Université de Lille 1 SCIENCES ET TECHNOLOGIES — UFR de Mathématiques

50th Seminar Aachen-Bonn-Köln-Lille-Siegen on Automorphic Forms

Université Lille 1, May 3, 2017

Organizers: K. Bringmann, J. Bruinier, V. Gritsenko, A. Krieg, P. Moree, G. Nebe, N-P. Skoruppa, S. Zwegers

This is the 50th meeting of the joint French-German intercity seminar on automorphic forms. Everybody who is interested in automorphic forms or related areas is welcome. We encourage in particular young researchers to participate and to report on their work in one of our meetings.

When: Wednesday, May 3, 2017

Where: USTL, Cité Scientifique Lille 1, Villeneuve d'Ascq
Bat. M3, la salle Duhem

Schedule

14.00 – 14.50 **Emmanuel ROYER (Clermont-Ferrand)**
Poisson structures, quasimodular forms and Jacobi forms.

15.00 – 15.50 **Evgeny FERAPONTOV (Loughborough University, UK)**
Dispersionless integrable systems and modular forms.

15.50 – 16.30 **Coffee Break**

16.30 – 17.20 **Gaetan CHENEVIER (Laboratoire de mathmatiques d'Orsay)**
On level 1 modular forms of small weights.

17.30 – 18.20 **Nils-Peter SKORUPPA (U. Siegen)**
Thetablocks revisited

18.30 **Buffet (in the building M2)**

For further informations concerning this meeting please send an email to *Valery.Gritsenko@math.univ-lille1.fr*.
For the previous meetings see *http://www.matha.rwth-aachen.de/en/forschung/abkls/*

Abstract of Talks

Speaker: *Emmanuel Royer*

Title: *Poisson structures, quasimodular forms and Jacobi forms.*

Abstract: *The sequence of Rankin-Cohen brackets is a formal deformation of the algebra of modular forms. In recent works with F. Dumas and with Y. Choie, F. Dumas and F. Martin, we construct formal deformations of the algebras of quasi modular forms and weak Jacobi forms. A first step in this description is a complete description of the Poisson structures on these algebras.*

Speaker: *Evgeny Ferapontov*

Title: *Dispersionless integrable systems and modular forms.*

Abstract: *In this talk I will give a review of several problems in the theory of dispersionless integrable systems where modular forms occur naturally. This includes the classification of first-order integrable Lagrangians and second-order quasilinear PDEs.*

Speaker: *Gaetan Chenevier*

Title: *On level 1 modular forms of small weights.*

Abstract: *I will show that, up to twist and action of* $\mathrm{GL}(n,\mathbb{R})$*, there are only* 11 *cuspidal modular eigenforms for* $\mathrm{GL}(n,\mathbb{Z})$ *all of whose "weights" are integers in the range* $[0,22]$ *(the positive integer* n *being arbitrary). For instance, the constant function for* $n=1$*, and the classical cuspforms of weight* 12, 16, 18, 20 *and* 22 *for* $n=2$*, define* 6 *of those* 11*, and I will explain that there are none for* $n>4$*. I will give several applications of this result, such as a proof "without any lattice computation" that there are exactly* 24 *isometry classes of even unimodular lattices in rank* 24 *(Niemeier lattices), the determination of the* p*-neighborhood graph of the Niemeier lattices for each prime* p *(the case* $p=2$ *being due to Borcherds), or the computation of the dimension of the space of classical cuspidal Siegel modular forms for* $\mathrm{Sp}(2g,\mathbb{Z})$ *(with* g *arbitrary) in weight less than or equal to* 12*. Joint work with Jean Lannes.*

Speaker: *Nils-Peter Skoruppa*

Title: *Thetablocks revisited*

Abstract: *Thetablocks are an easy, yet powerful and still partly mysterious tool for generating explicitly holomorphic Jacobi forms of various types. After explaining (reminding) the notion of thetablocks introduced a decade ago by Gritsenko, Zagier and the speaker we discuss various recent statistics, records, results and applications.*