



universität
wien

FAKULTÄT FÜR MATHEMATIK

Dekan Univ.-Prof. Dr. Radu Ioan Bot

Einladung zur öffentlichen Defensio

Sergey Yurkevich

Thema der Dissertation

Integer sequences, algebraic series and differential operators

Abstract:

Like the dissertation, the presentation will address mathematical and algorithmic problems and questions connected to integer sequences, algebraic series and differential operators. I am going to briefly summarize the main contributions and ideas of each of the thesis' chapters.

Explicitly, I will first show that a family of hypergeometric sequences can be represented as diagonals, then express the generating function of the Dubrovin-Yang-Zagier numbers in closed form, and provide a new formula for the reduced volume of any projection of the Clifford torus. Further, I will present three new algorithms solving the following problems more efficiently than previously possible: The computation of the N -th term of a q -holonomic sequence, the computation of the N -th power of a polynomial matrix, and the decision whether a given polyhedron has Rupert's property. Finally, like in the thesis, I will also answer the following three explicitly stated but previously open questions: Is the Fibonacci sequence $(F_n)_{n \geq 0}$ a constant term sequence? (No), Does the q -analog of Pólya's Theorem hold? (Not in general but for some $q \in \mathbb{C}$), Does the Truncated icosidodecahedron have Rupert's property? (Yes).

Finally, if time permits, I will speak about some interesting open questions, problems and conjectures related to the topic of the dissertation.

Prüfungssenat

Univ.-Prof. Mag. Dr. Andreas Cap
(Vorsitz, Universität Wien)

ao. Univ.-Prof. i.R. Mag. Dr. Herwig Hauser
(Universität Wien)

Prof. Dr. Wadim Zudilin
(Radboud University)

Prof. Dr. Gilles Villard
(Laboratoire LIP)

Zeit und Ort:

Zeit: 06. Juli 2023, 15:00 Uhr

Ort: Sky Lounge, Oskar-Morgenstern-Platz 1,
1090 Wien