UNIVERSITÄT BIELEFELD

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# Phase Transition of Eigenvector for Spiked Random Matrices


In this talk, we will first review some recent results on the eigenvectors of random matrices under fixed-rank deformation, and then we will focus on the limit distribution of the leading eigenvectors of the Gaussian Unitary Ensemble (GUE) with fixed-rank (aka spiked) external source, in the critical regime of the Baik-Ben Arous-Peche (BBP) phase transition. The distribution is given in terms of a determinantal point process with extended Airy kernel. Our result can be regarded as an eigenvector counterpart of the BBP eigenvalue phase transition. The derivation of the distribution makes use of the recently rediscovered eigenvector-eigenvalue identity, together with the determinantal point process representation of the GUE minor process with external source. This is a joint work with Dong Wang (UCAS).


**Wednesday, May 04, 2022,**
**09:00 via Zoom**
**www.physik.uni-bielefeld.de**