Topology and Geometry Seminar

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Towards a discretization of Chern-Simons theory

Mathematics and Statistics

November 1, 2023
Time: 2:00 PM
On Zoom
(see Topology and Geometry seminar website for link)

Abstract: We will describe a discretization of Chern-Simons theory using Whitney forms. Derived moduli spaces are often described using L_∞ algebras and it is interesting to explore how a derived moduli space varies as we modify the 'governing L_∞ algebra' by a homotopy. In this example, we utilize the well-known Dupont homotopy operator to define a discretization of the infinite-dimensional DGLA controlling the moduli problem relevant to Chern-Simons theory. In doing so, we can describe an (ind-)finite-dimensional model for a derived enhancement of the moduli space of flat connections on an oriented closed 3-manifold M equipped with a triangulation K_M. This derived moduli space has a -1-shifted symplectic structure which also comes with 'geometric quantization data'. This can be used to define a 3-manifold invariant, which can be viewed as a discretization of Witten's Chern-Simons partition function invariant for 3-manifolds.

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