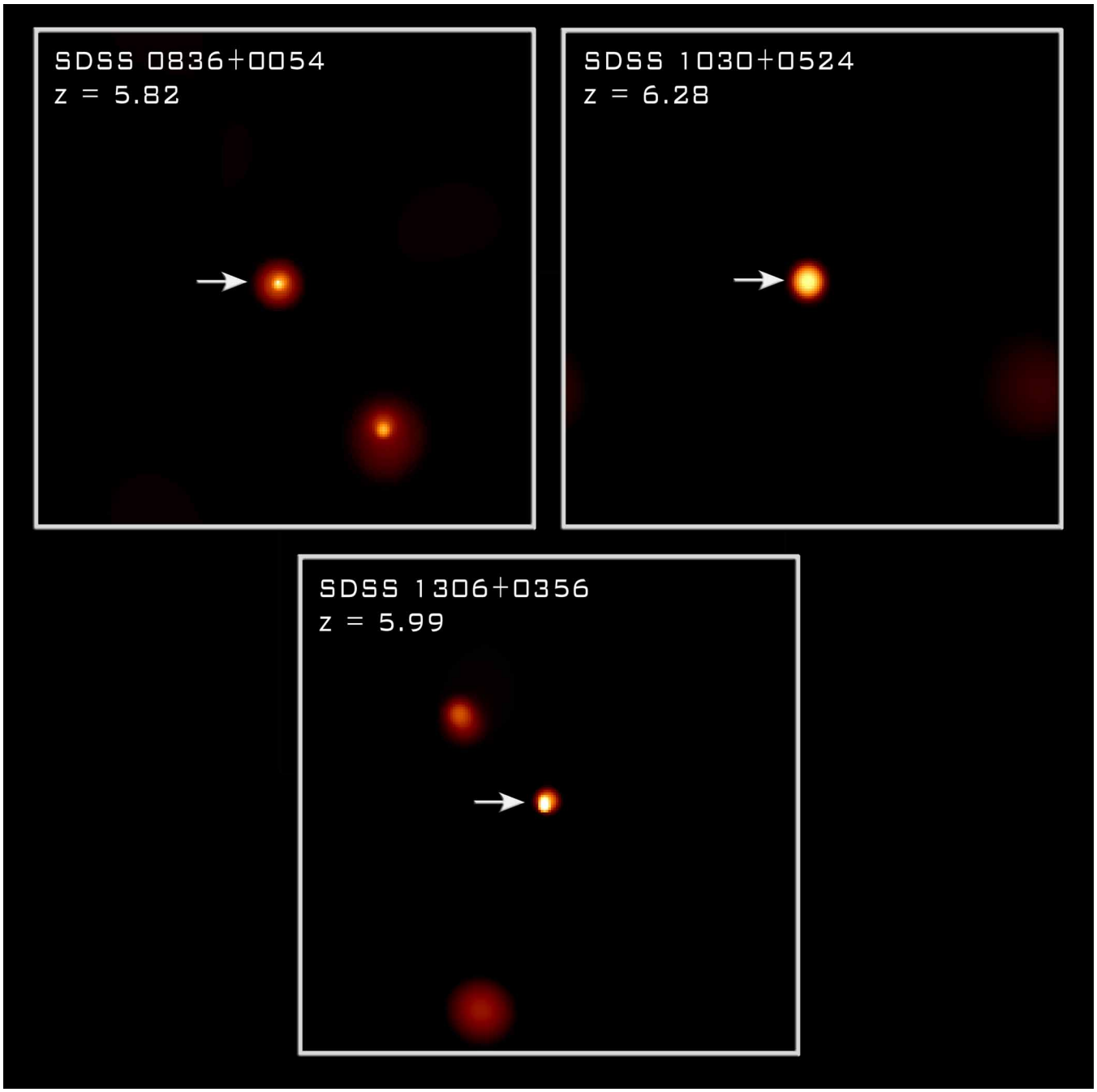

Chandra X-Ray Observatory Center

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SDSS 0836+0054, SDSS 1030+0524, and SDSS 1306+0356: Three quasars 13 billion light years from Earth.
Credit: NASA/CXC/PSU/N. Brandt et al.

The X-rays Chandra detected from these three quasars were emitted when the universe was only a billion years old, about 7 percent of the present age of the universe. Surprisingly, the power output and other properties of these quasars looked similar to quasars that were less distant. This indicates that the conditions around their central supermassive black holes must also be similar, contrary to some theoretical expectations. By various estimates, the supermassive black holes in these quasars weighed in at somewhere between one and 10 billion times the mass of the Sun. The implication is that the black holes put on a lot of weight soon after the galaxies formed.

Scale: Image is 1.61 arcmin for each panel.
Chandra X-ray Observatory ACIS Image