



Physics Colloquium



Thursday, November 19th at 3:30 pm in SC 234

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X-ray binary populations from 0.5-30 keV with NuSTAR and Chandra

The X-ray emitting properties of accreting black hole (BH) and neutron star (NS) binary populations, collectively referred to as X-ray Binaries (XRBs), appear to correlate well with galaxy parameters such as star formation rate (SFR) and stellar mass. These correlations have been well-studied in both the local universe and to higher redshift using the Chandra X-ray Observatory which has permitted spatially resolved studies in the 0.5-10 keV band. However, with the 0.5-10 keV band alone, there are ambiguities concerning the identity and states of the sources. We have extended work on extragalactic XRB populations to $E > 10$ keV using the unprecedented imaging capability of the NuSTAR Explorer mission to study a sample of ~ 6 galaxies in the relatively nearby universe and recently have begun a new campaign with NuSTAR and several other X-ray observatories in the nearby Andromeda galaxy (M31). We've built upon intensity-count rate diagnostics for Milky Way XRBs, determined from a rich database of Rossi X-ray Timing Explorer (RXTE) spectra, to enable direct constraint on the source identities and accretion states of binaries. We can combine this local Universe knowledge with new constraints from the deepest-ever X-ray survey of the distant Universe, the Chandra Deep Field-South, to show how XRBs evolve over cosmic time. XRBs may have a significant impact on conditions in the earlier Universe, including early heating of the Intergalactic Medium.

Refreshments at 3:00 pm in SC 103