

Invariant ordering of groups and low-dimensional topology

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Abstract:

In our talks, we will explain basics of invariant group orderings, and give an overview of interactions between orderings of groups and low-dimensional topology.

Talk 1: Ordering of groups and examples

After reviewing fundamental notions and results of orderable groups, we will give several constructions and example of orderings. Through the examples, we point out interactions of group ordering and other branch of mathematics, like dynamics or combinatorics.

Talk 2: Orderability of 3-manifold groups

In this talk we will concentrate our attention to the problem which is actively studied: Which 3-manifold group is left-orderable? We give several methods to show (non)-existence of orderings, and explain how ideas of techniques from 3-manifold theory can be applied to study orderability problem.

Talk 3: Expected connection of orderings and topology/geometry

As for the orderability of 3-manifold groups, there is fascinating conjecture: For an irreducible 3-manifold M , its fundamental group is NOT left-orderable if and only if M is Heegaard-Floer L-space. We will explain why we expect such a mysterious connection, and survey known results. Also, we provide several application of orderings to problem in topology/geometry.