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Einladung zum Vortrag

Hydrodynamic simulations of microscopic particles and swimming microorganisms in complex environments

anlässlich des Habilitationsverfahrens
für das Fach "Theoretische und Computergestützte Physik"

von

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Ort: **Victor-Franz-Hess-Hörsaal, Währinger Straße 17, Hoftrakt, 1. Stock**

The non-equilibrium transport of microscopic colloidal particles and biological cells in viscous environments is often determined by hydrodynamic flows [1]. These flows can either be applied externally, such as shear flows, or created by the particles themselves, as for sedimenting particles or swimming microorganisms. The biologically and biotechnologically relevant nontrivial interplay of particle shape, chirality, activity and hydrodynamic flows in complex environments is a challenging task and an active field of research in soft matter physics and biological physics.

Novel computational modeling and theoretical calculations enables us to uncover important physical mechanisms of several important problems, such as understanding the motion of swimming bacteria and passive microparticles in biological fluids [2] and in microfluidic flows [3,4], as well as understanding the complexity of microswimmer decision making in viscous and chemical environments [5].

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[4] G. Jing, A. Zöttl, E. Clement, A. Lindner, Chirality-induced bacterial rheotaxis in bulk shear flows, Science Advances 6, eabb2012 (2020). DOI: 10.1126/sciadv.abb2012
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