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Owen Gwilliams : 4-dimensional gauge theories and their holomorphic twists

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Yang-Mills theories have had an enormous impact in mathematics, perhaps most famously the Donaldson and Seiberg-Witten invariants, which arise via the topological twists of supersymmetric Yang-Mills theories. In this talk I will describe derived moduli spaces that arise from holomorphic and topological-holomorphic twists of these theories and then explore what it means to quantize such spaces. Given time, we will examine how various notions of duality might carry over to this setting, such as the S-duality that Kapustin and Witten used to offer a physical view on the geometric Langlands program or the Seiberg duality that plays a key role for N=1 theories. This work is joint, in various combinations, with Chris Elliott, Eugene Rabinovich, and Brian Williams.