

## ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

# PHYSICS COLLOQUIUM

**Thursday, 03 October 2013**

**17:00 -18:00**

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

**“Probing the quantum superposition principle”**

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### **Abstract**

Does the quantum superposition principle hold on mesoscopic or even macroscopic scales? The tremendous success of quantum theory notwithstanding, this question remains unsettled to date. I will discuss experimental tests of the quantum superposition principle, such as matter wave interferometry with large particles [1], as well as their implications on theories predicting a breakdown of quantum mechanics at macroscopic scales. I will also explain how the degree of macroscopicity reached in various superposition experiments can be assessed and compared [2].

[1] K. Hornberger, S. Gerlich, P. Haslinger, S. Nimmrichter, and M. Arndt, *Quantum interference of clusters and molecules*, Rev. Mod. Phys **84**, 157 (2012)

[2] S. Nimmrichter and K. Hornberger, *Macroscopicity of mechanical quantum superposition states*, Phys. Rev. Lett **110**, 160403 (2013)