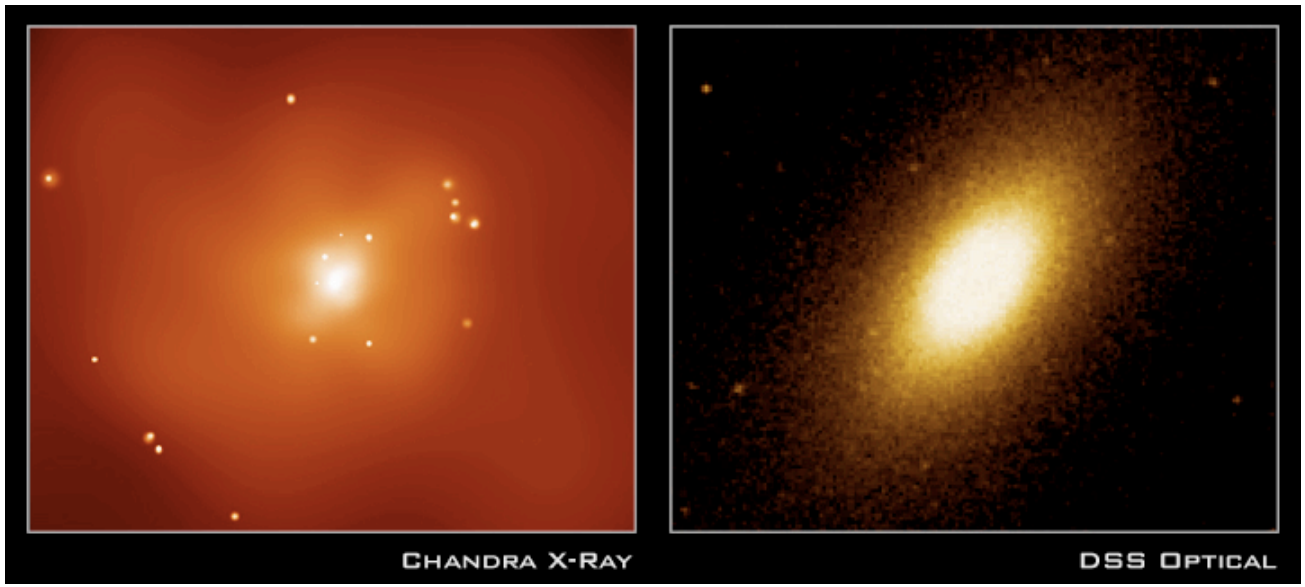
Chandra Science Highlight

NGC 720: CHANDRA CASTS CLOUD ON ALTERNATIVE TO DARK MATTER

Chandra ACIS Image.



The Chandra image of NGC 720 shows a galaxy enveloped in a slightly flattened, or ellipsoidal cloud of hot gas that has an orientation different from that of the optical image of the galaxy.

Reference: D. Buote et al., 2002 Astrophys. J. 577, 183.

Credit: NASA/CXC/UCI/D. Buote et al.

- The shape of the hot gas that produces the X-ray halo provides information about the gravitational field that confines the gas to the galaxy. The observed ellipticity of the halo is too large to be explained by theories in which stars and gas are assumed to contain most of the mass in the galaxy. This implies that dark matter is not an illusion due to a shortcoming of the standard theory of gravity - it is real.
- The Chandra data fit predictions of the standard cold dark matter model in which dark matter consists of slowly moving particles which interact with each other and "normal" matter only through gravity.
- Other dark matter models, such as self-interacting dark matter, are not consistent with the observation in that they require a dark matter halo that is nearly spherical.