Representation Theory and Number Theory Workshop

17–20 April 2017

Program

April 17 (Mon) **Room: S17-04-04**

2.00pm – 3.00pm	*Steven Spallone (IISER Pune)* *Spinoriality of Orthogonal Lie Group Representations*
3.00pm – 3.30pm	Break @ Mathematics Department Lounge
3.30pm – 4.30pm	Chandrasheel Bhagwat (IISER Pune) *Special Values of orthogonal L-functions and a period relation for orthogonal motive*
6.00pm	**Dinner**

April 18 (Tues) **Room: S17-04-05**

9.30am – 10.30am	*Dongwen Liu (Zhejiang)* *Theta lifting for loop groups*
10.30am – 11.00am	Break @ Mathematics Department Lounge
11.00am – 12.00pm	*Sungmun Cho (Kyoto)* *Reformulation of the Siegel series and intersection number*
12.00pm – 2.00pm	**Lunch**
2.00pm – 3.00pm	*Jing Song Chai (Hunan)* *On local converse conjecture of Jacquet*
3.00pm – 3.30pm	Break @ Mathematics Department Lounge
3.30pm – 4.30pm	*Dipramit Majumda (IIT Madras)* *p-adic Asai Transfer*
6.00pm	**Dinner**

April 19 (Wed) **Room: S17-04-05**

1.30pm – 2.30pm	*Laura Peskin (Weizmann Institute)* *Supercuspidal mod-p representations of the metaplectic cover of SL(2, Q_p)*
2.30pm – 3.00pm	Break @ Mathematics Department Lounge
3.00pm – 4.00pm	*Chenyan Wu (Fudan)* *Period Integrals, L-functions and (χ,b)-theory for symplectic groups*
4:00pm – 4:30pm	Break @ Mathematics Department Lounge
4:30pm-5:30pm	Dao Van Thinh (NUS) *Average size of 3-Selmer groups of elliptic curves over function fields*

April 20 (Thurs) **Room: S17-04-05**

9.30am – 10.30am	*Jiu-Kang Yu (CUHK)* *Algebraic structures on uniform pro-p groups*
10.30am – 11.00am	Break @ Mathematics Department Lounge
11.00am – 12.00pm	*Zhifeng Peng (NUS)* *Weak beyond endoscopy formula of automorphic representations of symplectic groups*
12.00pm – 2.30pm	**Lunch**

Abstracts

Chandrasheel Bhagwat (IISER Pune)

Special Values of orthogonal L-functions and a period relation for orthogonal motive.

Abstract: We will discuss certain rationality results for the critical values of the degree-2n L-functions attached to GL_1 x _SO(n,n) over rationals for an even positive integer n. We will also discuss a relation for Deligne periods of an orthogonal motive. This is a part of a joint work with A. Raghuram.

Jingsong Chai (Hunan)
On local converse conjecture of Jacquet

Abstract: In this talk, we will introduce a local converse conjecture, which is due to Jacquet, on determination of irreducible generic representations on p-adic GL(n) by local twisted gamma factors. We will report recent proofs on this conjecture.

Sungmun Cho (Kyoto)
Reformulation of the Siegel series and intersection number

Abstract : The Siegel series is the local factor of the Fourier coefficient of the Siegel-Eisenstein series. It is also a crucial ingredient in Kudla's program to compare it with intersection numbers.
In this talk, I will explain a conceptual reformulation of the Siegel series. As the first application, I will explain a conceptual (and simple) proof of the equality between intersection number and the (derivative of) Siegel series. As the second application, I will explain a newly discovered identity between them. This is a joint work with T. Yamauchi.

Van Thinh Dao (NUS)
Average size of 3-Selmer groups of elliptic curves over function fields.

Abstract: Over rational number, M. Bhargava and A. Shankar proved that the average size of 2-Selmer groups (3-Selmer groups) of elliptic curves equal to three (and four respectively) by using the geometry of number. After that, by employing the geometric setting inspired by the proof of the fundamental lemma, Q.P. Ho, V.B. Le Hung, and B.C. Ngo was able to estimate the average size of 2-Selmer groups of elliptic curves over function

fields. Their results are consistent with the results of M. Bhargava and A. Shankar in rational field case. In this talk, I will try to compute the average size of 3-Selmer groups of elliptic curves over function fields by adopting the method of Q.P. Ho et al.

Dongwen Liu (Zhejiang)
Theta lifting for loop groups

Abstract: We apply the method of theta lifting to construct cusp forms on loop symplectic groups, following the classical tower property due to S. Rallis. This is based on a joint work with Yongchang Zhu, and we will also explain some related results and work in progress.

Dipramit Majunda (IIT Madras)
p-adic Asai Transfer

Abstract: Let F be a real quadratic number field. The Asai transfer is an instance of Langlands functoriality that takes automorphic representations over GL_2/F to automorphic representations over GL_4/Q. In this talk, I will describe the construction of a p-adic version of this Langlands transfer. More precisely, we construct a rigid analytic map between the universal eigenvarieties (due to Hansen) associated to GL_2/F and GL_4/Q interpolating classical Asai transfer. This is a joint work with B. Baskar.

Zhifeng Peng (NUS)
Weak beyond endoscopy formula of automorphic representations of symplectic groups

Abstract. Langlands program is the centre of the modern number theory, automorphic representation. Endoscopy theory has succeed to solve the principle of functoriality about classical group. For obtaining more general functorilaity about the more general reductive group, Langlands proposed the beyond endoscopy notion, which is inserting the L-function
to the trace formula through the test function. We hope that we can obtain the more general trace formula, which can be obtained to isolate the term of tempered representation from endoscopic stable trace formula. So in this talk I will introduce the special case to
show that how to obtain the weak decomposition formula about tempered of discrete representations on Symplectic groups.

Laura Peskin (Weizmann Institute)
Supercuspidal mod-p representations of the metaplectic cover of SL(2, Q_p)

Abstract: By recent work of Abe-Henniart-Herzig-Vignéras, the classification of smooth, irreducible, admissible mod-p representations of a connected reductive p-adic group is known in terms of supercuspidal (equivalently, supersingular) representations. A similar classification holds for the smooth, irreducible, admissible, genuine representations of the metaplectic double cover of Sp(2n, F) when F is p-adic (joint work with K. Koziol). However, the supercuspidal mod-p representations of p-adic groups are typically difficult to classify: even in the case of GL(2, F) with F/Qp a quadratic extension, there is no supercuspidal representation with finite presentation (B. Schraen). The case of GL(2, Qp), studied by C. Breuil, and a few related groups, seem to be exceptional in admitting a finite list of explicitly presented supercuspidal representations. I will show that the metaplectic cover of SL(2, Qp) is one of these happy exceptional cases, and give a construction of its genuine supercuspidal representations.

Steven Spallone (IISER Pune)
Spinoriality of Orthogonal Lie Group Representations

Abstract: Let G be a connected semisimple complex Lie group and $\pi: G \to SO(V)$ an orthogonal representation with highest weight λ. We give a polynomial formula in λ which determines whether π lifts to a homomorphism $\tilde{\pi}: G \to Spin(V)$. This is joint work with Rohit Joshi.

Chenyan Wu (Fudan)
Period Integrals, L-functions and (χ,b)-theory for symplectic groups

Abstract: We introduce a new family of period integrals attached to irreducible cuspidal automorphic representations σ of symplectic groups. We show that it detects the poles of automorphic L-functions and hence the occurrences of (χ,b)-factors in the global Arthur parameter of σ.

Jiu-Kang Yu (Chinese Univ. of Hong Kong)
Algebraic structures on uniform pro-p groups

Abstract: We will discuss results concerning algebraic nature of uniform pro-p groups.