

# CONCENTRATION FOR COULOMB GASES AND COULOMB TRANSPORT INEQUALITIES

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This talk will present a recent joint work with Mylène Maïda and Adrien Hardy on the non-asymptotic behavior of Coulomb gases in dimension two and more. Such gases are modeled by an exchangeable Boltzmann-Gibbs measure with a singular two-body interaction. We obtain concentration of measure inequalities for the empirical distribution of such gases around their equilibrium measure, with respect to bounded Lipschitz and Wasserstein distances. This implies macroscopic as well as mesoscopic convergence in such distances. In particular, we improve the concentration inequalities known for the empirical spectral distribution of Ginibre random matrices. Our approach is remarkably simple and bypasses the use of renormalized energy. It crucially relies on new inequalities between probability metrics, including Coulomb transport inequalities which can be of independent interest.