Discrete Mathematics Seminar

Time: Friday, December 1, 2017, 2:15-3:15 PM
Room: 237 Derrick Hall
Title: On properties of subgroups and solubility of finite groups
Speaker: Dr. Jinbao Li, Visiting Scholar, Department of Mathematics, Texas State University

Abstract:

It has been a long history to study the influence of s-permutability (or s-quasinormality) of subgroups on the structure of finite groups. A subgroup $H$ of a group $G$ is said to be s-permutable in $G$ if $HP=PH$ is a subgroup of $G$ for every Sylow subgroup $P$ of $G$. In recent years, this concept has been generalized by many authors, and a number of new permutability of subgroups together with new embedded properties of subgroups have been introduced and studied. For example, $H$ is said to be s-semipermutable in $G$ if for every Sylow $p$-subgroup $P$ of $G$ with order coprime to $|H|$, we have $PH=HP$. Recently, Isaacs investigated further the properties of s-semipermutable subgroups and obtained many interesting results. On the other hand, $H$ is said to be complemented in $G$ if $G=HK$ and the intersection of $H$ and $K$ is trivial. P. Hall’s famous result shows that a group $G$ is soluble if and only if all Sylow subgroups of $G$ are complemented in $G$.

In this talk, we give a generalization of subgroup properties mentioned above and present a new characterization of solubility of finite groups. Our result includes many well-known results in this area as special cases. This is a joint work with Dr. Yang.