



universität
wien

Fakultät für Mathematik

Mathematisches Kolloquium

EINLADUNG

Albrecht Böttcher
(TU Chemnitz)

"Lattice theory and Toeplitz determinants"

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Abstract:

A lattice is a discrete subgroup of a finite-dimensional Euclidean space. A basic quantity of every lattice is the volume of its fundamental domains. This volume is the determinant of some matrix, and in several interesting cases this matrix is just a perturbed Toeplitz matrix. The generating function of this Toeplitz matrix is in general not well-behaved, so that the classical Szego limit theorem for Toeplitz determinants cannot be used. It rather turns out that the generating function is often a so-called Fisher-Hartwig symbol. As such symbols are also emerging in statistical physics, their determinants have been thoroughly studied for decades. The results of these studies now prove to be of use in lattice theory. The talk is an introduction to some aspects of lattice theory and Toeplitz determinants. It touches in particular the Minkowski-Hlawka bound and the perfect lattice induced by the equiangular tight (7,28) frame. It also exhibits some recent results obtained in joint work of the speaker with Lenny Fukshansky, Stephan Ramon Garcia, Hiren Maharaj, and Deanna Needell.

Zeit: Mittwoch 23. November 2016
15.45 Uhr Kaffeejause,
16.15 Uhr Vortrag,
vinum cum pane im Anschluss

Ort: Fakultät für Mathematik,
Oskar-Morgenstern-Platz 1,
Sky Lounge

Karlheinz Gröchenig
Christian Krattenthaler