

MIT/HARVARD ANALYSIS SEMINAR

Alexander Barnett
Dartmouth College

will speak on:

"Numerical study of the asymptotic rate of quantum ergodicity in chaotic billiards"

Date : *Friday, March 17, 2006*

Time : *4:15 pm*

Location: *MIT, Room 2-142*

Abstract: It is a long-standing question how eigenfunctions of the Laplacian (modes of a drum) behave asymptotically at large eigenvalue, for manifolds whose geodesic flow (Hamiltonian motion of a point particle) is hyperbolic. This field is called 'quantum ergodicity' or 'quantum chaos'. I will discuss known results and conjectures on the rate at which modes tend to become spatially uniform. I sketch the highly efficient and specialized methods invented to compute large numbers of modes of 2D Euclidean manifolds with Dirichlet boundary (ie, 'billiards'), at mode numbers of order 10^6 . These calculations provide, with unprecedented accuracy, evidence for the Quantum Unique Ergodicity conjecture of Rudnick-Sarnak, and for an ergodicity rate conjecture of Feingold-Peres involving the classical autocorrelation of the test function.