

University of Michigan and Michigan State University Student Geometry and Topology Conference

Saturday, December 2

Today's talks will be held in Dennison 260

Adam Knapp 10:30am - 11:20am

Donaldson-Smith standard surface count

Michigan State University

This would be somewhat of a preliminary talk to Inanc's. One of the invariants associated to Lefschetz fibrations, the Donaldson-Smith standard surface count (DS), counts isolated pseudo-holomorphic surfaces arranged in a certain way to the fibers of the Lefschetz fibration. This has been shown to be equal to the Gromov-Witten invariant and thus the Seiberg-Witten invariant. The count also fits into a TQFT-like structure. I would give an overview of the results.

Diane Vavrichek 11:45am -12:35pm

Group Accessibility and Applications to Topology

University of Michigan

We will introduce the notion of a splitting of a group, and then talk about the history of the work done on group accessibility. We will then discuss more recent results, as well as applications to 3-manifold topology.

Cagri Karakurt 2:15pm - 3:05pm

Open Books on Plumbings

Michigan State University

We will give some explicit examples of open books on arbitrary plumbings of oriented circle bundles over surfaces. We will show that, for a non-positive plumbing, the corresponding contact structure is Stein fillable. The main reference for this talk is:

B. Ozbagci, T. Etgu, Explicit Horizontal Open Books on Some Plumbings; arXiv:math.GT/0509611

Kevin Wildrick 3:30pm - 4:20pm

Quasisymmetry and conformal geometry on metric spaces

University of Michigan

Quasisymmetry and conformal geometry on metric spaces What kind of geometry and analysis can be done on non-smooth spaces? We will introduce the notion of quasisymmetry, an analogue of conformality in the general metric setting. We will discuss how many classical theorems for Riemann surfaces have non-smooth analogues involving quasisymmetric maps, and give some applications to hyperbolic geometry and geometric group theory.

Inanc Baykur 4:45pm - 5:35pm
Near-symplectic 4-manifolds and (smooth) invariants
Michigan State University

The focus of this talk is on extending several techniques and ideas originated from the study of symplectic 4-manifolds to the much broader class of near-symplectic 4-manifolds. The goal is to make use of the extra structures on near-symplectic 4-manifolds in order to answer questions regarding their smooth topology. We will discuss broken Lefschetz fibrations ('singular Lefschetz fibrations' of Auroux, Donaldson and Katzarkov), and Perutz's Lagrangian matching invariants associated to them.

Sunday, December 3

Today's talks will be held in East Hall 1360

Eric Zupunski 10:00am - 10:50am
Actions of Groups on Trees and R -Trees
University of Michigan

Knowing that a group acts on a space X can provide information about the topological space X . For example, if X is a symplectic manifold, then knowing that a torus of an appropriate dimension acts on X can be used to classify all such symplectic manifolds X . In covering space theory, the action of a group on a topological space provides a way to understand quotients of a space.

In this talk, however, we will be more interested in the opposite viewpoint. If G is a group and we know it acts on a topological space X , what can we say about G ? To make the question reasonable, we will restrict G to finitely generated (and occasionally finitely presented) groups and will be most interested in the case that X is a tree. In this case, Bass-Serre theory provides a decomposition of the group by amalgamated free products and HNN extensions. (These terms will be defined in the talk.)

We will also consider the case where X is a generalization of a (simplicial) tree, called an R -tree. One advantage of this space is that groups which admit only trivial actions on trees can act non-trivially on R -trees. Time permitting, we will present how R -trees arise in geometry.

Selahi Durusoy 11:15am - 12:05pm

Heegaard Floer homology and its applications to knot theory

Michigan State University

Initially defined for closed 3-manifolds, Heegaard Floer homology has given rise to many useful invariants in knot theory, contact topology and also theory of 4-manifolds. I will review the construction and basic properties of Heegaard Floer homology with an emphasis on Knot Floer homology. I will illustrate these with concrete examples and also mention several applications of the theory.

Joerg Enders 2:00pm - 2:50pm

An application of monotonicity in the Ricci flow

Michigan State University

Ricci flow is a heat-type evolution of a Riemannian metric. Due to the nonlinearity of the flow equation singularities do occur. Understanding the structure of those is one of the main goals in the study of the Ricci flow. After introducing special solutions to the equation, so-called Ricci solitons, this talk will discuss a result by Natasa Sesum on how Perelman's entropy can be used to recover Ricci solitons as models for certain types of singularities.