

Deep X-ray and UV Surveys of Galaxies with Chandra, XMM-Newton, and GALEX

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Abstract

Only with the deepest Chandra surveys has X-ray emission from normal and star forming galaxies (as opposed to AGN, which dominate the X-ray sky) been accessible at cosmologically interesting distances. The X-ray emission from accreting binaries provide a critical glimpse into the binary phase of stellar evolution and studies of the hot gas reservoir constrain past star formation. UV studies provide important, sensitive diagnostics of the young star forming populations and provide the most mature means for studying galaxies at $2 < z < 4$. This talk will review current progress on studying X-ray emission in concert with UV emission from normal/star-forming galaxies at higher redshift.

We will also report on our new, deep surveys with GALEX and XMM-Newton in the nearby Coma cluster. These studies are relevant to DEEP06 as Coma is the nearest rich cluster of galaxies and provides an important benchmark for high-redshift studies in the X-ray and UV wavebands. The 30 ks GALEX (note: similar depth to the GALEX Deep Imaging Survey) and the 110 ks XMM observations provide extremely deep coverage of a Coma outskirts field, allowing the construction of the UV and X-ray luminosity function of galaxies and important constraints on star formation scaling relations such as the X-ray-Star Formation Rate correlation and the X-ray/Stellar Mass correlation. We will discuss what we learn from these deep observations of Coma, including the recently established suppression of the X-ray emission from galaxies in the Coma outskirts that is likely associated with lower levels of past star formation and/or the results of tidal gas stripping.