Quantum Entanglement Studies in Nuclear and Particle Physics

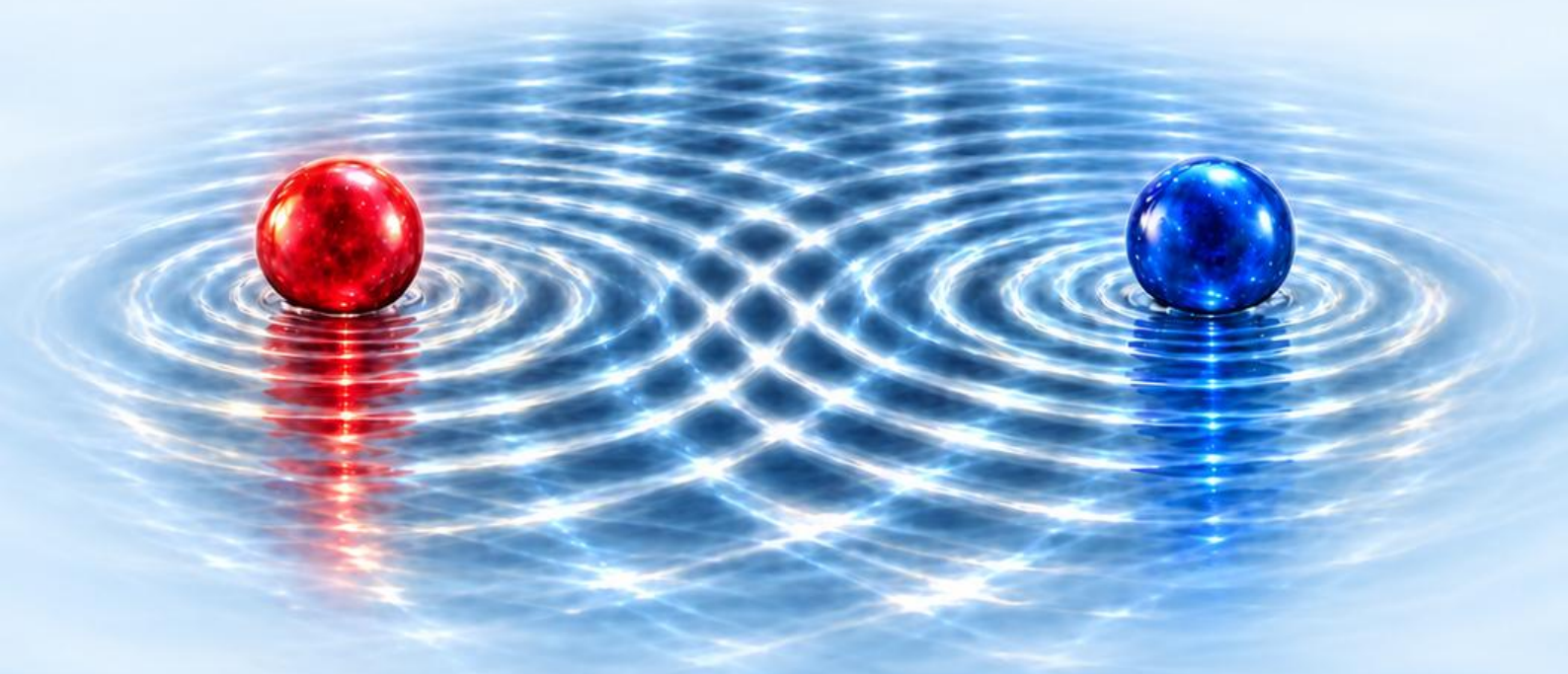
QuESt 2026

October 24-26, 2026

Fudan University, Shanghai, China

HANDBOOK

5th floor, B wing, No. 1 Interdisciplinary Building
Jiangwan Campus, Fudan University
2005 Songhu Road, Shanghai, China



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Welcome Message & Registration

Welcome to QuESt 2026 at Fudan University in Shanghai.

With the growing convergence of quantum information science, nuclear physics, and particle physics, quantum entanglement is opening new avenues for understanding nuclear many-body systems, nuclear reaction dynamics, and fundamental interactions. This workshop brings researchers together to discuss theoretical and experimental progress and new perspectives on quantum entanglement in nuclear structure, reactions and decay, as well as high-energy particle interactions.

Registration takes place at Fraser Place Hotel on Saturday, October 24, from 14:00 to 19:00. A buffet dinner will be available at the hotel that evening, arranged by the conference organizers. Participants arriving on October 25 or 26 may register directly at the conference venue.

Scientific sessions will be held at Room B5009, No. 1 Interdisciplinary Building, Jiangwan Campus, on Sunday, October 25, and Monday, October 26. We look forward to discussions and exchanges across these closely connected fields.

Scientific Topics

- Nuclear structure, continuum coupling, and quantum entanglement in many-body systems.
- Generation, evolution, and detection of entanglement in nuclear reactions, scattering, and decay processes.
- Spin, flavor, and momentum entanglement in particle physics and high-energy collisions, and their observable signatures.
- Bell nonlocality, quantum-state tomography, and applications of quantum information methods in nuclear and particle physics experiments.

Local Organizing Committee

- Yugang Ma (ECNU/ FDU)
- Dong Bai (HHU)
- Simin Wang (FDU)
- Tao Luo (FDU)

Sunday, October 25, 2026

Chair: Simin Wang / 王思敏		
08:50-09:00	Opening Remarks	**Yu-Gang Ma / 马余刚**
09:00-09:25	Quantum Information Tools for Particle Physics	**Yu Shi / 施郁**
09:25-09:50	First exploitation of baryon β decays through polarization and entanglement	**Tao Luo / 罗涛**
09:50-10:15	Spin Teleportation via Bell-Triplet States Emergent from Proton-Proton Scattering	**Zhaoxin Shen / 沈兆鑫**
10:15-10:40	Higher-Order Quantum Correlations in High Energy Physics	**Cong-Feng Qiao / 乔从丰**
10:40-11:00	Photo & Coffee break	
Chair: Xiu-Lei Ren / 任修磊		
11:00-11:25	Spin correlation of hyperon-antihyperon systems in e+e- annihilation	**Qun Wang / 王群**
11:25-11:50	First determination of the full spin density matrix in $\psi(3686) \to \Lambda\bar{\Lambda}$	**Liang Yan / 严亮**
11:50-12:15	The interference effect in UPCs	**Jian Zhou / 周剑**
12:30-14:00	Lunch at Fudan Jiangwan Campus Cafeteria (3F)/ 午饭：复旦江湾餐厅 3 楼（近 5 号门）	
Chair: Dong Bai / 柏栋		
14:00-14:25	A universal probe of spin through fragmentation energy correlator	**Huaxing Zhu / 朱华星**
14:25-14:50	From Precision Nucleon Tomography to Quantum Decoherence	**Dingyu Shao / 邵鼎煜**
14:50-15:15	Quantum Entanglement and Quantum NonLocality at High Energy Frontier	**Hao Zhang / 张昊**
15:15-15:40	Paradigm-changing studies of spin entangled hyperons and anti-hyperons at BESIII	**Haibo Li / 李海波**
15:40-16:00	Coffee break	
Chair: Xi-Guang Cao / 曹喜光		
16:00-16:25	Quantum Entanglement in Nuclear Dynamics	**Pengwei Zhao / 赵鹏巍**
16:25-16:50	Stabilizer–Haar Averaging of Entanglement in NN Scattering	**Jinniu Hu / 胡金牛**
16:50-17:15	Quantum entanglement of partons	**Yang Li / 李阳**
17:30-19:30	Dinner at Ruitaihe Restaurant (3F, UFUN Shopping Mall)/ 晚宴：悠方瑞泰和江南宴	

Monday, October 26, 2026

Chair: Tao Luo / 罗涛		
09:00-09:25	Quantum Information at Lepton Colliders: From Light Quarks to Photons	**Bin Yan / 岩斌**
09:25-09:50	RHIC 上 rho 介子光致产生中的量子纠缠现象	**Chi Yang / 杨驰**
09:50-10:15	Quantum information of DIS process at the EIC	**Kun Cheng / 程焜**
10:15-10:35	Coffee break	
Chair: Tao Luo / 罗涛		
10:35-11:00	Simulating hadronic scattering in (1+1)D SU(2) lattice gauge theory from tensor networks	**Wenyang Qian / 钱文扬**
11:00-11:25	Entanglement dynamics in deep inelastic scattering from real-time quantum simulation	**Meijian Li / 李枚键**
11:25-11:50	Quantum entanglement in nuclear collective motion	**Qibo Chen / 陈启博**
12:00-14:00	Lunch at Fudan Jiangwan Campus Cafeteria (3F)/ 午饭：复旦江湾餐厅 3 楼（近 5 号门）	
Chair: Simin Wang / 王思敏		
14:00-14:25	Entanglement of the back to back gluon pair in unpolarized pp collisions	**Shu-Yi Wei / 魏树一**
14:25-14:50	Systematic description of rare-earth nuclei in the framework of the shell model	**Guanjian Fu / 傅冠健**
14:50-15:15	Quantum Entanglement in Atomic Nuclei from a Quantum Information Perspective	**Fei-Long Xu / 徐飞龙**
15:15-15:35	Coffee break	
Chair: Simin Wang / 王思敏		
15:35-16:00	Which Pair Carries the Spin−Probing Entanglement in Four-Pion Decays	**Wangmei Zha / 查王妹**
16:00-16:25	Spin entanglement of proton from a light-front Hamiltonian	**Xingbo Zhao / 赵行波**
16:25-16:50	Can Mirror Symmetry Challenge Local Realism? Probing Photon Entanglement from Positronium via Compton Scattering	**Junle Pei / 裴俊乐**
17:10-18:40	Dinner at Fudan Jiangwan Campus Cafeteria (3F)/ 晚饭：复旦江湾餐厅 3 楼（近 5 号门）	

From Airports and Stations to Hotel

Fraser Place Hotel 1258 Yinhang Road, Yangpu District, Shanghai

上海五角场辉盛坊公寓酒店 地址：上海市杨浦区殷行路 1258 号

- **Metro routes**

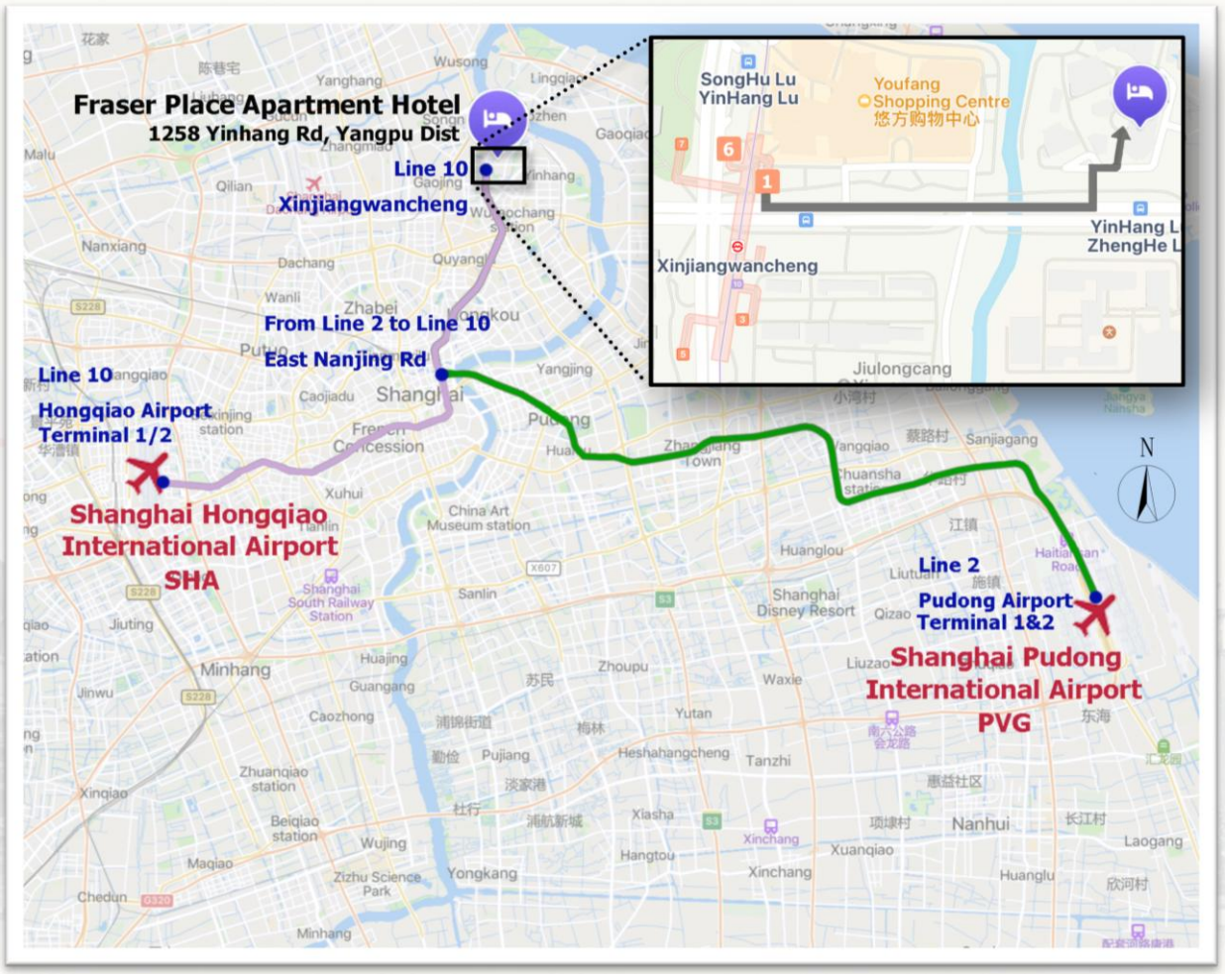
  From Pudong International Airport (PVG)
  Line 2 to East Nanjing Road (南京东路); change to Line 10 to Xinjiangwancheng 新江湾城 (toward Jilong Road /基隆路方向).

  From Hongqiao Airport (T1 / T2) or Hongqiao Railway Station
  Take Line 10 to Xinjiangwancheng 新江湾城 (toward Jilong Road /基隆路方向) from T1, T2 or Hongqiao Railway Station.

  From Shanghai Railway Station
  Line 4 inner loop (next stop: Baoshan Road / 宝山路) to Hailun Road (海伦路); change to Line 10 to Xinjiangwancheng 新江湾城 (toward Jilong Road /基隆路方向).

  All routes: get off at Xinjiangwancheng (新江湾城), use Exit 1 or 6 and walk east along Yinhang Road for about 500 m.

- **Taxi (estimated):** PVG 60 min; SHA / Hongqiao Station 50 min; Shanghai Station 30 min.



Map of Fudan University

Conference venue

B5009, 5th floor, B wing, No. 1 Interdisciplinary Building
Jiangwan Campus, Fudan University, 2005 Songhu Road, Shanghai

Hotel

Fraser Place Hotel, 1258 Yinhang Road, Yangpu District, Shanghai

Tips

Bring your badge or ID when visiting the campus. For access arrangements or assistance, contact the local organizing team.

Conference Venue

B5009, 5th floor, B wing, No. 1 Interdisciplinary Building
Jiangwan Campus, Fudan University, 2005 Songhu Road, Shanghai

Shuttle Bus Schedule

Date	Departure	Route
Sun. Oct. 25	08:25	Fraser Place Hotel → Conference venue
Sun. Oct. 25	12:20	Conference venue → Jiangwan Campus Cafeteria (near Gate 5)
Sun. Oct. 25	17:20	Conference venue →Ruitaihe Restaurant, UFUN Shopping Mall
Mon. Oct. 26	08:30	Fraser Place Hotel → Conference venue
Mon. Oct. 26	12:00	Conference venue → Jiangwan Campus Cafeteria (near Gate 5)
Mon. Oct. 26	17:00	Conference venue → Jiangwan Campus Cafeteria (near Gate 5)

Weather Forecast

Date	Weather	Low °C	High °C
Sat. Oct. 24	Light Rain	21	24
Sun. Oct. 25	Light Rain	22	25
Mon. Oct. 26	Mostly cloudy with showers	18	25

Suggested Clothing

Bring layers for cool mornings and evenings, a light jacket, comfortable walking shoes and a compact umbrella. Check the latest forecast before departure.

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FUDAN UNIVERSITY

NSFC
理论物理专款
上海核物理理论研究中心
Shanghai Research Center for Theoretical Nuclear Physics