



Contribution ID: 88

Type: **Contributed talk in mini symposium**

Astrophysical challenges in the post-reionization intergalactic medium: relics from cosmic reionization

Monday, December 11, 2023 5:00 PM (10 minutes)

The high-redshift nature of the post-reionization IGM makes it a promising avenue to constrain the nature of dark matter since nonlinearities are not as prominent as in low-redshift alternatives. Nevertheless, to fully unlock 21 cm intensity mapping and the Lyman- α forest, which are the two primary cosmological probes of the post-reionization era; we must first account for their respective responses to the reionization process or otherwise face large biases in the inference of cosmological parameters from current/near-term instruments like DESI and SKA. In this talk, I will explain the origin of the imprints of reionization in both 21 cm intensity mapping and the Lyman- α forest, quantify the strength of this novel broadband systematic, and establish their dependence on epoch of reionization and cosmic dawn astrophysics. Furthermore, I will introduce mitigation/separation techniques that allow for unbiased Bayesian inference of cosmological parameters in the post-reionization era.

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Session Classification: Cosmology with large-scale structure