

Volume 41.11

November 2021

# Desert Sky Observer

Antelope Valley Astronomy Club



# Desert Sky Observer

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

November 2021

## Upcoming Events

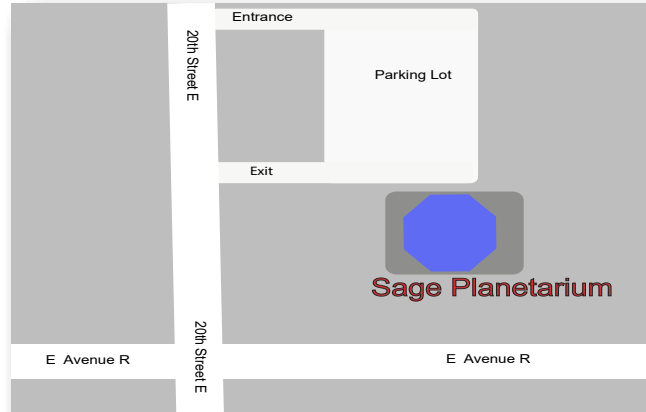
November 6: DSSP -- Saddleback SP  
November 12 : Club Meeting  
November 13: Moon Walk 5:30 pm@ PDW  
November 18: Lunar eclipse -- before midnight

Every clear night: Personal Star Party

December 4: Christmas Party  
December 11: Moon Walk 5:30 pm @ PDW



AVAC Calendar



## Board Members

**President:** Darrell Bennett (661) 220-0122  
[president@avastronomyclub.org](mailto:president@avastronomyclub.org)

**Vice-President:** Matt Leone (661) 713-1894  
[vice-president@avastronomyclub.org](mailto:vice-president@avastronomyclub.org)

**Secretary:** Rose Moore (661) 972-1953  
[secretary@avastronomyclub.org](mailto:secretary@avastronomyclub.org)

**Treasurer:** Rod Girard (661) 803-7838  
[treasurer@avastronomyclub.org](mailto:treasurer@avastronomyclub.org)

## Appointed Positions

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

**Equipment & Library:**  
John Van Evera 661-754-1819  
[library@avastronomyclub.org](mailto:library@avastronomyclub.org)

**Club Historian:** vacant  
[history@avastronomyclub.org](mailto:history@avastronomyclub.org)

**Webmaster:** Steve Trotta (661) 269-5428  
[webmaster@avastronomyclub.org](mailto:webmaster@avastronomyclub.org)

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



## 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 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.*

## 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/](http://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



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

## President's Message

By Darrell Bennett

Well Hello Everyone,

Wow. Just two months left in this year, to me it has gone by too fast. On October 3rd we had our annual Deep Sky Party at Red Cliffs . The weather was great but the sky was a little bit smokey. I usually wait till M42 comes up, but, I decided to leave after looking at 14 objects.

On October 8th we held our Annual Club Business Meeting to elect the Executive Board Members. My congratulations to Phil Wriedt, our new incoming President. I know Phil will do a great job and I will help him if he asks for it; and I know everyone will help to support him.

Then on October 23rd was Prime Desert Woodlands Moon Walk. Well that didn't happen because of too many clouds and too much wind. We did try showing up with our scopes hoping it would clear up and the wind would die down but didn't happen; so we waited for Jeremy to show up just to tell him that there will be no observing tonight.

And --- Lastly on October 29th was the College of the Canyons Star Party.

Until next month, Keep Looking Up

## On The Cover

This mosaic image of the magnificent starburst galaxy, Messier 82 (M82) (The Cigar Galaxy) is the sharpest wide-angle view ever obtained of M82. It is a galaxy remarkable for its webs of shredded clouds and flame-like plumes of glowing hydrogen blasting out from its central regions where young stars are being born 10 times faster than they are inside in our Milky Way Galaxy.

Credit:

NASA, ESA and the Hubble Heritage Team (STScI/AURA). Acknowledgment: J. Gallagher (University of Wisconsin), M. Mountain (STScI) and P. Puxley (NSF).

## From the Secretary

By Rose Moore

Our Christmas Party will be on Saturday Dec. 4th starting at 6pm at Gino's Restaurant in the Lancaster Marketplace. Buffet starts at 6:30pm. I will be sending out frequent reminders to members in the upcoming weeks. Cost is \$30 per person, \$15 for kids. You may pay via the PayPal link on our website, or pay at the next meeting on Friday Nov. 12th, or mail in a payment. Deadline for the payment is Nov. 15th. If you have any questions, please contact one of the Board members!

Coming up we have a dark sky star party on Saturday Nov. 6th at Saddleback State Park. This is an overnight star party. We have reserved the large group campsite for this star party. There will be a BBQ before the star party, starting about 3-4pm. The club will be supplying the charcoal, you will need to bring your own meat and/or veggies to put on the grill and cook. You may bring whatever you want to eat and drink, and if you would like to share, you may bring something for a potluck. An email will be sent out several days before the star party.

We have a club meeting on Friday Nov. 12th. We will possibly have a speaker, by Zoom, for the meeting. Will keep you posted!

On Saturday Nov. 13th we have a Prime Desert Moon Walk at 5:30pm. We will need members with telescopes, or you may come out to take the walk. Weather permitting.

We had our club business meeting and elections at October's meeting. Our new, or returning Board members, are: Phil Wriedt - President, Gail Lofdahl - Vice President, Rod Girard - Treasurer, Rose Moore - Secretary. Congratulations to all! We appreciate any help from members. Remember that the Board meetings are open to club members who are interested in seeing how items are discussed and planned.

Please come out and support your club at any of these events! Cheers, Rose

### Member Scope For Sale

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

## Measure the Night Sky

David Prosper, NASA Night Sky Network

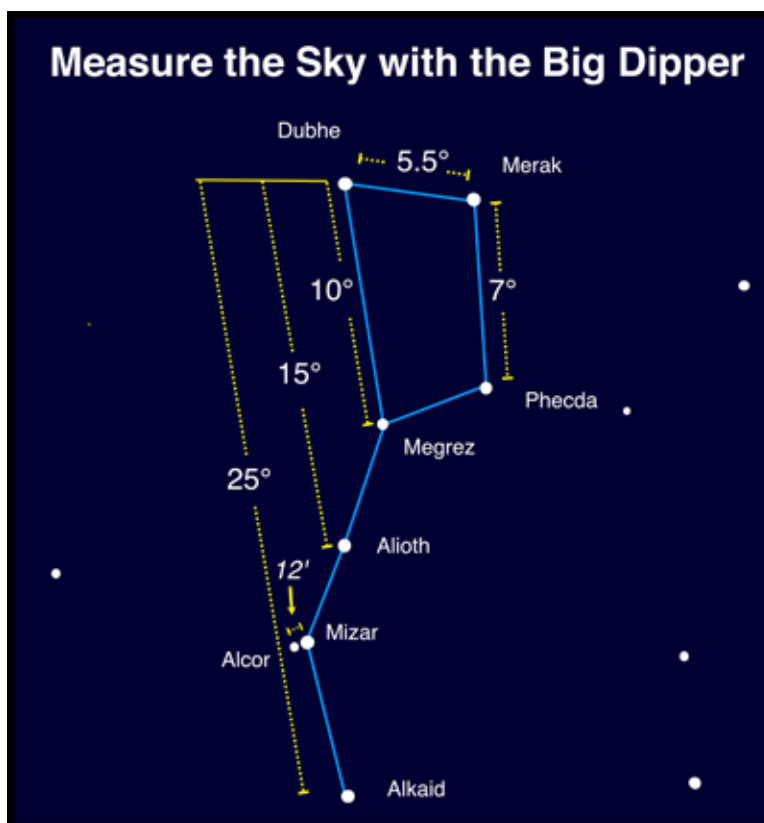
Fall and winter months bring longer nights, and with these earlier evenings, even the youngest astronomers can get stargazing. One of the handiest things you can teach a new astronomer is how to measure the sky – and if you haven't yet learned yourself, it's easier than you think!



Astronomers measure the sky using degrees, minutes, and seconds as units. These may sound more like terms for measuring time - and that's a good catch! – but today we are focused on measuring **angular distance**. **Degrees** are largest, and are each made up of 60 **minutes**, and each minute is made up of 60 **seconds**. To start, go outside and imagine yourself in the center of a massive sphere, with yourself at the center, extending out to the stars: appropriately enough, this is called the **celestial sphere**. A circle contains 360 degrees, so if you have a good view of the horizon all around you, you can slowly spin around exactly once to see what 360 degrees looks like, since you are in effect drawing a circle from inside out, with yourself at the center! Now break up that circle into quarters, starting from due North; each quarter measures 90 degrees, equal to the distance between each cardinal direction! It measures 90 degrees between due North and due East, and a full 180 degrees along the horizon between due North and due South. Now, switch from a horizontal circle to a vertical one, extending above and below your head. Look straight above your head: this point is called the zenith, the highest point in the sky. Now look down toward the horizon; it measures 90 degrees from the zenith to the horizon. You now have some basic measurements for your sky.



Use a combination of your fingers held at arm's length, along with notable objects in the night sky, to make smaller measurements. A full Moon measures about half a degree in width - or 1/2 of your pinky finger, since each pinky measures 1 degree. The three stars of Orion's Belt create a line about 3 degrees long. The famed "Dig Dipper" asterism is a great reference for Northern Hemisphere observers, since it's circumpolar and visible all night for many. The Dipper's "Pointer Stars," Dubhe and Merak, have 5.5 degrees between them - roughly three middle fingers wide. The entire asterism stretches 25 degrees from Dubhe to Alkaid - roughly the space between your outstretched thumb and pinky. On the other end of the scale, can you split Mizar and Alcor? They are separated by 12 arc minutes - about 1/5 the width of your pinky.



*Image created with assistance from Stellarium*

Keep practicing to build advanced star-hopping skills. How far away is Polaris from the pointer stars of the Big Dipper? Between Spica and Arcturus? Missions like Gaia and Hipparcos measure tiny differences in the angular distance between stars, at an extremely fine level. Precise measurement of the heavens is known as **astrometry**. Discover more about how we measure the universe, and the missions that do so, at [nasa.gov](https://nasa.gov).

This article is distributed by NASA Night Sky Network

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

## Space News

News from around the Net

### James Webb Space Telescope Will Look Back To The Cosmic Dark Ages

Some have called NASA's James Webb Space Telescope the "telescope that ate astronomy." It is the most powerful space telescope ever built and a complex piece of mechanical origami that has pushed the limits of human engineering. On Dec. 18, 2021, after years of delays and billions of dollars in cost overruns, the telescope is scheduled to launch into orbit and usher in the next era of astronomy. . . (continued at <https://astronomy.com/news/2021/10/james-webb-space-telescope-will-look-back-to-the-cosmic-dark-ages> )



### Streetlights To Satellites: Addressing Light Pollution With The United Nations

The statistics are stunning: More than 80% of the world's population (and more than 99% of those in the U.S. and Europe) live under light-polluted skies. Most people can't see the Milky Way. All this artificial sky glow has real impacts, affecting everything from insect reproduction to bird migration to crop yields to human health. Yet over the last 25 years, light pollution has only increased, by at least 50% overall — and in some areas, it's up 400%. . . . (continued at <https://skyandtelescope.org/astronomy-news/taking-dark-skies-to-the-united-nations/> )



### How Bright Will Comet Leonard Get?

Predicting a newly discovered comet's brightness is no easy business. Astronomers often use the power-law formula to make visibility forecasts, but an equation can fail to account for a comet's essential unpredictability. Not only do these fragile, icy fossils experience surprise outbursts and disintegrations, but their luster can vary radically depending on something as simple as viewing angle. . . . (continued at <https://skyandtelescope.org/astronomy-news/how-bright-will-comet-leonard-get/> )



### NASA Fully Stacked For Moon Mission, Readies For Artemis I

NASA's Orion spacecraft is secured atop the agency's powerful Space Launch System rocket, and the integrated system is entering the final phase of preparations for an upcoming uncrewed flight test around the Moon. The mission, known as Artemis I, will pave the way for a future flight test with crew before NASA establishes a regular cadence of more complex missions with astronauts on and around the Moon under Artemis. With stacking complete, a series of integrated tests now sit between the mega-Moon rocket and targeted liftoff for deep space in February 2022. . . (continued at <https://www.nasa.gov/feature/nasa-fully-stacked-for-moon-mission-readies-for-artemis-i> )



### What Colors Are The Planets In Our Solar System? And Why Are They So Different?

The planets of the solar system are varied in their appearance. Mercury is slate gray while Venus is pearly white, Earth a vibrant blue, and Mars a dusky red. Even the gas giants are different, Neptune and Uranus an opaque blue, while Jupiter and Saturn are mostly beige with brilliant red-brown belts. But why are these planets so different?. . . ( continued at <https://astronomy.com/news/2021/10/colors-of-the-solar-system> )



## Space News

News from around the Net

### Why We Need To Return To Uranus And Neptune

During the 1980s, the Voyager 2 spacecraft transformed our view of the ice giants Uranus and Neptune from mere wandering points of light to complex and beautiful planetary systems. The Voyager data remains a treasure trove of information on the planets' interiors, atmospheres and diverse satellites. . . . (continued at <https://www.skyatnightmagazine.com/space-science/spacecraft-mission-uranus-neptune/> )



### A New Climate Model Suggests That Venus Never Had Oceans

Thanks to evidence provided by missions like NASA's Magellan spacecraft, scientists have theorized that Venus likely experienced a catastrophic resurfacing event about 500 million years ago (give or take 200 Mya). This is believed to be the reason why Venus is such a hellish place today, with an atmosphere that is 92 times as dense as Earth's, predominantly composed of carbon dioxide (CO<sub>2</sub>), and temperatures hot enough to melt lead. . . . (continued at <https://www.universetoday.com/153037/a-new-climate-model-suggests-that-venus-never-had-oceans/> )



### Calling Citizen Scientists: You Can Help Find Exoplanets From Your Couch

If you've ever wanted to help find an exoplanet, this is your chance. There's a new open research initiative that invites participants to help identify exoplanets using simple visual pattern matching — and it's open to anybody who wants to help. You don't even have to own a telescope. The project is an open, distributed search for exoplanets, in cooperation with a planet-hunting telescope array called the Next-Generation Transit Survey (NGTS). . (continued at <https://www.extremetech.com/extreme/328496-calling-citizen-scientists-you-can-help-find-exoplanets-from-your-couch> )



### Astronomers Discover Infant Planet

One of the youngest planets ever found around a distant infant star has been discovered by an international team of scientists led by University of Hawai'i at Mānoa faculty, students, and alumni. Thousands of planets have been discovered around other stars, but what sets this one apart is that it is newly-formed and can be directly observed. The planet, named 2M0437b, joins a handful of objects advancing our understanding of how planets form and change with time, helping shed new light on the origin of the Solar System and Earth. (continued at <https://phys.org/news/2021-10-astronomers-infant-planet.html> )



### Astronomers May Have Discovered The First Planet Outside Of Our Galaxy

Signs of a planet transiting a star outside of the Milky Way galaxy may have been detected for the first time. This intriguing result, using NASA's Chandra X-ray Observatory, opens up a new window to search for exoplanets at greater distances than ever before. The possible exoplanet candidate is located in the spiral galaxy Messier 51 (M51), also called the Whirlpool Galaxy because of its distinctive profile. Exoplanets are defined as planets outside of our Solar System. (continued at <https://phys.org/news/2021-10-astronomers-planet-galaxy.html> )

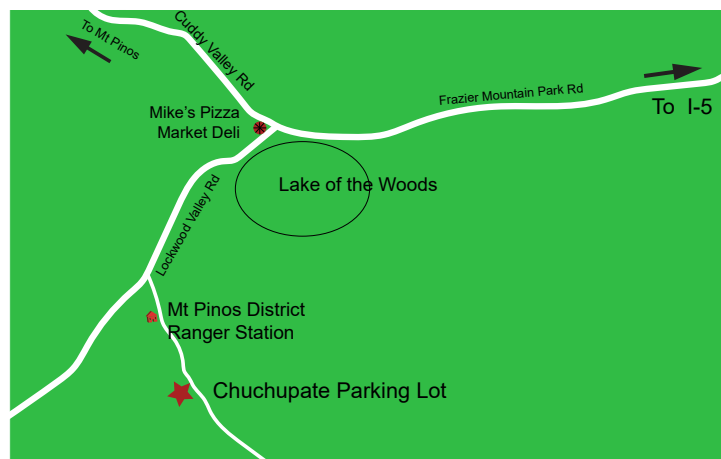




## Dark Sky Observing Sites

**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.

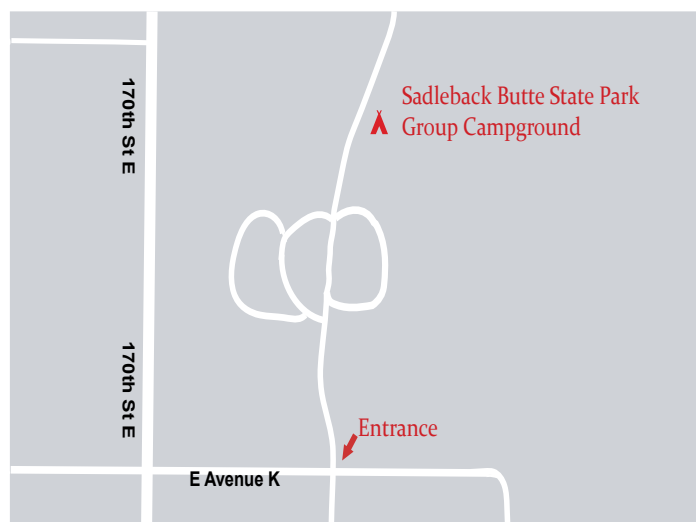


**The Red Cliffs Natural Area** is part of **Red Rock Canyon State Park** is a day use area and is not for use by the public after dark. The Club gets a special permit for a star party and pays a fee.

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.



**Saddleback Butte State Park** is east of 170th Street East between Avenue I and Avenue K. Elevation 3651 feet. Temperatures in summer average 95° with a high of 115,° winter average lows are 33° with occasional snow. There are 37 individual campsites and one group campsite. When the club has a star party there the group campsite is used. Individual campsites cost \$20 per night. Enter off Avenue K.



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November 2021

## Planet Summary

The **Sun** starts November in western Libra and crosses the corner of Scorpio and ends the month in Ophiuchus.

A **Lunar Eclipse** starts 22:15 on the 18th, enters the Umbra 23:15, begins to leave Umbra 01:35, by 04:00 the Moon is completely free of the Penumbra.

**Mercury** starts the month rising before the Sun. A little after noon on the 3rd the Moon will pass  $0^{\circ}8'$  to the north. Mercury will be just  $15^{\circ}$  west of the Sun when this occurs. On the 29th superior conjunction is achieved.

**Venus** is just past greatest elongation east as the month begins. Venus will remain in the evening twilight through the end of the year. The 3 day old Moon makes a close pass late on the evening of the 7th. It will be viable from parts of Asia.

**Mars** is too close to the Sun to be seen until very in the month, when it begins to emerge in the bright morning twilight.

**Jupiter** continues its eastward motion, keeping company with Deneb Algedi, among the stars of western Capricorn. The 1st quarter Moon passes less than  $6^{\circ}$  to the south on the 11th.

**Saturn** spends the month chasing Jupiter among the stars of Capricorn. On the 10th the 44% waxing Moon passes  $7^{\circ}$  to the south.

**Uranus** continues moving west in central Aries at mag 5.7. On the 17th the almost full Moon passes  $2^{\circ}$  to the south.

**Neptune** will spend the month slowly moving west in northeast Aquarius at mag 7.8. On the 13th the 73% waxing Moon passes  $5^{\circ}$  to the south.

**Pluto** spends the month slowly moving east in Sagittarius at mag 14.3.

## Moon Phases



## Sun and Moon Rise and Set\*

Date	Moonrise	Moonset	Sunrise	Sunset
11/1/2021	03:29	16:25	07:13	17:58
11/5/2021	08:12	18:44	07:17	17:54
11/10/2021	12:34	22:48	06:22	16:50
11/15/2021	15:09	02:56	06:26	16:47
11/20/2021	17:43	07:44	06:31	16:44
11/25/2021	22:08	11:47	06:36	16:43
11/30/2021	02:21	14:23	06:40	16:42

## Planet Data\*

November 1

	Rise	Transit	Set	Mag	Phase%
Mercury	05:55	11:38	17:21	-0.84	81.9
Venus	11:11	15:52	20:32	-4.44	47.6
Mars	06:35	12:06	17:35	1.65	99.8
Jupiter	14:29	19:48	01:11	-2.54	99.1
Saturn	13:40	18:46	23:52	0.61	99.7

November 15

	Rise	Transit	Set	Mag	Phase%
Mercury	05:48	11:07	16:25	-0.95	97.6
Venus	10:13	14:54	19:35	-4.95	39.4
Mars	05:36	10:47	16:07	1.64	99.5
Jupiter	12:36	17:57	23:17	-2.44	99.0
Saturn	11:57	16:54	22:01	0.66	99.7

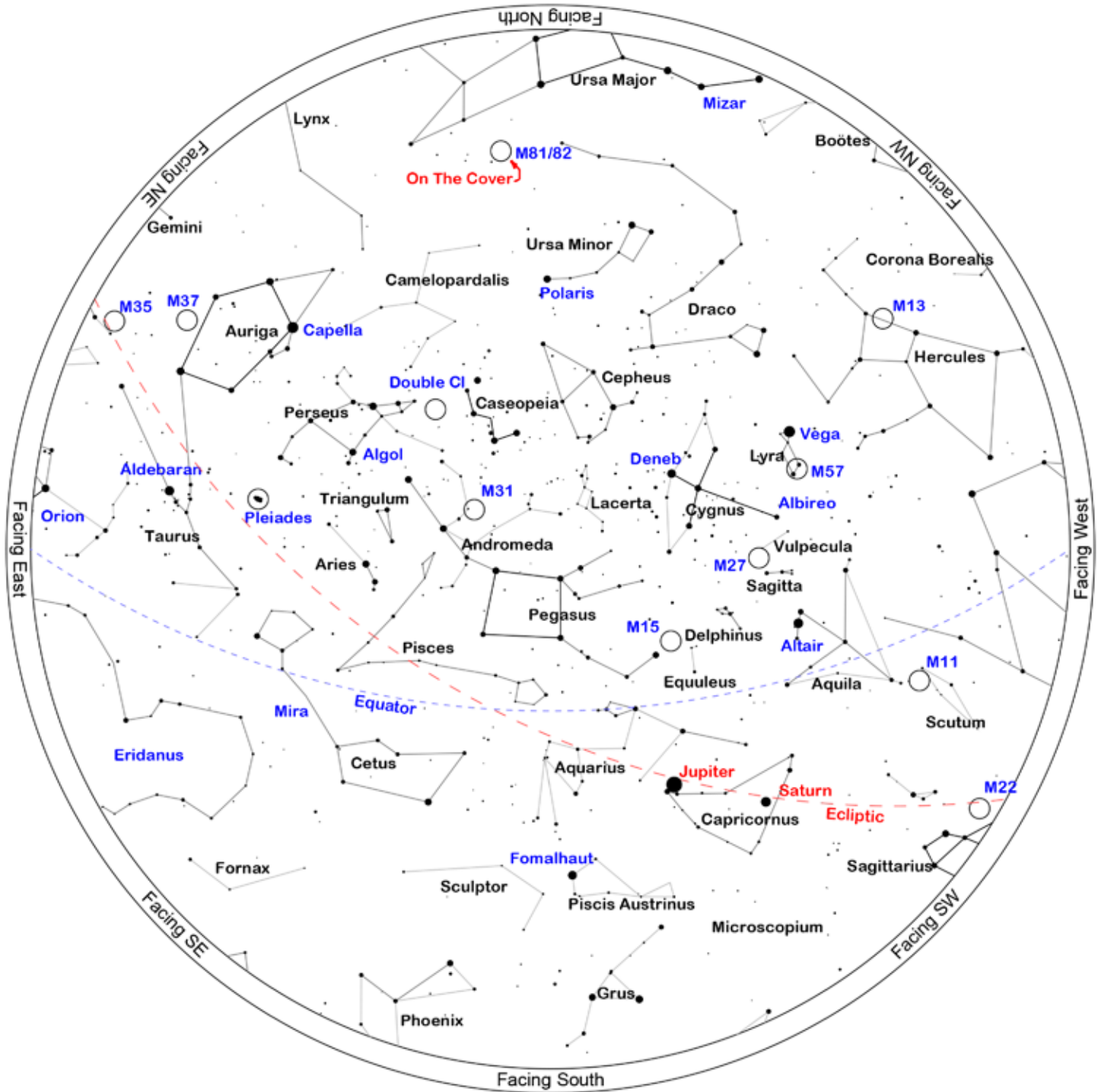
November 30

	Rise	Transit	Set	Mag	Phase%
Mercury	06:48	11:45	16:41	-1.15	99.9
Venus	09:55	14:43	19:32	-4.66	28.5
Mars	05:17	10:29	15:40	1.62	99.1
Jupiter	11:42	17:04	22:27	-2.34	99.0
Saturn	10:51	15:59	21:07	0.69	99.8

\*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: 2021 November 6, 21:00 (UTC -07:00)

Powered by: Heavens-Above.com

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November 2021

## 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 November 6, 2021. The list is sorted by the transit time of the object.

ID	Common Name	Type		RA	Dec	Mag	Rise	Transit	Set
M12	Gumball Globular	Globular	Oph	16h 47m 14s	-01° 56.8'	8.0	07:39	13:37	19:34
NGC6231	Table of Scorpius	Open	Sco	16h 54m 00s	-41° 48.0'	2.6	10:12	13:44	17:15
IC4628	Prawn Nebula	Neb	Sco	16h 56m 58s	-40° 27.3'		10:07	13:46	17:26
NGC6254		Globular	Oph	16h 57m 09s	-04° 05.9'	6.6	07:55	13:47	19:38
Barnard47		DkNeb	Oph	16h 59m 42s	-22° 38.0'		08:53	13:49	18:45
M62	Flickering Globular	Globular	Oph	17h 01m 13s	-30° 06.7'	8.0	09:22	13:51	18:20
M19		Globular	Oph	17h 02m 38s	-26° 16.0'	8.5	09:09	13:52	18:36
Barnard51		DkNeb	Oph	17h 04m 44s	-22° 15.0'		08:57	13:54	18:52
IC4637		P Neb	Sco	17h 05m 10s	-40° 53.1'	14.0	10:17	13:55	17:32
Barnard56		DkNeb	Sco	17h 08m 48s	-32° 05.0'		09:38	13:58	18:19
Barnard59	Pipe Nebula	DkNeb	Oph	17h 11m 23s	-27° 29.0'		09:22	14:01	18:40
NGC6302	Bug Nebula	P Neb	Sco	17h 13m 42s	-37° 06.0'	9.6	10:05	14:03	18:01
Barnard251		DkNeb	Oph	17h 13m 48s	-20° 09.0'		08:59	14:03	19:08
Barnard63		DkNeb	Oph	17h 16m 00s	-21° 28.0'		09:06	14:06	19:05
M92		Globular	Her	17h 17m 07s	+43° 08.1'	7.5	05:20	14:07	22:53
M9		Globular	Oph	17h 19m 12s	-18° 31.0'	9.0	08:59	14:09	19:18
NGC6326		P Neb	Ara	17h 20m 46s	-51° 45.2'	12.0	12:07	14:10	16:14
Barnard256		DkNeb	Oph	17h 22m 12s	-28° 49.0'		09:38	14:12	18:46
Barnard67a		DkNeb	Oph	17h 22m 30s	-21° 53.0'		09:13	14:12	19:11
Barnard71		DkNeb	Oph	17h 23m 02s	-24° 00.0'		09:21	14:13	19:04
NGC6357	Lobster Nebula	Neb	Sco	17h 24m 43s	-34° 12.1'		10:03	14:14	18:26
Abell41		P Neb	Ser	17h 29m 04s	-15° 13.3'	13.9	08:59	14:19	19:38
Abell42		P Neb	Oph	17h 31m 31s	-08° 19.1'	14.6	08:41	14:21	20:01
Barnard78		DkNeb	Oph	17h 32m 00s	-25° 35.0'		09:36	14:22	19:07
NGC6388		Globular	Sco	17h 36m 17s	-44° 44.1'	6.9	11:14	14:26	17:38
M14		Globular	Oph	17h 37m 36s	-03° 14.7'	9.5	08:33	14:27	20:21
Barnard276		DkNeb	Oph	17h 39m 39s	-19° 49.0'		09:24	14:29	19:34
M6	Butterfly Cluster	Open	Sco	17h 40m 20s	-32° 15.2'	4.5	10:10	14:30	18:50
NGC6397		Globular	Ara	17h 40m 42s	-53° 40.0'	5.6	12:58	14:30	16:03
NGC6426		Globular	Oph	17h 44m 55s	+03° 10.1'	11.2	08:23	14:34	20:46
Barnard83a		DkNeb	Sgr	17h 45m 18s	-20° 00.0'		09:30	14:35	19:40
IC4665		Open	Oph	17h 46m 30s	+05° 39.0'	4.2	08:18	14:36	20:55
NGC6445	Crescent Nebula	P Neb	Sgr	17h 49m 15s	-20° 00.6'	13.0	09:34	14:39	19:43
NGC6503		Galaxy	Dra	17h 49m 27s	+70° 08.6'	10.2	Circ	14:39	Circ
NGC6441		Globular	Sco	17h 50m 13s	-37° 03.0'	7.4	10:42	14:40	18:38
Barnard283	B283	DkNeb	Sco	17h 51m 00s	-33° 52.0'		10:27	14:41	18:54

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ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
Barnard285	B285	DkNeb	Ser	17h 51m 32s	-12° 52.0'		09:15	14:41	20:08
M7	Scorpion's Tail, Ptolemy's Cluster	Open	Sco	17h 53m 51s	-34° 47.6'	3.5	10:34	14:43	18:52
IC4670		Neb	Sgr	17h 55m 07s	-21° 44.6'		09:46	14:45	19:44
NGC6501		Galaxy	Her	17h 56m 04s	+18° 22.3'	12.3	07:49	14:46	21:42
M23	NGC6494	Open	Sgr	17h 57m 04s	-18° 59.1'	6.0	09:39	14:47	19:55
NGC6543	Cat Eye Nebula	P Neb	Dra	17h 58m 36s	+66° 38.0'	8.1	Circum	14:48	Cir- cum
NGC6496		Globular	Sco	17h 59m 04s	-44° 16.0'	9.2	11:33	14:49	18:04
Barnard291		DkNeb	Sgr	17h 59m 43s	-33° 53.0'		10:36	14:49	19:02
Barnard292		DkNeb	Sgr	18h 00m 34s	-33° 20.0'		10:35	14:50	19:06
Barnard293		DkNeb	Sgr	18h 01m 12s	-35° 20.0'		10:44	14:51	18:57
M20	Trifid Nebula, The Clover	Open+DNeb	Sgr	18h 02m 42s	-22° 58.2'	5.0	09:57	14:52	19:47
M8	Lagoon Nebula, Drag- on Nebula	Open+DNeb	Sgr	18h 03m 41s	-24° 22.7'	5.0	10:03	14:53	19:43
Barnard295		DkNeb	Sgr	18h 04m 05s	-31° 09.0'		10:29	14:54	19:18
M21		Open	Sgr	18h 04m 13s	-22° 29.3'	7.0	09:57	14:54	19:50
NGC6530		Open	Sgr	18h 04m 31s	-24° 21.5'	4.6	10:04	14:54	19:44
NGC6528		Globular	Sgr	18h 04m 50s	-30° 03.3'	9.5	10:25	14:54	19:23
IC4684		Neb	Sgr	18h 09m 08s	-23° 26.1'		10:05	14:59	19:52
IC4685		Neb	Sgr	18h 09m 18s	-23° 59.2'		10:07	14:59	19:50
Barnard303		DkNeb	Sgr	18h 09m 28s	-23° 59.0'		10:08	14:59	19:50
IC1274		Neb	Sgr	18h 09m 51s	-23° 38.8'		10:07	14:59	19:52
IC1275		Neb	Sgr	18h 10m 07s	-23° 45.7'		10:07	15:00	19:52
NGC6572		P Neb	Oph	18h 12m 06s	+06° 51.2'	9.0	08:40	15:02	21:23
NGC6567		P Neb	Sgr	18h 13m 45s	-19° 04.5'	12.0	09:56	15:03	20:11
IC4701		Neb	Sgr	18h 16m 36s	-16° 38.0'		09:51	15:06	20:21
Barnard93		DkNeb	Sgr	18h 16m 53s	-18° 03.0'		09:56	15:06	20:17
IC1284		Neb	Sgr	18h 17m 39s	-19° 40.3'		10:01	15:07	20:13
M24	Small Sagittarius Star Cloud,	Open	Sgr	18h 18m 26s	-18° 24.3'	4.5	09:58	15:08	20:18
M16	Eagle Nebula,	Open+D Neb	Ser	18h 18m 48s	-13° 48.3'	6.5	09:45	15:08	20:32
Barnard308		DkNeb	Sgr	18h 19m 08s	-22° 14.0'		10:11	15:09	20:06
M18	Black Swan,	Open	Sgr	18h 19m 58s	-17° 06.1'	8.0	09:56	15:10	20:23
M17	Omega Nebula, Swan Nebula, Horseshoe Nebula	Open+D Neb	Sgr	18h 20m 47s	-16° 10.3'	7.0	09:54	15:10	20:27
HR6923		Mult	Dra	18h 23m 54s	+58° 48.0'	5.0	Circ	15:13	Circ
M28		Globular	Sgr	18h 24m 33s	-24° 52.1'	8.5	10:26	15:14	20:02
NGC6637		Globular	Sgr	18h 31m 23s	-32° 20.8'	7.7	11:01	15:21	19:41



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ID		Type	Const	RA	Dec	Mag	Rise	Transit	Set
IC1287		Neb	Sct	18h 31m 26s	-10° 47.7'		09:48	15:21	20:53
M25		Open	Sgr	18h 31m 42s	-19° 07.0'	6.5	10:14	15:21	20:29
IC4725		Open	Sgr	18h 31m 48s	-19° 06.7'	4.6	10:14	15:21	20:29
NGC6642		Globular	Sgr	18h 31m 54s	-23° 28.5'	8.8	10:28	15:21	20:15
NGC6644		P Neb	Sgr	18h 32m 35s	-25° 07.7'	12.0	10:35	15:22	20:10
NGC6647		Open	Sgr	18h 32m 49s	-17° 13.6'	8.0	10:09	15:22	20:36
IC4732		P Neb	Sgr	18h 33m 55s	-22° 38.6'	13.0	10:27	15:23	20:19
NGC6656	Crackerjack Cluster	Globular	Sgr	18h 36m 24s	-23° 54.2'	5.1	10:34	15:26	20:18
IC4756		Open	Ser	18h 38m 54s	+05° 27.0'	5.0	09:11	15:28	21:46
NGC6681		Globular	Sgr	18h 43m 12s	-32° 17.4'	8.1	11:13	15:33	19:53
NGC6694		Open	Sct	18h 45m 18s	-09° 23.0'	8.0	09:58	15:35	21:11
IC4776		P Neb	Sgr	18h 45m 51s	-33° 20.5'	12.0	11:20	15:35	19:51
Barnard318		DkNeb	Sct	18h 49m 42s	-06° 23.0'		09:54	15:39	21:24
M11	Wild Duck Cluster,	Open	Sct	18h 51m 05s	-06° 16.1'	7.0	09:55	15:41	21:26
M57	Ring Nebula	P Neb	Lyr	18h 53m 35s	+33° 01.7'	9.5	07:53	15:43	23:34
Barnard117		DkNeb	Sct	18h 53m 43s	-07° 24.0'		10:01	15:43	21:25
NGC6715		Globular	Sgr	18h 55m 03s	-30° 28.7'	7.7	11:17	15:45	20:12
NGC6717		Globular	Sgr	18h 55m 06s	-22° 42.0'	9.2	10:49	15:45	20:40
Barnard122		DkNeb	Sct	18h 56m 48s	-04° 45.0'		09:57	15:46	21:36
Barnard123		DkNeb	Sct	18h 57m 39s	-04° 43.0'		09:57	15:47	21:37
NGC6723		Globular	Sgr	18h 59m 33s	-36° 37.9'	7.3	11:49	15:49	19:49
Barnard128		DkNeb	Aql	19h 01m 40s	-04° 34.0'		10:01	15:51	21:41
NGC6729		BrNeb	CrA	19h 01m 54s	-36° 57.0'		11:53	15:51	19:50
Barnard326		DkNeb	Aql	19h 03m 00s	-00° 23.0'		09:51	15:53	21:54
NGC6749		Globular	Aql	19h 05m 15s	+01° 54.0'	11.1	09:47	15:55	22:03
Barnard329		DkNeb	Aql	19h 06m 59s	+03° 11.0'		09:45	15:57	22:08
NGC6760		Globular	Aql	19h 11m 12s	+01° 01.8'	9.1	09:55	16:01	22:06
Abell56		P Neb	Aql	19h 13m 07s	+02° 52.8'	12.4	09:52	16:03	22:13
NGC6772		P Neb	Aql	19h 14m 36s	-02° 42.4'	14.0	10:09	16:04	21:59
Barnard138		DkNeb	Aql	19h 16m 00s	+00° 13.0'		10:02	16:06	22:09
M56		Globular	Lyr	19h 16m 36s	+30° 11.0'	9.5	08:28	16:06	23:44
NGC6778		P Neb	Aql	19h 18m 25s	-01° 35.7'	13.0	10:10	16:08	22:06
Abell61		P Neb	Cyg	19h 19m 10s	+46° 14.5'	13.0	06:58	16:09	01:20
Barnard140		DkNeb	Aql	19h 19m 49s	+05° 13.0'		09:52	16:09	22:27
NGC6790		P Neb	Aql	19h 22m 57s	+01° 30.8'	10.0	10:06	16:12	22:19
M55	NGC6809	Globular	Sgr	19h 40m 00s	-30° 57.7'	7.0	12:04	16:30	20:55
NGC6813		Neb	Vul	19h 40m 22s	+27° 18.5'		09:03	16:30	23:57
NGC6820		Neb	Vul	19h 42m 28s	+23° 05.2'		09:20	16:32	23:44

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ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
Barnard338		DkNeb	Aql	19h 43m 02s	+07° 27.0'		10:09	16:33	22:56
NGC6818	Little Gem	P Neb	Sgr	19h 43m 58s	-14° 09.1'	10.0	11:11	16:33	21:56
NGC6826	Blinking Planetary	P Neb	Cyg	19h 44m 48s	+50° 31.0'	8.8	06:38	16:34	02:31
Abell65		P Neb	Sgr	19h 46m 34s	-23° 08.2'	13.1	11:42	16:36	21:30
NGC6838		Globular	Sge	19h 53m 46s	+18° 46.6'	8.3	09:46	16:43	23:41
NGC6842		P Neb	Vul	19h 55m 02s	+29° 17.3'	14.0	09:10	16:45	00:19
HR7619		Mult	Cyg	19h 55m 38s	+52° 26.3'	4.9	06:18	16:45	03:12
Abell66		P Neb	Sgr	19h 57m 32s	-21° 36.6'	14.1	11:48	16:47	21:47
Barnard144	Fish on the platter nebula	DkNeb	Cyg	19h 58m 00s	+35° 20.0'		08:46	16:48	00:49
NGC6853	Apple Core Nebula, Diablo Nebula, Double-Headed Shot, Dumbbell Nebula	P Neb	Vul	19h 59m 36s	+22° 43.2'	8.1	09:39	16:49	00:00
NGC6857		Neb	Cyg	20h 02m 48s	+33° 31.4'	11.4	09:00	16:52	00:45
IC4954		Neb	Vul	20h 04m 45s	+29° 15.1'		09:20	16:54	00:29
M75		Globular	Sgr	20h 06m 05s	-21° 55.3'	9.5	11:57	16:56	21:54
Barnard342		DkNeb	Cyg	20h 09m 30s	+41° 12.0'		08:25	16:59	01:33
NGC6885	Vulpeculae Cluster	Open	Vul	20h 12m 00s	+26° 29.0'	5.9	09:38	17:02	00:25
NGC6891		P Neb	Del	20h 15m 09s	+12° 42.2'	12.0	10:26	17:05	23:43
NGC6894		P Neb	Cyg	20h 16m 24s	+30° 33.9'	14.0	09:26	17:06	00:46
IC4997		P Neb	Sge	20h 20m 09s	+16° 43.9'	12.0	10:19	17:10	00:01
Barnard345		DkNeb	Cyg	20h 21m 00s	+46° 33.0'		07:57	17:11	02:24
NGC6913	Cooling Tower	Open	Cyg	20h 23m 57s	+38° 30.5'	6.6	08:56	17:13	01:31
Abell70		P Neb	Aql	20h 31m 33s	-07° 05.3'	14.3	11:38	17:21	23:04
Barnard348		DkNeb	Cyg	20h 34m 00s	+42° 05.0'		08:44	17:24	02:03
NGC6960	Filamentary Nebula,	Neb	Cyg	20h 45m 58s	+30° 35.6'		09:55	17:35	01:16
IC5070	Pelican Nebula	Neb	Cyg	20h 51m 00s	+44° 24.1'		08:45	17:41	02:36
NGC6981		Globular	Aqr	20h 53m 28s	-12° 32.2'	9.4	12:16	17:43	23:10

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  
Australis  
Tri - Triangulum  
Tuc - Tucana  
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