Spring 2016

- **February 11**
  Speaker: **Peng Sun** (Central University of Finance and Economics, Beijing, China)
  Title: **Exponential Decays and Topological Entropy** *Abstract:* We study two types of exponential decay under dynamics: Lebesgue number of open covers and expansive constants for expansive maps. We find that these exponents can provide better estimates of topological entropy.
- **February 18**
  Speaker: **Artem Dudko** (SUNY Stony Brook)
  Title: **On representations of weakly branch groups.** *Abstract:* The class of weakly branch groups acting on rooted trees plays important role in group theory and dynamics and contains many examples of groups with unusual properties. I'll present results on representations associated to actions of weakly branch groups on boundaries of rooted trees and corollaries related to invariant random subgroups, centralizers of group actions, spectra of Schreier graphs etc. The talk is based on a joint work with R. Grigorchuk.

- **March 3**
  Speaker: **Steven Frankel** (IAS)
  Title: **Quasigeodesic and pseudo-Anosov flows** *Abstract:* We will discuss two kinds of flows on 3-manifolds: quasigeodesic and pseudo-Anosov. Quasigeodesic flows are defined by a tangent condition, that each flowline is coarsely comparable to a geodesic. In contrast, pseudo-Anosov flows are defined by a transverse condition, where the flow contracts and expands the manifold in different directions. When the ambient manifold is hyperbolic, there is a surprising relationship between these apparently disparate classes of flows. We will show that a quasigeodesic flow on a closed hyperbolic 3-manifold has a “coarsely contracting-expanding” transverse structure, and use this to show that every such flow has closed orbits. We will also illustrate an approach to Calegari’s conjecture, that every quasigeodesic flow can be deformed into a pseudo-Anosov flow.
- **March 10**
  Speaker: **Andrey Gogolev** (Binghamton)
  Title: **Surgery constructions of Anosov flows** *Abstract:* I will recall classical Franks-Williams construction of a non-transitive Anosov flow. Then I will explain how Franks-Williams idea can be transplanted into the setting of geodesic flows.
  The first half of the talk will be dedicated to dynamical preliminaries and will be more entertaining than normal.
- **March 17**
  Speaker: **Jean Lafont** (Ohio State university)
  Title: **Almost-isometries: rigidity versus flexibility.** *Abstract:* Almost-isometries are quasi-isometries with multiplicative constant 1, i.e. maps which distort distances by some uniform additive amount. Given a pair of Riemannian metrics on a closed manifold, we can look at their lifts to the universal cover, and ask whether or not these metrics are almost-isometric (it is easy to see they are quasi-isometric). In the rigidity direction, there are many cases where the only times these metrics are almost-isometric is if they are actually isometric (joint with Kar and Schmidt). In the flexibility direction, we give examples where there is an infinite dimensional space of metrics whose lifts are almost-isometric, but where no two are isometric (joint with Schmidt and van Limbeek).
  The talk will be accessible to a general audience.

- **April 7**
  Speaker: **Tam Nguyen Phan** (Binghamton University)
  Title: **Finite volume, noncompact manifolds of negative curvature** *Abstract:*Let M be a noncompact, complete, Riemannian manifold. Gromov proved that if the sectional curvature of M is negative and bounded, and

if the volume of M is finite, then M is homeomorphic to the interior of a compact manifold with boundary. In other words, M has finitely many ends, and each end of M is topologically a product $C\times [0,\infty)$ of a closed manifold C with a ray. I will discuss the question what topological restrictions there are on each end of such a manifold M. The talk will be accessible to a general audience.

- **April 14**
  Speaker: **Matt Zaremsky** (Binghamton University)
  Title: **Finiteness properties of some subgroups of the pure braid groups** *Abstract:*The Bieri-Neumann-Strebel-Renz invariants of a group are a sequence of geometric objects that encode a great deal of information about certain subgroups of the group, including “finiteness properties” like finite generation and finite presentability. In general they are quite difficult to compute, and a full computation has been done only for very few “interesting” families of groups. I will discuss some of my results on the BNSR-invariants of the pure braid groups, and the implications for finiteness properties of their subgroups. In particular I will discuss some natural subgroups that are finitely generated but not finitely presented, finitely presented but not of type F_3, type F_3 but not F_4, and so forth.
- **April 21**
  Speaker: **Christoforos Neofytidis** (Binghamton)
  Title: **Mapping degree sets of Cartesian products** *Abstract:*We study stability of properties of closed oriented manifolds under taking non-trivial Cartesian products, with special emphasis to properties related to the sets of self-mapping degrees. We derive applications with respect to the non-existence of orientation reversing self-maps.

- **April 28** No seminar due to a special event:
  Peter Hilton Memorial Lecture.
  Speaker: **Amie Wilkinson** (University of Chicago)
  Title: **Geometry, Lyapunov Exponents and Rigidity**

- **May 5**
  Speaker: **Kevin Schreve** (University of Michigan)
  Title: **Thurston norm via Fox Calculus** *Abstract:*Given a 3-manifold whose fundamental group admits a presentation with two generators and one relator we will show how one can easily determine the Thurston norm. This is based on joint work with Stefan Friedl and Stephan Tillmann.
- **May 9** (Working seminar, 4:40-5:40, WH-100E)
  Speaker: **Barry Minemyer** (Ohio State University)
  Title: **The isometric embedding problem and Nash's C^1 solution**

- **May 11** (Working seminar, 3:30-4:30, WH-309)
  Speaker: **Barry Minemyer** (Ohio State University)
  Title: **The Nash smooth isometric embedding theorem**

- **May 12**
  Speaker: **Barry Minemyer** (Ohio State University)
  Title: **The isometric embedding problem for length metric spaces** *Abstract:*In the spring of 2010, Pedro Ontaneda suggested to me the research question of whether or not the famous Nash isometric embedding theorems could be extended to geodesic metric spaces. In this talk I will begin by explaining the general problem,

discuss what is known in the more concrete cases of manifolds and polyhedra, and end with a new result which applies to a much larger class of spaces than anything that was previously known.