



# Chandra Science Highlight

## Magnetic field strength of a neutron-star-powered ultraluminous X-ray source



A composite image of the Whirlpool galaxy (a.k.a. M51) shows X-rays from Chandra (purple) and optical data from the Hubble Space Telescope (red, green, and blue). The location of the ultraluminous X-ray source (ULX8) is on the left side of the image, marked with a circle.

- Evidence was found for a strong absorption line in the Chandra spectrum of ULX8.
- The most likely explanation for the absorption line is that is produced by protons circling around a magnetic field with a strength of about a quadrillion gauss, although absorption by electrons in a 100 billion gauss magnetic field cannot be ruled out.
- Such strong magnetic fields could exist on the surface of a neutron star.

Distance estimate: 30 million light years

Image scale: Image is 6 x 6 arcmin across. (About 52,000 x 52,000 light years.)

Credit: X-ray: NASA/CXC/Caltech/M. Brightman et al.; Optical: NASA/STScI

Instrument: ACIS

Reference: M. Brightman et al., Nature Astronomy 2, 312 (2018)  
arXiv:1803.02376

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