מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Geometric Functional Analysis and Probability Seminar

Room 261 ,Ziskind Building
on Thursday, Feb 18, 2016
at 11:15

Evgeny Strahov
Hebrew University of Jerusalem

Determinantal processes related to products of random matrices

Abstract:

I will talk about determinantal processes formed by eigenvalues and singular values of products of complex Gaussian matrices. Such determinantal processes can be understood as natural generalizations of the classical Ginibre and Laguerre ensembles of Random Matrix Theory, and the correlation kernels of these processes can be expressed in terms of special functions/double contour integrals. This enables to investigate determinantal processes for products of random matrices in different asymptotic regimes, and to compute different probabilistic quantities of interest. In particular, I will present the asymptotics for the hole probabilities, i.e. for probabilities of the events that there are no particles in a disc of radius r with its center at 0, as r goes to infinity. In addition, I will explain how the gap probabilities for squared singular values of products of random complex matrices can be described in terms of completely integrable Hamiltonian differential equations, and how to interpret these Hamiltonian differential equations as the monodromy preserving deformation equations of the Jimbo, Miwa, Mori, Ueno and Sato theory. Finally, I will discuss certain time-dependent determinantal processes related to products of random matrices.