

TUESDAY

APRIL 19

12:30 P.M.

RM 184 NSH

Virial Thermometers: A New Understanding of the Circumgalactic Medium

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The circumgalactic medium, halo gas surrounding galaxies, is observed to be highly enriched in the low-redshift ($z \sim 0.2$) Universe. I will present new results of hydrodynamical simulations confronting COS-Halos quasar absorption line observations of highly ionized oxygen (O VI) within 150 kpcs of L^* spirals and ellipticals. Observations show a strong correlation between a galaxy's star formation rate and the amount of O VI in the circumgalactic medium. While initial interpretations of this correlation suggested galactic superwinds actively enriching extended halos, I will argue for a different model. Most metals nucleosynthesized by stars are ejected by superwinds into the circumgalactic gas. However, ionization corrections determine what oxygen ion is observed. I will present a model where O VI happens to trace the virial temperature of halos hosting star-forming spirals, while passive elliptical live in more massive, more enriched halos where oxygen primarily lives in higher ions. The results are much greater reservoirs of circumgalactic metals than previously assumed. Thus the amount and state of oxygen serves as an indicator of a halo's virial temperature.