2018 Distinguished Lecture Series

Holomorphic Disks, Algebra, and Knot Invariants

Peter Ozsvath - Princeton University

Lecture 1: An Introduction to Knot Floer Homology

Wednesday, June 6, 2018, 3:00 – 3:50 p.m. MS 6627

Knot Floer homology is an invariant for knots in three-dimensional space, defined using methods from symplectic geometry (the theory of pseudo-holomorphic curves). After giving some geometric motivation for its construction, I will sketch the construction of this invariant, and describe some of its key properties and applications. Knot Floer homology was originally defined in joint work with Zoltan Szabo, and independently by Jacob Rasmussen; but this lecture will touch on work of many others. This first lecture is intended for a general audience.

Lecture 2: Bordered Floer Homology

Thursday, June 7, 2018, 3:00 – 3:50 p.m. MS 6627

Bordered Floer homology is an invariant for three-manifolds with parameterized boundary. It associates a differential graded algebra to a surface, and certain modules to three-manifolds with specified boundary. I will describe properties of this invariant, with a special emphasis on its algebraic structure. Bordered Floer homology was defined in joint work with Dylan Thurston and Robert Lipshitz.

Lecture 3: A Bordered Approach to Knot Floer Homology

Friday, June 8, 2018, 3:00 – 3:50 p.m. MS 6627

I will describe current work with Zoltan Szabo, in which we compute a suitable specialization of knot Floer homology, using bordered techniques. The result is a purely algebraic formulation of knot Floer homology, which can be explicitly computed even for fairly large knots.