



# Desert Sky Observer

Volume 39

Antelope Valley Astronomy Club Newsletter

October 2019

## Up-Coming Events

October 5: [Lunar Club](#)

October 11: Club Meeting\*

October 19: [Prime Desert Moon Walk](#)

October 26: [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

Well it is finally my favorite time of the year. Cooler days and longer nights. This is the best time of the year to go out and do some observing, Early in the evening we have the summer constellations still and later the winter constellations come up.

Last Labor Day weekend we had our Deep Sky Party up at Mt. Pinos, some members went up on Friday and the rest on Saturday. I was having a problem with my power cord so I didn't bring my scope up there, just my chair to hang out with the members and other amateur astronomers.

On my way to Mt Pinos, I stopped at Rick's Pizza in Lockwood Valley to get a pizza to eat and share when I got to the top of the parking lot. I ordered an x-large pizza with pepperoni on it. It was a little expensive, but if you are the only pizza place there, I guess you can get away with it. After waiting 40 minutes, I started up the mountain.



I was surprised that it was not that crowded, as last year was. I got there I first saw Rod and Tom, Matt and Michael were still sleeping. After saying hi to everyone, I offered them some of my pizza. When I opened the box I didn't see any pepperoni, they put it under the cheese. After eating the first two slices, I couldn't eat any more of it. To me it had to be the worst pizza I ever had. I threw the other half away; I will not be buying any more of their pizza.

As it got dark, I just sat in my chair and stared at the Milky Way through the treetops. I did however occasionally get up to go over and look through Matt's big 24 inch Dob and check out what Rod had on his monitor. By 11:00pm, I said goodbye to everyone and headed home.

On September 21st we had our monthly public star party at Prime Desert, Moon Walk. The weather was great no wind and no clouds. We had a great turn out and Jeremy said we had 194 people show up this month. I would like to thank Frank, Phil and Kevin for coming out and showing the public the night skies.

On October 11th we will have our annual business meeting and board election, nominations for Executive Board are open to all members. This is your club and you only get out of it what you put into it.

Because of my new job at Disney Studios in Burbank, I cannot make any of the club meetings. However, I still can help on the weekends. So, if everyone can just help out just a little, the club will do great things.

Hope for clear skies and keep looking up.

## Secretary

### Rose Moore

Welcome Fall weather!

Coming up (probably prior to this DSO) is a dark sky star party the last weekend in September at Chuchupate. Please check the weather before making a trip up the mountain. An email with info will be sent just before the weekend with directions. There are pit toilets, but no running water.

We will have a Lunar Club event at Judy Fuentes' home on Saturday Oct. 5th, start time to be announced. Start time and information to follow in an email. Weather permitting. Sunset is at 6:32pm. There will be a few planets up, and it is a First Quarter Moon.

Also on Saturday Oct. 5th in Tehachapi, is a public star party at the Municipal Airport starting at 7:30pm, and ending at 10:00 pm. Weather permitting. We will need members with telescopes from the Tehachapi area. More info to follow.

Our club business meeting is on Friday Oct. 11th, starting at 7pm. Please come out and vote for your Executive Board for 2020. We need your input, your energy, your suggestions, and your vote to make this club work!

On Saturday Oct. 19th, we have a Prime Desert Woodland Moon Walk with Jeremy. This event starts at 7pm, set up time is approximately 1 hour prior to start. Weather permitting.

We have a dark sky star party on Saturday October 26th at Red Cliffs Natural Area near Cantil. The Moon will be a small crescent and down by around 5:30pm. Saturn and Jupiter will be set by 10:30pm and 9pm, respectively. There are pit toilets and a couple of picnic tables. No running water. Weather permitting. More info to follow.

November brings a Prime Desert Woodland Moon Walk, a dark sky star party, and a meeting. The meeting's presenter will be Tom Hames, who will conduct another painting class. This will require reservations, and will be open to the public as well. There will be a small fee.

In December we are having our Christmas Party on Saturday Dec. 7th, starting at 6pm. The event will be held at Gino's Restaurant at the Marketplace in Lancaster. The cost is \$25 per person. You may pay our Treasurer Rod at the October or November meeting, or pay by Paypal (link to be set up soon), or mail in a check. More information to follow.

Rose

## Space Place

### Find Strange Uranus in Aries

David Prosper

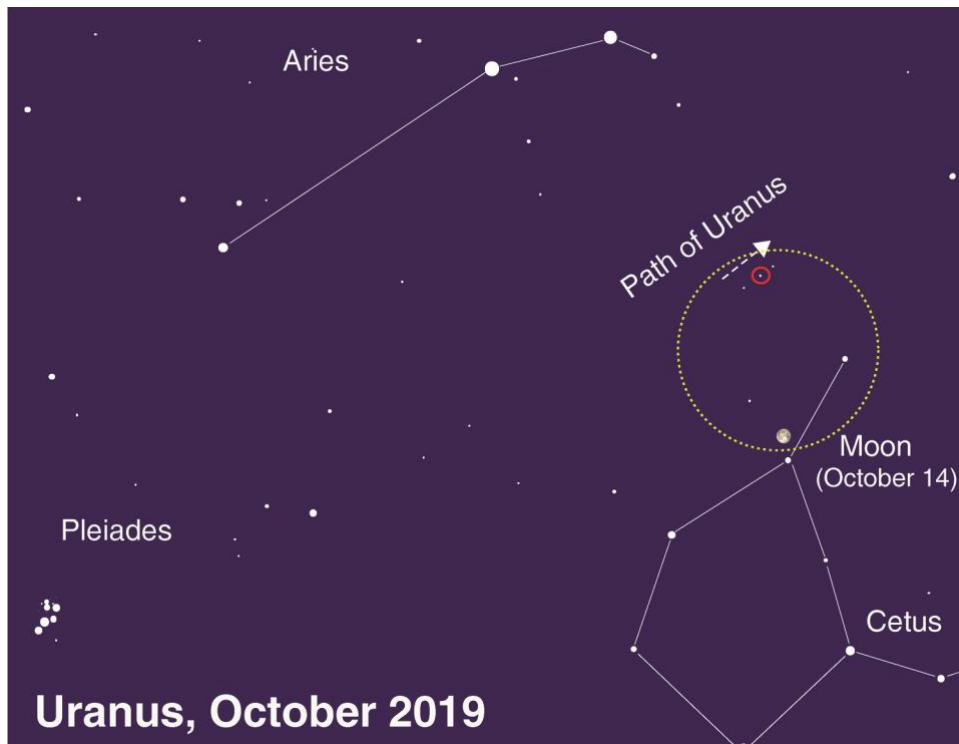
Most of the planets in our solar system are bright and easily spotted in our night skies. The exceptions are the ice giant planets: Uranus and Neptune. These worlds are so distant and dim that binoculars or telescopes are almost always needed to see them. A great time to search for Uranus is during its opposition on October 28, since the planet is up almost the entire night and at its brightest for the year.

Search for Uranus in the space beneath the stars of Aries the Ram and above Cetus the Whale. These constellations are found west of more prominent Taurus the Bull and Pleiades star cluster. You can also use the Moon as a guide! Uranus will be just a few degrees north of the Moon the night of October 14, close enough to fit both objects into the same binocular field of view. However, it will be much easier to see dim Uranus by moving the bright Moon just out of sight. If you're using a telescope, zoom in as much as possible once you find Uranus; 100x magnification and greater will reveal its small greenish disc, while background stars will remain points.

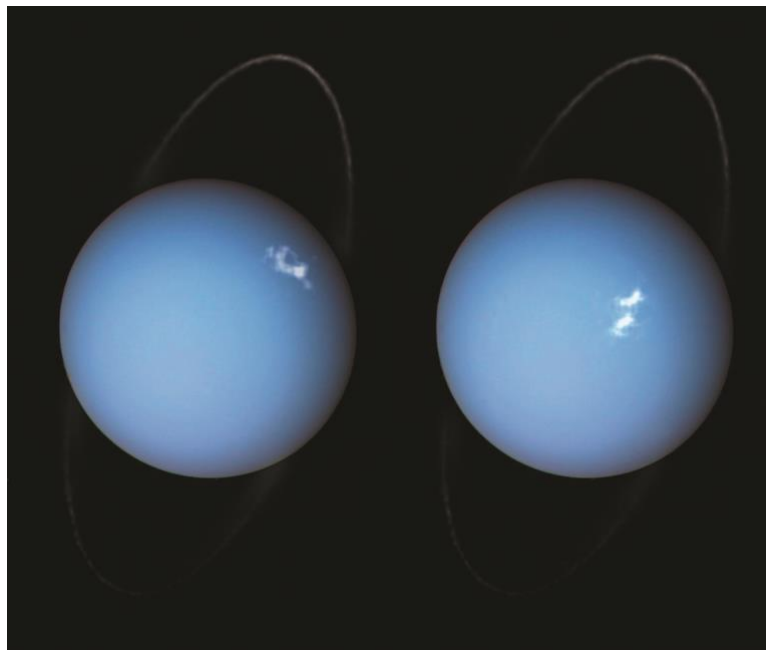
Try this observing trick from a dark sky location. Find Uranus with your telescope or binoculars, then look with your unaided eyes at the patch of sky where your equipment is aimed. Do you see a faint star where Uranus should be? That's not a star; you're actually seeing Uranus with your naked eye! The ice giant is just bright enough near opposition - magnitude 5.7 - to be visible to observers under clear dark skies. It's easier to see this ghostly planet unaided after first using an instrument to spot it, sort of like "training wheels" for your eyes. Try this technique with other objects as you observe, and you'll be amazed at what your eyes can pick out.

By the way, you've spotted the first planet discovered in the modern era! William Herschel discovered Uranus via telescope in 1781, and Johan Bode confirmed its status as a planet two years later. NASA's Voyager 2 is the only spacecraft to visit this strange world, with a brief flyby in 1986. It revealed a strange, severely tilted planetary system possessing faint dark rings, dozens of moons, and eerily featureless cloud tops. Subsequent observations of Uranus from powerful telescopes like Hubble and Keck showed its blank face was temporary, as powerful storms were spotted, caused by dramatic seasonal changes during its 84-year orbit. Uranus's wildly variable seasons result from a massive collision billions of years ago that tipped the planet to its side.

Discover more about NASA's current and future missions of exploration of the distant solar system and beyond at [nasa.gov](http://nasa.gov)



*Caption: The path of Uranus in October is indicated by an arrow; its position on October 14 is circled. The wide dashed circle approximates the field of view from binoculars or a finderscope. Image created with assistance from Stellarium.*



*Caption: Composite images taken of Uranus in 2012 and 2014 by the Hubble Space Telescope, showcasing its rings and auroras. More at [bit.ly/uranusauroras](http://bit.ly/uranusauroras) Credit: ESA/Hubble & NASA, L. Lamy / Observatoire de Paris*

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

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[www.avastronomyclub.org](http://www.avastronomyclub.org)

## News Headlines

### **NASA's WFIRST Will Help Uncover the Universe's Fate**

Scientists have discovered that a mysterious pressure dubbed "dark energy" makes up about 68% of the total energy content of the cosmos, but so far we don't know much more about it. Exploring the nature of dark energy is one of the primary reasons NASA is building the Wide Field Infrared Survey Telescope (WFIRST), a space telescope whose measurements will help illuminate the dark energy puzzle. With a better understanding of dark energy, we will have a better sense of the past and future evolution of the universe..

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

### **NASA's Future Moon Rocket Will Probably Be Delayed Again |**

The giant rocket that NASA is building to send astronauts to the Moon will likely be delayed and over budget — yet again. That's according to a new report from the Government Accountability Office, which reviewed the hardware NASA has been developing for deep space human exploration. The report... is the latest in a long string of reviews that have identified schedule problems and cost overruns with the rocket's development program.

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

### **Russia Says It Will Keep Source of Hole (and Air Leak) on Soyuz Secret— But NASA Wants to Know**

Amid reports that the Russians will keep the cause of an air leak discovered at the International Space Station in 2018 secret, NASA Administrator Jim Bridenstine has promised to speak personally with the head of the Russian space agency. "They have not told me anything," Bridenstine said during a Houston energy conference question session Thursday (Sept. 19) according to the Houston Chronicle.

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

### **The universe may be billions of years younger than we thought**

New calculations suggest the universe could be a couple billion years younger than scientists now estimate, and even younger than suggested by two other calculations published this year that trimmed hundreds of millions of years from the age of the cosmos. The huge swings in scientists' estimates — even this new calculation could be off by billions of years — reflect different approaches to the tricky problem of figuring the universe's real age.

<https://nbcnews.to/2kYeJzV>

## October Sky Data

First Qtr Oct 5      Full Oct 13      Last Qtr Oct 21      New Oct 27



## Planet Summary

**Mercury**, reaches eastern elongation (at an angular distance of 24.6 degrees) on the 19th of the month but its elevation at sunset is so low that, lying to the upper left of Venus, it will be very hard to spot. A very low south-western horizon will be needed along with binoculars.

**Venus** may be glimpsed in the west south-west some 30 minutes after sunset at the start of the month, but will be very difficult to see due to the fact that the ecliptic is at a shallow angle to the horizon. By month's end it sets about one hour after the Sun but will still be hard to spot. Its magnitude remains at about -3.9 and its disk, ~10 arc seconds across, is almost fully lit.

**Mars**, which passed behind the Sun (superior conjunction) on September 2nd, returns to the pre-dawn sky at the start of its new apparition. It might just be glimpsed just south of east in the latter part of the month but will only have an elevation of ~11 degrees at sunrise by month's end.

**Jupiter** can be seen low in the southwest as darkness falls. As the month progresses, its angular size drops from 35.8 to 33.5 arc seconds. Jupiter lies in the southeastern part of Ophiuchus and is heading towards the southernmost part of the ecliptic so, as it appears in the twilight, will only have an elevation of ~10 degrees.

**Saturn** can be seen in the south as darkness falls at the start of the month. Then, its disk is ~16.8 arc seconds across and its rings - which are still, at 25.2 degrees, nicely tilted from the line of sight - spanning some 41 arc seconds across. Sadly, now in Sagittarius and lying on the south-western side of the milky way, it is at the lowest point of the ecliptic and will only reach an elevation of ~14 degrees.

The Orionid **meteor shower** is set to peak on the night of Oct. 22-23, but a bright moon will disrupt viewing until shortly before dawn. The meteors that streak across the sky are some of the fastest among meteor showers, because the Earth is hitting a stream of particles almost head on.

## Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
10/1/2019	10:01	21:03	06:48	18:37
10/5/2019	14:05	n/a	06:50	18:31
10/10/2019	17:18	03:55	06:54	18:25
10/15/2019	19:44	08:31	06:58	18:18
10/20/2019	23:37	13:23	07:02	18:12
10/25/2019	04:07	17:03	07:07	18:06
10/31/2019	10:57	21:10	07:11	18:00

## Planet Data

	Oct 1			
	Rise	Transit	Set	Mag
<b>Mercury</b>	08:23	13:54	19:26	-0.1
<b>Venus</b>	07:50	13:33	19:16	-3.4
<b>Mars</b>	06:02	12:09	18:17	2.0
<b>Jupiter</b>	12:25	17:23	22:21	-1.6
<b>Saturn</b>	14:17	19:15	00:13	1.6

	Oct 15			
	Rise	Transit	Set	Mag
<b>Mercury</b>	09:00	14:10	19:19	0.1
<b>Venus</b>	08:19	13:44	19:08	-3.3
<b>Mars</b>	05:50	11:47	17:45	2.0
<b>Jupiter</b>	11:40	16:37	21:34	-1.5
<b>Saturn</b>	13:24	18:22	23:20	1.6

	Oct 31			
	Rise	Transit	Set	Mag
<b>Mercury</b>	08:56	13:55	18:53	0.6
<b>Venus</b>	08:54	14:00	19:06	-3.3
<b>Mars</b>	05:36	11:22	17:09	2.0
<b>Jupiter</b>	10:50	15:46	20:43	-1.5
<b>Saturn</b>	12:24	17:23	22:21	1.6

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



## 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
M27	P Neb	Vul	19h 59m 36s	+22°43'15"	7.5	13:14	20:23	03:32
NGC6871	Open	Cyg	20h 05m 59s	+35°46'38"	5.2	12:29	20:29	04:30
M75	Glob	Sgr	20h 06m 05s	-21°55'19"	9.5	15:29	20:29	01:29
NGC6884	P Neb	Cyg	20h 10m 24s	+46°27'39"	13.0	11:26	20:33	05:41
NGC6879	P Neb	Sge	20h 10m 27s	+16°55'22"	13.0	13:43	20:34	03:24
NGC6881	P Neb	Cyg	20h 10m 52s	+37°24'42"	14.0	12:25	20:34	04:43
NGC6882	Open	Vul	20h 11m 58s	+26°29'00"	8.1	13:13	20:35	03:57
NGC6888	Neb	Cyg	20h 12m 06s	+38°21'17"		12:22	20:35	04:49
NGC6886	P Neb	Sge	20h 12m 43s	+19°59'22"	12.0	13:36	20:36	03:36
NGC6891	P Neb	Del	20h 15m 09s	+12°42'16"	12.0	14:00	20:38	03:16
NGC6894	P Neb	Cyg	20h 16m 24s	+30°33'55"	14.0	13:02	20:39	04:17
NGC6905	P Neb	Del	20h 22m 23s	+20°06'16"	12.0	13:45	20:45	03:46
NGC6910	Open	Cyg	20h 23m 12s	+40°46'42"	7.4	12:19	20:46	05:13
M29	Open	Cyg	20h 23m 57s	+38°30'30"	9.0	12:33	20:47	05:01
NGC6914	Neb	Cyg	20h 24m 43s	+42°28'57"		12:10	20:48	05:26
NGC6934	Glob	Del	20h 34m 11s	+07°24'17"	8.9	14:34	20:57	03:20
NGC6946	Gal	Cyg	20h 34m 52s	+60°09'14"	8.9	Circum	20:58	Circum
NGC6945	Gal	Aqr	20h 39m 01s	-04°58'21"	13.0	15:13	21:02	02:51
NGC6960	Neb	Cyg	20h 45m 58s	+30°35'42"		13:31	21:09	04:47
M72	Glob	Aqr	20h 53m 28s	-12°32'14"	10.0	15:48	21:17	02:45
NGC6992	Neb	Cyg	20h 56m 19s	+31°44'36"		13:37	21:19	05:02
NGC6995	Neb	Cyg	20h 57m 10s	+31°14'06"		13:40	21:20	05:01
NGC7000	Neb	Cyg	20h 59m 18s	+44°31'00"		12:31	21:22	06:14
NGC7008	P Neb	Cyg	21h 00m 33s	+54°32'35"	13.0	10:20	21:24	08:27
NGC7006	Glob	Del	21h 01m 29s	+16°11'15"	10.6	14:36	21:25	04:13
NGC7009	P Neb	Aqr	21h 04m 11s	-11°21'50"	8.0	15:56	21:27	02:59
NGC7010	Gal	Aqr	21h 04m 40s	-12°20'18"	14.0	15:59	21:28	02:57
NGC7026	P Neb	Cyg	21h 06m 19s	+47°51'08"	13.0	12:10	21:29	06:49
NGC7027	P Neb	Cyg	21h 07m 02s	+42°14'10"	10.0	12:54	21:30	06:06
NGC7048	P Neb	Cyg	21h 14m 15s	+46°17'18"	11.0	12:32	21:37	06:43
NGC7076	Neb	Cep	21h 26m 24s	+62°53'33"		Circum	21:49	Circum
NGC7082	Open	Cyg	21h 29m 17s	+47°07'36"	7.2	12:40	21:52	07:05
M15	Glob	Peg	21h 29m 58s	+12°10'02"	7.5	15:17	21:53	04:29
M39	Open	Cyg	21h 31m 42s	+48°25'00"	5.5	12:30	21:55	07:20
M2	Glob	Aqr	21h 33m 27s	-00°49'23"	7.5	15:56	21:57	03:57
NGC7090	Gal	Ind	21h 36m 28s	-54°33'24"	11.0	20:33	22:00	23:27
M30	Glob	Cap	21h 40m 22s	-23°10'45"	8.5	17:08	22:03	02:59
NGC7160	Open	Cep	21h 53m 40s	+62°36'12"	6.1	Circum	22:17	Circum
NGC7177	Gal	Peg	22h 00m 41s	+17°44'16"	11.2	15:31	22:24	05:17



ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC7213	Gal	Gru	22h 09m 16s	-47°10'00"	10.5	19:34	22:32	01:31
NGC7243	Open	Lac	22h 15m 08s	+49°53'54"	6.4	12:57	22:38	08:19
NGC7245	Open	Lac	22h 15m 11s	+54°20'36"	9.2	11:41	22:38	09:35
NGC7261	Open	Cep	22h 20m 06s	+58°03'00"	8.4	Circum	22:43	Circum
NGC7314	Gal	PsA	22h 35m 46s	-26°03'01"	10.9	18:13	22:59	03:45
NGC7354	P Neb	Cep	22h 40m 20s	+61°17'07"	13.0	Circum	23:03	Circum
NGC7383	Gal	Peg	22h 49m 36s	+11°33'23"	13.9	16:38	23:13	05:47
NGC7386	Gal	Peg	22h 50m 02s	+11°41'54"	12.5	16:38	23:13	05:48
NGC7392	Gal	Aqr	22h 51m 49s	-20°36'26"	11.9	18:11	23:15	04:19
NGC7410	Gal	Gru	22h 55m 01s	-39°39'42"	10.4	19:30	23:18	03:06
NGC7426	Gal	Lac	22h 56m 03s	+36°21'41"	13.0	15:16	23:19	07:22
NGC7469	Gal	Peg	23h 03m 16s	+08°52'26"	11.9	16:59	23:26	05:53
NGC7492	Glob	Aqr	23h 08m 27s	-15°36'41"	11.5	18:12	23:32	04:51
NGC7507	Gal	Scl	23h 12m 08s	-28°32'24"	10.4	18:58	23:35	04:12
NGC7513	Gal	Scl	23h 13m 14s	-28°21'30"	11.8	18:59	23:36	04:14
NGC7538	Neb	Cep	23h 13m 38s	+61°30'42"		Circum	23:37	Circum
NGC7562	Gal	Psc	23h 15m 58s	+06°41'15"	11.5	17:18	23:39	06:00
NGC7552	Gal	Gru	23h 16m 11s	-42°35'05"	10.7	20:08	23:39	03:10
NGC7570	Gal	Peg	23h 16m 45s	+13°28'59"	14.0	17:00	23:40	06:20
NGC7590	Gal	Gru	23h 18m 55s	-42°14'22"	11.6	20:09	23:42	03:15
NGC7626	Gal	Peg	23h 20m 43s	+08°13'01"	11.2	17:19	23:44	06:09
NGC7635	Neb	Cas	23h 20m 45s	+61°12'42"		Circum	23:44	Circum
NGC7662	P Neb	And	23h 25m 54s	+42°32'06"	9.0	15:11	23:49	08:27
NGC7686	Open	And	23h 30m 07s	+49°08'00"	5.6	14:21	23:53	09:25
NGC7694	Gal	Psc	23h 33m 16s	-02°42'12"	14.0	18:01	23:56	05:52
NGC7713	Gal	Scl	23h 36m 15s	-37°56'20"	12.0	20:02	23:59	03:56
NGC7727	Gal	Aqr	23h 39m 54s	-12°17'35"	10.7	18:34	00:03	05:32
NGC7742	Gal	Peg	23h 44m 16s	+10°46'01"	11.5	17:35	00:07	06:40
NGC7775	Gal	Peg	23h 52m 24s	+28°46'20"	14.0	16:45	00:15	07:46
NGC7789	Open	Cas	23h 57m 24s	+56°42'30"	6.7	Circum	00:20	Circum
NGC7810	Gal	Peg	00h 02m 19s	+12°58'17"	14.0	17:47	00:25	07:04
NGC7808	Gal	Cet	00h 03m 32s	-10°44'40"	14.0	18:53	00:27	06:00
NGC7822	Neb	Cep	00h 03m 36s	+67°09'00"		Circum	00:27	Circum
NGC35	Gal	Cet	00h 11m 10s	-12°01'15"	14.0	19:05	00:34	06:04
NGC40	P Neb	Cep	00h 13m 01s	+72°31'19"	11.0	Circum	00:36	Circum
NGC45	Gal	Cet	00h 14m 04s	-23°10'53"	10.4	19:41	00:37	05:33
NGC55	Gal	Scl	00h 15m 08s	-39°13'12"	8.0	20:48	00:38	04:29
NGC133	Open	Cas	00h 31m 19s	+63°21'00"	9.0	Circum	00:54	Circum
NGC157	Gal	Cet	00h 34m 47s	-08°23'46"	10.4	19:18	00:58	06:38
M31	Gal	And	00h 42m 44s	+41°16'08"	4.3	16:36	01:06	09:36
NGC246	P Neb	Cet	00h 47m 03s	-11°52'19"	8.0	19:40	01:10	06:40
NGC288	Glob	Scl	00h 52m 45s	-26°35'01"	8.1	20:32	01:16	06:00
NGC300	Gal	Scl	00h 54m 53s	-37°41'03"	9.0	21:20	01:18	05:16
NGC327	Gal	Cet	00h 57m 55s	-05°07'50"	13.0	19:32	01:21	07:10
NGC337	Gal	Cet	00h 59m 50s	-07°34'39"	11.6	19:41	01:23	07:05

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC380	Gal	Psc	01h 07m 18s	+32°28'59"	12.5	17:45	01:30	09:16
NGC381	Open	Cas	01h 08m 19s	+61°35'00"	9.0	Circum	01:31	Circum
NGC404	Gal	And	01h 09m 27s	+35°43'05"	10.1	17:32	01:33	09:33
NGC420	Gal	Psc	01h 12m 10s	+32°07'23"	13.0	17:51	01:35	09:19
NGC467	Gal	Psc	01h 19m 10s	+03°18'02"	11.9	19:31	01:42	07:54
M33	Gal	Tri	01h 33m 51s	+30°39'37"	6.2	18:19	01:57	09:35
M76	P Neb	Per	01h 42m 18s	+51°34'15"	12.0	16:03	02:05	12:08
NGC659	Open	Cas	01h 44m 24s	+60°40'24"	7.9	Circum	02:07	Circum
NGC690	Gal	Cet	01h 47m 48s	-16°43'18"	14.0	20:55	02:11	07:27
NGC720	Gal	Cet	01h 53m 00s	-13°44'19"	10.2	20:51	02:16	07:41
NGC752	Open	And	01h 57m 41s	+37°47'06"	5.7	18:10	02:21	10:31
NGC772	Gal	Ari	01h 59m 20s	+19°00'29"	10.3	19:26	02:22	09:19
NGC769	Gal	Tri	01h 59m 36s	+30°54'34"	13.0	18:44	02:23	10:02
NGC803	Gal	Ari	02h 03m 45s	+16°01'52"	12.4	19:39	02:27	09:15
NGC877	Gal	Ari	02h 18m 00s	+14°32'39"	11.8	19:58	02:41	09:24
NGC869	Open	Per	02h 19m 00s	+57°07'42"	4.0	Circum	02:42	Circum
NGC884	Open	Per	02h 22m 18s	+57°08'12"	4.0	Circum	02:45	Circum
NGC908	Gal	Cet	02h 23m 05s	-21°14'02"	10.2	21:44	02:46	07:48
NGC896	Neb	Cas	02h 25m 28s	+62°01'09"		Circum	02:49	Circum
NGC925	Gal	Tri	02h 27m 17s	+33°34'44"	10.0	19:00	02:50	10:41
NGC986	Gal	For	02h 33m 34s	-39°02'44"	11.0	23:05	02:57	06:48
NGC1042	Gal	Cet	02h 40m 24s	-08°26'01"	10.9	21:24	03:03	08:43
NGC1023	Gal	Per	02h 40m 24s	+39°03'46"	9.5	18:46	03:03	11:21
NGC1055	Gal	Cet	02h 41m 45s	+00°26'33"	10.6	21:01	03:05	09:09
NGC1100	Gal	Eri	02h 45m 36s	-17°41'19"	13.0	21:56	03:09	08:22
NGC1084	Gal	Eri	02h 46m 00s	-07°34'38"	10.6	21:27	03:09	08:51
NGC1187	Gal	Eri	03h 02m 38s	-22°52'03"	11.0	22:29	03:26	08:23
NGC1199	Gal	Eri	03h 03m 39s	-15°36'50"	11.5	22:07	03:27	08:46
NGC1214	Gal	Eri	03h 06m 56s	-09°32'41"	14.0	21:53	03:30	09:07
NGC1261	Glob	Hor	03h 12m 16s	-55°12'57"	8.4	02:24	03:35	04:47
NGC1316	Gal	For	03h 22m 42s	-37°12'30"	8.9	23:45	03:46	07:46
NGC1317	Gal	For	03h 22m 44s	-37°06'12"	11.0	23:45	03:46	07:47
NGC1325	Gal	Eri	03h 24m 25s	-21°32'40"	11.6	22:46	03:48	08:49
NGC1333	Neb	Per	03h 29m 20s	+31°24'56"		20:11	03:52	11:33
NGC1350	Gal	For	03h 31m 08s	-33°37'43"	10.5	23:37	03:54	08:11
NGC1342	Open	Per	03h 31m 38s	+37°22'36"	6.7	19:46	03:55	12:03
NGC1365	Gal	For	03h 33m 36s	-36°08'25"	9.5	23:51	03:57	08:02
NGC1371	Gal	For	03h 35m 01s	-24°55'59"	11.0	23:08	03:58	08:48
NGC1370	Gal	Eri	03h 35m 14s	-20°22'24"	14.0	22:53	03:58	09:03
NGC1385	Gal	For	03h 37m 29s	-24°30'07"	11.2	23:09	04:01	08:52
NGC1398	Gal	For	03h 38m 52s	-26°20'15"	9.7	23:17	04:02	08:47
NGC1432	Neb	Tau	03h 45m 50s	+24°22'06"		20:54	04:09	11:23
NGC1435	Neb	Tau	03h 46m 10s	+23°45'54"		20:57	04:09	11:22
M45	Open	Tau	03h 47m 30s	+24°07'00"	1.6	20:57	04:11	11:24
NGC1461	Gal	Eri	03h 48m 27s	-16°23'34"	11.7	22:55	04:12	09:29

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC1444	Open	Per	03h 49m 25s	+52°39'30"	6.6	17:53	04:13	14:32
NGC1491	Neb	Per	04h 03m 14s	+51°18'57"		18:28	04:26	14:25
NGC1499	Neb	Per	04h 03m 14s	+36°22'00"		20:23	04:26	12:30
NGC1501	P Neb	Cam	04h 06m 59s	+60°55'14"	13.0	Circum	04:30	Circum
NGC1502	Open	Cam	04h 07m 50s	+62°19'54"	5.7	Circum	04:31	Circum
NGC1521	Gal	Eri	04h 08m 19s	-21°03'07"	11.4	23:29	04:31	09:34
NGC1514	P Neb	Tau	04h 09m 17s	+30°46'33"	10.0	20:54	04:32	12:11
NGC1535	P Neb	Eri	04h 14m 16s	-12°44'22"	10.0	23:10	04:37	10:05
NGC1579	Neb	Per	04h 30m 14s	+35°16'47"		20:55	04:53	12:51
NGC1637	Gal	Eri	04h 41m 28s	-02°51'28"	10.9	23:10	05:05	11:00
NGC1643	Gal	Eri	04h 43m 44s	-05°19'09"	14.0	23:19	05:07	10:55
NGC1729	Gal	Ori	05h 00m 16s	-03°21'09"	13.0	23:30	05:23	11:17
NGC1784	Gal	Lep	05h 05m 27s	-11°52'18"	11.8	23:58	05:29	10:59
NGC1788	Neb	Ori	05h 06m 53s	-03°20'27"		23:36	05:30	11:24
NGC1808	Gal	Col	05h 07m 43s	-37°30'48"	9.9	01:32	05:31	09:30
NGC1851	Glob	Col	05h 14m 07s	-40°02'46"	7.3	01:51	05:37	09:23
M79	Glob	Lep	05h 24m 11s	-24°31'29"	8.5	00:56	05:47	10:39
NGC1952	Neb	Tau	05h 34m 32s	+22°00'52"	8.4	22:51	05:58	13:04
NGC1973	Neb	Ori	05h 35m 05s	-04°43'55"		00:08	05:58	11:48
NGC1981	Open	Ori	05h 35m 09s	-04°25'54"	4.6	00:08	05:58	11:49
NGC1977	Neb	Ori	05h 35m 16s	-04°49'15"		00:09	05:58	11:48
M42	D Neb	Ori	05h 35m 16s	-05°23'25"	4.0	00:10	05:58	11:46
NGC1975	Neb	Ori	05h 35m 18s	-04°41'05"		00:08	05:58	11:48
NGC1980	Neb	Ori	05h 35m 25s	-05°54'54"		00:12	05:59	11:45
M43	D Neb	Ori	05h 35m 31s	-05°16'03"	9.0	00:10	05:59	11:47
NGC1990	Neb	Ori	05h 36m 13s	-01°12'07"		00:00	05:59	11:59
NGC1999	Neb	Ori	05h 36m 25s	-06°42'57"		00:15	06:00	11:44
NGC2023	Neb	Ori	05h 41m 38s	-02°15'33"		00:08	06:05	12:01
NGC2024	Neb	Ori	05h 41m 42s	-01°51'24"		00:07	06:05	12:03
NGC2022	P Neb	Ori	05h 42m 06s	+09°05'13"	12.0	23:38	06:05	12:33
NGC2064	Neb	Ori	05h 46m 18s	+00°00'21"		00:07	06:09	12:12
NGC2067	Neb	Ori	05h 46m 31s	+00°07'54"		00:07	06:10	12:13
M78	D Neb	Ori	05h 46m 45s	+00°04'48"	8.0	00:07	06:10	12:13
NGC2071	Neb	Ori	05h 47m 07s	+00°17'39"		00:07	06:10	12:14
M37	Open	Aur	05h 52m 18s	+32°33'12"	6.0	22:30	06:15	14:01
NGC2126	Open	Aur	06h 02m 32s	+49°52'00"	10.0	20:45	06:26	16:06
NGC2141	Open	Ori	06h 02m 55s	+10°26'48"	9.4	23:55	06:26	12:57
NGC2149	Neb	Mon	06h 03m 31s	-09°43'50"		00:50	06:27	12:03
NGC2170	Neb	Mon	06h 07m 32s	-06°23'57"		00:45	06:31	12:16
NGC2169	Open	Ori	06h 08m 24s	+13°57'54"	5.9	23:50	06:31	13:13
M35	Open	Gem	06h 09m 00s	+24°21'00"	5.5	23:18	06:32	13:46
NGC2174	Neb	Ori	06h 09m 24s	+20°39'34"		23:30	06:32	13:35
NGC2182	Neb	Mon	06h 09m 31s	-06°19'35"		00:47	06:33	12:18
NGC2183	Neb	Mon	06h 10m 47s	-06°12'43"		00:48	06:34	12:20
NGC2185	Neb	Mon	06h 11m 00s	-06°13'36"		00:48	06:34	12:20

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC2194	Open	Ori	06h 13m 45s	+12°48'24"	8.5	23:59	06:37	13:15
NGC2215	Open	Mon	06h 20m 49s	-07°17'00"	8.4	01:01	06:44	12:27
NGC2232	Open	Mon	06h 28m 01s	-04°50'48"	3.9	01:01	06:51	12:41
NGC2243	Open	CMA	06h 29m 34s	-31°17'00"	9.4	02:26	06:53	11:19
NGC2244	Open	Mon	06h 31m 56s	+04°56'35"	4.8	00:39	06:55	13:11
NGC2245	Neb	Mon	06h 32m 41s	+10°09'24"		00:25	06:56	13:26
NGC2247	Neb	Mon	06h 33m 05s	+10°19'17"		00:25	06:56	13:27
NGC2250	Open	Mon	06h 33m 49s	-05°05'06"	9.0	01:08	06:57	12:46
NGC2242	P Neb	Aur	06h 34m 07s	+44°46'38"	14.0	22:04	06:57	15:51
NGC2251	Open	Mon	06h 34m 38s	+08°22'00"	7.3	00:32	06:58	13:23
NGC2252	Open	Mon	06h 34m 42s	+05°22'00"	8.0	00:40	06:58	13:15
NGC2261	Neb	Mon	06h 39m 10s	+08°44'40"		00:36	07:02	13:29
NGC2264	Open	Mon	06h 40m 58s	+09°53'42"	3.9	00:34	07:04	13:34
NGC2269	Open	Mon	06h 43m 17s	+04°37'30"	10.0	00:51	07:06	13:22
NGC2266	Open	Gem	06h 43m 19s	+26°58'12"	10.0	23:43	07:06	14:30
M41	Open	CMA	06h 46m 01s	-20°45'24"	5.0	02:05	07:09	12:13
NGC2282	Neb	Mon	06h 46m 51s	+01°18'56"		01:04	07:10	13:16
NGC2286	Open	Mon	06h 47m 40s	-03°08'54"	7.5	01:17	07:11	13:05
NGC2281	Open	Aur	06h 48m 17s	+41°04'42"	5.4	22:42	07:11	15:40
NGC2298	Glob	Pup	06h 48m 59s	-36°00'15"	9.4	03:06	07:12	11:18
NGC2301	Open	Mon	06h 51m 45s	+00°27'36"	6.0	01:11	07:15	13:19
NGC2311	Open	Mon	06h 57m 47s	-04°36'42"	10.0	01:31	07:21	13:11
NGC2316	Neb	Mon	06h 59m 41s	-07°46'39"		01:41	07:23	13:04
NGC2324	Open	Mon	07h 04m 07s	+01°02'42"	8.4	01:22	07:27	13:33
NGC2335	Open	Mon	07h 06m 49s	-10°01'42"	7.2	01:55	07:30	13:05
NGC2331	Open	Gem	07h 06m 59s	+27°15'42"	9.0	00:05	07:30	14:55
NGC2343	Open	Mon	07h 08m 06s	-10°37'00"	6.7	01:57	07:31	13:05
NGC2339	Gal	Gem	07h 08m 21s	+18°46'49"	11.6	00:35	07:31	14:28
NGC2314	Gal	Cam	07h 10m 32s	+75°19'37"	11.9	Circum	07:34	Circum
NGC2354	Open	CMA	07h 14m 10s	-25°41'24"	6.5	02:50	07:37	12:25
NGC2355	Open	Gem	07h 16m 59s	+13°45'00"	10.0	00:59	07:40	14:21
NGC2359	Neb	CMA	07h 18m 30s	-13°13'36"		02:15	07:42	13:08
NGC2362	Open	CMA	07h 18m 41s	-24°57'18"	4.1	02:52	07:42	12:32
NGC2367	Open	CMA	07h 20m 06s	-21°52'54"	7.9	02:43	07:43	12:43
NGC2383	Open	CMA	07h 24m 40s	-20°56'54"	8.4	02:45	07:48	12:51
NGC2384	Open	CMA	07h 25m 10s	-21°01'18"	7.4	02:45	07:48	12:51
NGC2371	P Neb	Gem	07h 25m 34s	+29°29'17"	13.0	00:15	07:49	15:22
NGC2395	Open	Gem	07h 27m 12s	+13°36'30"	8.0	01:10	07:50	14:31
NGC2392	P Neb	Gem	07h 29m 11s	+20°54'42"	10.0	00:49	07:52	14:55
NGC2414	Open	Pup	07h 33m 12s	-15°27'12"	7.9	02:36	07:56	13:16
NGC2421	Open	Pup	07h 36m 13s	-20°36'42"	8.3	02:55	07:59	13:03
NGC2427	Gal	Pup	07h 36m 28s	-47°38'08"	11.6	05:05	08:00	10:54
M47	Open	Pup	07h 36m 35s	-14°29'00"	4.5	02:37	08:00	13:22
NGC2415	Gal	Lyn	07h 36m 57s	+35°14'32"	12.4	00:02	08:00	15:58
NGC2423	Open	Pup	07h 37m 06s	-13°52'18"	6.7	02:36	08:00	13:25

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC2419	Glob	Lyn	07h 38m 08s	+38°52'54"	10.4	23:45	08:01	16:18
NGC2420	Open	Gem	07h 38m 23s	+21°34'24"	8.3	00:56	08:01	15:07
NGC2438	P Neb	Pup	07h 41m 50s	-14°44'07"	10.0	02:43	08:05	13:27
NGC2440	P Neb	Pup	07h 41m 55s	-18°12'31"	11.0	02:53	08:05	13:17
NGC2451	Open	Pup	07h 45m 15s	-37°58'00"	2.8	04:12	08:08	12:05
NGC2452	P Neb	Pup	07h 47m 26s	-27°20'07"	13.0	03:29	08:11	12:52
NGC2453	Open	Pup	07h 47m 35s	-27°11'42"	8.3	03:29	08:11	12:53
NGC2477	Open	Pup	07h 52m 10s	-38°31'48"	5.8	04:21	08:15	12:09
NGC2467	Open	Pup	07h 52m 26s	-26°26'12"	7.0	03:31	08:16	13:00
NGC2456	Gal	Lyn	07h 54m 11s	+55°29'41"	14.0	Circum	08:17	Circum
NGC2483	Open	Pup	07h 55m 39s	-27°53'42"	7.6	03:39	08:19	12:58
NGC2506	Open	Mon	08h 00m 01s	-10°46'12"	7.6	02:50	08:23	13:56
NGC2509	Open	Pup	08h 00m 48s	-19°03'06"	9.0	03:15	08:24	13:33
NGC2527	Open	Pup	08h 04m 58s	-28°08'48"	6.5	03:50	08:28	13:07
NGC2533	Open	Pup	08h 07m 04s	-29°53'00"	7.6	03:58	08:30	13:02
NGC2547	Open	Vel	08h 10m 09s	-49°12'54"	4.7	05:53	08:33	11:14
NGC2539	Open	Pup	08h 10m 37s	-12°49'06"	6.5	03:06	08:34	14:01

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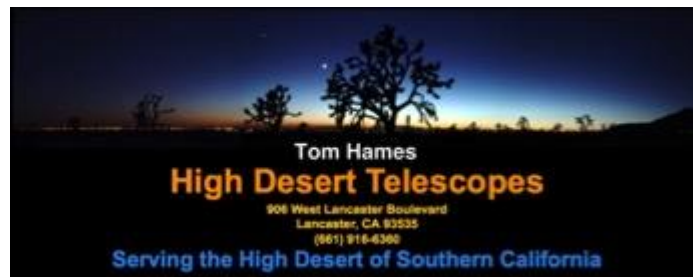


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