ANTELOPE VALLEY ASTRONOMY CLUB, INC.

Desert Sky Observer

Volume 32 *Antelope Valley Astronomy Club Newsletter* **February 2012**

Up-Coming Events

February 10: Club Meeting*
February 11: Moon Walk @ Prime Desert Woodlands
February 13: Executive Board Meeting @ Don's house
February 18: Telescope Night and Star Party @ Devil's Punchbowl

* 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

Artist's rendering

Well I gave a star party and no one showed up! Not that I can blame them – it was raining and windy and cold – it even hailed! Still I dragged out the scope and got it ready to go. Briefly, between the clouds I looked at Jupiter and it was quite a treat. The Galilean moons were all tight to the planet either coming from just in front or behind. It gave a bejeweled look like a large ruby surrounded by four small diamonds. Even with the winds and clouds the sky was surprisingly steady and I went as high as 260x with ease, exposing the shadow of Europa transiting the planet.

But soon more clouds came and inside we had a nice fire so I put the DVD "400 Years of the Telescope" on and settled in for the night. My daughter had a few friends over after a skating party that afternoon and later when I went out for one more look they came out to see what was up. Jupiter was not nearly as good as before but they all took a look. "Cool!" said one, "I can see the moons!" said another.

Then it was gone. The clouds moved in and the wind picked up and the "star party" was over. I can't blame anyone for not coming out. It was a horrible night for star gazing – except for those few minutes when it was perfect. I'm glad I was out there to see it. Someone saw what Galileo saw for the first time and someone said, "Oh wow!" So all in all it was a pretty good star party.

Well this is why we have star parties close to home in the winter. Next month we're taking a bit of a gamble though and joining the Devil's Punchbowl rangers for their first telescope night of 2012. Currently all trails are open so come out early and take a hike or be at the parking lot before sunset and walk down the short path to the telescope pad and amphitheater. We'll set up there and Dave and the rangers will bring out their scope and hot cocoa too. I'll also have a short Messier Marathon practice list to get ready for March's Messier Marathon. We'll try to pick out M74, M77, M31, M32, M110 and M33 just after sunset and then go from there toward the East in right ascension. A month from then, during the real Messier Marathon that early group will be the hardest as they will be much lower in the western sky and the crescent moon will

interfere. So bring your monster dobs and telrads – and remember, we have several to check out from the club library – and we'll hunt for fuzzballs.

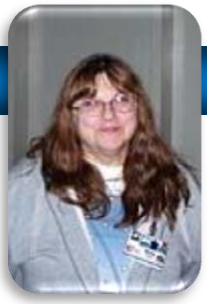
Now that you've had a chance to practice, come out to Saddleback Butte on March 24th for our annual Messier Marathon Star Party and Cookout. We have the group site at Saddleback from noon Saturday until Sunday so come out early and enjoy the hills and dunes. Around 4pm the club will have hotdogs and hamburgers and then once the sun sets we'll get down to business. I hope to see first light for the newly redesigned AINA telescope. With new baffles and light shrouds it'll be my Messier Marathon secret weapon – (though it'll be set up for all to use, really) – it makes working your way through the Virgo Cluster a breeze!

Well the clouds are thick and tonight's not looking good so I guess it's "Apollo 13" and AstronomyCast,

Vice President

Doug Drake

Dr. Daniel Barth returns to speak to our club. Dr. Barth is currently the Physics/Astronomy Program Chair at Tahquitz High School in Hemet, CA and the Associate Professor of Astronomy at Mt. San Jacinto College in San Jacinto, CA. He runs the astronomy program and teaches astronomy and physics in the Upward Bound Program. Dr. Barth is an author and has been an active astronomer for over 40 years. He is the author of textbooks as well as a series of science fiction/astronomy oriented books for kids. Dr. Barth will be speaking on 'Solar System Formation' or 'Planetary Pinball!



Director of Community Development

Rose Moore

February starts off with our first Prime Desert Moon Walk for the year. Come on out and bring your telescopes and share the night sky with the public! Or join Jeremy for the walk through the desert preserve. Dress warm! Start time is 6pm, weather permitting.

We do not have information as yet, but please check your emails and the club website for information on the Leona Valley Science Fair, and if we'll be participating.

Some other events coming up in the next few months are: more Prime Desert Moon Walks, Lockheed Martin Space Day (4/20 Friday), the Poppy Festival (4/21-22 Saturday and Sunday), and the Transit of Venus at the SAGE (6/5 Tuesday). There will be signup sheets at the meetings.

We are booked for Mt. Wilson for Saturday, September 15th for 1/2 night session. This is open to adults and kids (12 and over), limited to a total of 25 members. Stay tuned for further information, signup sheets, and payment information.

We cannot make our public outreach events successful without YOU! Please consider attending even just 1 or 2 events this year. Your level of expertise is not what's important, but your enthusiasm is!

Stay warm and clear skies!

A Convenient "Grab & Fly" Telescope Setup by Tom Koonce

Have you ever headed out on a long trip and wished that you could do a little star-gazing once you arrived at your destination? But perhaps you have thought about the logistics of traveling with a telescope like the inconvenience of getting your telescope equipment through airport security, potential damage to the telescope, or maybe been daunted about what eyepieces and accessories to take? This article could help you to stop worrying… and start packing.

I had a unique opportunity to travel "down under" to observe from the dark skies of south central Australia, east of Melbourne, and then from the large island of Tasmania located off the southern tip of Australia. I knew I had to take a telescope with me or I'd certainly regret it. Major airlines fly into Melbourne, but only small "regional" airlines fly into Tasmania, so the amount of baggage I could take on the three week trip was strictly limited to a total weight of 23 kg (50.7 lbs). My astronomy setup would have to fit into an already limited volume that included work attire, a bulky jacket, shoes, shaving kit, notebooks of work materials, and a laptop. While the observing portion of this trip was secondary to the business portion of this trip, it was still very important to me personally and deserved careful planning ahead of time.

Some of my initial questions to be answered were concerning the climate of the location. Would it be hot or cold this time of year? Cloudy or clear? Dark skies or urban light pollution? My excitement grew as each of these answers were favorable to potential great southern sky views of the Clouds of Magellan, Southern Cross, Alpha Centauri, Canopus, the Coal Sack, the Tarantula Nebula, and on and on. Wow.

Now what telescope should be taken? It had to be portable, deliver wide-field views when paired with one or two eyepieces, but be of sufficient quality that I could "crank up the power" if I wanted to. It needed to be rugged enough to survive the jostling of going through security (I foresaw a major hassle regarding this) and the vibration shock of the flight and maybe a rough landing. It also needed to be light enough to be supported by a photo tripod since such a tripod was the only possible support within my weight and luggage volume limitations. The Tele Vue Pronto ED doublet refractor telescope with a 480 mm focal length, f/6.8 and an objective diameter of 70 mm was chosen. I had purchased a Pronto in mint used condition from a friend for $500 several years ago and loved it. When this short refractor is paired with both a Tele Vue 13mm Ethos and an 8mm Ethos, it can provide stunning views. The scope was also fitted with a 90 degree prism, two inch eyepiece focuser, a glass solar filter and a simple red dot sight.

I made a new foam insert for the stock Tele Vue Pronto padded carry bag to fit the telescope, both Ethos eyepieces, the right angle prism and accessories. I chose a closed cell foam with sufficient density to provide cushioning for all of the items, but rigid enough to hold each item securely. The solar filter, small red flashlight, my small southern sky atlas, dust blower and an O-III filter had to be carried in a 1 gallon ziplock in my suitcase, but still I was pleased that I managed to get my observing essentials down to such a small package.

The tripod I chose was the Manfrotto "Bogen" Carbon Fiber Tripod (BOG190CXPRO4) with a standard ball head. The entire tripod was no longer than the Pronto's carry case and I attached to the case with Velcro straps. The tripod was very light, but surprisingly stable with the 6 lb Pronto, diagonal, and with a 2 lb Ethos eyepiece mounted on it. Its maximum load was stated to be 11 lbs. The lack of a celestial drive was not an issue for my visual observations made with this setup. Also the time to setup and take down was less than 5 minutes. There was the expected difficulty looking at any object at zenith with this setup. To be honest, a big reason why I chose this tripod was because a friend offered to let me borrow one for the trip,

and it's hard to argue with "free". It is an expensive tripod, but a perfect "Grab and Fly" match for this telescope setup.



The "Grab and Fly" Telescope Case and Contents

Before the trip I had a concern regarding what this telescope/eyepiece/tripod package would look like to the airport security folks on their scanners since they probably didn't seen too many telescopes come through as carry-on baggage? Primarily because of this, an extra hour was planned for security questions prior to the flight. I could have relaxed. I had no fluids (of course) in the bag, and nothing looked like a weapon on the X-ray. The TSA was very reasonable and had no problems whatsoever with the telescope. They did ask me what it was, to which I told them it was a "telescope lens", and then they sent me on my way. I was to my gate with an extra hour to spare. Once on the plane, this entire setup conveniently fit into an overhead aircraft bin, even on the regional-type aircraft from Melbourne south to Tasmania.

The trip allowed me ample time to observe the southern sky. The telescope setup worked like a champ. While I only used the solar filter once, I had the telescope out every night for at least two hours and all night long on the weekends. The weather in Tasmania had me chasing openings in the clouds for a couple of nights, but it cleared up and provided the darkest observing skies I have ever seen in my life. Regretfully the 70mm Tele Vue Pronto isn't made anymore, but its been replaced by its close (more expensive) cousin, the Tele Vue 76 APO Doublet Refractor.

While this article has been about the selection of a convenient "Grab and Fly" telescope that could be taken anywhere one may be headed, I haven't said much about the deep sky views I had on my trip, of the hours I spent smiling, ear-to-ear, as I leisurely cruised from the Tarantula Nebula over to the Clouds of Magellan, or mention the friendliness of the Australian amateur astronomers I met. Those experiences were the real story made possible by having a "Grab and Fly" telescope.

Telescope Reviews:

Pronto: http://www.company7.com/televue/telescopes/pronto.html

Ranger: http://www.company7.com/televue/telescopes/ranger.html

Space Place

The Nerdiest Video Game Ever

By Dr. Tony Phillips

NASA has a job opening. Wanted: People of all ages to sort, stack, and catalogue terabytes of simulated data from a satellite that launches in 2015. Agile thumbs required.

Sorting terabytes of data? It's more fun than it sounds.

In fact it's a game: Satellite Insight. The Space Place Team at the Jet Propulsion Laboratory created the entertaining app for iPhones to get the word out about GOES-R, an advanced Earth science satellite built by NOAA and NASA.

Described by the *Los Angeles Times* as possibly "the nerdiest game ever," Satellite Insight may be downloaded for free from Apple's app store. Be careful, though, once you start playing it's hard to stop. Some reviewers have likened it to Tetris, one of the most popular video games of all time.

GOES, short for "Geostationary Operational Environmental Satellite," is the workhorse spacecraft for weather forecasters. NOAA operates two (at a time) in geosynchronous orbit, one above the west coast of N. America and one above the east coast. They monitor clouds, wind, rain, hurricanes, tornadoes and even solar flares. The GOES program has been in action since 1975.

GOES-R is the next-generation satellite with advanced technologies far beyond those of the older GOES satellites. It has sensors for lightning detection, wildfire mapping, storm tracking, search and rescue, solar imaging, and more. Many of the sensors are trailblazers. For example, the Advanced Baseline Imager has 60 times the capability of the current imager—16 channels instead of 5. It has twice the spatial resolution and five times the temporal refresh rate, including the 30-second imaging of weather systems over a region of 1000 km x 1000 km. Also, the Geostationary Lightning Mapper can count and pinpoint lightning bolts over the Americas 24/7. It's the first such detector to fly on a geosynchronous satellite, and it could lead to transformative advances in severe storm warning capability.

All in all, GOES-R represents a "huge technological leap from the current GOES." We know this because Satellite Insight tells us so. The app has an informative "Learn More" feature where players can find out about the satellite and the data they have been sorting.

Which brings us back to sorting data. It's a bit like eating Cheerios; just don't tell the kids it's nutritious, and they love it. Helping GOES-R gather and stash data from all those advanced sensors is just as satisfying, too—a dose of Earth science wrapped in thumb-flying fun.

More information about Satellite Insight may be found on the web at http://itunes.apple.com/us/app/satellite-insight/id463588902?mt=8. The game also available in web form (flying thumbs optional) at spaceplace.nasa.gov/satellite-insight.

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

Twin NASA Moon Probes Start New Year by Entering Lunar Orbit
A pair of NASA spacecraft are ringing in the New Year in grand style, with both now successfully circling the moon after journeying through space for more than three months.
http://www.space.com/14102-nasa-grail-spacecraft-moon-orbit-2012.html

An Evaporating Exoplanet?
There's something strange obscuring the light from a cool, low-mass star observed by NASA's Kepler mission. Every 15.685 Earth days, KIC 12557548's light dims for about 1.5 hours. The dips in starlight aren't always the same — some events block more light than others — so the occultations don't look like the regular blip caused by a planet passing in front of the star. After considering various options, an international team of astronomers reported recently that the signal might be from debris thrown off by a small rocky planet as it disintegrates under the star's glare.
http://www.skyandtelescope.com/community/skyblog/newsblog/An-Evaporating-Exoplanet-137751408.html

Clearest Picture Yet of Dark Matter Points the Way to Better Understanding of Dark Energy
Two teams of physicists at the U.S. Department of Energy's Fermilab and Lawrence Berkeley National Laboratory (Berkeley Lab) have independently made the largest direct measurements of the invisible scaffolding of the universe, building maps of dark matter using new methods that, in turn, will remove key hurdles for understanding dark energy with ground-based telescopes.
http://newscenter.lbl.gov/news-releases/2012/01/09/clearest-view-dark-matter/

The Milky Way Contains at Least 100 Billion Planets According to Survey
Our Milky Way galaxy contains a minimum of 100 billion planets according to a detailed statistical study based on the detection of three extrasolar planets by an observational technique called microlensing. Kailash Sahu, of the Space Telescope Science Institute in Baltimore, Md., is part of an international team reporting today that our galaxy contains a minimum of one planet for every star on average. This means that there is likely to be a minimum of 1,500 planets within just 50 light-years of Earth.
http://hubblesite.org/newscenter/archive/releases/2012/07/full/

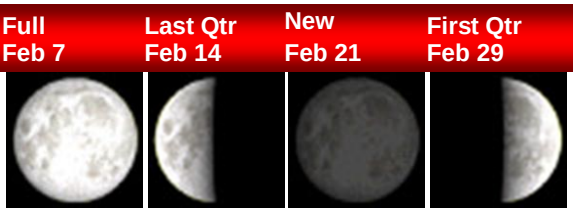
NASA's Chandra Finds Largest Galaxy Cluster in Early Universe
An exceptional galaxy cluster, the largest seen in the distant universe, has been found using NASA's Chandra X-ray Observatory and the National Science Foundation-funded Atacama Cosmology Telescope (ACT) in Chile.
http://www.nasa.gov/mission_pages/chandra/news/H-12-008.html

Sun Unleashes Strongest Flare Yet of 2012
A massive solar flare — the strongest one so far this year — erupted today (Jan. 27) from the same active region of the sun that triggered a raging solar tempest earlier this week. The solar flare was rated an X1.7-class eruption, according to the National Oceanic and Atmospheric Administration (NOAA). X-class flares are the most powerful type of solar storm, with M-class storms falling within the mid-range, and C-class flares being the weakest.
http://www.space.com/14387-biggest-solar-flare-2012-radiation-storm.html

Astrophoto of The Month

Venus and a young crescent Moon just after sunset, but with two other things. A jet aircraft is flying through this apparition and you can also see a faint purple Zodiac light, what a sight!
Photo by Doug Drake 1/25/12

February Sky Data



Best time for deep sky observing this month:
February 12 through February 25

Mercury is in superior conjunction (almost directly beh ind the Sun) on February 7th. It then emerges into the evening sky, and we may possibly be able to find this elusive little planet just after sunset, at the very end of the month.

Venus continues to shine as a brilliant "Evening Star" this month. It can be seen in the south-western sky immediately after sunset, and remains visible well into the evening; even at the start of February it sets after 8 pm, and by the end of the month it stays up until after 10 pm. Venus is so intensely bright that it can be seen even in twilight.

Mars is rising in the east in the middle of the evening, and it's high in the southern sky in the early hours of the morning; it doesn't set until after sunrise. Relative to the stars, the "Red Planet" is moving slowly north-westwards in the constellation of Leo well to the east of the bright star Regulus. As the Earth draws closer to Mars, it appears grow steadily brighter.

Jupiter is well up in the south-western sky at dusk. Relative to the stars, it is moving very slowly north-eastwards in Aries. At the start of February Jupiter and Venus are some 40 degrees apart, but Venus is rapidly overhauling Jupiter. at the end of the month they are only 12 degrees apart (little more than a hand's breadth).

Saturn is rising in the east shortly before midnight, and it's still well up in the south-western sky in the early before dawn. Relative to the stars, Saturn is almost stationary in the constellation of Virgo. If you can find the Plough almost overhead, follow the curve of its handle down to the south, first to the bright reddish star Arcturus, and then on down to the bright white star Spica; Saturn is close to the left, or upper left, of Spica, and perhaps a little brighter; Saturn shines with a steadier light.

There are no significant **meteor-showers** in February, and it is generally a quiet time for sporadic (non-shower) meteors too.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
2/1/2012	11:56	01:37	06:50	17:21
2/5/2012	15:31	04:57	06:47	17:25
2/10/2012	21:00	08:04	06:42	17:30
2/15/2012	01:28	11:42	06:37	17:34
2/20/2012	05:30	16:48	06:32	17:39
2/25/2012	08:05	21:36	06:26	17:44
2/29/2012	10:34	00:19	06:21	17:47

Planet Data

Feb 1

	Rise	Transit	Set	Mag
Mercury	06:43	11:54	17:02	-1.2
Venus	08:41	14:39	20:37	-4.1
Mars	20:17	02:42	09:06	-0.6
Jupiter	10:26	17:08	23:47	-2.4
Saturn	23:14	04:56	10:38	0.6

Feb 15

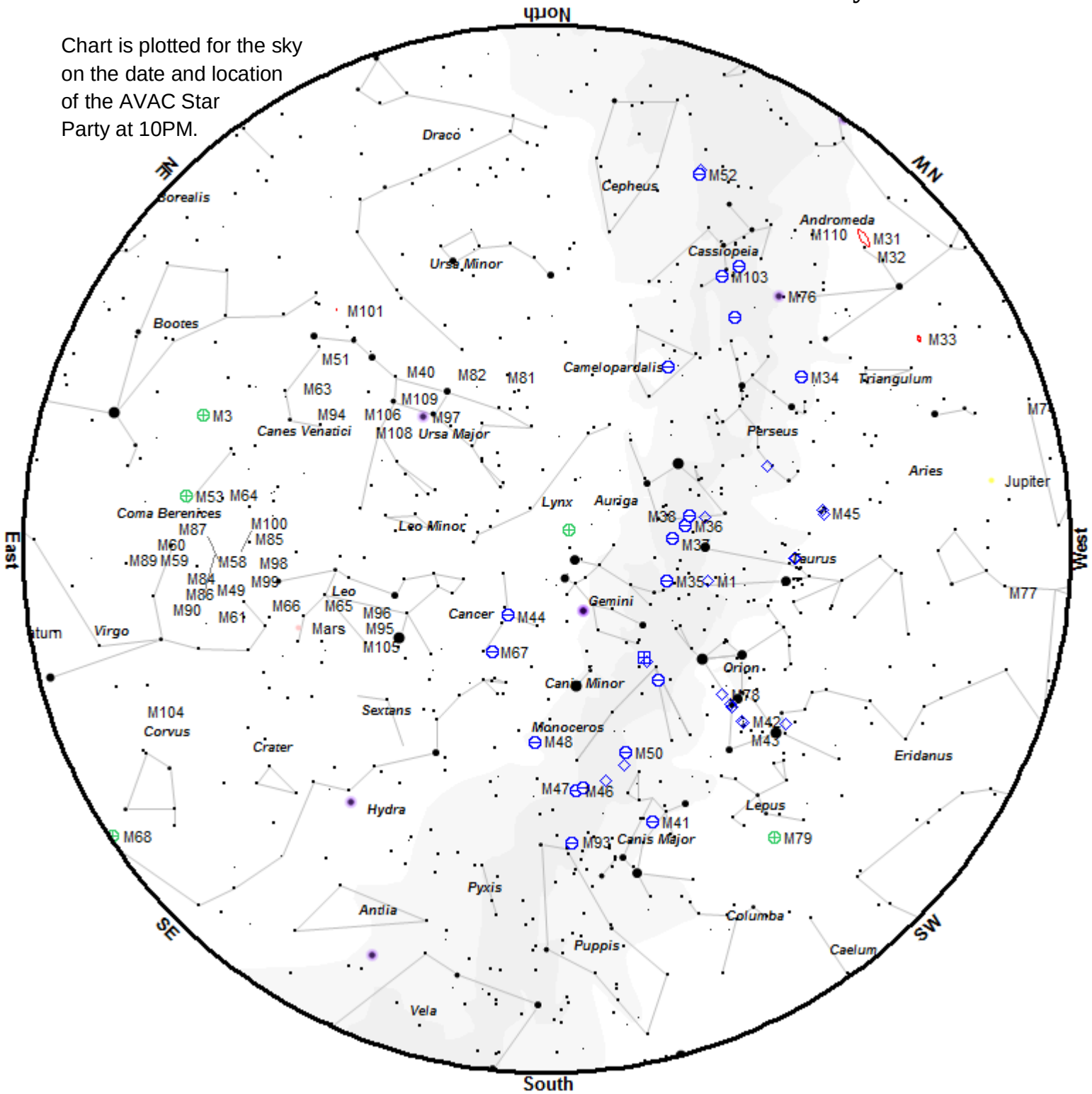
	Rise	Transit	Set	Mag
Mercury	06:59	12:33	18:09	-1.4
Venus	08:25	14:43	21:01	-4.2
Mars	19:08	01:36	08:05	-0.9
Jupiter	09:36	16:21	23:02	-2.3
Saturn	22:19	04:01	09:43	0.5

Feb 31

	Rise	Transit	Set	Mag
Mercury	06:58	13:06	19:13	-0.8
Venus	08:07	14:46	21:24	-4.2
Mars	17:49	00:23	06:57	-1.2
Jupiter	08:48	15:35	22:18	-2.2
Saturn	21:22	03:05	08:47	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		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
M 52	Open	8.2	Cas	23h24m48.0s	+61°35'36"	18:46	19:00	19:22	detectable
NGC 7789	Open	7.5	Cas	23h57m24.0s	+56°42'30"	18:46	19:00	19:42	detectable
M 110	Gal	8.9	And	00h40m22.3s	+41°41'09"	18:46	19:00	19:52	detectable
M 32	Gal	8.9	And	00h42m41.8s	+40°51'58"	18:42	19:00	19:53	easy
M 31	Gal	4.3	And	00h42m44.3s	+41°16'07"	18:43	19:01	19:54	easy
NGC 7790	Open	7.2	Cas	23h58m24.0s	+61°12'30"	18:38	19:01	19:54	obvious
M 77	Gal	9.7	Cet	02h42m40.8s	-00°00'48"	18:44	19:01	20:12	detectable
M 76	PNe	10.1	Per	01h42m19.9s	+51°34'31"	18:44	19:02	20:43	detectable
M 33	Gal	6.4	Tri	01h33m50.9s	+30°39'36"	18:44	19:02	20:13	detectable
NGC 637	Open	7.3	Cas	01h43m04.0s	+64°02'24"	18:36	19:03	21:47	obvious
NGC 559	Open	7.4	Cas	01h29m31.0s	+63°18'24"	18:38	19:03	21:31	easy
NGC 663	Open	6.4	Cas	01h46m09.0s	+61°14'06"	18:40	19:03	21:42	easy
M 103	Open	6.9	Cas	01h33m23.0s	+60°39'00"	18:38	19:03	21:29	obvious
NGC 457	Open	5.1	Cas	01h19m35.0s	+58°17'12"	18:38	19:03	21:08	obvious
NGC 752	Open	6.6	And	01h57m41.0s	+37°47'06"	18:51	19:03	19:34	challenging
NGC 884	Open	4.4	Per	02h22m18.0s	+57°08'12"	18:37	19:04	22:07	obvious
NGC 869	Open	4.3	Per	02h19m00.0s	+57°07'42"	18:37	19:04	22:05	obvious
M 34	Open	5.8	Per	02h42m05.0s	+42°45'42"	18:41	19:04	21:30	easy
NGC 957	Open	7.2	Per	02h33m21.0s	+57°33'36"	18:39	19:05	22:21	easy
NGC 1027	Open	7.4	Cas	02h42m40.0s	+61°35'42"	18:44	19:06	21:40	detectable
Heart Neb	Neb	6.5	Cas	02h33m52.0s	+61°26'50"	18:40	19:06	22:31	challenging
NGC 1245	Open	7.7	Per	03h14m42.0s	+47°14'12"	18:50	19:06	20:05	challenging
NGC 1342	Open	7.2	Per	03h31m38.0s	+37°22'36"	18:40	19:06	21:57	easy
M 45	Open	1.5	Tau	03h47m00.0s	+24°07'00"	18:36	19:06	22:21	obvious
NGC 1444	Open	6.4	Per	03h49m25.0s	+52°39'30"	18:35	19:07	23:25	obvious
NGC 1528	Open	6.4	Per	04h15m23.0s	+51°12'54"	18:40	19:09	23:27	easy
Hyades	Open	0.8	Tau	04h26m54.0s	+15°52'00"	18:38	19:09	22:42	easy
NGC 1502	Open	4.1	Cam	04h07m50.0s	+62°19'54"	18:33	19:10	00:07	obvious
NGC 1647	Open	6.2	Tau	04h45m55.0s	+19°06'54"	18:43	19:11	22:08	detectable
NGC 1664	Open	7.2	Aur	04h51m06.0s	+43°40'30"	18:38	19:12	23:49	easy
NGC 1851	Glob	7.1	Col	05h14m06.0s	-40°02'48"	18:45	19:14	20:24	detectable
NGC 1746	Open	6.1	Tau	05h03m50.0s	+23°46'12"	18:42	19:15	22:33	detectable
M 38	Open	6.8	Aur	05h28m40.0s	+35°50'54"	18:40	19:28	23:36	detectable
M 42	Neb	4.0	Ori	05h35m18.0s	-05°23'00"	18:38	19:33	22:43	easy
M 1	Neb	8.4	Tau	05h34m30.0s	+22°01'00"	18:49	19:33	21:31	challenging
M 43	Neb	9.0	Ori	05h35m30.0s	-05°16'00"	18:39	19:34	22:44	challenging
M 36	Open	6.5	Aur	05h36m18.0s	+34°08'24"	18:36	19:35	00:29	easy
M 78	Neb	8.0	Ori	05h46m48.0s	+00°05'00"	18:40	19:45	23:16	challenging

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 37	Open	6.2	Aur	05h52m18.0s	+32°33'12"	18:38	19:50	00:34	easy
NGC 2129	Open	7.0	Gem	06h01m07.0s	+23°19'20"	18:35	19:59	00:34	obvious
NGC 2169	Open	7.0	Ori	06h08m24.0s	+13°57'54"	18:35	20:06	00:19	obvious
M 35	Open	5.6	Gem	06h09m00.0s	+24°21'00"	18:38	20:07	00:25	easy
NGC 2175	Open	6.8	Ori	06h09m39.0s	+20°29'12"	18:42	20:08	23:48	detectable
NGC 2237	Neb	5.5	Mon	06h32m02.0s	+04°59'10"	18:40	20:30	00:14	challenging
NGC 2264	Open	4.1	Mon	06h40m58.0s	+09°53'42"	18:40	20:39	00:40	obvious
M 41	Open	5.0	CMa	06h46m01.0s	-20°45'24"	19:05	20:44	22:22	easy
NGC 2301	Open	6.3	Mon	06h51m45.0s	+00°27'36"	18:40	20:50	00:21	easy
M 50	Open	7.2	Mon	07h02m42.0s	-08°23'00"	18:44	21:00	23:58	detectable
NGC 2353	Open	5.2	Mon	07h14m30.0s	-10°16'00"	18:40	21:12	00:00	easy
NGC 2355	Open	9.7	Gem	07h16m59.0s	+13°45'00"	18:51	21:14	23:58	difficult
NGC 2360	Open	9.1	CMa	07h17m43.0s	-15°38'30"	19:48	21:15	22:43	challenging
NGC 2392	PNe	8.6	Gem	07h29m10.8s	+20°54'42"	18:36	21:27	01:54	obvious
M 47	Open	4.3	Pup	07h36m35.0s	-14°29'00"	19:09	21:34	00:00	obvious
NGC 2423	Open	7.0	Pup	07h37m06.0s	-13°52'18"	19:06	21:35	00:04	easy
NGC 2439	Open	7.1	Pup	07h40m45.0s	-31°41'36"	19:26	21:38	23:50	easy
M 46	Open	6.6	Pup	07h41m46.0s	-14°48'36"	19:16	21:39	00:03	detectable
NGC 2440	PNe	11.5	Pup	07h41m55.4s	-18°12'31"	19:39	21:40	23:40	detectable
M 93	Open	6.5	Pup	07h44m30.0s	-23°51'24"	20:43	21:42	22:41	easy
NGC 2451	Open	3.7	Pup	07h45m23.0s	-37°57'21"	19:50	21:43	23:37	easy
NGC 2477	Open	5.7	Pup	07h52m10.0s	-38°31'48"	19:58	21:50	23:41	easy
NGC 2506	Open	8.9	Mon	08h00m01.0s	-10°46'12"	20:00	21:58	23:55	difficult
NGC 2547	Open	5.0	Vel	08h10m09.0s	-49°12'54"	21:29	22:07	22:46	detectable
NGC 2546	Open	5.2	Pup	08h12m15.0s	-37°35'42"	21:03	22:10	23:16	difficult
NGC 2571	Open	7.4	Pup	08h18m56.0s	-29°45'00"	19:59	22:16	00:34	easy
M 44	Open	3.9	Cnc	08h40m24.0s	+19°40'00"	18:48	22:38	02:43	easy
IC 2391	Open	2.6	Vel	08h40m32.0s	-53°02'00"	21:46	22:38	23:29	detectable
IC 2395	Open	4.6	Vel	08h42m30.0s	-48°06'48"	21:39	22:40	23:41	easy
M 67	Open	7.4	Cnc	08h51m18.0s	+11°48'00"	19:57	22:49	01:40	detectable
M 82	Gal	9.0	UMa	09h55m52.4s	+69°40'47"	18:47	23:53	05:21	easy
M 81	Gal	7.8	UMa	09h55m33.1s	+69°03'56"	18:49	23:53	05:19	detectable
NGC 3132	PNe	8.2	Vel	10h07m01.8s	-40°26'11"	22:13	00:04	01:56	easy
NGC 3132	PNe	8.2	Vel	10h07m01.8s	-40°26'11"	22:13	00:04	01:56	easy
NGC 3228	Open	6.4	Vel	10h21m22.0s	-51°43'42"	23:38	00:19	00:59	easy
NGC 3227	Gal	11.5	Leo	10h23m30.6s	+19°51'54"	21:22	00:21	03:18	difficult
NGC 3242	PNe	8.6	Hya	10h24m46.1s	-18°38'32"	22:25	00:22	02:19	obvious
M 97	PNe	11.0	UMa	11h14m47.7s	+55°01'09"	22:38	01:12	03:47	challenging
M 65	Gal	10.1	Leo	11h18m55.7s	+13°05'32"	21:56	01:16	04:36	detectable
M 66	Gal	9.7	Leo	11h20m14.9s	+12°59'30"	21:54	01:17	04:42	detectable
M 106	Gal	9.1	CVn	12h18m57.6s	+47°18'13"	22:13	02:16	05:24	detectable
Col 256	Open	2.9	Com	12h25m06.0s	+26°06'00"	21:58	02:22	05:28	easy
M 84	Gal	10.1	Vir	12h25m03.9s	+12°53'12"	23:06	02:22	05:19	detectable
M 86	Gal	9.8	Vir	12h26m12.2s	+12°56'44"	23:22	02:23	05:14	detectable
M 49	Gal	9.3	Vir	12h29m46.8s	+08°00'01"	23:10	02:26	05:22	detectable

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 87	Gal	9.6	Vir	12h30m49.2s	+12°23'29"	23:08	02:28	05:22	detectable
NGC 4565	Gal	10.1	Com	12h36m20.8s	+25°59'15"	23:25	02:33	05:19	difficult
M 68	Glob	7.3	Hya	12h39m28.0s	-26°44'36"	00:32	02:36	04:41	detectable
M 104	Gal	9.1	Vir	12h39m59.3s	-11°37'22"	23:57	02:37	05:17	detectable
M 94	Gal	8.7	CVn	12h50m53.1s	+41°07'12"	22:20	02:47	05:28	easy
M 64	Gal	9.3	Com	12h56m43.8s	+21°41'00"	23:09	02:53	05:26	detectable
NGC 5128	Gal	7.8	Cen	13h25m27.7s	-43°01'07"	01:43	03:22	05:02	difficult
NGC 5139	Glob	3.9	Cen	13h26m46.0s	-47°28'36"	02:41	03:23	04:06	detectable
NGC 5195	Gal	10.5	CVn	13h29m59.6s	+47°15'58"	23:28	03:27	05:26	detectable
M 51	Gal	8.7	CVn	13h29m52.3s	+47°11'40"	22:44	03:27	05:29	easy
M 83	Gal	7.8	Hya	13h37m00.8s	-29°51'56"	01:26	03:34	05:22	detectable
M 3	Glob	6.3	CVn	13h42m11.0s	+28°22'42"	23:34	03:39	05:30	easy
M 101	Gal	8.4	UMa	14h03m12.4s	+54°20'53"	00:01	04:00	05:25	detectable
M 5	Glob	5.7	Ser	15h18m34.0s	+02°05'00"	01:49	04:54	05:29	easy
NGC 5897	Glob	8.4	Lib	15h17m24.0s	-21°00'36"	03:38	04:54	05:23	difficult
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	01:58	05:04	05:29	easy
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	02:16	05:06	05:29	easy
NGC 6543	PNe	8.3	Dra	17h58m33.4s	+66°37'59"	01:41	05:07	05:39	obvious
M 12	Glob	6.1	Oph	16h47m14.0s	-01°56'48"	03:21	05:07	05:30	easy
M 10	Glob	6.6	Oph	16h57m09.0s	-04°06'00"	03:39	05:08	05:27	detectable
IC 4665	Open	5.3	Oph	17h46m18.0s	+05°43'00"	04:05	05:08	05:24	detectable
M 80	Glob	7.3	Sco	16h17m02.0s	-22°58'30"	05:02	05:08	05:28	detectable
M 57	PNe	9.4	Lyr	18h53m35.1s	+33°01'45"	03:55	05:09	05:30	easy
M 14	Glob	7.6	Oph	17h37m36.0s	-03°14'48"	04:15	05:09	05:27	detectable
NGC 5986	Glob	7.6	Lup	15h46m03.0s	-37°47'12"	04:16	05:09	05:27	detectable
M 56	Glob	8.4	Lyr	19h16m36.0s	+30°11'06"	04:24	05:10	05:24	detectable
NGC 6633	Open	5.6	Oph	18h27m15.0s	+06°30'30"	04:32	05:10	05:30	easy
IC 4756	Open	5.4	Ser	18h39m00.0s	+05°27'00"	04:47	05:10	05:26	easy
M 9	Glob	7.8	Oph	17h19m12.0s	-18°31'00"	04:29	05:11	05:25	detectable
NGC 6871	Open	5.8	Cyg	20h05m59.0s	+35°46'36"	05:01	05:11	05:27	easy
NGC 6910	Open	7.3	Cyg	20h23m12.0s	+40°46'42"	05:07	05:12	05:28	easy
M 19	Glob	6.8	Oph	17h02m38.0s	-26°16'06"	04:28	05:12	05:26	detectable
M 29	Open	7.5	Cyg	20h23m57.0s	+38°30'30"	04:21	05:12	05:28	easy
NGC 6572	PNe	8.0	Oph	18h12m06.4s	+06°51'12"	04:17	05:12	05:39	obvious
M 23	Open	5.9	Sgr	17h57m04.0s	-18°59'06"	04:33	05:13	05:27	detectable
M 62	Glob	6.4	Oph	17h01m13.0s	-30°06'48"	04:25	05:13	05:29	detectable
NGC 6124	Open	6.3	Sco	16h25m20.0s	-40°39'12"	04:16	05:15	05:34	challenging
M 6	Open	4.6	Sco	17h40m20.0s	-32°15'12"	04:36	05:17	05:33	easy
NGC 6383	Open	5.4	Sco	17h34m48.0s	-32°34'00"	04:40	05:17	05:31	easy
NGC 6178	Open	7.2	Sco	16h35m47.0s	-45°38'36"	04:54	05:21	05:33	easy
NGC 6167	Open	6.6	Nor	16h34m34.0s	-49°46'18"	05:13	05:25	05:34	detectable
NGC 6193	Open	5.4	Ara	16h41m20.0s	-48°45'48"	05:10	05:26	05:34	easy.

A.V.A.C. Information

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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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