FIM Nachdiplomvorlesung

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A-infinity structures and moduli spaces

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Mondays, 10:15 - 12:00

HG G 43, ETH Zürich, Rämistrasse 101

Abstract

The concept of an A-infinity algebra, originally motivated by homotopy theory (as a more flexible version of Massey products), more recently featured in symplectic geometry and algebraic geometry, due to groundbreaking ideas of Fukaya and Kontsevich's homological mirror symmetry program.

In my lectures I will start with basics of A-infinity algebras. In particular, I will discuss their deformation theory and explain how to construct A-infinity enhancement of derived categories using homological perturbations. I will then consider some examples arising from algebraic geometry.

From the point of view of establishing equivalences of A-infinity algebras, needed for homological mirror symmetry, it is important to study all possible A-infinity structures extending a given graded associative algebra. I will introduce the corresponding moduli problem and will show that in some cases there exists a fine moduli space parametrizing A-infinity structures. I will consider in detail examples of moduli spaces of A-infinity structures related to moduli spaces of curves.

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