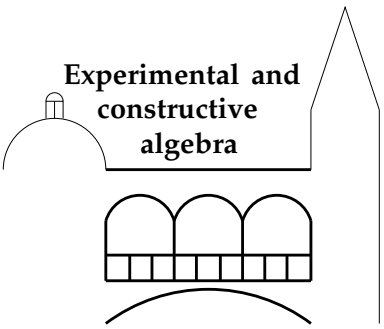
Graduiertenkolleg

Experimentelle und konstruktive Algebra



Kolloquiumsvortrag

Dienstag, 15. Mai 2018, 14:00 Uhr, Hörsaal V

Gabriele Nebe (Lehrstuhl D für Mathematik):

Strongly perfect lattices sandwiched between Barnes-Wall lattices

New series of 2^{2m}-dimensional universally strongly perfect lattices Λ_I and Γ_J are constructed with

$$2BW_{2m}^{\#} \subseteq \Gamma_J \subseteq BW_{2m} \subseteq \Lambda_I \subseteq BW_{2m}^{\#}.$$

for subsets $I, J \subseteq \{0, \ldots, m\}$ such that $m - i$ is odd and $m - j$ is even for all $j \in J$, $i \in I$. The lattices are found by restricting the spin representations of the automorphism group of the Barnes-Wall lattice to its subgroup $\mathcal{U}_m := \mathcal{C}_m(4_{\mathbf{1}}^H)$. The group $\mathcal{U}_m$ is the Clifford-Weil group associated to the Hermitian self-dual codes over $\mathbf{F}_4$ containing $\mathbf{1}$, so the ring of polynomial invariants of $\mathcal{U}_m$ is spanned by the genus-m complete weight enumerators of such codes. This allows us to show that all the $\mathcal{U}_m$ invariant lattices are universally strongly perfect. We introduce a new construction, $D^{(cyc)}$, for chains of (extended) cyclic codes to obtain (bounds on) the minimum of the new lattices.

This is joint work with Sihuang Hu.

Wir laden alle Interessierten herzlich ein.