



Chandra X-Ray  
Observatory Center

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**GOODS Chandra Deep Field South with EXOs:** X-ray sources with no optical counterparts located in the constellation Fornax.  
**Credit:** NASA/CXC/R.Giacconi et al. and D.M.Alexander, F.E.Bauer, W.N.Brandt et al.; ID of x-ray sources: A.Koekemoer et al. [2003]

This image shows Chandra's Deep Field South containing seven faint, mysterious X-ray sources (see boxes). These sources, which are likely supermassive black holes, have not been detected optically, but are seen with infrared telescopes. The sources could be central black holes in unusually dusty galaxies where the optical radiation is absorbed by the dust. Or, they could be candidates for the most distant supermassive black holes ever observed. In the latter case, the red shift due to the expansion of the universe has shifted the optical radiation to infrared wavelengths, and we are seeing them as they were when the universe was only about 500 million years old. Further observations at X-ray, optical and infrared wavelengths will be needed to determine the exact nature of these objects.

**Scale for 3C294:** Image is 24 arcmin on a side.  
*Chandra X-ray Observatory ACIS Image*

*CXC operated for NASA by the Smithsonian Astrophysical Observatory*