I M B M istanbul matematiksel bilimler merkezi
istanbul center for mathematical sciences

Gauge-Flation: Non-Abelian Gauge Field Inflation

M. M. Sheikh-Jabbari

IPM, Tehran

Abstract

We introduce an inflationary scenario, Non-Abelian Gauge Field Inflation or gauge-flation for short, in which slow-roll inflation is driven by non-Abelian gauge field minimally coupled to gravity. I present a detailed analysis, both numerical and analytical, of the gauge-flation. By studying the phase diagrams of the theory, we show that getting enough number of e-folds during a slow-roll inflation is fairly robust to the choice of initial gauge field values. We study stability and the classical inflationary trajectory with respect to anisotropic initial conditions and show that the isotropic configuration is indeed fixed point of the dynamics of the system and the system flows to the isotropic inflationary trajectory in a couple of e-folds.

In addition, I show the results of the gauge-flation cosmic perturbation theory which has its own specific features and novelties. The specific gauge-flation model I analyze in this talk has two parameters, a cutoff scale L and the gauge coupling g. Fitting our results with the current cosmological data fixes $L \sim 10H \sim 10^{15}$ GeV (H is the Hubble parameter) and $g \sim 10^4$, which are in the natural range of parameters in generic particle physics beyond standard models. Our model also predicts a tensor-to-scalar ratio $r > 0:05$, in the range detectable by the Planck satellite.

Date : Thursday, February 2, 2012
Time: 9:30-10:30 and 11:00-12:00
Place: IMBM Seminar Room, Boğaziçi University