UNIVERSITÄT BIELEFELD

Faculty of Physics
Faculty of Mathematics

THE UNIVERSITY OF MELBOURNE

Seminar

Bielefeld - Melbourne Random Matrices

Dan Dai

City University of Hong Kong

Asymptotics of Fredholm determinant associated with the Pearcey kernel

The Pearcey kernel is a classical and universal kernel arising from random matrix theory, which describes the local statistics of eigenvalues when the limiting mean eigenvalue density exhibits a cusp-like singularity. It appears in a variety of statistical physics models beyond matrix models as well.

In this talk, we consider the Fredholm determinant $\det(I-\gamma K^{Pe}_{s,\rho})$, where $0 \le \gamma \le 1$ and $K^{Pe}_{s,\rho}$ stands for the trace class operator acting on $L^2(-s, s)$ with the classical Pearcey kernel. Based on a steepest descent analysis for a 3 by 3 matrix-valued Riemann-Hilbert problem, we obtain asymptotics of the Fredholm determinant as $s \to +\infty$, which is also interpreted as large gap asymptotics in the context of random matrix theory.

This is a joint work with Shuai-Xia Xu and Lun Zhang.

Wednesday, 07 October 2020, 0900 hrs CEST

Zoom Konferenzschaltung— Please contact Anas Rahmann (anas.rahman@unimelb.edu.au) for details regarding access

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