Representation Theory Day

16 April 2014
9.30am – 4.30pm
S17, NUS
Programme

9.30am – 10.30am  Local theta correspondences of epipelagic representations
LOKE Hung Yean
National University of Singapore, Singapore
Room: S17 #04-04

10.30am – 10.45am  Break @ Mathematics Lounge

10.45am – 11.45am  Basic results and questions on non-connected reductive groups
CHIN Chee Whye
National University of Singapore, Singapore
Room: TBA

11.45am – 2.00pm  Lunch

2.00pm – 3.00pm  Local Systems of Nilpotent Orbits and the Lusztig-Vogan Conjecture
Daniel WONG
Hong Kong University of Science and Technology, Hong Kong SAR
Room: S17 #05-11

3.00pm – 3.30pm  Break @ Mathematics Lounge

3.30pm – 4.30pm  Local theta correspondence and generalized Whittaker models
ZHU Chengbo
National University of Singapore, Singapore
Room: S17 #04-04

6.00pm  Dinner
Abstract

Local theta correspondences of epipelagic representations
LOKE Hung Yeon, National University of Singapore, Singapore

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.

Basic results and questions on non-connected reductive groups
CHIN Chee Whye, National University of Singapore, Singapore

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.

Local Systems of Nilpotent Orbits and the Lusztig-Vogan Conjecture
Daniel WONG, Hong Kong University of Science and Technology, Hong Kong SAR

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

ZHU Chengbo, National University of Singapore, Singapore

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.