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Sylvia Serfaty*, serfaty@cims.nyu.edu. *LDP and CLT for Log and Coulomb Gases.*

We present a Large Deviation Principle for large systems of particles with logarithmic interactions in 1D and 2D, or more general inverse power (= Riesz) interactions, including Coulomb interactions. The LDP lies at next to leading order and is expressed in terms of the microscopic point processes or "empirical fields". In the case of the 1D and 2D logarithmic interactions, we also present a Central Limit Theorem for the fluctuations from the macroscopic distribution. All the results are valid for arbitrary values of the inverse temperature, and fairly general confining potentials. This is based on joint work with Thomas Leblé, and Florent Bekerman and Thomas Leblé. (Received February 14, 2018)