The Galaxy-Dark Matter Connection

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How is light distributed with respect to the dark matter? What is the typical mass-to-light ratio of dark matter haloes as function of halo mass? I present a new statistical tool to address these questions. I show how the abundances and clustering properties of galaxies constrain the so-called conditional luminosity function (CLF), which specifies how many galaxies of luminosity L reside in a halo of mass M. Using the CLF formalism I will put a number of stringent constraints on large scale structure, galaxy formation and cosmological parameters.

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