

Search for the Design Principles in Biology

Venue: Room 5101, Core 5
Time: 5-6 PM
21st April '23

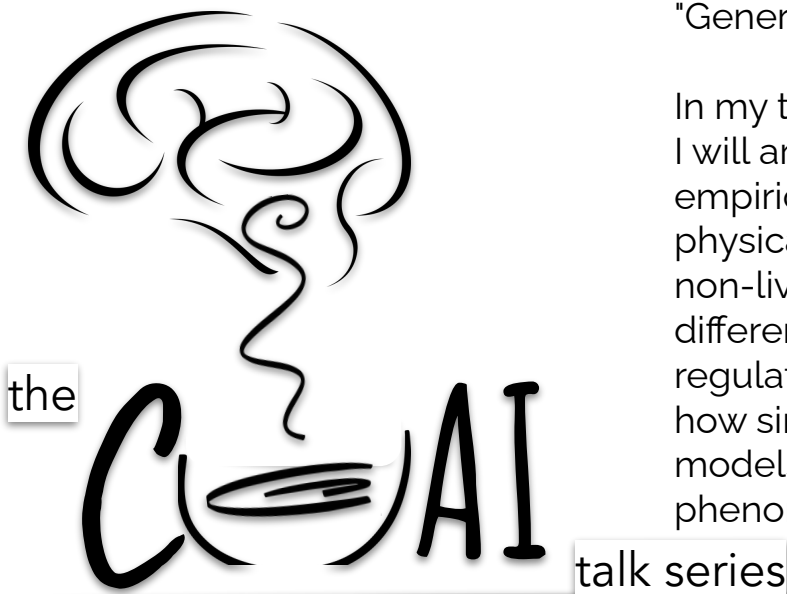


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Once upon a time, Biology was a 'descriptive' subject. We gathered information on different organisms and arranged those systematically. However, Biochemistry and Molecular Biology revolutionized Biology. Now we detect, quantify and manipulate molecules within living systems.

Using high-throughput techniques, Biologists are now generating a humongous amount of information. However, information alone is not helpful. We must distill that to develop scientific 'Theories' and 'Laws.' Over decades, scientists across disciplines have attempted to fill this void. They borrowed methods and concepts from Physics and Engineering to understand the "Generalised Design Principles" in living beings.

In my talk, I will focus on this approach to Biology. I will argue that the 'Devil' is not in the details of empirical observations but in the underlying physical rules that work across the living and non-living world. I will use examples from different biological phenomena, like gene regulatory circuits and morphogenesis. I will show how simple physical rules and mathematical models help us to understand diverse, complex phenomena in biology.



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About the Speaker

Prof. Bose did Ph. D in Biochemistry from All India Institute of Medical Sciences, New Delhi . Before that, he studied M. Pharm and B. Pharm in Jadavpur University, Kolkata. His primary interest is understanding biology through mathematics and physics. He enjoys debugging codes, scribbling equations, and manipulating cells to disclose their secrets. Apart from musing over science, he is a cycloholiac, enjoys long-distance cycling and has interests in wildlife. He fondly maintains a record on birds at IIT Guwahati (<https://www.iitg.ac.in/biplabbose/files/birds.html>).

All are welcome