ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 2 March 2017

17:00 -18:00

3rd Floor Seminar Room

" Atomtronics and Matterwave optics "

Dr. Wolf von Klitzing

Institute of Electronic Structure and Lasers, FoRTH, Greece

Abstract

We have grown accustomed to the fact that light behaves like a wave which refracts, diffracts and interferes. We have also gotten used to it consisting of photons that can be counted. We are used to light-bulb-like light sources and lasers with their associated coherence properties. The fact that very similar properties can be seen for atoms is much harder to accept. Quantum mechanics has taught us a long time ago that any particle is also a wave, but it is only recently that we have learned to produce and manipulate matterwave in a well-controlled fashion. We can now fashion mirrors, lenses, beam-splitters and even coherent matterwave guides for atoms. This now opens up a whole new range of experiments such as large-scale atom interferometers and atomtronic circuits.

In this seminar I will present the basic atom-optical elements such as beamsplitters, mirrors and waveguides for atoms, which make up the first atomtronic circuits and atom interferometers. I will then outline some of the exciting new experiments that are being planend at this moment, including a space mission to measure Einstein's equivalence principle and the detection of gravitational waves using large-scale matter-wave interferometers.