Random matrices, von Neumann algebras and (2+1)-dimensional topological quantum field theories

Vaughan Jones
University of California, Berkeley

Tuesday, April 12, 2011

008 Kemeny Hall, 4:00 pm
(Tea 3:30 pm 300 Kemeny Hall)

Abstract

Voiculescu used the large N limit of random matrices to define a trace on the algebra of noncommutative polynomials. A few years ago, Guionnet, Shlyakhetnko and I discovered how to extend the Voiculescu trace to more general graded algebras coming from planar algebras. These (non-commutative) graded algebras have a formal resemblance to the canonical ring of an algebraic variety. Among the constructions arising in this work was a notion of matrix model where the number of matrices is non integral. Planar ideas lead to the consideration of potentials in matrix models which allow enumeration of various planar structures. In more recent work Curran and Shlyakhtenko have used the ideas to give a "visible" construction of the quantum double of a subfactor.

This talk should be accessible to graduate students.