



Pacific Institute for the  
Mathematical Sciences



## KAREN MEAGHER

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**Title:** An Introduction to Algebraic Methods for the Erdős–Ko–Rado Theorem

**Abstract:**

The first half of this talk will be a gentle introduction to the Erdős–Ko–Rado theorem (EKR) Theorem. This is a theorem that determines the size and structure of the largest collection of intersecting sets. It has become a cornerstone of extremal set theory and has been extended to many other objects. I will show how this result can be proven using techniques from algebraic graph theory.

In the second half of this talk, I will give more details about extensions of the EKR theorem to permutations. Two permutations are intersecting if they both map some natural number to the same point. In 1977, Deza and Frankl proved that the size of a set of intersecting permutations is at most  $(n-1)!$ . It wasn't until 2003 that the structure of sets of intersecting permutations that meet this bound was determined. Since then, this area has developed greatly and I will give details about the recent results in this area. Again, my focus will be on algebraic techniques, and I will show how the characters of the group can be used to prove the result.

**Bio:**

Karen Meagher obtained her PhD from the University of Ottawa, and completed a post-doctoral fellowship with Chris Godsil at the University of Waterloo. She has been working at the University of Regina since 2007, where she is a Professor.

Karen is an expert in algebraic graph theory with a focus on design theory and extremal set theory. She has written a book about Erdos-Ko-Rado theorems, in collaboration with Chris Godsil, published by Cambridge University Press.

In addition to her mathematical endeavours, Karen has served as acting Associate Dean of Graduate Studies at the University of Regina.

Friday—March 13, 2020

12:00 to 12:50 pm

UHall C640

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