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# Khovanov invariants via immersed curves

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## Abstract

Both Heegaard Floer homology and Khovanov homology admit relative versions associated with surface decompositions. In the case of a manifold with torus boundary, the Heegaard Floer invariant can be Both Heegaard Floer homology and Khovanov homology admit relative versions associated with surface decompositions. In the case of a manifold with torus boundary, the Heegaard Floer invariant can be interpreted in terms of immersed curves in a punctured torus; and in the case of a 4-ended tangle, the Khovanov invariant can be interpreted in terms of immersed curves in the 4-punctured sphere. While these invariants have different origins, this point of view highlights common algebraic underpinnings. Using mutation as a point of departure, this series will focus on Khovanov invariants in order to tell some of the algebraic and the geometric parts of this story.

Lecture 1 (1 hour): Conway's mutation problem

Lecture 2 (1.5 hours): Bar-Natan's category from a bordered perspective

Lecture 3 (1.5 hours): Tangle invariants as immersed curves

Lecture 4 (1 hour): Linearity: towards mutation invariance over any field

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