



# INDIAN STATISTICAL INSTITUTE

Theoretical Statistics and Mathematics Unit, Kolkata

## SEMINAR

Date: July 24, 2024

Time: 04:15 PM

### VENUE:

**L- 1**

(3<sup>rd</sup> Floor, A.N. Kolmogorov Bhavan), ISI Kolkata

### TITLE:

## **Bulk Spectrum of Adjacency Matrices of Random Hypergraphs**

### SPEAKER:

**Dipranjan Pal**

Stat-Math Unit, ISI Kolkata

### ABSTRACT:

*In this talk we consider an adjacency matrix type matrix of  $Erd\{o\}s-R\{e\}nyi$   $r$ - uniform random hypergraph, which is a direct generalisation of the adjacency matrix of random graphs. The matrix looks like  $\sum_{\ell=1}^M Y_{\ell} a_{\ell} a^T_{\ell}$ , where  $Y_{\ell}$ 's are i.i.d mean 0 variance 1 random variables and  $a_{\ell}$ 's are deterministic vectors. We prove a universality result for this model. The entries of the matrix are not independent, they have a special correlation structure depending on  $r$ . We also discuss the LSD of the matrix when the correlations are small, i.e on the regime  $r = o(\sqrt{n})$ . This is an ongoing work with Dr. Soumendu Sundar Mukherjee.*

**ALL ARE CORDIALLY INVITED**