

Math 621a
Instructor: Hee Oh
TTH 10:30-11:20
Rm. 205 LOM

Introduction to Homogeneous Dynamics

First Meeting, Tuesday, September 9, 2014

We will try to discuss dynamical properties of flows on homogeneous spaces which are quotients of simple Lie groups by lattices. We plan to cover the following topics:

- (1) Haar measures, Invariant measures on homogeneous spaces, Lattices, Arithmetic groups
- (2) Ergodicity and Mixing of flows on homogeneous spaces, Unitary representations
- (3) (Non)-Divergence properties of unipotent flows
- (4) Measure classification theorem and Orbit closure theorem
- (5) Applications

Each of these topics can be a semester course. Instead of discussing most general versions of theorems, we will, most of the time, work with examples and consider homogeneous spaces of $SL_2(R)$, $SL_3(R)$ or $SL_2(C)$.

Some of the relevant references include:

Raghunathan: Discrete subgroups of Lie groups

Margulis: Discrete subgroups of semi simple Lie groups Bekka and Mayer: Ergodic theory and topological dynamics of groups actions on homogeneous spaces Einsiedler and Ward: Ergodic theory with a view towards Number theory

Morris: Ratner's theorems on unipotent flows

Fall Term 2014