



ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 13 December 2012

17:00 -18:00

3rd Floor Seminar Room

**“Ribbons, fences, crossroads, and scrolls: Building blocks
in the nano-world”**

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Abstract

The emergence of novel nano-materials, such as nanotubes, buckyballs, graphene and similar two-dimensional systems, has created unprecedented hope for far-reaching applications in several different fronts of modern technology. By the same token, low-dimensionality and quantum size effects render the above systems the ideal “laboratories” to test old theories and predict new physical phenomena. Here we will first review representative examples of the potential use of nano-materials in electronics, spintronics, and nano-electro-mechanical systems. We will then highlight the role that morphology and shape can play in modifying the physical properties of materials for their optimal employment in specific applications. Emphasis will be placed on results of computational studies that probe the co-existence and interaction of different materials in complex geometries. We will thus demonstrate that, using the appropriate building blocks in suitable conformation can enable key processes, such as charge doping, chemical functionalization, mechanical energy storage and conversion.