Movement and symmetry in graphs - Part II
(Org: **Karen Gunderson** (University of Manitoba), **Karen Meagher** (University of Regina) and/et **Joy Morris** (University of Lethbridge))

EDWARD DOBSON, University of Primorska
Recognizing vertex-transitive digraphs which are wreath products and double coset digraphs

We show that a Cayley digraph of a group G with connection set S is isomorphic to a nontrivial wreath product of digraphs if and only if there is a proper nontrivial subgroup $H \leq G$ such that $S \setminus H$ is a union of double cosets of H in G. We then give applications of this result which include showing the problem of determining automorphism groups of vertex-transitive digraphs is equivalent to the problem of determining automorphism groups of Cayley digraphs.

MAHSA NASROLLAHI, University of Regina
On a generalization of the Erdos-Ko-Rado theorem to intersecting and set-wise intersecting perfect matchings

A perfect matching ($\mathcal{PM}$) in the complete graph K_{2k} is a set of edges in which every vertex is covered exactly once. Two $\mathcal{PM}$s are t-intersecting if they have at least t edges in common. Two $\mathcal{PM}$s P and Q of a graph on $2k$ vertices are said to be set-wise t-intersecting if there exist edges $P_1, \ldots, P_t$ in P and $Q_1, \ldots, Q_t$ in Q whose unions of edges have the same set of vertices. In this talk we show an extension of the famous Erdős-Ko-Rado theorem to intersecting and set-wise intersecting $\mathcal{PM}$ for $t = 2$ and $t = 3$.

VENKATA RAGHU TEJ PANTANGI, Southern University of Science and Technology
Intersecting sets in Permutation groups.

An intersecting set in a transitive permutation group $G \leq Sym(\Omega)$ is a subset $\mathcal{F} \subset G$ such that given $g, h \in \mathcal{F}$, there exists $\omega \in \Omega$ with $\omega^g = \omega^h$. Cosets of point stabilizers are natural examples of intersecting sets. In view of the classical Erdos-Ko-Rado theorem, it is of interest to find the size of the largest intersecting set. A group is said to satisfy the EKR property if $|\mathcal{F}| \leq |G_\omega|$, for every intersecting set $\mathcal{F}$. It is known that 2-transitive groups satisfy the EKR property. We will show that general permutation groups are "quite far" from satisfying the EKR property.

JASON SEMERARO, University of Leicester
Higher tournaments, hypergraphs, automorphisms and extremal results

In 2017, Karen Gunderson and I use switching classes of tournaments to provide constructions of r-hypergraphs with the maximum number of hyperedges, subject to the condition that every set of $r + 1$ vertices spans at most 2 hyperedges. Here we assume $r \geq 3$. A d-tournament is a set together with an inductively defined orientation on each of its d-sets. Generalising results of Babai–Cameron, we show that 3-tournaments admit a switching operation and use our results to obtain some new lower bounds for extremal numbers.

GABRIEL VERRET, University of Auckland
Regular Cayley maps and skew morphisms of monolithic groups

Skew morphisms, which generalise automorphisms for groups, provide a fundamental tool for the study of regular Cayley maps and, more generally, for finite groups with a complementary factorisation $G = BY$, where Y is cyclic and core-free in G. We will explain the connection between these topics and discuss some recent results on the case when B is a monolithic group.