



# Chandra Science Highlight

## Perseus A: A Giant Elliptical Galaxy at the Heart of Perseus Cluster



Chandra X-ray Observatory ACIS image.

Estimated distance: 250 million light years.

Scale: Image is 3.87 arcmin across

This composite image of the active galaxy NGC 1275, a.k.a. Perseus A shows a delicate network of relatively cool (10,000 K) gaseous filaments of hydrogen gas emitting at optical wavelengths (fine red features), energetic radio bubbles (diffuse red blobs) and hot (50 MK) X-ray emitting gas (blue).

- The radio bubbles are a by-product of violent activity in the vicinity of a central supermassive black hole. They push aside the hot gas and drag out the filaments behind them.
- The filaments, some of which are ~200 light years thick and 20,000 light years in length, act as dramatic markers of the feedback process by which energy is transferred from the central black hole to the surrounding gas.
- Strong magnetic fields ~100 microgauss are able to contain these filaments and prevent them from evaporating in their million degree surroundings, or from immediately forming stars.

Reference: A. Fabian et al. arXiv:0808.2712v1 [astro-ph]

Credit: X-ray: NASA/CXC/IoA/A. Fabbian et al.; Radio: NRAO/VLA/G. Taylor; Optical: NASA/ESA/Hubble Heritage (STScI/AURA) & Univ. of Cambridge/IoA/A. Fabian