UNIVERSITY OF CRETE
DEPARTMENT OF PHYSICS

CCN CRETE CENTER FOR QUANTUM COMPLEXITY AND NANOTECHNOLOGY

ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 23 April 2015

17:00 -18:00

3rd Floor Seminar Room

"Nanoscale magnetic sensing with stationary and mobile NV centers"

Prof. Christian Degen

Department of Physics, ETH

Abstract

Diamond has emerged as a unique material for a variety of applications, both because it is very robust and because it has defects with interesting properties. One of these defects, the nitrogen-vacancy center, has a single spin associated with it that show quantum behavior up to room temperature. Our group is harnessing the properties of single NV centers for high-resolution magnetic sensing applications. In this talk, I will give an introduction into our group's effort in diamond-based magnetic sensing. I will show how NV centers can be embedded in nanostructures suitable for scanning probe microscopy, and present initial experiments with such a scanning NV sensor. I will highlight the importance of the diamond material, and in particular the diamond surface, for improving the properties of shallow (<10 nm) NV defects. Finally, I will discuss recent attempts of our group to perform NMR detection of small ensembles of nuclear spins, and ultimately a single proton spin, that are deposited on the surface of a diamond chip.