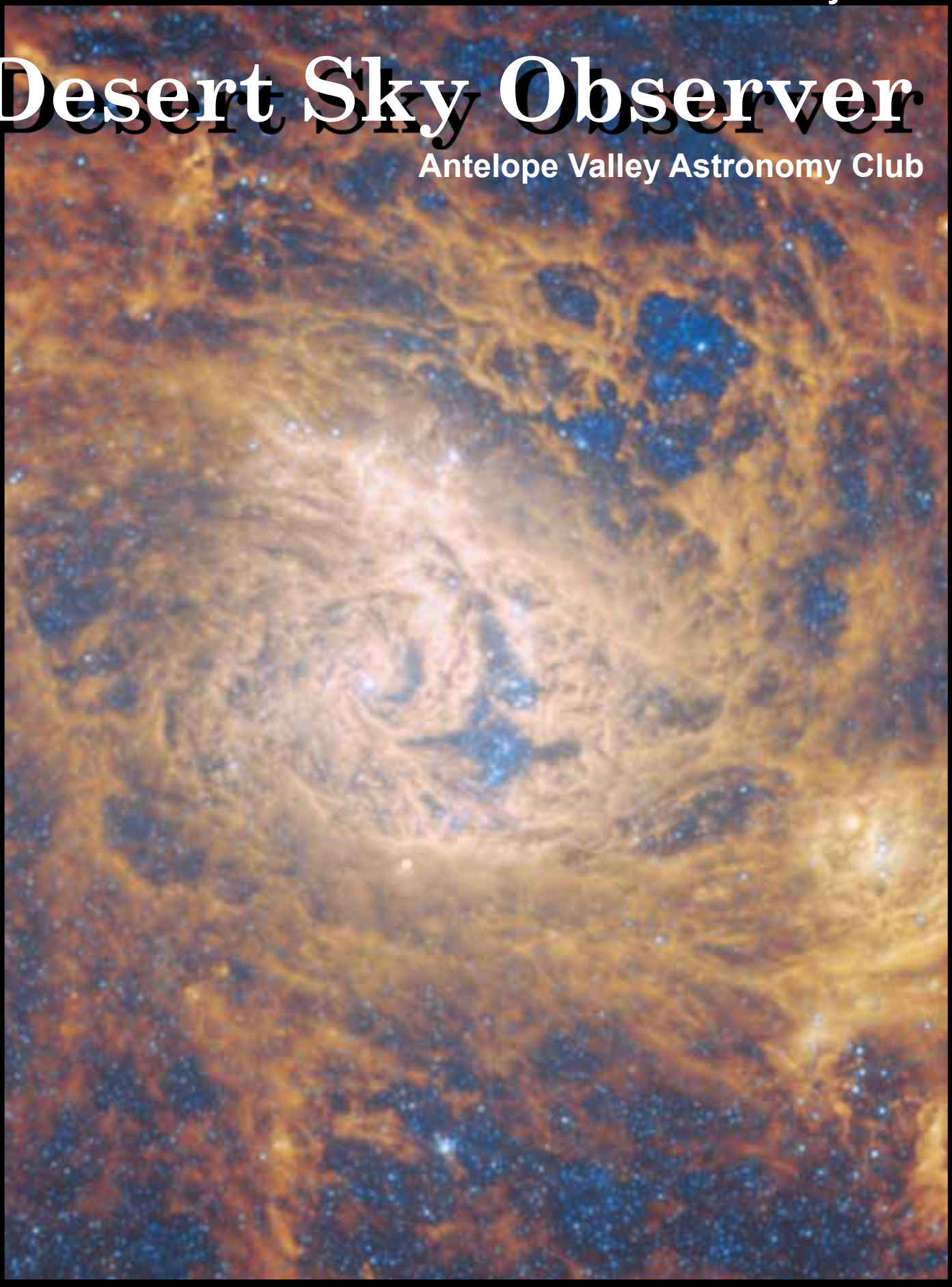
Volume 44.2 February 2024

Desert Sky Observer

Antelope Valley Astronomy Club



Upcoming Events

February 9: Club Meeting - Star Party at Sage
February 10: Moonwalk @ PDW 6:00 pm

Every clear night: Personal Star Party

March 8: Club Meeting
March 9: Messier Marathon Star Party
March10: Daylight Saving begins
March 25: Penumbral Lunar eclipse
March 30: Moonwalk @ PDW @ 7:30PM

AVAC Calendar

Board Members

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

Vice-President: Matt Leone (661) 256-3851
vice-president@avastronomyclub.org

Secretary: Rose Moore (661) 972-1953
secretary@avastronomyclub.org

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

Director of Community Development:
Christian Amaya(661) 972-0091
community@avastronomyclub.org

Appointed Positions

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

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

Club Historian: vacant
history@avastronomyclub.org

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

Night Sky Coordinator:
Rose Moore (661) 972-1953

Astronomical League Coordinator:
Phil Wriedt (661) 917-4874
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.instagram.com/av_astronomyclub

www.avastronomyclub.org

The Antelope Valley Astronomy Club, Inc. is a 26 USC §503(c)(3) California 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!

At our meeting on January 12th we had an Astronomy painting class, guided by Suzanne Leone, who designed the prototype nebulae. Held in the Multi-Purpose Room, we painted the night away. I hope all of the artists were satisfied with their creations. So the question to the membership is: should we do this again in November? or next January?

On the 9th of February, the night of our Club meeting, we will be holding a public star party at the SAGE. Bring your telescope or binoculars. Bring your neighbors, Scouts, Girl Scouts, and anyone else who might have an interest in Astronomy. Last year when we did this there were quite a few families who came and were introduced to the Club. Let's use this as a tool to gain new members. Let's hope is doesn't rain.

The next day will be the Moonwalk at Prime Desert Woodland. Sunset is at 5:30 PM so the walk itself will start about 6:00 PM. Once again we need telescopes there for the public to view the sky. Come, get setup before sunset, caus' setting up in the dark just ain't no fun. It goes without saying (but I'll say it anyway) It's cold out there! It might rain too, so be prepared. Jeremy has said, he will do the Moonwalk even if its cloudy. Don't setup if it's overcast or rainy.

It's still that time of the year; to renew your membership. Just follow the directions on page 5, pay via PayPal or give Rod a check at the next meeting. We have lots of observing opportunities planned for the new year.

Keep Looking Up, Phil

On The Cover

Please note: North is 45.0° left of vertical RA: 13h 37' 1.85" DEC: -29° 51' 59.71" (Hydra)

The spiral galaxy M83, which is also known as NGC 5236, was observed by Webb as part of a series of observations collectively titled Feedback in Emerging extrAgalactic Star clusTers, or FEAST. Another target of the FEAST observations, M51, was the subject of a previous Webb Picture of the Month. As with all six galaxies that comprise the FEAST sample, M83 and M51 were observed with both NIRCam and MIRI, two of the four instruments that are mounted on Webb.

continued on next page

For sale: 4 inch Celestron Equatorial telescope. Includes mount, solar filter, finder scope, eyepieces, two inch diagonal, carrying bag. Few scratches on finish. Price: $250. Email either Duane (gurba1826@gmail.com) or Rose (rmorion1@bak.rr.com)

From the Secretary

By Rose Moore

Members:

Coming up for our club meeting on February 9th will be a public star party. Start time is approximately 7pm. Weather permitting, free and open to the public. Set up time is 30-60 minutes prior to the event. We need members with their telescopes to help out at this event. There will be an email sent out a few days prior to the star party and it will include any changes in the start and end time. Jupiter will be up, and it will be a new Moon.

On Saturday February 10th will be a Prime Desert Moon Walk starting at 6:00 pm. Weather permitting. We need members with telescopes for this event, or come to take the walk with Jeremy and the public. Set up time is 30-60 minutes prior to start time. A crescent 1% Moon will be up till 6:41pm. Jupiter will be up, Saturn up till 6:46pm, as well as Neptune.

For March we have our club meeting on Friday March 8th, and our Messier Marathon/dark sky star party on Saturday March 9th. Location will be announced as we get closer. We might consider going to Saddleback, but getting individual campsites instead of the larger group campsite. Further info coming, will keep you all posted! We also have a Lunar Eclipse on Monday March 25th. This is a Penumbral Eclipse and it is unknown at this time if the club and Jeremy will be holding an event for this at the SAGE.

There will be a Prime Desert Moon Walk on Saturday March 30th, more info to come.

Matt and I will be working on getting speakers for the club. We have an application in through the Night Sky Network's speaker group. The NASA Speaker Request page does not seem to be up yet, so I have sent them another email.

See you at a club event soon!

Rose

On The Cover ... continued

MIRI, or the Mid-InfraRed Instrument, makes observations in the mid-infrared, which spans wavelengths of light very different from optical wavelengths. Optical wavelengths in astronomy roughly correspond to the range of light waves that human eyes are sensitive to, and extend from about 0.38 to 0.75 micrometres (a micrometre, or micron, is one thousandth of a millimetre). By contrast, MIRI detects light from 5 to 28 micrometres — however, when it makes observations, it does not typically observe across this entire wavelength range all at once. Instead, MIRI has a set of ten filters that allow very specific regions of light through. For example, one of MIRI's filters (dubbed F770W), allows light with wavelengths of 6.581 to 8.687 micrometres to pass through it.

This image was compiled using data collected through just two of MIRI's ten filters, near the short end of the instrument's wavelength range. The result is this extraordinarily detailed image, with its creeping tendrils of gas, dust and stars. In this image, the bright blue shows the distribution of stars across the core in the centre, merging into a broad network of gas and dust which fills the image. This material glows brightest orange along the path of the arms, and is darker red across the rest of the galaxy. Through many gaps in the dust, countless tiny stars can be seen, most densely around the core.]

Credit: ESA/Webb, NASA & CSA, A. Adamo (Stockholm University) and the FEAST JWST team

AVAC Membership Renewal

It is that time year again, time to renew your AVAC Membership and HOORAY!!!, we are back in the Sage Planetarium for our monthly meetings. We have had in person meetings for the last few months now and it has been great. However if you haven't had a chance to make it out to one of these meetings I wholeheartedly encourage you to attend. The Sage Planetarium is one of the club's most rewarding benefits.

It is very gratifying to see the early membership renewals. In these times of financial uncertainty our members are more than ever the lifeblood for the AVAC. That said, please worry not, financially the club is still solvent and we are able to meet all our obligations while providing for future club events and guest speakers etc.

Please remember that 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.

For administrative reasons we encourage members to renew their membership in January. For myself the easiest way to renew my membership was through the AVAC website via our PayPal account. However you can renew at our monthly club meetings with good old cash or by check.

For those unable to attend our monthly meeting you can renew your membership through the mail by sending a check to the club's Post Office Box:

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

For members less familiar with the club's website, it is actually fairly simple:

- Google Antelope Valley Astronomy Club and then open on the link.
- Click on MEMBER and then click on LOGIN.
- The default Member Name will be your Membership Number.
- If you had Signed Up on line you would have created a Password, but if you have forgotten it, use the Forgot Password link.
- Once you have Logged In, under Member click on Profile.
- Under Profile click on Membership.
- Under Your Current Membership click on Renew Now.
- You will have the choice of paying with a PayPal account or with a Credit Card.
- If you choose Credit Card PayPal will allow you to pay as a Guess

Thank you,
Rod Girard AVAC Treasurer

Constant Companions: Circumpolar Constellations, Part I

by Katherine Troche, Astronomy Society of the Pacific, NASA Night Sky Network

Winter in the northern hemisphere offers crisp, clear (and cold!) nights to stargazers, along with better views of several circumpolar constellations. What does circumpolar mean when referring to constellations? This word refers to constellations that surround the north and south celestial poles without ever falling below the horizon. Depending on your latitude, you will be able to see up to nine circumpolar constellations in the northern hemisphere. Today, we'll focus on three that have gems within: Auriga, Cassiopeia, and Ursa Minor. These objects can all be spotted with a pair of binoculars or a small to medium-sized telescope.

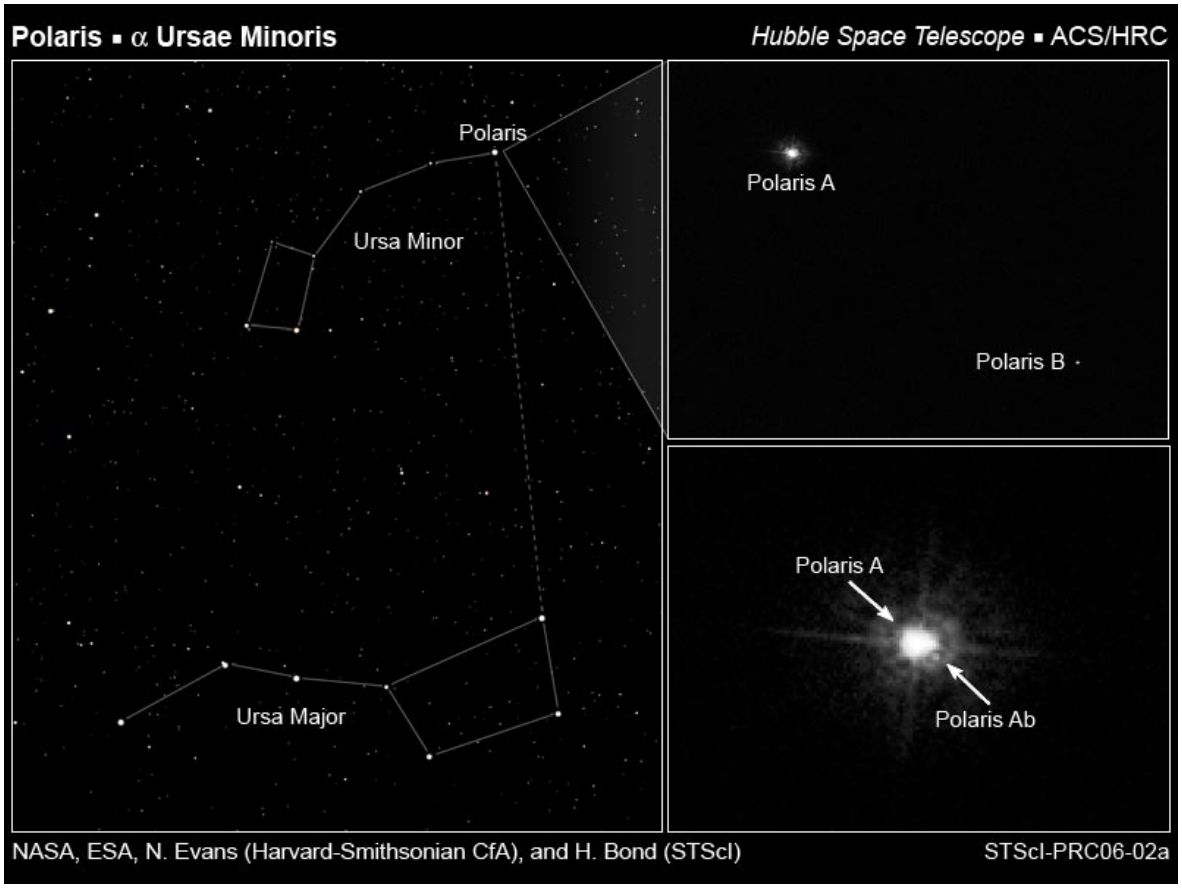
The counterclockwise circumpolar constellations Auriga, Cassiopeia, and Ursa Minor in the night sky, with four objects circled in yellow labeled: Pinwheel Cluster, Starfish Cluster, Owl Cluster, and Polaris. Credit: Stellarium Web

• The Pinwheel Cluster: Located near the edge of Auriga, this open star cluster is easy to spot with a pair of binoculars or small telescope. At just 25 million years old, it contains no red giant stars and looks similar to the Pleiades. To find this, draw a line between the stars Elnath in Taurus and Menkalinan in Auriga. You will also find the Starfish Cluster nearby.

• The Owl Cluster: Located in the 'W' or 'M' shaped constellation Cassiopeia, is the open star cluster known as the Owl Cluster. Sometimes referred to as the E.T. Cluster or Dragonfly Cluster, this group of stars never sets below the horizon and can be spotted with binoculars or a small telescope.

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!



A black and white image from the Hubble Telescope of the Polaris star system, showing three stars: Polaris A, Ab, and Polaris B.
Credit: NASA, ESA, N. Evans (Harvard-Smithsonian CfA), and H. Bond (STScI)

• Polaris: Did you know that Polaris is a triple star system? Look for the North Star on the edge of Ursa Minor, and with a medium-sized telescope, you should be able to separate two of the three stars. This star is also known as a Cepheid variable star, meaning that it varies in brightness, temperature and diameter. It's the closest one of its kind to Earth, making it a great target for study and conceptual art.

Up next, catch the King of the Planets before its gone for the season with our upcoming mid-month article on the Night Sky Network page through NASA's website!

Artist's Concept of Polaris System, Annotated, Kat Troche

Space News

News from around the Net

JWST Turns Up Even More Heavier-Than-Expected Black Holes

In the two years since the James Webb Space Telescope (JWST) launched, astronomers are learning one thing: The early universe is a lot weirder than we thought. JWST, which is the largest space telescope ever launched, is able to see back in time like never before thanks to a combination of its large mirrors and its sensitivity to infrared light. This means that it can see in stunning clarity objects whose light was emitted billions of years ago in the ultraviolet or visible portion of the spectrum, and has now been stretched by the universe's expansion to longer wavelengths than optical telescopes like Hubble. . . . (continued at https://www.astronomy.com/science/jwst-turns-up-even-more-heavier-than-expected-black-holes/)

Meet Bellatrix, The Amazon Star

If you're unfamiliar with this star, don't feel bad. If Bellatrix were located in just about any other constellation, it would probably be the "star of the show," but as it stands, Bellatrix takes a backseat to brighter Rigel and Betelgeuse. It's further overlooked because of the three-star belt and the Orion Nebula and Horsehead nebulae. However, at 2nd magnitude, Bellatrix is truly a brilliant star. At first glance Bellatrix appears white, but a little time watching will reveal its blue color, especially in contrast to nearby red Betelgeuse. And when it comes to stars, blue means hot. The star's surface is heated to a roaring 21,750 kelvin (40,000°F) — a difficult quantity to comprehend even though there are plenty of stars even hotter. . . . (continued at https://skyandtelescope.org/observing/celestial-objects-to-watch/bright-stars/meet-bellatrix-the-amazon-star/)

The World's Largest Iceberg Sets Sail For Adventure Beyond Antarctic Waters

In November 2023, the monster iceberg A23e finally dislodged from the seafloor after being grounded and stuck there for 40 years. A series of recent satellite images show that the mighty iceberg is now heading away from Antarctic waters, seeking fame and fortune in the high seas. A23a measures 4,000 sq kilometers in area and is over 280 meters thick, and is currently the world's largest iceberg.. . .(continued at https://www.universetoday.com/165423/the-worlds-largest-iceberg-sets-sail-for-adventure-beyond-antarctic-waters/)

Astronomers Study An Unlikely Stellar Fountain Of Youth

A mysterious and intensely fierce environment resides in the centers of galaxies. Objects orbiting the galactic centers are always subject to falling into the trap of the accretion disks or event horizons of central black holes, which exist in most galaxies. Our own Milky Way Galaxy has a supermassive black hole named Sagittarius A* (Sgr A*) "weighing" some 4.3 million solar masses. Near this central behemoth lie other objects, whizzing around at high speeds. Many are in very close range to Sgr A*, but now astronomers have studied an extremely young star cluster designated IRS13 . . . (continued at https://www.astronomy.com/science/a-very-young-star-cluster-in-the-near-vicinity-of-sgr-a/)

Solar And Lunar Eclipses In 2024

Up to seven eclipses of the Sun and Moon can take place in one year, though the last time that happened was 1982, and the fewest possible is four. During 2024 we'll experience the four-event minimum. There'll be a total solar eclipse in April (which crosses North America) and an annular solar eclipse in October, but 2024's two lunar eclipses will be barely noticeable. It's a very similar pattern to what took place in 2023. You can go directly to the circumstances of this year's events if you wish — or continue on to explore some eclipse basics. . . .(continued at https://skyandtelescope.org/observing/solar-and-lunar-eclipses-in-2024/)

Space News

News from around the Net

The Mars Ingenuity Helicopter Ends Its Mission After 3 Years

After three years filled with many firsts, NASA's Ingenuity Helicopter has made its final flight. Ingenuity, though still upright on Mars and in communication with NASA, can no longer fly after it was damaged during a recent landing. "The historic journey of Ingenuity, the first aircraft on another planet, has come to end," said NASA administrator Bill Nelson. "That remarkable helicopter flew higher and farther than we ever imagined and helped NASA do what we do best – make the impossible possible." . . . (Continued at https://www.astronomy.com/space-exploration/the-mars-ingenuity-helicopter-ends-its-mission-after-3-years/)

What The Next Solar Maximum Means For You

Much like the Earth, our Sun is a dynamic body with a complex – and sometimes violent – weather system. Solar storms eject highly energetic radiation that can impact our planet, forming strong auroras and disrupting power grids, electronics, and satellites. The scientific study of space weather attempts to understand, track, and forecast this solar activity, which peaks with the solar maximum every 11 years. The current solar cycle is predicted to peak in 2024. . . . (continued at https://www.csiro.au/en/news/all/articles/2024/january/solar-maximum)

Stars Travel More Slowly At Milky Way's Edge: Galaxy's Core May Contain Less Dark Matter Than Previously Estimated By clocking the speed of stars throughout the Milky Way galaxy, MIT physicists have found that stars further out in the galactic disk are traveling more slowly than expected compared to stars that are closer to the galaxy's center. The findings raise a surprising possibility: The Milky Way's gravitational core may be lighter in mass, and contain less dark matter, than previously thought. The new results are based on the team's analysis of data taken by the Gaia and APOGEE instruments. Gaia is an orbiting space telescope that tracks the precise location, distance, and motion of more than 1 billion stars throughout the Milky Way, ... (continued at https://phys.org/news/2024-01-stars-slowly-milky-edge-galaxy.html)

Nancy Grace Roman Could Find The First Stars In The Universe

In the beginning, the Universe was so hot and so dense that light could not travel far. Photons were emitted, scattered, and absorbed as quickly as the photons in the heart of the brightest stars. But in time the cosmos expanded and cooled to the point that it became transparent, and the birthglow of the Big Bang could traverse space and time for billions of years. We still see it as the microwave cosmic background. As the Universe expanded it grew dark, filled only with warm clouds of hydrogen and helium. In time those clouds collapsed to form the first stars, and light again filled the heavens. . . . (continued at https://www.universetoday.com/165444/nancy-grace-roman-could-find-the-first-stars-in-the-universe/#more-165444)

Clouds, Large And Small, Of The Southern Sky

Deep in January's sky, far south of the equator, are two of the most amazing celestial showpieces — the Large and Small Magellanic Clouds. Easily visible from dark locations as two foggy expanses, they're a bit harder for light-polluted city dwellers to discern. Each is a small galaxy near our own Milky Way, with the Large Magellanic Cloud around 160,000 light-years away and the Small Magellanic Cloud about 200,000 light-years distant. When you first spot them, you really would think that they are just two wispy clouds. That they don't drift with the wind is a bit of a giveaway that they are celestial in nature, however.. . . .(continued at https://skyandtelescope.org/astronomy-news/clouds-large-small-southern-sky/)

Dark Sky Observing Sites

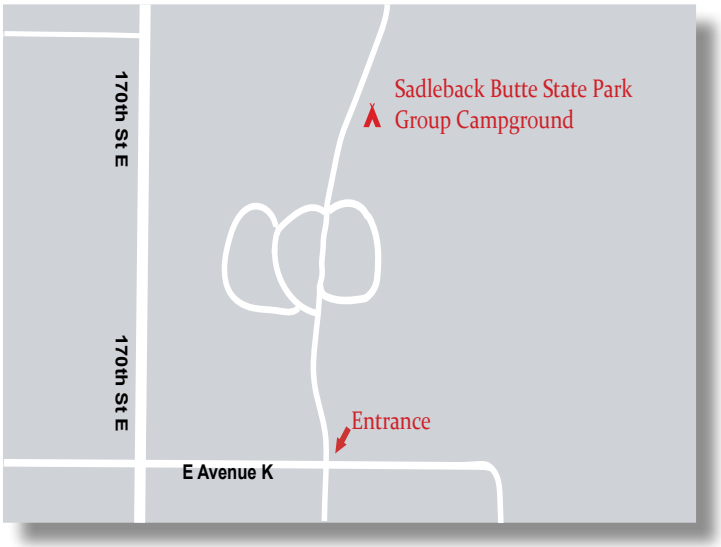
The Chuchupate parking lot is a half a mile beyond the Mt Pinos ranger station (on some maps The Chuchupate Ranger Sta.), the parking lot is also called Frazier Mountain trailhead.

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.



Solar System Summary

The **Sun** moves from central Capricorn to the middle of Aquarius by the end of February.

The Planets

Mercury begins the month in the morning twilight falling toward the rising Sun.. On the 28th Solar conjunction is achieved along with Saturn. Saturn arriving in the morning twilight and Mercury the evening twilight, while passing each other by less than ¼°.

Venus is still prominent in the morning sky. Starting the month at mag -3.97 in central of Sagittarius continues its slide back toward the Sun, ending the month in Capricorn at -3.92. On the 21st, Mars is at mag 1.3, ¾° south.

Mars starts the month in Sagittarius, moving east into Capricorn. On the 21st Venus passes by, ¾° north.

Jupiter continues moving forward in southern Aries at mag -2.2. On the 14th the 36% waxing Moon passes 2⅔° north.

Saturn moving east in central Aquarius at mag 0.95, by mid-month disappears into the setting Sun. Achieves Solar conjunction on the 27th/28th.

Uranus continues moving east in eastern Aries at mag 5.7.

Neptune is moving east on the southern border of Pisces at 7.9. On the 11th the 8% waxing Moon passes less than 1° to the south.

Dwarf Planets

134340 Pluto spends the month, now on the western edge of Capricorn moving east at mag 14.5 just south of M75.

1 Ceres at mag 9.0 starts the month, in the morning twilight, on the edge of Sagittarius slowly moving east.

2 Pallas at mag 9.5 continues moving east into southern Hercules.

3 Juno at mag 8.5, moves in retrograde in southern Leo.

4 Vesta at mag 7.4, completes its retrograde movement in Taurus and thereafter returning to its eastern course.

Moon Phases

First Qtr Feb 16 | Full Feb 24 | Third Qtr Feb 2 | New Feb 9

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
2/1/2024	23:59	23:59	06:51	17:21
2/5/2024	03:11	12:45	06:47	17:25
2/10/2024	07:31	18:41	06:43	17:30
2/15/2024	10:07	00:30	06:38	17:35
2/20/2024	14:10	04:33	06:33	17:40
2/25/2024	19:02	07:12	06:27	17:44
2/29/2024	22:51	08:47	06:22	17:48

Planet Data*

February 1

	Rise	Transit	Set	Mag	Phase%
Mercury	05:57	10:55	15:53	-0.31	88.7
Venus	05:00	09:57	14:55	-3.97	86.0
Mars	05:43	10:39	15:35	1.33	98.4
Jupiter	10:49	17:27	00:10	-2.41	99.0
Saturn	08:10	13:42	19:14	0.96	99.9

February 15

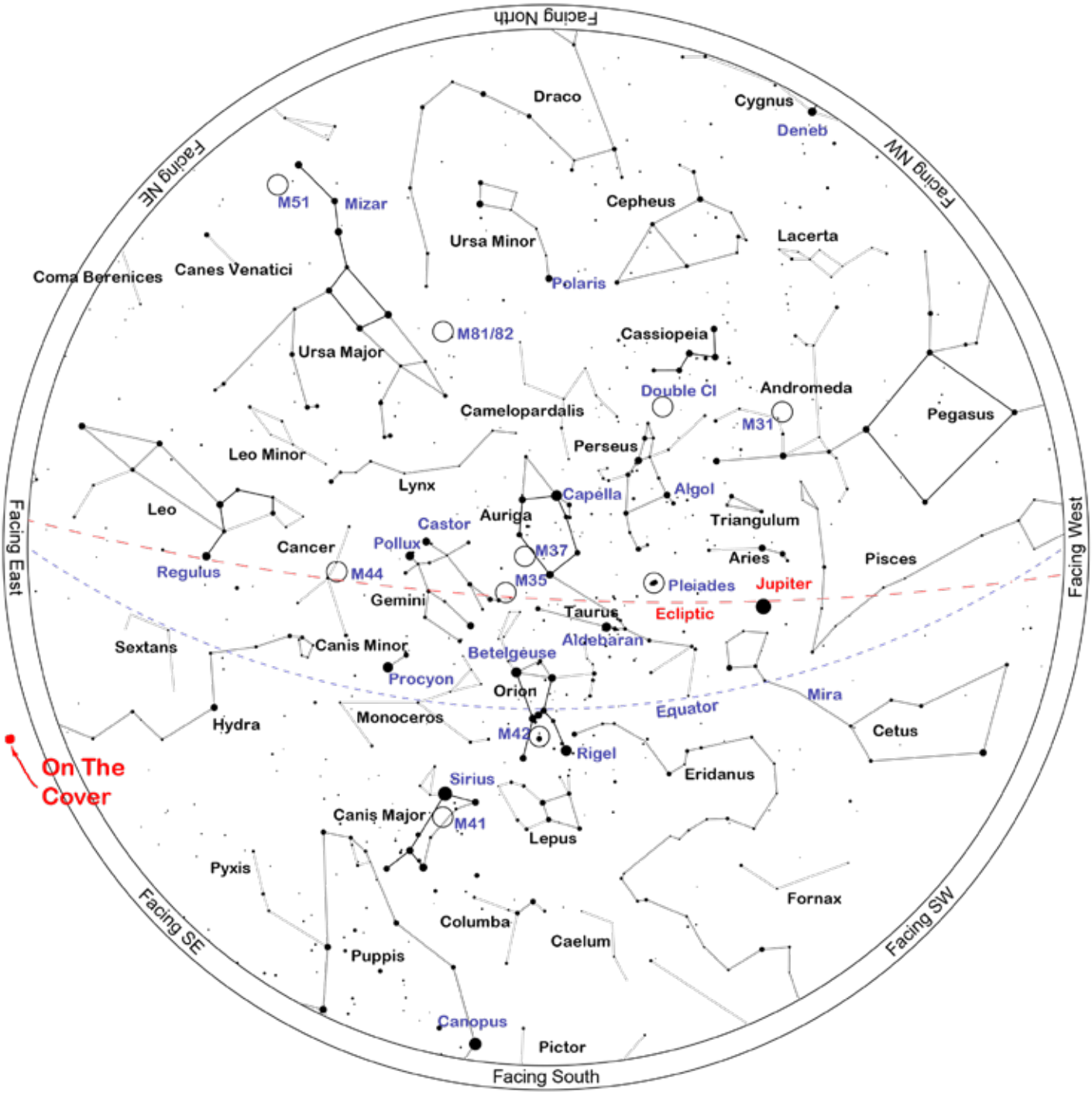
	Rise	Transit	Set	Mag	Phase%
Mercury	06:20	11:32	16:45	-0.77	96.4
Venus	05:12	10:16	15:20	-3.94	88.8
Mars	05:27	10:29	15:39	1.29	97.8
Jupiter	09:59	16:39	23:19	-2.32	99.1
Saturn	07:19	12:53	18:27	0.96	99.9

February 29

	Rise	Transit	Set	Mag	Phase%
Mercury	06:34	12:13	17:53	-1.67	99.7
Venus	05:17	10:32	15:48	-3.92	91.4
Mars	05:08	10:19	15:30	1.26	97.2
Jupiter	09:10	15:52	22:35	-2.25	99.2
Saturn	06:29	12:05	17:40	0.95	100.0

*All time mentioned are local and approximate.
*Sun, Moon and Planetary date based on Quartz Hill, CA

Sky Chart



On The Cover

Location: Set from geolocation service
Latitude: 34° 39' N, longitude: 118° 10' W
Time: 2024 February 10, 20:00 (UTC -08:00)

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 February 10, 2024. The list is sorted by the transit time of the object.

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC129		Open	Cas	00h 30m 00s	+60° 13.1'	6.5	Circ	15:08	Circ
NGC133		Open	Cas	00h 31m 19s	+63° 21.0'	9.0	Circ	15:09	Circ
NGC146		Open	Cas	00h 33m 03s	+63° 18.0'	9.1	Circ	15:11	Circ
NGC147	C17	E Gal	Cas	00h 33m 12s	+48° 30.0'	9.3	05:37	15:11	00:45
NGC190		Galaxy	Psc	00h 38m 55s	+07° 03.7'	14.0	08:54	15:17	21:39
M110	Satellite Of Andromeda Galaxy	Galaxy	And	00h 40m 22s	+41° 41.1'	8.9	06:40	15:18	23:56
NGC210		Galaxy	Cet	00h 40m 35s	-13° 52.3'	10.9	09:55	15:18	20:42
NGC206	V-36	Neb	And	00h 40m 36s	+40° 44.0'		06:47	15:18	23:50
Arp168	M32	Galaxy	And	00h 42m 41s	+40° 51.0'	9.0	06:48	15:20	23:53
M32	Satellite Of Andromeda Galaxy	Galaxy	And	00h 42m 42s	+40° 51.9'	9.1	06:48	15:20	23:53
M31	Andromeda Galaxy	Galaxy	And	00h 42m 44s	+41° 16.1'	4.3	06:45	15:20	23:55
NGC246	C56	P Neb	Cet	00h 47m 00s	-11° 53.0'	10.9	09:56	15:25	20:54
NGC254		Galaxy	Scl	00h 47m 28s	-31° 25.2'	11.8	11:02	15:25	19:48
NGC288		Globular	Scl	00h 52m 45s	-26° 35.0'	8.1	10:49	15:30	20:12
NGC281	PacMan Nebula	Open	Cas	00h 52m 54s	+56° 37.4'	7.0	Circ	15:31	Circ
IC59	Cassiopeiae Nebula	Neb	Cas	00h 57m 29s	+61° 08.6'		Circ	15:35	Circ
IC63	Cassiopeiae Nebula	Neb	Cas	00h 59m 29s	+60° 54.7'		Circ	15:37	Circ
C51	IC1613	IrrGal	Cet	01h 04m 48s	+02° 07.0'	9.3	09:34	15:43	21:51
NGC474		Galaxy	Psc	01h 20m 07s	+03° 24.9'	11.1	09:46	15:58	22:10
NGC485		Galaxy	Psc	01h 21m 28s	+07° 01.0'	14.0	09:37	15:59	22:22
M103	NGC581	Open	Cas	01h 33m 23s	+60° 39.0'	7.0	Circ	16:11	Circ
NGC598	Pinwheel Galaxy	Galaxy	Tri	01h 33m 51s	+30° 39.6'	5.7	08:31	16:12	23:52
NGC604	III-150	Neb	Tri	01h 34m 33s	+30° 47.0'		08:31	16:12	23:54
M74	The Phantom	Galaxy	Psc	01h 36m 42s	+15° 47.0'	9.8	09:26	16:14	23:03
M76	Little Dumbbell Nebula	P Neb	Per	01h 42m 18s	+51° 34.2'	12.0	06:06	16:20	02:34
NGC651	Apple Core Nebula	P Neb	Per	01h 42m 21s	+51° 34.1'	12.2	06:06	16:20	02:34
NGC637		Open	Cas	01h 43m 04s	+64° 02.4'	8.2	Circ	16:21	Circ
NGC654		Open	Cas	01h 44m 00s	+61° 53.0'	6.5	Circ	16:22	Circ
NGC720		Galaxy	Cet	01h 53m 00s	-13° 44.3'	10.2	11:07	16:31	21:54
NGC780		Galaxy	Tri	02h 00m 35s	+28° 13.5'	14.0	09:07	16:38	00:09
NGC784		Galaxy	Tri	02h 01m 17s	+28° 50.2'	11.8	09:06	16:39	00:12
NGC821		Galaxy	Ari	02h 08m 21s	+10° 59.6'	10.8	10:12	16:46	23:20
Baily191	NGC884	Open	Per	02h 22m 18s	+57° 08.1'	4.0	Circ	17:00	Circ
IC1795		Neb	Cas	02h 26m 32s	+62° 02.4'		Circ	17:04	Circ
NGC936		Galaxy	Cet	02h 27m 37s	-01° 09.3'	10.1	11:06	17:05	23:05
NGC943	Arp309	Galaxy	Cet	02h 29m 09s	-10° 49.0'	11.4	11:35	17:07	22:39

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC956		Open	And	02h 32m 30s	+44° 35.6'	9.0	08:12	17:10	02:09
IC1805	Heart Nebula	Open	Cas	02h 32m 47s	+61° 27.6'	6.5	Circ	17:11	Circ
NGC1052		Galaxy	Cet	02h 41m 05s	-08° 15.3'	10.6	11:39	17:19	22:58
M34	Spiral Cluster	Open	Per	02h 42m 05s	+42° 45.6'	6.0	08:35	17:20	02:05
M77	Cetus A	Galaxy	Cet	02h 42m 41s	-00° 00.8'	9.7	11:18	17:20	23:23
NGC1084		Galaxy	Eri	02h 46m 00s	-07° 34.6'	10.6	11:42	17:24	23:05
IC1848	Soul Nebula	Open	Cas	02h 51m 18s	+60° 24.4'	6.5	Circ	17:29	Circ
NGC1156		Galaxy	Ari	02h 59m 42s	+25° 14.2'	11.7	10:18	17:37	00:57
NGC1201		Galaxy	For	03h 04m 08s	-26° 04.1'	10.6	12:58	17:42	22:26
NGC1175		Galaxy	Per	03h 04m 32s	+42° 20.3'	12.8	09:00	17:42	02:24
HR963	Fornacis	Dbl	For	03h 12m 04s	-28° 59.2'	3.9	13:17	17:50	22:23
NGC1316	Fornax A	Galaxy	For	03h 22m 42s	-37° 12.4'	8.9	14:04	18:00	21:57
Barnard202	B202	DkNeb	Ari	03h 25m 38s	+30° 16.0'		10:24	18:03	01:43
Barnard204	B204	DkNeb	Ari	03h 28m 29s	+30° 11.0'		10:27	18:06	01:45
NGC1350		Galaxy	For	03h 31m 08s	-33° 37.7'	10.5	13:55	18:09	22:22
Barnard1		DkNeb	Per	03h 32m 57s	+31° 09.0'		10:28	18:11	01:54
Barnard2		DkNeb	Per	03h 33m 31s	+32° 19.0'		10:23	18:11	01:59
Barnard3		DkNeb	Per	03h 40m 01s	+31° 58.0'		10:31	18:18	02:04
NGC1407		Galaxy	Eri	03h 40m 12s	-18° 34.8'	9.8	13:09	18:18	23:27
IC347		Galaxy	Eri	03h 42m 32s	-04° 17.9'	13.0	12:29	18:20	00:11
NGC1448		Galaxy	Hor	03h 44m 32s	-44° 38.6'	11.0	15:10	18:22	21:34
IC348		Open	Per	03h 44m 34s	+32° 09.7'	7.3	10:35	18:22	02:10
M45	Pleiades	Open	Tau	03h 47m 30s	+24° 07.0'	1.6	11:10	18:25	01:41
Barnard5	B5	DkNeb	Per	03h 47m 53s	+32° 53.0'		10:35	18:26	02:16
NGC1461		Galaxy	Eri	03h 48m 27s	-16° 23.5'	11.7	13:10	18:26	23:42
IC353		Neb	Tau	03h 53m 00s	+25° 48.0'		11:09	18:31	01:53
IC2003		P Neb	Per	03h 56m 22s	+33° 52.5'	13.0	10:39	18:34	02:29
NGC1499	California Nebula	Neb	Per	04h 03m 14s	+36° 22.0'		10:34	18:41	02:48
NGC1515		Galaxy	Dor	04h 04m 03s	-54° 06.0'	11.0	17:22	18:42	20:02
NGC1496		Open	Per	04h 04m 32s	+52° 39.7'	10.0	08:08	18:42	05:17
NGC1502		Open	Cam	04h 07m 50s	+62° 19.8'	5.7	Circ	18:46	Circ
IC360		Neb	Tau	04h 09m 00s	+26° 06.0'		11:24	18:47	02:10
NGC1514	Crystal Ball Nebula	P Neb	Tau	04h 09m 17s	+30° 46.5'	10.0	11:06	18:47	02:28
NGC1513		Open	Per	04h 09m 57s	+49° 30.8'	8.4	09:02	18:48	04:33
IC359		Neb	Tau	04h 12m 28s	+27° 42.1'		11:21	18:50	02:19
NGC1535		P Neb	Eri	04h 14m 16s	-12° 44.3'	10.0	13:25	18:52	00:19
Barnard10	B10	DkNeb	Tau	04h 18m 41s	+28° 16.0'		11:25	18:56	02:28
NGC1545		Open	Per	04h 20m 57s	+50° 15.2'	6.2	09:04	18:59	04:54

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC1569		Galaxy	Cam	04h 30m 49s	+64° 50.8'	11.2	Circ	19:09	Circ
Barnard18	B18	DkNeb	Tau	04h 31m 13s	+24° 21.0'		11:52	19:09	02:25
NGC1582		Open	Per	04h 31m 53s	+43° 49.0'	7.0	10:17	19:10	04:02
NGC1560		Galaxy	Cam	04h 32m 48s	+71° 52.7'	11.5	Circ	19:11	Circ
Barnard19	B19	DkNeb	Tau	04h 33m 00s	+26° 16.0'		11:47	19:11	02:34
Barnard20	B20	DkNeb	Per	04h 37m 04s	+50° 58.0'		09:10	19:15	05:20
IC2087		Neb	Tau	04h 40m 00s	+25° 44.5'		11:56	19:18	02:39
Barnard23	B23	DkNeb	Tau	04h 40m 33s	+29° 52.0'		11:41	19:18	02:56
NGC1624		Open	Per	04h 40m 36s	+50° 27.6'	10.4	09:21	19:18	05:16
NGC1640		Galaxy	Eri	04h 42m 14s	-20° 26.0'	11.7	14:17	19:20	00:23
NGC1647		Open	Tau	04h 45m 55s	+19° 06.8'	6.4	12:25	19:24	02:22
IC2118	Witch Head Nebula	Neb	Eri	05h 04m 54s	-07° 15.0'		14:00	19:43	01:25
NGC1851	C73	Globular	Col	05h 14m 06s	-40° 03.0'	7.3	16:10	19:52	23:33
IC405	Flaming Star Nebula	Neb	Aur	05h 16m 29s	+34° 21.3'		11:57	19:54	03:52
M79	NGC1904	Globular	Lep	05h 24m 11s	-24° 31.4'	8.5	15:13	20:02	00:51
M38	Starfish Cluster	Open	Aur	05h 28m 40s	+35° 50.8'	7.0	12:02	20:06	04:11
M1	Crab Nebula	SNR	Tau	05h 34m 32s	+22° 00.8'	8.4	13:04	20:12	03:21
M42	Great Orion Nebula	Open+D Neb	Ori	05h 35m 16s	-05° 23.4'	4.0	14:25	20:13	02:01
M43	De Mairan's Nebula	D Neb	Ori	05h 35m 31s	-05° 16.0'	9.0	14:25	20:13	02:01
M36	Pinwheel Cluster	Open	Aur	05h 36m 18s	+34° 08.3'	6.5	12:18	20:14	04:10
M78	NGC2068	D Neb	Ori	05h 46m 45s	+00° 04.8'	8.0	14:21	20:24	02:27
M37	Salt-and-pepper Cluster	Open	Aur	05h 52m 18s	+32° 33.2'	6.0	12:41	20:30	04:19
M35	NGC2168	Open	Gem	06h 09m 00s	+24° 21.0'	5.5	13:30	20:47	04:03
M41	Little Beehive	Open	CMa	06h 46m 01s	-20° 45.3'	5.0	16:22	21:24	02:26
M50	Heart-shaped Cluster	Open	Mon	07h 02m 42s	-08° 23.0'	7.0	16:01	21:40	03:20
M47	NGC2422	Open	Pup	07h 36m 35s	-14° 29.0'	4.5	16:53	22:14	03:36
M46	NGC2437	Open	Pup	07h 41m 46s	-14° 48.6'	6.5	16:59	22:19	03:40
M93	NGC2447	Open	Pup	07h 44m 30s	-23° 51.4'	6.5	17:31	22:22	03:14
M48	NGC2548	Open	Hya	08h 13m 43s	-05° 45.0'	5.5	17:05	22:51	04:38
M44	Beehive Cluster	Open	Cnc	08h 40m 24s	+19° 40.0'	4.0	16:18	23:18	06:19
M67	King Cobra	Open	Cnc	08h 51m 18s	+11° 48.0'	7.5	16:53	23:29	06:05
M81	Bode's Galaxy	Galaxy	UMa	09h 55m 33s	+69° 03.9'	7.8	Circ	00:33	Circ
M82	Cigar Galaxy	Galaxy	UMa	09h 55m 53s	+69° 40.8'	9.2	Circ	00:34	Circ
M95	NGC3351	Galaxy	Leo	10h 43m 58s	+11° 42.2'	10.6	18:46	01:22	07:58
M96	NGC3368	Galaxy	Leo	10h 46m 46s	+11° 49.2'	10.1	18:48	01:24	08:01
M105	NGC3379	Galaxy	Leo	10h 47m 50s	+12° 34.9'	10.5	18:47	01:26	08:04
M108	NGC3556	Galaxy	UMa	11h 11m 31s	+55° 40.4'	10.6	Circ	01:49	Circ
M97	Owl Nebula	P Neb	UMa	11h 14m 48s	+55° 01.1'	12.0	Circ	01:53	Circ
M65	Leo Triplet	Galaxy	Leo	11h 18m 56s	+13° 05.5'	10.1	19:17	01:57	08:37

ID	Common Name	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M66	Leo Triplet	Galaxy	Leo	11h 20m 15s	+12° 59.4'	9.7	19:18	01:58	08:38
M109	NGC3992	Galaxy	UMa	11h 57m 36s	+53° 22.4'	10.6	15:44	02:35	13:27
M98	NGC4192	Galaxy	Com	12h 13m 48s	+14° 54.0'	10.9	20:06	02:52	09:37
M99	Virgo Cluster	Galaxy	Com	12h 18m 50s	+14° 25.0'	10.4	20:12	02:57	09:41
M106	NGC4258	Galaxy	CVn	12h 18m 58s	+47° 18.2'	9.1	17:35	02:57	12:19
M61	Swelling Spiral	Galaxy	Vir	12h 21m 55s	+04° 28.3'	10.1	20:44	03:00	09:15
M40	Winnecke 4	Dbl+Asterism	UMa	12h 22m 12s	+58° 05.0'	8.7	Circ	03:00	Circ
M100	Mirror of M99	Galaxy	Com	12h 22m 55s	+15° 49.3'	10.1	20:12	03:01	09:49
M84	NGC4374	Galaxy	Vir	12h 25m 04s	+12° 53.2'	10.2	20:23	03:03	09:42
M85	NGC4382	Galaxy	Com	12h 25m 24s	+18° 11.4'	10.0	20:07	03:03	09:59
M86	NGC4406	Galaxy	Vir	12h 26m 12s	+12° 56.7'	9.9	20:24	03:04	09:44
M49	NGC4472	Galaxy	Vir	12h 29m 47s	+08° 00.0'	9.3	20:42	03:08	09:33
M87	Smoking Gun	Galaxy	Vir	12h 30m 49s	+12° 23.4'	9.6	20:31	03:09	09:47
M88	NGC4501	Galaxy	Com	12h 31m 59s	+14° 25.2'	10.2	20:26	03:10	09:54
M91	Missing Messier Object	Galaxy	Com	12h 35m 27s	+14° 29.7'	10.9	20:29	03:13	09:57
M89	NGC4552	Galaxy	Vir	12h 35m 40s	+12° 33.3'	10.9	20:35	03:13	09:52
M90	NGC4569	Galaxy	Vir	12h 36m 50s	+13° 09.7'	10.2	20:34	03:15	09:55
M58	NGC4579	Galaxy	Vir	12h 37m 44s	+11° 49.1'	10.4	20:39	03:15	09:52
M68	NGC4590	Globular	Hya	12h 39m 28s	-26° 44.5'	9.0	22:36	03:17	07:58
M104	Sombrero Galaxy	Galaxy	Vir	12h 39m 59s	-11° 37.3'	9.2	21:48	03:18	08:48
M59	NGC4621	Galaxy	Vir	12h 42m 02s	+11° 38.7'	10.7	20:44	03:20	09:56
M60	NGC4649	Galaxy	Vir	12h 43m 40s	+11° 33.1'	9.8	20:46	03:21	09:57
M94	Croc's Eye Galaxy	Galaxy	CVn	12h 50m 53s	+41° 07.1'	8.9	18:55	03:29	12:03
M64	Black Eye Galaxy	Galaxy	Com	12h 56m 44s	+21° 41.0'	9.3	20:27	03:34	10:42
M53	NGC5024	Globular	Com	13h 12m 55s	+18° 10.1'	8.5	20:55	03:51	10:46
M63	Sunflower Galaxy	Galaxy	CVn	13h 15m 49s	+42° 01.7'	9.3	19:14	03:54	12:34
M51	Whirlpool Galaxy, Question Mark Galaxy	Galaxy	CVn	13h 29m 52s	+47° 11.7'	8.9	18:47	04:08	13:28
M83	Southern Pinwheel Galaxy	Galaxy	Hya	13h 37m 00s	-29° 51.8'	8.0	23:45	04:15	08:44

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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