Faculdade de Ciências da Universidade de Lisboa
cmafcio@fc.ul.pt Tel. (+351) 21 750 00 27

SEMINÁRIO DE ANÁLISE E EQUAÇÕES DIFERENCIAIS

Dia 26 de Janeiro (quinta-feira), às 13h30, sala 6.2.33

Some new qualitative results on the nonlinear Schrödinger equation

Simão Correia

(CMAF-CIO - Faculdade de Ciências da Universidade de Lisboa)

Abstract: In this seminar, we shall consider the nonlinear Schrödinger equation on $\mathbb{R}^d$,

$$iu_t + \Delta u + \lambda |u|^\sigma u = 0$$

with an initial condition at $t = 0$. This is already a classical equation, with a vast literature regarding the behaviour of the solutions to this problem. We shall discuss two new subjects: the extension of the H^1 local well-posedness result to a larger functional space; a concept of finite speed of propagation, which we shall call *finite speed of disturbance*. The first topic relies deeply on a simple functional transform, the *plane wave transform*. This transform is of independent mathematical interest, with connections to the Fourier transform, the Laplace transform and the convolution of functions. The second topic relies on a first integral of the equation and, using finite speed of disturbance, we shall prove new global well-posedness results.

Seminário financiado por Fundos Nacionais através da FCT – Fundação para a Ciência e a Tecnologia no âmbito do projeto UID/MAT/04561/2013

Local: FCUL – Edf. C6 - Piso 2, 6.2.33