



Desert Sky Observer

Volume 31

Antelope Valley Astronomy Club Newsletter

March 2011

Up-Coming Events

- March 3: [Leona Valley Science Fair](#)
- March 5: Dark Sky Star Party @ [Devils Punchbowl](#)
- March 11: Club Meeting*
- March 14: Board meeting @ [Don's house](#)
- March 26: Prime Desert Woodlands [Moon Walk](#)

* 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

Someone at work was talking about all the coyotes howling the night before and wondered if it was a full moon. I said, "No, it's twenty days old, waning gibbous." Everyone stopped and stared as if driving by a wreck on the freeway. "Why do you bother to know how old the moon is?" Someone asked. I realized I've been planning much of my life around moon phases for some time now, whether it's for club star parties or imaging sessions at Two Goats.

I often choose family vacation time that is during the full moon so as not to miss star parties or evenings that could be better spent imaging (don't tell Mimi...). That's why I was miffed when I realized this year's air traffic controllers' hockey tournament was going to coincide with the star party at Devil's Punchbowl! I've missed an outreach event here or there but I can't recall the last star party I didn't go to (of course, since I get to choose all the dates and locations, I should be able to make them all!)

So normally, I'm returning on the Saturday after the hockey tournament but this year I'm not back until Sunday. Not that it matters as this star party coincides with the Punchbowl rangers' Telescope Night. Dave and the others will be out around 8pm with their Meade 11" scope and free hot chocolate.

And don't forget the Leona Valley Science Fair on Thursday, March 3rd. Come out at around 5:30 for a short star party for the students. Call Tom Koonce at (661) 917-7576 for more info.

Finally, don't miss the March meeting on the 11th. Jeremy will be talking about Charles Messier and his famous list of objects. Come brush up on your faint fuzzies just in time for the Messier Marathon in April! You won't want to miss this one as we're putting on a free Bar-B-Que in the afternoon. It'll be at saddleback Butte at the group camp site which will be ours from Saturday noon until Sunday. Check the website for all times and directions or email me at president@avastronomyclub.org for more info – I'll try and read my email between hockey games!



Vice President

Rose Moore

Our club meeting for the month of March will have Jeremy Amarant give a presentation on the Messier objects! This should be of interest for those who will be participating in the Messier Marathon Club Star Party on April 2nd at Saddleback, as well as all other club members and the public. Come out and learn about some of the most beautiful night sky objects!

For April, we will have Dr. David Lynch of the Aerospace Corporation speaking on 'Asteroid Impacts on Earth'. Dr. Lynch is an astronomer, author, and also works with the USGS on plate tectonics, focusing on the San Andreas Fault.

The new Night Sky Network kit on 'Space Rocks, Asteroids, and Meteorites' will be the focus of our May meeting. Dick Hague, Shane and Karole Barker will be giving the presentation to the club. The NSN kits are educational for club members, as well as giving us a new way to present information to the public!

We have a tentative speaker for our June meeting. Dr. Robert Piccioni, a physicist and author, will be speaking on 'Einstein for Everyone'. Dr. Piccioni is noted for bringing complicated topics of science and simplifying them so that the general public will be able to understand the scientific concepts! We are attempting to work out some details before finalizing Dr. Piccioni attending our club meeting.

July's meeting will be Linda Morabito-Meyer, an astronomer, engineer, and astronomy professor. She has worked at JPL, the Planetary Society, and other centers, on several missions, and was the discoverer of the volcanic plume on Io. Topic to be announced.

The application for the Poppy Festival is in the mail! The dates are Saturday and Sunday, April 16th and 17th. Please consider signing up to man our booth, or to help with the telescopes and meet the public. We can use help on both days. Please sign up at the meetings in March and April, or call Robert Lynch for information or to sign up!

Our club picnic will be Saturday June 4th, starting at 3pm at the Trotta's home in Acton. Signup sheets for the potluck will be started at the March meeting. Please think about what you might want to bring. Also if you have items for the raffle or silent auction, please contact me or one of the board members with the information.

A signup sheet has been started for the club trip to Mt. Wilson on Saturday, July 2nd. **Please be aware, as noted on the top of the signup sheet, that this trip is open for members only at this time! If, as we get closer to the date, there are slots open, then they will be open to non members and friends in order from the stand by list. Please contact me if any questions.

A deposit has been made to the Embassy Suites for our Christmas Party for December 10th, Saturday, at 6pm. More info to follow in the fall!

Stay warm, and Clear skies!

Rose



Director of Community Development

Robert Lynch

We have several events coming up in the next month. Please check the calendar on our website and sign up for the events, or call or email me if you can attend any of the events.

This Thursday is the Leona Valley Science Fair and Star Party. We need members for judging the science projects during the hours from 2:00 to 3:00pm. We will also need members for a star party for the kids and their families from 5:30 to 7:00pm.

Our Dark Sky Star Party this month is at Devil's Punchbowl on Saturday March 5. Let's hope for some clear, dry, and less chilly weather!

Our first Prime Desert Woodlands Moon Walk with Jeremy for this year is on Saturday, March 26th starting at 6:30pm. We need volunteers with scopes to come out and support this fun event!

Also this month have one public outreach event which will be held Wednesday the 30th, at 6:30 pm at the Acton Library there will be a Lecture by Jeremy on The life and death of a star. A Star Party will be held after the lecture and we'll need members with telescopes to sign up for this event to help.

Coming up Saturday, April 2 is our annual Messier Marathon/Club Star Party which will be held at Saddleback Butte. Plan to arrive and set up before the Sun goes down. We will be having a BBQ.

Also next month is the Antelope Valley Poppy Festival being held April 16-17. We need more volunteers with scopes to sign up come out and support for both Saturday and Sunday, but mostly Sunday.



Secretary

Drank Moore

Once again, in writing my DSO contribution, I find myself commending the willingness of most amateur astronomers, and our club members in particular, to help others who have any interest in the Cosmos. While most of us who have been involved in the Antelope Valley Astronomy Club for any length of time are familiar with the club's prolific public outreach programs, unless you have attended a Dark Sky Star Party or other club observing event, you may be unaware of the "outreach" that goes on within the club with member helping member. Many of us, who are now proficient observers and adept at using our astronomy equipment, only got there with the help of many other generous club members.

It's common at our star parties to find our members helping others collimate their telescopes, set up and align mounts, find and identify objects, verify objects for catalog certificates, troubleshoot and repair problems, share equipment, and keeping a constant supply of coffee, hot cocoa, snacks, and even ice cream (from Rose's freezer) flowing freely.

These, and other things, are done informally, automatically, and without second thought.

This is YOUR club, and we want each and every one of you to feel comfortable coming to a star party, with or without a telescope, with the expectancy and certainty that you will get something out of the experience, learn things you did not know before, and most importantly have a good time.

At the monthly meetings at the SAGE Planetarium, we often mention that Board Meetings are open to anyone who wants to attend and that you are free to introduce ideas and agenda items at those meeting.

Recently, Darrell Bennett, who has always been generous in helping other members learn the various aspects of the hobby from telescope operation to identifying objects in the night sky, attended a Board Meeting and suggested some enhancements to Star Parties which the Board enthusiastically supported.

The first of these is what we shall call an “Open Scope” program at each and every Star Party. Under this program, one or more telescopes (depending on attendance and length of the event) will be the official “Open Scope” for at least several hours a night. One telescope may be the Open Scope during a certain block of time, and another between different hours. This telescope (or telescopes), manned by an experienced member, will be available for viewing requests by anyone who has a particular interest or request. If there's an object you want to see, ask the operator of the Open Scope and they'll point it there...or TEACH YOU how to point it there. If you have questions about an object, we'll find the answer. Though most members will do this for anyone, anyhow, we want to ensure that no one is “bashful” about asking so we will assign a telescope specifically for this purpose. Though the details are yet to be figured out, we'll find a way to ensure that everyone knows which instrument is the Open Scope.

We will also establish a “Mentor”, or “Star Party Leader” program for Star Parties. There will be signups for mentors at club meetings, as well as on the Event Calendar on the website and, once again, a method will be established to clearly identify them at star parties. Mentors may operate an Open Scope for members without a telescope or make themselves available to help inexperienced members set up their own telescope and assist them with finding objects. Once again, our intent is to ensure that no one is left behind and that everyone gets something out of each event.

The final thing that we will try to implement, as much as possible, is to have a “Meet Up” , or rendezvous point, before events so members can follow each other to our sometimes remote locations and/or carpool when possible. Though members often go to events at different times, with some staying overnight or even for multiple days, we want to establish a list of who is going where, and when, so we can try to match members with similar agendas. We don't anyone left behind because they don't know how to get to an event or are reluctant to drive to a remote location alone.

This is your club! We are trying to make events more accessible so that EVERYONE can enjoy the wonders of the night sky, and the fellowship of other members, at every event. Please avail yourselves of these opportunities.

Also, take note that these programs were established because ONE member took the time to come to a board meeting and suggest them to the board. We encourage all members to participate in the governance of the club in this manner. If you can't come to a board meeting, offer your suggestions during the monthly general meeting or send an email, or make a telephone call, to any board member. We are here to ensure that each and every member gets the maximum benefit from their membership.

Dark Skies...
Frank Moore

Time to Go by Tom Koonce

The history of astronomy has always been tied closely to the accurate measurement of time. We take it for granted that even the least expensive digital watch keeps better time than the finest timepiece of a few hundred years ago. Even so, anyone who has put up with jet lag during a long trip knows how difficult it is to keep track of the local time. If we could all think in Universal Time, I suppose it would still be a struggle to get an idea of local sunrise and sunset times. These days, dual time-zone watches make it easier, but before pocket watches and other portable clocks, it must have been impossible for the Renaissance-period road warriors to track, right? At least I thought so until a recent visit to a museum where I saw ingenious portable timepieces dating from c. 1600.



Figure 1 – Ivory Portable Timepiece; c. 1600

A “Traveler” timepiece was a portable sundial with a magnetic compass built in to allow for its initial alignment. The models that I saw were made of ivory or brass (in later models) and consisted of a base with small embedded compass, a hinged “lid”, and either a small hole in the lid (Figure 1), or a string that connected base and lid at a 45 degree angle (Figure 2). Note the listing of cities on the underside of the lid in Figure 1.



Figure 2 – Brass Portable Timepiece; c. 1650

After aligning the Traveler sundial with magnetic north and correcting for magnetic declination, the user used the shadow cast by the Sun on the string or the spot cast by the hole in the lid to determine the time on the scale marked on the base in the manner of sundials. Despite the small size of the unit and the user’s likely errors in alignment, the instrument still gave times accurate to within an hour or so. The accuracy depended on the time of year, time of day, and the 2 axis leveling of the Traveler. And of course, if it was a cloudy day, the user was simply out of luck.



Figure 3 – Outer Lid of a Traveler timepiece; c. 1621.
(Photos by author, Finland National Museum)

The workmanship on the pieces that I photographed for this article were finely detailed and carefully inscribed. These instruments were not inexpensive, nor were they something that everyone of the period needed to have. But portable spring powered clocks of the day were unreliable on long trips because of their constant need of winding. After one forgetful day or night and the owner would be left with a temporarily useless timepiece, but on a sunny day, the Traveler sundial timepiece was always reliable. People of means such as scholars and business men who traveled far and regularly enough to make this instrument a necessity would have been the primary consumers. While I won't trade in my quartz watch anytime soon, I think these instruments are cool enough, even now, that I'd like one to demo before a star party.

Clear Skies!
Tom

Interesting Fact: First Wrist Watch. In 1504, the first portable (but not very accurate) timepiece was invented in Nuremberg, Germany by Peter Henlein. The first reported person to actually wear a watch on the wrist was the French mathematician and philosopher, Blaise Pascal (1623-1662). With a piece of string, he attached his pocket watch to his wrist. Reference: <http://inventors.about.com/od/cstartinventions/a/clock.htm>

Space Place

Thank Goodness the Sun is Single

By Trudy E. Bell

It's a good thing the Sun is single. According to new research, Sun-like stars in close double-star systems "can be okay for a few billion years—but then they go bad," says Jeremy Drake of the Harvard-Smithsonian Astrophysical Observatory in Cambridge, Mass.

How bad? According to data from NASA's Spitzer Space Telescope, close binary stars can destroy their planets along with any life. Drake and four colleagues reported the results in the September 10, 2010, issue of *The Astrophysical Journal Letters*.

Our Sun, about 864,000 miles across, rotates on its axis once in 24.5 days. "Three billion years ago, roughly when bacteria evolved on Earth, the Sun rotated in only 5 days," explains Drake. Its rotation rate has been gradually slowing because the solar wind gets tangled up in the solar magnetic field, and acts as a brake.

But some sun-like stars occur in close pairs only a few million miles apart. That's only about five times the diameter of each star—so close the stars are gravitationally distorted. They are actually elongated toward each other. They also interact tidally, keeping just one face toward the other, as the Moon does toward Earth.

Desert Sky Observer



Planetary collisions such as shown in this artist's rendering could be quite common in binary star systems where the stars are very close.

Such a close binary is “a built-in time bomb,” Drake declares. The continuous loss of mass from the two stars via solar wind carries away some of the double-star system’s angular momentum, causing the two stars to spiral inward toward each other, orbiting faster and faster as the distance shrinks. When each star’s rotation period on its axis is the same as its orbital period around the other, the pair effectively rotates as a single body in just 3 or 4 days.

Then, watch out! Such fast spinning intensifies the magnetic dynamo inside each star. The stars “generate bigger, stronger ‘star spots’ 5 to 10 percent the size of the star—so big they can be

detected from Earth,” Drake says. “The stars also interact magnetically very violently, shooting out monster flares.”

Worst of all, the decreasing distance between the two stars “changes the gravitational resonances of the planetary system,” Drake continued, destabilizing the orbits of any planets circling the pair. Planets may so strongly perturbed they are sent into collision paths. As they repeatedly slam into each other, they shatter into red-hot asteroid-sized bodies, killing any life. In as short as a century, the repeated collisions pulverize the planets into a ring of warm dust.

The infrared glow from this pulverized debris is what Spitzer has seen in some self-destructing star systems. Drake and his colleagues now want to examine a much bigger sample of binaries to see just how bad double star systems really are.

They’re already sure of one thing: “We’re glad the Sun is single!”

Read more about these findings at the NASA Spitzer site at <http://www.spitzer.caltech.edu/news/1182-ssc2010-07-Pulverized-Planet-Dust-May-Lie-Around-Double-Stars>. For kids, the Spitzer Concentration game shows a big collection of memorable (if you’re good at the game) images from the Spitzer Space Telescope. Visit <http://spaceplace.nasa.gov/en/kids/spitzer/concentration/>.

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

News Headlines

NASA Releases Images of Human-Made Crater on Comet

NASA's Stardust spacecraft returned new images of a comet showing a scar resulting from the 2005 Deep Impact mission. The images also showed the comet has a fragile and weak nucleus. The spacecraft made its closest approach to comet Tempel 1 on Monday, Feb. 14, at 8:40 p.m. PST (11:40 p.m. EST) at a distance of approximately 178 kilometers (111 miles). Stardust took 72 high-resolution images of the comet. It also accumulated 468 kilobytes of data about the dust in its coma, the cloud that is a comet's atmosphere.

<http://www.sciencedaily.com/releases/2011/02/110215205951.htm>

How Low Can a Dark Matter Halo Go?

With all the splendor and beauty of the galaxies around us, it is easy to forget that such "normal" matter only makes up about fifteen percent of the matter in the universe. The rest is a form of matter that does not interact with light at all, conveniently called "dark matter." Even though we cannot see it directly, it has helped to shape the universe into what we see today, and we can trace it using what we can see.

<http://news.discovery.com/space/how-low-can-a-dark-matter-halo-go.html#mkcpgn=rssnws1>

Halt, Black Hole! Gemini Captures Explosions That Deprive Black Holes of Mass

Astronomers have long suspected that something must stymie actively growing black holes, because most galaxies in the local universe don't have them. Now, the Gemini Observatory has captured a galactic check-and-balance — a large-scale quasar outflow in the galaxy Markarian 231 that appears to be depriving a supermassive black hole its diet of gas and dust.

<http://www.universetoday.com/83486/halt-black-hole-gemini-captures-explosions-that-deprive-black-holes-of-mass/>

Rare meteorites reveal Mars collision caused water flow

Rare fragments of Martian meteorites have been investigated at the University of Leicester revealing one of the ways water flowed near the surface of Mars. Scientists at the University's renowned Space Research Centre, in the Department of Physics and Astronomy, examined five meteorite samples – including the very first nakhlite, found a century ago.

<http://www2.le.ac.uk/offices/press/press-releases/2011/february/rare-meteorites-reveal-mars-collision-caused-water-flow>

It's official: The sun is a sphere.

On Feb. 6th, NASA's twin STEREO probes moved into position on opposite sides of the sun, and they are now beaming back uninterrupted images of the entire star—front and back. "For the first time ever, we can watch solar activity in its full 3-dimensional glory," says Angelos Vourlidas, a member of the STEREO science team at the Naval Research Lab in Washington, DC. NASA released a 'first light' 3D movie on, naturally, Super Bowl Sunday

http://www.nasa.gov/mission_pages/stereo/news/entire-sun.html

Astronomers identify thick disc of older stars in nearby Andromeda galaxy

An international team of astronomers has identified for the first time a thick stellar disc in the Andromeda galaxy, the nearest large spiral galaxy to our own Milky Way. The discovery of the thick disc, a major result from a five-year investigation, will help astronomers better understand the processes involved in the formation and evolution of large spiral galaxies like ours, according to the team, which includes UCLA research astronomer Michael Rich and colleagues from Europe and Australia.

<http://www.spaceref.com/news/viewpr.html?pid=32776>

March Sky Data

New Mar 4 First Qtr Mar 12 Full Mar 19 Last Qtr Mar 26



Best time for deep sky observing this month:
March 1 - March 8 and March 24 - March 31

Mercury is at its greatest distance east of the Sun on March 23rd, so we have an unusually good chance to look for this elusive little planet just after sunset. The best time will be between about March 19th and 23rd, around 7:30 to 8 pm. Mercury will be very low in the western sky, and you may need binoculars to find it in the glow of sunset.

Venus is still visible this month as a brilliant “Morning Star”, low in the eastern sky before sunrise, but it’s rising an hour or less before sunrise, and getting increasingly difficult to see. Relative to the stars, Venus is moving rapidly north-eastwards, crossing Capricornus and entering Aquarius on March 25th – but by the time Venus rises, the sky is too bright to see any of the stars.

Mars was in conjunction (almost directly behind the Sun) on February 4th. We won’t be seeing the “Red Planet” this month.

Jupiter is also approaching conjunction, on April 6th. We may be able to see the giant planet low in the west at sunset, at the start of March, looking like a particularly bright star. But Jupiter sets earlier every night, and we will lose sight of it before the end of the month.

Saturn is the only planet well placed for viewing this month. It’s rising in the east around 8 pm, and it’s high in the southern sky in the early hours of the morning. Relative to the stars, Saturn is moving very slowly north-westwards in the constellation of Virgo, drawing upwards away from the bright star Spica. On the night of Saturday March 19th, the Full Moon will be to the right of Saturn; the following night, the Moon will appear below the planet.

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

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
3/1/2011	04:24	15:14	06:20	17:48
3/5/2011	06:20	18:56	06:15	17:51
3/10/2011	08:59	23:37	06:09	17:55
3/15/2011	14:42	04:00	07:02	18:59
3/20/2011	20:40	07:10	06:55	19:03
3/25/2011	01:10	11:11	06:48	19:07
3/31/2011	04:57	16:56	06:40	19:12

Planet Data

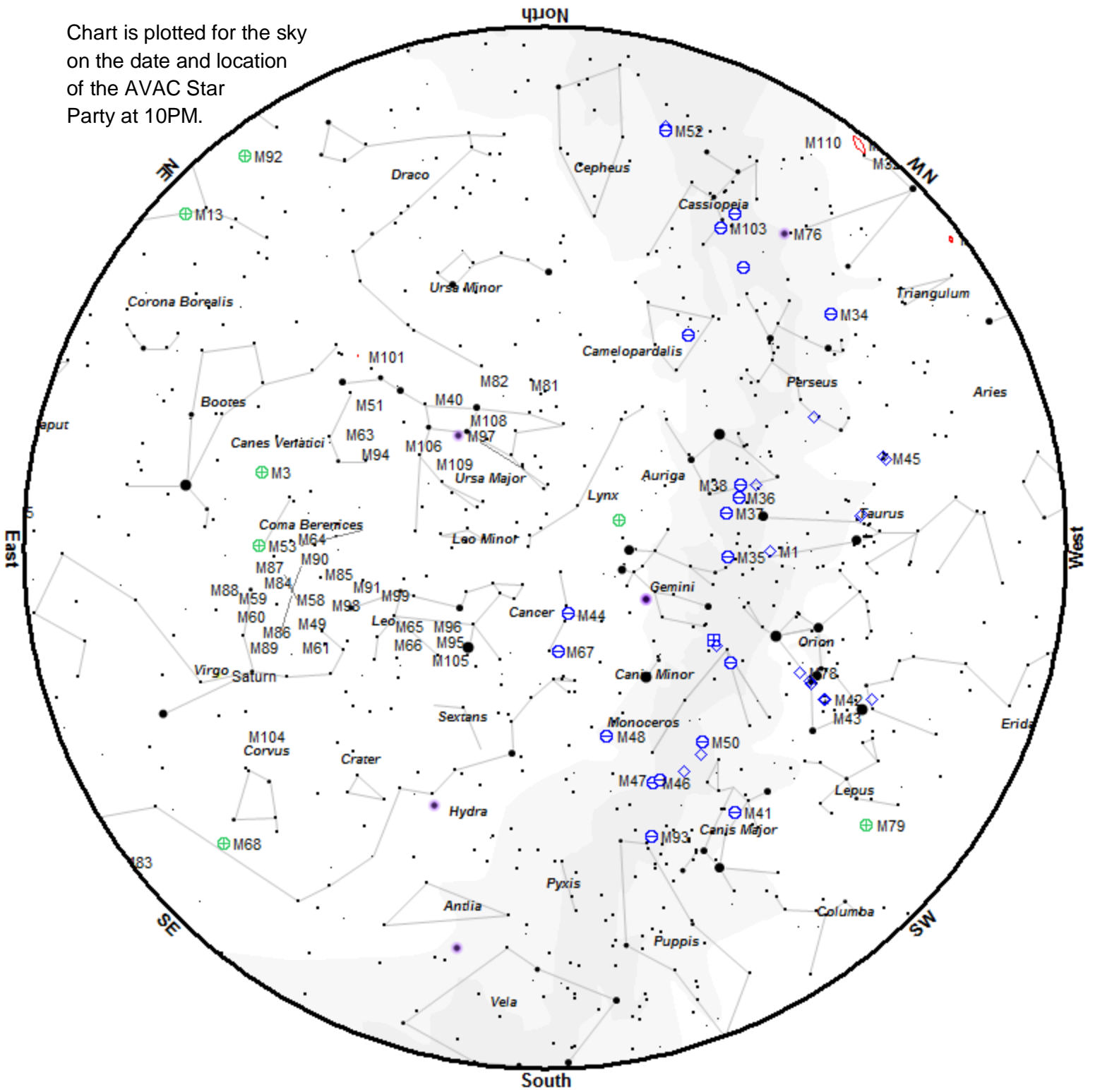
	Mar 1			
	Rise	Transit	Set	Mag
Mercury	06:33	12:21	18:10	-1.6
Venus	04:08	09:22	14:34	-4.1
Mars	06:04	11:44	17:24	1.1
Jupiter	07:28	13:45	19:58	-2.1
Saturn	20:19	02:16	08:12	0.5

	Mar 15			
	Rise	Transit	Set	Mag
Mercury	07:35	13:58	20:21	-0.9
Venus	05:11	10:35	15:58	-4.0
Mars	06:38	12:31	18:21	1.1
Jupiter	07:42	14:02	20:19	-2.1
Saturn	20:20	02:17	08:15	0.4

	Mar 31			
	Rise	Transit	Set	Mag
Mercury	06:54	13:41	20:23	2.1
Venus	05:06	10:47	16:26	-4.0
Mars	06:08	12:14	18:18	1.2
Jupiter	06:49	13:13	19:34	-2.1
Saturn	19:11	01:10	07:09	0.4

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

Chart is plotted for the sky on the date and location of the AVAC Star Party at 10PM.



Star Magnitudes						Galaxy	Nebula
●	●	●	●	●	●		
0	1	2	3	4	5	Globular Cluster	Planetary Nebula
						Cluster+Nebosity	

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
Heart Neb.	Neb	6.5	Cas	02h33m52.0s	+61°26'50"	18:31	18:58	23:20	challenging
NGC 1245	Open	7.7	Per	03h14m42.0s	+47°14'12"	18:31	19:00	23:01	challenging
NGC 884	Open	4.4	Per	02h22m18.0s	+57°08'12"	18:52	19:16	21:07	obvious
NGC 869	Open	4.3	Per	02h19m00.0s	+57°07'42"	18:52	19:16	21:05	obvious
NGC 1027	Open	7.4	Cas	02h42m40.0s	+61°35'42"	18:59	19:17	20:44	detectable
NGC 957	Open	7.2	Per	02h33m21.0s	+57°33'36"	18:55	19:17	21:19	easy
NGC 1342	Open	7.2	Per	03h31m38.0s	+37°22'36"	18:57	19:17	20:59	easy
M 45	Open	1.5	Tau	03h47m00.0s	+24°07'00"	18:53	19:17	21:21	obvious
Hyades	Open	0.8	Tau	04h26m54.0s	+15°52'00"	18:53	19:17	21:40	easy
NGC 1444	Open	6.4	Per	03h49m25.0s	+52°39'30"	18:50	19:18	22:24	obvious
NGC 1647	Open	6.2	Tau	04h45m55.0s	+19°06'54"	18:58	19:18	21:02	detectable
NGC 1502	Open	4.1	Cam	04h07m50.0s	+62°19'54"	18:48	19:19	23:07	obvious
NGC 1528	Open	6.4	Per	04h15m23.0s	+51°12'54"	18:54	19:19	22:18	easy
NGC 1746	Open	6.1	Tau	05h03m50.0s	+23°46'12"	18:57	19:19	21:22	detectable
NGC 1664	Open	7.2	Aur	04h51m06.0s	+43°40'30"	18:53	19:20	22:36	easy
M 42	Neb	4.0	Ori	05h35m18.0s	-05°23'00"	18:51	19:20	21:43	easy
M 38	Open	6.8	Aur	05h28m40.0s	+35°50'54"	18:54	19:21	22:19	detectable
M 36	Open	6.5	Aur	05h36m18.0s	+34°08'24"	18:51	19:22	23:14	easy
M 37	Open	6.2	Aur	05h52m18.0s	+32°33'12"	18:52	19:23	23:19	easy
NGC 2129	Open	7.0	Gem	06h01m07.0s	+23°19'20"	18:50	19:24	23:33	obvious
NGC 2169	Open	7.0	Ori	06h08m24.0s	+13°57'54"	18:51	19:25	23:19	obvious
M 35	Open	5.6	Gem	06h09m00.0s	+24°21'00"	18:53	19:26	23:08	easy
NGC 2175	Open	6.8	Ori	06h09m39.0s	+20°29'12"	18:55	19:26	22:27	detectable
NGC 2264	Open	4.1	Mon	06h40m58.0s	+09°53'42"	18:52	19:40	23:31	obvious
M 41	Open	5.0	CMa	06h46m01.0s	-20°45'24"	18:56	19:44	21:23	easy
NGC 2301	Open	6.3	Mon	06h51m45.0s	+00°27'36"	18:53	19:50	23:15	easy
M 50	Open	7.2	Mon	07h02m42.0s	-08°23'00"	18:56	20:00	22:43	detectable
NGC 2353	Open	5.2	Mon	07h14m30.0s	-10°16'00"	18:53	20:12	23:00	easy
NGC 2355	Open	9.7	Gem	07h16m59.0s	+13°45'00"	19:02	20:14	22:28	difficult
M 1	Neb	8.4	Tau	05h34m30.0s	+22°01'00"	18:48	20:24	22:23	challenging
M 43	Neb	9.0	Ori	05h35m30.0s	-05°16'00"	18:32	20:26	23:34	challenging
NGC 2392	PNe	8.6	Gem	07h29m10.8s	+20°54'42"	18:47	20:27	00:54	obvious
M 47	Open	4.3	Pup	07h36m35.0s	-14°29'00"	18:52	20:34	23:00	obvious
NGC 2423	Open	7.0	Pup	07h37m06.0s	-13°52'18"	18:57	20:35	23:04	easy
M 78	Neb	8.0	Ori	05h46m48.0s	+00°05'00"	18:32	20:37	00:06	challenging
NGC 2439	Open	7.1	Pup	07h40m45.0s	-31°41'36"	19:00	20:38	22:37	easy
M 46	Open	6.6	Pup	07h41m46.0s	-14°48'36"	18:59	20:39	23:03	detectable
NGC 2440	PNe	11.5	Pup	07h41m55.4s	-18°12'31"	18:59	20:40	22:40	detectable

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 93	Open	6.5	Pup	07h44m30.0s	-23°51'24"	19:43	20:42	21:41	easy
NGC 2451	Open	3.7	Pup	07h45m23.0s	-37°57'21"	19:05	20:43	22:26	easy
NGC 2477	Open	5.7	Pup	07h52m10.0s	-38°31'48"	19:11	20:50	22:30	easy
NGC 2571	Open	7.4	Pup	08h18m56.0s	-29°45'00"	19:14	21:16	23:21	easy
NGC 2237	Neb	5.5	Mon	06h32m02.0s	+04°59'10"	19:52	21:21	22:58	challenging
M 44	Open	3.9	Cnc	08h40m24.0s	+19°40'00"	18:56	21:38	01:29	easy
IC 2395	Open	4.6	Vel	08h42m30.0s	-48°06'48"	20:46	21:40	22:33	easy
M 67	Open	7.4	Cnc	08h51m18.0s	+11°48'00"	19:23	21:49	00:16	detectable
NGC 2360	Open	9.1	CMa	07h17m43.0s	-15°38'30"	19:51	22:07	00:23	challenging
NGC 2506	Open	8.9	Mon	08h00m01.0s	-10°46'12"	21:23	22:50	00:17	difficult
M 82	Gal	9.0	UMa	09h55m52.4s	+69°40'47"	18:58	22:53	04:30	easy
M 81	Gal	7.8	UMa	09h55m33.1s	+69°03'56"	19:00	22:53	04:13	detectable
NGC 2547	Open	5.0	Vel	08h10m09.0s	-49°12'54"	21:57	23:00	00:02	detectable
NGC 2546	Open	5.2	Pup	08h12m15.0s	-37°35'42"	21:08	23:02	00:53	difficult
NGC 3132	PNe	8.2	Vel	10h07m01.8s	-40°26'11"	21:15	23:04	00:54	easy
NGC 3132	PNe	8.2	Vel	10h07m01.8s	-40°26'11"	21:15	23:04	00:54	easy
NGC 3228	Open	6.4	Vel	10h21m22.0s	-51°43'42"	22:48	23:19	23:50	easy
NGC 3227	Gal	11.5	Leo	10h23m30.6s	+19°51'54"	20:39	23:21	02:02	difficult
NGC 3242	PNe	8.6	Hya	10h24m46.1s	-18°38'32"	21:25	23:22	01:19	obvious
M 65	Gal	10.1	Leo	11h18m55.7s	+13°05'32"	21:10	00:16	03:23	detectable
M 66	Gal	9.7	Leo	11h20m14.9s	+12°59'30"	21:10	00:17	03:25	detectable
M 106	Gal	9.1	CVn	12h18m57.6s	+47°18'13"	21:35	01:16	04:52	detectable
Col 256	Open	2.9	Com	12h25m06.0s	+26°06'00"	21:15	01:22	05:04	easy
M 84	Gal	10.1	Vir	12h25m03.9s	+12°53'12"	22:23	01:22	04:21	detectable
M 86	Gal	9.8	Vir	12h26m12.2s	+12°56'44"	22:43	01:23	04:05	detectable
M 49	Gal	9.3	Vir	12h29m46.8s	+08°00'01"	22:27	01:26	04:27	detectable
M 87	Gal	9.6	Vir	12h30m49.2s	+12°23'29"	22:25	01:28	04:29	detectable
NGC 4565	Gal	10.1	Com	12h36m20.8s	+25°59'15"	22:44	01:33	04:21	difficult
M 68	Glob	7.3	Hya	12h39m28.0s	-26°44'36"	23:34	01:36	03:39	detectable
M 104	Gal	9.1	Vir	12h39m59.3s	-11°37'22"	23:00	01:37	04:13	detectable
M 94	Gal	8.7	CVn	12h50m53.1s	+41°07'12"	21:39	01:47	05:07	easy
M 64	Gal	9.3	Com	12h56m43.8s	+21°41'00"	22:26	01:53	05:02	detectable
M 97	PNe	11.0	UMa	11h14m47.7s	+55°01'09"	23:29	02:03	04:38	challenging
NGC 5195	Gal	10.5	CVn	13h29m59.6s	+47°15'58"	22:50	02:27	05:05	detectable
M 51	Gal	8.7	CVn	13h29m52.3s	+47°11'40"	22:03	02:27	05:09	easy
M 83	Gal	7.8	Hya	13h37m00.8s	-29°51'56"	00:39	02:34	04:30	detectable
M 3	Glob	6.3	CVn	13h42m11.0s	+28°22'42"	22:36	02:39	05:10	easy
M 101	Gal	8.4	UMa	14h03m12.4s	+54°20'53"	23:27	03:00	05:05	detectable
3C 273.0	QSO	12.8	Vir	12h29m06.7s	+02°03'08"	00:53	03:18	05:30	challenging
3C 273.0	QSO	12.8	Vir	12h29m06.7s	+02°03'08"	00:53	03:18	05:30	challenging
NGC 5128	Gal	7.8	Cen	13h25m27.7s	-43°01'07"	02:39	04:14	05:39	difficult
M 5	Glob	5.7	Ser	15h18m34.0s	+02°05'00"	00:53	04:14	05:12	easy
NGC 5139	Glob	3.9	Cen	13h26m46.0s	-47°28'36"	03:41	04:16	04:51	detectable
NGC 5986	Glob	7.6	Lup	15h46m03.0s	-37°47'12"	03:25	04:39	05:08	detectable
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	01:08	04:44	05:13	easy

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	01:28	04:46	05:11	easy
M 12	Glob	6.1	Oph	16h47m14.0s	-01°56'48"	02:21	04:46	05:12	easy
M 80	Glob	7.3	Sco	16h17m02.0s	-22°58'30"	04:00	04:46	05:10	detectable
NGC 6543	PNe	8.3	Dra	17h58m33.4s	+66°37'59"	00:42	04:47	05:21	obvious
M 10	Glob	6.6	Oph	16h57m09.0s	-04°06'00"	02:54	04:47	05:09	detectable
IC 4665	Open	5.3	Oph	17h46m18.0s	+05°43'00"	03:35	04:49	05:07	detectable
M 57	PNe	9.4	Lyr	18h53m35.1s	+33°01'45"	02:55	04:50	05:14	easy
M 56	Glob	8.4	Lyr	19h16m36.0s	+30°11'06"	03:47	04:50	05:06	detectable
M 14	Glob	7.6	Oph	17h37m36.0s	-03°14'48"	03:23	04:50	05:10	detectable
NGC 6633	Open	5.6	Oph	18h27m15.0s	+06°30'30"	03:33	04:51	05:10	easy
IC 4756	Open	5.4	Ser	18h39m00.0s	+05°27'00"	03:48	04:51	05:08	easy
M 9	Glob	7.8	Oph	17h19m12.0s	-18°31'00"	04:18	04:51	05:09	detectable
NGC 6871	Open	5.8	Cyg	20h05m59.0s	+35°46'36"	04:02	04:51	05:07	easy
M 19	Glob	6.8	Oph	17h02m38.0s	-26°16'06"	03:47	04:52	05:09	detectable
NGC 7160	Open	6.4	Cep	21h53m40.0s	+62°36'12"	04:48	04:52	05:14	obvious
NGC 6910	Open	7.3	Cyg	20h23m12.0s	+40°46'42"	04:08	04:52	05:08	easy
M 29	Open	7.5	Cyg	20h23m57.0s	+38°30'30"	04:14	04:52	05:08	easy
M 27	PNe	7.3	Vul	19h59m36.3s	+22°43'16"	04:23	04:52	05:10	easy
M 71	Glob	8.4	Sge	19h53m46.0s	+18°46'42"	04:27	04:52	05:10	easy
NGC 6572	PNe	8.0	Oph	18h12m06.4s	+06°51'12"	03:16	04:52	05:21	obvious
M 62	Glob	6.4	Oph	17h01m13.0s	-30°06'48"	03:44	04:52	05:10	detectable
M 11	Open	6.1	Sct	18h51m05.0s	-06°16'12"	04:41	04:53	05:07	detectable
M 16	Open	6.5	Ser	18h18m48.0s	-13°48'24"	04:45	04:53	05:13	obvious
M 23	Open	5.9	Sgr	17h57m04.0s	-18°59'06"	04:02	04:53	05:09	detectable
M 18	Open	7.5	Sgr	18h19m58.0s	-17°06'06"	03:49	04:54	05:12	easy
M 21	Open	7.2	Sgr	18h04m13.0s	-22°29'24"	04:14	04:54	05:08	detectable
M 25	Open	6.2	Sgr	18h31m47.0s	-19°07'00"	04:24	04:55	05:07	detectable
M 20	Open	5.2	Sgr	18h02m42.0s	-22°58'18"	04:01	04:55	05:11	easy
M 8	Neb	5.0	Sgr	18h04m02.0s	-24°23'14"	03:54	04:55	05:13	easy
NGC 6383	Open	5.4	Sco	17h34m48.0s	-32°34'00"	04:06	04:55	05:11	easy
M 6	Open	4.6	Sco	17h40m20.0s	-32°15'12"	03:59	04:56	05:14	easy
M 28	Glob	6.9	Sgr	18h24m33.0s	-24°52'12"	04:24	04:57	05:09	detectable
M 7	Open	3.3	Sco	17h53m51.0s	-34°47'36"	04:25	04:58	05:12	easy
NGC 6178	Open	7.2	Sco	16h35m47.0s	-45°38'36"	04:19	04:58	05:14	easy
NGC 6322	Open	6.5	Sco	17h18m25.0s	-42°56'00"	04:22	05:01	05:17	easy
NGC 6193	Open	5.4	Ara	16h41m20.0s	-48°45'48"	04:43	05:03	05:13	easy
NGC 5897	Glob	8.4	Lib	15h17m24.0s	-21°00'36"	04:33	05:19	05:37	difficult

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

**P.O. BOX 8545,
LANCASTER, CA 93539-8545**

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.

Board Members

President:

Don Bryden (661) 270-0627
president@avastronomyclub.org

Vice-President:

Rose Moore (661) 972-1953
vice-president@avastronomyclub.org

Secretary:

Frank Moore (661) 972-4775
secretary@avastronomyclub.org

Treasurer:

Virginia Reed (805) 587-6295
treasurer@avastronomyclub.org

Director of Community Development:

Robert Lynch (661) 433-9030
community@avastronomyclub.org

Appointed Positions

Newsletter Editor:

Steve Trotta (661) 269-5428
newsletter@avastronomyclub.org

Equipment & Library:

Karol Barker (661) 940-3312
library@avastronomyclub.org

Club Historian:

Tom Koonce (661) 943-8200
history@avastronomyclub.org

Webmaster:

Steve Trotta (661) 269-5428
webmaster@avastronomyclub.org

Astronomical League Coordinator:

Steve Trotta (661) 269-5428
al@avastronomyclub.org

Our Sponsors

Thank you to our sponsors for your generous support!

Cosmos Level Sponsors



Woodland Hills Camera

5348 Topanga Canyon Blvd., Woodland Hills
888-427-8766.

www.telescopes.net

Universe Level Sponsors

Riechmann Safety Services

Galaxy Level Sponsors



Al's Vacuum and Sewing

904 West Lancaster Blvd., Lancaster
(661) 948-1521