ENGINEERING SCIENCES & APPLIED MATH--FEATURED SPEAKER

Principles of Sensory Adaptation

Yuhai Tu

PhD in Theoretical Physics, IBM Watson

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M416 (ESAM Conference Room), Tech

Adaptation is one of the most fundamental phenomena in biology. Living systems, ranging from a single cell to multi-cellular organisms to populations of interacting species, have the amazing ability to adapt to changes in their environments by adjusting their internal states. What are the possible mechanisms for adaptation in living systems? Are there any design principles governing interactions of the underlying living matter (biomolecules, cells, organisms) that are responsible for the vast variety of adaptive behaviors in biology? Are there any fundamental physical requirements and limits to the performance of adaptation?

In this presentation, we plan to discuss some of the recent developments in addressing these fundamental questions in representative cellular systems, e.g., chemotaxis in *Escherichia coli* and *Dictyostelium discodeum,* by combining theoretical analysis, computational modeling, and quantitative experiments. If time permits, we will outline some of the opportunities for future investigations into other important biological functions, such as biochemical oscillations and length control, by using the general approach and ideas, e.g., those from nonequilibrium statistical physics, which were developed in studying sensory adaptation.

Note: Cookies will be served at 3:30