R|T|G
Logic and Dynamics

UNDERGRADUATE **M**ATHEMATICS **R**ESEARCH **C**OLLOQUIUM SERIES

Tuesday, Dec. 4, 2012

4:00-5:00 PM

General Academic Building, Room 104

A pre-lecture reception with cookies, coffee and tea will be held at 3:30 PM in the General Academic Building, Room 472.

The *RTG in Logic & Dynamics* is a research training group supported by the National Science Foundation and the University of North Texas.

Department of Mathematics
University of North Texas
1155 Union Circle #311430
Denton, TX 76203
(940) 565-2155

rtg@unt.edu
www.math.unt.edu/rtg

For UNT campus parking information visit:
http://www.unt.edu/transit/

UNT®
UNIVERSITY OF NORTH TEXAS™

CRISTINA BALLANTINE
COLLEGE OF THE HOLY CROSS

THE VANDERMONDE DETERMINANT PLAYS TETRIS

Vandermonde determinants are ubiquitous in mathematics. Since every even power of the Vandermonde determinant is a symmetric polynomial, we would like to understand its decomposition in terms of the basis of Schur functions. Besides its importance in mathematics, the decomposition would help us understand the quantum Hall effect. While we will not explore the problem from the point of view of physics, we will investigate several combinatorial properties of the coefficients in the decomposition. In particular, I will give an inductive approach to computing some of the coefficients by building them up from Tetris type shapes. I will introduce all relevant material necessary to understand the talk.

Cristina Ballantine was born in Transylvania and grew up in Bucharest, Romania. She received her undergraduate degree from the University of Stuttgart, her Ph.D. from the University of Toronto and has spent sabbaticals in Portugal and Münster, Germany. She taught at the University of Wyoming, Bowdoin College and Dartmouth College before joining the College of the Holy Cross in 2002. Prof. Ballantine lives in central Massachusetts with her husband, Dan, and their daughters, Hanna and Emma. She enjoys reading novels and mathematical blogs, watching movies, gardening, biking and hiking.