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Geometry and topology of zero sets of random waves on a manifold

There are several questions about the zero set of Laplace eigenfunctions that have proved to be extremely hard to deal with and remain unsolved. Among these are the study of the size of the zero set, the study of the number of connected components, and the study of the topology of such components. A natural approach is to randomize the problem and ask the same questions for the zero sets of random linear combinations of eigenfunctions. In this talk I will present some recent results in this direction.