

Introduction to active soft matter physics

時間: 4月24日(金) ①10:30- ②13:00- ③14:40-

場所: 明治大学駿河台キャンパス 研究棟 4階 第2会議室

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明治大学駿河台キャンパスグローバルフロント第2会議室(訂正)

講師: Philippe Marcq

(Université Pierre et Marie Curie and Institut Curie, Paris, France)

Soft matter physics studies condensed materials whose interaction energies are of the same order as the thermal energy. An inspection of the relevant orders of magnitude shows that living cells and tissues are, indeed, soft. They are also driven, non-equilibrium systems: the quantitative study of the biomechanical properties of cells and tissues therefore belongs to the blossoming field of soft active matter (see [1,2,3] for recent reviews).

In these lectures, I will introduce through examples some of the concepts and tools of the field of active soft matter, and address in particular the following questions:

- how non-equilibrium polymers contribute to cytoskeletal mechanics
- how molecular motors contribute to force generation in living cells, and help explain features of cell contractility and cell motility
- how cell contractility, cell division and cell death impact the rheology and dynamics of living tissues.

[1] Active behavior of the Cytoskeleton; F. Jülicher et al., Phys. Rep. 449 3-28 (2007)

[2] Hydrodynamics of soft active matter; M.C. Marchetti et al., Rev. Mod. Phys. 85 1143–1189 (2013)

[3] Physics of adherent cells; U.S. Schwarz and S.A. Safran; Rev. Mod. Phys. 85 1327–1381 (2013)

お問い合わせ: 石原秀至

明治大学理工学部物理学科 shuji@meiji.ac.jp