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Moduli Spaces of Curves and Enumerative Geometry via Topological Recursion.

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Abstract of the thesis:

The thesis considers several enumerative geometric problems concerning the topology of the moduli space of curves and their combinatorics. These enumerative geometric problems are analysed from different intertwined points of view and using different mathematical tools, including Hurwitz theory, Givental theory, cohomological field theories, integrable hierarchies, Fock spaces, quantum curves, and a relatively new powerful technique introduced by Chekhov, Eynard and Orantin known as topological recursion. These subjects lie in the interplay between enumerative algebraic geometry, differential geometry and mathematical physics.