ADRIAN LOPEZ RAVEN, Perimeter Institute

Categorical 't Hoof Expansion and Chiral Algebras

It is over 50 years since 't Hooft noted that Quantum Field Theories with matrix-valued fields furnish a String Theory expansion as the rank of the matrices goes to infinity. Several examples of this correspondence are known and go by the name of Holography, though no general recipe to construct the dual String Theory is known.

In this work, we derive B-model String Theory dual data for a wide family of matrix-valued chiral algebras. Amongst the dual String Theory backgrounds, one finds novel non-commutative geometries. Using techniques from Homological Algebra, we extract universal properties of the conjectural worldsheet theories dual to these chiral algebras, in the form of A_∞ categories and modules. We believe some of the techniques developed in this work may find use in broader examples of Holography.