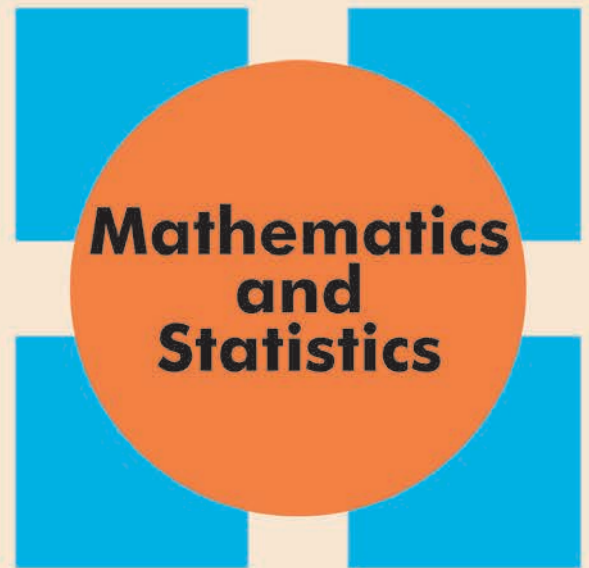


Math Graduate Seminar

Ferdinand Ihringer
University of Regina

Erdős-Ko-Rado Sets in Finite Geometries



Date: October 24, 2016

Time: 12:30 - 1:30 PM

Room: Math Lounge 307.20

Abstract: Let $N = \{1, \dots, n\}$. An *Erdős-Ko-Rado sets* (EKR set) of N is a family Y of d -sets of N which pairwise intersect non-trivially. A famous result by Erdős, Ko and Rado shows

$$|Y| \leq \binom{n-1}{d-1}$$

for $n \geq 2k$.

There are many natural generalizations of EKR sets to other structures such as permutation groups or combinatorial designs. This talk will put its focus on EKR sets in vector spaces and polar spaces. Let V be an n -dimensional vector space over a finite field of order q . A *polar space* of rank d over V is defined by a non-degenerate, reflexive sesquilinear form (or some quadratic form) and consists of all subspaces which vanish on this form. The largest of these subspaces are called *generators* and have dimension d . An EKR of a polar space is a set of pairwise non-trivially intersecting generators. Here the largest size of EKR sets in some Hermitian polar spaces is still open.

The talk will start with discussing original EKR sets and its various proofs, which are already accessible to high school students, and will end with current research in vector spaces and finite classical polar spaces.