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New supersymmetric indices from localization on orbifolds

We introduce a general systematic procedure to construct supersymmetric gauge theories on backgrounds with orbifold singularities, such as the spindle, and compute their partition functions. In addition to the presence of orbifold points, another novel aspect of our construction is that the background metric is allowed to be complex-valued. Combining this with supersymmetric localization leads to novel types of supersymmetric indices, unifying and generalizing the superconformal and topologically twisted indices. These provide new observables in supersymmetric field theories and are relevant for the microstate counting of the recently constructed supersymmetric and accelerating black holes in four-dimensional Anti-de Sitter space-time.

Authors: Dr PITTELLI, Antonio; MARTELLI, Dario (Unknown); INGLESE, Matteo (University of Turin)

Presenter: Dr PITTELLI, Antonio

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