Movement and symmetry in graphs - Part I

(Org: **Karen Gunderson** (University of Manitoba), **Karen Meagher** (University of Regina) and/et **Joy Morris** (University of Lethbridge))

KAREN GUNDERSON, University of Manitoba

Bootstrap percolation on infinite graphs

In r-neighbour bootstrap percolation, vertices of a graph are either 'healthy' or 'infected' and infection spreads to a healthy vertex with at least r infected neighbours. Percolation is said to occur if all vertices are eventually infected. When vertices are infected initially at random, the main question is the value of the critical probability – where percolation becomes more likely than not. I will present results on how the variance of vertex degrees affects the value of the critical probability in Galton–Watson trees and discuss some open problems on the critical probabilities for infinite regular graphs including Cayley graphs.

JEANNETTE JANSSEN, Dalhousie University

An approximation algorithm for finding the zero-forcing number of a graph

Consider the following graph process: Given a graph with vertices coloured black or white. At each step, if a black vertex has exactly one white neighbour, then this neighbour turns black. If the process turns all vertices black, then the initial set of black vertices is a zero-forcing set. The minimum size of a zero-forcing set in a graph G is called the zero-forcing number $z(G)$. We give an approximation algorithm that finds a zero-forcing set of size at most $(pw + 1)z(G)$, where pw is the path-width of G. This is joint work with Ben Cameron, Rogers Mathew, and Zhiyuan Zhang.

KAREN MEAGHER, University of Regina

Open problems related to Erdős-Ko-Rado type results

I have been working on Erdős-Ko-Rado type results using methods from Algebraic Graph Theory for many years. In this talk I will describe several problems and conjectures related to this work where my standard methods fail and I need new tools! These are all problems I am hoping to make progress on with the collaborative research group Movement and Symmetry in Graphs.

JOY MORRIS, University of Lethbridge

Regular Representations

A regular representation is a combinatorial object whose automorphism group is acting regularly (generally on the points). A regular action is one that is sharply transitive: i.e., there is precisely one automorphism taking any point to any other. I will give an overview of some of the results on regular representations (graphical, digraphical, tournament, etc.), including asymptotic results and results about when they can be easily detected.