

Dynamical Complexity in Living Fluids

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Brief Biographical Sketch

Dr. Praneet Prakash is an Assistant Professor at the Kotak School of Sustainability. He received his PhD from the Indian Institute of Science, Bengaluru, and subsequently conducted postdoctoral research at the University of Cambridge. His research interests include environmental fluids, living, active, and complex matter, with a particular emphasis on the sustainability of living systems.

Abstract

Living microbial fluids inhabit highly fluctuating environments and survive in low-nutrient resource baths. It is now well recognized that nutrient exchanges among microbes play a vital role in their survival. The existence of such interaction raises general questions about the dynamics of nutrient exchange in living fluids. In this talk, we will explore experimentally and theoretically a realization of such interactions in which active bacteria dynamically responds to the oxygen produced by immotile green algae through photosynthesis. Even in this simplest mixture of living fluids, we find a complex dynamics involving nutrient exchanges, enhanced diffusivity, and a stochastic version of “flux expulsion”.