



University of Science and Technology of China



Fudan University, Shanghai, China



Tsinghua University, Beijing, China

2026

第四届基础物理量子模拟学术会议

QUANTUM SIMULATIONS OF FUNDAMENTAL PHYSICS

会议手册

The 4th Conference on "Quantum Simulations of Fundamental Physics"

Dates:

Conference on Oct 10th–14th, 2026

Tutorial lectures on Oct 11th, 2026

Location:

Broadway Mansions Hotel Shanghai

上海大厦

20 Bei-Suzhou Street, Hongkou District, Shanghai

中国上海市北苏州路20号

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Organization Committee:

Youjin Deng

Lu-Ming Duan

Xiaopeng Li

W.Vincent Liu

Peter Zoller

Sponsor Institutions:

University of Science and Technology of China

Fudan University, Shanghai, China

Tsinghua University, Beijing, China

Schedule

Tutorial Lectures		
Location: Room 329, Building 4, No.99 Xiupu Road, Pudong District, Shanghai (中科院上海研究院老园区4号楼3楼329报告厅)		
Oct 11 th		
9:00-11:00	Bing Yang	Quantum Simulations of Lattice Gauge
Lunch		
13:00-15:00	Zong-Cao Yan	High Precision Theory for Few Body Systems
15:00-15:30	Coffee Break	
15:30-17:30	W. Vincent Liu	Recent Progress on Quantum Simulations with

Conference on Quantum Simulations of Fundamental Physics		
Location: 20 Bei-Suzhou Street, Hongkou District, Shanghai (上海大厦)		
Oct 12 th		
9:00-9:10	Chair: W. Vincent Liu	Opening Speech by Peter Zoller
9:10-9:50	Chair: Peter Zoller	Adolfo del Campo, Fast Quantum Control and Adaptive Quantum Zeno Measurements
9:50-10:30		Lin Li, Probing Real-Time Lattice Gauge Theory Scattering Dynamics and Many-Body Non-Hermitian Phase Transition in a Rydberg-Atom Array
10:30-10:50	Coffee Break	
10:50-11:30	Chair: Luming Duan	Yanhong Xiao, Quantum Trajectory of a Spin Oscillator, Continuous Retrodiction Beyond the Heisenberg Uncertainty Relation
11:30-12:10		Hannes Bernien, Quantum Information Processing and Simulation in Dual-Species Rydberg Arrays
Lunch		
14:00-14:40	Chair: Andreas Hemmerich	Kwek Leong Chuan, Integrated Photonic Chip as a Quantum and Photonic Simulator
14:40-15:20		Xi-Wen Guan, One-dimensional Hubbard Model: From Tomonaga-Luttinger to Luther-Emery Liquids
15:20-15:50	Coffee Break	
15:50-16:30	Chair: Youjin Deng	Liyang Qiu, Exploring New Regimes of the Doped Fermi-Hubbard Model in a Tunable Quantum Simulator
16:30-17:10		Giacomo Roati, Angular Momentum of Strongly-interacting Atom Pairs by Sound Interferometry
17:10-17:50		Bo Liu , Experimental Realization of Floquet-Engineered Non-Hermitian Topological Phases via Single-Photon Dynamics



Oct 13 th		
9:00-9:40	Chair: Xiaoji Zhou	Bo Song, Enhancement and Suppression of Photon Scattering in Fast Multiparticle Imaging
9:40-10:20		Yukai Wu, Quantum Computation with a Trapped 2D Ion Array
10:20-10:40	Coffee Break	
10:40-11:20	Chair: Dayou Yang	Hui Zhai, Universal Spin-position Locked Rydberg Interaction
11:20-12:00		Emanuel Gull, Compact Representation, Compression, Continuation, and Spectra of Response Functions in Time and Frequency
Lunch		
14:00-14:40	Chair: Lei Feng	Sriram Ganeshan, Lindbladian Quantization of Mechanical Systems with Nonholonomic Constraints
14:40-15:20		Hongzheng Zhao, Engineering Long-range and Multi-body Interactions via Global Kinetic Constraints
15:20-15:50	Coffee Break	
15:50-16:30	Chair: Andreas Hemmerich	Xiaoji Zhou, Atomic Quantum Simulator with Tunable Temperature
16:30-17:10		Haoran Sun, Correlated Orbital Physics in a p-Band Hexagonal Lattice
17:10-17:50		Augusto Smerzi, Quantum Sensing and Search with an Oracle

Oct 14 th		
9:00-9:40	Chair: Xiwen Guan	You Zhou, (Shallow) Phase Circuits for Quantum Randomness and Measurements
9:40-10:20		Nobuyuki Yoshioka, Observable Estimation in Fault-tolerant Quantum Computation
10:20-10:40	Coffee Break	
10:40-11:20	Chair: Zong-Cao Yan	Xiao Yuan, Fault-Tolerant Quantum Computing and Quantum Advantage
11:20-12:00		Ming Gong, Quantum Simulation with Programmable Superconducting Quantum Processors
Lunch		
14:00-14:40	Chair: Yukai Wu	Zi Cai, Memory-induced Long-range Order in One-dimensional Systems
14:40-15:20		Phatthamon Kongkhambut, Exploring Time-Crystalline Order in an Open Quantum System
15:20-15:50	Coffee Break	
15:50-16:30	Chair: Xiaopeng Li	Klemens Hammerer, Quantum Simulation with Continuous Light: Non-Gaussian and Bell-nonlocal Many-body Correlations
16:30-17:10		Nir Navon, Emergence of Fermi's Golden Rule in a Quantum Many-Body System
17:10-17:30		Organizers' view on quantum simulationsClosing remarks by Peter Zoller
Departure		