

Mathematics Colloquium

$SL(2, \mathbb{Z})$, the Farey Graph, and the Torus Complex

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Friday, November 6, 2009
4:10 p.m. – 5 p.m.
Building 53 Room 202

Abstract

Given a group, one can always construct a topological space (e.g., the Cayley graph) on which the group acts nicely. By understanding properties of the space, one can then translate those into properties of the group. We will consider the group $SL(2, \mathbb{Z})$ of integer 2×2 matrices with determinant one. I will explain how $SL(2, \mathbb{Z})$ acts on the Farey graph and its dual. Using this fact, we will find a group presentation (generators and relations) of $SL(2, \mathbb{Z})$. This is a classical application of Bass-Serre Theory. In my research, I generalize this example to build the n -dimensional Torus complex over a ring R , a space on which $SL(n, R)$ acts simplicially. In particular, this gives a palindromic presentation of $SL(3, \mathbb{Z})$.

About the speaker: Brie Finegold is a Ph. D. candidate at UCSB, working under the supervision of Daryl Cooper. Her research is in the areas of geometric group theory and low-dimensional topology.

Refreshments before the talk, 3:30 - 4 p.m.,
in the Math Department Conference Room, 25-208B.