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The First Large-Scale Computation of the Gukov–Manolescu Series

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The Z-hat invariant defined by Gukov–Pei–Putrov–Vafa is a BPS-counting q-series built from Calabi–Yau geometry, whose values at roots of unity recover the Witten–Reshetikhin–Turaev invariants of 3-manifolds. In this talk, I will review a construction for its knot-theoretic counterpart, the Gukov–Manolescu series F_K, and present the first large-scale computation of F_K for 1,246 knots, obtained via an extensive search in the braid space and a fast C++ implementation of the F_K state-sum model.

Presenter: SAN MARTIN SUAREZ, Lara (Caltech)