

# Leo Minor

Subjects: Astronomy & Astrophysics

Contributor: Encyclopedia Editorial Office

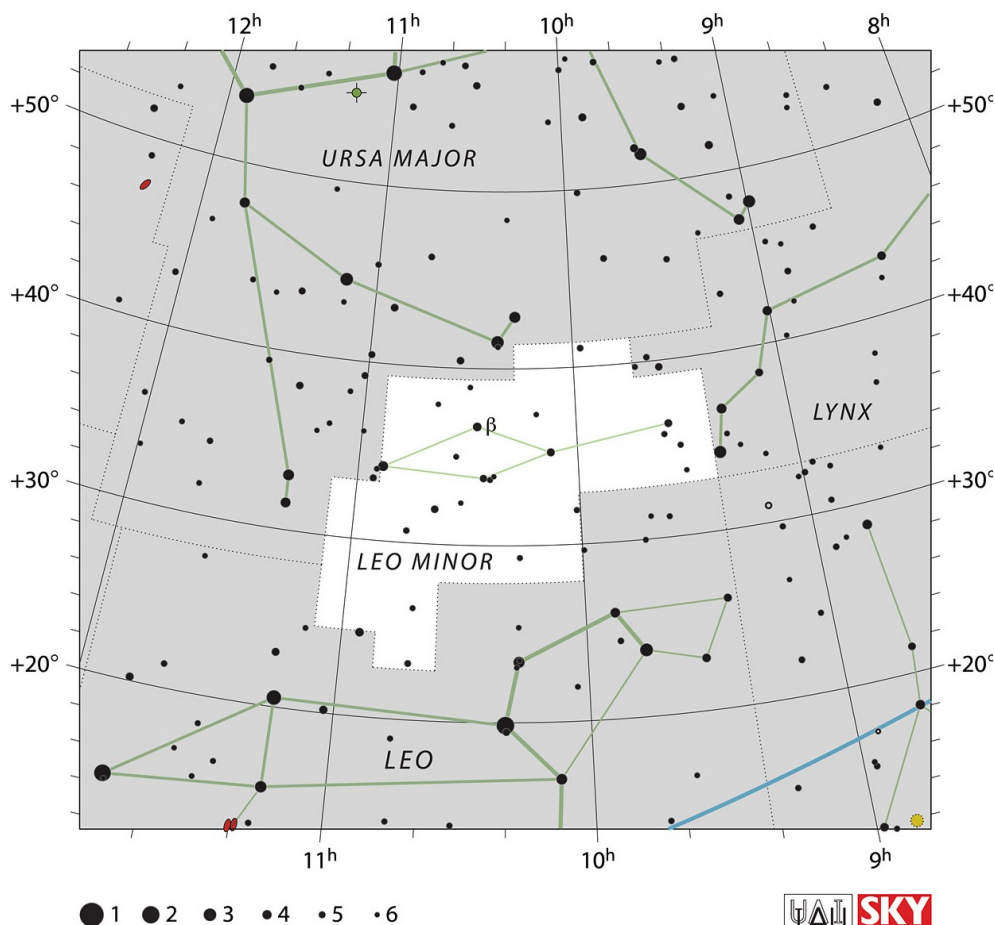
Leo Minor, the Lesser Lion, is a small constellation located in the northern celestial hemisphere. Its name is Latin for "the smaller lion", in contrast to Leo, the larger lion. It lies between the larger and more recognizable Ursa Major to the north and Leo to the south.

Keywords: astronomy ; constellation ; IAU ; star ; galaxy

## 1. Introduction

Leo Minor, Latin for "the Lesser Lion," is a constellation situated in the northern celestial hemisphere. Occupying an area of approximately 231 square degrees, Leo Minor is relatively small compared to its neighboring constellations. It is bordered by Ursa Major to the north, Lynx to the east, Leo to the south, and Ursa Minor to the west. Leo Minor is best observed from latitudes between  $+90^\circ$  and  $-40^\circ$  and is visible to observers located in both the Northern and Southern Hemispheres. Its right ascension extends from approximately 9 hours to 11 hours, while its declination ranges from about  $+30^\circ$  to  $+45^\circ$  (**Figure 1**). These celestial coordinates position Leo Minor in an optimal viewing area for observers in the mid-northern latitudes during the spring and summer months.

Despite its relatively small size, Leo Minor contains several notable stars, including 46 Leonis Minoris (Praecipua) and  $\beta$  Leonis Minoris. Praecipua is the brightest star in the constellation, with a visual magnitude of approximately 4.2. Additionally, Leo Minor hosts a few deep-sky objects, such as the galaxy NGC 3003 and the galaxy group known as Robert's Quartet.



## 2. Historical Background and Mythology

Leo Minor, the Lesser Lion, is a constellation with a relatively short historical background and minimal mythology compared to other more prominent constellations. It was first introduced in the 17th century by the Polish astronomer Johannes Hevelius, who created several new constellations in the northern celestial hemisphere.

The name "Leo Minor" suggests a connection to the larger and more famous constellation Leo, the Lion. However, Leo Minor does not appear in classical mythology, nor is it associated with any specific mythological figures or stories. Instead, its name reflects its position in relation to Leo, appearing as a smaller and subordinate lion in the sky.

The lack of mythology surrounding Leo Minor does not diminish its astronomical significance. Instead, it serves as a reminder of the evolving nature of constellation development and the contributions of astronomers like Hevelius to the field of celestial cartography. Leo Minor, along with other constellations introduced during the same period, represents the efforts of early astronomers to organize and catalog the night sky.

Despite its relatively recent introduction, Leo Minor has become a recognized part of the modern constellation map. It serves as a point of interest for astronomers and stargazers, offering a unique area of the sky to explore and observe. While it may not have the storied history or mythological associations of other constellations, Leo Minor contributes to our understanding of the universe and highlights the ongoing evolution of astronomical knowledge.

## 3. Notable Stars

**46 Leonis Minoris**, also named **Praecipua**, derived from the Latin for "the Chief", is the brightest star in the constellation of Leo Minor. The name may originally have referred to 37 Leonis Minoris, and later mistakenly transferred to this star. The IAU Working Group on Star Names (WGSN) approved the name *Praecipua* for this star on 30 June 2017 and it is now so included in the List of IAU-approved Star Names. Praecipua is a red clump giant. Based upon parallax measurements, its distance from the Sun is approximately 95 light-years. It is a suspected variable with an amplitude of about 0.05 magnitudes.

**Beta Leonis Minoris**, Latinized from **β Leonis Minoris**, is a binary star in the constellation of Leo Minor. It has an overall apparent visual magnitude of approximately 4.2. The primary is a giant star of spectral class G9III and apparent magnitude of 4.4. It has around double the mass, 7.8 times the radius and 36 times the luminosity of the Earth's Sun. Separated by 0.1 to 0.6 second of arc from the primary, the secondary is a yellow-white main sequence star of spectral type F8. The two orbit around a common centre of gravity every 38.62 years, and lie 154 light-years (47 parsecs) away from the Solar System.

Although it is the only star in Leo Minor with a Bayer designation, it is only the second brightest star in the constellation (the brightest is 46 Leonis Minoris). Leo Minor does not have a star designated Alpha.

## 4. Deep-Sky Objects

**NGC 3432:** NGC 3432 is a spiral galaxy located in Leo Minor, approximately 63 million light-years away from Earth. It is classified as an SAB(rs)bc galaxy, indicating a barred spiral structure with loosely wound arms and moderate to strong star formation activity. NGC 3432 is notable for its asymmetric spiral arms and a bright central region, making it an interesting target for astrophotography and visual observation with amateur telescopes.

**NGC 3344:** NGC 3344 is another spiral galaxy situated in Leo Minor, approximately 22 million light-years away from Earth. It is classified as an SA(s)cd galaxy, indicating a spiral structure with loosely wound arms and ongoing star formation in its disk. NGC 3344 exhibits a distinct spiral pattern with a bright nucleus and faint outer arms, making it an appealing target for amateur astronomers and researchers studying galaxy morphology and evolution.

**Hanny's Voorwerp:** Hanny's Voorwerp (Dutch for "Hanny's Object") is an astronomical object discovered by Dutch schoolteacher Hanny van Arkel in 2007 as part of the Galaxy Zoo citizen science project. It is located in the constellation Leo Minor, specifically near the galaxy IC 2497. This object gained attention due to its unusual appearance and its association with the nearby galaxy. Hanny's Voorwerp appears as a greenish-blue mass of gas and dust, illuminated by the light from the nearby galaxy IC 2497. It is believed to be a quasar light echo or ionization echo, caused by the interaction between the galaxy and a nearby active galactic nucleus (AGN). The AGN emits intense radiation, which

ionizes the gas in Hanny's Voorwerp, causing it to emit light. The discovery of Hanny's Voorwerp has provided valuable insights into the processes of galaxy formation and evolution. It offers astronomers a unique opportunity to study the effects of AGN activity on the surrounding interstellar medium and to better understand the relationship between galaxies and their environments.

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