

## Number Theory Seminar

# Applications of Diophantine Equations to Combinatorial Problems

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**ABSTRACT:** We discuss some problems of combinatorial number theory which can be attacked by methods from diophantine approximation. The first type of problems has a geometric origin: counting lattice points in octahedra or studying point distributions in squares and cubes. Explicit and asymptotic formulas are obtained and analyzed by means of diophantine equations. This yields ineffective finiteness results as well as effective results. A specific application is the construction of a non-lacunary point sequence with optimal metric discrepancy bound which proves a conjecture of R.C. Baker. The second class of problems is related to additive representations of algebraic integers by units. It is easy to determine all quadratic number fields such that every integer is a sum of units. For general number fields this is an open problem. We present some results concerning more general fields. The method heavily depends on diophantine equations, in particular on Thue equations.

**Date:** Friday, 26.01.2007 at 14.15pm

**Place:** HWZ (HG G43)

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