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A study of the baryon cycle in groups at different stages of assembly

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Multiphase studies of the baryon cycle in groups at different stages of assembly combined with the multi-wavelength characterization of galaxies in the groups will inform us of the gas kinematics, group dynamics, galaxy properties, and subsequently the evolution of both groups and galaxies. While some works find increased star formation suppression events in groups, several others find enhanced star formation due to gas supply from satellite galaxies, mergers, and accretion from the cosmic web. This dichotomy of gas-rich and gas-poor groups has been linked to the stage in group evolution with the former being in early and the latter in late stages of assembly. Even though it is well known that galaxies shape and are shaped by their environments, the relative contribution of environmental and internal galactic processes still remains poorly understood. We study the baryon cycle in two nearby low-mass, gas-rich, late-type dominated, and relatively isolated groups where the biggest members show varying levels of tidal interaction. The high spatial & spectral resolution, sensitivity, and wide field-of-view of MeerKAT enable us to detect HI down to N(HI) ~ 3x10^{19} cm^{-2} and to probe a major extent of the group. We explore previously known and unknown dwarf members, tidal interactions, outflows, etc. to accurately characterize the group environments and to study the kinematics of the neutral gas in the group. Resolved studies of such unique laboratories that encapsulate several key processes of the baryon cycle spanning the ISM, CGM, and IGrM are crucial for constraining galaxy evolution models.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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