

Institute for Applied Mathematics, Bonn University

Oberseminar Stochastik

Thursday, 15 October 2026, 16:30

Lipschitz-Saal (LWK 1.016)

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Beyond local laws: expectation and decorrelation.

Let $W = W^*$ be a large random matrix. For a broad range of ensembles it is known that the resolvent $G(z) := (W - z)^{-1}$ concentrates around a deterministic quantity as long as $|\operatorname{Im} z|$ is larger than the local eigenvalue spacing of W . This is the so-called single-resolvent local law. Multi-resolvent local laws extend this framework by showing that products of several resolvents also concentrate. In this talk, I will discuss two phenomena that provide additional information beyond the standard local laws: decorrelation in energy space and gains from taking expectations. I will also present several recent applications of these results, which would not be accessible via standard local laws. These applications include non-Gaussian corrections to fluctuations in local laws, law of fractional logarithm for Wigner minor process and hyperuniformity of eigenvalues of non-Hermitian random matrices. The talk is based on several recent joint works with Z. Bao, G. Cipolloni, L. Erdős and J. Henheik.