

BI-CO MATHEMATICS COLLOQUIUM

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“Combinatorial Knot Floer homology for Knots in Lens Spaces”

Monday, September 24, 2007

Talk at 4:15 – Park 338

Tea at 3:45 – Park 355, Math Lounge

Abstract:

Knot Floer homology, developed by Ozsvath and Szabo and independently by Rasmussen, associates a sequence of graded abelian groups to a null-homologous knot K in a 3-manifold Y . These groups encode an enormous amount of topological information. For example, knot Floer homology detects the Seifert genus and provides a complete test for fiberedness. However, until recently, computation of these invariants was difficult, since their definition relied on counts of J -holomorphic curves in a symplectic manifold.

Recent work of Manolescu, Ozsvath, Sarkar, Szabo, Thurston, and Wang (in various combinations) have placed a subset of these invariants on a firmly combinatorial footing. In particular, in the case where $Y = S^3$, the most robust of the knot Floer homology invariants can be combinatorially defined using so-called grid diagrams. I will discuss joint work with Baker and Hedden which generalizes the construction to provide a combinatorial description of knot Floer homology for knots in lens spaces. This generalization has already, in joint work with Ruberman and Strle, provided new information about the smooth concordance group, and we hope that it will have applications to questions about which knots in S^3 admit lens space surgeries.

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