
The Circumgalactic Medium of Massive Quiescent Galaxies at $z \sim 0.5$

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Abstract

While elliptical galaxies exhibit no ongoing star formation, > 40% of these galaxies harbor a significant amount of cool gas. The presence of chemically enriched cool gas in massive halos presents a challenge to predictions from both analytic models and numerical simulations. While AGN feedback is commonly thought to be at play in these massive halos, recent work has also reiterated the importance of feedback from old stellar populations, including Type Ia supernovae (SNe Ia). Observations of the circumgalactic medium (CGM) of massive ellipticals are necessary to identify additional physical mechanisms beyond starburst-driven winds that can explain the presence of cool gas, which bear significantly on our understanding of the cycling of baryons between galaxies and the intergalactic medium. I will present new results from COS-LRG, a survey of CGM gas around $z \sim 0.5$ luminous red galaxies ($M_{\text{star}} > 10^{11} M_{\text{sun}}$) which are probed by background QSOs with UV spectroscopy from the HST Cosmic Origin Spectrograph. These observations provide important constraints on the ionization state and chemical abundance in the gaseous halo of massive galaxies. I will discuss the implications of our findings for the nature of chemically enriched cool gas in massive halos and our understanding of the underlying feedback mechanisms.

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