Reading seminar : nonlinear dispersive equations

Abstract:

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The analysis of dispersive partial differential equations (PDE) has known tremendous developments in the last thirty years. A typical example of a nonlinear dispersive PDE is the nonlinear Schrödinger equation (NLS), which arises in various fields such as nonlinear optics or Bose-Einstein condensates.

Its analysis requires the introduction of methods ranging from harmonic analysis to variational technics. The main features of NLS are presented in the book of Thierry Cazenave, on which this reading seminar will be based.

We will in particular cover Strichartz estimates, the local and global Cauchy theory, the study of blowing up solutions and the stability of solitary waves.

References.

T. Cazenave : Semilinear Schrödinger equations, Courant Lecture Notes in Mathematics, 10, NYU, CIMS, AMS 2003.