

SPP 1726: Microswimmers

Annual Meeting 02.-03. June 2015

Programme:

02. June 2015

8:45: Departure from Ibis Hotel

9:10 – 9:15: Opening

9:15 – 10:55: Session 1

Artificial microswimmers formed by liquid crystal droplets

Christian Bahr, Stephan Herminghaus, Corinna Maaß, Carsten Krüger, Chanyu Jin, Gunnar Kloes (MPI Goettingen)

Self-propulsion in surroundings with non-uniform Peclet numbers

Clemens Bechinger, Celia Lozano (U Stuttgart)

Experimental investigations of metachronal synchronization in 2D cilia arrays

Christoph Brückner, Uwe Schnakenberg, Alexander Rockenbach, Laura Kamps (U Freiberg/RWTH Aachen)

Propulsion and Interaction of Hot Brownian Swimmers

Frank Cichos, Klaus Kroy, Andreas Bregulla, Guillermo Zecua (U Leipzig)

Stirring by microorganisms: the case of *Shewanella*

Bruno Eckhardt, Kai Thormann, Felix Schmidt, Marco Kuehn (U Marburg/U Giessen)

10:55 – 11:20: Coffee Break

11:20 – 13:00: Session 2

From solitary swimmers to swarms and back: trypanosomes on their journey through the tsetse fly

Markus Engstler, Ines Subota, Tim Krueger, Sarah Schuster (U Würzburg)

Magneto-aerotaxis in magnetotactic bacteria

Damien Faivre, Stefan Klumpp, Peter Vach (MPI Golm)

Tailoring the mutual interaction between self-propelled particles: teaching colloids how to swarm

Svetlana Santer, Mark Santer, David Feldmann, Nino Lomadze (U Potsdam/MPI Golm)

Dynamical aggregation of self-propelled colloidal particles

Thomas Speck, Peter Virnau, Andreas Haertel, Jonathan Siebert, Benjamin Trefz (U Mainz)

Influence of hydrodynamics and confinement on the collective motion of microswimmers

Holger Stark, Andreas Zoettl, Maurice Maurer (TU Berlin)

13:00 – 14:20: Lunch

14:20 – 15:20: Session 3

Cooperative Motion of Microswimmers: The Role of Shape Anisotropy and Hydrodynamic Interactions

Christian Holm, Joost de Graaf, Georg Rempfer (U Stuttgart)

Enzyme powered autonomous microswimmer

Peer Fischer, Peter Gräber, Peter Oswald, Mariana Alarcon, Angela Holst, Johannes Sachs, Debora Walker (MPI Stuttgart/U Stuttgart/U Freiburg)

Swimming of deformable microcapsulesJan Kierfeld, Horst-Holger Boltz (TU Dortmund)**15:20 – 16:20: Coffee Break + Poster Session****16:20 – 17:40: Session 4****Understanding the collective behavior of microswimmers within microscopic statistical theory**Hartmut Löwen, Andreas Menzel, Arnab Saha, Borge ten Hagen, Julian Bialké (U Düsseldorf)**Design, Synthesis and Optimization of Origami-based Nanoswimmers**Katrin Günther, Alexander Herms, Michael Mertig (TU Dresden)**Hydrogel-Microswimmers Actuated by Near Infrared Light effected Volume Change**Martin Möller, Ahmed Mourran, Hang Zhang (DWI Aachen)**Modular Phoretic Microswimmers - Measuring Electrokinetic Inputs for Theoretical Modelling**Thomas Palberg, Denis Botin, Christopher Wittenberg, Alexander Reinmüller (U Mainz)**18:00: Departure to Ibis Hotel****19:00 – 21:00: Dinner at Ibis Hotel****21:00 – 22:30: Meeting of Steering Committee (members only)****03. June 2015****8:45: Departure from Ibis Hotel****9:15 – 10:55: Session 5****Creaming, diving and swimming microcapsules driven by chemical reactions**Heinz Rehage, Ann-Kathrin Froin, Monika Pella (TU Dortmund)**Hydrodynamic simulation of phoretic swimmers**Marisol Ripoll, Martin Wagner (FZ Jülich)**Active microrheology**Thomas Voigtmann, Alexander Liluashvili, Demian Levis (DLR Koeln)**Swimming Behaviour of a Sperm-Flagella Driven Micro-Bio-Robot: From Fundamental Studies to Biomedical Applications**Veronika Magdanz, Oliver G. Schmidt (IFW Dresden/TU Chemnitz)**Single motion and collective behavior of self-propelling droplets driven by Marangoni flow**Ralf Seemann, Jean-Baptiste Fleury, Leonard Li, Marin Brinkmann (U Saarbrücken)**10:55 – 11:20: Coffee Break****11:20 – 13:00: Session 6****Syncing noisy flagella**Benjamin Friedrich, Gary Klindt (MPI Dresden)**Ciliated Microswimmers**Gerhard Gompper, Jens Elgeti, Sebastian Rode, Guglielmo Saggiorato (FZ Jülich)

3D Navigation of sperm cells in a chemical gradient

U. Benjamin Kaupp, [Luis Alvarez](#), Jan Jikeli, Verena Jansen, An Gong (caesar Bonn)

Bacterial Swarming: Role of Flagella in Emergent Behavior

Roland Winkler, [Thomas Eisenstecken](#) (FZ Jülich)

Motion of chemically active micro-objects in confined spaces I: Experimental aspects

Samuel Sanchez, [Juliane Simmchen](#), [Jaideep Katuri](#) (MPI Stuttgart)

13:00 – 13:05: Conference Picture**13:05 – 14:25: Lunch****14:25 – 14:40: Announcements / Organizational Items****14:40 – 16:00: Session 7****Motion of chemically active micro-objects in confined spaces II: Theoretical aspects**

[William Uspal](#), Mihail Popescu, Siegfried Dietrich, Mykola Tasinkevych (MPI Stuttgart)

Investigation of the Self-propulsion of Janus Particles near a Polymer Functionalized Surface

Regine von Klitzing, [Mojdeh Heidari](#) (TU Berlin)

Flow characteristics of aerial swimmers: flapping wing propulsion of tiny insects flying at extremely low Reynolds numbers

[Jan Bartussek](#), Fritz Lehmann (U Rostock)

Dilute, active, worm-like polymers: Spontaneous coiling, statics, and dynamics

[Rolf E. Isele-Holder](#), Jens Elgeti, Gerhard Gompper (FZ Jülich)

16:00 – 16:20: Final Discussion and Concluding Remarks**16:30: Departure to Ibis Hotel**

List of Posters:

- [1] **Self-Propelling Liquid Crystal Droplets**
Carsten Krüger, Chenyu Jin, Gunnar Kloes, Christian Bahr, Stephan Herminghaus, Corinna Maaß (MPI Goettingen)
- [2] **Active Brownian motion in viscoelastic fluids**
Juan Ruben Gomez-Solano, Alex Blokhuis, Clemens Bechinger (U Stuttgart / MPI Stuttgart)
- [3] **The Role of Preferential Adsorption on the Hydrodynamics Properties of Droplets Driven by Marangoni Flow**
Leonard Li, Michael Hein, Martin Brinkmann, Ralf Seemann, Jean-Baptiste Fleury (U Saarbruecken / MPI Goettingen)
- [4] **Self-Propelled Rods Snake their Way through Micro Channels**
Joost de Graaf (U Stuttgart)
- [5] **Modelling Self-Propelled Particles using a Lattice-Boltzmann Electrokinetics Solver**
Georg Rempfer (U Stuttgart)
- [6] **Bead-spring microswimmers in a MPCD fluid**
Hendrik Ender, Jan Kierfeld (TU Dortmund)
- [7] **Soft Elastic Capsules in Axisymmetric Linearized Viscous Flow**
Horst-Holger Boltz, Jan Kierfeld (TU Dortmunde)
- [8] **Deformable microswimmer in a swirl**
Niklas Kuechler, Andreas Menzel, Hartmut Loewen (U Duesseldorf)
- [9] **How does a flexible chain of active particles swell?**
Sonja Babel, Andreas Kaiser, Borge ten Hagen, Christian von Ferber, Hartmut Loewen (U Duesseldorf / Coventry U)
- [10] **Gravitaxis of asymmetric self-propelled colloidal particles**
Borge ten Hagen, Felix Kuemmel, Raphael Wittkowski, Daisuke Takagi, Clemens Bechinger, Hartmut Loewen (U Duesseldorf / U Stuttgart / U Hawaii / MPI Stuttgart)
- [11] **Microwedges submersed into active fluids**
Andreas Kaiser, Katarina Popowa, Henricus H. Wensink, Anton Peshkov, Andrey Sokolov, Borge ten Hagen, Igor S. Aranson, Hartmut Loewen (U Duesseldorf / U Paris / Argonne National Lab)
- [12] **Photothermally actuated hydrogel microswimmers**
Hang Zhang, Ahmed Mourran, Martin Möller (DWI Leibniz-Institut)
- [13] **Characterization of modular micro-swimmers driven by local electric field**
Denis Botin, Christopher Wittenberg, Alexander Reinmueller, Hannah Mueller, Julian Weber, Jairo J. Orozco Sandoval, Ludmila Marotta Mapa, Thomas Palberg (U Mainz)
- [14] **Synthesis of DNA-Origami-based thermophoretic Micro- /Nanoswimmers**
Alexander Herms, Katrin Günther, A. Bregulla, F. Cichos, M. Mertig (TU Dresden, U Leipzig, KSI Meinsberg)
- [15] **Design and Understanding of Two Different Types of Artificial Microswimmers**
Ann-Kathrin Froin, Heinz Rehage (TU Dortmund)
- [16] **Synthesis and investigation of asymmetric, viscoelastic micro-swimmers with a propulsion based on chemical reactions**
Monika Pella, Heinz Rehage (TU Dortmund)
- [17] **Photo-induced motion of colloidal particles**
David Feldmann, Nino Lomadze, Svetlana Santer (U Potsdam)

- [18] Detention times of microswimmers at surfaces. Influence of noise and hydrodynamic swimmer-wall interactions**
Andreas Zoettl, Konstantin Schaar, Holger Stark (TU Berlin)
- [19] Simulating the Swimming Motion of *Trypanosoma brucei***
Johannes Blaschke, Davod Alizadehrad, Holger Stark (TU Berlin)
- [20] Stirring by microorganisms: the case of *Shewanella***
Marco Kühn, Felix Schmidt, Kai Thormann, Bruno Eckhardt (U Marburg / U Gießen)

Miscellaneous Information:

Presentations

There will be a 20 minutes presentation including discussion/questions for each SPP funded and associated project. Because of the tight schedule, please prepare your presentation such that you can keep the time limit. You can use your own laptop or a laptop provided by caesar for your presentation. The laptop from caesar can be used to present pdf and MS power point files. Please test your presentation latest during the break before the session of your talk. In any case, even if you plan to use your own laptop, please bring the presentation on a USB stick such that we can use a fallback solution.

Posters

Posters can be pinned up at the poster boards as soon as you arrive at the meeting venue. Please pin your poster to the board with the number that matches your poster number in the attached programme. Please don't forget to take your poster with you after the end of the meeting.

On-site registration

There will be an on-site registration where you can pick up your conference badges and printed versions of the programme. The registration desk will be open before the first session of the day and during the coffee breaks of the conference.

Conference picture

We will take a photo of all conference attendees right before lunch on 03 June. The exact location for the photo will be announced at the meeting.

Conference dinner

The conference dinner will be at the Ibis Hotel in Vorgebirgsstr. 33, 53119 Bonn. Because of limited financial resources, only the meals and one soft-drink per attendee can be covered from the SPP budget. Additional expenses (e.g. further drinks) will have to be covered by the attendees.

Bus transfer

There will be a bus transfer from Ibis Hotel to Forschungszentrum caesar in the morning and back to Ibis in the evening. Because of the tight schedule, please be at the bus stop a few minutes before the planned departure to avoid delays.

Overnight stays

A room is reserved for you at the Ibis Hotel, Vorgebirgsstr. 33, 53119 Bonn, if you have made a request for overnight stays during the online registration. The rooms are reserved on your names. The reservation includes breakfast and low-speed WiFi.