Probability Seminar

Title: Rotating trapped fermions in 2d and the complex Ginibre ensemble

Speaker: Satya Majumdar (Orsay)

Date: Wed 12th June 2019 at 2:00PM

Location: Seminar Room SCN 1.25

Abstract: We establish an exact mapping between the positions of N noninteracting fermions in a 2d rotating harmonic trap in its ground-state and the eigenvalues of the NxN complex Ginibre ensemble of Random Matrix Theory (RMT). Using RMT techniques, we make precise predictions for the statistics of the positions of the fermions, both in the bulk as well as at the edge of the trapped Fermi gas. In addition, we compute exactly, for any finite N, the Rényi entanglement entropy and the number variance of a disk of radius r in the ground-state. We show that while these two quantities are proportional to each other in the (extended) bulk, this is no longer the case very close to the trap center nor at the edge. Near the edge, and for large N, we provide exact expressions for the scaling functions associated with these two observables.