Microswimmers – From Single Particle Motion to Collective Behaviour

Tuesday, October 4

8.00-9:00 h *Registration*

Session 01

09:00 **W. Poon** (University of Edinburgh, United Kingdom)
Painting with bacteria

09:30 **V. Kantsler** (University of Warwick, United Kingdom)
Swimming navigation in-micro

10:00 **O. D. Lavrentovich** (Kent State University, USA)
Effects of director field on dynamics of bacteria in liquid crystals

10:20 **A. DeSimone** (SISSA, Trieste, Italy)
Metaboly in Euglenids: A Model and its experimental validation

10:40 **B. Eckhardt** (Philipps-Universität Marburg, Germany)
Exploiting a buckling instability to escape from traps

11:00 *Coffee*

Session 02

11:20 **E. Lauga** (University of Cambridge, United Kingdom)
Symmetry-breaking in flexible active filaments

11:50 **R. Adhikari** (The Institute of Mathematical Sciences, Chennai, India)
Tractions laws for active colloids and their application to crystallization

12:20 **D. R. Brumley** (ETH Zürich, Switzerland)
Long-range interactions disrupt synchronized states in chains of fluid-coupled oscillators

12:40 **B. M. Friedrich** (MPI für Physik komplexer Systeme, Dresden, Germany)
A force-velocity relationship of flagellar oscillations

13:00 **T. Palberg** (JGU Mainz, Germany)
Ion-exchange-based electroosmotic pumps utilized for microswimming

13:20 *Lunch*

Tuesday, October 4

Session 03

14:30 **I. Giardina** (Sapienza University of Rome, Italy)
Information propagation and collective changes of states in biological groups

15:00 **R. Di Leonardo** (CNR Sapienza University of Rome, Italy)
Holographic imaging reveals the mechanism of wall entrapment in swimming bacteria

15:30 **S. Sanchez** (Institute for Bioengineering Catalonia, Barcelona, Spain)
Enzyme-powered biocompatible mesoporous silica micro/nano-bots

15:50 **V. Magdanz** (Leibniz-Institut für Festkörper- und Werkstoffforschung, Dresden, Germany)
Tubular hybrid microswimmers for the controlled guidance and delivery of spermatozoa

16:10 **M. Pella** (TU Dortmund, Germany)
Synthesis and investigation of different types of alginate-based artificial microswimmers

16:30 *Coffee*

Session 04

16:50 **A. Würger** (Université de Bordeaux, France)
Charge-driven self-propulsion of hot Janus particles

17:20 **H. Chaté** (CEA - Saclay, France)
Weak synchronization and large-scale collective oscillations in dense bacterial suspensions

17:50 **K. Kroy** (Universität Leipzig, Germany)
Exact symmetries in the velocity fluctuations of a hot Brownian swimmer

18:10 **S. Santer** (Universität Potsdam, Germany)
Light driven diffusioosmosis: Manipulation of particle assembly

Wednesday, October 5

Session 05

09:00 **R. Kapral** (University of Toronto, Canada)
Collective dynamics of chemically-powered motors

09:30 **R. Golestanian** (Oxford University, United Kingdom)
Collective chemotaxis in active matter

10:00 **R. van Roij** (Utrecht University, The Netherlands)
From one force-free swimmer to an active dispersion: Mechanism, shape, and (osmotic?) pressure

10:20 **M. N. Popescu** (MPI für Intelligente Systeme, Stuttgart, Germany)
Chemically active particles near responsive interfaces

10:40 **J. de Graaf** (University of Edinburgh, United Kingdom)
Lattice-Boltzmann methods for autophoretic swimmers

11:00 *Coffee*

Session 06

11:20 **P. Peyla** (Université Grenoble Alpes, France)
Spreading of an active cloud of microswimmers

11:50 **L. G. Wilson** (University of York, United Kingdom)
3D holographic imaging of microswimmers

12:20 **K. Ishimoto** (Kyoto University, Japan)
Multiple mechanical functions of sperm hyperactivation

12:40 **L. Alvarez** (caesar, Bonn, Germany)
Sperm: The search machine

13:00 **J. Elgeti** (Forschungszentrum Jülich, Germany)
Sperm cells swimming in confinement

13:20 *Lunch*

Session 07

14:30 **J. F. Brady** (California Institute of Technology, Pasadena, USA)
The Force on a body in active matter

15:00 **P. Tierno** (Universitat de Barcelona, Spain)
Colloidal microworms and microcarpets propelling via a cooperative hydrodynamic conveyor-belt

15:30 **E. Climent** (Université Toulouse, France)
Vertical migration of motile phytoplankton chains through turbulence

15:50 **T. Voigtmann** (Deutsches Zentrum für Luft- und Raumfahrt, Köln, Germany)
Active Brownian-particle glasses: A mode-coupling theory

16:10 **M. Ripoll** (Forschungszentrum Jülich, Germany)
Hydrodynamic self-assembly of thermophoretic swimmers

16:30-18:30 **Poster Session I**

Thursday, October 6

Session 08

09:00 **I. S. Aronson** (Argonne National Laboratory, USA)
Expulsion of bacteria by a vortical flow

09:30 **D. Ahmed** (ETH Zürich, Switzerland)
Artificial swimmers in acoustic and magnetic fields

10:00 **P. Fischer** (Universität Stuttgart, Germany)
Artificial microswimmers

10:20 **C. Maaß** (MPI für Dynamik und Selbstorganisation, Göttingen, Germany)
Droplet swimmers in complex geometries: Autochemotaxis and trapping at pillars

10:40 **R. Seemann** (Universität des Saarlandes, Saarbrücken, Germany)
Evolutive self-propelling Janus droplets utilized for programmable DNA cargo delivery

11:00 *Coffee*

Session 09

11:20 **M. C. Marchetti** (Syracuse University, USA)
Jamming of cell monolayers

11:50 **Y. Kafri** (Technion, Haifa, Israel)
Pressure in active systems

12:20 **J. Blaschke** (Technische Universität Berlin, Germany)
Hydrodynamics of microswimmers: Phase Separation and influence of gravity

12:40 **P. Virnau** (JGU Mainz, Germany)
Phase behavior of active colloidal particles

13:00 **K. Günther** (TU Dresden, Germany)
Construction and characterization of artificial thermophoretic micro-& nanoswimmers

13:20 *Lunch*

Session 10

14:30 **D. B. Weibel** (University of Wisconsin, USA)
Bacterial cell mechanics and motility

15:00 **C. W. Wolgemuth** (University of Arizona, Tucson, USA)
Unexpected parallelisms: From swimming bacteria to wound healing and cancer metastasis

15:30 **K. Drescher** (MPI für terrestrische Mikrobiologie, Marburg, Germany)
Nematic ordering transitions in bacterial biofilms

15:50 **R. G. Winkler** (Forschungszentrum Jülich, Germany)
Bacterial swarmer cells in confinement

16:10 **M. Engstler** (Universität Würzburg, Germany)
Trypanosome microswimmers in the tsetse fly

16:30-18:30 **Poster Session II**

19:30 *Conference Dinner*

Friday, October 7

Session 11

09:00 **A. R. Bausch** (TU München, Germany)
Cytoskeletal pattern formation

09:30 **D. Saintillan** (UCSD, San Diego, USA)
Collective motion in confinement

10:00 **J. Kierfeld** (TU Dortmund, Germany)
Shapes of sedimenting soft elastic capsules in a viscous fluid

10:20 **A. Mourran** (DWI - Leibniz-Institut, Aachen, Germany)
Swimming of morphoelastic ribbon helix

10:40 **S. Klumpp** (Universität Göttingen, Germany)
Magnetism and motility of magnetotactic bacteria

11:00 *Coffee*

Session 12

11:20 **I. Pagonabarraga** (Universitat de Barcelona, Spain)
Collective behavior and pattern formation in actuated magnetic and Janus colloidal suspensions

11:50 **M. Bär** (PTB, Braunschweig, Germany)
Modelling pattern formation and waves in suspensions of bacterial microswimmers

12:20 **A. M. Menzel** (HHU Düsseldorf, Germany)
Statistical description and dynamical density functional theory of semidilute microswimmer suspensions

12:40 **C. Bechinger** (Universität Stuttgart, Germany)
Light controlled active Brownian motion

13:00 **V. Mikulich** (TU Bergakademie Freiberg, Germany)
Effect of cilia orientation on transport of micro-particles

13:20-14:30 *Lunch*