

## **Seminarium Studium Doktoranckiego NCBJ**

**Thursday, 8 April, 9:00**

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

**Speaker:**

**Alice Boldrin (Szkoła Doktorska NCBJ)**

**Title:**

**Dirac method in Bianchi I**

**Abstract:**

Observational data 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 a nearly scale-invariant amplitude spectrum. Our goal is to construct a theory of the primordial universe based on the assumption that it was dominated by quantum gravity effects, which led the Universe to avoid the initial singularity. Presently available quantum frameworks usually assume primordial isotropy. The driving idea behind this work is that alternative frameworks need to possess less primordial symmetries. In particular we will start by assuming a non-isotropic Universe which eventually will be described by the Bianchi IX metric. In this presentation I will focus on the first steps needed to reach our goals. I will explain how we can obtain a Hamiltonian formulation for a Bianchi I Universe, which is a homogeneous and anisotropic Universe whose description is simpler than the one needed for Bianchi IX. After a rather technical introduction I will present the Dirac method, how and why it is useful. Finally I will show our results focusing on the difference between a Bianchi I Universe and a FLRW one.