

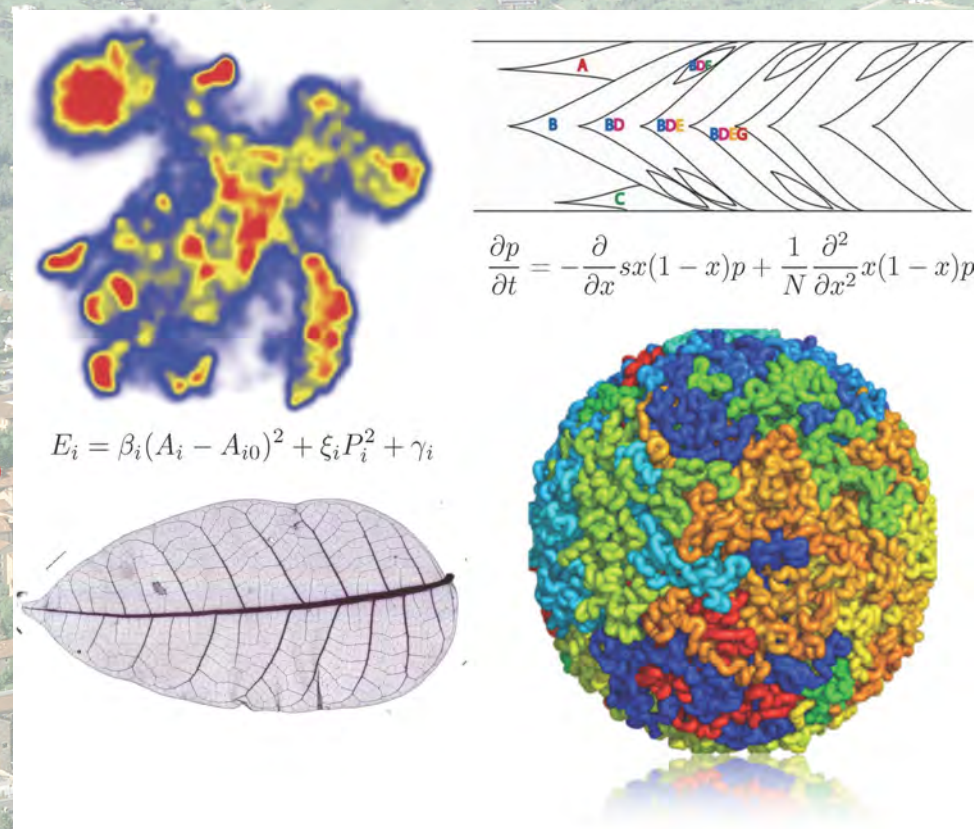
Boulder School for Condensed Matter and Materials Physics

Theoretical Biophysics

July 8-26, 2019

From the point of view of physics, biological systems stand out due to their complexity and heterogeneity. Living systems span many length and timescales, and are constantly kept out of equilibrium by active energy-consuming processes. Understanding their functioning poses a major challenge to traditional physical approaches. It is often difficult to predict the overall behavior of a biological system just from knowing, often partially, the behavior of their individual components. Can we understand how a cell tissue collectively moves in response to an external stimuli, merely based on the contacts between neighboring cells? Similarly, can one predict how a swarm of birds or insects react to a threat? On another scale, how do interactions between pairs of amino acids in a protein determine its function? How does a neural network encode information about the collective activity of these cells? Can we predict the next dominant strain of influenza by studying its evolution in response to immune defenses of infected populations? Despite their diversity, these questions have in common the emergence of a global and collective phenomenon from a collection of local interactions. The 2019 Boulder Summer School will explore recent theoretical inroads into these and related questions.

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Figures from Gordon Berman, Michael Desai, Eleni Katifori, and Leonid Mirny

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The school will pay for most local expenses, and there are travel grants available for participants from U.S. universities. Students and postdocs interested in participating should submit an electronic application by the January 15 deadline. The application form, and detailed information regarding housing, travel and financial support are available at

<http://boulderschool.yale.edu/>

The Boulder School in Condensed Matter and Materials Physics provides expert training, not usually available within the traditional system of graduate and post-graduate education, for advanced graduate students and postdoctoral researchers working in condensed matter physics, materials science and related fields. The School is supported by the National Science Foundation, with additional funding provided by the University of Colorado, and meets annually during July in Boulder, Colorado.