HONOURS SEMINARS

Date: Friday, March 21
Time: 2:30 – 3:30
Location: CW 307.20 (Math Lounge)

Adam Dyck

An Erdős-Ko-Rado theorem for Subpartitions

Supervised by Karen Meagher

Abstract:
A $k\ell$-subset partition, or (k,ℓ)-*subpartition*, is a $k\ell$-subset of an n-set that is partitioned into ℓ distinct classes, each of size k. From here, we can consider an Erdős-Ko-Rado (EKR)-like theorem for intersecting families of (k,ℓ)-subpartitions. In this talk, I will show that for $n \geq k\ell$, $\ell \geq 2$, and $k \geq 3$, the largest 1-intersecting family contains at most $\frac{1}{(\ell-1)!}\binom{n-k}{k}\binom{n-2k}{k}\cdots\binom{n-(\ell-1)k}{k}$ (k,ℓ)-subpartitions, and that this bound is only attained by the family of all (k,ℓ)-subpartitions with a common fixed class, known as the *canonical 1-intersecting family*. We can also consider t-*intersecting* families, where each (k,ℓ)-subpartition must have at least t classes in common, and for n sufficiently large relative to k, ℓ, and t, the largest such family is the *canonical* t-*intersecting family*. I will then discuss the method behind the proof, its application to other EKR-like objects, and both the advantages and drawbacks of relying on this method to prove these results

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