

M A T H E M A T I C A L P H Y S I C S S E M I N A R

Rutgers University
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Towards crystallization in Coulomb systems

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Abstract

We are interested in the statistical mechanics of (classical) two-dimensional Coulomb gases and one-dimensional log gases in a confining potential. We connect the Hamiltonian to the “renormalized energy”, a way to compute the total Coulomb interaction of an infinite jellium, and whose minimum is expected to be achieved by the triangular lattice in 2D, and is achieved by the lattice $\mathbb{Z}$ in 1D. We apply this to the study of the finite temperature situation. Results include computations of the next order term in the partition function, equidistribution of charges, and concentration to the minimizers of the renormalized energy as the temperature tends to zero. This is based on joint works, mostly with Etienne Sandier.