



**Theoretical Statistics and Mathematics Unit, Kolkata**  
**INDIAN STATISTICAL INSTITUTE**

**SEMINAR**

**Date: January 13, 2025**

**Time: 02:30 PM**

**VENUE:**

**L- infinity**

**(5<sup>th</sup> Floor, A.N. Kolmogorov Bhavan), ISI Kolkata**

**TITLE:**

**Different Approaches to Quantum Graphs**

**SPEAKER:**

**Purbayan Chakraborty**

University of Warsaw, Poland

**ABSTRACT:**

*The notion of quantum graphs as non-commutative generalisation of classical confusability graphs of an information channel initially arose from the study of information theory. It treated them as an operator system. Wang and Banica interpreted finite dimensional  $C^*$  algebra as a finite quantum space and studied their quantum symmetries. Building on it Weaver introduced the notion of quantum relations on quantum space and thus gave non-commutative analogues of classical simple graphs. Later several other operator algebraic approaches emerged e.g. quantum adjacency matrices, edge projections etc. to define the idea of quantum graphs. Recently, following Banica's work quantum symmetries of quantum graphs have also been studied. In this talk we will discuss these several approaches to define quantum graphs and present their equivalences. We will talk about how to construct examples of such objects. If time permits we will briefly try to talk about the quantum symmetries of quantum graphs.*

**ALL ARE CORDIALLY INVITED**