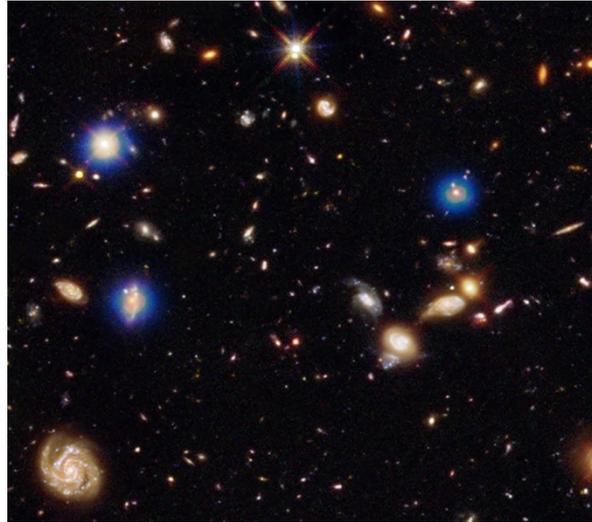




Chandra Science Highlight

Linking Black Hole Growth and Star Formation Rates in Galaxies



A portion of the Chandra Deep Field-South showing an optical and infrared image from the Hubble Space Telescope (HST) together with sources detected by Chandra (blue).

Distance estimate: 4 billion light years to 12 billion light years (redshift $z=0.4$ to 4)

Image scale: Image is 9.25 arcsec across

- The Chandra sources are produced by hot gas falling towards supermassive black holes in the centers of the host galaxies.
- A study of 1907 Chandra sources with strong X-ray emission showed that supermassive black holes have grown more rapidly in more massive galaxies.
- In large galaxies containing 160 billion solar masses in stars, the average mass of the central black hole is 300 million solar masses. In galaxies with only 5 times less mass in stars, the average black hole mass is 50 times smaller.
- The increased mass of central black holes in massive galaxies may indicate that massive galaxies are more effective in feeding gas to the black holes due to the deeper gravitational potential wells in these galaxies.

Credit: X-ray: NASA/CXC/Penn. State/G. Yang et al & NASA/CXC/ICE/M. Mezcua et al.; Optical: NASA/STScI

Instrument: ACIS

Reference: G. Yang et al., 2018, MNRAS, 475, 1887.
arXiv:1710.09399

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