



**UNIVERSITÄT  
BIELEFELD**



Faculty of Physics



Faculty of Mathematics



THE UNIVERSITY OF  
MELBOURNE

# Seminar

Bielefeld - Melbourne Random Matrices

## Meng Yang

University of *Copenhagen*

### **Determinantal Coulomb gas ensembles with a class of discrete rotational symmetric potentials**

We consider determinantal Coulomb gas ensembles with a class of discrete rotational symmetric potentials whose droplets consist of several disconnected components. Under the insertion of a point charge at the origin, we derive the asymptotic behaviour of the correlation kernels both in the macro- and microscopic scales.

In the macroscopic scale, this particularly shows that there are strong correlations among the particles on the boundary of the droplets. In the microscopic scale, this establishes the edge universality. For the proofs, we use the nonlinear steepest descent method on the matrix Riemann-Hilbert problem to derive the asymptotic behaviours of the associated planar orthogonal polynomials and their norms up to the first subleading terms. Based on the joint work with Sung-Soo Byun. (arXiv:2210.04019).

**Wednesday, 1<sup>st</sup> February 2023,  
0900 hrs CET**

Zoom Conference call— Please contact Leslie Molag  
([lmolag@math.uni-bielefeld.de](mailto:lmolag@math.uni-bielefeld.de)) for details regarding access