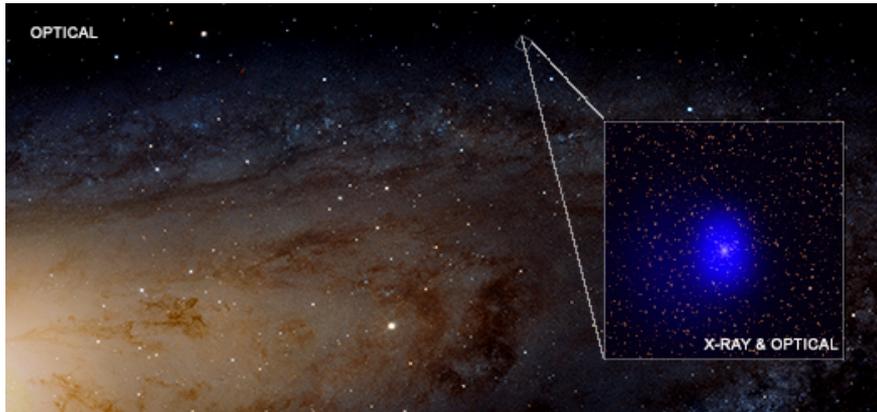




Chandra Science Highlight

J0045+41: A Cosmic Photobomb



The main image shows the northeast portion of the Andromeda Galaxy, a.k.a. M31. The inset shows Chandra (blue) and Hubble (white) data for the source LGGs J004527.30+413254.3 (J0045+41 for short).

Distance estimate for J0045+41: About 2.6 billion light years (redshift $z=0.215$)

Image scale: Full image is 1 degree across. Inset is 15 arcsec across.

- J0045+41, previously thought to be an X-ray binary star system in M31 at a distance of 2.5 million light years from Earth, has been found to be a cosmic photobomb, i.e., a background object accidentally in the view of a nearby object.
- The X-rays from J0045+41 are likely produced by gas falling into one and possibly two supermassive black holes in the center of a galaxy 2.6 billion light years away.
- Optical observations from the 48-inch telescope on Palomar Mountain found evidence for repeating variations on time scales ranging from 80-350 days.
- These variations are suggestive of an orbiting pair of supermassive black holes.
- A supermassive black hole pair could have been formed billions of years earlier by the merger of two galaxies containing supermassive black holes.

Credits: X-ray: NASA/CXC/U. Washington/T. Dorn-Wallenstein et al.; Optical: NASA/ESA/J. Dalcanton et al. & R. Gendler

Instrument: ACIS

Reference: T. Dorn-Wallenstein et al. 2017 ApJ 850, 86
[arXiv:1704.08694](https://arxiv.org/abs/1704.08694)

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