

# The Circumgalactic Medium of Quasars

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**Abstract.** I will argue that observations of the diffuse gas in the outskirts of quasar host galaxies, or the so called circumgalactic medium, are essential for understanding how luminous quasars evolve in a cosmological context. Such observations also provide a fruitful comparison to theory, because hydrodynamics at moderate overdensities is much easier to simulate than the complicated processes which trigger quasar activity. A novel technique will be introduced, whereby a foreground quasar can be studied in absorption against a background quasar, resolving scales as small as 30 kpc. This experiment reveals a rich absorption spectrum which contains a wealth of information about the physical conditions of diffuse gas around quasars. Hydrodynamical simulations of the massive dark matter halos which host luminous quasars under predict the amount of cool gas observed in quasar environs by a large factor, challenging our understanding of how massive galaxies form. I will also discuss a very sensitive search for Ly-alpha emission from the same gas which we study in absorption.

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