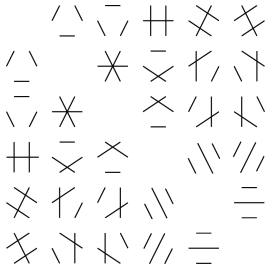
Mathematics Seminar



Rocky Mountain Algebraic Combinatorics Seminar

Algebraic and Combinatorial Macdonald Polynomials

Nick Loehr
Virginia Polytechnic Institute and State University

Macdonald polynomials, which are symmetric polynomials involving two extra parameters, have played a central role in algebraic combinatorics ever since their introduction by Ian Macdonald in 1988. By specializing the parameters in various ways, one obtains many classical and modern bases for the vector space of symmetric functions. Unfortunately, the original algebraic definition of Macdonald polynomials are complicated, non-explicit, and difficult to work with. This talk contrasts the algebraic definition with Jim Haglund's revolutionary combinatorial formula for Macdonald polynomials involving explicit objects and permutation statistics parametrized by integer partitions. I will outline the proof (due to Haglund, Haiman, and myself) that the combinatorial formula agrees with the algebraic definition, as well as describing some ramifications of Haglund's formula. The talk assumes no specific prior knowledge of Macdonald polynomials or symmetric functions.

Extremal Problems on Cycles and Theta Graphs

Jason Williford
University of Wyoming

Let n be a positive integer and G a graph. We define $ex(n, G)$ to be the largest number of edges possible in a graph on n vertices that does not contain G as a subgraph.

The problem of determining $ex(n, G)$ for general n and G officially began with Turán's theorem that solves $ex(n, K_m)$ for all n and m, a result that is striking in its precision. The celebrated Erdős-Stone-Simonovits theorem generalizes this asymptotically to all G with chromatic number at least 3. However, the magnitude of $ex(n, G)$ is unknown for most bipartite G.

In this talk we will discuss some of the recent progress on $ex(n, G)$ when G is a cycle or a theta graph (a collection of edge disjoint paths between two vertices). This will involve constructions of graphs defined on vector spaces over finite fields.

Weber 223
4–6 pm
Friday, April 29, 2016
(Refreshments in Weber 117, 3:30–4 pm)
Colorado State University

This is a joint Denver U / UC Boulder / UC Denver / U of Wyoming / CSU seminar that meets biweekly.
Anyone interested is welcome to join us at a local restaurant for dinner after the talks.

Colorado State University

Department of Mathematics
Fort Collins, Colorado 80523