

Applied Physics & Machine Learning Seminar Series, IIT Hyderabad

Online webinar on **Nov 17, 2020 at 3:00 PM**

Date : 17-11-2020
Time : 3:00 PM (IST)
Topic : Seminar at IITH
Speaker : **Dr. Sudipto Muhuri**
Affiliation : University of Pune
Title : **Catchbond mediated intracellular processes**
Link : <https://meet.google.com/ime-wpda-edq>



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Abstract

Catchbonding - characterized by increased lifetime of bonds in response to applied force, is observed for biological macromolecules including motor proteins within cell. Hitherto, the primary functional role of the biological catchbond was thought to be that of improving adhesion properties of cells to surfaces under conditions of tensile force acting on them. However, our theoretical study uncovers a crucial functional role of the biological catchbonding in intracellular processes ranging from spindle oscillations during cell division to intracellular transport. In particular we find that that catchbonding behaviour in molecular motors manifests as the phenomenon of paradox of codependence -wherein inhibition of one species of motor in bidirectional intra-cellular transport can lead to an overall decline in the motility of the cellular cargo. We also find that this catch-bonding behaviour provides a generic mechanism of generating spontaneous oscillations in motor-cytoskeletal filament complexes.