

2026年国际软物质与生物物理理论研讨会

2026 International Workshop on Soft Matter and Biophysics Theories (SMBT2026)
AND Advanced Core-to-Core Network for the Physics of Self-organizing Active Matter Workshop

Sept. 20th – 25th, 2026 | Beijing, China (中国北京)



主办单位：中国科学院理论物理研究所
Institute of Theoretical Physics, Chinese Academy of Sciences



About the workshop:

The "International Workshop on Soft Matter and Biophysics Theories (SMBT)", has annually been organized by Institute of Theoretical Physics, Chinese Academy of Sciences (ITP-CAS) since the year of 2016, of which the aim is to promote interactions and collaborations between theoreticians and experimentalists working on the chosen topic of each year. This year, SMBT2026 will be held jointly with "Advanced core-to-core network for the physics of self-organizing active matter" workshop, which was previously held in Kyoto (2023), Edinburgh (2024) and Dresden (2025), and will also be organized in collaboration with "Dynamical Materials Science".

The theme of this year SMBT2026 is: "Active Matter Theories".

The workshop will be held on Sept. 20th – Sept. 25th, 2026 at Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China.

Organising Committee:

Zhong-Can Ou-Yang (ITP-CAS)	Haijun Zhou (ITP-CAS)
Yanting Wang (ITP-CAS)	Hualin Shi (ITP-CAS)
Pan Zhang (ITP-CAS)	Fanlong Meng (ITP-CAS)
Weikang Wang (ITP-CAS)	Shigeyuki Komura (WIUCAS)
Ryoichi Yamamoto (Kyoto University)	Matthew Turner (University of Warwick)
Holger Stark (Technical University of Berlin)	Kazumasa Takeuchi (Tokyo University)

Brief Schedule (Beijing time):

Sept. 20 th	14:00-20:00	Registration at Liaoning International Hotel (Buffet Dinner First Floor, Sheng'an Hui Restaurant 18:00 – 20:00)
Sept. 21 st – 24 th	09:00-18:00	Talks and poster presentations
Sept. 25 th	09:00-12:00	Talks

Conference Program

Sept. 21st, 2026 (Monday)

Venue: Meeting room 6620, South Building of ITP (理论物理所南楼 6620 会议室)

8:30-8:50	Registration on the 6 th floor of South Building of ITP	
8:50-9:00	Opening Remarks	
Session 1 • Chair: Hepeng Zhang		
Beijing Time	Speaker	Title
9:00-9:30	Holger Stark Technical University of Berlin	Controlling and designing active paranematic flow
9:30-10:00	Marco Mazza Loughborough University	Topological Transitions in Active Spaghetti: from Motion to Structure
10:00-10:30	Yongfeng Zhao Soochow University	Surface tensions and interfacial phenomena in scalar active matter
10:30-11:00	Group Photo and Coffee break	
Session 2 • Chair: Holger Stark		
11:00-11:30	Hepeng Zhang Shanghai Jiao Tong University	Bacterial turbulence drives interfacial waves and shape dynamics in phase-separated droplets
11:30-12:00	Daiki Matsunaga The University of Osaka	Active Transport and Control of Liposomes Driven by Encapsulated Microorganisms
12:00 Lunch at 4th floor of Wuke Hotel (物科餐厅四层)		

Sept. 21st, 2026 (Monday)

Venue: Meeting room 6620, South Building of ITP (理论物理所南楼 6620 会议室)

Session 3 • Chair: Fabio Marchesoni		
Beijing Time	Speaker	Title
14:00-14:30	Oliver Bäumchen University of Bayreuth	Emergence of Collective Effects in Microbial Suspensions
14:30-15:00	Qunli Lei Nanjing University	Liquid-gas Criticality of Non-equilibrium Hyperuniform Fluids
15:00-15:30	Vahid Nasirimarekani Max Planck Institute for Dynamics and Self-Organization	Gliding Chiral Active Matter
15:30-16:30	Poster presentation 1 and Coffee break (The third floor coffee lounge)	
Session 4 • Chair: Oliver Bäumchen		
16:30-17:00	Fabio Marchesoni Tongji University	Collective dynamics in nonreciprocal 2D chiral suspensions
17:00-17:30	Guangyin Jing Northwest University	Activity-Driven Bacterial Turbulence
17:30-18:00	Xinliang Xu Hainan University	Bacterial dynamics near surfaces: residence time and surface diffusivity
18:00 Dinner at 4th floor of Wuke Hotel (物科餐厅四层)		

Sept. 22nd, 2026 (Tuesday)

Venue: Meeting room 6620, South Building of ITP (理论物理所南楼 6620 会议室)

Session 5 • Chair: Qi-huo Wei		
Beijing Time	Speaker	Title
9:00-9:30	Erwin Frey Ludwig-Maximilians-Universität München	Emergence and Self-organisation in Biological Systems
9:30-10:00	Zhihong You Xiamen University	The Physics of Perceptive Matter: Information-Mediated Constitutive Laws
10:00-10:30	Luca Cocconi University of Cambridge	Mechanosensing via inhibition of dissipation in a thermodynamically consistent active solid
10:30-11:00	Coffee break	
Session 6 • Chair: Erwin Frey		
11:00-11:30	Qi-huo Wei Southern Technology University	Walls, Vortices and Monopoles in Polar Liquids
11:30-12:00	Sebastian Heidenreich Physikalisch Technische Bundesanstalt	Polar or nematic active fluid? The collective dynamics of bacterial suspensions
12:00 Lunch at 4th floor of Wuke Hotel (物科餐厅四层)		

Sept. 22nd, 2026 (Tuesday)

Venue: Meeting room 6620, South Building of ITP (理论物理所南楼 6620 会议室)

Session 7 • Chair: Limei Xu		
Beijing Time	Speaker	Title
14:00-14:30	Juliane Simmchen University of Strathclyde	Spontaneous symmetry breaking enables anti-rolling motion of MnO2 microrods
14:30-15:00	Rui Zhang Hong Kong University of Science and Technology	Defect Dynamics in Liquid Crystals with Odd Nematic Elasticity
15:00-15:30	Azusa Kage Muroran Institute of Technology	An experimental Biologist’s View on Bioconvection and Gravitaxis of Unicellular Microswimmers
15:30-16:30	Poster presentation 2 and Coffee break (The third floor coffee lounge)	
Session 8 • Chair: Juliane Simmchen		
16:30-17:00	Limei Xu Peking University	TBD
17:00-17:30	Yunyun Li Tongji University	Active phase separation triggered by defects
17:30-18:00	Robert Ross Westlake University	Hyperdisordered Cell Packing on a Growing Surface
18:00 Banquet Venue: 8th floor, Liaoning Hall A, Liaoning International Hotel (辽宁大厦 8 层辽宁 A 厅)		

Sept. 23rd, 2026 (Wednesday)

Venue: Meeting room 6620, South Building of ITP (理论物理所南楼 6620 会议室)

Session 9 • Chair: Junhua Yuan		
Beijing Time	Speaker	Title
9:00-9:30	Olivier Dauchot French National Center for Scientific Research	Hydrodynamic Theories for Fluids of Learning Robots
9:30-10:00	Kabir Husain University College London	The Evolution of Non-equilibrium Error-correction
10:00-10:30	Xinpeng Xu Guangdong Technion-Israel Institute of Technology	Deep learning-based statistical inference of stochastic cell migration in a complex microenvironment
10:30-11:00	Coffee break	
Session 10 • Chair: Olivier Dauchot		
11:00-11:30	Junhua Yuan University of Science and Technology of China	Hydrodynamic phase entrainment drives synchronization of sperm flagella
11:30-12:00	Kai Qi Shanghai Institute of Microsystem and Information Technology	Hydrodynamic Simulations of Microswimmers in Complex Fluids
12:00 Lunch at 4th floor of Wuke Hotel (物科餐厅四层)		
14:00-18:00	Free Discussion	

Sept. 24th, 2026 (Thursday)

Venue: Meeting room 6620, South Building of ITP (理论物理所南楼 6620 会议室)

Session 11 • Chair: Carsten Beta		
Beijing Time	Speaker	Title
9:00-9:30	Chenxu Wu Xiamen University	Dynamics of microvesicle formation driven by glycocalyx
9:30-10:00	Shoichi Toyabe Tohoku University	Efficient transport of thermal and active systems in experiments
10:00-10:30	Kento Yasuda Nihon University	Extended Onsager’s Variational Principle for Active Matter
10:30-11:00	Coffee break	
Session 12 • Chair: Chenxu Wu		
11:00-11:30	Carsten Beta Potsdam University	TBD
11:30-12:00	Wei Wang Harbin Institute of Technology, Shenzhen	New observations of Quincke roller collective behaviors
12:00 Lunch at 4th floor of Wuke Hotel (物科餐厅四层)		

Sept. 24th, 2026 (Thursday)

Venue: Meeting room 6620, South Building of ITP (理论物理所南楼 6620 会议室)

Session 13• Chair: Fangfu Ye		
14:00-14:30	Cathy McNamee Kyoto University	Changing the forces between materials in aqueous solutions with audible sounds
14:30-15:00	Azam Gholami New York University, Abu Dhabi, UAE	Spontaneous flows and interfacial instabilities in oxygen-sensitive living active matter
15:00-15:30	Daniel Pearce University of Geneva	Scale and order in active nematics
15:30-16:30	Poster presentation 3 and Coffee break (The third floor coffee lounge)	
Session 14 • Chair: Cathy McNamee		
16:30-17:00	Fangfu Ye Institute of Physics, CAS	ECM-mediated Cell Migration and Self-Organization
17:00-17:30	Hiroshi Kori University of Tokyo	Data, Dynamics, and Networks: Insights from Synchronization Theory
17:30-18:00	Yi Peng Institute of Physics, CAS	Flocking Phase Separation and the Collective Modes in Inertial Active Matter
18:00 Dinner at 4th floor of Wuke Hotel (物科餐厅四层)		

Sept. 25th, 2026 (Friday)

Venue: Meeting room 6620, South Building of ITP (理论物理所南楼 6620 会议室)

Zoom: 880 4357 4732 **Passcode:**113763

<https://us06web.zoom.us/j/88043574732?pwd=GODbXNBOSStMrliCPkTKCJxKSI73Kco.1>

Session 15 • Chair: Suropriya Saha		
Beijing Time	Speaker	Title
9:00-9:30	Mingcheng Yang Institute of Physics, CAS	Surface Tension Between Coexisting Phases of Active Particles
9:30-10:00	Hao Wu Wenzhou Institute, UCAS	A Parity-Based No-Go Theorem for Uniform Odd Viscosity in Active Fluids
10:00-10:30	Kazuaki Takasan University of Tokyo	Quantum Active Matter
10:30-11:00	Coffee break	
Session 16 • Chair: Mingcheng Yang		
11:00-11:30	Suropriya Saha Max Planck Institute for Dynamics and Self-Organization	Spinning Mixtures: Nonreciprocity Transfers Chirality Across Scales in Scalar Densities
11:30-12:00	Sifan Yin Max Planck Institute for the Physics of Complex Systems	Developmental mechanics of divergent buckling patterns in chick gut
12:00 Lunch at 4th floor of Wuke Hotel (物科餐厅四层)		

Poster Sessions

Poster Presentation 1

Sept. 21, 2026, 15:30-16:30

No.	Name	Affiliation	Title
1	Shigeyuki Komura	Wenzhou Institute, UCAS	Covariant Langevin equation using scalar free energy
2	Anish Kumar	IIT (BHU) Varanasi	From LRO to Disorder via QLRO in Spatially Inhomogeneous Polar Flock
3	Hiroki Matsukiyo	Kyoto University	Numerical study on the defect configuration of an active nematic around a circular obstacle with ridge effect
4	Zihan Tan	TU Berlin	Swimming trypanosome in confinements
5	Changle Liao	Tokyo University	Near-field Hydrodynamics Disentangles Angular Correlations in Confined Active Suspensions
6	Charu Datt	Keio University	Fluid dynamics in chemically active emulsions
7	Toshihiro Omori	Tohoku University	Elasto-plastic hydrodynamics of a microswimmer encapsulated in a capsule
8	Chung Wing Chan	Kyoto University	Symmetry, Localization, and Topology in Scalar-Patterned Flocks
9	Mingqi Yan	LMU Munich	Stochastic bubble dynamics in phase-separated scalar active matter
10	Zhongqiang Xiong	Wenzhou Institute, UCAS	Taylor dispersion in sedimentation of an axisymmetric Brownian particle with centre offset
11	Mizuki NAKAMURA	Chiba University	Selection of Rayleigh-Bénard convection patterns in two immiscible liquid layers with an undeformed interface
12	Mohd Yasir Khan	South China University of Technology	Frustrated Flocking: Anti-alignment-driven ordering transitions in a modified Vicsek model

No.	Name	Affiliation	Title
13	Changhao Li	Zhejiang University	Entropy Production and Its Scaling with Spatiotemporal Scales in Nonreciprocal Phase Separation
14	Daniel Zhou	LMU München	Duality Between Chemical Potential Dynamics and Reaction–Diffusion Systems
15	Debsuvra Ghosh	OIST	Strain-event redistribution in corrugated bacterial channels
16	Kei Oriyose	Tokyo University	Rectification of Active Particles in Asymmetric Periodic Potentials
17	Fedor Zavalko	SRI for Systems Biology	Immobilization of glycolytic enzymes on nanoparticles results in glycolytic complex formation with functional overtones that are regulated by assembly order and immobilization density
18	Shun Sasaki	Kyushu University	Complex Viscoelastic Response of Concentrated Emulsion Suspensions in the Glass–Jamming Regime
19	Salah Ghellab	Chalmers University of Technology	Programming phoretic interaction through supramolecular recognition
20	Cheng Qi	Shenzhen University	Fingering instability of a non-equilibrium coacervate system

Poster Presentation 2

Sept. 22, 2026, 15:30-16:30

No.	Name	Affiliation	Title
1	BenChang Wu	Xiamen University	Nonreciprocity-induced crystallization and melting
2	Yujie Gao	Tokyo University	Flocking behavior with Cucker-Smale model under Markov switching mechanism
3	Michael Schindler	ESPCI Paris	Self-propelled hard disks: Implicit alignment and transition to collective motion
4	Weiqi Wen	Tokyo University	Phase Response of Active Particles under Chaotic Flow Forcing
5	Zhiwei Peng	University of Alberta	Macrotransport theory for active matter
6	Airi N. Kato	Meiji University	Active particle in a thin film droplet and their coupled dynamics
7	Song-Chuan Zhao	Kyushu University	Active Fluidization and Critical Power-Law Rheology in Dense Glassy Bacterial Suspensions
8	Kiyoto Kubo	Tohoku University	Complex viscosity of dilute microswimmer suspension under oscillating shear flow
9	Kaustav Mondal	IISER Thiruvananthapuram	Competing effects of activity and diffusive noise in collective ordering of rod-like particles
10	Hiroyuki Kitahata	Chiba University	Effective Diffusion Resulting from Reciprocal Linear Flows
11	WAHAJ UR REHMAN	University of Granada	Mechanochemical Waves in Epithelial Tissues
12	Bin Zheng	Wenzhou Institute, UCAS	Neural optimization of the most probable paths of 3D active Brownian particles
13	Hiroyuki Ebata	Osaka University	Liquid-like dynamics in dense cancer cell collectives

No.	Name	Affiliation	Title
14	Tomoya NAKAMURA	Chiba University	Effect of Surfactants on the Pattern Formation Dynamics of Metal Dendrites
15	Shiyuan Hu	Beihang University	Hydrodynamic Interactions in the Swimming of Microorganisms
16	Sotaro Fukuda	Tokyo University	Analysis of Large-Scale Pedestrian Trajectory Data in Shinjuku Station
17	John Molina	Kyoto University	Optimal Control for (Altruistic) Social Distancing in an Epidemic
18	Alexey Dmitriev	ITMO University	Experimental studies of cluster formation and collective phenomena in robotic swarms
19	Zhilan Deng	Max Planck School	High-throughput profiling of red blood cell mechanics for anti-malaria drug screening
20	Zhuqin Li	Nanjing University	Fluidization and anomalous density fluctuations in 2D Voronoi cell tissues with pulsating activity

Poster Presentation 3

Sept. 24, 2026, 15:30-16:30

No.	Name	Affiliation	Title
1	Yuan Li	Xiamen University	Pressure-Mediated Long-Range Synchronization and Condensation of Confined Active Vortices
2	Yuto Hosaka	Kyoto University	Hydrodynamics of particles in a linear viscous flow with parity violation
3	Shota Nakano	Osaka University	Elastohydrodynamics of flow-maximising ciliary coordination
4	Zhen Li	Tokyo University	Structural balance under heterogeneous social temperatures
5	Zhiyuan Zhao	Zhejiang University of Science and Technology	Viscoelasticity reshapes the frequency response of an asynchronously rotating magnetic sphere
6	Zhanglin Hou	Wenzhou University	Driving Particles Using Information
7	Subhransu Sekhar Mishra	Institute of Physics, Bhubaneswar	Orientational Relaxation Restructures Collective Motion in Polar Active Matter
8	Zhiwei Liu	Wenzhou Institute, UCAS	Wall slip behavior of airway mucus under large amplitude oscillatory shear as biomarker
9	Natsuki Kurita	Tokyo University	Martingale approach to parameter identifiability with an application to stochastic flocking models
10	Sakurako Tanida	Tokyo University	Synchronization and nonmonotonic waiting times in scheduled and on-demand elevators
11	Ryosuke UETA	Tokyo University	Exploration of Colloidal Gel Structures via Particle-Fluid Simulation
12	Sohei Nakamura	Kyushu University	Cell Migration Responding to Substrate Stiffness Patterns
13	Hiroki Sugiyama	Tokyo University	Mathematical Foundations of a Privacy-Preserving Human Flow Sensing System

No.	Name	Affiliation	Title
14	Debasish Saha	IISER Bhopal	Non-Markovian escape under stochastic resetting
15	Daisuke Makieda	Tokyo University	Data Analysis and Simulation of Human Exploration Behavior during an Exhibition at Tokyo Big Sight
16	Yudai Shirasaka	Kyushu University	Microrheology of Concentrated Colloidal Suspensions under an Applied Macroscopic Shear Field
17	Anastasiia Sibiriakova	Sanquin, Netherlands	Ising-Based Optimization Model of Fibrin Network Formation
18	Rozhin Sahafi	Institute for Advanced Studies in Basic Sciences	Diffusive motion of a bacterium in an inhomogeneous and anisotropic hydrodynamic medium near a wall and its entropy production
19	Qingju Qi	ESPCI Paris - PSL	Numerical Study of the Transition to Collective Actuation in Polar Active Solids
20	Tai Han	Institute of Theoretical Physics, CAS	Stochastic Model and Optimal Controls of an Active Tracking Particle with Information Processing