GROUPS MEET GRAPHS: ON PRIME GRAPHS OF FINITE GROUPS

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ABSTRACT. Let $\pi(G)$ denote the set of prime divisors of the order $|G|$ a finite group G. The well-known *prime graph* of G, denoted by $\Gamma(G)$, is the graph with vertex set $\pi(G)$ with edges $\{p, q\} \in E(\Gamma(G))$ if and only if there exists an element of order pq in G. In this talk we present joint work with Alexander Gruber, Mark L. Lewis, Keeley Naughton, and Benjamin Strasser. We discuss a purely graph theoretical characterization of prime graphs of solvable groups which says that a graph is isomorphic to the prime graph of a solvable group if and only if its complement is 3-colorable and triangle free. We also introduce and discuss the notion of a minimal prime graph.