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MATH DEPARTMENT COLLOQUIUM

Dr. Catherine Yan
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Texas A&M University
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3:30 – 4:30 PM
DERR 329

Enumeration with Moon Polyominoes and Beyond

A polyomino is a shape made by connecting certain numbers of equal-sized squares, each jointed together with at least one other square along an edge. A combinatorial model, the model of fillings of polyominoes, is obtained by assigning a non-negative integer to each square of the polyomino. This model emerged from the study of maximal monotone chains in various combinatorial structures, including permutations, words, matchings, set partitions, integer sequences, graphs, and multi-graphs. It provides a unified frame in enumerative combinatorics and allows us to apply different algebraic tools and combinatorial transformations. In this talk I will show how to use this model to analyze some basic combinatorial statistics.

Catherine Yan is a Professor in the Department of Mathematics at Texas A&M University. Her mathematical interest includes Algebraic and Enumerative Combinatorics, Probabilistic Methods, and Discrete Structures. She received a Bachelor degree at Peking University, China, and a Ph.D in Mathematics at Massachusetts Institute of Technology under the supervision of Gian-Carlo Rota. Before moving to Texas, Dr. Yan had been a Courant Instructor at New York University. She also held joint positions at various places, including the Institute for Advanced Study at Princeton, AT&T Labs, Nankai University, Dalian University of Technology, and the Graduate School of Academic Sinica, China. She was a Sloan Research Fellow and a silver medalist at the International Mathematics Olympiad. She serves on the editorial board for five research journals. Since 2014 she has been a co-Editor-in-Chief for Advances in Applied Mathematics.