



Tuesday, Nov 25, 4:15pm | PAB 4-708 | Zoom: 517 486 4983

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## Field Dependent Dynamics in the Early Universe: Non-Equilibrated Scalars and Cosmological Stasis

This talk will be divided into two parts. In the first part, we will discuss non-equilibrated scalar fields in the early Universe. Even when such scalars are only weakly coupled to the thermal bath, their field-dependent interactions can induce nontrivial thermal effects that modify the evolution of the bath. As an example, we will show how a modulus that controls the quartic coupling of an Abelian Higgs sector can significantly strengthen the associated phase transition, with possible observational consequences. In the second part, we will discuss the phenomenon of stasis, a nonstandard cosmological epoch in which two or more energy components of the Universe maintain comparable, fixed relative abundances for extended periods of time. We will present an explicit particle-physics realization of this mechanism in which a scalar field modulates a Yukawa coupling. Finally, we will examine the resulting phenomenological constraints and implications.