

# Department of Mathematics and Computer Science

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Friday, April 13, 2018, 4:10 pm

COLLOQUIUM TALK

**Speaker: Nathan Dunfield (UIUC)**

Old Main 2231

## Fun with finite covers of 3-manifolds: connections between topology, geometry, and arithmetic

### **Abstract:**

From the revolutionary work of Thurston and Perelman, we know the topology of 3-manifolds is deeply intertwined with their geometry. In particular, hyperbolic geometry, the non-Euclidean geometry of constant negative curvature, plays a central role. In turn, hyperbolic geometry opens the door to applying tools from number theory, specifically automorphic forms, to what might seem like purely topological questions.

After a passing wave at the recent breakthrough results of Agol, I will focus on exciting new questions about the geometric and arithmetic meaning of torsion in the homology of finite covers of hyperbolic 3-manifolds, motivated by the recent work of Bergeron, Venkatesh, Le, and others. I will include some of my own results in this area that are joint work with F. Calegari and J. Brock.

SNACKS IN FACULTY LOUNGE AT 3:30 PM.  
EVERYONE WELCOME (EVEN IF YOU ARE UNABLE TO ATTEND THE TALK)

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