

Messier 6, the Butterfly Cluster

and as NGC 6405) is an open cluster of stars in the constellation of Scorpius. Its name derives from the vague resemblance of its shape to a butterfly.

The first astronomer to record the Butterfly Cluster's existence was **Giovanni Battista Hodierna** in 1654.

However, **Robert Burnham, Jr.** has proposed that the 1st century astronomer **Ptolemy** may have seen it with the naked eye while observing its neighbour, the Ptolemy Cluster (M7). **Charles Messier catalogued the cluster as M6 in 1764 but it wasn't till the 20th century that star counts, distance, and other properties were measured.**

CHARACTERISTICS

Most of the bright stars in this cluster are hot, blue B-type stars but the brightest member is a K-type orange giant star, *BM Scorpis*, which contrasts sharply with its blue neighbours in photographs. *BM Scorpis*, is classed as a semiregular variable star, its brightness varying from magnitude +5.5 to magnitude +7.0.

Estimates of the Butterfly Cluster's distance have varied over the years, with a mean value of around 1,600 light-years, giving it a spatial dimension of some

12 light years. Modern measurements show its total visual brightness to be magnitude 4.2.

M6 is described by Burnham as a "charming group whose arrangement suggests the outline of a butterfly with open wings." The first certain reported observer was Giovanni Batista Hodierna who has documented it in 1654; but Hodierna's records did not become generally known. Thus, **Philippe Loys de Chéseaux** independently rediscovered it in 1745-46, and was the first to recognize it as "a very fine star cluster." **Nicholas Louis de Lacaille** included it in his catalogue of 1751-52 as Lac III.12, and **Charles Messier eventually catalogued it on May 23, 1764.**

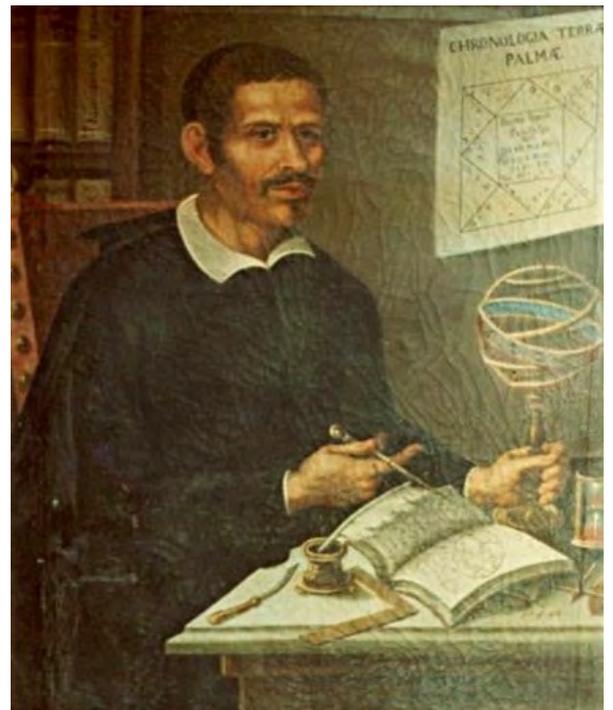
Ake Wallenquist, in 1959, has identified about 80 cluster members in M6, spread over a region about 54 arcmin in diameter. The main portion of the cluster fills a field of about 25' angular diameter. The distance of M6 was estimated by **Rohlf et.al.** at about 2000 light-years, a value also given by **Mallas/Kreimer** and in the Sky Catalogue 2000.0, but Burnham reports that newer studies have shown that due to absorption effects, the true distance may be smaller, and cites values of 1300 to 1470 light-years; **Kenneth Glyn Jones** has 1304. More modern values are given by **Archinal/Hynes** and **WEBDA** as 1,584 and 1,588 light-years, respectively; we adopt here an approximate value of 1,600 light-years here.

Given this distance, the apparent diameter of this star cluster of 25' corresponds to a linear extension of some 12 light-years, with extensions covering 25 light-years. The average density has been estimated at 0.6 star per cubic parsec. M6's age has been estimated at 100 million years according to Burnham. Modern sources agree about the total visual brightness of M6 at about 4.2 magnitudes, while older estimates, done by northern observers, had it notably fainter at about 5.3 mag.

The variable star *BM Scorpis* is the left most of the 4 bright stars forming the remarkable quadrangle of approximate parallelogram shape in our photo above.



To some, the outline of the open cluster of stars M6 resembles a butterfly. M6 spans about 20 light-years and lies about 2,000 light years distant. It can best be seen in a dark sky with binoculars towards the constellation of Scorpius, covering about as much of the sky as the full moon. Like other open clusters, M6 is composed predominantly of young blue stars, although the brightest star is nearly orange. M6 is estimated to be about 100 million years old. Determining the distance to clusters like M6 helps astronomers calibrate the distance scale of the universe.



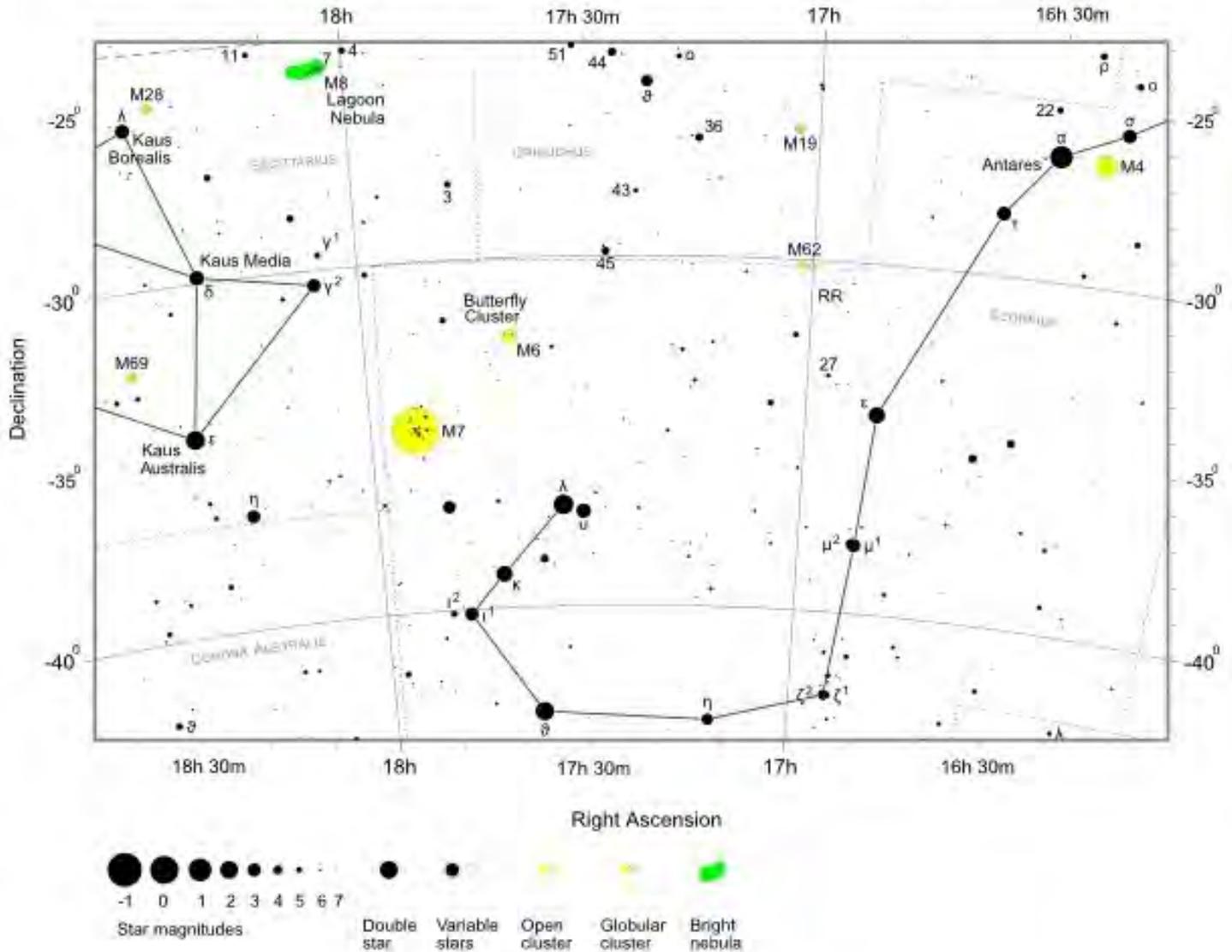
Giovanni Battista Hodierna (April 13, 1597 – April 6, 1660) was an Italian astronomer at the court of the Duke of Montechiaro. He compiled a catalogue of some 40 entries, including at least 19 real and verifiable nebulous objects that might be confused with comets.

Hodierna was born in Ragusa, (Sicily). He died in Palma di Montechiaro. His work anticipated Messier's catalogue, but had little impact at the time. Messier seems not to have known of it.

Of all the Messier items, M6 is situated at the closest angular distance from the Galactic Centre, which is located in the constellation Sagittarius very near to the 3-constellation edge of Sagittarius, Scorpius and Ophiuchus.

Messier Finder Chart for M6 Butterfly Cluster and M7

Also shown M4, M8 Lagoon Nebula, M19, M28, M62 and M69



The Butterfly Cluster, M6, is found between the constellations Scorpio and Sagittarius, or more exactly, between the Scorpio's Stinger Tail and the Spout of the Sagittarius Teapot asterism.

On the Finder map above the stars *Kaus Borealis* (north), *Kaus Media* and *Kaus Australis* (south) are part of the Teapot and form the bow (*Kaus* in arabic) of Sagittarius constellation.

AK, with EarthSky and Wikipedia Notes