

# The little man and the cosmic cauldron

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Eta Carinae (NACO/VLT)

ESO Press Photo 17a/08 (27 May 2008)



This new image of the luminous blue variable Eta Carinae was taken with the NACO near-infrared adaptive optics instrument on ESO's Very Large Telescope, yielding an incredible amount of detail. The images clearly shows a bipolar structure as well as the jets coming out from the central star. Credit: ESO

On the occasion of the 10th anniversary of the Very Large Telescope's First Light, ESO is releasing two stunning images of different kinds of nebulae, located towards the Carina constellation. The first one, Eta Carinae, has the shape of a 'little man' and surrounds a star doomed to

explode within the next 100 000 years. The second image features a much larger nebula, whose internal turmoil is created by a cluster of young, massive stars.

Being brighter than one million Suns, Eta Carinae is the most luminous star known in the Galaxy. It is the closest example of a luminous blue variable, the last phase in the life of a very massive star before it explodes in a fiery supernova.

Eta Carinae is surrounded by an expanding bipolar cloud of dust and gas known as the Homunculus ('little man' in Latin), which astronomers believe was expelled from the star during a great outburst seen in 1843.

Eta Carinae was one of the first objects to be imaged during First Light with ESO's VLT, 10 years ago. At the time, the image obtained with a test camera already showed the unique capabilities of the European flagship telescope for ground-based optical and infrared astronomy, as well as of its unique location on the mountain of Paranal. The image had a resolution of 0.38 arcseconds.

The new, recently obtained image reveals even more, with a resolution a factor of 6 to 7 times better. It was obtained with the NACO near-infrared instrument on Yepun, Unit Telescope 4 of the VLT. NACO is an adaptive optics instrument, which means that it can correct for the blurring effect of the atmosphere. And looking at the image, the power of adaptive optics is clear. The image quality is as though the whole 8.2-m telescope had been launched into space.

When viewed through the eyepiece of a small telescope, the Homunculus may indeed resemble a little man, but the astounding NACO image clearly shows a bipolar structure. Also very well resolved is the fine structure of the jets coming out from the central star.

Last year, the Very Large Telescope Interferometer also studied Eta Carinae in great detail and provided invaluable information about the stellar wind of Eta Carinae.

The second image was obtained with the ISAAC infrared imager on Antu, Unit Telescope 1.

Located 9 000 light-years away, i.e. farther away than Eta Carinae, NGC 3576 is also in the direction of the southern Carina constellation. NGC 3576 is about 100 light-years across, that is, 25 times larger than the distance between the Sun and its closest neighbouring star.

This intriguing nebula is a gigantic region of glowing gas, where stars are currently forming. The intense radiation and winds from the massive stars are shredding the clouds from which they form, creating dramatic scenery. It is estimated that the nebula is about 1.5 million year old, the blink of an eye on cosmological timescales.

Source: ESO

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