

# Algebra Seminar

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Wednesday, October 23, 2013  
HH-3017, 1:00 p.m.

*"Growth of subalgebras and subideals in free Lie algebras"*

**Abstract:**

This is a joint work with A. Olshanskii. We investigate subalgebras in free Lie algebras, the main tool being relative growth and cogrowth functions. Our study reveals drastic differences in the behavior of proper finitely generated subalgebras and nonzero subideals. For instance, the growth of a proper finitely generated subalgebra  $H$  of a free Lie algebra  $L$ , with respect to any fixed free basis  $X$ , is exponentially small compared to the growth of the whole of  $L$ . Quite opposite, the cogrowth of any nonzero subideal  $S$  is exponentially small compared to the growth of  $L$ .