

Speaker: Rishi Nath. CUNY

Title: Combinatorics arising from the Navarro-Willems conjecture.

Abstract: Let p and q be distinct primes, G a finite group, and consider a p -block B_p and a q -block B_q (of G). In 1997, G. Navarro and W. Willems conjectured the following: If $\text{Irr}(B_p) = \text{Irr}(B_q)$ then B_p consists of a single character. However C. Bessenrodt showed that the 6-fold covering group of A_7 provides a counterexample when $p = 5$ and $q = 7$. This has not diminished the interest in the conjecture, which is true in a number of important cases.

In 2007, J. Olsson and D. Stanton proved that the conjecture holds for the symmetric groups. Their approach involves studying simultaneous p and q core partitions (related to the work of J. Anderson). Subsequent research in this area has taken on many directions; B. Ford, L. Sze et al are studying the conjecture for the alternating groups, others have begun investigation properties of simultaneous cores and bar-cores, and recently M. Fayers found a connection with an action of the affine symmetric group. In this talk we survey this area, generalize some results, and discuss new directions and open questions.