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## Floer theory for Lagrangian submanifolds

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### Abstract

We plan to give a survey on our joint work with K. Fukaya and H. Ohta concerning Floer theory for Lagrangian submanifolds. For a (relatively) spin Lagrangian submanifold  $L$  in a (closed) symplectic manifold  $M$ , we construct a certain algebraic object, the filtered  $A_\infty$ -algebra associated to  $L$ , using the moduli spaces of holomorphic discs systematically. The obstruction to defining Floer cohomology of  $L$  can be formulated in terms of the Maurer-Cartan equation in the filtered  $A_\infty$ -algebra associated to  $L$ . In the same spirit, for a relatively spin pair of Lagrangian submanifolds, we construct what we call the filtered  $A_\infty$ -bimodule. We will give a sketch of the construction and some of applications. We would also like to report the current status of our project.