

THE CONSTELLATION CRUX, THE CROSS

Crux, or the Southern Cross, is a constellation in the southern sky. It is one of the best known constellations in the southern hemisphere, and easily recognizable for the cross-shaped asterism formed by its four brightest stars and the Two Pointers to it, *alpha* and *beta Centauri*. The constellation is associated with a number of stories and figures prominently in different mythologies in the southern hemisphere.

Crux is not visible north of $+20^\circ$ in the northern hemisphere, and **it is circumpolar south of 34°S , which means that it never sets below the horizon.** On the celestial sphere, Crux is exactly opposite the constellation Cassiopeia. **It is the smallest constellation in the sky.**

Crux means “the cross” in Latin. Ancient Greeks considered Crux to be a **part of the constellation**

Centaurus. Even though its stars were catalogued by **Frederick de Houtman** in 1603 and charted on most celestial globes, **it was not until 1679 that it became a constellation in its own right.** It was the French astronomer **Augustin Royer** who formally separated Crux from Centaurus. Some historians credit the Dutch astronomer **Petrus Plancius** for creating the constellation in 1613, as it was published by **Jakob Bartsch** in 1624.

FACTS & LOCATION and MAJOR STARS,

Crux is the smallest of the modern 88 constellations, occupying an area of only 68 square degrees. It can be seen at latitudes between $+20^\circ$ and -90° . The neighbouring constellations are Centaurus and Musca.

Crux has one star with known planets and contains no Messier objects.

The brightest star in the constellation is *Alpha Crucis*, with an apparent visual magnitude of 0.77. It is also the 12th brightest star in the sky. *Acrux* is a multiple star system composed of

Alpha-1 Crucis, a B class subgiant, and *Alpha-2 Crucis*, a B class dwarf. The two are separated by four arc seconds. Both stars are very hot, almost class O, and their respective luminosities are 25,000 and 16,000 times that of the Sun. A line extending the cross by 3-1/2 times beyond *Alpha Crucis* leads to the Southern Pole.

Beta Crucis is the second brightest star of the Southern Cross and the 20th brightest star in the night sky. It got the name *Mimosa* because of its colour. It has an apparent visual magnitude of 1.30 and is approximately 350 light years distant from the solar system. It is classified as a *Beta Cephei* variable. Its estimated age is 10 million years. *Beta Crucis* is also a binary, composed of two stars, about 8 AU apart, that orbit each other in five years.

Gamma Crucis is a red giant belonging to the spectral class M4III. It has an apparent visual magnitude of 1.59 and is approximately 88 light years distant from Earth. *Gamma Crucis* is the third brightest star in Crux and the 26th brightest star in the sky. It also is a binary star, with a primary component belonging to the spectral class M4 III and a white, A3 class star with a visual magnitude of 6.4 for an optical companion. The companion is about 400 light years distant from Earth.

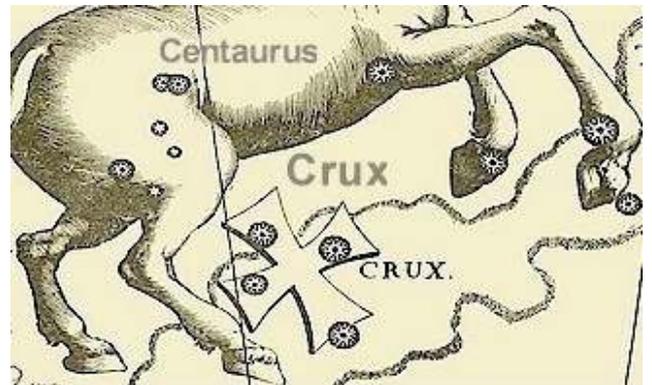
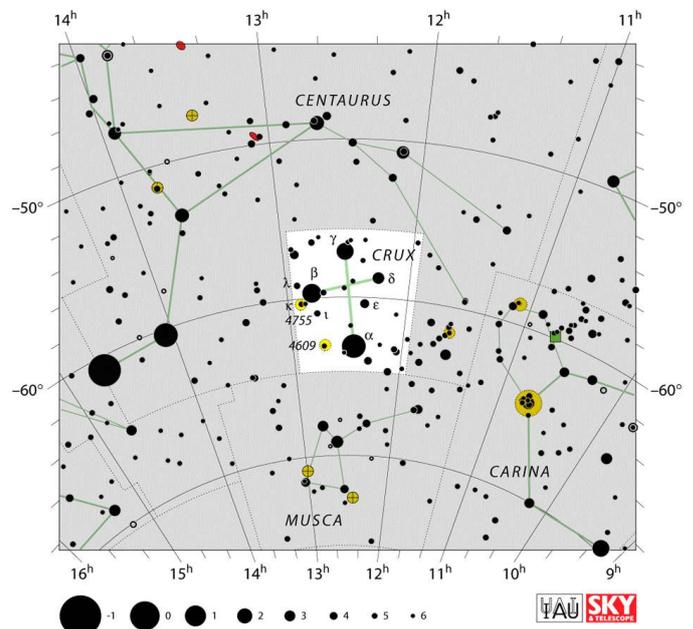
Delta Crucis is a subgiant belonging to the spectral class B2IV. It has an apparent magnitude of 2.775 and is about 360 light years distant. It is classified as a *Beta Cephei* type variable.

Zeta Crucis is another double star in Crux constellation. It is composed of a blue-white dwarf belonging to the spectral class B2.5 V, and a faint (12.49m) companion. *Zeta Crucis* has an apparent visual magnitude of 4.04 and is approximately 360 light years distant.

Epsilon Crucis is an orange giant, a class K3III star with a visual magnitude of 3.56, approximately 228 light years from Earth. A handy guide to visual magnitudes of stars is the clockwise decrease from *Alpha Crucis*.

There is one meteor shower associated with the constellation; the *Crucids*.

Crux belongs to the Hercules family of constellations, along with *Aquila*, *Ara*, *Centaurus*, *Corona Australis*, *Corvus*, *Crater*, *Cygnus*, *Hercules*, *Hydra*, *Lupus*, *Lyra*, *Ophiuchus*, *Sagitta*, *Scutum*, *Sextans*, *Serpens*, *Triangulum Australe*, and *Vulpecula*.



CULTURAL SIGNIFICANCE AND MYTHOLOGY

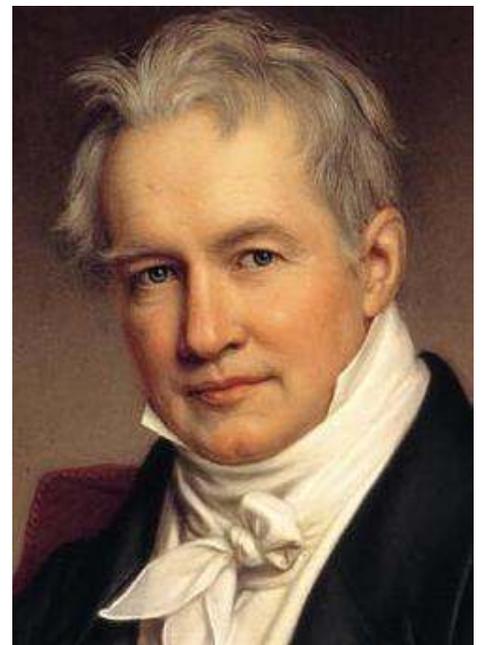
Crux is a famous constellation in many cultures. Ancient Greeks considered it to be part of the Centaurus constellation. Greeks were able to see Crux before its stars dropped below the horizon for Europe. It was entirely visible as far north as Britain in the fourth millennium BC. However, the precession of the equinoxes gradually lowered its stars below the European horizon. Some saw significance in this, linking the disappearance of the celestial cross from the sky to the crucifixion of Christ. It was last seen on the horizon of Jerusalem about the time that Christ was crucified. The 2nd century Greek astronomer **Ptolemy** listed the stars of Crux as part of the constellation Centaurus in his *Almagest*. But by the year 400 AD, the constellation was not visible from most of Europe anymore, and they were eventually forgotten by the inhabitants of northern latitudes. The Europeans did not rediscover Crux until the great naval expeditions of the late 15th and early 16th century

The explorer **Alexander von Humboldt** writes: The two great stars, which mark the summit and the foot of the Cross, having nearly the same right ascension, it follows that the constellation is almost perpendicular at the moment when it passes the meridian. This circumstance is known to the people of every nation situated beyond the Tropics or in the southern hemisphere. It has been observed at what hour of the night, in different seasons, the Cross is erect or inclined. It is a time piece, which advances very regularly nearly four minutes a day, and no other group of stars affords to the naked eye an observation of time so easily made.

The Southern Cross carries cultural significance in many countries in the southern hemisphere. A stone image of Crux constellation has been found in Machu Picchu in Peru. The Inca knew the constellation as Chakana, which means “the stairs.” The Maori called it Te Punga, or “the (ship’s) anchor.”

In Australian Aboriginal astronomy, the cross asterism and the Coalsack Nebula represent the head of the Emu in the Sky, while Crux itself is said to be a possum sitting in a tree, representing the sky deity Mirrabooka. The Coalsack Nebula, a seemingly starless dark patch in the night sky, described often as “the inky spot - an opening into the awful solitude of empty space beyond the stars” is actually an opaque interstellar dust cloud that obscures the light of the Milky Way stars. It stretches across nearly seven by five degrees of the sky, crossing over into the neighbouring constellations, Centaurus and Musca. It earned the nickname **Black Magellanic Cloud**, rivalling the prominence of the Large and Small Magellanic Cloud dwarf galaxies. The Incas tell that the god *Ataguchu*, in a fit of temper, kicked the Milky Way and a fragment flew off, forming the Small Magellanic Cloud where it landed on the sky, and leaving the black mark of the Coalsack behind. The *Kappa Crucis* Cluster, NGC 4755, also known as the Jewel Box (or Herschel’s Jewel Box), is an open star cluster in Crux. It was discovered by the French astronomer **Nicolas Louis de Lacaille** on his trip to South Africa in 1751-52. It is one of the youngest clusters ever discovered, with an estimated age of only 14 million years. The cluster has a visual magnitude of 4.2 and contains about a hundred stars. 19th century English astronomer **Sir John Herschel** described the cluster as “a casket of variously coloured precious stones,” which is how the cluster appears in a telescope and how it subsequently got the name the Jewel Box. To the naked eye, the cluster appears like a star near *Beta Crucis*. The three brightest stars in it got nicknamed “traffic lights” because of their different colours.

Amerigo Vespucci (1454 – 1512) was an Italian explorer, financier, navigator and cartographer who first demonstrated that Brazil and the West Indies did not represent Asia's eastern outskirts as initially conjectured by Columbus, but instead constituted an entirely separate landmass. This second super continent, colloquially referred to as the New World, came to be termed "America", from Americus, the Latin version of Amerigo. Vespucci was the first of the modern Europeans to notice the Four Stars, but he called them Mandorla - the Italian word for almond. An ancient symbol of two circles coming together, overlapping one another to form an almond shape in the middle. Early Christians used the symbol to describe the coming together of heaven and earth, between the divine and human.



Alexander von Humboldt (1769 – 1859) was a Prussian geographer, naturalist, and explorer. His quantitative work on botanical geography laid the foundation for the field of biogeography. Between 1799 and 1804 Humboldt travelled extensively in Latin America, exploring and describing it for the first time from a modern scientific point of view.

