Discrete Bethe–Sommerfeld conjecture

Rui Han*

rui.han@math.gatech.edu

We will talk about discrete versions of the Bethe–Sommerfeld conjecture. Namely, we study the spectra of multi-dimensional periodic Schrödinger operators on various discrete lattices with sufficiently small potentials. In particular, we provide sharp bounds on the number of gaps that may perturbatively open, we characterize those energies at which gaps may open, and we give sharp arithmetic criteria on the periods that ensure no gaps open. We will also provide examples that open the maximal number of gaps and estimate the scaling behavior of the gap lengths as the coupling constant goes to zero.

This talk is based on a joint work with Svetlana Jitomirskaya and another work with Jake Fillman.

*School of Mathematics, Georgia Institute of Technology, 686 Cherry Street, Atlanta, GA 30332-0160, USA