

CONSTELLATION BOÖTES, THE HERDSMAN

Boötes is the cultivator or Ploughman who drives the Bears, Ursa Major and Ursa Minor around the Pole Star Polaris. The bears, tied to the Polar Axis, are pulling a plough behind them, tilling the heavenly fields "in order that the rotations of the heavens should never cease". It is said that Boötes invented the plough to enable mankind to better till the ground and as such, perhaps, immortalizes the transition from a nomadic life to settled agriculture in the ancient world. This pleased Ceres, the Goddess of Agriculture, so much that she asked Jupiter to place Boötes amongst the stars as a token of gratitude.

Boötes was first catalogued by the Greek astronomer **Ptolemy** in the 2nd century and is home to Arcturus, the third individual brightest star in the night sky, after Sirius in Canis Major and Canopus in Carina constellation. It is a constellation of large extent, stretching from Draco to Virgo, nearly 50° in declination, and 30° in right ascension, and contains 85 naked-eye stars according to **Argelander**.

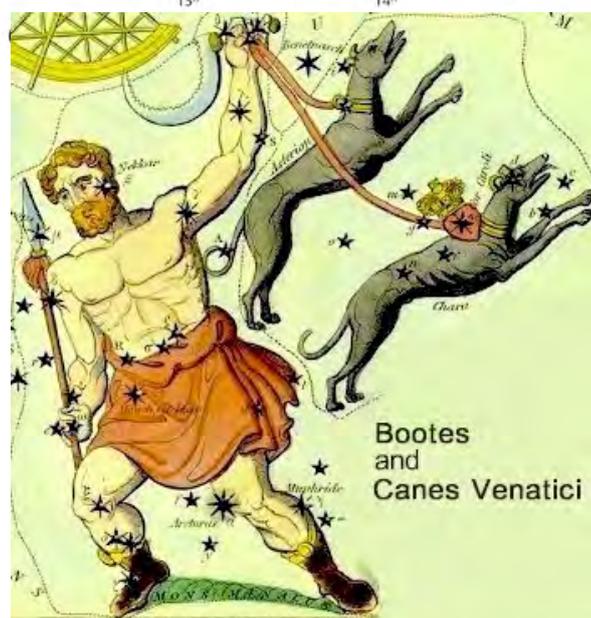
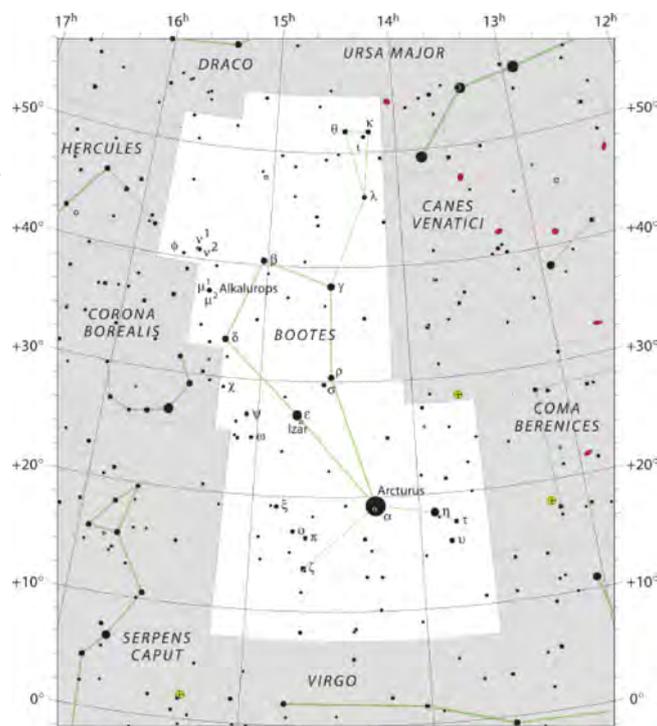
The constellation exhibits better than most constellations the character assigned to it. One can readily picture to one's self the figure of a Herdsman with upraised arm driving the Greater Bear before him.

FACTS, LOCATION & MAP

- The neighbouring constellations are Canes Venatici, Coma Berenices, Corona Borealis, Draco, Hercules, Serpens Caput, Virgo, and Ursa Major.
- Boötes has 10 stars with known planets and does not contain any Messier objects.
- The brightest star in the constellation is Arcturus, Alpha Boötis, which is also the third brightest star in the night sky.
- There are three meteor showers associated with the constellation Boötes: the January Bootids, the June Bootids, and the Quadrantids.
- Boötes belongs to the Ursa Major family of constellations, along with Camelopardalis, Canes Venatici, Coma Berenices, Corona Borealis, Draco, Leo Minor, Lynx, Ursa Major, and Ursa Minor.

MAJOR STARS IN BOÖTES

- *Alpha Boötis* Arcturus is the third brightest star in the sky and the brightest star in the northern hemisphere. It has an apparent visual magnitude of -0.04 . It is often listed as the fourth brightest star, behind Alpha Centauri, because the latter is a binary star with a combined magnitude of -0.27 . The name Arcturus means "guardian of the bear" in Ancient Greek. The star is located at the left foot of the Herdsman, the one standing next to the bear constellations, Ursa Major and Ursa Minor. The star is a type K1.5 IIIpe orange giant, one with an unusual spectrum of light and full of emission lines. (The "pe" stands for "peculiar emission.") Approximately 36.7 light years distant, the star has a luminosity at least 110 times that of the Sun and a very high proper motion; it moves at 122km/s relative to the solar system. It will arrive at the point nearest to the Sun in approximately 4,000 years. Arcturus lies on the celestial equator and can easily be found if one follows the arc of the three bright stars that form the handle of the Big Dipper asterism in Ursa Major. It is a member of the Local Interstellar Cloud (or Local Fluff), an interstellar cloud through which the Earth and the solar system are currently moving. The cloud is 30 light years across. Arcturus is believed to be an old disk star. It appears to be travelling with a group of 52 other old disk stars, commonly known as the Arcturus Stream. Arcturus is mentioned by **Homer**, **Hesiod** and **Ptolemy**. **Germanicus Caesar** said that Arcturus "lies where his garment is fastened by a knot", but **Ptolemy** placed it between the thighs, which is where mapmakers have traditionally depicted it.



The constellation abbreviation is 'Boo' as adopted by the International Astronomical Union in 1922. The official constellation boundaries, set by Eugène Delporte in 1930, are a polygon of 16 segments.

- *Beta Boötis* Nekkar is a yellow G-type giant 219 light years from Earth. It is a flare star, a type of variable star that shows dramatic increases in luminosity for a few minutes. The name Nekkar derives from a mis-transliteration of the Arabic word for “cattle driver.” Sometimes the star is also referred to as Meres.
- *Gamma Boötis* Seginus is a Delta Scuti type variable star, one showing variations in brightness as a result of both radial and non-radial pulsations on its surface. The star is approximately 85 light years distant. Its luminosity varies between magnitude 3.02 and 3.07 with a period of 6.97 hours. The star belongs to the spectral class A7III.
- *Epsilon Boötis* Izar is a binary star located approximately 300 light years away in the constellation Boötes. It consists of a bright orange giant and a smaller and fainter main sequence star. It is also sometimes known as *Pulcherrima*, which means “the loveliest” in Latin. The name Izar comes from the Arabic word for “veil.”
- *Eta Boötis* Muphrid is a spectroscopic binary star with a period of 494 days. It is located close to Arcturus in the sky, only 3.24 light years away. The star’s traditional name is Muphrid, derived from the Arabic phrase for “the single one of the lancer.” It is also known as Saak. Muphrid lies 37 light years from Earth.
- *Mu Boötis* is also known as Alkalurops. The name comes from the Greek word kalaurops, which means “the shepherd’s staff.” It is a triple star approximately 121 light years distant. The brightest component is a yellow-white F-type subgiant with an apparent visual magnitude of 4.31. The companion is a binary star lying 108 arcseconds away.

DEEP SKY OBJECTS IN BOÖTES

- The Boötes void, also known as the Great Void or the Supervoid, is a sphere-shaped region of the sky, almost 250 million light years in diameter, that contains very few galaxies. The void was originally discovered by **Robert P. Kirshner**, Harvard College Professor of Astronomy, in 1981, as part of a survey of galactic redshifts. By now, it is known that there are at least 60 galaxies in the void.
- The Hercules–Corona Borealis Great Wall, the largest known structure in the Universe, covers a significant part of Boötes.
- NGC 5466, The Boötes Dwarf Galaxy is a dwarf spheroidal galaxy located approximately 197,000 light years from Earth. It is one of the faintest galaxies known, with an absolute magnitude of -5.8 and apparent magnitude of 13.1. It was only discovered in 2006.
- Boötes I orbits the Milky Way Galaxy and, because of its distorted shape, it is believed to be tidally disrupted by the Milky Way. The galaxy is approximately 720 light years across.
- NGC 5466 is a globular cluster approximately 51,800 light years from Earth. The cluster was first discovered by **William Herschel** in 1784. It lies about 52,800 light years from the Galactic centre and is believed to be the source of a star stream called the 45 Degree Tidal Stream, which was discovered in 2006.



Boötes shown in the Uranographia of Johann Bode (1801). He carries a club or staff in his right hand and a sickle in his left, with which he also grasps the leash of his hunting dogs, represented by neighbouring Canes Venatici. Ptolemy in the Almagest mentioned the club (shown in some representations as a spear) but said nothing about the sickle, which seems to have been a later addition.

Here Boötes is standing on Mons Maenalus, an obsolete sub-constellation. Above his head is another obsolete constellation, Quadrans Muralis.

MYTHOLOGY

The constellation is closely linked in legend with the Great Bear, Ursa Major, because of its position behind the bear’s tail. The origin of the name Boötes is not certain, but it probably comes from a Greek word meaning ‘noisy’ or ‘clamorous’, referring to the herdsman’s shouts to his animals. An alternative explanation is that the name comes from the ancient Greek meaning ‘ox-driver’, from the fact that Ursa Major was sometimes visualized as a cart pulled by oxen. The Greek poet Aratus visualized Boötes as a man driving the bear around the pole. Later astronomers have given Boötes two dogs, in the form of the neighbouring constellation Canes Venatici. A second legend identifies Boötes with Icarus (not the son of Daedalus). According to this tale, recounted at length by Hyginus in Poetic Astronomy, the god Dionysus taught Icarus how to cultivate vines and make wine. Therefor the traditional astrological influences for Boötes; "likes fine wine". AK, from Wiki Notes