

Program

Sunday, 27 January 2019

11:00 – 15:00 Registration

12:30 *LUNCHTIME SNACKS and WELCOME COFFEE*
Informal get together

14:30 – 14:45 Scientific organizers **Opening and welcome**

Flagellar hydrodynamics I / Chair: Benjamin Friedrich

14:45 – 15:30 Ramin Golestanian **A few examples of emergent behaviour in active hydrodynamic systems**

15:30 – 16:15 Jens Elgeti **Hydrodynamics of sperm cells**

16:15 – 16:45 *COFFEE BREAK*

Data Blitz I / Chair: Benjamin Friedrich

16:45 – 17:00 Olivier Thouvenin **Ciliary motility instructs the formation of the central canal and bidirectionality of cerebrospinal fluid flow to ensure effective transport during embryogenesis**

17:00 – 17:15 Anders Andersen **Swimming, feeding, and stealth of flagellates**

Key note lecture I / Chair: Timo Strünker

17:15 – 18:15 Heymut Omran **The human β -HC paralogues DNAH9 and DNAH11 achieved during evolution specific functional roles for the distinct proximal and distal axonemal compartments of motile respiratory cilia**

18:30 *DINNER*

Key note lecture II / Chair: Veikko Geyer

19:45 – 20:45 Raymond Goldstein **Dynamics of adaptive phototaxis in uni- and multicellular green algae**

Program

Monday, 28 January 2019

08:00 *BREAKFAST*

Structure and assembly of cilia / Chair: Jonathon Howard

09:00 – 09:45 Daniela Nicastro Structure and function of motile cilia
studied by cryo-electron tomography

09:45 – 10:30 Gaia Pigino Ciliary assembly and transport

10:30 – 11:00 *COFFEE BREAK*

Data Blitz II / Chair: Veikko Geyer

11:00 – 11:15 Mohamed Mohamed Motor recruitment and activation for
intraflagellar transport

11:15 – 11:30 Thomas Fai Length regulation of multiple flagella
that self-assemble from a shared pool
of components

Dynamics of molecular motors / Chair: Veikko Geyer

11:30 – 12:15 Frank Jülicher Theory of ciliar dynamics

12:15 **Conference Photo** (in the foyer of the lecture hall)

12:30 *LUNCH*

Program

Monday, 28 January 2019

Motor control in the axoneme / Chair: Frank Jülicher

- 14:00 – 14:45 Jonathon Howard Curvature feedback coordinates axonemal dyneins to drive the flagellar beat in *Chlamydomonas*
- 14:45 – 15:30 Philip Bayly Flagella motion from dynamic instability without dynein regulation
- 15:30 – 16:00 *COFFEE BREAK*

Data Blitz III / Chair: Timo Strünker

- 16:00 – 16:15 Soheil Mojiri Multi-plane phase contrast imaging reveals fast 3D observation of axonemes
- 16:15 – 16:30 Hermes Gadelha How does the human sperm flagellum beat in 4D?
- 16:30 – 17:30 Poster blitz presentations (1 min each / 1 slide)
- 17:30 – 18:15 Poster session
- 18:30 *DINNER*
- 19:45 – 20:45 Poster session (continued)

Program

Tuesday, 29 January 2019

08:00 *BREAKFAST*

Cilia as signaling centers I / Chair: Heymut Omran

09:00 – 09:45 Benjamin Kaupp Deconstruction of cellular
computations in a flagellum by reverse
opto-chemical engineering

09:45 – 10:30 Markus Delling The function of TRPP channels as flow
sensors in establishing left right
asymmetry

10:30 – 11:00 *COFFEE BREAK*

Cilia as signaling centers II / Chair: Heymut Omran

11:00 – 11:45 Jean-Ju Chung A novel pH-dependent Ca²⁺ sensor for
regulating sperm motility and fertility

11:45 – 12:30 Dagmar Wachten Optogenetic analysis of signaling in
sperm flagella

12:30 *LUNCH*

Program

Tuesday, 29 January 2019

Data Blitz IV / Chair: Veikko Geyer

- | | | |
|---------------|--------------------|--|
| 14:00 – 14:15 | Timothy Krüger | Collective swimming behaviour of a high density flagellate population on semi-solid surfaces |
| 14:15 – 14:30 | Christian Schiffer | Rotational motion and rheotaxis of sperm do not require CatSper Ca ²⁺ channels |

Navigation of ciliated swimmers I / Chair: Benjamin Kaupp

- | | | |
|---------------|---------------|---|
| 14:30 – 15:15 | Gáspár Jékely | Neuronal coordination of locomotor cilia in <i>Platynereis</i> larvae |
| 15:15 – 16:00 | Luis Alvarez | Hacking sperm's navigation program |
| 15:30 – 16:45 | COFFEE BREAK | |

Navigation of ciliated swimmers II / Chair: Benjamin Kaupp

- | | | |
|---------------|--|--|
| 16:45 – 17:30 | Mariana Medina-Sánchez | Exploiting sperm power in biomedicine |
| 17:30 – 18:15 | Laurence Wilson | Adaptive swimmers: <i>Leishmania</i> parasites |
| 18:15 – 18:30 | Stefan Jorda | About the Wilhelm and Else Heraeus Foundation |
| 18:30 | <i>HERAEUS DINNER at the Physikzentrum and get together (cold & warm buffet, free beverages)</i> | |

Program

Wednesday, 30 January 2019

08:00 *BREAKFAST*

Collective dynamics I / Chair: Ramin Golestanian

08:30 – 09:15 Eberhard Bodenschatz **Cilia mediated flow and cell polarity of the brain ventricular system**

09:15 – 10:00 Nathalie Delgehyr **Ependymal cilia beating induces an actin network to protect centrioles against shear stress**

10:00 – 10:30 *COFFEE BREAK*

Collective dynamics II / Chair: Ramin Golestanian

10:30 – 11:15 Nathalie Jurisch-Yaksi **The function of motile-cilia driven flow in the nervous system**

11:15 – 12:00 Benjamin Friedrich **Synchronization of cilia and flagella**

12:00 – 12:15 Scientific organizers **Poster awards / summary and closing remarks**

12:15 *LUNCH*

End of the seminar and FAREWELL COFFEE / Departure

*Please note that there will be **no** dinner at the Physikzentrum on Wednesday evening for participants leaving the next morning.*