

Applied Analysis Seminar

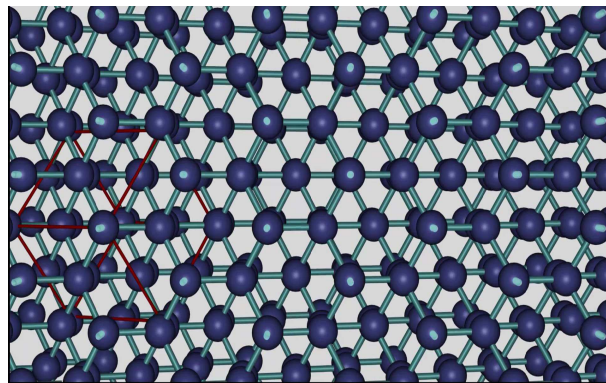
Thursday, April 28th
14:15, SR 1

Institut für Angewandte Mathematik
Mathematikon

Theta functions and minimization of interaction energies

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At the microscopic scale, most crystals are composed of atoms which are arranged on a periodic lattice, which can be viewed as a minimizer of a certain interaction energy. The goal of this talk is to explain how to minimize some finite lattice energies

$$E_f[L] = \sum_{p \in L \setminus \{0\}} f(|p|^2),$$

among Bravais lattices $L \subset \mathbb{R}^2$, when f is a long-range interacting potential. By using a result of Montgomery about theta functions, we will show several properties of optimality and non-optimality of the triangular lattice for E_f , with or without a density constraint.