MATH 636 WINTER 2017 T Th 11:30 - 1 EH 3866 R. Spatzier

# AN INTRODUCTION TO DYNAMICAL SYSTEMS

**Prerequisites:** basic point set topology/manifold theory, real analysis

**Goals:** We will discuss rigidity results in geometry and dynamics. These have been highlights of research during the last five decades and are intricately woven together. We will start with Mostow's Global Rigidity Theorem from the 1960's: Let M be a closed manifold of dimensions at least three. Then M carries at most one metric of constant negative curvature -1. Closely related are Margulis' superrigidity and Arithmeticity theorems from the 1970s that classify all representations of fundamental groups of so-called higher rank symmetric spaces. The latter have later been characterized in terms of Riemannian metrics with sufficiently many flats in the 1980's. They have also been characterized quasi-isometrically. Since, much progress have been made on the dynamics side, starting with measure rigidity results for unipotent groups by Ratner in the 1980s, later for higher rank abelian subgroups of semi simple elements and for actions of lattices. Highlights from the last few years include the classifications of Anosov actions of higher rank abelian groups on tori and nilmanifolds, and lately of higher rank lattice actions on low-dimensions manifolds.

**Books:** No text is required but the following are recommended:
**Talks:** You are expected to give a talk during the semester.

**Contact Info:** 5850 East Hall, spatzier@umich.edu, 734 763 2192