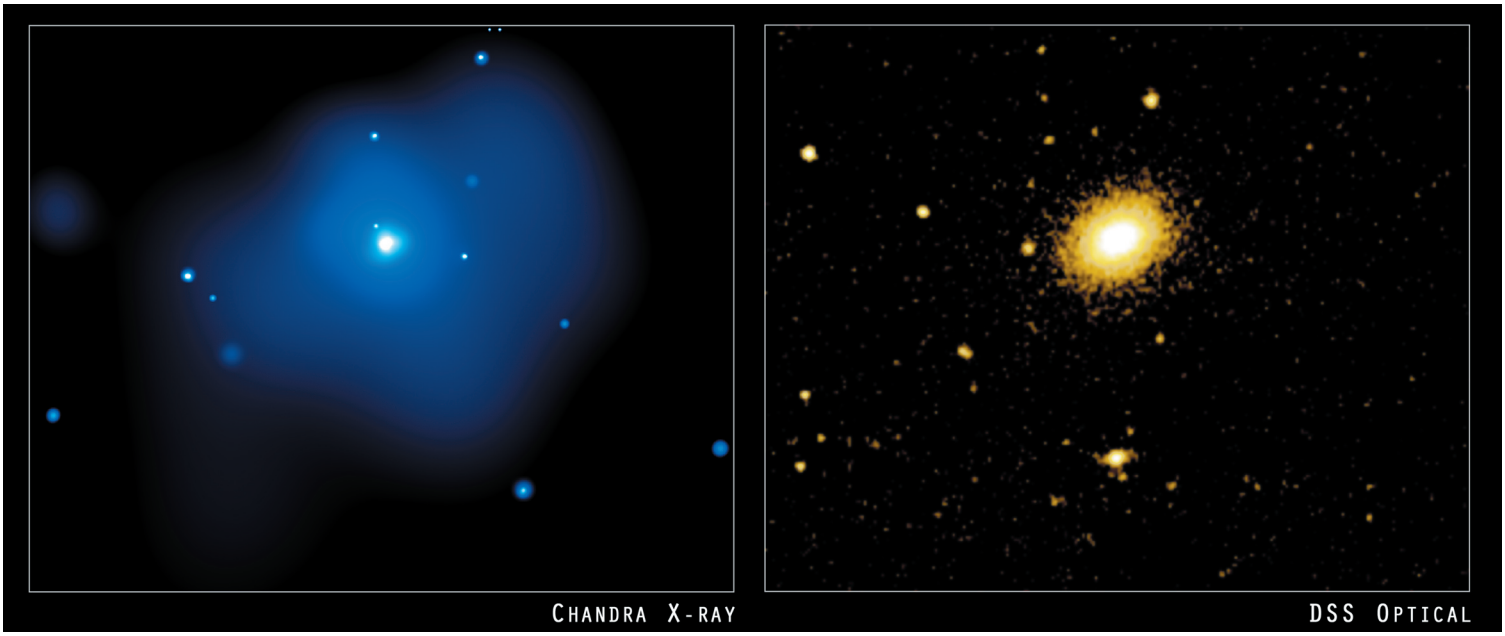

Chandra X-Ray Observatory Center

Harvard-Smithsonian Center for Astrophysics
60 Garden Street, Cambridge, MA 01238 USA
http://chandra.harvard.edu

NGC 4555: A large, elliptical galaxy about 300 million light years from Earth.
Credit: X-ray: NASA/CXC/E.O'Sullivan et al; Optical: Palomar DSS

Chandra's image of NGC 4555 revealed that it is embedded in a cloud of 10-million-degree Celsius gas (left). This hot gas cloud has a diameter of about 400,000 light years, roughly twice that of the visible galaxy (right). An enormous envelope, or halo, of dark matter is needed to hold the hot gas cloud to the galaxy. The total mass of the required dark matter halo is about ten times the combined mass of the stars in the galaxy, and 300 times the mass of the hot gas cloud. Most large, elliptical galaxies are found in groups and clusters of galaxies where they can gain or lose dark matter through collisions with other galaxies, so it is difficult to determine how much dark matter they originally possessed. The Chandra observation of NGC 4555 confirms that an isolated, elliptical galaxy can possess a dark matter halo of its own.

Scale: Each panel is 8 x 6.5 arcmin.

Chandra X-ray Observatory ACIS Image