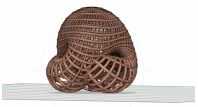
TEXAS STATE



Topology Seminar at Texas State

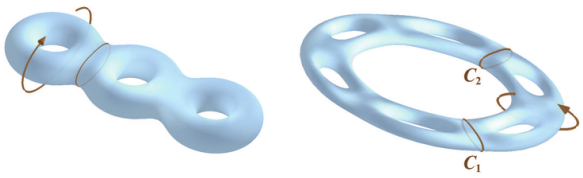
When: Friday, April 21, 2023, 11:00 a.m.

Where: DERR 333 *and* ZOOM (Zoom info at bottom of page)

Presenter: Miriam Kuzbary (Georgia Tech. [NSF postdoc])

Title: Asymptotic behavior of invariants of homology spheres

Abstract: As shown by Morita, every integral homology 3-sphere Y has a decomposition into two simple pieces (called a Heegaard splitting) glued along a surface diffeomorphism which acts trivially on the homology of the surface. These diffeomorphisms form the Torelli subgroup of the mapping class group of the surface, and the Torelli group is finitely-generated for surfaces of genus 3 or higher. Though the group of integral homology spheres is infinitely generated, by fixing the genus of a Heegaard splitting we can use finite generation in the surface setting to better understand how invariants like the Rokhlin and Casson invariant change. This perspective has led to important results in the study of the Torelli group and the Casson invariant (Birman-Craggs-Johnson, Morita, Broaddus-Farb-Putman). In work in progress with Santana Afton and Tye Lidman, we show that the d-invariant of Y, a smooth homology cobordism invariant of homology spheres defined using Heegaard Floer homology, is bounded above by a linear function of word length in the Torelli group. Moreover, we show the d-invariant is bounded for homology spheres corresponding to various large families of mapping classes.



Generators of the Torelli group I g . Left: Dehn twist along a separating curve. Right: the bounding pair map. (Figure 5 in *Establishing strongly-coupled 3D AdS quantum gravity with Ising dual using all-genus partition functions.* by Jian, CM., Ludwig, A.W.W., Luo, ZX. et al. J. High Energ. Phys. 2020, 129 (2020). https://doi.org/10.1007/JHEP10(2020)129)

Zoom Information

Meeting URL (click this)
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