

Special Matrix Computations & Scientific Computing Seminar

Organizer(s): Lek-Heng Lim

Monday, 11:30am–12:30pm (**Note special time**), 380 Soda

Oct. 26 **Prof. Shmuel Friedland**, University of Illinois at Chicago

Theoretical and computational methods in statistical mechanics

In this lecture, for a general mathematical audience, we will discuss theoretical and computational aspect of the Pott's model in statistical mechanics on the integer lattice in d -dimensional space. (The Pott's models are generalizations of Ising model.) We will introduce the notion of the grand partition function and pressure. We will relate the first order transition in Pott's models to non-differentiability of corresponding Lipschitz convex functions. We will demonstrate the computability of the pressure using rigorous upper and lower bounds via the transfer matrices. This lecture is dedicated to the memory of my colleague and collaborator Uri N. Peled, and is based on our joint paper <http://arxiv.org/abs/0906.5176> An early variant of this talk is available at <http://www2.math.uic.edu/friedlan/preshusem12.06.pdf>