Contribution ID: **307** Type: **not specified**

6D Anomaly cancellation for discrete gauge symmetries and their UV completion

Friday 11 July 2025 16:00 (30 minutes)

In this talk, we discuss 6D discrete gauge symmetries and their anomaly cancellation from several perspectives. First, we approach the problem from a field theory viewpoint by lifting fermions and B-fields to the 7D anomaly theory, which allows us to extract non-trivial consistency conditions, refined up to a choice of quadratic refinement. Second, we demonstrate how these conditions can be matched to a Higgsed remnant of a U(1) gauge theory, for a specific fixed choice of quadratic refinement—one that we also show to be realized in the F-theory geometry. By exploiting anomaly inflow on the 2D non-critical strings that couple to the 6D B-fields, along with the modularity of the Type IIA topological string partition function, we extract the corresponding Green-Schwarz-Sagnotti-West couplings from the geometry of torus-fibered Calabi-Yau threefolds. We conclude by highlighting several applications of these discrete anomaly cancellation conditions for both field theory and geometry.

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