

Feeding and Feedback in the Cosmic Web: Disentangling a local nexus of filaments

Abstract

We propose medium-deep observations of a network of filaments feeding the "SuperGroup" assembling cluster Abell 4038 ($z \sim 0.03$), furnishing a dataset of enormous value in the study and simulations of the interplay of dark matter and baryonic processes across environment. Targeting these infalling systems will a) probe a broad range of group halo mass, b) provide statistical power in the low mass group halos (and low mass galaxies) most sensitive to environmental effects, and c) straightforwardly control for assembly bias. With 80 hours on-source (covering an area of 40 square degrees), MeerKAT's superior sensitivity on spatial scales of $\sim 15\text{-}20''$ will enable us to connect HI content, HI asymmetry, and AGN activity to mass assembly on large (filaments) and small (e.g., pairs, triples) scales; it is, therefore, the ideal pre-SKA instrument to examine the replenishing versus quenching power of filaments in the local universe.