Louis Jeanjean, Université Marie et Louis Pasteur, France

Title: A Multiplicity result for a mass supercritical NLS with a partial confinement.

Abstract

In this talk we consider the existence of solutions for the NLS with partial confinement and mass supercritical nonlinearity,

$$-\Delta u + (x_1^2 + x_2^2)u + \lambda u = |u|^{p-1}u, \quad x \in I\!R^3. \tag{1}$$

We are interested in prescribed L^2 norm solutions. It corresponds to the search for constrained critical points of the associated *energy* functional on the constraint given by the prescribed L^2 norm.

The existence, for small values of the L^2 norm, of a first solution, characterized as a local minimum of the *energy* functional on the constraint and being an energy ground state was already known. We now show the existence of a second positive solution, at a mountain pass level. Our solution is obtained as a limit of a sequence of solutions of corresponding problems in bounded domains of $I\!R^3$. The symmetry of the solutions in bounded domains is central to the convergence process. This is a joint work with Linjie Song.