

Otto-von-Guericke-Universität Magdeburg
Fakultät für Mathematik

Auf Einladung des Institutes für Algebra und Geometrie spricht

Herr Prof. Dr. Ivan Soprunov

(Cleveland State University)

über das Thema

Zeros of sparse polynomials over finite fields

Zoom-Koordinaten: Meeting ID: 971 4945 5855 / Passcode:490213

Zeit: Dienstag, 19. Oktober 2021, 13.00 Uhr

Zu diesem Vortrag laden wir alle Interessierten herzlich ein.

Prof. Dr. Benjamin Nill

Abstract: Fix a lattice polytope P and consider the family of polynomials whose monomials have exponents in P and whose coefficients are arbitrary elements of a finite field F_q . Our goal is to estimate the maximum number of F_q -zeros of the polynomials in such a family in terms of geometric/combinatorial invariants of P . When q is large, the maximum is given by polynomials with the largest number of factors. On the combinatorial side, this corresponds to “maximal Minkowski decompositions” inside P . I will first explain this connection and review the previously known case of bivariate polynomials (i.e. $\dim P = 2$). I will then focus on the case of trivariate polynomials (i.e. $\dim P = 3$) where the combinatorics is much richer and new phenomena arise. This problem has a direct application to minimum distance estimation for a class of linear error-correcting codes, called “toric codes”. The talk is based on a joint work with Kyle Meyer and Jenya Soprunova.