

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, and from the sub-picosecond dynamics of the initial events in photosynthesis to the multigenerational dynamics of evolutionary change. In these three symposia we highlight recent progress, and current challenges, in the search for a physicists' understanding of living systems. Lectures include ample time for interruptions and discussion, hopefully bringing both novices and experts to the frontier of the subject.

Friday 15 Mar 2019: Exploring large populations of neurons

(Science Center, Room 4102)

Measuring and understanding the brain's model of the external world

Loren Frank, University of California at San Francisco and HHMI

The intrinsic neuronal dynamics of a canonical cognitive circuit

Ila Fiete, Massachusetts Institute of Technology

Between chaos and functionality in the dynamics of large networks

Fred Wolf, Max Planck Institute for Dynamics and Self-Organization

RG-inspired approaches to the analysis of real neural networks

William Bialek, Princeton University and The CUNY Graduate Center

Friday 12 Apr 2019: The problem of ecological diversity

(Skylight Room, 9100)

A bottom-up approach to microbial community assembly

Jeff Gore, Massachusetts Institute of Technology

The origin of chaos in large interacting ecosystems

Giulio Biroli, École Normale Supérieure

Collective behaviors in large interactive ecosystems: A phase diagram

Chiara Cammarota, King's College London

Microbial diversity and spatio-temporal chaos

Daniel Fisher, Stanford University

Friday 3 May 2019: Dynamics and information in transcriptional control

(Science Center, Room 4102)

Transcription factors, chromosome topology, and transcription control

Jie Xiao, Johns Hopkins University

The role of phase separation in regulation of gene transcription in eukaryotes

Arup Chakraborty, Massachusetts Institute of Technology

DNA polymer physics and transcription dynamics in the developing fly embryo

Thomas Gregor, Princeton University and Institut Pasteur

Towards a derivation of the *Drosophila* gap gene network from optimization principles

Gaspar Tkacik, IST Austria

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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