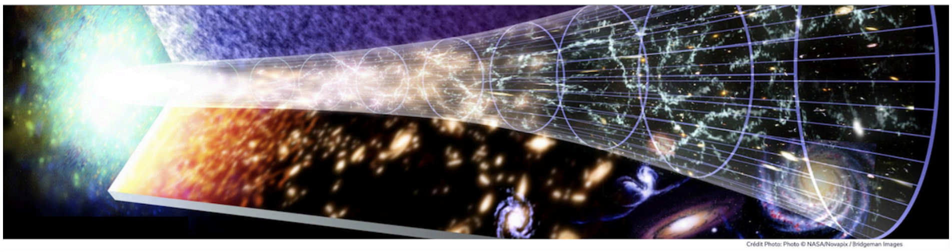

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Dark matter halo properties of intermediate-z star-forming galaxies

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To address the core-cusp problem, which has been one of the major problems of the ΛCDM concordance model, we analyze the dark matter halo properties of a large sample of intermediate-redshift ($0.3<z<1.5$) star-forming galaxies spanning a wide range of stellar masses ($6.5<\log(M^*/Msun)<11$). For this, we employ integral field unit observations from the MUSE Hubble Ultra Deep Field Survey, as well as photometry from HST and JWST. We analyze the morpho-kinematics of our sample with a 3D modeling approach, using the Galpak3D tool (Bouché+15), which allowed us to measure individual rotation curves in the outskirts of galaxies. We performed disk-halo decompositions with a 3D parametric model, which includes a stellar, dark matter, and gas component, as well as corrections for pressure support. The dark matter halos of the sample were parametrized using six different halo models, including the generalized α, β, γ profile (Di Cintio +14), a Navarro-Frenk-White (Navarro, Frenk, White 1997), Dekel (Dekel et al. 2017, Freundlich et al. 2020a), Burkert (Burkert 1995), coreNFW (Read et al. 2016), and Einasto profile (Navarro et al. 2004). Our 3D methodology was validated using mock data cubes from idealized disk simulations. We performed a comparison between the different disk-halo models, finding that the Di Cintio+14 model is better preferred by the data compared to all the other models. We investigate the properties of the dark matter halos of our sample, such as the fractions of dark matter and its evolution with redshift, the stellar mass-halo mass relation, the concentration-halo mass relation, and the halo scale radius-density relation, as well as the link between core/cusp formation and other galaxy properties such as their star formation history.

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