

Speaker: Eric Zaslow

Title: Quantum Lagrangians and Open Gromov-Witten Invariants

Abstract: Fock-Goncharov described the cluster structure on the moduli space of framed local systems on a punctured surface, as well as its quantization. Dimofte-Gabella-Goncharov described a quantum Lagrangian inside this space. I will explain how these structures arise from a study of Legendrian surfaces via trivalent planar graphs, a view which reveals connections to other areas.

Locally, the quantum Lagrangian looks like a holonomic D-module, thus is cyclic and defined by a function — and the cluster structure tells you how to compute it. To write this function in coordinates, one must choose a "phase" and "framing." After doing so, this function is conjectured to be a number of things: 1) the wavefunction of a brane in three-space, and of an effective quiver quantum mechanics (after Vafa et al); 2) the open Gromov-Witten generating function of a Lagrangian filling of the Legendrian surface; 3) when the graph is a "canoe" with g seats: the generating function of DT invariants of a symmetric quiver with g nodes (after Kontsevich-Soibelman) and of cohomological numbers of the twisted character variety of a genus- g surface (after Hausel-Rodriguez Villegas).