



Desert Sky Observer

Volume 39

Antelope Valley Astronomy Club Newsletter

April 2019

Up-Coming Events

April 6: [Prime Desert Moon Walk](#)

April 12: Club Meeting*

April 27: [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

Darrell Bennett

Now that spring is here, I am looking forward to clear skies and warm nights.

If you missed our March meeting, you missed hearing a great speaker, Michael Staab from JPL. He talked about the Mars Rover Opportunity.

On March 11, I continued my tour of the local Astronomy clubs to see how they run their meetings. This time I went to the Los Angeles Astronomical Society meeting, held at Griffith Observatory. I knew some of the members from years going to RTMC and PATS. I spoke with the club president, Tim Thompson about getting the two clubs together for a star party. Tim invited me to join their club too.

On March 23, we had our Prime Desert Woodlands walk. It was cloudy at first but then it cleared up. It was still cold. I would like to thank Frank, Rose, Rod, Kevin and Chris for coming out for the walk with the public and club members. We had 98 people attend that night. The next PDW is April 6, if you have not been on the walk with Jeremy you really should come.

On March 30, we had our Messier Marathon at Saddle Back Butte State Park. When I arrived at 1:30pm, the gate was locked; I drove up to the Ranger Station to let them know. Someone came an hour later to open the gate. We had 18 people attend. I cooked burgers and hot dogs for everyone and then cooked my fish for my fish tacos.

Two people who were camping nearby came to look through the scopes. They told us they just came down from Seattle. Matt, Rod and I lasted until midnight when it just got too cold and everything started to get wet from the dew. For those who slept in tents it was very cold. When Rod and I were woken up by Matt packing up at 7:00am, we had ice on our tables and tents. I waited for the sun to come over the hill before I started to pack up. We all had fun.

Someone left behind a Bushnell 10x50 binoculars with a price tag on it. I will bring them to the next meeting. If they are yours come to see me at the meeting.

Secretary

We are doing a trip to the Mt. Wilson 60 inch telescope. Our trip will be on Friday, July 5th. A sign up sheet is already started but we do have a few openings. This trip is limited to 25 members. Kids must be 12 and over. The cost will be \$40 per person. This is due to the increasing costs from Mt. Wilson, and the added pre tour. This trip is for members, and we have a standby sheet for overflow or non-members.

If you wish to sign up, you must notify me to put you on the list before you pay to make sure there is a spot for you!! Either email me (rmorion1@bak.rr.com) or leave me a voicemail (661-972-1953)!!

You may pay via the Paypal link (www.avastronomyclub.org/mtwilson) *Or go to the club's website homepage and follow the link from there. *Or you may pay at the April 12th or May 10th meeting. *Or you may mail a check to the club PO box: AVAC, PO Box 8545, Lancaster, CA 93539.

We have a speaker for our April 12th meeting. Our speaker will be Dr. Ralph Bird, who is a postdoctoral researcher at the University of California, Los Angeles. He works on the search for antinuclei cosmic rays and with VERITAS, a very high energy gamma ray telescope. Dr. Bird completed his PhD at the University College Dublin, Ireland where he was using the VERITAS telescope. Prior to his PhD he worked as a nuclear safety engineer for Rolls-Royce Pic, working on both civil and submarine power plants. His presentation is 'Our Galaxy Through Gamma Ray Eyes: A View of the Extremes'.

On Saturday April 6, we have a Prime Desert Moon Walk at 8pm. Weather permitting. We need members with telescopes, or come out to take the astronomy walk and talk with Jeremy.

Saturday April 27th is our dark sky party at Red Cliffs. This is an overnight event. Weather permitting. Come on out to view the night sky with fellow members! More info and directions to follow!

Upcoming in May: a speaker for our May 10th meeting, a PDW Moon Walk, and a dark sky star party at Red Rock Canyon State Park for Memorial Day weekend!

Space Place

Mars the Wanderer

By David Prosper

April's skies find Mars traveling between star clusters after sunset, and a great gathering of planets just before sunrise.

Mars shows stargazers exactly what the term "planet" originally meant with its rapid movement across the evening sky this month. The ancient Greeks used the term *planete*, meaning wanderer, to label the bright star-like objects that travelled between the constellations of the zodiac year after year.

You can watch Mars as it wanders through the sky throughout April, visible in the west for several hours after sunset. Mars travels past two of the most famous star clusters in our night sky: the Pleiades and Hyades. Look for the red planet next to the tiny but bright Pleiades on April 1st. By the second week in April, it has moved eastward in Taurus towards the larger V-shaped Hyades. Red Mars appears to the right of the slightly brighter red-orange star Aldebaran on April 11th. We see only the brightest stars in these clusters with our unaided eyes; how many additional stars can you observe through binoculars?

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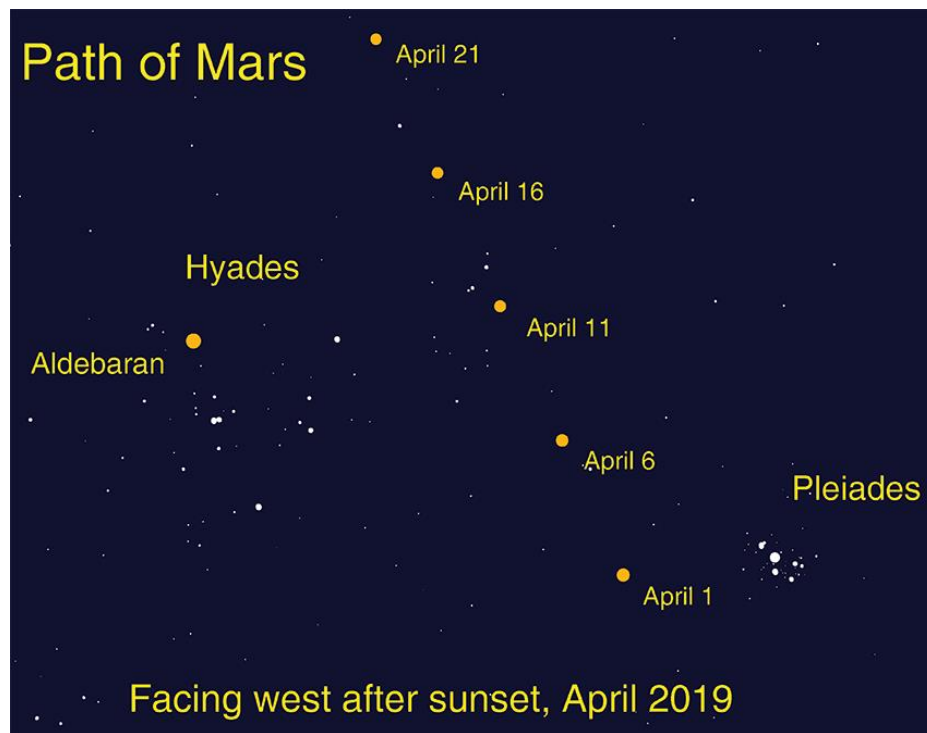
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Open clusters are made up of young stars born from the same “star nursery” of gas and dust. These two open clusters are roughly similar in size. The Pleiades appears much smaller as they are 444 light years away, roughly 3 times the distance of the Hyades, at 151 light years distant. Aldebaran is in the same line of sight as the Hyades, but is actually not a member of the cluster; it actually shines just 65 light years away! By comparison, Mars is practically next door to us, this month just a mere 18 light minutes from Earth - that’s about almost 200 million miles. Think of the difference between how long it takes the light to travel from these bodies: 18 minutes vs. 65 years!

The rest of the bright planets rise before dawn, in a loose lineup starting from just above the eastern horizon to high above the south: Mercury, Venus, Saturn, and Jupiter. Watch this month as the apparent gap widens considerably between the gas giants and terrestrial planets. Mercury hugs the horizon all month, with Venus racing down morning after morning to join its dimmer inner solar system companion right before sunrise. In contrast, the giants Jupiter and Saturn move away from the horizon and rise earlier all month long, with Jupiter rising before midnight by the end of April.

The Lyrids meteor shower peaks on April 22nd, but sadly all but the brightest meteors will be washed out by the light of a bright gibbous Moon.

You can catch up on all of NASA’s current and future missions at [nasa.gov](https://www.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 to find local clubs, events, and more!

News Headlines

NASA's Cassini Finds Saturn's Rings Coat Tiny Moons

New findings have emerged about five tiny moons nestled in and near Saturn's rings. The closest-ever flybys by NASA's Cassini spacecraft reveal that the surfaces of these unusual moons are covered with material from the planet's rings - and from icy particles blasting out of Saturn's larger moon Enceladus. The work paints a picture of the competing processes shaping these mini-moons.

<https://go.nasa.gov/2Fz3Hro>

NASA's Mars Helicopter Completes Flight Tests

In late January 2019, all the pieces making up the flight model (actual vehicle going to the Red Planet) of NASA's Mars Helicopter were put to the test. Weighing in at no more than 4 pounds (1.8 kilograms), the helicopter is a technology demonstration project currently going through the rigorous verification process certifying it for Mars.

<https://www.jpl.nasa.gov/news/news.php?feature=7361>

Can Humans Sense Magnetic Storms?

Close your eyes and relax. Daydream about something pleasant. In this state your brain is filled with “alpha waves,” a type of electrical brainwave associated with wakeful relaxation.

Now try it during a geomagnetic storm. It may not be so easy. A new study just published in the journal eNeuro by researchers at Caltech offers convincing evidence that changes in Earth's magnetic field can suppress alpha waves in the human brain.

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

Jupiter Marble

A striking view of Jupiter's Great Red Spot and turbulent southern hemisphere was captured by NASA's Juno spacecraft as it performed a close pass of the gas giant planet. Juno took the three images used to produce this color-enhanced view on Feb. 12, 2019, between 9:59 a.m. PST (12:59 p.m. EST) and 10:39 a.m. PST (1:39 p.m. EST), as the spacecraft performed its 17th science pass of Jupiter. At the time the images were taken, the spacecraft was between 16,700 miles (26,900 kilometers) and 59,300 miles (95,400 kilometers) above Jupiter's cloud tops, above a southern latitude spanning from about 40 to 74 degrees. JunoCam's raw images are available at www.missionjuno.swri.edu/junocam for the public to peruse and process into image products.

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

April Sky Data

New Apr 5 First Qtr Apr 12 Full Apr 19 Last Qtr Apr 26



Planet Summary

Mercury passed through inferior conjunction on March 15th and, at the start of the month rises low in the east-southeast about 30 minutes before the Sun but, shining at a magnitude of +1 only reaching an elevation of ~4 degrees. Mercury reaches greatest elongation west, some 28 degrees from the Sun, on April 11th.

Venus begins April with a magnitude of -3.4 with its angular size reducing from 13.1 to 11.6 arc seconds during the month as it moves away from the Earth. However, at the same time, the percentage illuminated disk (its phase) increases from 81% to 86%.

Mars remains prominent in the south western sky after sunset setting some four hours after the Sun at the start of April but less than 3 and a half hours by month's end. Its angular size falls from 4.6 arc seconds to 4.2 arc seconds during the month so one will not be able to spot any details on its salmon-pink surface.

Jupiter starts the month rising around 1 a.m. and brightens from magnitude -1.8 to -2.0 as the month progresses while its angular size increases slightly from 40 to 43 arc seconds. Sadly it is heading towards the southern part of the ecliptic and currently lies in the southern part of Ophiuchus just above Scorpius so, as it crosses the meridian, it will only have an elevation of ~14 degrees.

Saturn around 3 am on April 1st but around 1 am by month's end. Its disk is ~17 arc seconds across and its rings - which are still nicely tilted from the line of sight - spanning 36 arc seconds across. By the end of April, Saturn will near the meridian just before sunrise so morning twilight is the best time to observe it but.

The Lyrid **meteor shower** will reach its maximum rate of activity on 23 April 2019. Some shooting stars associated with the shower are expected to be visible each night from 19 April to 25 April. Named after constellation Lyra, the Lyrids are one of the oldest recorded meteor showers—according to some historical Chinese texts, the shower was seen over 2,500 years ago.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
4/1/2019	05:03	16:05	06:41	19:12
4/5/2019	07:07	19:48	06:36	19:15
4/10/2019	10:14	n/a	06:30	19:18
4/15/2019	15:27	04:14	06:23	19:22
4/20/2019	21:05	07:23	06:17	19:26
4/25/2019	00:59	11:12	06:11	19:30
4/30/2019	04:08	15:46	06:06	19:34

Planet Data

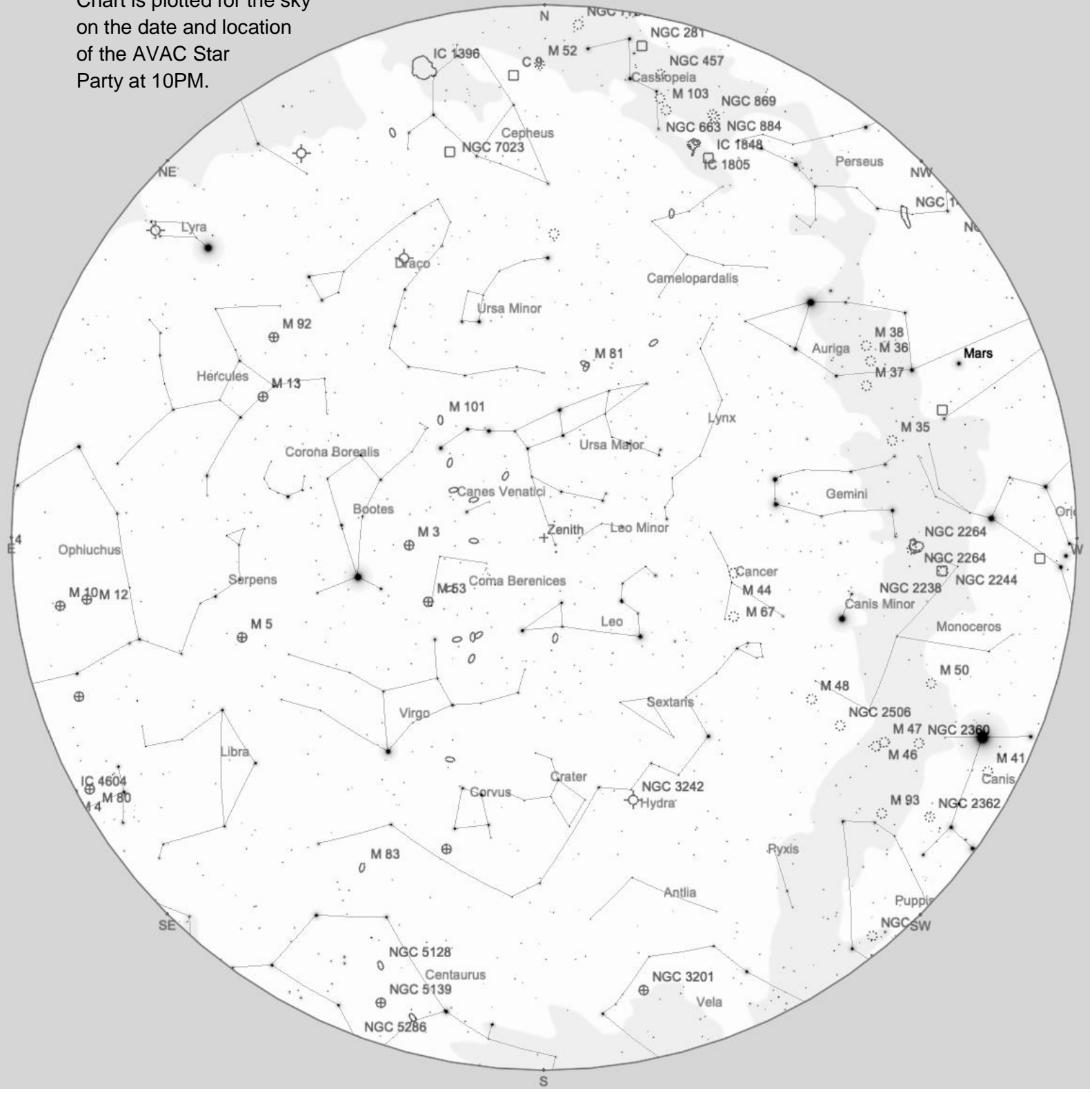
	Apr 1			
	Rise	Transit	Set	Mag
Mercury	05:41	11:28	17:16	1.0
Venus	05:17	10:53	16:29	-3.4
Mars	09:07	16:11	23:15	1.6
Jupiter	00:53	05:51	10:48	-1.8
Saturn	02:40	07:41	12:42	1.6

	Apr 15			
	Rise	Transit	Set	Mag
Mercury	05:41	11:28	17:16	1.0
Venus	05:17	10:53	16:29	-3.4
Mars	09:07	16:11	23:15	1.6
Jupiter	00:53	05:51	10:48	-1.8
Saturn	02:40	07:41	12:42	1.6

	Apr 30			
	Rise	Transit	Set	Mag
Mercury	05:21	11:38	17:55	-0.2
Venus	04:58	11:10	17:21	-3.3
Mars	08:24	15:38	22:51	1.8
Jupiter	22:56	03:54	08:52	-2.0
Saturn	00:49	05:50	10:51	1.5

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

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



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
NGC2972	Open	Vel	09h 40m 13s	-50°19'24"	9.9	19:16	21:45	00:14
NGC2976	Gal	UMa	09h 47m 16s	+67°54'59"	10.2	Circum	21:52	Circum
NGC3081	Gal	Hya	09h 59m 30s	-22°49'34"	12.0	17:07	22:04	03:01
NGC3132	P Neb	Vel	10h 07m 02s	-40°26'11"	8.0	18:28	22:12	01:56
NGC3201	Glob	Vel	10h 17m 37s	-46°24'45"	6.8	19:18	22:22	01:27
NGC3228	Open	Vel	10h 21m 22s	-51°43'42"	6.0	20:14	22:26	00:39
NGC3242	P Neb	Hya	10h 24m 46s	-18°38'34"	9.0	17:19	22:30	03:40
NGC3245	Gal	LMi	10h 27m 18s	+28°30'27"	10.8	15:03	22:32	06:02
NGC3268	Gal	Ant	10h 30m 00s	-35°19'32"	11.8	18:26	22:35	02:44
NGC3330	Open	Vel	10h 38m 46s	-54°07'24"	7.4	21:08	22:44	00:19
NGC3334	Gal	LMi	10h 41m 31s	+37°18'45"	14.0	14:38	22:46	06:54
NGC3384	Gal	Leo	10h 48m 17s	+12°37'46"	10.0	16:15	22:53	05:31
NGC3441	Gal	Leo	10h 52m 31s	+07°13'29"	14.0	16:35	22:57	05:20
NGC3546	Gal	Crt	11h 09m 47s	-13°22'53"	14.0	17:49	23:15	04:40
M97	P Neb	UMa	11h 14m 48s	+55°01'08"	12.0	11:57	23:20	10:42
NGC3628	Gal	Leo	11h 20m 17s	+13°35'19"	9.5	16:45	23:25	06:06
NGC3659	Gal	Leo	11h 23m 45s	+17°49'02"	13.0	16:35	23:29	06:22
NGC3680	Open	Cen	11h 25m 38s	-43°14'36"	7.6	20:04	23:31	02:57
NGC3898	Gal	UMa	11h 49m 15s	+56°05'03"	10.8	Circum	23:54	Circum
NGC3960	Open	Cen	11h 50m 33s	-55°40'24"	8.3	22:58	23:55	00:53
NGC3953	Gal	UMa	11h 53m 49s	+52°19'36"	10.1	13:45	23:59	10:13
NGC3958	Gal	UMa	11h 54m 34s	+58°22'00"	13.0	Circum	23:59	Circum
M109	Gal	UMa	11h 57m 36s	+53°22'29"	10.6	13:29	00:02	10:36
NGC4051	Gal	UMa	12h 03m 10s	+44°31'53"	10.3	15:16	00:08	09:00
NGC4066	Gal	Com	12h 04m 09s	+20°20'52"	14.0	17:08	00:09	07:10
NGC4096	Gal	UMa	12h 06m 01s	+47°28'41"	10.6	14:55	00:11	09:27
NGC4168	Gal	Vir	12h 12m 17s	+13°12'17"	11.3	17:38	00:17	06:57
NGC4203	Gal	Com	12h 15m 05s	+33°11'50"	10.7	16:31	00:20	08:09
NGC4230	Open	Cen	12h 17m 09s	-55°17'12"	9.0	23:13	00:22	01:31
NGC4239	Gal	Com	12h 17m 15s	+16°31'52"	13.0	17:33	00:22	07:11
NGC4244	Gal	CVn	12h 17m 30s	+37°48'27"	10.2	16:12	00:22	08:33
NGC4242	Gal	CVn	12h 17m 30s	+45°37'08"	11.0	15:22	00:22	09:23
M99	Gal	Com	12h 18m 50s	+14°25'01"	10.4	17:41	00:24	07:07
M61	Gal	Vir	12h 21m 55s	+04°28'23"	10.1	18:12	00:27	06:42
NGC4314	Gal	Com	12h 22m 32s	+29°53'44"	10.5	16:53	00:27	08:02
NGC4324	Gal	Vir	12h 23m 06s	+05°14'59"	13.0	18:11	00:28	06:45
NGC4357	Gal	CVn	12h 23m 59s	+48°46'46"	14.0	15:00	00:29	09:57
NGC4361	P Neb	Crv	12h 24m 31s	-18°47'06"	10.0	19:20	00:29	05:39
NGC4373	Gal	Cen	12h 25m 18s	-39°45'38"	11.1	20:43	00:30	04:18

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC4388	Gal	Vir	12h 25m 47s	+12°39'42"	11.1	17:53	00:31	07:08
NGC4428	Gal	Vir	12h 27m 28s	-08°10'05"	13.0	18:52	00:32	06:13
NGC4438	Gal	Vir	12h 27m 46s	+13°00'32"	10.1	17:54	00:33	07:11
NGC4517	Gal	Vir	12h 32m 46s	+00°06'49"	10.5	18:35	00:38	06:41
NGC4546	Gal	Vir	12h 35m 29s	-03°47'35"	10.3	18:48	00:40	06:33
NGC4559	Gal	Com	12h 35m 58s	+27°57'35"	9.9	17:13	00:41	08:08
NGC4568	Gal	Vir	12h 36m 34s	+11°14'18"	10.8	18:08	00:41	07:15
NGC4583	Gal	CVn	12h 38m 04s	+33°27'31"	14.0	16:53	00:43	08:33
NGC4631	Gal	CVn	12h 42m 08s	+32°32'29"	9.3	17:01	00:47	08:33
NGC4632	Gal	Vir	12h 42m 32s	-00°04'54"	12.0	18:45	00:47	06:50
M94	Gal	CVn	12h 50m 53s	+41°07'12"	8.9	16:27	00:56	09:25
NGC4731	Gal	Vir	12h 51m 01s	-06°23'33"	11.0	19:10	00:56	06:41
NGC4763	Gal	Crv	12h 53m 27s	-17°00'21"	13.0	19:43	00:58	06:14
NGC4841	Gal	Com	12h 57m 32s	+28°28'36"	11.5	17:33	01:02	08:32
NGC4911	Gal	Com	13h 00m 56s	+27°47'26"	12.8	17:39	01:06	08:33
NGC4945	Gal	Cen	13h 05m 27s	-49°28'02"	9.0	22:32	01:10	03:48
NGC5041	Gal	Com	13h 14m 33s	+30°42'20"	14.0	17:41	01:19	08:58
NGC5044	Gal	Vir	13h 15m 24s	-16°23'07"	11.0	20:03	01:20	06:37
NGC5139	Glob	Cen	13h 26m 47s	-47°28'53"	3.7	22:36	01:32	04:28
NGC5198	Gal	CVn	13h 30m 11s	+46°40'15"	13.0	16:26	01:35	10:44
NGC5253	Gal	Cen	13h 39m 56s	-31°38'26"	10.6	21:20	01:45	06:10
NGC5273	Gal	CVn	13h 42m 08s	+35°39'14"	11.6	17:47	01:47	09:47
M3	Glob	CVn	13h 42m 11s	+28°22'35"	7.0	18:18	01:47	09:16
NGC5286	Glob	Cen	13h 46m 27s	-51°22'30"	7.6	23:34	01:51	04:08
NGC5307	P Neb	Cen	13h 51m 03s	-51°12'20"	12.0	23:37	01:56	04:15
NGC5329	Gal	Vir	13h 52m 10s	+02°19'30"	14.0	19:48	01:57	08:06
NGC5341	Gal	CVn	13h 52m 32s	+37°49'00"	14.0	17:47	01:57	10:08
NGC5350	Gal	CVn	13h 53m 22s	+40°21'49"	11.4	17:34	01:58	10:23
NGC5353	Gal	CVn	13h 53m 27s	+40°16'59"	11.1	17:34	01:58	10:23
NGC5377	Gal	CVn	13h 56m 17s	+47°14'07"	11.2	16:47	02:01	11:15
NGC5367	Neb	Cen	13h 57m 43s	-39°58'42"		22:16	02:03	05:49
NGC5395	Gal	CVn	13h 58m 38s	+37°25'30"	11.6	17:55	02:04	10:12
NGC5398	Gal	Cen	14h 01m 22s	-33°03'46"	13.0	21:47	02:06	06:25
NGC5473	Gal	UMa	14h 04m 43s	+54°53'33"	11.4	14:53	02:10	13:26
NGC5460	Open	Cen	14h 07m 27s	-48°20'36"	5.6	23:24	02:12	05:01
NGC5506	Gal	Vir	14h 13m 15s	-03°12'27"	13.0	20:24	02:18	08:12
NGC5660	Gal	Boo	14h 29m 50s	+49°37'22"	11.8	16:57	02:35	12:12
NGC5643	Gal	Lup	14h 32m 41s	-44°10'26"	11.0	23:17	02:38	05:58
NGC5740	Gal	Vir	14h 44m 25s	+01°40'47"	11.9	20:42	02:49	08:57
NGC5746	Gal	Vir	14h 44m 56s	+01°57'18"	10.6	20:42	02:50	08:58
NGC5749	Open	Lup	14h 48m 53s	-54°29'54"	9.0	01:26	02:54	04:22
NGC5812	Gal	Lib	15h 00m 56s	-07°27'28"	11.2	21:23	03:06	08:48
NGC5831	Gal	Vir	15h 04m 07s	+01°13'12"	11.5	21:03	03:09	09:15
NGC5822	Open	Lup	15h 04m 21s	-54°23'48"	7.0	01:39	03:09	04:40
NGC5823	Open	Cir	15h 05m 30s	-55°36'12"	7.9	02:10	03:10	04:10

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC5879	Gal	Dra	15h 09m 47s	+57°00'03"	11.5	Circum	03:15	Circum
NGC5873	P Neb	Lup	15h 12m 51s	-38°07'30"	13.0	23:22	03:18	07:14
NGC5878	Gal	Lib	15h 13m 46s	-14°16'14"	11.5	21:55	03:19	08:42
NGC5882	P Neb	Lup	15h 16m 50s	-45°38'56"	11.0	00:11	03:22	06:32
M5	Glob	Ser	15h 18m 33s	+02°04'57"	7.0	21:15	03:23	09:32
NGC5925	Open	Nor	15h 27m 26s	-54°31'42"	8.0	02:05	03:32	05:00
NGC5937	Gal	Ser	15h 30m 46s	-02°49'47"	13.0	21:41	03:36	09:31
NGC5982	Gal	Dra	15h 38m 40s	+59°21'21"	11.1	Circum	03:44	Circum
NGC5986	Glob	Lup	15h 46m 04s	-37°47'08"	7.1	23:53	03:51	07:49
NGC6058	P Neb	Her	16h 04m 27s	+40°40'59"	13.0	19:43	04:09	12:36
NGC6031	Open	Nor	16h 07m 35s	-54°00'54"	8.5	02:35	04:12	05:50
NGC6072	P Neb	Sco	16h 12m 58s	-36°13'47"	14.0	00:13	04:18	08:23
NGC6067	Open	Nor	16h 13m 11s	-54°13'06"	5.6	02:44	04:18	05:52
M4	Glob	Sco	16h 23m 35s	-26°31'35"	7.5	23:44	04:28	09:13
NGC6124	Open	Sco	16h 25m 20s	-40°39'12"	5.8	00:48	04:30	08:13
NGC6144	Glob	Sco	16h 27m 14s	-26°01'26"	9.1	23:46	04:32	09:18
NGC6134	Open	Nor	16h 27m 46s	-49°09'06"	7.2	01:52	04:33	07:14
NGC6153	P Neb	Sco	16h 31m 31s	-40°15'13"	12.0	00:52	04:36	08:21
NGC6217	Gal	UMi	16h 32m 39s	+78°11'53"	11.2	Circum	04:38	Circum
NGC6169	Open	Nor	16h 34m 04s	-44°02'42"	7.0	01:17	04:39	08:01
NGC6167	Open	Nor	16h 34m 34s	-49°46'18"	6.7	02:05	04:39	07:14
NGC6188	Neb	Ara	16h 40m 05s	-48°39'42"		01:59	04:45	07:31
NGC6192	Open	Sco	16h 40m 23s	-43°22'00"	9.0	01:19	04:45	08:11
NGC6193	Open	Ara	16h 41m 20s	-48°45'48"	5.2	02:02	04:46	07:31
M13	Glob	Her	16h 41m 41s	+36°27'35"	7.0	20:43	04:47	12:50
NGC6200	Open	Ara	16h 44m 07s	-47°27'48"	7.4	01:53	04:49	07:45
NGC6210	P Neb	Her	16h 44m 30s	+23°47'59"	9.0	21:37	04:49	12:02
NGC6204	Open	Ara	16h 46m 09s	-47°01'00"	8.2	01:51	04:51	07:51
NGC6229	Glob	Her	16h 46m 59s	+47°31'39"	9.4	19:35	04:52	14:08
M12	Glob	Oph	16h 47m 14s	-01°56'52"	8.0	22:55	04:52	10:50
NGC6216	Open	Sco	16h 49m 24s	-44°43'42"	10.0	01:37	04:54	08:11
NGC6231	Open	Sco	16h 54m 10s	-41°49'30"	2.6	01:23	04:59	08:35
M10	Glob	Oph	16h 57m 09s	-04°05'56"	7.5	23:10	05:02	10:54
NGC6250	Open	Ara	16h 57m 56s	-45°56'12"	5.9	01:55	05:03	08:11
NGC6259	Open	Sco	17h 00m 45s	-44°39'18"	8.0	01:48	05:06	08:23
M62	Glob	Oph	17h 01m 13s	-30°06'45"	8.0	00:35	05:06	09:37
NGC6281	Open	Sco	17h 04m 41s	-37°59'06"	5.4	01:13	05:10	09:06
NGC6310	Gal	Dra	17h 07m 57s	+60°59'23"	14.0	Circum	05:13	Circum
NGC6302	P Neb	Sco	17h 13m 44s	-37°06'12"	13.0	01:18	05:19	09:20
NGC6309	P Neb	Oph	17h 14m 04s	-12°54'38"	11.0	23:52	05:19	10:46
NGC6304	Glob	Oph	17h 14m 32s	-29°27'43"	8.4	00:46	05:19	09:53
NGC6316	Glob	Oph	17h 16m 37s	-28°08'23"	9.0	00:43	05:21	10:00
M92	Glob	Her	17h 17m 07s	+43°08'11"	7.5	20:40	05:22	14:04
NGC6325	Glob	Oph	17h 17m 59s	-23°45'57"	10.7	00:29	05:23	10:17
NGC6326	P Neb	Ara	17h 20m 46s	-51°45'17"	12.0	03:13	05:26	07:38

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6334	Neb	Sco	17h 20m 49s	-36°06'12"		01:20	05:26	09:31
NGC6342	Glob	Oph	17h 21m 10s	-19°35'14"	9.9	00:19	05:26	10:33
NGC6356	Glob	Oph	17h 23m 35s	-17°48'52"	8.4	00:16	05:28	10:41
NGC6355	Glob	Oph	17h 23m 59s	-26°21'10"	9.6	00:44	05:29	10:14
NGC6357	Neb	Sco	17h 24m 43s	-34°12'06"		01:15	05:30	09:44
NGC6352	Glob	Ara	17h 25m 29s	-48°25'21"	8.2	02:43	05:30	08:18
NGC6366	Glob	Oph	17h 27m 44s	-05°04'36"	10.0	23:44	05:33	11:22
NGC6369	P Neb	Oph	17h 29m 21s	-23°45'34"	13.0	00:40	05:34	10:28
NGC6412	Gal	Dra	17h 29m 37s	+75°42'14"	11.8	Circum	05:34	Circum
NGC6388	Glob	Sco	17h 36m 17s	-44°44'08"	6.9	02:24	05:41	08:58
NGC6401	Glob	Oph	17h 38m 37s	-23°54'33"	9.5	00:50	05:43	10:37
NGC6400	Open	Sco	17h 40m 12s	-36°56'54"	9.0	01:43	05:45	09:47
M6	Open	Sco	17h 40m 20s	-32°15'12"	4.5	01:23	05:45	10:08
NGC6397	Glob	Ara	17h 40m 42s	-53°40'26"	5.7	04:02	05:46	07:29
NGC6416	Open	Sco	17h 44m 19s	-32°21'42"	5.7	01:27	05:49	10:11
NGC6426	Glob	Oph	17h 44m 55s	+03°10'11"	11.2	23:38	05:50	12:01
NGC6425	Open	Sco	17h 47m 01s	-31°31'48"	7.2	01:26	05:52	10:17
NGC6439	P Neb	Sgr	17h 48m 20s	-16°28'44"	14.0	00:36	05:53	11:10
NGC6445	P Neb	Sgr	17h 49m 15s	-20°00'36"	13.0	00:48	05:54	11:00
NGC6503	Gal	Dra	17h 49m 27s	+70°08'40"	10.2	Circum	05:54	Circum
NGC6441	Glob	Sco	17h 50m 13s	-37°03'03"	7.4	01:54	05:55	09:56
NGC6451	Open	Sco	17h 50m 41s	-30°12'36"	8.0	01:25	05:56	10:26
NGC6453	Glob	Sco	17h 50m 52s	-34°35'54"	9.9	01:43	05:56	10:08
M7	Open	Sco	17h 53m 51s	-34°47'36"	3.5	01:47	05:59	10:10
NGC6538	Gal	Dra	17h 54m 17s	+73°25'26"	14.0	Circum	05:59	Circum
M23	Open	Sgr	17h 57m 04s	-18°59'06"	6.0	00:53	06:02	11:11
NGC6543	P Neb	Dra	17h 58m 33s	+66°37'59"	9.0	Circum	06:03	Circum
NGC6496	Glob	Sco	17h 59m 04s	-44°16'00"	9.2	02:44	06:04	09:24
NGC6507	Open	Sgr	17h 59m 50s	-17°27'00"	10.0	00:51	06:05	11:19
M20	Neb	Sgr	18h 02m 42s	-22°58'18"	5.0	01:11	06:08	11:04
NGC6520	Open	Sgr	18h 03m 24s	-27°53'18"	8.0	01:29	06:08	10:48
NGC6522	Glob	Sgr	18h 03m 35s	-30°02'06"	8.6	01:37	06:08	10:40
M8	Neb	Sgr	18h 03m 41s	-24°22'48"	5.0	01:17	06:09	11:00
NGC6526	Neb	Sgr	18h 04m 06s	-24°26'30"		01:17	06:09	11:01
M21	Open	Sgr	18h 04m 13s	-22°29'24"	7.0	01:11	06:09	11:07
NGC6530	Open	Sgr	18h 04m 31s	-24°21'30"	4.6	01:18	06:09	11:01
NGC6528	Glob	Sgr	18h 04m 50s	-30°03'21"	9.5	01:38	06:10	10:41
NGC6539	Glob	Ser	18h 04m 50s	-07°35'11"	9.6	00:28	06:10	11:52
NGC6537	P Neb	Sgr	18h 05m 13s	-19°50'35"	13.0	01:04	06:10	11:17
NGC6546	Open	Sgr	18h 07m 22s	-23°17'48"	8.0	01:17	06:12	11:08
NGC6541	Glob	CrA	18h 08m 02s	-43°42'57"	6.6	02:49	06:13	09:37
NGC6553	Glob	Sgr	18h 09m 17s	-25°54'30"	8.3	01:28	06:14	11:01
NGC6559	Neb	Sgr	18h 09m 57s	-24°06'23"		01:22	06:15	11:08
NGC6565	P Neb	Sgr	18h 11m 53s	-28°10'41"	13.0	01:38	06:17	10:55
NGC6563	P Neb	Sgr	18h 12m 03s	-33°52'07"	14.0	02:01	06:17	10:33

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6572	P Neb	Oph	18h 12m 06s	+06°51'13"	9.0	23:56	06:17	12:38
NGC6568	Open	Sgr	18h 12m 44s	-21°36'18"	9.0	01:17	06:18	11:19
NGC6569	Glob	Sgr	18h 13m 39s	-31°49'35"	8.7	01:54	06:19	10:43
NGC6567	P Neb	Sgr	18h 13m 45s	-19°04'34"	12.0	01:10	06:19	11:28
NGC6583	Open	Sgr	18h 15m 49s	-22°08'12"	10.0	01:21	06:21	11:20
NGC6578	P Neb	Sgr	18h 16m 16s	-20°27'03"	13.0	01:17	06:21	11:26
NGC6605	Open	Ser	18h 16m 24s	-15°00'00"	6.0	01:00	06:21	11:42
NGC6595	Open	Sgr	18h 17m 05s	-19°51'57"	7.0	01:15	06:22	11:28
NGC6604	Open	Ser	18h 18m 03s	-12°14'35"	6.5	00:54	06:23	11:52
M24	Open	Sgr	18h 18m 26s	-18°24'24"	4.5	01:12	06:23	11:34
NGC6584	Glob	Tel	18h 18m 38s	-52°12'57"	9.2	04:17	06:24	08:30
M16	Neb	Ser	18h 18m 48s	-13°48'24"	6.5	00:59	06:24	11:48
M17	Neb	Sgr	18h 20m 47s	-16°10'18"	7.0	01:08	06:26	11:43
NGC6625	Open	Sct	18h 23m 01s	-12°01'24"	9.0	00:58	06:28	11:58
NGC6624	Glob	Sgr	18h 23m 41s	-30°21'40"	8.3	01:58	06:29	10:59
M28	Glob	Sgr	18h 24m 33s	-24°52'07"	8.5	01:39	06:29	11:20
NGC6629	P Neb	Sgr	18h 25m 42s	-23°12'10"	12.0	01:35	06:31	11:26
NGC6633	Open	Oph	18h 27m 15s	+06°30'30"	4.6	00:12	06:32	12:53
M25	Open	Sgr	18h 31m 42s	-19°07'00"	6.5	01:28	06:37	11:45
NGC6644	P Neb	Sgr	18h 32m 35s	-25°07'44"	12.0	01:48	06:37	11:27
NGC6645	Open	Sgr	18h 32m 37s	-16°53'00"	9.0	01:22	06:37	11:53
NGC6647	Open	Sgr	18h 32m 49s	-17°13'42"	8.0	01:23	06:38	11:52
NGC6649	Open	Sct	18h 33m 27s	-10°24'12"	8.9	01:04	06:38	12:13
NGC6661	Gal	Her	18h 34m 37s	+22°54'36"	11.9	23:30	06:39	13:49
M22	Glob	Sgr	18h 36m 24s	-23°54'17"	6.5	01:48	06:41	11:35
NGC6683	Open	Sct	18h 42m 13s	-06°12'42"	10.0	01:01	06:47	12:33
M70	Glob	Sgr	18h 43m 12s	-32°17'27"	9.0	02:26	06:48	11:11
M26	Open	Sct	18h 45m 18s	-09°23'00"	9.5	01:13	06:50	12:27
NGC6704	Open	Sct	18h 50m 45s	-05°12'18"	9.2	01:07	06:56	12:44
NGC6709	Open	Aql	18h 51m 18s	+10°19'06"	6.7	00:25	06:56	13:27
M57	P Neb	Lyr	18h 53m 35s	+33°01'44"	9.5	23:11	06:58	14:46
NGC6716	Open	Sgr	18h 54m 34s	-19°54'06"	6.9	01:53	06:59	12:06
M54	Glob	Sgr	18h 55m 03s	-30°28'47"	8.5	02:30	07:00	11:30
NGC6723	Glob	Sgr	18h 59m 33s	-36°37'54"	7.3	03:01	07:04	11:08
NGC6738	Open	Aql	19h 01m 21s	+11°36'54"	8.0	00:31	07:06	13:41
NGC6726	Neb	CrA	19h 01m 39s	-36°53'30"		03:05	07:07	11:09
NGC6745	Gal	Lyr	19h 01m 42s	+40°45'31"	13.0	22:40	07:07	15:34
NGC6729	Neb	CrA	19h 01m 55s	-36°57'30"		03:05	07:07	11:08
NGC6741	P Neb	Aql	19h 02m 37s	-00°26'57"	11.0	01:06	07:07	13:09
NGC6749	Glob	Aql	19h 05m 15s	+01°54'02"	11.1	01:02	07:10	13:18
NGC6751	P Neb	Aql	19h 05m 56s	-05°59'31"	13.0	01:24	07:11	12:57

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- Family membership at \$30.00 per year.
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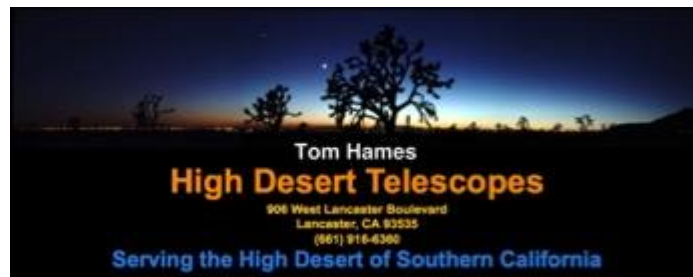


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