



Desert Sky Observer

Volume 37

Antelope Valley Astronomy Club Newsletter

April 2017

Up-Coming Events

April 1: [Prime Desert Woodland Moon Walk](#)

April 2: [Executive Board Meeting](#)

April 14: Club Meeting*

April 29: [Dark Sky Star Party](#)

* 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

“Greetings earthlings. We come in peace.” (I always wanted to say that.)

Once again the main feature of the past month has been our crazy weather.

In spite of the cold and wet, we had some very successful outreach events. On Saturday, March 18, 155 members of the public enjoyed the views through our telescopes at the monthly Prime Desert Woodland Moonwalk. Even though we had partially cloudy skies and cold temperatures, 14 members of the AVAC were on hand with 12 telescopes (and binoculars) available for public viewing. Wow, what a turnout and I want to thank all of you who came out.

Last night, April 1, we had 128 members of the public show up for our latest Prime Desert Woodland Moonwalk. Once again we had ample scopes on hand and were able to share views of the Orion Nebula, the Pleiades or Seven Sisters, Mars, Jupiter, and the moon. Though we could pick a few of them out, there was a high haze that made viewing most of the deep space objects difficult.

On Saturday March 25, and into the morning of Sunday March 26, our annual Messier Marathon was held at Saddleback Butte Stare Park. Once again, in spite of less than ideal conditions, we had a great turnout. The skies were mostly clear, with a few scattered clouds and a cloudy layer on the southern horizon, and many members had great success in finding Messier and other catalog objects.

Later on in the event it became quite cold and people spent a lot of time huddled around the propane heaters which we had placed under the canopies and between several of the tables. They became like fireplaces with member’s faces bathed in their warm glow as they warmed up and had conversations to the gentle and soothing hiss of the heaters. It really was quite nice. In the end it was the dew, that saturated everything, that led us to cover our equipment and drove everybody inside. In spite of the early end to the celestial hunt, Matt Leone bagged 88 of the Messier Objects.

This coming weekend, on Saturday April 8, we will be participating in the annual Cyber Quest event with the Palmdale School District. I’ll be emailing you with further details.

Our April Dark Sky Star Party will be held at the Red Cliffs Natural area in Red Rock Canyon State Park. Once again a separate email with directions will be sent to the membership. Also, coming up in Red Rock Canyon State Park, we will be having a public outreach and interpretive event at the park headquarters and Ricardo Campground on Saturday May 27. I'll be doing a multimedia presentation in the outdoor amphitheater followed by a constellation tour and star party. We have the two campsites closest to the amphitheater and Park Headquarters reserved for both Friday and Saturday nights. More details on this will follow as well.

A few other dates to note will be that annual "Star-B-Que" at the Brite Lake Recreation Area near Tehachapi on Saturday July 22. Once again our private picnic will be followed by a public star party. Also, once again, the Tehachapi Valley Recreation and Parks District has waived all fees for us and the public attending the star party as they continue their support of our event.

Finally, we've nailed down Saturday December 2 as the date of our annual Christmas Party so you need to put it on your calendar. Though we had a great time at Domingo's this past year it was a little crowded so we have reserved the banquet room at Gino's Italian Ristorante in the Lancaster Marketplace. This is the same room where we previously had the Christmas Party when it was Julianni's and it will afford us a little more space to spread out.

It saddens me to report to you that one of the founders of the Antelope Valley Astronomy Club, Fred Ley, passed away in Athens, Greece on March 25. We had received word earlier in the day that he had suffered a massive stroke when Tom Hames, who was one of Fred's longest and closest friends, arrived at the Messier Marathon he advised us that Fred had passed away.

During his time in the Antelope Valley, Fred was a civilian employee at Edwards Air Force Base specializing in Computer Aided Design (CAD). The informal beginnings of the Antelope Valley Astronomy Club took root in the early 1980's when Fred Ley, Doug Drake, Keith Lawson, Steve Mathis, and Tom Hames used to meet for star parties at Mount Pinos, RTMC, and other locations and to have telescope making and social gatherings in and around town.

Ten years ago Fred moved to Athens, Greece, for his late mother, where he lived till his death. Fred was only 59 years of age. The Antelope Valley Astronomy Club board will be discussing ways in which we may honor his memory.

That's all for now. We'll see at the upcoming meetings, outreach events, and star parties.



Secretary
Rose Moore

Many thanks to all the members who turned out for PDW in March! We had 14 members attending, and lots of telescopes. There were 155 attendees for the walk with Jeremy! Also thanks to all that turned out for our Messier Marathon at Saddleback State Park. The weather cleared up enough for members to get some good viewing, but those that were up late had to deal with the cold and damp. Matt Leone viewed the most Messier objects for a total of 80!

Coming up Saturday April 1st is another PDW Moon Walk. The start time is 7:30pm. We need members with telescopes. Weather permitting!

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Events for May include College of the Canyons on Friday May 5th, and a Prime Desert Moon Walk on Saturday May 20th. More info on these events to follow. Frank will have information on a local dark sky star party for May 27th. For those who are planning to go to RTMC at Big Bear, May 25-29, you may find more information here at this link: <http://rtmcastronomyexpo.org/> Pre-registration has started and is available until May 7th.

We have speakers lined up for our May and June meeting so far. An application has been sent to the NASA Speaker Bureau, however, they forwarded the application to NASA Armstrong instead of to JPL. The application was submitted with dates for the entire year, but the person handling the paperwork did not see the dates placed in the comments on the bottom, so I sent it back to them and brought the dates to their attention. Hopefully we'll have some results!

Clear Skies!

Space Place

What It's Like on a TRAPPIST-1 Planet

By Marcus Woo

With seven Earth-sized planets that could harbor liquid water on their rocky, solid surfaces, the TRAPPIST-1 planetary system might feel familiar. Yet the system, recently studied by NASA's Spitzer Space Telescope, is unmistakably alien: compact enough to fit inside Mercury's orbit, and surrounds an ultra-cool dwarf star—not much bigger than Jupiter and much cooler than the sun.

If you stood on one of these worlds, the sky overhead would look quite different from our own. Depending on which planet you're on, the star would appear several times bigger than the sun. You would feel its warmth, but because it shines stronger in the infrared, it would appear disproportionately dim.

"It would be a sort of an orangish-salmon color—basically close to the color of a low-wattage light bulb," says Robert Hurt, a visualization scientist for Caltech/IPAC, a NASA partner. Due to the lack of blue light from the star, the sky would be bathed in a pastel, orange hue.



This artist's concept allows us to imagine what it would be like to stand on the surface of the exoplanet TRAPPIST-1f, located in the TRAPPIST-1 system in the constellation Aquarius. Credit: NASA/JPL-Caltech/T. Pyle (IPAC)

But that's only if you're on the light side of the planet. Because the worlds are so close to their star, they're tidally locked so that the same side faces the star at all times, like how the Man on the Moon always watches Earth. If you're on the planet's dark side, you'd be enveloped in perpetual darkness—maybe a good thing if you're an avid stargazer.

If you're on some of the farther planets, though, the dark side might be too cold to survive. But on some of the inner planets, the dark side may be the only comfortable place,

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as the light side might be inhospitably hot.

On any of the middle planets, the light side would offer a dramatic view of the inner planets as crescents, appearing even bigger than the moon on closest approach. The planets only take a few days to orbit TRAPPIST-1, so from most planets, you can enjoy eclipses multiple times a week (they'd be more like transits, though, since they wouldn't cover the whole star).

Looking away from the star on the dark side, you would see the outer-most planets in their full illuminated glory. They would be so close—only a few times the Earth-moon distance—that you could see continents, clouds, and other surface features.

The constellations in the background would appear as if someone had bumped into them, jostling the stars—a perspective skewed by the 40-light-years between TRAPPIST-1 and Earth. Orion's belt is no longer aligned. One of his shoulders is lowered.

And, with the help of binoculars, you might even spot the sun as an inconspicuous yellow star: far, faint, but familiar.

Want to teach kids about exoplanets? Go to the NASA Space Place and see our video called, “Searching for other planets like ours”: <https://spaceplace.nasa.gov/exoplanet-snap/>

News Headlines

NASA's Weekly Video Clips Feature hundreds of hours of raw video from NASA human spaceflight programs

NASA's Johnson Space Center in Houston shares hundreds of hours of raw video from the space station and other NASA human spaceflight programs – some of it high- definition video -- and support activities on archive.org each week. The files can be large, sometimes 20 gigabytes or larger. This new weekly video highlights page includes postings that date back to January 2016. Go back to earlier weekly uploads by clicking on the navigation buttons at the bottom of the highlights web page.

<https://jscfeatures.jsc.nasa.gov/videoupdate/>

Futuristic Clock Prepared for Space

No one keeps time quite like NASA. Last month, the space agency's next-generation atomic clock was joined to the spacecraft that will take it into orbit in late 2017. Timekeeping plays a critical role in spacecraft navigation and will be especially important for future deep space missions. This clock will be smaller, lighter and magnitudes more precise than any atomic clock flown in space before.

<https://goo.gl/inyRi7>

Inside The Vexing Quest To Safely Light Our Modern Lives

2017 could be the turning point for the revolution in how cities are lit, given that the American Medical Association recently acknowledged that cancer, diabetes, cardiovascular disease, and obesity as at least partial products of chronic sleep disruption brought on by exposure to bright light sources at night. To help solve this problem, IDSA's grassroots campaigning and publicity-generating "star parties" call for towns and cities to implement "warmer" municipal lighting systems—as opposed to the harsh, yet traditional, short-wavelength "blue" light.

<https://health.good.is/articles/light-revolution>

Mysterious Cosmic Explosion Puzzles Astronomers

Scientists have discovered a mysterious flash of X-rays using NASA's Chandra X-ray Observatory, in the deepest X-ray image ever obtained, as reported in our latest press release. The X-ray source is located in a region of the sky known as the Chandra Deep Field-South (CDF-S).

<http://chandra.si.edu/photo/2017/cdfsxt1/>

Pulsars may be churning out small reserves of antimatter

We live in a universe dominated by normal matter. This wasn't always true — right after the Big Bang, in fact, nearly equal amounts of matter and antimatter were created, and then soon afterwards destroyed as they annihilated each other. But because the amounts of matter and antimatter weren't exactly equal, this annihilation was unequal, too, and normal matter won out. There is, however, still a small amount of antimatter in our universe, and there seems to be an unexplained excess of it. The reason for this antimatter surplus has long been sought, and now it seems astronomers may have finally arrived at a conclusion: It's not dark matter responsible for the excess, but plain old pulsars.

<http://www.astronomy.com/news/2017/03/pulsars-making-antimatter>

April Sky Data

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

Mercury will lie ~14 degrees above the western horizon on April 1st at nightfall when it is at its greatest elongation, some 19 degrees, from the Sun. Then at magnitude 0.1, its brightness drops to magnitude +3 by the 18th of the month. Mercury passes through inferior conjunction on the 20th.

Venus rises in the east about an hour before sunrise on the first of the month and then climbs a little higher each morning. On April 1st, the disk forms a slender crescent nearly one arc minute tall and is just 2% lit. By the end of the month, Venus has its maximum brightness of magnitude -4.7 with its angular size reduced to 39 arc seconds and its illuminated fraction increased to 26%.

In early April, **Mars** has an elevation of ~20 degrees above the western horizon at sunset, but this reduces to ~11 degrees by month's end. Its brightness falls slightly during the month from magnitude +1.5 to +1.6 while its angular diameter falls from 4.2 to 3.9 arc seconds.

Jupiter comes into opposition on April 7th. Visible all night, it will be due south at around midnight. The size of Jupiter's disk decreases slightly from 44.2 to 43.6 arc seconds as April progresses with its magnitude reducing very slightly from -2.5 to -2.4.

Saturn rises around midnight and will be highest in the pre-dawn sky. Its diameter increases from 17 to 18 arc seconds during the month as its brightness increases slightly from magnitude +0.4 to +0.3. It will be high enough in the south-east in the hours before dawn to make out the beautiful ring system which, at over 26 degrees to the line of sight, are nearly as open as they ever become.

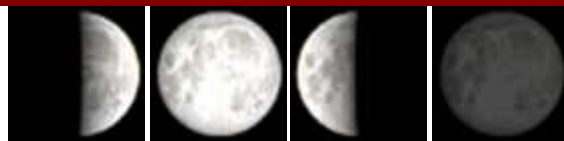
The Lyrids **meteor shower** is expected to peak on April 22 and 23. A Waning Crescent Moon will make for good viewing conditions. The best time to watch it is after midnight and before dawn.

First Qtr
Apr 3

Full
Apr 10

Last Qtr
Apr 19

New
Apr 26



Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
4/1/2017	09:17	23:34	05:38	18:13
4/5/2017	14:10	03:16	06:33	19:16
4/10/2017	19:03	06:22	06:26	19:20
4/15/2017	23:32	09:20	06:19	19:24
4/20/2017	02:37	13:31	06:13	19:28
4/25/2017	05:50	18:52	06:07	19:32
4/30/2017	10:00	00:23	06:02	19:36

Planet Data

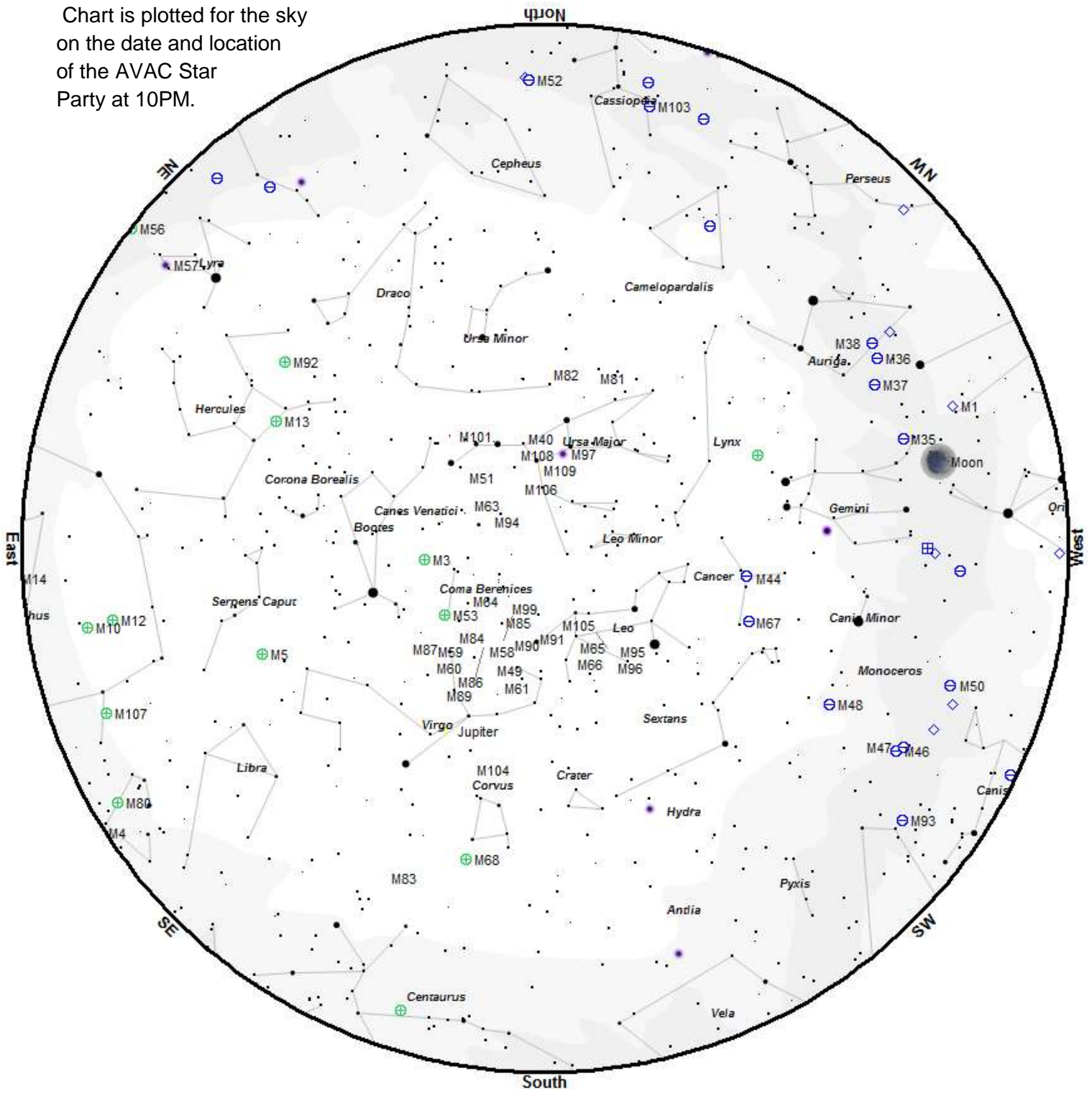
	Apr 1			
	Rise	Transit	Set	Mag
Mercury	07:11	14:02	20:51	0.1
Venus	05:30	11:55	18:26	-4.2
Mars	08:06	15:05	22:02	1.5
Jupiter	19:30	01:20	07:11	-2.5
Saturn	00:55	05:57	11:00	0.4

	Apr 15			
	Rise	Transit	Set	Mag
Mercury	06:20	13:15	20:04	4.0
Venus	04:39	10:53	17:11	-4.5
Mars	07:42	14:49	21:56	1.5
Jupiter	18:26	00:19	06:11	-2.5
Saturn	23:59	05:02	10:05	0.4

	Apr 31			
	Rise	Transit	Set	Mag
Mercury	05:15	11:44	18:19	2.4
Venus	04:04	10:16	16:30	-4.5
Mars	07:18	14:33	21:47	1.6
Jupiter	17:19	23:13	05:07	-2.4
Saturn	22:58	04:01	09:04	0.3

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 2547	Open	Vel	08h10m09.0s	-49°12'54"	5.0	20:21	20:33	20:43	challenging
IC 2395	Open	Vel	08h42m30.0s	-48°06'48"	4.6	20:31	20:43	20:59	detectable
NGC 2451	Open	Pup	07h45m23.0s	-37°57'21"	3.7	20:41	20:50	21:00	easy
NGC 2477	Open	Pup	07h52m10.0s	-38°31'48"	5.7	20:42	20:51	20:59	easy
NGC 2439	Open	Pup	07h40m45.0s	-31°41'36"	7.1	20:45	20:55	21:09	detectable
NGC 2546	Open	Pup	08h12m15.0s	-37°35'42"	5.2	20:41	20:55	21:18	difficult
NGC 3228	Open	Vel	10h21m22.0s	-51°43'42"	6.4	20:38	20:56	21:30	challenging
M 93	Open	Pup	07h44m30.0s	-23°51'24"	6.5	20:46	21:00	21:33	easy
NGC 2571	Open	Pup	08h18m56.0s	-29°45'00"	7.4	20:47	21:01	21:32	detectable
NGC 2360	Open	CMa	07h17m43.0s	-15°38'30"	9.1	20:44	21:02	21:38	challenging
M 50	Open	Mon	07h02m42.0s	-08°23'00"	7.2	20:49	21:03	21:29	detectable
NGC 2353	Open	Mon	07h14m30.0s	-10°16'00"	5.2	20:46	21:03	21:46	easy
NGC 2440	PNe	Pup	07h41m55.4s	-18°12'31"	11.5	20:51	21:03	21:23	difficult
NGC 2423	Open	Pup	07h37m06.0s	-13°52'18"	7.0	20:48	21:04	21:41	easy
M 47	Open	Pup	07h36m35.0s	-14°29'00"	4.3	20:46	21:04	21:52	obvious
NGC 2237	Neb	Mon	06h32m02.0s	+04°59'10"	5.5	20:47	21:05	21:47	challenging
NGC 2301	Open	Mon	06h51m45.0s	+00°27'36"	6.3	20:47	21:05	21:45	easy
M 46	Open	Pup	07h41m46.0s	-14°48'36"	6.6	20:51	21:05	21:38	detectable
NGC 3132	PNe	Vel	10h07m01.8s	-40°26'11"	8.2	20:42	21:06	22:14	easy
NGC 3132	PNe	Vel	10h07m01.8s	-40°26'11"	8.2	20:42	21:06	22:14	easy
NGC 2264	Open	Mon	06h40m58.0s	+09°53'42"	4.1	20:47	21:07	22:00	easy
NGC 2506	Open	Mon	08h00m01.0s	-10°46'12"	8.9	20:57	21:07	21:27	difficult
NGC 2355	Open	Gem	07h16m59.0s	+13°45'00"	9.7	20:56	21:10	21:39	difficult
NGC 1502	Open	Cam	04h07m50.0s	+62°19'54"	4.1	20:45	21:11	23:38	obvious
NGC 2392	PNe	Gem	07h29m10.8s	+20°54'42"	8.6	20:43	21:11	22:17	obvious
M 67	Open	Cnc	08h51m18.0s	+11°48'00"	7.4	20:54	21:14	22:32	detectable
M 44	Open	Cnc	08h40m24.0s	+19°40'00"	3.9	20:49	21:15	23:21	easy
NGC 3242	PNe	Hya	10h24m46.1s	-18°38'32"	8.6	20:41	21:16	22:39	obvious
NGC 3227	Gal	Leo	10h23m30.6s	+19°51'54"	11.5	20:52	21:21	23:59	difficult
M 82	Gal	UMa	09h55m52.4s	+69°40'47"	9.0	20:51	21:23	02:34	detectable
M 81	Gal	UMa	09h55m33.1s	+69°03'56"	7.8	20:51	21:23	02:17	detectable
M 97	PNe	UMa	11h14m47.7s	+55°01'09"	9.7	20:52	21:34	02:07	detectable
M 65	Gal	Leo	11h18m55.7s	+13°05'32"	10.1	20:49	21:35	01:08	detectable
M 66	Gal	Leo	11h20m14.9s	+12°59'30"	9.7	20:50	21:36	01:08	detectable
M 94	Gal	CVn	12h50m53.1s	+41°07'12"	8.7	20:52	23:29	03:32	detectable
Col 256	Open	Com	12h25m06.0s	+26°06'00"	2.9	20:49	23:29	02:56	easy
NGC 4565	Gal	Com	12h36m20.8s	+25°59'15"	10.1	20:56	23:29	02:09	difficult
M 86	Gal	Vir	12h26m12.2s	+12°56'44"	9.8	20:56	23:29	01:47	detectable

ID	Cls	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Difficulty
M 87	Gal	Vir	12h30m49.2s	+12°23'29"	9.6	20:54	23:29	02:07	detectable
M 49	Gal	Vir	12h29m46.8s	+08°00'01"	9.3	20:52	23:29	02:02	detectable
3C 273.0	QSO	Vir	12h29m06.7s	+02°03'08"	12.8	20:47	23:29	02:11	difficult
3C 273.0	QSO	Vir	12h29m06.7s	+02°03'08"	12.8	20:47	23:29	02:11	difficult
M 104	Gal	Vir	12h39m59.3s	-11°37'22"	9.1	20:54	23:29	01:39	detectable
M 68	Glob	Hya	12h39m28.0s	-26°44'36"	7.3	21:05	23:29	01:02	detectable
M 106	Gal	CVn	12h18m57.6s	+47°18'13"	9.1	20:55	23:30	02:40	detectable
M 64	Gal	Com	12h56m43.8s	+21°41'00"	9.3	20:53	23:30	02:57	detectable
M 84	Gal	Vir	12h25m03.9s	+12°53'12"	10.1	20:53	23:29	02:00	detectable
NGC 5128	Gal	Cen	13h25m27.7s	-43°01'07"	7.8	22:19	23:45	01:14	challenging
NGC 5139	Glob	Cen	13h26m46.0s	-47°28'36"	3.9	23:24	23:45	00:16	challenging
M 51	Gal	CVn	13h29m52.3s	+47°11'40"	8.7	20:53	23:48	04:23	easy
NGC 5195	Gal	CVn	13h29m59.6s	+47°15'58"	10.5	20:59	23:48	03:47	detectable
M 83	Gal	Hya	13h37m00.8s	-29°51'56"	7.8	22:01	23:56	01:57	detectable
M 3	Glob	CVn	13h42m11.0s	+28°22'42"	6.3	20:55	00:00	04:05	easy
M 101	Gal	UMa	14h03m12.4s	+54°20'53"	8.4	21:04	00:21	04:20	detectable
M 5	Glob	Ser	15h18m34.0s	+02°05'00"	5.7	22:22	01:37	04:39	easy
NGC 5897	Glob	Lib	15h17m24.0s	-21°00'36"	8.4	00:02	01:36	03:11	challenging
NGC 5986	Glob	Lup	15h46m03.0s	-37°47'12"	7.6	00:50	02:04	03:19	difficult
M 80	Glob	Sco	16h17m02.0s	-22°58'30"	7.3	01:23	02:35	03:46	detectable
NGC 6124	Open	Sco	16h25m20.0s	-40°39'12"	6.3	01:02	02:44	04:25	challenging
M 13	Glob	Her	16h41m41.0s	+36°27'36"	5.8	22:42	03:00	04:47	easy
M 12	Glob	Oph	16h47m14.0s	-01°56'48"	6.1	23:45	03:05	04:47	easy
M 10	Glob	Oph	16h57m09.0s	-04°06'00"	6.6	00:24	03:15	04:44	detectable
M 62	Glob	Oph	17h01m13.0s	-30°06'48"	6.4	01:20	03:19	04:45	detectable
M 19	Glob	Oph	17h02m38.0s	-26°16'06"	6.8	01:24	03:21	04:43	detectable
M 92	Glob	Her	17h17m07.0s	+43°08'12"	6.5	23:11	03:35	04:47	easy
M 9	Glob	Oph	17h19m12.0s	-18°31'00"	7.8	01:40	03:37	04:42	difficult
M 14	Glob	Oph	17h37m36.0s	-03°14'48"	7.6	01:06	03:54	04:46	detectable
IC 4665	Open	Oph	17h46m18.0s	+05°43'00"	5.3	01:10	04:00	04:44	detectable
NGC 6543	PNe	Dra	17h58m33.4s	+66°37'59"	8.3	21:59	04:02	04:56	obvious

A.V.A.C. Information

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

The Club has three categories of membership.

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

Membership entitles you to...

- Desert Sky Observer—monthly newsletter.
- The Reflector – the publication of the Astronomical League.
- The A.V.A.C. Membership Manual.
- To borrow club equipment, books, videos and other items.

AVAC

**P.O. BOX 8545,
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Visit the Antelope Valley Astronomy Club website at www.avastronomyclub.org/

The Antelope Valley Astronomy Club, Inc. is a 501(c)(3) Non-Profit Corporation.

The A.V.A.C. is a Sustaining Member of The Astronomical League and the International Dark-Sky Association.

Board Members

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Director of Community Development:

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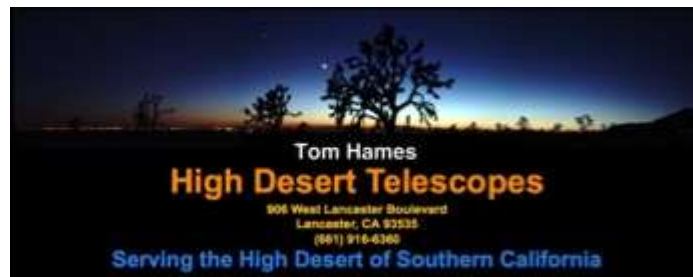


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