

Math colloquium, Oct 12.

Speaker: Kannan Soundararajan

Title: Quantum Unique Ergodicity and Number Theory.

Abstract: A fundamental problem in the area of quantum chaos is to understand the distribution of high eigenvalue eigenfunctions of the Laplacian on certain Riemannian manifolds. A particular case which is of interest to number theorists concerns hyperbolic manifolds arising as a quotient of the upper half-plane by a discrete "arithmetic" subgroup of  $SL_2(\mathbb{R})$  (for example,  $SL_2(\mathbb{Z})$ , and in this case the corresponding eigenfunctions are called Maass cusp forms). In this case, Rudnick and Sarnak have conjectured that the high energy eigenfunctions become equidistributed. I will discuss some recent progress which has led to a resolution of this conjecture, and also on a holomorphic analog for classical modular forms.