

## Calderon-Zygmund Analysis Seminar

Monday, October 12, 3:45 pm

### Title: Blow up for the energy super critical NLS

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**Abstract.** The defocusing Non Linear Schrodinger is a canonical non linear waves model. In the energy sub critical case, it is known since the pioneering works of Ginibre and Velo (1981) that all solutions are global in time and scatter, and breakthrough works in the 90s solved the borderline energy critical case. In the energy super range of parameters however, all known approaches to global existence fail, simply because the a priori bounds provided by conservation laws are too weak to control the flow which is a canonical energy super critical feature. Moreover all known scenari for singularity formation rely on the existence of well localized stationary or self similar profiles which are not expected for the defocusing NLS problem. I will in this talk describe the main steps of the proof of existence of blow solutions for the defocusing NLS (implosion in the hydrodynamical formulation) in a suitable range of energy super critical parameters which follows four steps,

- 1 front renormalization, hydrodynamical formulation and reduction to a leading order compressible Euler flow;
2. construction of  $C^\infty$  self similar solutions to the compressible Euler equation;
3. spectral estimate for the linearized operator in self similar variables and local in space decay;
4. non linear space time bounds.

This is joint work with F. Merle, I. Rodnianski and J. Szeftel.