

Baryons in the Universe 2024



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Baryon Pasting Project

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We are entering the golden age of multi-wavelength astronomical surveys. In the 2020s, a plethora of multi-band surveys (such as Rubin-LSST, DESI, Simons Observatory, CMB-S4, and eROSITA, to name a few) are underway or planned to provide unprecedented insights into the cosmic structure formation and the fundamental physics of the cosmos. One of the key challenges of this cosmic frontier lies in understanding the halo-galaxy-gas connection and the roles of still poorly understood galaxy formation physics and its impact on cosmology. In this talk, I will present the Baryon Pasting project, which aims to create a physically-motivated, computationally efficient model for large multi-wavelength cosmological surveys. I will discuss the current status, challenges, and future prospects towards forward-modeling multi-wavelength cosmological surveys and enabling cross-survey, cross-correlation cosmology.

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