

The circumgalactic medium: understanding galaxy evolution & baryon cycling

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Recent pioneering COS observations have allowed for detailed studies of the circumgalactic medium (CGM) around galaxies at low redshift. However, due to the complexity of including the necessary physics in simulations, a solid theoretical foundation for understanding the intricate interplay between gaseous inflows from the IGM, galactic winds, and gas recycling has been lacking. In this talk, I will show how studying both observations and simulations of the CGM can be leveraged to understand galaxy evolution and the Baryon Cycle. I discuss the extent and strength of HI and metals in the neighborhood of galaxies, as well as the typical temperatures, densities, and ionization conditions of the gas that gives rise to absorption features. I will discuss observable diagnostics of inflows and outflows, key to our understanding of galaxy evolution. I additionally demonstrate the sensitivity of these observables to the details of how galactic super-winds are modeled, and how different feedback prescriptions leave unique, observable signatures within the CGM (unless, of course, they don't).