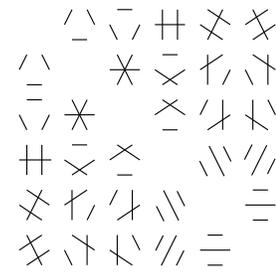# Mathematics Seminar

Rocky Mountain Algebra&Combinatorics Seminar

Relational complexity: permutation groups and relational structures

Saul Freedman

CSU

The relational complexity of a permutation group G on a set Ω is a statistic measuring the minimal "complexity" of certain combinatorial/model-theoretic objects (homogeneous relational structures defined on Ω) with automorphism group G. Equivalently, the relational complexity of G is a measure of the way in which the orbits of G on k-tuples of points of Ω, for various k, determine the original action of G on Ω.

This talk, which will explore relational complexity from both of the above perspectives, will feature new results, joint with Veronica Kelsey and Colva Roney-Dougal, on the relational complexity of almost simple linear groups, and on the minimal number of relations of a homogeneous relational structure with a given automorphism group.

Using Algebras to Analyze Hypergraph Structure

Amaury Minino

CSU

We propose a new method using the derivation algebra of the adjacency tensor. Current methods utilize the spectral theory of adjacency tensors to study hypergraphs. Our methods give insight into the internal structures of a hypergraphs which is often not discernable using combinatorial methods. They also lead to theorems on uniqueness of the decompositions found.

Weber 223
4–6 pm, Friday, November 7, 2025
(Refreshments 3:30–4 pm)
Colorado State University
4 pm, Friday, November 7, 2025