

INSTITUTUL DE MATEMATICA “SIMION STOILOW” AL ACADEMIEI ROMANE

**Conferința lunară**

***The characteristic polynomial of a random matrix: a remarkable mathematical object***

**Ashkan Nikeghbali**

(Univ. of Zürich, Switzerland)

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**Abstract:** We shall start with a simple random variable: the characteristic polynomial of a random unitary matrix. This object has appeared in the past decades in many areas of physics and mathematics (supersymmetry, number theory, representation theory, probability theory, etc.) and many remarkable facts, computations and challenges have emerged from the many works around it. In this talk, I shall review some of these facts, and show how the complexity of the problem increases when one goes from considering the characteristic polynomial at one point as a single random variable to considering it as a random variable taking values in the space of analytic functions. I shall then take this point of view to other random matrix ensembles and try to formulate some universality type results. Throughout the talk, the conjectured connections with the distribution of values of the Riemann zeta function on the critical line will serve us as a guide.