

# Seminarium Zakładu Fizyki Teoretycznej

Departament Badań Podstawowych

Narodowego Centrum Badań Jądrowych

October 9, 2024 (Wednesday), h. 11:15

The seminar will be held in room 207 @Pasteura 7

**Danilo Artigas**

(Kyoto University, Japan)

## **Non-linear treatment of cosmological perturbations**

**ABSTRACT:** Linear-perturbation theory has proven to be an extremely powerful tool to compare inflationary models with observational data. Recently, the newcoming high-precision observations call for predictions beyond linear perturbations. Such effects are known to be relevant for example in the production of primordial black holes or scalar-induced gravitational waves.

The separate-universe approach proposes to capture some of these non-linearities. It describes the universe as a set of causally disconnected homogeneous and isotropic patches (FLRW). In this talk, I will show that by allowing the patches to exhibit constant curvature, the separate-universe approach can be extended to non-slow-roll models. I will discuss the case of ultra-slow roll where this new approach allows to correctly predict the power spectrum of scalar perturbations together with non-Gaussianities.