Johns Hopkins University

Department of Chemical & Biomolecular Engineering

Spring 2023 Seminar Series

Professor Raymond Goldstein
University of Cambridge, UK

Date: Thursday, April 13, 2023
Time: 10:30 a.m.
Shaffer Hall 3
Zoom Meeting ID: 919 5918 2879
Passcode: 270887

Title: Fluid Dynamics and the Evolution of Biological Complexity

Abstract: One of the most fundamental issues in evolutionary biology is the nature of transitions from unicellular to multicellular life. How was it, and why was it that the simplest unicellular organisms that emerged from the primordial soup evolved into organisms with many cells, and many cell types, dividing up life's processes? In this lecture I will describe experimental and theoretical work on this question, using a lineage of green algae as model organisms. Focusing on the nature of phototaxis - directional swimming toward light - I will illustrate the interconnection between sensing, steering, and locomotion in the low Reynolds number regime.

Bio: Ray Goldstein received undergraduate degrees in physics and chemistry from MIT, and a Ph.D. in theoretical condensed matter physics from Cornell University. Following postdoctoral work at the University of Chicago and faculty positions in physics and applied mathematics at Princeton University and the University of Arizona, he moved to the Department of Applied Mathematics and Theoretical Physics at the University of Cambridge in 2006 as the Schlumberger Professor of Complex Physical Systems.

His research interests span from statistical physics to nonlinear dynamics and geophysics, with particular emphasis on biological physics, both theoretical and experimental. His work has been recognized by a Sloan Foundation Fellowship, a Presidential Faculty Fellowship from the National Science Foundation, the G.K. Batchelor Prize in Fluid Mechanics, the Rosalind Franklin Medal of the Institute of Physics (UK) and Fellowship in the American Physical Society, the Institute of Physics, the Institute of Mathematics and its Applications and the Royal Society. He shared the 2012 Ig Nobel Prize in Physics for work on the shape of a ponytail.