



# Seminar Aachen-Bonn-Köln-Lille-Siegen on Automorphic Forms

Universität zu Köln, 04 October, 2017

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

This is the 51st meeting of the joint French-German seminar on automorphic forms which is organized by research groups in the cited cities. 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 information concerning this meeting please send an email to [kbringma@math.uni-koeln.de](mailto:kbringma@math.uni-koeln.de).

When: Wednesday, 04 October, 2017

Where: Universität zu Köln – Weyertal 86 – 50931 Köln – Hörsaal des  
Mathematischen Instituts

## Schedule

1 pm – 1.50 pm

**Jonas Kaszián (Köln)**

*Indefinite Theta Functions*

2 pm – 2.50 pm

**Dr. Henrik Bachmann (Nagoya/Bonn)**

*Multiple harmonic  $q$ -series at primitive roots of unity and finite multiple zeta values*

3 pm – 4 pm

**Tea/Coffee Break**

4 pm – 4.50 pm

**Prof. Dr. Aloys Krieg (Aachen)**

*Hecke-Theory and Applications for  $O(2,3)$*

5.30 pm

**Dinner**

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## Abstracts

Dr. Henrik Bachmann (Hamburg): *Multiple harmonic  $q$ -series at primitive roots of unity and finite multiple zeta values*

*Abstract:* In this talk we will present recent results on the connection of finite multiple zeta values (FMZV) and symmetrized multiple zeta values (SMZV). We start by giving a crash course on the classical theory of multiple zeta values and then discuss their finite analogues, which were recently introduced by Kaneko and Zagier. After this we introduce the notion of finite multiple harmonic  $q$ -series at a primitive root of unity and show that these specialize to the FMZV and the SMZV through an algebraic and analytic operation, respectively. Further, we obtain families of linear relations among these series which induce linear relations among FMZV and SMZV of the same form. This gives evidence towards a conjecture of Kaneko and Zagier relating FMZV and SMZV. If time permits, we will also discuss a possible connection to quantum modular forms. This talk is based on a joint work with Y. Takeyama and K. Tasaka.

Jonas Kaszián (Köln): *Indefinite Theta Functions*

*Abstract:* In this talk we discuss the recent development concerning theta series for indefinite quadratic forms. We begin with the results of Sander Zwegers' thesis (2002) on signature  $(n,1)$  forms, which laid the foundation for the progress made in multiple papers published in 2016. In joint work with K. Bringmann, L. Rolin and A. Milas, we studied exceptional examples related to Gromov-Witten theory and representation theory of  $W$ -algebras.