Thesis Seminar

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1 pm in HH-3017

Graded modules over the Lie algebra $\mathfrak{sl}_2(\mathbb{C})$

Abstract: In this talk I will introduce some results from my future thesis. I will talk about the graded module over the Lie algebra $\mathfrak{sl}_2(\mathbb{C})$. First I will discuss the gradings of the weight $\mathfrak{sl}_2(\mathbb{C})$-modules. Then I will explain the gradings of the torsion-free $\mathfrak{sl}_2(\mathbb{C})$-modules of rank 1. This work has been published in a paper joint with Yuri Bahturin and Mikhail Kotchetov. Then I will focus on some new results about the torsion-free $\mathfrak{sl}_2(\mathbb{C})$-module of rank 2. I construct a new family of torsion-free $\mathbb{Z}_2^2$-graded modules of rank 2. I will show that "almost all" of these modules are simple. The remaining, reducible, modules in this family contain a unique maximal proper submodule, which is graded simple. Moreover, I will mention a general result about $\mathbb{Z}$-gradings of the simple torsion-free $\mathfrak{sl}_2(\mathbb{C})$-module of finite rank. This is joint work with Yuri Bahturin.