

Pistol Star



Most Luminous Star Known

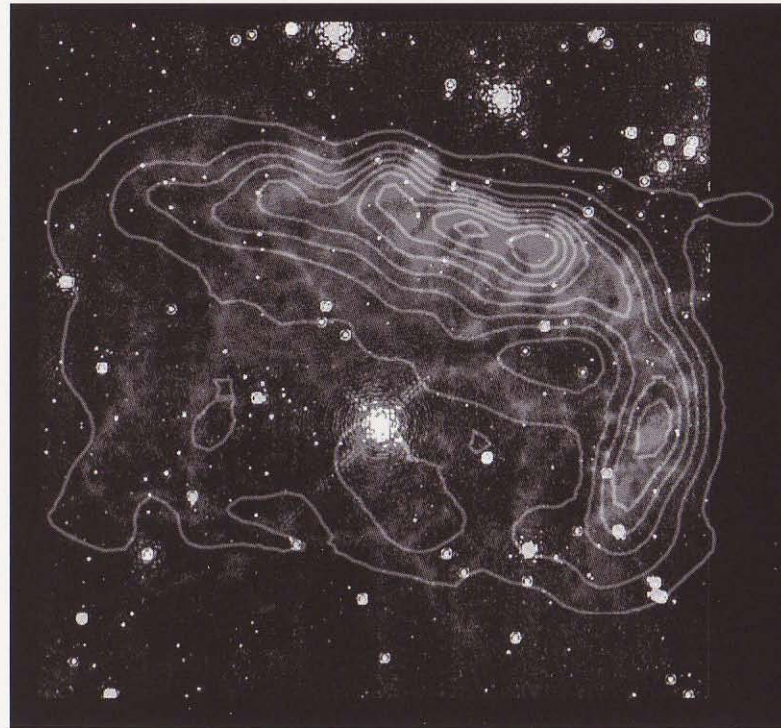
Astronomers using the Hubble Space Telescope have identified what may be the most luminous star known — a celestial titan that releases up to 10 million times the power of the Sun and is big enough to fill the diameter of Earth's orbit. The Pistol Star is invisible to the naked eye because it is hidden 25,000 light-years away behind great dust clouds in the center of our Milky Way Galaxy. Astronomers estimate that the star produces as much energy in six seconds as our Sun does in one year and may be the missing link between normal hot stars and exotic, very large ones.

Great Nebula

Born up to three million years ago, the Pistol Star may have weighed up to 200 times the mass of the Sun before shedding much of its weight in violent eruptions that began about 4,000 to 6,000 years ago. These eruptions may have created the brilliant, extremely large, pistol-shaped nebula that surrounds it. The nebula is so large (four light-years across) that it would nearly span the distance from the Sun to Alpha Centauri, the nearest star to our solar system.

Dramatic End

Burning at such a dramatic rate, the star is destined for a short life and abrupt end. The star will continue to lose more material, eventually revealing its bare hot core sizzling at 100,000 degrees. In comparison, our Sun is halfway through its 10 billion-year lifetime. Scientists believe the Pistol could die in a spectacular supernova at any time in the next three million years.



About this image

The Pistol Star gets its name from the shape of its surrounding nebula when observed by radio telescopes. This radio contour map of the nebula, superimposed over the Hubble image, was made using the Very Large Array radio telescope in New Mexico by Mark Morris (UCLA) and Farhad Yusef-Zadeh (Northwestern University). Don F. Figer (UCLA) used Hubble's recently installed Near-Infrared Camera and Multi-Object Spectrometer (NICMOS) to observe the Pistol Star on September 13, 1997. Such a luminous star should be very bright in the sky, but tiny dust grains between us and the star absorb most of its light. NICMOS, however, is sensitive to infrared radiation, which is not absorbed by dust and so reveals the star.

Definitions

Nebula: A region of diffuse, ionized gas (plasma) surrounding one or more young hot stars.

Supernova: An explosive death of a massive star whose tremendous energy output causes its expanding debris to glow brightly for weeks or months afterwards.

Infrared: Electromagnetic radiation with slightly longer wavelengths and slightly smaller frequencies than those of the visible light we see with our eyes.

Fast Facts

Location

Near the center of our Milky Way Galaxy in the direction of the constellation Sagittarius

Distance from Earth

25,000 light-years

Size

Large enough to fill the diameter of Earth's orbit

Electronic Addresses

You can get images and other information about the Hubble Space Telescope using the Internet.

Using the World Wide Web (Netscape Navigator, Microsoft Internet Explorer, and other browsers), use URL <http://oposite.stsci.edu/public.html> and follow links from there.

Using ftp, connect to [ftp.stsci.edu](ftp://ftp.stsci.edu) and find files and directories in /pubinfo.