

ITS @ The Graduate Center

Initiative for the Theoretical Sciences

Symposia on the Physics of Biological Function

Physics and biology intersect on many scales, from the internal motions of single molecules to the collective motions of animal groups. In these three symposia we highlight recent progress and current challenges in the search for a physicist's understanding of living systems. Approaches range from detailed analysis of particular systems to abstract formulations of the problems that organisms have to solve, and more generally the search for simple models for complex systems. Lectures include ample time for interruptions and discussion, hopefully bringing both novices and experts to the frontier of the subject.

Friday 11 Oct 2019: Toward the physics of complex behaviors

(Science Center, Room 4102)

Quantitative windows into the minds of dolphins

Marcelo Magnasco, Rockefeller University

Animal navigation in uncertain environments

Agnese Seminara, Université Côte d'Azur

How birds sing: Taking precise data, making precise theories

Samuel Sober and Ilya Nemenman, Emory University

Friday 15 Nov 2019: Searching for simpler models

(Skylight Room, 9100)

Neural network pruning and the lottery ticket hypothesis

Jonathan Frankle, Massachusetts Institute of Technology

No equations, no variables, no parameters

Yannis Kevrekidis, Johns Hopkins University

Sloppy models and approximation theory

Katherine Quinn, The CUNY Graduate Center

Using simple models to understand complex processes

Mark Transtrum, Brigham Young University

Friday 6 Dec 2019: Adaptation

(Segal Theater)

Adaptive strategies for chemical sensing and navigation

Thierry Emonet, Yale University

Neural adaptation: Theory, models, and mechanism

Adrienne Fairhall, University of Washington

Adaptation and Bayesian forecasting in biological systems

Thierry Mora, École Normale Supérieure and Princeton University

Adaptation and control in molecular evolution

Armita Nourmohammad, University of Washington

Events begin at 9:30 AM with coffee and bagels, and conclude a bit after 6 PM.

Lunch will be served. For more information see <https://biophysics.princeton.edu>.

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