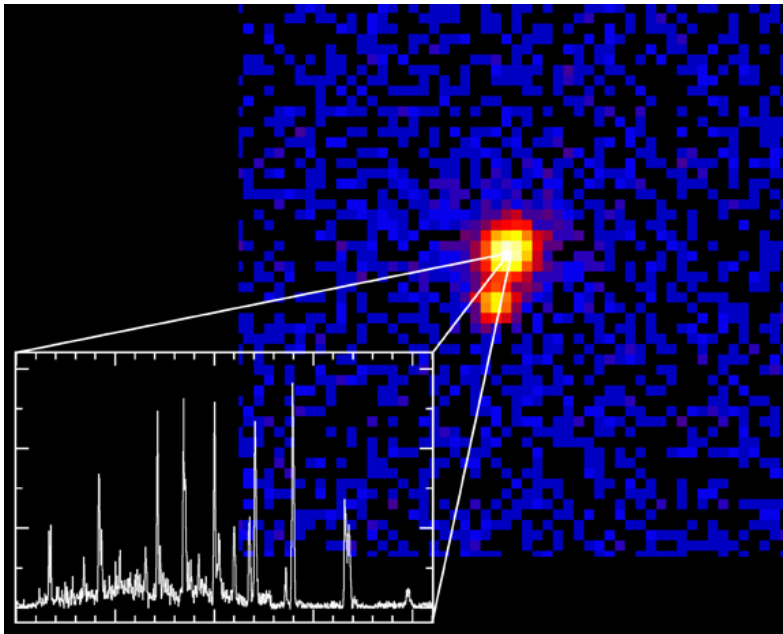




Chandra Science Highlights

Zeta Orionis: An O-star in the Belt of Orion, The Hunter



The X-ray spectrum of the O-star Zeta Orionis taken by NASA's Chandra X-ray Observatory suggests that O-stars may have magnetic loop structures on their surfaces similar to those found on the sun. The ACIS image on the upper right shows that Zeta Orionis is a binary star system. The HETG spectra was taken from the larger "A" component.

Credit: NASA/CXC/W. Waldron, J. Cassinelli

Chandra X-ray Observatory ACIS/HETG Image

Scale: The image is 27 arcsec on a side.

- Strong lines from ions of iron, oxygen, silicon and other elements were observed.
- The ratio of the intensities forbidden to the intercombination lines in the He-like silicon ions indicate a density 1000 times higher than predicted by current models.
- The high density and the symmetric line profiles are consistent with a magnetic loop model for the x-ray emission, analogous to solar x-ray emission.
- This result presents a challenge to understand how hot magnetic loops could exist on an O-type star, as such stars are not thought to have the convection zones necessary to create hot loops of magnetized plasma.

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