Steklov spectral inverse problem in a conformal class

Benjamin Florentin

Institut Élie Cartan de Lorraine

March 24, 2025

In this talk, we will focus on the spectral inverse problem consisting in recovering the metric of a compact Riemannian manifold with boundary from knowledge of its Steklov spectrum, or equivalently the spectrum of its Dirichlet-to-Neumann map. In other words, can one hear the shape of a "Steklov drum"?

When the boundary is Anosov with simple length spectrum, the study of singularities in the trace of the wave operator makes it possible to exhibit certain spectral invariants via the Duistermaat-Guillemin trace formula and we will discuss how these invariants can be exploited and naturally combined with the injectivity of the geodesic X-ray transform to attack the problem. Some results obtained in the class of conformal metrics will be presented and it will be explained how generically it is possible to "hear the Taylor series at the boundary" of a conformal Steklov drum.