Astrophysics Seminar

WHAT HAVE GALAXIES DONE WITH THEIR METALS?

Dr. Molly Peeples, UCLA

Tuesday, February 26 ❖ 12:30 P.M. ❖ 184 NSH

The eventual fate of a galaxy's metals is a direct tracer of its history of star formation, gas flows, and feedback processes. I will show that a simple model combining empirical star formation histories with the local relation between stellar mass, gas-phase metallicities, and star formation rates reproduces the metal distributions of z=0 galaxies remarkably well. I will then present an accounting of metals made by ~L* galaixes at z=0, showing that the bulk of metals released by supernovae and AGB stars are no longer in galaxies, and are instead in the circumgalactic medium (CGM) or intergalactic medium. The COS-Halos survey has created a statistically-sampled map of the gaseous CGM of low redshift ~L* galaxies out to impact parameters ~150 kpc using the Cosmic Origins Spectrograph (COS) on the Hubble Space Telescope. Using this map, I will show that the masses of metals found in the cool (10^4 < T < 10^5 K) photoionized and the more highly ionized OVI-traced CGM could potentially account for all of the metals expelled from ~L* galaxies at z~0.

Notre Dame Science
Department of Physics