

Abstract:

We study the spectral asymptotics for Laplacians with Dirichlet boundary conditions on randomized Cantor-like sets and on their complement. In this talk, we mainly focus on statistically self-similar Cantor sets and strings.

Firstly, we investigate the spectral asymptotics for the classical Laplacian on the complement of statistically self-similar Cantor sets, called statistically self-similar Cantor strings. We establish a Strong Law of Large Numbers for the eigenvalue counting function which leads to the second order term in the Weyl asymptotics. Afterwards, we discuss the random fluctuation of the normalized eigenvalue counting function around its limit by giving a Central Limit Theorem. Since the Central Limit Theorem only makes a statement about convergence in distribution, we also establish an almost sure error estimate of the random fluctuation using a Law of the Iterated Logarithm.

Secondly, we determine the leading order term in the Weyl expansion for measure theoretical Laplacians with respect to statistically self-similar Cantor measures.