# David Biddle (Binghamton)

# On the Size and Connectivity of Graphs of Generating Sets of Finitely Generated Groups

## Abstract for the Combinatorics and Algebra Seminars 2011 October 25

Let G be a finitely generated group with minimal generating set of size d. For each $t \geq d$ let $\Gamma_t = \Gamma_t(G)$ be the graph with vertex set V consisting of all generating t-tuples of elements of G and with edges [1] if for some distinct i and j, $g'_i$ is $g_i$ multiplied on left or right by $g_j^{\pm 1}$, and all other $g'_k$ are the same as the corresponding $g_k$.

Following work by Graham and Diaconis I examine connectivity properties of these graphs when G is abelian and when G is a small symmetric group. (For instance, $|V(\Gamma_3(\Sigma_4))| = 10{,}080!!$). Pictures will be provided free of charge.

I will relate the size and connectivity properties of these graphs to classic counting problems of Phillip Hall.

---

[1] $g_1, \ldots, g_t), (g'_1, \ldots, g'_t$