

Colloquium

Department of Fundamental Research

National Centre for Nuclear Research

Warsaw, Poland

March 15 (Monday), 3:15 pm

The meeting is held online:

<https://www.gotomeet.me/NCBJmeetings/gravity-physics>

(chrome browser is required)

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An approach to the measurement problem

based on a quantum gravitational notion of time:

physical and philosophical considerations.

Abstract: After a brief discussion of the measurement problem in Quantum Mechanics, I present a solution of problem of time in quantum gravitational systems based on a relational description between the observables of the system under consideration and the clocks. I will discuss how uncertainties in the measurement of time arise due to quantum and gravitational effects. When one takes into account the quantum nature of clocks quantum superpositions are not observable in macroscopic systems like measurement devices. This allows to understand the issue of macro-objectification and give sufficient conditions for the occurrence of events. I will conclude with some philosophical considerations based on the notions of objects and events.

Stanisław Mrówczyński and Włodzimierz Piechocki