The AstroGuy OBSERVING GUIDE

DECEMBER 2026

A practical field companion for mid-northern observers. All times are Eastern Standard Time (EST, UTC-5).

Best Observing Windows

Deep sky: Favor clear, transparent evenings December 2-15. New Moon is December 8. The clusters and double star may still be spotted in moonlight; save faint nebulosity for darker skies, observing after moonset toward the end of this window.

Planets: Saturn is well placed in the evening sky. Jupiter and Mars are best late at night and before dawn. Venus is brilliant before sunrise; Mercury is very low in the east-southeast during the first week of the month.

Meteors: Watch for Geminids on the night of December 13 into dawn December 14. The crescent Moon sets during the evening. Conditions improve as Gemini climbs; the radiant is highest around 2 a.m.

December 2026 Moon Phase Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 Last Quarter 45.6% illuminated	2 Waning Crescent 35.2% illuminated	3 Waning Crescent 25.6% illuminated	4 Waning Crescent 17.3% illuminated	5 Waning Crescent 10.5% illuminated
6 Waning Crescent 5.3% illuminated	7 Waning Crescent 1.9% illuminated	8 New Moon 0.3% illuminated	9 Waxing Crescent 0.6% illuminated	10 Waxing Crescent 2.7% illuminated	11 Waxing Crescent 6.5% illuminated	12 Waxing Crescent 11.8% illuminated
13 Waxing Crescent 18.6% illuminated	14 Waxing Crescent 26.5% illuminated	15 Waxing Crescent 35.5% illuminated	16 Waxing Crescent 45.2% illuminated	17 First Quarter 55.3% illuminated	18 Waxing Gibbous 65.6% illuminated	19 Waxing Gibbous 75.5% illuminated
20 Waxing Gibbous 84.4% illuminated	21 Waxing Gibbous 91.9% illuminated	22 Waxing Gibbous 97.2% illuminated	23 Full Moon 99.7% illuminated	24 Waning Gibbous 99.3% illuminated	25 Waning Gibbous 95.9% illuminated	26 Waning Gibbous 89.9% illuminated
27 Waning Gibbous 81.8% illuminated	28 Waning Gibbous 72.2% illuminated	29 Waning Gibbous 61.9% illuminated	30 Last Quarter 51.4% illuminated	31 Waning Crescent 41.1% illuminated		

Exact Major Phase Times (EST)	Observing Notes
Last Quarter: Dec 1, 1:09 a.m. New Moon: Dec 8, 7:52 p.m. First Quarter: Dec 17, 12:43 a.m. Full Moon: Dec 23, 8:28 p.m. Last Quarter: Dec 30, 2:00 p.m.	Daily Moon icons and percentages approximate noon EST. All times use EST (UTC-5).

December 2026 Planetary Data

Representative mid-month values for planning. *Saturn diameter is globe only, excluding rings.

Planet	Best visibility	Constellation	Mag.	Diameter (arcsec)	Guide notes
Mercury	Morning twilight	Ophiuchus	-0.7	4.8	First week is best; very low ESE. Clear horizon essential. Difficult thin-Moon pairing Dec 7.
Venus	Morning	Libra	-4.8	31.7	Brilliant SE before dawn. Phase grows from about 28% to 48%; disk shrinks from 39 to 26 arcseconds.
Mars	Late night / morning	Leo	+0.2	8.9	Best high before dawn. Disk grows from about 8 to 10 arcseconds; steady air matters.
Jupiter	Late night / morning	Leo	-2.3	40.9	Cloud belts and four Galilean moons. By late month, highest around 3:30 a.m.
Saturn	Evening	Cetus	+0.7	18.2*	Convenient after dark. Highest around 8 p.m. early in month and before 6 p.m. at month's end.
Uranus	Evening / night	Taurus	+5.6	3.8	Binocular target with a chart. Tiny disk through a telescope; dated positions marked below.
Neptune	Early evening	Pisces	+7.7	2.3	Telescope and chart. Observe before it drops low in the west; Saturn is a wide-field pointer.

Quick Target List

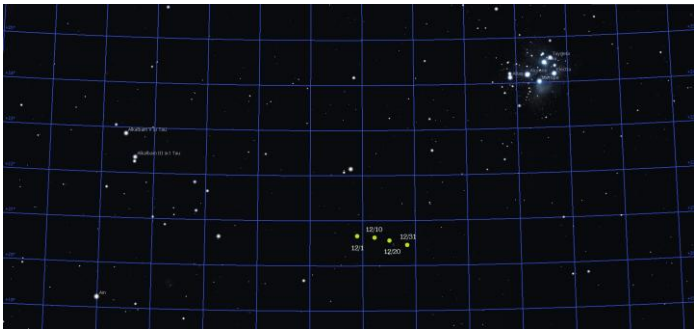
Cassiopeia: the six observing stops in this episode. Paired-cluster data below are for NGC 457 only.

Object	Type	Constellation	Mag.	Size	Distance	Best approach
M52	Open cluster	Cassiopeia	+7.2	13 arcmin	About 5,000 ly	A telescope resolves the cluster
Eta Cas / Achird	Double star	Cassiopeia	+3.5 / +7.4	13 arcsec apart	19.4 ly	Compare colors
NGC 457 + 436	Open clusters	Cassiopeia	+6.4	20 arcmin	7,900 ly	Low power; wide field for both
M103	Open cluster	Cassiopeia	+7.4	6 arcmin	10,000 ly	Compact fan shape
Stock 2	Open cluster	Cassiopeia	+4.4	1° pattern; 2° extent	About 1,200 ly	Binoculars; telescope at low power
Heart and Soul	Nebulae / clusters	Cassiopeia	Diffuse	Degree-scale	6,000-8,000 ly	Clusters with a telescope; nebulae need dark skies

December Highlights

Dec 5, 6 a.m.: Moon about 8° from Venus. Dec 17, 7 p.m.: Moon about 6° from Saturn. Dec 27 before dawn: Moon near Jupiter. Dec 28, 5 a.m.: Moon about 6° from Mars.

Uranus and Neptune Finder Charts



Uranus: green marks show Dec 1, 10, 20 and 31; Pleiades is at the upper right.



Neptune: wide field with Saturn.

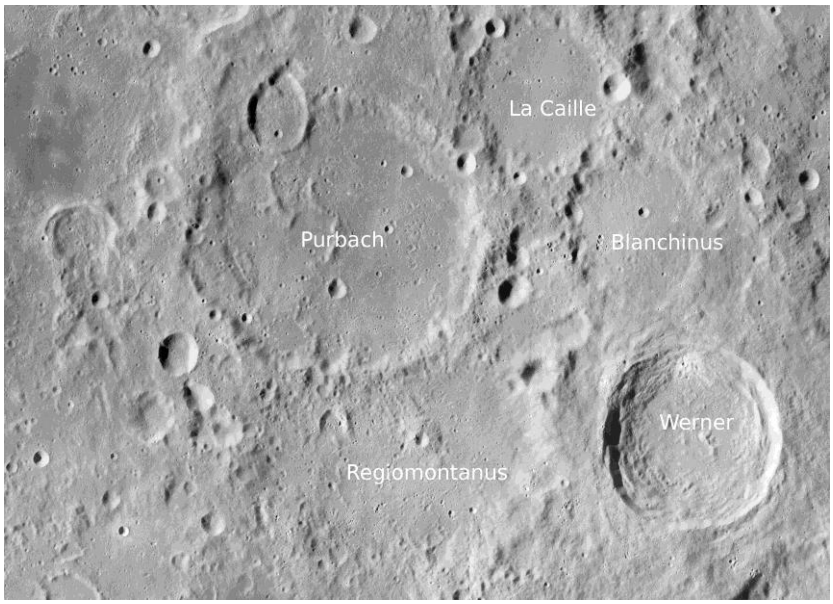
Charts created with Stellarium.

Purbach Lunar Feature of the Month

An ancient walled plain in the southern lunar highlands. Its damaged walls, overlapping craters and uneven floor make it worth spending time at the eyepiece.

When should you look?

On the evenings of December 16 and 17, low sunlight emphasizes the rim and floor relief. Return on December 18 to compare the view as more of the interior becomes illuminated. Early risers can try again before dawn on December 30 and 31, when sunlight approaches from the opposite direction.



Purbach and its neighbors in an LROC Wide Angle Camera mosaic. North is up. Image: NASA / LRO / LROC Team, via Wikimedia Commons; public domain.

How can you find it?

Begin with the Ptolemaeus, Alphonsus and Arzachel chain, which was covered in the September 2026 episode. Continue south, past Thebit, to Purbach just north of Regiomontanus. Start at low power, then increase magnification as the seeing allows. Look for Purbach G overlapping the northern rim, then explore the smaller craters, low hills and ridges on the floor.

This Pre-Nectarian formation is among the Moon’s oldest craters. Ridges around Purbach, Blanchinus and La Caille also produce the Lunar X near first quarter. January’s episode will explore the Lunar X and Lunar V.

Object Notes and Finder Tips

Cassiopeia. Stops follow the episode's right ascension order. Download linked finder charts before observing offline.

M52

Open cluster | *Cassiopeia*

Magnitude	+7.2
Size	13 arcmin
Distance	About 5,000 light-years
Best approach	Binoculars; telescope at low power

Star hop: Extend the line from Schedar through Caph by about the same distance again.

What to notice: Binoculars show unresolved light about half the Moon's width. A small telescope gives a mottled glow with brighter stars; larger apertures resolve a richer cluster. Messier discovered M52 while observing a comet in 1774.

M52 finder chart

Eta Cassiopeiae / Achird

Double star | *Cassiopeia*

Magnitudes	+3.5 and +7.4
Separation	About 13 arcseconds
Distance	19.4 light-years
Best approach	Small telescope; start around 30-50×

Star hop: Find the fainter naked-eye star immediately northeast of Schedar. The Astronomical League chart shows the surrounding field.

What to notice: Compare the brighter primary with its much dimmer companion. Increase magnification until they separate comfortably, and see what colors your eyes show. The pair is a physical binary, unlike a chance alignment.

Eta Cassiopeiae finder chart

NGC 457 with NGC 436

Open clusters | *Cassiopeia*

Magnitude	+6.4 for NGC 457
Size	20 arcmin for NGC 457
Distance	7,900 light-years for NGC 457
Best approach	Low power; field wider than 1°

Star hop: Move about 2° south-southeast from Ruchbah to NGC 457. NGC 436 is roughly two-thirds of a degree northwest of it.

What to notice: Two bright eyes and chains of stars make the Owl or E.T. figure. NGC 436 is smaller and fainter. The bright stars forming the eyes are not cluster members.

NGC 457 finder chart

M103

Open cluster | *Cassiopeia*

Magnitude	+7.4
Size	6 arcmin
Distance	10,000 light-years
Best approach	Small telescope; low to moderate power

Star hop: From Ruchbah, move about 1° northeast.

What to notice: Look for a compact triangular or fan-shaped group and a reddish star among its members. More aperture reveals fainter stars. M103 was the final entry in Messier's published catalog of 1781; M104 through M110 were added later.

M103 finder chart

Object Notes and Finder Tips

Stock 2 / Muscleman Cluster

Open cluster | *Cassiopeia*

Magnitude	+4.4
Size	About 1° central pattern; 2° extent
Distance	About 1,200 light-years
Best approach	Binoculars or a wide-field telescope

Star hop: Start at NGC 869 in the Double Cluster in Perseus. Follow the star chain about 2° north and slightly west into Cassiopeia.

What to notice: Curving chains form a stick figure with raised, flexed arms. Use a wide field so the pattern stands apart from its surroundings. The familiar figure covers roughly a degree, while modern catalogs include a wider cluster extent.

Stock 2 finder chart

Heart and Soul Region

Emission nebulae and embedded clusters | *Cassiopeia*

Brightness	Diffuse; integrated magnitude misleading
Size	Degree-scale fields
Distance	Roughly 6,000-8,000 light-years
Best approach	Stars first; dark sky for nebulosity

Star hop: Use a wide-field atlas east of the Double Cluster. Locate the Heart / IC 1805 region and Melotte 15, then the nearby Soul / IC 1848 region.

What to notice: Melotte 15's stars are more accessible than the surrounding gas. Under dark, transparent skies, a wide field and suitable nebula filter may show brighter patches. Young stars' radiation and winds shape the gas; photographs show much more detail and color.

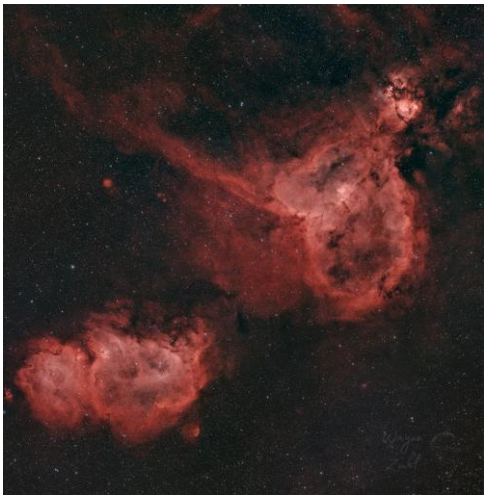
Heart and Soul background

Quick Field Tips

• Favor clear, transparent evenings December 2-15 for faint targets; observe after moonset toward the end of this window.

• Use low power for Stock 2 and NGC 457 with NGC 436.

• Increase magnification gently on M103 and Eta Cassiopeiae.



Heart and Soul Nebulae. Photograph © Wayne Zuhl.

Your Notes