



ICTS Astrophysics & Relativity Seminar (HYBRID)

Title : Rethinking Recombination: Primordial magnetic fields and their implications for the Hubble tension

Speaker : Jonathan Schiff (University of California, Santa Barbara)

Date : Thursday, 09th November 2023

Time : 03:30 PM (IST)

Abstract : Perhaps the most significant challenge to the widely successful Lambda-CDM theory is the disagreement between late and early Universe measurements of the present day Hubble expansion rate (H_0), referred to as the Hubble tension. One of the ways to resolve the Hubble tension is to modify the recombination history of the early universe. An intriguing proposal to realize this invokes primordial magnetic fields (PMFs) to stir up the plasma on small scales and speed up recombination. An earlier recombination shrinks the sound horizon at the surface of last scattering and consequently increases the early Universe inference of H_0 . On the small scales at which PMFs introduce baryon clumping, the nonlocal transport of photons in the Lyman-alpha resonance and Lyman-continuum, which mediate the recombination process, becomes important. Utilizing a linearized scheme for magnetohydrodynamics in the early Universe, our work provides a self-consistent and computationally inexpensive treatment of the evolution of PMF-induced small-scale inhomogeneities incorporating nonlocal radiative transport. Moreover, the general framework we have developed is useful for any future proposals which seek to modify the recombination history on small scales.

Venue : Offline: Madhava Lecture Hall

Online: Please click on the below link to join the seminar

<https://zoom.us/j/98322598366?pwd=cC9xbk40bWxaSTRKY2R1cTBTU1pMZz09>