



# Desert Sky Observer

Volume 39

Antelope Valley Astronomy Club Newsletter

May 2019

## Up-Coming Events

May 10: Club Meeting\*

May 18: [Prime Desert Moon Walk](#)

May 24: [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 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

### Darrell Bennett

Now that May is here, we are looking forward to warmer weather and clear skies. However, we still have that wind. Don't get me wrong I love the wind, just not when we go out to observe.

On April 6, we had a Prime Desert Moon Walk. It started out cloudy but then it cleared up and had just a little wind. We had a smaller crowd this time, 58 people attended everyone still had a fun. Our next Prime Desert Moon Walk will be on May 18, hope to see you there.

On April 27, we had a monthly Star Party at Red Cliff, right next to Red Rock Canyon State Park. When I got there about 5:30pm, it was windy and blowing pretty good. As the sun went down the wind let up a little and the night sky was great. 15 people came with 6 scopes. At about 2:00am the last of us called it a night. Some people stayed the night there but I packed up and drove home getting to my house at 3:30am.



Our next Star Party will be on May 24 to May 26, Memorial Day weekend. This will be at Red Rock State Park on Highway 14. Frank will give a presentation at the outdoor amphitheater on Saturday night.

On June 1, we will have another Star Party at Chuchupate in the Lockwood Valley. Jeremy has agreed to come out, give a live star talk about what is up in the sky, and help us find our way in the night sky. So come out and listen to Jeremy's sky tour, he doesn't do this that often.

On July 5, we will be going to Mt. Wilson to use the 60-inch telescope, plus a pre-tour of the grounds. The cost is only \$40.00, which is a great price. The public tickets are \$95.00 and the Los Angeles Astronomical Society is charging \$50.00 for their members to go. I think we only have a few spots open so let one of the board members know if you want to go.

On May 10, we will have our next club meeting at the Sage Planetarium at 7:00pm. Hope to see all of you there.

## Secretary

### Rose Moore

On Friday May 10th we have a club meeting with speaker Dr. Ben Zuckerman. Ben Zuckerman is a Professor in the Dept. of Physics & Astronomy at UCLA. He received undergraduate and graduate degrees from MIT and Harvard. His major scientific interests have been the birth and death of stars and planetary systems. He has maintained a continuing interest in the question of the prevalence of life, especially intelligent life, in the Universe and since the mid-1970s regularly taught a course on "Life in the Universe". His topic for our meeting is: "The Search For Life in the Universe -- and Why It Will Fail". Please come out and support your club!

We have a PDW on Saturday May 18th at 8:30pm. We need members with telescopes. Or you can join Jeremy on the walk and talk. Weather permitting.

For Memorial Day weekend, we have a star party at Red Rock Canyon State Park. This starts Friday the 24th and ends on Sunday morning at 8am. More info coming via email!

Our dark sky party for June 1st will be at Chuchupate/Lockwood Valley. More info to follow. Weather permitting.

We will be having a star party for STEM students on Edwards Air Force Base on Thursday June 20th from 8pm to 10pm (approximately). We need members with telescopes for the event! Further info will be coming in an email as I find out the time for set up and information that the base will need on incoming members, etc

We still have several openings for the Mt. Wilson trip on Friday July 5th. Please contact me via email, or read over the previous emails. Payment of \$40 is due by Friday May 10th.

Clear skies, Rose

### Member Scope for Sale:

Member Duane Lewis is selling his 9.25 inch Celestron CGEM OTA with the tripod, CGE mount, counterweights, one 1.25" 20 mm Plossl eyepiece, a 1.25" diagonal and a 2" diagonal, telrad mount, and a Denkmeier (unknown model) binocular viewer. The OTA was tuned up by member Don Bryden before he moved. It has not been used since. Price is \$1200. Duane is unable to have this set up for viewing because of lack of space. So arrangements will have to be made for viewing the scope and accessories. For more info please contact Duane by email only: [gurba1826@gmail.com](mailto:gurba1826@gmail.com) - or contact Rose by email only: [rmorion1@bak.rr.com](mailto:rmorion1@bak.rr.com).

## Space Place

### Watching the Late Spring Skies

By David Prosper

Late spring brings warmer nights, making it more comfortable to observe a good showing of the Eta Aquarids meteor shower. Skywatchers can also look for the delicate Coma Star Cluster, and spot the Moon on the anniversary of Apollo 10's "test run" prior to the Moon landing in 1969.

The Eta Aquarids meteor shower should make a good showing this year, peaking the morning of May 6. This meteor shower has an unusual "soft peak," meaning that many meteors can be spotted several days before and after the 6th; many may find it convenient to schedule meteor watching for the weekend, a night or two before the peak. You may be able to spot a couple dozen meteors an hour from areas with clear dark skies. Meteors can appear in any part of the sky and you don't need any special equipment to view them; just find an area away from lights, lie down on a comfy lawn chair or blanket, relax, and patiently look up. These brief bright streaks are caused by Earth moving through the stream of fine dust particles left by the passage of Comet Halley. While we have to wait another 43 years for the famous comet grace our skies once more, we are treated to this beautiful cosmic postcard every year.

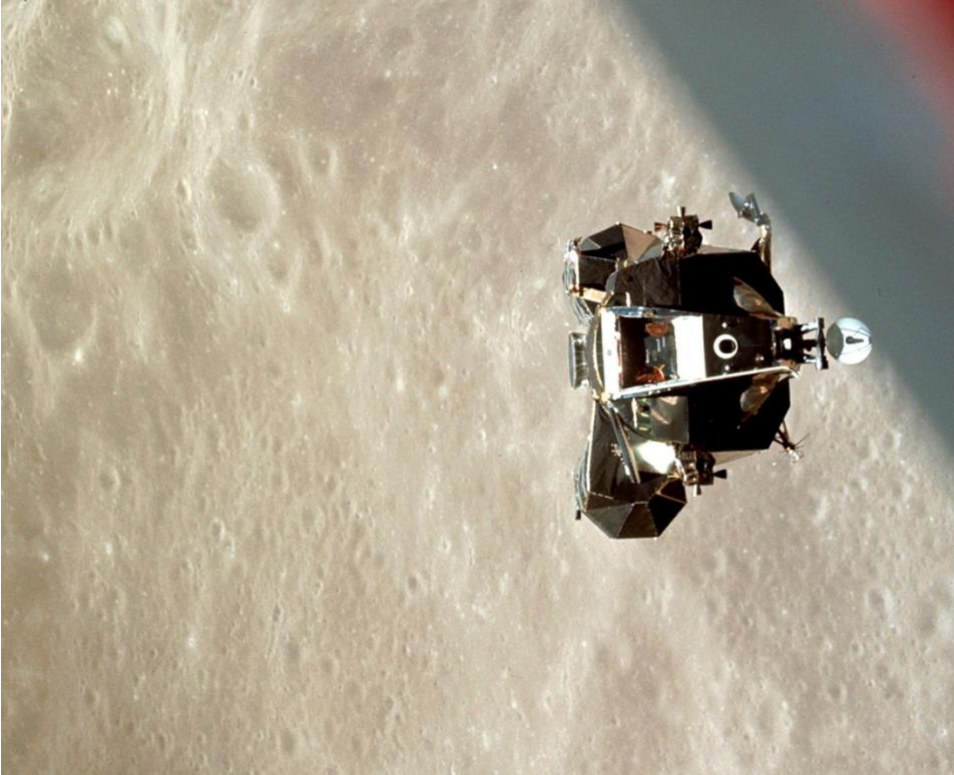
While you're up meteor watching, try to find a delightful naked eye star cluster: the Coma Star Cluster (aka Melotte 111) in the small constellation of Coma Berenices. It can be spotted after sunset in the east and for almost the entire night during the month of May. Look for it inside the area of the sky roughly framed between the constellations of Leo, Boötes, and Ursa Major. The cluster's sparkly members are also known as "Berenice's Hair" in honor of Egyptian Queen Berenices II's sacrifice of her lovely tresses. Binoculars will bring out even more stars in this large young cluster.

May marks the 50th anniversary of the Lunar Module's test run by the Apollo 10 mission! On May 22, 1969, NASA astronauts Thomas Safford and Eugene Cernan piloted the Lunar Module - nicknamed "Snoopy" - on a test descent towards the lunar surface. Undocking from "Charlie Brown" - the Command Module, piloted by John Young - they descended to 47,400 feet above the surface of the Moon before returning safely to the orbiting Command Module. Their success paved the way for the first humans to land on the Moon later that year with Apollo 11. Look for the Moon on the morning of May 22, before or after dawn, and contemplate what it must have felt like to hover mere miles above the lunar surface. You'll also see the bright giant planets Saturn and Jupiter on either side of the Moon before sunrise. When will humans travel to those distant worlds?

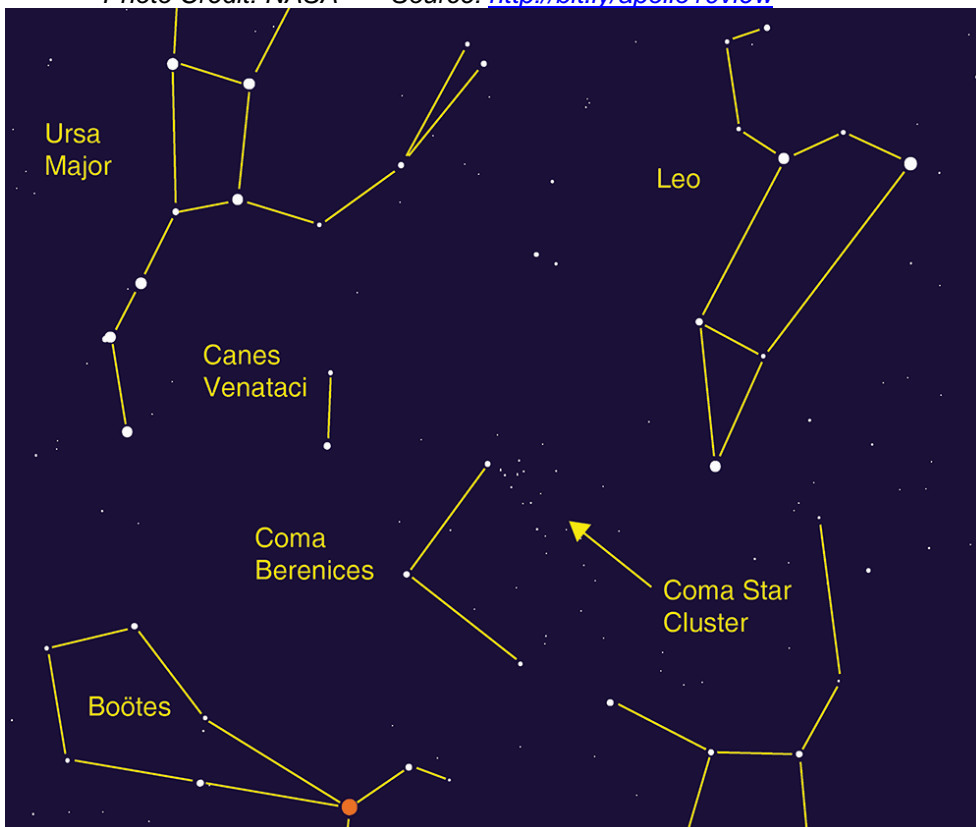
You can catch up on all of NASA's current and future missions at [nasa.gov](http://nasa.gov)

***This article is distributed by NASA Night Sky Network***

*The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit [nightsky.jpl.nasa.org](http://nightsky.jpl.nasa.org) to find local clubs, events, and more!*



A view of Apollo 10's Lunar Module from the Command Module as it returned from maneuvers above the lunar surface.  
Photo Credit: NASA Source: <http://bit.ly/apollo10view>



Try to spot the Coma Star Cluster! Image created with assistance from [Stellarium](http://Stellarium)

## News Headlines

### **Teachable Moment - Star Wars Day “May the fourth be with you”**

What do "Star Wars," NASA's Dawn spacecraft and Newton's Laws of Motion have in common? An educational lesson that turns science fiction into science fact using spreadsheets – a powerful tool for developing the scientific models addressed in the Next Generation Science Standards.

<https://go.nasa.gov/2J10DYn>

### **How Scientists Captured the First Image of a Black Hole**

Accomplishing what was previously thought to be impossible, a team of international astronomers has captured an image of a black hole's silhouette. Evidence of the existence of black holes – mysterious places in space where nothing, not even light, can escape – has existed for quite some time.... it was thought that capturing an image of a black hole was impossible because an image of something from which no light can escape would appear completely black.

<https://go.nasa.gov/2W9tUDH>

### **Marsquake! NASA's InSight Lander Feels 1st Red Planet Tremor**

Scientists just felt the Red Planet move under their feet — robotically from millions of miles away, on the stark surface of Mars. On April 6, NASA's InSight lander sensed its first confirmed marsquake, a phenomenon scientists suspected, but couldn't confirm, occurred on the neighboring planet. Measuring the Martian equivalent of earthquakes, seismic waves traveling through the interior of the planet, was among the lander's key science goals.

<https://bit.ly/2GE3ROG>

### **NASA tweaks call for lunar lander concepts**

NASA has updated a planned call for proposals for lunar landers to enable a human mission in 2024, broadening the scope to include integrated lander concepts. In a procurement filing issued late April 26, NASA updated an earlier notice published April 8 that announced plans to solicit proposals for an ascent stage for a human-rated lunar lander. Instead, the upcoming procurement will seek proposals for “a complete integrated lander” that includes an ascent module as well as a descent module and transfer stage.

<https://bit.ly/2IYL9nC>

### **Hubble Data Widens Mystery of the Universe's Expansion Rate**

Astronomers using NASA's Hubble Space Telescope say they have crossed an important threshold in revealing a discrepancy between the two key techniques for measuring the universe's expansion rate. The recent study strengthens the case that new theories may be needed to explain the forces that have shaped the cosmos

<https://go.nasa.gov/2XJaCFO>

## May Sky Data

New May 4      First Qtr May 11      Full May 18      Last Qtr May 26



## Planet Summary

**Mercury** passes through superior conjunction (behind the Sun) on May 21st and will only be visible, low in the west-northwest, on the last few days of the month.

**Venus** has a magnitude of -3.3 in May with its angular size reducing from 11.5 to 10.8 arc seconds during the month as it moves away from the Earth. However, at the same time, its phase increases from 88% to 92% - which is why the brightness remains constant at 3.3.

**Mars**, though fading from +1.8 to +2.0 magnitudes during the month, is still visible in Taurus in the south western sky after sunset. Mars sets some three hours after the Sun at the start of May but less than two and a half hours by month's end. Its angular size falls from 4.2 arc seconds to less than 4 arc seconds during the month.

**Jupiter** starts the month shining at magnitude -2.0 which increases to -2.1 as the month progresses. At the same time, its angular size increases from 43 to 46 arc seconds. As May begins, it rises by 11:00pm so will be due south around 4 am while at month's end it rises at ~8:30 pm so due south at ~01:30. Sadly it is heading towards the southernmost part of the ecliptic so, as it crosses the meridian, it will only have an elevation of ~14 degrees.

**Saturn**, shining with a magnitude increasing from +1.5 to +1.3 during the month, rises around midnight during the month so crosses the meridian just before dawn. Its disk is ~18 arc seconds across and its rings - which are still nicely tilted from the line of sight - spanning 40 arc seconds across. Sadly, it is at the lowest point of the ecliptic and will only reach an elevation of ~10 degrees.

The new moon on May 4 will provide inky black skies for this year's Eta Aquariid **meteor shower**. No matter where you are on the globe, watch for meteors on the several mornings around May 5. The forecast calls for the greatest number of Eta Aquariid meteors to fall before dawn on (or near) May 5. However, this shower has a rather broad maximum, so the day before or after may be just as good.

## Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
5/1/2019	04:38	16:42	06:05	19:35
5/5/2019	06:46	20:38	06:01	19:38
5/10/2019	11:03	00:38	05:57	19:42
5/15/2019	16:37	04:07	05:53	19:46
5/20/2019	21:55	07:22	05:49	19:49
5/25/2019	01:01	11:46	05:46	19:53
5/31/2019	04:08	17:23	05:44	19:56

## Planet Data

## May 1

	Rise	Transit	Set	Mag
<b>Mercury</b>	05:21	11:40	17:59	-0.2
<b>Venus</b>	04:57	11:10	17:23	-3.3
<b>Mars</b>	08:23	15:37	22:51	1.8
<b>Jupiter</b>	22:52	03:50	08:47	-2.0
<b>Saturn</b>	00:45	05:46	10:47	1.5

## May 15

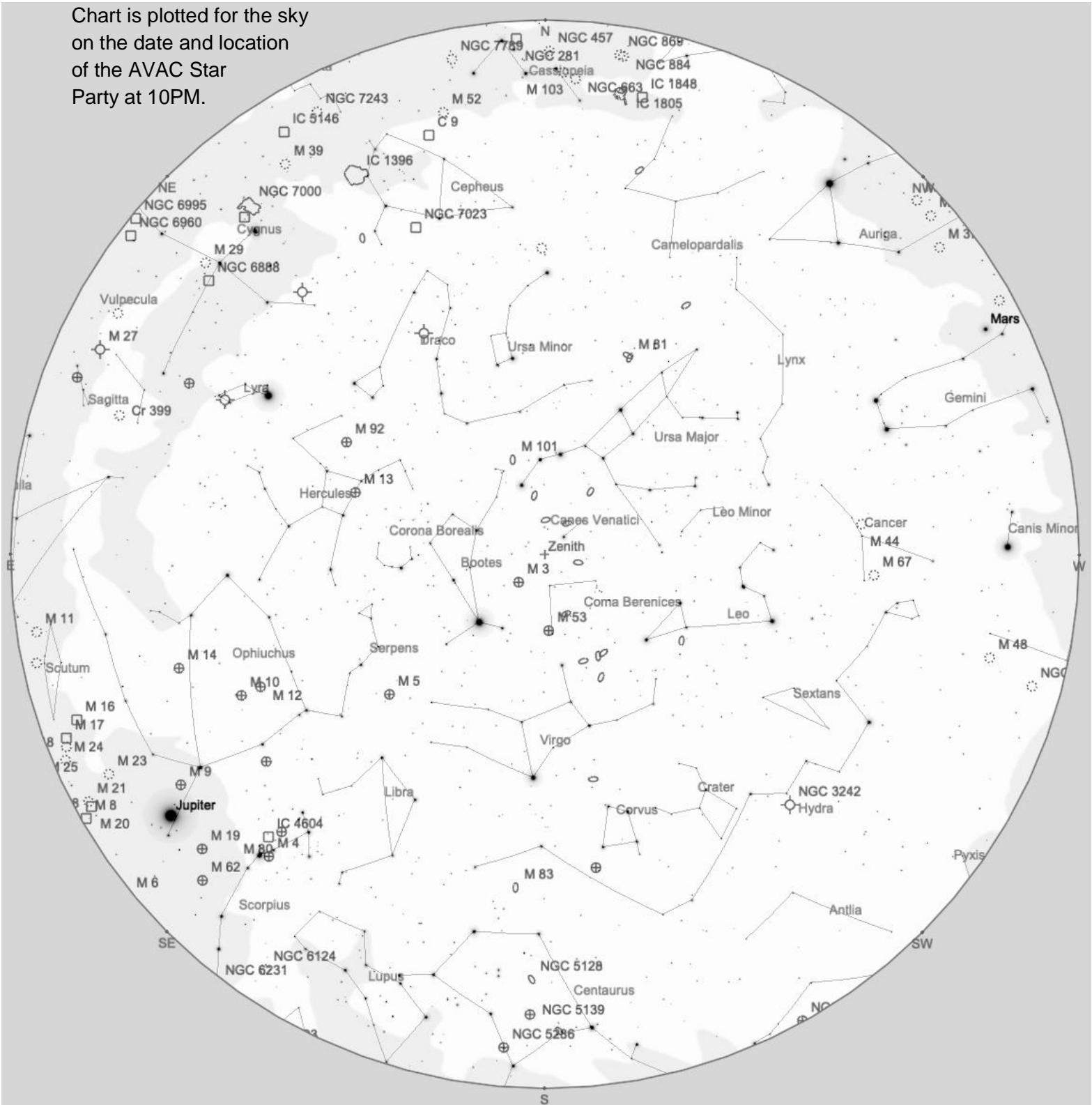
	Rise	Transit	Set	Mag
<b>Mercury</b>	05:36	12:25	19:14	-1.4
<b>Venus</b>	04:48	11:18	17:49	-3.3
<b>Mars</b>	08:06	15:21	22:37	1.9
<b>Jupiter</b>	21:52	02:50	07:47	-2.1
<b>Saturn</b>	23:49	04:50	09:51	1.4

## May 31

	Rise	Transit	Set	Mag
<b>Mercury</b>	06:29	13:45	21:02	-1.1
<b>Venus</b>	04:42	11:31	18:20	-3.3
<b>Mars</b>	07:50	15:04	22:18	2.0
<b>Jupiter</b>	20:41	01:39	06:37	-2.1
<b>Saturn</b>	22:43	03:44	08:45	1.3

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.



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 transit time of the object.

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC3923	Gal	Hya	11h 51m 02s	-28°48'23"	10.1	17:45	22:21	02:57
NGC3988	Gal	Leo	11h 57m 24s	+27°52'39"	14.0	15:01	22:28	05:55
NGC4041	Gal	UMa	12h 02m 12s	+62°08'15"	11.1	Circum	22:32	Circum
NGC4078	Gal	Vir	12h 04m 48s	+10°35'44"	14.0	16:03	22:35	05:07
NGC4088	Gal	UMa	12h 05m 34s	+50°32'22"	10.5	12:47	22:36	08:24
NGC4125	Gal	Dra	12h 08m 06s	+65°10'26"	9.8	Circum	22:38	Circum
NGC4120	Gal	Dra	12h 08m 31s	+69°32'40"	14.0	Circum	22:39	Circum
NGC4151	Gal	CVn	12h 10m 33s	+39°24'21"	10.4	14:22	22:41	07:00
NGC4156	Gal	CVn	12h 10m 50s	+39°28'22"	13.0	14:22	22:41	07:01
NGC4185	Gal	Com	12h 13m 22s	+28°30'38"	13.0	15:14	22:44	06:13
NGC4267	Gal	Vir	12h 19m 45s	+12°47'55"	10.9	16:12	22:50	05:28
NGC4350	Gal	Com	12h 23m 58s	+16°41'36"	11.1	16:05	22:54	05:44
NGC4361	P Neb	Crv	12h 24m 31s	-18°47'06"	10.0	17:45	22:55	04:05
NGC4383	Gal	Com	12h 25m 25s	+16°28'12"	13.0	16:07	22:56	05:45
NGC4402	Gal	Vir	12h 26m 08s	+13°06'45"	11.7	16:17	22:56	05:35
M86	Gal	Vir	12h 26m 12s	+12°56'46"	9.9	16:18	22:56	05:35
NGC4421	Gal	Com	12h 27m 03s	+15°27'41"	11.6	16:11	22:57	05:43
NGC4442	Gal	Vir	12h 28m 04s	+09°48'14"	10.5	16:29	22:58	05:28
NGC4450	Gal	Com	12h 28m 29s	+17°05'06"	10.1	16:08	22:59	05:50
NGC4459	Gal	Com	12h 29m 00s	+13°58'43"	10.4	16:18	22:59	05:41
NGC4461	Gal	Vir	12h 29m 03s	+13°11'02"	11.2	16:20	22:59	05:39
NGC4473	Gal	Com	12h 29m 49s	+13°25'47"	10.2	16:20	23:00	05:40
NGC4490	Gal	CVn	12h 30m 36s	+41°38'32"	9.8	14:28	23:01	07:33
M87	Gal	Vir	12h 30m 49s	+12°23'27"	9.6	16:24	23:01	05:38
M88	Gal	Com	12h 31m 59s	+14°25'12"	10.2	16:19	23:02	05:45
NGC4512	Gal	Dra	12h 32m 48s	+63°56'20"	14.0	Circum	23:03	Circum
NGC4543	Gal	Vir	12h 35m 20s	+06°06'54"	14.0	16:46	23:06	05:25
M91	Gal	Com	12h 35m 27s	+14°29'47"	10.9	16:23	23:06	05:49
NGC4578	Gal	Vir	12h 37m 31s	+09°33'18"	11.4	16:39	23:08	05:37
NGC4595	Gal	Com	12h 39m 52s	+15°17'52"	13.0	16:25	23:10	05:56
NGC4596	Gal	Vir	12h 39m 56s	+10°10'33"	10.5	16:40	23:10	05:41
NGC4618	Gal	CVn	12h 41m 34s	+41°07'55"	10.8	14:43	23:12	07:41
NGC4636	Gal	Vir	12h 42m 50s	+02°41'16"	9.6	17:03	23:13	05:23
NGC4698	Gal	Vir	12h 48m 23s	+08°29'15"	10.7	16:53	23:19	05:45
NGC4754	Gal	Vir	12h 52m 18s	+11°18'48"	10.6	16:49	23:23	05:56
NGC4900	Gal	Vir	13h 00m 39s	+02°30'01"	11.5	17:21	23:31	05:40
NGC4921	Gal	Com	13h 01m 26s	+27°53'08"	12.1	16:05	23:32	06:59
NGC4958	Gal	Vir	13h 05m 49s	-08°01'15"	10.5	17:55	23:36	05:17
NGC5019	Gal	Vir	13h 12m 42s	+04°43'46"	14.0	17:27	23:43	05:59



ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC5018	Gal	Vir	13h 13m 01s	-19°31'08"	10.8	18:36	23:43	04:51
NGC5053	Glob	Com	13h 16m 27s	+17°41'52"	9.8	16:54	23:47	06:39
NGC5109	Gal	UMa	13h 20m 53s	+57°38'31"	14.0	Circum	23:51	Circum
NGC5111	Gal	Vir	13h 22m 57s	-12°57'52"	13.0	18:26	23:53	05:20
NGC5147	Gal	Vir	13h 26m 20s	+02°06'00"	11.8	17:48	23:57	06:05
NGC5139	Glob	Cen	13h 26m 47s	-47°28'53"	3.7	21:01	23:57	02:53
M51	Gal	CVn	13h 29m 52s	+47°11'45"	8.9	14:47	00:00	09:14
NGC5195	Gal	CVn	13h 29m 59s	+47°16'00"	9.6	14:46	00:00	09:14
NGC5205	Gal	UMa	13h 30m 04s	+62°30'42"	13.0	Circum	00:00	Circum
NGC5193	Gal	Cen	13h 31m 53s	-33°14'04"	13.0	19:44	00:02	04:21
M3	Glob	CVn	13h 42m 11s	+28°22'35"	7.0	16:43	00:12	07:41
NGC5286	Glob	Cen	13h 46m 27s	-51°22'30"	7.6	22:00	00:17	02:34
NGC5307	P Neb	Cen	13h 51m 03s	-51°12'20"	12.0	22:02	00:21	02:40
NGC5328	Gal	Hya	13h 52m 53s	-28°29'22"	11.8	19:46	00:23	05:00
NGC5354	Gal	CVn	13h 53m 27s	+40°18'09"	11.5	15:59	00:24	08:48
NGC5383	Gal	CVn	13h 57m 05s	+41°50'46"	11.4	15:54	00:27	09:01
NGC5367	Neb	Cen	13h 57m 43s	-39°58'42"		20:42	00:28	04:14
NGC5485	Gal	UMa	14h 07m 11s	+55°00'05"	11.5	13:16	00:37	11:59
NGC5460	Open	Cen	14h 07m 27s	-48°20'36"	5.6	21:49	00:38	03:26
NGC5482	Gal	Boo	14h 08m 31s	+08°55'54"	14.0	18:12	00:39	07:06
NGC5504	Gal	Boo	14h 12m 16s	+15°50'31"	14.0	17:55	00:43	07:30
NGC5550	Gal	Boo	14h 18m 28s	+12°52'58"	14.0	18:10	00:49	07:27
NGC5668	Gal	Vir	14h 33m 24s	+04°27'01"	11.5	18:49	01:04	07:18
NGC5687	Gal	Boo	14h 34m 53s	+54°28'32"	11.8	14:04	01:05	12:06
NGC5689	Gal	Boo	14h 35m 30s	+48°44'31"	11.9	15:38	01:06	10:34
NGC5728	Gal	Lib	14h 42m 24s	-17°15'12"	11.3	19:58	01:13	06:27
NGC5791	Gal	Lib	14h 58m 46s	-19°16'02"	13.0	20:21	01:29	06:37
NGC5822	Open	Lup	15h 04m 21s	-54°23'48"	7.0	00:04	01:35	03:05
NGC5823	Open	Cir	15h 05m 30s	-55°36'12"	7.9	00:36	01:36	02:36
NGC5854	Gal	Vir	15h 07m 48s	+02°34'06"	11.8	19:28	01:38	07:48
NGC5875	Gal	Boo	15h 09m 13s	+52°31'42"	13.0	15:22	01:39	11:57
NGC5873	P Neb	Lup	15h 12m 51s	-38°07'30"	13.0	21:47	01:43	05:39
NGC5899	Gal	Boo	15h 15m 03s	+42°02'57"	11.8	17:10	01:45	10:20
NGC5885	Gal	Lib	15h 15m 04s	-10°05'08"	11.7	20:10	01:45	07:20
NGC5882	P Neb	Lup	15h 16m 50s	-45°38'56"	11.0	22:37	01:47	04:58
M5	Glob	Ser	15h 18m 33s	+02°04'57"	7.0	19:40	01:49	07:57
NGC5903	Gal	Lib	15h 18m 36s	-24°04'06"	11.5	20:56	01:49	06:42
NGC5925	Open	Nor	15h 27m 26s	-54°31'42"	8.0	00:30	01:58	03:25
NGC5927	Glob	Lup	15h 28m 00s	-50°40'23"	8.3	23:33	01:58	04:23
NGC5961	Gal	CrB	15h 35m 16s	+30°51'51"	14.0	18:27	02:06	09:44
NGC5962	Gal	Ser	15h 36m 32s	+16°36'28"	11.4	19:17	02:07	08:56
NGC5986	Glob	Lup	15h 46m 04s	-37°47'08"	7.1	22:19	02:16	06:14
NGC6058	P Neb	Her	16h 04m 27s	+40°40'59"	13.0	18:08	02:35	11:01
NGC6031	Open	Nor	16h 07m 35s	-54°00'54"	8.5	01:00	02:38	04:16
NGC6070	Gal	Ser	16h 09m 59s	+00°42'33"	11.7	20:36	02:40	08:45

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6072	P Neb	Sco	16h 12m 58s	-36°13'47"	14.0	22:38	02:43	06:48
NGC6067	Open	Nor	16h 13m 11s	-54°13'06"	5.6	01:10	02:43	04:17
NGC6126	Gal	CrB	16h 21m 28s	+36°22'35"	14.0	18:48	02:52	10:55
M4	Glob	Sco	16h 23m 35s	-26°31'35"	7.5	22:09	02:54	07:38
NGC6124	Open	Sco	16h 25m 20s	-40°39'12"	5.8	23:13	02:56	06:38
NGC6153	P Neb	Sco	16h 31m 31s	-40°15'13"	12.0	23:17	03:02	06:46
M107	Glob	Oph	16h 32m 32s	-13°03'11"	10.0	21:36	03:03	08:30
NGC6152	Open	Nor	16h 32m 45s	-52°38'36"	8.0	01:03	03:03	05:03
NGC6178	Open	Sco	16h 35m 47s	-45°38'36"	7.2	23:56	03:06	06:16
NGC6188	Neb	Ara	16h 40m 05s	-48°39'42"		00:25	03:10	05:56
NGC6193	Open	Ara	16h 41m 20s	-48°45'48"	5.2	00:27	03:12	05:56
M13	Glob	Her	16h 41m 41s	+36°27'35"	7.0	19:08	03:12	11:16
NGC6200	Open	Ara	16h 44m 07s	-47°27'48"	7.4	00:18	03:14	06:10
NGC6210	P Neb	Her	16h 44m 30s	+23°47'59"	9.0	20:02	03:15	10:27
NGC6204	Open	Ara	16h 46m 09s	-47°01'00"	8.2	00:17	03:16	06:16
M12	Glob	Oph	16h 47m 14s	-01°56'52"	8.0	21:20	03:17	09:15
NGC6208	Open	Ara	16h 49m 28s	-53°43'42"	7.2	01:37	03:20	05:03
NGC6239	Gal	Her	16h 50m 05s	+42°44'22"	12.3	18:41	03:20	12:00
NGC6235	Glob	Oph	16h 53m 25s	-22°10'34"	10.2	22:25	03:24	08:23
NGC6231	Open	Sco	16h 54m 10s	-41°49'30"	2.6	23:49	03:24	07:00
NGC6242	Open	Sco	16h 55m 33s	-39°27'42"	6.4	23:37	03:26	07:15
M10	Glob	Oph	16h 57m 09s	-04°05'56"	7.5	21:36	03:27	09:19
NGC6250	Open	Ara	16h 57m 56s	-45°56'12"	5.9	00:20	03:28	06:36
NGC6253	Open	Ara	16h 59m 05s	-52°42'30"	10.0	01:30	03:29	05:29
NGC6259	Open	Sco	17h 00m 45s	-44°39'18"	8.0	00:13	03:31	06:49
M62	Glob	Oph	17h 01m 13s	-30°06'45"	8.0	23:00	03:31	08:03
M19	Glob	Oph	17h 02m 38s	-26°16'04"	8.5	22:48	03:33	08:18
NGC6284	Glob	Oph	17h 04m 29s	-24°45'51"	9.0	22:44	03:35	08:25
NGC6281	Open	Sco	17h 04m 41s	-37°59'06"	5.4	23:38	03:35	07:32
NGC6293	Glob	Oph	17h 10m 10s	-26°34'56"	8.2	22:56	03:40	08:25
NGC6340	Gal	Dra	17h 10m 25s	+72°18'17"	11.0	Circum	03:41	Circum
NGC6302	P Neb	Sco	17h 13m 44s	-37°06'12"	13.0	23:43	03:44	07:45
NGC6309	P Neb	Oph	17h 14m 04s	-12°54'38"	11.0	22:17	03:44	09:12
M92	Glob	Her	17h 17m 07s	+43°08'11"	7.5	19:05	03:47	12:29
NGC6322	Open	Sco	17h 18m 25s	-42°56'00"	6.0	00:20	03:49	07:18
M9	Glob	Oph	17h 19m 12s	-18°30'58"	9.0	22:39	03:49	09:00
NGC6326	P Neb	Ara	17h 20m 46s	-51°45'17"	12.0	01:39	03:51	06:03
NGC6334	Neb	Sco	17h 20m 49s	-36°06'12"		23:45	03:51	07:57
NGC6356	Glob	Oph	17h 23m 35s	-17°48'52"	8.4	22:41	03:54	09:07
NGC6355	Glob	Oph	17h 23m 59s	-26°21'10"	9.6	23:09	03:54	08:39
NGC6357	Neb	Sco	17h 24m 43s	-34°12'06"		23:41	03:55	08:09
NGC6369	P Neb	Oph	17h 29m 21s	-23°45'34"	13.0	23:06	04:00	08:53
NGC6384	Gal	Oph	17h 32m 24s	+07°03'37"	10.6	21:41	04:03	10:25
NGC6374	Open	Sco	17h 34m 42s	-32°34'54"	9.0	23:44	04:05	08:26
NGC6388	Glob	Sco	17h 36m 17s	-44°44'08"	6.9	00:50	04:07	07:24

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6400	Open	Sco	17h 40m 12s	-36°56'54"	9.0	00:09	04:10	08:12
M6	Open	Sco	17h 40m 20s	-32°15'12"	4.5	23:48	04:11	08:33
NGC6397	Glob	Ara	17h 40m 42s	-53°40'26"	5.7	02:27	04:11	05:55
NGC6416	Open	Sco	17h 44m 19s	-32°21'42"	5.7	23:52	04:15	08:37
NGC6426	Glob	Oph	17h 44m 55s	+03°10'11"	11.2	22:04	04:15	10:26
NGC6439	P Neb	Sgr	17h 48m 20s	-16°28'44"	14.0	23:02	04:19	09:35
NGC6440	Glob	Sgr	17h 48m 53s	-20°21'39"	9.7	23:14	04:19	09:24
NGC6445	P Neb	Sgr	17h 49m 15s	-20°00'36"	13.0	23:13	04:19	09:26
NGC6441	Glob	Sco	17h 50m 13s	-37°03'03"	7.4	00:19	04:20	08:22
NGC6469	Open	Sgr	17h 53m 12s	-22°16'30"	8.0	23:25	04:23	09:22
M7	Open	Sco	17h 53m 51s	-34°47'36"	3.5	00:12	04:24	08:36
M23	Open	Sgr	17h 57m 04s	-18°59'06"	6.0	23:18	04:27	09:37
NGC6543	P Neb	Dra	17h 58m 33s	+66°37'59"	9.0	Circum	04:29	Circum
NGC6507	Open	Sgr	17h 59m 50s	-17°27'00"	10.0	23:16	04:30	09:44
NGC6517	Glob	Oph	18h 01m 51s	-08°57'32"	10.3	22:54	04:32	10:10
M20	D Neb	Sgr	18h 02m 42s	-22°58'18"	5.0	23:36	04:33	09:29
NGC6520	Open	Sgr	18h 03m 24s	-27°53'18"	8.0	23:54	04:34	09:13
M8	D Neb	Sgr	18h 03m 41s	-24°22'48"	5.0	23:42	04:34	09:26
NGC6535	Glob	Ser	18h 03m 51s	-00°17'51"	10.6	22:32	04:34	10:36
NGC6526	Neb	Sgr	18h 04m 06s	-24°26'30"		23:43	04:34	09:26
M21	Open	Sgr	18h 04m 13s	-22°29'24"	7.0	23:36	04:34	09:33
NGC6530	Open	Sgr	18h 04m 31s	-24°21'30"	4.6	23:43	04:35	09:27
NGC6537	P Neb	Sgr	18h 05m 13s	-19°50'35"	13.0	23:29	04:35	09:42
NGC6544	Glob	Sgr	18h 07m 20s	-24°59'53"	8.3	23:48	04:38	09:27
NGC6546	Open	Sgr	18h 07m 22s	-23°17'48"	8.0	23:42	04:38	09:33
NGC6541	Glob	CrA	18h 08m 02s	-43°42'57"	6.6	01:14	04:38	08:02
NGC6559	Neb	Sgr	18h 09m 57s	-24°06'23"		23:47	04:40	09:33
NGC6565	P Neb	Sgr	18h 11m 53s	-28°10'41"	13.0	00:04	04:42	09:21
NGC6563	P Neb	Sgr	18h 12m 03s	-33°52'07"	14.0	00:27	04:42	08:58
NGC6572	P Neb	Oph	18h 12m 06s	+06°51'13"	9.0	22:21	04:42	11:04
NGC6568	Open	Sgr	18h 12m 44s	-21°36'18"	9.0	23:42	04:43	09:44
NGC6567	P Neb	Sgr	18h 13m 45s	-19°04'34"	12.0	23:35	04:44	09:53
NGC6583	Open	Sgr	18h 15m 49s	-22°08'12"	10.0	23:47	04:46	09:45
NGC6578	P Neb	Sgr	18h 16m 16s	-20°27'03"	13.0	23:42	04:47	09:51
NGC6595	Open	Sgr	18h 17m 05s	-19°51'57"	7.0	23:41	04:47	09:54
NGC6604	Open	Ser	18h 18m 03s	-12°14'35"	6.5	23:19	04:48	10:17
M24	Open	Sgr	18h 18m 26s	-18°24'24"	4.5	23:38	04:49	10:00
NGC6584	Glob	Tel	18h 18m 38s	-52°12'57"	9.2	02:43	04:49	06:55
M16	D Neb	Ser	18h 18m 48s	-13°48'24"	6.5	23:24	04:49	10:14
M18	Open	Sgr	18h 19m 58s	-17°06'07"	8.0	23:35	04:50	10:05
M17	D Neb	Sgr	18h 20m 47s	-16°10'18"	7.0	23:33	04:51	10:09
NGC6654	Gal	Dra	18h 24m 08s	+73°10'58"	11.6	Circum	04:54	Circum
M28	Glob	Sgr	18h 24m 33s	-24°52'07"	8.5	00:05	04:55	09:45
NGC6629	P Neb	Sgr	18h 25m 42s	-23°12'10"	12.0	00:00	04:56	09:52
NGC6633	Open	Oph	18h 27m 15s	+06°30'30"	4.6	22:37	04:57	11:18

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6638	Glob	Sgr	18h 30m 56s	-25°29'56"	9.2	00:13	05:01	09:49
M25	Open	Sgr	18h 31m 42s	-19°07'00"	6.5	23:53	05:02	10:11
NGC6642	Glob	Sgr	18h 31m 54s	-23°28'35"	8.8	00:07	05:02	09:57
NGC6644	P Neb	Sgr	18h 32m 35s	-25°07'44"	12.0	00:14	05:03	09:52
NGC6645	Open	Sgr	18h 32m 37s	-16°53'00"	9.0	23:47	05:03	10:18
NGC6647	Open	Sgr	18h 32m 49s	-17°13'42"	8.0	23:49	05:03	10:18
NGC6649	Open	Sct	18h 33m 27s	-10°24'12"	8.9	23:29	05:04	10:38
NGC6652	Glob	Sgr	18h 35m 46s	-32°59'28"	8.9	00:46	05:06	09:26
M22	Glob	Sgr	18h 36m 24s	-23°54'17"	6.5	00:13	05:07	10:00
NGC6664	Open	Sct	18h 36m 33s	-08°13'12"	7.8	23:26	05:07	10:47
M26	Open	Sct	18h 45m 18s	-09°23'00"	9.5	23:38	05:16	10:53
NGC6702	Gal	Lyr	18h 46m 58s	+45°42'21"	12.2	20:16	05:17	14:18
NGC6704	Open	Sct	18h 50m 45s	-05°12'18"	9.2	23:32	05:21	11:10
M11	Open	Sct	18h 51m 05s	-06°16'12"	7.0	23:36	05:21	11:07
NGC6709	Open	Aql	18h 51m 18s	+10°19'06"	6.7	22:50	05:22	11:53
NGC6712	Glob	Sct	18h 53m 04s	-08°42'19"	8.2	23:44	05:23	11:02
M57	P Neb	Lyr	18h 53m 35s	+33°01'44"	9.5	21:36	05:24	13:12
NGC6716	Open	Sgr	18h 54m 34s	-19°54'06"	6.9	00:18	05:25	10:31
M54	Glob	Sgr	18h 55m 03s	-30°28'47"	8.5	00:56	05:25	09:55
NGC6723	Glob	Sgr	18h 59m 33s	-36°37'54"	7.3	01:27	05:30	09:33
NGC6738	Open	Aql	19h 01m 21s	+11°36'54"	8.0	22:57	05:32	12:06
NGC6726	Neb	CrA	19h 01m 39s	-36°53'30"		01:30	05:32	09:34
NGC6729	Neb	CrA	19h 01m 55s	-36°57'30"		01:30	05:32	09:34
NGC6741	P Neb	Aql	19h 02m 37s	-00°26'57"	11.0	23:31	05:33	11:34
NGC6749	Glob	Aql	19h 05m 15s	+01°54'02"	11.1	23:28	05:36	11:43
NGC6751	P Neb	Aql	19h 05m 56s	-05°59'31"	13.0	23:50	05:36	11:23
NGC6755	Open	Aql	19h 07m 49s	+04°16'00"	7.5	23:24	05:38	11:52
NGC6772	P Neb	Aql	19h 14m 36s	-02°42'24"	14.0	23:49	05:45	11:40
NGC6778	P Neb	Aql	19h 18m 25s	-01°35'48"	13.0	23:50	05:49	11:47
NGC6781	P Neb	Aql	19h 18m 28s	+06°32'20"	12.0	23:28	05:49	12:09
NGC6791	Open	Lyr	19h 20m 53s	+37°46'18"	9.5	21:41	05:51	14:02
NGC6790	P Neb	Aql	19h 22m 57s	+01°30'48"	10.0	23:46	05:53	12:00
NGC6803	P Neb	Aql	19h 31m 16s	+10°03'23"	11.0	23:31	06:02	12:32
NGC6804	P Neb	Aql	19h 31m 35s	+09°13'31"	12.0	23:34	06:02	12:30
NGC6807	P Neb	Aql	19h 34m 34s	+05°41'03"	14.0	23:47	06:05	12:23
M55	Glob	Sgr	19h 40m 00s	-30°57'44"	7.0	01:42	06:10	10:38
NGC6813	Neb	Vul	19h 40m 22s	+27°18'34"		22:46	06:11	13:36
NGC6820	Neb	Vul	19h 42m 28s	+23°05'17"		23:03	06:13	13:23
NGC6818	P Neb	Sgr	19h 43m 58s	-14°09'10"	10.0	00:51	06:14	11:38
NGC6826	P Neb	Cyg	19h 44m 48s	+50°31'30"	10.0	20:27	06:15	16:03
NGC6822	Gal	Sgr	19h 44m 57s	-14°48'10"	9.0	00:53	06:15	11:37
NGC6833	P Neb	Cyg	19h 49m 47s	+48°57'40"	14.0	20:50	06:20	15:50
NGC6834	Open	Cyg	19h 52m 12s	+29°24'30"	7.8	22:49	06:22	13:55
NGC6842	P Neb	Vul	19h 55m 02s	+29°17'20"	14.0	22:53	06:25	13:58
M27	P Neb	Vul	19h 59m 36s	+22°43'15"	7.5	23:21	06:30	13:39

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6871	Open	Cyg	20h 05m 59s	+35°46'38"	5.2	22:36	06:36	14:37
NGC6870	Gal	Tel	20h 10m 11s	-48°17'13"	12.2	03:51	06:40	09:29
NGC6884	P Neb	Cyg	20h 10m 24s	+46°27'39"	13.0	21:34	06:41	15:48
NGC6879	P Neb	Sge	20h 10m 27s	+16°55'22"	13.0	23:50	06:41	13:31
NGC6881	P Neb	Cyg	20h 10m 52s	+37°24'42"	14.0	22:33	06:41	14:50
NGC6882	Open	Vul	20h 11m 58s	+26°29'00"	8.1	23:20	06:42	14:04
NGC6888	Neb	Cyg	20h 12m 06s	+38°21'17"		22:29	06:42	14:56
NGC6886	P Neb	Sge	20h 12m 43s	+19°59'22"	12.0	23:43	06:43	13:43
NGC6891	P Neb	Del	20h 15m 09s	+12°42'16"	12.0	00:08	06:45	13:23
NGC6894	P Neb	Cyg	20h 16m 24s	+30°33'55"	14.0	23:09	06:47	14:24
NGC6905	P Neb	Del	20h 22m 23s	+20°06'16"	12.0	23:52	06:53	13:53
M29	Open	Cyg	20h 23m 57s	+38°30'30"	9.0	22:40	06:54	15:08
NGC6914	Neb	Cyg	20h 24m 43s	+42°28'57"		22:17	06:55	15:33

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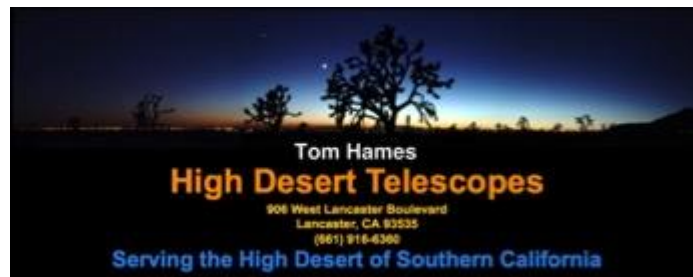


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