



# IIA ASTROPHYSICS SEMINAR



29 August 2024, Thursday, 11:30 AM

IIA Auditorium

## Primordial Features and Reionization: Probing the Early Universe with the Redshifted 21 cm Signal

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IIA

*Cosmic inflation is the most promising paradigm for explaining the fine-tuned initial conditions of the standard Big Bang model. Various inflationary models have been proposed over the years, and some of them predict their unique observational signatures in the primordial density perturbations, known as the “primordial features.” Searching for the imprints of the primordial features in the cosmological observations provides a way to understand the physics of the early universe. In this talk, I will focus on a specific class of primordial features predicted by particle production mechanisms during inflation. I will discuss the constraints on this model derived from the CMB observations by Planck and also the potential of the upcoming radio telescope - Square Kilometer Array (SKA) to detect such features. Particularly, the redshifted 21 cm line from the early universe carries invaluable information regarding the evolution of density perturbations and the astrophysical processes of the Epoch of Reionization (EoR). I will present highlights from our ongoing work, focusing on how primordial features and EoR parameters affect the 21 cm signal at high redshifts.*



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