

Objects of the Month — Ophiuchus



TARGETS FOR EVERY LEVEL OF OBSERVER

Sept—2012

Finder chart

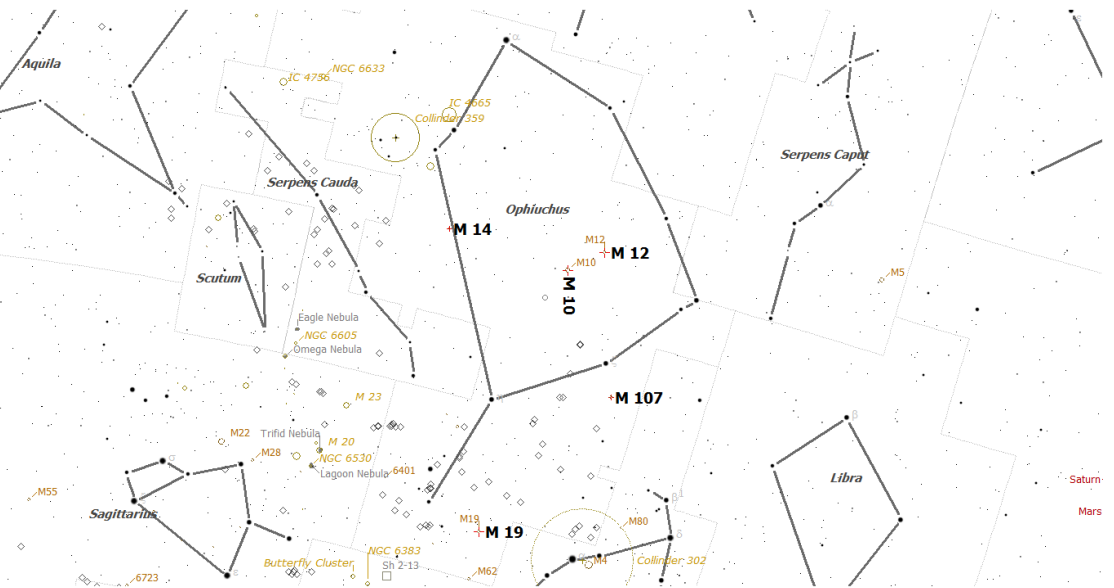
Ophiuchus is an easily recognizable summer-time constellation. It is situated to the north of Scorpio and Sagittarius. The name of the constellation comes from the Greeks and means "Serpent Bearer." The serpent in this case are the constellations Serpens Cauda and Serpens Caput.

Ophiuchus lies between us and the central bulge of our galaxy. For this reason it is the home of over twenty globular clusters. It is second only to Sagittarius in globular cluster.

Globular clusters are an interesting group of galactic structures. These clusters are totally void of all dust and because of this there are no active stellar development within the cluster. The stars within the cluster contain very low levels of metals. Metals are considered anything heavier than helium. This tells us that these stars formed at a time when there was very little metals in the universe which means these stars are extremely old.

These globulars orbit the central bulge of our galaxy in what we call the halo region. There are around 160 known globulars that are gravitationally bound to our galaxy. The origin of these clusters is still in debate. Popular theories suggest that they are cores of dwarf galaxies that have become bound to our galaxy. What is known is that most galaxies do have these globulars orbiting them. I have seen some in the Andromeda galaxy under very dark skies and with the aid of a good map.

There seems to be a relationship between



the size of the galaxy and the number of globulars that orbit it. For example, the super galaxy M87 in Virgo has over 2,000 globulars circling it.

The first globular, M22, was identified, not by Charles Messier, but by German astronomer Abraham Ihle in 1665. Messier was the first to actually resolve the globulars into individual stars, starting with M4 in Scorpio.

Shapely was the first to estimate a distance to the globulars utilizing the RR Lyra variable stars. His estimates led to the first estimate of the size of our galaxy and placed our sun far from the center of the galaxy.

So, when observing globulars there are several things to look for. First you can estimate the size of the glob by knowing the field of view of your eyepiece.

Second, look for how concentrated the cluster is. Shapely assigned numbers from I to XII to indicate the concentration of the cluster with I being the most concentrated. M13, in Hercules is a Class V cluster, while M4 in Scorpio is a Class IX. M55 is a

highly concentrated Class I cluster while Palomar 12 is a Class XII and could be mistaken for an open cluster.

Another thing you can observe is how resolvable the stars are. On a really clear night and with good optics it is possible to resolve stars down to the core in a Class V type cluster.

The globbs that I picked this month are all easily observable. Ophiuchus is high in the summertime sky and so these guys are in a good position to observe through to the end of September.

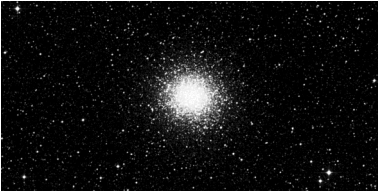
If you enjoy these ones, you can get a list of more globbs from the Astronomical League at http://www.wro.org/scodova/RNGC_List_by_ALGCOC_RA.pdf. This is a list of 190 galactic and exogalactic globbs that should keep you busy for a while.

Clear Skies;

rw

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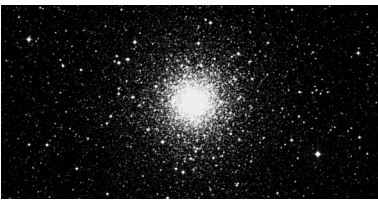
M14



We start our journey this month with M14, located about a third of the distance between gamma and eta Ophiuchus. Messier discovered this globular in 1774. This is a 7.6 mag Class VIII

globular measuring 11' across. M14 has the unique status of being only one of two globular clusters which has been observed to contain a nova. Total mass of the cluster is about 1 million solar masses.

M10



Our next stop is M10. Discovered by Messier in 1764, it lies on a line about two thirds of the distance between alpha and zeta Ophiuchus.

It is a Class VII glob that shines at a magnitude 6.6

which makes it a good target for binoculars. This cluster measures 20' across with a total mass of 225,000 solar masses.

With my 10" reflector I could resolve stars down to the core

under dark skies.

M12



M12 is about 2' west of M10. This is another bright glob coming in at 6.1 mag. It has a slightly smaller tidal diameter of 16' and is less concentrated than the previous targets giving it a Class X

Shapely designation. This cluster is much less massive at 87,000 solar masses.

I estimated the diameter at about 3.2 minutes, and could resolve 6 to 12 stars on edge. My averted vision re-

vealed more towards the central region.

M107



M107 lies about 2 degrees south of Zeta Ophiuchus. This is a Class X cluster with a visual magnitude of 7.8. It was discovered by Mechain in 1782. It has a total mass of only about 182,000 solar

masses.

This is not as nice as some of the other globs on our list as it is smaller at 13 minutes and it is less concentrated.

M19



Our last stop tonight is M19 which lies about a third of the way between Theta Oph and Alpha Sco. Messier discovered this cluster in 1764.

This is a mag 6.8 Class VIII

cluster with a tidal diameter of 17 minutes.

This is another one of the massive clusters with over 1,000,000 solar masses.

Pictures in visible light show this cluster somewhat flattened. This is caused by intervening dust blocking some of the light on the eastern side of the cluster.