ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ

ΤΜΗΜΑ ΦΥΣΙΚΗΣ

ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 22 December 2011

17:00 -18:00

3rd Floor Seminar Room

"From rock fracture to plate tectonics. Evidence of non extensive statistical mechanics in Earth physics?"

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Abstract

The non-extensive statistical mechanics pioneered by the Tsallis group offers a consistent theoretical framework, based on a generalization of entropy, to analyze the behavior of systems with fractal or multi-fractal distribution of their elements. Such systems where long-range interactions or intermittency are important, lead to power law behavior. The question of whether earth systems are described by non-extensive statistical physics, even at the phenomenological level (i.e., without specifying any underlying model), represents a challenge. This is the problem we address here. Our aim is not to develop a precise model, but rather to present a simple argument of physical plausibility. Examples supporting the non-additive behavior of earth system, from rocks fracture (e.g., acoustic emissions) to geodynamic (e.g., plate tectonics, global seismicity) scale are presented.