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Laboratoire PMMH
10 rue Vauquelin, 75231 Paris Cedex 05



Séminaire PMMH

Bureau d'Études, Bâtiment L, 2^{ème} étage

Vendredi 3 juin 2016, 11h00-12h00

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Forschungszentrum Jülich

Microswimmer : From swimming bacteria to collective behaviors of active Brownian particles

Locomotion is a major achievement of biological evolution. Microorganisms, such as bacteria, algae, and sperm cells are equipped with flagella and are able to exploit drag for their propulsion. Two prominent swimming mechanisms are rotating helical flagella, exploited by many bacteria, and snake-like or whip-like motion of eukaryotic flagella, utilized by sperm and algae. Thereby, hydrodynamic interactions play a major role in the swimming motion. In assemblies of motile microorganisms, cooperativity plays a major role as they exhibit highly organized movements with remarkable large-scale patterns such as networks, complex vortices, or swarms. To unravel the emergent behaviors often simplified models such as active Brownian particles (ABPs) are considered. The generic approaches provide valuable insight into the non-equilibrium statistical aspects of active matter. In the talk, theoretical and computer simulation results will be presented for the swimming behavior of *E. coli* bacteria, both in bulk and at surfaces. Moreover, the cooperative dynamics of ABPs will be discussed and a link will be established to the non-equilibrium pressure equation of state.

Prochain séminaire : vendredi 10 juin, Carine Douarche (LPS, Univ. Paris Sud)
Programme des séminaires : www.pmmh.espci.fr, onglet *Séminaires PMMH*
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