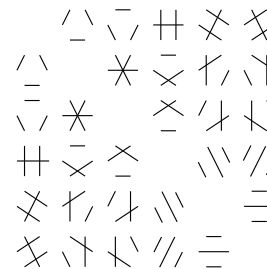


Mathematics Seminar



Rocky Mountain Algebraic Combinatorics Seminar

Polytopes count (introductory talk)

Aram Bingham
Colorado School of Mines

We'll see how many problems in combinatorics can be converted to the problem of counting integral points inside appropriate polytopes. Not only is this conversion a practical advantage in settings where nice, closed formulas for combinatorial quantities aren't available, but phrasing computations as integral point-counting problems is often key to establishing complexity theoretic results. We'll take up the particular example of Littlewood-Richardson coefficients, which have motivated many of the conjectures on their cousins the Kronecker coefficients.

Kronecker coefficients, polytopes, and complexity

Aram Bingham
Colorado School of Mines

The "Kronecker coefficients problem" is one of the last major open questions in the classical representation theory of symmetric groups. It asks for a combinatorial rule describing the decomposition of tensor products of irreducible symmetric group representations, and a solution is known only in limited special cases. Kronecker coefficients have also been the subject of much recent research motivated by the geometric complexity theory (GCT) program, which hypothesized efficient computation of these numbers as part of a strategy to separate the computational complexity classes P and NP. We will discuss the specific conjectures coming from GCT and report some progress on computing these coefficients via discrete volumes of polytopes (joint work with Ernesto Vallejo).

Weber 223
4–6 pm, Friday, Oct 28, 2022
(Refreshments 3:30–4 pm)
Colorado State University
4 pm, Friday, Oct 28, 2022

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



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