

1079-05-123

Toshikazu Sunada* (sunada@math.meiji.ac.jp). *Discrete Abel-Jacobi maps and Crystallography.*

From the mathematical view, a crystal structure as a graph (a 1-dimensional cell complex or a network, in other words) is simply an abelian covering graph over a finite graph. Among infinitely many possible placements in space of a given crystal structure, there is a “canonical” one which is characterized by a certain minimal principle, and was used to describe asymptotic behaviors of simple random walks on crystal lattices (M. Kotani and T. Sunada, 2000). This talk will address some recent results about the canonical placement of the maximal abelian covering graph over a finite graph. It is observed that the canonical placement is closely related to an analogue of Abel-Jacobi maps in algebraic geometry, which is a map (morphism) from the finite graph into the Cayley graph associated with a finite abelian group. (Received January 04, 2012)