



Fritz-Haber-Institut der Max-Planck-Gesellschaft, Humboldt-Universität zu Berlin,
Max-Delbrück-Centrum für Molekulare Medizin, Otto-von-Guericke-Universität
Magdeburg, Physikalisch-Technische Bundesanstalt, Technische Universität Berlin,
Universität Potsdam

Berlin Center for Studies of Complex Chemical Systems

Seminar

Complex Nonlinear Processes in Chemistry and Biology

Honorary Chairman: G. Ertl

Organizers: M. Bär, C. Beta, H. Engel, M. Falcke, M. J. B. Hauser, J. Kurths, A. S. Mikhailov, P. Plath, L. Schimansky-Geier, and H. Stark

Friday, June 12, 2015, at 16:00

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Microswimmers in confinement and in Poiseuille flow

Active particles such as microorganisms or active Janus colloids are self-driven units which move autonomously by converting energy into directed movement. In contrast to the physics of passive particles, the motion of active matter is inherently out of equilibrium generating fascinating novel physical phenomena. First, I will discuss hydrodynamic and stochastic interactions of a microswimmer with a no-slip surface [1]. Second, I will present our results on locomotion of active particles in Poiseuille flow which show regular and chaotic oscillatory swinging and tumbling trajectories [2,3]. Finally, I show how hydrodynamic flow fields influence the collective behavior of active particles under confinement [4].

[1] K. Schaar, A. Zöttl, and H. Stark, arXiv:1412.6435 (2015).

[2] A. Zöttl and H. Stark, PRL **108**, 218104 (2012).

[3] A. Zöttl and H. Stark, EPJ E **36**, 4 (2013).

[4] A. Zöttl and H. Stark, PRL **112**, 118101 (2014).