

ICTS Mathematics Colloquium

Title : Non-asymptotic approach in random matrix theory

Speaker : Mark Rudelson, University of Michigan, USA

Date : Monday, December 23, 2019

Time : 2:30 PM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : Random matrices arise naturally in various contexts ranging from theoretical physics to computer science. In a large part of these problems, it is important to know the behavior of the spectral characteristics of a random matrix of a large but fixed size.

We will discuss a recent progress in this area illustrating it by problems coming from combinatorics and computer science. In particular, we will consider the condition number of a random matrix which characterizes error accumulation when a linear system is solved numerically. We will also show how random matrix theory allows to estimate the number of perfect matchings in a deterministic graph. Towards the end of the talk, we will discuss an application of random matrices to a well-known paradox in traffic networks. Adding a highway to an existing highway network leads sometimes to increased traffic jams. This phenomenon has been recently explained on a toy model using random matrices.