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Jake Fillman and **Rui Han***, School of Mathematics, Georgia Tech, 686 Cherry St., Atlanta, GA 30332, and **Svetlanta Jitomirskaya**. *Discrete Bethe-Sommerfeld Conjecture*.

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. (Received September 23, 2018)