TUAT Fluid Dynamics Seminar

Flexibility breaks the symmetry of the microswimmer hydrodynamics

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Abstract

A microswimmer is a self-propelled particle in a fluid at low Reynolds number, ranging from swimming microorganisms to artificial active colloids and microbots. Due to the linearity of the Stokes equations for the flow around microswimmers, the dynamics are accordingly time-reversal as highlighted by the scallop theorem, which states that a microswimmer cannot generate net locomotion via a reciprocal motion. This symmetry, however, can be broken by soft dynamics such as fluid elasticity and swimmer elasticity. In this talk, after a brief introduction to the low-Reynolds-number hydrodynamics with moving boundaries, we will discuss locomotion in viscoelastic fluids and structure-coupled dynamics, showcasing our recent studies on swimming bacteria and sperm cells.
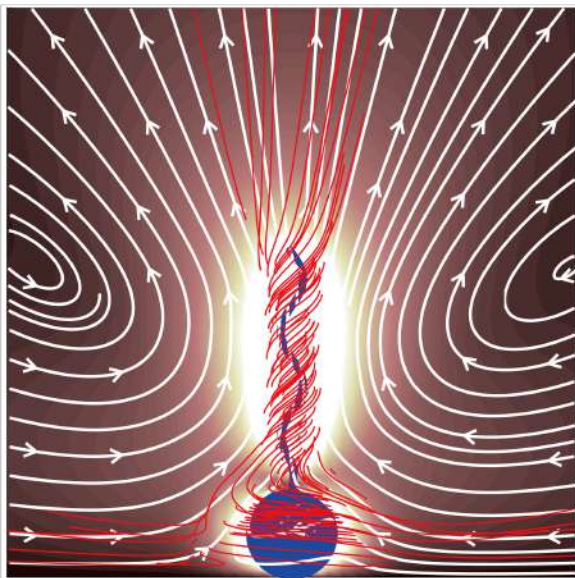
Date : Friday, January 29th, 2021

Time : 11:00 - 12:00

Venue: Online　***Please visit the following link on time.**

https://meet.google.com/cut-tcuz-ymv

organized by: Assoc. Prof. Y. Tagawa (tagawayo@cc.tuat.ac.jp)