



Desert Sky Observer

Volume 34

Antelope Valley Astronomy Club Newsletter

June 2014

Up-Coming Events

- June 11: [Board Meeting](#)
- June 13: Club Meeting*
- June 14: [Repair Day](#)
- June 14: [Prime Desert Moon Walk](#)
- June 21: [Poppy Reserve Star Party](#)
- June 28: Chuchupate Star Party

* 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 Frank Moore

Hey AVAC astronomers. Did any of you see the the camelopardalid meteor shower?

Neither did we, that we know of, and we were out much of the night of May 23 at a star party and telescope clinic at Tehachapi High School. Throughout the approximately five hours of the event, three meteors were announced by various participants though, per all reports, none came from the expected camelopardalid radiant. Darrell Bennett, and other AVAC members who were up at the Starlight Festival and RTMC at Big Bear reported similar results with Darrell saying, “We saw only one meteor last night, it was a big dud.” Oh well. So much for the “meteor storm” predictions.

Rose and I were unable to go up to RTMC or Starlight because I had to go to Tucson to pick up our “grand dog”, who we will be watching for the summer while our daughter interns on a research project for Arizona State Parks near Pinetop, Arizona. Beautiful country up there, with dark skies, so we may have to drag the telescopes up there for a weekend. I did get back in time for us to participate in a Star Party and Telescope Clinic at Tehachapi High School, which was organized by NASA Solar System Ambassadors Dale Hawkins and Lauren Hollen. There were about ten telescopes set up there and though it was cloudy at first, limiting viewing to Jupiter, Saturn, and Mars, it cleared off later and I was able to share many deep space objects. A big thank you to Jim, Ann, and Kennedy for their participation as well as Brandon Wood and my wife Rose.

Earlier in the month, Rose, myself, Bob Kemp, and Bill Schebeck participated in the College of Canyons Spring Star Party on their Canyon Country Campus. We shared the telescope field there with student astronomers from the College of The Canyons, The Burbank Sidewalk Astronomers, and the Local Group Astronomy Club. The event was the 30th anniversary of the Local Group and the college had a cake for them to celebrate the event. Also, on May 14, Don Bryden, Bob Ayers, Rose and myself shared views of the Sun, Jupiter, Mercury, and Mars with students, parents, and teachers at the Open House at Discovery School in Lancaster.

So far, we have a relatively light calendar coming up in June with a Prime Desert Woodland Moonwalk on Saturday June 14, and a Dark Sky Star Party at the Chuchupate observing site in the Lockwood Valley on Saturday June 28 with at least several members going up as early as Thursday June 26. Though it's still tentative, we may have a star party, at the Overlook camp site at Castaic Lake, for a Cub Scout pack on Saturday June 7. Contact Don or myself if you would be able to participate.

Finally, repeat after me and say, "Thank you Bob!!" Bob Kemp has graciously agreed to take over the Newsletter Editor duties from Steve Trotta. Please bear with us while we make the transition.



Vice President

Rose Moore

Many thanks to those members who came out to support our club for our May outreach activities! You made them a success, as well as all of us having a good time!!

Our upcoming speaker for June is Jeff LaGrange from Goldstone. He'll be speaking on Radio Astronomy and Radar Imaging. Please come out to the meeting on June 13th for an informative presentation! If you would like to give a speaker donation, please do so before the meeting or immediately after the speaker's presentation, and see our Treasurer Virginia.

Our speaker for July is Diana Darus from JPL, topic to be announced. For September we have Chris Butler returning for a presentation, also topic to be announced.

Don't forget our club picnic, our Star-b-que for members and their guests, is scheduled for August 23rd at Brite Lake in Tehachapi. We will have a sign up list for the potluck starting at July's meeting. Also, our club Christmas Party is scheduled for Dec. 6th at Julianni's in Lancaster. This will be a buffet with the usual goodies of a raffle, silent auction, slide show, and more!

Please come out to support your club meetings and your club's outreach events!!



Director of Community Development

Don Bryden

June is here! Named for Juno, the daughter of Saturn, sister of Jupiter and mother of Mars. June will be the last month to catch all three relatives up at night (by early July Jupiter will be too close to the Sun to observe). The real treat for June will be the return of the Summer Triangle and the Milky Way and of course Saturn and its rings. Come out and look for some great globulars like M4, M80, M10, M12 and M13. A bit later, Sagittarius and all those great nebulae and star clouds will be visible such as M8, M20, M17 and M6.

Well your club will not be sitting idly by! We'll start off with a club meeting at SAGE on June 13th and a great guest speaker (see Rose's article above for more info). The next day, Saturday the 14th, we'll have our club Repair Day in the afternoon at Two Goats followed by a Prime Desert Woodlands Moonwalk that evening. Come out at around 3pm and learn about collimating, adjusting and cleaning advanced telescope optics or lend a hand in sprucing up some of the club equipment. We'll have snacks and drinks and the pool will be open so bring the kids (no mirrors in the pool, please). That evening at 8:30 we'll have our scopes

set up at Prime Desert to share the night sky with the public so come out and go on the walk with Jeremy or set up your scope and share the view.

About two weeks later we'll be out at Chuchupate for a long weekend of dark skies. A few members will be out from Thursday, the 26th until Sunday, the 29th. Come on out and work on that Messier object list or just enjoy the clear dark skies!



RTMC Report

Don Bryden

Another Memorial weekend has come and gone and you know what that means – RTMC and Camp Oakes. This year, the festivities in Big Bear were extra-special as it was also the first annual Starlight Festival. These two events are complimentary (according to the Starlight folks). The RTMC and Riverside Astro Society had a slightly different view as they were worried that the Fest would take both vendors and participants away. They were right to some extent but still, the vendors were there, the raffles were had and the speakers were great. And the skies were dark and steady – eventually.

It was Wednesday evening before RTMC. I was packing the car and trailer so I could take the LoonyScope up to Camp Oakes. Bob Kemp and I were planning to drive up together the next morning so we could arrive by noon and grab our usual camp spot. Bob would take his RV and I'd follow in my car so we'd have a convenient way to get down the mountain and into town. While we looked forward to the dark skies of Camp Oakes we also wanted to be able to check out the Starlight Festival which was in the town of Big Bear Lake. And I needed to get back and forth between the camp and our cabin where Mimi and Sophie would be staying. Let me back up a year...

RTMC 2013 was, unfortunately, during a full moon. As a result many observers stayed away. Previously, Mimi and Sophie would come up for the weekend and stay with me at the camp in the RV. Last year, I had the use of a friend's cabin in Big Bear Lake so we all went up for the weekend together. After that, Mimi and Sophie decided that the only way to do RTMC was to stay in my buddy Al's cabin! Fast forward to RTMC 2014: Mimi and Sophie would be coming up on Friday for the weekend and staying in the cabin and I would split my time between cabin and Camp Oakes. Observing at night and Starlight Festival during the day – sounds like a plan!

Thursday, 9am – Bob's house. The forecast for the weekend was mostly clear, sunny and warm with a 30% chance of thunderstorms. A few hours later we were on the 18 and climbing up the back way to Big Bear. Just before Lake Baldwin the drops started falling. By the time we were on Shay road it was a steady rain. As we headed out the 38 toward the camp it got a bit heavier and by the time we got to the old camp road it was mixed with snow and the dirt road had turned to a bog! As we pulled into the campsite the hail and snow started. We unhitched the trailer, picked up our long distance club member Bob Hanel and headed back to town to scout out where the Starlight Festival would be and grab an early dinner.



By the time we got back to camp a few more folks had trickled in and the rain/sleet/snow/hail had stopped (though the overcast was solid clouds!). Darrell Bennett showed up and a few other regulars and first timers from other clubs, including Jack Eastman and his wonderful Alvan Clark brass refractor. The skies were still cloudy and no one had bothered to set up. As we retreated to Bob's RV I said, "You watch. It'll be clear by midnight!" About 10:30pm we went outside and sure enough, the stars had come out! Still, it was cold and damp and muddy so observing would wait until tomorrow.

Friday, 8am – The plan was to set up the scopes and other equipment and then I was going to town to meet Mimi and Sophie. A little shopping and dinner and of course stopping at a few dozen of the myriad garage sales up there for the weekend, I dropped the girls back at the cabin and headed up the hill. Now it was Friday night and most campers had arrived and the scopes were out. Besides the usual peeks at Jupiter, Mars and Saturn, we found a nice comet in Ursa Major. The OIII filters were pulled out and detailed looks at the Western veil, the Lagoon and the Swan were shared. As folks started heading off to bed I got busy with finding tiny, dim galaxies as I continued my hunt for Herschel objects. Darrell, Bob Kemp and Bob Ayers kept hunting for Milky Way gems as it and the Summer Triangle slowly rose in the East. Clouds kept chasing us from one side of the meridian to the other and the dew started dropping. Still, we stayed out since it was Friday night and the predicted meteor shower from the recent passage of Comet 209P/LINEAR was due to hit around 1am Saturday morning. Well we were all glad we stayed up because we saw BOTH METEORS! Darrell had the best comment, "We see more meteors during a typical dark sky star party than we did tonight!" So much for the meteor storm!



Saturday, 6:30am... 7am... 7:30am – when we finally got up we headed down to the swap meet. It was a little sparse this year but not too bad. The vendors were opening up as well. Most had abandoned RTMC for the Starlight Festival though many had booths at both places. Farah and the Woodland Hills gang were here and in town at the Festival and old favorites such as Astro Parts Outlet (Don Rothman), Infinitees, Mare Meteoritics, San Diego Rock Shop and Gems a Plenty were all at their usual spots. After wandering around the swap meet and vendors we went out back for some breakfast and had a nice meal with Frank and Linda Boecker from the RAS and members of the RTMC

staff. While the Starlight Festival organizers would have you believe that they are complimentary to RTMC, Frank and Linda did not agree. They had little choice, though, as attendance by both campers and vendors was down.

Later, I met Darrell in town and we checked out the Starlight Festival. We just poked around a bit but we all planned to spend more time there on Sunday as we wanted to get ready for the raffle and a night of observing. After a nice pot luck cookout with Bob K, Bob A, Darrell, me and the girls, we went over to the main lodge and grabbed our usual spot OUT FRONT! We were skunked again, although I won a nice collection of books written by or about John Dobson donated by the San Francisco Sidewalk Astronomers. After, the girls retired to the cabin and we fired up the scopes. After initial cooling and collimation we were ready to go. Saturday was much better than Friday. We found the comet again and all the usual gems and I picked up all the Herschels that the clouds blocked from the previous night. As we had no expectations of another meteor shower that wouldn't show, everyone was in bed by 2am. After the umpteenth tiny little faint galaxy in Virgo I also called it a night. It's fun to work on these Astro League lists but some can get a bit tedious!

5

Sunday, 8am – The girls locked up the cabin and headed for home. Bob, Darrell and I made a breakfast of the last of Darrell's eggs and sausage then packed up the scopes. They were staying for the Sunday night raffle but we wanted to spend the day at the Starlight Festival and be ready to go when we returned. This time we were able to spend a lot more time with the vendors and presenters at the festival. In particular, Sami from Lumicon was very gregarious. You all may recall his speaking at the club meeting earlier this year and that he gave us a bunch of cleaning kits for door prizes or that he joined the club and offered all members a nice discount on his products. Well he picked up where he left off! When Bob was trying to decide between a new 2" UHC, H-beta or H-alpha filter, Sami made him a deal on all three then offered to ship him a new filter slide for free! He then gave us more goodies for the club and three very nice Lumicon hats!

Whether it was Farah at Woodland Hills Camera & Telescope, Scott Kardell for the IDA or Sami from Lumicon, everyone had the same question: Where was Frank!? Well as you can read in his article above, Frank and Rose were doing some outreach of their own up at Tehachapi. All I can say is that Frank, I would have stayed up later if you were there to help with those damned Herschels! And with all the questions about the Starlight Festival and what would RTMC be like with all the vendors also down in town, it turned out to be a very nice weekend despite the hail! I hope to see more club members there next year but until then come on out for a meeting, outreach or star party and I'll see you under the stars – I'll be the one looking for the really small, really faint smudge of a galaxy!

Desert Sky Observer



Space Place

The Hottest Planet in the Solar System

By Dr. Ethan Siegel

When you think about the four rocky planets in our Solar System—Mercury, Venus, Earth and Mars—you probably think about them in that exact order: sorted by their distance from the Sun. It wouldn't surprise you all that much to learn that the surface of Mercury reaches daytime temperatures of up to 800 °F (430 °C), while the surface of Mars never gets hotter than 70 °F (20 °C) during summer at the equator. On both of these worlds, however, temperatures plummet rapidly during the night; Mercury reaches lows of -280 °F (-173 °C) while Mars, despite having a day comparable to Earth's in length, will have a summer's night at the equator freeze to temperatures of -100 °F (-73 °C).



Image credit: NASA's Pioneer Venus Orbiter image of Venus's upper-atmosphere clouds as seen in the ultraviolet, 1979.

Those temperature extremes from day-to-night don't happen so severely here on Earth, thanks to our atmosphere that's some 140 times thicker than that of Mars. Our average surface temperature is 57 °F (14 °C), and day-to-night temperature swings are only tens of degrees. But if our world were completely airless, like Mercury, we'd have day-to-night temperature swings that were *hundreds* of degrees. Additionally, our average surface temperature would be significantly colder, at around 0 °F (-18 °C), as our atmosphere functions like a blanket: trapping a portion of the heat radiated by our planet and making the entire atmosphere more uniform in temperature.

But it's the *second* planet from the Sun -- Venus -- that puts the rest of the rocky planets' atmospheres to shame. With an atmosphere **93 times as thick as Earth's**, made up almost entirely of carbon dioxide, Venus is the ultimate planetary greenhouse, letting sunlight in but hanging onto that heat with incredible effectiveness. Despite being nearly twice as far away from the Sun as Mercury, and hence only receiving 29% the sunlight-per-unit-area, the surface of Venus is a toasty 864 °F (462 °C), with *no difference* between day-and-night temperatures! Even though Venus takes hundreds of Earth days to rotate, its winds circumnavigate the entire planet every four days (with speeds of 220 mph / 360 kph), making day-and-night temperature differences irrelevant.

Catch the hottest planet in our Solar System all spring-and-summer long in the pre-dawn skies, as it waxes towards its full phase, moving away from the Earth and towards the opposite side of the Sun, which it will finally slip behind in November. A little atmospheric greenhouse effect seems to be exactly what we need here on Earth, but as much as Venus? No thanks!

Check out these "10 Need-to-Know Things About Venus":

<http://solarsystem.nasa.gov/planets/profile.cfm?Object=Venus>.

June Sky Data

First Qtr June 6 Full June 14 Last Qtr June 21 New June 28

**Best time for deep sky observing this month:
June 16 through June 30**



Given a low horizon in the west-northwest it should be possible to spot **Mercury** about 45 minutes after sunset at the very start of June but it will soon be lost to view as it moves towards inferior conjunction on June 19th.

Venus, shining at magnitude ~ -3.9 during the month, is moving rapidly westwards across the lower part of Aries and into Taurus and can be seen low above the eastern horizon half an hour before sunrise. Its disk drops in angular size from 14 to 12 arc seconds but, at the same time the percentage of the disk which is illuminated increases from 77 to 85

Following its opposition in April, **Mars** is now receding rapidly and so will dim from magnitude -0.5 to 0 during the month. As it does so, its angular size will shrink from 11.8 down to 9.5 arc seconds so its best to observe it early in the month if the weather allows. It will be highest in the sky as darkness falls and gives us a last chance this apparition to observe features on the surface.

As June begins, **Jupiter** sets nearly 3 hours after sunset. It is, however, now well past its best and fading from -1.9 to -1.8 during the month while its angular diameter shrinks from 33 to 32 arc seconds as it moves towards superior conjunction with the Sun on July 24th. By month's end it will be low above the horizon after sunset forming an almost straight line to the left of Castor and Pollux in the constellation of Gemini.

Saturn came to opposition on May 10th and as June begins is high in the south as darkness begins. It is shining with a magnitude of $+0.2$ as June begins, falling to $+0.4$ by month's end. Its fully illuminated disk has a diameter of ~ 18 arc seconds. The rings (with a diameter of ~ 40 arc seconds) have now opened to around 21 degrees from the line of sight, presenting a magnificent view.

There are no significant **meteor-showers** in June.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
6/1/2014	10:11	00:03	06:40	20:59
6/5/2014	13:46	01:44	06:39	21:02
6/10/2014	18:39	04:40	06:38	21:04
6/15/2014	23:27	09:30	06:38	21:06
6/20/2014	02:06	15:00	06:39	21:07
6/25/2014	05:31	19:47	06:40	21:08
6/30/2014	09:50	23:13	06:42	21:08

Planet Data

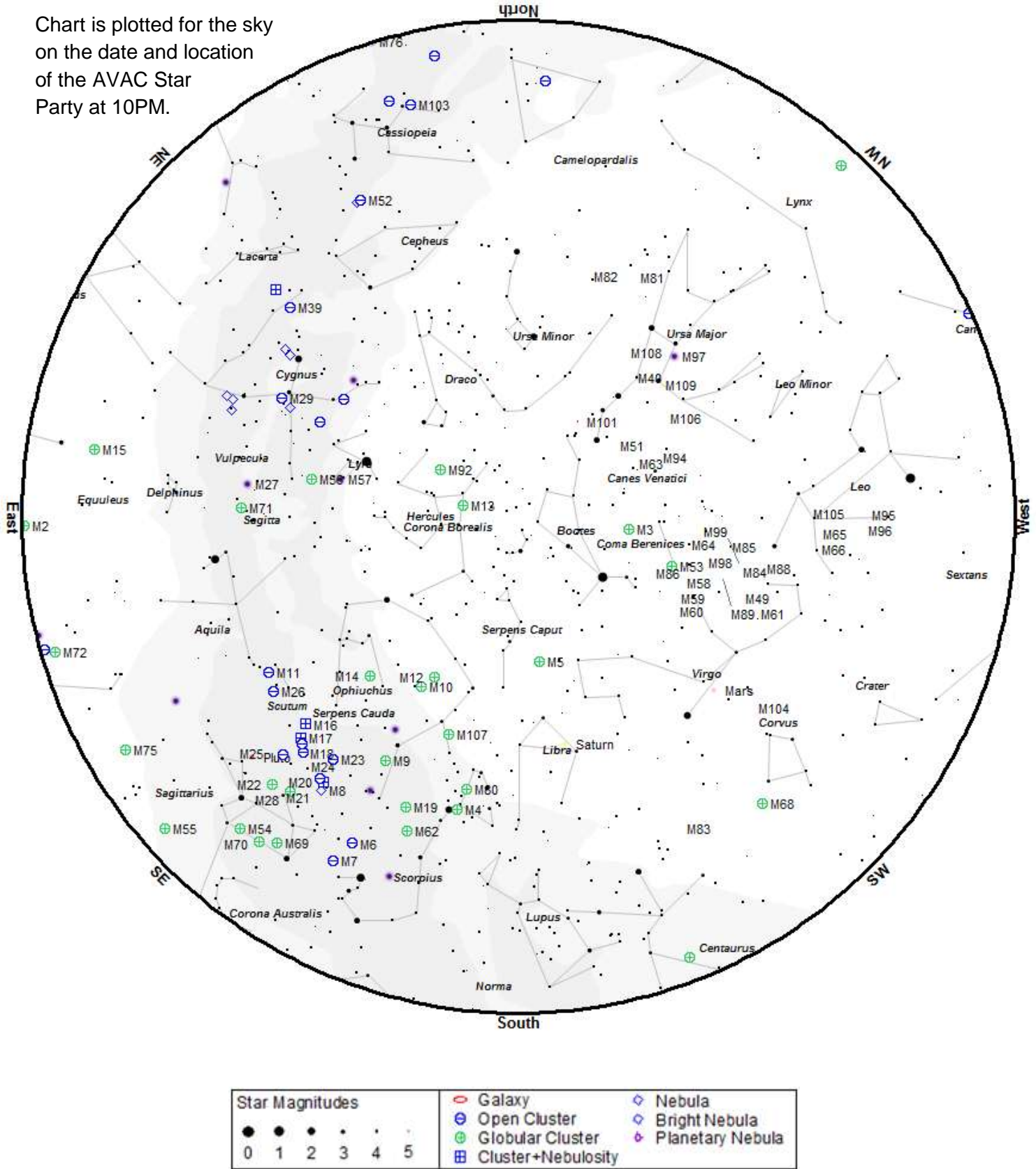
	June 1			
	Rise	Transit	Set	Mag
Mercury	06:56	14:19	21:40	1.5
Venus	03:42	10:22	17:01	-4.0
Mars	14:50	20:47	02:43	-0.5
Jupiter	08:22	15:39	22:53	-1.9
Saturn	17:50	23:15	04:40	0.2

	June 15			
	Rise	Transit	Set	Mag
Mercury	06:06	13:19	20:26	4.5
Venus	03:36	10:32	17:26	-3.9
Mars	14:10	20:03	01:55	-0.2
Jupiter	07:41	14:56	22:08	-1.9
Saturn	16:52	22:17	03:42	0.3

	June 31			
	Rise	Transit	Set	Mag
Mercury	04:47	11:49	18:55	2.3
Venus	03:37	10:46	17:54	-3.9
Mars	13:36	19:22	01:08	0.0
Jupiter	06:57	14:11	21:21	-1.8
Saturn	15:50	21:15	02:41	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.



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, this month that's RTMC. 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	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Difficulty
NGC 5460	Open	Cen	14h07m27.0s	-48°20'36"	6.1	21:18	21:34	21:57	not visible
NGC 5128	Gal	Cen	13h25m27.7s	-43°01'07"	7.8	21:18	21:36	22:01	challenging
M 68	Glob	Hya	12h39m28.0s	-26°44'36"	7.3	21:31	21:43	22:05	detectable
M 83	Gal	Hya	13h37m00.8s	-29°51'56"	7.8	21:30	21:48	22:30	detectable
M 104	Gal	Vir	12h39m59.3s	-11°37'22"	9.1	21:31	21:50	22:34	detectable
M 65	Gal	Leo	11h18m55.7s	+13°05'32"	10.1	21:35	21:51	21:52	detectable
M 66	Gal	Leo	11h20m14.9s	+12°59'30"	9.7	21:35	21:51	21:54	detectable
M 49	Gal	Vir	12h29m46.8s	+08°00'01"	9.3	21:35	21:54	22:50	detectable
M 84	Gal	Vir	12h25m03.9s	+12°53'12"	10.1	21:36	21:55	22:53	detectable
M 87	Gal	Vir	12h30m49.2s	+12°23'29"	9.6	21:34	21:56	22:57	detectable
M 86	Gal	Vir	12h26m12.2s	+12°56'44"	9.8	21:37	21:56	22:44	detectable
NGC 4565	Gal	Com	12h36m20.8s	+25°59'15"	10.1	21:38	21:58	23:01	difficult
M 64	Gal	Com	12h56m43.8s	+21°41'00"	9.3	21:34	21:59	23:32	detectable
M 97	PNe	UMa	11h14m47.7s	+55°01'09"	9.7	21:38	22:00	23:16	detectable
M 82	Gal	UMa	09h55m52.4s	+69°40'47"	9.0	21:36	22:01	22:47	detectable
M 81	Gal	UMa	09h55m33.1s	+69°03'56"	7.8	21:36	22:01	22:45	detectable
M 106	Gal	CVn	12h18m57.6s	+47°18'13"	9.1	21:38	22:01	23:32	detectable
M 94	Gal	CVn	12h50m53.1s	+41°07'12"	8.7	21:33	22:02	00:07	detectable
M 3	Glob	CVn	13h42m11.0s	+28°22'42"	6.3	21:32	22:03	00:24	easy
NGC 5195	Gal	CVn	13h29m59.6s	+47°15'58"	10.5	21:37	22:04	00:12	detectable
M 51	Gal	CVn	13h29m52.3s	+47°11'40"	8.7	21:33	22:04	00:48	easy
NGC 5897	Glob	Lib	15h17m24.0s	-21°00'36"	8.4	21:39	22:05	23:15	challenging
M 101	Gal	UMa	14h03m12.4s	+54°20'53"	8.4	21:37	22:08	00:40	detectable
M 5	Glob	Ser	15h18m34.0s	+02°05'00"	5.7	21:31	22:09	01:06	easy
NGC 5986	Glob	Lup	15h46m03.0s	-37°47'12"	7.6	21:36	22:12	23:21	difficult
NGC 6067	Open	Nor	16h13m11.0s	-54°13'06"	6.5	22:08	22:37	23:06	not visible
M 80	Glob	Sco	16h17m02.0s	-22°58'30"	7.3	21:34	22:40	23:51	detectable
NGC 6124	Open	Sco	16h25m20.0s	-40°39'12"	6.3	21:31	22:49	00:30	challenging
NGC 6167	Open	Nor	16h34m34.0s	-49°46'18"	6.6	22:35	22:58	23:22	challenging
NGC 6178	Open	Sco	16h35m47.0s	-45°38'36"	7.2	21:58	22:59	00:00	detectable
M 13	Glob	Her	16h41m41.0s	+36°27'36"	5.8	21:32	23:05	03:32	easy
NGC 6193	Open	Ara	16h41m20.0s	-48°45'48"	5.4	22:29	23:05	23:42	difficult
M 12	Glob	Oph	16h47m14.0s	-01°56'48"	6.1	21:32	23:10	02:30	easy
M 10	Glob	Oph	16h57m09.0s	-04°06'00"	6.6	21:36	23:20	02:10	detectable
M 62	Glob	Oph	17h01m13.0s	-30°06'48"	6.4	21:40	23:24	01:21	detectable
M 19	Glob	Oph	17h02m38.0s	-26°16'06"	6.8	21:44	23:26	01:21	detectable
M 92	Glob	Her	17h17m07.0s	+43°08'12"	6.5	21:33	23:40	04:01	easy
M 9	Glob	Oph	17h19m12.0s	-18°31'00"	7.8	21:49	23:42	01:39	difficult

ID	Cls	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Difficulty
NGC 6322	Open	Sco	17h18m25.0s	-42°56'00"	6.5	22:11	23:42	01:11	easy
NGC 6383	Open	Sco	17h34m48.0s	-32°34'00"	5.4	21:53	23:58	02:04	easy
NGC 6388	Glob	Sco	17h36m17.0s	-44°44'06"	6.8	23:12	00:00	00:47	challenging
M 14	Glob	Oph	17h37m36.0s	-03°14'48"	7.6	21:41	00:01	02:48	detectable
M 6	Open	Sco	17h40m20.0s	-32°15'12"	4.6	21:47	00:03	02:23	easy
NGC 6397	Glob	Ara	17h40m42.0s	-53°40'24"	5.3	23:32	00:04	00:37	not visible
M 7	Open	Sco	17h53m51.0s	-34°47'36"	3.3	22:20	00:17	02:13	detectable
M 23	Open	Sgr	17h57m04.0s	-18°59'06"	5.9	22:26	00:20	02:15	detectable
NGC 6543	PNe	Dra	17h58m33.4s	+66°37'59"	8.3	21:23	00:21	04:25	obvious
M 20	Open	Sgr	18h02m42.0s	-22°58'18"	5.2	23:14	00:26	01:38	easy
M 21	Open	Sgr	18h04m13.0s	-22°29'24"	7.2	23:09	00:27	01:45	detectable
M 8	Neb	Sgr	18h04m02.0s	-24°23'14"	5.0	23:40	00:27	01:15	easy
NGC 6541	Glob	CrA	18h08m02.0s	-43°42'54"	6.3	23:41	00:31	01:21	challenging
NGC 6572	PNe	Oph	18h12m06.4s	+06°51'12"	8.0	21:20	00:34	04:28	obvious
M 24	Open	Sgr	18h18m26.0s	-18°24'24"	11.1	22:42	00:41	02:40	not visible
M 16	Open	Ser	18h18m48.0s	-13°48'24"	6.5	22:13	00:42	03:11	obvious
M 18	Open	Sgr	18h19m58.0s	-17°06'06"	7.5	22:35	00:43	02:52	easy
M 17	Open	Sgr	18h20m47.0s	-16°10'18"	7.3	22:41	00:44	02:47	difficult
M 28	Glob	Sgr	18h24m33.0s	-24°52'12"	6.9	00:13	00:47	01:24	detectable
NGC 6633	Open	Oph	18h27m15.0s	+06°30'30"	5.6	21:36	00:50	04:12	easy
M 25	Open	Sgr	18h31m47.0s	-19°07'00"	6.2	23:01	00:55	02:48	detectable
M 22	Glob	Sgr	18h36m24.0s	-23°54'12"	5.2	00:02	00:59	01:56	detectable
M 70	Glob	Sgr	18h43m13.0s	-32°17'30"	7.8	23:27	01:06	02:46	detectable
M 11	Open	Sct	18h51m05.0s	-06°16'12"	6.1	22:21	01:14	04:00	detectable
M 57	PNe	Lyr	18h53m35.1s	+33°01'45"	9.4	21:34	01:16	04:17	easy
NGC 6716	Open	Sgr	18h54m34.0s	-19°54'06"	7.5	23:32	01:17	03:03	detectable
M 54	Glob	Sgr	18h55m03.0s	-30°28'42"	7.7	23:49	01:18	02:47	difficult
NGC 6723	Glob	Sgr	18h59m33.0s	-36°37'54"	6.8	23:57	01:22	02:49	detectable
M 56	Glob	Lyr	19h16m36.0s	+30°11'06"	8.4	22:16	01:39	04:08	detectable
M 55	Glob	Sgr	19h40m00.0s	-30°57'42"	6.3	00:15	02:03	03:51	detectable
NGC 6818	PNe	Sgr	19h43m57.8s	-14°09'12"	10.0	23:39	02:07	04:24	easy
M 71	Glob	Sge	19h53m46.0s	+18°46'42"	8.4	22:19	02:16	04:17	easy
M 27	PNe	Vul	19h59m36.3s	+22°43'16"	7.3	22:21	02:22	04:18	easy
NGC 6871	Open	Cyg	20h05m59.0s	+35°46'36"	5.8	22:07	02:28	04:18	easy
NGC 6910	Open	Cyg	20h23m12.0s	+40°46'42"	7.3	22:09	02:46	04:18	easy
M 29	Open	Cyg	20h23m57.0s	+38°30'30"	7.5	22:21	02:46	04:17	easy
NGC 7009	PNe	Aqr	21h04m10.9s	-11°21'48"	8.3	00:44	03:24	04:29	obvious
M 39	Open	Cyg	21h31m48.0s	+48°26'00"	5.3	22:47	03:32	04:19	easy
NGC 7160	Open	Cep	21h53m40.0s	+62°36'12"	6.4	22:12	03:34	04:24	obvious
M 15	Glob	Peg	21h29m58.0s	+12°10'00"	6.3	00:15	03:35	04:19	easy
M 2	Glob	Aqr	21h33m27.0s	-00°49'24"	6.6	00:46	03:38	04:18	detectable
NGC 7243	Open	Lac	22h15m08.0s	+49°53'54"	6.7	00:21	03:39	04:14	detectable
M 52	Open	Cas	23h24m48.0s	+61°35'36"	8.2	01:24	03:42	04:09	detectable
NGC 7790	Open	Cas	23h58m24.0s	+61°12'30"	7.2	00:21	03:44	04:21	easy

A.V.A.C. Information

Membership in the Antelope Valley Astronomy Club is open to any individual or family.

The Club has three categories of membership.

- Family membership at \$30.00 per year.
- Individual membership at \$25.00 per year.
- Junior membership at \$15.00 per year.

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