

The Trivial Notions Seminar
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Infinite Dimensional Morse Theory for Low
Dimensional Manifolds

A talk by
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Abstract

Morse theory is one of the most important tools in topology and geometry. Among many other applications, Smale used a homology theory based on Morse theory to prove Poincare conjecture in dimension greater than 4. Later Witten gave a more modern formulation of this so called Morse homology, in terms of tunneling effect in physics. Inspired by Witten's work, Floer discovered it is possible to define Morse homology in some interesting infinite dimensional manifolds.

After a fast review of Morse theory, I will explain how one can use a Morse function to define Morse homology. Next I will discuss one of the Floer's approaches to carry over Morse homology to certain infinite dimensional manifolds. Nowadays this type of morse homology is called lagrangian Floer Homology. Ozsvath and Szabo used lagrangian Floer homology to define Heegaard Floer homology which is an invariant assigned to 3-manifolds. A glimpse into this theory will be the finishing part of my talk.

Thursday September 13th, at 1:30 pm
Science Center 507