Applied Physics & OSA

Optics Seminar

Highly Nonlinear Phononic Crystals

Prof. Chiara Daraio

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The discovery of novel highly nonlinear dynamic phenomena will be presented for the specific cases of granular materials and carbon nanotubes. This research was conducted for designing and constructing optimized macro-, micro- and nano-scale structural configurations of materials and for studying their phononic behavior. Variation of composite arrangements of granular elements with different elastic properties in a linear chain-of-spheres, Y-junction or 3-D configurations led to a variety of novel physical phenomena and interesting wave properties. Potential applications can be found in the area of mechanical and biomedical engineering as well as security and communications systems. The characterization of mechanical and electronic properties of carbon nanostructures with different atomic arrangements and microstructures, exhibiting an exciting nonlinear behavior, will also be discussed.

Brief Biography:

Professor Daraio's interests reside at the interface of materials science, condensed matter physics and solid mechanics, particularly in the design, development and testing of multi-scale metamaterials; phononic crystals; responsive soft matter; highly nonlinear solitary waves; mechanical and electronic properties of nano and biomaterials. http://www.daraio.caltech.edu

She received her Laurea degree (Equivalent to a master degree) in Mechanical Engineering from the Universita' di Ancona, Universita' Politecnica delle Marche, Ancona, Italy (2001). She received her M.S. (2003) and Ph.D. degrees (2006) in Materials Science and Engineering from the University of California, San Diego. She has been a guest researcher at the Lawrence Berkeley National Laboratories, NCEM, since 2003 and she is a Gold Medal winner of the MRS Graduate Student Award (2005).

Wednesday, November 8, 2006.
4:00pm-5:00pm.
Watson 104

Refreshments will be available in the Watson Lobby at 3:45pm.

Host: Prof. Kerry Vahala