Representation Theory Day

16 April 2014 (Wednesday)

Programme

9.30am – 10.30am   **Local theta correspondences of epipelagic representations (Room: S17-04-04)**
Hung Yean Loke (NUS)

10.30am – 10.45pm   Break @ Mathematics Department Lounge

10.45am – 11.45am   **Basic results and questions on non-connected reductive groups (Room: TBA)**
Chee Whye Chin (NUS)

11.45am – 2.00pm   **Lunch**

2.00pm – 3.00pm   **Local Systems of Nilpotent Orbits and the Lusztig-Vogan Conjecture (Room: S17-05-11)**
Daniel Wong (Hong Kong University of Science and Technology)

3.00pm – 3.30pm   Break @ Mathematics Department Lounge

3.30pm – 4.30pm   **Local theta correspondence and generalized Whittaker models (Room: S17-04-04)**
Chengbo Zhu (NUS)

6.00pm   **Dinner**

Abstracts

Hung Yean Loke, Local theta correspondences of epipelagic representations

In this talk, I consider a reductive dual pair (G,G') = (Sp(2n),O(N)) where N = 2n, 2n+1 or 2n+2. I will show that under the local theta correspondence, an epipelagic supercuspidal representation \pi of \tilde{G} lifts to an epipelagic supercuspidal representation \pi' of \tilde{G'}. Here the tildes above the groups denote their double covers in the metaplectic group. Furthermore, the stable vectors associated to \pi and \pi' are related by certain moment maps. This is a joint project with Jia-jun Ma and Gordan Savin.

Chee Whye Chin, Basic results and questions on non-connected reductive groups

This will be a largely expository talk on some of the basic properties of non-connected reductive groups, both their structure theory as well as their representation theory. Along the way we will also indicate, wherever possible, questions about these groups that are not yet resolved.

Daniel Wong, Local Systems of Nilpotent Orbits and the Lusztig-Vogan Conjecture

Let G be a simply connected complex semisimple Lie group. Lusztig and Vogan separately conjectured that there is a bijection between
$$\mathcal{N}_{o,r}/\sim\ \ \leftrightarrow\ \ \Lambda_+, \text{dominant weights in}\ \mathfrak{g}$$
where the elements $\mathcal{N}_{o,r}$ are of the form $(\mathcal{O},\rho)$, with a nilpotent orbit $\mathcal{O}$, and ρ is an irreducible, algebraic representation of the stabilizer group G^e of a nilpotent element $e \in \mathcal{O}$. We will look at some progress of this conjecture for ρ being a local system, i.e. when ρ is restricted to its identity component group $(G^e)_0$, $\rho|_{(G^e)_0} = triv$.

Chengbo Zhu, Local theta correspondence and generalized Whittaker models

I will explain the relationship between local theta correspondence and generalized Whittaker models associated to nilpotent orbits, in the most general circumstances. The result may be interpreted as a variation of the induction principle for local theta correspondence, in which nilpotent orbits are divided into two parts ("semisimple-like" and "truly nilpotent"). For the part "semisimple-like", things behave according to local theta correspondence of a smaller dual pair, and for the part "truly nilpotent", things behave according to the respective generalized Whittaker models. This is Part II of the joint work with Raul Gomez.