

# Thesis Presentation

**First Speaker:**

**Justin McGrath**  
**Memorial University**

**Tuesday, April 22, 2014**

## *Effective Coherence in Random Groups*

**Abstract:**

We discuss random groups in terms of Gromov's density model and the Arzhantseva-Ol'Shanksii model. Effective coherence is the property that given a finite collection of elements of a finitely presented group  $G$ , there is an algorithm that finds an explicit finite presentation of the subgroup generated by the collection. It is of interest to determine whether random groups in the sense of Gromov or Arzhantseva-Ol'Shanksii model have this property. The talk will report on findings of this investigation.

**Second Speaker:**

**Adam Gardner**  
**Memorial University**

## *A Combinatorial Riemannian Penrose Inequality*

**Abstract:**

General relativity describes gravitation as curvature in spacetime. This curvature is created by both the matter present and by the inherent curvature of the spacetime. The Riemannian Penrose inequality places a lower bound on the total mass of the space based on the total area of all event horizons in the space. Using a combinatorial version of the Gauss-Bonnet Theorem, we prove an analogue of the Riemannian Penrose Inequality for metric simplicial 2-complexes which are asymptotically flat.