

Transport and mixing of phoretic or active particles

mercredi 15 mars 2023 14:00 (1h 45m)

Diffusiophoresis is a phenomenon which induces a transport of microparticles suspended in a solvent when salinity gradients are present. This effect, whose origin relies on charge effects at the surface of the particles, results in a tiny velocity drift with respect to the fluid flow which advect them. In this talk, I will discuss the physical origin of diffusiophoresis and its consequences when jointly mixing salt and colloids. I will explain how a one percent modification of the flow can radically modify this advection-diffusion problem, accelerating or delaying mixing, or leading to particle trapping in flows with closed streamlines. Depending on time, I will discuss the dynamics and modelization of an active system made of interacting camphor swimmers whose propulsion mechanism relies on the concentration inhomogeneities they create when releasing camphor at the surface of water.

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