ASTROPHYSICS SEMINAR SERIES

Are the Dark Matter Halos of Milky-Way-Like Galaxies Filled with Hot Gas?

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12:30 pm - Rm 184 NSH

Cosmological simulations consistently find that the dark matter halos of low-redshift ~L* galaxies are filled with hot gas shocked to the virial temperature (~10^6 K), out to and beyond the virial radius of the dark matter halo (~250 kpc). I will demonstrate that recent observations of gas around star-forming ~L* galaxies (mainly by HST) can in many respects be explained with an alternative scenario, where the hot gas is confined by an accretion shock at ~100 kpc, while further out the gas is predominantly cool (<10^5 K). Non-star forming galaxies on the other hand do not show evidence for this volume-filling cool phase in the outer halo, more in line with the scenario suggested by simulations. I will discuss theoretical uncertainties which may explain why this alternative scenario is not realized in current cosmological simulations, and also predictions which can be used to detect accretion shocks in upcoming observational campaigns and future telescopes.

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