

58th Seminar Aachen-Bonn-Köln-Lille-Siegen on Automorphic Forms

RWTH Aachen, Wednesday, February 12, 2020

Organizers:

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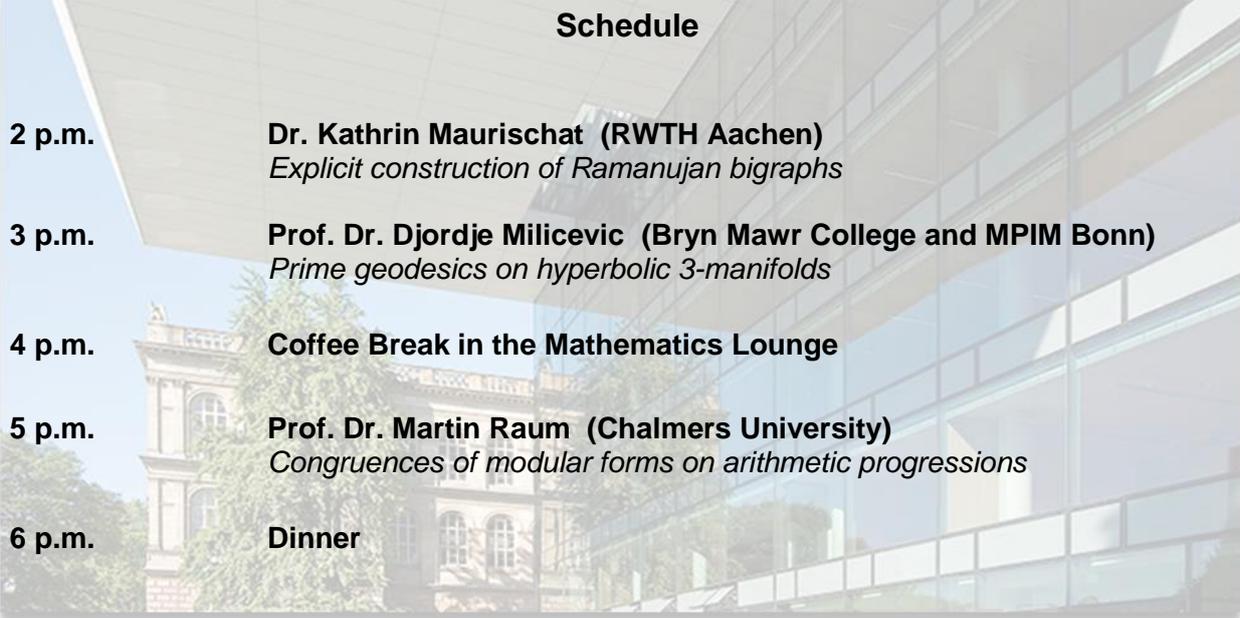
This is the 58th meeting of the joint French-German seminar on automorphic forms. Everybody who is interested in automorphic forms is welcome. We encourage in particular young researchers to participate and to report on their work in one of our meetings. For further information concerning this meeting please send an email to krieg@rwth-aachen.de

Note: If you come by car and want to use an RWTH parking lot please contact us in advance. Cars without a permit are towed away. The meeting takes place in the Math. Building and not in the Main Building as before.

When: Wednesday, February 12, 2020

Where: RWTH Aachen – Pontdriesch 14-16 – 52062 Aachen – SeMath – Room 008

Schedule



2 p.m.	Dr. Kathrin Maurischat (RWTH Aachen) <i>Explicit construction of Ramanujan bigraphs</i>
3 p.m.	Prof. Dr. Djordje Milicevic (Bryn Mawr College and MPIM Bonn) <i>Prime geodesics on hyperbolic 3-manifolds</i>
4 p.m.	Coffee Break in the Mathematics Lounge
5 p.m.	Prof. Dr. Martin Raum (Chalmers University) <i>Congruences of modular forms on arithmetic progressions</i>
6 p.m.	Dinner

Abstracts

Kathrin Maurischat: *Explicit construction of Ramanujan bigraphs*

Ramanujan bigraphs are known to arise as quotients of Bruhat-Tits buildings for non-split unitary groups U_3 . However, these are only implicitly defined. We show that one also obtains Ramanujan bigraphs in special split cases, and we give explicit constructions. The proof is obtained by inspecting the automorphic spectrum for temperedness, and for the construction we introduce the notion of bi-Cayley graphs. This is joint work with C. Ballantine, S. Evra, B. Feigon, O. Parzanchevski.

Djordje Milicevic: *Prime geodesics on hyperbolic 3-manifolds*

On arithmetic spaces such as the familiar modular surface, closed geodesics encode arithmetic information such as class numbers while serving as intrinsic geometric invariants and guiding the fine distribution of the Laplacian spectrum and dynamics of the geodesic flow. Prime geodesic theorems give an asymptotic count for the rich set of primitive geodesics, which generate the entire length spectrum, and stand in analogy to the prime number theorem. In this talk, we will discuss the geometry and spectra on the hyperbolic 3-space and present new results, joint with Lindsay Dever, about the distribution of prime geodesics on compact hyperbolic 3-manifolds.

Martin Raum: *Congruences of modular forms on arithmetic progressions*

One purpose of modular forms, and more generally, weakly holomorphic modular forms is to aid or even enable the analysis of certain generating series, namely modular generating series. A common question asked for coefficients $c(n)$ of a generating series is which patterns of divisibility they satisfy. Among the most accessible patterns, there is divisibility on arithmetic progressions: $c(an + b)$ is divisible by a given positive integer ℓ for all n . The theory of modular forms modulo primes yields a good handle on such question as long as a and b remain fixed and ℓ is prime.