

Modified gravity and the cosmological tensions

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Cosmological tensions are one of the central topics of modern cosmology. The most prominent is the Hubble tension in which the measured expansion rate of the Universe from distance ladder is more than 5σ larger than that predicted by Λ CDM based on CMB. Recently, BAO observation from DESI also reports a $2 - 3\sigma$ tension with Λ CDM which might point to evolving dark energy. In this talk I will discuss our recent research on the possible gravitational origin of these cosmological tensions. Starting from model independent reconstruction technique, we found that the DESI BAO observation can be well explained by non-minimal coupling between gravity and matter. Further study shows that the same non-minimal coupled gravity can also naturally explain the Hubble tension, hinting a common gravitational origin of the two major cosmological tensions.

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