Analysis Seminar

New perspectives on scaling thresholds and quantitative criteria for blow-up

By

Aynur Bulut
(Louisiana State University)

Abstract: In this talk, we give an overview of several recent results where quantitative estimates play a key role. In the first part of the talk, we discuss new convex integration constructions for fluid systems with external forcing. We will then discuss a novel application of these ideas to the surface quasi-geostrophic (SQG) equation. Moving forward with the theme of quantitative estimates, in the second part of the talk we will describe new bounds for the defocusing energy-supercritical Nonlinear Schrödinger equation (NLS) and use these to give a universal blow-up criteria which goes below the scaling invariant threshold. These results are in line with a recent breakthrough construction of finite-time blow-up solutions, and in particular give the first generic result distinguishing potential defocusing blow-up phenomena from many of the known examples of blow-up in the focusing setting. At the end of the talk, we will briefly describe applications to related models.

Date: Tuesday, May 28, 2024
Time: 14:00-15:00
Place: SA141 - Mathematics Seminar Room