

Date: January 28th, 2009

Speaker: Matthew Macauley, Clemson University

Title: *Graph dynamical systems and Coxeter groups*

Abstract: A graph dynamical system consists of

- (i) a graph where each vertex has a state,
- (ii) a sequence of vertex functions, and
- (iii) an update scheme which specifies how to compose the functions to yield the dynamical system map that governs the discrete time evolution.

This is a natural framework for mathematically representing interaction-based or complex systems. In contrast, a Coxeter group is a group generated by involutions, or reflections. In this talk, I will show how both of these fields share similar underlying mathematical themes involving graph theory, algebra, and geometric combinatorics. By studying the mathematics involved, we are able to extend results in both fields, as well as further unify the two. Along the way, I will outline numerous open problems and ripe research projects. Additionally, I will illustrate a connection to yet others areas of mathematics, including the representation theory of quivers, and node firing games.