

## MESSIER 22, NGC 6656

Planetary Nebula in the Constellation Sagittarius

Right ascension 18h 36m 23.94s

Declination  $-23^{\circ} 54' 17.1$

Distance  $10.6 \pm 1.0$  kly ( $3 \pm 0.3$  kpc)

Apparent magnitude (V) +5.1

Apparent dimensions (V) 32 arcmins

Mass  $2.9 \times 10^5 M_{\odot}$

Radius  $50 \pm 5$  ly

Estimated age 12 Gyr

### NOTABLE FEATURES

One of four globulars known to contain a planetary nebula

Other designations NGC 6656, GCI 99

Messier 22 (also known as M22 or NGC 6656) is an elliptical globular cluster in the constellation Sagittarius, near the Galactic bulge region. **It is one of the brightest globulars visible in the night sky.**

### HISTORY

**M22 was one of the first globulars to be discovered, on August 26, 1665 by Abraham Ihle and it was included in Charles Messier's catalogue of comet-like objects on June 5, 1764.**

It was also one of the first globular clusters to be carefully studied, first by **Harlow Shapley** in 1930, who discovered roughly 70,000 stars and found it had a dense core. Then **Halton Arp** and **William G. Melbourne** continued studies in 1959. Because of the large colour spread of its red giant branch (RGB) sequence, which is similar to that observed in Omega Centauri, it became the object of intense scrutiny starting in 1977 with **James E. Hesser** et al.

### LOCATION

**M22 is located just south of the Ecliptic, and northwest of Lambda Sagittarii (Kaus Borealis), the northernmost star (and tip of the lid) of the "Teapot" asterism.**

### CHARACTERISTICS

With amateur telescopes M22 is one of the nearer globular clusters to Earth at a distance of about 10,600 light-years away. It spans 32' on the sky which translates to a spatial diameter of  $99 \pm 9$  light-years. 32 variable stars have been recorded in M22. It is projected in front of the galactic bulge and is therefore useful for its microlensing effect on the background stars in the bulge.

**Two black holes of between 10 and 20 solar masses each have been discovered in this globular cluster. But it is estimated that there could be a total 5 black holes within M22.** The Interactions between stars and black holes could explain the unusually large and dense core of the cluster.



This image shows the centre of the globular cluster Messier 22, also known as M22, as observed by the NASA/ESA Hubble Space Telescope. Globular clusters are spherical collections of densely packed stars, relics of the early years of the Universe, with ages of typically 12 to 13 billion years. This is very old considering that the Universe is only 13.8 billion years old. **Messier 22 is one of about 150 globular clusters in the Milky Way and at just 10 000 light-years away it is also one of the closest to Earth.** It was discovered in 1665 by **Abraham Ihle**, making it one of the first globulars ever to be discovered. This is not so surprising as it is one of the brightest globular clusters visible from the northern hemisphere, located in the constellation of Sagittarius, close to the Galactic Bulge — the dense mass of stars at the centre of the Milky Way. The cluster has a diameter of about 70 light-years and, when looking from Earth, appears to take up a patch of sky the size of the full Moon. Despite its relative proximity to us, the light from the stars in the cluster is not as bright as it should be as it is dimmed by dust and gas located between us and the cluster. As they are leftovers from the early Universe, globular clusters are popular study objects for astronomers. M22 in particular has fascinating additional features: six planet-sized objects that are not orbiting a star have been detected in the cluster, it seems to host two black holes, and the cluster is one of only three ever found to host a planetary nebula — a short-lived gaseous shells ejected by massive stars at the ends of their lives.

