49th Seminar Aachen-Bonn-Köln-Lille-Siegen on Automorphic Forms

Universität Siegen, February 15, 2017

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

This is the 49st 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, February 15, 2017

Where: Universität Siegen - Walter-Flex-Strasse 3 - 57068 Siegen
        Emmy-Noether-Campus — Raum D-224

Schedule

14.00 − 15.00   **João Guerreiro (Columbia University, MPIM):**
                Error term in the prime geodesic theorem

15.15 − 16.15   **Lassina Dembélé (University of Warwick, MPIM)**
                Lifts of Hilbert modular forms and application
                to a conjecture of Gross

                Coffee Break

17.00 − 18.00   **David Dursthoff (Universität Aachen):**
                Extremal lattices and Hilbert modular forms

                Dinner

For further informations concerning this meeting please send an email to *nils.skoruppa@gmail.com*. For the previous meetings see *http://www.matha.rwth-aachen.de/en/forschung/abkls/*

Abstract of Talks

Speaker: *João Guerreiro*

Title: *Error term in the prime geodesic theorem*

Abstract: *Closed geodesics on the surface $\mathrm{PSL}_2(\mathbb{Z})\backslash\mathbb{H}$, where $\mathbb{H}$ is the upper half plane, satisfy an asymptotic law that is very similar to the one describing the distribution of prime numbers. Moreover, the error term in this asymptotic law is related to the spectrum of the Laplace operator, which is also the set of zeros of the Selberg zeta function. In this talk, I will exploit the connection between closed geodesics and Maa cusp forms to estimate the error term in the prime geodesic theorem, giving a bound for its mean square. This is joint work with Giacomo Cherubini.*

Speaker: *Lassina Dembélé*

Title: *Lifts of Hilbert modular forms and application to a conjecture of Gross*

Abstract: *In this talk, we prove the existence of certain lifts of Hilbert modular forms to orthogonal groups. Then, we use those lifts to provide evidence for a conjecture of Dick Gross on the modularity of abelian varieties.*

Speaker: *David Dursthoff*

Title: *Extremal lattices and Hilbert modular forms*

Abstract: *Extremal lattices are remarkable objects of number theory. They define many of the densest known sphere packings, good spherical designs, and their theta series are interesting modular forms. In this talk we will give a notion of extremality for real quadratic number fields. Hilbert modular forms are used to study even unimodular lattices. Further, we use theta series with harmonic coefficients to compute so-called configuration numbers and to classify all extremal lattices in small dimensions. We will give examples for the fields $\mathbb{Q}[\sqrt{5}]$, $\mathbb{Q}[\sqrt{2}]$, and $\mathbb{Q}[\sqrt{3}]$.*