

## Abstracts

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Hiraku Atobe

*Kyoto University, Japan*

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*Local newforms for unramified even unitary groups*

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In 1973, Casselman established the theory of local newforms of  $GL_2$ , which bridges a gap between elliptic modular forms and automorphic representations of  $GL_2$  over the rational fields. In this talk, we introduce compact open subgroups of quasi-split even unitary groups over  $p$ -adic field for each even non-negative integers, and explain the theory of local newforms for irreducible tempered generic representations with a certain condition on the central characters. To do this, we introduce the Fourier-Jacobi modules of irreducible representations.

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Rui Chen

*Zhejiang University, China*

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*Homological theta lifting and applications*

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Following the idea of Adams, Prasad and Savin, one can consider the Ext-analogues of theta lifting. In this talk I will discuss some recent works on this direction, give some applications and exhibit some interesting phenomenon related to local L-functions.

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Nadya Gurevich

*Ben-Gurion University of the Negev, Israel*

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*Automorphic functional on the space of the minimal representation*

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The minimal representation  $\Pi_v$  on a p-adic group  $G(F_v)$  often affords a model on the space of functions on a p-adic variety  $X$ . A maximal parabolic subgroup, whose unipotent radical is either abelian or Heisenberg, acts on functions in this model by explicit geometric formulas. Such model is important in establishing local theta correspondence for dual pairs in  $G$ .

Local models give rise to a global model of the representation  $\Pi$  of the group of adelic points  $G(A)$ . The representation  $\Pi$  can be realized automorphically, as residue of some degenerate Eisenstein series.

The goal of the talk is to write an automorphic functional on the global model of  $\Pi$  for split groups of type  $D_n$  and  $E_n$ , stressing the main term and the boundary terms, and their recursive nature.

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Hiroataka Kakuham  
*Hokkaido University, Japan*

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*An extension of the conjecture of Prasad to quaternionic dual pairs*

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In this talk, I will formulate a conjecture describing the behavior of the internal structures of L-packets under the local theta correspondence for quaternionic dual pairs, which extends the conjecture of Prasad. To do this, we use the local Langlands conjecture for rigid inner twists. Moreover, I will explain the proof in the Archimedean case. In this case, a description of theta correspondence has already been given in terms of certain parameters that are extensions of Harish-Chandra parameters. Thus, the basic strategy of the proof is to translate them in terms of Langlands parameters.

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Jia-Jun Ma

*Xiamen University Malaysia, Malaysia*

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*Semi-classical analysis in several complex variables*

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Let  $G_1$  and  $G_2$  be a reductive dual pair. The Harish-Chandra series of  $G_1$  and  $G_2$  correspond to each other under the theta correspondence. With Congling Qiu and Jialiang Zou, we explicitly computed this correspondence by analyzing the relevant Hecke algebra bimodules and applying a Tits deformation argument. This provides another proof of Aubert-Michel-Rouquier's conjecture, which was first proved by Shu-Yen Pan. In this talk, we will discuss a geometrization of the picture. Consequently, we obtained a new description of the theta correspondence in terms of the Springer theory.

This is an ongoing joint work with Congling Qiu, Jialiang Zou, and Zhiwei Yun.

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Kyo Nishiyama

*Aoyama Gakuin University (AGU), Japan*

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*Degenerate principal series representations and real double flag varieties  
of finite type*

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Let  $G = \mathrm{Sp}(2n)$  (or  $U(n, n)$ ) and  $P$  a maximal parabolic subgroup stabilizing a Lagrangian subspace (Siegel parabolic subgroup). Let  $H \simeq \mathrm{GL}(n)$  be a Levi subgroup of  $P$ , which is also asymmetric subgroup of  $G$ . We choose a parabolic subgroup  $Q \subset H$ .

Let  $X = H/Q \times_G G/P$  be a real double flag variety on which  $H$  acts diagonally. We are interested in the geometry of  $X$ . For example, there are only finitely  $H$ -orbits on  $X$ , so that it is of finite type.

In this talk, we introduce integral kernel operators which intertwine degenerate principal series of  $G = \mathrm{Sp}(2n)$  and  $H = \mathrm{GL}(n)$ . For the kernel of the operator, we use relative invariants associated with a prehomogeneous vector space naturally arising from the geometry of  $X$ . The integrals have complex parameters, and at certain integral parameters we get finite dimensional representations as images.

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Shu-Yen Pan

*National Tsing Hua University, Hsinchu*

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*Finite theta correspondence, unipotent support and orbit correspondence*

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In this talk we show that if two irreducible representations are paired by the theta correspondence for a finite symplectic/orthogonal dual pair, then the unipotent supports of their Alvis-Curtis duals are paired by the orbit correspondence. Moreover, if the orthogonal group in the dual pair is even and two representations are special unipotent, we show that the reverse implication also holds.

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Binyong Sun  
*Zhejiang University, China*

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*Some theorems in the representation theory of classical Lie groups*

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After introducing some basic notions in the representation theory of classical Lie groups, I will explain three results in this theory: the multiplicity one theorem for classical groups, the conservation relation for local theta correspondence, and the non-vanishing hypothesis at infinity for Rankin-Selberg convolutions. Some relevant or consequent results will also be explained.

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Shuichiro Takeda  
*Osaka University, Japan*

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*The local theta correspondence: an infomercial talk*

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This is an infomercial talk on the forthcoming book on the local theta correspondence authored by W.T. Gan, S. Kudla, and the speaker. In this talk, I will give an overview of the local theta correspondence, especially focusing on what is in the book.

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Chenyan Wu

*The University of Melbourne, Australia*

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*Theta correspondence and simple factors of global Arthur parameters*

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Let  $\pi$  be a cuspidal automorphic representation of a classical group or a metaplectic group. We show an exact relation between two invariants associated to  $\pi$ , one being the lowest occurrence index of  $\pi$  with respect to theta lifts and the other the location of the maximal positive pole of an Eisenstein series attached to  $\pi$ . As an application, we use this relation to show that certain global Arthur packets cannot contain cuspidal automorphic representations.

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