

Enhanced moduli of D-branes and superpotentials

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Moduli of D-branes on Calabi-Yau manifolds are naturally equipped with enhanced geometric structures which play an important role in classical field theory and are an essential input for the quantization problem. I will explain how one can recognize when such enhanced structures arise from a local or global superpotential. I will discuss applications to higher dimensional Chern-Simons functionals, to non-abelian Hodge theory, to the moduli spaces of framed sheaves on log Calabi-Yau geometries, and to the moduli of monopoles. This is based on joint works with Calaque, Katzarkov, Toen, Vaquié, and Vezzosi.