

Floer homotopy theory, new and old

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Abstract

In 1995 the speaker, Jones, and Segal introduced the notion of “Floer homotopy theory”. The proposal was to attach a (stable) homotopy type to the geometric data given in a version of Floer homology. More to the point, the question was asked, “When is the Floer homology isomorphic to the (singular) homology of a naturally occurring spectrum defined from the properties of the moduli spaces inherent in the Floer theory?” Years passed before this notion found some genuine applications to symplectic geometry and low dimensional topology. However in recent years several striking applications have been found, and the theory has been developed on a much deeper level. In this expository talk I will sketch both the interesting algebraic topology and symplectic topology involved in the theory and talk about recent applications by Lipshitz-Sarkar, Manolescu, and Abouzaid-Blumberg.