



ΠΑΝΕΠΙΣΤΗΜΙΟ ΙΩΑΝΝΙΝΩΝ

ΤΜΗΜΑ ΜΑΘΗΜΑΤΙΚΩΝ



Εβδομαδιαίο Σεμινάριο

DISPERSIVE SHOCK WAVES IN NEARLY INTEGRABLE NONLINEAR CHAINS

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The Fermi-Pasta-Ulam model, a chain of equal masses with weakly anharmonic nearest neighbour interaction, has been introduced to investigate the dynamical foundations of Statistical Mechanics. Instead of the expected ergodic behaviour, i.e. equipartition of energy among all the normal modes, an essentially regular dynamic was found. After nearly sixty years, the complete understanding of the dynamics of such a system in the thermodynamic limit (i.e. for the number of masses going to infinity with fixed energy per particle) is still an open problem. We will present the model and some related phenomenology according to the original point of view, showing in particular the metastability property. We will then illustrate the role of the dispersive shock waves of the KdV equation to describe the FPU metastability. We will also briefly discuss the role of the choice of initial data, of the dimensionality of the lattice, and the role of integrability.

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Μετά την ομιλία ακολουθεί καφές και συζήτηση στο εντευκτήριο του Τμήματος