



Chandra Science Highlight

Hydra A: Black Hole Pumps Iron



Scale: Image is 4.8 arc min across
Chandra X-ray Observatory ACIS

This composite image of the Hydra A galaxy cluster shows 10-million-degree gas observed by Chandra in blue and jets of radio emission observed by the Very Large Array in pink. Optical data (in yellow) from the Canada-France-Hawaii telescope and the Digitized Sky Survey shows galaxies in the cluster.

- Outbursts produced by a supermassive black hole located in the large central galaxy of the cluster have created the radio jets, and carved out cavities in the hot gas that are hundreds of thousands of light years across.
- Chandra spectra indicate that the abundance of iron and other heavy elements is enhanced by up to 0.2 dex along the radio jets and lobes relative to the undisturbed gas.
- The enhancements extend from a radius of 70,000 light years to ~400,000 light years from the central galaxy.
- The total iron mass that has been transported out of the central galaxy is estimated to be between ten and twenty percent of the iron content of that galaxy.

Reference: C. Kirkpatrick et al. 2009, arXiv:0909.2252v1 [astro-ph.GA]

Credit: X-ray: NASA/CXC/U.Waterloo/C. Kirkpatrick et al.; Radio: NSF/NRAO/VLA; Optical: Canada-France-Hawaii Telescope/DSS

September 2009