MIDWEST TOPOLOGY SEMINAR

2011 Fall Meeting
October 8, 2011
Illinois State University, Normal, IL

1 Schedule

Saturday, October 8, State Farm Hall (College of Business) COB 139, Caterpillar Auditorium

Time	Speaker
9:15 - 10:00	Coffee and Refreshments
10:00 - 11:00	**Brooke Shipley** (Univ. of Illinois, Chicago)
	An algebraic model for free rational G-equivariant spectra
11:30 - 12:30	**Anna Marie Bohmann** (Northwestern University)
	Global equivariant homotopy theory
12:30 - 2:00	Lunch break
2:00 - 3:00	**Igor Kriz** (Univ. of Michigan)
	Fun with knots, links and trees (joint work with Daniel Kriz)
3:00 - 3:45	Coffee and refreshments
3:45 - 4:45	**Randy McCarthy** (UIUC)
	Goodwillie's Calculus and functors of Algebras

2 Abstracts

Speaker: **Anna Marie Bohmann**, Northwestern University.

Title: Global equivariant homotopy theory

Abstract: Much recent work has shown that equivariant homotopy theory can give insight into the non-equivariant world. While concrete calculations focus on specific groups, many familiar objects in homotopy theory have (or we would like them to have) equivariant generalizations that feel "natural." One way of stating such naturality is by asking how these generalizations fit together across different groups of equivariance. Global equivariant homotopy theory is the study of spectra that vary naturally in the group of equivariance. Change of groups is an important tool in existing calculations, and one might hope that some calculations work globally and not just one group at a time. I will discuss the basic ideas of what we mean by "global" spectra and explain how these notions capture the naturalness we see in familiar spectra such as complex cobordism and K-theory, but don't see for Eilenberg–MacLane spectra.

Speaker: **Igor Kriz**, University of Michigan.

Title: Fun with knots, links and trees (joint work with Daniel Kriz)

Abstract: This is joint work with Daniel Kriz. During the last decade or so, a new generation of knot (and link) invariants emerged from an idea called categorification. Some known examples are elementary, e.g. Khovanov homology, some are not, e.g. Ozsvath-Szabo's knot Floer homology. I will talk about a recent beautiful and mysterious explicit combinatorial construction which became known as Baldwin-Ozsvath-Szabo (BOS) cohomology. This construction emerges as an E_3-term of a spectral sequence converging to a certain twisted Heegaard Floer cohomology group. We prove that the construction is a link invariant.

Speaker: **Randy McCarthy**, UIUC

Title: Goodwillie's Calculus and functors of Algebras

Abstract: Tom Goodwillie created a Taylor tower for functors of suitable model categories with an initial and final object (not necessarily equal).

Using this, one can form a tower for functors of a category with an initial object only. This new tower approximates the functor at the initial object in terms of the functor applied to approximations of the initial object. For example, Rosona Eldred has shown that this tower for an n-analytic functor of spaces is equivalent to applying F to an approximation of the empty set by n-connected spaces. We will introduce this Tower and discuss how classical DeRham cohomology and the dlog map arise as examples in algebras.

Speaker: **Brooke Shipley**, Univ. of Illinois, Chicago

Title: An algebraic model for free rational G-equivariant spectra

Abstract: This is joint work with John Greenlees. We construct an algebraic model for the homotopy theory of free rational G-equivariant spectra for G a compact Lie group. We will first review earlier work which shows that when G is connected the algebraic model is given by differential graded torsion modules over the cohomology of BG.