

JOINT TUFTS/MIT COSMOLOGY SEMINAR

Probing primordial non-Gaussianity with line intensity mapping

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Primordial non-Gaussianity (PNG) is a unique window into the physics of the early universe and the origin of primordial fluctuations. Deviations from Gaussian initial conditions, leave an imprint on statistical properties of large scale structure. Upcoming wide-field optical galaxy surveys such as DES, EULCID and LSST, which map the cosmic web by resolving individual sources such as galaxies and quasars, are expected to improve the constraints on PNG beyond the limits set by the Planck satellite. An alternative approach to probe the underlying dark matter distribution is detecting various molecular and atomic emission lines using the intensity mapping technique, which relies on measuring the cumulative light from ensemble of sources, including faint, unresolved galaxies. It therefore provides a 3D map of the large scale structure at redshifts and scales inaccessible to galaxy surveys. In this talk, I will discuss the potential of future intensity mapping surveys targeting CO and [CII] emission lines, in the redshift range as far back as the Epoch of Reionization, in constraining PNG of the local shape. I will show that even a non-purpose-designed intensity mapping survey such as COMAP, can achieve constraints on the local shape at the level comparable to that from optical surveys, via measurement of the line intensity power spectrum. I will further discuss the prospects of how these constraints can be improved by choosing optimized survey specs, in addition to taking advantage of multi-tracer technique.

Tuesday, March 6, 2018, 2:30 pm
574 Boston Ave, Room 310
Tufts University

Refreshments at 2:00 outside room 304