Orthogonal polynomials, partition functions and asymptotics

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The asymptotic analysis of orthogonal polynomials, on the real line as well as in the complex plane, has proven very fruitful in the study of the partition function and free energy of certain ensembles of random matrices, as the size of the matrices N tends to infinity. In this talk, we will present the general theory and illustrate it with two examples, both with weights of the form $w(z) = e^{-NV(z)}$, where $V(z)$ is a polynomial of degree 2 or 3.

This is joint work with Pavel M. Bleher and Maxim Yattselev (Indiana University-Purdue University Indianapolis, United States).

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