Large deviations for the empirical field of Coulomb and Riesz systems

Abstract:
We study a system of $N$ particles with Coulomb/Riesz pairwise interactions under a confining potential. After rescaling we deal with a microscopic quantity, the associated empirical point process, for which we give a large deviation principle whose rate function is the sum of a relative entropy and of the "renormalized energy" defined by Sandier-Serfaty. We also present applications to point processes emerging from random matrix theory. This is joint work with S. Serfaty.