

Seminarium Studium Doktoranckiego NCBJ

Thursday, 11 March, 9:00

<https://www.gotomeet.me/NCBJmeetings/phd-seminar>

Speaker:

Jaime de Cabo Martin (Szkoła Doktorska NCBJ)

Title:

Exploring the primordial power spectrum of scalar perturbations from quantum bounce cosmologies.

Abstract:

Observational data from the Cosmic Microwave Background indicates that the Universe has emerged from its primordial phase in a very peculiar state: as a patch of flat, isotropic and homogeneous space furnished with small adiabatic density perturbations with nearly scale invariant amplitude spectrum. In this talk we will briefly review the main problems of the standard cosmological model for the description of the primordial universe and we will try to solve them not within the usual inflationary solution but in the framework of quantum bounce cosmology. We will present the basic ideas for performing such a description using Hamiltonian formulation of General Relativity. We will derive the reduced scalar quantum Hamiltonian for the flat FLRW universe filled with a perfect fluid. We will introduce the so-called Natural and Mukhanov parametrizations for the description of the dynamics of the scalar perturbations. Finally, we will investigate the primordial power spectrum of such perturbations, trying to approach the solution both numerically and analytically.