

LECTURE SERIES in GEOMETRIC TOPOLOGY

Equivalence of homology theories in low dimensions

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Heegaard Floer meets Seiberg--Witten

Since early 1980s, gauge theory and symplectic geometry have played an important role in understanding the topology of 3 and 4-dimensional manifolds. Some very powerful topological invariants have been introduced using moduli spaces of solutions to certain geometric PDEs. Despite their seemingly different constructions, some of these invariants from gauge theory and symplectic geometry exhibit very similar properties. The aim of this talk is to explain the general philosophy behind their equivalence. This is joint work with Yi-Jen Lee and Clifford H. Taubes.

Floer homologies in dimension 3

Introduced by Andreas Floer as an infinite dimensional analog of Morse homology, Floer homology is a widely studied subject in both geometry and topology. In this talk, I will describe some of the Floer homologies for closed, oriented 3-manifolds and their relations to one another.

Embedded Contact Homology and Heegaard Floer homology correspondence

The aim of this talk is to explain the correspondence between a version of Hutchings's embedded contact homology and Heegaard Floer homology. This is joint work with Yi-Jen Lee and Clifford H. Taubes.

Embedded Contact Homology and Seiberg--Witten Floer homology correspondence

The aim of this talk is to explain the correspondence between a version of Hutchings's embedded contact homology and Seiberg--Witten Floer homology. This is joint work with Yi-Jen Lee and Clifford H. Taubes.