

Welcomes
2026 Taft Lecturer

Dr. Michael Shelley

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Thursday April 9th
Rec Center Room 3230
4:00-5:00pm

Self-Organization, Flows, and Transport in (and of) Living Cells

Organisms organize their internal contents at the microscale through striking dynamical processes. In the early *C. elegans* embryo, pronuclei are positioned by the interplay of centrosomal arrays and molecular motors as the cell prepares for its first division. In female *Drosophila*, self-organized intracellular flows transport materials across growing egg cells, establishing functional asymmetries essential for development. And in males, ultralong sperm - as long as the organism itself - are packed and stored in a remarkable state of ordered unrest.

I will describe our work at Flatiron in understanding such phenomena by tightly interfacing multiscale modeling and simulation with quantitative experiment. The theoretical frameworks draw on fluid and nonlinear dynamics, coarse-graining, and active matter, and show how applied mathematics can illuminate the biophysical mechanisms that enable living systems to build, move, and organize themselves.

**Refreshments will be served before the lecture, 3:15-3:45pm in the
Math Faculty & Graduate Student Lounge - Room 4118 French Hall**