ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday 6 Dicember 2007
17:00-18:00

3rd Floor Seminar Room

"Experiments on intrinsic energy localization in nonlinear lattices"

Prof. A. J. Sievers
Laboratory of Atomic and Solid State Physics,
Cornell University, Ithaca, NY, USA

Abstract

It had been known for some time that nonlinearity and discreteness play important roles in many branches of condensed matter physics as evidenced by the appearance of domain walls, kinks and solitons. A recent discovery is that localized dynamical energy in a perfect nonlinear lattice can be stabilized by the lattice discreteness. An intrinsic localized mode (ILM) is the resulting generic feature. Its energy profile resembles that of a localized mode at a defect in a harmonic lattice but, like a soliton, it can propagate; however, unlike a soliton, collisions between such excitations result in energy transfer between them with the more localized excitation stealing energy from the less localized one. Experiments involving these excitations continue to produce surprises. Our recent studies demonstrate both the production and manipulation of localized energy along micromechanical arrays and also the generation of countable ILMs and their controlled switching in an atomic lattice.