

Abstract Submitted
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Bridging the Gap: Characterizing Groups of Galaxies JASON PARISI, PRIYAMVADA NATARAJAN, Yale Univ — While galaxies are ubiquitous in the universe, and galaxy clusters, the most massive structures are rare, intermediate mass scale objects - galaxy groups - are abundant. However, their properties are not as well studied at present, partly due to the difficulty in characterizing them and their dynamics. Besides, they are likely transitory objects that eventually merge into assembling clusters. Galaxy groups therefore offer an interesting laboratory to study dynamical processes as well as to probe the interplay between baryons and dark matter. We present the first results from a galaxy group finder algorithm that selects candidates from the large high-resolution cosmological Illustris simulation with a view to better understand their formation, and to more accurately characterize them as a class of astrophysical objects. Fundamental relations between galaxy groups and their dark matter substructure, their member galaxies, and other observables are characterized. We compare the current observational classification of galaxy groups - compact, fossil, and loose - with correlations recovered from simulations, and propose new criteria to describe galaxy groups. Preliminary Illustris findings are compared with multi-wavelength observational findings.

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