

**Programme on**  
**“Arithmetic Geometry and Automorphic Representations”**  
**April 7 - May 29, 2015**

**organized by**  
**Stephen S. Kudla (U Toronto), Michael Rapoport (U Bonn), Joachim Schwermer (U Vienna)**

**Workshop II, Part 1, on**  
**“Automorphic Forms - Geometry and Arithmetic”**  
**May 6 - 8, 2015**

- **Wednesday, May 6, 2015**

10:00 – 11:00 **Marcela Hanzer**

*Degenerate Eisenstein series for symplectic groups*

11:00 – 11:30 *coffee / tea break*

11:30 – 12:30 **Joachim Mahnkopf**

*On local constancy of dimension of slope subspaces of automorphic forms*

- **Thursday, May 7, 2015**

10:00 – 11:00 **Roberto Miatello**

*The Kuznetsov formula and Hecke eigenvalues on Hilbert modular groups*

11:00 – 11:30 *coffee / tea break*

11:30 – 12:30 **John Millson**

*The geometric theta lift for compact quotients of orthogonal and unitary symmetric spaces*

- **Friday, May 8, 2015**

10:00 – 11:00 **Jens Funke**

*The geometric theta lift for non-compact quotients of the complex  $n$ -ball.*

11:00 – 11:30 *coffee / tea break*

11:30 – 12:30 **Jing-Feng Lau**

*On the residual spectrum of a quasi-split simply-connected group of type  $D_4$*

## Abstracts

**Marcela Hanzer** (University Zagreb, Croatia)

In this talk we explicitly describe some automorphic representations which arise from the degenerate Eisenstein series for symplectic groups. We use and generalize some ideas from the previous work with G. Mui on the general linear groups. In the case of symplectic group we present our results in the Siegel case, where some results in this direction were already known from the classical work of Kudla and Rallis on the Siegel-Weil formula. We also present a further generalization of this method (which does not use theta correspondence) to the case of the non-Siegel Eisenstein series for symplectic groups (this is work in progress).

**Joachim Mahnkopf** (University Vienna, Austria)

We describe a higher rank analogue of a conjecture of Gouvea-Mazur which states that the dimension of the slope subspaces of spaces of automorphic forms is locally constant as a function of the weight. In the original  $\mathrm{GL}_2$ -case the conjecture has been proven by Wan using Katz' theory of  $p$ -adic overconvergent modular forms and work of Coleman. We will use an approach which is based on a comparison of Bewersdorff's elementary trace formula in varying weights.

**Roberto Miatello** (Universidad Nacional de Córdoba, Argentina)

We use a version of the Kuznetsov sum formula to derive equidistribution results for eigenvalues of Hecke operators of automorphic cusp forms on Hilbert modular groups. This is joint work with R. Bruggeman (Utrecht).

**John Milson** (University Maryland, USA)

I will develop an analogy between the special cycles and special cohomology classes on compact quotients of orthogonal and unitary symmetric spaces and the homology and cohomology of the dual compact symmetric spaces. The special cycles are the analogues of certain Schubert cycles (the Chern cycles) and the special cohomology classes are the analogues of the dual Chern forms. To take this analogy further, the cohomology of the compact dual symmetric spaces is isomorphic to the relative Lie algebra cohomology with coefficients in the trivial representation  $H^*(\mathfrak{g}, K; \mathbb{C})$ . The special cohomology classes arise by applying the theta distribution to some very special relative Lie algebra cohomology classes of the Weil representation,  $H^*(\mathfrak{g}, K; W_n)$ . I have recently been studying  $H^*(\mathfrak{g}, K; W_n)$  to see what else is there besides these special classes that Steve Kudla and I discovered with the help of Roger Howe in the early 1980's. I will also discuss my recent results with Nicolas Bergeron and Colette Moeglin concerning what part of the cohomology of the above arithmetic quotients comes from these special classes.

**Jens Funke** (University Durham, United Kingdom)

This is work in progress with John Millson and in parts rather speculative. We first discuss the work of Cogdell on Picard modular surfaces and explain how it can be interpreted in the framework of our program to systematically extend the Kudla-Millson lift to the non-compact situation. In the second part we speculate how one could extend these results to  $U(n,1)$ .

**Jing Feng Lau** (National University Singapore)

In this talk, I will present the results for the residual spectrum of a quasi-split simply-connected group of type  $D_4$  supported on maximal parabolics and some partial results for the residual spectrum supported on the Borel subgroup if time permits. This is work still in progress.