

The Helix Nebula in new colors

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ESO's Visible and Infrared Survey Telescope for Astronomy (VISTA) has captured this unusual view of the Helix Nebula (NGC 7293), a planetary nebula located 700 light-years away. The coloured picture was created from images taken through Y, J and K infrared filters. While bringing to light a rich background of stars and galaxies, the telescope's infrared vision also reveals strands of cold nebular gas that are mostly obscured in visible images of the

Helix. Credit: ESO/VISTA/J. Emerson. Acknowledgment: Cambridge
Astronomical Survey Unit

(PhysOrg.com) -- ESO's VISTA telescope, at the Paranal Observatory in Chile, has captured a striking new image of the Helix Nebula. This picture, taken in infrared light, reveals strands of cold nebular gas that are invisible in images taken in visible light, as well as bringing to light a rich background of stars and galaxies.

The [Helix Nebula](#) is one of the closest and most remarkable examples of a [planetary nebula](#). It lies in the constellation of Aquarius (The Water Bearer), about 700 light-years away from Earth. This strange object formed when a star like the Sun was in the final stages of its life. Unable to hold onto its outer layers, the star slowly shed shells of gas that became the nebula. It is evolving to become a [white dwarf star](#) and appears as the tiny blue dot seen at the centre of the image.

The nebula itself is a complex object composed of dust, ionised material as well as molecular gas, arrayed in a beautiful and intricate flower-like pattern and glowing in the fierce glare of ultraviolet light from the central hot star.

The main ring of the Helix is about two light-years across, roughly half the distance between the Sun and the nearest star. However, material from the nebula spreads out from the star to at least four light-years. This is particularly clear in this [infrared view](#) since red molecular gas can be seen across much of the image.

While hard to see visually, the glow from the thinly spread gas is easily captured by VISTA's special detectors, which are very sensitive to [infrared light](#). The 4.1-metre telescope is also able to detect an

impressive array of background [stars and galaxies](#).

The powerful vision of ESO's VISTA telescope also reveals fine structure in the nebula's rings. The infrared light picks out how the cooler, molecular gas is organised. The material clumps into filaments that radiate out from the centre and the whole view resembles a celestial firework display.

Even though they look tiny, these strands of molecular hydrogen, known as cometary knots, are about the size of our Solar System. The molecules in them are able to survive the high-energy radiation that emanates from the dying star precisely because they clump into these knots, which in turn are shielded by dust and [molecular gas](#). It is currently unclear how the cometary knots may have originated.

Provided by ESO

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