UNIVERSITY OF CRETE
DEPARTMENT OF PHYSICS

CRETE CENTER FOR
QUANTUM COMPLEXITY
AND NANOTECHNOLOGY

ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 04 December 2014

17:00 -18:00

3rd Floor Seminar Room

"On the motion of cyclic maromolecules: a departure from the classic picture"

Prof. Dimitris Vlassopoulos
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Abstract

Macromolecular motion is rather well understood. Today, after 45 years of work and 2 Nobel prizes in Physics, we know that polymers move in certain ways, depending on their size and molecular structure (architecture). The key ingredient for motion is their ability for conformational adjustments, which is mediated by the free ends. What happens however when there are no free ends? This is the case of cyclic (or ring) polymers, which are often encountered in nature. This question was addressed in the 1980s but a huge controversy arose and no consensus could be reached. We revisit this outstanding problem and discuss recent experimental results, which, with the support of modelling and simulations, demonstrate the uniqueness of this class of macromolecules and the associated new mechanism of motion.
We shall present the case of polymers with free ends, the issues with rings, and the interdisciplinary methodology used to tackle the problem of their motion. Finally, we shall discuss perspectives in the field.