Boğaziçi
MATH COLLOQUIUM

The Influence of Irreducible Character Degrees on Group Structures via Associated Graphs

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Abstract: Given a finite group G, it is an area of research to convey nontrivial information about the structure of G through some sets of invariants associated to G such as the set of conjugacy class sizes or the set of degrees of the irreducible complex characters of G and would be interesting to distinguish the group structure of G influenced by these sets. There is a large literature which is devoted to study the ways in which one can associate a graph with a group, for the purpose of investigating the algebraic structure using properties of the associated graph. In this talk we consider the set of the irreducible complex characters of G, namely $Irr(G)$, and the related degree set $cd(G) = \{\chi(1) : \chi \in Irr(G)\}$. Let $\rho(G)$ be the set of all primes which divide some character degrees of G. We consider the notion of bipartite divisor graph, denoted by $B(G)$, with vertex set $\rho(G) \cup cd(G) \setminus \{1\}$ and we determine which finite simple graphs can occur as bipartite divisor graphs of finite groups. This question has attracted many researchers over the years.

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