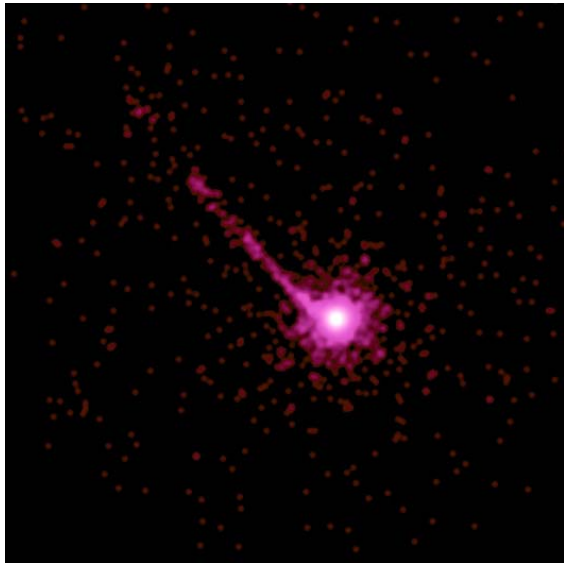




Chandra Science Highlights

PKS 1127-145: A Quasar with an Extended X-ray Jet and an Intervening Absorber



The X-ray image of the quasar PKS 1127-145, a highly luminous source of X-rays and visible light about 10 billion light years from Earth (redshift $z=1.187$), shows an enormous X-ray jet that extends approximately a million light years from the quasar.

(Credit: NASA/A.Siemiginowska (CfA)/J. Bechtold (U.Arizona))

Reference: J. Bechtold, et al. 2001, *Astrophys. J.* 562, 133; A. Siemiginowska et al. *Astro-ph/0201116*

Scale: Image is 60 arc seconds on a side
Chandra X-ray Observatory ACIS image.

- **The jet from the quasar extends $\sim 30''$ from the quasar core, corresponding to a projected linear size $\sim 1,000,000$ light years. The jet is thought to be produced by intense electromagnetic fields generated in gas swirling around a supermassive black hole. The length of the jet and the bright knots of X-ray emission suggest that this activity has been long-lived and intermittent.**
- **Compton scattering of cosmic microwave background photons off relativistic electrons in a jet moving with bulk relativistic velocities ($v=.95c$) is the most probable emission mechanism.**
- **This observation demonstrates that X-ray jets may be detectable at large distances (redshifts) because the intensity of cosmic microwave background radiation increases strongly with redshift (fourth power of $1+z$).**
- **X-ray absorption associated with a foreground galaxy at a distance of 4 billion light years (redshift $z=0.312$) was also detected. An analysis of this absorption indicates that the oxygen abundance is about 20% of the value measured in our Galaxy.**