

## Discrete Mathematics Seminar

Time: Friday, 9 April 2010, 12:30–1:30 PM  
Location: 238 Derrick Hall  
Title: Generalized Stirling Numbers & Rook Theory  
Speaker: Dr. Brian Miceli, Mathematics Department, Trinity University

Abstract:

Stirling numbers of the second kind, or Stirling set numbers, satisfy the recursion

$$S(n + 1, k) = S(n, k - 1) + kS(n, k),$$

where  $S(0, 0) = 1$  and  $S(n, k) = 0$  whenever  $n < k \leq 0$ . Similarly, one may define Stirling numbers of the first kind by the recursion

$$s(n + 1, k) = s(n, k - 1) - ns(n, k),$$

where  $s(0, 0) = 1$  and  $s(n, k) = 0$  whenever  $n < k \leq 0$ . Both of these numbers appear in a great deal of combinatorial literature, where they count various objects and can be shown to be inverses of each other. In this talk, we give both types of Stirling numbers rook theoretic interpretations (that is, we will think of them as counting certain placements of objects on a board), and we will use these interpretations to prove some of these interesting formulas. We will then talk about generalizations of both types of Stirling numbers, including  $q$ -analogues, and show that these generalized numbers give us similar formulas while still being inverses of one another.

Bio:

I grew up 45 minutes south of San Francisco and in 1996 went to school as a civil engineering major at Cal Poly, San Luis Obispo. I switch to math somewhere around 1999, and in 2001 began math graduate study at UC, San Diego. I received my M.S. from UCSD in 2003 and my Ph.D. from UCSD in 2006 and then I said goodbye to California and moved to Texas to begin teaching at Trinity, where I am now finishing my 4th year.

On a more personal note, I like cooking, dogs, playing racquetball, and teaching Calc II, although I hate to teach Calc III, and while I am sad that March Madness is over, I am very excited about the upcoming World Cup.