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Contributory: Model-Independent Evidence for a Localized Anomaly in the Late-Time Expansion History

Tuesday, 17 November 2026 14:15 (15 minutes)

In this talk, I present a model-independent spline reconstruction of cosmological distances using latest low-redshift datasets to investigate the late-time expansion history of the Universe. Comparing the reconstructed expansion history with the prediction of the Planck Λ CDM model, I demonstrate a localized deviation over a certain redshift interval which reaches a maximum significance of approximately 3.5σ near $z = 0.47$. I further demonstrate that this feature persists under substantial variations of the reconstruction methodology, dataset composition and sound-horizon calibration. I argue using mock analyses that the reconstruction is unbiased and that the observed anomaly is unlikely to arise from reconstruction bias or miscalibrated uncertainties. If confirmed by future observations, this localized feature could point to previously unrecognized late-time physics or reveal subtle inconsistencies between early and late Universe cosmological probes.

Primary authors: GUPTA CHOUDHURY, Shibendu (Indian Institute of Astrophysics); Dr MUKHERJEE, Purba (Korea Astronomy and Space Science Institute); Prof. DI VALENTINO, Eleonora (University of Sheffield); Prof. SEN, Anjan A. (Jamia Millia Islamia)

Presenter: GUPTA CHOUDHURY, Shibendu (Indian Institute of Astrophysics)