ANTELOPE VALLEY ASTRONOMY CLUB, INC.

Desert Sky Observer

Volume 37 *Antelope Valley Astronomy Club Newsletter* **September 2017**

Up-Coming Events

September 8: Club Meeting*
September 9: Prime Desert Woodland Moon Walk
September 16: Dark Sky Star Party @ TBA

* Monthly meetings are held at the S.A.G.E. Planetarium 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

Tehachapi, CA, 5:00 am on Friday August 18, 2017. Rose holds the gate as I slowly back the old Winnebago motor home out of the driveway. The Wirehaired Dachshund "Gypsy" sits in the passenger seat and the doxie mix Ollie sits in his perch on the dash. Rose closes the gate, climbs in and places Gypsy on her lap. Ollie jumps into his car seat on the floor between the front buckets and away we go.

Thus began our trip to the path of totality, in Lincoln City, Oregon, for the August 2017 Total Solar Eclipse. Every exterior compartment, and many interior cabinets, were full of astronomy gear and support accessories and the Celestron C6-R refractor rode under the sofa.

The first and longest leg of our trip, to the KOA campground at Mt. Shasta City, CA took us 540 miles. Unfortunately, smoke from fires in Oregon, Northern California, and even British Columbia was so thick in the area that we couldn't even see Mt. Shasta even as we camped at its base. Even though the sky was an ugly gray, and we were weary from our long drive, we still enjoyed that first night and the dogs liked their walks in the woods (pine pitch stuck to their fur and all).

The distance traveled on that first day made the next leg of our trip, the 368 miles from Mt. Shasta to Lincoln City, OR, seem like a piece of cake. The closer we got to the path of totality the more it became apparent that something out of the ordinary was going on. All along Highway 20 between Corvallis and the coastal town of Newport, there were two basic types of signs. First, were the entrepreneurs with signs advertising "Eclipse Parking" or "Eclipse Camping" and their going rates. Then, on the other hand, were the multitude of newly hung "No Parking" or "No Trespassing" signs on the properties of people who didn't want their lives disrupted by the eclipse crowds.

The coast came into view as we approached Newport and the views were stunning. The skies were absolutely clear and blue but, unfortunately, it was the last time we'd see that type of weather until after the eclipse. We stopped at a Fred Meyer supermarket to get a few items we had forgotten and I was surprised to see half a dozen 40 foot refer trailers, cordoned off with yellow "Caution" tape, in the parking lot. It seems that the market, in anticipation of huge crowds, had extra refrigerated and frozen inventory standing by in the trailers. We heard later that the crowds never materialized and that many businesses, like Fred

Meyer and other markets, as well as restaurants and area hotels, lost their shirts on the extra inventory they ordered in anticipation of the non-existent "Eclipseageddon".

After a gorgeous 22 mile drive up the Oregon coast from Newport to Lincoln City we finally arrived at our destination, the Premier RV Resort of Lincoln City. During check in, and noting my Tehachapi address, Mike the resident manager inquired as to if I'd been in the Air Force or worked at Edwards AFB. It seems he's a retired Air Force Officer who was stationed there for a while. He then hopped in his golf court and led us to our site….that was PERFECT.

We were in a corner site in the middle row, on the upper tier of the park, which got us away from the trees ringing the park and gave us a little extra room. As was observed the next morning, the rising sun cleared the trees to the East at about 8:00 am giving us plenty of time to ensure that alignments were correct and that we were tracking properly on the day of the eclipse. Mike told me that the sprinklers would irrigate the lawn at our site early Sunday morning, but that they were programmed to not run on Monday morning so that we could setup on Sunday, and leave the equipment up overnight, if we so desired.

Which is what we did. I got everything setup and aligned Sunday morning, August 20, and had the equipment tracking the sun with the 80mm Daystar h-alpha scope on the Orion Atlas mount and C6-R on the Losmandy G-11 mount, so folks could take a gander throughout the day. After being out of touch during his drive from California due to a failed cellphone, Bob Ayres showed up late Sunday morning and, at some point when he went to Verizon to see about getting his phone issue fixed, he found a pizza parlor and returned with the most marvelous pie which we had for an early dinner.

We had some great prominences and a huge complex of sunspots (maybe even a coronal hole), which looked great through the Daystar Quark-Chromosphere. Once the sun went down and Polaris and few other stars became visible on Sunday night, I fine-tuned my alignments and, in fact, had a little bit of a star party for our fellow campers before the clouds, dew, and then fog shut us down. While I was having the little informal star party, the RV park was hosting a "Chili Dog Social", with live music, on the observation deck at the end of our row. In fact, they really put out the Red Carpet for their eclipse week guests with the activities listed below leading up to, and following, the eclipse.

Wednesday - Crafters' Fair
Thursday - Kid's Scavenger Hunt - with prizes
Friday - Strawberry Short Cake Social
Saturday Morning - Pancake Breakfast
Saturday Evening - Happy Hour with Live Music
Sunday Evening - Hot Dog Dinner - with Live Music
Monday - Eclipse Pot Luck
Tuesday - Taco Tuesday - with Live Music

On the morning of the eclipse, the sky looked gray and depressing at first and then cleared off around the time of first contact. It stayed clear till about half an hour before totality when, as the temperature dropped noticeably and got below the dew point, the fog began to form again. We could still see the sun and developing eclipse but it wasn't going to be perfect. Still, it was impressive enough that I was a happy camper and we decided right then and there that we'll chase totality during the next total solar eclipse in April of 2024.

The old C6-R, with a Baeder filter, was a champ and it was still sucking the photons in all the way through totality. It really made the difference in what we could see and with its 1200 mm focal length, and the wide field of view of a 17mm TeleVue Ethos, we could really zoom in while still offering views of the full disc. The sunspots were a great bonus. When I pulled the solar filter off during the approximately two minutes of totality, everyone (over a dozen in our little group) took their short turn at the eyepiece and we

could clearly see the corona and prominences. At the end of totality we had a big bright, awesome, diamond ring effect, I jumped up from my drum stool, from which I'd been operating the remote for the DSLR, and screamed "Diamond Ring". Only problem is....in my excitement I forgot to hit the camera remote and MISSED IT. It bummed me out, but was still an awesome experience. I later found that I had caught an image of the Diamond Ring effect at the beginning of totality.

In fact, when I uploaded the eclipse images from my camera to my computer, all 189 of them, I was pleasantly surprised at what I was able to capture. Considering our hazy, sometimes foggy, conditions they came out much better than I imagined. There were a few gaps in the sequence of events, where we lost the sun almost entirely, but there was still enough to make a bit of timeline. I was able to capture, albeit a bit hazy, a semblance of Bailey's Beads, the Diamond Ring, and some of the corona. In hindsight maybe I should have had the camera at prime focus on the C6-R, for its superior light gathering and resolving ability as compared to the 300mm telephoto, but then I wouldn't have had it for the folks to enjoy visually and especially during totality.

Following the eclipse, I had intended to leave the equipment up all day, and into that night, but the sky got grayer still so I took it all down and packed it away in the RV. By Monday night, the fog was blowing in over the trees and, with everything becoming wet with dew, it seems it was the right decision. On Tuesday, we took off for a three day stay in Tualatin, OR, and visits with my son Aaron, his girlfriend, and my sister and family who live in Beaverton. We also picked up some of our daughter Hannah's "stuff", including her bicycle and scuba gear that she had left with former roommates when she moved to Kentucky for grad school. We hit the road for our two day trip back home on the morning of Friday August 25th and got home on Saturday the 26th. It was quite a whirlwind trip, and we were left exhausted, but it was worth it and we'd do it again.

We'll show some of my eclipse images, and those of other members, at the AVAC meeting at the SAGE Planetarium on Friday September 8. If you have images you want to share, whether you traveled to totality or not, please send them to me so I can put them on a storage device for connection to the system at the SAGE Planetarium. We want to hear everyone's stories of the eclipse, whether from home or somewhere on the path of totality.

Remember, we also have a Prime Desert Woodland Moonwalk on the night of Saturday September 9 at 7:30. Our September Dark Sky Star Party is scheduled for the weekend of Saturday, September 16 and, as is usual for this time of year, I'm watching weather and wildfire trends before deciding on a location. We'll inform you via a separate email. Also, we have canceled the Lunar Observing Event previously scheduled for Saturday September 23 as the annual public star party at Tehachapi Airport is scheduled for that night and AVAC members who live in the Tehachapi area, Rose and myself included, will be supporting this event. Other AVAC members are welcome to come with telescopes or not. This is not an overnight event and we'll take the equipment down by 11:00 or whenever the crowd begins to thin out. A separate email will follow about this as well.

Please check out the stories and images of the eclipse, submitted by other AVAC members, throughout this edition of the newsletter.

Secretary

Rose Moore

I hope everyone has settle back in from their eclipse travels and adventures! Our next meeting, Sept. 8th Friday, we are going to have a review of member's stories and pictures from the eclipse. See Frank's note above.

Our next PDW Moon Walk is scheduled for Saturday, Sept. 9 at 7:30pm. We'll need members with telescopes. Weather permitting.

On Friday, October 13th, we have our annual Business Meeting to elect officers to the AVAC Board. We usually have a dismal turnout for this meeting, < 20 members. We need your support to elect officers into the Board positions. Whether you nominate yourself or someone else, they do need to be qualified to fulfill the elected position. If any questions, refer to the OPS Manual available online, or bring your questions to September's meeting. The Business meeting is also your chance to bring up any questions or concerns about what you want to see accomplished with your club.

Reminders: Club Dark Sky Star Party on Saturday Sept. 16th to be announced; Nightfall at Borrego Springs is Oct. 19-22nd, (Thursday to Sunday); Prime Desert Moon Walk is Saturday Oct. 28th at 6:30pm; our annual club Christmas Party is Saturday December 2nd at 6:00 pm at Gino's in the Marketplace/Lancaster. More info to follow.

Members Solar Eclipse Photos and Stories

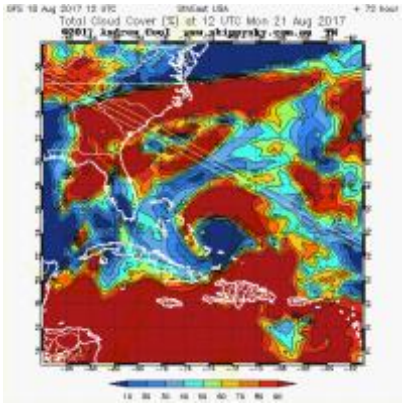
Don Bryden

Solar Saros 145, Member 22. Also known as the "Great American Eclipse, 2017". I've planned for this for several years, stockpiling eclipse shades and preparing my optics and imagers. I had my Stellarvue SV-105 with my Nikon D300 running a script from Eclipse Orchestrator to take exposure after exposure from first contact through fourth so I could watch the eclipse and not worry about the camera. I also had my AstroTech ED-75 for viewing through a Daystar Quark and video camera connected to my computer monitor. I had my plastic eclipse glasses and Sunoculars for casual partial phase viewing, too.

Last year, before moving to the Charleston area, when folks would ask me if I were going to set up a telescope to view the eclipse, I would joke saying, "Sure, but not in Charleston!" This time of year was "hurricane season" and notoriously cloudy. I planned to go to Casper, WY or

perhaps Yellowstone Park. The drive from the cabins in Yellowstone was a short twenty minutes to get to the path of totality so a nice vacation at Yellowstone and an opportunity to view the eclipse seemed like a great idea.

I added my name to the list, requesting a reservation in the park. The prices were high but not too bad - $200 to $350 a night depending on the cabin. Finally, I got an email from the concessionaire! My second and third choices were available and for only $650 a night. Hmmm, the eclipse price-gouging had begun!



I started looking at other options but eventually, living in Summerville, SC – right on the path of totality – made it hard to justify going to the trouble and expense of traveling anywhere else. Plus, my dad, cousins, nephews, aunt & uncle were all taking the day off to come visit as well as several neighbors.

The days leading up to the eclipse were perfect – sunny, not to hot and humid – some late afternoon thunderstorms but nothing I couldn't handle.

Still, Skippy Sky's predictions of total overcast were looming. And, as some of you may know, Skippy Sky don't lie! The day of the eclipse came and the sun was shining. I used my Easy-Up not for the rain but to give me and the scopes a bit of shade. All was set up and aligned. Tracking was good and all the equipment was humming along – except for my Dec. drive – the motor had popped out of the hanger! Nothing a bit of gaffer's tape couldn't fix and I was back in business. I guess we just had our glitch for this mission!

The sun hadn't fully cleared the tree line when Skippy Sky's curse rolled in. And not just your big puffy clouds but solid overcast, just as predicted. Still, I only needed two minutes. The rain started. Just two minutes of a break in the overcast. Wait! There's a little blue sky. The partial eclipse had started and I could see it clearly in the eyepiece. Chuck, my dad's brother, was standing next to me so I said, "Quick! Take a look." He struggled to see through the eyepiece. "Just look straight through. Put your eye on the eyecup." "I can't see anything", he said. I thought, "It's so hard to tell people how to look into an eyepiece and not have it black out." But no, Chuck was doing everything right. It was the clouds. They were back. It was really coming down now. That would be the last we saw of even a glimpse of the sun. People began to wander off. Some were checking out other venues. "It's clear out on Isle of Palms!" "Columbia is mostly clear, too!" But they all knew it was too late. The rain was harder now. My relatives headed into the house. A girl from up the street was talking to three French tourists. She had stayed with them for a semester while at Clemson and they flew all the way to Charleston to visit and see the eclipse. I invited them inside. "NASA TV is showing the eclipse live." I covered my gear and brought them inside.

We had Jersey Mike's, drinks, chips and other goodies. People chatted and got to know one another. Two of the three tourists were also amateur astronomers and didn't want to give up hope yet either. We ate and talked and took pictures. We watched different broadcasts of people experiencing totality. The pictures were great. The crowds went wild. Soon it was almost time for second contact here. The rain had mostly stopped but the sky was as thick as ever, now with lightning and thunder. We wandered outside and I gave a countdown. The lightning flashed and thunder boomed and the cloudy skies turned to night. Then it was over. We had missed it all. My dad ruefully took a snapshot of the TV showing totality somewhere where skies were fair. If you look carefully, you can see the windows from my sun porch reflecting in the shot. Just call me Casey, I suppose…

Oh, somewhere in this favored land the sun is shining bright,
The band is playing somewhere, and somewhere hearts are light;
And somewhere men are laughing, and somewhere children shout,
But there is no joy in Summerville—mighty Casey has struck out.

Frank Moore

CR6

Fellow Travelers

Frank aligning a shot

Scopes and Rose

Frank and Bob

The RV Gang

More of the gear

The setup

First contact in the clear

More crescent

Crescent on the Sunspotter

Thinner crescent

Diamond Ring in the haze

Bailys Beads

Totality

Bailys Beads at the end

Diamond Ring at the end

After Totality

Crescent on the Sunspotter

After Totality

Darrell Bennett

Everyone looking up

First bite

A bigger bite

Going

Almost Gone

Prominences

Corona

Prominences

The other side

Darrell and Neil deGrasse Tyson

Steve Trotta

I decided to combine an eclipse trip with a visit to my daughter, she lives just south of Kansas City, KS. I tasked her with the job of finding us someplace in the path of totality. She found a tiny little town named Elmira in Missouri, population 49, and exactly on the centerline with 2 minutes 38 seconds of totality.

The forecast called for a 50% chance of thunderstorms for the big day. Driving to Elmira, we went through torrential down pours. I was convinced we were going to miss out, but kept going just in case. The drive was taking longer than we thought because of the rain, so that was adding to my stress level.

When we arrived in Elmira, the partial phase was already in progress and we were getting glimpses of it through the clouds. I looked to the west and saw a small clearing and thought, maybe that will be in front of the sun so we can at least have a glimpse of totality. Literally seconds before totality, the clouds parted and stayed away for the whole 2 minutes 38 seconds. It pays to view from a church parking lot. Thank you Elmira Baptist Church for the use of your parking lot and the request that Pastor Chris and the congregation sent up asking for an opening in the clouds.

I forgot the remote for my camera so I had to use the timer. Because of the clouds and using the timer, I kept getting a lot of pictures of clouds. I also missed pictures of the diamond rings. Oh well, I got to experience my first total eclipse. I can't wait till the next one, I'm already making plans for April 8, 2024.

The streetlights started coming on

Tiny crescent

Totality

Totality

Totality

Totality

Bailys Beads

Crescent after

September Sky Data

Best time for deep sky observing this month:
September 12 through September 23

Mercury has now become a morning object. Rising in elevation during the first part of the month, by the 10th it will have brightened to zero magnitude and lie just half a degree to lower right of Regulus. Mercury reaches greatest elongation, some 18 degrees from the Sun on the 12th - its best morning apparition this year. On the 14th, it lies 11 degrees to the lower left of Venus whilst, before dawn on the 16th, it closes to just 0.3 degrees from Mars.

Venus is visible in the east before dawn this month, rising around 2 hours before sunrise. Its magnitude remains at around -3.9 during the month as its angular diameter shrinks from 12.4 to 11.2 arc seconds. However, at the same time, its illuminated phase increases from 84% to 91%

Mars has now become a morning object at the start of its new apparition. During the month, Mars has a magnitude of 1.8 and an angular size of just 3.6 arc seconds so no details will be seen on its surface. As the month progresses Mars rises higher in the sky before dawn and moves closer to Venus.

Now five months after opposition, **Jupiter** can still just be seen very low in the southwestern sky after nightfall. With a magnitude of around -1.7 and an angular size of ~31 arc seconds it will be at its dimmest and smallest during this year's apparition and is too low for any reasonable telescopic views.

Saturn came into opposition back on June 11th and so will be seen in the southwest as darkness falls and sets late evening. It shines initially at magnitude +0.4 falling to +0.5 during the month and has an angular size of ~16.5 arc seconds. With an angle of 26.8 degrees inclination to the line of sight, the rings are virtually as open as they ever can be. Their maximum tilt, at 27 degrees, will come in October - the first time since 2002.

There are no major **meteor-showers** in September,but this is generally a good time of the year for seeing sporadic meteors, which may appear at any time, in any part of the sky.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
9/1/2017	17:24	03:04	07:24	20:17
9/5/2017	20:08	06:45	07:27	20:12
9/10/2017	23:15	11:59	07:31	20:05
9/15/2017	02:45	17:04	07:34	19:58
9/20/2017	08:01	20:29	07:38	19:50
9/25/2017	12:46	23:27	07:42	19:43
9/30/2017	16:46	02:37	07:45	19:36

Planet Data

Sept 1

	Rise	Transit	Set	Mag
Mercury	05:30	12:09	18:41	2.5
Venus	03:47	10:49	17:50	-4.0
Mars	05:21	12:08	18:54	1.8
Jupiter	09:41	15:30	21:16	-1.8
Saturn	14:25	19:28	00:31	0.4

Sept 15

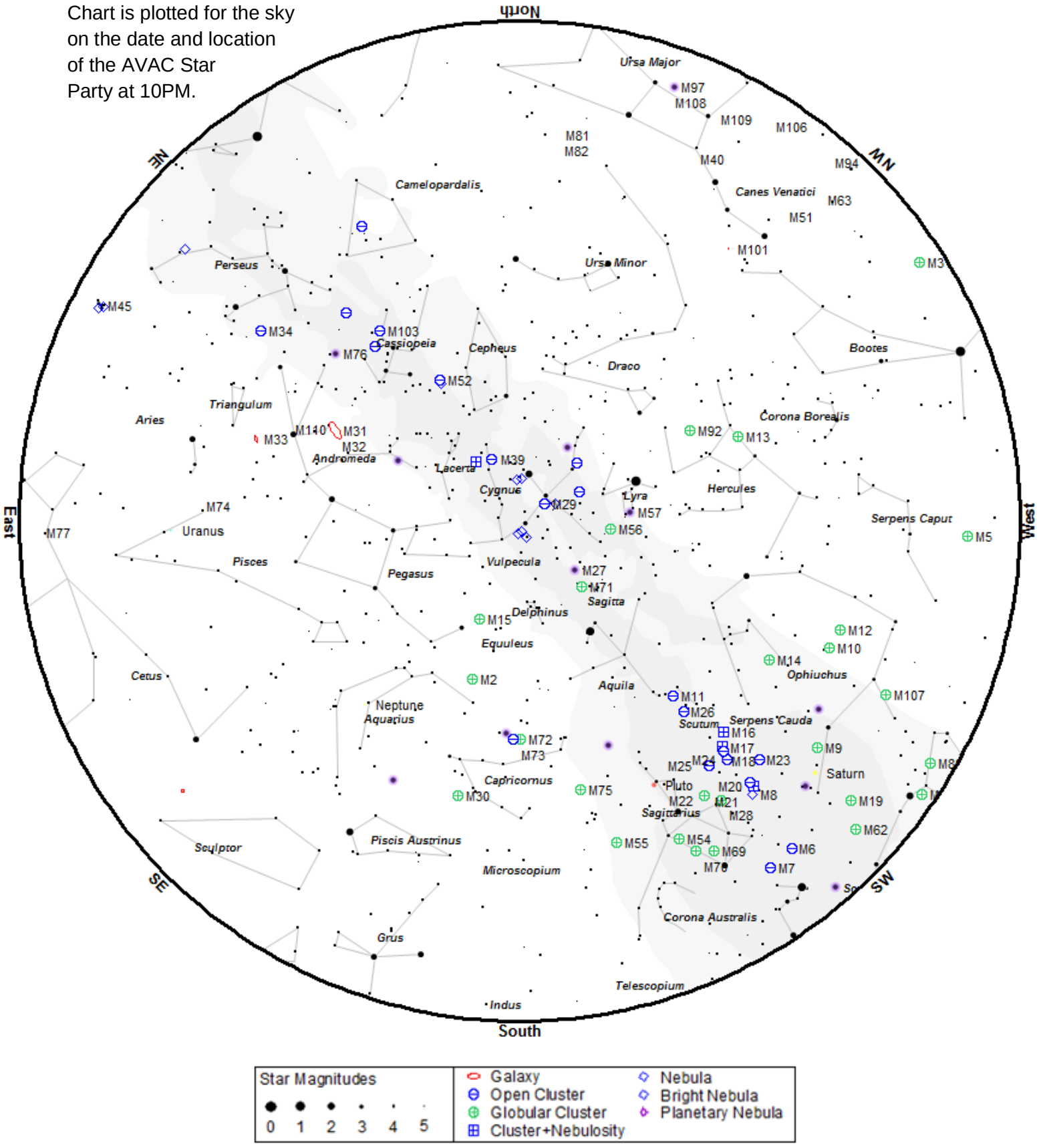
	Rise	Transit	Set	Mag
Mercury	05:08	11:45	18:21	-0.8
Venus	04:14	11:02	17:49	-3.9
Mars	05:09	11:45	18:23	1.8
Jupiter	08:59	14:45	20:28	-1.7
Saturn	13:31	18:34	23:37	0.5

Sept 31

	Rise	Transit	Set	Mag
Mercury	06:13	12:20	18:31	-1.4
Venus	04:44	11:13	17:42	-3.9
Mars	04:56	11:22	17:49	1.8
Jupiter	08:14	13:57	19:37	-1.7
Saturn	12:35	17:38	22:41	0.5

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

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



Star Magnitudes		
0 1 2 3 4 5	Galaxy	Nebula
	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	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Difficulty
NGC 6322	Open	Sco	17h18m25.0s	-42°56'00"	6.5	19:59	20:11	20:34	easy
NGC 6388	Glob	Sco	17h36m17.0s	-44°44'06"	6.8	20:05	20:12	20:20	challenging
NGC 6541	Glob	CrA	18h08m02.0s	-43°42'54"	6.3	20:06	20:17	20:36	challenging
M 80	Glob	Sco	16h17m02.0s	-22°58'30"	7.3	20:05	20:17	20:43	detectable
M 62	Glob	Oph	17h01m13.0s	-30°06'48"	6.4	20:05	20:19	20:50	detectable
M 19	Glob	Oph	17h02m38.0s	-26°16'06"	6.8	20:08	20:20	20:53	detectable
NGC 6383	Open	Sco	17h34m48.0s	-32°34'00"	5.4	20:04	20:20	21:13	easy
M 7	Open	Sco	17h53m51.0s	-34°47'36"	3.3	20:02	20:20	21:17	detectable
M 6	Open	Sco	17h40m20.0s	-32°15'12"	4.6	20:01	20:21	21:27	easy
M 5	Glob	Ser	15h18m34.0s	+02°05'00"	5.7	20:07	20:21	20:58	easy
M 9	Glob	Oph	17h19m12.0s	-18°31'00"	7.8	20:09	20:23	20:24	difficult
M 12	Glob	Oph	16h47m14.0s	-01°56'48"	6.1	20:05	20:25	21:18	easy
M 10	Glob	Oph	16h57m09.0s	-04°06'00"	6.6	20:07	20:25	21:20	detectable
M 101	Gal	UMa	14h03m12.4s	+54°20'53"	8.4	20:10	20:26	20:53	detectable
M 23	Open	Sgr	17h57m04.0s	-18°59'06"	5.9	20:06	20:25	20:58	detectable
M 20	Open	Sgr	18h02m42.0s	-22°58'18"	5.2	20:04	20:25	22:00	easy
M 8	Neb	Sgr	18h04m02.0s	-24°23'14"	5.0	20:04	20:25	21:54	easy
M 21	Open	Sgr	18h04m13.0s	-22°29'24"	7.2	20:04	20:26	20:30	detectable
M 70	Glob	Sgr	18h43m13.0s	-32°17'30"	7.8	20:06	20:26	21:40	detectable
M 28	Glob	Sgr	18h24m33.0s	-24°52'12"	6.9	20:05	20:26	21:52	detectable
M 14	Glob	Oph	17h37m36.0s	-03°14'48"	7.6	20:07	20:27	21:56	detectable
NGC 6723	Glob	Sgr	18h59m33.0s	-36°37'54"	6.8	20:06	20:27	21:41	detectable
M 16	Open	Ser	18h18m48.0s	-13°48'24"	6.5	20:01	20:28	21:55	obvious
M 17	Open	Sgr	18h20m47.0s	-16°10'18"	7.3	20:08	20:28	21:44	difficult
M 18	Open	Sgr	18h19m58.0s	-17°06'06"	7.5	20:03	20:28	21:36	easy
M 22	Glob	Sgr	18h36m24.0s	-23°54'12"	5.2	20:05	20:28	20:42	detectable
M 54	Glob	Sgr	18h55m03.0s	-30°28'42"	7.7	20:08	20:28	21:40	difficult
M 13	Glob	Her	16h41m41.0s	+36°27'36"	5.8	20:05	20:29	22:45	easy
NGC 6572	PNe	Oph	18h12m06.4s	+06°51'12"	8.0	19:54	20:29	23:11	obvious
IC 4665	Open	Oph	17h46m18.0s	+05°43'00"	5.3	20:07	20:29	22:07	detectable
M 25	Open	Sgr	18h31m47.0s	-19°07'00"	6.2	20:05	20:29	21:31	detectable
M 92	Glob	Her	17h17m07.0s	+43°08'12"	6.5	20:05	20:30	23:22	easy
NGC 6716	Open	Sgr	18h54m34.0s	-19°54'06"	7.5	20:04	20:31	21:49	detectable
NGC 6633	Open	Oph	18h27m15.0s	+06°30'30"	5.6	20:03	20:32	23:25	easy
M 11	Open	Sct	18h51m05.0s	-06°16'12"	6.1	20:05	20:32	22:57	detectable
IC 4756	Open	Ser	18h39m00.0s	+05°27'00"	5.4	20:05	20:32	23:13	easy
NGC 6543	PNe	Dra	17h58m33.4s	+66°37'59"	8.3	19:57	20:33	01:21	obvious
M 57	PNe	Lyr	18h53m35.1s	+33°01'45"	9.4	20:00	20:35	00:47	easy

ID	Cls	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Difficulty
M 56	Glob	Lyr	19h16m36.0s	+30°11'06"	8.4	20:07	20:40	23:54	detectable
M 55	Glob	Sgr	19h40m00.0s	-30°57'42"	6.3	20:06	20:48	22:42	detectable
NGC 6818	PNe	Sgr	19h43m57.8s	-14°09'12"	10.0	19:58	20:52	23:19	easy
M 71	Glob	Sge	19h53m46.0s	+18°46'42"	8.4	20:04	21:01	01:02	easy
M 27	PNe	Vul	19h59m36.3s	+22°43'16"	7.3	20:04	21:07	01:11	easy
NGC 6871	Open	Cyg	20h05m59.0s	+35°46'36"	5.8	20:04	21:13	01:40	easy
NGC 6910	Open	Cyg	20h23m12.0s	+40°46'42"	7.3	20:03	21:30	02:10	easy
M 29	Open	Cyg	20h23m57.0s	+38°30'30"	7.5	20:04	21:31	02:00	easy
NGC 7009	PNe	Aqr	21h04m10.9s	-11°21'48"	8.3	19:57	22:11	00:55	obvious
M 15	Glob	Peg	21h29m58.0s	+12°10'00"	6.3	20:06	22:37	02:16	easy
M 39	Open	Cyg	21h31m48.0s	+48°26'00"	5.3	20:04	22:38	03:49	easy
M 2	Glob	Aqr	21h33m27.0s	-00°49'24"	6.6	20:09	22:40	01:52	detectable
M 30	Glob	Cap	21h40m22.0s	-23°10'42"	6.9	21:37	22:48	23:58	detectable
NGC 7160	Open	Cep	21h53m40.0s	+62°36'12"	6.4	20:01	23:00	05:03	obvious
NGC 7243	Open	Lac	22h15m08.0s	+49°53'54"	6.7	20:09	23:22	03:39	detectable
NGC 7293	PNe	Aqr	22h29m38.5s	-20°50'14"	6.3	21:57	23:36	01:14	detectable
M 52	Open	Cas	23h24m48.0s	+61°35'36"	8.2	20:29	00:31	04:32	detectable
NGC 7789	Open	Cas	23h57m24.0s	+56°42'30"	7.5	21:06	01:03	04:55	detectable
NGC 7790	Open	Cas	23h58m24.0s	+61°12'30"	7.2	20:06	01:05	05:28	easy
NGC 55	Gal	Scl	00h15m08.4s	-39°13'13"	8.5	00:19	01:22	02:24	challenging
M 110	Gal	And	00h40m22.3s	+41°41'09"	8.9	21:59	01:47	05:14	detectable
M 31	Gal	And	00h42m44.3s	+41°16'07"	4.3	21:20	01:49	05:22	easy
M 32	Gal	And	00h42m41.8s	+40°51'58"	8.9	21:15	01:49	05:24	easy
NGC 253	Gal	Scl	00h47m33.1s	-25°17'20"	7.9	01:30	01:54	02:17	detectable
NGC 288	Glob	Scl	00h52m45.0s	-26°35'00"	8.1	00:30	01:59	03:26	challenging
NGC 457	Open	Cas	01h19m35.0s	+58°17'12"	5.1	20:34	02:26	05:28	obvious
NGC 559	Open	Cas	01h29m31.0s	+63°18'24"	7.4	20:31	02:36	05:29	easy
M 103	Open	Cas	01h33m23.0s	+60°39'00"	6.9	20:41	02:40	05:32	obvious
M 33	Gal	Tri	01h33m50.9s	+30°39'36"	6.4	22:53	02:41	05:23	detectable
M 76	PNe	Per	01h42m19.9s	+51°34'31"	10.1	22:32	02:48	05:23	detectable
NGC 637	Open	Cas	01h43m04.0s	+64°02'24"	7.3	20:42	02:50	05:32	obvious
NGC 663	Open	Cas	01h46m09.0s	+61°14'06"	6.4	21:04	02:52	05:27	easy
NGC 752	Open	And	01h57m41.0s	+37°47'06"	6.6	00:39	03:04	05:09	challenging
NGC 869	Open	Per	02h19m00.0s	+57°07'42"	4.3	21:36	03:26	05:32	obvious
NGC 884	Open	Per	02h22m18.0s	+57°08'12"	4.4	21:39	03:29	05:32	obvious
Heart Neb	Neb	Cas	02h33m52.0s	+61°26'50"	6.5	00:39	03:40	05:17	challenging
NGC 957	Open	Per	02h33m21.0s	+57°33'36"	7.2	22:13	03:40	05:28	easy
M 77	Gal	Cet	02h42m40.8s	-00°00'48"	9.7	00:42	03:47	05:26	detectable
NGC 1027	Open	Cas	02h42m40.0s	+61°35'42"	7.4	23:13	03:48	05:24	detectable
NGC 1245	Open	Per	03h14m42.0s	+47°14'12"	7.7	01:56	03:48	05:17	challenging
M 34	Open	Per	02h42m05.0s	+42°45'42"	5.8	23:28	03:48	05:26	easy
NGC 1342	Open	Per	03h31m38.0s	+37°22'36"	7.2	00:22	04:40	05:28	detectable
NGC 1444	Open	Per	03h49m25.0s	+52°39'30"	6.4	23:18	04:49	05:33	obvious
NGC 1502	Open	Cam	04h07m50.0s	+62°19'54"	4.1	23:12	04:52	05:34	obvious
NGC 1528	Open	Per	04h15m23.0s	+51°12'54"	6.4	00:12	04:54	05:29	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.
- To borrow club equipment, books, videos and other items.

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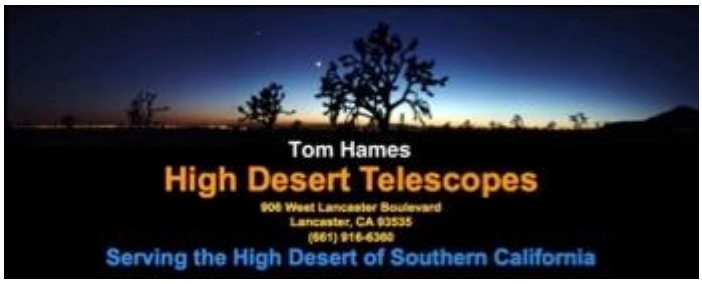

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