



UNIVERSITY OF ROCHESTER

Department of Mathematics Colloquium Series

ABSTRACT

Random Matrix Theory (RMT) models a wide variety of phenomena in physics, pure and applied mathematics, and also in other branches of knowledge. More precisely, eigenvalues of a large random matrix provide a very good model for correlated quantities that arise in many problems, such as electron energy levels of the hydrogen atom in a strong magnetic field, or time intervals between buses when drivers try to optimize the traffic flow. Methods of RMT are also applicable to many other problems, such as random growth, lattice percolation problems, patience sorting.

In this talk we will concentrate on the study of the eigenvalues of a random matrix as its entries undergo diffusion. This problem was introduced very early on by Dyson in connection with Gaussian Unitary Ensembles of random matrices. We call any process on ensembles of random matrices in which the entries undergo diffusion a Dyson process. From such Dyson processes various scaling limits are taken that lead to new, universal processes. Two particularly important examples are the Airy process and the Pearcey process, so named because of the nature of the underlying singularity (a fold singularity and a cusp singularity, respectively). This talk will survey these recent developments.

The talk is addressed to an audience with interest in mathematics.

Professor Craig Tracy

Winner of the George Polya Prize (SIAM, 2002)

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The Airy and Pearcey Processes

Thursday, May 4, 3:30-4:30 p.m.
Hoyt Auditorium

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