Contribution ID: **20** Type: **not specified**

MAQRO –macrorealism or quantum physics? A case for space

Tuesday, 29 April 2014 17:20 (30 minutes)

MAQRO is a proposed fundamental science mission to test the foundations of quantum physics. Over the last decades, the technology available in space has reached a level that will soon allow performing quantum experiments in space. Although, space experiments are an expensive and time-consuming business, the technological developnent may soon render space interesting as an environment for experimental tests that would not be possible on Earth. In particular, matter-wave experiments with increasingly massive objects ultimately may require free-fall times that are not achievable in Earth-based experiments. This is the case for MAQRO. In MAQRO, quantum superpositions of nanospheres with a mass up to 10e10 atomic mass units are prepared and then verified by observing the resulting interference patterns. A number of theoretical, "macrorealistic" models predict deviations from quantum physics for such massive test objects. MAQRO will allow for decisive tests of several such models.

Presenter: Dr KALTENBAEK, Rainer (University of Vienna, Vienna Center for Quantum Science and Technology, Faculty of Physics)