

TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

Monday, October 17, 2022, 2:30 p.m.

Electroconvection in Fluids

by Elie Abdo

Temple University

Abstract: We consider an electroconvection model describing the evolution of a surface charge density in a two-dimensional incompressible fluid. The charge density evolves according to a nonlinear and nonlocal drift-diffusion equation. The drift velocity obeys Navier-Stokes equations forced by nonlinear electrical forces driven by the charge density and by time-independent body forces in the fluid. In this talk, we address the global well-posedness and long-time dynamics of the deterministic model. When forced by smooth noise processes, we study the existence and uniqueness of a smooth invariant measure for the Markov transition kernels associated with the model.