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Simultaneous alleviation of major cosmological tensions through Λ

ms$CDMcosmology$

Saturday 9 September 2023 11:30 (1 hour)

In this talk, we will first give a brief introduction to the $\Lambda_{\rm s}$CDM model, which explores the recent conjecture suggesting a rapid transition of the universe from anti-de Sitter vacua to de Sitter vacua, viz., the cosmological constant switches sign from negative to positive at redshift $z_\dagger \sim 1.7$, inspired by the graduated dark energy (gDE). And then, we will present the results of its comprehensive observational analysis showing that, predicting $z_\dagger \approx 1.7$, $\Lambda_{\rm s}$CDM simultaneously addresses the major cosmological tensions of the standard ΛCDM model, viz., the H_0, M_B, and S_8 tensions, along with some other less significant tensions such as the BAO Ly-α discrepancy. We will conclude with a theoretical discussion on the possible physical mechanisms from which this scenario may be realized and their implications for our current understanding of the universe.

Presenter: Prof. AKARSU, Ozgur (Istanbul Technical University)