Contribution ID: **87** Type: **not specified**

Resolving Hubble Tension with New Gravitational Scalar Tensor Theories

Sunday, 11 September 2022 16:30 (10 minutes)

We investigate the cosmological applications of new gravitational scalar-tensor theories and analyze them in the context of H0 tension. In these theories the Lagrangian contains the Ricci scalar and its first and second derivatives, in a specific combination that makes them free of ghosts. In the Einstein frame they are proved to be a subclass of bi-scalar extensions of general relativity. Extracting the dark energy sector containing both the scalar degrees of freedom, we study two specific models capable of alleviating the H0 tension. We find that the evolution of the Hubble function is sensitive to the value of the model parameter. We show that the effect of the additional terms, coming from these theories, is negligible at high redshifts, consequently they match with ΛCDM cosmology. However as time passes the deviation increases and thus at low redshifts the Hubble parameter acquires increased values in a controlled way. In particular, we show that for two specific choices of the biscalar construction, alleviation of the tension is possible, resulting to H0 $\approx$ 74 km/s/Mpc for particular parameter values. We also find that the effective dark energy equation of state parameter depicts phantom evolution, thus serving as a mechanism for Hubble tension alleviation. We further confront our models with the Cosmic Chromometer data.

Presenter: Dr BANERJEE, Shreya (Friedrich Alexander University, Erlangen, Germany)