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Active matter in inhomogeneous environments

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Active matter is a term used to describe matter that is composed of a large number of self-propelled active 'particles' that individually convert stored or ambient energy into systematic motion. Examples include a flock of birds, a school of fish, or at smaller scales a suspension of bacteria or even the collective motion within a human cell. When viewed collectively, active matter is an out-of-equilibrium material. This talk focuses on active matter systems where the active particles are very small, for example bacteria or chemically active colloidal particles. The motion of small active particles in homogeneous Newtonian fluids has received considerable attention, with interest ranging from phoretic propulsion to biological locomotion, whereas studies on active bodies immersed in inhomogeneous fluids are comparatively scarce. In this talk I will show how the dynamics of active particles can be dramatically altered by the introduction of fluid inhomogeneity and discuss the effects of spatial variations of fluid density, viscosity, and other fluid complexity.

Keyword-1

Active matter

Keyword-2

Biophysics

Keyword-3

Complex fluids

Author: ELFRING, Gwynn (Dept. of Mechanical Engineering, UBC)

Presenter: ELFRING, Gwynn (Dept. of Mechanical Engineering, UBC)

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