

APR09-2008-030062

Abstract for an Invited Paper
for the APR09 Meeting of
the American Physical Society

Black Holes, Dark Matter, and Dark Energy: Measuring the Invisible through X Rays

CHRISTINE JONES, Harvard-Smithsonian Center for Astrophysics

X-ray telescopes allow us to “see” the high energy radiation from objects that cannot be seen at other wavelengths including black holes and the very hot gas in galaxies and clusters of galaxies. Since soft X-rays are absorbed by our atmosphere, X-ray detectors must be flown above most of the Earth’s atmosphere. The first orbiting X-ray telescope flew on Skylab in the early 1970’s and recorded images of the Sun on film. Observing fainter X-ray sources required both the development of large, high-incidence mirrors and the development of electronic detectors capable of measuring the arrival of an X-ray photon in two dimensions. This talk will review the development of X-ray observatories from the early Einstein observatory through the current Chandra, SWIFT and XMM-Newton missions. While X-ray observations have changed our views in many areas of astronomy from stars to quasars, this talk will focus on the advances in our knowledge of supermassive black holes, dark matter and dark energy.