Courant Institute of Mathematical Sciences
Mathematics Colloquium
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Speaker: David Fisher, Indiana University

Title: Subexponential growth, measure rigidity, strong property (T) and Zimmer's conjecture

Abstract:

Lattices in higher rank simple Lie groups, like SL(n,R) for n>2, are known to be extremely rigid. Examples of this are Margulis' superrigidity theorem, which shows they have very few linear representations, and Margulis' arithmeticity theorem, which shows they are all constructed via number theory. Motivated by these and other results, in 1983 Zimmer made a number of conjectures about actions of these groups on compact manifolds. After providing some history and motivation, I will discuss a very recent result, proving many cases of the main conjecture. While avoiding technical matters, I will try to describe some of the novel flavor of the proof. The proof has many surprising features, including that it uses hyperbolic dynamics to prove an essentially elliptic result, that it uses results on homogeneous dynamics, including Ratner's measure classification theorem, to prove results about inhomogeneous system and that it uses analytic notions originally defined for the purposes of studying the K theory of C^* algebras. This is joint work with Aaron Brown and Sebastian Hurtado.