



# INDIAN STATISTICAL INSTITUTE

Theoretical Statistics and Mathematics Unit, Kolkata

## SEMINAR

Date: July 19, 2023, Wednesday  
Time: 04:15 PM

### VENUE:

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

### TITLE:

Attributed preferential attachment: local weak limits,  
Page-rank and sampling

### SPEAKER:

**Sayan Banerjee**  
University of North Carolina at Chapel Hill

### ABSTRACT:

*We investigate growing random networks, comprising nodes with different attribute types (communities), which evolve under the combined effect of node popularity (graph degree) and interaction between attributes (some attribute propensity kernel). Using stochastic approximation techniques, we show that local neighborhoods of typical nodes in large networks approach limiting random graphs given in terms of randomly stopped multi-type branching processes. This is used to obtain detailed information on the limiting distributions of centrality scores like degree and PageRank. We also see how our theoretical results shed light on sampling schemes ensuring prescribed representation of minorities, and on competition between majority and minority communities in the growing network. Based on joint work with Nelson Antunes, Shankar Bhamidi and Vladas Pipiras.*

**ALL ARE CORDIALLY INVITED**