

# Seminar of Probability and Stochastic Process

Tuesday, 8th March, from 11h15 to 12h15

[ME A0 407](#), EPFL, Ecublens

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**UMPA, ENS Lyon**

## Random matrix theory and Free probability

### Abstract:

In this talk, we shall study the global asymptotics of the spectrum of large random matrices. For a wide class of hermitian random matrices, for instance with i.i.d. subdiagonal entries with a second moment, it is known that under an appropriate scaling the empirical eigenvalue distribution converges to a deterministic measure which does not depend on the details of the distribution of the entries.

Free probability theory was introduced in the 90's by Voiculescu as a non commutative theory of probability. It has been shown to be the theory providing notations and tools to study random matrices with size going to infinity. To illustrate this connection I shall present two results of what is called "asymptotic freeness": the first concerns the weak convergence of the empirical eigenvalue distribution of polynomials in random matrices, the second one concerns the convergence of the operator norm of such matrices.

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