

CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Monday, May 6

5:00 – 5:50 PM

Room EDB 209

AN INTRODUCTION TO SYMMETRIC FUNCTIONS – A GEM IN ALGEBRAIC COMBINATORICS

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Abstract: Algebraic combinatorics is a subject that interprets algebraic objects combinatorially, thereby obtaining deep connections between the two areas. The study of polynomial rings is one of the important topics in algebraic combinatorics, as the associated combinatorial tools provide profound connections with partitions of integers and the representation theory of the symmetric group, the general linear group, Hecke algebras, and other important algebras. It also gives fruitful information on objects in algebraic geometry such as the multiplicative structure of the cohomology ring of the Grassmannian.

In this talk, I will introduce the ring of symmetric functions and discuss some important basis, with a more detailed discussion on Schur functions and semi-standard Young tableaux. I will then discuss some important theorems and open problems in Algebraic Combinatorics and end with a brief history of k -Schur functions and an exciting new family of symmetric functions called Catalan functions which provides a new insight on the existing theorems and conjectures inspired by Macdonald positivity conjecture.

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