



ÉCOLE DE PHYSIQUE DES HOUCHES



Summer School on Theoretical Biological Physics

Session CXXI

July 3rd –28th, 2023

Organizers:

Anne-Florence BITBOL (Institute of Bioengineering, EPFL), **Thierry MORA** (CNRS & Ecole Normale Supérieure, Laboratoire de Physique), **Ilya NEMENMAN** (Department of Physics and Biology, Emory University) and **Aleksandra WALCZAK** (CNRS & Ecole Normale Supérieure, Laboratoire de Physique)

Overview:

This 4-week school is aimed at elucidating the function and principles of biological systems, from cells to ecosystems, in light of the laws of physics. The topics will include evolution, ecology, behavior, neuroscience and signaling, as well as active matter, biological networks and machine learning, focusing on the challenges that biology introduces to non-equilibrium and many-body physics. Our goal is to extract unifying features with an emphasis on theoretical, yet experiment-driven advances.

Website: <http://www.phys.ens.fr/~tmora/leshouches2023.html>

Topics:

Ambitions for theory
Evolution
Navigation
Neuroscience
Active Matter
Non-equilibrium Physics
Signaling
Flow Networks
Adaptation
Ecology
Machine Learning
Behaviour

First confirmed lecturers:

William Bialek (Princeton U)
Oskar Hallatschek (UC Berkeley)
Massimo Vergassola (ENS Paris)
Ann Hermundstad (HHMI/Janelia)
Cristina Marchetti (UCSB)
Nikta Fakhri (MIT)
Sandeep Krishna (NCBS-TIFR Bangalore)
Karen Alim (TUM Munich)
Rosalind Allen (U of Edinburgh)
Pankaj Mehta (Boston University)
Lenka Zdeborova (EPFL)
Greg Stephens (VU Amsterdam)

Topical seminars will be given during the school by distinguished invited scientists
Poster presentations by participants

Registration: The online Application Form can be found at <https://www.houches-school-physics.com>. Applications must reach the School before March 1st, 2023 in order to be considered by the Selection Committee. The full cost per participant includes housing and meals, and is specified on the School's Website. Further information can be found on the website too. For Scientific Matters, please contact the organizers biophysics.theory@gmail.com. For Administrative and Logistic Matters, please contact the Les Houches Physics school at :

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Location: Les Houches is a village located in Chamonix valley, in the French Alps. Established in 1951, the Physics School is situated at 1150 m above sea level in natural surroundings, with breathtaking views on the Mont-Blanc mountain range, conducive to reflection and discussion.

