Institute for Applied Mathematics, Bonn University

Oberseminar Stochastik

Thursday, 10 July 2025, 16:30 Lipschitz-Saal (LWK 1.016)

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Kac-Rice inspired approach to non-Hermitian random matrices

Beyond the framework of standard Ginibre ensembles one of the general tools available for studying non-Hermitian random matrices is the "Hermitization Trick" due to Girko. I will describe an alternative approach based on Kac-Rice counting formulas which provides access not only to eigenvalues but also to nontrivial right eigenvectors of non-Hermitian random matrices. To illustrate power of the approach I will consider a family of matrices interpolating between complex Ginibre and real Ginibre ensembles, which in particular allows one to reveal a new scaling regime of "weak non-reality" arising as $N \to \infty$. This part will be based on the recent preprint arXiv:2506.21058. If time allows, I will also briefly discuss some results on notoriously difficult case of complex symmetric matrices, obtained by the same method in collaboration with Gernot Akemann and Dmitry Savin.