

MICROGRAVITY SCIENCES AND PROCESSES (A2)
Gravity and Fundamental Physics (1)

Author: Dr. Rupert Ursin
Austrian Academy of Sciences, Austria, Rupert.Ursin@oeaw.ac.at

SPACE-QUEST: MISSION PROPOSAL FOR QUANTUM OPTICS EXPERIMENTS IN SPACE

Abstract

Quantum mechanics was developed to describe the behavior of the smalls, such as Atoms. Excitingly, quantum mechanical effects - like entanglement - predict quantitatively different behavior from their classical counterparts, even on very large scales. Implication for conceptually new technologies, such as absolute secure cryptography codes are among the most prominent outcomes so far. Over past few years several theoretical as well as experimental studies were performed. I will report on the ESA funded studies to develop a hardware for a potential space mission as well as on the ongoing free-space optical demonstration of quantum optics on the 144 km horizontal link between Canary islands. I will also report on the programmatic developments and on the international relationships we are perusing to USA as well as to China.