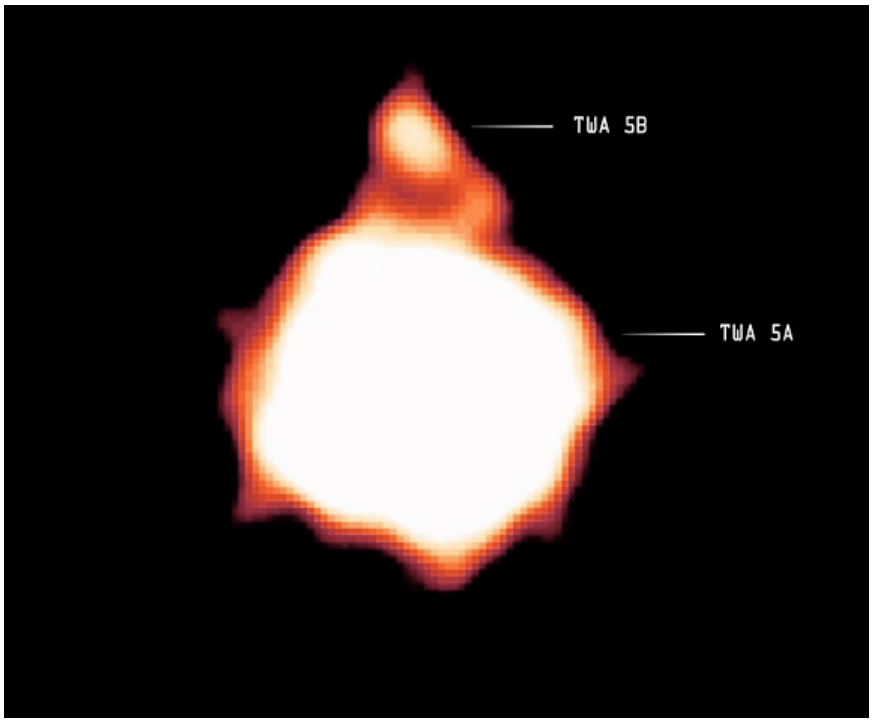
Chandra Science Highlight

TWA 5B: An X-ray Emitting Brown Dwarf Star

Chandra X-ray Observatory ACIS Image.



Scale: Image is 6 arc seconds on a side

Chandra's observation of TWA 5 resolves the X-ray emission from TWA 5B, a brown dwarf star orbiting a close binary star system TWA 5A.

Credit: NASA/CXC/Chuo U./Y. Tsuboi et al.

- Separation of two sources shows that the intensity of X-rays from TWA 5B is much too large to be explained by reflection of X-rays from TWA 5A.
- X-rays from TWA 5B are consistent with emission from a hot corona with T = 3 MK, and an X-ray luminosity L= 4 x 10^{27} erg/s.
- At an age of 12 Myr, TWA 5B is an example of a brown dwarf that is near the end of its deuterium burning phase, and provides a link between active and relatively inactive brown dwarfs.
- With a mass estimated to be between 15 and 40 Jupiter masses, the detection of X-rays from TWA 5B raises the possibility that young, massive planets might emit X-rays

Reference: Y. Tsuboi et al. 2003 Astrophys.J. 587, L51