

Actin in love: emergent behavior in an actin-driven system

Self-propelled particles captivate the soft matter community, offering insights into collective motion in nature, such as bird flocks or bacterial swarms. The white circle in the time series represents a bead (6 microns in diameter) with attached actin filament nucleating proteins, forming two branched actin networks as tails.

Initially growing in opposite directions, the tails curl over time due to competition between actin network extrusion from the beads and drag force from the viscous background.

Eventually, the tails collapse together, ejecting the bead downwards and forming the bottom of a heart-like structure. These tails grow from ~70 microns at $t = 0$ min to ~240 microns at $t = 1$ hr and 10 min.

