UNIVERSITÄT BIELEFELD

Faculty of Physics
Faculty of Mathematics

THE UNIVERSITY OF MELBOURNE

Seminar

Bielefeld - Melbourne Random Matrices

Yacin Ameur

Lund University

Localization and Freezing for the Planar Coulomb Gas in an External Field

We will consider a Coulomb gas consisting of a large number n of identical repelling (logarithmically interacting) point charges, subject to an external field which confines the gas to a finite portion of the plane known as the "droplet". The statistical properties of the gas depend critically on the inverse temperature $\beta=1/(k_BT)$.

During my talk I will discuss two recent kinds of results.

The first one makes precise the physical intuition that the gas should with high probability be localized to a small neighbourhood of the droplet. Results of this kind have been known earlier only in the case $\beta=1$ and for special potentials. (In particular, Brian Rider has given very precise results for the classical Ginibre ensemble.)

The second group of results are valid at low temperatures ($\beta>c\log n$ where n is number of particles) and shows that (under natural assumptions) almost every sample is uniformly separated and equidistributed in the droplet, all the way up to the boundary. These results, which are joint with José-Luis Romero, generalizes and improves on earlier results on the distribution of Fekete-configurations, corresponding to the temperature zero.

Wednesday, 20 January 2021, 0900 hrs CET

Zoom Konferenzschaltung– Please contact Thorsten Neuschel (thorsten.neuschel@math.uni-bielefeld.de) for details regarding access

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