

Leo

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Leo, the Lion, is one of the zodiac constellations, known for its distinctive shape resembling a lion's mane and head. It is one of the oldest recognized constellations, dating back to ancient civilizations such as the Mesopotamians, Egyptians, and Greeks. Leo is home to several bright stars and notable deep-sky objects.

Keywords: astronomy ; constellation ; IAU ; zodiac ; star ; galaxy

1. Introduction

Leo, known as the Lion, is a prominent constellation in the northern celestial hemisphere. It is one of the zodiac constellations, positioned along the ecliptic plane through which the Sun, Moon, and planets appear to travel. Leo is renowned for its distinctive shape, resembling a lion's mane and head, and is one of the oldest recognized constellations, dating back to ancient civilizations such as the Mesopotamians, Egyptians, and Greeks.

Leo spans an area of approximately 947 square degrees in the night sky, making it the 12th largest constellation overall. It is bordered by several other constellations, including Cancer to the northwest, Hydra to the southwest, and Virgo to the east. Leo is most prominent during the spring months in the Northern Hemisphere, when it reaches its highest point in the sky. The constellation is home to several bright stars, with its brightest star, Regulus (Alpha Leonis), marking the lion's heart. Regulus is a blue-white main-sequence star located approximately 79 light-years away from Earth. Other notable stars in Leo include Denebola (Beta Leonis), Algieba (Gamma Leonis), and Zosma (Delta Leonis). These stars contribute to Leo's distinctive shape and are easily recognizable in the night sky.

Leo is located in the second quadrant of the northern hemisphere (NQ2) and can be observed between latitudes $+90^\circ$ and -65° . Its right ascension spans from approximately 9 hours to 11 hours, while its declination ranges from about $+15^\circ$ to $+0^\circ$. These celestial coordinates place Leo in an optimal viewing area for observers in the Northern Hemisphere, particularly during the spring months when it is most prominent (**Figure 1**).

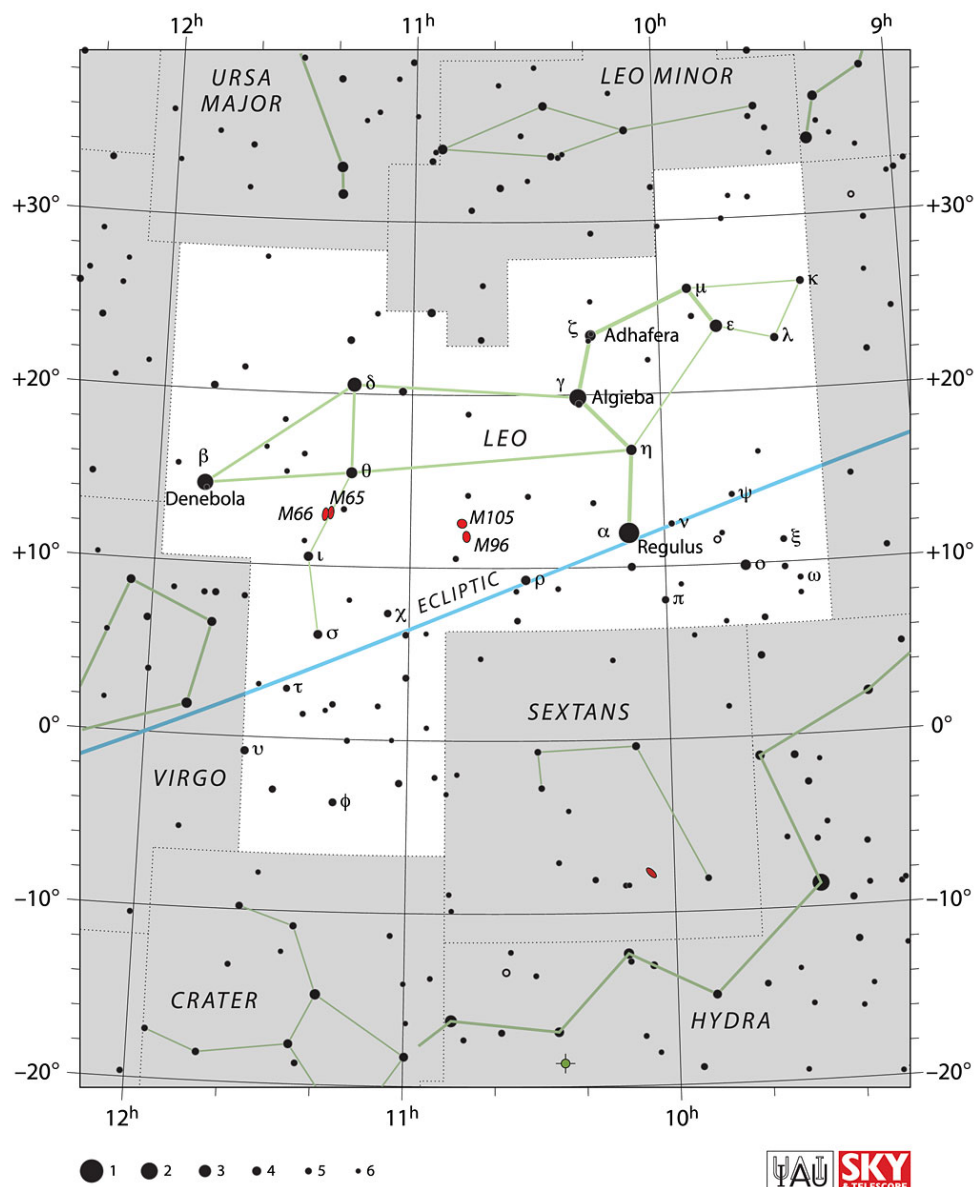


Figure 1. IAU chart of Leo. Source: <https://www.iau.org/static/archives/images/screen/leo.jpg>. Credit: IAU and Sky & Telescope. Reproduced under CC BY 4.0 license.

2. Historical Background and Mythology

In ancient Mesopotamia, Leo was associated with the Sumerian constellation known as "UR.GU.LA," meaning "The Great Lion." The Mesopotamians observed the stars of Leo as part of their celestial divination practices, believing that the movements of the stars influenced the fate of kingdoms and individuals.

The ancient Egyptians also revered Leo and incorporated it into their mythology. They associated the constellation with the goddess Sekhmet, who was depicted as a lioness-headed deity representing power, war, and protection. Sekhmet was considered a fierce protector of the pharaohs and was believed to ward off evil spirits and disease.

In Greek mythology, Leo is often associated with the Nemean Lion, a monstrous creature with an impenetrable golden fur and razor-sharp claws. According to legend, the Nemean Lion terrorized the region of Nemea, causing havoc and devouring livestock and villagers. Heracles (Hercules), one of the greatest heroes of Greek mythology, was tasked with slaying the beast as part of his Twelve Labors. The first labor of Heracles was to kill the Nemean Lion, a seemingly impossible task given the lion's invulnerable hide. Heracles confronted the lion in its cave and, unable to pierce its skin with conventional weapons, strangled it to death using his bare hands. He then skinned the lion using its own claws, creating a cloak of impenetrable armor that he wore as a symbol of his strength and courage. In another version of the myth, Zeus, impressed by the lion's strength and ferocity, placed it among the stars as the constellation Leo to honor its memory. In either case, Leo became a symbol of bravery and heroism, representing the triumph of good over evil and the indomitable spirit of the human will.

In modern astronomy, Leo remains a prominent constellation visible in the night sky from both hemispheres. Its distinctive shape and bright stars make it easily recognizable, and it serves as a point of reference for celestial navigation and observation. Despite the advancements in scientific understanding, the ancient myths and legends associated with Leo continue to resonate with people today, connecting us to our cultural heritage and the mysteries of the cosmos.

3. Notable Stars

Regulus (Alpha Leonis): Regulus is the brightest star in the constellation Leo and one of the brightest stars in the night sky. It is located approximately 79 light-years away from Earth and is classified as a multiple star system consisting of four stars. Regulus is a blue-white main-sequence star, with a visual magnitude of about 1.4, making it easily visible to the naked eye.

Denebola (Beta Leonis): Denebola is the second brightest star in Leo and is located approximately 36 light-years away from Earth. It is a white main-sequence star with a visual magnitude of about 2.1, making it one of the brighter stars visible in the night sky. Denebola is notable for its rapid rotation, which causes it to flatten slightly at the poles.

Algieba (Gamma Leonis): Algieba is a binary star system located approximately 130 light-years away from Earth. It consists of two giant stars, Algieba A and Algieba B, which orbit each other and have similar spectral types. The primary component, Algieba A, has a visual magnitude of about 2.2, while the secondary component, Algieba B, has a magnitude of about 3.6.

Zosma (Delta Leonis): Zosma is a white subgiant star located approximately 58 light-years away from Earth. It has a visual magnitude of about 2.6 and is one of the brighter stars in Leo. Zosma is known for its relatively high proper motion, indicating that it moves across the sky at a faster rate compared to other stars.

4. Deep-Sky Objects

Messier 65 (M65): Messier 65 is a spiral galaxy located approximately 35 million light-years away from Earth. It is part of the Leo Triplet, a group of galaxies that also includes Messier 66 and NGC 3628. M65 exhibits prominent spiral arms and is a popular target for amateur astronomers due to its relatively bright appearance.

Messier 66 (M66): Messier 66 is another spiral galaxy in the Leo Triplet, located approximately 36 million light-years away from Earth. It is characterized by its asymmetric spiral arms and active star-forming regions, which are visible as bright knots of light.

M95 and M96 are both spiral galaxies 20 million light-years from Earth. Though they are visible as fuzzy objects in small telescopes, their structure is only visible in larger instruments. M95 is a barred spiral galaxy. **M105** is about a degree away from the M95/M96 pair; it is an elliptical galaxy of the 9th magnitude, also about 20 million light-years from Earth

NGC 2903: NGC 2903 is a barred spiral galaxy located approximately 30 million light-years away from Earth. It is notable for its bright nucleus and well-defined spiral arms, which contain regions of intense star formation. NGC 2903 is considered a member of the Leo Group of galaxies and is a popular target for astrophotographers due to its relatively large angular size.