NITIN CHIDAMBARAM, University of Alberta
Topological recursion and quantum curves

The Eynard-Orantin topological recursion is a technique inspired by random matrix theory, that can be used to compute interesting enumerative invariants including knot invariants, Hurwitz numbers and Gromov-Witten invariants. Given a spectral curve, topological recursion computes an infinite sequence of symplectic-invariant meromorphic differentials on the curve. I will present the basic formalism of topological recursion. A 'quantum curve' is a differential operator associated with the curve and a WKB-type asymptotic solution to this curve. Quantum curves also encode some interesting (quantum) enumerative invariants. In this context, the conjecture that topological recursion on a spectral curve can be used to construct a quantum curve seems natural (this is proved for a large class of genus zero curves). I shall try to explain the relationship between topological recursion and quantum curves and hopefully discuss our recent work with Bouchard and Dauphinee (arxiv:1610.00225) where we studied the first class of higher genus quantum curves.