The Large Reservoirs of Gas Around Galaxies

The Circumgalactic Medium (CGM) is where infalling gas that feeds star formation meets outflowing, feedback-enriched materials. It is where satellites are stripped and disrupted, and where gas ejected from galaxies may eventually be recycled. This medium is seen primarily in absorption, taking the form of diffuse, ionized gas bound to the dark matter halo of its host galaxy and extending to at least 300 kpc. In this talk, Dr. Werk will present two observationally motivated puzzles requiring theoretical investigation. First, she will review the evidence that the CGM of quenched galaxies contains as much cold gas as their star-forming counterparts. This observation implies that galaxies are transformed from star-forming disks to quiescent spheroids while retaining a significant store of cold gas in their halos. Then, Dr. Werk will show that the cool and warm phases of the CGM (T < 10^6 K) account for most of the baryons purported to be missing from dark matter halos of both star-forming and passive galaxies with M_halo ~ 10^12. Yet, surprisingly, the cool (10^4 K) gas in the CGM is far from pressure equilibrium with a hot medium that could provide hydrostatic support.