Abstract:

Determinantal point processes arise in the description of eigenvalues of unitary invariant Hermitian random matrices, as well as in many statistical mechanics models such as random tilings, non-intersecting paths, etc. I will explain a cumulant method developed by A. Soshnikov to analyze the asymptotics distributions of linear statistics of determinantal processes and certain combinatorial identities associated with the sine process. I will present some applications to orthogonal ensembles and, if time permits, to certain biorthogonal ensembles and discuss some models which exhibit a transition from Poisson to GUE.