



# Desert Sky Observer

Volume 37

Antelope Valley Astronomy Club Newsletter

May 2017

## Up-Coming Events

- May 5: [College of the Canyon Star Party](#)
- May 12: Club Meeting\*
- May 20: [Prime Desert Woodland Moon Walk](#)
- May 25-29: [Riverside Telescope Makers Conference](#)
- May 27: Dark Sky Star Party @ [Red Rock Canyon](#)

\* 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 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 Frank Moore

With apologies to you all, and especially our newsletter editor, I'm finally getting my DSO submission out.

We had a fantastic Dark Sky Star Party at the Red Cliffs Natural area, Red Rock Canyon State Park, this past weekend (Sat April 29). By my count, there were 14 AVAC members in attendance with 11 astronomical instruments (ten telescopes plus Kevin Reilly's Oberwerk binoculars). We also had one amateur astronomer from Orange County who tagged along with our group, utilizing our Special Event Permit, so he could image throughout the night and at least half a dozen members of the public came to check out the views through our telescopes. In a surprise treat, Kevin Reilly barbecued chicken thighs and other delights for the whole gang.

The skies were perfect with only the slightest breeze and an occasional gust of wind. The 18% illuminated waxing crescent moon made for an interesting target till it set behind the cliffs at about 11:00 pm at which time Jupiter was transiting high overhead. Once the light of the moon had faded, true darkness set in and the clarity and "seeing" were exceptional. In addition to many of the brighter objects, we all chased many targets that are normally not viewable under less ideal skies.

My favorite targets of the night were the objects in the Virgo Cluster of Galaxies. With the 28mm Orion Megaview eyepiece (82\* AFW) on our Celestron C-11, I could get four or five of the galaxies in the field of view at a time. As soon as I slewed one out of the field of view, another would take its place. Bumping the power up, and zooming in on individual galaxies yielded even more exciting views. Tom Hames favorite target of the night was M-104, the Sombrero Galaxy in his new Skywatcher 14" dob and both it and the Whirlpool Galaxy looked outstanding through Rod Girard's Celestron Edge HD 9.25 and Revolution Imager.

From 1:00 am on the Milky Way really began to twinkle overhead and by 2:00 it was a brilliant display of stars stretching from horizon to horizon. Of course, and is always my custom during the appropriate season, one of my last targets was the Veil Nebula with an oxygen-III filter. While I still had the O-III filter installed, our visitor suggested that I slew over to M-17, the Swan Nebula. Under the viewing conditions

we had that night, and with the O-III filter, it was stunning and we could clearly see the “Omega” shape which gives it the secondary name of the Omega Nebula. While we were “in the neighborhood”, I went to M-8, the Lagoon Nebula, which was so clear that we kept bumping the power till it filled the eyepiece. Darrell Bennet and I were the last two observers on the telescope field and when he hit the road at about 3:30 am I finally headed off to bed. It was a remarkable night.

As noted in previous DSO’s and mentioned at the last few meetings, our May 27 Dark Sky Star party will be held at the Ricardo Campground, within Red Rock Canyon State Park, in conjunction with our interpretive program in the amphitheater. We will have solar observing in Campsites 1 & 2 during the day, followed by the amphitheater presentation, and then a public star party that night. Details will follow in a separate email. As noted previously, the AVAC will not have an official presence at the RTMC Astronomy Expo this year though some members may be attending.

I will be monitoring the weather and wildfire situation in June before deciding on a location for our June Dark Sky Star Party. I had originally planned on having it at Chuchupate, near Frazier Park, but many who attended that event at Red Cliffs expressed a desire to return there. The weather (heat) and wildfire situation (smoke) will affect our decision.

Our guest speaker at the May 12 meeting at the SAGE Planetarium will be Dr. Anna Ho from CalTech. Dr. Ho will be speaking on the “Invisible Universe” and will show us what our Universe would look like if we could see it in Infra-red, Ultra-violet, and X-rays and explain the technology used by Astrophysicists to see it in various wavelengths and spectrums. This is one not to be missed.

Our next outreach event, on Friday May 5, is the Spring Star Party at the College of the Canyons, Canyon Country Campus. Email reminders have already been sent out.

The next Prime Desert Woodland Preserve Moonwalk, with SAGE Planetarium Director Jeremy Amarant, will be held on Saturday May 20 at 8:30 pm. Speaking of Jeremy Amarant, he and his wife Jennifer welcomed a new baby boy, Connor, into the world on April 28. The AVAC and its members offer our congratulations.

## Space Place

### **NOAA's Joint Polar Satellite System (JPSS) to monitor Earth as never before**

By Ethan Siegel

Later this year, an ambitious new Earth-monitoring satellite will launch into a polar orbit around our planet. The new satellite—called JPSS-1—is a collaboration between NASA and NOAA. It is part of a mission called the Joint Polar Satellite System, or JPSS.

At a destination altitude of only 824 km, it will complete an orbit around Earth in just 101 minutes, collecting extraordinarily high-resolution imagery of our surface, oceans and atmosphere. It will obtain full-planet coverage every 12 hours using five separate, independent instruments. This approach enables near-continuous monitoring of a huge variety of weather and climate phenomena.

JPSS-1 will improve the prediction of severe weather events and will help advance early warning systems. It will also be indispensable for long-term climate monitoring, as it will track global rainfall, drought conditions and ocean properties.

The five independent instruments on board are the main assets of this mission:

- The Cross-track Infrared Sounder (CrIS) will detail the atmosphere's 3D structure, measuring water vapor and temperature in over 1,000 infrared spectral channels. It will enable accurate weather forecasting up to seven days in advance of any major weather events.
- The Advanced Technology Microwave Sounder (ATMS) adds 22 microwave channels to CrIS's measurements, improving temperature and moisture readings.
- Taking visible and infrared images of Earth's surface at 750 meter resolution, the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument will enable monitoring of weather patterns, fires, sea temperatures, light pollution, and ocean color observations at unprecedented resolutions.
- The Ozone Mapping and Profiler Suite (OMPS) will measure how ozone concentration varies with altitude and in time over every location on Earth's surface. This can help us understand how UV light penetrates the various layers of Earth's atmosphere.
- The Clouds and the Earth's Radiant System (CERES) instrument will quantify the effect of clouds on Earth's energy balance, measuring solar reflectance and Earth's radiance. It will greatly reduce one of the largest sources of uncertainty in climate modeling.

The information from this satellite will be important for emergency responders, airline pilots, cargo ships, farmers and coastal residents, and many others. Long and short term weather monitoring will be greatly enhanced by JPSS-1 and the rest of the upcoming satellites in the JPSS system.



*Ball and Raytheon technicians integrate the VIIRS Optical and Electrical Modules onto the JPSS-1 spacecraft in 2015. The spacecraft will be ready for launch later this year.  
Image Credit: Ball Aerospace & Technologies Corp.*

Want to teach kids about polar and geostationary orbits? Go to the NASA Space Place: <https://spaceplace.nasa.gov/geo-orbits/>

## News Headlines

### **Cassini Finds 'The Big Empty' Close to Saturn**

As NASA's Cassini spacecraft prepares to shoot the narrow gap between Saturn and its rings for the second time in its Grand Finale, Cassini engineers are delighted, while ring scientists are puzzled, that the region appears to be relatively dust-free. This assessment is based on data Cassini collected during its first dive through the region on April 26...

"The region between the rings and Saturn is 'the big empty,' apparently," said Cassini Project Manager Earl Maize of NASA's Jet Propulsion Laboratory in Pasadena, California. "Cassini will stay the course, while the scientists work on the mystery of why the dust level is much lower than expected."

<https://goo.gl/cy6l4P>

### **New Horizons, The PI's Perspective: No Sleeping Back on Earth!**

The other big advantage of hibernation is that our mission and science operations teams get a break from babysitting the bird and can concentrate on other things—in this case, detailed planning for that KBO flyby coming on Jan. 1, 2019. So while our spacecraft may be dozing, our team sure isn't—they are as busy as can be with the many hundreds of flyby planning details that have to be completed this year, so we can finish testing the plan early next year during another hibernation. After all, flyby operations begin in July 2018, which is less than 15 months away!

<https://goo.gl/KbghA7>

### **Debris from Halley's Comet: The eta Aquarid Meteor Shower**

The 2017 eta Aquarid meteor shower is expected to peak on the nights around May 5th and 6th. The shower can be seen from both hemispheres, but the southern hemisphere is favored with twice as many meteors as the northern hemisphere--60 meteors per hour in the south vs. 30 per hour in the north. The best time to look, no matter where you live, is during the hours just before local sunrise.

<http://spaceweather.com/meteors/etaaquarids/etaaquarids.html>

### **James Webb Space Telescope Mirror Seen in Full Bloom**

It's springtime and the deployed primary mirror of NASA's James Webb Space Telescope looks like a spring flower in full bloom. NASA technicians lifted the telescope using a crane and moved it inside a clean room at NASA's Goddard Space Flight Center in Greenbelt, Maryland. Once launched into space, the Webb telescope's 18-segmented gold mirror is specially designed to capture infrared light from the first galaxies that formed in the early universe, and will help the telescope peer inside dust clouds where stars and planetary systems are forming today.

<https://goo.gl/VXSjWG>

Sun and Moon Rise from Sky 6 Tools, Sun and Moon

## May Sky Data

First Qtr May 2      Full May 10      Last Qtr May 18      New May 25



**Best time for deep sky observing this month:  
May 16 through May 27**

**Mercury** is lost in the glare of the Sun this month so cannot be observed.

**Venus** rises in the east in the morning twilight on the first of the month and then climbs a little higher each morning as May progresses. On May 1st, the disk, forming a crescent 38 arc seconds high, is just 27% lit shining with a magnitude of -4.7 - its maximum brightness. By the end of the month, Venus shines at magnitude -4.5 with its angular size reduced to 25 arc seconds and its illuminated fraction increased to 48

**Mars** lies in Taurus initially making a triangle with Aldabaran to its lower left and the Pleiades to its lower right. By month's end, Mars will be lost in the Sun's glare. It will then be lost from view all summer as it passes behind the Sun. Its brightness falls slightly during the month from magnitude +1.6 to +1.7 while its angular diameter falls from 3.9 to 3.7 arc seconds. No details would be expected to be seen on its salmon-pink surface.

**Jupiter** came into opposition on April 7th so, this month, it transits in the late evening and is visible rising in the east at dusk. The size of Jupiter's disk decreases slightly from 43.5 to 40.8 arc seconds during May with its magnitude reducing very slightly from -2.4 to -2.3.

As May begins, **Saturn** rises around 11:30pm and will be highest in the pre-dawn sky at ~4am. By the end of May it will rise at ~9:30pm and transit at around 2am. Its diameter increases from 17.8 to 18.3 arc seconds during the month as its brightness increases slightly from magnitude +0.3 to +0.1. Its beautiful ring system is open at over 26 degrees, nearly as open as they ever become.

The Eta Aquarid **meteor shower** is active between April 19 and May 28. In 2017, the forecast calls for the greatest number of Eta Aquarid meteors before dawn on May 5 or 6. Despite a waxing gibbous moon in the sky – which will set in the wee hours after midnight – 2017 might be a good year for this shower. skywatchers can expect to see about 30 meteors per hour

## Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
5/1/2017	12:01	01:23	07:01	20:37
5/5/2017	16:04	04:18	06:57	20:40
5/10/2017	20:42	07:03	06:52	20:44
5/15/2017	00:52	10:35	06:48	20:48
5/20/2017	03:29	15:19	06:45	20:52
5/25/2017	06:52	20:58	06:42	20:55
5/31/2017	12:57	01:41	06:40	20:59

## Planet Data

	May 1			
	Rise	Transit	Set	Mag
<b>Mercury</b>	05:11	11:40	18:14	2.2
<b>Venus</b>	04:02	10:14	16:28	-4.5
<b>Mars</b>	07:17	14:32	21:47	1.6
<b>Jupiter</b>	17:15	23:09	05:03	-2.4
<b>Saturn</b>	22:54	03:57	09:00	0.3

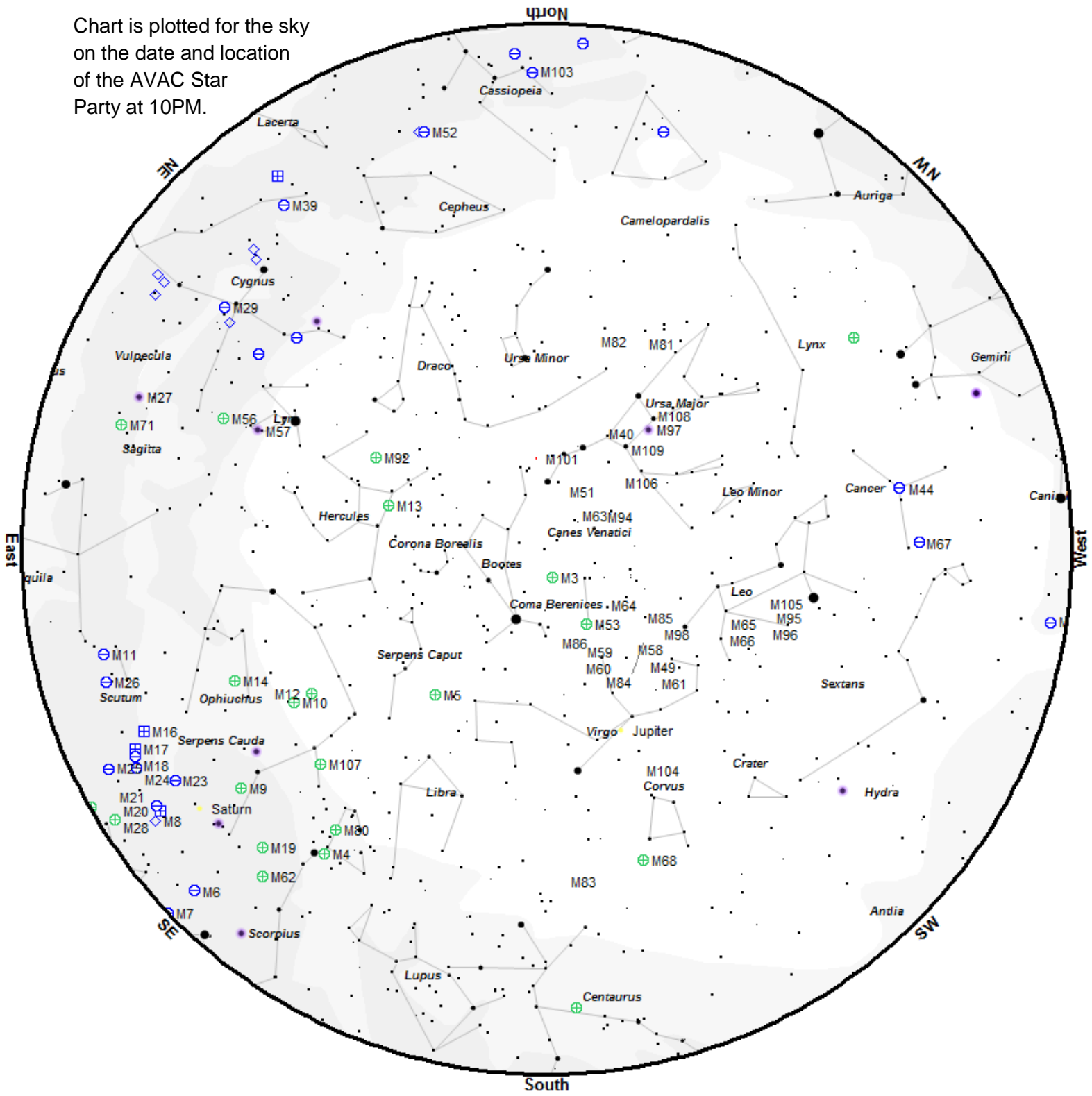
	May 15			
	Rise	Transit	Set	Mag
<b>Mercury</b>	04:40	11:11	17:43	0.7
<b>Venus</b>	03:39	09:57	16:15	-4.4
<b>Mars</b>	06:58	14:18	21:37	1.6
<b>Jupiter</b>	16:14	22:09	04:04	-2.4
<b>Saturn</b>	21:56	02:59	08:02	0.2

	May 31			
	Rise	Transit	Set	Mag
<b>Mercury</b>	04:33	11:27	18:17	-0.3
<b>Venus</b>	03:18	09:48	16:17	-4.3
<b>Mars</b>	06:39	14:02	21:24	1.7
<b>Jupiter</b>	15:07	21:03	02:59	-2.3
<b>Saturn</b>	20:49	01:52	06:55	0.1

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
●	●	●	●	●	●	⊕ Open Cluster	◇ Bright Nebula
0	1	2	3	4	5	⊕ 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 3132	PNe	Vel	10h07m01.8s	-40°26'11"	8.2	21:04	21:13	21:21	easy
NGC 3132	PNe	Vel	10h07m01.8s	-40°26'11"	8.2	21:04	21:13	21:21	easy
NGC 3242	PNe	Hya	10h24m46.1s	-18°38'32"	8.6	21:09	21:32	22:39	obvious
M 67	Open	Cnc	08h51m18.0s	+11°48'00"	7.4	21:23	21:36	21:57	detectable
NGC 3227	Gal	Leo	10h23m30.6s	+19°51'54"	11.5	21:23	21:42	22:45	difficult
M 65	Gal	Leo	11h18m55.7s	+13°05'32"	10.1	21:19	21:44	23:30	detectable
M 66	Gal	Leo	11h20m14.9s	+12°59'30"	9.7	21:19	21:44	23:32	detectable
M 68	Glob	Hya	12h39m28.0s	-26°44'36"	7.3	21:18	21:45	23:14	detectable
3C 273.0	QSO	Vir	12h29m06.7s	+02°03'08"	12.8	21:13	21:45	00:22	difficult
3C 273.0	QSO	Vir	12h29m06.7s	+02°03'08"	12.8	21:13	21:45	00:22	difficult
M 104	Gal	Vir	12h39m59.3s	-11°37'22"	9.1	21:17	21:48	23:50	detectable
M 82	Gal	UMa	09h55m52.4s	+69°40'47"	9.0	21:21	21:50	00:53	detectable
M 81	Gal	UMa	09h55m33.1s	+69°03'56"	7.8	21:21	21:50	00:49	detectable
M 97	PNe	UMa	11h14m47.7s	+55°01'09"	9.7	21:21	21:50	00:27	detectable
M 86	Gal	Vir	12h26m12.2s	+12°56'44"	9.8	21:21	21:50	00:01	detectable
M 49	Gal	Vir	12h29m46.8s	+08°00'01"	9.3	21:19	21:50	00:15	detectable
M 84	Gal	Vir	12h25m03.9s	+12°53'12"	10.1	21:19	21:50	00:14	detectable
M 87	Gal	Vir	12h30m49.2s	+12°23'29"	9.6	21:20	21:51	00:20	detectable
NGC 5128	Gal	Cen	13h25m27.7s	-43°01'07"	7.8	21:13	21:56	23:23	challenging
NGC 5139	Glob	Cen	13h26m46.0s	-47°28'36"	3.9	21:33	21:56	22:25	challenging
M 106	Gal	CVn	12h18m57.6s	+47°18'13"	9.1	21:21	22:14	00:55	detectable
NGC 5195	Gal	CVn	13h29m59.6s	+47°15'58"	10.5	21:21	22:14	01:55	detectable
M 51	Gal	CVn	13h29m52.3s	+47°11'40"	8.7	21:19	22:14	02:34	easy
M 3	Glob	CVn	13h42m11.0s	+28°22'42"	6.3	21:17	22:14	02:13	easy
Col 256	Open	Com	12h25m06.0s	+26°06'00"	2.9	21:17	22:14	01:10	easy
NGC 4565	Gal	Com	12h36m20.8s	+25°59'15"	10.1	21:21	22:14	00:23	difficult
M 83	Gal	Hya	13h37m00.8s	-29°51'56"	7.8	21:17	22:14	00:06	detectable
M 94	Gal	CVn	12h50m53.1s	+41°07'12"	8.7	21:18	22:15	01:44	detectable
M 64	Gal	Com	12h56m43.8s	+21°41'00"	9.3	21:17	22:15	01:08	detectable
M 101	Gal	UMa	14h03m12.4s	+54°20'53"	8.4	21:24	22:32	02:31	detectable
M 5	Glob	Ser	15h18m34.0s	+02°05'00"	5.7	21:21	23:46	03:10	easy
NGC 5897	Glob	Lib	15h17m24.0s	-21°00'36"	8.4	22:12	23:46	01:21	challenging
NGC 5986	Glob	Lup	15h46m03.0s	-37°47'12"	7.6	23:02	00:14	01:27	difficult
M 80	Glob	Sco	16h17m02.0s	-22°58'30"	7.3	23:33	00:45	01:56	detectable
NGC 6124	Open	Sco	16h25m20.0s	-40°39'12"	6.3	23:12	00:54	02:34	challenging
NGC 6178	Open	Sco	16h35m47.0s	-45°38'36"	7.2	00:03	01:04	02:05	detectable
M 13	Glob	Her	16h41m41.0s	+36°27'36"	5.8	21:26	01:10	04:16	easy
M 12	Glob	Oph	16h47m14.0s	-01°56'48"	6.1	21:59	01:15	04:12	easy

<b>ID</b>	<b>Cls</b>	<b>Con</b>	<b>RA 2000</b>	<b>Dec 2000</b>	<b>Mag</b>	<b>Begin</b>	<b>Best</b>	<b>End</b>	<b>Difficulty</b>
M 10	Glob	Oph	16h57m09.0s	-04°06'00"	6.6	22:34	01:25	04:05	detectable
M 62	Glob	Oph	17h01m13.0s	-30°06'48"	6.4	23:32	01:29	03:26	detectable
M 19	Glob	Oph	17h02m38.0s	-26°16'06"	6.8	23:34	01:31	03:26	detectable
M 92	Glob	Her	17h17m07.0s	+43°08'12"	6.5	21:31	01:45	04:17	easy
M 9	Glob	Oph	17h19m12.0s	-18°31'00"	7.8	23:50	01:47	03:44	difficult
M 14	Glob	Oph	17h37m36.0s	-03°14'48"	7.6	23:18	02:06	04:12	detectable
IC 4665	Open	Oph	17h46m18.0s	+05°43'00"	5.3	23:21	02:15	04:12	detectable
NGC 6543	PNe	Dra	17h58m33.4s	+66°37'59"	8.3	21:11	02:26	04:28	obvious
NGC 6572	PNe	Oph	18h12m06.4s	+06°51'12"	8.0	22:48	02:39	04:33	obvious
NGC 6633	Open	Oph	18h27m15.0s	+06°30'30"	5.6	23:06	02:55	04:22	easy
IC 4756	Open	Ser	18h39m00.0s	+05°27'00"	5.4	23:47	03:07	04:19	easy
M 57	PNe	Lyr	18h53m35.1s	+33°01'45"	9.4	22:40	03:18	04:23	easy
M 56	Glob	Lyr	19h16m36.0s	+30°11'06"	8.4	00:18	03:32	04:16	detectable
NGC 6871	Open	Cyg	20h05m59.0s	+35°46'36"	5.8	00:08	03:43	04:20	easy
NGC 6910	Open	Cyg	20h23m12.0s	+40°46'42"	7.3	00:11	03:44	04:20	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.

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

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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.

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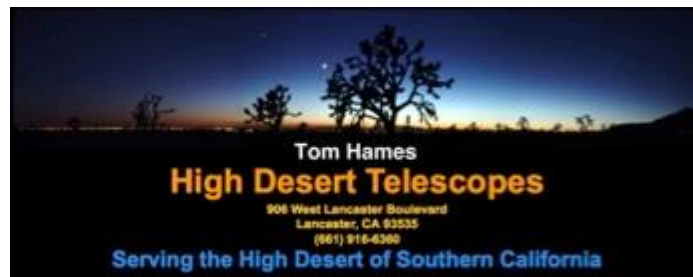


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