



# INDIAN STATISTICAL INSTITUTE

Theoretical Statistics and Mathematics Unit, Kolkata

## LECTURE

Date: February 05, 2024

Time: 04:15 PM

### VENUE:

**L-infinity**

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

### TITLE:

**Quantum Statistical Inference**

### SPEAKER:

**Samriddha Lahiry**

Harvard University

### ABSTRACT:

*Recent advancements in quantum technology, such as quantum computing, communication, and metrology, have given rise to questions related to quantum measurements, which can be elegantly formulated in the language of mathematical statistics. However, quantum mechanics, inherently noncommutative, yields inferential results that are distinctly non-trivial, compared to their counterparts in classical statistics. In classical statistics, a fundamental paradigm involves approximating complex models with simpler ones. One commonly establishes asymptotic equivalence between i.i.d models, characterized by a local parameter, and a Gaussian shift model. This approximation, known as local asymptotic normality (LAN), facilitates the construction of an estimator based on a procedure in the Gaussian model, offering comparable risk bounds. Notably, local asymptotic equivalence can be extended to quantum scenarios, linking quantum i.i.d. models with quantum Gaussian models. In this context, we obtain optimal estimators in the complex former models based on optimal estimators in the simpler latter models.*

**ALL ARE CORDIALLY INVITED**