Hubble captures dual views of an unusual star cluster

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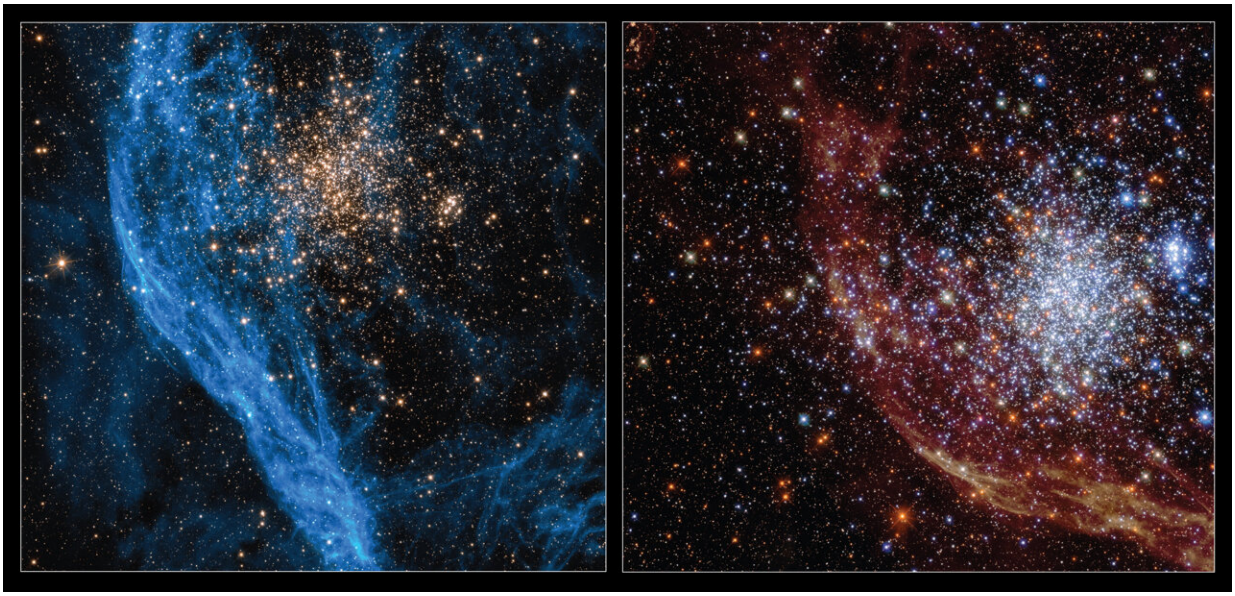


Credit: NASA, ESA and N. Bastian (Donostia International Physics Center); Processing: Gladys Kober (NASA/Catholic University of America)

While these two images may look dazzlingly different, they are actually pictures of the same cosmic object: NGC 1850. Although the same Hubble instrument took both images, different filters with different assigned colors were used to study particular wavelengths of light emanating from these objects. The image with blue nebulosity includes some near-infrared light along with visible light (what our human eyes can detect), whereas the image with red nebulosity (also a different

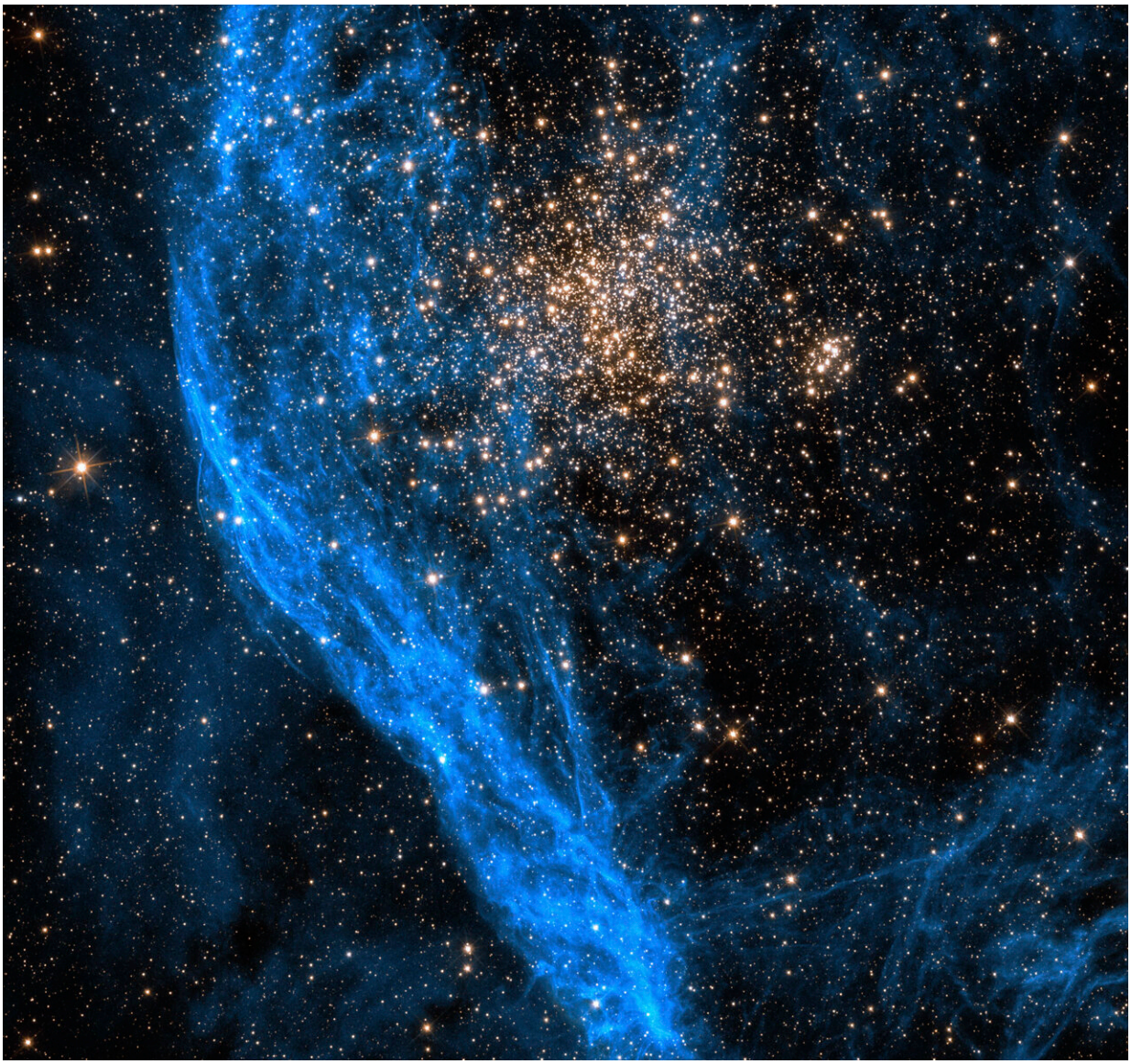
"pointing" at the same object) covers a much broader range from the near-ultraviolet to the beginnings of the infrared spectrum. Ultraviolet observations are ideal for detecting the light from the hottest and youngest stars, as seen in this luminous, starry view.

This 100 million-year-old globular cluster is located in the Large Magellanic Cloud, a satellite galaxy of the Milky Way and a birthplace for billions of stars. The cluster is approximately 160,000 light-years away in the constellation Dorado. Typical of globular clusters, it is a spherical collection of densely packed stars held together by mutual gravitational attraction. Unlike most globular clusters, however, the stars of NGC 1850 are relatively young. Globular clusters with young stars such as NGC 1850 are not present in our own Milky Way galaxy.

Astrophysicists theorize that when the first generation of stars in NGC 1850 was born, the stars ejected matter like dust and gas into the surrounding cosmos. The density of the newly formed star cluster was so high that this ejected matter could not escape the cluster's gravitational pull, causing it to stay nearby. The intense gravity of the cluster also pulled in hydrogen and helium gas from its surroundings. These two sources of gas combined to form a second generation of stars, increasing the density and size of this globular cluster.

This Hubble image shows the star cluster NGC 1850, located about 160,000 light-years away. For this image, five filters were used with the camera to gather data. Two of the filters were at near-ultraviolet wavelengths, two more at visible light wavelengths, and the final one was in the near-infrared. The data gathered through the two ultraviolet filters is violet and blue. The data from the two visible light filters is green and orange. The color red denotes near-infrared data. The image follows chromatic order, which means the shortest wavelength in the image is blue while the longest wavelength is red. Chromatic order allows us to visualize wavelengths of light beyond our eye's sensitivity in a way that is familiar to us. Credit: NASA, ESA and N. Bastian (Donostia International

Physics Center); Processing: Gladys Kober (NASA/Catholic University of America)



This Hubble image shows the star cluster NGC 1850, located about 160,000 light-years away. For this image, two filters were used with the camera to gather data, one at visible wavelengths the other at near-infrared wavelengths. Following chromatic order, the shorter wavelength visible light data is blue, while the longer near-infrared data is red. Credit: NASA, ESA and P. Goudfrooij (Space

Telescope Science Institute); Processing: Gladys Kober (NASA/Catholic University of America)

In 2021, scientists detected the presence of a black hole in NGC 1850. They have also detected many brighter blue stars (seen on the right of the second image) that burn hotter and die younger than red stars. Also present are around 200 red giants, stars that have run out of hydrogen in their centers and are fusing hydrogen further from their core, causing the outer layers to expand, cool, and glow red (seen throughout the second image). Surrounding the cluster is a pattern of nebulosity, diffuse dust and gas theorized to come from supernova blasts (the blue veil-like structures on the first image and the red ones on the second image).

NGC 1850 is approximately 63,000 times the mass of the sun, and its core is roughly 20 light-years in diameter. Astronomers used Hubble Space Telescope observations at a wide range of wavelengths to image this large star cluster and learn more about star formation.

Provided by NASA's Goddard Space Flight Center

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