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Oberseminar ZAHLENTHEORIE

Am Mittwoch, **4. Juni**, finden im Oberseminar Zahlentheorie folgende Vorträge statt:

- 14:00 Uhr: Prof. Dr. Karma Dajani (University of Utrecht/Uni Würzburg):
  A Dynamical Approach to N-Continued Fraction Expansions
- 15:00 Uhr: Prof. Dr. Cor Kraaikamp (TU Delft):
  Quilting Natural Extensions of Continued Fraction Expansions
- 16:00 Uhr: Prof. Dr. Carsten Elsner (FHDW Hannover):
  On Errorsums

Abstracts befinden sich auf der Rückseite.

Sämtliche Vorträge finden im **Raum SE 40** des Ostgebäudes der Mathematik statt!

Natürlich sind interessierte Zuhörer herzlich willkommen!

Mit freundlichen Grüßen,

Jörn Steuding.

Prof. Dr. Karma Dajani (Uni Utrecht/Uni Würzburg):

A Dynamical Approach to N-Continued Fraction Expansions

(joint work with C. Kraaikamp and N. van der Wekken)

Abstract: Recently (2008), Edward Burger and his co-authors introduced a new class of continued fraction algorithms, the so called N-continued fraction of the form

$$x = n_0 + \cfrac{N}{n_1 + \cfrac{N}{n_2 + \ddots + \cfrac{N}{n_k + \ddots}}} = [n_0; n_1, n_2, \ldots, n_k, \cdots]_N, \quad (1)$$

where $N, d_i \in \mathbb{Z}$, $N, d_i \neq 0$. They showed that for every quadratic irrational number x there exist infinitely many eventually periodic N-continued fractions with period-length 1. In 2011, Maxwell Anselm and Steven Weintraub studied further the properties of N-continued fractions. One nice result they obtained is that for $N \geq 2$, every x between 0 and N has uncountably many N-continued fractions. In this talk we will give a dynamical approach to N-continued fraction expansions. Due to this approach, the remarkable above mentioned result by Anselm and Weintraub is immediately obvious. We also give the ergodic properties of various subclasses of N-continued fraction expansions.

Prof. Dr. Cor Kraaikamp (TU Delft):

Quilting Natural Extensions of Continued Fraction Expansions

Abstract: In 1981, Hitoshi Nakada introduced a family of continued fraction maps, and studied their natural extensions. These are the Nakada alpha-expansions, which are defined for a parameter alpha between 0 and 1. These alpha-expansions played a key role in the revival of the interest in continued fraction expansions, and are up to today subject of thorough investigations. Using some extremely basic ideas called ‘insertions’ and ‘singularizations’ we will show that there is a strong relation between alpha-expansions for various values of alpha-expansions. In this talk I will show how far these ideas can be carried over, and how they can be used in other settings, e.g. for the so-called ‘Rosen fractions.’

Prof. Dr. Carsten Elsner (FHDW Hannover):

On Errorsums

Abstract: Let $p_0/q_0, p_1/q_1, p_2/q_2, \ldots$ be the convergents of a real number α. The most common error sums are defined by

$$\mathcal{E}^*(\alpha) = \sum_{m=}^{\infty} (q_m\alpha - p_m), \qquad \mathcal{E}(\alpha) = \sum_{m=}^{\infty} |q_m\alpha - p_m|,$$

but variants of these types of errorsums are also taken into account. The talk is divided into three parts:

(1) General results on errorsums

(2) Errorsums of square roots of positive integers

(3) Errorsums for the values of the exponential function