

DEPARTMENT OF MATHEMATICS AND STATISTICS  
AND  
CENTER FOR COMPUTATIONAL SCIENCES  
MISSISSIPPI STATE UNIVERSITY

## COLLOQUIUM

### **Fourier Analysis of Finite Groups and Its Applications to Combinatorics**

KEN W. SMITH

Central Michigan University

**Monday, February 26, 2007 at 4:00 pm**

**Allen 14**

**Abstract:** Construction of combinatorial objects with high symmetry is important in many modern areas of technology (wireless communications, cryptography, radar, for example.) In some situations, the combinatorial object may be viewed as a subset of a group or an element of an integral group ring. In those environments, the representations of the group play an important role. In this talk I will introduce difference sets (symmetric designs with a regular automorphism group) and demonstrate the applications of character theory to the construction of these sets. If time permits, I will show how a similar mathematical approach has led to the recent proof of the Barker array conjecture. I will end the talk by describing a series of open problems – my “fantasy” lists of problems I would like to help solve.

Dr. Smith is a candidate for our Department Head position.  
There will be a reception for him at 3:30 in Allen 467.

Contact Len Miller, miller@math.msstate.edu or (662) 325 7138.