Chandra Science Highlight

NGC 3393: A Spiral Galaxy With A Close Nuclear Pair of Supermassive Black Holes

Chandra X-ray Observatory ACIS image

Distance Estimate: 160 million light years

Scale: Image is 12.5 arcsec across (about 9800 light years)
Inset image: 1.6 arcsec across (1260 light years)

The main image is a composite of X-rays from Chandra (blue) and optical data from the Hubble Space Telescope (gold) of the spiral galaxy NGC 3393. The inset box shows the X-ray image of the central region of the galaxy.

- Two separate peaks of X-ray emission (roughly at 11 o'clock and 4 o'clock) can clearly be seen in the inset box. These two sources are separated by only 490 light years.
- The X-rays from the central region exhibit fluorescent emission from iron atoms, a characteristic feature of accreting black holes that are heavily obscured by dust and gas. This indicates that the sources are accreting supermassive black holes that are the remnant of a merger of two galaxies.
- At a distance of 160 million light years, this would be the nearest known pair of supermassive black holes
- The galaxy shows no evidence of a collision, so it is likely that the black hole pair formed when a smaller galaxy merger with NGC 3393 about a billion years ago.

References: Fabbiano, G et al. Nature, Volume 477, pp. 431-434 (2011)

Credit: X-ray: NASA/CXC/SAO/G.Fabbiano et al: Optical: NASA/STScI