University of North Texas
Mathematics Undergraduate Colloquium

Tuesday,
April 8, 2014
5:00-6:00 p.m.

General Academic Building, Room 104

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

The colloquium is sponsored by UNT Deapartment of Mathematics and the RTG in Logic & Dynamics, a research training group supported by the National Science Foundation and the University of North Texas.

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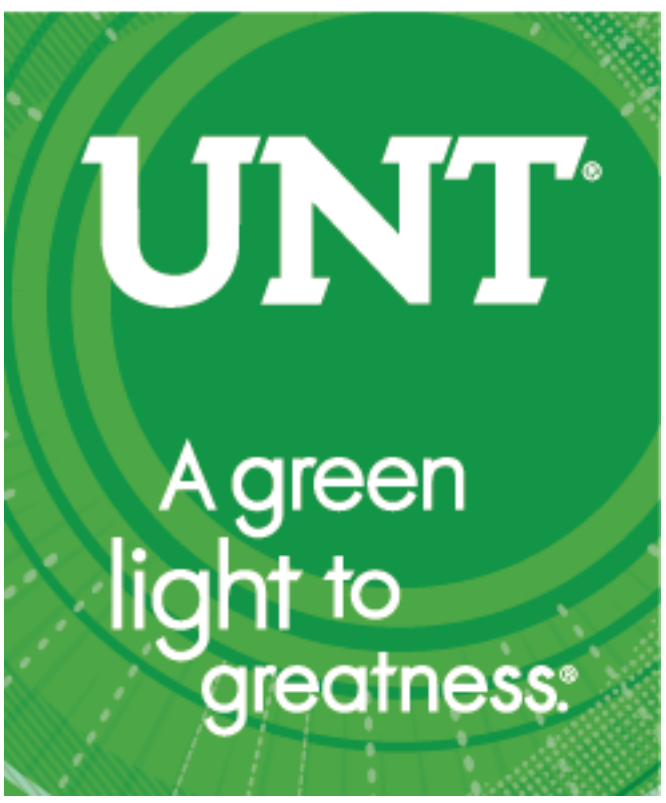

Monica Vazirani
University of California, Davis

Monica Vazirani is a professor at UC Davis. She received her PhD from UC Berkeley in 1999, after shich she had an NSF postdoc she spent at UC San Diego and UC Berkeley, as well as postdoctoral positions at MSRI and Caltech. Dr. Vazirani's research interests include the combinatorics of partitions, tableaux, crystal graphs and parking functions, and how they express deeper phenomena from representation theory.

Applications of Symmetry via the Lemma That is Not Burnside's

If you want to count the number of tiles in your floor, you probably will not count each one individually, but be lazy and look for a short cut. For instance, if the room is rectangular and walking part of its perimeter you discover there are 8 tiles along the north wall and 6 tiles along the west wall, you expect 48 tiles total. This short cut employs the power of symmetry. (And a bit of algebra.)

In this talk, I'll discuss a powerful counting method that is often referred to as Burnside's Lemma, althought it goes back to Frobenius (1887) and Cauchy (1845). This method uses symmetry and a bit more algebra. I will illustrate the lemma by counting necklaces strung with colored beads. Other applications include counting: isomers of a given molecule; crystal structures; chords in a twelve-tone musical scale; Latin squares; finite automata.