

Constellations in the Souther Sky - Pyxis, the Compass

Pyxis constellation lies in the southern sky. It represents a mariner's compass. It was one of the constellations created by the French astronomer **Nicolas Louis de Lacaille** in 1752. Lacaille originally named the constellation *Pyxis Nautica*, but the name was later simplified to just Pyxis.

Pyxis lies near the former constellation *Argo Navis*, a huge constellation representing the Argonauts' ship, which was eventually broken into several smaller constellations.

FACTS, LOCATION & MAP

Pyxis is the 65th constellation in size, occupying an area of 221 square degrees. It is located in the second quadrant of the southern hemisphere and can be seen at latitudes between +50° and -90°. The neighboring constellations are **Antlia, Hydra, Puppis and Vela**.

Pyxis contains three stars with known planets (see below), but has no Messier objects. The brightest star in the constellation is *Alpha Pyxididis*, with an apparent visual magnitude of 3.68.

There are no meteor showers associated with the constellation.

Pyxis belongs to the Heavenly Waters family of constellations, along with Carina, Columba, Delphinus, Equuleus, Eridanus, Piscis Austrinus, Puppis and Vela.

STORY

The constellation Pyxis was created by the French astronomer Nicolas Louis de Lacaille in 1751-52 during his exploration of the southern skies. He named the constellation *la Boussole* and later Latinized the name to *Pixis Nautica*. The constellation appeared under this name in the second edition of Lacaille's chart in 1763. The name was eventually shortened to Pyxis.

The constellation represents the magnetic compass used by navigators and seamen at the time and should not be confused with *Circinus*, which was named after a draftsman's compasses. **Pyxis lies in the vicinity of the three constellations that were once known as Argo Navis, a single large constellation that represented the ship of the Argonauts.** Lacaille was the one who divided the constellation into three smaller ones – Carina, Puppis and Vela – and this might be the reason why Pyxis is sometimes mentioned as the fourth constellation that was part of Argo Navis, even though it wasn't. The Greek astronomer **Ptolemy** had catalogued the stars from *Alpha to Delta Pyxididis*, but not as part of *Argo Navis*, but as stars located on or around the ship's mast.

In 1844, the English astronomer **John Herschel** suggested that the name Pyxis be replaced with Malus, the mast, which would have made the constellation a subdivision of *Argo Navis* if Herschel's suggestion had been accepted, but it wasn't. The International Astronomical Union (IAU) eventually adopted Pyxis as one of the 88 modern constellations.

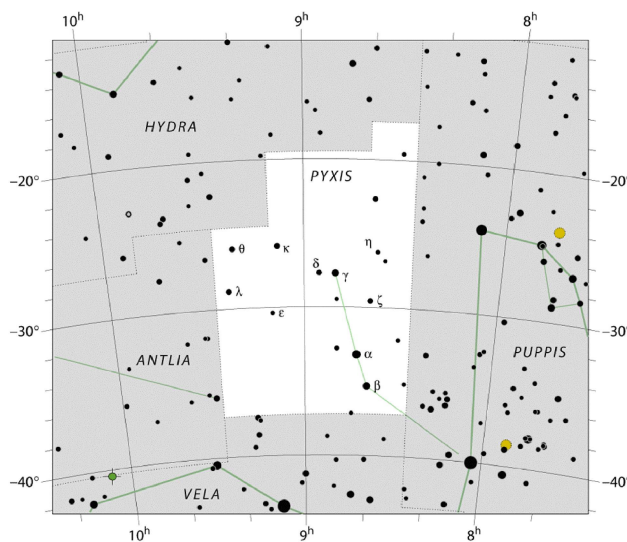
MAJOR STARS IN PYXIS

Alpha Pyxididis is a giant star belonging to the spectral class B1.5III. It has an apparent visual magnitude of 3.67 and is approximately 880 light years distant. The star is classified as a *Beta Cephei* variable, which means that variations in its brightness are a result of pulsations of the star's surface. *Alpha Pyxididis* has more than 10 solar masses and a radius six times that of the Sun. **It is about 10,000 times more luminous than the Sun and will eventually end its life in a supernova explosion.**

Beta Pyxididis is a binary star with a combined apparent magnitude of 3.954, about 420 light years distant from the Sun. It is the second brightest star in Pyxis. The star has a spectral classification G7Ib-II, which means that it is a bright supergiant, yellowish in colour with 28 times the Sun's radius. It has a magnitude 12.5 visual companion located 12.7 arc seconds away.

Gamma Pyxididis is an orange giant of the spectral type K3III. It has a visual magnitude of 4.026 and is approximately 209 light years distant. It is the third brightest star in the constellation.

T Pyxididis is a binary star system, composed of a star similar to the Sun and a white dwarf. It usually has a visual magnitude of 15.5, but being a recurrent nova the magnitude can go up to 6.4. **There are currently only ten recurrent novae known.** *T Pyxididis* was observed erupting in 1890, 1902, 1920, 1944, 1966 and 2011.



Pyxis Constellation Map, by IAU and Sky&Telescope



The two stars in the *T Pyxidis* system lie close together and the white dwarf draws mass off the Sun-like star, which causes the periodic eruptions. The system is 3260 light years distant from Earth. Evidence suggests that the star has increased in mass despite the eruptions and that it might soon explode as a Type 1a supernova, the kind of supernova that results from a violent explosion of a white dwarf. When this happens the explosion and the resulting thermonuclear blast will destroy the Earth's ozone layer and make our planet uninhabitable.

DEEP SKY OBJECTS IN PYXIS

NGC 2818 A Hubble Space Telescope photo of the planetary nebula, one of few planetary nebulae in the Milky Way residing inside a star cluster. The nebula is 3.25 light years in radius and lies about 10,400 light years from the solar system.

NGC 2627 is an open cluster in Pyxis. It contains about 40 stars with magnitudes ranging from 11 to 13.

NGC 2613 The cluster has a visual magnitude of 8.4 and is about 8000 light years distant. The cluster is located to the south-west of *Zeta Pyxidis*.

NGC 2613 is a barred spiral galaxy, seen almost edge-on. It is believed to resemble our galaxy, the Milky Way. It has an apparent magnitude of 10.6 and is approximately 60 million light years distant.



NGC 2818 is a planetary nebula in Pyxis, created when a dying star ejected its outer layers, which now appear as glowing gases.



Several other names for Pyxis are still in common use by astronomers today, such as *Malus*, the Mast, *Pyxis Nautica*, the Nautical Box or Mariner's Compass to honor the invention of the magnetic compass used on ships, the German *Kompass* (not to be confused with the Pair of Compasses of the constellation *Circinus*), the French *la Boussole or Compas de Mer*, and the Italian *Bussola*.

The ultimate origin of Pyxis is Greek *puxos*, the box-tree, whence also the word *pyx*. The French *boussole* is from the Italian diminutive *bossola*, "a box that mariners keep their compass in". If Pyxis is

supposed to represent the compass of the Ship *Argo Navis*, it noteworthy to remember that the *Argo* would not have had a compass, as **the ancient Greeks did not use compasses for navigation**. Western Sailing ships started using the marine compass in the Mediterranean Sea around the thirteenth or fourteenth century. To "box the compass" was to be able to name all 32 points of the compass in clockwise order, a drill for apprentice seamen. The 32 points are simple bisections of the directions of the four winds. The 32 points rose come from the directions of the eight major winds, the eight half-winds and the sixteen quarter-winds.

Johann Bode (1747-1826) called the constellation *Lochium Funis* (the "Log and Line," a nautical device once used for measuring speed and distance travelled at sea) around Pyxis but this did not survive.

The official constellation boundaries were set by Eugène Delporte in 1930, and are defined by a polygon of eight segments (see Constellation Map at the top). The closest star to earth in the constellation is **Gliese 318**, a white dwarf of spectral class DA5 and visual magnitude 12.00, 26 light years away.

Pyxis is home to three stars with confirmed planetary systems:

HD 73256 is a yellow star of spectral type G9V with a hot Jupiter, HD 73256 b, orbiting it every 2.55 days. It is 119 light years away.

HD 73267 is a star with its companion HD 73267 b orbiting every 1260 days.

Gliese 317 is a red dwarf around 50 light years distant which is orbited by two gas giant planets, and is a good candidate for future searches for more terrestrial rocky planets.

Pyxis lies in the plane of the Milky Way, although part of the eastern edge is dark, with material obscuring our galaxy arm there.

