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strong-weak resurgent symmetry and the beauty of L-functions

Friday 6 September 2024 14:00 (30 minutes)

Quantizing the mirror curve to a toric Calabi-Yau threefold gives rise to quantum operators whose fermionic spectral traces produce factorially divergent formal power series in the Planck constant and its inverse. These are conjecturally captured by the Nekrasov-Shatashvili and standard topological string free energies, respectively, via the TS/ST correspondence. Building on the study by C. Rella on the resurgent structure of the first fermionic spectral trace of local P2, we take the perspective of the Stokes constants and their generating functions. We prove that a full-fledged strong-weak resurgent symmetry is at play, exchanging the perturbative/nonperturbative contributions to the holomorphic and anti-holomorphic blocks in the factorization of the spectral trace. This relies on a global net of relations connecting the perturbative series and the discontinuities in the dual regimes, which is built upon the analytic properties of the L-functions with coefficients given by the Stokes constants and the q-series acting as their generating functions. Based on a joint work with C. Rella arXiv:2404.10695.

Link to publication (if applicable)

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