



BiophysTO Lunchtime Seminar Series

Date

Wednesday, August 28, 2019
2:00 – 3:00 pm

Location

McLennan Physical
Laboratories
Room MP606
60 St. George Street

Dr. Anna Erzberger
Rockefeller University

How to form a mirror-symmetric organ? Surface mechanics of developing sensory hair-cells

Actively regulated symmetry breaking, which is ubiquitous in biological cells, underlies phenomena such as directed cellular movement and morphological polarization. Here we investigate how an organ-level polarity pattern emerges through symmetry breaking at the cell level during the formation of a mechanosensory organ. Combining theory, genetic perturbations, and in vivo imaging assisted by deep learning, we study the development and regeneration of the fluid-motion sensors in the zebrafish's lateral line. We find that two interacting symmetry-breaking events—one mediated by biochemical signaling and the other by cellular mechanics—give rise to a novel form of collective cell migration, which produces a mirror-symmetric polarity pattern in the receptor organ.

Bio:

Anna Erzberger is a theoretical physicist interested in the self-organizing properties of living matter, in particular the principles governing the assembly of cells into functional organs during development and regeneration. She is currently a postdoctoral fellow in the Laboratory of Jim Hudspeth at Rockefeller University, where she works on the physical aspects of sensory organ morphogenesis. She obtained her Ph.D. working with Guillaume Salbreux and Frank Julicher at the Max-Planck-Institute for the Physics of Complex Systems in Dresden, where she investigated the active mechanics of the cell cytoskeleton. In collaboration with experimentalists at University College London, she discovered a novel form of non-adhesive cancer cell motility.

Host: Dr. Sid Goyal



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