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4C41.17 and 3C294: Two massive young galaxies twelve and ten billion light years from Earth, respectively.

Credit: 4C41.17 C: NASA/CXC/Columbia U./C. Scharf et al.; 3C294: NASA/CXC/Cambridge U./A. Fabian et al.

Chandra's images of two distant massive galaxies show that they are enveloped by vast clouds of high-energy particles that are evidence for past explosive activity. In both galaxies radio and X-ray jets allow this activity to be traced back to central super-massive black holes, seen as the bright spots in the centers of these images. The powerful jets are heating gas outside the galaxies in regions hundreds of thousands of light years across. The galaxies grow through the infall of matter from intergalactic space until heating by the jets stops the infall and limits the growth of the galaxies.

Scale for 4C41.17: Image is 50 arcsec on a side.

Scale for 3C294: Image is 60 arcsec on a side.

Chandra X-ray Observatory ACIS Image

CXC operated for NASA by the Smithsonian Astrophysical Observatory