Discrete Mathematics Seminar

Time: Friday, 10 February 2017, 2:15 – 3:15 PM
Location: 237 Derrick Hall
Title: On $p$-parts of character degrees of finite groups
Speaker: Dr. Yong Yang, Department of Mathematics, Texas State University

Abstract:

Let $G$ be a finite group and $P$ be a Sylow $p$-subgroup of $G$, it is reasonable to expect that the degrees of irreducible characters of $G$ somehow restrict the structure of $P$. The Ito-Michler Theorem proves that each ordinary irreducible character degree is coprime to $p$ if and only if $G$ has a normal abelian Sylow $p$-subgroup. Of course, this implies that $|G : F(G)|_p = 1$ where $F(G)$ is the Fitting subgroup of $G$.

Let $G$ be a finite group and $Irr(G)$ the set of irreducible complex characters of $G$. Let $\epsilon_p(G)$ be the largest integer such that $p^{\epsilon_p(G)}$ divides $\chi(1)$ for some $\chi \in Irr(G)$. In this talk, we show that $|G : F(G)|_p \leq p^{K\epsilon_p(G)}$ for a universal constant $K$. This settles a conjecture of A. Moreto.