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Mathematics Colloquium

Equivariant versions of 3-manifold invariants

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Abstract

This is a talk about 3-manifolds and knots. We will begin by reviewing some basic constructions and motivations in low-dimensional topology, and will then construct the homology cobordism groups, which are groups of 3-manifolds with the same homology as the 3-sphere (in various coefficient rings) up to a reasonable notion of equivalence. We will discuss what is known about the structure of (some of) these groups and their connections to higher dimensional topology. Next, we will introduce several maps from the homology cobordism groups to the rational numbers which have been constructed using gauge- and Floer- theoretic invariants of 3-manifolds, and which have been used to study a wide variety of topological questions in recent years. Finally, we will construct two new such maps (coming from a new equivariant version of the three-manifold invariant Heegaard Floer homology) and talk briefly about some of their existing and potential applications to 3-manifold topology and knot theory. This construction is joint work with C. Manolescu.

Wednesday, 27 January 2016, 4pm

Smith Hall 204

Tea and refreshments will be served at 3:45pm.