

Institute for Applied Mathematics, Bonn University

## Oberseminar Stochastik

Thursday, 22 May 2025, 16:30

Lipschitz-Saal (LWK 1.016)

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## Zigzag strategy for random matrices

It is a remarkable property of random matrices, that their resolvents tend to concentrate around a deterministic matrix as the dimension of the matrix tends to infinity, even for a small imaginary part of the involved spectral parameter. These estimates are called local laws and they are the cornerstone in most of the recent results in random matrix theory.

In this talk, I will present a novel method of proving single-resolvent and multi-resolvent local laws for random matrices, the Zigzag strategy, which is a recursive tandem of the characteristic flow method and a Green function comparison argument. Novel results, which we obtained via the Zigzag strategy, include the optimal Eigenstate Thermalization Hypothesis (ETH) for Wigner matrices, uniformly in the spectrum, and universality of eigenvalue statistics at cusp singularities for correlated random matrices.

Based on joint works with G. Cipolloni, L. Erdős, O. Kolupaiev, and V. Riabov.