



ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

**PHYSICS COLLOQUIUM**

**Thursday, 21 February 2013**

**17:00 -18:00**

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

**“Taming waves in theory and experiment”**

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**Abstract**

I will speak about recent advances in shaping and controlling waves in cavities and random media [1]. In particular, I will show how the experimentally accessible information stored in a system's scattering matrix can be used to create highly collimated wave beams which traverse this system without being diffracted [2,3]. The key tool to realize such particle-like scattering states is the so-called time-delay operator which can be implemented with electromagnetic as well as with acoustic waves. In the second part of my talk I will explain how a suitably designed disorder can be used to control the coherent transmission through waveguides [4] as well as the emission properties of a so-called random laser [5].

- [1] Mosk, Lagendijk, Lerosey, Fink, Nature Phot. 6, 283, (2012).
- [2] Rotter, Ambichl, Libisch, PRL 106, 120602 (2011) .
- [3] Appell, Phys. Rev. Focus 27, 13 (2011).
- [4] Dietz et al., PRB 86, 201106(R) (2012)
- [5] Hisch et al. (in preparation)