

## Messier 30 Globular Cluster in Capricornus

Messier 30 (also known as M30 or NGC 7099) is a globular cluster of stars in the southern constellation of Capricornus. It was discovered by the French astronomer **Charles Messier** in 1764, who described it as a circular nebula without a star. In the New General Catalogue, compiled during the 1880s, it was described as a "remarkable globular, bright, large, slightly oval."

### OBSERVATION DATA (J2000 EPOCH)

Class V Constellation Capricornus

Right ascension 21h 40m 22.12s

Declination  $-23^{\circ} 10' 47.5s$

Distance  $27.14 \pm 0.65$  kly ( $8.3 \pm 0.20$  kpc)

Apparent magnitude (V) +7.7

Apparent dimensions (V) 12'.0

### PHYSICAL CHARACTERISTICS

Mass  $1.6 \times 10^5 M_{\odot}$

Metallicity  $[Fe/H] = -2.27[7]$  dex

Estimated age 12.93 Gyr

Other designations M30, NGC 7099, GCI 122

This cluster can be easily viewed with a pair of 10x50 binoculars,[9] forming a patch of hazy light some 4 arcminutes wide that is slightly elongated along the east–west axis. With a larger instrument, individual stars can be resolved and the cluster will cover an angle of up to 12 arcminutes across with a compressed core one arcminute wide. It is best observed around August.



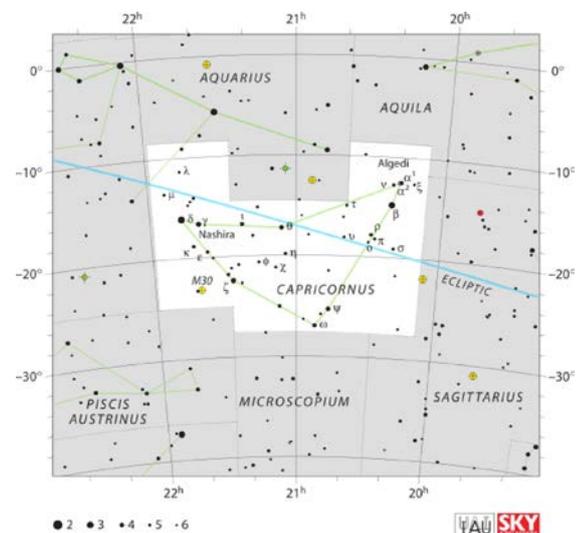
M30 is located at a distance of about 27,100 light-years from Earth, and is about 93 light-years across. The estimated age is roughly 12.93 billion years and it has a combined mass of about 160,000 times the mass of the Sun. The cluster is following a retrograde orbit through the inner galactic halo, suggesting that it was acquired from a satellite galaxy rather than forming within the Milky Way. It is currently located at a distance of about 22.2 kly (6.8 kpc) from the centre of the galaxy, compared to an estimated 26 kly (8.0 kpc) for the Sun.

The M30 cluster has passed through a dynamic process called core collapse and now has a concentration of mass at its core of about a million times the Sun's mass per cubic parsec. This makes it one of the highest density regions in the Milky Way galaxy. Stars in such close proximity will experience a high rate of interactions that can create binary star systems, as well as a type of star called a blue straggler that is formed by mass transfer. A process of mass segregation may have caused the central region to gain a greater proportion of higher mass stars, creating a colour gradient with increasing blueness toward its middle.

Capricornus is one of the constellations of the zodiac. Its name is Latin for "horned goat" or "goat horn" or "having horns like a goat's", and it is commonly represented in the form of a sea-goat: a mythical creature that is half goat, half fish. It is one of the 88 modern constellations, and was also one of the 48 constellations listed by the 2nd century astronomer **Ptolemy**. Under its modern boundaries it is bordered by Aquila, Sagittarius, Microscopium, Piscis Austrinus, and Aquarius.



**The constellation is located in an area of sky called the Sea or the Water, consisting of many water-related constellations** such as Aquarius, Pisces and Eridanus. **It is the smallest constellation in the zodiac.**



AK, with EarthSky and Wikipedia Notes