UNIVERSITÄT BIELEFELD

Faculty of Physics
Faculty of Mathematics

THE UNIVERSITY OF MELBOURNE

Seminar

Bielefeld - Melbourne Random Matrices

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A New Approach to Local and Global Statistics for the Elliptic Ginibre Ensemble in Higher Dimensions

The complex elliptic Ginibre ensemble allows one to interpolate between the Ginibre ensemble and the Gaussian Unitary ensemble. It represents a determinantal point process in the complex plane with corresponding kernel, constructed with planar Hermite polynomials. Our main tool is a saddle point analysis of a single contour integral representation of this kernel. It provides a unifying approach to rigorously derive several known and new results of local and global spectral statistics.

In particular, we prove rigorously some global statistics in the elliptic Ginibre ensemble first derived by Forrester and Jancovici. The limiting kernel receives its main contribution from the boundary of the limiting elliptic droplet of support.

We introduce a d-complex dimensional generalization of the elliptic Ginibre ensemble, which interpolates between d-real and d-complex dimensions. In the Hermitian limit, this new ensemble is related to non-interacting Fermions in a trap in d-real dimensions with d-dimensional harmonic oscillator. We provide new local bulk and edge statistics at weak and strong non-Hermiticity for this new ensemble.

This is joint work with Gernot Akemann and Maurice Duits.

Wednesday, 13 April 2022, 0900 hrs CEST

Zoom Konferenzschaltung— Please contact Leslie Molag (lmolag@math.uni-bielefeld.de) for details regarding access

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