Hunting for the WHIM with Chandra

Caleb A. Scharf(*Columbia Astrophysics Laboratory*)

Abstract

At least 40% of all present-epoch baryonic matter is expected to exist in low density, large-scale filamentary and sheet-like structures in which gas has been gravitationally shock heated to ($10^5 - 10^7$ K): the so-called Warm Hot Intergalactic Medium (WHIM). Searching for the X-ray emission from the WHIM is expected to be excruciatingly difficult owing to its low surface brightness, projection confusion, and soft spectrum. This is, however, probably the only way to truly map out and quantify the WHIM, since line absorptions will be very weak and only remotely feasible in the most photon rich AGN spectra. I present here new work on optimizing the detection of both WHIM structures and the lowest temperature galaxy groups, expected to also trace the same underlying mass distributions on 10's of Mpc scales. I utilize the spatial-spectral ability of Chandra to form what amounts to a redshift dependent spatial-spectral 'matched-filter' with sensitivity to low temperature gas emission. The method and initial results are described here.

CATEGORY: EXTRAGALACTIC DIFFUSE EMISSION AND SURVEYS