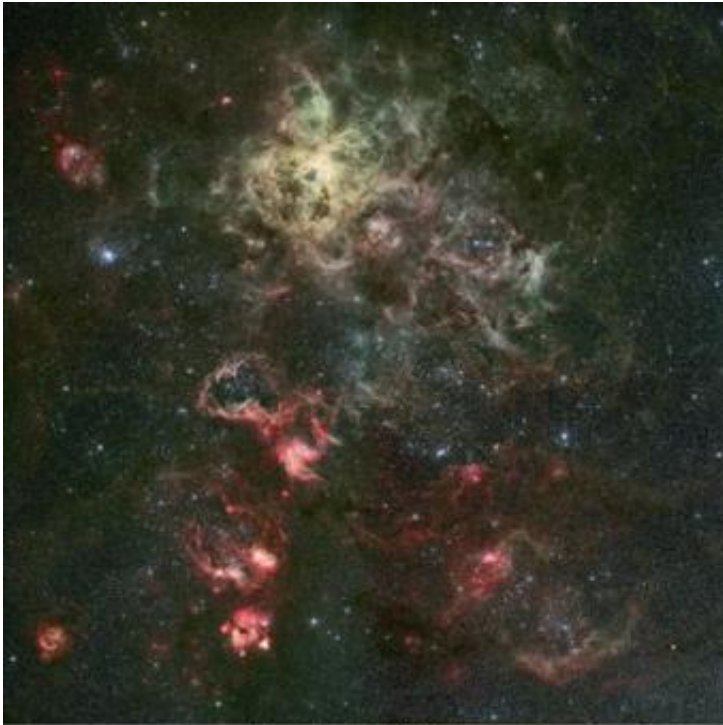


Portrait of a dramatic stellar crib

December 21 2006



The Tarantula Nebula
(WFI/2.2-m)

ESO PR Photo 50a/06 (21 December 2006)



One square degree image of the Tarantula Nebula and its surroundings. The spidery nebula is seen in the upper-center of the image. Slightly to the lower-right, a web of filaments harbors the famous supernova SN 1987A (see below). Many other reddish nebulae are visible in the image, as well as a cluster of young stars on the left, known as NGC 2100. Credit: ESO

Known as the Tarantula Nebula for its spidery appearance, the 30 Doradus complex is a monstrous stellar factory. It is the largest emission

nebula in the sky, and can be seen far down in the southern sky at a distance of about 170,000 light-years, in the southern constellation Dorado (The Swordfish or the Goldfish). It is part of one of the Milky Way's neighbouring galaxies, the Large Magellanic Cloud.

The Tarantula Nebula is thought to contain more than half a million times the mass of the Sun in gas and this vast, blazing labyrinth hosts some of the most massive stars known. The nebula owes its name to the arrangement of its brightest patches of nebulosity, that somewhat resemble the legs of a spider. They extend from a central 'body' where a cluster of hot stars (designated 'R136') illuminates and shapes the nebula. This name, of the biggest spiders on the Earth, is also very fitting in view of the gigantic proportions of the celestial nebula - it measures nearly 1,000 light-years across and extends over more than one third of a degree: almost, but not quite, the size of the full Moon. If it were in our own Galaxy, at the distance of another stellar nursery, the Orion Nebula (1,500 light-years away), it would cover one quarter of the sky and even be visible in daylight.



SN 1987A and the Honeycomb Nebula
(WFI/2.2m)

ESO PR Photo 50b/06 (21 December 2006)



The brightest supernova which has exploded in the current epoch is SN 1987A, located in the Large Magellanic Cloud, at the edge of the Tarantula nebula. The explosion was seen on 23 February 1987 and since then the ejected material has created a set of ring structures. The outer ring is clearly visible in this image. In the lower part of the image, an amazing structure is seen: the Honeycomb Nebula. Source: ESO

Because astronomers believe that most of the stars in the Universe were formed in large and hectic nurseries such as the 30 Doradus region, its study is fundamental. Early this year, astronomers took a new, wide look at the spider and its web of filaments, using the Wide Field Imager on the 2.2-m MPG/ESO telescope located at La Silla, Chile, while studying

the dark clouds in the region. Dark clouds are enormous clouds of gas and dust, with a mass surpassing a million times that of the Sun. They are very cold, with temperatures about -260 degrees Celsius, and are difficult to study because of the heavy walls of dust behind which they hide. Their study is however essential, as it is in their freezing wombs that stars are born.

Observing in four different bands, the astronomers made a mosaic of the half-degree field of view of the instrument to obtain an image covering one square degree. With each individual image containing 64 million pixels, the resultant mosaic thus contained 4 times as many, or 256 million pixels! The observations were made in very good image quality, the 'seeing' being typically below 1 arcsecond.

The image is based on data collected through four filters, including two narrow-band filters that trace hydrogen (red) and oxygen (green). The predominance of green in the Tarantula is a result of the younger, hotter stars in this region of the complex.

It would be easy to get lost in the meanderings of the filamentary structures or get stuck in the web of the giant arachnid, as is easily experienced with the zoom-in feature provided on the associated photo page, and it is therefore difficult to mention all the unique objects to be discovered. Deserving closer attention perhaps is the area at the right-hand border of the Tarantula. It contains the remains of a star that exploded and was seen with the unaided eye in February 1987, i.e. almost 20 years ago. Supernova SN 1987A, as it is known, is the brightest supernova since the one observed by the German astronomer Kepler in 1604. The supernova is known to be surrounded by a ring, which can be distinguished in the image.

A little to the left of SN 1987A, another distinctive feature is apparent: the Honeycomb Nebula. This characteristic bubble-like structure results

apparently from the interaction of a supernova explosion with an existing giant shell, which was itself generated by the combined action of strong winds from young, massive stars and supernova explosions.

Source: European Southern Observatory (ESO)

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