1086-57-1231 **Mladen Bestvina***, Department of Mathematics, University of Utah, 155 S 1400 E Rm 233, Salt Lake City, UT 84112. *Geometric group theory and 3-manifolds hand in hand: the fulfillment of Thurston's vision for three-manifolds.*

In the late 70s, Thurston revolutionized our understanding of 3-manifolds. He stated a far reaching Geometrization Conjecture and proved it for a large class of manifolds, called Haken manifolds. He also posed 24 open problems, describing his vision of the structure of 3-manifolds.

Pieces of Thurston's Vision have been confirmed in the subsequent years. Perelman proved the Geometrization Conjecture (see Morgan's Current Events lecture in 2004), Tameness Conjecture (Agol and Calegari-Gabai), Ending Lamination Conjecture (Brock-Canary-Minsky), and the Surface Subgroup Conjecture (Kahn-Markovic, see Brock's Current Events lecture in 2012). In the meantime, Dani Wise developed a sophisticated program to study objects called cube complexes, and in particular to promote immersions to embeddings in a finite cover. Ian Agol completed Wise's program and as a result essentially all problems on Thurston's list are now solved.

In this talk I will introduce cube complexes and how they are associated to surfaces in 3-manifolds, leading up to the main theorem on cube complexes and how it implies the "virtual Haken conjecture". (Received September 20, 2012)