

Equuleus

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Equuleus, Latin for "the little horse," is one of the 88 modern constellations recognized by the International Astronomical Union. Despite its small size and dim stars, Equuleus holds historical significance, dating back to ancient times when it was known as a separate constellation or asterism. Today, it remains a subtle yet intriguing feature of the night sky, nestled between the larger constellations of Pegasus and Delphinus.

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1. Introduction

Equuleus, Latin for "the little horse," is a constellation located in the northern celestial hemisphere. It is one of the smallest constellations in the night sky, spanning an area of approximately 72 square degrees. Positioned between the larger constellations of Pegasus and Delphinus, Equuleus is often overshadowed by its more prominent neighbors but holds its own significance in astronomical observation and lore. The celestial coordinates of Equuleus lie between approximately 20h 00m and 21h 20m of right ascension and 5° to 15° of declination (**Figure 1**). Equuleus resembles a small horse standing on its hind legs. According to Greek mythology, Equuleus represents the offspring of Pegasus, the winged horse, and Medusa, the Gorgon slain by the hero Perseus. While Equuleus may lack the grandeur of its mythical parent, its presence in the night sky serves as a reminder of the rich tapestry of stories woven into the stars by ancient civilizations.

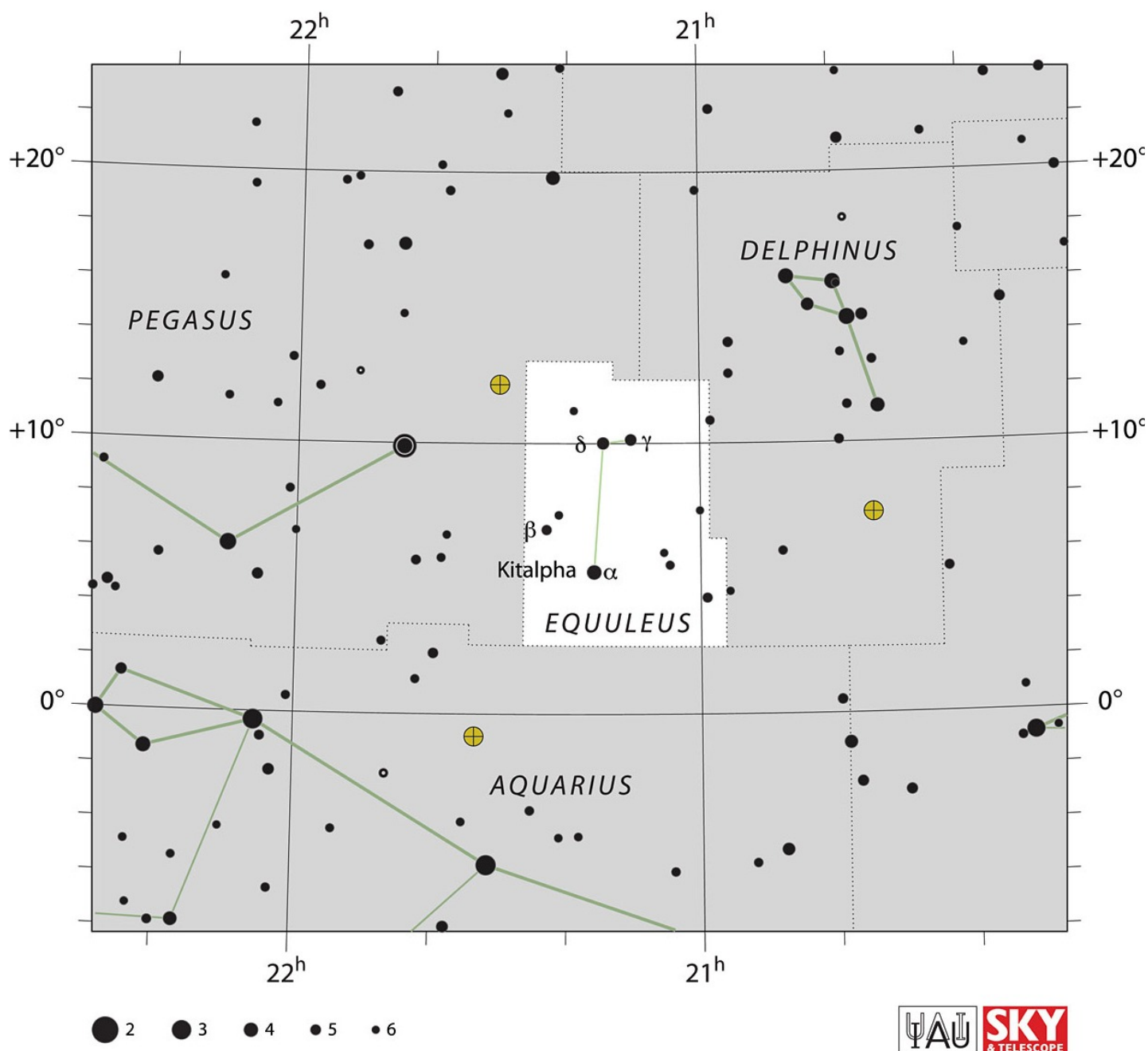


Figure 1. IAU chart of Equuleus. Source: <https://www.iau.org/static/archives/images/screen/aqr.jpg>. Credit: IAU and Sky & Telescope. Reproduced under CC BY 4.0 license.

2. Historical Background and Mythology

In Greek mythology, Equuleus is often associated with the story of Pegasus, the winged horse. According to legend, Pegasus was born from the blood of the Gorgon Medusa when she was slain by the hero Perseus. As Pegasus flew to Mount Olympus, where he became the trusted steed of the gods, he accidentally kicked the ground of Earth, and from that spot emerged a smaller horse, which became known as Equuleus. In another

version of the myth, Equuleus is said to represent the horse Celeris, which belonged to Castor, one of the Gemini twins in Greek mythology. Celeris was renowned for its incredible speed and was often depicted alongside Castor and his twin brother Pollux.

Despite its association with these legendary horses, Equuleus was not originally depicted as a separate constellation in ancient Greece. Instead, it was considered part of the larger constellation Pegasus. However, over time, astronomers began to recognize Equuleus as its own distinct constellation, distinguishing it from its larger equine counterpart.

In terms of historical astronomy, Equuleus has been cataloged by various cultures throughout history. It was included in Ptolemy's *Almagest*, a comprehensive treatise on astronomy written in the 2nd century AD. In medieval Islamic astronomy, Equuleus was also recognized and cataloged by astronomers such as Al-Sufi.

3. Notable Stars

Alpha Equulei (α Equulei): Alpha Equulei, also known as Kitalpha, is the brightest star in the Equuleus constellation. Situated approximately 186 light-years away from Earth, Alpha Equulei is a binary star system composed of a white main-sequence star (Alpha Equulei A) and a fainter companion. The primary star, Alpha Equulei A, shines with a visual magnitude of 3.92, making it easily visible to the naked eye under dark sky conditions. It has a spectral type of A9V and is slightly larger and more luminous than our Sun. The secondary companion orbits Alpha Equulei A with a period of about 88.9 years, adding to the complexity and intrigue of this binary system. The traditional name "Kitalpha" is derived from the Arabic phrase "al-kitāf al-faras," meaning "the horse's shoulder," reflecting its position in the Equuleus constellation.

Delta Equulei (δ Equulei): Delta Equulei is another noteworthy star in Equuleus, located approximately 63 light-years away from Earth. It forms a double star system, with an orange giant primary star (Delta Equulei A) and a fainter companion (Delta Equulei B). The primary star, Delta Equulei A, has a visual magnitude of 4.49 and a spectral type of K2III, indicating that it is larger and more evolved than our Sun. Its distinctive orange hue makes it easily recognizable in the night sky. The secondary companion, Delta Equulei B, has a visual magnitude of approximately 8.69 and orbits the primary star. While Delta Equulei A dominates the system, the presence of the companion adds complexity to this stellar pair, making it an interesting target for observation and study by astronomers.

Gamma Equulei (γ Equulei) is a binary star system located in the Equuleus constellation. It is also known by its traditional name, Kitalpha Borealis. Gamma Equulei is situated approximately 116 light-years away from Earth. Its primary component, Gamma Equulei A, is a yellow-white main-sequence star with a visual magnitude of about 4.69. This star is similar in spectral type to our Sun but is slightly more massive and luminous. The secondary component, Gamma Equulei B, is a fainter star orbiting around Gamma Equulei A. It is much dimmer than the primary star, with a visual magnitude of approximately 11. This companion star is likely a red dwarf, a smaller and cooler type of star that is much less luminous than main-sequence stars like Gamma Equulei A. Gamma Equulei A

and B orbit each other with a period of about 11.3 years. Their separation in the sky varies as they move along their orbital path, leading to changes in their apparent positions as viewed from Earth.

I 4. Deep-Sky Objects

NGC 7015: NGC 7015 is a barred spiral galaxy located in the Equuleus constellation. It is situated approximately 210 million light-years away from Earth. This galaxy exhibits prominent spiral arms that wrap around a central bar-shaped structure, typical of barred spiral galaxies. NGC 7015 has a visual magnitude of around 13.2, making it relatively dim and requiring a moderate-sized telescope for observation.

Stephan's Quintet: Although not entirely within the boundaries of Equuleus, Stephan's Quintet is a famous grouping of five galaxies that includes one member situated in the northern part of the constellation. This galaxy cluster is located approximately 290 million light-years away from Earth. Stephan's Quintet is notable for its intricate interactions between its member galaxies, including tidal distortions, gas stripping, and ongoing star formation triggered by gravitational interactions. Observing Stephan's Quintet requires a telescope with moderate to high magnification under dark sky conditions.

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