ICTS Seminar

Title   :   Mirror symmetry for character varieties and field theory

Speaker   :   Sergey Galkin, PUC Rio de Janeiro and HSE Moscow

Date   :   Wednesday, March 4, 2020

Time   2:00 pm

Venue   :   Emmy Noether Seminar Hall, ICTS Campus, Bangalore

Abstract   :   In a joint work in progress with Swarnava Mukhopadhyay and Pieter Belmans we use mirrors for projective threespaces as building blocks to construct mirrors for moduli spaces of SU(2) character varieties on Riemann surfaces. In the construction we choose a decomposition of a surface into pairs of pants, but we show that the periods do not depend on the decomposition. This allows to compute the respective periods very fast and simultaneously for all genera. As a corollary, we construct a sequence of oscillatory integrals that depend only on Riemann surfaces (namely, on its genus and number of boundary components) and satisfy gluing axiom of topological field theory. Another by-product of the construction is the existence of $\exp(C \sqrt{n})$ pairwise distinct balanced random walks in dimension n with equal probabilities of return to the origin.

Our mirror construction is also related to our conjecture on decomposition of the derived category of coherent sheaves on a moduli space of stable rank 2 bundles on algebraic curve into derived categories of symmetric products of the original curve. I will show mirror heuristics as well as an algebro-geometric evidence towards this conjecture.