

Topological strings, resurgence, and quantum mechanics

Marcos Marino (University of Geneva)

Abstract: Topological string theory can be sometimes reformulated in terms of quantum mechanical models. This has shed light on the non-perturbative definition of topological string theory and has applications to quantum integrable systems. In this talk, I will show that, conversely, topological string theory leads to new viewpoints on quantum mechanical systems and their resurgent properties. First, I give evidence that the holomorphic anomaly equations of perturbative topological string theory govern the all-orders WKB periods (also known as Voros multipliers), unveiling in this way their modular properties. In addition, the trans-series extension of the holomorphic anomaly, which goes beyond perturbation theory, gives a new method to calculate instanton effects in one-dimensional spectral problems. Finally, I will explain how the spectral theory/topological string correspondence, which is fully non-perturbative, leads to a solvable deformation of Quantum Mechanics.