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**KAREN MEAGHER**, University of Regina  
*Derangement graphs for 2-transitive groups*

The *derangement graph* of a permutation group  $G$  is a Cayley graph on  $G$  and the connection set is the set of all derangements in  $G$  (these are the elements with no fixed points). The eigenvalues of the derangement graph can be calculated using the irreducible characters of the group. The well-known *ratio bound* (also known as the Delsarte-Hoffman ratio bound) uses the eigenvalues of the graph to bound the size of the maximum coclique (or independent set) in the derangement graph. In this talk, I will show how a variant of this bound can be used to prove that the size of the largest coclique in the derangement graph for any 2-transitive group is the size of the stabilizer of a point. This is related to the Erdős-Ko-Rado Theorem for groups.