



## Short Course on *Microswimmers*, October 14-18, 2019 at CSRC

微游泳体短期培训课程，10月14-18日，北京计算科学研究中心

### *Organizers:*

Hugues Chaté (Beijing CSRC) & Xia-qing Shi [施夏清] (Soochow University, 苏州大学)

### *Main lecturers:*

- David Saintillan (UCSD)
  1. *Low-Reynolds number hydrodynamics and the fluid mechanics of swimming microorganisms*
  2. *Hydrodynamic interactions between swimmers and with boundaries*
  3. *Kinetic theories for active suspensions and their collective motion*
  4. *Rheology and spontaneous flows in active suspensions*
- Roland Winkler (Juelich)
  1. *Stochastic dynamics — Active Brownian particles*
  2. *Statistical mechanics of active systems Part I*
  3. *Statistical mechanics of active systems Part II*
  4. *Mesoscale simulations of active systems*
  5. *Atomistic and coarse-grained modeling of microswimmers*

## Programme (final)

### Monday, October 14:

- 8:30-9:00 *Registration*
- 9:00-9:10 *a few words from the organizers*
- 9:10-10:25 D. Saintillan Lecture 1
- *tea break*
- 10:55-12:10 R. Winkler Lecture 1
- *lunch break*
- 14:00-15:15 R. Winkler Lecture 2
- *tea break*
- 15:45-16:25 Junhua Yuan [袁军华] Invited talk: *Chemotaxis in a bacterial swarm*

### Tuesday, October 15:

- 9:00-10:15 D. Saintillan Lecture 2

- *tea break*
- **10:45-12:00** R. Winkler Lecture 3
- *lunch break*
- **14:00-15:15** Zhiguang Wu [吴志光] Lecture: *Controllable assembly-based micro-/nanoswimmers for biomedical applications*
- *tea break*
- **15:45-16:25** Shuo Guo [郭硕] Invited talk: *Symmetric shear banding and swarming vortices in bacterial superfluids*

### Wednesday, October 16:

- **9:00-10:15** D. Saintillan Lecture 3
- *tea break*
- **10:45-12:00** D. Saintillan Lecture 4
- *lunch break*
- **14:00-15:15** R. Winkler Lecture 4
- *tea break*
- **15:45-17:00** Hands-on class: *Multi-particle collision dynamics* (Mingcheng Yang [杨明成], Roland Winkler)

### Thursday, October 17:

- **9:00-10:15** D. Saintillan Lecture 5
- *tea break*
- **10:45-12:00** Yang Ding [丁阳] *Theoretical and numerical methods for the hydrodynamics of a single swimmer in creeping flow*
- *lunch break*
- **14:00-15:15** Xinliang Xu [徐辛亮] *Modeling hydrodynamic interactions in active suspensions*
- *tea break*
- **15:45-17:00** R. Winkler Lecture 5

### Friday, October 18:

- **9:00-9:40** Mingcheng Yang [杨明成] *Constraint dependence of active depletion forces on passive particles*
- **9:40-10:20** Zhiguang Wu [吴志光] *Active delivery from micro-nanoswimmers*
- *tea break*
- **10:50-11:30** Zhonghuai Hou [侯中怀] *Collective behaviors of active particles: Effect of Complex Interactions*
- **11:30-12:10** Liyan Qiao [乔丽颜] *Dynamics of self-propelled motors in chemically active media*
- *lunch break*
- **14:00-14:40** Guangyin Jing [经光银] *Bacterial swimming in shear flow*
- **14:40-15:10** He Li [李赫] *Quantitative modeling of bacterial active nematics*
- **15:10-15:20** *Concluding words*

## Venue, practical details

The short course and the symposium will take place at the Computational Science Research Center in the North of Beijing (directions [here](#)). The first lecture will start at 9am on Monday, October 14. The symposium on Friday October 18 will end around 3pm. Lunches will be taken at CSRC's cafeteria.

*Website of the short course* (for registration, updated program):  
<https://www.csrc.ac.cn/en/event/schools/2019-09-23/53.html>

*For Inquiries/Remarks/Questions: [activematter@qq.com](mailto:activematter@qq.com)*