



**Chandra X-ray  
Observatory Center**

Harvard-Smithsonian Center for Astrophysics  
60 Garden St. Cambridge, MA 02138 USA  
<http://chandra.harvard.edu>

**Abell 1689:** A galaxy cluster at a distance of about 2.3 billion light years from Earth.  
(Credit: X-ray: NASA/CXC/MIT/E.-H Peng et al; Optical: NASA/STScI)

**Caption:** This image of Abell 1689 is a composite of data from the Chandra X-ray Observatory (purple) and the Hubble Space Telescope (yellow). Abell 1689 is a massive cluster of galaxies that shows signs of merging activity. The long arcs in the optical image, the largest system of such arcs ever found, are caused by gravitational lensing of the background galaxies by matter in the galaxy cluster. Further studies of this cluster are needed to explain the lack of agreement between mass estimates based on the X-ray data and on the gravitational lensing.

**Scale:** Image is 3.2 arcmin across.

*Chandra X-ray Observatory ACIS Image*

*CXC operated for NASA by the Smithsonian Astrophysical Observatory*