

## Workshop Quantum Foundations. The physics of "what happens" and the measurement problem

Contribution ID: 23

Type: **not specified**

### **Probing collapse models at high energy scale: New Aspects?**

*Friday, 26 May 2017 11:50 (30 minutes)*

The measurement problem reveals one of the conceptual difficulties the quantum theory meets despite its extreme success. Why do we not observe a table or a cat in two places at the same time? A microscopic system is in a superposition: in which way is it broken up while we perform a measurement on the system? What is a measurement apparatus? So-called models of spontaneous collapse (collapse models) claim to provide an answer to these questions through a powerful and mathematically complete approach which models the collapse of the wave function as an objective physical process. These models feature an important property, namely they can be excluded in plethora of experiments, for example, tests by X-rays, optomechanical systems, cold-atom experiments and others. In this talk we present a study of the two popular models of spontaneous collapse at high energy scale, i.e. within flavor oscillating neutral mesons which are superpositions of two different mass-eigenstates. We show how these systems contribute to the testing of collapse models constraining the possible collapse scenarios by experimental data and propose a new interpretation of the decay mechanism of neutral mesons via spontaneous collapse.

**Presenter:** Mr SIMONOV, Kyrylo (University of Vienna)