For Favour of posting

The Hong Kong University of Science and Technology

Department of Mathematics

Mathematics Colloquium

Phase transitions and scaling limits in lattice models

By

Dr. Zhongyang LI

University of Connecticut

Abstract

The perfect matching is a subset of a graph where each vertex is incident to exactly one edge. It is a natural mathematical model for molecule structures, and can provide exact solutions to various other statistical mechanical models, including the celebrated Ising model and the 1-2 model. We will discuss the limit shape of the perfect matching when a rescaled graph approximates a certain simply-connected domain in the plane, as well as the frozen boundary, which is the boundary separating the frozen region and the liquid region.

A closely related model is the 1-2 model, which is a probability measure on subgraphs of the hexagonal lattice where each vertex is incident to 1 or 2 edges. With the help of the dimer model, we can obtain a sharp phase transition result for the 1-2 model. We will also discuss the exact formula to compute the probability that a path occurs in a 1-2 model configuration, and almost sure non-existence of an infinite path, with the help of the mass-transport principle.

Date: **Tuesday, 29 January 2019****

Time: **11:00 a.m. – 12:00 p.m.****

Venue: **Room 2465, Academic Building (near Lifts 25-26), HKUST**

All are welcome!

Revised on 10 Jan 2019