

Boötes

Subjects: [Astronomy & Astrophysics](#)

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Boötes, recognized by the International Astronomical Union (IAU), is a constellation in the northern celestial hemisphere. It is known for its prominent shape resembling a kite or an ice cream cone, with its brightest star, Arcturus, marking one corner.

IAU

constellation

astronomy

1. Introduction

Boötes, a constellation in the northern celestial hemisphere, holds a significant place in astronomy and mythology. Its name is derived from the Greek word "Boötēs," meaning "herdsman" or "plowman," reflecting its association with agriculture and rural life in ancient cultures. Boötes is situated between the constellations of Ursa Major and Virgo, making it a prominent feature in the spring night sky for observers in the northern latitudes.

The celestial coordinates of Boötes lie approximately between right ascension 13 hours and 15 hours and declination +15 degrees to +55 degrees. It is bordered by several other notable constellations, including Ursa Major, Virgo, and Canes Venatici (**Figure 1**). Arcturus, the brightest star in Boötes and the fourth brightest star in the night sky, serves as a guiding light for navigators and stargazers alike. With a visual magnitude of -0.04, Arcturus shines with a distinct orange hue and is easily recognizable due to its brightness and position in the sky.

In Greek mythology, Boötes is often associated with the figure of a herdsman or plowman. One prominent mythological interpretation identifies Boötes as the son of Demeter, the goddess of agriculture, tasked with herding the celestial oxen that plow the fields of the sky. Another interpretation links Boötes with Icarus, a Greek winemaker who was transformed into a constellation after being taught the secret of winemaking by the god Dionysus.

Astronomically, Boötes is home to several notable deep-sky objects, including the globular cluster M3 and the galaxy pair NGC 5982 and NGC 5985. These celestial wonders offer opportunities for observation and study, contributing to our understanding of the cosmos and the intricate patterns of celestial objects.

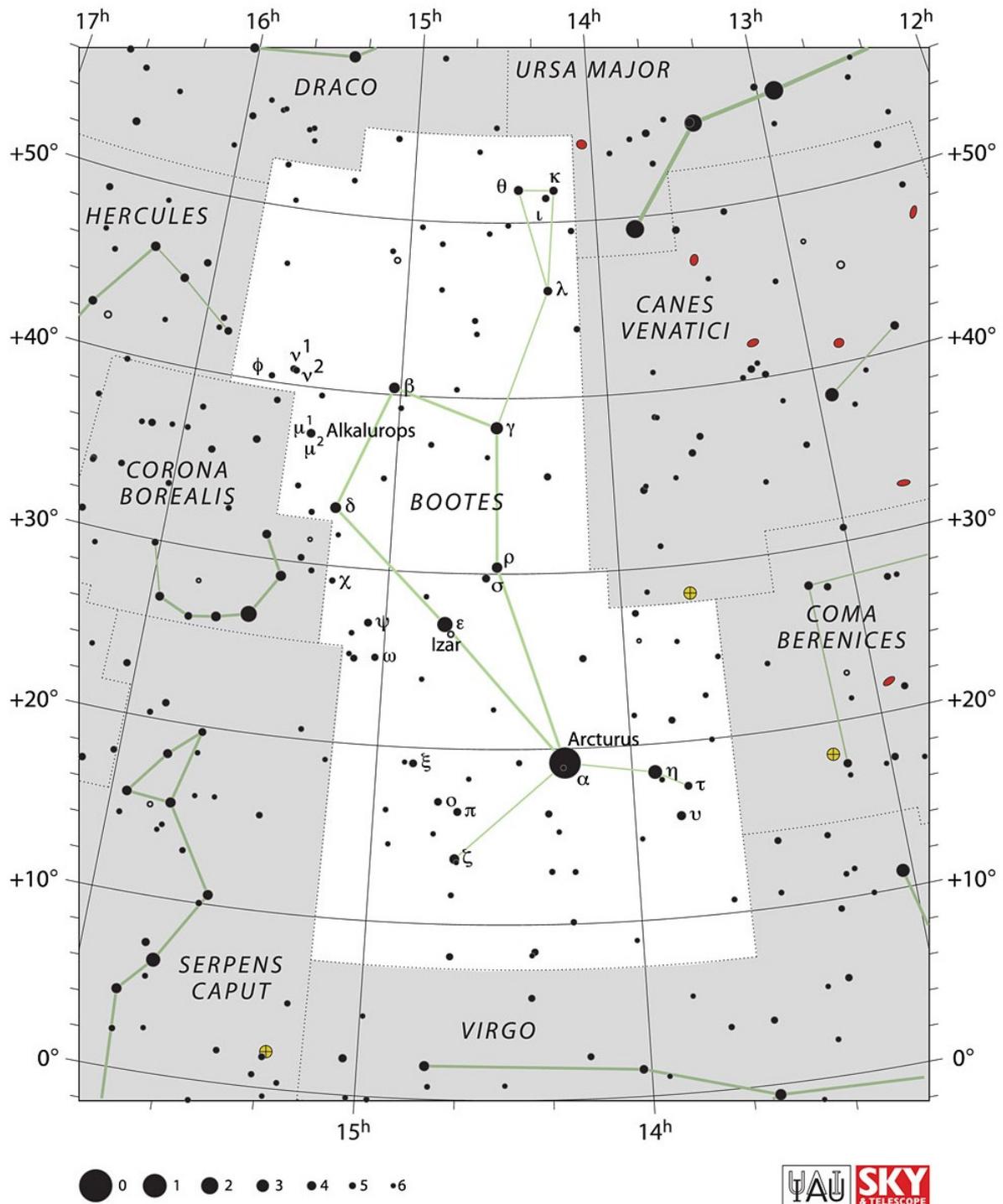


Figure 1. IAU chart of Boötes. Source: <https://www.iau.org/static/archives/images/screen/boo.jpg>. Credit: IAU and Sky & Telescope. Reproduced under CC BY 4.0 license.

2. Historical Background and Mythology

Boötes, a constellation in the northern celestial hemisphere, has a rich historical background and is steeped in mythology dating back to ancient civilizations. Its name is derived from the Greek word "Boōtēs," meaning "herdsman" or "plowman," reflecting its association with agricultural activities and rural life in ancient cultures.

Boötes is one of the 48 constellations cataloged by the Greek astronomer Ptolemy in the 2nd century CE and has since held significance in both astronomy and mythology.

In Greek mythology, Boötes is often associated with the figure of a herdsman or plowman. One prominent mythological interpretation identifies Boötes as the son of Demeter, the goddess of agriculture, tasked with herding the celestial oxen that plow the fields of the sky. According to this myth, Boötes was placed in the heavens as a reward for his diligence and dedication to his duties. His position among the stars serves as a reminder of the importance of agriculture and the cycle of the seasons in ancient Greek society.

Another interpretation of Boötes in Greek mythology links the constellation with the figure of Icarius, a Greek winemaker from Attica. According to legend, Icarius was a generous man who was visited by the god Dionysus, the god of wine and revelry. Dionysus taught Icarius the secret of winemaking, and in gratitude, Icarius shared his wine with the people of Attica. However, when some shepherds drank too much and fell into a drunken stupor, they mistakenly believed Icarius had poisoned them and killed him. In grief, Icarius' daughter Erigone and their faithful dog Maera discovered his body and were later transformed into the constellations Virgo and Canis Major, respectively. In some versions of the myth, Icarius himself is transformed into the constellation Boötes, represented as a herdsman or plowman holding a staff or sickle.

In addition to its association with agricultural themes, Boötes holds significance in various other cultures and mythologies throughout history. In ancient Egypt, the constellation may have been linked to the god Osiris, the god of the afterlife and fertility, who was often depicted as a figure holding a staff or scepter. In Mesopotamian astronomy, Boötes may have been associated with the figure of Gilgamesh, a legendary king of Uruk, who was revered as a heroic figure and a protector of civilization.

3. Notable Stars in Boötes

Arcturus (Alpha Boötis): Arcturus is the brightest star in Boötes and the fourth brightest star in the night sky. It is a red giant star located approximately 37 light-years away from Earth. With a visual magnitude of -0.04, Arcturus shines with a distinct orange hue and serves as a prominent marker in the spring and summer night sky. Arcturus has been known since ancient times and holds significance in various cultures and mythologies.

Izar (Epsilon Boötis): Izar, also known as Pulcherrima, is a binary star system located in Boötes. It consists of a bright yellow-orange giant star and a fainter bluish companion star. The primary star, Izar A, is a spectroscopic binary, meaning the two stars orbit each other too closely to be resolved individually. Izar is a popular target for amateur astronomers due to its striking color contrast and binary nature.

Muphrid (Eta Boötis): Muphrid is a binary star system located in Boötes, approximately 37 light-years away from Earth. The primary star, Muphrid A, is a blue-white main-sequence star, while the companion star, Muphrid B, is a white dwarf star. Muphrid is notable for its high proper motion, meaning it appears to move rapidly across the sky relative to distant background stars.

Alkalurops (Mu Boötis): Alkalurops is a triple star system located in Boötes. It consists of three main-sequence stars, designated Mu Boötis A, B, and C. Mu Boötis A and B form a close binary pair, while Mu Boötis C orbits the binary pair at a greater distance. Alkalurops is visible to the naked eye and is a popular target for amateur astronomers interested in multiple star systems.

Seginus (Gamma Boötis): Seginus is a binary star system located in Boötes, approximately 85 light-years away from Earth. The primary star, Seginus A, is a yellow-white main-sequence star, while the companion star, Seginus B, is a fainter white dwarf star. Seginus is notable for its relatively high proper motion and its position near the ecliptic, making it a useful reference point for astronomers.

| 4. Deep-Sky Objects

Messier 3 (M3): Messier 3 is a globular cluster located in the constellation Boötes. It is one of the largest and brightest globular clusters in the night sky, containing hundreds of thousands of stars densely packed together in a spherical shape. M3 is estimated to be around 8 billion years old and is located approximately 33,900 light-years away from Earth. It is a popular target for amateur astronomers due to its brightness and relatively easy visibility.

NGC 5466: NGC 5466 is another globular cluster located in Boötes. It is smaller and fainter than Messier 3 but still presents an impressive sight through telescopes. NGC 5466 is estimated to be around 52,000 light-years away from Earth and is notable for its sparse appearance compared to other globular clusters. Its relatively low density of stars makes it an interesting object for study in stellar dynamics and evolution.

NGC 5248: NGC 5248 is a spiral galaxy located in the constellation Boötes. It is approximately 58 million light-years away from Earth and is classified as a Seyfert galaxy, meaning it has an active nucleus that emits intense radiation. NGC 5248 exhibits prominent spiral arms and a bright central bulge, making it a striking sight in telescopic observations. It is a popular target for amateur astronomers interested in galaxy morphology and structure.

NGC 5676: NGC 5676 is an intermediate spiral galaxy located in Boötes. It is approximately 200 million light-years away from Earth and is notable for its elongated shape and prominent spiral arms. NGC 5676 exhibits signs of ongoing star formation in its spiral arms, visible as bright knots of young, hot stars. It is a fascinating object for study in galactic dynamics and evolution.

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