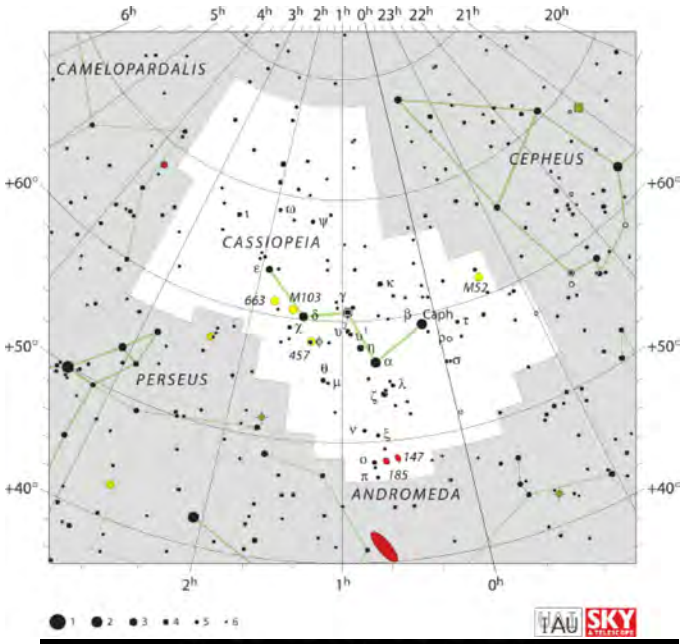
CONSTELLATION CASSIOPEIA

named after the queen of Aethiopia.

Cassiopeia was the wife of Cepheus, King of Aethiopia and mother of Princess Andromeda. It is a constellation in the northern sky and one of the 48 constellations listed by the 2nd-century Greek astronomer **Ptolemy**, and remains one of the 88 modern constellations today.

It is easily recognizable due to its distinctive 'W' shape formed by five bright stars. It is bordered by Andromeda to the south, Perseus to the southeast, and Cepheus to the north. It is opposite the Big Dipper. In northern locations it is visible year-round and it can be seen even in low southern latitudes low in the North.



THE STARS

The four brightest stars of Cassiopeia are all brighter than the third magnitude.

- *Alpha Cassiopeiae*, traditionally called Shedir (from the Arabic Al Sadr, "the breast"), is a double star. The primary is an orange giant of magnitude 2.2, 229 light-years from Earth.
- *Beta Cassiopeiae*, or Caph (meaning "hand"), is a white-hued star of magnitude 2.3, 54 light-years from Earth. 16th-century Arabian astronomer **Al Tizini** gave this star the name Al Sanam al Nakah, (The Camel's Hump), referring to the contemporaneous Persian figure.
- *Gamma Cassiopeiae* is a shell star, a type of variable star that has a very high rate of rotation. This causes the star to be somewhat unstable and periodically eject rings of material. Gamma Cassiopeiae has a minimum magnitude of 3.0 and a maximum magnitude of 1.6; it is currently approximately magnitude 2.2.
- *Delta Cassiopeiae*, known as "Ruchbah" meaning knee, is an Algol-type eclipsing variable star 99 light-years from Earth. It varies by 0.1 magnitudes around magnitude 2.7; its period is 2 years and 1 month.

The constellation Cassiopeia as seen in the Northern Hemisphere. Also shown is the Radiant of the Perseus Shower.

- *Epsilon Cassiopeiae* is a blue-white hued star of magnitude 3.3, 442 light-years from Earth.
- *Rho Cassiopeiae* is a semi-regular pulsating variable yellow-hued supergiant star about 10,000 light-years from Earth but among the most luminous stars in the galaxy with a luminosity of approximately 500,000 solar luminosities. It has a minimum magnitude of 6.2 and a maximum magnitude of 4.1; its period is approximately 320 days.
- *Eta Cassiopeiae* is a binary star with a period of 480 years. The primary is a yellow-hued star of magnitude 3.5 and the secondary is a red-hued star of magnitude 7.5. The system is 19 light-years from Earth.
- *Iota Cassiopeiae* is a triple star 142 light-years from Earth. The primary is a white-hued star of magnitude 4.5, the secondary is a yellow-hued star of magnitude 6.9, and the tertiary is a star of magnitude 8.4
- *Sigma Cassiopeiae* is a binary star 1500 light-years from Earth. It has a green-hued primary of magnitude 5.0 and a blue-hued secondary of magnitude 7.3.
- *Psi Cassiopeiae* is a triple star 193 light-years from Earth. The primary is an orange-hued giant star of magnitude 4.7 and the secondary is a close pair of stars of magnitude 9.0

DEEP-SKY OBJECTS

Because it lies in rich Milky Way star fields, Cassiopeia contains many deep sky objects, including open clusters and nebulae.

M52 and M103, two Messier objects, are located in Cassiopeia; both are open clusters. M52, once described as a "kidney-shaped" cluster, contains approximately 100 stars and is 5200 light-years from Earth. M103 has only about 25 stars included.

NGC 457 and NGC 663, two prominent open clusters in Cassiopeia with about 80 stars.

NGC 457 is looser and NGC 457 is arrayed in chains, approximately 10,000 light-years from Earth.
IC 289 is a Planetary nebula cloud of ionised gas being pushed out into space by the remnants of the star's core.
There are two supernova remnants in Cassiopeia. The first is the aftermath of the supernova called Tycho's Star. It was observed in 1572 by **Tycho Brahe** and now exists as a bright object in the radio spectrum. Within the 'W' asterism formed by Cassiopeia's five major stars lies Cassiopeia A (Cas A). It is the remnant of a supernova that took place approximately 300 years ago (as observed now from Earth; it is 10,000 light-years away), and has the distinction of being the strongest radio source observable outside our solar system. It was seen as a faint star in 1680 by **John Flamsteed**. It was the first image returned by the Chandra X-Ray Observatory in the late 1990s.

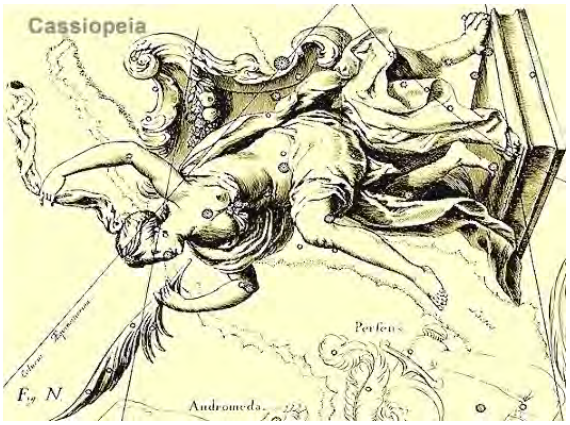
NGC 457 is another open cluster in Cassiopeia, also called the E.T. Cluster, the Owl Cluster, and Caldwell 13. The cluster was discovered in 1787 by **William Herschel**. It has an overall magnitude of 6.4 and is approximately 10,000 light-years from Earth, lying in the Perseus arm of the Milky Way.
Two members of the Local Group of galaxies are in Cassiopeia. NGC 185 and NGC 147 are elliptical galaxies about magnitude 9.2, Both galaxies are gravitationally bound to the Andromeda Galaxy.

METEOR SHOWER

The December **Phi Cassiopeiids** are a recently discovered early December meteor shower that radiates from Cassiopeia. They are noted for being very slow, with an entry velocity of some 16.7 kilometres per second.

MYTHOLOGY

The constellation is named after Cassiopeia, the queen of Aethiopia. She was the wife of Cepheus, King of Aethiopia and mother of Princess Andromeda who was bound to a rock as prey for the monster Cetus as punishment for Cassiopeia's boast to be more beautiful than the Nereids. Andromeda was rescued by the hero Perseus, whom she later married. But that's another story. Cassiopeia herself was forced to wheel around the North Celestial Pole on her throne, spending half of her time clinging to it so she does not fall off.
In the 1997 film Contact starring **Jodie Foster** and **Matthew McConaughey**, Doctor Arroway says: "You see that large W-shaped constellation there? That's Cassiopeia, it gives off lots of radio signals from a remnant of a supernova. I listen to them a lot."



Cassiopeia in her chair, as depicted in Urania's Mirror, published in London c. 1825.

Constellations are the invention of human imagination, not of nature. They are an expression of the human desire to impress its own order upon the apparent chaos of the night sky. For navigators beyond sight of land or for travellers in the trackless desert who wanted signposts, for farmers who wanted a calendar and for shepherds who wanted a nightly clock, the division of the sky into recognizable star groupings had practical purposes. But perhaps the earliest motivation was to humanize the forbidding blackness of night. Newcomers to astronomy are often disappointed to find that the great majority of constellations bear little, if any, resemblance to the figures whose names they carry; but the constellation figures are not intended to be taken literally. **Rather, they are symbolic, a celestial allegory**. The night sky was a screen on which human imagination could project the deeds and personifications of deities, sacred animals and moral tales. **It was a picture book in the days before writing**.
Such facts were unknown to the ancient Greeks and their predecessors, to whom we owe the constellation patterns that we recognize today. They were not aware that, with a few exceptions, the stars of a constellation have no connection with each other, but lie at widely differing distances. Chance alone has given us such familiar shapes as the 'W' of Cassiopeia, the square of Pegasus, the sickle of Leo or the Southern Cross.
But neither the Greeks nor the Egyptians actually invented the constellations that are described in the Almagest. The evidence for that lies not just in written records, but in the sky itself: **From the extent of the constellation-free zone arounf the South Pole we can conclude that the constellation makers must have lived at a latitude of around 35–36 degrees north – that is, south of Greece but north of Egypt.** And secondly, the constellation-free zone is centred on a south celestial pole at the time around 2000 BC. The celestial poles changes slowly because of a wobble of the Earth axis, an effect known as precession, and in principle this effect can be used to estimate the date of any set of star positions. AK, from Ian Ridpath Notes