CCSU

DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, March 30

10:30 – 11:20 AM

Maria Sanford, Room 101

AN INTRODUCTION TO COXETER GROUPS

DONGWEN QI

GEORGIA SOUTHWESTERN STATE UNIVERSITY

Abstract: Coxeter groups arise in many parts of mathematics as groups generated by reflections. The symmetric groups on n letters form an important class of Coxeter groups.

A Coxeter group is typically defined in terms of generators and relations, which can also be characterized by some combinatorial conditions: the deletion property, and the exchange property. In this talk, we will show some application of these combinatorial characterizations.

The irreducibility of a Coxeter group is determined by its presentation (generators and relations), which also distinguishes when a Coxeter group is an infinite group and when it is affine or non-affine.

In the second part of the talk, we will discuss the group theoretic differences between irreducible, infinite, affine Coxeter groups and irreducible, infinite, non-affine Coxeter groups. It is shown that the center of any finite-index subgroup of an irreducible, infinite, non-affine Coxeter group is trivial and any finite-index subgroup cannot be expressed as a direct product of two subgroups. A unique decomposition theorem is established for any finite-index group of a class of Coxeter groups. It is also shown that the orbit of any element other than the identity under the conjugation action in a irreducible, infinite, non-affine, Coxeter group is an infinite set. An irreducible, infinite, affine Coxeter group does not possess any of the above properties. Our discussion also leads to the conclusion: An irreducible, infinite Coxeter group is affine if and only if it contains an abelian group of finite index.

For further information:

gotchevi@ccsu.edu 860-832-2839

http://www.math.ccsu.edu/gotchev/colloquium/