Coulomb gases: dynamics and statistical equilibrium

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We consider large systems of points with Coulomb interactions, sometimes generalized to Riesz interactions. These arise for instance in random matrix theory, statistical and plasma physics and models of quantum mechanics. We will present an electric approach that allows both to derive mean-field limits for dynamics (for instance gradient flows) of such systems, and to study their Gibbs measure. In the latter case, results aim at describing the system down to the microscale, characterize fluctuations and limit point processes and connect with crystallization questions as the temperature vanishes.