Tuesday, January 16, 2018
4:00 p.m.

Mathematical Physics Seminar
Jefferson 356

"Renormalized Hennings Invariants and TQFTs"

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Abstract: Non-semisimple constructions in quantum topology produce strong invariants and TQFTs with unprecedented properties. The first family of non-semisimple quantum invariants of 3-manifolds was defined by Hennings in 1996. The construction enabled Lyubashenko to build mapping class groups representations out of every finite-dimensional factorizable ribbon Hopf algebra. Further attempts at extending these constructions to TQFTs only produced partial results, as the vanishing of Hennings invariants in many crucial situations made it impossible to treat non-connected surfaces. We will show how to overcome these problems. In order to do so, we will first renormalize Hennings invariants through the use of modified traces. When working with factorizable Hopf algebras, we further show that the universal construction of Blanchet, Habegger, Masbaum and Vogel produces a fully monoidal TQFT which extends Lyubashenko's mapping class group representations. This is a joint work with Nathan Geer and Bertand Patureau.