

Loop Quantum Gravity summer school 26

圈量子引力 2026 国际暑期学校

Manual

10-22 May 2026

Yangzhou • China

Welcome to Loop Quantum Gravity summer school 26

To promote progress in Loop quantum gravity (LQG), we are organizing Loops'26 summer school under the financial support by Special Fund for Theoretical Physics of the National Natural Science Foundation of China (NSFC), which will take place from May 10-22, 2026, at Yangzhou, China. The primary objective of this 14-day summer school is to provide students in the area of quantum gravity with an up-to-date introduction to the fundamentals of canonical and covariant LQG, quantum black holes, and cosmology, with an emphasis on the numerous novel results achieved within the field over the past years.

The summer school is hosted by Yangzhou University, and co-organized by Zhejiang University of Technology, Hunan Normal University, the Canal-city University Cooperation Mechanism, and the World Historic and Cultural Canal Cities Cooperation Organization.

Time and locations

Location: RAMADA hotel near the Slender West Lake (华美达酒店瘦西湖店)

Address: No.590 Wenchangzhong Road, Guangling District, Yangzhou, China.

江苏省扬州市文昌中路 590 号

Registration on-site: 14:00-20:00 on May 10 in the hotel lobby

Lectures: May 11-22 in the multi-function hall in front of the hotel entrance

****please wear your badge for entry****

Meals: Restaurant in the first floor of hotel ****breakfast with meal vouchers from the hotel; lunch and dinner (dinner on May 10-dinner on May 22) with date-specific meal vouchers**.**

Departure: May 23, 2026

Lectures

1.Fundamental topics

- (1) Quantum Mechanism Angular Momentum & Graphic Calculus; Canonical Quantization; Canonical & Path Integral Quantization of Field Theory and Renormalization
- (2) Quantum Field Theory in Curved Spacetimes

- (3) Advanced General Relativity, Holonomy; Asymptotic Symmetry; Numeric Workshop
 - (4) Functional Analysis & von Neumann/C* Algebra; Spin Foam Quantization; Quantum Entanglement/Information
 - (5) Effective Theory of Loop Quantum Black Holes: Covariant & Different Gauge-fixing Approaches, Gravitational Collapse and Black Hole Formation
- 2.Special Topics** will focus on Loop Quantum Cosmology and Modified Loop Quantum Cosmology

Fee

The summer school is free of registration fee and will cover meals (dinner on 10/5-dinner on 22/5 in the hotel); however, the participants should cover their own travel and accommodation expenses.

Homepage

<https://indico.global/event/15268/>

More information including invitation letter/会议通知 and academic schedule, etc., will be uploaded.

Scientific Advisory Committee

Ronggen Cai (co-chair), Anzhong Wang (co-chair), Abhay Ashtekar, Alejandro Corichi, Bianca Dittrich, Beatriz Elizaga de Navascues, Jonathan Engle, Kristina Giesel, Viqar Husain, Jiliang Jing, Wojciech Kaminski, Yi Ling, Etera Livine, Yongge Ma, Guillermo Mena Marugan, Karim Noui, Daniele Oriti, Jorge Pullin, Suvrat Raju, Carlo Rovelli, Hanno Sahlmann, Madhavan Varadarajan, Francesca Vidotto, Bin Wang

Local Organizing Committee

Xiaomei Kuang (chair), , Jianpin Wu (co-chair), Yungui Gong (co-chair), Wencong Gan, Gaoping Long, Puxun Wu, Jinsong Yang, Xiangdong Zhang, Tao Zhu

Schedule-overview

10/5 (Sunday)	14:00-20:00 registration in RAMADA hotel lobby
11/5 (Monday)	08:30-09:00 Opening ceremony
22/5 (Friday)	17:10-17:40 Closing ceremony

	9:00-9:50	10:00-10:50	break	11:20-12:10	lunch	14:00-14:50	15:00-15:50	break	16:20-17:10	dinner	19:00-20:00
11/5 Mon.	Yongge Ma	Yongge Ma		Jingsong Yang		Jingsong Yang	Jingsong Yang		Yongge Ma		
12/5 Tue.	Yu Tian	Yu Tian		Jingsong Yang		Xiangdong Zhang	Yi Ling		Yi Ling		Discussions/Tutorial
13/5 Wed.	Xiangdong Zhang	Xiangdong Zhang		Yu Tian		Free discussions					
14/5 Thu.	Yu Tian	Yu Tian		Xiaoning Wu		Yi Ling	Yi Ling		Xiaoning Wu		Discussions/Tutorial
15/5 Fri.	Xiaoning Wu	Xiaoning Wu		Yu Tian		Hongguang Liu	Hongguang Liu		Hongguang Liu		
16/5	Weekend: free discussions										
17/5	Weekend: free discussions										
18/5 Mon.	Ivan Agullo	Ivan Agullo		Ivan Agullo		Cong Zhang	Cong Zhang		Cong Zhang		
19/5 Tue.	Parampreet Singh	Parampreet Singh		Parampreet Singh		Cong Zhang	Cong Zhang		Cong Zhang		Discussions/Tutorial
20/5 Wed.	Madhavan Varadarajan	Madhavan Varadarajan		Ivan Agullo		Baofei Li	Madhavan Varadarajan		Madhavan Varadarajan		
21/5 Thu.	Muxin Han	Muxin Han		Baofei Li		Baofei Li	Kristina Giesel		Kristina Giesel		Discussions/Tutorial
22/5 Fri.	Muxin Han	Muxin Han		Muxin Han		Kristina Giesel	Kristina Giesel		Kristina Giesel		
23/5	Departure										

The lectures include:

Fundamentals

Yongge Ma & Xiangdong Zhang: Advanced General Relativity, Holonomy

Jinsong Yang: Quantum Mechanism Angular Momentum & Graphic Calculus

Yu Tian: Canonical & Path Integral Quantization of Field Theory and Renormalization

Yi Ling: Quantum Entanglement/Information

Xiaoning Wu: Asymptotic Symmetry

Hongguang Liu: Numeric Workshop

Madhavan Varadarajan: Operator Algebra methods in LQG

Kristina Giesel: Canonical Quantization

Muxin Han: Spin Foam Quantization

Ivan Agullo: Field Theory in Curved Spacetimes

Special Topics

Parampreet Singh: Loop Quantum Cosmology

Baofei Li: Modified Loop Quantum Cosmology

Cong Zhang: Effective Theory of Loop Quantum Black Holes: Covariant & Different Gauge-fixing Approaches, Gravitational Collapse and Black Hole Formation

Chair-overview

Date\Time	09:00-12:10	14:00-17:10
11/5 Mon.	(08:30-09:00 Opening ceremony) Jianpin Wu	Tao Zhu
12/5 Tue.	Yu Sang	Guoyang Fu
13/5 Wed.	Yuting Zhou	-
14/5 Thu.	Xue Zhang	Chang Liu
15/5 Fri.	Hasnain Ali	Xiaomei Kuang
16/5	Weekend	
17/5		
18/5 Mon.	Dong Zhao	Larissa Santos
19/5 Tue.	Dan Zhang	Chang Liu
20/5 Wed.	Hasnain Ali	Yunlong Zheng
21/5 Thu.	Yumei Wu	Chunyu Zhang
22/5 Fri.	Wencong Gan	(17:10-17:40 Closing ceremony) Xiaomei Kuang

Loops'26 Summer School – Schedule

Location: Multi-function hall in front of the hotel entrance (please wear your badge for entry).

Meals: Restaurant in the first floor of hotel (breakfast with meal vouchers from the hotel; lunch and dinner with date-specific meal vouchers).

Sunday(10/5)	14:00-20:00	registration	
Monday (May 11)			
Time	Content	Speaker	Chair
08:30-09:00	Opening ceremony		Jianpin Wu
09:00-09:50	Advanced General Relativity, Holonomy	Yongge Ma	Jianpin Wu
10:00-10:50	Advanced General Relativity, Holonomy	Yongge Ma	
10:50-11:20	break		
11:20-12:10	Quantum Mechanism Angular Momentum & Graphic Calculus	Jingsong Yang	
12:10-13:30	lunch		
14:00-14:50	Quantum Mechanism Angular Momentum & Graphic Calculus	Jingsong Yang	Tao Zhu
15:00-15:50	Quantum Mechanism Angular Momentum & Graphic Calculus	Jingsong Yang	
15:50-16:20	break		
16:20-17:10	Advanced General Relativity, Holonomy	Yongge Ma	
17:10-18:30	dinner		

Tuesday (May 12)			
Time	Content	Speaker	Chair
09:00-09:50	Canonical & Path Integral Quantization of Field Theory and Renormalization	Yu Tian	Yu Sang
10:00-10:50	Canonical & Path Integral Quantization of Field Theory and Renormalization	Yu Tian	
10:50-11:20	break		
11:20-12:10	Quantum Mechanism Angular Momentum & Graphic Calculus	Jingsong Yang	
12:10-13:30	lunch		
14:00-14:50	Advanced General Relativity, Holonomy	Xiangdong Zhang	Guoyang Fu
15:00-15:50	Quantum Entanglement/Information	Yi Ling	
15:50-16:20	break		
16:20-17:10	Quantum Entanglement/Information	Yi Ling	
17:10-18:30	dinner		
19:00-20:00	Discussions/Tutorial		

Wednesday (May 13)			
Time	Content	Speaker	Chair
09:00-09:50	Advanced General Relativity, Holonomy	Xiangdong Zhang	Yuting Zhou
10:00-10:50	Advanced General Relativity, Holonomy	Xiangdong Zhang	
10:50-11:20	break		
11:20-12:10	Canonical & Path Integral Quantization of Field Theory and Renormalization	Yu Tian	
12:10-13:30	lunch		
14:00-14:50	Free Discussions		-
15:00-15:50			
15:50-16:20			
16:20-17:10			
17:10-18:30	dinner		

Thursday (May 14)			
Time	Content	Speaker	Chair
09:00-09:50	Canonical & Path Integral Quantization of Field Theory and Renormalization	Yu Tian	Xue Zhang
10:00-10:50	Canonical & Path Integral Quantization of Field Theory and Renormalization	Yu Tian	
10:50-11:20	break		
11:20-12:10	Asymptotic Symmetry	Xiaoning Wu	
12:10-13:30	lunch		
14:00-14:50	Quantum Entanglement/Information	Yi Ling	Chang Liu
15:00-15:50	Quantum Entanglement/Information	Yi Ling	
15:50-16:20	break		
16:20-17:10	Asymptotic Symmetry	Xiaoning Wu	
17:10-18:30	dinner		
19:00-20:00	Discussions/Tutorial		

Friday (May 15)			
Time	Content	Speaker	Chair
09:00-09:50	Asymptotic Symmetry	Xiaoning Wu	Hasnain Ali
10:00-10:50	Asymptotic Symmetry	Xiaoning Wu	
10:50-11:20	break		
11:20-12:10	Canonical & Path Integral Quantization of Field Theory and Renormalization	Yu Tian	
12:10-13:30	lunch		
14:00-14:50	Numeric Workshop	Hongguang Liu	Xiaomei Kuang
15:00-15:50	Numeric Workshop	Hongguang Liu	
15:50-16:20	break		
16:20-17:10	Numeric Workshop	Hongguang Liu	
17:10-18:30	dinner		

Weekend (May 16-17)
Free Discussions

Monday (May 18)			
Time	Content	Speaker	Chair
09:00-09:50	Field Theory in Curved Spacetimes	Ivan Agullo	Dong Zhao
10:00-10:50	Field Theory in Curved Spacetimes	Ivan Agullo	
10:50-11:20	break		
11:20-12:10	Field Theory in Curved Spacetimes	Ivan Agullo	
12:10-13:30	lunch		
14:00-14:50	Effective Theory of Loop Quantum Black Holes	Cong Zhang	Larissa Santos
15:00-15:50	Effective Theory of Loop Quantum Black Holes	Cong Zhang	
15:50-16:20	break		
16:20-17:10	Effective Theory of Loop Quantum Black Holes	Cong Zhang	
17:10-18:30	dinner		

Tuesday (May 19)			
Time	Content	Speaker	Chair
09:00-09:50	Loop Quantum Cosmology	Parampreet Singh	Dan Zhang
10:00-10:50	Loop Quantum Cosmology	Parampreet Singh	
10:50-11:20	break		
11:20-12:10	Loop Quantum Cosmology	Parampreet Singh	
12:10-13:30	lunch		
14:00-14:50	Effective Theory of Loop Quantum Black Holes	Cong Zhang	Chang Liu
15:00-15:50	Effective Theory of Loop Quantum Black Holes	Cong Zhang	
15:50-16:20	break		
16:20-17:10	Effective Theory of Loop Quantum Black Holes	Cong Zhang	
17:10-18:30	dinner		
19:00-20:00	Discussions/Tutorial		

Wednesday (May 20)			
Time	Content	Speaker	Chair
09:00-09:50	Operator Algebra methods in LQG	Madhavan Varadarajan	Hasnain Ali
10:00-10:50	Operator Algebra methods in LQG	Madhavan Varadarajan	
10:50-11:20	break		
11:20-12:10	Field Theory in Curved Spacetimes	Ivan Agullo	
12:10-13:30	lunch		
14:00-14:50	Modified Loop Quantum Cosmology	Baofei Li	Yunlong Zheng
15:00-15:50	Operator Algebra methods in LQG	Madhavan Varadarajan	
15:50-16:20	break		
16:20-17:10	Operator Algebra methods in LQG	Madhavan Varadarajan	
17:10-18:30	dinner		

Thursday (May 21)			
Time	Content	Speaker	Chair
09:00-09:50	Spin Foam Quantization	Muxin Han	Yumei Wu
10:00-10:50	Spin Foam Quantization	Muxin Han	
10:50-11:20	break		
11:20-12:10	Modified Loop Quantum Cosmology	Baofei Li	
12:10-13:30	lunch		
14:00-14:50	Modified Loop Quantum Cosmology	Baofei Li	Chunyu Zhang
15:00-15:50	Canonical Quantization	Kristina Giesel	
15:50-16:20	break		
16:20-17:10	Canonical Quantization	Kristina Giesel	
17:10-18:30	dinner		
19:00-20:00	Discussions/Tutorial		

Friday (May 22)			
Time	Content	Speaker	Chair
09:00-09:50	Spin Foam Quantization	Muxin Han	Wencong Gan
10:00-10:50	Spin Foam Quantization	Muxin Han	
10:50-11:20	break		
11:20-12:10	Spin Foam Quantization	Muxin Han	
12:10-13:30	lunch		
14:00-14:50	Canonical Quantization	Kristina Giesel	Xiaomei Kuang
15:00-15:50	Canonical Quantization	Kristina Giesel	
15:50-16:20	break		
16:20-17:10	Canonical Quantization	Kristina Giesel	
17:10-17:40	Closing ceremony		Xiaomei Kuang
17:40-19:30	dinner		

Saturday (May 23)
Departure