Inverse boundary problems for elliptic PDE in low regularity setting

Katya Krupchyk[*1]

[1]University of Irvine – United States

Abstract

In this talk, we shall discuss some recent progress in the global uniqueness issues for inverse boundary problems for second order elliptic equations, such as the conductivity and magnetic Schr´odinger equations, with low regularity coefficients. Generally speaking, in an inverse boundary problem, one wishes to determine the coefficients of a PDE inside a domain from the knowledge of its solutions along the boundary of the domain. While ubiquitous in practice, the mathematical analysis of such problems presents some challenges, and the consideration of the low regularity setting, motivated by applications, brings additional interesting difficulties. In this talk, we shall discuss the case of full, as well as partial, measurements, for domains in the Euclidean space, as well as in the more general setting of transversally anisotropic compact Riemannian manifolds with boundary. Some of the important ingredients in our approach are semiclassical Carleman estimates with limiting Carleman weights with an optimal gain of derivatives, precise smoothing estimates, as well as a construction of Gaussian beam quasimodes in a low regularity setting. This is joint work with Gunther Uhlmann.

---

[*]Speaker