DMITRY KOROTKIN, Concordia University

Bergman tau-function and geometry of moduli spaces

Abstract. Bergman tau-function is a universal object appearing in several seemingly unrelated areas - from Riemann-Hilbert problems of a special type - to asymptotical expansion of matrix integrals and computation of determinant of Laplacian on polyhedral Riemann surfaces. The Bergman tau-function can be defined on various spaces: Hurwitz spaces (spaces of meromorphic functions on Riemann surfaces), spaces of holomorphic 1-differentials and n-differentials on Riemann surfaces etc. The analysis of global properties of the Bergman tau-function on these spaces allows to derive new (and re-derive some important old) relations between natural divisors on these spaces. In particular, we obtain an expression for the Hodge class on spaces of admissible covers, reproduce Mumford's formula relating determinant line bundles of vector bundles of abelian and quadratic differentials over moduli spaces of Riemann surfaces etc.

The talks are based on joint works with A.Kokotov and P.Zograf.