Physics Colloquium

Michigan Technological University

Thursday, November 20, 2008
4:00 pm
Room 139, Fisher Hall

On Some Aspects of Nanomaterials

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Abstract: The emerging field of nanotechnology brings with it numerous fascinating applications, most of which lie in biology. The potential use of nanospheres and nanotubes in drug delivery, as well as the use of quantum dots and nanowires in diagnostics, serves as a high enough motivation for one to study thoroughly and understand such materials systems. The present talk will focus on interfaces and the role they play at the nanoscale. A first step towards understanding how the interfacial structure affects the unique optoelectronic properties of materials is to model the existence of interfaces from a mechanics point of view. In concluding, the significance of the microstrucure of materials will be illustrated by looking at the processes that take place during electrochemical cycling of next-generation anodes for Li-ion batteries. The understanding the damage that takes place during charging and discharging of Li-batteries, will result in a significant miniaturization of biomedical-implantable devices, which has promising applications in the treatment of many neurological diseases such as paralysis and Parkinson's disease.

Biography: Katerina Aifantis graduated from Michigan Tech in 2002. She received a NSF graduate research fellowship to obtain her Master's from Cambridge and her PhD from Groningen in 2005, at 21; making her the youngest PhD holder ever in the Netherlands. In 2008 she received a 5-year European Research Council Starting Grant. Currently she retains her affiliation with Harvard and is setting up her lab in Aristotle University of Thessaloniki, where she will carry out her grant research.

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