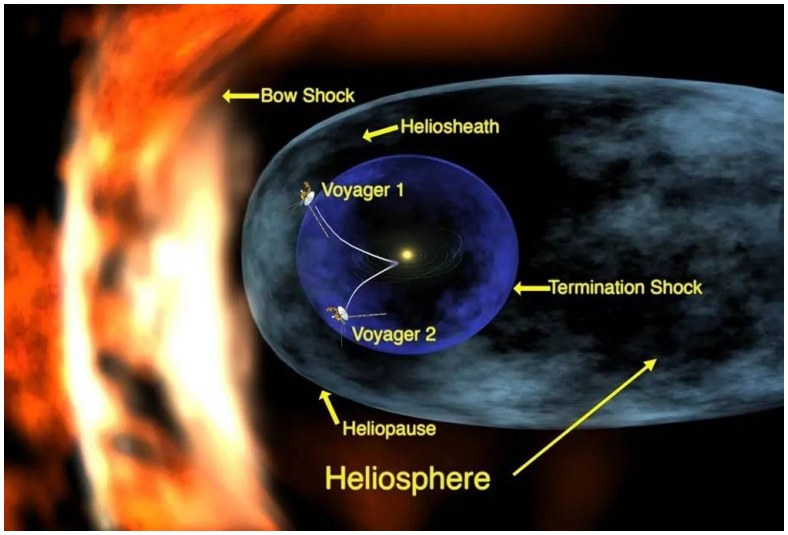
Skywatchers

Newsletter of the China Lake Astronomical Society

DEC 01, 2025 CLAS MEETING 7:30

This Month Issue



Maturango Museum

Meetings and programs are open to the public, and are held at Maturango Museum on

Monday, December 1, 2025 7:00 PM

December Meeting & Program

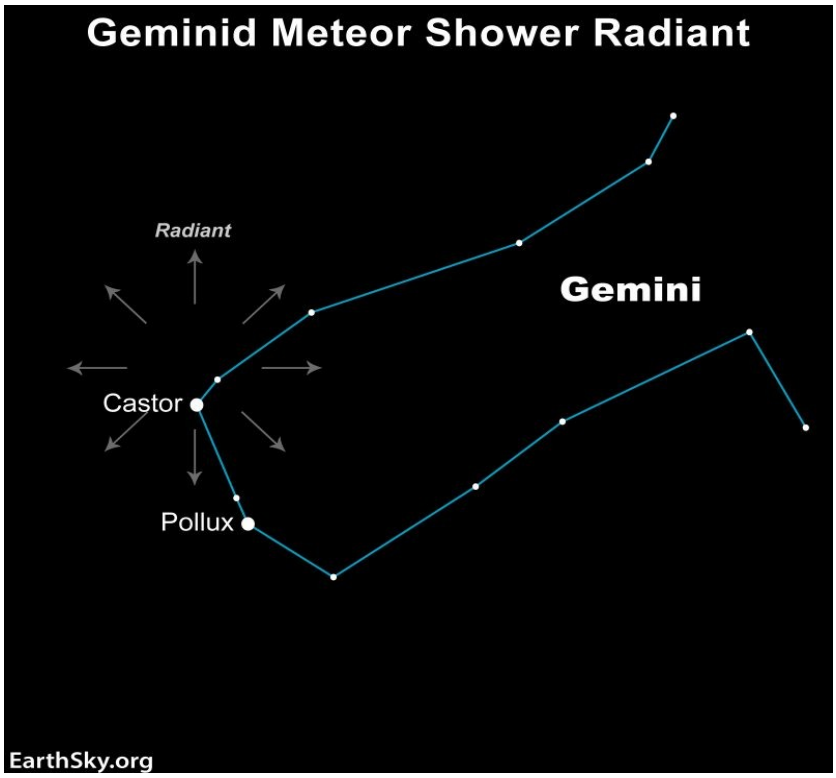
Refreshments: 7:00 PM Announcements : 7:30 Program: 7:45

Program

Gina Bugher

The Heliosphere, our Solar System's Atmosphere

Learn how Voyagers 1 and 2 have discovered that our own sun's Solar Wind pushes out against the Local Interstellar Medium and protects us from dangerous Interstellar Radiation.



Watch the Geminid meteor shower around the night of December 13, 2025. The meteors radiate from near the bright star Castor in the constellation Gemini the Twins, in the east on December evenings, highest around 2 a.m. your local time (time on your clock for all parts of the globe). In 2025, the bright planet Jupiter will be nearby Gemini as well.

Source: Geminid meteor shower peaks in dark skies December 13-14

Geminid meteor shower parent comet

From the late, great Don Machholz *(1952-2022), who discovered 12 comets* ...An asteroid known as 3200 Phaethon is responsible for the Geminid meteor shower. This origin differs from most meteor showers, which result from comets, not asteroids. What's the difference between a comet and an asteroid? A comet is a dirty snowball, with a solid nucleus covered by a layer of ice which sublimates (turns from a solid to a gas) as the comet nears the sun. Comets are typically lightweight, with a density slightly heavier than water. They revolve around the sun in elongated orbits, going close to the sun, then going far from the sun. Seen through a telescope, a comet will show a coma, or head of the comet, as a nebulous patch of light around the nucleus, when it gets close to the sun. But when seen far from the sun, most comets appear star-like, because you see only the nucleus . An asteroid is a rock. Typically, an asteroid's orbit is more circular than that of a comet. Through a telescope an asteroid appears star-like. These definitions worked well until a few decades ago. Larger telescopes began discovering asteroids far from the sun, and some of these objects, as they approached the sun, grew comas and tails, requiring the change of designation from asteroid to comet. For example, an odd object named Chiron, considered an asteroid when discovered in 1977, was reclassified as a comet in 1989 when it showed a coma. It orbits the sun every 50 years and travels from just inside the orbit of Saturn to the orbit of Uranus. So an object initially considered an asteroid can be reclassified as a comet. Then, can the opposite occur? Can a comet be reclassified as an asteroid? Yes, it can. It is possible that a comet can shut down when its volatile materials become trapped beneath the nucleus' surface. This is known as a dormant comet. When the comet loses all of its volatile materials, it is known as an extinct comet. The asteroid 3200 Phaethon seems to be an example of either a dormant or an extinct comet.

2025 Major Meteor Showers (Class I)

Shower	Activity Period	Maximum		Radiant		Velocity	r	Max.	Time	Moon
		Date	S. L.	R.A.	Dec.	km/s		ZHR		
Quadrantids (QUA)	Dec 26-Jan 16	Jan 03	283.25°	15:20	+49.7°	40.4	2.1	120	0500	05
Lyrids (LYR)	Apr 17-Apr 26	Apr 22	032.3°	18:08	+33.3°	46.6	2.1	18	0400	24
eta Aquarids (ETA)	Apr 15-May 27	May 04	044.3°	22:28	-01.4°	65.4	2.4	60	0400	07
Southern delta Aquarids (SDA)	Jul 19-Aug 13	Jul 30	126.9°	22:40	-16.4°	40.4	3.2	25	0300	06
Perseids (PER)	Jul 17-Aug 29	Aug 13	140.5°	03:17	+58.1°	58.8	2.6	100	0400	19
Orionids (ORI)	Oct 02-Nov 12	Oct 23	209.5°	06:25	+15.8°	65.5	2.5	20	0500	02
Leonids (LEO)	Oct 28-Dec 07	Nov 17	235.4°	10:16	+21.8°	69.7	2.5	15	0500	27
Geminids (GEM)	Dec 01-Dec 21	Dec 13	261.85°	07:33	+32.4°	33.8	2.6	120	0100	24
Ursids (URS)	Dec 13-Dec 24	Dec 22	270°65	14:38	+75.3°	33.1	3.0	10	0500	02

Brown Road Star Party Location

Dark Sky star parties are held on BLM land off Brown Road (Old Hwy 395) south of Ridgecrest.

The dirt road should not be a problem for cars.

From the intersection of China Lake Blvd and Hwy 395, cross 395 to Brown Rd and continue 2.3 mi.

Look for an orange cone and turn here to the left.

Follow this dirt road 0.4 mi. to the star party location.

NOTE: After dark, please **avoid using car bright headlights.**
At the location, use a red flashlight or other dim light pointed down.

China Lake Astronomical Society
Membership or Renewal 2025

Name:_____

Address:_____

City, State, Zip:_____

Phone:_____Email:_____

Yearly Membership $ 25 (*due in January*) Family $ 40 Youth 18 & under $ 10.
Checks or Money Orders accepted _____

Contact Roger Brower 760-446-0454 (email brower@iwvisp.com)
Make Checks or Money Orders Payable to China Lake Astronomical Society.(CLAS)

Roger Brower, Treasurer
China Lake Astronomical Society
P.O. Box 1783
Ridgecrest, CA 93556.

Monday, January 5, 2026 7:00 PM

January Meeting at Members Photo Program

Refreshments: 7:00 PM Announcements : 7:30 Program: 7:45

Program

CLAS Members

Annual Members Photography Program

Come see a program of astrophotography from members of CLAS from the past year. Our stable of skilled photographers is growing every year and you can see some wonderful images of the night sky.

Evans

CHINA LAKE ASTRONOMICAL SOCIETY

SKYWATCHER'S NEWSLETTER

DECEMBER 2, 1965

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December Meeting

The next meeting will be at 7:30 p.m. Monday evening December 6, 1965 at the Society clubhouse at 401-A McIntire. The meeting will feature a tape recording made last August at the Western Amateur Astronomers convention at the Atmospherium-Planetarium in Reno. The tape comes to us through the courtesy of Mr. O. Richard Norton, Director of the Fleischman Atmospherium-Planetarium at the University of Nevada. The recording is of the banquet speech by this year's G. Bruce Blair medal winner, Dr. Clyde W. Tombaugh. Dr. Tombaugh spoke about his search for the planet Pluto, and of the chance for additional solar planets. The talk was enjoyed by those who heard it in Reno; you will enjoy it also.

The meeting will also serve as the Annual Meeting as required by our constitution for the election of officers for 1966.

Griffith Planetarium

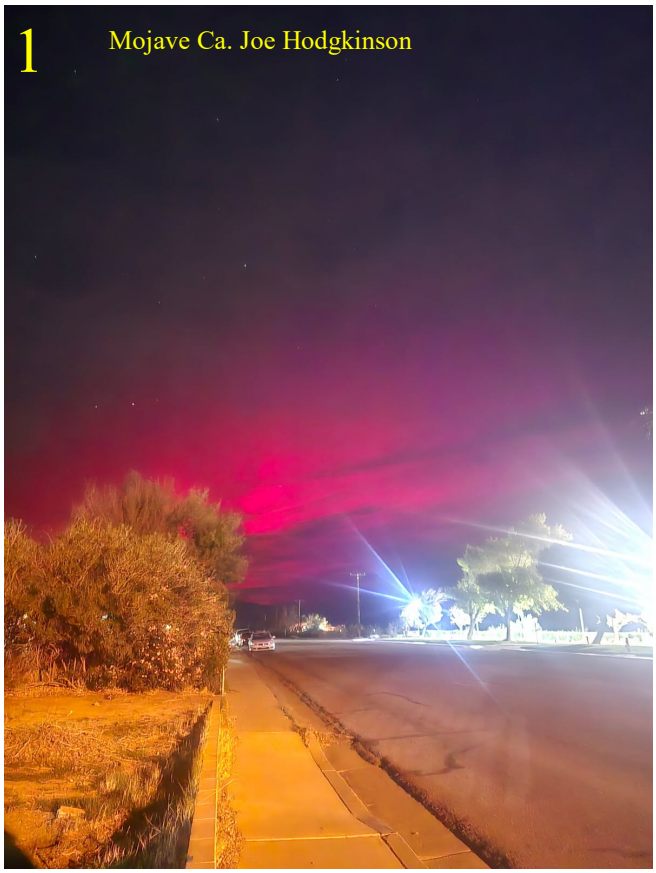
Should anyone wish to rest his weary feet after Christmas Shopping in Los Angeles, he might do so at the planetarium show THE PLANETS ON PARADE, until December 12. December 14 to January 2 is the annual presentation of THE CHRISTMAS STAR. Saturday and Sunday shows are at 1:30, 4:30, and 8:30 p.m.

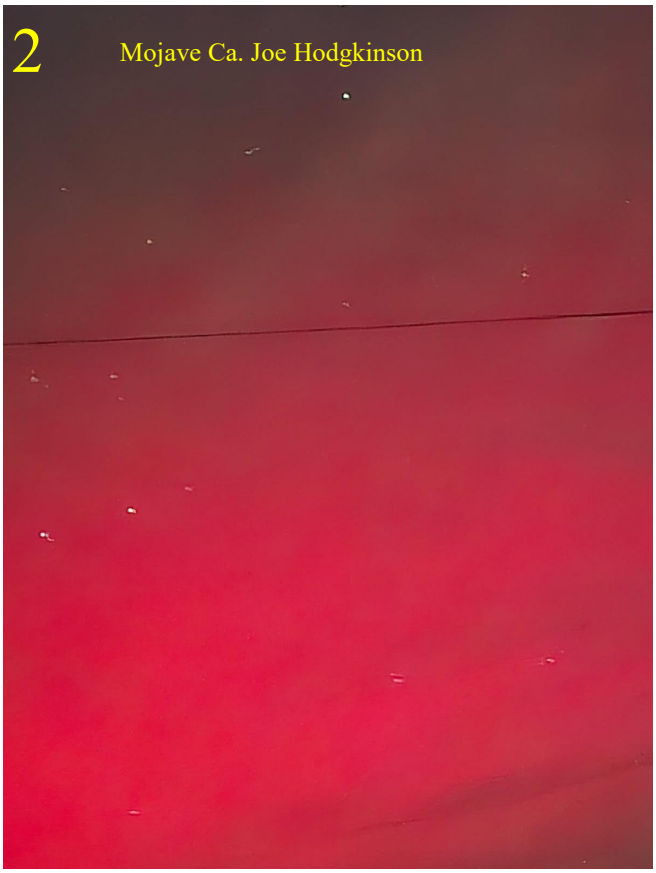
It's that time of year again

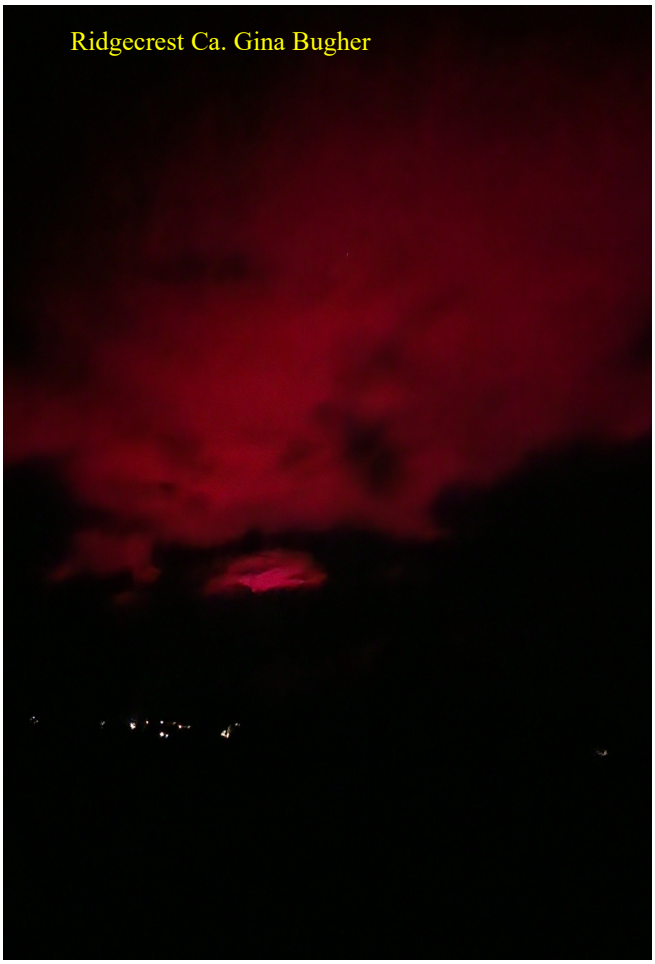
We have received order blanks for two similar annual publications. One is the 1966 Observer's Handbook, published by the Royal Astronomical Society of Canada. The other is the 1966 Celestial Calendar and Handbook, published by C. F. Johnson, Jr. of Watertown, Conn. Each costs $1.00. There is considerably more information in the Observer's Handbook, probably more than most members need. The Calendar is plastic bound for easy reference, and is in convenient calendar format, with enough space to make your own notes. We will take orders at the meeting; if you can't make the meeting, contact Jim McMahon soon.

Reminder

Many memberships expire in December. Please see Jim McMahon, the CLAS Treasurer, to pay your dues.







The upcoming CLAS meeting on Jan 05th will be devoted for members photos.

Recently an incredible Auroral display was created by a CME ejected from our Sun. Many 1000's of pictures were taken across the U.S. For those members who happened to get some images please submit them to the newsletter editor or bring them to the Jan 05 meeting.

The Evening Sky Map

FREE* EACH MONTH FOR YOU TO EXPLORE, LEARN & ENJOY THE NIGHT SKY

WWW.SKYMAPS.COM

NORTHERN HEMISPHERE
DECEMBER 2025

Sky Calendar – December 2025

Follow us on Bluesky
skymaps.com/bsky/

4 **Moon, Uranus and the Pleiades** within 5.0° circle at 1h UT (evening sky). Mag. 5.6. Near Full Moon.

4 **Moon near the Pleiades** at 4h UT (evening sky).

4 **Moon at perigee** (closest to Earth) at 11:11 UT (distance 356,963km; angular size 33.5').

4 **Full Moon** at 23:14 UT. Supermoon.

7 **Moon near Jupiter** at 18h UT (morning sky). Mag. −2.6.

7 **Mercury at westernmost elongation** at 21h UT (21° from Sun, morning sky). Mag. −0.4.

10 **Moon near Regulus** at 9h UT (morning sky).

11 **Last Quarter Moon** at 20:52 UT.

14 **Geminid Meteor Shower** peaks in a broad maximum centred at 8h UT over 10–12 hours. Active December 4–17. Produces bright, medium-speed meteors (100+ meteors/hour) at its peak. The best and most reliable of the major annual showers.

14 **Moon near Spica** at 17h UT (morning sky).

17 **Moon at apogee** (farthest from Earth) at 6h UT (distance 406,322km; angular size 29.4').

18 **Moon near Mercury** at 11h UT (18° from Sun, morning sky). Mag. −0.5.

18 **Moon near Antares** at 14h UT (17° from Sun, morning sky).

19 **Mercury 5.5° NNE of Antares** at 21h UT (18° from Sun, morning sky). Mags. −0.5 and 1.0.

20 **New Moon** at 1:43 UT. Start of lunation 1274.

21 **December solstice** at 15:01 UT. The time when the Sun reaches the point farthest south of the celestial equator marking the start of winter in the Northern Hemisphere and summer in the Southern Hemisphere.

27 **Moon near Saturn** at 1h UT (evening sky). Mag. 1.2.

27 **First Quarter Moon** at 19:10 UT.

31 **Moon, Uranus and the Pleiades** within 5.2° circle at 11h UT (evening sky). Mag. 5.6.

More sky events and links at http://Skymaps.com/skycalendar/

All times in Universal Time (UT). (USA Eastern Standard Time = UT − 5 hours.)

SKY MAP SHOWS HOW THE NIGHT SKY LOOKS
EARLY DEC 8 PM
LATE DEC 7 PM

SKY MAP DRAWN FOR A LATITUDE OF 40° NORTH AND IS SUITABLE FOR LATITUDES UP TO 15° NORTH OR SOUTH OF THIS

NORTH · NE · EAST · SE · SOUTH · SW · WEST · NW

Jupiter · Saturn · Great Square of Pegasus · Ecliptic

Symbols
Galaxy
Double Star
Variable Star
Diffuse Nebula
Planetary Nebula
Open Star Cluster
Globular Star Cluster

Star Magnitudes -1 0 1 2 3 4

INSTRUCTIONS: THE SKY MAP SHOWS THE ENTIRE NAKED-EYE SKY FROM HORIZON-TO-HORIZON AS IT APPEARS ON CERTAIN DATES AND TIMES. THE CENTER OF THE MAP IS THE PART OF THE SKY DIRECTLY OVERHEAD (ZENITH). TO USE THE MAP, HOLD IT OVERHEAD AND TURN IT SO THAT THE DIRECTION YOU FACE BEGIN BY USING THE SKY MAP TO FIND A BRIGHT STAR PATTERN IN THE SKY.

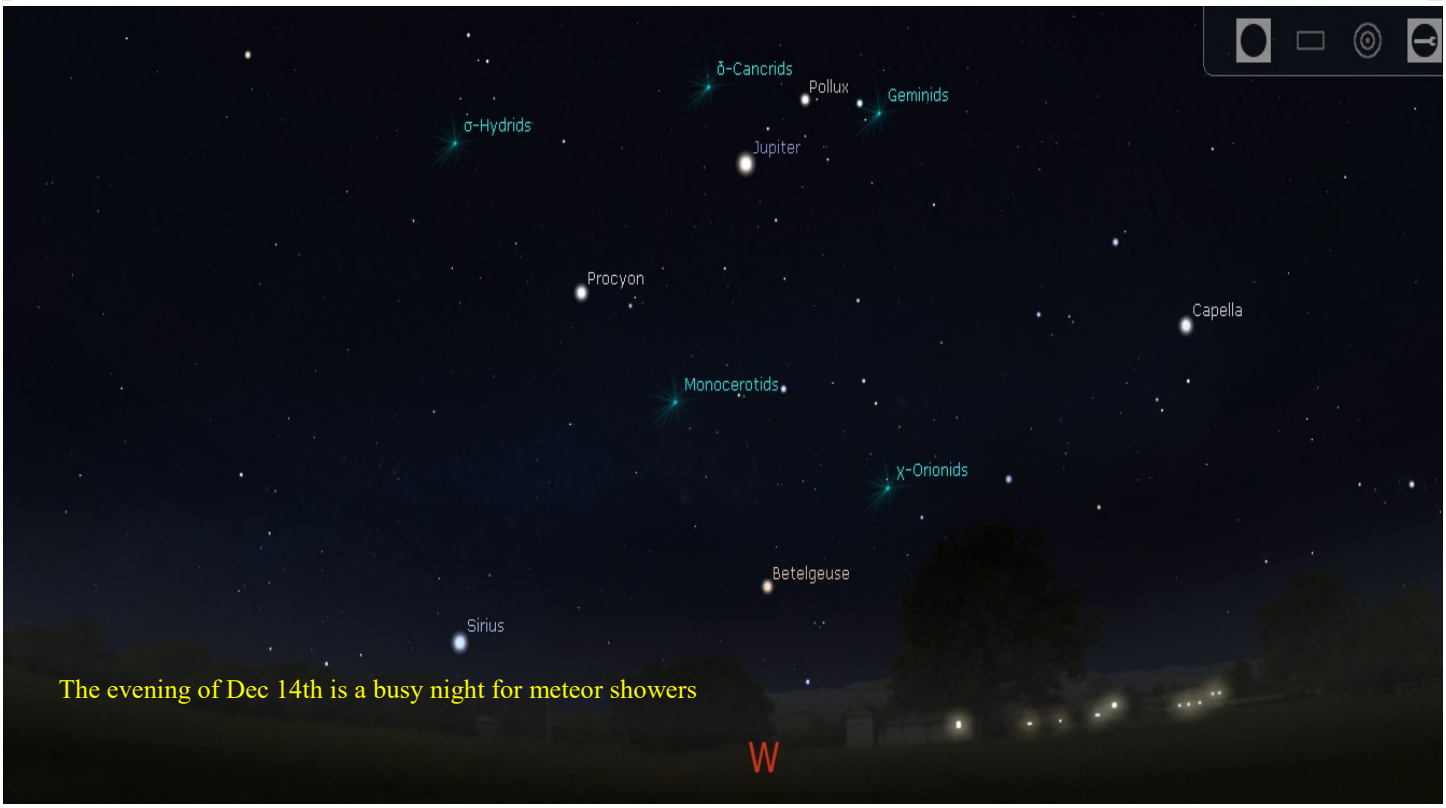
Skymaps.com

Support The Evening Sky Map

• Helping curious minds to explore the night sky since January 2000 •

Recommended Products for Sky Watchers: skymaps.com/store/

All sales support the production of this free resource. Thank you.



About the Celestial Objects

Listed on this page are several of the brighter, more interesting celestial objects visible in the evening sky this month (refer to the monthly sky map). The objects are grouped into three categories. Those that can be easily seen with the naked eye (that is, without optical aid), those easily seen with binoculars, and those requiring a telescope to be appreciated. **Note, all of the objects (except single stars) will appear more impressive when viewed through a telescope or very large binoculars.** They are grouped in this way to highlight objects that can be seen using the optical equipment that may be available to the star gazer.

Tips for Observing the Night Sky

When observing the night sky, and in particular deep-sky objects such as star clusters, nebulae, and galaxies, it's always best to observe from a dark location. Avoid direct light from street lights and other sources. If possible observe from a dark location away from the light pollution that surrounds many of today's large cities.

You will see more stars after your eyes adapt to the darkness—usually about 10 to 20 minutes after you go outside. Also, if you need to use a torch to view the sky map, cover the light bulb with red cellophane. This will preserve your dark vision.

Finally, even though the Moon is one of the most stunning objects to view through a telescope, its light is so bright that it brightens the sky and makes many of the fainter objects very difficult to see. So try to observe the evening sky on moonless nights around either New Moon or Last Quarter.

Astronomical Glossary

Conjunction – An alignment of two celestial bodies such that they present the least angular separation as viewed from Earth.

Constellation – A defined area of the sky containing a star pattern.

Diffuse Nebula – A cloud of gas illuminated by nearby stars.

Double Star – Two stars that appear close to each other in the sky; either linked by gravity so that they orbit each other (binary star) or lying at different distances from Earth (optical double). Apparent separation of stars is given in seconds of arc (").

Ecliptic – The path of the Sun's center on the celestial sphere as seen from Earth.

Elongation – The angular separation of two celestial bodies. For Mercury and Venus the greatest elongation occurs when they are at their most angular distance from the Sun as viewed from Earth.

Galaxy – A mass of up to several billion stars held together by gravity.

Globular Star Cluster – A ball-shaped group of several thousand old stars.

Light Year (ly) – The distance a beam of light travels at 300,000 km/sec in one year.

Magnitude – The brightness of a celestial object as it appears in the sky.

Open Star Cluster – A group of tens or hundreds of relatively young stars.

Opposition – When a celestial body is opposite the Sun in the sky.

Planetary Nebula – The remnants of a shell of gas blown off by a star.

Universal Time (UT) – A time system used by astronomers. Also known as Greenwich Mean Time. USA Eastern Standard Time (for example, New York) is 5 hours behind UT.

Variable Star – A star that changes brightness over a period of time.

CELESTIAL OBJECTS

NORTHERN HEMISPHERE
DECEMBER 2025

Skymaps.com

Easily Seen with the Naked Eye

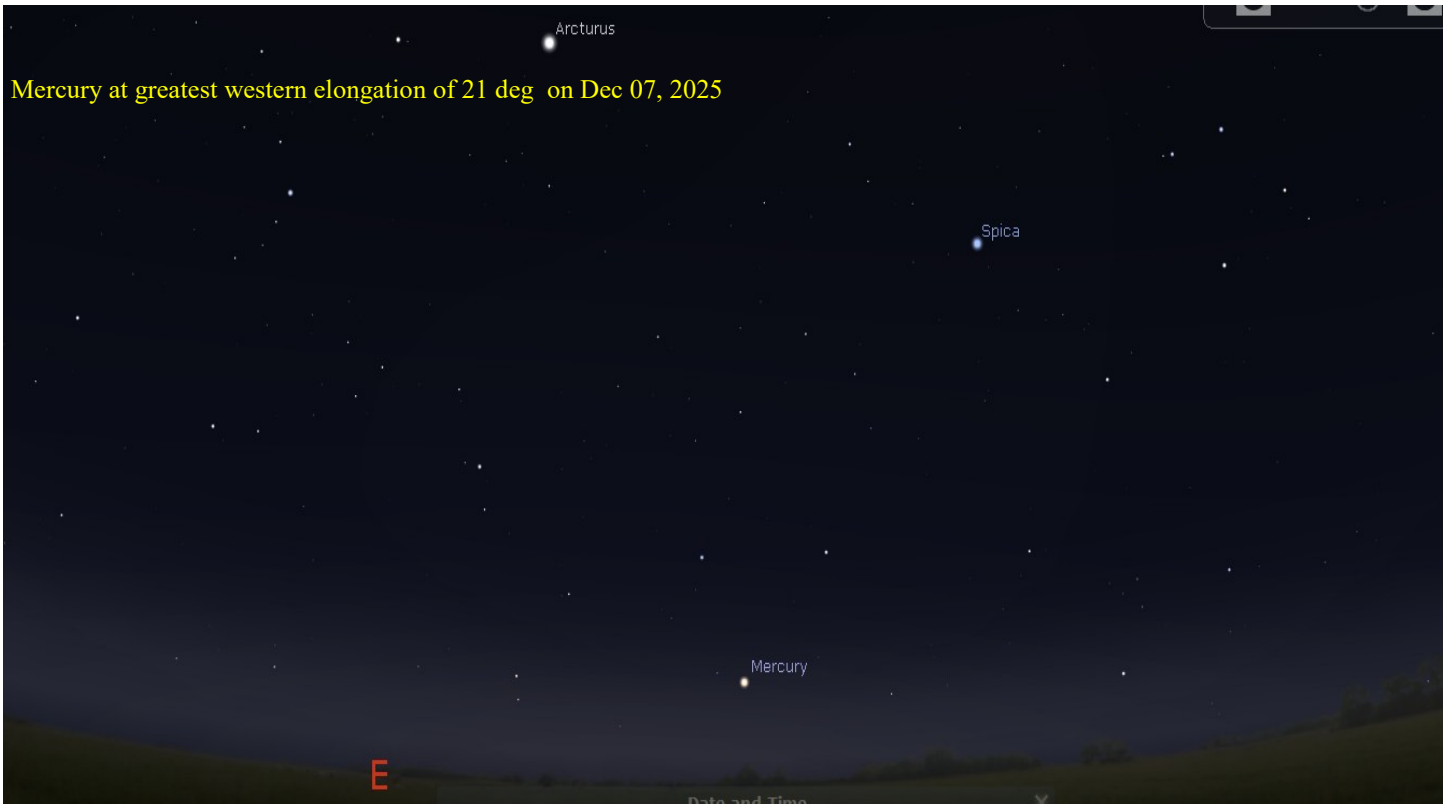
Altair	Aql	★	Brightest star in Aquila. Name means "the flying eagle". Dist=16.7 ly.
Capella	Aur	★	The 6th brightest star. Appears yellowish in color. Spectroscopic binary. Dist=42 ly.
δ Cephei	Cep	◔	Cepheid prototype. Mag varies between 3.5 & 4.4 over 5.366 days. Mag 6 companion.
Deneb	Cyg	★	Brightest star in Cygnus. One of the greatest known supergiants. Dist=1,400±200 ly.
Castor	Gem	★	Multiple star system with 6 components. 3 stars visible in telescope. Dist=52 ly.
Pollux	Gem	★	With Castor, the twin sons of Leda in classical mythology. Dist=34 ly.
Vega	Lyr	★	The 5th brightest star in the sky. A blue-white star. Dist=25.0 ly.
Rigel	Ori	★	The brightest star in Orion. Blue supergiant star with mag 7 companion. Dist=770 ly.
Betelgeuse	Ori	★	One of the largest red supergiant stars known. Diameter=300 times that of Sun. Dist=430 ly.
Algol	Per	◔	Famous eclipsing binary star. Magnitude varies between 2.1 & 3.4 over 2.867 days.
Fomalhaut	PsA	★	Brightest star in Piscis Austrinus. In Arabic the "fish's mouth". Dist=25 ly.
Pleiades	Tau	◌	The Seven Sisters. Spectacular cluster. Many more stars visible in binoculars. Dist=399 ly.
Hyades	Tau	◌	Large V-shaped star cluster. Binoculars reveal many more stars. Dist=152 ly.
Aldebaran	Tau	★	Brightest star in Taurus. It is not associated with the Hyades star cluster. Dist=65 ly.
Polaris	UMi	★	The North Pole Star. A telescope reveals an unrelated mag 8 companion star. Dist=433 ly.

Easily Seen with Binoculars

M31	And	⌀	The Andromeda Galaxy. Most distant object visible to naked eye. Dist=2.5 million ly.
M2	Aqr	◍	Resembles a fuzzy star in binoculars.
η Aquilae	Aql	◔	Bright Cepheid variable. Mag varies between 3.6 & 4.5 over 7.166 days. Dist=1,200 ly.
M38	Aur	◌	Stars appear arranged in "pi" or cross shape. Dist=4,300 ly.
M36	Aur	◌	About half size of M38. Located in rich Milky Way star field. Dist=4,100 ly.
M37	Aur	◌	Very fine star cluster. Discovered by Messier in 1764. Dist=4,400 ly.
μ Cephei	Cep	★	Herschel's Garnet Star. One of the reddest stars. Mag 3.4 to 5.1 over 730 days.
Mira	Cet	◔	Famous long period variable star. Mag varies between 3.0 & 10.1 over 332 days.
χ Cygni	Cyg	◔	Long period pulsating red giant. Magnitude varies between 3.3 & 14.2 over 407 days.
M39	Cyg	◌	May be visible to the naked eye under good conditions. Dist=900 ly.
ν Draconis	Dra	★	Wide pair of white stars. One of the finest binocular pairs in the sky. Dist=100 ly.
M35	Gem	◌	Fine open cluster located near foot of the twin Castor. Dist=2,800 ly.
M92	Her	◍	Fainter and smaller than M13. Use a telescope to resolve its stars.
ε Lyrae	Lyr	★	Famous Double Double. Binoculars show a double star. High power reveals each a double.
R Lyrae	Lyr	◔	Semi-regular variable. Magnitude varies between 3.9 & 5.0 over 46.0 days.
Cr 69	Ori	◌	Lambda Orionis Cluster. Dist=1,630 ly.
M42	Ori	◻	The Great Orion Nebula. Spectacular bright nebula. Best in telescope. Dist=1,300 light years.
M15	Peg	◍	Only globular known to contain a planetary nebula (Mag 14, d=1"). Dist=30,000 ly.
Double Cluster	Per	◌	Double Cluster in Perseus. NGC 869 & 884. Excellent in binoculars. Dist=7,300 ly.
253	Scl	⌀	Fine, large, cigar-shaped galaxy. Requires dark sky. Member of Sculptor Group.
Cr 399	Vul	◌	Coathanger asterism or "Brocchi's Cluster". Not a true star cluster. Dist=218 to 1,140 ly.

Telescopic Objects

γ Andromedae	And	★	Attractive double star. Bright orange star with mag 5 blue companion. Sep=9.8".
7009	Aqr	◍	Saturn Nebula. Requires 8-inch telescope to see Saturn-like appendages.
7293	Aqr	◍	Helix Nebula. Spans nearly 1/4 deg. Requires dark sky. Dist=300 ly.
γ Arietis	Ari	★	Impressive looking double blue-white star. Visible in a small telescope. Sep=7.8".
η Cassiopeiae	Cas	★	Yellow star mag 3.4 & orange star mag 7.5. Dist=19 ly. Orbit=480 years. Sep=12".
Albireo	Cyg	★	Beautiful double star. Contrasting colours of orange and blue-green. Sep=34.4".
61 Cygni	Cyg	★	Attractive double star. Mags 5.2 & 6.1 orange dwarfs. Dist=11.4 ly. Sep=28.4".
γ Delphini	Del	★	Appear yellow & white. Mags 4.3 & 5.2. Dist=100 ly. Struve 2725 double in same field.
θ Eridani	Eri	★	Striking blue-white double star. Mags 3.2 & 4.3. Visible in a small telescope. Sep=8.2".
β Lyrae	Lyr	◔	Eclipsing binary. Mag varies between 3.3 & 4.3 over 12.940 days. Fainter mag 7.2 blue star.
M57	Lyr	◍	Ring Nebula. Magnificent object. Smoke-ring shape. Dist=4,100 ly.
ω Orionis	Ori	★	Superb multiple star. 2 mag 7 stars one side, mag 9 star on other. Struve 761 triple in field.
M1	Tau	◻	Crab Nebula. Remnant from supernova which was visible in 1054. Dist=6,500 ly.
M33	Tri	⌀	Fine face-on spiral galaxy. Requires a large aperture telescope. Dist=2.3 million ly.
M81	UMa	⌀	Beautiful spiral galaxy visible with binoculars. Easy to see in a telescope.
M82	UMa	⌀	Close to M81 but much fainter and smaller.
M27	Vul	◍	Dumbbell Nebula. Large, twin-lobed shape. Most spectacular planetary. Dist=975 ly.



Mercury at greatest western elongation of 21 deg on Dec 07, 2025

DECEMBER DAILY CELESTIAL CALENDAR

3 The Moon passes 4 deg north of Uranus, 7 P.M, PST

4 The Moon is at perigee (221,806 miles from Earth), 3:07 A.M. PST

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4 Full Moon occurs at 3:14 P.M. PST

7 The Moon passes 4 deg north of Jupiter 8:00 A.M. PST

7 Mercury is at greatest western elongation (21 deg) 1:00 P.M.PST

7 Asteroid Psyche is at opposition, 6 P.M. PST

9 The Moon passes 0.7deg north of Regulas, 11:00 P.M. PST

10 Neptune is stationary, 4:00 P.M. PST

11 Last Quarter Moon occurs at 0:52 P.M. PST

14 Geminid Meteor Shower peaks

16 Asteroid Juno is in conjunction with the Sun, 10:00 P.M. PST

16 The Moon is at apogee (252,477 miles from Earth), 10:09 P.M. PST

18 The Moon passes 6 deg south of Mercury, 4 A.M. PST

18 The Moon passes 0.4 deg south of Antares, 5 A.M. PST

18 Mercury passes 6 deg north of Antares, 1 P.M. PST

19 New Moon occurs 5:43 P.M. PST

21 Winter Solstice occurs at 7:03 A.M. PST

22 The Moon passes 0.6 deg north of Pluto, 1 P.M. PST

26 The Moon passes 4 deg north of Saturn, 8 P.M. PST

25 The Moon passes 3 deg north of Neptune, 1:00 A.M. PST

27 First Quarter Moon occurs at 11:10 A.M. PST

31 The Moon passes 5 deg north of Uranus, 4 A.M. PST

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2025 & 2026 New Moons

- December 19th, 2025
- January 18th, 2026
- February 17th, 2026
- March 18th, 2026
- April 17th, 2026
- May 16th, 2026
- June 14th, 2026
- July 14th, 2026
- August 12th, 2026
- September 10th, 2026 Nov 08th, 2026
- October 10th, 2026 Dec 08th, 2026

Star Parties for Red Rock Ricardo Station

Brown Road Star Parties

Location of Brown Road Star Parties found on page 8

Maturango Museum

Quarter Moon Star Party at Maturango -

Quarter Moon Star Party

Quarter Moon Star Party at Maturango - Jan 24

Club Information

Monthly Skywatchers Newsletter.

Our newsletter is sent by email once a month to those who have subscribed. You do not have to be a member. Subscribe at a meeting or online at ChinaLakeAstro.org/subscribe

Annual Membership Dues

- Individual $25.00 per year.
- Family $ 40
- Youth 18 & under $10

Officers

PRESIDENT – Ralph Paonessa

VICE-PRESIDENT – Keith Weisz

SECRETARY – Vacant

TREASURER – Roger Brower

NEWSLETTER EDITOR – Ted Hodgkinson ghodkinson@sbcglobal.net

Club Information

Meetings of the China Lake Astronomical Society are held at the Maturango Museum 7:00 P.M. on the first Monday evening of each month, except when the first Monday is a holiday.

WESTERN AMATEUR ASTRONOMERS WEB SITE http://www.waastro.org/