



Contribution ID: 20

Type: **Oral presentation**

Quintessence model in the late Universe

Scalar fields have shown great potential in inducing tailored modifications compared to cosmic evolution in the Λ CDM model. We investigate a quintessence model with five physically motivated scalar field potentials: the general power-law, quadratic, fifth-power, hyperbolic sinh, and axion-like potentials. The model parameters are constrained by using the late-time cosmological observations, including Cosmic Chronometers (CC), Pantheon⁺, BAO, and DESI DR2 data. To assess the influence of the local distance-ladder calibration, we additionally perform a separate analysis using the Pantheon⁺ & SH0ES compilation. Our analysis shows that the inclusion of the SH0ES calibration systematically shifts the inferred Hubble constant toward higher values, whereas the addition of BAO and DESI DR2 data prefers comparatively lower values and significantly reduces parameter degeneracies. We center the action of these models in the late Universe which leaves early Λ CDM cosmology unchanged. Across all five potentials, an inverse correlation between H_0 and Ω_{m0} is consistently observed, indicating that higher values of the Hubble constant are associated with a lower present-day matter density and a stronger contribution from dark energy to the current accelerated expansion.

Primary author: MISHRA, Bivudutta (BITS-Pilani, Hyderabad Campus)