



The Math Colloquium  
Department of Mathematics  
San José State University



**Monica Vazirani**  
UC Davis

*Cores, Shi arrangements, and Catalan numbers*

APRIL 6, 2011, MH320

**Abstract:** The Catalan numbers 1, 2, 5, 14, 42, ... are known to count many mathematical objects. (See Richard Stanley's "Enumerative Combinatorics" or <http://math.mit.edu/~rstan/ec/catadd.pdf> for a list of over 150 different combinatorial interpretations.) Some of the more well-known include triangulations of an  $n + 2$ -gon or ways of closing up  $n$  pairs of parentheses. The objects we'll consider are the pieces of space cut out by some hyperplanes called the Shi Arrangement, since the reflections over those hyperplanes provide extra tools and structure. That extra structure is shared by certain diagrams called cores (think: Tetris pieces). In joint work with Susanna Fishel, we give a bijection between special Shi regions and cores.

*Background:* Students should have a basic knowledge of linear algebra. A course in abstract algebra or some familiarity with permutations is recommended as well.

**About the speaker:** Monica Vazirani received her Ph.D. from UC Berkeley and is a Professor of Mathematics at UC Davis. Her research is in combinatorial representation theory.

SNACKS IN MH331B AT 2:30 PM

TALK STARTS AT 3 PM

For more information, see our full schedule at:

<http://www.math.sjsu.edu/~hsu/colloq/>