

李理论 7 月 10 日学术报告信息

(报告地点：数学楼 102 报告厅)

报告一：Maximal subalgebras of Lie algebras of simple algebraic groups over fields of good characteristics.

By Professor Alexander Premet (The University of Manchester)

摘 要: In his seminal papers, published in 1950s, E.B. Dynkin classified the maximal Lie subalgebras of finite dimensional simple Lie algebras over the field of complex numbers. In characteristic zero, this problem is essentially equivalent to the problem of classifying the maximal connected subgroups of simple algebraic groups. Over an algebraically closed field K of characteristic $p > 0$, all maximal connected subgroups of simple algebraic K -groups G are classified in a long series of papers by Seitz, Testerman and Liebeck-Seitz. However, the problem of classifying all maximal Lie subalgebras of the Lie algebras $\text{Lie}(G)$ is still open at the present time.

In my talk, based on the joint work with David Stewart, I will describe all maximal Lie subalgebras of simple Lie algebras of the form $\text{Lie}(G)$ where G is an exceptional simple algebraic K -group and the characteristic of K is a good prime for the root system of G . I will also discuss some interesting open problems related to classifying maximal Lie subalgebras of special linear, orthogonal and symplectic Lie algebras over fields of positive characteristics.

时 间: 上午 9: 00-10: 00

报告二：Drinfeld realizations of quantum affine algebras in classical types

By Professor Naihuan Jing (North Carolina State University)

摘 要: We will use the RTT formulism and universal R matrices to show that the quantum algebras given by the Jimbo's quantum R matrix are isomorphic with Drinfeld's new realization in classical types. This is joint work with Ming Liu and Alexander Molev.

时 间: 上午 10: 20-11: 20

报告三：Dirac series and coherent continuation in orbit method

By Professor Jingsong Huang

(The Hong Kong University of Science and Technology)

摘 要: Classifying irreducible unitary representations of real reductive Lie groups is a central problem in representation theory, which is well-known as the unitary dual problem. The orbit method establishes a correspondence between irreducible unitary representations of a Lie group and its coadjoint orbits. Dixmier's work on primitive ideals gave one of the earliest indications of such a correspondence. The theory was established by Kirillov for nilpotent groups and it was later extended by Kostant and Auslander to solvable groups. Vogan proposed that the orbit method should serve as a unifying principle in the description of the unitary dual of real reductive groups.

In Vogan's formulation of the orbit method for real reductive groups, the correspondence from the coadjoint orbits to irreducible unitary representations is divided into three steps according to the Jordan decomposition of a linear functional on Lie algebras into hyperbolic, elliptic and nilpotent components. The hyperbolic step and elliptic step are well understood, while the nilpotent step to construct unipotent representations from nilpotent orbits has been a focus of active research in many related areas.

The aim of this talk is to show that our recent work joint with Pandzic and Vogan on classifying unitary representations by their Dirac cohomology shed light on understanding unipotent representations. In particular, the coherent continuation relates the Dirac series (irreducible unitary representations with nonzero Dirac cohomology) to unipotent representations.

时 间: 下午 1: 30-2: 30

报告四：From regular polyhedra to Lie theory

By Weiqiang Wang (University of Virginia)

摘 要: We explain several connections from the symmetry groups of regular polyhedra to ADE (affine) Dynkin diagrams (and their variants such as the corresponding affine Lie algebras). This talk is aiming at a general audience.

时 间: 下午 2: 50-3: 50

报告五：Kac conjecture on the superconformal algebras.

By Dong Liu (Huzhou Univeristy)

摘 要： Superconformal algebras are important algebraic objects realized in supersymmetric conformal field theories. These algebras can be regarded as a supersymmetric generalization of the Virasoro algebra. In this talk, we classify all Harish-Chandra modules over the $N=1, 2$ superconformal algebras, and extend Kac conjecture to superconformal algebras. It is based on the joint research with Profs. PEI Yufeng and XIA Limeng.

时 间： 下午 4: 10-5: 10