

СЕКЦИЯ

„АЛГЕБРА И ЛОГИКА”

Драги колеги,

На 11 март 2022 г. (петък) от 14:00 часа ще се проведе дистанционно заседание на семинара по „Алгебра и логика”.

Доклад на тема

Multi-summation in difference rings and applications

ще изнесе

Carsten Schneider (Research Institute for Symbolic Computation, Johannes Kepler University, Linz, Austria).

Семинарът ще се проведе посредством платформата **Zoom** и всеки желаещ може да се присъедини като последва линка, зададен на страницата на семинара.

От секция „Алгебра и логика” на ИМИ – БАН

<http://www.math.bas.bg/algebra/seminarAiL/>

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Abstract

Symbolic summation in difference fields started with Karr's summation algorithm (1981) which can be considered as the discrete version of Risch's indefinite integration algorithm in differential fields. In the last 20 years this approach has been generalized and enhanced to a constructive summation theory of difference rings.

In general, one can represent algorithmically any expression in terms of indefinite nested sums defined over hypergeometric products in such rings. As a crucial by-product one obtains optimal representations where the arising sums and products are algebraically independent among each other. In particular, difference ring algorithms have been developed that enable one to simplify certain classes of definite multi-sums to expressions in terms of indefinite nested sums defined over

hypergeometric products.

Within this machinery one can apply Zeilberger's creative telescoping paradigm in order to compute linear recurrences for definite multi-sums and one can find all solutions of linear recurrences that can be expressed in terms of indefinite nested sums and products. In this talk we will present this algorithmic difference ring theory for symbolic summation implemented in the summation package Sigma and will illustrate its potential by non-trivial applications coming, e.g., from combinatorics and elementary particle physics.