

Workshop Program

Sunday, November 7

- 18:30 - 19:30 Registration
19:00 - 21:30 Welcome reception in the institute's main building

Monday, November 8

- 08:50 - 09:00 Welcome address and introduction to the workshop
Frank Jülicher (MPIPKS) and
the scientific coordinator Tamas Vicsek

Chairperson: Christian Schmeiser

- 09:00 - 09:50 Iain Couzin (Princeton University)
Information transfer and the evolution of collective behavior
- 09:50 - 10:40 Sriram Ramaswamy (Indian Institute of Science, Bangalore)
On the order of the flocking transition
- 10:40 - 11:05 Gonzalo de Polavieja (Instituto Cajal, Madrid)
Collective patterns of decisions from individuals estimating the best spatial location
- 11:05 - 11:30 Coffee break
- 11:30 - 11:55 Eric Bertin (ENS Lyon)
Derivation and stability of hydrodynamic equations for self-propelled particles
- 11:55 - 12:20 A. Jamie Wood (University of York)
How perceived threat affects collective motion: Modelling speed distributions and their importance
- 12:20 - 14:00 Lunch

Chairperson: Hugues Chaté

- 14:00 - 14:50 Charlotte K. Hemelrijk (University of Groningen)
Aerial displays of thousands of starlings: Causation of flock shape and density
- 14:50 - 15:40 Lutz Schimansky-Geier (Humboldt-Universität zu Berlin)
Fluctuations in self-propelled particles
- 15:40 - 16:05 Jan Haskovec (Austrian Academy of Sciences, Linz)
From individual to collective behaviour of coupled velocity jump processes: A locust example
- 16:05 - 16:30 Coffee break
- 16:30 - 17:30 Chairperson: Frank Jülicher (MPIPKS)
COLMOT10 Colloquium
Raymond E. Goldstein (University of Cambridge)
Microfluidics of cytoplasmic streaming
- 17:30 - 19:00 Poster evening session - Focus on posters with odd poster numbers
- 19:00 - 20:30 Supper

Workshop Program

Tuesday, November 9th

Chairperson: Raymond E. Goldstein

- 09:00 - 09:50 Mitsugu Matsushita (Chuo University, Tokyo)
Colony formation in bacteria - Collective movement of cells
- 09:50 - 10:40 Markus Bär (Physikalisch-Technische Bundesanstalt, Berlin)
Pattern formation and collective motion of myxobacteria
- 10:40 - 11:20 **Group photo** (to be published on the workshop's web page) and
Coffee break
- 11:20 - 11:45 Christophe Deroulers (Université Paris Diderot)
The phase diagram of migrating cells: Aggregation without attraction
- 11:45 - 12:10 Christina Surulescu (Westfälische Wilhelms-Universität Münster)
On some modeling approaches to cell dispersal
- 12:10 - 14:00 Lunch
- Chairperson: Sriram Ramaswamy
- 14:00 - 14:50 Inbal Hecht (Tel Aviv University)
From passive to active navigation: How can a cell find the way?
- 14:50 - 15:40 Carl-Philipp Heisenberg (IST Austria/MPI CBG Dresden)
Cell movements during zebrafish gastrulation
- 15:40 - 16:10 Coffee break
- 16:10 - 16:35 Victor Luria (Columbia University)
Genetic variability and decision-making in the assembly of sensory-motor circuits
- 16:35 - 17:00 Larissa Conradt (University of Sussex)
Collective decision making in animals
- 17:00 - 19:00 **Film & Animation**
- 19:00 - 20:30 Supper

Workshop Program

Wednesday, November 10th

Chairperson: Iain Couzin

- 09:00 - 09:50 Irene Giardina (Università di Roma La Sapienza)
Scale free correlations in bird flocks
- 09:50 - 10:40 Jacques Gautrais (Research Center on Animal Cognition, Toulouse)
Experimental identification of fish interactions in a tank predicts velocity-induced phase transition
- 10:40 - 11:20 Coffee break
- 11:20 - 11:45 Kunal Bhattacharya (Eötvös Loránd University, Budapest)
Collective decision making in cohesive flocks
- 11:45 - 12:10 Francesco Ginelli (Institut des Systèmes Complexes, Paris)
Collective behavior in large animal groups
- 12:10 - 13:50 Lunch
- 13:50 Leaving for the excursion
- 14:30 - 17:30 Excursion through Dresden's old city centre including an organ play in the Hofkirche (Cathedral)
- 19:30 - Conference dinner in the restaurant "Alte Meister"

Workshop Program

Thursday, November 11th

Chairperson: András Czirók

- 09:00 - 09:50 M Cristina Marchetti (Syracuse University)
Modeling active fluids: From microscopic to hydrodynamics
- 09:50 - 10:40 Ezequiel Albano (Universidad Nacional de La Plata)
On the structural properties of networks formed upon swarming
- 10:40 - 11:20 Coffee break
- 11:20 - 11:45 Toru Ohira (Sony Computer Science Laboratories, Inc., Tokyo)
Chase and escape on group motion
- 11:45 - 12:10 Pawel Romanczuk (Humboldt-Universität zu Berlin)
Onset of collective motion due to escape and pursuit - Theory and experiment
- 12:10 - 14:00 Lunch

Chairperson: M Cristina Marchetti

- 14:00 - 14:50 Christian Schmeiser (Universität Wien)
A possible mechanism for dendritic bacterial swarming without nutrition limitation
- 14:50 - 15:15 Nikolaos Vlassopoulos (LORIA, Vandoeuvre-lès-Nancy)
How fast can virtual amoebae aggregate? Analysis for the optimal firing rate in an instance of the reaction-diffusion-chemotaxis aggregation scheme
- 15:15 - 15:40 Masayasu Mimura (Meiji University, Kawasaki)
Self-organized patterns in bacterial colonies
- 15:40 - 16:20 Coffee break
- 16:20 - 19:00 **Poster evening session - Focus on posters with even poster numbers**
- 19:00 - 20:30 Supper

Workshop Program

Friday, November 12th

Chairperson: Mitsugu Matsushita

- 09:00 - 09:50 Hugues Chaté (CEA Saclay)
Minimal models for collective motion
- 09:50 - 10:40 Fernando Peruani
(Max-Planck-Institut für Physik komplexer Systeme, Dresden)
Clustering, spatial patterns, and information spreading in self-propelled particle systems
- 10:40 - 11:20 Coffee break
- 11:20 - 11:45 Andrea Perna (Uppsala University)
Formation of exploratory networks by Argentine ants: From individual behaviour to two-dimensional patterns
- 11:45 - 12:10 Fatihcan M. Atay
(Max-Planck-Institut für Mathematik in den Naturwissenschaften, Leipzig)
Consensus and synchronization on networks with delayed and time-varying links
- 12:10 - 13:30 Lunch
- Chairperson: Lutz Schimansky-Geier
- 13:30 - 14:20 David J.T. Sumpter (Uppsala University)
Can we determine the rules of motion of fish?
- 14:20 - 15:10 Andras Czirok (Eötvös Loránd University, Budapest)
Collective cell movements in vivo, in vitro and in simulations
- 15:10 - 15:40 Concluding remarks - Andreas Deutsch & Guy Théraulaz