



INDIAN INSTITUTE OF SCIENCE
BANGALORE

INSTITUTE COLLOQUIUM
(Physical & Mathematical Sciences)

By

Professor Govindan Rangarajan
Department of Mathematics

On

Are You Connected?

Detecting Connectivity Patterns in Networks

Date : Friday, 21st September 2012

Time : 4-00 p.m

Venue : Faculty Hall, Main Building

Professor P. Balaram, Director
will preside

ALL ARE WELCOME

Tea: 5-00 p.m

ABSTRACT

Detecting connectivity patterns in a network of nodes/processes is crucial to the subsequent analysis of the network structure. Once these connectivity patterns are detected, there is also tremendous interest in determining how these patterns change with time. This is important since changes in connectivity patterns can serve as functional biomarkers for the onset of diseases or can be used to detect changes in the underlying states. Granger causality (first proposed by the Nobel Prize winning economist Clive Granger) is a tool that can be used to detect and quantify connectivity patterns. We propose extensions of Granger causality that enable it to be applied to a much wider variety of complex systems. We also demonstrate how changes in connectivity patterns can be measured using these extensions. If time permits, we will consider block coherence, a new tool that we have proposed to study connectivity patterns.