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Cosmology in an extended parameter space: new constraints on dark energy and neutrino masses with DESI BAO

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Based on arXiv: 2409.13022 (published in ApJ Letters). We update constraints on cosmological parameters in a 12-parameter model, which extends the standard 6-parameter ΛCDM to include dynamical dark energy and massive neutrinos, along with other new parameters. We use the latest Planck PR4 (2020) likelihoods, DESI DR1 BAO, and the latest uncalibrated type Ia Supernovae (SNe) datasets. In this talk, I will discuss the implications for dynamical dark energy in such an extended model, and at the same time, provide robust bounds on neutrino masses which will be useful for the astro- and particle physics communities. I will also discuss the current status of the weak lensing tension and the Hubble tension in this extended cosmology.

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