Contribution Title:	MATRIX MODELS, ENUMERATION OF MAPS AND FREE PROBABILITY
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Matrix integrals are well known to be connected with the problem of enumerating maps since the work of 't Hooft and Brézin-Itzykson-Parisi-Zuber in the seventies. This seminal observation had many applications in QFT and QCD. They showed in particular that matrix models converge as the dimension of the matrices goes to infinity towards generating functions for the enumeration of planar maps, that is, connected graphs embedded into the sphere.

On the other hand, Voiculescu discovered in the eighties that the right way to look at certain problems related with free groups was by imitating some basic probability theory. One of his central observations was that such groups can be equipped with tracial states (also called traces), which resemble expectations in classical probability, whereas the property of freeness can be seen as a notion similar to independence in classical probability. This led to free probability, which is a probability theory for noncommutative variables where many concepts taken from probability theory such as the notions of laws, convergence in law, independence, central limit theorem, Brownian motion, entropy, and more can be naturally defined. In the nineties, he showed that independent random matrices converge as their dimension goes to infinity to free variables. Moments of such variables can be described by planar maps.

In this talk, we shall provide further connections between free probability, the enumeration of maps and random matrices. In particular, we will illustrate the uses of free probability in the analysis of matrix models and vice-versa.