

## Networks, Causality and Statistics for Climate Sciences

Adway Mitra (IIT Kharagpur), Prof. Auroop Ganguly (Northeastern University)

**Dates: 7 - 10 January 2025**

**Total Lectures Hours: 15**

**Location: AI Classroom, CRR Building 4<sup>th</sup> Floor, IIT Kharagpur**

The aim of this course is to explore the topics of Complex Networks and statistical models, including causality and extreme value statistics for Climate Sciences. With the threat of global climate change, there is renewed interest in climate sciences, especially for understanding the relations between climatic processes and their impacts. Data-driven methods, such as networks and causal models may help to uncover relations that were previously unknown. Moreover, as extreme weather events keep increasing under the changing climate, extreme value statistics provide a tool in understanding the nature and scale of such events, and quantifying their risks. Specifically, compound extreme events are of special concern. Attribution of such events to specific causes is also an important task, which requires specialized statistical tools. This course aims to not only provide in-depth technical understanding of these methods and their uses in climate science, but also how they can form the basis of development of policies, technology and innovation aimed at combatting climate change.

Day	Date	Time	Speaker	Topic
1	Tuesday, 7 <sup>th</sup> Jan	2-3 PM	Sayanti Mukherjee (SUNY Buffalo)	Resilient Infrastructure Networks
1	Tuesday, 7 <sup>th</sup> Jan	6-8 PM	Auroop Ganguly (Northeastern University)	Climate Technology and Policy
2	Wednesday, 8 <sup>th</sup> Jan	11 AM - 1 PM	Auroop Ganguly (Northeastern University)	Climate Data Sciences
2	Wednesday, 8 <sup>th</sup> Jan	5-7 PM	Auroop Ganguly (Northeastern University)	Climate Dynamics
3	Thursday, 9 <sup>th</sup> Jan	11 AM - 1 PM	Auroop Ganguly (Northeastern University)	Climate Networks
3	Thursday, 9 <sup>th</sup> Jan	5-7 PM	Adway Mita (IIT Kharagpur)	Causality in Climate
4	Friday, 10 <sup>th</sup> Jan	11 AM - 1 PM	Auroop Ganguly (Northeastern University)	Climate Enterprise
4	Friday, 10 <sup>th</sup> Jan	6-8 PM	Poulomi Ganguly (IIT Kharagpur, virtual)	Compound Climate Extremes