

MANY CHEERFUL FACTS

presents

(At Least) Two Approaches to the Jones Polynomial

a talk by Matt Tucker-Simmons

11:10 am - 12:00 on Wednesday, February 22nd, in room 1015.

In the early 1980s, in the midst of solving a difficult problem about von Neumann algebras, Vaughan Jones discovered a polynomial invariant for knots and links. This connection is quite surprising because a von Neumann algebra is a very analytic object which lives inside the algebra of bounded operators on a Hilbert space. In this talk I will show how the representation theory of von Neumann algebras leads to representations of the braid group and on to the Jones polynomial. I will also discuss Kauffman's combinatorial reformulation of the Jones polynomial in terms of the skein relations, which allow one to compute the polynomial recursively. In case all these words have scared people off, don't worry; proofs will be scarce.

*I am the very model of a modern Major General,
I've information vegetable, animal, and mineral,
I know the kings of England, and I quote the fights historical
From Marathon to Waterloo, in order categorical;
I'm very well acquainted, too, with matters mathematical,
I understand equations, both the simple and quadratical,
About binomial theorem I'm teeming with a lot o' news,
With many cheerful facts about the square of the hypotenuse!*

- Gilbert & Sullivan $P \circ P$