Normalized solutions of mass supercritical Schrödinger equations with potential

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Abstract:

We present recent results on the existence of a normalized solution of the nonlinear Schrödinger equation

$$-\Delta u + V(x)u + \lambda u = |u|^{p-2}u \qquad \text{in } \mathbb{R}^N$$

in the mass supercritical and Sobolev subcritical case $2 + \frac{4}{N} < p < 2^*$. Under various conditions on the potential $V : \mathbb{R}^N \to \mathbb{R}$ we obtain a solution $(u, \lambda) \in H^1(\mathbb{R}^N) \times \mathbb{R}^+$ with prescribed L^2-norm $\|u\|_2 = \rho$. The potentials we consider are positive and vanishing at infinity, possibly having singularities.

The talk is based on recent work with Riccardo Molle, Matteo Rizzi, Gianmaria Verzini.