On the Centers and Cocenters of the Cyclotomic Hecke and KLR Algebras of Type A

(Hu Jun, Beijing Institute of Technology)

In this talk, I shall report our recent work on the centers and cocenters of the cyclotomic Hecke and KLR algebras of type A. We shall characterize minimal length elements in each conjugacy class of the complex reflection group G(r,1,n). The talk are based on some joint work with Shi Lei, and with Shi Xiaolin and Shi Lei.

Blocks and Characters of Modules of Non-integral Weights for Exceptional Lie Superalgebras

(Luo Li, East China Normal University)

We classify blocks in the BGG category O of modules of non-integral weights for the exceptional Liesuperalgebras D(2|1,zeta) and G(3). Furthermore, we compute the characters for their irreducible modules of non-integral weights in O. This is joint work with Chih-Whi Chen and Shun-Jen Cheng.

Nearly Ordinary p-adic Period Integrals

(Liu Dongwen, Zhejiang University)

We define nearly ordinary p-adic automorphic forms along a parabolic subgroup P, which generalizes Emerton's completed cohomology, and we define the p-adic period integrals of these automorphic forms over a P-spherical subgroup. These integrals interpolate classical modular symbols, and give a systematic way of producing p-adic measures. As applications, we use these period integrals to construct some nearly ordinary p-adic L-functions, including the Rankin-Selberg case. The modifying Euler factors at p are calculated explicitly, which are consistent with the prediction given by Coates and Perrin-Riou, and we determine their exceptional zeros. This is a joint work with Binyong Sun.

Jordan Decomposition for Weights and a Reduction of the Inductive Condition of Alperin Weight Conjecture

(Feng Zhicheng, Southern University of Science and Technology)

The Alperin weight conjecture was announced by J. Alperin in 1986 and constitutes one of the main problems in the modular representation theory. About ten years ago, it was reduced to the verification of certain statements for simple groups by the work of Navarro, Tiep and Spaeth. In this talk we will discuss current approaches and recent progress in the inductive investigation of the Alperin weight conjecture, especially on the reduction of the inductive condition to quasi-isolated blocks. Joint work with Zhenye Li and Jiping Zhang.

Some Recent Progress on the Unitary Dual of U(p,q)

(Wong Daniel Kayue, Chinese University of Hong Kong)

A long-standing yet unsolved problem in representation theory of reductive groups is the classification of irreducible unitary representations, i.e. the unitary dual. In this talk, we will introduce some combinatorics relevant to the study of the unitary dual of U(p,q), and will mention some new theorems and conjectures on the problem.
This talk is based on the preprint arxiv:2210.08684, along with on-going works with Dan Barbasch and Hongfeng Zhang.

Applications of Multiplicity Theorem for Standard Representations in Quotient Branching Laws

(Chan Kei Yuen, University of Hong Kong)

The multiplicity-one-theorem asserts the uniqueness of irreducible quotients when restricting an irreducible representation of a classical group over a local field. This is an important part in the non-tempered Gan-Gross-Prasad program for quotient branching laws.
It is observed that the multiplicity-one result can be extended to standard representations. In this talk, I shall discuss about my work on applications of this generalization in quotient branching laws, focusing on the case of general linear groups. In particular, combining with homological properties of standard representations, we can determine which Bernstein-Zelevinsky layer contributes to a quotient branching law in terms of Bernstein-Zelevinsky derivatives.

Extended Duality and Unipotent Representations

(Yu Shilin, Xiamen University)

Unipotent representations are believed to be the building blocks of unitary dual of semisimple/reductive Lie groups. In their work of constructing special unipotent representations for complex semisimple groups, Barbasch and Vogan constructed a duality map between the nilpotent orbits of G and that of its Langlands dual group $G^\vee$ (also discovered by Lusztig and Spaltenstein), which allows them to describe the unipotent ideals and representations of G in terms of $G^\vee$. Later Sommers and Achar extended this duality map by considering pairs $(\mathbb{O}, C)$ consisting of a nilpotent orbit $\mathbb{O}$ and a conjugacy class C in its Lusztig canonical quotient group $\bar{A}(\mathbb{O})$.

In the joint work with Lucas Mason-Brown and Dmytro Matvieievskyi, we extend the Sommers duality map in another direction by considering covers of nilpotent orbits, which turns out to be equivalent to Achar's duality map (in a nontrivial way). This extended duality map allows us to describe the (generalized) unipotent ideals and bimodules attached to nilpotent covers, proposed previously by Ivan Losev and my other two coauthors, in terms of the Langlands dual group.

Recent Progress on p-adic Jacquet-Langlands Correspondence for GL(2,Qp)

(Hu Yongquan, Chinese Academy of Sciences)

The classical Jacquet-Langlands (J-L) correspondence relates complex smooth representations of GL(n) and that of its inner forms. It was proved in 1970s and provides one of the first examples of the functoriality conjecture in Langlands program. However, when we consider representations with p-adic or mod p coefficients, the analogue of J-L correspondence is still poorly understood, even in the simplest case of GL(2,Qp). In this talk, I will report some recent progress on the p-adic and mod p local J-L correspondence for GL(2,Qp). This is joint work with Haoran Wang.

Calogero-Moser System and Quantum Cohomology of the Springer Resolution

(Su Changjian, Tsinghua University)

I will report a joint work with Changzheng Li and Rui Xiong. The Calogero-Moser (CM) system, which is also called the hypergeometric system, is a generalization of the Gauss hypergeometric equation. We give explicit formulae for the integrals of motions of this system. The method is to study the quantum cohomolgy ring of the Springer resolution.