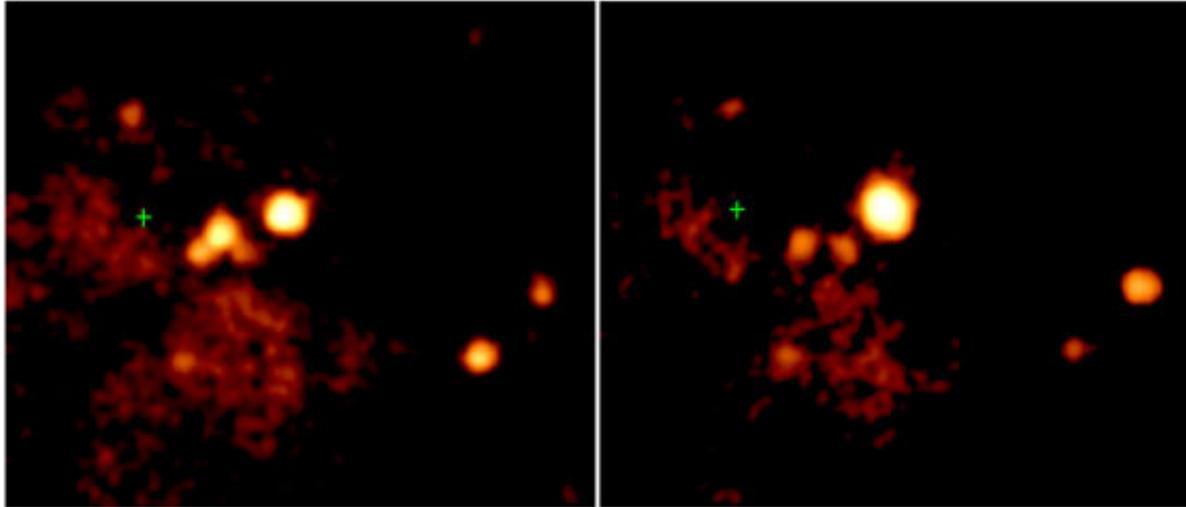




# Chandra Science Highlights

## M82: A STARBURST GALAXY, CENTRAL REGION



*Scale: 30 arcsec on a side.*

Using Chandra's superior resolution, astronomers have discovered a new type of black hole. The bright source near the center of the image is associated with the black hole. It is located 9 arcsec away from the dynamical center (small green +) of M82 and has a mass of more than 500 suns. This mid-mass black hole may represent the missing link between smaller stellar black holes and the supermassive variety found at the centers of most galaxies.

Credit: NASA/SAO/CXC

[http://chandra.harvard.edu/photo/cycle/m82bh/snap\\_both2.jpg](http://chandra.harvard.edu/photo/cycle/m82bh/snap_both2.jpg)

Ref.: H. Matsumoto et al (2000) Ap.J. Letters (in press); P. Kaaret et al (2000) MNRAS (in press)

- The source was seen to increase from a luminosity of  $1.2 \times 10^{40}$  erg/s to  $8.8 \times 10^{40}$  erg/s between 1999 Oct 28 and 2000 Jan 20. (compare left and right panels).
- The mass implied by the Eddington limit is about 700 solar masses.
- The detection of a 600 s oscillation of the X-ray emission from the source excludes the possibility that the source is a supernova remnant, and suggests that it is a black hole with a mass less than about a million solar masses.

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