

## **Seminarium Studium Doktoranckiego NCBJ**

**Thursday, 20 May, 9:00**

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

**Speaker:**

**Andrea Bevilacqua (Szkoła Doktorska NCBJ)**

**Title:**

**$\kappa$ -deformed complex fields and discrete symmetries**

**Abstract:**

In this talk I will briefly describe a construction of  $\kappa$ -deformed complex scalar field theory with the objective of shedding light on the way discrete symmetries and CPT invariance are affected by the deformation.

It is commonly expected that the usual description of spacetime as a smooth manifold is no longer reliable as we approach the Planck scale when quantum effects of the geometry can no longer be neglected. Since the prehistory of research on quantum gravity, noncommutativity of spacetime has been advocated as a possible way to effectively model quantum gravitational effects in regimes of negligible curvature. A widely studied incarnation of this idea suggests that the scale of noncommutativity should be seen as an observer-independent length scale and that, in order to accommodate such a fundamental scale, ordinary relativistic symmetries should be deformed in such a way that they should reproduce the usual Poincaré algebra in the limit of vanishing noncommutativity. The  $\kappa$ -Poincaré algebra is an example of such deformation.

After a brief introduction to the formalism and the involved quantities, I will introduce the action and I will proceed to the calculation of the equations of motion (EOM). I will then discuss CPT transformation of the fields and present the translation charges, which will lead to a discussion of the one-particle states. I will then conclude with some comments and prospects for the future.