

# Phenomenology: Scalar-tensor theories to tackle cosmological tensions

*Tuesday, September 5, 2023 2:00 PM (30 minutes)*

We investigate different extended scalar-tensor theories of gravity. Particularly, we study the theory in the Jordan frame with different non-minimal coupling, with a standard and non-standard kinetic term, and the impact of a cubic interaction term. The nonminimally coupled scalar field, regulating the gravitational strength, moves around recombination because of its coupling to pressureless matter. This mechanism induces a degeneracy between the non-minimal coupling parameters and the value of the Hubble constant  $H_0$ . Depending on the evolution of the scalar field, regulated by the sign of the kinetic term and by the presence of the Galileon term, these models can lead to a larger or lower value of  $H_0$  compared to the standard  $\Lambda$ CDM model and to different value of  $\Omega_8$ . We explore the joint constraints with publicly available cosmological data, and we forecast the constraints expected by future cosmological observations.

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**Session Classification:** Parallel Sessions