



## ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

# PHYSICS COLLOQUIUM

**Thursday, 27 November 2014**

**17:00 -18:00**

**3<sup>rd</sup> Floor Seminar Room**

**“Resolving and manipulating the dynamics of the electron wave packets in high-field laser-atom interaction with sub-fs resolution.”**

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### **Abstract**

The fundamental mechanism underlying harmonic emission in the strong-field regime is governed by tunnel ionization of the atom, followed by the motion of the electron wave packet in the continuum, and finally by its recollision with the atomic core. Due to the quantum nature of the process, the properties of the electron wave packet strongly correlate with those of the emitted radiation. By observing the interference pattern created by the spatiotemporal overlap of photons emitted by two interfering electron paths the intricacies associated with the recollision process have been resolved and the full quantum-mechanical nature of the recollision process has been revealed. Also, the applications of the control of the electron wave packets on the generation of intense "isolated" attosecond pulses and their use on tracking the ultrafast dynamics in atoms and molecules will be briefly presented.