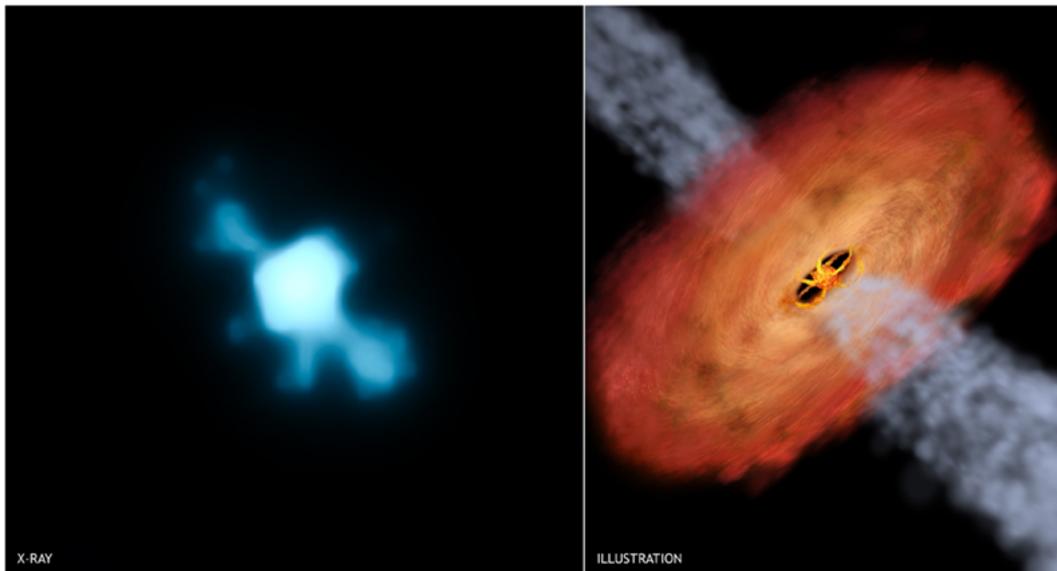




Chandra Science Highlight

DG Tau: A Young Star with a Bipolar X-ray Jet

Chandra X-ray Observatory ACIS image.



The image on the left from NASA's Chandra X-ray Observatory shows the first double-sided X-ray jet ever detected from a young star. The bright source of X-rays in the middle of the image is the star DG Tau and the jet runs from the top left to the bottom right. The faint vertical feature below the star does not show evidence for an additional jet, but is a chance alignment of four X-ray photons. The illustration on the right shows a proposed model of the system with the star, disk and inner regions of the jets.

Scale: Image is 24.5 arcsec across Estimated distance to DG Tau: 456 light years

- The jets extend about 70 billion miles away from the star, or about 700 times the Earth-Sun separation.
- Highly energetic X-rays are also detected from the young star, partially absorbed by streams of material flowing from the disk onto the star. The disk itself is much too cool to be detected by Chandra.
- The combined X-ray power in the jet is similar to that of the star, but X-rays from the jet have the advantage of striking the disk much more directly from above and below. The jets are therefore important contributors to X-ray heating and ionization of the disk and may play a role in the physical evolution and chemical processing of material in the disk.

Credit: X-ray: NASA/CXC/ETH Zuerich/M.Gedel et al.; Illustration: NASA/CXC/M.Weiss

Reference: M. Guedel et al. (2008), *Astron. & Astrophys.* 478, 797; see also arXiv:0712.1330v1 [astro-ph]

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