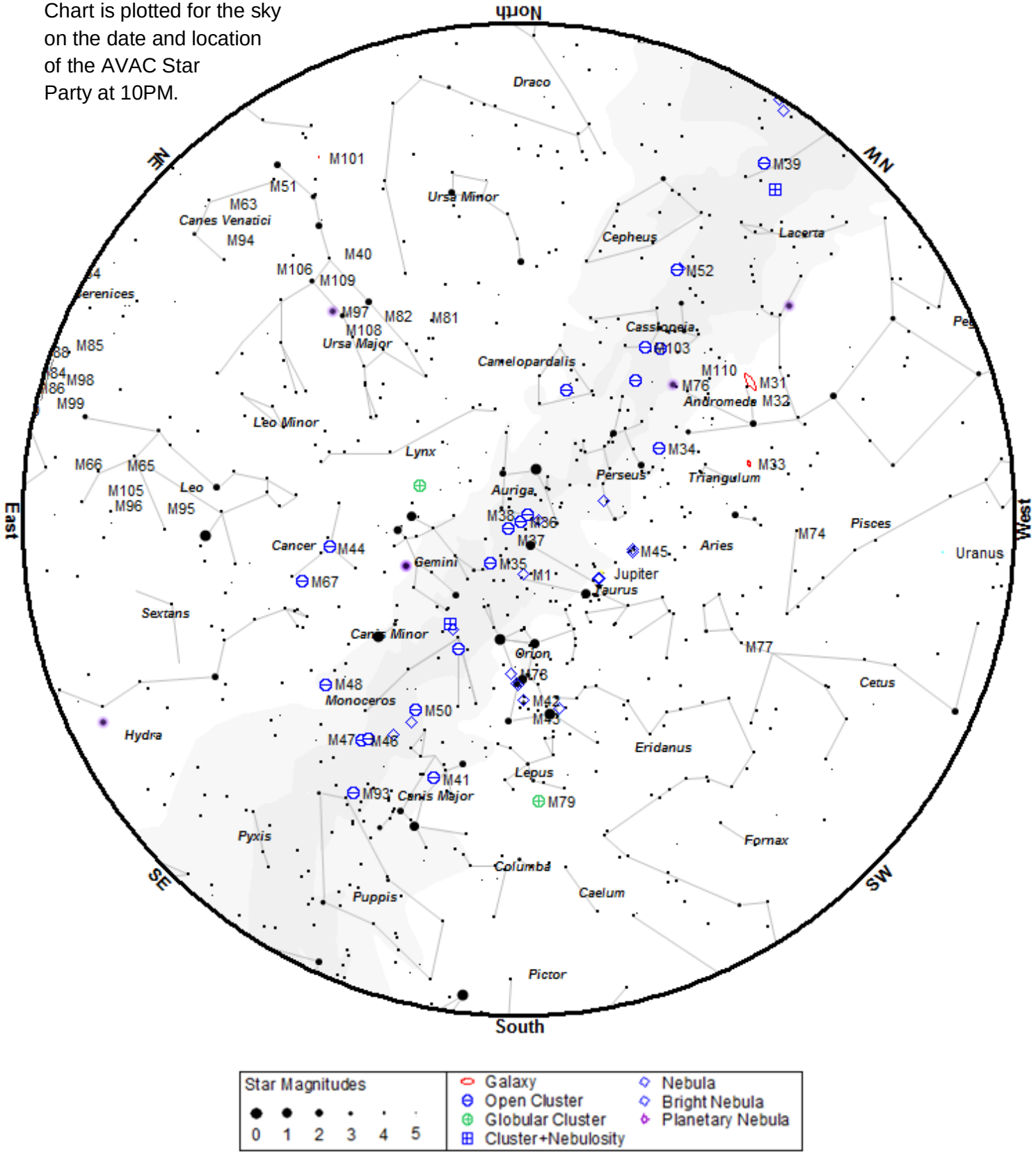
	Rise	Transit	Set	Mag
Mercury	06:58	11:59	16:56	-1.2
Venus	05:47	10:47	15:46	-3.9
Mars	08:06	13:26	18:46	1.2
Jupiter	13:20	20:28	03:36	-2.7
Saturn	01:11	06:42	12:17	0.6

Jan 31

	Rise	Transit	Set	Mag
Mercury	07:23	12:45	18:08	-1.1
Venus	06:03	11:10	16:16	-3.9
Mars	07:39	13:13	18:44	1.2
Jupiter	12:15	19:24	02:32	-2.6
Saturn	00:11	05:42	11:13	0.5

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							Galaxy	Nebula
0	1	2	3	4	5		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	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
NGC 7160	Open	6.4	Cep	21h53m40.0s	+62°36'12"	18:03	18:30	20:18	obvious
NGC 7243	Open	6.7	Lac	22h15m08.0s	+49°53'54"	18:12	18:30	19:53	detectable
M 52	Open	8.2	Cas	23h24m48.0s	+61°35'36"	18:12	18:33	20:34	detectable
NGC 7789	Open	7.5	Cas	23h57m24.0s	+56°42'30"	18:14	18:33	20:36	difficult
NGC 7790	Open	7.2	Cas	23h58m24.0s	+61°12'30"	18:05	18:34	22:18	easy
M 110	Gal	8.9	And	00h40m22.3s	+41°41'09"	18:11	18:34	21:03	detectable
M 32	Gal	8.9	And	00h42m41.8s	+40°51'58"	18:07	18:34	21:48	easy
M 31	Gal	4.3	And	00h42m44.3s	+41°16'07"	18:08	18:35	21:51	easy
M 33	Gal	6.4	Tri	01h33m50.9s	+30°39'36"	18:09	18:38	21:46	detectable
NGC 457	Open	5.1	Cas	01h19m35.0s	+58°17'12"	18:05	18:38	23:31	easy
NGC 559	Open	7.4	Cas	01h29m31.0s	+63°18'24"	18:06	18:39	23:55	easy
M 103	Open	6.9	Cas	01h33m23.0s	+60°39'00"	18:03	18:40	23:52	obvious
M 76	PNe	10.1	Per	01h42m19.9s	+51°34'31"	18:09	18:40	22:18	detectable
NGC 637	Open	7.3	Cas	01h43m04.0s	+64°02'24"	18:03	18:41	00:12	obvious
NGC 663	Open	6.4	Cas	01h46m09.0s	+61°14'06"	18:06	18:41	00:03	easy
NGC 752	Open	6.6	And	01h57m41.0s	+37°47'06"	18:18	18:41	20:37	challenging
NGC 869	Open	4.3	Per	02h19m00.0s	+57°07'42"	18:02	18:48	00:29	obvious
NGC 884	Open	4.4	Per	02h22m18.0s	+57°08'12"	18:02	18:50	00:32	obvious
Heart	Neb	6.5	Cas	02h33m52.0s	+61°26'50"	18:07	18:57	00:46	challenging
NGC 957	Open	7.2	Per	02h33m21.0s	+57°33'36"	18:07	18:57	00:24	easy
M 77	Gal	9.7	Cet	02h42m40.8s	-00°00'48"	18:10	19:04	22:10	detectable
M 34	Open	5.8	Per	02h42m05.0s	+42°45'42"	18:08	19:03	23:29	detectable
NGC 1027	Open	7.4	Cas	02h42m40.0s	+61°35'42"	18:11	19:04	23:35	detectable
NGC 1245	Open	7.7	Per	03h14m42.0s	+47°14'12"	18:20	19:36	21:50	challenging
NGC 1342	Open	7.2	Per	03h31m38.0s	+37°22'36"	18:08	19:52	00:08	detectable
M 45	Open	1.5	Tau	03h47m00.0s	+24°07'00"	18:05	20:08	00:45	obvious
NGC 1444	Open	6.4	Per	03h49m25.0s	+52°39'30"	18:02	20:10	01:48	obvious
NGC 1502	Open	4.1	Cam	04h07m50.0s	+62°19'54"	18:00	20:29	02:30	obvious
NGC 1528	Open	6.4	Per	04h15m23.0s	+51°12'54"	18:08	20:37	01:47	easy
Hyades	Open	0.8	Tau	04h26m54.0s	+15°52'00"	18:07	20:47	01:03	easy
NGC 1647	Open	6.2	Tau	04h45m55.0s	+19°06'54"	18:16	21:06	00:26	detectable
NGC 1664	Open	7.2	Aur	04h51m06.0s	+43°40'30"	18:08	21:12	02:11	easy
NGC 1746	Open	6.1	Tau	05h03m50.0s	+23°46'12"	18:18	21:25	00:52	detectable
M 38	Open	6.8	Aur	05h28m40.0s	+35°50'54"	18:15	21:50	02:00	detectable
M 1	Neb	8.4	Tau	05h34m30.0s	+22°01'00"	20:00	21:55	23:50	challenging
M 43	Neb	9.0	Ori	05h35m30.0s	-05°16'00"	18:46	21:56	01:06	challenging
M 42	Neb	4.0	Ori	05h35m18.0s	-05°23'00"	18:46	21:56	01:05	easy
M 36	Open	6.5	Aur	05h36m18.0s	+34°08'24"	18:09	21:57	02:50	easy

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 78	Neb	8.0	Ori	05h46m48.0s	+00°05'00"	18:38	22:07	01:38	challenging
M 37	Open	6.2	Aur	05h52m18.0s	+32°33'12"	18:12	22:13	02:57	easy
NGC 2129	Open	7.0	Gem	06h01m07.0s	+23°19'20"	18:09	22:21	02:56	obvious
NGC 2169	Open	7.0	Ori	06h08m24.0s	+13°57'54"	18:17	22:29	02:39	obvious
NGC 2175	Open	6.8	Ori	06h09m39.0s	+20°29'12"	18:51	22:30	02:10	detectable
M 35	Open	5.6	Gem	06h09m00.0s	+24°21'00"	18:19	22:30	02:47	easy
NGC 2237	Neb	5.5	Mon	06h32m02.0s	+04°59'10"	19:08	22:52	02:38	challenging
NGC 2264	Open	4.1	Mon	06h40m58.0s	+09°53'42"	19:00	23:01	03:02	easy
NGC 2301	Open	6.3	Mon	06h51m45.0s	+00°27'36"	19:41	23:12	02:43	easy
M 50	Open	7.2	Mon	07h02m42.0s	-08°23'00"	20:26	23:23	02:20	detectable
NGC 2353	Open	5.2	Mon	07h14m30.0s	-10°16'00"	20:47	23:35	02:23	easy
NGC 2355	Open	9.7	Gem	07h16m59.0s	+13°45'00"	20:55	23:37	02:19	difficult
NGC 2360	Open	9.1	CMa	07h17m43.0s	-15°38'30"	22:14	23:38	01:01	challenging
NGC 2392	PNe	8.6	Gem	07h29m10.8s	+20°54'42"	19:21	23:50	04:17	obvious
M 47	Open	4.3	Pup	07h36m35.0s	-14°29'00"	21:33	23:56	02:22	obvious
NGC 2423	Open	7.0	Pup	07h37m06.0s	-13°52'18"	21:28	23:57	02:24	easy
M 46	Open	6.6	Pup	07h41m46.0s	-14°48'36"	21:40	00:02	02:23	detectable
NGC 2506	Open	8.9	Mon	08h00m01.0s	-10°46'12"	22:25	00:20	02:16	challenging
M 44	Open	3.9	Cnc	08h40m24.0s	+19°40'00"	20:56	01:01	05:03	easy
M 67	Open	7.4	Cnc	08h51m18.0s	+11°48'00"	22:20	01:11	04:03	detectable
M 82	Gal	9.0	UMa	09h55m52.4s	+69°40'47"	20:11	02:16	05:50	detectable
M 81	Gal	7.8	UMa	09h55m33.1s	+69°03'56"	20:26	02:16	05:48	detectable
NGC 3227	Gal	11.5	Leo	10h23m30.6s	+19°51'54"	23:46	02:43	05:35	difficult
M 97	PNe	9.7	UMa	11h14m47.7s	+55°01'09"	23:13	03:34	05:48	detectable
M 65	Gal	10.1	Leo	11h18m55.7s	+13°05'32"	00:20	03:38	05:48	detectable
M 66	Gal	9.7	Leo	11h20m14.9s	+12°59'30"	00:16	03:40	05:48	detectable
M 106	Gal	9.1	CVn	12h18m57.6s	+47°18'13"	00:36	04:39	05:49	detectable
Col 256	Open	2.9	Com	12h25m06.0s	+26°06'00"	00:21	04:44	05:53	easy
M 84	Gal	10.1	Vir	12h25m03.9s	+12°53'12"	01:29	04:45	05:49	detectable
M 86	Gal	9.8	Vir	12h26m12.2s	+12°56'44"	01:45	04:46	05:48	detectable
M 49	Gal	9.3	Vir	12h29m46.8s	+08°00'01"	01:33	04:49	05:50	detectable
M 87	Gal	9.6	Vir	12h30m49.2s	+12°23'29"	01:32	04:50	05:49	detectable
NGC 4565	Gal	10.1	Com	12h36m20.8s	+25°59'15"	01:49	04:56	05:47	difficult
M 104	Gal	9.1	Vir	12h39m59.3s	-11°37'22"	02:18	04:59	05:50	detectable
M 94	Gal	8.7	CVn	12h50m53.1s	+41°07'12"	00:42	05:07	05:53	detectable
M 64	Gal	9.3	Com	12h56m43.8s	+21°41'00"	01:33	05:12	05:52	detectable
M 51	Gal	8.7	CVn	13h29m52.3s	+47°11'40"	01:05	05:19	05:52	easy
NGC 5195	Gal	10.5	CVn	13h29m59.6s	+47°15'58"	01:49	05:20	05:51	detectable
M 101	Gal	8.4	UMa	14h03m12.4s	+54°20'53"	02:18	05:22	05:49	detectable
M 3	Glob	6.3	CVn	13h42m11.0s	+28°22'42"	01:55	05:22	05:51	detectable
M 5	Glob	5.7	Ser	15h18m34.0s	+02°05'00"	04:02	05:29	05:50	easy
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	03:57	05:30	05:50	easy
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	04:18	05:31	05:50	easy

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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