



V838 Monocerotis Light Echo

Stellar flash reveals hidden landscape of gas and dust

In 2002, a red supergiant star gave off a sudden pulse of light, painting a cosmic masterpiece across the black canvas of space. The supergiant star V838 Monocerotis—or V838 Mon—experienced a rapid period of intense swelling and heating, expanding to nearly 1,000 times the size of our Sun.

Although it remains unclear exactly what triggered the sudden expansion of V838 Mon, the resulting burst of light briefly made it one of the brightest stars in the Milky Way galaxy. The star appears, in these Hubble images, to be ejecting matter outward. In reality, the star's spherical light pulse is merely illuminating existing but previously invisible regions of gas and dust around the star. This phenomenon, known as a light echo, created the explosion-like optical illusion.

Just as sound travels through air and echoes off a surface, light travels through space and 'echoes' when it is reflected or re-emitted by objects it encounters. In this case, the light from V838 Mon traveled outward and bounced off nearby gas and dust like a camera's flashbulb in a dark, smoke-filled room. As the shell of light around the star expands through space, it encounters more dust, scatters, and eventually dims over time.

The Hubble Space Telescope captured V838 Mon's light echo over the course of several months. Hubble images show the movement of the light pulse as it illuminated layers of dust and gas (right). The material revealed by the flash was likely ejected by a previous explosion similar to the star's 2002 outburst.

Since its outset in 2002, V838 Mon's light echo has continued to evolve in appearance. The front image, taken by Hubble on February 8, 2004, captures swirls in the dust and gas that are likely the result of turbulence in the surrounding cloud as it drifts away from the star.

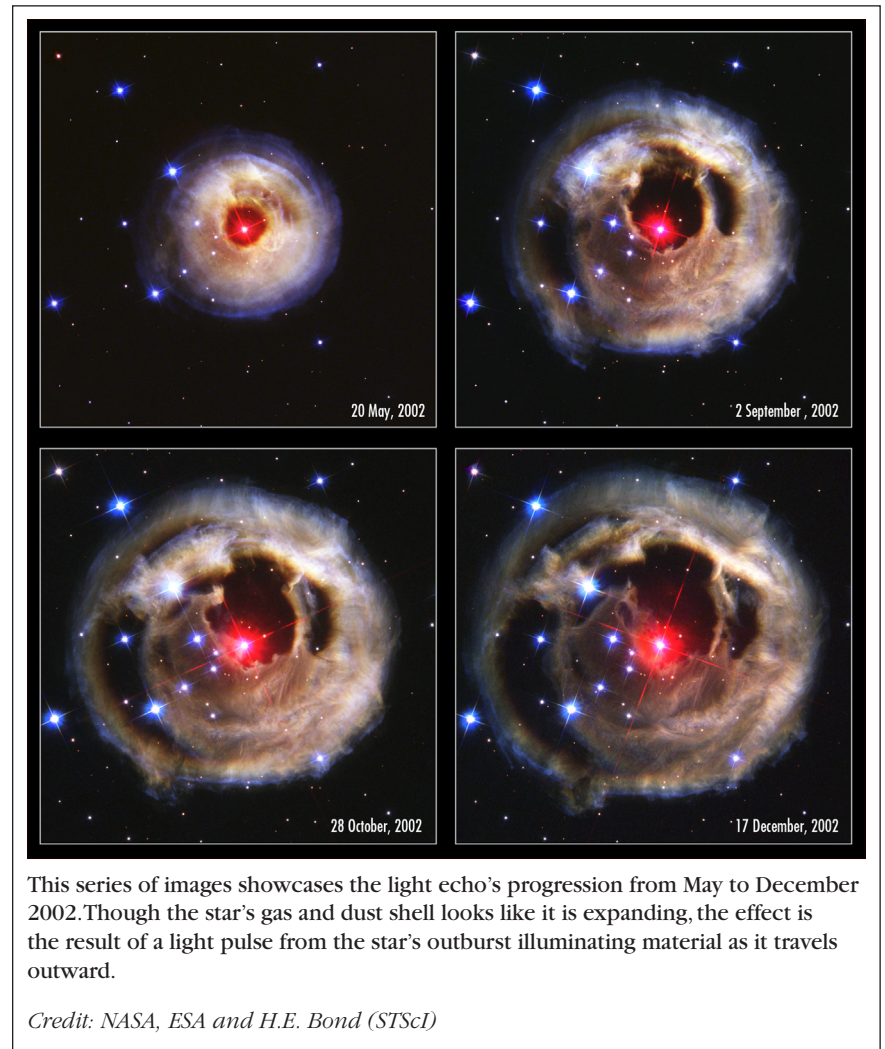
V838 Mon is located about 20,000 light-years away in the constellation Monoceros (the Unicorn).

Image Credit: NASA and The Hubble Heritage Team (AURA/STScI)

VOCABULARY

Light echo: A phenomenon that occurs when light is reflected or re-emitted by matter it encounters in space.

Supergiant stars: The largest and brightest group of stars. They are several hundred times larger in diameter than the Sun and approximately a million times brighter.



This series of images showcases the light echo's progression from May to December 2002. Though the star's gas and dust shell looks like it is expanding, the effect is the result of a light pulse from the star's outburst illuminating material as it travels outward.

Credit: NASA, ESA and H.E. Bond (STScI)

For images and information on the Hubble mission, go to www.nasa.gov/hubble and hubblesite.org. Follow the Hubble mission on social media: @NASAHubble.

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