

Colloquium ICMAT-UCM

UNIVERSALITY IN RANDOM MATRIX THEORY

SPEAKER: Prof. Arno Kuijlaars (Department of Mathematics, KU Leuven, Belgium)

DATE: Friday, 3 November, 2017 - 13:00 h

VENUE: Room B14, Faculty of Mathematics, Universidad Complutense de Madrid

ABSTRACT: Eigenvalues of large random matrices have a remarkable behavior as the size of the matrices tends to infinity. The local repulsion of eigenvalues leads to microscopic limit laws that are independent of the fine details of the random matrix model. This universality phenomenon was observed by Wigner in the 1950s and proved by mathematicians in great generality since the 1990s. Deviations from universality correspond to phase transitions in limiting eigenvalue behavior that can be analyzed with nonlinear special functions: the Painlevé transcendents. For example the breaking of a spectral gap corresponds to a special solution of the Painlevé II equation.

In the talk I will give an overview of these developments. I will also discuss the more recently discovered universal behavior for eigenvalues and singular values of products of random matrices.

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