

Abstract Motohico Mulase

Magic of Ribbon Graphs

In these talks I will unfold a tapestry describing the magic of ribbon graphs. The name "ribbon graphs" first appeared in the 1992 paper of Kontsevich solving Witten's conjecture. Ribbon graphs represent complex structures of arbitrary algebraic curves (Strebel), gives Feynman diagram expansion of matrix integrals ('t Hooft), express tautological classes on moduli space of curves combinatorially (Kontsevich), and enumeration of them leads to topological recursion. After reviewing key ideas on each of these topics, I will describe a new result, with Dumitrescu, that ribbon graphs provide cohomological field theory and a visual explanation of Frobenius-Hopf duality, that plays a crucial role in Givental-Teleman's classification theorem of CohFTs. No prerequisite is assumed.