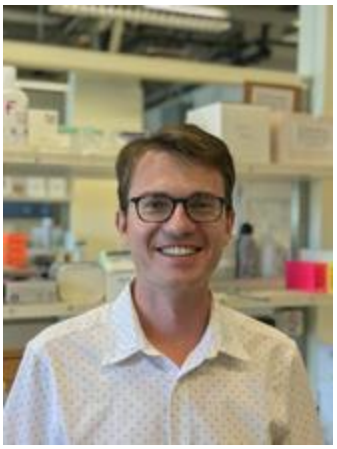

Joseph Larkin

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Research Interests:

Throughout evolutionary history, life has explored the laws of physics, creating remarkable new strategies to perpetuate itself. Our experimental group seeks to understand how these strategies arise, using microbial populations as a model. We are interested in how the physical and chemical environment influences microbes, and how these microbes in turn engineer that very environment. In particular, we study how bacterial biofilms change their local conditions by producing extracellular matrix and how cell-to-cell signals drive such behaviors. We probe theoretical models of these phenomena with the goal of building toward an emergent understanding of living matter.

Our group also has specific interest in how electrophysiology influences the behavior of bacteria, including through cell-to-cell communication, and control of both metabolism and gene expression.

To investigate these problems, we use time-lapse imaging and custom experimental devices to observe and probe microbial behaviors in space and time.

Selected Publications:

"Statistics of correlated percolation in a bacterial community", Xiaoling Zhai, Joseph W. Larkin, et al. *PLoS Comput. Biol.***15**(12): 012010 (2017) e1007508 (2019).

"Signal Percolation within a Bacterial Community", Joseph W. Larkin, et al, *Cell Syst.* **7**, 1-9 (2018).

"Length-independent DNA packing into nanopore zero-mode waveguides for low-input DNA sequencing", Joseph Larkin, et al. *Nat. Nanotechnol* **12**: 1169–1175 (2017).

"Coupling between distant biofilms and emergence of nutrient time-sharing", Jintao Liu, et al. *Science* **356**: 638-642 (2017).