



# Desert Sky Observer

Volume 38

Antelope Valley Astronomy Club Newsletter

September 2018

## Up-Coming Events

September 8: [Dark Sky Star Party](#)

September 14: Club Meeting\*

September 15: [Lunar Club](#)

September 29: [Prime Desert Moon Walk](#)

\* 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

276 people! Wow, can you believe it?

We had at least 276 people in attendance for the Prime Desert Woodland Moonwalk on Saturday August 25. That was 268 members of the public and eight AVAC members with five telescopes. As has been the case with most of astronomy events since the wildfire season started in California, we had marginal viewing conditions due to high smoke but were still able to share Venus, Jupiter, Saturn, Mars and a 98% illuminated moon with the public. I had expected other local events, like the AV Fair, to limit our audience and was totally surprised at the turnout.

Even with a 13% transmission lunar filter in the optical train, the moon was uncomfortably bright but I can't remember ever having people so enthused and thrilled about viewing the moon which elicited the "Ooohs" and "Aahs" normally reserved for more elusive deep space objects. Darrell Bennett even managed to pull the Ring Nebula (M57) out of the murk and moonlight, with his 12" Meade SCT, for sharing with the public.

Earlier in the month, on Saturday August 11, those who went up to Mount Pinos for the Dark Sky Star Party were greeted by HUGE crowds of both astronomers and other campers. The parking lot at the Mount Pinos Nordic Base was absolutely full and Matt Leone, Darrell Bennett, Rod Girard and other members who attended reported that cars were parked on both sides of the road for at least half a mile down the mountain. The best guess among those who attended, is that it was a combination of smoke at lower elevation observing sites, the last weekend before school started, and the peak of the Perseid Meteor Shower. Rod Girard reported that there was even a man "riding a giant guinea pig which lit up in psychedelic colored lights." Our best guess...maybe rehearsal for Burning Man? Except for excessive traffic and headlights, viewing conditions were very good and AVAC Treasurer Rod Girard was even able to image "green comet" Comet 21P Giacobini – Zinner.

The following weekend, on Saturday August 18, we had a lunar observing event at Judy Fuentes' house in Antelope Acres.

Beginning in September, the best “near new moon” weekends for star parties start occurring at the beginning of the month. As a result, the September Dark Sky Star Party is scheduled for Saturday December 8 at the Chuchupate Trailhead parking lot site off Lockwood Valley, Rd. Details will be sent in a separate email.

Later in the month, on Saturday September 15, we will have our “Lunar Part and Mexican Food Fest” at Judy Fuentes’ property in Antelope Acres. Judy has promised her famous taquitos and we’ll get a few trays of Mexican dishes from Vallarta Market. If you make a Mexican specialty of which you’re particularly proud, let us know and bring it to the event. Again, details to follow.

For those of you who keep track for long term planning, we’ve had a few calendar changes and the dates and times of the September and October Prime Desert Woodland Preserve Moowalks have been changed. The September Moonwalk will be on Saturday September 22 at 7:00 pm and the October event on Saturday October 20 at 6:30 pm. The October event will be preceded by Jeremy Amaran’s annual “Scary Science” show in the Prime Desert Woodland interpretive center.

We also have a new event, in that on Saturday November 10 we will be conducting a Star Party at the Exotic Feline Breeding Compound in Rosamond in conjunction with their special “Red Light Tours” of the facility. As the name implies, for their Red Light Tours, the EFBC offers guests special to visit the center, after dark, and enjoy guided tours of its exhibit and to see the exotic felines under the cover of twilight or darkness. For those who participated in our previous event(s) at the facility, we will be setting up inside the compound, in a courtyard and adjacent to the cages, rather than in an outside parking lot.

Also, coming up, our Annual Business Meeting and Board Election will be held at our meeting on Friday, October 13, 2017, at 7:00 PM in the Sage Planetarium. Please come out, hear the “State of the AVAC” reports and participate in the governance of YOUR organization. Several of the current officers have been serving, in various board positions, for many years and have expressed their intention to not seek election or serve in the coming year. It’s time for someone else to step up and give them a break. How about YOU?

Nominations for positions to the Executive Board will be accepted until, and at, the Annual Business Meeting. PLEASE submit your nominations via email to [board@avastronomyclub.org](mailto:board@avastronomyclub.org) or to any board member as noted on the Contacts page of the AVAC website. <http://www.avastronomyclub.org/contacts.html>

You may also notify any individual Board Member via telephone or email, as per the contact information on the Contacts page, in person, or merely by submitting a note.

For those with a desire to lead the club in the coming year...WE NEED YOU. Your ideas, your energy, and your enthusiasm are what makes this club work. Self-nominations are more than welcome.



## Secretary Rose Moore

We have some upcoming events for September including our DSSP (Sept. 8th), our meeting, a Lunar Club event (Sept. 15th) and a PDW (Sept. 29th).

Our Lunar Club event will be held at Judy Fuentes' home in Antelope Acres on Saturday Sept. 15th starting at around 5pm. This is our Mexican Independence Day celebration and we will be cooking up some Mexican food. Further info to follow. The Moon will be a waxing crescent about 35% illuminated.

The Prime Desert Moon Walk on Saturday Sept. 29th starts at 7pm. Come on out with your telescope, or take the walk with Jeremy and the public. Weather permitting.

Coming up in October is our Business Meeting! Members need to come out and support our club. The last few years we have had a terrible showing at this meeting. This is the time to voice any changes within the club you would like to see, and to vote for the new Executive Board.

We need some members to step up and take their turn running the club. I will not be accepting any position on the Board.

In November, we will have a speaker for our meeting: Dr. Jeff Rich from the Carnegie Observatories in Pasadena. His topic will be merging galaxies and some information on the Carnegie Observatories.

## Space Place

### A Trip Through the Milky Way

By Jane Houston Jones and Jessica Stoller-Conrad

Feeling like you missed out on planning a last vacation of summer? Don't worry—you can still take a late summertime road trip along the Milky Way!

The waning days of summer are upon us, and that means the Sun is setting earlier now. These earlier sunsets reveal a starry sky bisected by the Milky Way. Want to see this view of our home galaxy? Head out to your favorite dark sky getaway or to the darkest city park or urban open space you can find.

While you're out there waiting for a peek at the Milky Way, you'll also have a great view of the planets in our solar system. Keep an eye out right after sunset and you can catch a look at Venus. If you have binoculars or a telescope, you'll see Venus's phase change dramatically during September—from nearly half phase to a larger, thinner crescent.

Jupiter, Saturn and reddish Mars are next in the sky, as they continue their brilliant appearances this month. To see them, look southwest after sunset. If you're in a dark sky and you look above and below Saturn, you can't miss the summer Milky Way spanning the sky from southwest to northeast.

You can also use the summer constellations to help you trace a path across the Milky Way. For example, there's Sagittarius, where stars and some brighter clumps appear as steam from a teapot. Then there is Aquila, where the Eagle's bright Star Altair combined with Cygnus's Deneb and Lyra's Vega mark what's

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called the “summer triangle.” The familiar W-shaped constellation Cassiopeia completes the constellation trail through the summer Milky Way. Binoculars will reveal double stars, clusters and nebulae all along the Milky Way.

Between Sept. 12 and 20, watch the Moon pass from near Venus, above Jupiter, to the left of Saturn and finally above Mars!

This month, both Neptune and brighter Uranus can also be spotted with some help from a telescope. To see them, look in the southeastern sky at 1 a.m. or later. If you stay awake, you can also find Mercury just above Earth’s eastern horizon shortly before sunrise. Use the Moon as a guide on Sept. 7 and 8.

Although there are no major meteor showers in September, cometary dust appears in another late summer sight, the morning zodiacal light. Zodiacal light looks like a cone of soft light in the night sky. It is produced when sunlight is scattered by dust in our solar system. Try looking for it in the east right before sunrise on the moonless mornings of Sept. 8 through Sept 23.

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



*Caption: This illustration shows how the summer constellations trace a path across the Milky Way. To get the best views, head out to the darkest sky you can find. Credit: NASA/JPL-Caltech*

*This article is provided by NASA Space Place. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit <https://spaceplace.nasa.gov/> to explore space and Earth science!*

## News Headlines

### **New Horizons Makes First Detection of Kuiper Belt Flyby Target**

NASA's New Horizons spacecraft has made its first detection of its next flyby target, the Kuiper Belt object nicknamed Ultima Thule, more than four months ahead of its New Year's 2019 close encounter. Mission team members were thrilled – if not a little surprised – that New Horizons' telescopic Long Range Reconnaissance Imager (LORRI) was able to see the small, dim object while still more than 100 million miles away, and against a dense background of stars.

<http://pluto.jhuapl.edu/News-Center/News-Article.php?page=20180828>

### **Martian Skies Clearing over Opportunity Rover**

A planet-encircling dust storm on Mars, which was first detected May 30 and halted operations for the Opportunity rover, continues to abate. With clearing skies over Opportunity's resting spot in Mars' Perseverance Valley, engineers at NASA's Jet Propulsion Laboratory in Pasadena, California, believe the nearly 15-year-old, solar-powered rover will soon receive enough sunlight to automatically initiate recovery procedures -- if the rover is able to do so.

<https://go.nasa.gov/2wu9nza>

### **Parker Solar Probe On Course To Touch The Sun**

At 6:07 a.m. EDT on Aug. 20, 2018, NASA's Parker Solar Probe successfully completed its first trajectory correction maneuver (known as TCM-1), achieving a near-perfect firing of its propulsion system and putting the spacecraft on course to “touch” the Sun. This maneuver sets up the orbital geometry that will allow Parker Solar Probe to come within about 3.83 million miles (8.86 solar radii) of sun's surface on its closest approach in 2014.

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

### **15 of Spitzer's Greatest Discoveries From 15 Years in Space**

NASA's Spitzer Space Telescope has spent fifteen years in space. In honor of this anniversary, 15 of Spitzer's greatest discoveries are featured in a gallery. Launched into a solar orbit on Aug. 25, 2003, Spitzer trails behind Earth and has been gradually drifting farther away from our planet. Spitzer was the final of NASA's four Great Observatories to reach space. Initially scheduled for a minimum 2.5-year primary mission, NASA's Spitzer Space Telescope has lasted far beyond its expected lifetime

<https://go.nasa.gov/2wvII5W>

## September Sky Data

Last Qtr Sep 2      New Sep 9      First Qtr Sep 16      Full Sep 24



## Planet Summary

**Mercury** can be seen low in the east-northeast some 30 to 45 minutes before sunrise during the first week of September. Around the 11th of the month Mercury disappears into the Sun's glare as it moves towards superior conjunction (behind the Sun) on the 20th of the month.

**Venus** is seen low in the west southwest after sunset setting at about 90 (reducing to 65) minutes after the Sun. The planet brightens from -4.1 to -4.2 making it easier to spot in the Sun's glare. Its angular size increases from 29 to 46 arc seconds during the month as the percentage illumination narrows from 40% to just 17%.

After sunset, **Mars** can be seen just east of south shining at a magnitude of -1.9 but this falls to -1.1 by month's end. Its angular size is 21 arc seconds at the start of the month falling to 16 arc seconds by the start of October. With a small telescope it should be possible to spot details, such as Syrtis Major, on its salmon-pink surface.

**Jupiter** can be seen in the west soon after sunset at the start of the month. It shines at magnitude -1.5 (falling to -1.4 during the month) and has a disk some 35 (falling to 33) arc seconds across. Sadly, moving slowly eastwards in Libra during the month, Jupiter is heading towards the southern part of the ecliptic so atmospheric dispersion will hinder our view.

**Saturn** will be visible in the south at an elevation of ~24 degrees after sunset at the beginning of September. Its disk has an angular size of 17.5 arc seconds falling to 16.5 during the month. The rings were at their widest some months ago and are still, at 25 degrees to the line of sight, well open and spanning ~2.5 times the size of Saturn's globe.

There are no major **meteor-showers** in September, but this is generally a good time of the year for seeing sporadic meteors, which may appear at any time, in any part of the sky.

## Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
9/1/2018	23:16	12:14	06:28	19:17
9/5/2018	01:50	16:22	06:30	19:11
9/10/2018	07:29	20:08	06:34	19:04
9/15/2018	12:40	23:18	06:37	18:57
9/20/2018	16:42	02:29	06:41	18:50
9/25/2018	19:31	07:08	06:44	18:43
9/30/2018	22:48	12:14	06:48	18:36

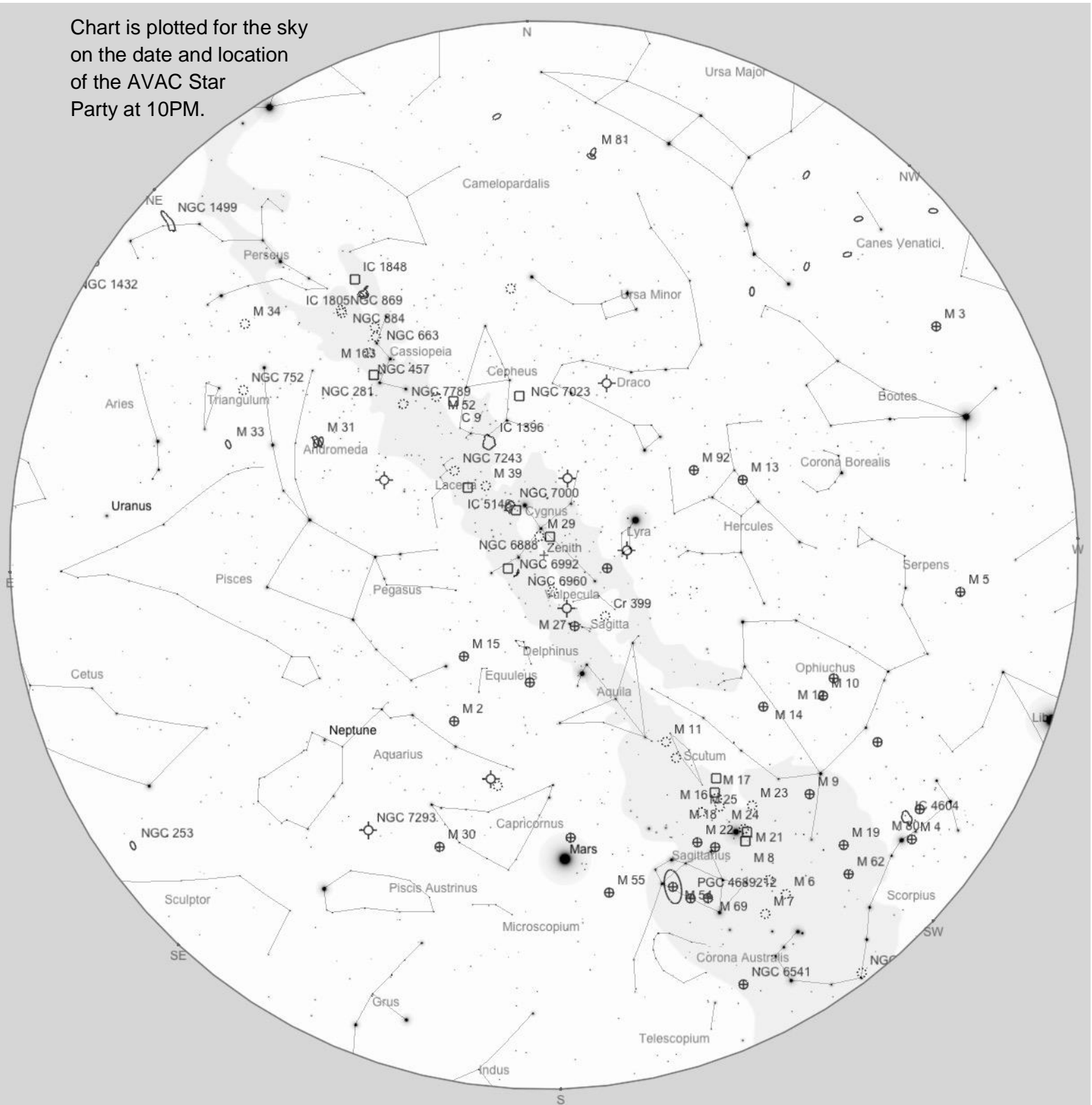
## Planet Data

	Sep 1			
	Rise	Transit	Set	Mag
<b>Mercury</b>	05:10	11:54	18:38	-0.7
<b>Venus</b>	10:08	15:36	21:05	-4.1
<b>Mars</b>	17:34	22:20	03:07	-1.9
<b>Jupiter</b>	11:54	17:12	22:30	-1.5
<b>Saturn</b>	15:25	20:23	01:20	1.5
	Sep 15			
	Rise	Transit	Set	Mag
<b>Mercury</b>	06:17	12:37	18:56	-1.3
<b>Venus</b>	10:04	15:17	20:30	-4.2
<b>Mars</b>	16:43	21:34	02:25	-1.5
<b>Jupiter</b>	11:09	16:25	21:41	-1.4
<b>Saturn</b>	14:30	19:28	00:25	1.5
	Sep 30			
	Rise	Transit	Set	Mag
<b>Mercury</b>	07:26	13:14	19:03	-0.7
<b>Venus</b>	09:38	14:40	19:42	-4.2
<b>Mars</b>	15:57	20:54	01:52	-1.1
<b>Jupiter</b>	10:23	15:37	20:50	-1.4
<b>Saturn</b>	13:33	18:30	23:27	1.6

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
M7	Open	Sco	17h 53m 51s	-34°47'36"	3.5	15:47	19:58	00:10
NGC6543	P Neb	Dra	17h 58m 33s	+66°37'59"	9.0	Circum	20:03	Circum
NGC6496	Glob	Sco	17h 59m 04s	-44°16'00"	9.2	16:43	20:04	23:24
NGC6524	Gal	Her	17h 59m 15s	+45°53'15"	14.0	11:02	20:04	05:06
NGC6507	Open	Sgr	17h 59m 50s	-17°27'00"	10.0	14:51	20:04	01:18
NGC6517	Glob	Oph	18h 01m 51s	-08°57'32"	10.3	14:28	20:06	01:45
M20	Open	Sgr	18h 02m 42s	-22°58'18"	5.0	15:11	20:07	01:04
NGC6522	Glob	Sgr	18h 03m 35s	-30°02'06"	8.6	15:37	20:08	00:40
M8	Open	Sgr	18h 03m 41s	-24°22'48"	5.0	15:17	20:08	01:00
NGC6535	Glob	Ser	18h 03m 51s	-00°17'51"	10.6	14:07	20:08	02:10
NGC6526	Neb	Sgr	18h 04m 06s	-24°26'30"		15:17	20:09	01:00
NGC6530	Open	Sgr	18h 04m 31s	-24°21'30"	4.6	15:17	20:09	01:01
NGC6528	Glob	Sgr	18h 04m 50s	-30°03'21"	9.5	15:38	20:09	00:41
NGC6539	Glob	Ser	18h 04m 50s	-07°35'11"	9.6	14:27	20:09	01:52
NGC6537	P Neb	Sgr	18h 05m 13s	-19°50'35"	13.0	15:03	20:10	01:16
NGC6541	Glob	CrA	18h 08m 02s	-43°42'57"	6.6	16:49	20:13	23:37
NGC6553	Glob	Sgr	18h 09m 17s	-25°54'30"	8.3	15:27	20:14	01:00
NGC6559	Neb	Sgr	18h 09m 57s	-24°06'23"		15:22	20:15	01:07
NGC6570	Gal	Oph	18h 11m 07s	+14°05'34"	13.0	13:34	20:16	02:58
NGC6565	P Neb	Sgr	18h 11m 53s	-28°10'41"	13.0	15:38	20:17	00:55
NGC6563	P Neb	Sgr	18h 12m 03s	-33°52'07"	14.0	16:01	20:17	00:32
NGC6572	P Neb	Oph	18h 12m 06s	+06°51'13"	9.0	13:55	20:17	02:38
NGC6568	Open	Sgr	18h 12m 44s	-21°36'18"	9.0	15:16	20:17	01:18
NGC6569	Glob	Sgr	18h 13m 39s	-31°49'35"	8.7	15:54	20:18	00:43
NGC6567	P Neb	Sgr	18h 13m 45s	-19°04'34"	12.0	15:09	20:18	01:27
NGC6587	Gal	Her	18h 13m 51s	+18°49'32"	12.1	13:22	20:18	03:15
NGC6606	Gal	Lyr	18h 14m 42s	+43°16'07"	14.0	11:36	20:19	05:02
NGC6583	Open	Sgr	18h 15m 49s	-22°08'12"	10.0	15:21	20:20	01:20
NGC6578	P Neb	Sgr	18h 16m 16s	-20°27'03"	13.0	15:16	20:21	01:26
NGC6605	Open	Ser	18h 16m 24s	-15°00'00"	6.0	15:00	20:21	01:42
NGC6604	Open	Ser	18h 18m 03s	-12°14'35"	6.5	14:54	20:23	01:52
M24	Open	Sgr	18h 18m 26s	-18°24'24"	4.5	15:12	20:23	01:34
NGC6643	Gal	Dra	18h 19m 46s	+74°34'08"	11.1	Circum	20:24	Circum
M18	Open	Sgr	18h 19m 58s	-17°06'07"	8.0	15:10	20:25	01:40
NGC6624	Glob	Sgr	18h 23m 41s	-30°21'40"	8.3	15:58	20:28	00:58
M28	Glob	Sgr	18h 24m 33s	-24°52'07"	8.5	15:39	20:29	01:19
NGC6629	P Neb	Sgr	18h 25m 42s	-23°12'10"	12.0	15:35	20:30	01:26
NGC6633	Open	Oph	18h 27m 15s	+06°30'30"	4.6	14:11	20:32	02:52
NGC6638	Glob	Sgr	18h 30m 56s	-25°29'56"	9.2	15:48	20:36	01:24



ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M69	Glob	Sgr	18h 31m 23s	-32°20'51"	9.0	16:14	20:36	00:58
NGC6644	P Neb	Sgr	18h 32m 35s	-25°07'44"	12.0	15:48	20:37	01:26
NGC6649	Open	Sct	18h 33m 27s	-10°24'12"	8.9	15:04	20:38	02:12
M22	Glob	Sgr	18h 36m 24s	-23°54'17"	6.5	15:48	20:41	01:34
NGC6664	Open	Sct	18h 36m 33s	-08°13'12"	7.8	15:01	20:41	02:22
NGC6683	Open	Sct	18h 42m 13s	-06°12'42"	10.0	15:01	20:47	02:33
M70	Glob	Sgr	18h 43m 12s	-32°17'27"	9.0	16:25	20:48	01:10
NGC6703	Gal	Lyr	18h 47m 19s	+45°33'02"	11.4	11:52	20:52	05:52
M11	Open	Sct	18h 51m 05s	-06°16'12"	7.0	15:10	20:56	02:41
NGC6712	Glob	Sct	18h 53m 04s	-08°42'19"	8.2	15:19	20:58	02:37
M57	P Neb	Lyr	18h 53m 35s	+33°01'44"	9.5	13:10	20:58	04:46
M54	Glob	Sgr	18h 55m 03s	-30°28'47"	8.5	16:30	21:00	01:29
NGC6723	Glob	Sgr	18h 59m 33s	-36°37'54"	7.3	17:01	21:04	01:07
NGC6738	Open	Aql	19h 01m 21s	+11°36'54"	8.0	14:31	21:06	03:41
NGC6726	Neb	CrA	19h 01m 39s	-36°53'30"		17:04	21:06	01:08
NGC6729	Neb	CrA	19h 01m 55s	-36°57'30"		17:05	21:07	01:08
NGC6741	P Neb	Aql	19h 02m 37s	-00°26'57"	11.0	15:06	21:07	03:09
NGC6749	Glob	Aql	19h 05m 15s	+01°54'02"	11.1	15:02	21:10	03:18
NGC6751	P Neb	Aql	19h 05m 56s	-05°59'31"	13.0	15:24	21:11	02:57
NGC6760	Glob	Aql	19h 11m 12s	+01°01'50"	9.1	15:10	21:16	03:21
NGC6772	P Neb	Aql	19h 14m 36s	-02°42'24"	14.0	15:24	21:19	03:15
M56	Glob	Lyr	19h 16m 36s	+30°11'02"	9.5	13:45	21:21	04:57
NGC6778	P Neb	Aql	19h 18m 25s	-01°35'48"	13.0	15:25	21:23	03:21
NGC6781	P Neb	Aql	19h 18m 28s	+06°32'20"	12.0	15:03	21:23	03:44
NGC6791	Open	Lyr	19h 20m 53s	+37°46'18"	9.5	13:15	21:26	05:36
NGC6790	P Neb	Aql	19h 22m 57s	+01°30'48"	10.0	15:21	21:28	03:34
NGC6802	Open	Vul	19h 30m 35s	+20°15'42"	8.8	14:34	21:35	04:36
NGC6803	P Neb	Aql	19h 31m 16s	+10°03'23"	11.0	15:06	21:36	04:06
NGC6804	P Neb	Aql	19h 31m 35s	+09°13'31"	12.0	15:08	21:36	04:04
NGC6807	P Neb	Aql	19h 34m 34s	+05°41'03"	14.0	15:21	21:39	03:57
NGC6811	Open	Cyg	19h 37m 17s	+46°23'18"	6.8	12:35	21:42	06:48
M55	Glob	Sgr	19h 40m 00s	-30°57'44"	7.0	17:17	21:45	02:12
NGC6813	Neb	Vul	19h 40m 22s	+27°18'34"		14:20	21:45	05:10
NGC6820	Neb	Vul	19h 42m 28s	+23°05'17"		14:37	21:47	04:57
NGC6823	Open	Vul	19h 43m 09s	+23°18'00"	7.1	14:37	21:48	04:59
NGC6824	Gal	Cyg	19h 43m 41s	+56°06'34"	11.9	Circum	21:48	Circum
NGC6818	P Neb	Sgr	19h 43m 58s	-14°09'10"	10.0	16:25	21:49	03:12
NGC6826	P Neb	Cyg	19h 44m 48s	+50°31'30"	10.0	12:01	21:49	07:38
NGC6822	Gal	Sgr	19h 44m 57s	-14°48'10"	9.0	16:28	21:50	03:11
NGC6833	P Neb	Cyg	19h 49m 47s	+48°57'40"	14.0	12:24	21:54	07:25
NGC6830	Open	Vul	19h 50m 59s	+23°06'00"	7.9	14:45	21:56	05:06
NGC6834	Open	Cyg	19h 52m 12s	+29°24'30"	7.8	14:24	21:57	05:30
M71	Glob	Sge	19h 53m 46s	+18°46'42"	8.5	15:02	21:58	04:55
NGC6842	P Neb	Vul	19h 55m 02s	+29°17'20"	14.0	14:27	22:00	05:32
M27	P Neb	Vul	19h 59m 36s	+22°43'15"	7.5	14:55	22:04	05:13

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6871	Open	Cyg	20h 05m 59s	+35°46'38"	5.2	14:10	22:11	06:11
M75	Glob	Sgr	20h 06m 05s	-21°55'19"	9.5	17:11	22:11	03:11
NGC6861	Gal	Tel	20h 07m 19s	-48°22'12"	11.1	19:24	22:12	01:00
NGC6884	P Neb	Cyg	20h 10m 24s	+46°27'39"	13.0	13:08	22:15	07:22
NGC6879	P Neb	Sge	20h 10m 27s	+16°55'22"	13.0	15:25	22:15	05:05
NGC6881	P Neb	Cyg	20h 10m 52s	+37°24'42"	14.0	14:07	22:16	06:24
NGC6883	Open	Cyg	20h 11m 20s	+35°49'55"	8.0	14:15	22:16	06:17
NGC6888	Neb	Cyg	20h 12m 06s	+38°21'17"		14:03	22:17	06:30
NGC6886	P Neb	Sge	20h 12m 43s	+19°59'22"	12.0	15:17	22:17	05:17
NGC6891	P Neb	Del	20h 15m 09s	+12°42'16"	12.0	15:42	22:20	04:58
NGC6894	P Neb	Cyg	20h 16m 24s	+30°33'55"	14.0	14:43	22:21	05:59
NGC6905	P Neb	Del	20h 22m 23s	+20°06'16"	12.0	15:27	22:27	05:27
NGC6914	Neb	Cyg	20h 24m 43s	+42°28'57"		13:52	22:29	07:07
NGC6934	Glob	Del	20h 34m 11s	+07°24'17"	8.9	16:16	22:39	05:02
NGC6940	Open	Vul	20h 34m 26s	+28°17'00"	6.3	15:10	22:39	06:08
NGC6946	Gal	Cyg	20h 34m 52s	+60°09'14"	8.9	Circum	22:40	Circum
NGC6960	Neb	Cyg	20h 45m 58s	+30°35'42"		15:13	22:51	06:28
M72	Glob	Aqr	20h 53m 28s	-12°32'14"	10.0	17:30	22:58	04:26
NGC6992	Neb	Cyg	20h 56m 19s	+31°44'36"		15:19	23:01	06:43
NGC6995	Neb	Cyg	20h 57m 10s	+31°14'06"		15:22	23:02	06:42
M73	Open	Aqr	20h 58m 56s	-12°38'07"	9.0	17:36	23:04	04:32
NGC7000	Neb	Cyg	20h 59m 18s	+44°31'00"		14:12	23:04	07:56
NGC7008	P Neb	Cyg	21h 00m 33s	+54°32'35"	13.0	12:02	23:05	10:09
NGC7006	Glob	Del	21h 01m 29s	+16°11'15"	10.6	16:18	23:06	05:54
NGC7009	P Neb	Aqr	21h 04m 11s	-11°21'50"	8.0	17:37	23:09	04:40
NGC7026	P Neb	Cyg	21h 06m 19s	+47°51'08"	13.0	13:52	23:11	08:30
NGC7027	P Neb	Cyg	21h 07m 02s	+42°14'10"	10.0	14:36	23:12	07:48
NGC7048	P Neb	Cyg	21h 14m 15s	+46°17'18"	11.0	14:13	23:19	08:25
NGC7041	Gal	Ind	21h 16m 32s	-48°21'49"	11.1	20:33	23:21	02:09
NGC7049	Gal	Ind	21h 19m 00s	-48°33'46"	10.7	20:37	23:24	02:10
NGC7062	Open	Cyg	21h 23m 27s	+46°22'42"	8.3	14:22	23:28	08:34
NGC7063	Open	Cyg	21h 24m 21s	+36°29'12"	7.0	15:25	23:29	07:33
NGC7076	Neb	Cep	21h 26m 24s	+62°53'33"		Circum	23:31	Circum
M15	Glob	Peg	21h 29m 58s	+12°10'02"	7.5	16:58	23:35	06:11
M39	Open	Cyg	21h 31m 42s	+48°25'00"	5.5	14:11	23:36	09:01
NGC7079	Gal	Gru	21h 32m 35s	-44°04'02"	11.6	20:16	23:37	02:59
M2	Glob	Aqr	21h 33m 27s	-00°49'23"	7.5	17:38	23:38	05:39
NGC7090	Gal	Ind	21h 36m 28s	-54°33'24"	11.0	22:14	23:41	01:08
M30	Glob	Cap	21h 40m 22s	-23°10'45"	8.5	18:49	23:45	04:41
NGC7128	Open	Cyg	21h 43m 57s	+53°42'54"	9.7	13:08	23:49	10:29
NGC7145	Gal	Gru	21h 53m 20s	-47°52'56"	11.2	21:05	23:58	02:51
NGC7166	Gal	Gru	22h 00m 33s	-43°23'23"	11.8	20:39	00:05	03:31
NGC7209	Open	Lac	22h 05m 07s	+46°29'00"	6.7	15:03	00:10	09:17
NGC7202	Gal	PsA	22h 06m 43s	-31°13'06"	13.0	19:45	00:11	04:38
NGC7217	Gal	Peg	22h 07m 52s	+31°21'33"	10.2	16:32	00:13	07:53

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC7244	Gal	Peg	22h 16m 27s	+16°28'15"	14.4	17:32	00:21	07:10
NGC7261	Open	Cep	22h 20m 06s	+58°03'00"	8.4	Circum	00:25	Circum
NGC7260	Gal	Aqr	22h 22m 36s	-04°07'13"	14.0	18:36	00:27	06:19
NGC7296	Open	Lac	22h 28m 02s	+52°17'18"	10.0	14:19	00:33	10:46
NGC7314	Gal	PsA	22h 35m 46s	-26°03'01"	10.9	19:54	00:40	05:26
NGC7331	Gal	Peg	22h 37m 04s	+34°24'57"	9.5	16:48	00:42	08:36
NGC7354	P Neb	Cep	22h 40m 20s	+61°17'07"	13.0	Circum	00:45	Circum
NGC7380	Open	Cep	22h 47m 21s	+58°07'54"	7.2	Circum	00:52	Circum
NGC7389	Gal	Peg	22h 50m 16s	+11°33'58"	13.4	18:20	00:55	07:30
NGC7418	Gal	Gru	22h 56m 36s	-37°01'49"	11.4	21:00	01:01	05:03
NGC7424	Gal	Gru	22h 57m 18s	-41°04'16"	11.0	21:22	01:02	04:42
NGC7450	Gal	Aqr	23h 00m 48s	-12°55'06"	13.0	19:38	01:05	06:33
NGC7479	Gal	Peg	23h 04m 57s	+12°19'20"	11.0	18:33	01:10	07:46
NGC7492	Glob	Aqr	23h 08m 27s	-15°36'41"	11.5	19:54	01:13	06:32
NGC7499	Gal	Psc	23h 10m 22s	+07°34'51"	13.8	18:52	01:15	07:38
NGC7507	Gal	Scl	23h 12m 08s	-28°32'24"	10.4	20:40	01:17	05:54
NGC7538	Neb	Cep	23h 13m 38s	+61°30'42"		Circum	01:18	Circum
NGC7531	Gal	Gru	23h 14m 48s	-43°35'58"	11.3	21:55	01:19	04:44
NGC7562	Gal	Psc	23h 15m 58s	+06°41'15"	11.5	19:00	01:21	07:42
NGC7582	Gal	Gru	23h 18m 23s	-42°22'14"	10.6	21:51	01:23	04:55
NGC7606	Gal	Aqr	23h 19m 05s	-08°29'09"	10.8	19:44	01:24	07:03
NGC7599	Gal	Gru	23h 19m 21s	-42°15'25"	11.4	21:51	01:24	04:57
NGC7626	Gal	Peg	23h 20m 43s	+08°13'01"	11.2	19:00	01:25	07:51
NGC7635	Neb	Cas	23h 20m 45s	+61°12'42"		Circum	01:25	Circum
NGC7631	Gal	Peg	23h 21m 27s	+08°13'03"	14.0	19:01	01:26	07:51
NGC7640	Gal	And	23h 22m 07s	+40°50'43"	10.9	16:59	01:27	09:54
NGC7662	P Neb	And	23h 25m 54s	+42°32'06"	9.0	16:52	01:31	10:09
NGC7686	Open	And	23h 30m 07s	+49°08'00"	5.6	16:02	01:35	11:07
NGC7822	Neb	Cep	00h 03m 36s	+67°09'00"		Circum	02:08	Circum
NGC43	Gal	And	00h 13m 01s	+30°54'55"	14.0	18:39	02:18	09:57
NGC40	P Neb	Cep	00h 13m 01s	+72°31'19"	11.0	Circum	02:18	Circum
NGC55	Gal	Scl	00h 15m 08s	-39°13'12"	8.0	22:29	02:20	06:10
NGC129	Open	Cas	00h 30m 00s	+60°13'06"	6.5	Circum	02:35	Circum
NGC133	Open	Cas	00h 31m 19s	+63°21'00"	9.0	Circum	02:36	Circum
NGC146	Open	Cas	00h 33m 03s	+63°18'06"	9.1	Circum	02:38	Circum
NGC147	Gal	Cas	00h 33m 12s	+48°30'27"	9.3	17:12	02:38	12:04
NGC150	Gal	Scl	00h 34m 16s	-27°48'16"	11.1	21:59	02:39	07:19
NGC185	Gal	Cas	00h 38m 58s	+48°20'14"	9.2	17:19	02:44	12:08
NGC189	Open	Cas	00h 39m 35s	+61°05'06"	8.8	Circum	02:44	Circum
M110	Gal	And	00h 40m 22s	+41°41'07"	8.9	18:12	02:45	11:18
NGC210	Gal	Cet	00h 40m 35s	-13°52'24"	10.9	21:21	02:45	08:10
M32	Gal	And	00h 42m 42s	+40°51'54"	9.1	18:20	02:47	11:15
M31	Gal	And	00h 42m 44s	+41°16'08"	4.3	18:17	02:47	11:17
NGC226	Gal	And	00h 42m 54s	+32°34'49"	14.0	19:02	02:48	10:34
NGC246	P Neb	Cet	00h 47m 03s	-11°52'19"	8.0	21:22	02:52	08:22

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC247	Gal	Cet	00h 47m 08s	-20°45'35"	8.9	21:48	02:52	07:55
NGC188	Open	Cep	00h 47m 28s	+85°15'18"	8.1	Circum	02:52	Circum
NGC253	Gal	Scl	00h 47m 33s	-25°17'18"	7.1	22:03	02:52	07:41
NGC288	Glob	Scl	00h 52m 45s	-26°35'01"	8.1	22:13	02:57	07:42
NGC357	Gal	Cet	01h 03m 22s	-06°20'19"	11.8	21:22	03:08	08:54
NGC386	Gal	Psc	01h 07m 31s	+32°21'43"	14.1	19:27	03:12	10:57
NGC404	Gal	And	01h 09m 27s	+35°43'05"	10.1	19:14	03:14	11:14
NGC457	Open	Cas	01h 19m 35s	+58°17'12"	6.4	Circum	03:24	Circum
NGC507	Gal	Psc	01h 23m 40s	+33°15'21"	11.2	19:39	03:28	11:17
NGC524	Gal	Psc	01h 24m 48s	+09°32'21"	10.6	21:01	03:29	09:58
NGC584	Gal	Cet	01h 31m 21s	-06°52'05"	10.4	21:52	03:36	09:20
NGC587	Gal	Tri	01h 32m 33s	+35°21'30"	13.0	19:39	03:37	11:36
M33	Gal	Tri	01h 33m 51s	+30°39'37"	6.2	20:01	03:38	11:16
M76	P Neb	Per	01h 42m 18s	+51°34'15"	12.0	17:45	03:47	13:49
NGC660	Gal	Psc	01h 43m 02s	+13°38'39"	10.8	21:07	03:48	10:28
NGC663	Open	Cas	01h 46m 09s	+61°14'06"	7.1	Circum	03:51	Circum
NGC720	Gal	Cet	01h 53m 00s	-13°44'19"	10.2	22:33	03:58	09:22
NGC741	Gal	Psc	01h 56m 21s	+05°37'43"	11.3	21:43	04:01	10:19
NGC752	Open	And	01h 57m 41s	+37°47'06"	5.7	19:52	04:02	12:13
NGC744	Open	Per	01h 58m 33s	+55°28'24"	7.9	Circum	04:03	Circum
NGC768	Gal	Cet	01h 58m 41s	+00°31'45"	14.0	21:59	04:03	10:07
NGC773	Gal	Cet	01h 58m 52s	-11°30'55"	14.0	22:32	04:04	09:35
NGC777	Gal	Tri	02h 00m 15s	+31°25'46"	12.0	20:24	04:05	11:46
NGC789	Gal	Tri	02h 02m 26s	+32°04'20"	14.0	20:23	04:07	11:51
NGC869	Open	Per	02h 19m 00s	+57°07'42"	4.0	Circum	04:24	Circum
NGC895	Gal	Cet	02h 21m 36s	-05°31'17"	11.8	22:38	04:26	10:14
NGC884	Open	Per	02h 22m 18s	+57°08'12"	4.0	Circum	04:27	Circum
NGC896	Neb	Cas	02h 25m 28s	+62°01'09"		Circum	04:30	Circum
NGC957	Open	Per	02h 33m 21s	+57°33'36"	7.6	Circum	04:38	Circum
NGC972	Gal	Ari	02h 34m 13s	+29°18'41"	11.3	21:06	04:39	12:11
NGC1024	Gal	Ari	02h 39m 12s	+10°50'49"	14.0	22:11	04:44	11:16
NGC1042	Gal	Cet	02h 40m 24s	-08°26'01"	10.9	23:05	04:45	10:25
NGC1052	Gal	Cet	02h 41m 05s	-08°15'20"	10.6	23:05	04:46	10:26
M34	Open	Per	02h 42m 05s	+42°45'42"	6.0	20:07	04:47	13:26
NGC1027	Open	Cas	02h 42m 40s	+61°35'42"	6.7	Circum	04:47	Circum
NGC1058	Gal	Per	02h 43m 30s	+37°20'28"	11.5	20:40	04:48	12:56
NGC1079	Gal	For	02h 43m 45s	-29°00'12"	11.4	00:13	04:48	09:24
NGC1134	Gal	Ari	02h 53m 41s	+13°00'52"	13.0	22:20	04:58	11:37
NGC1245	Open	Per	03h 14m 42s	+47°14'12"	8.4	20:06	05:19	14:33
NGC1250	Gal	Per	03h 15m 21s	+41°21'18"	14.0	20:49	05:20	13:51
NGC1184	Gal	Cep	03h 16m 45s	+80°47'34"	13.0	Circum	05:21	Circum
NGC1285	Gal	Eri	03h 17m 53s	-07°17'53"	14.0	23:40	05:23	11:05
NGC1333	Neb	Per	03h 29m 20s	+31°24'56"		21:53	05:34	13:15
NGC1350	Gal	For	03h 31m 08s	-33°37'43"	10.5	01:19	05:36	09:53
NGC1342	Open	Per	03h 31m 38s	+37°22'36"	6.7	21:28	05:36	13:45

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC1379	Gal	For	03h 36m 04s	-35°26'29"	12.0	01:32	05:41	09:50
NGC1432	Neb	Tau	03h 45m 50s	+24°22'06"		22:36	05:50	13:05
NGC1435	Neb	Tau	03h 46m 10s	+23°45'54"		22:38	05:51	13:03
M45	Open	Tau	03h 47m 30s	+24°07'00"	1.6	22:39	05:52	13:06
NGC1461	Gal	Eri	03h 48m 27s	-16°23'34"	11.7	00:36	05:53	11:10
NGC1444	Open	Per	03h 49m 25s	+52°39'30"	6.6	19:34	05:54	16:14
NGC1491	Neb	Per	04h 03m 14s	+51°18'57"		20:09	06:08	16:07
NGC1499	Neb	Per	04h 03m 14s	+36°22'00"		22:05	06:08	14:11
NGC1496	Open	Per	04h 04m 32s	+52°39'42"	10.0	19:50	06:09	16:29
NGC1501	P Neb	Cam	04h 06m 59s	+60°55'14"	13.0	Circum	06:12	Circum
NGC1502	Open	Cam	04h 07m 50s	+62°19'54"	5.7	Circum	06:12	Circum
NGC1514	P Neb	Tau	04h 09m 17s	+30°46'33"	10.0	22:35	06:14	13:52
NGC1513	Open	Per	04h 09m 57s	+49°30'54"	8.4	20:38	06:15	15:51
NGC1535	P Neb	Eri	04h 14m 16s	-12°44'22"	10.0	00:51	06:19	11:47
NGC1528	Open	Per	04h 15m 23s	+51°12'54"	6.4	20:23	06:20	16:17

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- Individual membership at \$25.00 per year.
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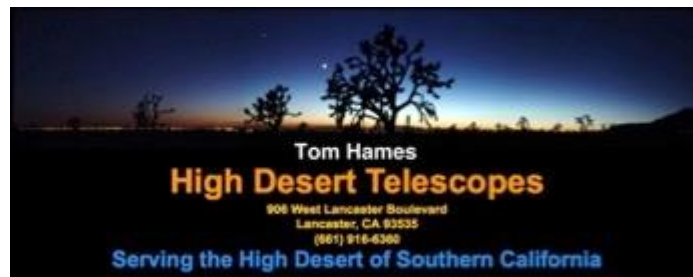


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