



LABORATORY FOR ELEMENTARY-PARTICLE
PHYSICS (LEPP)

Theory Seminar

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Inflation and Geometry

Realistic inflationary models involve multiple fields and are characterized not only by their potential but also by their internal geometry. The latter is at the origin of the geometrical destabilization of inflation, an instability that potentially affects all inflationary scenarios, and with multiple consequences that this seminar will review.

This instability drives the system into an inflationary attractor characterized by a strongly non-geodesic motion. We will explain the theoretical and observational consequences of this so-called sidetracked phase. In this context, cosmological fluctuations exhibit varied behaviors depending on the potential and the field space geometry, and they can be captured by single-field effective theories with either a modified dispersion relation, a reduced speed of sound, or an imaginary one. We will describe the peculiarities of the latter situation and its characteristic observational footprints. We will show that sidetracked inflation allows to inflate on potentials that would be too steep to support slow-roll inflation, which offers interesting prospects for embedding inflation into high-energy physics. Eventually, we will revisit non-Gaussianity in multifield inflation with curved field space by generalizing Maldacena's single-field result to such frameworks.

Wednesday, October 9, 2019
2:00pm
401 Physical Sciences Building