



Theory Seminar

“The Effective Field Theory of Dark Energy”

I will talk about a very recent in collaboration with Giulia Gubitosi and Filippo Vernizzi, where we a formalism previously applied to inflation and propose a universal description of dark energy and modified gravity that includes all single-field models. We consider the metric universally coupled to matter fields and we write in terms of it the most general unitary gauge action consistent with the residual unbroken symmetries of spatial diffeomorphisms. Our action is particularly suited for cosmological perturbation theory: the background evolution depends on only three operators. All other operators start at least at quadratic order in the perturbations and their effects can be studied independently and systematically. In particular, we have focused on the properties of a few operators which appear in non-minimally coupled scalar-tensor gravity and galileon theories and studied the mixing between gravity and the scalar degree of freedom that they produce. The scalar can always be de-mixed from gravity at quadratic order in the perturbations, but not necessarily through a conformal rescaling of the metric. I will also mention how to “translate” several explicit models in our language.

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