



FMSP Lectures

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Wednesday, May 15

15:00 – 17:20

Room 122

Part 1

Categorical analogues of surface singularities

Abstract:

Isotopy classes of surfaces that are embedded in 3-space can be described as a free 4-category that has one object and one weakly invertible arrow. That description coincides with a fundamental higher homotopy group. The surface singularities that correspond to cusps and optimal points on folds can be used to develop categorical analogues of swallow-tails and horizontal cusps. In this talk, the 4-category will be constructed from the ground up, and the general structure will be described.

Part 2

Prismatic Homology

Abstract:

A qualgebra is a set that has two binary operations whose relationships to each other are similar to the relations between group multiplication and conjugation. The axioms themselves are described in terms of isotopies of knotted trivalent graphs and the handle-body knots that are represented. The moves naturally live in prisms. By using a generalization of the tensor product of chain complexes, a homology theory is presented that encapsulates these axioms and the higher order relations between them. We show how to use this homology theory to give a solution a system of tensor equations related to the Yang-Baxter relation.