

Volume 42.5

May 2022

Desert Sky Observer

Antelope Valley Astronomy Club



Desert Sky Observer

www.avastronomyclub.org

May 2022

Upcoming Events

May 13: Club Meeting
May 15: Lunar Eclipse Public viewing at SAGE
May 21: Moonwalk 8:30 pm @ PDW
May 27 - 30: DSSP @ Red Rock Canyon SP

Every clear night: Personal Star Party

June 4: Moonwalk 8:30 pm @ PDW
June 10: Club Meeting
June 24: Mt Wilson trip
June 25: DSSP @ Chuchupate



AVAC Calendar



Board Members

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

Vice-President: Gail Lofdahl 661-722-5833
vice-president@avastronomyclub.org

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



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/.

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

President's Message

By Phil Wriedt

Hi To Everyone,

April started out cold and windy forcing the cancellation of our Messier Marathon at Saddleback State Park. At the end of the month the Star Party at Chuchupate was cold (not windy). A bright spot was the Moonwalk on the 9th where about 120 of the public strolled through the grounds the Woodland with Jeremy, while Darrell, Ed, Roger, and myself manned the telescopes. On the 22nd Jeremy and I made it to the College of the Canyons for their Spring Science Expo and Star Party.

In May we have a Club Meeting on Friday the 13th, and we have a speaker! Dr Barth from the University of Arkansas, will be giving a presentation via Zoom. I don't know the topic, but he's had a good presentation in the past.

On Sunday May 15, just after sunset there will be a total lunar eclipse. We will be holding an Eclipse Party in the parking lot at the SAGE. We need members with telescopes. Arrive to setup by 7pm. We'll stay until the crowd leaves or the eclipse ends. Watch your email for more details.

On the 21st there will be a Moonwalk at 8:30 pm. As always, we need members with telescopes. It's starting to get warmer, so there will be a good chance there will a crowd wanting to enjoy the park and the night sky.

The main event for the May is the Memorial Day DSSP and Public Star Party at Red Rock Canyon State Park; there will be a couple of members who will get there on Friday night the 27th to hold campsites 1&2 and 3&4. Saturday we will setup solar scopes during the day and that evening a normal star party. Our past Vice President Matt Leone will give a multimedia presentation in the amphitheater that evening with public viewing following.

Keep Looking Up, Phil

On The Cover

The star cluster Pismis 24 lies in the core of the large emission nebula NGC 6357 that extends one degree on the sky in the direction of the Scorpius constellation. Part of the nebula is ionised by the youngest (bluest) heavy stars in Pismis 24. The intense ultraviolet radiation from the blazing stars heats the gas surrounding the cluster and creates a bubble in NGC 6357. The presence of these surrounding gas clouds makes probing into the region even harder.

One of the top candidates for the title of "Milky Way stellar heavyweight champion" was, until now, Pismis 24-1, a bright young star that lies in the core of the small open star cluster Pismis 24 (the bright stars in the Hubble image) about 8,000 light-years away from Earth. Pismis 24-1 was thought to have an incredibly large mass of 200 to 300 solar masses. New NASA/ESA Hubble measurements of the star, have, however, resolved Pismis 24-1 into two separate stars, and, in doing so, have "halved" its mass to around 100 solar masses.

Credit:

NASA, ESA and Jesús Maíz Apellániz (Instituto de Astrofísica de Andalucía, Spain).

Acknowledgement: Davide De Martin (ESA/Hubble)

From the Secretary

By Rose Moore

Members:

We have several events for May! We welcome any members to come out to help at these events.

We have a club meeting on Friday May 13th at 7pm. We are trying to get speakers, but it's still difficult. We do have a speaker for June's meeting, Robert Zellum from JPL/NASA who will be speaking on exoplanets.

Sunday May 15th is a Lunar Eclipse, and we will be having an event at the SAGE Planetarium. We need members with scopes for the event. Moonrise is 7:40pm, during partial eclipse, but we won't be able to see anything until the Moon gets higher in the sky. Total eclipse starts at 8:29pm, maximum is at 9:11pm, and ends at 9:53pm. Weather permitting. More info to follow.

On Saturday May 21st, we have a Prime Desert Moon Walk at 8:30pm. Weather permitting. We need members with telescopes to come and support this event. Set up time is approximately 30-60 mins prior to event.

Our big event for the month is our public star party at Red Rock Canyon State Park; this begins on Friday May 27th and ends on Sunday morning around 9am. We need members with telescopes to show the public the night sky. If you have a solar scope, you can bring that out during the day! You do not have to attend the whole weekend, but if you can come out for a few hours during the day or night to help out, it would be greatly appreciated! On Saturday night, member Matt Leone will be giving a presentation at the mini amphitheater near the visitor center. Thank you to the members who have already signed up to help at this event! More info to follow in emails.

Coming up in June we have a PDW Moon Walk, a club meeting, a dark sky star party, and of course our trip to Mt. Wilson.

Mt. Wilson trip: currently you may pay for the Mt. Wilson trip via the PayPal link: <http://www.avastronomyclub.org/mtwilson> Or you may pay at our meeting on May 13th, by cash or check. If you can not get to the meeting, a payment may be made by check and mailed to: AVAC, P.O. Box 8545, Lancaster, CA 93539. Deadline for payment will be around May 15th. A family member or friend who is not a member may use the PayPal link to pay, if they are on our list for the trip. Please look over the information previously emailed out and let me know if any questions. I'll be making one more email about signing up for the trip soon, as we do have a few more available openings.

Clear skies and warmer weather, Rose

AVAC Membership Renewal

Please remember that we are able to have our monthly meetings again. Our meetings are open to the public and all will be welcome. So, if for any reason you are unable to renew your membership you are still welcome to attend and we look forward to seeing you all again. So PLEASE come to the meeting.

The easiest way to renew your membership is through the AVAC website via our PayPal account. But you can still renew using a check via the club's Post Office Box:

Antelope Valley Astronomy Club
PO BOX 8545
Lancaster, CA 93539-8545

Night Lights: Aurora, Noctilucent Clouds, and the Zodiacal Light

by David Prosper, NASA Night Sky Network



Comet NEOWISE flies high above a batch of noctilucent clouds in this photo from Wikimedia contributor Brwynog.

[License and source: CC BY-SA 4.0](#)

Have you spotted any “night lights”? These phenomena brighten dark skies with celestial light ranging from mild to dazzling: the subtle light pyramid of the **zodiacal light**, the eerie twilight glow of **noctilucent clouds**, and most famous of all, the wildly unpredictable and mesmerizing **aurora**.

Aurora, often referred to as the northern lights (aurora borealis) or southern lights (aurora australis), can indeed be a wonderful sight, but the beautiful photos and videos shared online are often misleading. For most observers not near polar latitudes, auroral displays are relatively rare and faint, and without much structure, more gray than colorful, and show up much better in photos. However, geomagnetic storms can create auroras that dance and shift rapidly across the skies with several distinct colors and appear to observers much further away from the poles - on very rare occasions even down to the mid-latitudes of North America! Geomagnetic storms are caused when a magnetic storm on our Sun creates a massive explosion that flings a mass of particles away from its surface, known as a Coronal Mass Ejection (CME). If Earth is in the path of this CME, its particles interact with our planet’s magnetic field and result in auroral displays high up in our ionosphere. As we enter our Sun’s active period of its 11-year solar cycle, CMEs become more common and increase the chance for dazzling displays! If you have seen any aurora, you can report your sighting to the Aurorasaurus citizen science program at aurorasaurus.org



A sampling of some of the various patterns created by aurora, as seen from Iceland in 2014. The top row photos were barely visible to the unaided eye and were exposed for 20-30 seconds; in contrast, the bottom row photos were exposed for just 4 seconds and were clearly visible to the photographer, Wikimedia contributor Shnuffel2022.

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Have you ever seen wispy clouds glowing an eclectic blue after sunset, possibly towards your west or northwest? That wasn't your imagination; those luminescent clouds are **noctilucent clouds** (also called Polar Mesospheric Clouds (PMC)). They are thought to form when water vapor condenses around 'seeds' of dust from vaporized meteorites - along with other sources that include rocket launches and volcanic eruptions - around 50 miles high in the mesosphere. Their glow is caused by the Sun, whose light still shines at that altitude after sunset from the perspective of ground-based observers. Noctilucent clouds are increasing both in frequency and in how far south they are observed, a development that may be related to climate change. Keeping in mind that observers closer in latitude to the poles have a better chance of spotting them, your best opportunity to spot noctilucent clouds occurs from about half an hour to two hours after sunset during the summer months. NASA's AIM mission studies these clouds from its orbit high above the North Pole: go.nasa.gov/3uV3Yj1vv



The zodiacal light as seen in the evening of March 1, 2021 above Skull Valley, Utah. The Pleiades star cluster (M45) is visible near the top.

Credit and source: NASA/Bill Dunford

You may have seen the **zodiacal light** without even realizing it; there is a reason it's nicknamed the "false dawn"! Viewers under dark skies have their best chance of spotting this pyramid of ghostly light a couple of hours after sunset around the spring equinox, or a couple of hours before dawn around the autumnal equinox. Unlike our previous two examples of night lights, observers closer to the equator are best positioned to view the zodiacal light! Long known to be composed of interplanetary dust orbiting in the plane of our solar system reflecting sunlight, these fine particles were thought to originate from comets and asteroids. However, scientists from NASA's Juno mission recently published a fascinating study indicating a possible alternative origin: dust from Mars! Learn more about their serendipitous discovery at: go.nasa.gov/3Onf3kN

Curious about the latest research into these night lights? Find news of NASA's latest discoveries at nasa.gov

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 Radio Telescope Made Famous By Contact Will Finally Search For Alien Signals — For Real

On February 14, 2020, the SETI Institute and the National Radio Astronomy Observatory (NRAO) announced a new partnership, which they appropriately named the Commensal Open-Source Multimode Interferometer Cluster Search for Extraterrestrial Intelligence (COSMIC SETI). This partnership will allow the Karl G. Jansky Very Large Array (VLA) to participate in the Search for Extraterrestrial Intelligence (SETI) for the first time in its history. In recent weeks, the project took a big step forward with the installation of fiber optic amplifiers and splitters on all VLA antennas, which give COSMIC access to the data streams from the entire VLA. . . .(continued at <https://www.inverse.com/science/seti-contact-telescope-aliens>)



Why Venus Rotates, Slowly, Despite Sun's Powerful Grip

If not for the soupy, fast-moving atmosphere on Venus, Earth's sister planet would likely not rotate. Instead, Venus would be locked in place, always facing the sun the way the same side of the moon always faces Earth. The gravity of a large object in space can keep a smaller object from spinning, a phenomenon called tidal locking. Because it prevents this locking, a UC Riverside scientist argues the atmosphere needs to be a more prominent factor in studies of Venus as well as other planets. . . .(continued to <https://www.sciencedaily.com/releases/2022/04/220420092119.htm>)



Neptune Is Cooler Than We Thought: Study Reveals Unexpected Changes In Atmospheric Temperatures

New research led by space scientists at the University of Leicester has revealed how temperatures in Neptune's atmosphere have unexpectedly fluctuated over the past two decades. The study, published today (Monday) in Planetary Science Journal, used observations in thermal-infrared wavelengths beyond the visible light spectrum, effectively sensing heat emitted from the planet's atmosphere. . . .(continued at <https://www.sciencedaily.com/releases/2022/04/220411101321.htm>)



NASA Is Ready To Try And Fix Lucy's Unlatched Solar Panel

NASA's Lucy spacecraft, currently on its way to the outer Solar System to study Jupiter's Trojan asteroids, has a solar panel problem. Shortly after its launch last October, engineers determined that one of Lucy's two solar panels failed to open completely. While the spacecraft has enough power to function, the team is concerned about how the unlatched panel might hinder Lucy's performance going forward. In an attempt to fix the problem, the team will carry out a new procedure next month that is designed to unfurl the solar panel the rest of the way, and latch it firmly in place. (continued at <https://www.universetoday.com/155578/nasa-is-ready-to-try-and-fix-lucys-unlatched-solar-panel/#more-155578>)



Hubble Space Telescope Studies Peculiar 'Ultra-Diffuse Galaxy'

Dark matter and old groups of stars are some of the mysteries associated with this galaxy type. A 'wispy' galaxy 4 billion light-years away from us features in a glorious new photo from the Hubble Space Telescope. Called GAMA 526784, the galaxy represents one of a set of "ultra-diffuse" galaxies that are puzzling astronomers. These galaxies are ghostly star collections with low luminosity, or inherent brightness. ... (continued at <https://www.space.com/hubble-telescope-photo-peculiar-diffuse-galaxy>)



Space News

News from around the Net

NASA, Partner Decide To Conclude Sofia Mission

NASA and its partners at the German Space Agency at the Deutsches Zentrum für Luft- und Raumfahrt (DLR) will conclude the Stratospheric Observatory for Infrared Astronomy (SOFIA) mission, after a successful eight years of science. SOFIA will end operations no later than Sept. 30, 2022, at the conclusion of its current mission extension. . . . (continued at <https://www.nasa.gov/feature/nasa-partner-decide-to-conclude-sofia-mission>)



How To Observe And Measure Naked-Eye Sunspots

See sunspots with your unaided eye using this simple method. We also have news on a bright supernova! I'm a passionate naked-eye sunspot observer. No telescope or binoculars needed. I use eclipse glasses or a #14 welder's glass to safely scrutinize the solar disk for black imperfections that betray the presence of large active regions on the Sun's photosphere. I often start with a quick look through my small, filtered refractor to identify likely prospects before attempting a naked-eye observation. But a telescope isn't necessary. . . (continued at <https://skyandtelescope.org/astronomy-news/how-to-observe-and-measure-naked-eye-sunspots/>)



Mars Helicopter Spots Wreckage Of Rover's Jettisoned Parachute And Backshell

New images taken by Ingenuity, NASA's record-breaking Mars helicopter, show Perseverance's discarded parachute and protective backshell, which helped the rover and helicopter safely land on the martian surface Feb. 18, 2021. "Perseverance had the best-documented Mars landing in history, with cameras showing everything from parachute inflation to touchdown," said Ian Clark of NASA's Jet Propulsion Laboratory (JPL), former Perseverance systems engineer and now Mars Sample Return ascent phase lead, in a NASA press release. . . . (continued at <https://astronomy.com/news/2022/04/mars-helicopter-images-rovers-jettisoned-parachute-and-backshell>)



Two Rocky Exoplanets Discovered Around Nearby Star

Using NASA's Transiting Exoplanet Survey Satellite (TESS), astronomers have detected two rocky alien worlds orbiting a nearby M dwarf star known as HD 260655. The newly found exoplanets are larger and at least two times more massive than the Earth. The finding is reported in a paper published April 21 on arXiv.org. TESS is conducting a survey of about 200,000 of the brightest stars near the sun with the aim of searching for transiting exoplanets. So far, it has identified over 5,600 candidate exoplanets (TESS Objects of Interest, or TOI), of which 205 have been confirmed so far. . . . (continued at <https://phys.org/news/2022-04-rocky-exoplanets-nearby-star.html>)



Ganymede Casts A Long Shadow Across The Surface Of Jupiter

What is that large dark smudge on Jupiter's side? It may remind you of a certain scene from the sci-fi film "2010: The Year We Make Contact," where a growing black spot appears in Jupiter's atmosphere. But this is a real photo, and the dark spot is just an elongated shadow of Ganymede, Jupiter's largest moon. Just like when Earth's Moon crosses between our planet and the Sun creating an eclipse for lucky Earthlings, when Jupiter's moons cross between the gas giant and the Sun, they create shadows too. NASA's Juno spacecraft captured this view of Jupiter during the mission's 40th close pass by the giant planet on Feb. 25, 2022. This image was taken by the camera on board the spacecraft, JunoCam, . . . (continued at <https://www.universetoday.com/155634/ganymede-casts-a-long-shadow-across-the-surface-of-jupiter/>)



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).

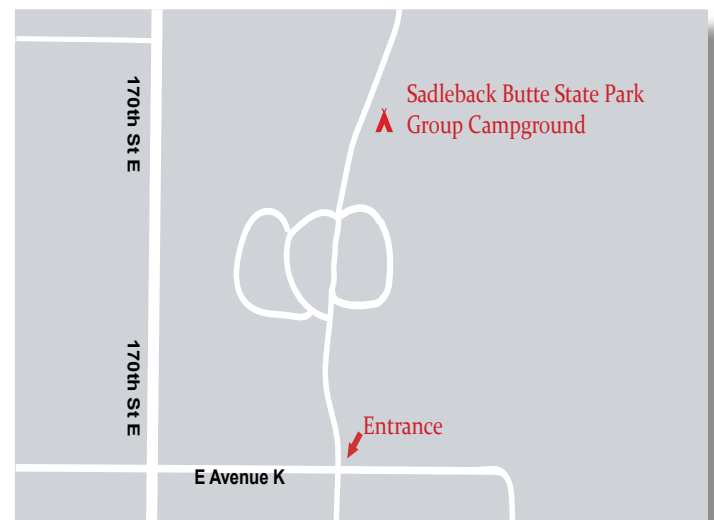
To get there, take the Frazier Mountain Park RD east about 7 miles from I-5, to Lake Of The Woods, Turn left on Lockwood Valley Rd. (If you see Mike's Pizza on your left you missed the turn) In less than a mile there is a road to the left, go past the ranger station, the parking lot is on the right.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



Planet Summary

The **Sun** starts May in Aries and is mid-Taurus by months end .

Total Lunar Eclipse in Libra, on May 15 beginning about 6:30 pm, when the Moon enters the Penumbra. The Moon enters the Umbra about 7:35pm, and begins to exit the Umbra about 9:55 pm. The Moon is full back in the Sunshine by 11:55 pm.

Mercury starts the month among the Pleiades, hard to see against the setting Sun. By mid month, it has its back to us as it swings in front of the Sun on the 21st. By the end of May its a 8% crescent in the morning glare.

Venus begins the month in Pisces, recovering from its encounter with Jupiter starting its fall towards the Sun; by the end of the month it crosses into Aries.

Mars begins the month the month in the middle of Aquarius ending up in Pisces. As the month progresses Mars becomes more prominent in the morning sky as the elongation extends to greater than 60.° On the morning of the 18th Neptune passes by 1/2° to the north. On the 29th Jupiter is 1/2° north.

Jupiter spends the month in Pisces. On the 1st, Venus is 1/3° south. At the end of May Mars is 1° to the east. On the 24th the 26% waning Moon, Jupiter and Mars form a 3° equilateral triangle.

Saturn begins the month about 1.3° north of Deneb Al Giedi of Capricorn. On the 22nd the 55% waning Moon passes some 5° to south

Uranus continues moving east in central Aries at mag 5.8. On the 5th it will be in conjunction with the Sun. By the 28th of May it will be at 20° elongation when the Moon passes by 1° south.

Neptune, in the morning sky, creeps across the border from Aquarius into Pisces mid-month. Mars passes by on the 18th 32 arc-secs south.

Pluto spends the month slowly moving east in Sagittarius at mag 14.4.

Moon Phases



First Qtr May 8 Full May 15 Third Qtr May 22 New May 30

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
5/1/2022	06:33	20:45	06:02	19:37
5/5/2022	09:14	23:26	05:58	19:40
5/10/2022	14:05	02:57	05:53	19:44
5/15/2022	19:40	05:27	05:49	19:48
5/20/2022	00:17	10:09	05:46	19:52
5/25/2022	03:14	15:38	05:43	19:56
5/30/2022	05:42	20:35	05:41	19:59

Planet Data*

May 1

	Rise	Transit	Set	Mag	Phase%
Mercury	06:58	14:09	21:21	0.63	31.4
Venus	04:14	10:12	16:11	-4.09	67.8
Mars	03:33	09:12	14:52	0.87	89.4
Jupiter	04:12	10:09	16:06	-2.15	99.5
Saturn	02:41	08:02	13:24	0.85	99.7

May 15

	Rise	Transit	Set	Mag	Phase%
Mercury	06:21	13:25	20:29	3.8	3.43
Venus	04:03	10:17	16:32	-4.03	72.7
Mars	03:06	08:56	14:47	0.78	88.4
Jupiter	03:24	09:24	15:24	-2.21	99.3
Saturn	01:48	07:10	12:32	0.80	99.7

May 30

	Rise	Transit	Set	Mag	Phase%
Mercury	05:12	12:00	18:47	3.13	6.3
Venus	03:52	10:24	16:56	-3.97	77.4
Mars	02:36	08:39	14:41	0.68	87.4
Jupiter	02:32	08:35	14:38	-2.29	99.1
Saturn	00:46	06:08	11:34	0.74	99.7

*All time mentioned are local and approximate.

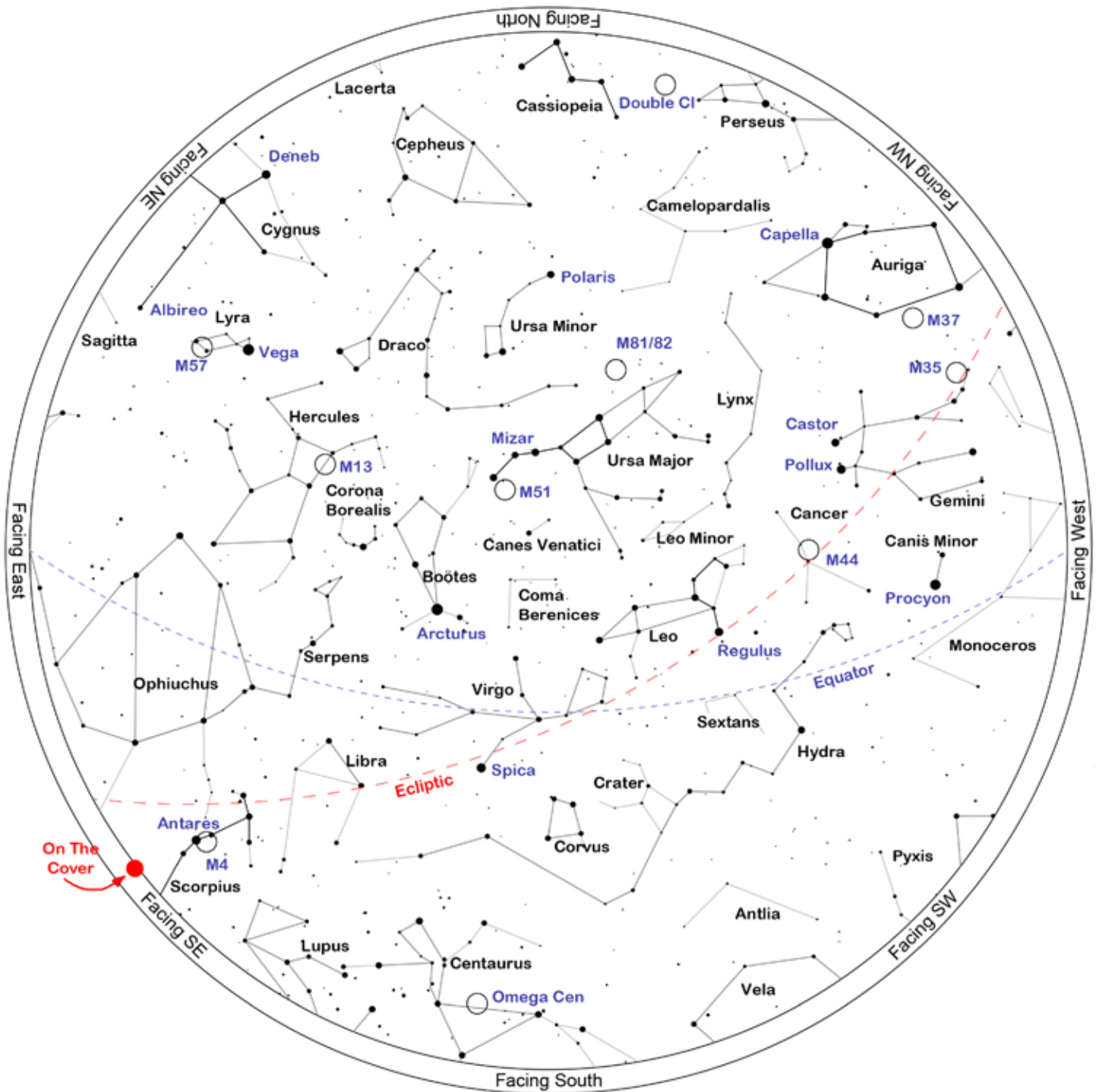
*Sun, Moon and Planetary date based on Quartz Hill, CA

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May 2022

Sky Chart



Location: Palmdale, CA 93551

Latitude: 34° 36' N, longitude: 118° 11' W

Time: 2022 May 28, 21:00 (UTC -07:00)

Powered by: Heavens-Above.com

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May 2022

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 May 28, 2022. The list is sorted by the transit time of the object.

ID	Common Name	Type		RA	Dec	Mag	Rise	Transit	Set
NGC6357	Lobster Nebula	Neb	Sco	17h 24m 43s	-34° 12.1'		21:48	01:59	06:10
IC4651		Open	Ara	17h 24m 52s	-49° 56.5'	6.9	23:34	01:59	04:23
Abell41		P Neb	Ser	17h 29m 04s	-15° 13.3'	13.9	20:44	02:03	07:22
Abell42		P Neb	Oph	17h 31m 31s	-08° 19.1'	14.6	20:26	02:05	07:45
Barnard78	B78	DkNeb	Oph	17h 32m 00s	-25° 35.0'		21:20	02:06	06:51
NGC6388		Globular	Sco	17h 36m 17s	-44° 44.1'	6.9	22:59	02:10	05:21
M14	NGC6402	Globular	Oph	17h 37m 36s	-03° 14.7'	9.5	20:18	02:12	08:05
Barnard276	B276	DkNeb	Oph	17h 39m 39s	-19° 49.0'		21:09	02:14	07:19
M6	Butterfly Cluster	Open	Sco	17h 40m 20s	-32° 15.2'	4.5	21:55	02:14	06:34
NGC6397	C86	Globular	Ara	17h 40m 42s	-53° 40.0'	5.6	00:45	02:15	03:44
NGC6426		Globular	Oph	17h 44m 55s	+03° 10.1'	11.2	20:07	02:19	08:30
Barnard83a	B83a	DkNeb	Sgr	17h 45m 18s	-20° 00.0'		21:15	02:19	07:24
IC4665		Open	Oph	17h 46m 30s	+05° 39.0'	4.2	20:02	02:20	08:39
NGC6445	Crescent Nebula	P Neb	Sgr	17h 49m 15s	-20° 00.6'	13.0	21:19	02:23	07:28
NGC6503		Galaxy	Dra	17h 49m 27s	+70° 08.6'	10.2	Circ	02:23	Circ
NGC6441		Globular	Sco	17h 50m 13s	-37° 03.0'	7.4	22:27	02:24	06:22
Barnard283	B283	DkNeb	Sco	17h 51m 00s	-33° 52.0'		22:12	02:25	06:37
Barnard285	B285	DkNeb	Ser	17h 51m 32s	-12° 52.0'		20:59	02:25	07:52
M7	Scorpion's Tail, Ptolemy's Cluster	Open	Sco	17h 53m 51s	-34° 47.6'	3.5	22:20	02:28	06:36
IC4670		Neb	Sgr	17h 55m 07s	-21° 44.6'		21:30	02:29	07:28
NGC6501		Galaxy	Her	17h 56m 04s	+18° 22.3'	12.3	19:34	02:30	09:26
M23	NGC6494	Open	Sgr	17h 57m 04s	-18° 59.1'	6.0	21:23	02:31	07:39
NGC6543	Cat Eye Nebula	P Neb	Dra	17h 58m 36s	+66° 38.0'	8.1	Circ	02:33	Circ
NGC6496		Globular	Sco	17h 59m 04s	-44° 16.0'	9.2	23:18	02:33	05:48
M20	Trifid Nebula, The Clover	Open+D Neb	Sgr	18h 02m 42s	-22° 58.2'	5.0	21:42	02:37	07:31
M8	Lagoon Nebula, Dragon Nebula	Open+D Neb	Sgr	18h 03m 41s	-24° 22.7'	5.0	21:48	02:38	07:27
Barnard295	B295	DkNeb	Sgr	18h 04m 05s	-31° 09.0'		22:14	02:38	07:02
M21	NGC6531	Open	Sgr	18h 04m 13s	-22° 29.3'	7.0	21:42	02:38	07:34
NGC6530		Open	Sgr	18h 04m 31s	-24° 21.5'	4.6	21:49	02:38	07:28
NGC6528		Globular	Sgr	18h 04m 50s	-30° 03.3'	9.5	22:10	02:39	07:07
IC4684		Neb	Sgr	18h 09m 08s	-23° 26.1'		21:50	02:43	07:36
IC4685		Neb	Sgr	18h 09m 18s	-23° 59.2'		21:52	02:43	07:34
Barnard303	B303	DkNeb	Sgr	18h 09m 28s	-23° 59.0'		21:52	02:43	07:35
IC1274		Neb	Sgr	18h 09m 51s	-23° 38.8'		21:52	02:44	07:36
IC1275		Neb	Sgr	18h 10m 07s	-23° 45.7'		21:52	02:44	07:36

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NGC6572		P Neb	Oph	18h 12m 06s	+06° 51.2'	9.0	20:24	02:46	09:08
NGC6567		P Neb	Sgr	18h 13m 45s	-19° 04.5'	12.0	21:40	02:48	07:55
IC4701		Neb	Sgr	18h 16m 36s	-16° 38.0'		21:36	02:51	08:06
Barnard93	B93	DkNeb	Sgr	18h 16m 53s	-18° 03.0'		21:40	02:51	08:01
IC1284		Neb	Sgr	18h 17m 39s	-19° 40.3'		21:46	02:52	07:57
M24	Small Sagittarius Star Cloud	Open	Sgr	18h 18m 26s	-18° 24.3'	4.5	21:43	02:52	08:02
M16	Eagle Nebula	Open+D Neb	Ser	18h 18m 48s	-13° 48.3'	6.5	21:29	02:53	08:16
Barnard308	B308	DkNeb	Sgr	18h 19m 08s	-22° 14.0'		21:56	02:53	07:50
M18	Black Swan,	Open	Sgr	18h 19m 58s	-17° 06.1'	8.0	21:40	02:54	08:07
M17	Horseshoe Nebula	Open+D Neb	Sgr	18h 20m 47s	-16° 10.3'	7.0	21:38	02:55	08:11
HR6923	SAO30949,	Mult	Dra	18h 23m 54s	+58° 48.0'	5.0	Circ	02:58	Circ
M28	NGC6626	Globular	Sgr	18h 24m 33s	-24° 52.1'	8.5	22:10	02:59	07:47
Barnard95	B95	DkNeb	Sct	18h 25m 35s	-11° 44.0'		21:30	03:00	08:29
Barnard97	B97	DkNeb	Sct	18h 29m 05s	-09° 55.0'		21:28	03:03	08:38
NGC6637		Globular	Sgr	18h 31m 23s	-32° 20.8'	7.7	22:46	03:05	07:24
IC1287		Neb	Sct	18h 31m 26s	-10° 47.7'		21:33	03:05	08:38
M25	M25	Open	Sgr	18h 31m 42s	-19° 07.0'	6.5	21:58	03:06	08:13
IC4725		Open	Sgr	18h 31m 48s	-19° 06.7'	4.6	21:59	03:06	08:13
NGC6642		Globular	Sgr	18h 31m 54s	-23° 28.5'	8.8	22:13	03:06	07:59
NGC6644		P Neb	Sgr	18h 32m 35s	-25° 07.7'	12.0	22:19	03:07	07:54
NGC6647		Open	Sgr	18h 32m 49s	-17° 13.6'	8.0	21:54	03:07	08:20
IC4732		P Neb	Sgr	18h 33m 55s	-22° 38.6'	13.0	22:12	03:08	08:04
NGC6656	Crackerjack Cluster	Globular	Sgr	18h 36m 24s	-23° 54.2'	5.1	22:19	03:10	08:02
IC4756		Open	Ser	18h 38m 54s	+05° 27.0'	5.0	20:55	03:13	09:31
NGC6681		Globular	Sgr	18h 43m 12s	-32° 17.4'	8.1	22:58	03:17	07:37
NGC6694		Open	Sct	18h 45m 18s	-09° 23.0'	8.0	21:43	03:19	08:56
IC4776		P Neb	Sgr	18h 45m 51s	-33° 20.5'	12.0	23:05	03:20	07:35
Barnard318	B318	DkNeb	Sct	18h 49m 42s	-06° 23.0'		21:39	03:24	09:09
M11	Wild Duck Cluster,	Open	Sct	18h 51m 05s	-06° 16.1'	7.0	21:40	03:25	09:10
M57	Ring Nebula	P Neb	Lyr	18h 53m 35s	+33° 01.7'	9.5	19:36	03:28	11:19
Barnard117	B117	DkNeb	Sct	18h 53m 43s	-07° 24.0'		21:46	03:28	09:10
NGC6715		Globular	Sgr	18h 55m 03s	-30° 28.7'	7.7	23:02	03:29	07:56
NGC6717	III-143	Globular	Sgr	18h 55m 06s	-22° 42.0'	9.2	22:34	03:29	08:25
Barnard122	B122	DkNeb	Sct	18h 56m 48s	-04° 45.0'		21:41	03:31	09:20
Barnard123	B123	DkNeb	Sct	18h 57m 39s	-04° 43.0'		21:42	03:32	09:21
NGC6723		Globular	Sgr	18h 59m 33s	-36° 37.9'	7.3	23:34	03:34	07:33
Barnard128	B128	DkNeb	Aql	19h 01m 40s	-04° 34.0'		21:46	03:36	09:26
NGC6729	C68	BrNeb	CrA	19h 01m 54s	-36° 57.0'		23:38	03:36	07:34
NGC6749		Globular	Aql	19h 05m 15s	+01° 54.0'	11.1	21:31	03:39	09:47

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ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6760		Globular	Aql	19h 11m 12s	+01° 01.8'	9.1	21:40	03:45	09:51
Abell56		P Neb	Aql	19h 13m 07s	+02° 52.8'	12.4	21:36	03:47	09:58
NGC6772		P Neb	Aql	19h 14m 36s	-02° 42.4'	14.0	21:53	03:49	09:44
Barnard138	B138	DkNeb	Aql	19h 16m 00s	+00° 13.0'		21:47	03:50	09:53
M56	NGC6779	Globular	Lyr	19h 16m 36s	+30° 11.0'	9.5	20:12	03:51	11:29
NGC6778		P Neb	Aql	19h 18m 25s	-01° 35.7'	13.0	21:54	03:52	09:51
Abell61		P Neb	Cyg	19h 19m 10s	+46° 14.5'	13.0	18:41	03:53	13:05
Barnard140	B140	DkNeb	Aql	19h 19m 49s	+05° 13.0'		21:36	03:54	10:11
NGC6790		P Neb	Aql	19h 22m 57s	+01° 30.8'	10.0	21:50	03:57	10:04
NGC6803		P Neb	Aql	19h 31m 16s	+10° 03.3'	11.0	21:34	04:05	10:36
NGC6804		P Neb	Aql	19h 31m 35s	+09° 13.5'	12.0	21:37	04:06	10:34
Abell62		P Neb	Aql	19h 33m 18s	+10° 37.0'	13.0	21:34	04:07	10:40
NGC6807		P Neb	Aql	19h 34m 34s	+05° 41.0'	14.0	21:50	04:09	10:27
M55	NGC6809	Globular	Sgr	19h 40m 00s	-30° 57.7'	7.0	23:49	04:14	08:39
NGC6813		Neb	Vul	19h 40m 22s	+27° 18.5'		20:47	04:14	11:42
NGC6820		Neb	Vul	19h 42m 28s	+23° 05.2'		21:04	04:16	11:29
Barnard338	B338	DkNeb	Aql	19h 43m 02s	+07° 27.0'		21:53	04:17	10:41
NGC6818	Little Gem	P Neb	Sgr	19h 43m 58s	-14° 09.1'	10.0	22:55	04:18	09:40
NGC6826	Blinking Planetary	P Neb	Cyg	19h 44m 48s	+50° 31.0'	8.8	18:20	04:19	14:17
Abell65		P Neb	Sgr	19h 46m 34s	-23° 08.2'	13.1	23:26	04:21	09:15
NGC6838		Globular	Sge	19h 53m 46s	+18° 46.6'	8.3	21:30	04:28	11:25
NGC6842		P Neb	Vul	19h 55m 02s	+29° 17.3'	14.0	20:54	04:29	12:04
HR7619	HD189037	Mult	Cyg	19h 55m 38s	+52° 26.3'	4.9	18:00	04:30	14:59
Abell66		P Neb	Sgr	19h 57m 32s	-21° 36.6'	14.1	23:32	04:31	09:31
NGC6853	Dumbbell Nebula	P Neb	Vul	19h 59m 36s	+22° 43.2'	8.1	21:23	04:34	11:44
NGC6857	III-144	Neb	Cyg	20h 02m 48s	+33° 31.4'	11.4	20:43	04:37	12:30
IC4954		Neb	Vul	20h 04m 45s	+29° 15.1'		21:04	04:39	12:14
M75	NGC6864	Globular	Sgr	20h 06m 05s	-21° 55.3'	9.5	23:42	04:40	09:38
Barnard342	B342	DkNeb	Cyg	20h 09m 30s	+41° 12.0'		20:09	04:43	13:18
NGC6885	Vulpeculae Cluster	Open	Vul	20h 12m 00s	+26° 29.0'	5.9	21:22	04:46	12:10
NGC6891		P Neb	Del	20h 15m 09s	+12° 42.2'	12.0	22:10	04:49	11:28
NGC6894		P Neb	Cyg	20h 16m 24s	+30° 33.9'	14.0	21:10	04:50	12:31
IC4997		P Neb	Sge	20h 20m 09s	+16° 43.9'	12.0	22:03	04:54	11:45
Barnard345	B345	DkNeb	Cyg	20h 21m 00s	+46° 33.0'		19:40	04:55	14:10
NGC6913	Cooling Tower	Open	Cyg	20h 23m 57s	+38° 30.5'	6.6	20:39	04:58	13:16
Abell70		P Neb	Aql	20h 31m 33s	-07° 05.3'	14.3	23:23	05:06	10:48
Barnard348	B348	DkNeb	Cyg	20h 34m 00s	+42° 05.0'		20:28	05:08	13:48
NGC6940		Open	Vul	20h 34m 26s	+28° 17.0'	6.3	21:37	05:08	12:40
NGC6960	Filamentary Nebula	Neb	Cyg	20h 45m 58s	+30° 35.6'		21:39	05:20	13:01

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ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
IC5068		Neb	Cyg	20h 50m 29s	+42° 28.6'		20:41	05:24	14:07
NGC6979	II-206	Neb	Cyg	20h 51m 00s	+32° 09.0'	11.0	21:38	05:25	13:12
IC5070	Pelican Nebula [2]	Neb	Cyg	20h 51m 00s	+44° 24.1'		20:28	05:25	14:22
NGC6981		Globular	Aqr	20h 53m 28s	-12° 32.2'	9.4	00:00	05:27	10:55
IC5076		Neb	Cyg	20h 55m 33s	+47° 23.7'		20:07	05:30	14:52
IC1340		Neb	Cyg	20h 56m 08s	+31° 02.8'		21:48	05:30	13:13
NGC6992	Cirrus Nebula [2]	Neb	Cyg	20h 56m 19s	+31° 44.6'		21:45	05:30	13:16
NGC6996	VIII-58	Open	Cyg	20h 56m 30s	+44° 38.0'	10.0	20:32	05:30	14:29
NGC6997		Open	Cyg	20h 56m 39s	+44° 37.9'	10.0	20:32	05:31	14:29
M73	NGC6994	Open+Asterism	Aqr	20h 58m 56s	-12° 38.1'	9.0	00:06	05:33	11:00
NGC7006		Globular	Del	21h 01m 30s	+16° 11.0'	10.6	22:46	05:35	12:25
NGC7009	Saturn Nebula	P Neb	Aqr	21h 04m 12s	-11° 22.0'	8.0	00:07	05:38	11:09
NGC7027		P Neb	Cyg	21h 07m 02s	+42° 14.1'	10.0	21:00	05:41	14:22
Barnard151	B151	DkNeb	Cep	21h 08m 13s	+56° 19.0'		Circ	05:42	Circ
IC1369		Open	Cyg	21h 12m 09s	+47° 46.1'	6.8	20:20	05:46	15:12
NGC7078	Great Pegasus Cluster	Globular	Peg	21h 29m 58s	+12° 10.0'	6.4	23:27	06:04	12:41
M39	NGC7092	Open	Cyg	21h 31m 42s	+48° 25.0'	5.5	20:33	06:06	15:39
M2	NGC7089	Globular	Aqr	21h 33m 27s	-00° 49.3'	7.5	00:07	06:07	12:08
NGC7090		Galaxy	Ind	21h 36m 28s	-54° 33.4'	11.0	05:02	06:10	07:19
IC1396	Elephant Trunk	Open	Cep	21h 38m 58s	+57° 29.3'	3.5	Circ	06:13	Circ
NGC7099		Globular	Cap	21h 40m 22s	-23° 10.7'	7.5	01:20	06:14	11:08
NGC7128		Open	Cyg	21h 43m 57s	+53° 42.9'	9.7	19:17	06:18	17:19
NGC7142		Open	Cep	21h 45m 09s	+65° 46.5'	9.3	Circ	06:19	Circ
NGC7139	III-696	P Neb	Cep	21h 46m 08s	+63° 47.5'	13.3	Circ	06:20	Circ
IC5146	Cocoon Nebula	Open	Cyg	21h 53m 29s	+47° 16.0'	7.2	21:06	06:27	15:49
IC1434		Open	Lac	22h 10m 42s	+52° 51.0'	9.0	20:06	06:45	17:23
NGC7245		Open	Lac	22h 15m 11s	+54° 20.6'	9.2	19:22	06:49	18:16
NGC7232		Galaxy	Gru	22h 15m 38s	-45° 51.0'	13.0	03:47	06:50	09:52
NGC7261		Open	Cep	22h 20m 06s	+58° 03.0'	8.4	Circ	06:54	Circ

And - Andromeda
Ant - Antlia
Aps - Apus
Aql - Aquila
Aqr - Aquarius
Ara - Ara
Ari - Aries
Aur - Auriga
Boo - Bootes
Cae - Caelum
Cam - Camelopardis
Cap - Capricornus
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Cas - Cassiopeia
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CrB - Corona Borealis
Crt - Crater
Cru - Crux
Crv - Corvus
CVn - Canes Venatici

Cyg - Cygnus
Del - Delphinus
Dor - Dorado
Dra - Draco
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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
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Psc - Pisces
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