

Algebra Seminar

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Locally finite Lie algebras

Abstract:

An algebra A over a field F is called a locally finite if any finite set of elements of A is contained in a finite-dimensional subalgebra. Equivalently, A is the direct limit of a family of finite-dimensional algebras. A hard (essentially, *wild*) problem that remains open is to classify simple locally finite algebra (associative, Lie, etc.) A complete classification of locally finite simple Lie algebras, due to Baranov - Zhilinski, exists in the case of so-called diagonal direct limits over algebraically closed field of characteristic zero. Even better known (fields of positive characteristic included!) Are so-called finitary simple Lie algebras (Baranov - Strade). In this latter case we can even classify all graded simple algebras (Bahturin - Kochetov - Zaicev).

In this talk I would like to discuss basic notions of the theory of locally finite Lie algebras and try to explain current state of the problem of classifying group gradings on the diagonal direct limits of classical simple Lie algebras.