

## Quantum Topology Seminar

### *Coloring Trivalent Graphs: A Defect TFT Approach.*

Amit Kumar (LSU)

**Abstract:** We show that the combinatorial matter of graph coloring is, in fact, quantum in the sense of satisfying the sum over all the possible intermediate state properties of a path integral. In our case, the topological field theory (TFT) with defects gives meaning to it. This TFT has the property that when evaluated on a planar trivalent graph, it provides the number of Tait-Coloring of it. This can be considered a generalization of groups. With the Klein-four group as a 1-defect condition, we reinterpret graph coloring as sections of a certain bundle, distinguishing a coloring (global-sections) from a coloring process (local-sections.) These constructions also lead to an interpretation of the word problem, for a finitely presented group, as a cobordism problem and a generalization of (trivial) bundles at the level of higher categories. See <https://arxiv.org/abs/2410.00378>.

Thursday, October 3 at 12:00 PM in Zoom