

Capricornus

Subjects: [Astronomy & Astrophysics](#)

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Capricornus, often depicted as a sea-goat in mythology, is a zodiac constellation located in the southern celestial hemisphere. Its name is derived from the Latin words "capra," meaning goat, and "cornu," meaning horn. Capricornus is notable for containing several bright stars and is associated with the winter solstice in the Northern Hemisphere.

astronomy

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1. Introduction

Capricornus, a prominent constellation in the southern celestial hemisphere, holds a significant place in both ancient mythology and contemporary astronomy. Represented as a sea-goat in Greek mythology, Capricornus is associated with the story of the god Pan, who transformed into a fish-tailed goat to escape the monster Typhon. Its name originates from the Latin words "capra" and "cornu," meaning goat and horn, respectively, reflecting its symbolic depiction.

Capricornus is situated in a region of the sky known as the zodiac, which corresponds to the apparent path of the Sun across the celestial sphere over the course of a year. As one of the zodiacal constellations, Capricornus holds astrological significance and is associated with the period from approximately December 22nd to January 19th, marking the winter solstice in the Northern Hemisphere.

The celestial coordinates of Capricornus place it between approximately 20h 00m and 21h 30m of right ascension and between -15° and -30° of declination. This positioning situates Capricornus in close proximity to other zodiacal constellations, such as Sagittarius and Aquarius, making it a familiar sight for observers in both hemispheres. Capricornus is characterized by its distinctive shape, often depicted as a goat with the tail of a fish. Within its boundaries lie several notable stars, including Algedi (Alpha Capricorni), Dabih (Beta Capricorni), and Nashira (Gamma Capricorni), which contribute to the constellation's visibility and identification in the night sky (**Figure 1**).

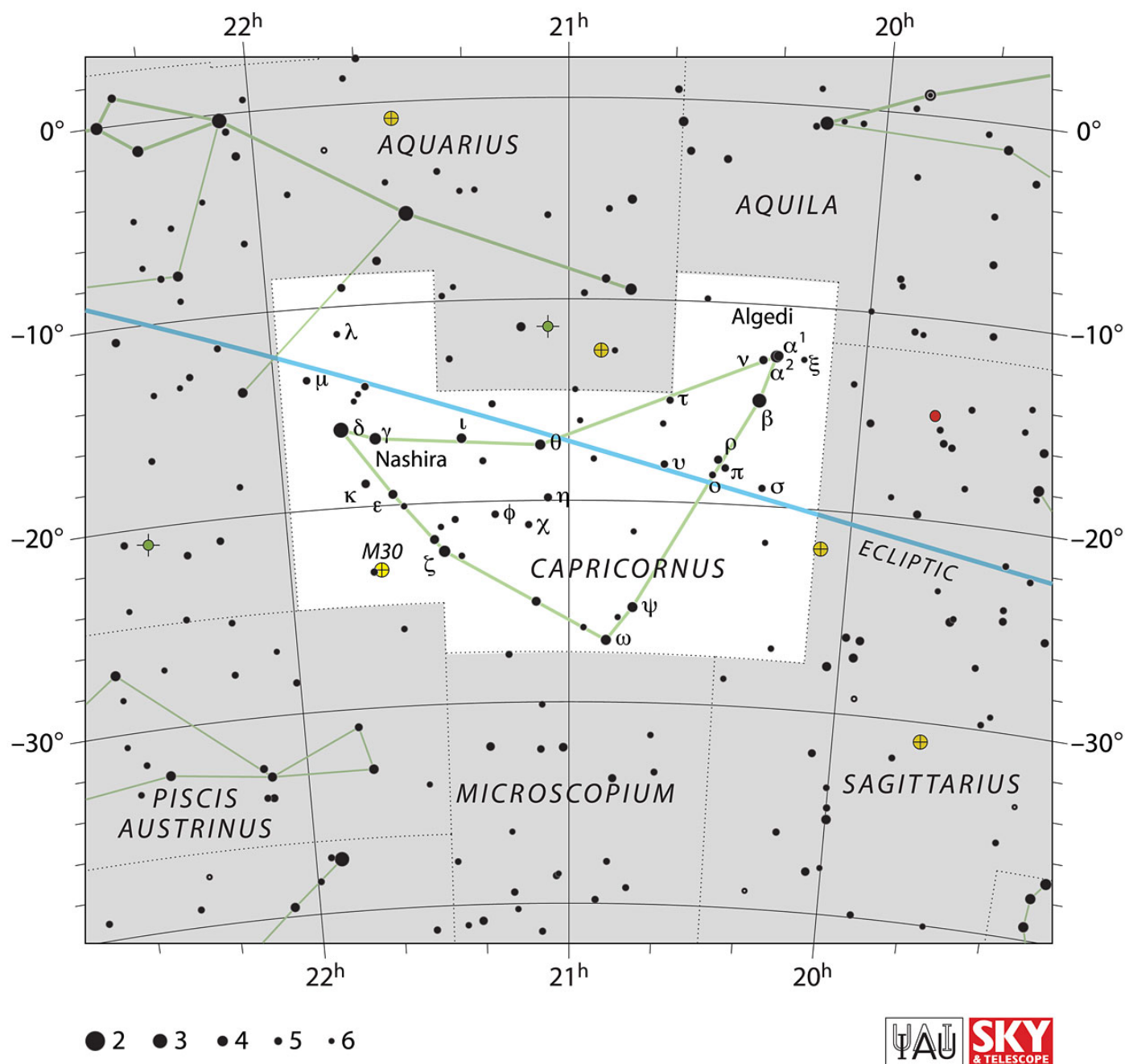


Figure 1. IAU chart of Capricornus. Source: <https://www.iau.org/static/archives/images/screen/cap.jpg>. Credit: IAU and Sky & Telescope. Reproduced under CC BY 4.0 license.

2. Historical Background and Mythology

In Greek mythology, Capricornus is often associated with the story of the god Pan, a half-man, half-goat creature known for his mischievous nature and association with nature and the wilderness. According to one myth, Pan was said to have been born during a time of chaos and conflict among the gods. Seeking refuge from the fearsome monster Typhon, Pan transformed himself into a fish-tailed goat and dove into the Nile River. As a result of his

daring escape, the gods honored Pan by placing him among the stars as the constellation Capricornus. The symbolic fusion of the goat and fish in Capricornus reflects the dual nature of Pan's transformation and the blending of terrestrial and aquatic elements. This imagery is thought to symbolize the cyclical nature of life, with the terrestrial goat representing stability and the aquatic fish symbolizing adaptability and fluidity.

In addition to its association with Pan, Capricornus has connections to other cultural and mythological traditions. In ancient Mesopotamia, the constellation was often associated with the god Ea, who was depicted as a half-goat, half-fish creature and was considered the god of wisdom, water, and fertility. The Babylonians referred to the constellation as the "Goat-Fish" and incorporated it into their celestial observations and astrological practices.

Throughout history, Capricornus has retained its significance as a symbol of strength, adaptability, and resilience. Its prominence in both mythological narratives and astrological interpretations has ensured its enduring presence in human culture, serving as a celestial marker for the passage of time and the changing of the seasons.

3. Notable Stars

Deneb Algedi, also known as δ Capricorni, is a binary star system located in the constellation Capricornus. Its name is derived from the Arabic phrase "Dhanab al-Jady," which translates to "the tail of the goat." The primary component of Deneb Algedi, δ Capricorni A, is a white giant star with a visual magnitude of approximately 2.8. It is classified as a spectral type A5III star and is about 39 times more luminous than the Sun. δ Capricorni A has a companion star, δ Capricorni B, which is a magnitude 9.2 star located at an angular separation of about 5.3 arcseconds from the primary star. Deneb Algedi is approximately 39 light-years away from Earth and is visible to the naked eye under dark sky conditions. It occupies a significant position in the constellation Capricornus, adding to the constellation's overall brightness and visual appeal.

Algedi (Alpha Capricorni): Algedi, also known as Alpha Capricorni, is a binary star system located in the head of the celestial goat. It is composed of two stars: Algedi A and Algedi B. Algedi A is a white giant star with a visual magnitude of approximately 3.58, while Algedi B is a white dwarf star with a visual magnitude of approximately 4.30. These two stars orbit each other at a distance of about 0.1 astronomical units, or roughly the distance between the Earth and the Sun. Algedi is one of the brightest stars in Capricornus and adds to the constellation's overall luminosity.

Dabih (Beta Capricorni): Dabih, also known as Beta Capricorni, is a multiple star system located in the body of the celestial goat. It consists of at least four stars, designated Dabih Major (Beta Capricorni A), Dabih Minor (Beta Capricorni B), Beta Capricorni C, and Beta Capricorni D. Dabih Major is a binary star with a visual magnitude of approximately 3.05, while Dabih Minor is a binary star with a visual magnitude of approximately 6.08. The other components of the system are fainter and less well-studied.

Nashira (Gamma Capricorni): Nashira, also known as Gamma Capricorni, is a bright star located in the southern part of the constellation. It is a blue-white main-sequence star with a visual magnitude of approximately 3.69.

Nashira is relatively close to Earth, with a distance of about 139 light-years. Its name is derived from the Arabic word meaning "bearer of good news," reflecting its significance in ancient cultures.

4. Deep-Sky Objects

Messier 30 (M30): Messier 30 is a globular cluster located in the constellation Capricornus. It is one of the brightest globular clusters in the sky and is easily visible with binoculars or a small telescope. M30 is estimated to be around 13.1 billion years old and contains hundreds of thousands of stars densely packed together in a spherical formation. Its central region is particularly dense, with stars concentrated toward the cluster's core. M30 offers a stunning sight when observed through a telescope, with individual stars resolved against a backdrop of fainter members.

NGC 6907: NGC 6907 is a spiral galaxy located in the constellation Capricornus. It is classified as an intermediate spiral galaxy and is notable for its distinct spiral arms and central bulge. NGC 6907 exhibits intricate structure and detail when observed with larger telescopes, revealing regions of dust lanes, star formation, and stellar clusters. It is situated approximately 125 million light-years away from Earth and is part of the larger Capricornus Galaxy Group, which contains several other galaxies.

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