
KATE POIRIER, City University of New York - New York City College of Technology

Directed planar trees, V -infinity algebras, and string topology

Stasheff's associahedra are polyhedra that provide a model for algebras whose products are associative up to homotopy. In this talk, we introduce "associahedra," which model \mathcal{V}_∞ algebras—algebras with a product and a co-inner product and relations that hold up to homotopy. Where associahedra are described combinatorially in terms of rooted planar trees, associahedra are generalizations described in terms of directed planar trees. We use the structure of associahedra to describe Tradler–Zeinalian's algebraic string operations on the Hochschild complex of a \mathcal{V}_∞ algebra and Drummond–Cole–Poirier–Rounds's corresponding string topology operations on the singular chains of the free loop space of a manifold. We also use this structure to show that the operad governing \mathcal{V}_∞ algebras is Koszul. This is joint work with Thomas Tradler.