

## Geometry, Topology and Dynamics Seminar

### *A tale of two norms*

Nathan Dunfield (UIUC)

**Abstract:** The first cohomology of a hyperbolic 3-manifold has two natural norms: the Thurston norm, which measures the topological complexity of surfaces representing the dual homology class, and the harmonic norm, which is just the  $L^2$  norm on the corresponding space of harmonic 1-forms. Bergeron-Sengun-Venkatesh recently showed that these two norms are closely related, at least when the injectivity radius is bounded below. Their work was motivated by the connection of the harmonic norm to the Ray-Singer analytic torsion and issues of torsion growth. After carefully introducing both norms and the connection to torsion growth, I will discuss new results that refine and clarify the precise relationship between them; one tool here will be a third norm based on least-area surfaces. This is joint work with Jeff Brock.

Monday, February 22 at 3:00 PM in SEO 636