



**Chandra X-ray  
Observatory Center**

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**Gravitational lenses:** Five quasars ranging in distance from 8.8 billion to 10.9 billion light years from Earth.

(Credit: NASA/CXC/Univ. of Oklahoma/X. Dai et al.)

**Caption:** Astronomers have used Chandra to measure the spin of five quasars, each consisting of a supermassive black hole rapidly consuming matter from a surrounding accretion disk. Gravitational lensing of the light from each of these black holes by an intervening galaxy has created multiple images of each quasar, as shown by these Chandra images of four of the targets. The matter in one of these cosmic vortices is swirling around its black hole at greater than about 70% of the speed of light.

*Chandra X-ray Observatory ACIS Image*

*CXC operated for NASA by the Smithsonian Astrophysical Observatory*