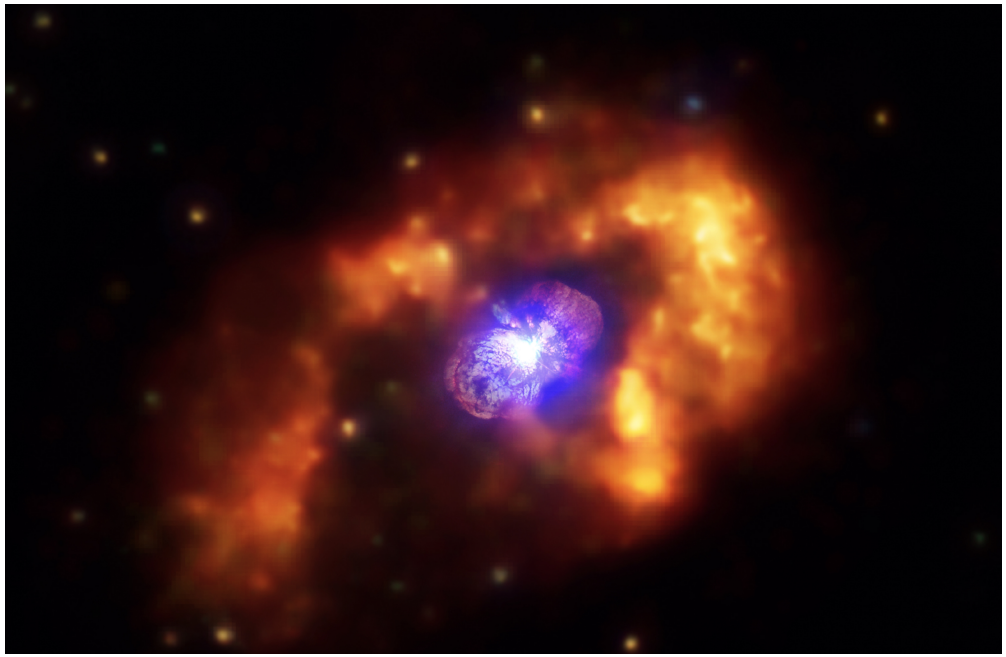
Chandra Science Highlight '

Chandra Rewinds Story of Great Eruption of the 1840s



***Caption**: A Chandra and Hubble Space Telescope composite image of the massive binary system Eta Carinae (Chandra data is orange and Hubble data is blue, purple, and white). During the so-called "Great Eruption" in the 1840s, Eta Carinae experienced a huge explosion and ejected between 10 and 45 times the mass of the Sun. This material became a dense pair of spherical clouds of gas, now called the Homunculus Nebula, on opposite sides of the two stars, seen in the middle of the composite image. The X-ray ring detected by Chandra shows where the rapidly moving blast wave from the 1840s explosion heated up material ejected in previous explosions. Rapid motion of the X-ray ring is shown in a new time-lapse Chandra video available at:*
https://chandra.si.edu/photo/2023/etacar/

- A new time-lapse sequence shows Eta Carinae as it changes over time from 1999 to 2020.
- Using data from NASA's Chandra X-ray Observatory, astronomers are tracking the expansion of an explosion that began about 180 years ago.
- The so-called "Great Eruption" was seen on Earth in the 1840s when Eta Carinae was temporarily one of the brightest stars in the sky.
- Detailed analysis of the Chandra data suggests that the Great Eruption consisted of two explosions – first the quick ejection of fast, low-density gas to create the X-ray ring, followed by the slow ejection of dense gas to form the Homunculus.

Distance estimate: 7,500 light-years

Credits: X-ray: NASA/SAO/GSFC/M. Corcoran et al.; Image Processing: L. Frattare, J. Major, N. Wolk (SAO/CXC)

Instrument: ACIS

Reference: Corcoran, M. et al, ApJ, 2022, 937, 122
https://iopscience.iop.org/article/10.3847/1538-4357/ac8f27

For more details, including viewing the time-lapse, see the Chandra Feature:
https://chandra.si.edu/photo/2023/etacar/

The CXC is operated for NASA by the Smithsonian ' Astrophysical Observatory '

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