

Im Oberseminar

## Deformationsquantisierung

spricht am **9. 1. 2014 um 10 Uhr c.t.**,

im Seminarraum 00.009 (Physik Ost)

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über das Thema:

An unabelian version of T.Voronov's construction of  $L_\infty$  structures.

In 2005 T.Voronov gave a rather useful explicit construction of an  $L_\infty$  structure on a graded vector space  $V$  which is supposed to be an abelian subalgebra complementing a subalgebra  $H$  in a graded Lie algebra  $G$  which he extended to the ambient Lie algebra  $G$ . His technique gave rise to some  $L_\infty$  constructions attached to coisotropic submanifolds and the simultaneous deformation of associative or Lie algebras and their morphisms (work of Y.Frégier et al.). We generalize his construction to an  $L_\infty$  structure on the quotient  $G/H$  (and the extension) without assuming that there is an abelian subalgebra complement to  $H$  in  $G$ . The construction simplifies a bit to some 'graded dressing transformation' if there is a (non)abelian subalgebra complement. The main idea is the observation that the quotient  $U(G)/(U(G)H)$  of the universal enveloping algebra  $U(G)$  of  $G$  is a cofree coalgebra on which  $G$  acts from the left by coderivations. This quotient had recently been studied in the trivially graded case by Calaque, Caldararu and Tu: using their result we can show that the generalized Voronov  $L_\infty$  structure is isomorphic just to a differential (no higher brackets) iff the (graded) Atiyah (or Nguyen-van Hai) class of the Lie algebra pair  $(G, H)$  vanishes. We shall indicate how the generalization may help to the quantization problem of coisotropic submanifolds as modules.

gez. Stefan Waldmann