

THE EIGHTH
JYOTIPRASAD MEDHI MEMORIAL ANNUAL
LECTURE



5:30 PM, 10TH OCTOBER, 2025

LECTURE HALL 3, IIT GUWAHATI

SPEAKER

Prof. Siva Athreya

International Centre for Theoretical Sciences,
Bangalore

Organized by
Department of Mathematics
Indian Institute of Technology Guwahati

Dr. Jyotiprasad Medhi (1925–2017) was undoubtedly the finest Mathematician and Statistician the northeast region of the country has ever produced. We are glad to institute an annual lecture in the fond memory of the worldwide acclaimed scholar and writer.

About the talk:

The eighth *Jyotiprasad Medhi Memorial Annual Lecture* will be delivered by **Prof. Siva Athreya** from International Centre for Theoretical Sciences, Bangalore. Prof. Athreya's research interests include stochastic partial differential equations, random graphs, computational epidemiology and so on. He is a fellow of Indian Academy of Sciences and Indian National Sciences Academy. He received the Shanti Swarup Bhatnagar award in 2012.

Title: Co-evolution of Vertex Opinions and Edge Dynamics in Dense Random Graphs

Abstract: A pressing challenge in network statistics lies in understanding systems with two simultaneous levels of dynamics: randomly evolving processes on randomly evolving networks locked in a feedback loop — a setting termed co-evolution that creates complex bi-directional interactions.

We propose a voter model on a dynamically evolving dense coloured graph in which vertices can change opinions and edges can switch between being present or absent in a coupled way. We prove a complete mathematical description of a class of mutually coupled opinion dynamics and graph dynamics in the large-size limit. We show emergence of a form of homogenisation that manifests itself through a collapse of the joint dynamics onto a subset, where the vertex opinions homogenise while edge states evolve via stochastic flows governed by the overall opinion densities. We will also explore when consensus and polarisation may occur in the population.

This is joint work with Frank den Hollander and Adrian Roellin.

The Department of Mathematics, IIT Guwahati, cordially invites you to the seventh *Jyotiprasad Medhi Memorial Annual Lecture*.

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