2009 Summer REU
Groups, Graphs, and Geometry

Visiting Faculty Talk #5

Date and time: Wednesday, July 22nd, 3:00 p.m.

Speaker: Prof. Karl Petersen, University of North Carolina, Chapel Hill, Department of Mathematics

Title: *From finite graphs to dynamical systems on infinite graphs and resulting questions in combinatorics, probability, and number theory*

Abstract: Start with a finite directed graph. Consider the set of infinite walks that follow the edges of this graph. At least two interesting transformations are defined on the space of paths followed by a walker, which are represented on an infinite, directed, graded graph: the shift and the adic or successor map. Keeping track of the number of times each edge has been traversed produces a new graph and a new dynamical system. Adding edges according to a fixed reinforcement scheme generates yet another system. Investigating the properties of these systems leads to open problems in combinatorics and number theory, such as divisibility by primes of binomial coefficients and Eulerian numbers.