



# Desert Sky Observer

Volume 36

Antelope Valley Astronomy Club Newsletter

May 2016

## Up-Coming Events

- May 7: [Dark Sky Star Party](#)
- May 9: Transit of Mercury
- May 13: Club Meeting\*
- May 14: [Prime Desert Moonwalk](#)
- May 26-30: [RTMC at Camp Oakes](#)

\* 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

Well...hello there. Is it that time again? Yep, time for Antelope Valley Astronomy Club's "Desert Sky Observer" for May.

For those who missed it, Astrophysicist and Southern California astronomy icon Tim Thompson gave a talk on gravitational waves at our April 8 meeting at the SAGE Planetarium. Tim, is retired from NASA/JPL, is a past President of the Los Angeles Astronomical Society, and is a docent and telescope operator at the Mount Wilson Observatory. The talk was fascinating and I was especially captivated with the workings of LIGO, the Laser Interferometer Gravitational-Wave Observatory, which made the observations of gravitational waves published in a paper by the LIGO Scientific Collaboration and Virgo Collaboration on February 11, 2016. Fascinating and heady stuff!

On Saturday April 23, it was a little windy, with a few wisps of clouds, at the Moon Walk event at Prime Desert Woodland Preserve but we were still able to share some wonderful sights with the public. We had a great turnout of members with telescopes for public viewing including Duane Lewis, Robert Lynch Jr., Bob Ayres, Ellen Mahler, Darrell Bennett, Tom Hames, Rose and Frank Moore and Matt Leone (with Sue's Oberwerk binoculars). We had other members who showed up to support the event or go on the moon walk and, I'm sorry, but I lost track of you all. Needless to say, we needed the GREAT support from members to share the night sky with the 244 members of the public who attended. Thank you!!

The next Prime Desert Woodland Moon Walk is on Saturday May 14 (the night after our May 13 meeting) and I hope you all support it as well as you did the last.

Our Dark Sky Star Party for May will be held on Saturday May 7. This will be held at the Red Cliffs Natural Area on the southern edge of Red Rock Canyon State Park. For members who may not be aware, Red Cliffs is a day use area that we, occasionally, are able to use overnight via a Special Event Permit from California State Parks. It has wonderfully dark and steady skies and often provides for wonderful viewing. The weekend of May 6, 7 is also the peak of the Eta Aquarid Meteor Shower and the dark, moonless, sky at Red Cliffs may provide for some stunning views of those as well. Detailed direction will be sent out in a

separate email and a Google map of the location can be found here, <https://goo.gl/Ss0F51> (Follow the dirt road back into the parking area).

The RTMC Astronomy Expo (formerly Riverside Telescope Makers Conference) runs from Thursday May 26 thru Monday May 30 (Memorial Day Weekend) at YMCA Camp Oakes near Big Bear City, CA. Some of us will be arriving as early as Thursday afternoon while others may just go up for the weekend. Most of us leave Sunday though some may stay all the way till Monday morning. The AVAC will be a Planet Level Sponsor for the event and we are planning on having a formal booth and display highlighting our outreach and educational activities. We can certainly use help from anyone who wants to take a shift, no matter how short, in the booth. If you are planning on going, and have not been in the past, check in with Frank for details and for directions to the club's usual camping spot. Detailed information can be found on the RTMC brochure here: [http://www.rtmcastronomyexpo.org/2016/brochure 2016.pdf](http://www.rtmcastronomyexpo.org/2016/brochure%202016.pdf)

Note: Because of it's so soon after RTMC weekend, and because we also have a Prime Desert Woodland Moon Walk event scheduled for that night, we will NOT be having a Dark Sky Star Party on Saturday June 4. Please plan on attending the Prime Desert Woodland event on Saturday June 4 instead. If we have the kind of crowd we had on April 23, we can certainly use your help.

## Vice President

### Bill Schebeck

April was a real mixed bag of good and not so good observing. I went to Chuchapote, it was overcast so I went home. The sky eventually cleared and for the hardy souls stuck it out, a great dark sky was their reward.

We had a record breaking attendance at the Prime Desert Woodland. It was cold and windy, but Jeremy spun his magic and the crowd was pleased. Between the public and members, there well over 200 people.

On the 7th, is our dark sky star party at Red Cliff State Park. I hope many of you can attend. As I write, the weather forecast is for rain, let's hope the weather is nice. Jupiter will be bright and 4 of its moons will be visible. Mars will be up in the morning and the Eta Aquarid Meteor may show off.

Ann and Rose have been working on a place to host the Christmas party. Next meeting is on the 13th and Jeremy has some new shows to share.

## Space Place

### Hubble Shatters The Cosmic Record For Most Distant Galaxy

By Ethan Siegel

The farther away you look in the distant universe, the harder it is to see what's out there. This isn't simply because more distant objects appear fainter, although that's true. It isn't because the universe is expanding, and so the light has farther to go before it reaches you, although that's true, too. The reality is that if you built the largest optical telescope you could imagine -- even one that was the size of an entire planet -- you still wouldn't see the new cosmic record-holder that Hubble just discovered: galaxy GN-z11, whose light traveled for 13.4 billion years, or 97% the age of the universe, before finally reaching our eyes.

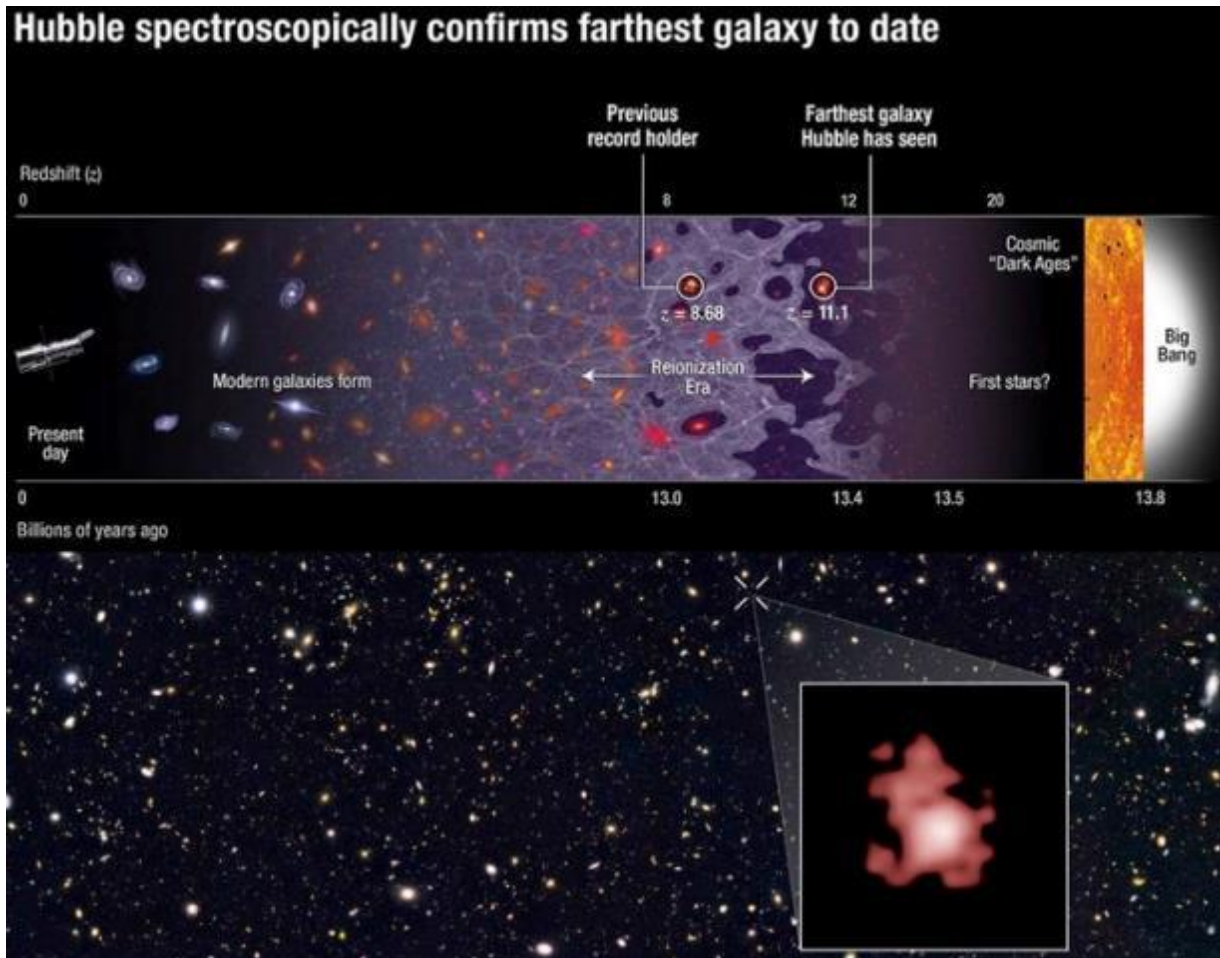
There were two special coincidences that had to line up for Hubble to find this: one was a remarkable technical achievement, while the other was pure luck. By extending Hubble's vision away from the ultraviolet and optical and into the infrared, past 800 nanometers all the way out to 1.6 microns, Hubble

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## Desert Sky Observer

became sensitive to light that was severely stretched and redshifted by the expansion of the universe. The most energetic light that hot, young, newly forming stars produce is the Lyman- $\alpha$  line, which is produced at an ultraviolet wavelength of just 121.567 nanometers. But at high redshifts, that line passed not just into the visible but all the way through to the infrared, and for the newly discovered galaxy, GN-z11, its whopping redshift of 11.1 pushed that line all the way out to 1471 nanometers, more than double the limit of visible light!

Hubble itself did the follow-up spectroscopic observations to confirm the existence of this galaxy, but it also got lucky: the only reason this light was visible is because the region of space between this galaxy and our eyes is mostly ionized, which isn't true of most locations in the universe at this early time! A redshift of 11.1 corresponds to just 400 million years after the Big Bang, and the hot radiation from young stars doesn't ionize the majority of the universe until 550 million years have passed. In most directions, this galaxy would be invisible, as the neutral gas would block this light, the same way the light from the center of our galaxy is blocked by the dust lanes in the galactic plane. To see farther back, to the universe's first true galaxies, it will take the James Webb Space Telescope. Webb's infrared eyes are much less sensitive to the light-extinction caused by neutral gas than instruments like Hubble. Webb may reach back to a redshift of 15 or even 20 or more, and discover the true answer to one of the universe's greatest mysteries: when the first galaxies came into existence!



Images credit: (top); NASA, ESA, P. Oesch (Yale University), G. Brammer (STScI), P. van Dokkum (Yale University), and G. Illingworth (University of California, Santa Cruz) (bottom), of the galaxy GN-z11, the most distant and highest-redshifted galaxy ever discovered and spectroscopically confirmed thus far.

## News Headlines

### **Weird lump of space rock might unlock the biggest secret of the solar system.**

A new kind of comet that is nearly tailless has been discovered — and the surprises don't stop there. The new comet recently returned from the edge of the solar system but may have originated much closer to the sun, scientists say. In fact, it may even reveal clues about the building blocks of Earth.

<http://goo.gl/Jmt1sR>

### **Curiosity Mars Rover Crosses Rugged Plateau**

NASA's Curiosity Mars rover has nearly finished crossing a stretch of the most rugged and difficult-to-navigate terrain encountered during the mission's 44 months on Mars.

The rover climbed onto the "Naukluft Plateau" of lower Mount Sharp in early March after spending several weeks investigating sand dunes. The plateau's sandstone bedrock has been carved by eons of wind erosion into ridges and knobs. The path of about a quarter mile (400 meters) westward across it is taking Curiosity toward smoother surfaces leading to geological layers of scientific interest farther uphill.

<http://www.jpl.nasa.gov/news/news.php?feature=6452>

### **James Webb Space Telescope's Golden Mirror Unveiled**

NASA engineers recently unveiled the giant golden mirror of NASA's James Webb Space Telescope as part of the integration and testing of the infrared telescope.

The 18 mirrors that make up the primary mirror were individually protected with a black covers when they were assembled on the telescope structure. Now, for the first time since the primary mirror was completed, the covers have been lifted.

Standing tall and glimmering gold inside NASA's Goddard Space Flight Center's clean room in Greenbelt, Maryland, this mirror will be the largest yet sent into space. Currently, engineers are busy assembling and testing the other pieces of the telescope.

<http://www.nasa.gov/feature/goddard/2016/james-webb-space-telescopes-golden-mirror-unveiled>

### **Mercury Transit Monday May 9 2016**

Fourteen times this century, Mercury transits the Sun, and can be seen as a tiny black dot silhouetted against the Sun's disk. The next time is on May 9 / 10, 2016.

As seen from Los Angeles, the event times are:

Begins: Mon, May 9, 2016 at 5:57 AM

Midpoint: Mon, May 9, 2016 at 7:58 AM

Ends: Mon, May 9, 2016 at 11:42 AM

<http://www.timeanddate.com/eclipse/in/usa/los-angeles>

## May Sky Data

New  
May 4

First Qtr  
May 10

Full  
May 17

Last Qtr  
May 25



**Best time for deep sky observing this month:  
May 1 through May 9**

The top highlight this month is **Mercury's** transit across the face of the Sun on May the 9th, but otherwise it will be too dim and low above the horizon to be seen.

**Venus** is heading towards superior conjunction with the Sun (on the far side) on June 2nd and is not visible during May.

**Mars** reaches its closest point to the Earth on May 29th for 11 years with an angular size then of 18.6 arc seconds. It starts the month with a magnitude of -1.5, brightening until it reaches its peak of -2.1 magnitudes so equalling the magnitude of Jupiter for a few day.

**Jupiter** is now a little past its best, but still stands out high in the South at nightfall. Its brightness falls slightly from magnitude -2.3 to -2.1 while its angular size drops from 41 to 37 arc seconds during the month. Jupiter sets around 3:30 am as May begins but by 1:40 am by month's end.

**Saturn** rises in the late evening about 30 minutes after Mars as May begins. Its brightness increases slightly from +0.2 to 0.0 magnitudes during the month while its angular size grows to 18.4 arc seconds. Saturn's rings are tilted by 26 degrees from the line of sight - almost as open as they ever get - and span 42 arc seconds. It is moving towards opposition on the night of June 2nd.

The Eta Aquarids **meteor shower** will peak on May 6-7 in 2016. A new Moon on May 6 will create favorable conditions for observers to see the shower. This shower favors the Southern Hemisphere, ranking as one of the finest showers of the year. At mid-northern latitudes, these meteors don't fall so abundantly, though mid-northern meteor watchers will catch some, too, and might be lucky enough to catch an earthgrazer - a bright, long-lasting meteor that travels horizontally across the sky - before dawn. The Eta Aquarids are mainly a predawn shower.

## Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
5/1/2016	03:37	15:06	07:00	20:37
5/5/2016	06:20	19:38	06:57	20:40
5/10/2016	10:42	00:54	06:52	20:44
5/15/2016	15:28	03:33	06:48	20:48
5/20/2016	19:56	06:16	06:45	20:52
5/25/2016	00:11	10:00	06:42	20:55
5/31/2016	03:33	16:09	06:40	20:59

## Planet Data

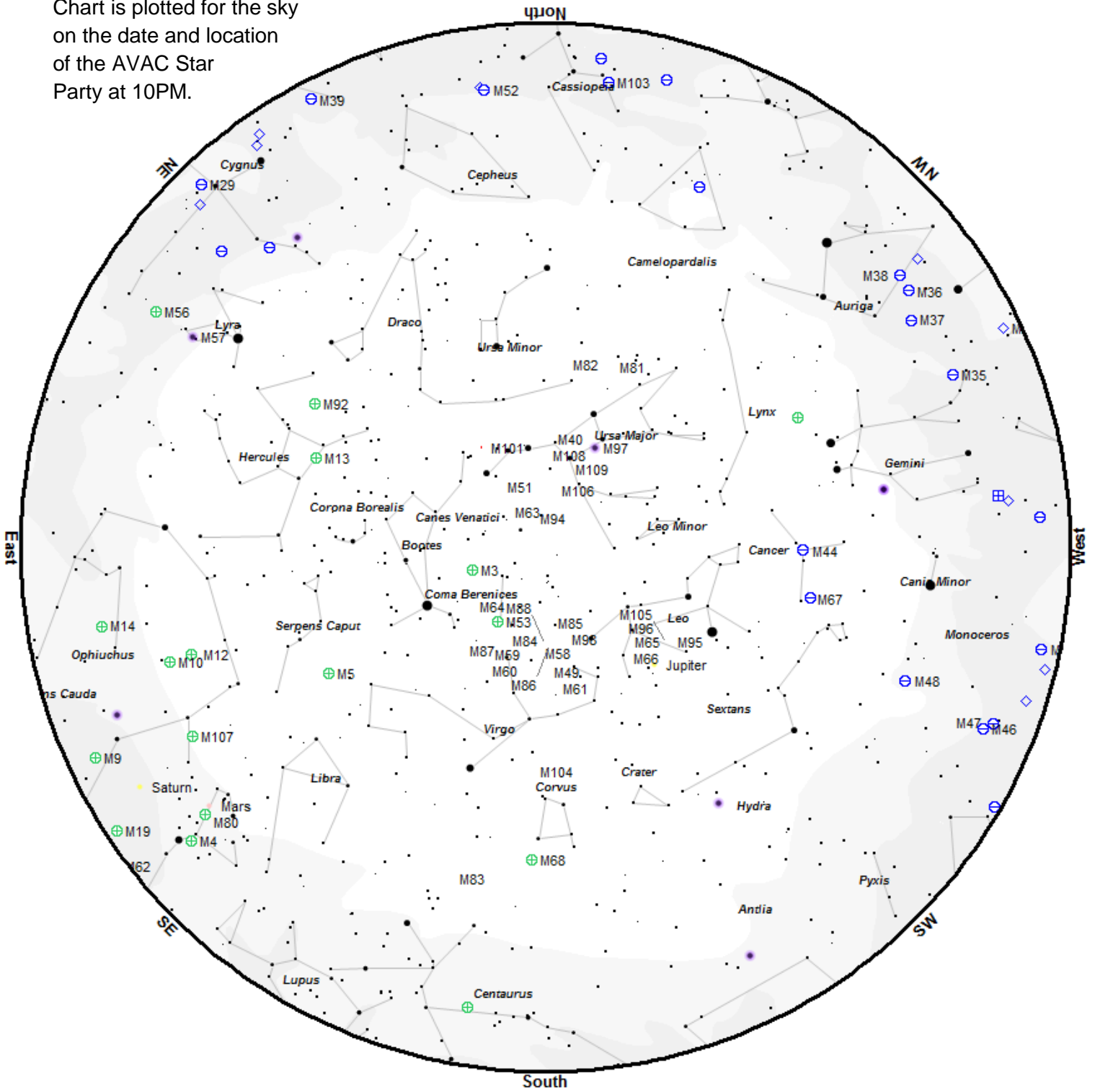
	May 1			
	Rise	Transit	Set	Mag
<b>Mercury</b>	08:13	13:19	18:25	-0.6
<b>Venus</b>	05:33	12:12	18:52	-3.9
<b>Mars</b>	21:27	02:31	07:35	-1.5
<b>Jupiter</b>	14:41	21:10	03:39	-2.3
<b>Saturn</b>	21:58	03:05	08:12	0.2

	May 15			
	Rise	Transit	Set	Mag
<b>Mercury</b>	05:18	12:12	19:01	3.8
<b>Venus</b>	05:28	12:24	19:22	-3.9
<b>Mars</b>	20:16	01:20	06:24	-1.9
<b>Jupiter</b>	13:46	20:15	02:44	-2.2
<b>Saturn</b>	20:59	02:06	07:14	0.1

	May 31			
	Rise	Transit	Set	Mag
<b>Mercury</b>	04:29	11:16	18:03	0.9
<b>Venus</b>	05:30	12:42	19:55	-3.9
<b>Mars</b>	18:49	23:54	04:58	-2.0
<b>Jupiter</b>	12:46	19:14	01:42	-2.1
<b>Saturn</b>	19:51	00:59	06:06	0.0

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 3228	Open	Vel	10h21m22.0s	-51°43'42"	6.4	20:41	20:56	21:15	challenging
NGC 2546	Open	Pup	08h12m15.0s	-37°35'42"	5.2	20:44	20:56	21:10	difficult
M 93	Open	Pup	07h44m30.0s	-23°51'24"	6.5	20:52	21:05	21:20	easy
NGC 2571	Open	Pup	08h18m56.0s	-29°45'00"	7.4	20:54	21:05	21:21	detectable
NGC 2360	Open	CMa	07h17m43.0s	-15°38'30"	9.1	20:51	21:06	21:27	challenging
M 50	Open	Mon	07h02m42.0s	-08°23'00"	7.2	20:58	21:07	21:19	detectable
NGC 2440	PNe	Pup	07h41m55.4s	-18°12'31"	11.5	20:49	21:07	21:34	difficult
NGC 2353	Open	Mon	07h14m30.0s	-10°16'00"	5.2	20:54	21:08	21:31	easy
NGC 2423	Open	Pup	07h37m06.0s	-13°52'18"	7.0	20:57	21:09	21:30	easy
M 1	Neb	Tau	05h34m30.0s	+22°01'00"	8.4	20:56	21:10	21:32	difficult
NGC 2169	Open	Ori	06h08m24.0s	+13°57'54"	7.0	20:56	21:10	21:35	obvious
NGC 2237	Neb	Mon	06h32m02.0s	+04°59'10"	5.5	20:54	21:10	21:35	challenging
NGC 2301	Open	Mon	06h51m45.0s	+00°27'36"	6.3	20:56	21:10	21:32	easy
M 47	Open	Pup	07h36m35.0s	-14°29'00"	4.3	20:54	21:10	21:37	obvious
NGC 3132	PNe	Vel	10h07m01.8s	-40°26'11"	8.2	20:50	21:10	21:54	easy
NGC 3132	PNe	Vel	10h07m01.8s	-40°26'11"	8.2	20:50	21:10	21:54	easy
M 46	Open	Pup	07h41m46.0s	-14°48'36"	6.6	21:00	21:10	21:28	detectable
NGC 2264	Open	Mon	06h40m58.0s	+09°53'42"	4.1	20:56	21:12	21:45	easy
NGC 2506	Open	Mon	08h00m01.0s	-10°46'12"	8.9	20:55	21:12	21:56	difficult
NGC 2129	Open	Gem	06h01m07.0s	+23°19'20"	7.0	20:57	21:13	21:46	obvious
NGC 2175	Open	Ori	06h09m39.0s	+20°29'12"	6.8	21:04	21:14	21:30	detectable
NGC 1664	Open	Aur	04h51m06.0s	+43°40'30"	7.2	21:00	21:14	21:40	easy
M 36	Open	Aur	05h36m18.0s	+34°08'24"	6.5	20:59	21:15	21:48	easy
M 35	Open	Gem	06h09m00.0s	+24°21'00"	5.6	21:01	21:15	21:44	easy
M 38	Open	Aur	05h28m40.0s	+35°50'54"	6.8	21:05	21:16	21:35	detectable
M 37	Open	Aur	05h52m18.0s	+32°33'12"	6.2	21:00	21:16	21:50	easy
NGC 2355	Open	Gem	07h16m59.0s	+13°45'00"	9.7	21:06	21:17	21:34	difficult
NGC 1502	Open	Cam	04h07m50.0s	+62°19'54"	4.1	20:54	21:19	23:18	obvious
NGC 2392	PNe	Gem	07h29m10.8s	+20°54'42"	8.6	20:54	21:19	21:46	obvious
NGC 2393	Gal	Gem	07h30m04.6s	+34°01'40"	14.6	20:55	21:20	22:15	not visible
NGC 3242	PNe	Hya	10h24m46.1s	-18°38'32"	8.6	20:49	21:20	22:08	obvious
M 67	Open	Cnc	08h51m18.0s	+11°48'00"	7.4	21:04	21:21	22:19	detectable
M 44	Open	Cnc	08h40m24.0s	+19°40'00"	3.9	20:59	21:22	22:53	easy
NGC 3227	Gal	Leo	10h23m30.6s	+19°51'54"	11.5	21:02	21:27	23:22	difficult
M 82	Gal	UMa	09h55m52.4s	+69°40'47"	9.0	20:59	21:32	01:52	detectable
M 81	Gal	UMa	09h55m33.1s	+69°03'56"	7.8	21:01	21:32	01:33	detectable
M 65	Gal	Leo	11h18m55.7s	+13°05'32"	10.1	21:00	21:32	00:28	detectable
M 66	Gal	Leo	11h20m14.9s	+12°59'30"	9.7	20:58	21:33	00:28	detectable

ID	Cls	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Difficulty
M 97	PNe	UMa	11h14m47.7s	+55°01'09"	9.7	21:02	21:37	01:23	detectable
M 106	Gal	CVn	12h18m57.6s	+47°18'13"	9.1	21:01	22:06	02:03	detectable
M 84	Gal	Vir	12h25m03.9s	+12°53'12"	10.1	21:01	22:11	01:24	detectable
Coll 256	Open	Com	12h25m06.0s	+26°06'00"	2.9	20:57	22:12	02:22	easy
M 86	Gal	Vir	12h26m12.2s	+12°56'44"	9.8	21:02	22:12	01:08	detectable
M 49	Gal	Vir	12h29m46.8s	+08°00'01"	9.3	21:00	22:16	01:26	detectable
M 87	Gal	Vir	12h30m49.2s	+12°23'29"	9.6	21:00	22:17	01:31	detectable
NGC 4565	Gal	Com	12h36m20.8s	+25°59'15"	10.1	21:03	22:22	01:33	difficult
M 68	Glob	Hya	12h39m28.0s	-26°44'36"	7.3	21:02	22:26	00:25	detectable
M 104	Gal	Vir	12h39m59.3s	-11°37'22"	9.1	20:59	22:26	01:07	detectable
M 94	Gal	CVn	12h50m53.1s	+41°07'12"	8.7	20:58	22:37	02:58	detectable
M 64	Gal	Com	12h56m43.8s	+21°41'00"	9.3	20:59	22:43	02:23	detectable
NGC 5128	Gal	Cen	13h25m27.7s	-43°01'07"	7.8	21:43	23:12	00:41	challenging
NGC 5139	Glob	Cen	13h26m46.0s	-47°28'36"	3.9	22:44	23:13	23:42	challenging
M 51	Gal	CVn	13h29m52.3s	+47°11'40"	8.7	20:59	23:15	03:52	easy
NGC 5195	Gal	CVn	13h29m59.6s	+47°15'58"	10.5	21:04	23:16	03:11	detectable
M 83	Gal	Hya	13h37m00.8s	-29°51'56"	7.8	21:23	23:24	01:25	detectable
M 3	Glob	CVn	13h42m11.0s	+28°22'42"	6.3	21:00	23:28	03:30	easy
M 101	Gal	UMa	14h03m12.4s	+54°20'53"	8.4	21:07	23:49	03:48	detectable
M 5	Glob	Ser	15h18m34.0s	+02°05'00"	5.7	21:42	01:04	04:22	easy
NGC 5897	Glob	Lib	15h17m24.0s	-21°00'36"	8.4	23:29	01:04	02:39	challenging
NGC 5986	Glob	Lup	15h46m03.0s	-37°47'12"	7.6	00:20	01:32	02:44	difficult
M 80	Glob	Sco	16h17m02.0s	-22°58'30"	7.3	00:51	02:03	03:13	detectable
M 13	Glob	Her	16h41m41.0s	+36°27'36"	5.8	21:58	02:27	04:38	easy
M 12	Glob	Oph	16h47m14.0s	-01°56'48"	6.1	23:13	02:33	04:37	easy
M 10	Glob	Oph	16h57m09.0s	-04°06'00"	6.6	23:51	02:43	04:34	detectable
M 92	Glob	Her	17h17m07.0s	+43°08'12"	6.5	22:26	03:02	04:37	easy
NGC 6543	PNe	Dra	17h58m33.4s	+66°37'59"	8.3	21:28	03:40	04:47	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

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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.

## Board Members

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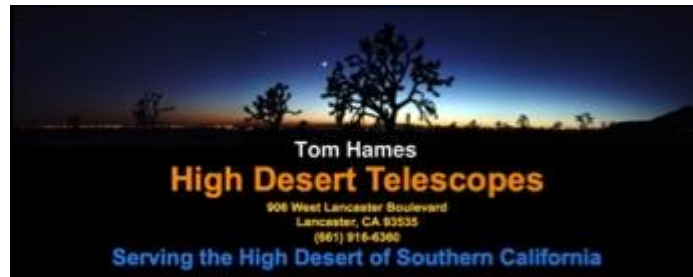


### Woodland Hills Camera

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[www.telescopes.net](http://www.telescopes.net)

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