

Double engine for a nebula

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This image, centered on the B[e] star HD 87643, beautifully shows the extended nebula of gas and dust that reflects the light from the star. The central star's wind appears to have shaped the nebula, leaving bright, ragged tendrils of gas and dust. A careful investigation of these features seems to indicate that there are regular ejections of matter from the star every 15 to 50 years. The image, taken with the Wide Field Imager on the MPG/ESO 2.2m telescope at La Silla, is based on data obtained through different filters: B, V and R. Credit: ESO/F. Millour et al.

(PhysOrg.com) -- The new image, showing a very rich field of stars towards the Carina arm of the Milky Way, is centred on the star HD 87643, a member of the exotic class of B[e] stars [1]. It is part of a set of observations that provide astronomers with the best ever picture of a B[e] star.

The image was obtained with the Wide Field Imager (WFI) attached to the MPG/ESO 2.2-metre telescope at the 2400-metre-high La Silla Observatory in Chile. The image shows beautifully the extended [nebula](#) of gas and dust that reflects the light from the star. The central star's wind appears to have shaped the nebula, leaving bright, ragged tendrils of gas and dust. A careful investigation of these features seems to indicate that there are regular ejections of matter from the star every 15 to 50 years.

A team of astronomers, led by Florentin Millour, has studied the star HD 87643 in great detail, using several of ESO's telescopes. Apart from the WFI, the team also used ESO's Very Large Telescope (VLT) at Paranal.

At the VLT, the astronomers used the NACO adaptive optics instrument, allowing them to obtain an image of the star free from the blurring effect of the atmosphere. To probe the object further, the team then obtained an image with the Very Large [Telescope Interferometer](#) (VLTI).

The sheer range of this set of observations, from the panoramic WFI image to the fine detail of the VLTI observations, corresponds to a zoom-in factor of 60 000 between the two extremes. The astronomers found that HD 87643 has a companion located at about 50 times the Earth-Sun distance and is embedded in a compact dust shell. The two [stars](#) probably orbit each other in a period between 20 and 50 years. A dusty disc may also be surrounding the two stars.

The presence of the companion could be an explanation for the regular ejection of matter from the star and the formation of the nebula: as the companion moves on a highly elliptical orbit, it would regularly come very close to HD 87643, triggering an ejection.

Note:

[1]: B[e] stars are stars of spectral type B, with emission lines in their spectra, hence the "e". They are surrounded by a large amount of dust.

More information: The work on HD 87643 has been published in a paper to appear in *Astronomy and Astrophysics*: A binary engine fueling HD 87643's complex circumstellar environment using AMBER/VLTI imaging, by F. Millour et al.

Source: ESO ([news](#) : [web](#))

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