

MATH 595: *DYNAMICS OF LARGE GROUPS*

Instructor: Sławomir Solecki

Time: MWF 1–1:50

The course will focus on the theory of continuous actions of non-locally compact groups that are equipped with a complete separable topology, the so called Polish groups. The class of such groups includes the unitary group of the separable Hilbert space, homeomorphism groups of compact metric spaces, automorphism groups of countable structures, and the group of measure preserving transformations. The emphasis will be on the structure of orbit equivalence relations induced by continuous actions of such groups. We will cover the following topics.

1. The Kechris–Louveau theorem identifying a fundamental obstacle for an equivalence relation to be an orbit equivalence relation.
2. Effros-type theorems on embedding of the Vitali equivalence relation into orbit equivalence relations.
3. Hjorth’s theory of turbulence giving a dynamical condition ensuring that an orbit equivalence relation is complicated.
4. Applications of points 2 and 3 to classification problems.

Literature:

1. S. Gao, *Invariant Descriptive Set Theory*, CRC Press, 2009.
2. I. Kaplan, B. Miller, *An embedding theorem of E_0 with model theoretic applications*, Journal of Math. Logic, 2014.
3. A.S. Kechris, A. Louveau, *The classification of hyper smooth Borel equivalence relations*, Journal of the American Math. Society, 1997.
4. A.S. Kechris, *Actions of Polish groups and classification problems*, in *Analysis and Logic*, London Math. Society, 2002.