FIM Nachdiplomvorlesung

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Noncommutative Algebra and Geometric Representation Theory

March 2 - June 1, 2012
Fridays 10.15 - 12.00h
HG G 43
ETH Zürich, Rämistrasse 101

Abstract

This course will offer an introduction to the representation theory of certain classes of noncommutative algebras which arise from algebraic and holomorphic symplectic varieties. All the algebras and varieties will have a Lie theoretic flavour or origin.

From our point of view, the fundamental guiding example will be the enveloping algebra of a simple Lie algebra, arising from the cotangent bundle of the flag manifold. But to begin with we will discuss the construction of symplectic varieties, their deformations and their quantizations at a reasonable level of generality. We will give many examples, including Hilbert schemes of symplectic surfaces, resolutions of Slodowy slices, and quiver varieties. We will then discuss many of the related algebras - particularly Cherednik algebras and finite W-algebras - and approaches to their representation theory, emphasising the connections with the symplectic geometry. We will cover recent analogues of the localization theorem of Beilinson and Bernstein, and also methods from deformation quantization.

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