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Instability and gravitational waves in axion inflation with strong backreaction from gauge modes

Tuesday, January 23, 2024 3:00 PM (1 hour)

I will talk about a model in which an inflaton, through an axionic coupling to a $U(1)$ gauge field, causes an amplification of the gauge field modes that strongly backreact on its dynamics. In particular, I will discuss, using analytical formulae, an instability of the system that emerges when one considers the evolution of the gauge field modes coupled to the inflaton zero mode, treating perturbatively the deviation of the inflaton velocity from its mean-field value. This analysis confirms previous numerical results. I will also discuss two different numerical studies of the system in the same regime, showing how this behavior can generate peculiar observable features in the spectrum of gravitational waves produced by the modes of the gauge field.

Presenter: SORBO, Lorenzo (University of Massachusetts)