Combinatorics
Seminar

Reconstructing Random Pictures

Corrine Yap
Georgia Tech

Abstract: Reconstruction problems ask whether or not it is possible to uniquely build a discrete structure from the collection of its substructures of a fixed size. This question has been explored in a wide range of settings, most famously with graphs and the resulting Graph Reconstruction Conjecture due to Kelly and Ulam, but also including geometric sets, jigsaws, and abelian groups. In this talk, we'll consider the reconstruction of random pictures (n-by-n grids with binary entries) from the collection of its k-by-k subgrids and prove a nearly-sharp threshold for k = k(n). Our main proof technique is an adaptation of the Peierls contour method from statistical physics. Joint work with Bhargav Narayanan.

Wednesday, August 30, 2023, 4:00 pm
Mathematics and Science Center: MSC E406

Mathematics
Emory University