ICTS Geometry and Physical Mathematics Seminar

Title : HL Cone, Foams, and Graph Coloring

Speaker : Amit Kumar (Louisiana State University, United States)

Date : Thursday, 03 April 2025

Time : 4:00 PM (IST)

Abstract : We begin with a review of the modern perspective on graph coloring, which appeared in the work of Kronheimer-Mrowka and Khovanov-Robert. Next, we outline how the work of Treuman-Zaslow and Caslas-Zaslow led to graph coloring being seen as topological defects labeled by the elements of Klein-Four Group. This highlights the quantum nature of graph coloring, namely, it satisfies 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. Defects can be considered as a generalization of groups. With the Klein-four group as a 1-defect condition, we reinterpret graph coloring as sections of a certain cover, distinguishing a coloring (global-sections) from a coloring process (local-sections), and give a new formulation of some of Tait's work.

Venue : Chern Lecture Hall
Zoom Link: https://icts-res-in.zoom.us/j/91318289557?pwd=lt0FdplW8TdUvAhKHO7vu7RE8cNnhs.1
Meeting ID: 913 1828 9557
Passcode: 000691