



# 全国李代数青年论坛

## 会议日程

主办单位：东北师范大学

联系人：陈良云 谭海军 张润莹  
刘杰峰 魏竹 马瑶

2022 年 11 月 13 日（腾讯会议 ID：522-284-739 会议密码：2022）			
8:20-8:30	开幕式+线上合影		
	主持人	报告人	报告题目
8:30-8:55	刘东	王艳	Simple Harish-Chandra modules over superconformal current algebras
9:00-9:25		蔡延安	Representations for Z-graded Lie superalgebras of growth 1.
9:30-9:55		孙冰	Biderivations and commuting linear maps on Hom-Lie algebras
10:00-10:10	休息		
10:10-10:35	穆强	唐黎明	On nilpotent generators of the special linear Lie superalgebras $sl(m,n)$
10:40-11:05		远继霞	Representations of the Special superalgebras
11:10-11:35		曹燕	On split twisted inner derivation triple systems with no restrictions on their 0-root spaces
11:40-13:30	午休		
13:30-13:55	任丽	洪燕勇	A class of infinite simple Lie conformal algebras
14:00-14:25		袁腊梅	Cohomology of O-operators on associative conformal algebras
14:30-14:55		赵俊	The cohomology of left-symmetric conformal algebra and its applications
15:00-15:10	休息		
15:10-15:35	唐孝敏	赵玉凤	Strongly multiplicity free modules for Lie algebras
15:40-16:05		马天水	Infinitesimal (BiHom-)bialgebras of any weight (I): Basic definitions and properties
16:10-16:35		刘美君	Cohomologies and crossed modules for pre-Lie Rinehart algebras
16:40-16:45	闭幕式		

## 主持人介绍

**刘东** (湖州师范学院)

**简介:** 湖州师范学院数学系三级教授、新疆大学兼职博士生导师,湖州师范学院省重点学科“基础数学”学科代数与几何方向负责人。博士毕业于华东师范大学,主要从事无限维李代数的结构与表示、超共形代数、顶点算子代数方面的研究。现为新疆大学天山学者,湖州市南太湖特支计划(市万人计划)获得者,曾获浙江省“151人才”(第二层次),浙江省“钱江人才计划”,浙江省自然科学基金委“十一五优秀成果奖”。在J. Algebra、J. Pure. Appl. Algebra、J. Math. Phys.、Proc. Amer. Math. Soc.等国际核心期刊上发表SCI 论文30多篇,主持国家自然科学基金面上项目3项、浙江省自然科学基金项目3项(含重点项目一项)。

**唐孝敏** (黑龙江大学)

**简介:** 黑龙江大学数学科学学院院长,教授、博士生导师,黑龙江省数学会副理事长。主要从事李理论及相关方向的研究,在Math. Nachr.、Taiwanese J. Math、Linear Algebra Appl.、Linear Multilinear Algebra等期刊发表SCI论文30多篇,并出版专著、教材2部,主持及参加国家自然科学基金、黑龙江省自然科学基金、黑龙江省教育厅项目等各类科研项目10余项。

**穆强** (哈尔滨师范大学)

**简介:** 哈尔滨师范大学数学科学学院教授,博士生导师,2017 年黑龙江省科学技术三等奖第一完成人。主要从事李代数和顶点代数方面的研究,在Trans. Amer. Math. Soc.、J. Algebra 等期刊发表SCI 论文10多篇,并担任SCI 杂志Electron. Res. Arch.编委。主持国家自然科学基金面上项目2项、黑龙江省基金,主持完成数学天元青年基金、黑龙江省基金、省教育厅新世纪人才、省教育厅科研项目。

**任丽** (四川大学)

**简介:** 四川大学数学学院教授,曾获2020年国家级青年人才称号。主要从事李代数和顶点算子代数方面的研究,在Adv. Math.、Trans. Amer. Math. Soc.、J. Algebra等著名SCI杂志发表论文10多篇。主持国家自然科学基金面上项目、青年项目、国家博士后特别基金等项目。

## 报告题目和摘要

蔡延安 (苏州大学)

题目: Representations for  $\mathbb{Z}$ -graded Lie superalgebras of growth 1

摘要: We will introduce recent progress on simple weight modules with finite dimensional weight spaces for  $\mathbb{Z}$ -graded Lie superalgebras of growth 1.

简介: 苏州大学数学科学学院副教授, 硕士生导师。主要从事李(超)代数的表示理论方面的研究, 在J. Algebra、J. Pure Appl. Algebra、Forum Math.等期刊发表SCI论文10多篇, 主持国家自然科学基金青年项目、中国博士后科学基金项目等。

曹燕 (哈尔滨理工大学)

题目: On split twisted inner derivation triple systems with no restrictions on their 0-root spaces

摘要: In this talk, I will introduce the class of split twisted inner derivation triple systems with no restrictions on their 0-root spaces and characterize the decompositions and simplicity of the algebra by developing techniques of connections of roots.

简介: 哈尔滨理工大学副教授, 硕士生导师。主要从事代数结构的分裂理论方面的研究, 在J. Algebra Appl.、J. Math. Phys.、Colloq. Math.等期刊发表SCI论文20多篇, 主持国家自然科学基金青年项目。

洪燕勇 (杭州师范大学)

题目: A class of infinite simple Lie conformal algebras

摘要: In this talk, I will give a characterization of simplicity of quadratic Lie conformal algebras, and introduce three kinds of infinite simple Lie conformal algebras. In particular, I will introduce some structure theory and representation theory of one class of infinite simple Lie conformal algebras. These results are from joint works with Zhixiang Wu, Yang Pan and Haibo Chen.

简介: 杭州师范大学副教授, 硕士生导师。主要从事李代数及相关代数方面的研究, 在Lett. Math. Phys.、J. Algebra、J. Pure Appl. Algebra、Algebra Represent. Theory等期刊发表SCI论文30多篇, 主持国家自然科学基金面上项目、青年项目。

刘美君 (东北师范大学)

题目: Cohomologies and crossed modules for pre-Lie Rinehart algebras

摘要: A pre-Lie-Rinehart algebra is an algebraic generalization of the notion of a left-symmetric algebroid. We construct pre-Lie-Rinehart algebras from r-matrices through Lie algebra actions. We study cohomologies of pre-Lie-Rinehart algebras and show that abelian extensions of pre-Lie-Rinehart algebras are classified by the second cohomology groups. We introduce the notion of crossed modules for pre-Lie-Rinehart algebras and

show that they are classified by the third cohomology groups of pre-Lie-Rinehart algebras. At last, we use (pre-)Lie-Rinehart 2-algebras to characterize the crossed modules for (pre-)Lie Rinehart algebras.

**简介:** 东北师范大学数学与统计学院2020级在读博士生, 导师陈良云教授。主要从事李代数胚及上同调理论方面的研究, 在J. Geom. Phys. 和 SIGMA Symmetry Integrability Geom. Methods Appl.期刊发表SCI论文2篇。

**马天水** (河南师范大学)

**题目:** Infinitesimal (BiHom-)bialgebras of any weight (I): Basic definitions and properties

**摘要:** In this talk, we focus on the study of  $\lambda$ -infinitesimal BiHom-bialgebra (abbr.  $l$ -infBH-bialgebra) which can be seen as an extension of Ebrahimi-Fard's  $l$ -infinitesimal bialgebra (including Joni and Rota's infinitesimal bialgebra, Loday and Ronco's infinitesimal bialgebra) and Liu, Makhlouf, Menini, Panaite's infinitesimal BiHom-bialgebra. Two ways are provided for a unitary (resp. counitary) algebra (coalgebra) to be a  $l$ -infBH-bialgebra. The notion of  $l$ -infBH-Hopf module is introduced. It is proved that every (left BiHom-)module (resp. comodule) over a (anti-)quasitriangular (resp. (anti-)coquasitriangular)  $l$ -infBH-bialgebra possesses the structure of  $l$ -infBH-Hopf module. Two approaches to construct BiHom-pre-Lie (co)algebras from  $l$ -infBH-bialgebras are presented. This is a joint work with Professor Abdenacer Makhlouf.

**简介:** 河南师范大学数学学院副教授、硕士生导师。主要从事Hopf 代数及其应用的相关研究, 在J. Geom. Phys.、J. Algebra Appl.等期刊发表SCI论文40多篇, 主持完成国家自然科学基金青年项目、欧盟FUSION 项目、河南省自然科学基金面上项目、中国博士后基金项目等; 曾获得河南省高等学校青年骨干教师、河南省优秀硕士毕业论文指导教师等荣誉称号。

**唐黎明** (哈尔滨师范大学)

**题目:** On nilpotent generators of the special linear Lie superalgebras  $sl(m, n)$

**摘要:** In this paper, we proved that the special linear Lie superalgebra  $sl(m, n)(m > 0, n > 0)$  can be generated by 2 nilpotent elements. Especially, the two series of  $sl(3, n)(n > 0)$  and  $sl(m, 2)(m > 0)$  can be generated by 1.5 nilpotent generators, that is, for any non-zero nilpotent element, there exists a nilpotent element such that the two elements can generate the whole Lie superalgebra.

**简介:** 哈尔滨师范大学副教授, 硕士生导师, 西班牙萨拉戈萨大学访问学者。曾获黑龙江省科学技术三等奖(第三), 黑龙江省科学技术三等奖(第四), 省高等教育教学成果奖二等奖(第三)。在J. Pure. Appl. Algebra等期刊发表SCI论文9篇, 主持国家自然科学基金青年项目、黑龙江省自然科学基金项目、黑龙江省教育厅科学基金项目。

孙冰 (长春师范大学)

题目: Biderivations and commuting linear maps on Hom-Lie algebras

摘要: The purpose of this paper is to determine skew-symmetric biderivations  $\text{Bider}_s(L, V)$  and commuting linear maps  $\text{Com}(L, V)$  on a multiplicative Hom-Lie algebra  $(L, \alpha)$  having their ranges in an  $(L, \alpha)$ -module  $(V, \rho, \beta)$ , which are both closely related to  $\text{Cent}(L, V)$ , the centroid of  $(L, \alpha)$  on  $(V, \rho, \beta)$ . We give the relationship between biderivations and commuting linear maps on a regular Hom-Lie algebra and those on the related Lie algebra. We also prove that, under appropriate assumptions, every  $\delta$  in  $\text{Bider}_s(L, V)$  is of the form  $\delta(x, y) = \beta^{-1}\gamma(x, y)$  for some  $\gamma$  in  $\text{Cent}(L, V)$ , and  $\text{Com}(L, V)$  coincides with  $\text{Cent}(L, V)$ . Besides, we give the algorithms for describing  $\text{Bider}_s(L, V)$  and  $\text{Com}(L, V)$  respectively.

简介: 长春师范大学副教授, 硕士生导师。在J. Geom. Phys.、Algebra Colloq.等期刊发表SCI论文10多篇, 主持国家自然科学基金青年基金项目、吉林省教育厅基金项目。

王艳 (天津大学)

题目: Simple Harish-Chandra modules over superconformal current algebras

摘要: Let  $\mathcal{A}$  be the tensor product of the Laurent polynomial algebra and the Grassmann algebra,  $\overline{\mathcal{R}}$  be the centerless  $N = 1$  Ramond algebra, and  $\mathfrak{g}$  be a finite-dimensional perfect Lie superalgebra with a non-degenerated invariant bilinear form. In this paper, we classify the simple Harish-Chandra modules over the superconformal current algebra  $\widehat{\mathcal{L}} = \overline{\mathcal{R}} \ltimes (\mathfrak{g} \otimes \mathcal{A}) \oplus \mathbb{C}C \oplus \mathbb{C}C_1$ . It is shown that they are highest weight modules, lowest weight modules, or simple quotient of tensor modules. In addition, as an application, we directly give the classification results of the simple Harish-Chandra modules over  $N = 1$  Heisenberg-Virasoro algebra.

简介: 天津大学数学学院副教授, 硕士生导师。2009年南开大学博士毕业, 毕业后到天津大学工作至今。主要从事Virasoro代数相关的无限维李(超)代数的表示理论方面的研究, 在J. Algebra、J. Algebra Appl.等期刊发表SCI论文9篇, 主持国家自然科学基金青年基金项目等。

远继霞 (黑龙江大学)

题目: Representations of the Special superalgebras

摘要: This paper aims to describe simple modules of the Special superalgebras over an algebraically closed field of characteristic  $p > 3$ . A sufficient and necessary condition for the generalized  $\chi$ -reduced restricted Kac modules with height no more than 1 to be irreducible is given.

简介: 黑龙江大学教授, 哈尔滨工业大学博士, 东北师范大学博士后。在J. Math. Phys.、J. Algebra Appl.、J. Geom. Phys.等期刊发表SCI论文20篇, 主持国家自然科学基金2项、黑龙江省自然科学基金2项、黑龙江省教育厅项目3项、中国博士后面基金项目。

**袁腊梅** (哈尔滨工业大学)

**题目:** Cohomology of O-operators on associative conformal algebras

**摘要:** In this talk, we first introduce the notions of O-operators and twisted Rota-Baxter operators on associative conformal algebras, and then describe cohomology of O-operators by generalizing Gerstenhaber-bracket and derived bracket.

**简介:** 哈尔滨工业大学副教授, 硕士生导师。主要从事共形代数的结构和表示理论方面的研究, 在J. Algebra、J. Pure Appl. Algebra、J. Algebra Appl. 等期刊发表SCI论文20多篇, 主持国家自然科学基金青年项目、中国博士后基金和教育部博士点基金项目。

**赵俊** (河南大学)

**题目:** The cohomology of left-symmetric conformal algebra and its applications

**摘要:** In this talk, we develop a cohomology theory of a left-symmetric conformal algebra and study its some applications. We define the cohomology of a left-symmetric conformal algebra, and then give an isomorphism between the cohomology spaces of the left-symmetric conformal algebra and the sub-adjacent Lie conformal algebra. As applications of the cohomology theory, we study the relations about linear deformations, formal 1-parameter deformation,  $T^*$ -extensions with cohomology of a left-symmetric conformal algebra respectively.

**简介:** 河南大学数学与统计学院讲师, 2020年6月毕业于东北师范大学数学与统计学院, 导师陈良云教授。主要从事李共形代数方面的研究, 在Sci. China Math.、J. Math. Phys. 等期刊发表SCI论文5篇, 主持国家自然科学基金青年项目、国家博士后基金项目、河南省青年基金项目。

**赵玉凤** (北京大学)

**题目:** Strongly multiplicity free modules for Lie algebras

**摘要:** Lehrer and Ruibin Zhang introduced the notion of strongly multiplicity free modules for Lie algebras in 2006. Motived by studying the invariant theory of G-endomorphism algebra in  $U(\mathfrak{g})$ , we find such modules could be described by PDS Sl2 Theory and eigenvalues of quadratic Casimir operators. This paper is joint with Binni Sun.

**简介:** 北京大学数学学院副教授。2006年毕业于中国科学院系统研究所, 获博士学位, 毕业后去北京大学任教至今。2011年至2012年在美国麻省理工学院数学系访问著名代数学家V. G. Kac。主要从事李代数表示理论的研究, 在J. Algebra、Acta Math. Sin.、Manuscripta Math.、Chinese Ann. Math. Ser. B等期刊发表多篇SCI论文, 主持国家自然科学基金青年项目。