



**UNIVERSITÄT  
BIELEFELD**



Faculty of Physics



Faculty of Mathematics



THE UNIVERSITY OF  
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# Seminar

Bielefeld - Melbourne Random Matrices

## Sho Matsumoto

University of Kagoshima

### Moments of partial traces and Weingarten calculus

We consider a uniform random Hermitian matrix acting on the tensor product of two finite-dimensional vector spaces, and study the probability distribution of its partial traces (marginals). More specifically, we find formulas for mixed moments of matrix entries of partial traces. Our main tool is Weingarten calculus, which provides a method for computing integrals of polynomial functions with respect to Haar measure on the unitary group. This talk is based on joint work with Colin McSwiggen (arXiv:2210.11349).

**Wednesday, 25 January 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