Mathematical Physics Seminar

Wed, Nov 2, 1:30-2:30 pm, Rec 108

Speaker:

Noah Snyder, IU Bloomington

Title. Towards the Quantum Exceptional Series

Abstract. Many Lie algebras fit into discrete families like GL_n, O_n, Sp_n. By work of Brauer, Deligne and others, the corresponding planar algebras fit into continuous familes GL_t and OSp_t

A similar story holds for quantum groups, so we can speak of two parameter families (GL_t)_q and (OSp_t)_q. These planar algebras are the ones attached to the HOMFLY and Kauffman polynomials. There are a few remaining Lie algebras which don't fit into any of the classical families: G2, F4, E6, E7 and E8. By work of Deligne, Vogel, and Cvitanovic, there is a conjectural 1-parameter continuous family of planar algebras which interpolates between these exceptional Lie algebras. Similarly to the classical families, there ought to be a 2-parameter family of planar algebras which introduces a variable q, and yields a new exceptional knot polynomial. In joint work with Scott Morrison and Dylan Thurston, we give a skein theoretic description of what this knot polynomial would have to look like. In particular, we show that any braided tensor category whose box spaces have the appropriate dimension and which satisfies some mild assumptions must satisfy these exceptional skein relations.

Zoom Link:available at <u>https://www.math.purdue.edu/~ebkaufma/seminar.html</u>