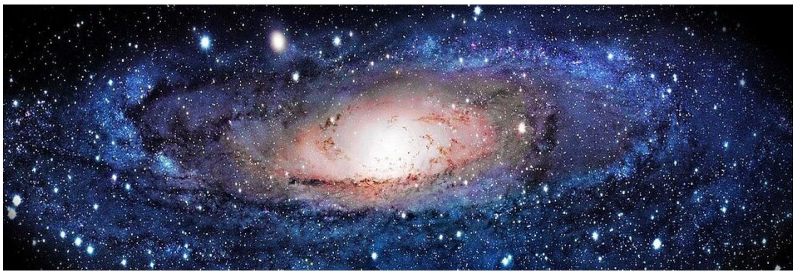

Contribution ID: **14** Type: **not specified**

N-body Simulations of Interacting Dark Energy with Non-Gaussian Initial Conditions

Wednesday 21 September 2022 10:00 (30 minutes)

We perform for the first time N-body simulations of interacting dark energy assuming non-Gaussian initial conditions, with the aim of investigating possible degeneracies of these two theoretically independent phenomena in different observational probes. We focus on the large-scale matter distribution, as well as on the statistical and structural properties of collapsed haloes and cosmic voids. On very large scales, we show that it is possible to choose the interaction and non-Gaussian parameters such that their effects on the halo power spectrum cancel, and the power spectrum is indistinguishable from a Λ cold dark matter (|ΛCDM|) model. On small scales, measurements of the non-linear matter power spectrum, halo-matter bias, halo and subhalo mass function, and cosmic void number function validate the degeneracy determined on large scales. However, the internal structural properties of haloes and cosmic voids, namely halo concentration–mass relation and void density profile, are very different from those measured in the |ΛCDM| model, thereby breaking the degeneracy. In practice, the values of f_NL required to cancel the effect of interaction are already ruled by observations. Our results show in principle that the combination of large- and small-scale probes is needed to constrain interacting dark energy and primordial non-Gaussianity separately.

Author: HASHIM, Mahmoud (CTP, BUE)

Presenter: HASHIM, Mahmoud (CTP, BUE)