ESPCI
Laboratoire PMMH
10 rue Vauquelin, 75231 Paris Cedex 05

Séminaire PMMH

Salle de réunion du PMMH, Campus Jussieu, Bâtiment Cassan A, 1 er étage

Vendredi 7 septembre 2018, 11h00-12h00

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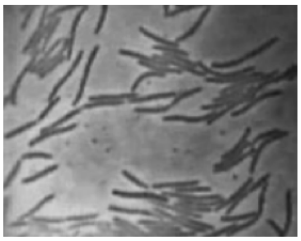
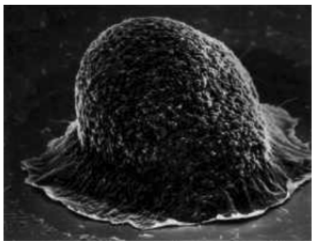
Towards a non-equilibrium statistical mechanics of biological and biomimetic systems

Collective phenomena are observed in biological and biomimetic systems at all scales, from bacterial systems to sheep herds in biology, and from Quincke rollers to bristlebots or kilobots in man-made, active systems. Provided that these non-equilibrium systems consist of independent units without a central control system, we can expect the observed collective behavior to emerge from simple rules among the interacting units. The underlying assumption is that many of these non-equilibrium, active systems are likely to share similar statistical properties as occurs in equilibrium physical systems. The development of suitable non-equilibrium statistical mechanics approach for such active systems is required for setting the basis of a material science of living systems and to shed light on highly relevant and diverse topics such as bacterial infections, cancer growth, tissue formation, and embryogenesis, as well as for the design and synthesis of biomimetic materials. In this talk I will show that such a reductionist, non-equilibrium statistical mechanics approach has allowed to explain a series of biological systems at very different scales, from bacteria to sheep herds, and discuss possible ways to control the emerging collective dynamics in active systems.


Prochain séminaire : vendredi 14 septembre 2018, Hans Herrmann (ETH, Zürich)
Programme des séminaires : www.pmmh.espci.fr, onglet *Séminaires PMMH*
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