

Cepheus

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Cepheus

Cepheus is the faint five-star outline wedged between Cassiopeia's zigzag and the tail of Draco — a rough pentagon that reads, at a glance, as a child's drawing of a house or a bishop's mitre, roof pointed toward the pole. From Ohio's latitude (roughly 40°N) it never sets: every star in its figure sits north of declination 58°, well inside the circumpolar zone, so Cepheus simply wheels around Polaris all night, every night, all year. It stands highest and clearest on autumn and winter evenings; in spring it swings low along the northern horizon instead, where trees and rooflines get in the way. In the myth this is the king of Aethiopia, husband of Cassiopeia and father of Andromeda — the fourth corner of a single story that also gives the autumn sky [Perseus](#), [Andromeda](#), and [Pegasus](#).

Finding it

Find Polaris, then find Cassiopeia's W (it reads as an M depending on the hour and season). Draw a line from Polaris through the middle star of the W and keep going about the same distance again: the dim pentagon of Cepheus is sitting there, considerably fainter than its neighbor and easy to lose in any haze. Alderamin, the brightest star at magnitude 2.45, anchors one corner of the house shape; Errai marks the peak of the roof, nearest the pole of them all. Because the constellation is circumpolar there is no wrong season to look, but it is easiest to pick out on a clear October–February evening, when it rides well clear of horizon murk and treelines.

The stars

RA is in decimal hours, Dec in decimal degrees, both J2000 — the same figures the site's own chart is drawn from. Magnitudes are visual.

Star	RA (h)	Dec (°)	Ma g	Spectral type	Distan ce	Name
Alderamin (? Cep)	21.3 10	62.5 9	2.4 5	A8V	~49 ly	Arabic <i>al-dhira? al-yamin</i> , "the right arm"
Alfirk (? Cep)	21.4 78	70.5 6	3.2 3	B1 IV	~690 ly	Arabic <i>al-firqah</i> , "the flock"
Errai (? Cep)	23.6 55	77.6 3	3.2 1	K1 III	~45 ly	Arabic <i>ar-ra?i</i> , "the shepherd"; IAU-adopted 2015
? Cephei	22.8 28	66.2 0	3.5 2	K0 III	~115 ly	No traditional or IAU name
? Cephei	22.1 81	58.2 0	3.3 5	K1 Ib	~836 ly	No traditional or IAU name

? Cephei	20.7	61.8	3.4	K0 IV	~47 ly	No traditional or IAU name
	55	4	3			

Alfirk is worth a second look: it is a hot, pulsating subgiant, and it is the star that lends its name to an entire class of variables, the **Beta Cephei stars** — massive, short-period pulsators unrelated to the Cepheids below despite the family resemblance in name.

Two stars carry more scientific weight than anything in that table, and neither is part of the figure the site draws — Delta Cephei sits just off the Errai–Zeta side of the pentagon, and Mu Cephei sits near the Iota–Zeta side. Both earn their own section.

Delta Cephei and the distance ladder

Delta Cephei, at roughly 890 light years (Gaia's 2022 parallax; older photographic and Hipparcos-based estimates have ranged from about 800 to 980 ly), is an unremarkable-looking yellow-white supergiant that changes brightness from magnitude 3.5 to 4.4 and back every 5 days 9 hours — a swing large enough to follow with the naked eye against its steady neighbors. The English amateur astronomer **John Goodricke** caught the variation in 1784, a year after he had done the same for Algol in Perseus. What makes Delta Cephei matter is not that it varies, but that stars of its type — the **Cepheid variables** — pulsate in a way where the period of the pulsation and the star's true luminosity are locked together: a slower Cepheid is always intrinsically brighter than a faster one, in a fixed, measurable ratio.

Henrietta Swan Leavitt worked out that period–luminosity relation in 1908 and refined it in 1912, from Cepheids in the Magellanic Clouds. It turned Cepheids into a ruler: measure a Cepheid's period, read off its true brightness, compare that to how bright it looks, and the difference gives distance. Edwin Hubble used exactly that ruler on a Cepheid he found in [Andromeda's](#) great galaxy in 1923, which is how the argument over whether that galaxy lay inside or far outside the Milky Way finally got settled. Every step of modern cosmology's distance scale still rests, at its base, on this one class of star — named for this one unremarkable-looking member of Cepheus.

Mu Cephei, the Garnet Star

William Herschel described Mu Cephei in 1783 as "a very fine deep garnet colour," and the name stuck. It is a red supergiant — some classifications call it a hypergiant — with a radius estimated at roughly 1,000 to 1,400 times the Sun's; set at the center of the solar system it would reach out past the orbit of Jupiter. Its distance is not well pinned down: red supergiants are notoriously hard to get a clean parallax on, and published estimates for Mu Cephei range from roughly 2,400 to well over 5,000 light years depending on the method, so treat any single number in a caption as provisional. It varies irregularly over a period of roughly two years, by a magnitude or so, and it sits near the edge of the emission nebula and star-forming region IC 1396 — see Deep sky, below.

The pole star cycle

Earth's axis does not point at a fixed spot among the stars; it traces a slow circle, one full turn every roughly 25,772 years, a wobble called precession. Thuban, in Draco, was the pole star around 2830 BCE, close enough that it marked true north for the builders of Egypt's great pyramids. Polaris holds the job now and will make its closest approach to the pole — under half a degree away — around 2102 CE. After that the

pole drifts on into Cepheus itself: Errai becomes the nearest bright star to the pole around 3000 CE, and the pole continues tracking across the constellation toward Alderamin, which takes over as the best marker around 7500 CE. From there the circle carries on to Deneb in Cygnus around 10,000 CE and to Vega in Lyra around 13,700 CE, before swinging back through Thuban and returning to Polaris to close the loop.

Errai has one more claim worth knowing: a planet was reported in orbit around it in 1988, withdrawn for lack of confirming data in 1992, and confirmed for real in 2002–03. Had the 1988 claim held up at the time, it would have beaten [Pegasus's](#) 51 Pegasi b to the title of first exoplanet found around a Sun-like star; instead the credit for a confirmed detection went to 51 Peg b in 1995, and Errai's planet — since named Tadmor — is usually filed as a near-miss rather than a first.

Myth and history

Ptolemy's *Almagest* (c. 150 CE) lists Cepheus among the 48 classical constellations, and by then the figure had long been fixed as a king: husband of Cassiopeia, father of Andromeda, ruler of a kingdom the Greeks called **Aethiopia** — a name that, in Greek usage, denoted the lands south and east of Egypt in general rather than the modern nation of Ethiopia specifically. The fullest ancient tellings of what happens to his family — Cassiopeia's boast, the sea monster, Andromeda chained to the rock — sit properly on the [Andromeda](#) and [Perseus](#) pages; Cepheus's own role in the story is mostly to be the king whose daughter is at stake.

Centuries before Ptolemy's Greek names were transliterated into Arabic, Bedouin sky-watchers read these same stars differently: not a king at all, but a shepherd — marked by Gamma Cephei — minding a dog and a small flock. Errai, the Arabic name still attached to that star, comes straight out of that scene: *ar-raʿi*, "the shepherd." It is a genuinely separate reading of the figure, not just a relabeling of the Greek one. No Babylonian counterpart to Cepheus is confidently attested in the surviving MUL.APIN star lists — unlike the case with [Pegasus's](#) Great Square, this is one region of sky where the earliest written record simply is not there, and it is more honest to say so than to force a match.

Deep sky

Object	Catalog	Type	Notes
Iris Nebula	NGC 7023	Reflection nebula	~1,400 ly away; a young star (HD 200775) lights up the dust around it. Small telescope object.
Elephant's Trunk	IC 1396 (with IC 1396A)	Emission nebula / dark globule	A vast star-forming region; the "trunk" is a dense dust pillar silhouetted against it, close to Mu Cephei on the sky.
—	NGC 188	Open cluster	One of the oldest known open clusters and the one closest to the north celestial pole — itself effectively circumpolar from Ohio.

Key dates

Date	Event
c. 150 CE	Ptolemy catalogues Cepheus among the 48 constellations of the <i>Almagest</i> .

1783	William Herschel describes Mu Cephei's "deep garnet colour."
1784	John Goodricke discovers Delta Cephei's variability, a year after doing the same for Algol.
1908–1912	Henrietta Leavitt establishes the Cepheid period–luminosity relation from stars in the Magellanic Clouds.
1988 / 2002–03	A planet is proposed, withdrawn, and finally confirmed around Errai (Gamma Cephei) — later named Tadmor.
2102 CE <i>(projected)</i>	Polaris makes its closest approach to the north celestial pole.
c. 3000 CE <i>(projected)</i>	Errai becomes the star nearest the north celestial pole.

Related

- [Perseus](#) — the hero, born generations later, who marries Cepheus and Cassiopeia's daughter.
- [Andromeda](#) — Cepheus and Cassiopeia's daughter, chained to the rock for Cetus.
- [Pegasus](#) — the winged horse born of Medusa's blood at Perseus's hand.