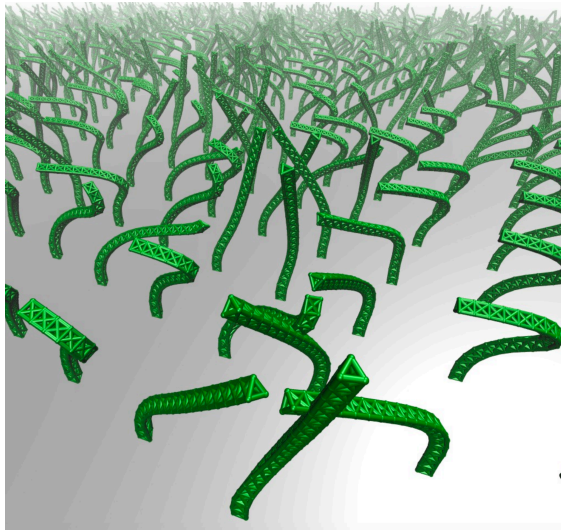


International Workshop
21 - 25 October 2019

Fluid Physics of Life

PROGRAM



Scientific coordinators:

Karen Alim • Max Planck Institute for Dynamics and Self-Organization, Göttingen & Technical University of Munich, Germany
Eberhard Bodenschatz • Max Planck Institute for Dynamics and Self-Organization, Göttingen, Germany
Gerhard Gompper • Forschungszentrum Jülich, Germany

Organisation:

Maria Voigt • MPIPKS, Dresden, Germany



Max-Planck-Institut für Physik komplexer Systeme

Nöthnitzer Str. 38, D-01187 Dresden

Tel.: +49-351-871-1934 / Fax: +49-351-871-2199

Email: fplife19@pks.mpg.de

Internet: <http://www.pks.mpg.de/fplife19>



The program will be continuously updated during the event. This
version was printed on October 18, 2019

Program

Monday, 21 October

- | | |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10:15 - 10:30 | Frank Jülicher (director MPIPKS) and scientific coordinators
Opening

Flows on different scales

<i>Chair: Eberhard Bodenschatz</i> |
| 10:30 - 11:30 | Ramin Golestanian (Max Planck Institute for Dynamics and Self-Organization)
A classical analog of Bose-Einstein condensation in active matter |
| 11:30 - 12:30 | Frank Jülicher
(Max Planck Institute for the Physics of Complex Systems)
Electrohydraulics of tissues |
| 12:30 - 13:30 | Lunch break |
| 13:30 - 16:00 | Discussions
(available discussion rooms: seminar room 3, 2 A 1, 1 B 1 and 2 B 1) |
| 16:00 - 16:30 | Coffee break |

fplife19-Colloquium chair: Steffen Rulands (MPIPKS)

16:30 - 17:30

fplife19-Colloquium: Karen Alim

(Max Planck Institute for Dynamics and Self-Organization
& Technical University of Munich)
Fluid flows shaping morphology

17:30 - 18:00

Discussions

18:00 - 19:00

Welcome dinner

Chair: Masaki Sano

19:00 - 19:30

Dmitry Fedosov (Forschungszentrum Jülich)

Formation and dissociation of VWF-platelet
aggregates in blood flow

19:30 - 20:00

Maciej Lisicki (University of Warsaw)

Swimming eukaryotic microorganisms exhibit a
universal speed distribution

20:00 - 21:00

Michael Wilczek (Max Planck Institute for
Dynamics and Self-Organization)

Self-organization in active fluids

Tuesday, 22 October

Flow tissue interactions

Chair: Karen Alim

- | | |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 09:00 - 10:00 | Masaki Sano (The University of Tokyo & Shanghai Jiao Tong University)
Toward Active Hydrodynamics for Extensile Tissue Dynamics |
| 10:00 - 10:30 | Coffee break |
| 10:30 - 11:30 | Regina Faubel (University of Pittsburgh)
The Ciliary Logistic Network - a transport system based on fluid dynamics |
| 11:30 - 12:30 | Douglas H. Kelley (University of Rochester)
The fluid physics of brain waste removal |
| 12:30 - 13:30 | Lunch break |
| 13:30 - 16:00 | Discussions
<i>(available discussion rooms: seminar room 3, 2 A 1, 1 B 1 and 2 B 1)</i> |
| 16:00 - 16:30 | Coffee break |
| 16:30 - 18:00 | Poster session I
(focus on odd poster numbers) |
| 18:00 - 19:00 | Dinner |

Chair: Michael Shelley

- 19:00 - 19:30 **Francesco Boselli** (University of Cambridge)
Fluid dynamics and development of orientational
polarity in multiciliated tissues
- 19:30 - 20:00 **Stephan Gekle** (University of Bayreuth)
Blood platelet formation - a biological
Rayleigh-Plateau instability
- 20:00 - 21:00 **Nathalie Jurisch-Yaksi** (Norwegian University of
Science and Technology)
The function of motile-cilia driven flow in the
nervous system

Wednesday, 23 October

Flow within the cell

Chair: Raymond E. Goldstein

- | | |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 09:00 - 10:00 | Moritz Kreysing (Max Planck Institute for Molecular Cell Biology and Genetics)
Light controlled cytoplasmic transport to probe cellular organization |
| 10:00 - 10:10 | Group photo
(to be published on the event's web page) |
| 10:10 - 10:30 | Coffee break |
| 10:30 - 11:30 | Alexandra Zidovska (New York University - Center for Soft Matter Research)
The "self-stirred genome": dynamics, flows and rheology |
| 11:30 - 12:30 | Michael Shelley
(Simons Foundation - Flatiron Institute)
Self-Organization and Mechanics in the Cell |
| 12:30 - 13:30 | Lunch break |
| 13:30 - 16:00 | Discussions
<i>(available discussion rooms: seminar room 3, 2 A 1, 1 B 1 and 2 B 1)</i> |
| 16:00 - 16:30 | Coffee break |

Chair: Gerhard Gompper

- 16:30 - 17:00 **Thomas Fai** (Brandeis University Waltham)
Fluid dynamics of vesicular transport in dendritic spine
- 17:00 - 17:30 **Isabella Guido** (Max Planck Institute for
Dynamics and Self-Organization)
Spontaneously oscillating synthetic cilia
- 17:30 - 18:00 **Benjamin M. Friedrich** (Technical University
Dresden - Center for Advancing Electronics)
Stability and noise of metachronal waves in cilia
carpets
- 18:15 Departure for downtown Dresden by tram
(meeting point: reception of the MPIPKS,
main building)
- 19:00 - 20:30 Workshop dinner at the restaurant 'Gasthaus am
Neumarkt', An der Frauenkirche 13, Dresden
(Tel.: +49 351 323 67 210)

Thursday, 24 October

Transport and signaling

Chair: Marcus Roper

09:00 - 10:00	Knut Drescher (Max Planck Institute for Terrestrial Microbiology) Dynamics of Bacterial Collective Behavior
10:00 - 10:30	Coffee break
10:30 - 11:30	Jörn Dunkel (Massachusetts Institute of Technology) Spontaneous symmetry breaking in active fluids
11:30 - 12:30	Kathleen Stebe (University of Pennsylvania, Philadelphia) Bacteria as Active Surface Agents
12:30 - 13:30	Lunch break
13:30 - 16:00	Discussions <i>(available discussion rooms: seminar room 3, 2 A 1, 1 B 1 and 2 B 1)</i>
16:00 - 16:30	Coffee break
16:30 - 18:00	Poster session II (focus on even poster numbers)
18:00 - 19:00	Dinner

Chair: Alexandra Zidovska

19:00 - 19:30

Jorge Arrieta

(Instituto Mediterráneo de Estudios Avanzados)
Light-Control of Localised Photo-Bio-Convection

19:30 - 20:00

Eleonora Secchi (ETH Zurich)

Fluid flow and motility control initial bacterial
colonization on curved surfaces

20:00 - 21:00

Arndt Siekmann

(University of Pennsylvania, Philadelphia)
The role of blood flow in building hierarchically
patterned blood vessel networks

Friday, 25 October

Flow biofilm interactions

Chair: Kathleen Stebe

- | | |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 09:00 - 10:00 | Raymond E. Goldstein (University of Cambridge)
Flow-induced dinoflagellate bioluminescence at the single cell level |
| 10:00 - 10:30 | Coffee break |
| 10:30 - 11:30 | Marcus Roper
(University of California, Los Angeles)
Can a shear stress set point produce stable microvascular networks? |
| 11:30 - 12:30 | Kaare H. Jensen
(Technical University of Denmark)
Controlling intercellular flow through mechano-sensitive plasmodesmata nanopores in plants |
| 12:30 - 13:30 | Lunch break |
| 13:30 - 14:30 | Discussions
<i>(available discussion rooms: seminar room 3, 2 A 1, 1 B 1 and 2 B 1)</i> |
| 14:30 - 15:00 | Closing and departure |
| 15:00 - 16:00 | Informal discussions |