

Topological strings and Siegel modular forms

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Abstract content

The topological string theory partition function captures non-trivial invariants of Calabi-Yau threefolds. In general, target space symmetries acting on the cohomology induce an automorphic structure on the free energies. For non-compact geometries with spectral curve of genus one this allowed to re-express the physical constraints in terms of modular forms. The construction, however, relied on a certain quasi modular object, the second Eisenstein series. We generalise this procedure to spectral curves of genus two and show that the appropriate automorphic objects are Siegel modular forms. In particular, we propose an analogue for the second Eisenstein series and a generalised Ramanujan identity both of which have not previously been described in the mathematical literature. On this class of geometries we provide a straightforward recipe for solving the topological string.

Summary

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