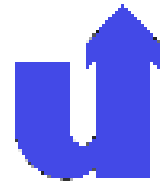**Max-Planck-Institut für Mathematik**   **Universität Siegen**

41st Seminar Aachen-Köln-Lille-Siegen
on Automorphic Forms

Max-Planck-Institut für Mathematik in Bonn, December 18, 2013

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

This is the 41st meeting of the joint French-German intercity seminar on automorphic forms. Everybody who is interested in automorphic forms is welcome. We encourage in particular young researchers to participate and to report on their work in one of our meetings. For further informations concerning this meeting please send an email to *moree@mpim-bonn.mpg.de* or *nils.skoruppa@gmail.com*

When: Wednesday, December 18, 2013
Where: Max-Planck-Institut für Mathematik
            Vivatsgasse 7, 53111 Bonn, MPI Lecture Hall
Organizers: Pieter Moree, Nils-Peter Skoruppa

Schedule

14.00 – 14.50   **Tomoyoshi Ibukiyama (Osaka University and MPIM Bonn):**
                Jacobi forms of degree two

15.00 – 15.50   **Martin Raum (ETH Zürich):**
                Siegel modular forms mod p and their $U(p)$ congruences

16.00   **Coffee and Tea Break**

17.00 – 17.50   **Roland Friedrich (Humboldt-Universität):**
                Combinatorics related to Modular Forms and Multiple Zeta Values

18.30   **Dinner**
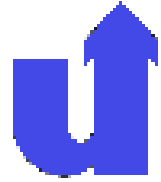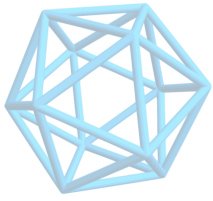
Abstracts

Tomoyoshi Ibukiyama
Jacobi forms of degree two

After reviewing a theory of Taylor expansion of scalar valued Jacobi forms of higher degree and several structure theorems obtained before, we talk new results on vector valued Jacobi forms of degree two. By using the Taylor expansion and a result on the image of Witt operator, we determine the module structure of vector valued Jacobi forms of degree two of index one over the ring of scalar valued Siegel modular forms. We also obtain an explicit dimension formula for $k > 8$ and confirm Tushima's conjecture.

Martin Raum
Siegel modular forms mod p and their $U(p)$ congruences

We discuss Jacobi coefficients with p-integral coefficients, and device them to study Siegel modular forms for the full Siegel modular group of arbitrary genus.

We revisit classical results on Jacobi forms due to Eichler and Zagier, and Sofer. Extensions of them to Jacobi forms of matrix index can be obtained by the recently much refined method of restriction. In particular, we will show that the module of Jacobi forms of fixed index with p-integral coefficients is free for all p greater than 3.

As for Siegel modular forms, we give a complete description of algebras of Siegel modular forms mod p. We then turn to $U(p)$ congruences, which we characterize under a mild technical hypothesis. As an example, we give a complete discussion of $U(p)$ congruence of the Schottky form in genus 4.

Roland Friedrich
Combinatorics related to Modular Forms and Multiple Zeta Values

In this talk we discuss combinatorial structures, encoded by Hopf algebras, which are related to modular forms and multiple zeta values. In particular we shall also consider their connections with Monstrous Moonshine. These Hopf algebras equally capture the notion of 'freeness' in non-commutative probability theory. The talk is based on material from joint work with McKay.