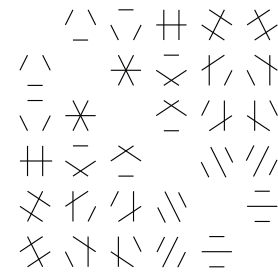# Mathematics Seminar

Rocky Mountain Algebraic Combinatorics Seminar

Dynamical Algebraic Combinatorics of Catalan Objects

Joseph Pappe

Colorado State University

Dynamical Algebraic Combinatorics is a growing field that studies how discrete objects evolve over time under certain maps or actions. In this talk, I will present two concepts, homomesies and the cyclic sieving phenomenon, and demonstrate their relevance in the study of Catalan combinatorics.

Promotion and Growth Diagrams for Fans of Dyck Paths and Vacillating Tableaux

Joseph Pappe

Colorado State University

Using chord diagrams, we construct a diagrammatic basis for the space of invariant tensors of certain Type B representations. This basis carries the property that rotation of the chord diagrams intertwines with the natural action of the longest cycle of the symmetric group on the tensor powers. Our approach involves a generalization of Schützenberger's promotion operator on crystal graphs and Fomin's growth diagrams. Additionally, we show that fans of Dyck paths and vacillating tableaux satisfy a cyclic sieving phenomenon. This is joint work with Stephan Pfannerer, Anne Schilling, and Mary Claire Simone.

Weber 223
4–6 pm, Friday, September 22, 2023
(Refreshments 3:30–4 pm)
Colorado State University
4 pm, Friday, September 22, 2023

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.

Colorado State University

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