Volume 42.7 July 2022

Desert Sky Observer

Antelope Valley Astronomy Club

Upcoming Events

July 8: Club Meeting
July 23: Moonwalk 8:30 pm @ PDW
July 30: DSSP @ Chuchupate

Every clear night: Personal Star Party

August 12: Club Meeting -- Painting Class
August 20: Moonwalk 8:00 pm @ PDW
August 27: DSSP @ ???

AVAC Calendar

Board Members

President: Phil Wriedt (661) 917-4874
president@avastronomyclub.org

Vice-President: Gail Lofdahl 661-722-5833
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Secretary: Rose Moore (661) 972-1953
secretary@avastronomyclub.org

Treasurer: Rod Girard (661) 803-7838
treasurer@avastronomyclub.org

Appointed Positions

Newsletter Editor: Phil Wriedt (661) 917-4874
dso@avastronomyclub.org

Equipment & Library:
John Van Evera 661-754-1819
library@avastronomyclub.org

Club Historian: vacant
history@avastronomyclub.org

Webmaster: Steve Trotta (661) 269-5428
webmaster@avastronomyclub.org

Astronomical League Coordinator:
Frank Moore (661) 972-4775
al@avastronomyclub.org

www.avastronomyclub.org
ANTELOPE VALLEY
ASTRONOMY CLUB, INC.

Monthly Meetings

Monthly meetings are held at the **S.A.G.E. Planetarium** in Palmdale, the second Friday of each month except December. 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.*

Membership

Membership in the Antelope Valley Astronomy Club is open to any individual or family.

The Club has three categories of membership.

- Family membership at $30.00 per year.
- Individual membership at $25.00 per year.
- Junior membership at $15.00 per year.

Membership entitles you to ...

- The Desert Sky Observer -- monthly newsletter
- The Reflector -- the publication of the Astronomical League.
- The AVAC Membership Manual.
- To borrow club equipment, books, videos, and other items.

AVAC
PO Box 8545
Lancaster, CA 93539-8545

Visit the Antelope Valley Astronomy Club website at www.avastronomyclub.org/.

www.avastronomyclub.org

The Antelope Valley Astronomy Club, Inc. is a §503(c)(3) Non-Profit Corporation.

The AVAC is a Sustaining Member of The Astronomical League and the International Dark-Sky Association

President's Message

By Phil Wriedt

Hi There!

On the 24th of last month a group of us met at the Pearblossom Park-N-Ride and drove up to Mt Wilson. The night was very clear, cloudless, apparently no inversion layer, and a tremendous skyglow. Photos from that night are on pages 4 &5; Personally I had a great time. It was my second trip out of the house all month, so I might have a bias. In my opinion, seeing was horrible. I believe a dark night at PDW would out perform Mt Wilson. Why ? Mt Wilson is less than 4 miles from the edge of the San Gabriel Valley, and all of the lights down there.

We have a Club Meeting on Friday July 8th. I know we are still having trouble luring speakers for our meetings, but surely that will change in the near future. Watch your email for more information.

July 23rd we have a Moonwalk at Prime Desert Woodland at 8:30 pm. It should be a beautiful night. Please bring your telescope, and greet the public. Again, watch the your email for up-to-date news and other information.

The next Dark Sky Star Party will be at Chuchupate Saturday July 30. Come on out and join the few die hards. Yeah, I know gas is expensive. Maybe it will go down by then. Watch for emails.....

You get out of it what you put into it.

Keep Looking Up, Phil

On The Cover

Peering deep inside a cluster of several hundred thousand stars, the NASA/ESA Hubble Space Telescope uncovered the oldest burned-out stars in our Milky Way Galaxy. Located in the globular cluster M4, these small, dying stars - called white dwarfs - are giving astronomers a fresh reading on one of the biggest questions in astronomy: How old is the universe? The ancient white dwarfs in M4 are about 12 to 13 billion years old. After accounting for the time it took the cluster to form after the big bang, astronomers found that the age of the white dwarfs agrees with previous estimates for the universe's age.

Credit:
NASA/ESA and H. Richer

From the Secretary

By Rose Moore

Members:

I hope all the members and guests that went up to Mt. Wilson had a good time. I haven't received any feedback yet. There was a bit of confusion just before the event with some members unable to make the trip. We did not have a large standby list, so I think a couple of spots were not filled. I was able to fill a 3 spots with the Cudney family-thank you Cudney family!

Coming up in July we have a club meeting on Friday July 8th at 7pm, a Prime Desert Moon Walk with Jeremy on Saturday July 23rd at 8:30pm, and a Dark Sky Star Party at Chuchupate on Saturday July 30th. Please look out for emails prior to these events with more information.

Matt Leone will be looking at dates for Lunar Club observing and we will post those soon!

For our club meeting in August we will be having an astronomy painting class, starting at approximately 6:30pm in the SAGE Academy right next to the Planetarium. The cost is $15 for members, and $25 for non members. Right now it is open to members only, but will be open to non members if we have any open spots. Email me if you want to be signed up! Please watch out for emails prior to the event. We have started a sign up sheet at our last meeting and will have it at our next club meeting. Member Sue Leone will be heading the class!

Come on out and support your club! Rose

The Club assembled at the 60" telescope.

The Club listening to our tour guide.

Cor Caroli
α Canum Venaticorum

M51, Whirlpool Galaxy
Canes Venatici

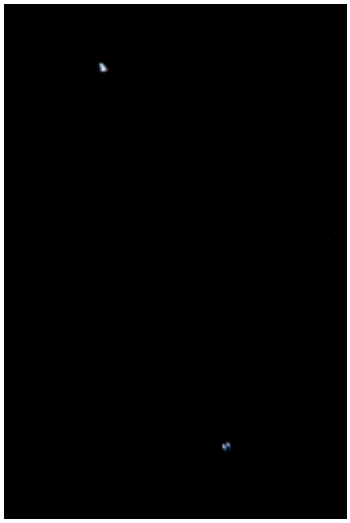
Albireo,
β Cygni

La Superba
Ɣ Canum Venaticorum

M13, Great Globular
Cluster in Hercules

M57, Ring Nebula
Lyra

M3, NGC5272
Canes Venatici



The Double Double, Lyra
Epsilon Lyrae, ε Lyrae

NGC6543, Cat's
Eye Nebula, Draco

All photos on this page by: Darrell Dooley, Mt. Wilson 60" Telescope

Find Hercules and His Mighty Globular Clusters

by David Prosper, NASA Night Sky Network

Hercules is one of the standout heroes of Greek mythology, but his namesake constellation can be surprisingly hard to find - despite being one of the largest star patterns in our night skies! Once you find the stars of Hercules, look deeper; barely hidden in the space around his massive limbs and "Keystone" asterism are two beautiful globular star clusters: M13 and M92!

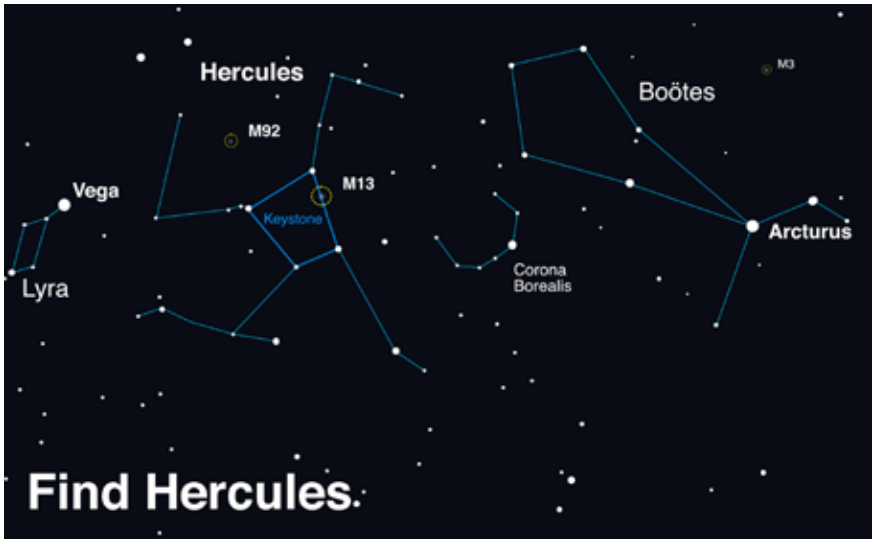
Since the constellation itself is relatively dim but bordered by brighter constellations, you can find the stars of Hercules by looking between the bright stars Vega and Arcturus. They are fairly easy to identify, and we have tips on how to do so in previous articles. Vega is the brightest star in the constellation Lyra and one of the three stars that make up the Summer Triangle (June 2020: Summer Triangle Corner: Vega). Arcturus is the brightest star in the constellation Boötes, and can be found by "arcing to Arcturus" from the handle of the Big Dipper (May 2021: Virgo's Galactic Harvest). You may be able to Hercules's "Keystone" asterism first; this distinct pattern of four stars is traditionally shown as the torso of the great hero, though some illustrators prefer marking the Keystone as the head of Hercules. What pattern do you see in the stars of Hercules?

Globular star clusters appear "fluffy," round, and dense with stars, similar to a dandelion gone to seed, in contrast to the more scattered and decentralized patterns of open clusters. Open clusters are generally made up of young stars that are gradually spreading apart and found inside our Milky Way galaxy, while globular clusters are ancient clusters of stars that are compact, billions of years old, bound to each other and orbit around our galaxy. Due to their considerable distance, globular clusters are usually only visible in telescopes, but one notable exception is M13, also known as the Great Cluster or Hercules Cluster. During very clear dark nights, skilled observers may be able to spot M13 without optical aid along the border of the Keystone, in between the stars Zeta and Eta Herculis - and a bit closer to Eta. Readily visible as a fuzzy "star" in binoculars, in telescopes M13 explodes with stars and can fill up an eyepiece view with its sparkling stars, measuring a little over half the diameter of a full Moon in appearance! When viewed through small telescopes, globular clusters can appear orblike and without discernable member stars, similar in appearance to the fuzzy comae of distant comets. That's why comet hunters Edmund Halley and Charles Messier discovered and then catalogued M13, in 1714 and 1764 respectively, marking this faint fuzzy as a "not-comet" so as to avoid future confusion.

While enjoying your view of M13, don't forget to also look for M92! This is another bright and bold globular cluster, and if M13 wasn't so spectacular, M92 would be known as the top celestial sight in Hercules. M92 also lies on the edge of naked-eye visibility, but again, binoculars and especially a telescope are needed to really make it "pop." Even though M92 and M13 appear fairly close together in the sky, in actuality they are rather far apart: M13's distance is estimated at about 25,000 light years from Earth, and M92's at approximately 27,000 light years distant. Since M13 and M92 appear so close together in our skies and relatively easy to spot, switching between these two clusters in your scope makes for excellent star-hopping practice. Can you observe any differences between these two ancient clusters of stars?

Globular clusters are closely studied by astronomers for hints about the formation of stars and galaxies. The clusters of Hercules have even been studied by NASA's space telescopes to reveal the secrets of their dense cores of hundreds of thousands of stars. Find their latest observations of globular clusters - and the universe - at nasa.gov.

Composite image of the dense starry core of M92 imaged in multiple wavelengths. While your own views of these globular clusters won't be nearly as crisp and detailed, you might be able to count some of its member stars. How far into their dense cores can you count individual stars? Credits: ESA/Hubble & NASA; Acknowledgment: Gilles Chapdelaine.
Source: https://www.nasa.gov/feature/goddard/2017/messier-92



Look up after sunset during summer months to find Hercules! Scan between Vega and Arcturus, near the distinct pattern of Corona Borealis. Once you find its stars, use binoculars or a telescope to hunt down the globular clusters M13 and M92. If you enjoy your views of these globular clusters, you're in luck - look for another great globular, M3, in the nearby constellation of Boötes. Image created with assistance from Stellarium: stellarium.org

Additional Skywatching Resources

Plan your skywatching with help from our planner page, featuring daily stargazing tips courtesy EarthSky monthly sky maps, and videos from NASA/JPL. You can even find out how to spot the International Space Station! Both Astronomy and Sky and Telescope magazines offer regular stargazing guides to readers, both in print and online. Want to join a group of folks for a star party? Find clubs and astronomy events near you, and may you have clear skies!

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.gov to find local clubs, events, and more!

Space News

News from around the Net

The Voyager probes are not fully powering down ... yet

The Voyager spacecraft have been flying through space for nearly 45 years, so seeing recent headlines that these interstellar pioneers are powering down understandably caused some waves. But are the Voyager spacecraft really about to be shut down? To clarify the situation, Astronomy reached out to the mission press officer Calla Cofield who was quick to correct the impression, saying, "nothing new is starting now." She went on to explain that NASA is following a strategic plan to keep their oldest explorers going for as long as possible.. . . (continued at https://astronomy.com/news/2022/06/voyager-spacecrafts-powering-down)

VY Canis Majoris is Dying, and Astronomers are Watching

Three-dimensional models of astronomical objects can be ridiculously complex. They can range from black holes that light doesn't even escape to the literal size of the universe and everything in between. But not every object has received the attention needed to develop a complete model of it, but we can officially add another highly complex model to our lists. Astronomers at the University of Arizona have developed a model of VY Canis Majoris, a red hypergiant that is quite possibly the largest star in the Milky Way. . . .(continued at https://www.universetoday.com/156464/vy-canis-majoris-is-dying-and-astronomers-are-watching/#more-156464)

NASA Announces Launch Delay for Psyche Asteroid Mission

NASA announced Friday the Psyche asteroid mission, the agency's first mission designed to study a metal-rich asteroid, will not make its planned 2022 launch attempt. Due to the late delivery of the spacecraft's flight software and testing equipment, NASA does not have sufficient time to complete the testing needed ahead of its remaining launch period this year, which ends on Oct. 11. The mission team needs more time to ensure that the software will function properly in flight. . . .(continued at https://www.nasa.gov/press-release/nasa-announces-launch-delay-for-psyche-asteroid-mission)

Image: Hubble captures a galactic menagerie

The NASA/ESA Hubble Space Telescope captured this massive galaxy cluster, called Abell 1351, with its Wide Field Camera 3 and Advanced Camera for Surveys. Abell 1351 lies in the constellation Ursa Major in the northern hemisphere. This image is filled with streaks of light which are actually the images of distant galaxies. The streaks are the result of gravitational lensing, an astrophysical phenomenon that occurs when a massive celestial body such as a galaxy cluster distorts spacetime strongly enough to affect the path of light passing through it,. . . (continued at https://phys.org/news/2022-06-image-hubble-captures-galactic-menagerie.html)

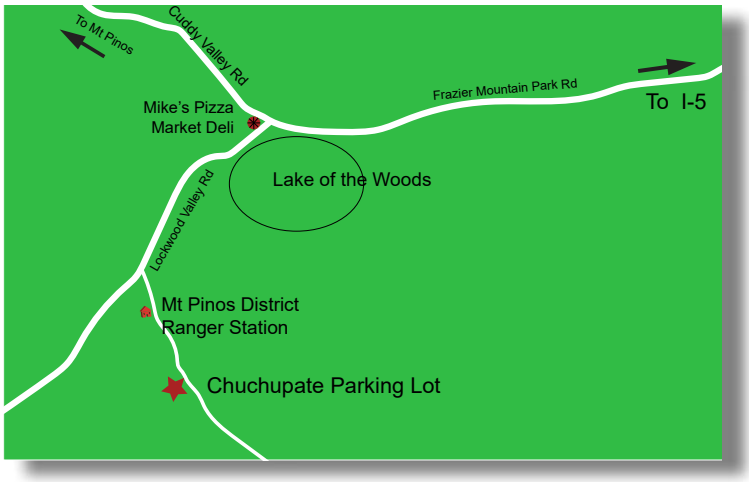
Arecibo Observatory Scientists Help Unravel Surprise Asteroid Mystery

When asteroid 2019 OK suddenly appeared barreling toward Earth on July 25, 2019, Luisa Fernanda Zambrano-Marin and the team at the Arecibo Observatory in Puerto Rico jumped into action. After getting an alert, the radar scientists zoned in on the asteroid, which was coming from Earth's blind spot — solar opposition. Zambrano-Marin and the team had 30 minutes to get as many radar readings as they could. It was traveling so fast, that's all the time she'd have it in Arecibo's sights.. . . .(continued at https://www.ucf.edu/news/arecibo-observatory-scientists-help-unravel-surprise-asteroid-mystery/)

Dark Sky Observing Sites

The Chuchupate parking lot is a half a mile beyond the Mt Pinos ranger station (on some maps The Chuchupate Ranger Sta., the parking lot is also called Frazier Mountain trailhead).

To get there, take the Frazier Mountain Park RD east about 7 miles from I-5, to Lake Of The Woods, Turn left on Lockwood Valley Rd. (If you see Mike's Pizza on your left you missed the turn) In less than a mile there is a road to the left, go past the ranger station, the parking lot is on the right. The Club gathers in the upper end of the lot. The Elevation is 5430 feet. There is a vault toilet.

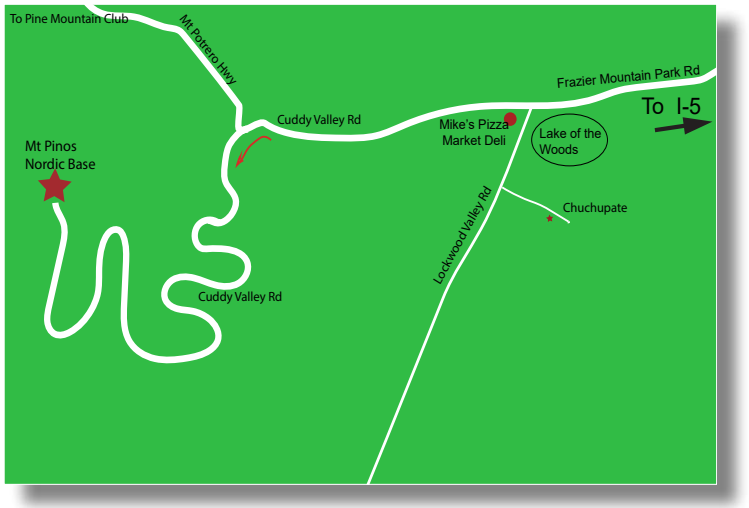


The Red Cliffs Natural Area is part of **Red Rock Canyon State Park** is a day use area and is not for use by the public after dark. The Club gets a special permit for a star party and pays a fee.

To get there: Take the CA-14 north 25 miles past Mojave. You will see giant red cliffs on the right side and a small sign that says "Red Cliffs Natural Area" and a dirt road. (If you see the large sign for the Ricardo campground, you drove a mile too far). Follow the road to the large parking lot (that hasn't been graded in a long time). Elevation is 2410 feet. There is a vault toilet.

Mt Pinos is a parking lot at 8350 feet for the "Mt Pinos Nordic Base." There is a vault toilet 300 yds to the east in the Chula Vista campground.

To get there: From I-5, get off at Frazier Mountain Park Rd and drive west about 7 miles to Mike's Pizza/ Market Deli at Lockwood Valley Rd. Keep on the main roadway (don't turn left to go to Chuchupate). Continue past Mike's Pizza on Cuddy Valley Rd (the road's new name) about 5 miles. Continue straight (do not turn right on to Mil Potrero Hwy) for another 8 1/2 miles to the parking area.
Note: The entire drive from I-5 is uphill.



Planet Summary

The **Sun** starts July in mid-Gemini and is centered on Cancer by months end .

Mercury starts the month in Taurus, hard to see against the rising Sun. Achieves superior conjunction on the 16th, Visible again very late in the month.

Venus begins the month in Taurus. Gradually becoming less conspicuous in the dawn sky, as its elongation from the Sun shrinks from 30° to 22°.

Mars begins the month in Pisces as it is continuing to rise in prominence brightening from +0.5 to +0.2 during the month as it slowly crawls into Aries.

Jupiter spends July stuck almost stationary in a corner of Cetus. The 64% waning Moon passes by on the 18th 3° to the south

Saturn begins the month in its retrograde motion near the tail of Capricorn. On the 15th the 95% waning Moon passes some 5° to south.

Uranus continues moving east in central Aries at mag 5.8. On the 31st it will be in conjunction with Mars. On the 21st of June the 34% waning Moon will be 21 arc-mins south (at 10:30 pm).

Neptune, in the late evening sky, on the western edge of Pisces slowly moving west. The 73% waning Moon flies past 4.5° south on the 17th.

Pluto spends the month slowing moving west on the eastern edge of Sagittarius at mag 14.3.

Ceres is in Gemini and 42/3° north of the ecliptic. Near the 20th it passes behind the Sun.

Pallas spends the month in Hercules about 40° north of the ecliptic

Juno is in Libra about 12° north of Saturn.

Vesta is in Aquarius 6 ⅔° south of the ecliptic.

Moon Phases

First Qtr Jul 6 | Full Jul 13 | Third Qtr Jul 20 | New Jul 28

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
7/1/2022	07:48	22:27	05:43	20:09
7/5/2022	11:45	23:22	05:45	20:09
7/10/2022	17:18	02:29	05:48	20:07
7/15/2022	22:13	07:54	05:51	20:06
7/20/2022	00:13	13:24	05:54	20:03
7/25/2022	03:03	18:15	05:57	20:00
7/30/2022	07:41	21:32	06:01	19:56

Planet Data*

July 1

	Rise	Transit	Set	Mag	Phase%
Mercury	04:35	11:45	18:56	-0.77	73.9
Venus	03:46	10:50	17:54	-3.91	86.1
Mars	01:32	07:59	14:26	0.46	85.6
Jupiter	00:33	06:44	12:51	-2.50	98.9
Saturn	22:39	04:00	09:25	0.56	99.9

July 15

	Rise	Transit	Set	Mag	Phase%
Mercury	05:42	12:55	20:08	-2.07	99.6
Venus	03:56	11:06	18:17	-3.97	82.3
Mars	01:04	07:41	14:18	0.35	85.1
Jupiter	23:41	05:52	12:00	-2.60	99.0
Saturn	21:42	03:03	08:27	0.47	99.9

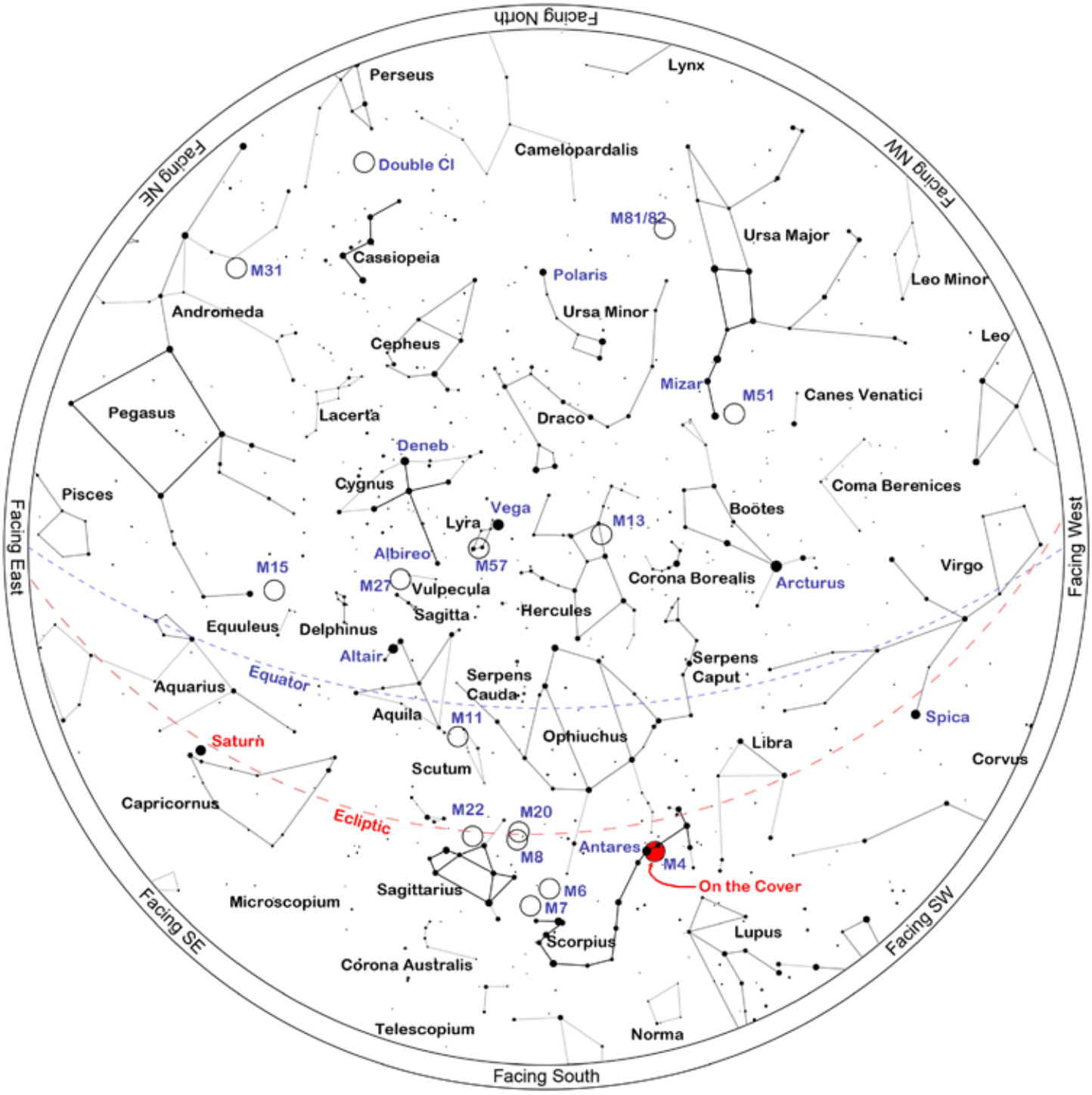
July 30

	Rise	Transit	Set	Mag	Phase%
Mercury	07:11	14:00	20:47	-0.71	88.2
Venus	04:16	11:26	18:36	-3.90	92.3
Mars	00:33	07:21	14:07	0.22	84.7
Jupiter	22:43	04:55	11:02	-2.70	99.1
Saturn	20:41	02:00	07:23	0.37	99.9

*All time mentioned are local and approximate.

*Sun, Moon and Planetary date based on Quartz Hill, CA

Sky Chart



Location: Palmdale, CA 93551
Latitude: 34° 36' N, longitude: 118° 11' W
Time: 2022 July 30, 22:00 (UTC -07:00)

Powered by: Heavens-Above.com

Suggested Observing List

The list below contains objects that will be visible on the night of the AVAC Deep Sky Star Party or the Saturday nearest the New Moon, in this case July 30, 2022. The list is sorted by the transit time of the object.

ID	Common Name	Type		RA	Dec	Mag	Rise	Transit	Set
NGC5907	Splinter Galaxy	Galaxy	Dra	15h 15m 54s	+56° 19.7'	11.4	Circ	19:41	Circ
NGC5882		P Neb	Lup	15h 16m 50s	-45° 38.9'	11.0	16:38	19:42	22:47
NGC5897		Globular	Lib	15h 17m 24s	-21° 00.6'	8.6	14:42	19:43	00:44
M5	NGC5904	Globular	Ser	15h 18m 33s	+02° 04.9'	7.0	13:36	19:44	01:53
Barnard228	B228	DkNeb	Lup	15h 44m 00s	-34° 30.0'		16:00	20:10	00:19
IC4593	White Eyed Pea	P Neb	Her	16h 11m 44s	+12° 04.3'	11.0	14:00	20:37	03:14
IC4592	Jabbah	Neb	Sco	16h 11m 59s	-19° 27.4'		15:31	20:38	01:44
M80	NGC6093	Globular	Sco	16h 17m 03s	-22° 58.5'	8.5	15:48	20:43	01:37
IC4601		Neb	Sco	16h 20m 18s	-20° 04.9'		15:42	20:46	01:50
Abell38		P Neb	Sco	16h 23m 17s	-31° 44.9'	11.7	16:27	20:49	01:11
M4	Cat's Eye, NGC6121	Globular	Sco	16h 23m 35s	-26° 31.5'	7.5	16:07	20:49	01:31
IC4603	Rho Ophiuchi Complex [1]	Neb	Oph	16h 25m 24s	-24° 28.0'		16:02	20:51	01:40
IC4604	Rho Ophiuchi Complex [2]	Neb	Oph	16h 25m 33s	-23° 26.5'		15:58	20:51	01:44
NGC6124	C75	Open	Sco	16h 25m 36s	-40° 40.0'	5.8	17:13	20:51	00:29
Abell39		P Neb	Her	16h 27m 33s	+27° 54.5'	12.9	13:23	20:53	04:23
IC4605		Neb	Sco	16h 30m 12s	-25° 06.8'		16:09	20:56	01:43
NGC6153		P Neb	Sco	16h 31m 31s	-40° 15.2'	12.0	17:17	20:57	00:37
NGC6181		Galaxy	Her	16h 32m 21s	+19° 49.5'	11.9	13:57	20:58	03:59
NGC6171		Globular	Oph	16h 32m 32s	-13° 03.1'	8.1	15:32	20:58	02:24
NGC6178		Open	Sco	16h 35m 47s	-45° 38.6'	7.2	17:57	21:01	00:06
NGC6193	C82	Open	Ara	16h 41m 18s	-48° 46.0'	5.2	18:30	21:07	23:44
M13	Great Hercules Cluster	Globular	Her	16h 41m 41s	+36° 27.5'	7.0	13:00	21:07	05:15
NGC6210	Turtle Planetary Neb	P Neb	Her	16h 44m 30s	+23° 48.0'	9.0	13:55	21:10	04:25
Barnard44a	B44a	DkNeb	Sco	16h 44m 45s	-40° 20.0'		17:31	21:10	00:50
NGC6204		Open	Ara	16h 46m 09s	-47° 01.0'	8.2	18:19	21:12	00:05
M12	Gumball Globular	Globular	Oph	16h 47m 14s	-01° 56.8'	8.0	15:15	21:13	03:10
NGC6231	C76	Open	Sco	16h 54m 00s	-41° 48.0'	2.6	17:49	21:20	00:51
IC4628	Prawn Nebula	Neb	Sco	16h 56m 58s	-40° 27.3'		17:43	21:23	01:02
NGC6254		Globular	Oph	16h 57m 09s	-04° 05.9'	6.6	15:31	21:23	03:14
Barnard47	B47	DkNeb	Oph	16h 59m 42s	-22° 38.0'		16:30	21:25	02:21
M62	Flickering Globular, NGC6266	Globular	Oph	17h 01m 13s	-30° 06.7'	8.0	16:58	21:27	01:55
M19	NGC6273	Globular	Oph	17h 02m 38s	-26° 16.0'	8.5	16:45	21:28	02:11
Barnard51	B51	DkNeb	Oph	17h 04m 44s	-22° 15.0'		16:33	21:30	02:27
IC4637		P Neb	Sco	17h 05m 10s	-40° 53.1'	14.0	17:54	21:31	01:07
Barnard56	B56	DkNeb	Sco	17h 08m 48s	-32° 05.0'		17:14	21:34	01:55
Barnard59	B59,Pipe Nebula	DkNeb	Oph	17h 11m 23s	-27° 29.0'		16:58	21:37	02:15

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6302	C69,Bug Nebula	P Neb	Sco	17h 13m 42s	-37° 06.0'	9.6	17:42	21:39	01:36
Barnard251	B251	DkNeb	Oph	17h 13m 48s	-20° 09.0'		16:35	21:39	02:43
Barnard63	B63	DkNeb	Oph	17h 16m 00s	-21° 28.0'		16:42	21:42	02:41
M92	NGC6341	Globular	Her	17h 17m 07s	+43° 08.1'	7.5	12:55	21:43	06:30
M9	NGC6333	Globular	Oph	17h 19m 12s	-18° 31.0'	9.0	16:36	21:45	02:54
NGC6326		P Neb	Ara	17h 20m 46s	-51° 45.2'	12.0	19:45	21:46	23:48
Barnard256	B256	DkNeb	Oph	17h 22m 12s	-28° 49.0'		17:14	21:48	02:21
Barnard67a	B67a	DkNeb	Oph	17h 22m 30s	-21° 53.0'		16:50	21:48	02:46
Barnard71	B71	DkNeb	Oph	17h 23m 02s	-24° 00.0'		16:58	21:49	02:40
NGC6357	Lobster Nebula	Neb	Sco	17h 24m 43s	-34° 12.1'		17:39	21:50	02:01
IC4651		Open	Ara	17h 24m 52s	-49° 56.5'	6.9	19:26	21:50	00:15
Abell41		P Neb	Ser	17h 29m 04s	-15° 13.3'	13.9	16:35	21:55	03:14
Abell42		P Neb	Oph	17h 31m 31s	-08° 19.1'	14.6	16:18	21:57	03:37
Barnard78	B78	DkNeb	Oph	17h 32m 00s	-25° 35.0'		17:12	21:58	02:43
NGC6388		Globular	Sco	17h 36m 17s	-44° 44.1'	6.9	18:51	22:02	01:13
M14	NGC6402	Globular	Oph	17h 37m 36s	-03° 14.7'	9.5	16:09	22:03	03:57
Barnard276	B276	DkNeb	Oph	17h 39m 39s	-19° 49.0'		17:00	22:05	03:10
M6	Butterfly Cluster	Open	Sco	17h 40m 20s	-32° 15.2'	4.5	17:46	22:06	02:25
NGC6397	C86	Globular	Ara	17h 40m 42s	-53° 40.0'	5.6	20:37	22:06	23:36
NGC6426		Globular	Oph	17h 44m 55s	+03° 10.1'	11.2	15:59	22:10	04:22
Barnard83a	B83a	DkNeb	Sgr	17h 45m 18s	-20° 00.0'		17:06	22:11	03:15
IC4665		Open	Oph	17h 46m 30s	+05° 39.0'	4.2	15:54	22:12	04:31
NGC6445	Crescent Nebula	P Neb	Sgr	17h 49m 15s	-20° 00.6'	13.0	17:10	22:15	03:19
NGC6503		Galaxy	Dra	17h 49m 27s	+70° 08.6'	10.2	Circ	22:15	Circ
NGC6441		Globular	Sco	17h 50m 13s	-37° 03.0'	7.4	18:18	22:16	02:13
Barnard283	B283	DkNeb	Sco	17h 51m 00s	-33° 52.0'		18:04	22:17	02:29
Barnard285	B285	DkNeb	Ser	17h 51m 32s	-12° 52.0'		16:51	22:17	03:43
M7	Ptolemy's Cluster	Open	Sco	17h 53m 51s	-34° 47.6'	3.5	18:11	22:19	02:28
IC4670		Neb	Sgr	17h 55m 07s	-21° 44.6'		17:22	22:21	03:19
NGC6501		Galaxy	Her	17h 56m 04s	+18° 22.3'	12.3	15:25	22:22	05:18
M23	NGC6494	Open	Sgr	17h 57m 04s	-18° 59.1'	6.0	17:15	22:23	03:30
NGC6543	C6,Cat Eye Nebula	P Neb	Dra	17h 58m 36s	+66° 38.0'	8.1	Circ	22:24	Circ
NGC6496		Globular	Sco	17h 59m 04s	-44° 16.0'	9.2	19:10	22:25	01:39
Barnard291	B291	DkNeb	Sgr	17h 59m 43s	-33° 53.0'		18:13	22:25	02:38
Barnard292	B292	DkNeb	Sgr	18h 00m 34s	-33° 20.0'		18:11	22:26	02:41
Barnard293	B293	DkNeb	Sgr	18h 01m 12s	-35° 20.0'		18:21	22:27	02:33
M20	Trifid Nebula, The Clover	Open+D Neb	Sgr	18h 02m 42s	-22° 58.2'	5.0	17:34	22:28	03:23

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M8	Lagoon Nebula, Dragon Nebula	Open+D Neb	Sgr	18h 03m 41s	-24° 22.7'	5.0	17:40	22:29	03:19
Barnard295	B295	DkNeb	Sgr	18h 04m 05s	-31° 09.0'		18:05	22:30	02:54
M21	NGC6531	Open	Sgr	18h 04m 13s	-22° 29.3'	7.0	17:34	22:30	03:26
NGC6530		Open	Sgr	18h 04m 31s	-24° 21.5'	4.6	17:40	22:30	03:20
NGC6528		Globular	Sgr	18h 04m 50s	-30° 03.3'	9.5	18:02	22:30	02:59
IC4684		Neb	Sgr	18h 09m 08s	-23° 26.1'		17:42	22:35	03:28
IC4685		Neb	Sgr	18h 09m 18s	-23° 59.2'		17:44	22:35	03:26
Barnard303	B303	DkNeb	Sgr	18h 09m 28s	-23° 59.0'		17:44	22:35	03:26
IC1274		Neb	Sgr	18h 09m 51s	-23° 38.8'		17:43	22:35	03:28
IC1275		Neb	Sgr	18h 10m 07s	-23° 45.7'		17:44	22:36	03:28
NGC6572		P Neb	Oph	18h 12m 06s	+06° 51.2'	9.0	16:16	22:38	05:00
NGC6567		P Neb	Sgr	18h 13m 45s	-19° 04.5'	12.0	17:32	22:39	03:47
IC4701		Neb	Sgr	18h 16m 36s	-16° 38.0'		17:27	22:42	03:57
Barnard93	B93	DkNeb	Sgr	18h 16m 53s	-18° 03.0'		17:32	22:42	03:53
IC1284		Neb	Sgr	18h 17m 39s	-19° 40.3'		17:38	22:43	03:49
M24, NGC6603	Small Sagittarius Star Cloud,	Open	Sgr	18h 18m 26s	-18° 24.3'	4.5	17:35	22:44	03:53
M16	Eagle Nebula	Open+D Neb	Ser	18h 18m 48s	-13° 48.3'	6.5	17:21	22:44	04:08
Bar-nard308	B308	DkNeb	Sgr	18h 19m 08s	-22° 14.0'		17:48	22:45	03:42
M18	Black Swan, NGC6613	Open	Sgr	18h 19m 58s	-17° 06.1'	8.0	17:32	22:46	03:59
M17	Omega Nebula, Swan Nebula, Horseshoe Nebula	Open+D Neb	Sgr	18h 20m 47s	-16° 10.3'	7.0	17:30	22:46	04:03
HR6923	39 Dra, SAO30949, HD170073	Mult	Dra	18h 23m 54s	+58° 48.0'	5.0	Circ	22:49	Circ
M28	NGC6626	Globular	Sgr	18h 24m 33s	-24° 52.1'	8.5	18:02	22:50	03:38
Barnard95	B95	DkNeb	Sct	18h 25m 35s	-11° 44.0'		17:22	22:51	04:21
Barnard97	B97	DkNeb	Sct	18h 29m 05s	-09° 55.0'		17:20	22:55	04:30
Abell44		P Neb	Sgr	18h 30m 11s	-16° 45.4'	12.6	17:41	22:56	04:10
NGC6637		Globular	Sgr	18h 31m 23s	-32° 20.8'	7.7	18:38	22:57	03:16
IC1287		Neb	Sct	18h 31m 26s	-10° 47.7'		17:25	22:57	04:29
M25	M25	Open	Sgr	18h 31m 42s	-19° 07.0'	6.5	17:50	22:57	04:05
IC4725		Open	Sgr	18h 31m 48s	-19° 06.7'	4.6	17:50	22:57	04:05
NGC6642		Globular	Sgr	18h 31m 54s	-23° 28.5'	8.8	18:05	22:57	03:50
NGC6644		P Neb	Sgr	18h 32m 35s	-25° 07.7'	12.0	18:11	22:58	03:45
NGC6647		Open	Sgr	18h 32m 49s	-17° 13.6'	8.0	17:45	22:58	04:12
IC4732		P Neb	Sgr	18h 33m 55s	-22° 38.6'	13.0	18:04	22:59	03:55
NGC6656	Crackerjack Cluster	Globular	Sgr	18h 36m 24s	-23° 54.2'	5.1	18:11	23:02	03:53

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
IC4756		Open	Ser	18h 38m 54s	+05° 27.0'	5.0	16:46	23:04	05:22
NGC6681		Globular	Sgr	18h 43m 12s	-32° 17.4'	8.1	18:49	23:09	03:28
NGC6694		Open	Sct	18h 45m 18s	-09° 23.0'	8.0	17:34	23:11	04:47
IC4776		P Neb	Sgr	18h 45m 51s	-33° 20.5'	12.0	18:57	23:11	03:26
Barnard318	B318	DkNeb	Sct	18h 49m 42s	-06° 23.0'		17:30	23:15	05:00
M11	Wild Duck Cluster	Open	Sct	18h 51m 05s	-06° 16.1'	7.0	17:31	23:17	05:02
M57	Ring Nebula	P Neb	Lyr	18h 53m 35s	+33° 01.7'	9.5	15:28	23:19	07:10
Barnard117	B117	DkNeb	Sct	18h 53m 43s	-07° 24.0'		17:37	23:19	05:01
NGC6715		Globular	Sgr	18h 55m 03s	-30° 28.7'	7.7	18:54	23:21	03:48
NGC6717	III-143	Globular	Sgr	18h 55m 06s	-22° 42.0'	9.2	18:25	23:21	04:16
Barnard122	B122	DkNeb	Sct	18h 56m 48s	-04° 45.0'		17:33	23:22	05:12
Barnard123	B123	DkNeb	Sct	18h 57m 39s	-04° 43.0'		17:34	23:23	05:13
NGC6723		Globular	Sgr	18h 59m 33s	-36° 37.9'	7.3	19:26	23:25	03:25
Barnard128	B128	DkNeb	Aql	19h 01m 40s	-04° 34.0'		17:37	23:27	05:17
NGC6729	C68	BrNeb	CrA	19h 01m 54s	-36° 57.0'		19:30	23:27	03:25
Barnard326	B326	DkNeb	Aql	19h 03m 00s	-00° 23.0'		17:27	23:29	05:30
NGC6749		Globular	Aql	19h 05m 15s	+01° 54.0'	11.1	17:23	23:31	05:39
Barnard329	B329	DkNeb	Aql	19h 06m 59s	+03° 11.0'		17:21	23:33	05:44
NGC6760		Globular	Aql	19h 11m 12s	+01° 01.8'	9.1	17:31	23:37	05:42
Abell56		P Neb	Aql	19h 13m 07s	+02° 52.8'	12.4	17:28	23:39	05:49
NGC6772		P Neb	Aql	19h 14m 36s	-02° 42.4'	14.0	17:45	23:40	05:35
Barnard138	B138	DkNeb	Aql	19h 16m 00s	+00° 13.0'		17:38	23:42	05:45
M56	NGC6779	Globular	Lyr	19h 16m 36s	+30° 11.0'	9.5	16:03	23:42	07:21
NGC6778		P Neb	Aql	19h 18m 25s	-01° 35.7'	13.0	17:46	23:44	05:42
Abell61		P Neb	Cyg	19h 19m 10s	+46° 14.5'	13.0	14:33	23:45	08:57
Barnard140	B140	DkNeb	Aql	19h 19m 49s	+05° 13.0'		17:28	23:45	06:03
NGC6790		P Neb	Aql	19h 22m 57s	+01° 30.8'	10.0	17:42	23:49	05:55
NGC6803		P Neb	Aql	19h 31m 16s	+10° 03.3'	11.0	17:26	23:57	06:28

And - Andromeda
Ant - Antlia
Aps - Apus
Aql - Aquila
Aqr - Aquarius
Ara - Ara
Ari - Aries
Aur - Auriga
Boo - Bootes
Cae - Caelum
Cam - Camelopardis
Cap - Capricornus
Car - Carina
Cas - Cassiopeia
Cen - Centaurus
Cep - Cepheus
Cet - Cetus
Cha - Chamaeleon
Cir - Circinus
CMa - Canis Major
CMi - Canis Minor
Cnc - Cancer
Col - Columba
Com - Coma Berenices
CrA - Corona Australis
CrB - Corona Borealis
Crt - Crater
Cru - Crux
Crv - Corvus
CVn - Canes Venatici
Cyg - Cygnus
Del - Delphinus
Dor - Dorado
Dra - Draco
Equ - Equuleus
Eri - Eridanus
For - Fornax
Gem - Gemini
Gru - Grus
Her - Hercules
Hor - Horologium
Hya - Hydra
Hyi - Hydrus
Ind - Indus
Lac - Lacerta
Leo - Leo
Lep - Lepus
Lib - Libra
LMi - Leo Minor
Lup - Lupus
Lyn - Lynx
Lyr - Lyra
Men - Mensa
Mic - Microscopium
Mon - Monoceros
Mus - Musca
Nor - Norma
Oct - Octans
Oph - Ophiuchus
Ori - Orion
Pav - Pavo
Peg - Pegasus
Per - Perseus
Phe - Phoenix
Pic - Pictor
PsA - Pisces Austrinus
Psc - Pisces
Pup - Puppis
Pyx - Pyxis
Ret - Reticulum
Scl - Sculptor
Sco - Scorpius
Sct - Scutum
Ser - Serpens
Sex - Sextans
Sge - Sagitta
Sgr - Sagittarius
Tau - Taurus
Tel - Telescopium
TrA - Triangulum Australe
Tri - Triangulum
Tuc - Tucana
UMa - Ursa Major
UMi - Ursa Minor
Vel - Vela
Vir - Virgo
Vol - Volans
Vul - Vulpecula

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