Title: Long term regularity of the one-fluid Euler-Maxwell system in 3D with vorticity

Abstract: In this talk we consider the "one-fluid" Euler–Maxwell model for electrons in 3 dimensions, and prove long-term regularity of solutions with small vorticity. In particular, for zero vorticity, we recover the corresponding small data global existence result of A. Ionescu and B. Pausader. Our analysis relies on a carrefully designed bootstrap (in time) algorithm which further relates with the structure of the nonlinearity. To take advantage of this structure, one is led to the study of biliniear operators of the form

$$\widehat{T[f,g]}(\xi) = \int_{\mathbb{R}} \int_{\mathbb{R}^3} e^{it\Phi(\xi,\eta)}\, m(\xi,\eta)\, \hat{f}(\xi-\eta,t)\, \hat{g}(\eta,t)\, d\eta\, dt \ .$$

This study involves Fourier transform methods adapted to the properties of the phase Φ.

This is a joint work with A. Ionescu.