



**Chandra X-ray
Observatory Center**

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Mkn 421: X-ray spectrum from a quasar located 400 million light years from Earth. (Spectrum: NASA/SAO/CXC/F.Nicastro et al.; Illustration: CXC/M.Weiss)

Caption: This illustration shows the absorption of X-rays from the quasar Mkn 421 by two intergalactic clouds of diffuse hot gas, and a portion of the Chandra X-ray spectrum of the quasar. The dips in the spectrum are produced when X-rays of a specific wavelength are absorbed by ions of oxygen in hot gas clouds located at various distances from Earth. The orange dips are caused by relatively nearby clouds which are not shown in the illustration; the green and red dips are from clouds at distances of 150 million and 370 million light years, respectively. These distant clouds are likely part of a predicted diffuse web-like system of hot gas clouds - the cosmic web - from which galaxies and clusters of galaxies are thought to have formed. This discovery is strong evidence that atoms and ions known to be present shortly after the Big Bang, but missing in inventories of matter in the present era, are hiding in the hard-to-see cosmic web.

Chandra X-ray Observatory LETG Spectrum

CXC operated for NASA by the Smithsonian Astrophysical Observatory