

PHYSICAL MATH SEMINAR

Geometry-driven drift of passive particles in flows.



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ABSTRACT:

In low-Reynolds-number flows, an active swimmer is required to develop non-reciprocal swimming strategies to achieve sustained propulsion. However, it is also possible for passive particles to drift, or move in directions different from the mean background flow, by virtue of their geometry and deformability. Motivated by a desire to understand the motion of elastic fibers in low-Reynolds-number flows, I present a study of the conditions required for both rigid particles and simple elastic particles to drift and how that drift may be tuned as functions of both the flow and the particle shape. In particular, I will focus on a class of particles we call hinges, which serve as qualitative analogs for more general curved fibers and show that adding elasticity to these hinges leads to symmetry breaking in oscillating flows.

TUESDAY, FEBRUARY 11, 2025

2:30 PM – 3:30 PM

Building 2, Room 449