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Galaxy formation in voids

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Galaxies in large-scale voids have been searched in several studies but only few of them have been found. In contrast, a huge number of dwarf galaxy sized dark matter halos should be present according to the cosmological structure formation scenario. We investigate this discrepancy using cosmological N-body hydro simulations including radiative heating and cooling as well as star formation. We show that reionization prevents galaxy formation in most of the dark matter halos. A small number of galaxies is formed and only very few of them in central regions of the void. A lot of the galaxies are young and gas rich. We show that several galaxy properties, as gas fraction, metallicity and stellar velocity dispersion, should scale with the stellar mass content. Generally dark matter halos in voids have only little interaction among each other therefore those regions are particular suited to study basic processes of galaxy formation.

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