

## Geometry/Topology Seminar

### *Geometric finiteness and the geometry of surface group extensions*

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**Abstract:** The theory of convex cocompact subgroups of the mapping class group contains two intertwining threads. One is the rich analogy between these subgroups of the mapping class group and the convex cocompact Kleinian group that inspired them. The other is work of Farb and Mosher plus Hamenstädt that shows convex cocompactness is precisely the property that characterizes when an extension of a surface group is Gromov hyperbolic. Both of these threads have natural generalizations that are unresolved. Among Kleinian groups, convex cocompactness is a special case of geometric finiteness, yet no robust notion of geometric finiteness has emerged for the mapping class group. In geometric group theory, there are a variety of generalizations of Gromov hyperbolicity, but there is no characterization of these geometries for surface group extensions. Mosher suggested these two threads should continue to intertwine with geometric finiteness in the mapping class group (however it is eventually defined) being equivalent to some generalization of Gromov hyperbolicity of the corresponding surface group extension. Inspired by their work on Veech groups, Dowdall, Durham, Leininger, and Sisto conjectured that this generalized hyperbolicity could be the hierarchical hyperbolicity of Behrstock, Hagen, and Sisto. We provide evidence for this conjecture by showing that several classes of subgroups that should be considered geometrically finite (stabilizers of multicurves, twist subgroups, cyclic subgroups) correspond to surface group extensions that are hierarchically hyperbolic.

Wednesday, October 25 at 3:00 PM in 636 SEO