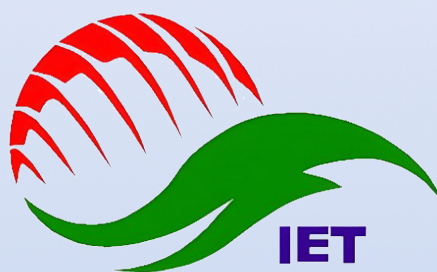




11th World Conference on Experimental Heat
Transfer, Fluid Mechanics and Thermodynamics

PROGRAM BOOK



August 15–18, 2025

Beijing, China

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Welcome Message from the Chairs

Dear distinguished Guests, Colleagues and Friends:



Prof. Jinliang Xu

Jinliang Xu



Prof. Lixin Cheng

Lixin Cheng

On behalf of the Assembly of World Conferences on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics (AWC) and the Local Organizing Committee, it is our great honor to warmly welcome you to the 11th World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics (ExHFT-11) in Beijing, China.

Since its inception in 1988, the ExHFT conference series has served as a premier platform for global researchers to exchange cutting-edge advancements in experimental heat transfer, fluid mechanics and thermodynamics. Over the decades, this conference has fostered innovation, collaboration, and scientific excellence across continents - from Dubrovnik to Lisbon, Iguazu Falls to Rhodes. Today, we gather together in Beijing, a historic city blending historic heritages with modern scientific ambition, to continue this legacy.

The scientific program of ExHFT-11 covers a broad spectrum of topics from fundamental research to industrial applications, covering heat transfer, fluid mechanics, thermodynamics, AI-driven methodologies, energy, sustainability, carbon neutrality, engineering design and practice, problem solving and interdisciplinary research. We are privileged to host all participants and guests including 16 renowned invited speakers from over 20 countries and anticipate knowledge and research findings exchange, rigorous discussions, interdisciplinary synergy, networking, collaboration and friendship. Special issues of journals will further disseminate our research findings and insights to our community.

We would like to express our sincere gratitude to AWC officers and members for their great supporting us to host this prestigious world conference in China and authors, reviewers and participants for their valuable contributions to ExHFT-11.

We wish you have a fruitful and pleasant stay at ExHFT-11 and have a great time in Beijing to explore and enjoy the Chinese culture, Chinese foods and cuisines, and historic heritages. May your time in Beijing be both professionally rewarding and culturally enriching.

Organization

Organized by:

North China Electric Power University

Co-organized by:

Xi'an Jiaotong University

The Institute of Engineering Thermophysics, Chinese Academy of Sciences

National Key Lab of Aerospace Power System and Plasma Technology

Chinese Society of Engineering Thermophysics

Under the Auspices of:

The Assembly of World Conferences on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics (AWC)

Sponsors (in alphabetical order):

Beijing Boyuan Xiangde Scientific Instrument Co., Ltd.

Beijing OPLAN Science and Technology Development Co., Ltd.

China Electric Power Planning and Engineering Institute

HF Agile Device Co., Ltd.

State Power Investment Corporation Research Institute Co., Ltd.

Sugon Intelligent Computing Information Technology Co., Ltd.

Assembly of World Conferences on ExHFT

Officers

J. Barbosa, USA, President

P. Stephan, DEU, Vice President

P. Di Marco, ITA, Secretary General

C. Markides, GBR, Officer

S. Maruyama, JPN, Officer

Local Organizing Committee

Conference Chairs

Jinliang Xu, North China Electric Power University, CHN

Lixin Cheng, Sheffield Hallam University, UK

Co-chairs

Bofeng Bai, Xi'an Jiaotong University, CHN

Qiang Du, The Institute of Engineering Thermophysics, CHN

Qibin Liu, The Institute of Engineering Thermophysics, CHN

Yun Wu, National Key Lab of Aerospace Power System and Plasma Technology, CHN

Executive Chair

Jian Xie, North China Electric Power University, CHN

Committee

Guanglin Liu, North China Electric Power University, CHN

Guohua Liu, North China Electric Power University, CHN

Xiaojing Ma, North China Electric Power University, CHN

Yanjuan Wang, North China Electric Power University, CHN

Xin Yan, North China Electric Power University, CHN

Chengzhen Sun, Xi'an Jiaotong University, CHN

Gang Wang, Xi'an Jiaotong University, CHN

Guoqing Li, The Institute of Engineering Thermophysics, CHN

Ruonan Wang, The Institute of Engineering Thermophysics, CHN

Qingzong Xu, The Institute of Engineering Thermophysics, CHN

Lead Scientists

S. Alekseenko	RUS	W. Lipiński	CYP
B. Bai	CHN	H. Madani	SWE
J. Barbosa	USA	C. Markides	GBR
S. Bortolin	ITA	S. Maruyama	JPN
M. Bucci	USA	S. Mancin	ITA
E. Cardoso	BRA	J. Meyer	ZAF
L. Chen	CHN	N. Milikovic	USA
L. Cheng	GBR	S. Mitra	CAN
P. Coelho	PRT	A. Moita	PRT
C. Colin	FRA	G. Morini	ITA
M. De Paepe	BEL	S. O’Shaughnessy	IRL
P. Di Marco	ITA	R. Raj	IND
M. Fernandino	NOR	G. Ribatski	BRA
S. Garimella	USA	K. Sefiane	GBR
P. Garstecki	POL	P. Stephan	DEU
K. Hooman	NLD	B. S. Sunden	SWE
H. Iwai	JPN	J. Szmyd	POL
T. Karapantsios	GRC	K. Tatsumi	JPN
S. J. Kim	KOR	A. Terzis	ISR
A. Komiya	JPN	J. R. Thome	CHE
T. Kowalewski	POL	D. Wen	DEU
C. le Niliot	FRA	Z. Wu	CHN
B. J. Lee	KOR	J. Xu	CHN
X. G. Liang	CHN	S. Yarusevich	CAN

Scientific Scope and Topics

The goal of ExHFT-11 is to provide a forum of international exposure for presenting and exchanging new research outcomes, ideas and methodologies in heat transfer, fluid mechanics, and thermodynamics. Conference topics include, but are not limited to:

- Heat and mass transfer
- Fluid dynamics
- Thermodynamics
- Measurement, experimental techniques and imaging processing
- Multiphase flow, heat and mass transfer
- Combustion and chemical reaction
- Machine learning and AI in heat transfer, fluid dynamics and thermodynamics
- Renewable and non-renewable energies
- Energy storage systems and carbon neutrality
- Interdisciplinary research
- Manufacturing processes and materials processing
- Industry problems and applications

Conference Guide

Registration

- Time: 10:00-22:00 Aug. 15, 2025
07:00-22:00 Aug. 16, 2025
- Location: 1st Floor of Wyndham Beijing North Hotel

Please attend the meeting on the day of registration at the registration desk to sign in and receive a badge and conference materials.

Dining Location

- All participants are required to dine at the place indicated by the meal ticket.
- Dining time and place:

Type	Time	Location
Dinner	17:30-20:00 Aug. 15, 2025	Palm Terrace (1F) / 棕榈庭院餐厅 Bravo Italian Restaurant (1F) / 博纳意大利餐厅
Lunch	12:00-13:30 Aug. 16, 2025	
Dinner	18:30-20:00 Aug. 16, 2025	
Lunch	12:00-13:30 Aug. 17, 2025	
Banquet	19:00-21:00 Aug. 17, 2025	Beijing Ballroom (2F) / 北京厅
Lunch	12:00-13:30 Aug. 18, 2025	Palm Terrace (1F) / 棕榈庭院餐厅 Bravo Italian Restaurant (1F) / 博纳意大利餐厅
Dinner	18:30-20:00 Aug. 18, 2025	

11th World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics

August 15–18, 2025, Beijing, China

Contact

会议注册/Conference Registration	
Prof. Guohua Liu (刘国华)	+86 13681126145
Dr. Xin Yan (闫鑫)	+86 15010630600
会场议程/ Conference Schedule	
Dr. Feng Sun (孙丰)	+86 13011205273
食宿安排/Accommodation	
Dr. Guanglin Liu (刘广林)	+86 15001292869
交通咨询/ Traffic Consultation	
Assoc. Prof. Enhui Sun (孙恩慧)	+86 13051652300
赞助展示/ Sponsor Exhibition	
Dr. Guanglin Liu (刘广林)	+86 15001292869

11th World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics

August 15–18, 2025, Beijing, China

Venue and Direction



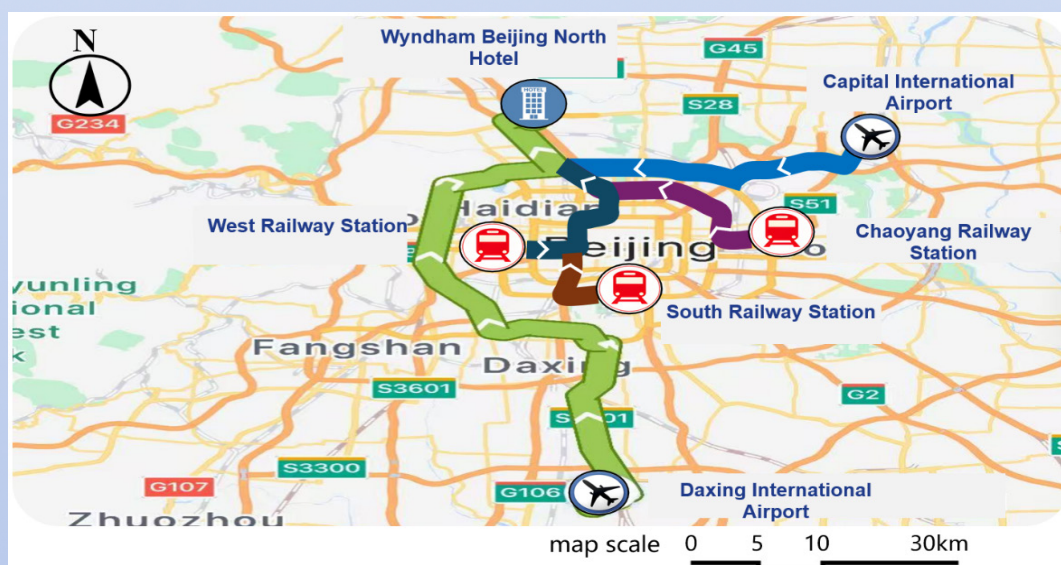
Venue: Wyndham Beijing North Hotel

Address: No. 317 Changping Road, Changping District, Beijing

The ExHFT-11 conference will be held in WYNDHAM BEIJING NORTH, which is located at the intersection of Changping District, Haidian District, and Chaoyang District. Within 30 minutes south, you can reach the National Convention Center, the Asian Olympic Business District where the Bird's Nest and Water Cube are located.

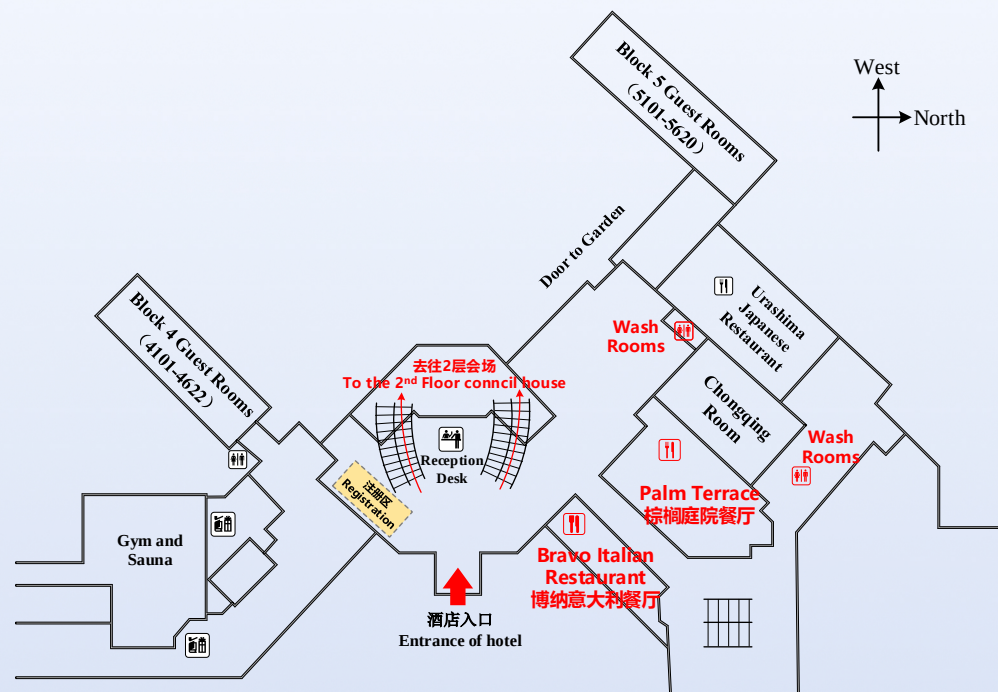
Transportation Guide

For attendees heading to the conference hotel, taking a taxi is recommended from all major arrival points: Beijing Capital International Airport is approximately 38 km away, with a taxi ride taking 50-60 minutes; Beijing Daxing International Airport is about 78 km distant, and a taxi journey will last 75-90 minutes; from railway stations, Beijing Chaoyang Station is 25 km away (35-45 minutes by taxi), Beijing West Station is 28 km away (40-50 minutes by taxi), and Beijing South Station is 35 km away (45-60 minutes by taxi). You can use the Beijing Subway App or Gaode/Baidu Maps for real-time navigation.

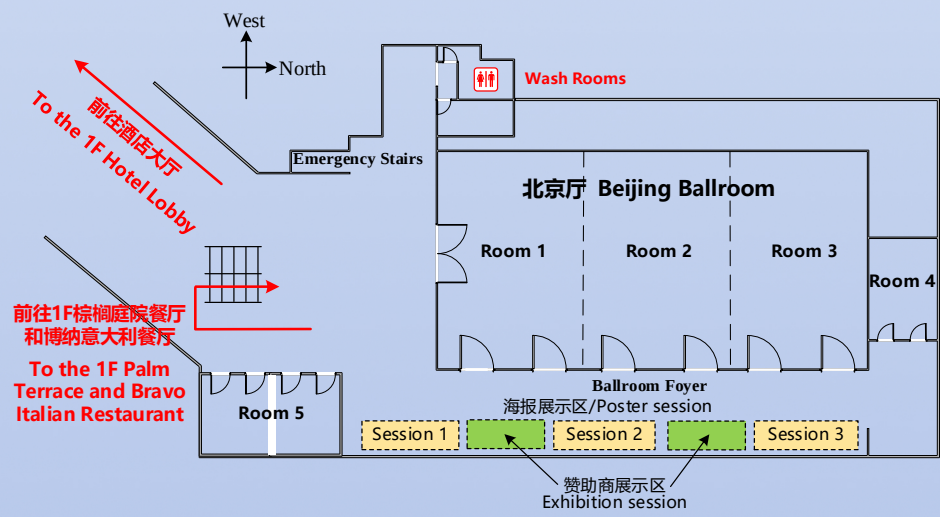
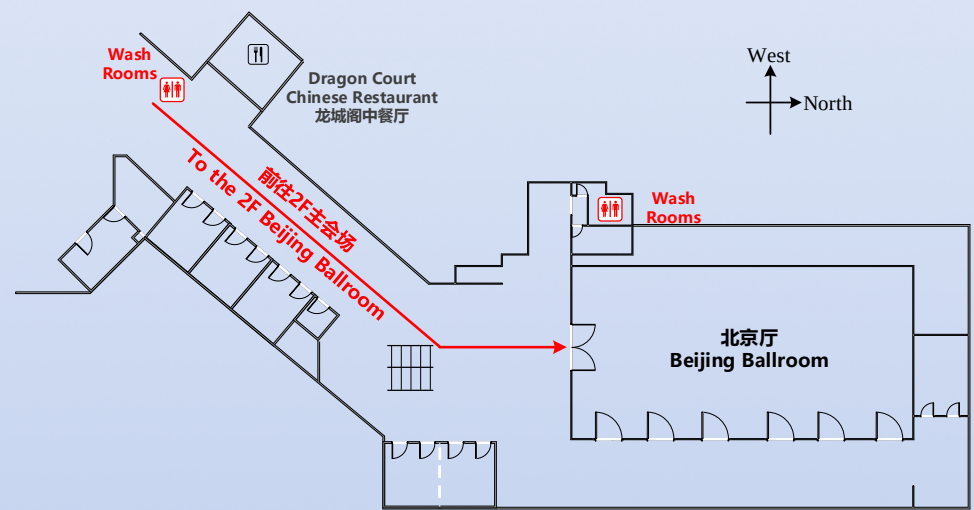


Routing Instructions in Venue

1st Floor



2nd Floor



Exhibition & Poster Session

Contents	Location
Exhibition Session	2nd Floor of WYNDHAM BEIJING NORTH
Poster Session	

Main Conference Materials

- Program Book
- Abstract Collection

Group Photo

ExHFT-11 group photo taking will start at 8:25 Aug. 16, 2025, at the conference Beijing Ballroom.

Banquet

Beijing Ballroom (2F) WYNDHAM BEIJING NORTH 19:00-21:00, Aug. 17, 2025

Instructions for Presenters

- Participants are kindly asked to turn off their cell phones or keep the cell phones in vibration mode during the lectures and in the poster areas.
- Speaker Check-In Procedures: It is strongly recommended that all speakers visit the session room **half an hour in advance** of their presentation. Speakers can review the presentation(s) to avoid compatibility issues with the computer supplied in the session room. Volunteers will also be available to assist speakers with their presentations. All files must be in **PowerPoint format**.
- The PowerPoint presentation for **Plenary/ Keynote/ Oral Lecture** is formatted in a 16:9 aspect ratio.
- Presenters should bring their files **on a USB flash drive or copy the files to the session room computer in advance**.

Recommended Duration of Sections

- **Plenary lectures:** 40 minutes including discussion.
- **Keynote lectures:** 30 minutes including discussion.
- **Oral lectures:** 15 minutes including discussion.

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Posters

- All the posters will be located along the 2nd Floor ballroom foyer outside the Beijing Ballroom.
- The posters are divided into **three sessions**, all scheduled from 09:00 to 19:00 on Aug. 17, 2025.
- The session chairs will evaluate and score each poster presentation between **09:00 and 11:00** on Aug. 17, 2025. All presenters are required to be present at their posters during this time.
- The poster will be in the size of **90 cm×150 cm, vertical**, to be fully displayed on the board.
- Presenters are responsible for mounting their materials on the poster boards before the opening of the poster sessions. **Boards will be numbered with paper numbers, and pushpin or tape will be provided to mount posters.**

Excellent Presentation Award

- The conference will feature the Excellent Presentation Award to recognize outstanding scientists and students. One oral lecture or one poster will be selected from each session to receive this award.
- All the award winner will be published on the conference website: <https://www.exhft-11.com/>.
- Electronic certificates issued by the Conference Organizing Committee will be sent to the award recipients via email.

Social Activities

2025.8.16 16:15-18:05 ExHFT Frontiers - Ignite Innovation

2025.8.16 19:30-20:30 Assembly Meeting of AWC Officers and Members

2025.8.17 19:00-21:00 Banquet

Internet Connection

Wi-Fi SSID: Wyndham-BJ-North Free

Wi-Fi is available for all conference participants at the venue. For guests staying at the Wyndham Hotel: Please log in by verifying your room number and surname. For other participants: Please choose WeChat verification on the authentication page to access the network.

Insurance

The Congress Organizers recommend participants to possess travel property medical or other necessary insurances before coming to China. The ExHFT-11 Conference Organizers cannot be held responsible for the costs resulting from personal accidents or property loss during the Congress.

Smoking Policy

Please note that smoking is strictly prohibited on the conference premises.

Conference Schedule

Date	Beijing Time	Schedule
Day 0 Aug 15, 2025	10:00-22:00	Registration & Reception Lobby of WYNDHAM BEIJING NORTH
Day 1 Aug 16, 2025	8:00-12:05	Opening Ceremony & Plenary Lectures 2nd Floor Beijing Ballroom
	13:30-18:05	Online Plenary Lecture & Oral Lectures & ExHFT Frontiers 2nd Floor Room 1
		Keynote Lectures & Oral Lectures 2nd Floor Room 2-3
		Oral Lectures 2nd Floor Room 4-5
	19:30-20:30	Assembly Meeting of AWC Officers and Members on-site: 2nd Floor Room 4 online: Prof. Jader barbosa Jr. will send Zoom link to AWC officers and members.
Day 2 Aug 17, 2025	8:00-12:00	Keynote Lectures & Oral Lectures 2nd Floor Room 1-3
		Oral Lectures 2nd Floor Room 4-5
	9:00-19:00	Poster Sessions 1-3 2nd ballroom foyer outside the Beijing Ballroom.
	13:30-18:00	Keynote Lectures & Oral Lectures 2nd Floor Room 1-3
		Oral Lectures 2nd Floor Room 4-5
	19:00-21:00	Banquet 2nd Floor Beijing Ballroom
Day 3 Aug 18, 2025	8:00-12:00	Keynote Lectures & Oral Lectures 2nd Floor Room 1-2
		Oral Lectures 2nd Floor Room 3-5
	13:30-16:00	Oral Lectures 2nd Floor Room 1-3, 5

Plenary Speakers

Lectures	Name	Affiliation
Plenary 1	Khellil Sefiane	The University of Edinburgh (Edin.), UK
Plenary 2	Gherhardt Ribatski	Universidade de São Paulo (USP), BRA
Plenary 3	Yong Tae Kang	Korea University (KU), KOR
Plenary 4	Junichiro Shiomi	The University of Tokyo (Utokyo), JPN
Plenary 5	Jinliang Xu	North China Electric Power University (NCEPU), CHN
Plenary 6 (online)	Matteo Bucci	Massachusetts Institute of Technology (MIT), USA

Keynote Speakers

Lectures	Name	Affiliation
Keynote 1 (online)	Jader Barbosa Jr	Louisiana State University (LSU), USA
Keynote 2	Guillaume Castanet	Centre national de la recherche scientifique (CNRS), FRA
Keynote 3	Yoshihiro Deguchi	Tokushima University (TU), JPN
Keynote 4	Hui Jin	Xi'an Jiaotong University (XJTU), CHN
Keynote 5	Ali Koşar	Sabanci University (SU), TUR
Keynote 6	Sunny Li	University of British Columbia (UBC), CAN
Keynote 7	Simone Mancin	University of Padova (UNIPD), ITA
Keynote 8 (online)	Ana S. Moita	Technical University of Lisbon (UL), PRT
Keynote 9	Yixiang Shi	Tsinghua University (THU), CHN
Keynote 10 (online)	Yoonjin Won	The University of California, Irvine (UC Irvine), USA



Plenary Speaker 1

Khellil Sefiane

The University of Edinburgh, UK

Title of the Presentation:

Capillary/Wetting Effects on Boiling Heat Transfer and Bubbles Dynamics

Bio: Prof. Khellil Sefiane, PhD, HDR, FRSC, and FInstP, is a professor and chair of Thermo-Physical Engineering in the School of Engineering at the University of Edinburgh (<https://www.ed.ac.uk/>), Scotland, United Kingdom. He is the Head of the research Institute for Multiscale Thermofluids (IMT) at the University of Edinburgh. Professor Sefiane is the Vice-Chair of the UK National Heat Transfer Committee, <https://www.uknhct.org/>. Professor Sefiane is the UK delegate on the Scientific Council of the International Centre for Heat and Mass Transfer, <https://www.ichmt.org/>. He also represents the UK on the European Thermal Committee, EURO THERM, <http://www.eurothermcommittee.eu/>. He is associate editor for the International Journal of Heat and Mass Transfer and has been associate editor for the International Journal of Multiphase Flows and the ASME Journal of Heat Transfer.

He held numerous honorary appointments in international institutions including an Adjunct Professor at the University of Toronto, Canada (2008-2014), Visiting Professor at Kyushu University, Japan (2015) and WPI -World Premier International Professor at the International Centre for Carbon Neutral Energy Research (I2CNER) at Kyushu in Japan (2015-2019), honorary Professor at Tsinghua University in China (2022-2025), Extraordinary Professor at Pretoria University, South Africa (2019) and visiting Professor at University Paris-Saclay, France (2020). He is Fellow of the Royal Society of Chemistry (FRSC), Fellow of the Institute of Physics (FInstP) and holds an ExxonMobil fellowship and a Global Research Award, both awarded by the Royal Academy of Engineering, London. Professor Sefiane has been research active for the last 28 years in various areas related to multiphase flows, heat transfer, microfluidics, interfacial phenomena and phase change. He has published more than a 250 journal papers in international journals and was co-editor of the textbook Drying of Complex Fluid Drops: Fundamentals and Applications, published by the Royal society of Chemistry (RSC), 2022, <https://pubs.rsc.org/en/content/ebook/978-1-78801-790-9>. He has been recipient of the prestigious Institute of Physics (IoP) award (2009), the Global Research Award by the Royal Academy of Engineering, London (2011) and the Japan Society for Promotion of Science (JSPS) Award in 2014 and the David Kenning Award in two phase and boiling heat transfer (2024). Professor Sefiane is member of numerous international scientific committees of experts in heat transfer and multiphase flows (ICHMT, EURO THERM, deputy chair of the Nu-Re Prize and chair of the David B.R. Kenning award committee). Prof. Sefiane taught undergraduate and graduate students at universities in UK, France, Canada, Japan and China. He has been recipient of research grants from the UK research Council (EPSRC), the British Royal Society (RS), the European Union (EU), the European Space Agency (ESA) and industry.



Plenary Speaker 2

Gherhardt Ribatski

Universidade de São Paulo, BRA

Title of the Presentation:

Experimental evaluation of the distribution and coalescence of oil microdroplets dispersed in water for in-tube horizontal flows

Bio: Dr. Gherhardt Ribatski is Full Professor of Multiphase Flow and Heat Transfer at the São Carlos School of Engineering, University of São Paulo (USP), Brazil. He received his B.S., M.Sc., and Doctoral degrees in Mechanical Engineering from the University of São Paulo. He held postdoctoral positions at the University of Illinois at Urbana–Champaign, Swiss Federal Institute of Technology in Lausanne (EPFL) and Universidade da Coruña. His research interests cover pool boiling, falling-film evaporation and condensation, two-phase flows, flow induced vibration, flow boiling and condensation for external and internal flows, heat transfer enhancement, heat exchangers, phase-change in microchannels, IR thermography wastewater treatment and solar energy.

Prof. Ribatski is a member of the Congress Committee of International Union of Theoretical and Applied Mechanics (IUTAM) and Brazilian Delegate to the Assembly for International Heat Transfer Conferences. He is a member of Assembly of World Conferences on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics, Virtual Institute of Two-Phase Flow and Heat Transfer, Scientific Council of the International Centre for Heat and Mass Transfer (ICHMT). He was Director Secretary (2016-2017) and is member and President of the Brazilian Society of Mechanical Sciences and Engineering (2018-2021). He has served as coordinator of the CAPES (Coordination for the Improvement of Higher Education Personnel- Brazil) committee for evaluation of graduate programs in the areas of Mechanical, Mechatronics, Naval and Ocean, Aeronautical, Industrial and Petroleum Engineering. He is a member of the area panel of Engineering of FAPESP (São Paulo Research Foundation – Brazil) and was Coordinator of the Graduate Program of Mechanical Engineering at São Carlos School of Engineering (EESC) of University of São Paulo (USP) from 2014 to 2019.

He has advised 13 Doctoral theses, supervised 11 postdoctoral researchers, presented 15 keynote lectures and taken part in the scientific committee of several International Conferences. Dr. Ribatski has over 120 refereed journal publications, 6 book chapters, 1 book and over 130 refereed papers in conferences.



Plenary Speaker 3

Yong Tae Kang

Korea University, KOR

Title of the Presentation:

Sorption thermal battery for plus energy building applications

Bio: He received his B.S. and M.S. in the Department of Mechanical Eng., Seoul National University in 1987 and 1989, respectively, and PhD in the Department of Mechanical Eng, The Ohio State University in 1994. After spending two years at the OSU as a postdoctoral researcher, he joined JST as a special researcher and TUAT, Tokyo, Japan as a visiting professor in 1997. After spending three years at JST and TUAT, he joined the faculty at Kyung Hee University, Korea in 2000, and moved to Korea University as a full professor in 2014. His research focuses on thermal energy systems, including absorption heat pumps, heat exchanger design, refrigeration systems, thermal energy storage, CO₂ capture using nanoabsorbents and sorption thermal battery. He published more than 200 international papers and more than 250 conference papers. He is now a member of ASHRAE (American Society of Heating, Refrigeration, and Air-Conditioning Engineers), KSME (Korean Society of Mechanical Engineers), IIR (International Institute of Refrigeration), JSHRAE (Japanese Society of Heating, Refrigeration, and Air-Conditioning Engineers) and SAREK (Society of Air-Conditioning and Refrigeration Engineers of Korea). In 2010, his Lab. was designated as a National Research Lab. by the Ministry of Science and Technology. In 2015, he received the Asian Academic Award jointly from SAREK/CAR/JSRAE. In 2017, he received the best research award from Korea University. In 2018, he was elected as a fellow of The Korean Academy of Science and Technology. He was also elected as a fellow of National Academy of Engineering of Korea in 2020. He served as a director of BK21 plus center for creative research engineers of convergence mechanical systems, School of Mechanical Engineering, Korea University. He is a former president of SAREK in 2022 and now fellow of the SAREK and AUTSE. Now he is a director of Research Center for Plus Energy Building Innovative Technology (ERC) sponsored by the Korea Government.



Plenary Speaker 4

Junichiro Shiomi

The University of Tokyo, JPN

Title of the Presentation:

Experiment-in-loop Materials Informatics for Heat Transfer and Beyond

Bio: He received B.E. (1999) from Tohoku University, and Ph. D. (2004) from the Royal Institute of Technology (KTH), Sweden. Leading the Thermal Energy Engineering Lab, he has been pursuing research to advance thermal management, waste heat recovery, and energy harvesting technologies based on nano-to-macro innovation in materials, structures, and systems.

Prof. Shiomi has been leading several projects including Grant-in-Aid for Scientific Research (S) (JSPS), Core Research for Evolutional Science and Technology (JST-CREST), Precursory Research for Embryonic Science and Technology (JST-PRESTO), and New Energy and Industrial Technology Development Organization (NEDO) projects. He is a Fellow of the Japan Society of Mechanical Engineers, Member of Science Council of Japan, and Member of Engineering Academy of Japan. He serves as an Associate Editor of Nanoscale and Microscale Thermophysical Engineering.

He is a recipient of the Zeldovich Medal from the Committee on Space Research, the Commendation for Science and Technology by the Minister of Educational, Culture, Sports, Science and Technology (the Young Scientists' Prize and the Science and Technology Prize), the Academic award of Heat Transfer Society of Japan, the Academic Award of Thermoelectric Society of Japan, the JSPS Award, and the Nukiyama Memorial Award.



Plenary Speaker 5

Jinliang Xu

North China Electric Power University, CHN

Title of the Presentation:

Coloration in Supercritical Fluids

Bio: Prof. Jinliang Xu is the Director of Key Laboratory of Power Station Energy Transfer Conversion and System of Ministry of Education, China. He was the Dean of School of Energy Power and Mechanical Engineering and the School of Renewable Energy, North China Electric Power University, in the period of 2010-2020. He got PhD at Xi'an Jiaotong University in 1995, and was a post-doctor in Tsinghua University from 1995 to 1997. After four years visiting position in oversea universities, he joined Guangzhou Institute of Energy Conversion from 2002, and setup the Micro Energy System Laboratory there. He joined North China Electric Power University in 2009 and founded the Beijing Key Laboratory of Multiphase Flow and Heat Transfer for Low Grade Energy Utilizations.

His research interest includes multiphase flow and heat transfer in micro/nano systems, advanced power generation system, low grade energy and renewable energy utilization. He published more than 300 journal papers such as Physics Reports-Review, Small, Nano Letters, Nano Energy, Int J. of Multiphase Flow, etc, as the corresponding author. He has been the highly cited author in recent six years in Energy field. He has been the chair or co-chair for a set of academic conferences such as 4th Micro and Nano Flows Conference (University College London, UK, 7-10 September 2014), IHTS 2014 (International Heat Transfer Symposium 2014, Beijing) and first Int. Conference on supercritical CO₂ power system (2018 Beijing) etc. He is the editor of the journals of Thermal Science and Engineering Progress, Water, Energies, Frontiers in Heat pipe. He is the guest editor for the special issue of Applied Thermal Engineering and Energy. He presented 50 plenary /keynote speeches in international conferences and has been the reviewer for more than 30 journals. He received the Natural Science Award of the Ministry of Education, China (first grade). He was "973" project chief scientist, Ministry of Science in the period of 2011-2016.



Plenary Speaker 6

Matteo Bucci

Massachusetts Institute of Technology, USA

Title of the Presentation:

High resolution investigations of nucleate boiling, from single bubbles to boiling crisis, from cryogenic fluids to high-pressure water

Bio: Prof. Matteo Bucci is the Esther and Harold E. Edgerton Associate Professor of Nuclear Science and Engineering at the Massachusetts Institute of Technology (MIT). His research group studies two-phase heat transfer mechanisms in nuclear reactors and space systems, develops high-resolution non-intrusive diagnostics and surface engineering techniques to enhance two-phase heat transfer, and creates machine learning tools to accelerate data analysis and conduct autonomous heat transfer experiments. He has won several awards for his research and teaching, including the MIT Ruth and Joel Spira Award for Excellence in Teaching (2020), ANS/PAI Outstanding Faculty Award (2018 and 2023), the UIT-Fluent Award (2006), the European Nuclear Education Network Award (2010), and the 2012 ANS Thermal-Hydraulics Division Award. Matteo is the founding editor and deputy Editor-in-Chief of AI Thermal Fluids. He also serves as Editor of Applied Thermal Engineering, is the founder and coordinator of the NSF Thermal Transport Café and works as a consultant for the nuclear industry.



Keynote Speaker 1

Jader Barbosa Jr

Louisiana State University, USA

Title of the Presentation:

Comparing and Combining Microchannel and Spray Cooling Schemes in Innovative Vapor-Compression Strategies for High Heat Flux Thermal Management

Bio: Jader Barbosa Jr. is a Professor in the Craft and Hawkins Department of Petroleum Engineering at Louisiana State University (LSU), USA. He earned his Ph.D. in Chemical Engineering from Imperial College London, UK. His academic interests encompass Fluids Engineering and Thermal Sciences, with a particular focus on Geoenery Engineering, Flow and Thermodynamics of Multiphase and Multicomponent Mixtures, and Emerging Cooling Technologies. Dr. Barbosa has authored over 370 scientific papers published in indexed journals. He is also a co-author of four patent applications and one book. He serves as a member of the International Technical Advisory Committee of the THERMAG and Multiphase Production Conferences and the Scientific Council of the International Center for Heat and Mass Transfer (ICHMT). He is also the President of the Assembly of World Conferences on Experimental Heat Transfer, Fluid Mechanics, and Thermodynamics (ExHFT).



Keynote Speaker 2

Guillaume Castanet

Centre national de la recherche scientifique, FRA

Title of the Presentation:

Heat and Mass Transfers in Droplet Flows: Recent Advances Using Laser-Induced Fluorescence

Bio: Guillaume Castanet is a research scientist of the French National Centre for Scientific Research (CNRS). He received his PhD degree in Mechanical engineering from the University of Lorraine (Nancy, France) in 2004. Since 2006, Guillaume Castanet has been working in the Laboratory of Energies Theoretical and Applied Mechanics (LEMTA) at the University of Lorraine. His research activities concern heat and mass transfer phenomena in droplet-laden flows and thin liquid films. Guillaume Castanet has published more than 100 papers in journals and conference proceedings. He is currently a member of the ILASS-Europe committee to promote the science and application of Liquid Atomization and Spray Systems.



Keynote Speaker 3

Yoshihiro Deguchi

Tokushima University, JPN

Title of the Presentation:

Advanced Control of Industrial Processes with Digital Twin
Integrating Laser Diagnostics and CFD

Bio: Yoshihiro Deguchi received his BE, ME, and DE degrees from Toyohashi University of Technology in 1985, 1987, and 1990, respectively, and after obtaining his DE, he worked for 20 years as a research engineer in the field of applied physics at Mitsubishi Heavy Industries, Ltd. He has been involved in the development of laser diagnostic methods such as tunable diode laser absorption spectroscopy, laser-induced breakdown spectroscopy, laser-induced fluorescence, and laser Raman spectroscopy, and has applied these technologies to industrial fields such as DX (Digital Transformation) and Digital Twin. In 2010, he joined Tokushima University as a full-time professor. He is one of the leading engineers in the practical application of laser diagnostics, especially for industrial systems. In addition to his research activities, he has also encouraged the use of intellectual property.



Keynote Speaker 4

Hui Jin

Xi'an Jiaotong University (XJTU), CHN

Title of the Presentation:

Cross-scale simulation on multiphase reacting flow of
supercritical water and coal particles

Bio: Prof. Hui Jin obtained his Ph.D. from the Xi'an Jiaotong University in 2011. He is a professor in State Key Laboratory of Multiphase Flow and Power Engineering in Xi'an Jiaotong University. His research fields focus on poly-generation technology for hydrogen production, power generation and heat supply based on coal/biomass gasification in supercritical water and related multiphase thermal physical and chemical theory. He is the winner of the National Science Fund for Distinguished Young Scholars in National Natural Science Foundation of China, the winner of "Chung-Hua Wu Outstanding Young Scholar Award", the winner of Particuology Young Scholar Award issued by Chinese Society of Particuology, and the leader of Youth Innovative Research Team of Shaanxi Province. He has published more than 100 first/corresponding author SCI papers with more than 10000 citations with H-index 55, 19 papers were indexed as ESI paper, and 4 papers were indexed as hot papers. Dr. Jin also has public or authorized 62 patents and 32 software copyrights. He was selected in the Stanford University Top 2% Scientists List from 2019 to 2023.



Keynote Speaker 5

Ali Koşar

Sabancı University, TUR

Title of the Presentation:

Hydrodynamic Cavitation on a Chip Devices for Energy and Biomedical Applications

Bio: Ali Koşar is a Distinguished Research Professor at Sabancı University. He earned his master's and doctoral degrees in Mechanical Engineering from Rensselaer Polytechnic Institute. He is focusing on the design and development of new generation micro heat sinks with functional surfaces and microfluidic devices including cavitation on chip devices. His research interests constitute a spectrum covering heat and fluid flow in micro/nano scale, condensation, boiling heat transfer, microfluidic systems, and cavitation. He co-authored over 200 research articles in top journals and 100 conference papers in prestigious international conferences. He is currently leading a large research group consisting of members from various disciplines, graduate students and engineers and to bridge different disciplines. He is the co-director of Center of Excellence for Functional Surfaces and Interfaces for Nano diagnostics (EFSUN), a Distinguished Researcher of Sabancı University Nanotechnology and Application Center (SUNUM) and a Member of Turkish Academy of Sciences (TÜBA).



Keynote Speaker 6

Sunny Li

University of British Columbia, CAN

Title of the Presentation:

Effect of Surface Wettability on Bubble Interactions with Underwater Surfaces

Bio: Dr. Sunny Li is a professor of mechanical engineering at The University of British Columbia (UBC), Okanagan campus. He is the director of UBC Thermal Management and Multiphase Flows Lab, the former Chair of CSME Thermal Science and Engineering Committee, and the Canadian Delegate on The Assembly for International Heat Transfer Conferences. His research centers around the fluid dynamics of multiphase flows and heat transfer involved in high-heat-flux cooling technologies and applications, with focus on the cooling and thermal management for microelectronics and power electronics. Before joining UBC, he was a research scientist in the Electronics Cooling Lab at the Global Research Center of General Electric, Schenectady, New York. He received his MASc and Ph.D. in mechanical engineering from the University of Toronto in 2004 and 2008, respectively.



Keynote Speaker 7

Simone Mancin

University of Padova, ITA

Title of the Presentation:

Layer by Layer: Unlocking the Potential of Additive Manufacturing in Thermal Science

Bio: Simone Mancin is an Associate Professor of Thermodynamics and Heat Transfer and the Director of the Thermal Energy Innovation research group at the University of Padova, Italy. His research mainly focuses on single- and two- phase heat transfer in enhanced surfaces and micro-geometries for electronic thermal management and air conditioning and refrigeration, phase change materials (PCMs) and Thermochemical material (TCM) for advanced latent thermal energy storage and additive manufacturing for Thermal Science. He is the author or co-author of about 250 papers. He is associate editor of HEDH, Thermal Science and Engineering Progress, Journal of Energy Storage, Part C: Journal of Mechanical Engineering Science, Heat Transfer Research and he is a member of the Editorial Board of International Journal of Thermofluids and Energies.



Keynote Speaker 8

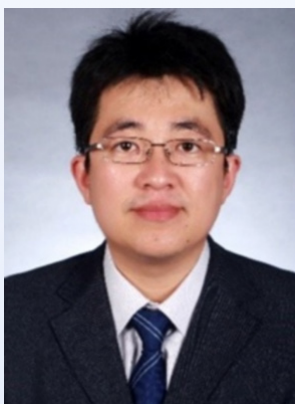
Ana S. Moita

Technical University of Lisbon, PRT

Title of the Presentation:

Two-phase flows in microfluidic devices: Green system for sustainable industrial applications

Bio: PhD (2009), MSc (2004) and Diploma Engineer (2001) in Mechanical Engineering in Instituto Superior Técnico, Technical University of Lisbon Ana Moita is an Assistant Professor at Instituto Superior Técnico, Universidade de Lisboa, a senior researcher in IN+, Center for Innovation, Technology and Policy Research/Instituto Superior Técnico and Director of the Laboratory of Thermofluids, Combustion and Energy Systems of this research center. A.S. Moita developed a strong background in wettability modification strategies, including micro-and-nanostructuring techniques applied to surface modification. She received 4 awards/distinctions. She is reviewer for numerous international conferences, more than 70 journals and 5 funding agencies, and is part of the scientific and or technical committee of 22 international conferences/workshops. A.S. Moita published 8 book chapters, more than 200 peer reviewed journal papers, and around 150 conference papers. She is Guest-Editor in various SI's in journals from MDPI and part of the Editorial board of Experimental Thermal and Fluid Science, Elsevier, since August 2022.



Keynote Speaker 9

Yixiang Shi

Tsinghua University, CHN

Title of the Presentation:

Electrochemical energy conversion and storage: towards Elevated Temperature

Bio: Prof. Yixiang Shi obtained his Bachelor (2003) and PhD (2008) degrees in thermal engineering from Tsinghua University. During 2007–2008, he worked in the University of California, Irvine, as a joint educated PhD candidate. After that, he worked as a postdoctoral researcher in at MIT during 2008–2009. He was appointed as research assistant (2010–2011), associate professor (2011–2020) and professor (since 2020) in Tsinghua University. His current research activities include fuel cell and electrochemical conversion, CO₂ separation and utilization, renewable energy/low grade heat power generation technology. He is the author/co-author of more than 280 peer-reviewed articles with over 6000 citations. Prof. Shi is a committee member of the International Academy of Electrochemical Energy Science (IAOEES), the International Association for Hydrogen Energy (IAHE) and the Tsinghua Science and Technology Association.



Keynote Speaker 10

Yoonjin Won

The University of California, Irvine, USA

Title of the Presentation:

Fundamentals of Machine Learning for Heat Transfer

Bio: She is currently an Associate Professor of Mechanical and Aerospace Engineering at the University of California, Irvine, with courtesy appointments in Electrical Engineering and Computer Science, and Materials Science Engineering. Dr. Won's research focuses on multiphase thermal science, integrating AI for science and experiment, scientific machine learning, and materials design. She leads the DoD funded multi-university research initiative (MURI), ML4Heat. She is a recipient of lots of Award, such as the National Science Foundation CAREER Award, the ASME Electronic & Photonic Packaging Division Early Career Award, the ASME Electronic & Photonic Packaging Division Women Engineer Award, and the ASME ICNMM Outstanding Leadership Award. Yoonjin Won received her B.S. degree in Mechanical and Aerospace Engineering from Seoul National University, and her M.S. and Ph.D. degrees in Mechanical Engineering from Stanford University. For more information on Dr. Won's qualifications and research group, please visit won.eng.uci.edu.

11th World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics

August 15–18, 2025, Beijing, China

ExHFT-11 Program

AUG 15-18, 2025 WYNDHAM BEIJING NORTH, CHINA

Day 1

Saturday, August 16, 2025

11th World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics

August 15–18, 2025, Beijing, China

Day1 (Agu 16) Morning			
Location: Beijing Ballroom Topic: Opening Ceremony & Plenary Lectures			Chair
8:00-8:10	Welcome message from the conference chairman	Jinliang Xu	Jinliang Xu
8:10-8:15	Welcome message from the president of the Assembly of World Conferences on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics (AWC)	Lixin Cheng on behalf of Jader Barbosa Jr.	
8:15-8:25	Welcome message from the principal of NCEPU	Tianshu Bi	
8:25-8:30	Photograph		
8:30-9:10	Capillary/wetting effects on boiling heat transfer and bubbles dynamics	Khellil Sefiane	Lixin Cheng
9:10-9:50	Experimental evaluation of the distribution and coalescence of oil microdroplets dispersed in water for in-tube horizontal flows	Gherhardt Ribatski	
9:50-10:05	Tea & Coffee Break		
10:05-10:45	Sorption thermal battery for plus energy building application	Yong Tae Kang	Khellil Sefiane
10:45-11:25	Experiment-in-loop materials informatics for heat transfer and beyond	Junichiro Shiomi	
11:25-12:05	Coloration in supercritical fluids	Jinliang Xu	
12:05-13:30	Lunch Buffet		

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Day 1 (Aug 16) Afternoon		
Location: Room 1		
Topic: Heat and Mass Transfer		
Chairs: Lin Chen & Junichiro Shiomi		
Time	Paper Number & Title	Speaker
13:30-14:10	Plenary (online): High resolution investigations of nucleate boiling, from single bubbles to boiling crisis, from cryogenic fluids to high-pressure water	Matteo Bucci
14:10-14:25	ExHFT-11560, Bio-inspired flow channeling in liquid-cooled hybrid pin-fin heat sinks for compact cooling systems	Hongwei Wu
14:25-14:40	ExHFT-11159, A bi-objective pseudo-3D topology optimization for regenerative cooling channels with enhanced heat transfer and balanced flow resistance	Ziwen Wang
14:40-14:55	ExHFT-11160, Visualization study on flow disturbance heat transfer in tube bundles	Quanyu Lu
14:55-15:10	ExHFT-11036, Optimizing thermoelectric generator heat transfer to improve waste heat recovery performance from blast furnace slag	Xi Li
15:10-15:25	ExHFT-11038, Entropy production and dissipation mechanisms in TPMS-architected adsorption desalination systems	Mingliang Li
15:25-15:40	ExHFT-11089, The internal flow structure and heat transfer phenomena of a vortex tube	Lei Yang
15:40-15:55	ExHFT-11553, A data-mechanism driven method for prediction of supercritical CO ₂ heat transfer behaviors in tubes	Haisong Zhang
15:55-16:15	Tea & Coffee Break	

Location: Room 1		
Topic: ExHFT Frontiers - Ignite Innovation		
Chair: Qibin Liu, Yun Wu, Qiang Du		
16:15-16:45 (30min)	Reactive particle-laden multiphase flow: from physicochemical behavior of individual to energy conversion of group	Bofeng Bai
16:45-17:05 (20min)	Towards intelligent plasma flow control with deep reinforcement learning	Haohua Zong
17:05-17:25 (20min)	Experimental study on gas flow through g-C ₃ N ₄ membranes with nanopores and nanochannels	Chengzhen Sun
17:25-17:45 (20min)	New thermodynamic mechanism and method study for solar thermochemical fuel conversion	Fan Jiao
17:45-18:05 (20min)	Buoyancy-induced flow and heat transfer in turbomachinery compressor disc cavities	Ruonan Wang

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Day 1 (Aug 16) Afternoon		
Location: Room 2		
Topic: Interdisciplinary Research		
Chairs: Maochang Liu & Wang Han		
Time	Paper Number & Title	Speaker
13:30-14:00	Keynote: Layer by layer: unlocking the potential of additive manufacturing in thermal science	Simone Mancin
14:00-14:15	ExHFT-11100, Development of CO ₂ sensing method using formation flying drones	Shanfeng Zhang
14:15-14:30	ExHFT-11589, Flow characteristics and windage dissipation mechanisms in supercritical CO ₂ turbine disk cavities under high rotational Reynolds numbers	Jiahao Tian
14:30-14:45	ExHFT-11592, Research on the adhesion characteristics of fly ash in the all-dry waste heat recovery and utilization system of converter gas	Di Liu
14:45-15:00	ExHFT-11922, Phonon dynamics detected by femtosecond spectroscopy	Liang Guo
15:00-15:15	ExHFT-111037, Analysis of generalized performance curves for supercritical CO ₂ compressors	Xiangbin Li
15:15-15:30	ExHFT-11741, Experimental study on the flow rate of a novel supercritical CO ₂ thermoacoustic pump	Shaowu Yue
15:30-15:45	ExHFT-11873, Surface engineering strategies for improved electrochemical stability of porous titanium substrates in membrane electrode assemblies	Zheng Zhou
15:45-16:00	ExHFT-11790, Performance-differentiated phase change sandwich composite with gradient thermal conductivity for versatile thermal management	Zihan Wang
16:00-16:15	Tea & Coffee Break	
16:15-16:30	ExHFT-11586, Physical degradation model of catalyst layer in PEMWE	Yong Xu
16:30-16:45	ExHFT-11835, Thermoelastic analysis of a novel strain relief device for sCO ₂ power cycle pipelines	Mingyu Zheng
16:45-17:00	ExHFT-11387, Micro-scale ice shoveling effect induced by magnetic-responsive microfins	Yiyi Chen
17:00-17:15	ExHFT-11758, Experimental study of stall warning methods in a high-speed compressor	Boning Fan
17:15-17:30	ExHFT-11912, Screen-printing for enlarging electrode-electrolyte interfacial area in anode-supported SOFCs	Naoki Tsukahara
17:30-17:45	ExHFT-11710, Visualization of natural convection thermal boundary layer and resonance induced heat transfer enhancement	Atsuki Komiya
17:45-18:00	ExHFT-11009, Advances in manufacturing processes and materials processing: innovations and applications	Abdul Quadir

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Day 1 (Aug 16) Afternoon		
Location: Room 3		
Topic: Multiphase Flow, Heat and Mass Transfer		
Chairs: Christos Markides & Zhichun Liu		
Time	Paper Number & Title	Speaker
13:30-14:00	Keynote: Hydrodynamic cavitation on a chip device for energy and biomedical applications	Ali Koşar
14:00-14:15	ExHFT-11715, Dual-gradient catalyst layer to overcome the electron and proton conductivity trade-off in PEMWE	Qichao Fan
14:15-14:30	ExHFT-11084, Visualization and heat transfer characteristics on pool boiling of liquid hydrogen	Masaharu Kubota
14:30-14:45	ExHFT-11102, Experimental investigation on flow pattern transition and critical heat flux characteristics in a vertical upward rectangular narrow channel	Chen Sun
14:45-15:00	ExHFT-11109, Numerical simulation on electrical output performance of large-scale PEMFC coupled with non-uniform assembly pressure	Yuxi Tong
15:00-15:15	ExHFT-11111, Ground-based experiments of a new type of nanofluids loop heat pipe	Jinghan Pan
15:15-15:30	ExHFT-11119, Optimization of cold plate structure in soft-pack battery thermal management systems based on bionic leaf vein textures	Zetao Gui
15:30-15:45	ExHFT-11125, Flow distribution and transient response in parallel microchannel heat sinks under thermal load variation	Yuxiang Guo
15:45-16:00	ExHFT-11127, Experimental study of R515B flow condensation in 5 mm and 7 mm OD micro-fin tubes at varying inclinations	Andrea Diani
16:00-16:15	Tea & Coffee Break	
16:15-16:30	ExHFT-11132, Experimental comparison of thermal non-equilibrium expansion	Xander van Heule
16:30-16:45	ExHFT-11134, Enhancement of cryogenic quenching heat transfer by nanoscale boehmite structures on aluminum surfaces	Simeng Chen
16:45-17:00	ExHFT-11144, Experimental investigation of the horizontal gas–liquid swirling flow induced by different vane-typed swirler structures	Wen Liu
17:00-17:15	ExHFT-11146, Enhanced 3D solar evaporation by natural convection	Xiaolong Ma
17:15-17:30	ExHFT-11814, Multiscale interfacial heat/mass transfer mechanism and strategies for high-efficiency energy system	Yaqi Cheng
17:30-17:45	ExHFT-11726, Experimental and modeling study of liquid-carrying mechanisms and critical gas velocity prediction in foam drainage gas well	Mengwei Li

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Day 1 (Aug 16) Afternoon		
Location: Room 4		
Topic: Energy Storage Systems and Carbon Neutrality		
Chairs: Dario Guarda & Pingjian Ming		
Time	Paper Number & Title	Speaker
13:30-13:45	ExHFT-11798, Experimental and numerical study on coupled heat transfer characteristics between liquid lead-bismuth eutectic and high-temperature high-pressure water	Yunfan Liu
13:45-14:00	ExHFT-11095, Comparative analysis of lauric acid and RT42 paraffin in a bar-and-plate heat exchanger	Waseem Raza
14:00-14:15	ExHFT-11354, Thermal output of packed bed and moving bed reactors in thermochemical energy storage system	Hongzhi Liu
14:15-14:30	ExHFT-11378, Thermoeconomic analysis of molten salt Carnot battery under time-of-use electricity pricing: A multi-provincial comparison	Bin Dai
14:30-14:45	ExHFT-11380, Electrocatalytic CO ₂ reduction to produce chemicals with high energy conversion efficiency at a high pressure	Boxu Chen
14:45-15:00	ExHFT-11383, Development of measurement method and system for thermal parameter characterization of lithium-ion batteries	Hengyun Zhang
15:00-15:15	ExHFT-11825, Demand response characteristics of multiple thermal storage units in building heating systems	Baoping Xu
15:15-15:30	ExHFT-11417, Dynamic characteristics of energy storage processes in a large-scale thermochemical energy storage fixed-bed unit under different heating modes	Bingwen Li
15:30-15:45	ExHFT-11623, Energy balance analysis of a rectangular phase change material enclosure	Maité Goderis
15:45-16:00	ExHFT-11465, Study on crystallization energy storage characteristics and structural optimization of lithium bromide in honeycomb bed	Wenxuan Ma
16:00-16:15	Tea & Coffee Break	
16:15-16:30	ExHFT-11469, LBM simulation of multicomponent reactive transport in gas diffusion layer of PEMFC: impact of structural variation on water removal and heat accumulation	Yongqi Wang
16:30-16:45	ExHFT-11542, Adsorption-type compressed CO ₂ energy storage system integrated with solar energy and multi-effect distillation system	Yupeng Li
16:45-17:00	ExHFT-11575, First-principles study on the adsorption mechanism of water molecules on the SrBr ₂ (100) surface	Mingyang Gao
17:00-17:15	ExHFT-11600, Multi-objective evaluation of battery thermal management systems for large-capacity energy storage Li-ion batteries	Zhifu Zhou
17:15-17:30	ExHFT-11059, Experimental and first-principles study of NH ₃ and H ₂ O adsorption and dissociation at the Ni-YSZ interface in SOFC anodes	Yuting Guo
17:30-17:45	ExHFT-11913, Heat and mass transfer in shape-stabilized composite phase change materials using functional mesoporous silica with adsorbed inorganic hydrated salt: a molecular dynamics study	Kai Qi
17:45-18:00	ExHFT-111041, Thermodynamic cycle analysis of a two-phase magnetohydrodynamic power generation system	Shaozheng Wang

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Day 1 (Aug 16) Afternoon		
Location: Room 5		
Topic: Heat and Mass Transfer		
Chairs: Ali Koşar & Haochun Zhang		
Time	Paper Number & Title	Speaker
13:30-13:45	ExHFT-11574, Study on boiling heat transfer enhancement by controllable oscillating elements	Daoming Xu
13:45-14:00	ExHFT-11571, A new method of enhancing boiling heat transfer by vibration of elastic material	Pengfei Huang
14:00-14:15	ExHFT-11227, Numerical investigation of hybrid liquid-PCM cooling for motors under short-term high overload conditions	Yongheng Liu
14:15-14:30	ExHFT-11228, Prediction of local heat transfer coefficient in a tube under rolling motions based on machine learning	Yaru Zhang
14:30-14:45	ExHFT-111060, Efficient ice melting mode triggered by strong Marangoni convection	Shangwen Lei
14:45-15:00	ExHFT-11930, Variation methods for predictions of the wetting state transition of condensate droplets from Wenzel to Cassie	Jian Dong
15:00-15:15	ExHFT-11685, Droplet impact dynamics on superhydrophobic surfaces with micropillar scale gradient	Shuxiang Wang
15:15-15:30	ExHFT-11565, Experimental investigation on mixing loss mechanism of combined holes	Jialin Liu
15:30-15:45	ExHFT-11130, Effect of surface coatings on droplets impacting upon cold surfaces: dynamic behaviors and freezing processes	Yuheng Shang
15:45-16:00	ExHFT-11141, Experimental study on thermal performance of ultra-thin heat pipe with a novel composite wick structure	Yunhua Gan
16:00-16:15	Tea & Coffee Break	
16:15-16:30	ExHFT-11142, Performance comparison of pseudo-3D topology optimization results based on different optimization objectives	Jian Zhang
16:30-16:45	ExHFT-11992, Heat transfer and pressure drop of flow boiling R32 inside a 6.4 mm enhanced tube	Marina Brancaccio
16:45-17:00	ExHFT-11153, Study on three-field synergy characteristics and comprehensive performance of fuel-air heat exchanger based on TPMS structure for aero-engine	Tao Jiang
17:00-17:15	ExHFT-11157, MXene synergistically enhanced high thermal conductivity hygroscopic hydrogels for efficient transpiration cooling in electronic devices	Kuan Zhao
17:15-17:30	ExHFT-11474, Enhanced thermal management for High-heat-flux hotspot via diamond-vapor chamber integration	Jiaxi Du
17:30-17:45	ExHFT-11451, Entropy-based performance evaluation of electromagnetic-controlled mixed convection in liquid sodium systems	Hengsen Jing
17:45-18:00	ExHFT-111027, Vapour clouds from volatile sessile droplets in microgravity: Marangoni jets, electroconvection and dancing due to g-jitters	Pierre Colinet

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Day 2

Sunday, August 17, 2025

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August 15–18, 2025, Beijing, China

Day 2 (Aug 17) Morning		
Location: Room 1		
Topic: Multiphase Flow, Heat and Mass Transfer		
Chairs: Hui Jin & Daniel Borba Marchetto		
Time	Paper Number & Title	Speaker
8:00-8:30	Keynote: Heat and mass transfers in droplet flows: recent advances using laser-induced fluorescence	Guillaume Castanet
8:30-8:45	ExHFT-11733, Enhancement of heat transfer for nucleate boiling with microlayer evaporation on micro-pillar arrayed surface	Jinming Zhang
8:45-9:00	ExHFT-11603, Performance enhancement of flow boiling in a micro-channel using a microgrooved surface	Waqas Ahmad
9:00-9:15	ExHFT-11479, Study on direction reversal of thermo-osmosis in a nanochannel	Kai Qi
9:15-9:30	ExHFT-11493, Direct numerical simulation of droplet evaporation and turbulence characteristics in a supersonic droplet-laden mixing layer	Haoyong Li
9:30-9:45	ExHFT-11749, Experimental flow pattern, slippage and water cut prediction of oil-water flows in vertical large diameter pipe	Landi Bai
9:45-10:00	ExHFT-11509, Performance prediction and analysis of oil-containing wastewater heat exchangers under oil film adhesion and non-oil film adhesion conditions	Yanlong Zhang
10:00-10:15	Tea & Coffee Break	
10:15-10:30	ExHFT-11519, Experimental investigation on energy storage characteristics of CaCO ₃ particles in a directly irradiated fluidized bed reactor	Mingyu Liu
10:30-10:45	ExHFT-11521, Study on boiling characteristics of liquid crystal elastomer surfaces with thermally adaptive wettability	Shuai Chen
10:45-11:00	ExHFT-11581, Study on the flow condensation flow patterns and heat transfer characteristics of low-GWP zeotropic mixture R1234ze(E)/R1336mzz(Z) in macro/mini-channels	Chunyu Feng
11:00-11:15	ExHFT-11580, Boiling of a subcooled liquid under continuous laser irradiation	Andrey Chernov
11:15-11:30	ExHFT-11579, Bubble characteristics on surface boiling: experiments and implementation of numerical models	Anatoliy Levin
11:30-11:45	ExHFT-11534, Molecular dynamics of interfacial heat transfer in graphene nanofluids on Cu-graphene composite porous substrates	Nian Xu
12:00-13:30	Lunch Buffet	

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Day 2 (Aug 17) Afternoon		
Location: Room 1 Topic: Multiphase Flow, Heat and Mass Transfer Chairs: Zhizhao Che & Lap Mou Tam		
Time	Paper Number & Title	Speaker
13:30-14:00	Keynote: Cross-scale simulation on multiphase reacting flow of supercritical water and coal particles	Hui Jin
14:00-14:15	ExHFT-11425, Fermi level pinning in concentrated light-induced band edge tuning maximizes photocatalytic solar-to-hydrogen efficiency	Maochang Liu
14:15-14:30	ExHFT-111015, Experimental investigation on thermal response time characteristics of supercritical CO ₂ transient flow process	Wenxuan Cao
14:30-14:45	ExHFT-11612, A comprehensive system-level model for performance evaluation of proton exchange membrane fuel cell system with dead-ended mode	Xiaolong Liu
14:45-15:00	ExHFT-11641, Numerical investigation for hypersonic transpiration cooling coupled with porous media flow	Zeyi Chen
15:00-15:15	ExHFT-11642, Simulation study of combustion and water evaporation characteristics of marine methanol auxiliary boiler	Chenxing Fan
15:15-15:30	ExHFT-11853, SDMS-PLIF thermography of nucleate flow boiling in a vertical mini-channel	Christos Markides
15:30-15:45	ExHFT-11856, Experimental study on electro-de-wetting (EDW) effect for pool boiling behavior regulation	Xueying Hao
15:45-16:00	ExHFT-11931, Condensation droplet dynamics on hydrophobic-hydrophilic hybrid surfaces with star-shaped hydrophilic regions	Yuchen Zhang
16:00-16:15	Tea & Coffee Break	
16:15-16:30	ExHFT-11921, A numerical framework for conjugate heat transfer and subcooled boiling at extreme pressure conditions	Deepak Selvakumar Ramachandran
16:30-16:45	ExHFT-11877, Investigation of flow and heat transfer characteristics in a battery thermal management system using porous composite phase change materials	Jiajun Xia
16:45-17:00	ExHFT-11892, Numerical investigation of reverse heat transfer in Maisotsenko cycle cooling towers	Yaqin Liu
17:00-17:15	ExHFT-11920, Experimental study on boiling two-phase flow and bubble dynamic characteristics in parallel microchannels	Lu Liu
17:15-17:30	ExHFT-11867, Influence of key sub-models on predicting hydrodynamics and heat transfer in CFD-DEM simulations of fluidized beds	Guoqing Lian
17:30-17:45	ExHFT-11802, Thermal capillary convection of two adjacent compound droplets	Xing Li
17:45-18:00	ExHFT-11858, Impact of coalescence in multi-swirl air blast atomization on spray evolution	Vivek Sahu

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Day 2 (Aug 17) Morning		
Location: Room 2		
Topic: Machine Learning and AI in Heat transfer, Fluid Dynamics and Thermodynamics		
Chairs: Maria Rosaria Vetrano & Ting Ma		
Time	Paper Number & Title	Speaker
8:00-8:30	Keynote (online): Fundamentals of machine learning for heat transfer	Yoonjin Won
8:30-8:45	ExHFT-11013, Solution of parameterized convective heat transfer equations using physics-informed neural networks	Pan Cui
8:45-9:00	ExHFT-11128, Physics-informed neural networks for modelling corrugated helical tube heat exchangers with fluid flow and heat transfer coupling	Yiran Duan
9:00-9:15	ExHFT-11860, Energy management strategy for hydrogen fuel cell trucks based on deep reinforcement learning	Xiantai Zeng
9:15-9:30	ExHFT-11527, Prediction of temperature response and multi-objective optimization for multilayer thermal protection structures	Zhiqian Ke
9:30-9:45	ExHFT-11583, Performance prediction and optimization for condensation heat transfer of saturated humid air integrating CFD and machine learning: focusing on surface modification	Wei He
9:45-10:00	ExHFT-11598, Solving parameterized dual-domain Darcy-Brinkman flows in gradient porous mediums via physics-informed neural networks	Haoyun Xing
10:00-10:15	Tea & Coffee Break	
10:15-10:30	ExHFT-11633, Intelligent thermal management of micro-channel heat sink cooling system bases on digital twin technology	Tianyou Xue
10:30-10:45	ExHFT-11883, Intelligent thermal management using SPH-reinforcement learning hybrid framework	Chenwei Zhao
10:45-11:00	ExHFT-11874, Interval prediction of lithium-ion battery surface temperature based on a BiLSTM-SDE network	Xianpeng Yu
11:00-11:15	ExHFT-11788, Influence of channel cross-sectional shape on the flow and heat transfer performance of latent functionally thermal fluid in microchannel cold plates and its rapid evaluation method	Zhenhua An
11:15-11:30	ExHFT-11457, Study on prediction performance of film cooling effectiveness for laidback diffusion fan-shaped hole based on machine learning	Hongpu Liu
11:30-11:45	ExHFT-11915, Numerical and machine learning analysis of bio-inspired coronary fin designs for enhanced melting in PCM thermal energy storage systems	Shan Ali Khan
12:00-13:30	Lunch Buffet	

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Day 2 (Aug 17) Afternoon		
Location: Room 2		
Topic: Multiphase Flow, Heat and Mass Transfer		
Chairs: Sunny Li & Xiuliang Liu		
Time	Paper Number & Title	Speaker
13:30-14:00	Keynote: Effect of surface wettability on bubble interactions with underwater surfaces	Sunny Li
14:00-14:15	ExHFT-11617, Numerical simulation of two-phase flow in a bearing chamber in a coupled Lagrangian-Eulerian framework	Da Qiao
14:15-14:30	ExHFT-11627, Dynamic rewetting characteristics of a screen channel liquid acquisition device for cryogenic propellant tank	Ye Wang
14:30-14:45	ExHFT-11629, Experimental study of bubble dynamics in subcooled flow boiling on novel laser textured microcavities	Maria Rosaria Vetrano
14:45-15:00	ExHFT-11828, Interaction between droplet and airflow during breakup of droplets in airflow	Zhikun Xu
15:00-15:15	ExHFT-11591, Thermal-hydraulic performance and structural strength collaborative optimization design of supercritical CO ₂ PCHE with zigzag channel	Fukang Wang
15:15-15:30	ExHFT-11655, CFD simulation of scale-up effects on the hydrodynamics in bubble columns with vertical internals	Xiaoping Guan
15:30-15:45	ExHFT-11656, Identification of volatile cloudy zone in a liquid-injected fluidized bed by CFD–DEM simulation	Ning Yang
15:45-16:00	ExHFT-11661, Study on the flow instability of carbon dioxide in parallel vertical rising tubes	Kuankuan Qi
16:00-16:15	Tea & Coffee Break	
16:15-16:30	ExHFT-11662, Enhancing thin film boiling heat transfer through electric field and surface macro-structure synergy	Jiameng Tian
16:30-16:45	ExHFT-11669, Dynamics of cohesive particles in thermal-induced turbulence	Han Huang
16:45-17:00	ExHFT-11687, Experimental study on R134a flow boiling in manifold microchannels with different porous microchannels	Huiming Wang
17:00-17:15	ExHFT-11667, Experimental investigation of fouling-induced heat transfer degradation in flat tube bank fin radiator in environment with high concentration dust	Shiqiang Zhu
17:15-17:30	ExHFT-11942, A heat-pipe-based horizontal thermal diode	Zhanxiao Kang
17:30-17:45	ExHFT-11256, Flow boiling heat transfer of R1336mzz(Z) in a 1.2 mm diameter horizontal channel	Daniel Borba Marchetto
17:45-18:00	ExHFT-11831, Experimental study of the dynamics of cavitation bubbles in a liquid layer	Jinzhao Liu

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Day 2 (Aug 17) Morning		
Location: Room 3		
Topic: Multiphase Flow, Heat and Mass Transfer		
Chairs: Gherhardt Ribatski & Chengzhen Sun		
Time	Paper Number & Title	Speaker
8:00-8:30	Keynote (online): Two-phase flows in microfluidic devices: green system for sustainable industrial applications	Ana S. Moita
8:30-8:45	ExHFT-11004, Heat transfer enhancement of supercritical carbon dioxide in horizontal channels with various geometries	Zhanru Zhou
8:45-9:00	ExHFT-11008, Numerical study of particle deposition characteristics in an S-shaped miniature cooling channel of gas turbine blade	Xueying Tian
9:00-9:15	ExHFT-11015, Research on the structural design of submerged combustion vaporizers coupled with external heat sources	Rui Wang
9:15-9:30	ExHFT-11073, Transient spray cooling heat transfer characteristics of liquid nitrogen on hydrophilic and hydrophobic surfaces	Fengmin Su
9:30-9:45	ExHFT-11048, Experimental study of thermal-hydraulic performance in jet impingement boiling of a nose cone	Yang Xin
9:45-10:00	ExHFT-11745, Influence on heat transfer performance of pulsating heat pipe with surfactant and response analysis	Yabing Chen
10:00-10:15	Tea & Coffee Break	
10:15-10:30	ExHFT-11054, Study on the heat transfer and pressure drop characteristics in different internal threaded tubes	Haonan Chen
10:30-10:45	ExHFT-11058, Probability-encoded free-falling hollow droplets	Xiao Xu
10:45-11:00	ExHFT-11069, Chocking characteristics of a pipeline-riser system under different pressure boundary conditions	Luhan Xu
11:00-11:15	ExHFT-11071, A novel metric for evaluating the impact of heated area on critical heat flux in thin film boiling	Jie Zhao
11:15-11:30	ExHFT-11244, Study of conditions of occurrence of different regimes of fragmentation of two-component droplets	Pavel Strizhak
11:30-11:45	ExHFT-11035, Measurement of precursor film of water droplets on TiO ₂ substrate by phase-shifting imaging ellipsometry	Eita Shoji
12:00-13:30	Lunch Buffet	

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Day 2 (Aug 17) Afternoon		
Location: Room 3		
Topic: Fluid Dynamics		
Chairs: Yoshihiro Deguchi & Jianhui Qi		
Time	Paper Number & Title	Speaker
13:30-14:00	Keynote: Advanced control of industrial processes with digital twin integrating laser diagnostics and CFD	Yoshihiro Deguchi
14:00-14:15	ExHFT-11010, Influence of process parameters on hydraulic and heat transfer characteristics of 3D-Printed mini channels	Jiahang Chen
14:15-14:30	ExHFT-11088, Effect of key structural parameters on the performance of supercritical CO ₂ centrifugal compressors	Jiantian Xu
14:30-14:45	ExHFT-11097, Heat transfer characteristics of lateral dual synthetic jets	Yuanyuan Liu
14:45-15:00	ExHFT-11112, Implicit large-eddy simulation of supersonic turbulent boundary layer	Congtao Shan
15:00-15:15	ExHFT-11174, Droplet impact onto superhydrophobic substrates under high pressures	Yan Yan
15:15-15:30	ExHFT-11926, Study of energy efficiency index and inter-operational correlations for shell-and-tube heat exchangers	Yilong Chen
15:30-15:45	ExHFT-11689, Buoyancy-induced flow in a rotating cavity with an axial throughflow: effects of large temperature differences and inflow turbulence	Yaguang Xie
15:45-16:00	ExHFT-11472, Hamilton analyses for droplets rolling on inclined surfaces	Bilong Liu
16:00-16:15	Tea & Coffee Break	
16:15-16:30	ExHFT-11483, Effect of the non-Newtonian behavior on pump operation and the turbulent friction factor	Matheus Henrique Cavalheiro Garros
16:30-16:45	ExHFT-11488, Direct numerical simulation of transcritical turbulent boundary layers: effect of wall temperature	Yuan Ma
16:45-17:00	ExHFT-11561, Numerical and experimental investigation on the suppression of boundary layer separation over an IET-F turbine blade using the plasma actuator	Zihao Zhu
17:00-17:15	ExHFT-11567, Tunable droplet bouncing on moving tapered superhydrophobic surfaces	Xinghui Wu
17:15-17:30	ExHFT-111047, Impacts of blade loading on compressor flow stability and performance desensitization to tip clearance	Zeyu Zhou
17:30-17:45	ExHFT-11441, The transient process in a laminar rotor-stator cavity	Siyi Li
17:45-18:00	ExHFT-11568, Influence of wall cooling on corner separation in axial compressors	Zhenmao Lin

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Day 2 (Aug 17) Morning		
Location: Room 4		
Topic: Heat and Mass Transfer		
Chairs: Deepak Selvakumar Ramachandran & Liang Guo		
Time	Paper Number & Title	Speaker
8:00-8:15	ExHFT-11792, The influence of sub-freezing surface temperatures on the behavior of droplets impacting superhydrophobic surfaces	Borong Qiu
8:15-8:30	ExHFT-11799, Experimental analysis of frictional heat generation zones in tribological pairs	Taikun Hou
8:30-8:45	ExHFT-11811, Dynamic model for organic Rankine-vapor compression (ORVC) system in cryogenic air separation applications	Zhuoren Xu
8:45-9:00	ExHFT-11816, Experimental study on heat transfer and fluid flow performances of printed circuit heat exchangers with wavy ducts	Xin Lu
9:00-9:15	ExHFT-11834, The effect of inclined tube on heat transfer performance of flue gas-molten salt heat exchanger	Aoke Liu
9:15-9:30	ExHFT-11848, Visualization study on frosting characteristics of horizontal cold plate surface under forced convection	Liang Dong
9:30-9:45	ExHFT-11863, Topology optimised design of prismatic cell cooling plates with multiple imports and exports	Da Zhang
9:45-10:00	ExHFT-11869, Study on cylinder pressure formation process of diesel rotary engine with pre-chamber	Yiwei Qiu
10:00-10:15	Tea & Coffee Break	
10:15-10:30	ExHFT-11904, Simulation of potato evaporation interface migration and drying characteristics for intermittent microwave	Junjie Tong
10:30-10:45	ExHFT-111102, C-FOM: a dual-objective metric for PV/T temperature and uniformity optimization	Hao Wang
10:45-11:00	ExHFT-11879, Heat transfer enhancement of ultra-thin thermal ground plane using parallel liquid-vapor paths	Jiaxuan Liu
11:00-11:15	ExHFT-11805, Thermal mixing of the jet in swirling cross-flow: effect of pressure	Yushuai Liu
11:15-11:30	ExHFT-11827, Heat transfer mechanisms in smooth and ribbed U-shaped channels	Yujie Sun
12:00-13:30	Lunch Buffet	

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Day 2 (Aug 17) Afternoon		
Location: Room 4		
Topic: Heat and Mass Transfer		
Chairs: Pawel Ziolkowski & Daili Feng		
Time	Paper Number & Title	Speaker
13:30-13:45	ExHFT-11410, Thermosyphon heat transport devices and its applications	Swati Gangwar
13:45-14:00	ExHFT-11637, Bioinspired manifold microchannel cooling with porous copper for high-power device	Gege Song
14:00-14:15	ExHFT-11645, A new manifold heat sink design for large-area and high-power chip cooling	Zhicheng Xin
14:15-14:30	ExHFT-11654, Computational and experimental investigations on flow and heat transfer of supercritical CO ₂ in horizontal tubes under strong buoyancy effects	Jianyong Wang
14:30-14:45	ExHFT-11787, Airflow-driven heat transfer enhancement on superhydrophobic surfaces during dropwise condensation	Antonio Abbatecola
14:45-15:00	ExHFT-11677, Measurement of local heat transfer distributions of water sheet sprays using a heater foil and infrared thermography	Alexandros Peteinaris
15:00-15:15	ExHFT-11680, Waste-derived carbon-based/ceramic-based composite PCMs for thermo-force synergistic reinforcement and efficient thermal management	Zihao Zhao
15:15-15:30	ExHFT-11933, Experimental investigations of fast-charging battery thermal management by composite PCMs and liquid cooling under high ambient temperature	Yunxiu Hu
15:30-15:45	ExHFT-11690, Influence of substrate flexibility and temperature on Marangoni convective instability patterns in sessile droplet evaporation	Qiaoling Xiong
15:45-16:00	ExHFT-11711, Experimental study on the transition flow characteristics of S-CO ₂ for compact solar receiver	Yanjun Liu
16:00-16:15	Tea & Coffee Break	
16:15-16:30	ExHFT-11714, Droplets impact on micro-nano structured surfaces under forced convection	Siyuan Yue
16:30-16:45	ExHFT-11750, Spectral equivalent volumetric radiative properties of combined material for collecting solar energy	Bo Liu
16:45-17:00	ExHFT-11765, Investigation on the evolution of heat transfer deterioration in vertical flow of supercritical carbon dioxide and inhibition mechanism	Jiangtao Wang
17:00-17:15	ExHFT-11766, Simplification of gas-liquid-solid coupling to a transient solid conduction based model for efficient and accurate pool boiling simulation	Youyou Zheng
17:15-17:30	ExHFT-11780, Optimization design of manifold structures in microchannel heat sinks: strategies for enhancing flow uniformity	Chong Deng
17:30-17:45	ExHFT-11666, Experimental study of flow and heat transfer for dual enhanced tubes under cryogenic conditions	Wentao Ji

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Day 2 (Aug 17) Morning		
Location: Room 5		
Topic: Fluid Dynamics		
Chairs: Xinghui Wu & Qian Xu		
Time	Paper Number & Title	Speaker
8:00-8:15	ExHFT-11619, The transport and leakage prevention process of nanoparticles in deep wells within porous media under non-Newtonian flow conditions	Sheng Zeng
8:15-8:30	ExHFT-11885, Study on the enhancement methods of tip flow characteristics in a transonic rotor with circumferentially non-uniform clearance	Long Zhang
8:30-8:45	ExHFT-11643, Numerical simulation of single-phase flow and heat transfer characteristics in counter-flow microchannel heat sinks with different manifold arrangements	Jingzhi Zhang
8:45-9:00	ExHFT-11712, Internal flow mechanisms in variable geometry turbine under varying loading magnitudes and distributions	Yan Cui
9:00-9:15	ExHFT-11857, Influence of Acetes-like shrimp impurities on the flow performance of tube bundles in shell-and-tube heat exchangers	Xiaobo Fan
9:15-9:30	ExHFT-11688, Experimental study of bubble dynamics in sessile water droplets under the influence of electrowetting	Lu Liu
9:30-9:45	ExHFT-11937, On the flow loss characteristics in wide-range speed flight from the perspective of thermodynamic entropy production	Xinwei Chen
9:45-10:00	ExHFT-11692, Investigation on electric field manipulation of sessile droplets evaporation	Ningguang Chen
10:00-10:15	Tea & Coffee Break	
10:15-10:30	ExHFT-111080, Hybrid molecular design for enhanced droplet mobility and condensation	Yuanzhe Li
10:30-10:45	ExHFT-11896, Effect of radial blade loading distribution on flow stability in axial compressors	Jieao Zhang
10:45-11:00	ExHFT-11708, Flow and heat transfer mechanisms in co-rotating disc cavities with various cob opening ratios	Xinran Li
11:00-11:15	ExHFT-11672, Turbulent secondary flow in spanwise rotating ducts with increasing aspect ratio	Xinyu Ma
11:15-11:30	ExHFT-11632, Effect of pin fin configuration on flow characteristics and thermal performance in a microchannel	Olga Solnyshkina
11:30-11:45	ExHFT-11728, Effects of liquid film instability on spray features of liquid-liquid pintle injectors	Han Huang
11:45-12:00	ExHFT-11721, OpenFOAM-based study of droplet impact dynamics on thin films and microgrooved surfaces	Muhammad Mohasan
12:00-13:30	Lunch Buffet	

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Day 2 (Aug 17) Afternoon		
Location: Room 5		
Topic: Measurement, Experimental Techniques and imaging Processing		
Chairs: Zhifu Zhou & Steven Lecompte		
Time	Paper Number & Title	Speaker
13:30-13:45	ExHFT-11681, Visualization of gas diffusion layer structure and water distribution in fuel cells based on X-ray micro-imaging technique	Yuanlu Lang
13:45-14:00	ExHFT-11156, Direct contact condensation heat transfer of steam with CO ₂ in a Venturi tube	Junxia Zhang
14:00-14:15	ExHFT-11621, X-ray computed tomography dynamic analysis of phase change materials and segregation	Dario Guarda
14:15-14:30	ExHFT-11597, Pore-scale visualization and quantitative measurements of capillary force during evaporative phase change in hydrophilic porous media at high heat flux for transpiration cooling applications	Yifei Liu
14:30-14:45	ExHFT-11322, A novel ultra-high and uniform flux radiative heat source with flexible heating orientation adjustment	Zhineng Zhu
14:45-15:00	ExHFT-11384, Study on measuring surface tension of fluids confined at microscale by surface light scattering method	Haoxuan Li
15:00-15:15	ExHFT-11388, Development of an experimental test rig for thermal performance validation of liquid cooled power electronics heat sinks with integrated phase change material	Jana Rogiers
15:15-15:30	ExHFT-11394, Application of thermosensitive coatings for water droplet freezing characterization	Donato Fontanarosa
15:30-15:45	ExHFT-11093, The cross-correlation techniques for measuring gas-liquid slug and churn flows in a large diameter pipe	Landi Bai
15:45-16:00	ExHFT-11426, Numerical simulation study on gas liquid two phase flow and heat transfer characteristics in PCHE under swinging conditions	Jingzhi Zhang
16:00-16:15	Tea & Coffee Break	
16:15-16:30	ExHFT-11431, Resolution enhancement of light field particle image velocimetry through physics-informed neural network	Xiaoyu Zhu
16:30-16:45	ExHFT-11538, Experimental study of salt separation efficiency of gas turbine air intake filters based on ion chromatography	Yu Fu
16:45-17:00	ExHFT-11572, On the use of optical synchronization in stimulated capillary jets	Yimo Zhang
17:00-17:15	ExHFT-11587, Direct in situ measurement of surface emissivity using infrared thermometer	Chengxin Hou
17:15-17:30	ExHFT-111081, Towards two-phase spray cooling of electric motor end windings	Kenny Couvreur
17:30-17:45	ExHFT-11251, The method of identification of impurities in sprays	Pavel Strizhak
17:45-18:00	ExHFT-11205, Measurement and characterization of liquid film thickness in Taylor flow within a variable cross-section microchannel	Dengwei Fu

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Day 3

Monday, August 18, 2025

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Day 3 (Aug 18) Morning		
Location: Room 1		
Topic: Heat and Mass Transfer		
Chairs: Lu Liu & Andrea Diani		
Time	Paper Number & Title	Speaker
8:00-8:30	Keynote (online): Comparing and combining microchannel and spray cooling schemes in innovative vapor-compression strategies for high heat flux thermal management	Jader Barbosa Jr
8:30-8:45	ExHFT-11162, Local topology optimization of regenerative cooling channels for heat transfer enhancement and uniform flow distribution	Yihang Li
8:45-9:00	ExHFT-11164, Numerical investigation on the flow behavior and heat transfer characteristics by an inclined jet impinging on a curved wall	Mingyang Liu
9:00-9:15	ExHFT-11255, Characteristic of CO ₂ adsorption by ammonium aqueous in steam condensation under venturi effect	Junxia Zhang
9:15-9:30	ExHFT-11170, Molecular dynamics study on heterogeneous condensation nucleation of mixed gas	Yifan Du
9:30-9:45	ExHFT-11895, Bubble features and temperature response from a single artificial cavity on stainless steel	Huichang Wang
9:45-10:00	ExHFT-11181, Experimental investigation of the flow distribution in CO ₂ at supercritical pressures in heated vertical parallel channels	Jiaqi Wu
10:00-10:15	Tea & Coffee Break	
10:15-10:30	ExHFT-11194, Fabrication and test of additively manufactured vapor chambers with TPMS gyroid structures	Kuanlin Chen
10:30-10:45	ExHFT-11253, Experimental study on pool boiling characteristics of non-azeotropic mixtures on micro-pit surfaces	Liang Liu
10:45-11:00	ExHFT-11201, Numerical heat transfer enhancement study on phase change thermal storage exchanger with perforated fins	Meiyang Xu
11:00-11:15	ExHFT-11202, Inverse heat conduction problem for thick-walled cylindrical components using the conjugate gradient method with adjoint equations	Jiangping Li
11:15-11:30	ExHFT-11224, Ultrahigh thermal conductivity hydrophilic-modified graphite foam for enhanced thermal performance of sodium acetate trihydrate based phase change materials	Xinyi Liu
11:30-11:45	ExHFT-11226, Calcium chloride hexahydrate based supercooling phase change material for low-temperature warming of lithium-ion batteries	Nian Shi
12:00-13:30	Lunch Buffet	

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Day 3 (Aug 18) Afternoon		
Location: Room 1		
Topic: Fluid Dynamics & Heat and Mass Transfer		
Chairs: Xinjian Liu & Gaosheng Wei		
Time	Paper Number & Title	Speaker
13:30-13:45	ExHFT-11755, Dynamics of the bubble jet and centroid motion near a semicylindrical protrusion within confined spaces	Junwei Shen
13:45-14:00	ExHFT-11771, Dynamics and wake analysis of a long tapered flexible cylinder in uniform flow	Xinyu Zhang
14:00-14:15	ExHFT-11772, Effects of upstream conditions on secondary flow development mechanisms in low aspect ratio turbines	Xiaoran Yang
14:15-14:30	ExHFT-11773, Direct numerical simulation of supersonic film flow field	Rui Zhao
14:30-14:45	ExHFT-11881, Research on aerodynamic performance optimization of parametric fan blades based on CFD	Qin Hu
14:45-15:00	ExHFT-11908, Numerical study of the thermal management of chiplet using microencapsulated phase change material slurry in spiral channel heat exchanger	Yong Ren
15:00-15:15	ExHFT-11528, Thermo-mechanical coupling simulation of ceramic matrix composite heat shield considering two-dimensional layered structure	Yuheng Liu
15:15-15:30	ExHFT-11530, Pore-scale heat and mass transfer during thermal ablation for porous composites using lattice Boltzmann method	Jiahui Zhao
15:30-15:45	ExHFT-11554, On the coupling of water sheet spray atomization and heat transfer augmentation using infrared thermography	Alexandros Peteinaris
15:45-16:00	ExHFT-11644, Research and formula construction on windage heating characteristics of the bolt structure on the rotating disk cavity	Xianci Xie

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Day 3 (Aug 18) Morning		
Location: Room 2		
Topic: Combustion and Chemical Reaction		
Chairs: Qiuyang Zhao & Yunhua Gan		
Time	Paper Number & Title	Speaker
8:00-8:30	Keynote: Electrochemical energy conversion and storage: towards elevated temperature	Yixiang Shi
8:30-8:45	ExHFT-11759, Study on the ignition and combustion process of single aluminum-lithium alloy particles in oxidizing gas	Gangshun Huang
8:45-9:00	ExHFT-11180, Effects of the flow regulation characteristics of liquid oxygen on spray combustion process for lox/methane swirl coaxial injector	Xiao Bai
9:00-9:15	ExHFT-11189, Reactive molecular dynamics study of the effect of supercritical CO ₂ on CH ₄ /O ₂ combustion	Yuqing Liu
9:15-9:30	ExHFT-11847, Dynamic characteristics of convection-diffusion-reaction for multicomponent fluids in and around porous particles	Kunpeng Zhao
9:30-9:45	ExHFT-11400, Numerical study of varying hydrogen blend effects in a combustor with methane-fueled DACRS burner: flame stabilization mechanisms	Wenbo Yang
9:45-10:00	ExHFT-11539, Effect of initial air mass fraction on diesel active pre-chamber combustion under high-temperature ignition	Zeja Zhang
10:00-10:15	Tea & Coffee Break	
10:15-10:30	ExHFT-11736, Pyrolysis characteristics and kinetic analysis of main organic components from microalgae using waste heat from blast furnace slag	Panxi Yang
10:30-10:45	ExHFT-11789, Mechanisms of expanding rich combustion limit by dual-zones synergistic flame stabilization in ram mode of an RBCC engine	Qi Liu
10:45-11:00	ExHFT-11837, An experimental study on the geometry and kinetic behavior of small-scale diffusion twin-flames	Xinyi Xiong
11:00-11:15	ExHFT-11547, The influence of combustor width on the working characteristics of a rotating detonation afterburner	Jinhui Kang
12:00-13:30	Lunch Buffet	

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Day 3 (Aug 18) Afternoon		
Location: Room 2		
Topic: Thermodynamics		
Chairs: Juan Fang & Enhui Sun		
Time	Paper Number & Title	Speaker
13:30-13:45	ExHFT-11820, Performance analysis and optimization of supercritical CO ₂ Brayton cycle systems for waste heat recovery	Mingxiang Lin
13:45-14:00	ExHFT-11150, A novel thermophysical model of hydrocarbon fuel based on pseudo-pure fluid theory for evaluating its regenerative cooling performance	Taotao Zhan
14:00-14:15	ExHFT-11182, Thermomechanical and power generation performance study of a novel linear thermoelectric generator based on geometry optimization	Boyang Liang
14:15-14:30	ExHFT-11807, Geothermal-LNG cross-energy coupling power generation system: Full-temperature-range adaptability assessment and multi-objective optimization strategies	Xihao Gao
14:30-14:45	ExHFT-11610, Development of a novel thermodynamic analytical method for the direct-fired supercritical carbon dioxide cycle: process splitting method	Tuantuan Xin
14:45-15:00	ExHFT-11634, Thermodynamics and performance analysis of a CAO/CA(OH) ₂ thermochemical heat pump for solar heat temperature boosting	Yujie Zhang
15:00-15:15	ExHFT-11752, Construction and regenerative optimization of hydrogen-oxygen direct combustion thermal cycle	Qinchai Chen
15:15-15:30	ExHFT-11781, Characteristics of single and tandem cylinders flow fields at high wall temperatures	Shikang Chen
15:30-15:45	ExHFT-11068, Parametric sensitivity simulation and experimental study of a several-hundred-kW-class supercritical CO ₂ power generation system	Kang Yang
15:45-16:00	ExHFT-11624, The energy release characteristics of the heat storage-enhanced compressed carbon dioxide tanks	Xin Yan

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Day 3 (Aug 18) Morning		
Location: Room 3 Topic: Heat and Mass Transfer Chairs: Guoqing Li & Hongwei Wu		
Time	Paper Number & Title	Speaker
8:00-8:15	ExHFT-11516, Enhancement of pool boiling heat transfer using laser-induced cavitation	Siyu Li
8:15-8:30	ExHFT-11275, Heat transfer experiments on Rayleigh–Bénard convection of supercritical CO ₂ around the pseudo-critical line	Rui Zhang
8:30-8:45	ExHFT-11312, Preparation and characterization of graphene oxide/polyvinyl alcohol hydrogel for thermal management of flexible electronics	Qi Yan
8:45-9:00	ExHFT-11336, Investigation on the influence of different working mediums on heat and mass transfer performance of conventional heat pipe and variable conductance heat pipe	Jihong Lei
9:00-9:15	ExHFT-11843, Study on heat transfer performance of coaxial cased heat exchanger under complex deep geological conditions	Shengpeng He
9:15-9:30	ExHFT-11376, Design and optimization of gold nanorod systems for enhanced total efficiency: experimental and numerical analysis	Paweł Ziółkowski
9:30-9:45	ExHFT-11398, A novel transient inversion algorithm for determining thermal conductivity of thermal barrier coatings on combustion chamber walls	Bocan Duan
9:45-10:00	ExHFT-11618, Optimization of heat collection fin design for enhanced thermoelectric generation and sustainable blast furnace operation	Xi Li
10:00-10:15	Tea & Coffee Break	
10:15-10:30	ExHFT-111105, Transfer enhancement mechanism and optimization strategies of segmented extended swirling driven by segmented helical insert in supercritical CO ₂	Yuchuan Lei
10:30-10:45	ExHFT-11569, Study on the entropy transition and interfacial thermal resistance changes with anion sizes at constant potential	Xiang Wei
10:45-11:00	ExHFT-11439, Experimental investigation of film cooling and aerodynamic performance on a turbine blade with subregional strategy	Chenfeng Wang
11:00-11:15	ExHFT-11448, Multi-objective optimization of flow and heat transfer characteristics in Taylor–Couette–Poiseuille flow of supercritical carbon dioxide using the RSM-NSGA-II/Pareto search-TOPSIS methodology	Fengxiong Lu
11:15-11:30	ExHFT-11507, Flow and heat transfer characteristics of molten salt nanofluid in clover-shaped twisted U-tube	Yifan Gui
11:30-11:45	ExHFT-11432, Photothermal superhydrophobic coatings synergistically modulated by gradient heterostructures for efficient anti-icing and de-icing	Zilong Liu
11:45-12:00	ExHFT-11355, Numerical investigation on drying characteristics between hot wind and wet coating of battery electrode	Hongqiang Ma
12:00-13:30	Lunch Buffet	

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Day 3 (Aug 18) Afternoon		
Location: Room 3		
Topic: Multiphase Flow, Heat and Mass Transfer		
Chairs: Feng Sun & Xin Yan		
Time	Paper Number & Title	Speaker
13:30-13:45	ExHFT-11763, Numerical simulation of heat transfer characteristics of horizontal circular tubes in microgravity	Jingzhi Zhang
13:45-14:00	ExHFT-11504, Numerical investigation of the flow and heat transfer characteristics of single row jet impingement cooling under film hole aspiration	Tianqing Su
14:00-14:15	ExHFT-11738, Inhibition of flow boiling instability for parallel micro-channels using topological inlet restrictor at a reduced pumping power	Shuai Feng
14:15-14:30	ExHFT-11740, Wavelet analysis of temperature signals and flow velocity in a global glass pulsating heat pipe	Yuhao Liu
14:30-14:45	ExHFT-11500, Influence of corner structure on transverse heat transfer uniformity and material properties of continuous casting slab	Yuewei Sheng
14:45-15:00	ExHFT-11434, Numerical study on heat transfer characteristics of supercritical CO ₂ -based mixtures in horizontal flow channel	Bingguo Zhu
15:00-15:15	ExHFT-111038, Understanding the primary atomization characteristics for the advanced porous injector.	Vivek Sahu
15:15-15:30	ExHFT-11099, Experimental investigation of the ignition of ammonia and stabilization of its combustion by spark plug in supersonic flow	Linshan Jiang
15:30-15:45	ExHFT-11379, Multiscale CFD–DEM study of spray fluidized beds: particle growth, wet interactions, and hydrodynamic behavior	Zhiheng Fan
15:45-16:00	ExHFT-111054, Eulerian CFD modeling of transient moisture desorption from brick masonry under diurnal solar radiation	Tabassom Saboori

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Day 3 (Aug 18) Morning		
Location: Room 4		
Topic: Energy Storage Systems and Carbon Neutrality		
Chairs: Yongpan Cheng & Yuting Guo		
Time	Paper Number & Title	Speaker
8:00-8:15	ExHFT-11705, Thermal management of a vanadium redox flow battery stack based on combined electrolyte tank and flow cooling control	Qian Xu
8:15-8:30	ExHFT-11066, A composite objective optimization framework for proactive scheduling strategy of hydrogen energy storage systems coordinated with variable renewable energy power prediction	Xinyi Liu
8:30-8:45	ExHFT-11732, Experimental analysis of PCM melting in high-aspect ratio tube-in-tube systems: impact of initial and boundary conditions on liquid fraction and front position	Leonardo Bernardini
8:45-9:00	ExHFT-11743, Direct electrocatalytic reduction of industrial flue gases to produce hydrocarbon fuels at high current densities	Boxu Chen
9:00-9:15	ExHFT-11761, Effect of geometry and cooling rate on free surface shrinkage of metallic PCM	Julie Van Zele
9:15-9:30	ExHFT-11409, Effect of discharge temperature and water flow rate in a finned and foamed latent thermal energy storage	Dario Guarda
9:30-9:45	ExHFT-11861, A hybrid FLC-MPC predictive control strategy for wind-hydrogen integrated power generation system	Hao Chen
9:45-10:00	ExHFT-11870, Research on coordinated operation strategy of wind-solar-hydrogen storage power generation system	Lun Wang
10:00-10:15	Tea & Coffee Break	
10:15-10:30	ExHFT-111104, Experimental investigation of a high-power density phase-change fiber thermal energy storage device	Zhengkai Xu
10:30-10:45	ExHFT-111068, Research on molten salt thermal storage media for medium-low temperature trough-type concentrating solar power plants	Qing Miao
10:45-11:00	ExHFT-11463, Closed-type reactor for CaCl ₂ hydration chemical heat storage: mass/heat transfer and chemical reaction	Jiahao Lin
11:00-11:15	ExHFT-11936, Study of LOHC combined hydrogen internal combustion engine energy supply system	Xuhao Yuan
11:15-11:30	ExHFT-11888, Parametric effects on compressed CO ₂ energy storage (CCES) system performance	Yuandong Guo
11:30-11:45	ExHFT-11724, Numerical simulation of hydrogen leakage from high pressure tank	Feiyu Zhang
11:45-12:00	ExHFT-11914, Investigation on thermal energy storage enhancement in phase change material-based lobed triplex-tube heat exchanger with Y-shaped fins	Shan Ali Khan
12:00-13:30	Lunch Buffet	

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Day 3 (Aug 18) Morning		
Location: Room 5		
Topic: Multiphase Flow, Heat and Mass Transfer		
Chairs: Ran Li & Kenny Couvreur		
Time	Paper Number & Title	Speaker
8:00-8:15	ExHFT-11168, Experimental study on stress wave propagation in structure under bubble collapse load	Yichen Zhu
8:15-8:30	ExHFT-11173, Study on the influence of multiple blisters on the critical heat flux of narrow rectangular channel	Xinyu Su
8:30-8:45	ExHFT-11223, Numerical simulation of single bubble growth and heat transfer in nuclear pool boiling under dual synthetic jets impingement	Xinyu Liang
8:45-9:00	ExHFT-11231, Thermal performance prediction and structural optimization of micro-pillar array wick in vapor chambers	Jing Wang
9:00-9:15	ExHFT-11232, The effect of structured surfaces on parallel microchannel heat sinks with two-phase flow	Pedro Pontes
9:15-9:30	ExHFT-111103, A hierarchical flow field design enabling enhanced mass transfer and performance in PEM water electrolysis	Chuanjie Lin
9:30-9:45	ExHFT-11367, Modeling and verification of the coupling mechanism of submicron particle vapor phase change-growth-agglomeration	Kai Chen
9:45-10:00	ExHFT-11371, Experimental study of pool boiling heat transfer and bubble dynamics on U-shaped tube at high pressures	Fuchang Yan
10:00-10:15	Tea & Coffee Break	
10:15-10:30	ExHFT-11706, Research on the mechanism of flow instability in vertical tubes under different heating conditions	Kaigang Gong
10:30-10:45	ExHFT-11785, Experimental investigation of phase-change transpiration cooling in a porous structure exposed to hot gas flow	Kamil Stasiak
10:45-11:00	ExHFT-11041, Size effects on electrode performance and bubble dynamics during water electrolysis	Xinlong Lu
11:00-11:15	ExHFT-11615, Experimental study on the vaporization of liquid nitrogen in zigzag PCHE under low temperature conditions	Yureng Lu
11:15-11:30	ExHFT-11588, Turbulent mixing in unstably thermal stratification modulated by the combined Rayleigh-Taylor/Kelvin-Helmholtz instability	Yayao Zhang
11:30-11:45	ExHFT-11694, On the enhancement of boundary layer skin friction by small solid particles	Dong Li
11:45-12:00	ExHFT-11784, Bubble formation and pressure loss in lattice-shaped microchannel	Kazuya Tatsumi
12:00-13:30	Lunch Buffet	

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Day 3 (Aug 18) Afternoon		
Location: Room 5		
Topic: Renewable and Non-renewable Energies		
Chairs: Yasong Sun & Haisong Zhang		
Time	Paper Number & Title	Speaker
13:30-13:45	ExHFT-11022, Optimization research of multigeneration integrated energy system with hybrid energy storage based on PSO-EGA-MPC method	Xu Yu
13:45-14:00	ExHFT-11684, Performance investigation of magnetic nanoparticle-fluidized bed bioelectrochemical system for cattle manure wastewater treatment with synchronous energy recovery	Yanmin Li
14:00-14:15	ExHFT-11077, DQP-Zn double-effect cell coupled with dynamic decoupled water electrolysis for flexible hydrogen production	Liwu Zhou
14:15-14:30	ExHFT-11337, Techno-economic and environmental feasibility of solar assisted air source heat pump systems for sustainable space heating in Canadian cities	Lexuan Zhong
14:30-14:45	ExHFT-11865, Multi-objective model predictive control of hydrogen supply system for automotive PEM fuel cell	Xue'e Wang
14:45-15:00	ExHFT-11450, Investigation of the effect of zero-gap electrolyzer on the electrochemical reduction of CO ₂ using experimental and numerical simulation methods	Zhiwei Liu
15:00-15:15	ExHFT-11481, Thermodynamic study of renewable energy driving the operation of a low-carbon cold storage system	Xuyan Song
15:15-15:30	ExHFT-11676, Analysis of THM coupling processes in fracture networks during heat extraction from hot dry rock by S-CO ₂	Mingzheng Qiao
15:30-15:45	ExHFT-11746, Fabrication and infrared emission characterization of black phosphorus devices for thermophotonic energy conversion	Atsushi Sakurai

Poster Sessions

(The Poster Sessions are from **09:00 to 19:00 on Aug. 17, 2025**. All presenters are required to be present **between 09:00 and 11:00**.)

Poster Session 1 Topic: Heat and Mass Transfer Chairs: Feng Han & Bingguo Zhu	
Paper Number	Title & Authors
ExHFT-11011	Heat transfer capability of ultrathin heat pipe with secondary processing wicks (Sirong Qu, Jiaxi Du, Yonggang Zhu, Huizhu Yang, Binjian Ma, Jialin Liang)
ExHFT-11021	Experimental and CFD investigations on heat transfer characteristics of roll-bond aluminum vapor chamber (Naisong Wu, Xiaoyuan Wang, Chengzhi Guo)
ExHFT-11023	Numerical simulation study on heat transfer characteristics of channels with different shapes under vibration conditions (Zihang Yan, Yang Xin, Haokun Li, Rui Fan, Huaping Liu)
ExHFT-11026	Experimental and numerical simulation of heat transfer characteristics of a novel internal finned tube (Zijian Fang, Shifeng Deng)
ExHFT-11050	Study on heat transfer characteristics of ultra-thin heat pipe with microchannel on silicon substrate (Rongkuo Ding, Guodong Xia, Ran Li, Chenchen Song)
ExHFT-11108	Numerical investigation of heat transfer and flow characteristics in double-layer microchannels with fins (Rui Fan, Yang Xin, Haokun Li, Zihang Yan, Huaping Liu)
ExHFT-11115	Numerical study on the cooling performance of discontinuous transpiration cooling layout for vehicle leading edge (Yunan Wang, Lin Wang, Zhenbing Luo, Xiong Deng)
ExHFT-11197	Experimental and numerical study of SCF microchannel heat exchanger based on novel heat transfer enhancement structure (Chenming Zheng, Zhiwei Wu, Yuanbo Liu, Wenlei Lian)
ExHFT-11233	Numerical simulation of uranium hexafluoride desublimation-deposition process for uranium enrichment system (Lin Shi, Hao Yan, Xianliang Lei, Yi Le, Di Yun, Yongchun Wei)
ExHFT-11261	Study on scaling effect and water-thermal management of proton exchange membrane fuel cells (Mengting Fu, Kun Ge)
ExHFT-11262	Development of saturated-interface-volume phase change model for CFD modelling of microscale heat pipes (Xinru Wang, Huicong Yao, Yinfeng Wang, Yuezhao Zhu)

ExHFT-11347	Regulation of wick structure thermal performance of thin-flat high-temperature heat pipes (Jiawei Chen, Xiaoyuan Wang, Yanshan Fen, Peiyang Ji)
ExHFT-11416	Influence of boundary layer on flow and heat transfer of liquid cold plate in multi-objective topology optimization (Yongwang Zhang, Zijie Lu, Maochang Liu)
ExHFT-11424	Lattice Boltzmann simulation of flow and heat transfer in water-cooled heat sink channels (Xinyi Wang, Maochang Liu)
ExHFT-11428	Research on the flow displacement of polymer microsphere fluid in porous media (Xiaohan Zhang, Maochang Liu)
ExHFT-11436	Microscopic mechanism of photothermal conversion of MXenes materials and accurate measurement (Jifen Wang, Zhiping Zeng, Hu Hanwen, Qiu Wujie)
ExHFT-11485	Optimization design and performance analysis of biomimetic phase change heat storage capsule (Xuhang Shi, Yan Liu, Xiying Xiong, Yafei Xuan, Xiao Ji, Chuanjie Zhang, Fuqiang Wang)
ExHFT-11522	Inverse heat conduction problem for thick-walled cylindrical components using the conjugate gradient method with adjoint equations (Jiangping Li, Liping Pang)
ExHFT-11555	Experimental investigation on start-up characteristics of high temperature two-phase loop thermosyphon (Yuhui Xue, Xiaoyuan Wang, Tianchen Liu)
ExHFT-11622	Design, fabrication, and commissioning of 4.5 K - 1.8 K sub-atmospheric heat exchanger research platform (Pengcheng Yang, Zhigang Zhu, Qiyong Zhang, Huajun Liu, Yuanliang Liu, Zhongyu Zou, Zhenxing Wang)
ExHFT-11625	Design and optimization of sub-atmospheric heat exchanger of 1.8 K superfluid helium cryogenic system (Pengcheng Yang, Zhigang Zhu, Qiyong Zhang, Huajun Liu, Yuanliang Liu, Zhongyu Zou)
ExHFT-11647	Research on the heat exchange process of plate-fin heat exchangers (Tianhao Xu, Liangliang Zhang, Jingzhi Zhang)
ExHFT-11674	Simulation study on heat dissipation characteristics of high enthalpy slag storage process (Ruibin Xue, Shuzhong Wang, Qingyuan Wang)
ExHFT-11809	Modeling and optimization of temperature-dependent electrodialysis (Zhe Zhang, Zhiguo Qu)
ExHFT-11824	Experimental study of battery thermal management using low temperature solid-solid metal phase change material (Changda Nie, Zhibo Chen, Hongyang Li, Peizhao Lyu, Xinjian Liu, Zhonghao Rao)
ExHFT-111029	Research on the cooling phase transformation law of single particles of high-temperature steel-slag (Qingyuan Wang, ShuZhong Wang, Ruibin Xue, Jiayu Zhu)

Poster Session 2 Topic: Fluid Mechanics Chairs: Chaohong Guo & Zhanchao Hu	
Paper Number	Title & Authors
ExHFT-11017	Modeling and investigation of the droplets coalescence and transport in fibrous porous media (Wenlong Li, Cheng Chang, Zhongli Ji)
ExHFT-11049	Rapid prediction and experimental validation of one-dimensional boiling heat transfer in porous media based on steam tables (Haokun Li, Yang Xin, Rui Fan, Zihang Yan, Huaping Liu, Wei Wu)
ExHFT-11072	The properties of adsorption layers on surfaces of different wettability: a molecular dynamics study (Wenchuan Liu, Dengwei Jing, Chenglin Fu, Zizuo Liu)
ExHFT-11085	The effect of wettability on coalescence and separation performance of oil-in-water emulsions (Lang Liu, Cheng Chang, Xiaowei Li, Tao Tang, Xiaolin Wu)
ExHFT-11179	Experimental study of trans/supercritical methane heat transfer characteristics in a vertical tube (Zhuohang Jiang, Jie Song, Qinglian Li, Jingfeng Peng, Peng Cheng, Lanwei Chen)
ExHFT-11307	Molecular dynamics simulation of water vapor condensation on particles with varying surface hydrophilicity (Yitong Lu, Yan Yu, Chuan Sang, Heng Guo)
ExHFT-11489	Flow condensation heat transfer characteristics of R32 in horizontal stainless steel reticulated thread tubes (Junjie Wu, Wei Li, Fei Wang, Leqi Li, Chunfeng Lao, Jun Jiang, Yan He)
ExHFT-11505	Experimental study on capillary characteristics of nanoporous membrane composite silicon microchannels (Changqing Li, Ran Li, Guodong Xia, Rongkuo Ding)
ExHFT-11506	Capillary flow characterization based on silicon microchannel-AAO membrane composite core (Chenchen Song, Ran Li, Guodong Xia, Kuorong Ding)
ExHFT-11590	Droplet impact dynamics on elastic surfaces (Jialin Fan, Xiaojing Ma, Jiazheng Yang, Jinliang Xu)
ExHFT-11602	Aerodynamic performance evaluation of subsonic compressor rotor with tip leading-edge damage (Xingyu Hu, Haideng Zhang)
ExHFT-11626	Combined effect of oil addition and surface texturing on HFE-7100 pool boiling (Yongfang Huang, Donato Fontanarosa, Xiaoxiao Xu, Maria Rosaria Vetrano)
ExHFT-11648	Gas-liquid two-phase flow coupling between riser bottom and top at choking condition (Suifeng Zou, Quanhong Wu, Hanxuan Wang, Luhan Xu)

ExHFT-11673	Numerical simulation study on the dynamics and breakup behavior of bubble flow in microchannels with obstacles (Yujuan Zhou, Zefeng Jing, Cheng Chen)
ExHFT-11703	Heterogeneous nucleation of water in SCWG syngas: effects of methane concentration and fluid–solid interaction (Tongjia Zhang, Hui Jin)
ExHFT-11734	Hydrodynamics of molten-metal bubble columns for CO ₂ -free hydrogen production with co-production of carbon materials through methane pyrolysis (Jianwei Wang, Zhiguo Qu)
ExHFT-11737	Research on the topology optimization of three-dimensional porous channels and their flow behavior at the pore-scale (Rui Ma, Shibin Li, Zhongwei Wang, Lin Wang)
ExHFT-11753	Fluctuation frequency originating from continuity wave in horizontal slug flow (Hefei Zhou, Yingbei Wang, Shuaiqing Shao, Lei Liu)
ExHFT-11760	Study on the influence mechanism of fluid dynamic pressure effect on graphite circumferential seal (Zhuang Wang, Huan Zhao, Dan Sun)
ExHFT-11810	Boiling dynamics modulation and heat transfer enhancement with an external degassing column (Yinan Zhang, Guoqing Huang, Yinghua Ma, Xihao Gao, Hongxia Chen)
ExHFT-11812	Numerical simulation of capillary wick cesium heat pipes using different phase-change models (Yinghua Ma, Yinan Zhang, Guoqing Huang, Xihao Gao, Hongxia Chen)
ExHFT-11822	Pneumatic breakup mechanism of gas quenching granulation of high-temperature molten steel slag (Jiayu Zhu, Shuzhong Wang, Ruibin Xue, Qingyuan Wang, Zhiyong Bai, Shuangping Chen)
ExHFT-11842	Numerical simulation study on phase change heat transfer of molten slag particles (Qingyuan Wang, ShuZhong Wang, Ruibin Xue, Jiayu Zhu)
ExHFT-11876	Study on the flow characteristics of high-speed projectile entry water with small angle (Keyu Lyu, Huanhao Zhang)
ExHFT-11880	Experimental study on non-uniform inflow effects on dynamic total pressure distortion in an S-shaped duct (Yueren Zuo, Haideng Zhang, Yun Wu, Enbo Sun)

Poster Session 3 Topic: Thermodynamics and Energy Utilization Chairs: Baoping Xu & Shuxiang Wang	
Paper Number	Title & Authors
ExHFT-11046	Prediction and optimization of quasi-two-stage single screw expander in small-scale organic Rankine cycle (Haixiao Wang, Biao Lei, Yuting Wu)
ExHFT-11052	Modeling and control of multi-energy coupled hydrogen production systems based on offshore wind power grid integration (Chao Geng, Yulong Ji, Rongbin Xin, Jifeng Zhang, Daan Cui, Zongyu Wang)
ExHFT-11056	Highly reflective hydrogel-based passive cooling materials with self-cleaning capability (Qingxi Xin, Dengwei Jing)
ExHFT-11057	Study on the frosting characteristics of micro-scale heat exchangers in new energy vehicles (Jiayi Cheng, Lingjian Kong)
ExHFT-11183	3d core-shell structured NiCo layered double hydroxide @ NiCo ₂ O ₄ for highly efficient decoupled water splitting (Yutong Chen, Dengwei Jing)
ExHFT-11321	Influence weights of key parameters and optimization strategies for thermoelectric generator performance enhancement (Zhuang Miao, Xiangning Meng, Xi Li, Boyang Liang)
ExHFT-11328	Thermo-mechanical verification analysis of containment mechanical penetrations (WanQing Zhu, Xinyu Wang, Zuoqin Qian, Yunzhen Han)
ExHFT-11385	An in-depth analysis of the failure process of PT coatings in PEMECs (Li Jing, Xinlong Lu, Lijing Ma, Dengwei Jing)
ExHFT-11419	Photothermal-driven decoupling of gas evolution at the solid-liquid interface boosts photocatalytic hydrogen production (Shidong Zhao, Maochang Liu)
ExHFT-11438	Impact of thermal energy storage unit on liquid air energy storage system performance: an experimental and simulation research (Jiakun Fan, Chenchen Wang, Na Sun, Fangqiu Li, Ju Chen, Jinya Zhang)
ExHFT-11467	Non-precious metal catalysts rich in defects effectively reduce the hydrogen concentration in the hydrogen-oxygen mixture (Yiming Zhang, Liwu Zhou, Lijing Ma, Dengwei Jing)
ExHFT-11518	Study on the heating performance of energy converters based on cavitation energy (Bailin Fan, Jiaqin Zhao, Yangyang Xie, Yuxin Wang)
ExHFT-11526	Experimental measurement of local temperature around bubbles during nucleate boiling (Wen He, Jinyu Han, Chenru Zhao, Hanliang Bo)
ExHFT-11532	Molecular dynamics study on adsorption and desorption (via SDBS surfactant) characteristics of Hua 201 area oil in nanopores (Yin Chen, Fenghua Liu, Lichen Zheng, Qiuyang Zhao, Liejin Guo)
ExHFT-11533	Proton exchange membranes with oriented Ion channels for enhanced conductivity (Bingru Lu, Hui Jin)

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ExHFT-11543	Safety analysis of oxygen enrichment in liquid air energy storage system: experimental insights (Jiakun Fan, Chenchen Wang, Na Sun, Fangqiu Li, Ju Chen, Jinya Zhang)
ExHFT-11549	Supercritical fluid flow reconstruction via a strongly nonlinear RBF-MLP neural network architecture (Feng Sun, Jinliang Xu)
ExHFT-11660	Simulation study on flow control of slag tube in the process of steel industry waste heat recovery (Ruibin Xue, Shuzhong Wang, Qingyuan Wang)
ExHFT-11701	Study on the performance of light-transmitting temperature-adaptive flexible films for all-season passive thermal management in greenhouses (Linna Hu, Zhongbao Liu, Zepeng Wang, Zhipeng Qie, Dafeng Yang)
ExHFT-11770	Experimental study on the impact of refrigerant injection in an R32 heat pump compressor (Bruno Marangolo, Paolo Di Marco, Xander van Heule, Steven Lecompte, Michel De Paepe)
ExHFT-11775	Study on co-pyrolysis characteristics of oil sludge and wheat straw: synergistic effects and implications for oxygen-enriched combustion (Fangshuo Shi, Jun Zhao, Chengcheng Yang)
ExHFT-11830	Effect of stirring combination on quality of arc continuous casting round bloom (Jiayu Zhu, ShuZhong Wang, Ruibin Xue, Qingyuan Wang, Shuangping Chen)
ExHFT-11902	Dynamics of cavitation bubbles induced by optical breakdown of nanosecond pulsed laser in water (Chenggang Deng, Jiameng Zhang, Bin Chen)
ExHFT-111061	Sub-/super-critical fluid-assisted modification of carbon nitride for efficient photocatalytic hydrogen evolution (Jinwen Shi, Liuhao Mao, Binjiang Zhai, Xing Kang, Canhang Yang, Hui Jin, Liejin Guo)

Brochure of the Organizing Unit

The Chinese Society of Engineering Thermophysics

Overview

The Chinese Society of Engineering Thermophysics (CSET) is a national, academic, and non-profit organization formed voluntarily by scientists, engineers, and related institutions engaged in the field of engineering thermophysics. It is a national first-class society founded in 1978 by Professor Zhonghua Wu, an outstanding Chinese engineering thermophysicist and the founder of the "Three-Dimensional Flow Theory of Turbomachinery". It serves as the Chinese representative of three international academic organizations: the International Society for Air-Breathing Engines, the International Centre for Heat and Mass Transfer, and the Combustion Institute. CSET currently has over 8000 members from renowned universities, research institutes and major industrial enterprises, working in fields such as low-carbon and efficient energy utilization, electricity, power engineering, aerospace propulsion, and refrigeration.



Academic exchange is a fundamental function of the society. CSET consists of six academic divisions: Engineering Thermodynamics, Gas Dynamics and Thermodynamics of Thermal Machines, Heat and Mass Transfer, Combustion, Multiphase Flow, and Fluid Machinery. It organizes national

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academic conferences every year and occasionally holds joint meetings with other national societies. These activities promote interdisciplinary collaboration, the sharing of the latest research findings, and the advancement of the discipline. Additionally, CSET hosts youth academic conferences, youth paper presentations, and forums for young researchers to support the growth of early-career researchers.

International collaboration is another key mission. As the Chinese representative of international organizations like the International Society for Air Breathing Engines (ISABE), the International Centre for Heat and Mass Transfer (IHTC), and the Combustion Institute, CSET actively organizes international academic activities. These events include major international conferences such as the ISABE Conference, International Heat Transfer Conference (IHTC), Asia-Pacific Combustion Conference (ASPACC), Asian International Conference on Fluid Machinery (AICFM), International Gas Turbine Conference (IGTC), International Symposium on Fire and Explosion Hazards (ISFEH), Asian Joint Conference on Propulsion and Power (AJCPP), and International Symposium on Coal Combustion (ISCC). These efforts have significantly enhanced international academic exchanges and cooperation, and raised China's global influence in the field of engineering thermophysics.

CSET also plays an active role in talent development and recognition. In 2007, to celebrate the 90th birthday of Professor Wu Zhonghua, CSET and the Institute of Engineering Thermophysics, Chinese Academy of Sciences, jointly established the Wu Zhonghua Award Fund. The fund supports outstanding young researchers and graduate students who demonstrate innovative thinking and prominent research achievements. By 2024, 61 researchers have received the "Wu Zhonghua Outstanding Young Scholar Award", and 188 graduate students have received the "Wu Zhonghua Graduate Award". In 2023, with approval from the Office of National Science and Technology Awards, CSET officially launched its Science and Technology Awards, which include Natural Science Award, Technological Invention Award, and International Cooperation Award. It has attracted wide attention and has effectively promoted research in engineering thermophysics. The society also assists members in applying for national research projects, talent programs, and academic events, and actively recommends Chinese scientists for roles in international organizations.

Relying on industrial science and technology services, CSET also optimizes scientific and technological consulting and evaluation. It takes the lead in establishing the "Science and Technology Innovation China" Dual-Carbon Industry Science and Technology Service Group, actively connects with frontline enterprises, and carries out scientific and technological assistance. In a series of technical visits to companies including New Territories Pump Co., LEO Group Pump Co., Ningbo Fan Co., and Anjie Smart-Link Group, in-depth discussions have been conducted with front-line engineers. And strategic cooperation agreements have been signed, with exchanges focusing on key

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technological challenges, expert resource introduction, and collaboration planning. Overall, the society has actively carried out the evaluation of scientific and technological achievements in engineering thermophysics, offering high-quality services to advance scientific innovation and technological progress.

The discipline of Power Engineering and Engineering Thermophysics focuses on the principles of energy conversion and its applications. It provides theoretical and technical support for efficient and clean energy use, aerospace propulsion, new energy technologies, and environmental protection. Under the dual-carbon goal, this discipline will play an increasingly important role in transforming the energy structure and improving energy utilization.

We warmly welcome you to join the Chinese Society of Engineering Thermophysics!



The Institute of Engineering Thermophysics of the Chinese Academy of Sciences

Overview:

The Institute of Engineering Thermophysics (IET) originated from the Power Laboratory of the Chinese Academy of Sciences (CAS) founded by Academician WU Chung-Hua in 1956. Over the past 60 years, the Institute has focused on major scientific and technological issues in the field of engineering thermophysics around major national strategic needs, committed to the basic research, key technology research and system integration in the field of energy and power, continuously consolidated the discipline foundation of "Energy Science and Technology" and "Aerospace Science and Technology", and has built an internationally renowned first-class research institute in the field of energy and power.



IET has won more than 100 national, academy and ministerial awards, which has made important

contributions to the sustainable domestic development of energy and power. The Institute focuses on the major needs of clean, low-carbon, safe and efficient energy, as well as independent and controllable development in the field of power. There are four main research directions, including advanced power equipment, distributed energy systems and energy storage, low-carbon combustion and utilization of high-carbon energy, high-altitude and long-endurance unmanned aerial vehicle technology and applications. Five emerging cutting-edge directions and future technologies are established, including hydrogen energy conversion and utilization, supercritical carbon dioxide Brayton cycle thermal power conversion, highly adaptive thermal functional new materials and devices, intelligent network patrol systems, space systems and microgravity combustion, to support the low-carbon transformation of the national energy structure and the leapfrog development of power equipment. There are 12 research units, 8 national key laboratory (centers) and 6 provincial and ministerial key laboratories.

The construction of the national key laboratory of the Institute has achieved a historic breakthrough. Among them, the National Key Laboratory of Light Turbine Power is steadily being constructed, and a sound organizational and management structure for the laboratory has been established. The "Key Laboratory of Long term and Large scale Energy Storage" was approved by the Party Leadership Group of the Chinese Academy of Sciences. Two major national scientific and technological infrastructure projects, are constructed, namely the "High Efficiency and Low Carbon Gas Turbine Test Facility" and the "Chung-Hua" Thermophysical Test Facility. We have undertaken multiple national major scientific and technological projects and made innovative achievement in the fields of light turbine power and advanced compressed air energy storage.

The Institute continuously breaks through new records in research funding and steadily advances major key projects. In 2023, the Institute undertook more than 300 projects, including national major scientific and technological infrastructure, national major special projects, key research and development plans, and other projects, with a total annual funding of 1.751 billion CNY.

Guided by the development goals of scientific and technological innovation, we strengthen the construction of national strategic talent force, adhere to the Party's management of talents, continuously optimize the talent environment, and strive to build a scientific and technological innovation team with a reasonable structure, moderate scale, strong innovation ability, and international competitiveness. By the end of 2023, there are 525 employees in total, including 487 professional technicians, including 3 academicians of the CAS Member and 224 senior staff. The Institute has the authority to confer doctoral and master's degrees in national disciplines such as "Power Engineering and Engineering Thermophysics" and "Aerospace Science and Technology", as well as the authority to confer master's degrees in "Environmental Science and Engineering" and "Energy

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Power". There are more than 180 PhD students, 280 master students, and more than 170 joint trainees from various universities. The Institute is also the leading construction unit of the School of Aeronautics and Astronautics, University of Chinese Academy of Sciences. There is a national postdoctoral mobile station, with more than 30 postdoctoral fellows currently on board.

The Institute has a strong foundation in international cooperation and has conducted extensive cooperation and exchanges with well-known universities and research institutes from more than 10 countries and regions, including the United States, the United Kingdom, and Canada. The Institute is the initiator of several international conferences such as the International Conference on Aerodynamics and Thermodynamics (ISAIF), the Conference of International Society for Air Breathing Engines (ISABE), the Asian Gas Turbine Conference (ACGT), the Asian Joint Conference on Propulsion and Power (AJCPP), and the World Energy Storage Technology Conference (WESC). In recent years, the Institute held more than ten important international conferences, and served as the secretariat of the International Energy Storage Technology and Industry Alliance.

The Institute of Engineering Thermophysics is affiliated by the Chinese Society of Engineering Thermophysics, and is the sponsor of two professional academic journals Journal of Engineering Thermophysics (in Chinese) and Journal of Thermal Science (in English).

State Key Laboratory of Green Hydrogen-Electricity

(Formerly State Key Laboratory of Multiphase Flow in Power Engineering)

The State Key Laboratory of Green Hydrogen-Electricity at Xi'an Jiaotong University was formerly known as the State Key Laboratory of Multiphase Flow in Power Engineering established in 1990 by Professor Chen Xuejun, an academican of the Chinese Academy of Sciences, founder of China's multiphase flow thermophysics discipline, and renowned scientist in energy and power. Aligned with the major strategic needs of China's energy sector, the laboratory initially focuses on fundamental and applied researches on multiphase flow science and technology for energy development, conversion, and utilization, with subsequent expansion into researches on industrial-scale transition and utilization of hydrogen energy from renewable energies. In 2023, it was reorganized and renamed the State Key Laboratory of Green Hydrogen-Electricity. Currently, Academician Guo Liejin serves as the laboratory director, and Academician Jin Hongguang as the director of the academic committee.



The laboratory ranked first in the discipline of energy utilization across all evaluation cycles of the national key lab assessment. Most notably, in 2003, 2008, 2013, and 2018, it was awarded the title of "Outstanding State Key Laboratory in the Engineering Field" by the Ministry of Science and Technology. In 2004, it was honored as "Advanced Collective of the National Key Laboratory Program" and won "Golden Bull Award". To date, the laboratory has claimed 30 national science and technology awards—8 National Natural Science Awards, 10 National Technological Invention Awards,

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and 12 National Science and Technology Progress Awards.

The laboratory boasts a high-caliber research team of national and international academicians, national-level leading talents, and recipients of national young talent programs. The team features a rational age structure, optimized disciplinary layout, and interdisciplinary research integration, and has been honored with more than 20 national and provincial “Innovation Group” titles. The laboratory currently employs over 200 full-time research staff, all holding doctoral degrees. Among them, 65% are professors, and 27% are associate professors; early-career researchers under the age of 45 constitute 63% of the team. Also, it hosts over 2,000 enrolled master's and doctoral candidates.



The reorganized laboratory is strategically aligned with China’s highest priorities of energy supply security and dual-carbon goals of carbon peaking and carbon neutrality. It aims to establish a systematic theoretical and technological framework for managed energy transition, and to achieve breakthroughs in core technologies underpinning a resilient, renewable-energy-based, multi-energy-integrated energy system. In particular, it has been dedicated to addressing key theoretical and technological challenges including large-scale CO₂ mitigation, cost-effective hydrogen supply, and integrated green hydrogen-electric systems to ensure energy security and facilitate the transformation of energy technologies to industrial applications through original innovations. As the national strategic scientific force, the laboratory aspires to evolve into a world-class innovation hub and talent consortium in green hydrogen-electric systems.

The Key Laboratory of Long-Duration and Large-Scale Energy Storage

The *Key Laboratory of Long-Duration and Large-Scale Energy Storage* (LLES) was officially approved for establishment by the Chinese Academy of Sciences (CAS) in December 2023. In accordance with the construction standards set by the Ministry of Science and Technology of China and CAS, and leveraging the institutional advantages of CAS, the LLES is led by the Institute of Engineering Thermophysics, CAS, in collaboration with the Dalian Institute of Chemical Physics and the Institute of Electrical Engineering, CAS. This joint effort fosters coordinated innovation and a systematic approach to fundamental research and key technological breakthroughs in the field of long-duration and large-scale energy storage. The LLES aims to become a world-class platform for foundational research and critical technology development, seizing the frontier of international innovation in next-generation energy storage and supporting China's national dual-carbon strategy.



The Laboratory is guided by a team of distinguished strategic scientists and academicians, including Professor Xu Jianzhong, Yi Baolian, Jin Hongguang, and Zhu Junqiang, who are leading advancements in green, low-carbon energy utilization and high-efficiency energy storage. The Academic Committee is chaired by Professor Xuan Yimin, an academician of the CAS, with Vice Chairs Professor He Yaling and Professor Jiang Peixue, both also CAS academicians. The Laboratory is directed by Professor Liu Qibin. Currently, the LLES has 107 full-time staff members, including 6

experts awarded the State Council's Special Allowance, and 12 selected for national-level talent programs. Among the team, 75 hold senior professional titles or above. In addition, over 100 postdoctoral researchers and visiting scholars are actively involved in ongoing research efforts.

The mission of the LLES is rooted in addressing the critical national demands of the “dual-carbon” strategy and the broader energy revolution. With a strong focus on long-duration and large-scale energy storage, the LLES is committed to advancing original innovation in both fundamental scientific theories and core technologies. Its work centers on developing groundbreaking theoretical frameworks and overcoming key technical challenges, while simultaneously building integrated energy systems that harmonize generation, grid, load, and storage. By cultivating a new generation of leading scientific and technological talent in the energy field, the LLES aspires to secure a commanding position in the global landscape of next-generation energy storage. It aims to establish a nationally leading and globally influential research platform that enhances China's international competitiveness, strengthens energy security, and supports the creation of a clean, low-carbon, safe, and efficient modern energy system.

Rooted in a robust foundation of scientific research and driven by successive generations of strategic scientists, the LLES has long aligned its work with national needs in energy and power science. It has pioneered a series of original theories and core technologies, including rational energy use, total energy system theory, integrated source-grid-load-storage systems, internal flow regulation in flow batteries, and compressed air energy storage. The LLES has built a seamless “theory–technology–application” research chain, advancing integrated development across academia, research, industry, and application. With an open and collaborative mindset, the LLES warmly welcomes scholars worldwide to join in exploring the scientific mechanisms, technological innovations, and systems integration of long-duration energy storage. Together, we aim to co-develop international standards, foster cross-disciplinary collaboration, and build a world-leading strategic force in energy storage and a premier global research platform for next-generation storage technologies.

National Key Lab of Aerospace Power System and Plasma Technology



航空动力系统与等离子体技术
全国重点实验室
National Key Lab of
Aerospace Power System and Plasma Technology

This laboratory is jointly established by the Air Force Engineering University, Aero Engine Corporation of China, and Xi'an Jiaotong University. The laboratory conducts research on applied fundamentals, frontier technologies, and key technologies. Its main research areas include the structural service safety of aerospace power system and plasma surface strengthening, extreme aerodynamic combustion and its plasma control, electromagnetic safety and its plasma control, as well as intelligent operation and maintenance, and plasma remanufacturing.



The overall goal is to build an internationally renowned systematic and characteristic research base for aerospace power system and plasma technology. It aims to foster major original innovations, support breakthroughs in key core technologies, and create a platform for collaborative research on major fundamental issues of aerospace power system, a platform for collaborative innovation on major frontier issues of aerospace power system, and a platform for collaborative cooperation in aerospace power system systems and plasma technology. The laboratory will strongly support the R&D and application of advanced aero engines while leading the development of related plasma technologies. It seeks to gather top-tier talent and cultivate first-class innovative professionals, providing strategic scientific and technological support for China's innovation and development in aero engine technology.

School of Energy Power and Mechanical Engineering at North China Electric Power University

The predecessor of the School of Energy, Power and Mechanical Engineering at North China Electric Power University was the Department of Power Engineering established in 1958 when the university was founded. Over the past 60 years, the School has undergone transformations and relocations along with the university, and has continuously grown and developed. The School now offers five first-level disciplines: Power Engineering and Engineering Thermophysics, Mechanical Engineering, Materials Science and Engineering, Civil Engineering, and Chemical Engineering and Technology, with 13 second-level disciplines. The School has 2 first-level disciplines authorized to offer PhD: Power Engineering and Engineering Thermophysics and Materials Science and Engineering, as well as professional doctoral programs in Energy Power and Mechanical Engineering, and has set up a postdoctoral research station in Power Engineering and Engineering Thermophysics. The academic level of the School has consistently ranked among the top in China. In the fourth and fifth rounds of China Discipline Ranking(CDR), Power Engineering and Engineering Thermophysics ranked A- in both rounds, while the rankings for Mechanical Engineering, Materials Science and Engineering, Chemical Engineering, and Civil Engineering have steadily improved. “Materials Science” and “Chemical Engineering” are among the top 1% in the world according to ESI rankings, while “Engineering” is among the top 1 %.

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The School has over 160 full-time teachers, among whom more than 130 hold senior professional titles. In the School, there are 2 academicians from the Chinese Academy of Engineering (Liu Jizhen and Yang Yongping), 12 national high-level talents, 2 chief scientists of the 973 Project, 2 academic leaders of the innovation teams of the Ministry of Education, and 10 recipients of the New Century Excellent Talents Support Program. The School also boasts several outstanding teaching and research

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teams, including the first batch of Huang Danian-style Teacher Team in China, the Beijing Staff Innovation Studio and the Beijing Higher Education Young Teachers' Innovation Teaching and Research Studio. Many of our outstanding teachers have been awarded various honorary titles, such as the National Award for Excellence in Innovation, National Outstanding Teacher, Capital Labor Medal, Beijing Municipal Outstanding Worker, Beijing Municipal Teaching Master, and Beijing Exemplary Individual of Teachers' Morality. A high-quality teaching and research staff team has been established, featuring a reasonable structure, active academic thinking, close collaboration, good professional ethics, and high teaching and research capabilities.



The School currently has 2 national-level scientific research platforms such as the National Energy Storage Technology Industry-Education Integration Innovation Platform, and 10 provincial and ministerial-level scientific research platforms including the Key Laboratory of Power Station Energy Transfer Conversion and System of the Ministry of Education. The School has won three second prizes of the National Science and Technology Progress Award and over thirty provincial and ministerial-level science and technology achievement awards. It has undertaken and completed more than 100 national and provincial-level projects, including National Key Basic Research Program (973 Program), National High Technology Research and Development Program of China (863 Program), National Key Research and Development Program, National Major Science and Technology Project for Aero Engine and Gas Turbine, National Natural Science Foundation Innovation Groups, and National Natural Science Foundation Major Projects. The School has great advantages in research

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fields such as advanced energy system thermodynamics and integrated optimization, multiphase flow and heat and mass transfer, pollutant removal, and power station equipment condition monitoring and fault diagnosis.



The School actively engages in domestic and international exchanges and cooperation, establishing strong partnerships with universities in the United States, the United Kingdom, Australia, Poland, and other countries. The “Clean Conversion and Efficient Utilization of Coal” 111 Program Base (Higher Education Discipline Innovation and Introducing High-Level Talent Plan, also known as the 111 Program) is progressing smoothly. In 2021, it was approved as the “Safe and Efficient Utilization of Hydrogen Energy” 111 Program Base as well. The School has been collaborating with Purdue University Northwest and other institutions for undergraduate joint programs and has trained energy professionals for countries along the “Belt and Road” route.

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For over 60 years, the School has taken on the responsibility of national power development and social needs, shouldering the task of the cultivation of specialized technical talents and scientific research in the power field during different periods. It has trained and dispatched over 30,000 professionals, earning high praise and widespread fame in the energy and power sectors as well as in society. In the future, all the teachers and students of the School will carry forward the spirit of NCEPU, build on past achievements and forge ahead, continuing to provide abundant “power” support for the discipline of “Energy and Power Science and Engineering” to enter the world-class ranks and for NCEPU to become a distinctive high-level research-oriented university.



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Talent Recruitment

No.	Recruitment Specialties	Job Category
1	Energy and power engineering, power engineering and engineering thermophysics and related majors	1. Postdoctoral position for new lecturers 2. Special position for attracting overseas doctoral (postdoctoral) talents 3. Distinguished Professor/ Associate Professor Position 4. Overseas high-level talent positions 5. National-level talent positions
2	Energy Storage Science and Engineering and related majors	
3	Hydrogen energy science and engineering and related majors	
4	Mechanical engineering, engineering drawing and related majors	
5	Materials science and engineering, mechanics and related majors	
6	Chemical engineering and related majors	

Thermal Science and Engineering Research Group at North China Electric Power University

The Thermal Science and Engineering team at North China Electric Power University was established in 2009 and designated as the Beijing Key Laboratory of "Multiphase Flow and Heat Transfer in Low-grade Energy" in 2010. In 2018, it was recognized as one of the first Huang Danian-style teams by the Ministry of Education (China). The team is led by Professor Jinliang Xu, who received the First Prize in Natural Sciences from the Ministry of Education, the Outstanding Contribution Award in Electric Power Science and Technology, and the Beijing Higher Education Teaching Award. The team consists of 12 members including a Marie Curie fellow, Beijing Young Talents, and Beijing Science and Technology Rising Stars.

Aiming at the international academic frontier and national demands, the team focuses on the areas of micro/nanoscale heat transfer, advanced power systems, and energy storage science and technologies. Supported by the Ministry of Science and Technology's 973 Project on deep utilization of boiler flue gas, the project on coal-fired supercritical CO₂ power generation system, and the projects from the National Natural Science Foundation of China, the team has achieved systematic research results. Their works have been published in prestigious journals such as Physics Reports, Nano Letters, Small, Nano Energy, Journal of Colloid and Interface Science, Soft Matter, Applied Energy, International Journal of Heat and Mass Transfer, and Science China. Professor Jinliang Xu has chaired or co-chaired six international conferences, and delivered more than 80 keynote or invited lectures at various academic events worldwide.

The team pays great attention on the talent development, guiding students towards independent thinking, leading them into the world of science with significant achievements. Students have received accolades such as the Wu Zhonghua Outstanding Graduate Student Award, the National College Student Energy Conservation and Emission Reduction Competition Grand Prize, the European Young Scientist Award in Thermal Science, the Best Paper Award in Heat and Mass Transfer and Multiphase Flow from the Society of Engineering Thermophysics, and the Best Paper Award from the Electrical Engineering Society. Figure 1 shows Professor Jinliang Xu guiding students in an experiment.

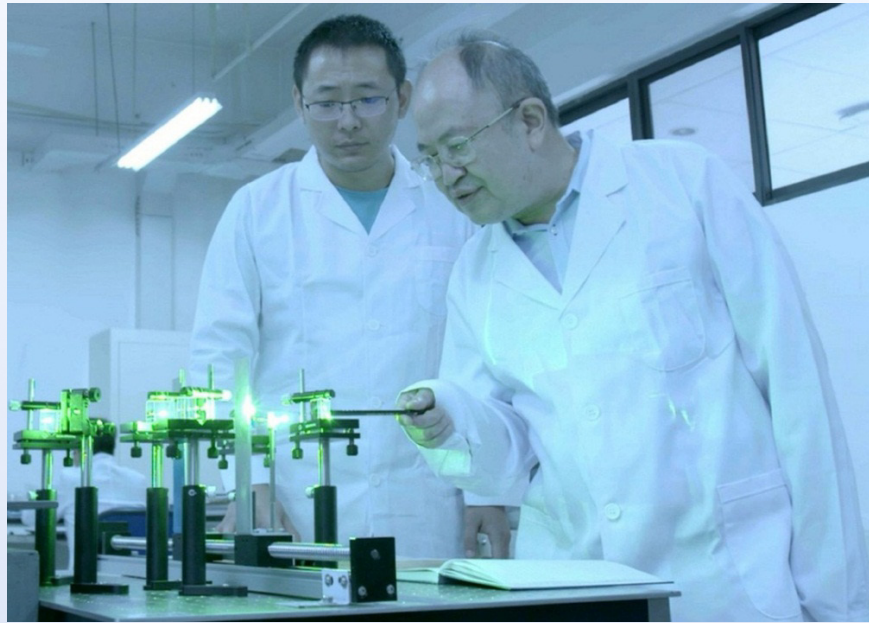


Figure 1. Professor Jinliang Xu supervising students in optical microfluidics experiments

The team has developed a flow and heat transfer experimental setup with ultra-high pressures and temperatures, filling the gap in sCO₂ data and supporting the national key R&D project on sCO₂ boiler. The supercritical heat transfer optical visualization platform supports the development of the supercritical pseudo-boiling theory (see Figure 2). The laser micro/nano machining and microscale phase change heat transfer platforms support researches on the fundamental understanding and technology developments of micro/nano-scale heat transfer. Additionally, facilities such as the solar simulator (see Figure 3) and the solid-liquid phase change thermal energy storage platform have been established. The achievements in each research direction are outlined below:

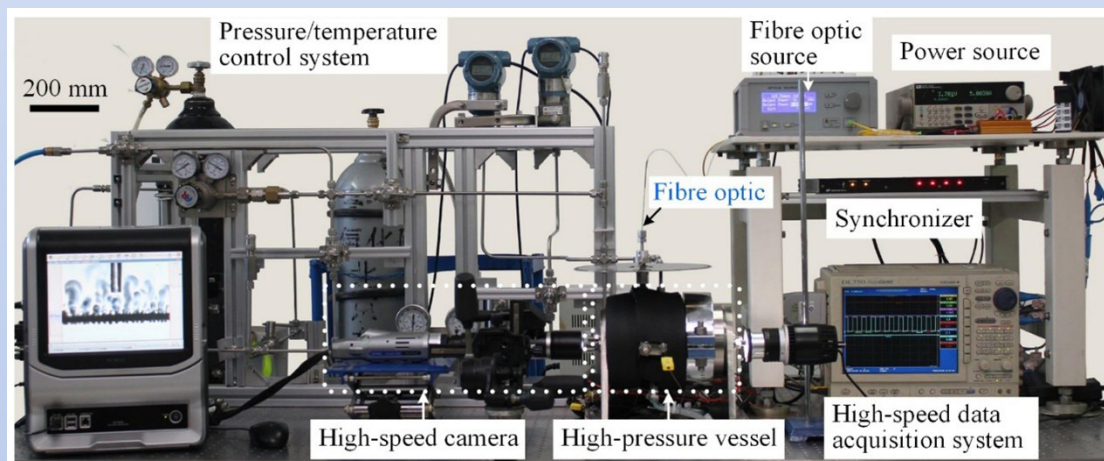


Figure 2. Supercritical pseudo-boiling optical visualization measurement platform



Figure 3. High-flux solar simulator platform

1. Supercritical carbon dioxide (sCO₂) power generation

A supercritical pseudo-boiling framework has been established. Two heat transfer modes of pseudo-boiling and pseudo-evaporation are experimentally identified. The pseudo-boiling theory successfully explains special flow and heat transfer phenomena that cannot be explained with the single-phase fluid assumption. Under the multiphase framework, a general supercritical convective heat transfer correlation is developed, having highest accuracies among various correlations reported in the literature. The R&D on sCO₂ boiler has led to the invention of the modular boiler, reducing pressure drops to 1/8 of the conventional boiler design, and eliminating efficiency penalties due to ultra-large pressure drops. The multi-stages-compression sCO₂ cycle is proposed, breaking through the efficiency limit of the widely used re-compression cycle. The developed overlap energy utilization principle deals with the strong coupling between the sCO₂ boiler and the cycle, eliminating the efficiency gap between the top and bottom cycles.

The works are evaluated as “first”, “significant contribution”, “general correlation” in open literature. The R&D progress of sCO₂ power generation technology was reported by the China-Education-Television. The team published the first academic monograph on coal-fired sCO₂ power generation and hosted the inaugural International Conference on sCO₂ Power Generation Technology, delivering more than 30 keynote/invited talks at international conferences. These achievements have supported the development of China's sCO₂ power generation technology.

2. Micro/nanoscale phase change heat transfer

Comprehensive studies have been conducted on interfacial phenomena and modulation methods in micro/nano scales. Universal laws on velocity and temperature boundary conditions are established with respect to channel size and surface characteristics. With the help of the general laws, a new bubble nucleation theory is proposed, explaining the effect of channel size and surface characteristics on boiling heat transfer. New phenomena such as bubble nucleation in channel corners and explosion

boiling, are discovered. A three-regime map is established for boiling heat transfer in multiscale channels. To improve boiling heat transfer performance in microchannels, see bubble technique is proposed to eliminate flow instability and decrease wall superheating at the onset of boiling to be lower than 1 K, offering an intelligent control strategy for thermal management in microsystems. The related works are rated as "key parameters", "unique three-zone model", and "strong connection", etc.

Using porous-wall microchannels instead of solid wall microchannels, high pressure and low pressure are found to be switching between neighboring microchannels periodically in the phase separation evaporator. The pressure switching mechanism helps to achieve the high-precision temperature control. The failure mechanism of dropwise condensation is revealed to be caused by droplet rolling on nanostructured surface. To avoid the surface failure, the digital-droplet-bouncing technique is proposed. The wettability match between evaporator and condenser is proposed to develop intelligent heat pipes, having advantages of increased heat transfer coefficients when raising heat loads. The works are commented as “general criterion”, “creating new method” and “excellent thermal response”, etc.

The R&D on micro/nanoscale phase change heat transfer won the First Prize in Natural Sciences from the Ministry of Education. The National Natural Science Foundation of China evaluated the works to have protentional applications in national defense and security, greatly enhancing the stability and reliability of equipment. Inspired by theoretical findings, technologies are developed. A 300 W high-power density LED cooler is developed, which won the Gold Award for Innovative Products from the Semiconductor Lighting Industry Alliance and achieved patent transfer. Novel cooler for the 5G base station is developed. Immersion cooling technology is developed for data center cooling. Due to the above contributions, Prof. Jinliang Xu has received the Outstanding Contribution Award in Electric Power Science and Technology and the Innovation Award for Industry-University-Research Cooperation.

3. Organic Rankine Cycle (ORC) Power Generation Technology

Comprehensive R&D on ORC have been conducted. A critical temperature criterion is proposed to select optimal working fluid, resolving historic debate on fluid selection. An ORC power generation system was established to test the ORC performance. The multiphase flow theory is developed for screw expander. The modulation principle is proposed to ensure vapor flowing in the near-wall region and liquid flowing in the tube core, enhancing condensation heat transfer. Hence, the phase separation condenser is developed, earning a U.S. patent. Mobile ORC equipment and technologies are also developed. In collaboration with the Electric Power Design Institute, a technological process of seawater desalination driven by flue gas heated ORC was developed. ORC is

also investigated to be driven by the heat extracted from the high temperature dry-rock in the deep soil. A technological process is developed for hydrogen production via water electrolysis using electricity supplied by waste heat driven ORC. The R&D on ORC won the China Industry-University-Research Cooperation Innovation Award and the Excellent Product Award at the China International High-Tech Achievement Fair, promoted engineering applications in the fields of waste heat power generation, seawater desalination and hydrogen production.

4. Solar thermal conversion and applications

By comprehensive understanding of functional materials, multi-fields-coupling and multiscale energy transfer and conversion in reactors, efficient solar energy conversion and utilization have been achieved. A new concept of indirect radiation pressure is proposed, where light induced plasmonic heating generates bubble in nanofluid liquid. Strong evaporation at the vapor-liquid interface achieves momentum exchange across the vapor-liquid interface to yield significant force, which is called the indirect radiation pressure. The competition between radiation pressure and buoyancy force gets a net force, whose direction changes periodically from downward to upward. Thus, a light driven piston engine is designed, fabricated and tested, having wide applications in industries.

The solar-driven evaporation of nanofluid droplet is investigated. The total solar energy absorption is decoupled into two parts in terms of optical bands, and the whole droplet is decoupled into two spatial domains. The study reveals a small length scale in the contact line region (CLR) to behave higher temperature and larger temperature gradient, recognized as a boundary layer effect, where self-organized nanoparticles occur there. The remain is the bulk volume region (BVR). It is found that even though CLR is two magnitudes smaller compared to the whole droplet, it dominates almost all the electromagnetic energy absorption, while BVR contributes almost all the infrared energy absorption. The work strongly reveals multiscale characteristic for light induced droplet evaporation.



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