



# Desert Sky Observer

Volume 32

Antelope Valley Astronomy Club Newsletter

October 2012

## Up-Coming Events

**October 12:** Club Annual Business Meeting & Election\*

**October 13:** Dark Sky Star Party @ [Red Cliffs Natural Preserve](#)

**October 24:** Acton Library Star Party @ [Acton Library](#)

**October 27:** Prime Desert Woodlands Moon Walk @ [Prime Desert Woodlands](#)

\* 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 20<sup>th</sup> 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 Fall! The leaves are turning, there's a crisp coolness in the air... OK so the trees are all Joshua trees and it's still 95<sup>o</sup> but hey, at least the nights are getting longer! Therein lies another dilemma: Summer or Winter observing? Our Director of Community Development is a prime example. While Rose loves the warm summer nights, she hates staying up so late. Conversely, while it gets dark earlier in the winter, she HATES the cold!

So what to do? My answer would be either switch to solar observing -OR- come out to Red Cliffs this month! The sun will set at 6:20pm and full darkness by 7:30pm. Plus Red Cliffs has nice warm, steady skies and little wind. So come on out and get that last look at the summer constellations and a preview of the winter objects. Mars will be just setting and a few hours later, Jupiter will be rising. We'll look at Uranus and Neptune as well.

Now I'd like to talk about some other club events, specifically the public ones. We regularly have Prime Desert Woodland Moonwalks and Super Science Saturdays. Other times we'll go to a church or school to share the night sky. Memorable events have included the Boy Scouts at Littlerock Dam, the Y Indian princesses at Joshua Tree and the Girl Scouts at Saddleback Butte. All these events rely on dedicated members to bring their scopes and share them with the public – especially the youth. If it weren't for members like Frank and Rose and Darrell, Duane, Jeremy and Robert and all you others who take the time to help out, the club would lose a valuable connection to our community.

Additionally, there are a lot of things that happen behind the scenes that keep this club going. The board members, the committee members and other volunteers do a yeoman's job to provide the membership with things like guest speakers, trips to JPL and Mt. Wilson, special dome shows, booths at Poppy Festival and PATS and just a familiar face at RTMC or Mt. Pinos.

Surprisingly, this does not take a lot of effort yet it is very rewarding. So with our upcoming Annual Business meeting this October 12th I would like to make a plea for more involvement by the membership. The same board has been in place, with just minor changes, for years. And while I'll bet that most of these current board members will gladly take on another job or similar duties, we really need fresh faces and ideas. We need you to get involved. Please consider nominating yourself for a board position or

volunteering for a committee. You won't regret it – plus you can come with us on our annual E-board trip to Hawaii – just kidding, of course, but I do bring cookies and snacks to every board meeting! So email a board member with your questions and nominations or just show up at the next meeting and GET INVOLVED!



## Vice President

### Doug Drake

Our annual business meeting is October 12, the second Friday of the month at 7:00PM. Come and vote for any changes to our constitution and new board members for 2013. I may not run for VP so think about your chance to be our VP for 2013.

For our November meeting we will have Dr. David Lynch talking about “Intelligent Life in the Universe.”

Our annual AVAC Club Christmas Party will be at the Embassy Suites in Palmdale on December 15, the second Friday of the month. This event is for members and their family/friends. There will be a silent auction and raffle. Anyone having items they want to donate, please let one of the board members know. You may also bring any items directly to the Christmas Party! The menu, as well as cost, payment, and directions will be up on the website on or by November. Club emails with info will also be sent out, as well as those needing 'snail mail' letters.



## Secretary

### Frank Moore

Remember folks, the Antelope Valley Astronomy Club will be holding its **Annual Business Meeting** and board election at the next meeting, on Friday, October 12, 2012, at 7:00 PM in the Sage Planetarium.

Please come out and participate in the governance, and future, of YOUR club. All paid members, in good standing, are eligible to vote for the 2012 Slate of Officers for the Executive Board as well Constitution/By-Laws Amendments (if any).

Nominations for positions to the Executive Board will be still be accepted at the meeting so come and put your name, or someone else you think would be a good officer, into the hat. We also need to folks to volunteer for various committees.

You can also submit your nominations via email to [board@avastronomyclub.org](mailto:board@avastronomyclub.org), by telephone to any board member, or to any board member as noted on the Contacts page of the AVAC website. <http://www.avastronomyclub.org/contacts.html>.

For those with a desire to serve, **WE NEED YOU !! Self-nominations are more than acceptable.**

We look forward to receiving your nominations and to seeing everyone at the Annual Business Meeting.



## Director of Community Development

### Rose Moore

I would first like to thank the members that came out to the PATS event this weekend to help out at the booth! Saturday was a bit busier for us, Sunday proved too quiet! We handed out club flyers, 2 packs of our LM posters, and met and talked to quite a number of people. I even met the President of the Astronomy Club of Panama! Quite a thrill for me, as I grew up there, and had my first introduction to astronomy there!

Thanks to all that participated in the trip to Mt. Wilson on Sept. 15th. We had quite of number of cancellations the last 2 weeks prior to the trip. The Board has addressed the idea of not having a trip every year, and also of setting some guidelines for payment and canceling in the future. We'll keep you posted.

Our club meeting this month is our annual business meeting! Please attend and participate! Also please see Frank's note regarding our business meeting this month.

We have a club Dark Sky Party on Saturday, Oct. 13th at Red Cliffs, starting around 4pm; and we have an Acton Library Star Party with Jeremy on Wednesday Oct. 24th starting at 6pm. Jeremy could use help from members with telescopes. Please contact Jeremy with any questions or concerns that day with weather.

Coming up is a Prime Desert Moonwalk with Jeremy on Saturday, Oct. 27th, starting at approximately 6:30pm. We need members with telescopes to show the public the night sky! Or why don't you attend and do the walk with Jeremy?

For November we have a Prime Desert Woodlands Moonwalk, our last for this year, and an Acton Library Lecture with Jeremy. In the works is a possible Star Party for the students at Amargosa Creek Middle School in Lancaster on Thursday, Nov. 15th. We held 2 star parties for them last year....Stay tuned!

See you there!

## Our Garden of Eden in the Cosmos by Paul Derrick

There are many things I like about stargazing, not the least of which is the unfathomable beauty and wonder found in the night sky. I especially appreciate how this can be enjoyed at many levels.

Peering naked-eye into the richness of the Milky Way under a dark moonless sky, observing unimaginably distant objects through binoculars and telescopes, seeing images from the incredible Hubble Space Telescope -- things I've done so many times one might suspect by now a 69-year old stargazer like me would be jaded by it all. But one would be wrong. The beauty and wonder of the cosmos can still take my breath away and leave me without words. I doubt I'll ever tire of it.

That being said, after recently watching all six episodes of Ken Burns' "The National Parks: America's Best Idea" on PBS, I've had to refocus my perspective just a bit. I've not been unaware of beauty and wonder of nature right here on Earth. For years our family has traveled, visited and camped in numerous parks in many states and even other countries, and I've had a special love affair with Big Bend and the Davis Mountains since my first visit in 1970.

So how could the program expand my view? A comment by a narrator about Earth being a Garden of Eden got me thinking. According to the Hebrew creation story, Earth was a Garden of Eden until our long-ago ancestors messed up and got thrown out.

But when I behold the beauty, magnificence and bounteousness our planet still has to offer, I wonder if the ancients really got the story right. Maybe we're still in the garden, and it remains to be seen whether we will preserve or destroy it.

Yes, the beauty of the Milky Way, the full Moon, and Venus as the "evening star" are hard to beat. Views of Saturn and its rings never fail to awe. And what artist could match some of nature's exquisite colors and shapes captured by Hubble?

Yet, within our solar system, Earth is the only place we can survive, much less find hospitable. We would burn to ashes on Mercury and Venus, and freeze solid on the outer planets and their moons, and even on our Moon. And even if we didn't burn or freeze, we would be hard pressed to find food to eat, air to breathe, and water to drink.

Someday our species will surely colonize the Moon, Mars and beyond, living in biospheres that provide food, air, water and comfortable temperatures. But will they have mountains to climb, rivers to raft, glaciers to hike, oceans to swim in, beaches for building sand castles, fields and forests to romp through? Will they have Old Faithful, Niagara Falls, giant sequoia and redwood trees, whales, and crying seagulls chasing after fishing boats?

The first line of a marvelous "Sesame Street" song comes to mind: "I'd like to visit the Moon, but I don't think I'd like to live there."

To be sure, I'll never cease marveling at the beauty and wonder of the distant cosmos, but I'll make sure I also look around and fully appreciate the Garden of Eden in my own back yard.

*Copyright by Paul Derrick. Permission is granted for free electronic distribution as long as this paragraph is included. For permission to publish in any other form, please contact the author at [paulderrickwaco@aol.com](mailto:paulderrickwaco@aol.com)*

## Space Place

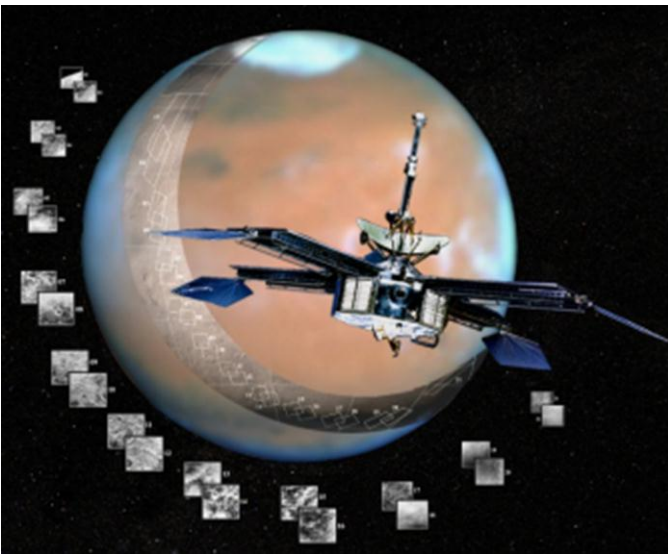
## Doing Science with a Spacecraft's Signal

By David Doody

Mariner 2 to Venus, the first interplanetary flight, was launched August 27 fifty years ago. This was a time when scientists were first learning that Venus might not harbor jungles under its thick atmosphere after all. A Russian scientist had discovered that atmosphere during the rare Venus transit of 1761, because of the effects of sunlight from behind.

Mariner 2 proved interplanetary flight was possible, and our ability to take close-up images of other planets would be richly rewarding in scientific return. But it also meant we could use the spacecraft itself as a “light” source, planting it behind an object of our choosing and making direct measurements.

Mariner 4 did the first occultation experiment of this sort when it passed behind Mars as seen from Earth in July 1965. But, instead of visible light from the Sun, this occultation experiment used the spacecraft's approximately 2-GHz radio signal.



*In this [poster art of Mariner 4](#), you can see the parabolic reflector atop the spacecraft bus. Like the reflector inside a flashlight, it sends a beam of electromagnetic energy in a particular direction. Credit: NASA/JPL/Corby Waste.*

The Mariner 4 experiment revealed Mars' thin atmosphere. Since then, successful radio science occultation experiments have been conducted at every planet and many large moons. And another one is on schedule to investigate Pluto and its companion Charon, when the New Horizons spacecraft flies by in July 2015. Also, during that flyby, a different kind of radio science occultation experiment will investigate the gravitational field.

The most recent radio science occultation experiment took place September 2, 2012, when the Cassini spacecraft carried its three transmitters behind Saturn. These three different frequencies are all kept precisely “in tune” with one another, based on a reference frequency sent from Earth. Compared to observations of the free space for calibration just before ingress to occultation, the experiment makes it possible to tease out a wide variety of components in Saturn's ionosphere and atmosphere.

Occultation experiments comprise only one of many categories of radio science experiments. Others include tests of General Relativity, studying the solar corona, mapping gravity fields, determining mass, and more. They all rely on NASA's Deep Space Network to capture the signals, which are then archived and studied.

Find out more about spacecraft science experiments in “Basics of Space Flight,” a website and book by this author, <http://www2.jpl.nasa.gov/basics>. Kids can learn all about NASA's Deep Space Network by playing the “Uplink-Downlink” game at <http://spaceplace.nasa.gov/dsn-game>.

## News Headlines

### **Space shuttle Endeavour's final touchdown**

The last space shuttle to grace the skies, Endeavour, ended two decades of glorious flights Friday, wowing onlookers as it descended onto a runway at Los Angeles International Airport atop a modified Boeing 747 jet at 12:51 p.m. PT. A crowd 5,000-strong, according to the Los Angeles County office of emergency management, gathered on a bluff overlooking the airport to watch Endeavour's low-altitude flyover and final touchdown.

<http://www.cnn.com/2012/09/21/us/endeavour-last-trip/index.html>

### **New Comet Discovered -- Will It Be Spectacular?**

The astronomy community was abuzz with news about a comet discovery on Tuesday, leading to speculation that it could make a spectacular flyby of the sun, giving Earth a ringside seat of an extremely bright celestial event. It could become so bright that it even outshines the moon. On the other hand, it might not. Confused? Well, that's comets for you.

<http://news.discovery.com/space/new-comet-discovered-will-it-be-spectacular-120925.html>

### **NASA Rover Finds Old Streambed On Martian Surface**

NASA's Curiosity rover mission has found evidence a stream once ran vigorously across the area on Mars where the rover is driving. There is earlier evidence for the presence of water on Mars, but this evidence - images of rocks containing ancient streambed gravels - is the first of its kind. Scientists are studying the images of stones cemented into a layer of conglomerate rock. The sizes and shapes of stones offer clues to the speed and distance of a long-ago stream's flow.

[http://www.nasa.gov/home/hqnews/2012/sep/HQ\\_12-338\\_Mars\\_Water\\_Stream.html](http://www.nasa.gov/home/hqnews/2012/sep/HQ_12-338_Mars_Water_Stream.html)

### **Fireworks in the Early Universe**

Galaxies in the early universe grew fast by rapidly making new stars. Such prodigious star formation episodes, characterized by the intense radiation of the newborn stars, were often accompanied by fireworks in the form of energy bursts caused by the massive central black hole accretion in these galaxies.

<http://www.sciencedaily.com/releases/2012/09/120919082931.htm>

### **NASA's Chandra Shows Milky Way is Surrounded by Halo of Hot Gas**

Astronomers have used NASA's Chandra X-ray Observatory to find evidence our Milky Way Galaxy is embedded in an enormous halo of hot gas that extends for hundreds of thousands of light years. The estimated mass of the halo is comparable to the mass of all the stars in the galaxy. If the size and mass of this gas halo is confirmed, it also could be an explanation for what is known as the "missing baryon" problem for the galaxy.

[http://www.nasa.gov/mission\\_pages/chandra/news/H-12-331.html](http://www.nasa.gov/mission_pages/chandra/news/H-12-331.html)

### **Hubble Goes to the eXtreme to Assemble Farthest Ever View of the Universe**

Like photographers assembling a portfolio of their best shots, astronomers have assembled a new, improved portrait of our deepest-ever view of the Universe. Called the eXtreme Deep Field, or XDF, the photo was assembled by combining ten years of NASA/ESA Hubble Space Telescope observations taken of a patch of sky within the original Hubble Ultra Deep Field. The XDF is a small fraction of the angular diameter of the full Moon.

<http://www.spacetelescope.org/news/heic1214/>

## Astrophoto of The Month

**M8 by Don Bryden**

The Lagoon nebula with Ha narrowband color and luminance

## October Sky Data

**Best time for deep sky observing this month:**  
**October 8 through October 18**

**Mercury** is at its greatest elongation east of the Sun on October 26th. But throughout the month it sets only a few minutes after the Sun. We're unlikely to see this elusive little planet this month.

**Venus** is rising in the north-east in the early hours of the morning, and by dawn the brilliant "Morning Star" will be well up in the south-eastern sky. It outshines every other star-like object in the sky – even the giant planet Jupiter, which is much higher up and further west.

**Mars** is still very low in the western sky at dusk; throughout October the "Red Planet" continues to set just over an hour after the Sun sets. It's not very bright, and it won't be easy to see in the twilight.

The giant planet **Jupiter** is rising in the north-east just as the sky grows dark. It can be seen all through the night, and it's still high in the south-western sky at dawn. Only the brilliant planet Venus, far to its lower left at dawn, outshines Jupiter. Relative to the stars, Jupiter is almost stationary in Taurus, between the horns of the Bull.

**Saturn** is in superior conjunction (almost directly behind the Sun) on October 13th. We won't see the ringed planet at all this month.

The Orionid **meteor shower** is active every year during the second half of October; this year it will probably peak around Sunday 21st, but activity stays high for a week or more. The best rates will be in the early hours of the morning, when we might normally hope to see one every four or five minutes. This year there will be little interference from the Moon, which sets before midnight.

A less well-known shower is the Draconids, which appear for only a few nights in early October; this year's peak is expected in the early hours of Monday October 8th. The radiant is in the constellation of Draco, not far from the bright star Vega. Most years produce only a few Draconid meteors, but there are occasional outbursts.

Last Qtr Oct 4      New Oct 10      First Qtr Oct 17      Full Oct 25



## Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
10/1/2012	19:21	08:16	06:47	18:35
10/5/2012	22:07	11:52	06:50	18:29
10/10/2012	01:47	15:19	06:54	18:22
10/15/2012	07:13	18:22	06:59	18:16
10/20/2012	12:37	23:07	07:03	18:10
10/25/2012	15:46	03:16	07:08	18:04
10/31/2012	19:17	08:54	07:13	17:58

## Planet Data

	Oct 1			
	Rise	Transit	Set	Mag
<b>Mercury</b>	08:01	13:38	19:17	-0.4
<b>Venus</b>	03:28	10:10	16:52	-4.1
<b>Mars</b>	10:32	15:42	20:52	1.2
<b>Jupiter</b>	21:54	05:06	12:22	-2.6
<b>Saturn</b>	08:16	14:00	19:42	0.7

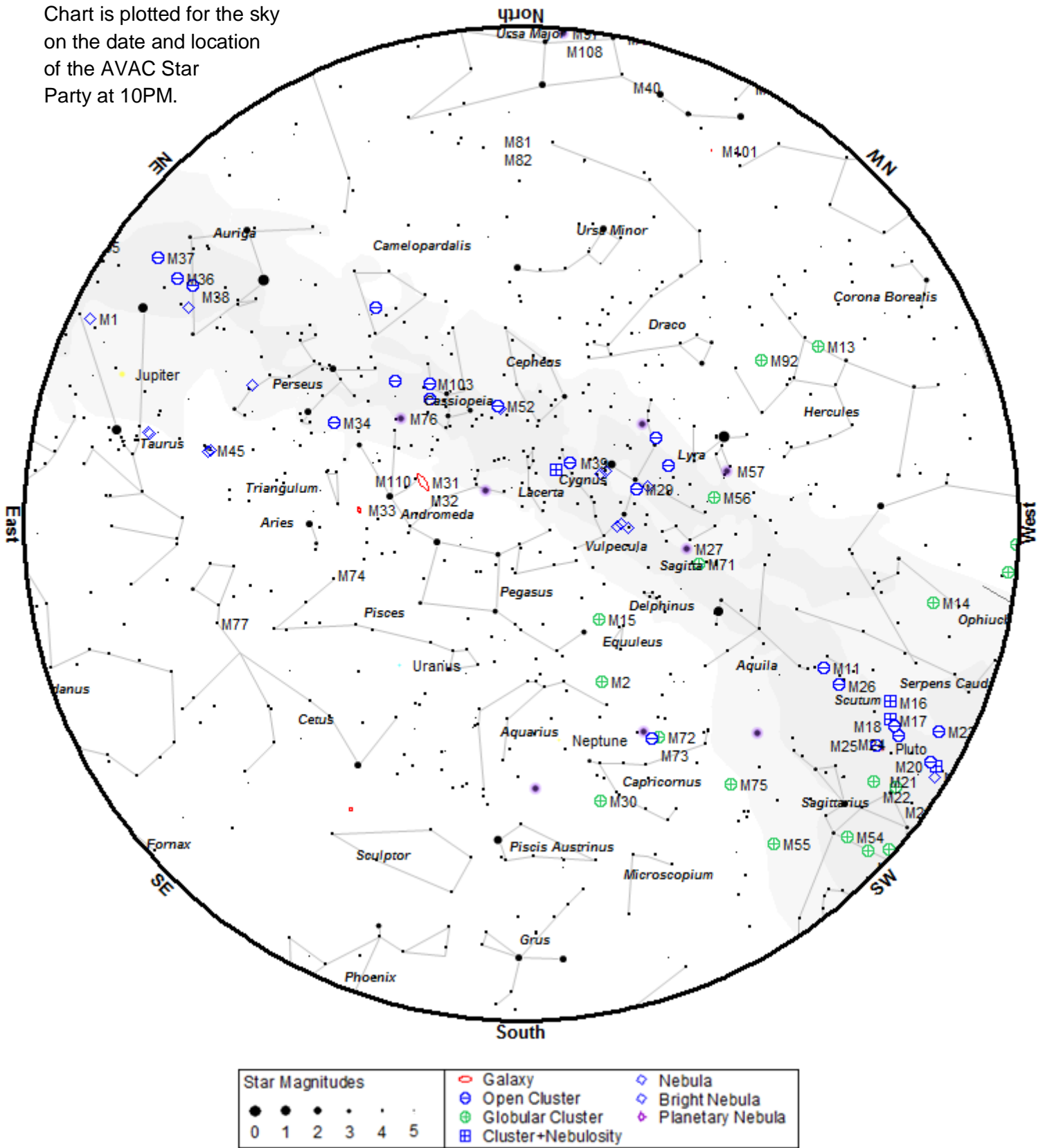
	Oct 15			
	Rise	Transit	Set	Mag
<b>Mercury</b>	08:45	13:59	19:14	-0.2
<b>Venus</b>	03:52	10:18	16:45	-4.1
<b>Mars</b>	10:26	15:29	20:31	1.2
<b>Jupiter</b>	20:58	04:10	11:22	-2.7
<b>Saturn</b>	07:29	13:12	18:51	0.6

	Oct 31			
	Rise	Transit	Set	Mag
<b>Mercury</b>	09:07	14:06	19:05	0.0
<b>Venus</b>	04:20	10:27	16:34	-4.0
<b>Mars</b>	10:18	15:16	20:13	1.2
<b>Jupiter</b>	19:51	03:03	10:14	-2.8
<b>Saturn</b>	06:35	12:16	17:54	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.



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.

Primary ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
NGC 6572	PNe	8.0	Oph	18h12m06.4s	+06°51'12"	19:10	19:41	21:23	obvious
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	19:23	19:42	21:04	easy
IC 4665	Open	5.3	Oph	17h46m18.0s	+05°43'00"	19:26	19:42	20:43	detectable
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	19:22	19:43	21:50	easy
NGC 6633	Open	5.6	Oph	18h27m15.0s	+06°30'30"	19:20	19:43	21:39	easy
M 11	Open	6.1	Sct	18h51m05.0s	-06°16'12"	19:24	19:44	21:17	detectable
IC 4756	Open	5.4	Ser	18h39m00.0s	+05°27'00"	19:23	19:44	21:36	detectable
NGC 6818	PNe	10.0	Sgr	19h43m57.8s	-14°09'12"	19:16	19:45	21:31	easy
NGC 6543	PNe	8.3	Dra	17h58m33.4s	+66°37'59"	19:13	19:46	23:33	obvious
M 57	PNe	9.4	Lyr	18h53m35.1s	+33°01'45"	19:18	19:46	23:03	easy
M 56	Glob	8.4	Lyr	19h16m36.0s	+30°11'06"	19:24	19:47	22:13	detectable
M 71	Glob	8.4	Sge	19h53m46.0s	+18°46'42"	19:21	19:50	23:15	easy
M 27	PNe	7.3	Vul	19h59m36.3s	+22°43'16"	19:20	19:51	23:26	easy
NGC 6871	Open	5.8	Cyg	20h05m59.0s	+35°46'36"	19:19	19:52	23:49	easy
NGC 6910	Open	7.3	Cyg	20h23m12.0s	+40°46'42"	19:20	19:57	00:24	easy
M 29	Open	7.5	Cyg	20h23m57.0s	+38°30'30"	19:20	19:57	00:14	easy
NGC 7009	PNe	8.3	Aqr	21h04m10.9s	-11°21'48"	19:12	20:24	23:07	obvious
M 15	Glob	6.3	Peg	21h29m58.0s	+12°10'00"	19:22	20:50	00:26	detectable
M 39	Open	5.3	Cyg	21h31m48.0s	+48°26'00"	19:20	20:51	01:58	easy
M 2	Glob	6.6	Aqr	21h33m27.0s	-00°49'24"	19:22	20:53	00:03	detectable
IC 1396	Neb		Cep	21h39m06.0s	+57°30'00"	19:20	20:59	02:30	challenging
Cocoon	Neb	10.0	Cyg	21h53m24.0s	+47°16'00"	19:21	21:12	02:13	challenging
NGC 7160	Open	6.4	Cep	21h53m40.0s	+62°36'12"	19:16	21:13	03:16	obvious
NGC 7243	Open	6.7	Lac	22h15m08.0s	+49°53'54"	19:24	21:34	01:45	detectable
M 52	Open	8.2	Cas	23h24m48.0s	+61°35'36"	19:30	22:44	02:51	detectable
NGC 7789	Open	7.5	Cas	23h57m24.0s	+56°42'30"	19:38	23:17	03:04	difficult
NGC 7790	Open	7.2	Cas	23h58m24.0s	+61°12'30"	19:20	23:18	05:17	easy
M 110	Gal	8.9	And	00h40m22.3s	+41°41'09"	20:13	23:59	03:45	detectable
M 32	Gal	8.9	And	00h42m41.8s	+40°51'58"	19:35	00:02	04:35	easy
M 31	Gal	4.3	And	00h42m44.3s	+41°16'07"	19:35	00:02	04:39	easy
NGC 457	Open	5.1	Cas	01h19m35.0s	+58°17'12"	19:25	00:39	05:51	easy
NGC 559	Open	7.4	Cas	01h29m31.0s	+63°18'24"	19:25	00:49	05:52	easy
M 103	Open	6.9	Cas	01h33m23.0s	+60°39'00"	19:23	00:52	05:53	obvious
M 33	Gal	6.4	Tri	01h33m50.9s	+30°39'36"	21:03	00:53	04:42	detectable
M 76	PNe	10.1	Per	01h42m19.9s	+51°34'31"	20:51	01:01	05:11	detectable
NGC 637	Open	7.3	Cas	01h43m04.0s	+64°02'24"	19:22	01:02	05:56	obvious
NGC 663	Open	6.4	Cas	01h46m09.0s	+61°14'06"	19:31	01:06	05:50	easy
NGC 752	Open	6.6	And	01h57m41.0s	+37°47'06"	22:55	01:16	03:38	challenging

Primary ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
NGC 869	Open	4.3	Per	02h19m00.0s	+57°07'42"	19:50	01:38	05:56	obvious
NGC 884	Open	4.4	Per	02h22m18.0s	+57°08'12"	19:54	01:41	05:55	obvious
NGC 957	Open	7.2	Per	02h33m21.0s	+57°33'36"	20:25	01:52	05:51	easy
Heart	Neb	6.5	Cas	02h33m52.0s	+61°26'50"	20:06	01:53	05:52	challenging
M 77	Gal	9.7	Cet	02h42m40.8s	-00°00'48"	22:57	02:01	05:06	detectable
M 34	Open	5.8	Per	02h42m05.0s	+42°45'42"	21:38	02:01	05:47	detectable
NGC 1027	Open	7.4	Cas	02h42m40.0s	+61°35'42"	21:33	02:02	05:46	detectable
NGC 1245	Open	7.7	Per	03h14m42.0s	+47°14'12"	00:19	02:33	04:49	challenging
NGC 1342	Open	7.2	Per	03h31m38.0s	+37°22'36"	22:36	02:51	05:51	detectable
M 45	Open	1.5	Tau	03h47m00.0s	+24°07'00"	22:29	03:06	05:57	obvious
NGC 1444	Open	6.4	Per	03h49m25.0s	+52°39'30"	21:32	03:08	05:58	obvious
NGC 1502	Open	4.1	Cam	04h07m50.0s	+62°19'54"	21:26	03:27	06:01	obvious
NGC 1528	Open	6.4	Per	04h15m23.0s	+51°12'54"	22:26	03:35	05:54	easy
Hyades	Open	0.8	Tau	04h26m54.0s	+15°52'00"	23:33	03:45	05:56	easy
NGC 1647	Open	6.2	Tau	04h45m55.0s	+19°06'54"	00:44	04:04	05:50	detectable
NGC 1664	Open	7.2	Aur	04h51m06.0s	+43°40'30"	23:13	04:10	05:56	easy
NGC 1746	Open	6.1	Tau	05h03m50.0s	+23°46'12"	00:54	04:23	05:52	detectable
M 38	Open	6.8	Aur	05h28m40.0s	+35°50'54"	00:39	04:48	05:54	detectable
M 1	Neb	8.4	Tau	05h34m30.0s	+22°01'00"	02:57	04:53	05:44	challenging
M 43	Neb	9.0	Ori	05h35m30.0s	-05°16'00"	01:44	04:54	05:55	challenging
M 42	Neb	4.0	Ori	05h35m18.0s	-05°23'00"	01:44	04:54	05:55	easy
M 36	Open	6.5	Aur	05h36m18.0s	+34°08'24"	00:03	04:55	05:57	easy
M 78	Neb	8.0	Ori	05h46m48.0s	+00°05'00"	01:36	05:05	05:55	challenging
M 37	Open	6.2	Aur	05h52m18.0s	+32°33'12"	00:29	05:09	05:57	easy
NGC 2129	Open	7.0	Gem	06h01m07.0s	+23°19'20"	00:46	05:15	05:59	obvious
M 35	Open	5.6	Gem	06h09m00.0s	+24°21'00"	01:12	05:18	05:55	easy
NGC 2175	Open	6.8	Ori	06h09m39.0s	+20°29'12"	01:49	05:18	05:53	detectable
NGC 2169	Open	7.0	Ori	06h08m24.0s	+13°57'54"	01:15	05:18	05:59	obvious
NGC 2237	Neb	5.5	Mon	06h32m02.0s	+04°59'10"	02:06	05:24	05:55	challenging
NGC 2264	Open	4.1	Mon	06h40m58.0s	+09°53'42"	01:59	05:25	05:56	easy
NGC 2301	Open	6.3	Mon	06h51m45.0s	+00°27'36"	02:39	05:27	05:56	easy
NGC 2355	Open	9.7	Gem	07h16m59.0s	+13°45'00"	03:44	05:28	05:50	difficult
NGC 2392	PNe	8.6	Gem	07h29m10.8s	+20°54'42"	02:18	05:29	06:00	obvious
M 50	Open	7.2	Mon	07h02m42.0s	-08°23'00"	03:24	05:29	05:52	detectable
M 82	Gal	9.0	UMa	09h55m52.4s	+69°40'47"	02:48	05:30	05:53	detectable
M 81	Gal	7.8	UMa	09h55m33.1s	+69°03'56"	02:50	05:30	05:52	detectable
NGC 2353	Open	5.2	Mon	07h14m30.0s	-10°16'00"	03:44	05:30	05:55	easy
M 44	Open	3.9	Cnc	08h40m24.0s	+19°40'00"	03:34	05:31	05:53	easy
M 67	Open	7.4	Cnc	08h51m18.0s	+11°48'00"	04:33	05:32	05:48	detectable
NGC 2506	Open	8.9	Mon	08h00m01.0s	-10°46'12"	04:48	05:32	05:46	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

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

Visit the Antelope Valley Astronomy Club website at [www.avastronomyclub.org/](http://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](mailto:president@avastronomyclub.org)

### Vice-President:

Doug Drake (661) 433-0672  
[vice-president@avastronomyclub.org](mailto:vice-president@avastronomyclub.org)

### Secretary:

Frank Moore (661) 972-4775  
[secretary@avastronomyclub.org](mailto:secretary@avastronomyclub.org)

### Treasurer:

Virgina Reed (661) 824-3932  
[treasurer@avastronomyclub.org](mailto:treasurer@avastronomyclub.org)

### Director of Community Development:

Rose Moore (661) 972-1953  
[community@avastronomyclub.org](mailto:community@avastronomyclub.org)

## Appointed Positions

### Newsletter Editor:

Steve Trotta (661) 269-5428  
[newsletter@avastronomyclub.org](mailto:newsletter@avastronomyclub.org)

### Equipment & Library:

Bill Grove  
[library@avastronomyclub.org](mailto:library@avastronomyclub.org)

### Club Historian:

Tom Koonce (661) 943-8200  
[history@avastronomyclub.org](mailto:history@avastronomyclub.org)

### Webmaster:

Steve Trotta (661) 269-5428  
[webmaster@avastronomyclub.org](mailto:webmaster@avastronomyclub.org)

### Astronomical League Coordinator:

Don Bryden (661) 270-0627  
[al@avastronomyclub.org](mailto: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](http://www.telescopes.net)

### Galaxy Level Sponsors



### *Al's Vacuum and Sewing*

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