ABSTRACT:

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Orderability and Dehn filling

Motivated by conjectures relating group orderability, Floer homology, and taut foliations, I will discuss a systematic and broadly applicable technique for constructing left-orders on the fundamental groups of rational homology 3-spheres. Specifically, for a compact 3-manifold M with torus boundary, I will give several criteria which imply that whole intervals of Dehn fillings of M have left-orderable fundamental groups. The technique uses certain representations from $\pi_1(M)$ into $\widetilde{\mathrm{PSL}_2 \mathbb{R}}$, which are organized into an infinite graph in $H^1(\partial M; \mathbb{R})$ called the translation extension locus. I will show many plots of such loci which inform the proofs of the main results and suggest interesting avenues for future research. This is joint work with Marc Culler.