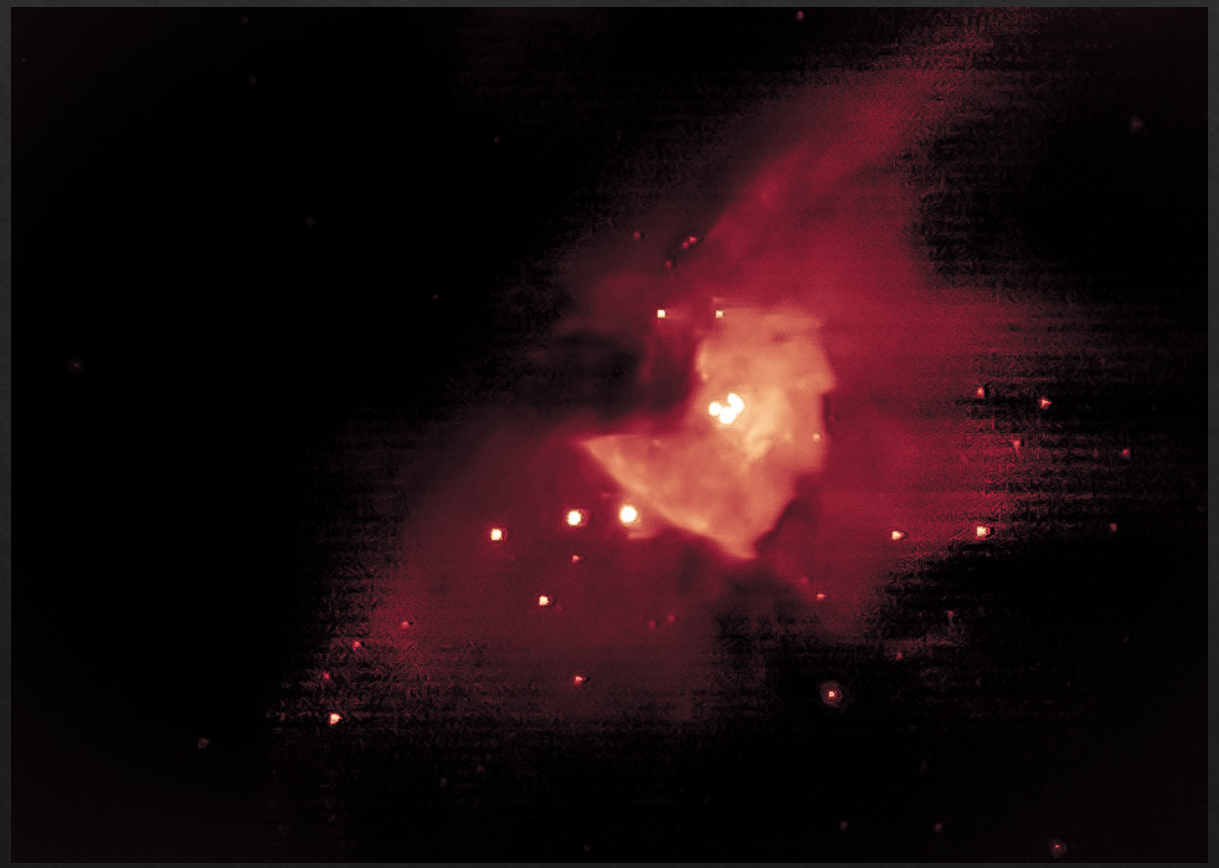
Messier Objects

By Shaun Sager

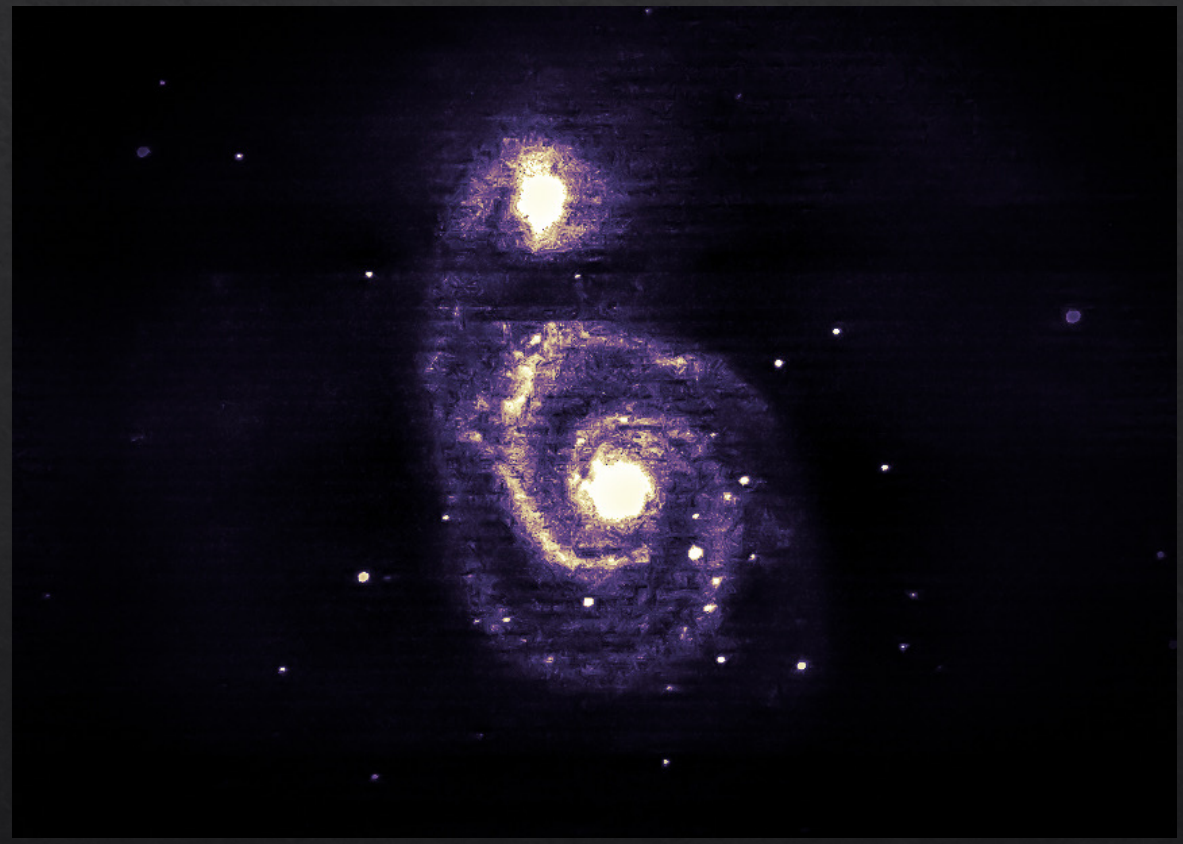
M42



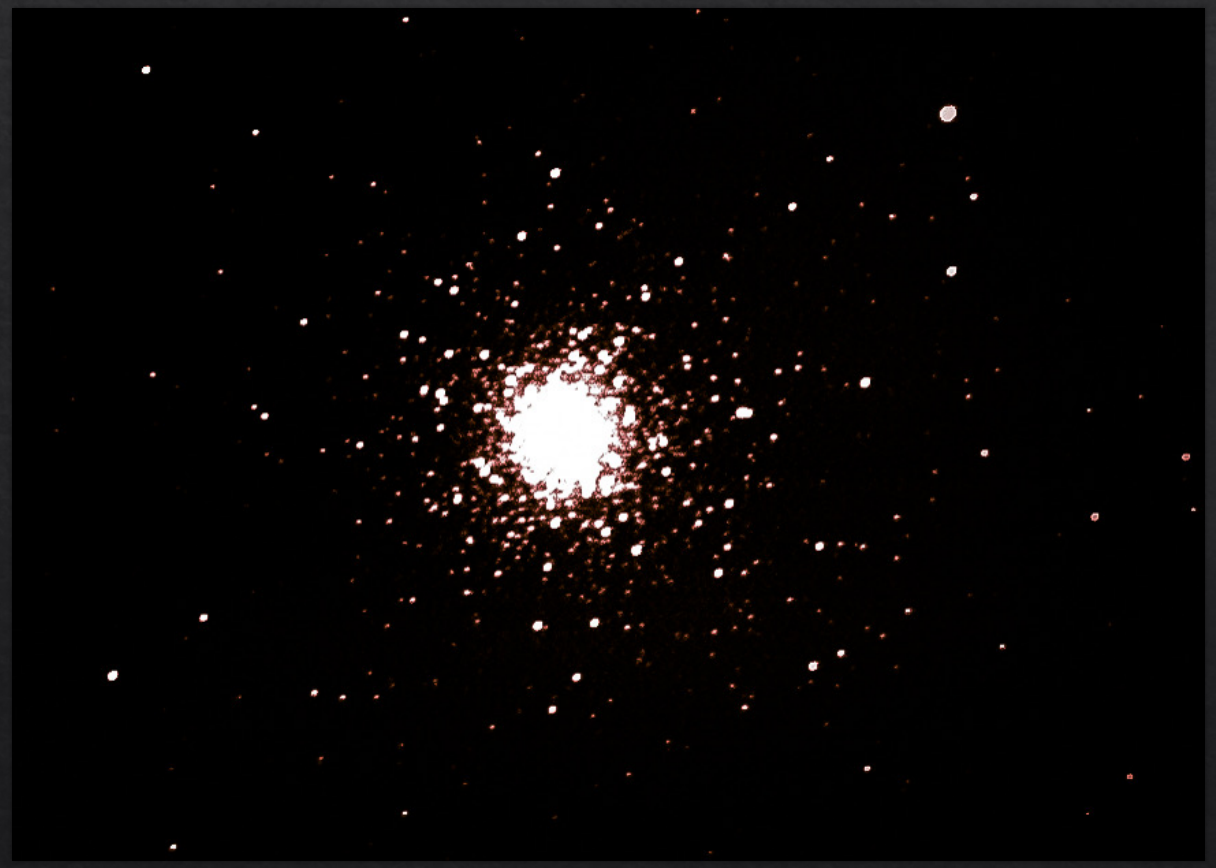
- M42, better known as the ‘Orion Nebula,’ is the nearest star forming region to Earth, at a distance of approximately 1500ly. The Trapezium cluster (bright center concentration) has some of the Galaxy's youngest stars, most of which are O & B spectral class giants less than 2mil years old. The entire structure is about 100ly across and is among the brightest of all the Messier objects.

M51

- The Whirlpool Galaxy (M51) is a grand design spiral galaxy in the constellation Canes Venatici some 23million light years away. The face on spiral arms have made the galaxy an extensive source of research for astronomers in understanding the nature of spiral galaxy structure. The Whirlpool is in the process of a 1Billion year merger with companion Galaxy M51B.



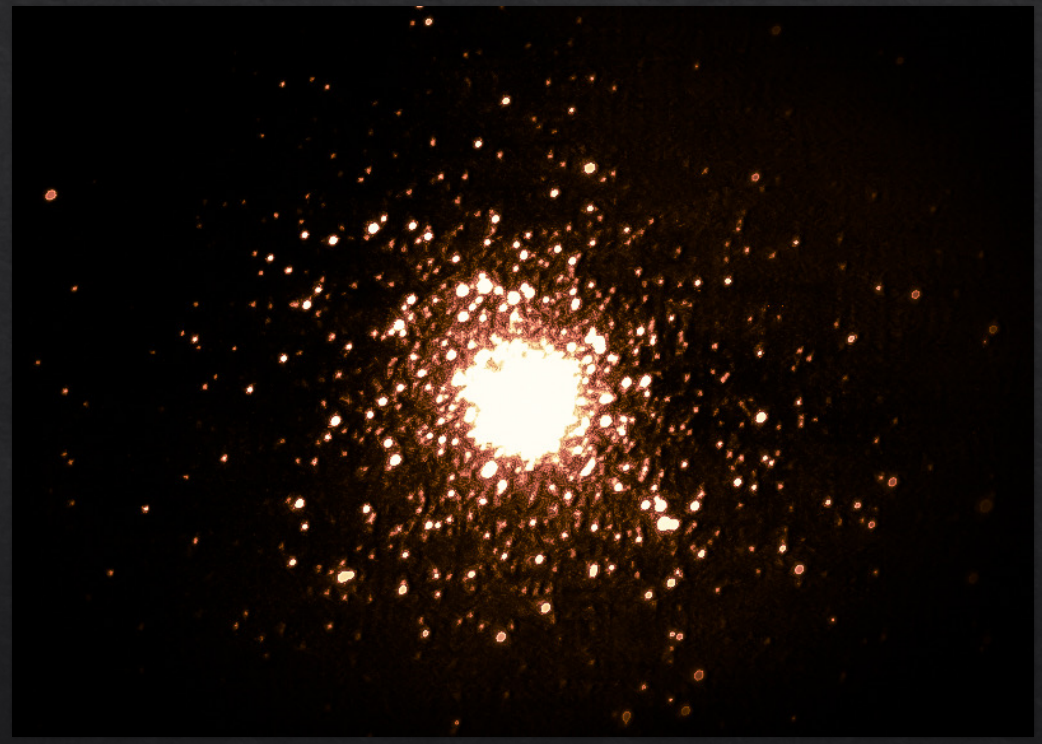
M03



- M03 was the first object in the Messier catalog actually spotted by Charles Messier, in 1764. Originally mistaken as a Nebula, William Herschel was later able to resolve individual stars leading Astronomers to eventually classify M03 as a ‘Globular’ Cluster. Containing more than 500,000 stars, M03 is the largest cluster in the Milky Way Galaxy and contains a staggering 274 variable stars—also a record. The metallicity of the cluster (3.2-4.6% solar concentration) is relatively high among globular clusters making it an Ooosterhoff Type I Cluster.

M05

- Located some 24,000 light years from Earth in the galactic ‘Halo’, the M05 Globular Cluster is among the largest structures in the galaxy. At upwards of 11 billion years in age, it is likely older than the Milky Way itself. M05 may contain upwards of 100,000 stars, of which 105 have been classified as ‘variables.’ In 1997 two millisecond pulsars were discovered in the cluster.



M46

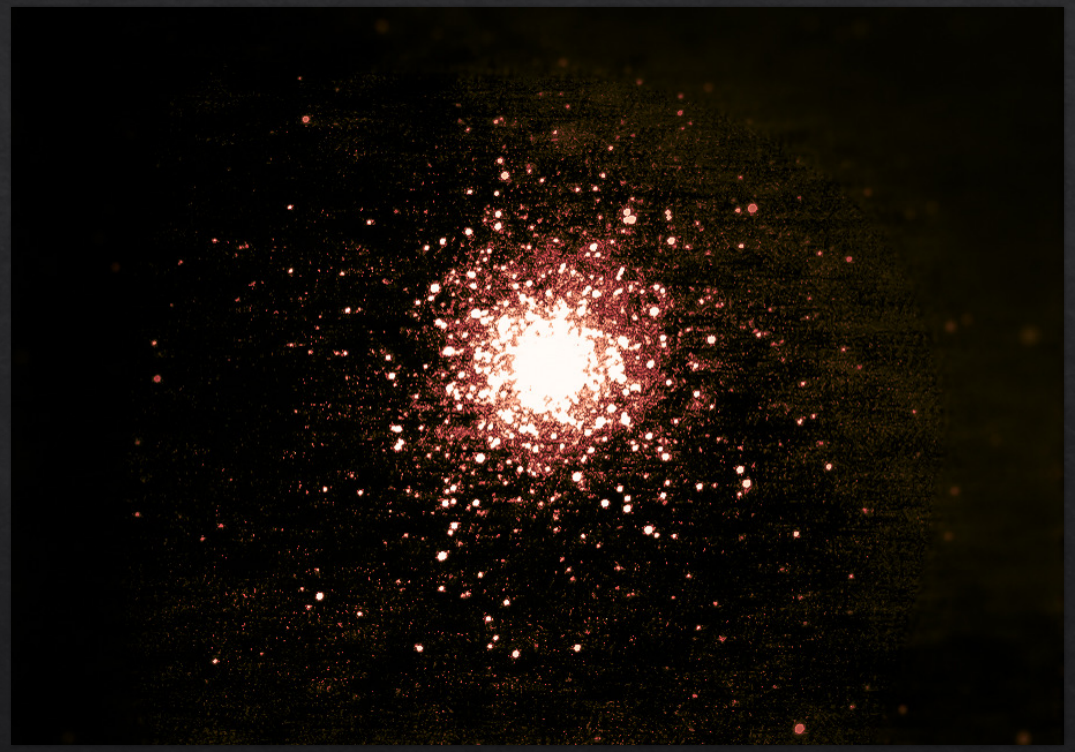
- Located 5000 light years away in Puppis, M46 shines at an apparent magnitude of 6.1. Home to roughly 500 stars, M46 is classified as an ‘Open Cluster,’ much younger and smaller than its Globular Cluster brethren. Its estimated age is only 251 million years. Its outer region is biased towards infrared light indicating a possible ‘mass segregation’ with larger, more massive stars ‘sinking’ towards the center and cooler, redder stars being pushed outwards by a form of dynamic friction.

M64

- M64 is well known for its dust-obscured nucleus—helping give the galaxy its nick-name the “Black Eye” Galaxy. A merger with a satellite galaxy some billion years ago has caused competing disk rotation. Gas and stars in the outer regions is moving opposite the gas and dust in the inner regions. Star formation is being driven where competing dust clouds collide. This unusual galaxy is located 17 million light years away in the constellation Coma Berenices.

M13

- The Great Cluster in Hercules, M13 is home to more than 100,000 stars and is among the brightest globular clusters visible from Earth at an apparent magnitude of 5.8. The dense concentration of stars at the core has caused some to collide—creating ‘Blue Stragglers’ of great interest to Astronomers. M13 is located approximately 25,000 light years from the Sun.



M37

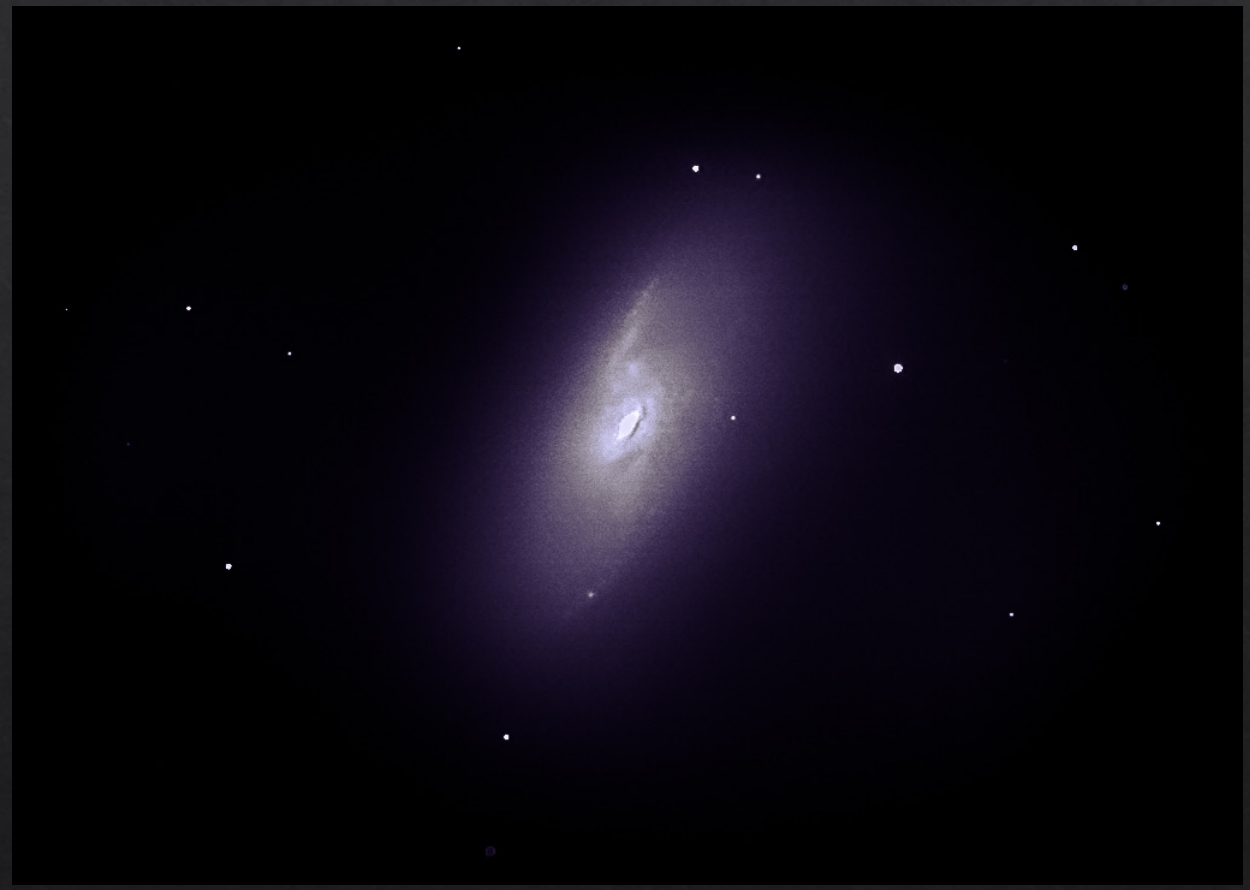
- Home to more than 500 stars, M37 is an Open Cluster in the constellation Auriga. The cluster is located directly opposite the Galactic Core when seen from Earth and orbits the galaxy every 219 million years. Approaching 500 million years in age, M37 has 15 stars which have evolved off the main sequence into red giants. The cluster was observed by Giovanni Battista Hodierna more than 100 years before Messier, as early as 1654.

M81

- Bright blue spiral arms and a large galactic bulge form the structure of M81. Just 11.6 million light years away, M81 is one of the closest major galaxies to the Local Group. Younger, bluer stars dominate the spiral arms while younger, redder stars dominate the galactic bulge. The bulge itself is much larger than the Milky Way's and features a supermassive black hole 7 times more massive.

M106

- M106 is an intermediate Spiral Galaxy 24 million light years from the Milky Way in the constellation Canes Venatici. The galaxy is roughly half the size of the Milky Way and contains a characteristic "extra" pair of spiral arms believed to be a derivative of violently churning matter from a supermassive black hole and an active galactic nucleus. The galaxy's Cepheid variable stars share similar metallicity properties to their Milky Way brethren and thus helped astronomers construct the cosmic distance ladder we use today



M60

- Home to more than 1300 galaxies, the Virgo Super Cluster is among the largest super-structures in the observable universe. M60 is one of these galaxies, classified as an “elliptical” for its rather featureless, oval shape. With a mass of more than a trillion Suns, M60 is a massive galaxy and may be interacting with its neighbor (top right) NGC 4647, a Spiral Galaxy. A distinct lack of new star formation within M60 seems to indicate that M60 is not interacting with NGC 4647 on the scale previously thought.

M47

- One of the younger open clusters in the Milky Way, M47 is estimated to be less than 80 million years old. Unlike the bright, brilliant, and highly populated neighboring cluster M46, M47 contains barely 50 stars—ranging from K-class orange giants to B-class main sequence giants. It is one of the least densely populated star clusters discovered to date. Sigma 1121 (pictured near the center) is a close binary star in the middle of the cluster.

Exposure Times

Messier Object	Type	Exposure (s)
M03	Globular Cluster	28
M05	Globular Cluster	52
M13	Globular Cluster	41
M37	Open Cluster	20
M42	Nebula	3
M46	Open Cluster	24
M47	Open Cluster	1
M51	Spiral Galaxy	125
M60	Elliptical Galaxy	68
M64	Spiral Galaxy	60
M81	Spiral Galaxy	65
M106	Spiral Galaxy	64

Sources

- Messier 37 | Messier Objects (messier-objects.com)
- Messier 81 | NASA
- Messier 64 (The Black Eye Galaxy) | NASA
- Messier 13 (The Hercules Cluster) | NASA
- Messier 51 (The Whirlpool Galaxy) | NASA
- Messier 5 | NASA
- Messier 3 | NASA
- Messier 106 | NASA
- Messier 81 | NASA
- Messier 46 | Messier Objects (messier-objects.com)
- Messier 47 | Messier Objects (messier-objects.com)