Maxwell Mini-Symposium Analysis and its Applications, 29 April 2015

Abstracts

Laszlo Erdös (IST, Vienna)
Hölder regularity theory in random matrices

We apply an adaptation of the De Giorgi-Nash-Moser parabolic regularity theory for a random walk in random environment. The problem originates from random matrix theory where the random environment is generated by the Dyson Brownian motion flow. This approach allows us to establish the universality of the distances of consecutive points for the general beta-ensemble and for the generalized Wigner ensemble.

Joachim Krieger (EPFL, Lausanne)
Dynamics of critical nonlinear wave equations

I will discuss recent advances in our understanding of the dynamics of certain critical nonlinear wave equations which arise as models in mathematical physics, such as the critical Wave Maps as well as the critical Maxwell-Klein-Gordon equation. Results on global regularity, concentration compactness/profile decomposition, and singularity formation will be explained. This involves work joint with W. Schlag, D. Tataru and J. Luehrmann.

Tony Lelievre (Ecole des Ponts ParisTech)
Metastable stochastic processes and quasi stationary distributions

Molecular dynamics is a simulation tool which is used in many scientific fields (physics, chemistry, biology) in order to understand the macroscopic properties of materials from their atomistic features. It consists in integrating over very long times very large systems of interacting particles. One of the major challenges from a numerical and modelling point of view is the timescale separation: how to bridge the gap between the timestep used to discretize the dynamics and the macroscopic timescales of interest? The aim of the talk will be to discuss theoretical and numerical aspects related to this question.