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Discrete Mathematics Seminar

Time: Friday, March 29, 2019, 2:15 - 3:15 PM
Location: 330 Derrick Hall
Title: Automorphisms of some finite p-groups
Speaker: Dr. Jeffrey Riedl, Department of Theoretical and Applied Mathematics,
           University of Akron

Abstract:

Group theory is the branch of mathematics that provides a framework for describing the structural symmetry of objects in mathematics and in the natural world. If G is a group, then the set of all automorphisms of G forms a group denoted $\mathrm{Aut}(G)$ which encodes all the information about the internal symmetry of G itself. Obtaining a full description of $\mathrm{Aut}(G)$ is a difficult problem in general but one that is of interest to mathematicians. Suppose G is a finite group that is a subgroup of a larger group W whose automorphism group $\mathrm{Aut}(W)$ is known. Let $N(G)$ and $C(G)$ denote the pair of subgroups of $\mathrm{Aut}(W)$ consisting of respectively those automorphisms of W that fix G setwise and those that fix G elementwise. The quotient group $N(G)/C(G)$ is naturally isomorphic to a subgroup of $\mathrm{Aut}(G)$. If we can compute $N(G)$ and $C(G)$ we may capture new information about $\mathrm{Aut}(G)$. For some finite p-groups G and some carefully-chosen groups W, the quotient represents most or all of $\mathrm{Aut}(G)$. We present results and discuss techniques related to this approach to the problem of describing $\mathrm{Aut}(G)$.