

Title: Counterexamples disproving pointwise convergence for solutions of dispersive PDE's

Abstract: In 1980 Carleson posed a question on the minimal regularity of an initial data function in a Sobolev space that implies pointwise convergence for the solution of the linear Schrödinger equation. After progress by many authors, this was recently resolved (up to the endpoint) by Bourgain, whose counterexample construction for the Schrödinger maximal operator proved a necessary condition on the regularity, and Du and Zhang, who proved a sufficient condition. In this talk, we will describe ideas underlying Bourgain's counterexamples, and how to develop more general counterexamples to prove a necessary condition related to any dispersive PDE in a broad, natural class.