

ABSTRACTS

JÜRGEN SANDER (Hildesheim): *Integral circulant Ramanujan graphs via multiplicativity and ultrafriable integers*

Any *integral circulant graph* $\text{ICG}(n, \mathcal{D})$ is characterised by its order n and a set \mathcal{D} of positive divisors of n in such a way that it has vertex set $\mathbb{Z}/n\mathbb{Z}$ and edge set $\{(a, b) : a, b \in \mathbb{Z}/n\mathbb{Z}, \gcd(a - b, n) \in \mathcal{D}\}$. A connected ρ -regular graph G is called *Ramanujan* if the second largest modulus of the eigenvalues of the adjacency matrix of G is at most $2\sqrt{\rho - 1}$. In 2010 DROLL described all Ramanujan unitary Cayley graphs, i.e. graphs of type $X_n := \text{ICG}(n, \{1\})$ having the Ramanujan property. We greatly extend this result to graphs $\text{ICG}(n, \mathcal{D})$ with arbitrary n and multiplicative divisor set \mathcal{D} . The proofs use methods from analytic number theory.

MARTIN KREH (Hildesheim): *Über die Anzahl an Lösungen von linearen Gleichungen über Faktorringsen von Hauptidealringen*

In diesem Vortrag soll die Anzahl von Lösungen linearer Kongruenzen (sowie deren Verallgemeinerungen über Hauptidealringen) bestimmt werden. Eine explizite Formel der Lösungsanzahl, die nur von der Smith-Normal-Form der beteiligten Matrix abhängt, kann unter anderem dazu benutzt werden, den Fehlerterm von singulären Summen, die bei der Kreismethode auftauchen, explizit in Abhängigkeit der Diskriminante der quadratischen Form zu bestimmen.

TEERAPAT SRICHAN (Würzburg): *Sampling the Riemann Hypothesis for the logarithmic derivative of the Riemann zeta-function with an ergodic transformation*

We study the behaviour of the logarithmic derivative of Riemann zeta-function $\frac{\zeta'}{\zeta}(\frac{1}{2} + it)$, when t is sampled by an ergodic transformation by $Tx := \frac{1}{2}(x - \frac{1}{x})$ for $x \neq 0$.

PASCAL STUMPF (Würzburg): *Über arithmetische Folgen in primen Restklassengruppen*

Ein kleiner Ausflug an die beiden Grenzen der maximal möglichen Länge unter allen arithmetischen Folgen in einer primen Restklassengruppe, insbesondere mit ihrem Verhalten bei wachsendem Modul (und einer glitzekleinen Frage vom Primzahldra-
che).

NICOLA OSWALD (Würzburg): *On the Complex Döbblin-Lenstra-Conjecture*

In my talk I will give a proof of an analogue of the so-called Döbblin-Lenstra Conjecture, originally proven in [Bosma et al., 1983], for a certain complex continued fraction developed by Julius Hurwitz' in 1895 [Hurwitz, 1895] and modified nearly one hundred years later by Shigeru Tanaka in 1985 [Tanaka, 1985].

Bibliography:

[Bosma et al., 1983] Bosma, W., Jager, H., and Wiedijk, F. (1983). Some metrical observations on the approximation by continued fractions. *Proceedings A* 86, 3:281299.

[Hurwitz, 1895] Hurwitz, J. (1895). Ueber eine besondere Art der Kettenbruch- Entwicklung complexer Grssen, Dissertation, University of Halle. printed by Ehrhardt Karras in Halle.

[Tanaka, 1985] Tanaka, A. (1985). A complex continued fraction transformation and its ergodic properties. *Tokyo J. Math.*, 8:191214.

ANKE POHL (Göttingen): *Symbolic dynamics, a dynamical characterization of Maass cusp forms, and a reduction theory for quadratic forms*

It is well-known that the classical reduction theory for indefinite binary quadratic forms with integer coefficients as well as the Maass cusp forms for the modular group are closely related to the geodesic flow on the modular surface. We will discuss a generalization of these relations to Hecke triangle groups and show how a well-chosen symbolic dynamics for the geodesic flow on the Hecke triangle surfaces leads to a characterization of Maass cusp forms as solutions of finite-term functional equations and, simultaneously, to a geometric reduction theory for indefinite quadratic forms over $\mathbb{Z}[\lambda]$.

JACK BUTTCANE (Göttingen): *The $GL(3)$ Kuznetsov formulas*

I will discuss the status of the generalization of Kuznetsov's formulas to $GL(3)$.

PÉTER MAGA (Göttingen): *Subconvexity for supnorms of automorphic forms on $PGL(n)$*

As it was proved by Sarnak, the supnorm of eigenfunctions of the Laplacian on a compact symmetric Riemannian manifold can be estimated from above by an appropriate power (given in terms of some invariants of the space) of their Laplace eigenvalue. Examples show that Sarnak's exponent is sharp in some cases. However, when the space has also arithmetic symmetries (i.e. Hecke operators) and we restrict to joint eigenfunctions of the Laplacian and the Hecke operators, one might expect a better exponent. We prove that a better exponent exists for automorphic forms on $PGL(n, \mathbb{R})$. Joint result with Valentin Blomer.

MARC TECHNAU (Würzburg): *On a Result of F.P. Boca on the Number of Products of Certain Matrices with Trace $\leq N$*

We discuss F.P. Bocas Paper 'Products of matrices $\begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$ and $\begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix}$ and the distribution of reduced quadratic irrationals' and related topics.

HELMUT MAIER (Ulm): *Asymptotik für hohe Momente von Brjuno's Funktion*

Wir geben eine Übersicht über neue Ergebnisse aus gemeinsamen Arbeiten des Sprechers mit Michael Rassias (IAS) und verwandte Ergebnisse von Arbeiten von anderen Autoren. Diese Ergebnisse haben Bezug zur Verteilung von Kotangenssummen.