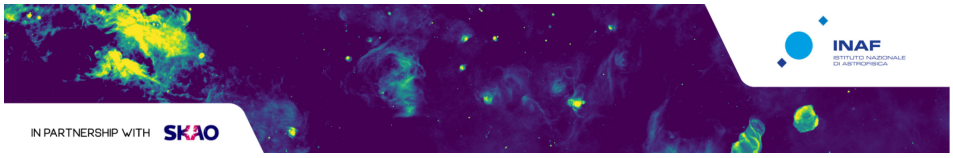


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# The MHI-Mhalo relation in the cosmic web

THe $M_{\rm HI} - M_{\rm halo}$ relation is a fundamental tool in cosmology, to perform cosmological inference from HI surveys. This relation has been so far constrain observationally in a robust way only in the nearby Universe, and has been studied in theory from state-of-the-art cosmological hydrodynamic simulations. Nonetheless, no dependence on secondary properties (also called 'assembly bias') has been considered so far. In this talk, I present the ongoing effort to characterize the dependence of the $M_{\rm HI} - M_{\rm halo}$ relation on the large-scale structure cosmic web environment across redshifts, lifting the assumption that such a relation is the same everywhere in the Universe irrespectively of the underlying physics. In particular, correctly describing the dependence of this relation on the cosmic web allows us to capture the effect of the formation and growth of cosmic structures and of baryon effects on the HI content of haloes, which in turn regulates the availability of HI fuel to sustain star formation, and hence to also better understand the baryon cycle of galaxies.

## Topics

Cosmology

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