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NGC 3783: An Active Galaxy with a giant black hole.
Credit: NASA/PSU/G. Pavlov et. al.

Caption: Chandra measured the effects of the intense radiation produced by matter before it plunges into the giant black hole at the core of the active galaxy NGC3783. The radiation heats the surrounding gas and drives a million mile per hour wind of energetic particles away from the crushing grip of the black hole's gravity. The actual Chandra image (top section) is the central bright spot. The long intersecting lines show the dispersion of the X-ray beam, by the High Energy Transmission Grating, spread into a rainbow-like display of hundreds of different X-ray "colors" or energies. Computers then translated this display into a jagged line-plot. Specific elements in the wind (oxygen, neon, magnesium, silicon, sulfur, argon, and iron) reveal their presence by sharp absorption dips in the plot. By examining the widths and locations of these dips, researchers can use the same principle as a radar gun to measure the velocities of the powerful gas flows at the galaxy's core.

Chandra X-ray Observatory HETG/ACIS Image

CXC operated for NASA by the Smithsonian Astrophysical Observatory