istanbul matematiksel bilimler merkezi
istanbul center for mathematical sciences

Workshop on Nonlinear Dispersive PDE

long time dynamics, boundary value problems, integrability

Monday, July 11, 2016

09.15-09.30: *Opening*

09.30-10.20: Varga Kalantarov (Koç University) *Blow up and preventing blow up of solutions of nonlinear PDEs*

In this talk we will discuss the problem of blow up of solutions with arbitrary positive initial energy of initial boundary value problems for nonlinear wave equations and the impact of convective terms on global solvability and finite time blow up of solutions of reaction-diffusion equations, convective Cahn-Hilliard equation, generalized Kuramoto-Sivashinsky equation and KdV type equations.

10.20-10.50: *Discussions/Questions/Coffee Break*

10.50-11.40: Nobu Kishimoto (Kyoto University) *Unconditional uniqueness for nonlinear dispersive equations*

When a solution to the Cauchy problem for a nonlinear evolution equation is obtained by a fixed point argument using auxiliary function spaces, uniqueness of solutions in a natural space (e.g., space of continuous functions with values in the same Banach space as initial data), which we call unconditional uniqueness, becomes a non-trivial property, and to show that often requires some additional work.

Recently, unconditional uniqueness for some nonlinear dispersive equations such as the Korteweg-de Vries equation and nonlinear Schrödinger equations has been shown in the periodic setting by a simple integration by parts argument, which can be regarded as a variant of the normal form reduction. In this talk, we review some results in this direction and introduce an abstract framework, and then apply it to some of specific nonlinear dispersive equations.

11.40-12.00: *Discussions/Questions*

12.00-14.00: *Lunch*

14.00-14.50: Nikos Tzirakis (University of Illinos at Urbana-Champaign) *The initial and boundary value problem for the cubic nonlinear Schrödinger equation*

In this talk I will discuss the well-posedness theory and the regularity properties of the cubic NLS. I will first review the theory for the case of the NLS equation on the real line and on the torus (periodic boundary conditions). I will then consider the NLS equation on the half line. In all cases we can prove that the nonlinear part of the cubic NLS is smoother than the initial data. This work is joint with B. Erdogan.

14.50-15.10: *Discussions/Questions*

Place : IMBM Seminar Room, Boğaziçi University South Campus
For more information please visit `http://www.imbm.org.tr/ndpde16/ndpde16.html`.

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