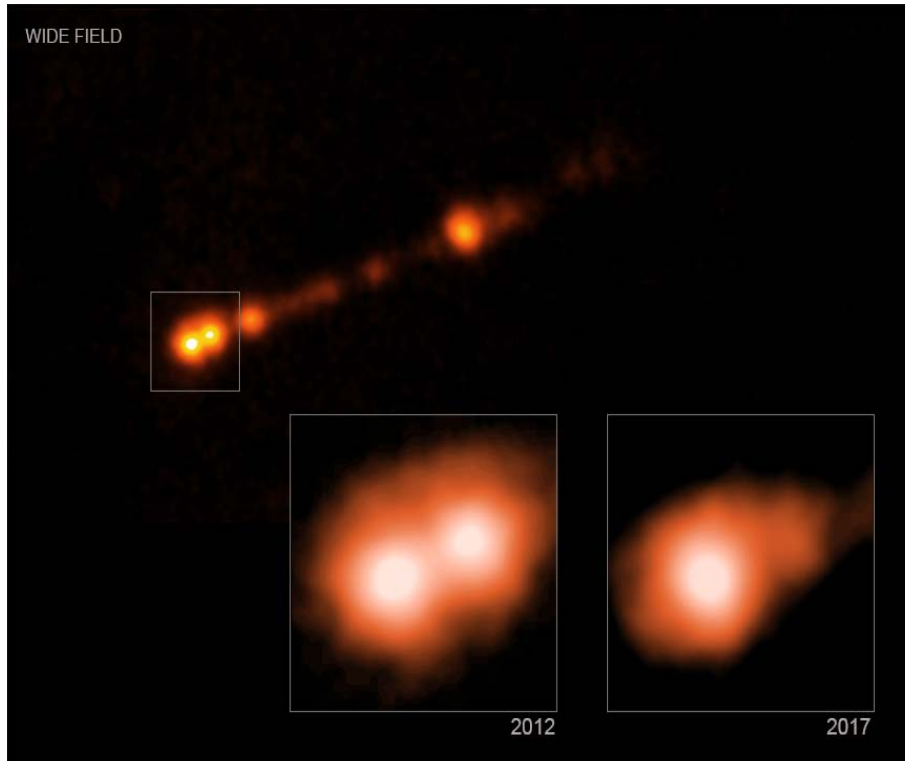




Chandra Science Highlight

Famous Black Hole Has Jet Pushing Cosmic Speed Limit



Caption: A Chandra image of a jet in the galaxy M87, with insets showing Chandra images taken in 2012 and 2017. The source in the lower left is X-ray emission from near the black hole, and the other source is a knot in the jet, HST-1, about 900 light years from the black hole.

- Superluminal motion of two knots in the jet from M87 have been detected using Chandra images taken in 2012 and 2017. The motion of the faster knot, HST-1, has an apparent speed of 6.3 times the speed of light.
- The fading of one of the knots by 70% was likely caused by particles losing energy by synchrotron radiation, implying X-rays from the same particles are detected at both times, rather than a moving wave or shock.
- Astronomers have previously seen superluminal motion in M87's jet at radio and optical wavelengths, but they have not been able to definitively show that matter in the jet is moving at almost the speed of light

Distance estimate: About 55 million light years.

Scale: The wide-field image is about 45 arcsec (12,000 light years) across. Insets are about 3 arcsec (790 light years) across.

Credits: NASA/CXC/SAO/B. Snios et al.

Instrument: HRC

Reference: Snios, B. et al., 2019, *Apj*, 879,8;
[arXiv:1905.04330](https://arxiv.org/abs/1905.04330)