Active Matter

Ensembles of ***active*** particles, i.e., particles with

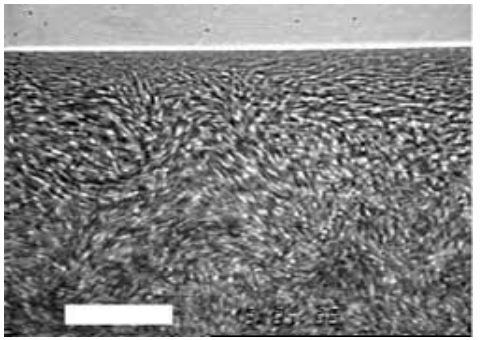
the ability to take in and dissipate energy and, in the process,

exhibit systematic motility

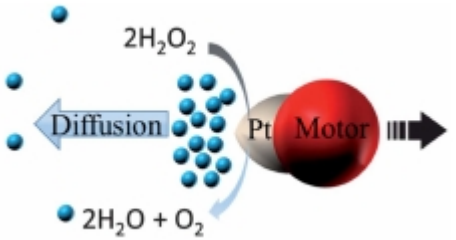
S. Ramaswamy, *Ann. Rev. Cond. Matt.* **1**, 323 (2010)

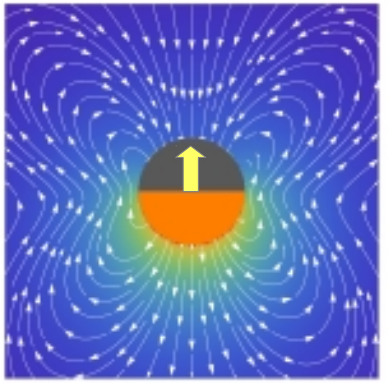
- schools of fish, flocks of birds

- micro-organisms
  (bacteria, flagellated cells)



- artificial self-propelled particles
  (micro-swimmers)





Active Matter Hauptseminar

Teachers: Profs. C. Bechinger, S. Dietrich, C. Holm

Aim: in-depth overview of the physics of micro-swimmers
from fundamental aspects to current developments

Objectives:

- mechanisms of motility at low Reynolds number
- man-made micro-swimmers: experiments, theory, simulations
- advanced numerical methods
- motion in confined spaces and in external fields or flows; taxis
- collective motion of micro-swimmers
- beyond Newtonian liquids: motion in complex fluids

Web page: https://www.icp.uni-stuttgart.de/~icp/Hauptseminar_Active_Matter_SS_2017

Organizational Meeting: **February 7th, 14:00**
ICP, Allmandring 3, Besprechungsraum

Active Matter Hauptseminar: The team

Theory, Experiment, and Numerics

Prof. Dr. Clemens Bechinger
(*PI2, Univ. Stuttgart*)

Prof. Dr. Siegfried Dietrich
(*MPI-IS Stuttgart, ITP4, Univ. Stuttgart*)

Prof. Dr. Christian Holm
(*ICP, Univ. Stuttgart*)

Celia Lozano

Juan Ruben Gomez Solano

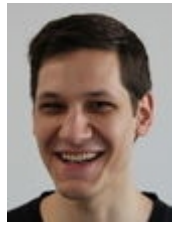
Paolo Malgaretti

William Uspal

Mihail Popescu

Michael Kuron

Georg Rempfer



Patrick Kreissl

http://www.pi2.uni-stuttgart.de/cms/

https://www.is.mpg.de/15930360/8_Active_matter

https://www.icp.uni-stuttgart.de/~icp/Staff#Group_of_Prof._Dr._Holm

Active Matter Hauptseminar: Topics

Date	Time	Topic
11 April 2017	14:00	Hydrodynamics of Newtonian Fluids
18 April 2017	14:00	Stokes Flow and Life at Low Reynolds Numbers
25 April 2017	14:00	Mechanical Microswimmers
2 May 2017	14:00	Phoretically-driven Microswimmers
9 May 2017	14:00	The Squirmer Model
16 May 2017	14:00	Boundary Element Method for Phoretic Swimmers
23 May 2017	14:00	Lattice Boltzmann Modeling of Active Particles
30 May 2017	14:00	Lattice Boltzmann Modeling of Chemical Swimmers
13 June 2017	14:00	Active Particles in External Fields
20 June 2017	14:00	Finite Element Modeling of Active Particles
27 June 2017	14:00	Microswimmers under Confinement
4 July 2017	14:00	Clustering of Microswimmers in a Langevin Dynamics Model
11 July 2017	14:00	Mixtures of Active and Passive Particles
18 July 2017	14:00	Microswimmers in Viscoelastic Media