

WINTER 2013 MIDWEST TOPOLOGY SEMINAR

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
FEBRUARY 23, 2013

Conference Schedule

10:00 - 11:00	Sign-in and refreshments
11:00 - 12:00	Kathryn Lesh
12:00 - 2:00	Lunch
2:00 - 3:00	Nick Rozenblyum
3:00 - 3:30	Coffee break
3:30 - 4:30	Julianna Tymoczko
4:30 - 5:00	Coffee break
5:00 - 6:00	Alejandro Adem

The informal conference dinner will start at 6:30 PM. Details will be announced.

Location: Sign-in and all breaks are in 321 Altgeld Hall (Math Common Room). All talks are in room 245 Altgeld Hall. The room next to it, 243 Altgeld Hall, has been reserved for discussions.

Titles and Abstracts

11 AM

Kathryn Lesh, Union College

Partition complexes, Bredon homology, and the Whitehead Conjecture

I'll discuss an adaptation of equivariant approximation techniques to the computation of Bredon homology. I'll apply it to compute the Bredon homology and cohomology of the partition complex with coefficients in a p -constrained Mackey functor (given some fine-print provisos on the Σ_n action). There is a relationship to a proposed “non-computational” proof of the Whitehead Conjecture. This is joint work with Greg Arone and Bill Dwyer.

2 PM

Nick Rozenblyum, Northwestern University

Higher trace maps and topological field theories

The Dennis trace map from the algebraic K -theory of a category to its Hochschild homology (and its numerous variants) is a fundamental object of study in geometry and topology. Hochschild homology of a category can be described as a kind of integral of the category over the circle, and this description provides a geometric construction of the trace map. I will describe a version of Hochschild homology given by integrating (∞, n) -categories over higher dimensional manifolds called “composition cohomology”, which provides the target for higher dimensional trace maps. From the point of view of manifold topology, this gives a universal construction of topological field theories. This is joint work with David Ayala.

3:30 PM

Julianna Tymoczko, Smith College

Localization techniques in torus-equivariant cohomology

Given a topological space X with a group action, the equivariant cohomology of X includes both the information from ordinary cohomology and the information of how the group acts on X . Though a priori more complicated than ordinary cohomology, equivariant cohomology is often easier to compute because of combinatorial techniques arising from the work of many, including Kirwan, Atiyah, Chang-Skjelbred, and especially Goresky-Kottwitz-MacPherson. We discuss this work and then show how to extend it beyond the circumstances in which it originally applied. This can be used to build a sort of Schubert calculus for a collection of varieties called Hessenberg varieties. We end with open questions.

5 PM

Alejandro Adem, University of British Columbia

Topology of spaces of representations for abelian groups

In this talk we describe recent work on the homotopy and equivariant K -theory with respect to conjugation for spaces of commuting elements in a compact Lie group. This is joint work with Fred Cohen and José Manuel Gómez.