CCHVAC 2025

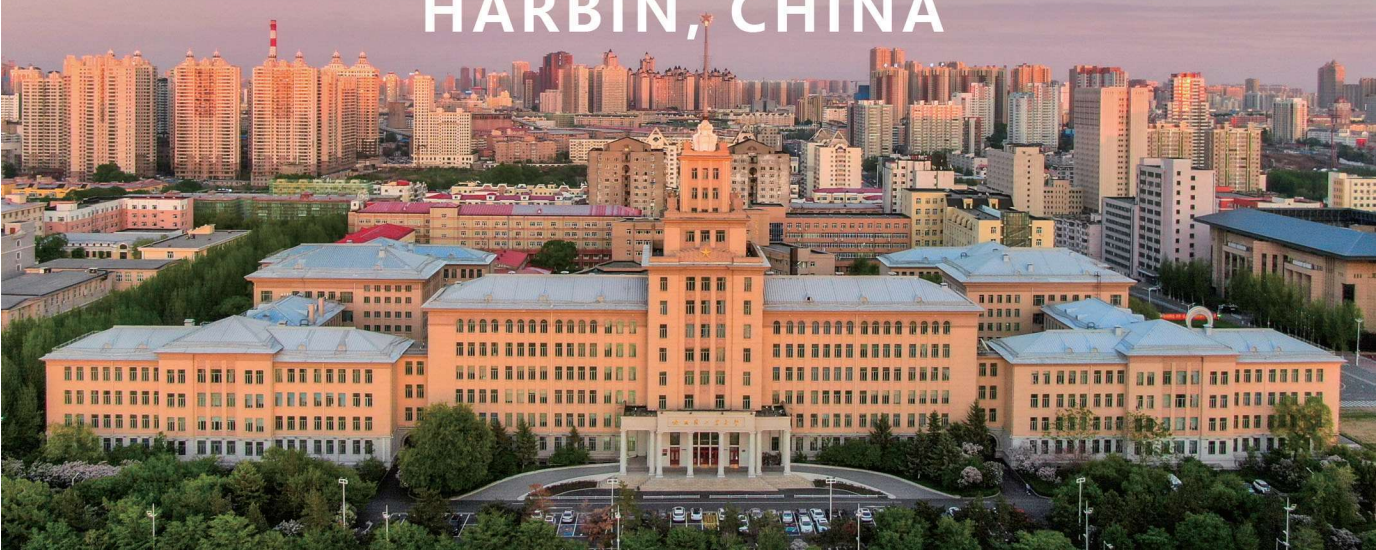
THE 12TH INTERNATIONAL CONFERENCE

COLD CLIMATE HVAC & ENERGY 2025

PROGRAM

AUGUST 06-08, 2025

HARBIN, CHINA



Harbin Institute of Technology (HIT) is a member of China's top nine University Union (C9). It is a National Key University with science and engineering as its core and has developed with management, liberal arts, economy, law and other disciplines. Renowned as "the cradle of engineers".

At HIT, there are 23 schools, 86 undergraduate programs, 9 National Key Disciplines, 12 National Key Labs, and 38 members of the prestigious Chinese Academy of Sciences and Chinese Academy of Engineering. Eleven disciplines of HIT are ranked among the top 1% on the Essential Science Indicators (ESI) lists. The material science and computer science of HIT in particular are ranked among the top 1‰, and engineering discipline ranked among the top 1‱.

Since its beginning, HIT has always had a strong international environment. Now HIT has signed academic cooperation agreements with 278 universities in 39 countries. These collaborations include student and faculty exchange programs, joint academic conferences, and scientific research cooperation.

The 12th International Conference Cold Climate HVAC & Energy (CCHVAC 2025) will be held from August 06 to 08, 2025 in Harbin, China, hosted by School of Architecture and Design, Harbin Institute of Technology. HIT is the birthplace of HVAC education in China, which offered the first HVAC course in the 1949. HIT would like to use this conference to share with academia, industries and organizations the progress and expansion of knowledge and technologies. We hope that the conference will provide opportunities to exchange new ideas and the state-of-the-art sciences and technologies, to identify solutions for problems in renewable energy, sustainable district heating and cooling.

On behalf of the Organizing Committee, I warmly invite you to join CCHVAC 2025 in the beautiful and welcoming city of Harbin.

Sincerely,
Long Ni
President of CCHVAC 2025
Professor, Harbin Institute of Technology

HOST AND ORGANIZER

哈爾濱工業大學
HARBIN INSTITUTE OF TECHNOLOGY

CO-ORGANIZERS

CHPA
中国节能协会热泵专业委员会
China Heat Pump Alliance

Midea
Building Tech.

COOPERATORS

四季沐歌
空气能

中科福德 | 空气能
ZKFD

SUPPORTERS

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因用户伟大

ARCO
爱柯冷暖

Shinhoo 新沪
全心全意做好泵

Table of Contents

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Jiqin Li	Assoc. Professor	Harbin Institute of Technology

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Wei Wu	Professor	City University of Hong Kong
Wei Xu	Professor	China Academy of Building Research

Weibo Yang	Professor	Yangzhou University
Xiangfei Kong	Professor	Hebei University of Technology
Xianting Li	Professor	Tsinghua University
Xiaohua Niu	Deputy Secretary-General	China District Heating Association
Xiaosong Zhang	Professor	Southeast University
Xinhua Xu	Professor	Huazhong University of Science and Technology
Xudong Zhao	Professor	University of Hull
Yanfeng Liu	Professor	Xi' an University of Architecture and Technology
Yang Zhao	Professor	Zhejiang University
Yanping Yuan	Professor	Southwest Jiaotong University
Yi Jiang	Academician	Tsinghua University
Yifeng Gao	Deputy Chairman	China Heat Pump Association
Zhaohui Zhang	Vice President	China Refrigeration and Air-Conditioning Industry Association
Zhengrong Li	Professor	Tongji University
Zhenyu Du	Professor	Taiyuan University of Technology
Zhijian Liu	Professor	North China Electric Power University

General Information

Emergency

Police: Call 110
Ambulance: Call 120
Fire: Call 119

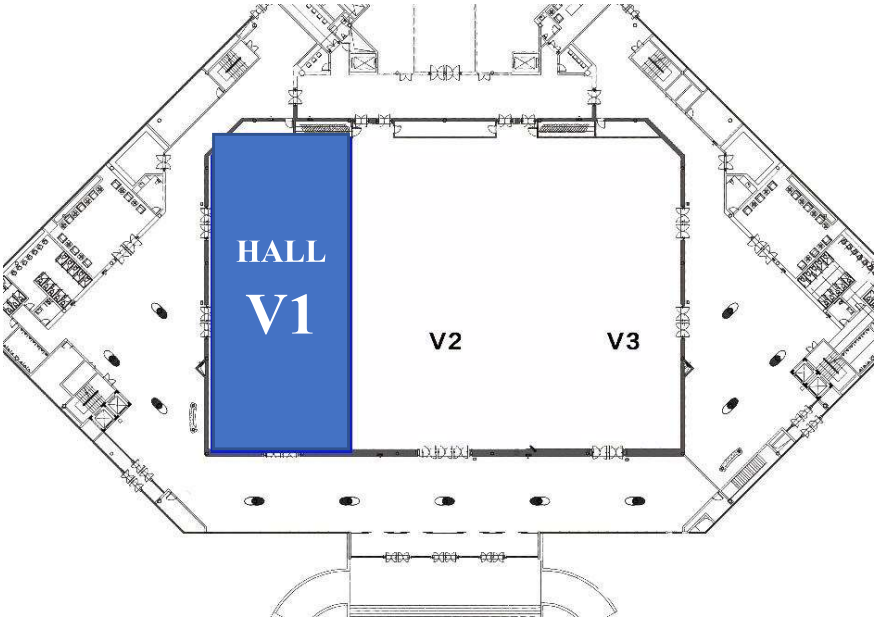
All emergency issues must be reported to the CCHVAC 2025 Conference Secretariat.

Cellphone: +86-18645041026 Peng Wang 王芃
+86-18845644935 Jiqin Li 李佶芩

Conference Venue

Victories Hotel (华旗饭店，★★★★)
301 Hongqi Avenue, Nangang District, Harbin, 150001, China (哈尔滨南岗区红旗大街301号)

Tel：+86-0451-81868888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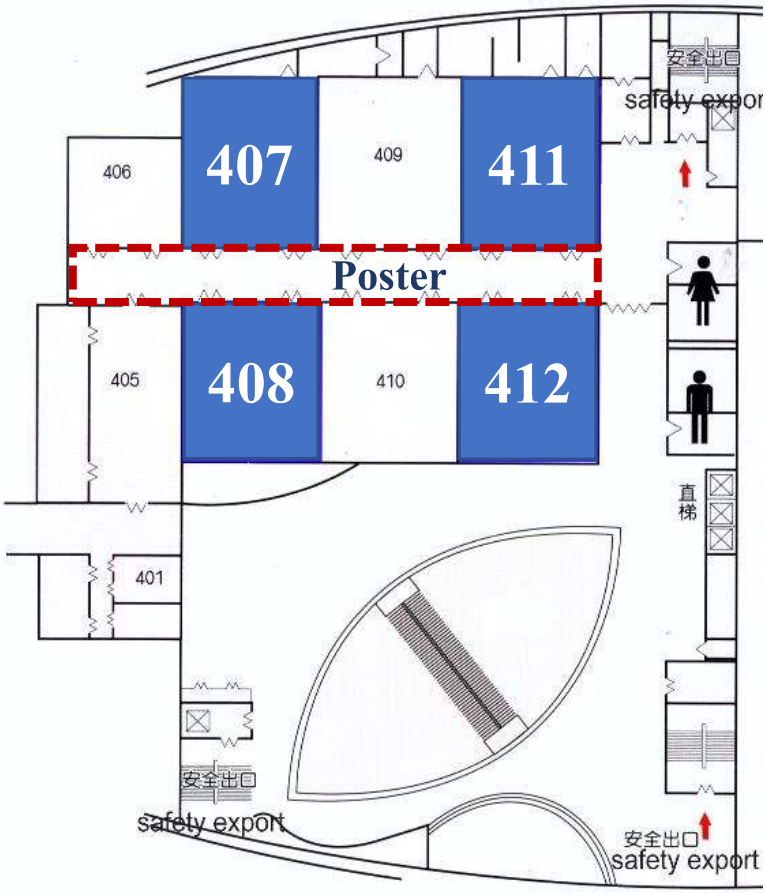
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Registration

Registration Hours

August 05 (Tues.) 10:00-21:00	Lobby on the 1st floor at Victories Hotel
August 06 (Wed.) 8:30-14:00	Lobby on the 1st floor at Victories Hotel

On-site Registration Fees

Regular Registration:	US $465 / person or CNY ¥2800
Full-time students:	US $310 / person or CNY ¥1800

The registration package for general participants and full-time students includes:

- Opening ceremony
- All plenary and workshops
- Tea breaks
- Lunch from August 06 (Wednesday) and August 07 (Thursday)
- Dinner on August 05 (Tuesday) and August 07 (Thursday)
- Conference banquet and art performance on August 06 (Wednesday)
- One technical visit
- One CCHVAC 2025 bag
- One CCHVAC 2025 gift

Name Badges

A name badge is issued upon registration. Due to security considerations, the name badge must be worn during all conference events.

Conference Facilities

Projectors

Multimedia LCD projectors will be available in all the meeting rooms.

Practical Information

Conference Publications

Accepted submissions are required to be published in the conference proceedings. Selected submissions will be recommended for further consideration of publication in the Special Issue of Energy.

Language

The official language is English.

Smoking Policy

Smoking is not allowed in the conference venue, no matter an area is designated for smoking or not.

Tax

All the prices listed in China include tax and service charge, unless tax and service charge are stated explicitly that would happen in some hotels and restaurants.

Tipping

Tipping is not expected for all the services in China, such as taxi, hotel, restaurants, cinemas, etc. However, a small tip could be left to hotel porters and tour guides for extraordinary service. The prices in most hotels and restaurants include service charges, unless the service charge is explicitly listed in the hotel bill or restaurant menu.

Water

Tap water at your hotel is not safe for drinking. Please drink only boiled or bottled water.

Instructions for Speakers

Workshop Presentations

There will be invited presentations and paper presentations in a workshop. Generally, the duration of an invited presentation is about 20 minutes, while that of a paper presentation is 10-15 minutes. The specific duration will be determined by the workshop chair based on the number of presentations.

A presenter is kindly requested to be in the meeting room 10 minutes prior to the beginning of the workshop. The presenter should check if the PowerPoint file works on the computer. It is advised that the presenter introduces himself/herself to the workshop chair and other presenters in the same workshop. Due to limited time, the introduction by the workshop chair for each presenter will be very brief. Each presenter may prepare a brief note and give it to the workshop chair.

When the workshop chair asks a presenter to start the presentation, the presenter should please:

1. Start the talk immediately on the topic and avoid another self-introduction by the presenter;
2. Pace the talk to end before the scheduled ending time. This will allow time for questions and discussion;
3. Listen carefully to the questions from audience and answer them briefly. If the presenter cannot answer the questions briefly, ask for a private discussion after the workshop;
4. Adhere to workshop chairs' instructions.

Poster Presentations

A poster presenter is requested to prepare the poster with display rack and place it in the corridor outside the workshop meeting rooms during the conference.

Photos Download

You can obtain photos by scan the QR code below.

CCHVAC 2025 Secretariat

Cellphone: +86-18645041026 Peng Wang 王芃
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Schedule

Aug. 5

Time	Contents
10:00-21:00	Sign In and On-site Registration (Lobby)
18:00-20:00	Dinner (5th Floor Restaurant)

Aug. 6

Time	Room	Contents
8:30-9:00	Hall V1	**Opening Ceremony** Chair: Long Ni Harbin Institute of Technology
9:00-10:00		**Keynote Speech 1-2** Chair: Yiqiang Jiang Harbin Institute of Technology Yunsong Han Harbin Institute of Technology ◆ **Matti Lehtonen** Aalto University (30 min) *Integration of Local Photovoltaic Power Generation in Power Networks of Communities* ◆ **Müslüm Arıcı** Kocaeli University (30 min) *Unlocking Latent Energy: Phase Change Materials for Energy Saving and Peak Load Reduction*
10:00-10:15	Tea Break	
10:15-12:00	Hall V1	**Keynote Speech 3-5** Chair: Xinhua Xu Huazhong University of Science and Technology Zhijian Liu North China Electric Power University ◆ **Allan Bertelsen** Royal Danish Embassy (30 min) *Electrification and the Role of Heat Pumps in Danish District Heating* ◆ **Katsunori Nagano** Tomakomai College (30 min) *Carbon Neutrality by Green Transformation (GX) through Heat Pump and Energy Storage with Energy Management System (EMS)* ◆ **Yi Jiang** Tsinghua University (45 min) *The Zero Carbon Solution for Heating in China*
12:15-13:00	Lunch (5th Floor Restaurant)	

Time	Room	Contents
13:30-15:30	412	**Workshop 1** *Solar Thermal Technology* Chair: Pu Bai Xi' an University of Architecture and Technology Yafeng Gao Chongqing University
	411	**Workshop 2** *Large Scale Thermal Energy Storage* Chair: Zhiyong Tian Huazhong University of Science and Technology Katsunori Nagano Tomakomai College
	408	**Workshop 3** *Phase Change Heat Transfer for Heating and Cooling* Chair: Mengjie Song Beijing Institute of Technology Chunwen Xu China University of Petroleum (East China)
	407	**Workshop 4** *Air Quality Control and Comfort Design* Chair: Bin Yang Tianjin Chengjian University Ying Sheng Tianjin University
15:30-15:45	Tea Break	
15:45-17:45	412	**Workshop 5** *Ground Source Heat Pump and Shallow Geothermal Energy Utilization* Chair: Weibo Yang Yangzhou University Min Li Central South University
	411	**Workshop 6** *Heat Pump/Refrigeration System for Heating/Cooling using Eco-friendly Working Fluid* Chair: Baomin Dai Tianjin University of Commerce Chen Liu University of Pisa
	408	**Workshop 7** *Intelligent and Energy Efficient Built Environment* Chair: Tianyi Zhao Dalian University of Technology Chaobo Zhang The Hong Kong Polytechnic University
	407	**Workshop 8** *Heat Pump Technology Application and Development* Chair: Hengyi Zhao China Heat Pump Alliance Man-Hoe Kim Kyungpook National University

Time	Room	Contents
17:45-18:30	412	**Midea Workshop**
	408	**Sponsors Workshop**
19:00-20:30	Banquet (Hall V1)	

Aug. 7

Time	Room	Contents
8:30-10:00	Hall V1	**Keynote Speech 6-8** Chair: Zhengrong Li Tongji University Bin Cao Tsinghua University ◆ **Peter V. Nielsen** Aalborg University (30 min) *Human Microenvironment and Airborne Transmission of Infectious Diseases* ◆ **Risto Kosonen** Aalto University (30 min) *Decarbonized and Energy Flexible Buildings and Small Communities* ◆ **Man-Hoe Kim** Kyungpook National University (30 min) *High-Efficiency High-Temperature Heat Pump Development: Low-GWP Refrigerants and Heat Exchanger Design Challenges*
10:15-12:00	412	**Workshop 9** *Medium and Deep Geothermal Energy* Chair: Ji Li China Academy of Building Research Wenxin Li Southeast University
	411	**Workshop 10** *Sustainable District Heating and Cooling* Chair: Man Fan Hebei University of Technology Shen Wei University College London
	408	**Workshop 11** *Low-carbon Building Technology* Chair: Dong Li Northeast Petroleum University Müslüm Arıcı Kocaeli University
	407	**Workshop 12** *Northern Zero/Low Energy Buildings* Chair: Kailiang Huang Shenyang Jianzhu University Kecheng Yu Jilin Jianzhu University

Time	Room	Contents
12:15-13:00	Lunch (5th Floor Restaurant)	
13:30-15:30	412	**Workshop 13** *Low Temperature Air Source Heat Pump* Chair: Shimin Liang Qingdao University of Technology Baolong Wang Tsinghua University
	411	**Workshop 14** *Absorption Heat Pumps and Applications in Heating System* Chair: Xiaoyun Xie Tsinghua University Xiling Zhao Tsinghua University
	408	**Workshop 15** *Computational Carbon Reduction* Chair: Yunsong Han Harbin Institute of Technology Hao Zheng City University of Hong Kong
15:30-15:45	Tea Break	
15:45-17:45	412	**Workshop 16** *Low-carbon Integrated Energy System* Chair: Yuchen Ju Aalto University Xiaochen Liu Tsinghua University
	411	**Workshop 17** *Renewable and Waste Heat Utilization* Chair: Xuejing Zheng Tianjin University Jijin Wang Qingdao University of Technology
	408	**Workshop 18** *Advanced Ventilation Technologies for Built Environment* Chair: Huijun Wu Guangzhou University Wenhui Ji Southwest Jiaotong University
18:00-20:30	Dinner (5th Floor Restaurant)	

Aug. 8

Time	Contents
8:30-11:30	**Technical Visit** • Key Laboratory of Cold Region Urban and Rural Human Settlement Environment Science and Technology, Ministry of Industry and Information Technology • Space Museum, HIT

Opening Ceremony

08:30-09:00, Wednesday, August 06

Chair: Long Ni, Professor, President of CCHVAC 2025

- Introduction of invited guests
- Welcome speech, Leadership of Department of Science and Technology of Heilongjiang Province
- Welcome speech, Leadership of Harbin Institute of Technology
- Welcome and introduction, Risto Kosonen, Professor, Aalto University

Introduction to Keynote Speakers

Yi Jiang

Academician

Professor

Professor Yi Jiang, an academician of the Chinese Academy of Engineering, is a distinguished professor and doctoral supervisor at Tsinghua University, heading the Research Center for Building Energy Efficiency. His research focuses on building energy efficiency, thermal environment, building automation, and central heating planning and control.

With nearly five decades of experience, Dr. Jiang has been pivotal in constructing fundamental theories and methods in building thermal environment science. He developed the Design by Simulation concept and led the creation of the DeST software, widely applied in commercial building design and energy - saving renovations. He has authored and co - authored over 20 academic books, significantly impacting the industry. As a leading figure in China's building energy field, he also holds key positions in numerous academic and industry organizations, actively promoting international cooperation and discipline development.

Keynote Speech Title: The Zero Carbon Solution for Heating in China

Risto Kosonen

Professor

Professor Risto Kosonen is working on indoor climate, energy flexible buildings, and energy efficiency of buildings and communities. Over 35 years' experience both in industry and university. Vice- President of REHVA, President of SCANVAC, President of FINVAC and Chair of Indoor Climate Association in Finland (FISIAQ). Committee membership of e.g. REHVA organizations.
Awards: Rydberg Gold Medal and REHVA Fellow.

Keynote Speech Title: Decarbonized and Energy Flexible Buildings and Small Communities

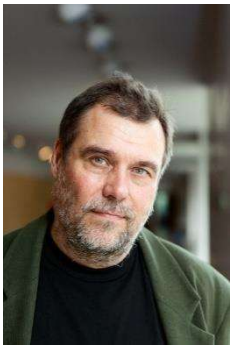
Peter V. Nielsen

Academician

Professor

Professor Peter V. Nielsen is Professor Emeritus at Aalborg University in Denmark.
He works with Computational Fluid Dynamics (CFD) in ventilation, and with full-scale experiments in rooms. He especially does research on aerosols dynamics in the microenvironment around people in connection with airborne cross infection risk. He developed the use of thermal manikins with breathing functions in 1992 for research in personal ventilation and air borne diseases. In a group of 36 international researchers they convinced WHO, that COVID-19 was airborne.
He was one of the first who used CFD in the indoor environment, published as early as in 1973.

Keynote Speech Title: Human Microenvironment and Airborne Transmission of Infectious Diseases



Matti Lehtonen

Professor

Professor Matti Lehtonen is working on smart grids, integration of renewable energy in power and energy systems, carbon neutral energy solutions, as well as integration of various flexibility resources in power and energy systems. He has more than 40 years experience in power and energy systems, of which 26 years as professor.
Dr. Lehtonen working as professor in Aalto University Espoo Finland and is also affiliated as visiting research scientist with Constanta Maritime University in Romania.

Keynote Speech Title: Integration of Local Photovoltaic Power Generation in Power Networks of Communities

Müslüm Arıcı

Professor

Professor Müslüm Arıcı is a Professor in the Thermodynamics and Heat Technique Division of the Department of Mechanical Engineering at Kocaeli University, Turkey. He has co-authored over 300 papers in prestigious peer-reviewed journals, with more than 10,000 citations indexed in Scopus. He currently serves as an editor for Case Studies in Thermal Engineering, Energy, Ecology and Environment, Journal of the Faculty of Engineering and Architecture of Gazi University, and Journal of Thermal Engineering. In addition, he is the co-editor of three international books. He has been listed among the world' s top 2% of scientists by Stanford University for the past four consecutive years. His research interests include thermal energy storage, energy-efficient buildings, renewable energy, and thermal management.

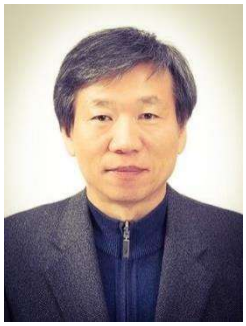
Keynote Speech Title: Unlocking Latent Energy: Phase Change Materials for Energy Saving and Peak Load Reduction

Katsunori Nagano

Professor

Professor Katsunori Nagano, a Japanese scholar, serves as President of the National Institute of Technology, Tomakomai College, with a Ph.D. in Engineering from Hokkaido University. His research focuses on thermal energy storage, ground-source heat pump systems, heat pump applications, low-energy housing, zero-energy buildings (ZEB), desiccant air conditioning, and energy conservation technologies. With over three decades of academic experience, he has held key roles at Hokkaido University (Tenured Professor 2006–2025, Director of International Exchange 2018–2020, Advisor to the President) and been a Guest Professor at Harbin Institute of Technology, China, since 2017. A leading figure in international energy research, he has led IEA roles including Subtask Leader for ECES Annexes 29/21 and Japanese Delegate for HPP Annexes 32/29, and is a member of ISES, ASHRAE, SHASE, and AIJ. Awarded the Carbon Neutral Award (2024) and multiple journal honors, his work advances global energy storage and renewable thermal technology integration.

Keynote Speech Title: Carbon Neutrality by Green Transformation through Heat Pump and Energy Storage with Energy Management System



Man-Hoe Kim

Professor

Professor Man-Hoe Kim is a distinguished figure in the field of mechanical engineering, currently serving as the Director of the Institute of Engineering Design Technology (IEDT) at Kyungpook National University (KNU).
His global perspective on engineering research is evident through his international appointments. He conducted crucial research into heat exchangers and HVAC system designs utilizing low-GWP alternative refrigerants. With over 35 years of experience, Professor Kim's primary research interests are comprehensive, focusing on: Analysis and design of heat exchangers for building and mobile air-conditioning/heat pump applications, alternative refrigerant systems, renewable energy, thermal system designs.

Keynote Speech Title: High-efficiency High-temperature Heat Pump Development: Low-GWP Refrigerants and Heat Exchanger Design Challenges

Allan Bertelsen

Energy Counsellor

Allan Bertelsen (Chinese name: Chen Ailun) serves as Energy Counsellor at the Royal Danish Embassy in China, where he spearheads strategic sectoral cooperation between China and Denmark in the energy field, with a focus on the application of clean and renewable energy in district heating systems. Dedicated to facilitating Sino-Danish knowledge exchange, he works to address market and regulatory barriers to support China’ s green energy transition. Holding dual master’ s degrees from Copenhagen Business School and the University of Chinese Academy of Sciences, his research has centered on the social impacts of China’ s energy transformation.

Keynote Speech Title: Electrification and the Role of Heat Pumps in Danish District Heating

Workshops

Workshop 1
Solar Thermal Technology

Wednesday, August 06, 13:30-15:30 Room 412

Chair: Pu Bai, Xi'an University of Architecture and Technology, China
Yafeng Gao, Chongqing University, China

Tuantuan Xin (Invited)
North China Electric Power University
Integrated Solar Gasification Hybrid System for Power Generation and Methanol Synthesis

Pu Bai (Invited)
Xi'an University of Architecture and Technology
Research on the Thermal Action Mechanism of Geotextile Membrane for Large Pit Thermal Energy Storage of Solar Area Heating

Jinzhi Zhou
Southwest Jiaotong University
Numerical Study on Convective Heat Transfer Characteristics of Photovoltaic Arrays and the Covered Flat Roof Surfaces

Bingxin Xu
Harbin University of Commerce
Research on the Application Potential of Solar Energy and Sustainability of District Energy in Severe Cold Region

Gaoqi Lai
Hebei University of Technology
Performance Evaluation of a Hybrid Solar-Heat Pump Dual-Source Heating System for Interactive Cascade Ventilation

Jialong Huang
Guangzhou University
Energy Performance Evaluation of PV Glazing for Building Application in Different Climate Zones

Siyuan Xiang
Changsha University of Science & Technology
Experimental Evaluation of Energy Conversion Characteristics in Composite Photovoltaic/Thermal System with Phase Change Material

Workshop 2
Large Scale Thermal Energy Storage

Wednesday, August 06, 13:30-15:30 Room 411

Chair: Zhiyong Tian, Huazhong University of Science and Technology, China
Katsunori Nagano, Tomakomai College, Japan

Yongqiang Luo (Invited)
Huazhong University of Science and Technology
Unconventional Deep U-type Borehole Heat Exchangers Exhibit Unparalleled Thermal Performance for Low-carbon Space Heating

Luyao Li (Invited)
Huazhong University of Science and Technology
Collaborative Deployment of Electric Heat Pumps and Pit Thermal Energy Storage to Enhance Renewable Energy Integration and Achieve Heating Decarbonization

Hongzhi Liu (Invited)
Hokkaido University
Enhancing the Rreaction Kinetics of K_2CO_3 for Low-temperature Thermochemical Energy Storage

Jianan Duan
Northeast Forestry University
Study on the Soil Temperature Variation Characteristics of Stratified Soil Temperature Control and Heat Storage System for Greenhouses in Northeast China

Xuran Ma
Harbin Institute of Technology
Flexibility Enhancement of Industrial Complex through Thermal Energy Storage

Aruna
Northeast Electric Power University
Analysis for Parameters Affecting Cycle Performance of CO_2 Two-stage Compression Cycles

Workshop 3
Phase Change Heat Transfer for Heating and Cooling

Wednesday, August 06, 13:30-15:30 Room 408

Chair: Mengjie Song, Beijing Institute of Technology, China
Chunwen Xu, China University of Petroleum (East China)

Naveed Ahmed (Online)
National University of Sciences & Technology
Data Driven AI for Heating/Cooling Applications

Keke Shao (Invited)
Beijing Institute of Technology
The Formation of Trapped Air Bubbles

Fan Gao (Invited)
Beijing Institute of Technology
Effect of the Centrifugal Acceleration on Frosting Characteristics on a Vertical Cold Surface in a Rotating Centrifugal Non-inertial System

Gang Wang
Dalian University of Technology
Coupled Evaluation of Future Climate Scenarios and Building Performance for PCM Applications in Office Buildings: Insights from Chinese Climate Zones

Jiaqi Chen
Nanjing University of Science and Technology
Experimental Study on the Performance of Phase Change Energy Storage-based Airplane Pre-conditioning Air Unit

Yuchao Ma
Harbin University of Commerce
Research and Optimization of Numerical Simulation for Cold Water Phase Change Heat Exchange

Mengting Xiang
Yangzhou University
Freezing and Accompanying Frosting Characteristics of Alcohol Binary Droplet on Cold Surface

Workshop 4
Air Quality Control and Comfort Design

Wednesday, August 06, 13:30-15:30 Room 407

Chair: Bin Yang, Tianjin Chengjian University, China
Ying Sheng, Tianjin University, China

Bin Yang (Invited)
Tianjin Chengjian University
Study on Thermal Environment Optimization in Temporarily Occupied Space: Ceiling Fan aided Convective Air Supply System

Ying Sheng (Invited)
Tianjin University
Experimental Study on the Performance of PM1.0 Removal by a Two-stage Electrostatic Precipitator in the High-frequency Acoustic Field

Jianlin Liu (Invited)
Donghua University
Investigation on Air Curtain Performance in Controlling Pollutant Dispersion during Vehicle Unloading in SemiOpen Industrial Buildings

Yuebo Gao
Tianjin University
Sustainable Particle Control in HVAC Systems with Energy-efficient Electrostatic-Response-Enhanced (ERE) system

Haiying Wang
Qingdao University of Technology
Study on Thermostat Control for Floor Heating-Effect on Thermal Comfort and Energy Use

Hongqiang Ma
East China Jiaotong University
A Review on Evaluation Methods of Outdoor Human Thermal Comfort in Residential Buildings

Wenxuan Zhao
Hunan University
Energy Assessment, Optimal Design Methods, and Advanced Control Technologies of Semiconductor Cleanroom Systems Requiring Strict Production Environments

Weili Wang
Guangzhou University
EfficientWiPose: A Lightweight and High-Accuracy WiFi-Based Human Pose Estimation System for Energy Efficient Smart Buildings

Workshop 5
Ground Source Heat Pump and Shallow Geothermal Energy Utilization

Wednesday, August 06, 15:45-17:45 Room 412

Chair: Weibo Yang, Yangzhou University, China
Min Li, Central South University, China

Min Li (Invited)
Central South University
Algorithms for Estimating Thermal Parameters from Thermal Response Tests of Ground Heat Exchangers

Changxing Zhang (Invited)
Shandong University of Science and Technology
Effect of Shape-Stabilized Phase Change Backfill Material (SSPCBM) on Thermal Performance of Borehole Heat Exchanger in the Layered Geological Structure

Weibo Yang (Invited)
Yangzhou University
Experimental and Numerical Investigations on Thermo-Mechanical Behaviors of Energy Pipe Pile with PCM Backfill

Qihai Sun
Shenyang Jianzhu University
Research on the Performance of the New Vertical Earth-Air Heat Exchange System and Its Auxiliary Heating Potential

Chaohui Zhou
China Three Gorges Corporation
Multirow Helically Coiled Tube Heat Exchanger in Surface Water Heat Pump Systems

Silin Zheng
Qingdao University of Technology
Exploring the Design Method of Subway Source Heat Pump System based on Source-Load Heat Flow Synergy

Xiangyu Guo
Qingdao University of Technology
The Influence of Groundwater Seepage on The Typical Daily Heat Exchange Characteristics of Energy Tunnels

Huiqing Cao
North China University of Technology
Assessment and Suitability Zoning of Shallow Geothermal Resources in Anji County, China

Workshop 6
Heat Pump/refrigeration System for Heating/Cooling using Eco-friendly Working Fluid

Wednesday, August 06, 15:45-17:45 Room 411

Chair: Baomin Dai, Tianjin University of Commerce, China
Chen Liu, University of Pisa, Italy

Jian Liu (Invited)
Southeast University
Parametric and Optimization Analysis of Heat Pump Using Low GWP Zeotropic Mixtures

Yulong Song (Invited)
Xi'an Jiaotong University
Recent Development of Super-High Temperature CO_2 Heat Pump Technology

Chen Liu (Invited)
University of Pisa
Optimization of Integrated Energy Systems for Cooling and Heating Using CO_2 Heat Pump Technology

Baomin Dai (Invited)
Tianjin University of Commerce
Performance of Annual CO_2 Space Heating and Cooling System Integrated with Soil Cold Storage

Minglu Qu
University of Shanghai for Science and Technology
Performance Enhancement of CO_2 Air Source Heat Pumps via Photovoltaic-Thermal (PV/T) Air Preheating: A Simulation and Experimental Study

Jay Wang
Auckland University of Technology
Preliminary Simulation Study of a Novel Open-Loop Air Cycle CO_2 Heat Pump Dryer

Junrui Nie
Beijing University of Technology
Numerical Study on the Impact of Cylinder Cooling on Energy Efficiency of the Compression Process in a CO_2 Refrigeration System

Workshop 7

Intelligent and Energy Efficient Built Environment

Wednesday, August 06, 15:45-17:45 Room 408

Chair: Tianyi Zhao, Dalian University of Technology, China
Chaobo Zhang, The Hong Kong Polytechnic University, China

Alexander Lin (Online)
National University of Singapore
Sustainable Built Environment Through AI-Driven Multi-Physics Optimization of Cellular Materials

Xiuming Li (Invited)
Northeast University
Performance Study of Evaporative Cooling Hybrid Air Conditioning System and Its Retrofitting Application in Small/Medium-Sized Data Centers

Yu Zhao (Invited)
Dalian University of Technology
Identification and Prediction of Key Environmental Parameters in Crowded Public Spaces

Chaobo Zhang (Invited)
The Hong Kong Polytechnic University
Mitigating Data Imbalance in Neural Network-based Building Energy Prediction Using Multi-Task Learning

Jian Sun
North China Electric Power University
Optimization of Artificial Intelligence-Based HVAC Systems in Public Buildings

Hamed Amini
Aalto University
Automatic Hourly Calibration of a Multi-Purpose Building Simulation Model in an Adaptive Framework Using IDA-Python API

Ruiying Jin
Tongji University
Automatic Wiring Method of Fire Alarm System in Metro Station Based on Bim and Ant Colony Algorithm

Huilong Wang
Shenzhen University
Reinforcement Learning Control of HVAC Systems for Demand Response: Modeling, Experimental Validation, and Economic Analysis

Workshop 8

Heat Pump Technology Application and Development

Wednesday, August 06, 15:45-17:45 Room 407

Chair: Hengyi Zhao, China Heat Pump Alliance, China
Man-Hoe Kim, Kyungpook National University, Korea

Yoram Shabtay (Online)
Heat Transfer Technologies LLC
The Development of SDCT Heat Exchanger Technologies for Air-Conditioning and Heat Pumps

Hengyi Zhao (Invited)
China Heat Pump Alliance
Heat Pump Application Development in China

Frank Gao (Invited)
International Copper Association
Energy Efficiency Evaluation Advances Boost the Technology of Heat Pumps and Air Conditioners

Yuting Wu (Invited)
Beijing University of Technology
Research and Development of Single Screw Heat Pump Technology

Baolong Wang (Invited)
Tsinghua University
Construction of CO_2 Heat Pump Cycles for Space Heating in Cold Regions Using the Intelligent GraPHsep Method

Lingling Xu
Xi'an University of Architecture and Technology
Enhancing Ground Source Heat Pump Performance with Novel Microencapsulated Phase Change Backfill Materials

Lu Wang
Beijing University of Technology
Experimental Study of a Heat Pump Water Bathing Heater with Waste Heat Recovery

Workshop 9

Medium and Deep Geothermal Energy

Thursday, August 07, 10:15-12:00 Room 412

Chair: Ji Li, China Academy of Building Research, China
Wenxin Li, Southeast University, China

Ji Li (Invited)
China Academy of Building Research
Research and Application of Key Technologies for Flexible Interaction between Heat Pump Groups and Power Grids

Wenxin Li (Invited)
Southeast University
Feasibility of Shallow-Medium/Deep Geothermal Energy Cascade Utilization for Heating Systems

Shihao Dong (Invited)
Harbin Institute of Technology
Application base Research of Coaxial Borehole Heat Exchanger in Ground Source Heat Pump

Ming Wang
City University of Hongkong/ Xi'an Jiaotong University
Trade-Off Analysis Between Heat Extraction and Energy Consumption in Deep Borehole Geothermal Heating Systems

Yonghuan Zhang
Hebei University of Engineering
Research on Middle and Deep Ground Source Heat Pump Heating System

Yaru Wang
Harbin Institute of Technology
An Optimal Flow Rate Design Method for Medium-Deep Coaxial Borehole Heat Exchangers

Xue Wang
China University of Mining and Technology
Performance Study of Pile-based Coupled with Medium-Deep Ground Source Heat Pump System

Workshop 10

Sustainable District Heating and Cooling

Thursday, August 07, 10:15-12:00 Room 411

Chair: Man Fan, Hebei University of Technology, China
Shen Wei, University College London, UK

Jingjing Yan (Invited)
Tianjin University
Hydraulic Transient Simulation and Sudden Fault Detection of Long-Distance District Heating System

Man Fan (Invited)
Hebei University of Technology
Research on Multidimensional Stability Optimization and Dynamic Performance of Composite Phase Change Materials in Long/Short Term Thermal Storage Scenarios

Yonggang Lei (Invited)
Taiyuan University of Technology
Application of Nonlinear Topology Optimization Method in Staged Construction of District Heating Network Engineering

Yuqian Zhou
Tianjin University
Machine Learning-Enhanced Leakage Detection in District Heating Networks: Integrating Improved Hydraulic Modeling and Signal Denoising for High-Accuracy Localization

Shisong Yan
Tianjin University
Thermal Load Prediction in District Heating Systems Using GAN-Based Data Augmentation and a Dynamic Weighted LSTM-Prophet Hybrid Model

Xiuxin Bi
Harbin Institute of Technology
Review of Low-Carbon Planning and Operation of Solar District Heating Systems

Wei Jiang
Harbin Institute of Technology
Decoupling Simulation of Thermal Processes with Two-time-scale in Heated Buildings for Cold Regions

Workshop 11

Low-carbon Building Technology

Thursday, August 07, 10:15-12:00 Room 408

Chair: Dong Li, Northeast Petroleum University, China
Müslüm Arıcı, Kocaeli University, Turkey

Zehui Chang (Invited)
Inner Mongolia University of Technology
Research on Solar Energy Storage and Heating Technology of Solar Greenhouse in severe cold area

Samanta Lopez Salazar (Invited)
Northeast Petroleum University
Optimization of Architectural Design to Improve Thermal Performance in Standard Housing in Daqing, China

Sarula Chen (Invited)
Anhui Jianzhu University
Comprehensive Investigation of Dynamic Energy Performances of Pipe-Embedded Enclosure Structures with Thermal Anisotropic Injection and Diffusion Features

Yangyang Wu (Invited)
Northeast Petroleum University
Exploration on the Adaptability of Solar Thermal Substitution for Oilfield Single Well Tank

Tianyu Wang
Dalian University of Technology
Simulation of the Effect of Heating Power on the Performance of Phase Change Floor

Huiyan Tang
Tongji University
A Study on the Optical and Thermal Performance and Energy Efficiency Analysis of a Novel Adjustable Wall-Like Window

Yili Zhong
Hunan University
Study on Split-pane Control of Visual Comfort with Electrochromic Windows Based on Subjective Evaluation and Objective Measurements

Zhe Yuan
Northeast Petroleum University
Thermal Performance Optimization of Aerogel-Phase Change Material Triple-Glazed Windows in Beijing's Climate

Workshop 12

Northern Zero/Low Energy Buildings

Thursday, August 07, 10:15-12:00 Room 407

Chair: Kailiang Huang, Shenyang Jianzhu University, China
Kecheng Yu, Jilin Jianzhu University, China

Xueyan Zhang (Invited)
Dalian University of Technology
Research on Heat Transfer Performance of Photovoltaic Building Envelope Structure based on Temperature Control Materials

Xin Jia (Invited)
Dalian University
Study on the Application of Photovoltaic Systems in Rural Buildings

Yuchen Ju
Aalto University
Centralized Demand Response Control for a Finnish Apartment Building Considering Indoor Air Conditions

Yijing Ge
Harbin Institute of Technology
Research on the Evaluation Weight of Green Office Buildings Based on the Entropy Weight Method A Case Study of Cold Regions

Xinyi Hu
Aalto University
Are Heating Electrification and Mechanical Ventilation Viable Approaches for Cold Climate Rural Buildings?

Tianqi Cai
China University of Mining and Technology
Energy Consumption and Carbon Emissions of Residential Buildings with Phase-Change Panels and Geopolymer Envelopes in China's Cold Region

Qihai Sun
Shenyang Jianzhu University
Research and Application of Artificial Intelligence-Based Heat Load Prediction Models for Ultra-Low Energy Buildings

Workshop 13

Low Temperature Air Source Heat Pump

Thursday, August 07, 13:30-15:30 Room 412

Chair: Shimin Liang, Qingdao University of Technology, China
Baolong Wang, Tsinghua University, China

Wenzhe Wei (Invited)
Beijing University of Technology
Investigation on Frosting Detection Method of Low-Temperature Inverter Air Source Heat Pump

Xiaoyu Li
Tsinghua University
Application Study of CO_2 Cascade Air Source Heat Pump in Public Building Renovation: Simulation, Field Measurement and Performance Evaluation

Jijin Wang
Qingdao University of Technology
Thermodynamic Evaluation for Two-Stage Compressor Air Source Heat Pump with Vapor Injection Cycle Using the Flash Tank and Intermediate Heat Exchanger

Jian Cao
Beijing University of Civil Engineering and Architecture
Field Performance Study of Distributed Small-Capacity Air Source Heat Pumps for Centralized Heating in Residential Buildings

Youpeng Sun
Harbin Institute of Technology
A Variable Flow Control Logic for Heating Supply Transfer by Time-Periods in Distributed Air Source Heat Pump Heating Systems

Shicheng Yao
Harbin University of Commerce
Frosting and Heating Performance of Electric Vehicle Heat Pump Air Conditioning System in Cold Area

Zhe Wang
Qingdao University of technology
Study on the Influencing Factors of "Cold and Wet Island Effect" of Air Source Heat Pumps

Shirui Su
Northeast Electric Power University
Study on Operation Characteristics of Solar-Assisted Enhanced Jet Enthalpy Air Source Heat Pump

Workshop 14

Absorption Heat Pumps and Applications in Heating System

Thursday, August 07, 13:30-15:30 Room 411

Chair: Xiaoyun Xie, Tsinghua University, China
Xiling Zhao, Tsinghua University, China

Xiling Zhao (Invited)
Tsinghua University
The Practice of Absorption Heat Pump Technology for Flue Gas Waste Heat Recovery

Xing Fu (Invited)
Beijing Huayuantaimeng Energy-saving Equipment Co., Ltd.
Waste Heat Recover System Using Absorption Heat Pumps for District Heating and Real Application Cases Introduction

Guohua Huang (Invited)
Tongfang Energy Saving Engineering Co., Ltd.
Research on the Technology of Using Large Temperature Difference Thermoelectric Composite Heat Pump for Industrial Steam Substitution

Xiaoyun Xie (Invited)
Tsinghua University
Research on Absorption Heat Pumps and Absorption Heat Exchangers for Heat Conversion in Waste Heat Sharing Systems for District Heating

Jiyou Lin
Harbin Institute of Technology (Weihai)
Ideal Thermodynamic Model and Parameter Analysis of Ejector Large Temperature Drop Cogeneration System

Zixuan Peng
Tsinghua University
Absorption Chiller Design for Liquid Cooling in Data Centers

Workshop 15
Computational Carbon Reduction

Thursday, August 07, 13:30-15:30 Room 408

Chair: Yunsong Han, Harbin Institute of Technology, China
Hao Zheng, City University of Hong Kong, China

Hao Zheng (Invited)
City University of Hong Kong
AI-Assisted Urban Design: With Carbon Reduction Goals

Wei Wang (Invited)
Southeast University
Automatic and Rapid Simulation of Building Energy Demand at Urban Scale

Jianli Chen (Invited)
Tongji University
Large Language Model based Auto Building Energy Modeling

Dongliang Han
Harbin Institute of Technology
Multi-Objective Evaluation of the 3E Framework (Environment, Energy, Economy): Optimizing Vegetation Strategies Across Residential Densities

Yongjie Wang
Tsinghua University
A Mean Room Temperature Prediction Lstm Model for Heating Buildings

Xianglu Ding
Harbin Institute of Technology
Research on Ice Restaurant Form Design Based on Indoor Thermal Environment Simulation

Biaoqing Tao
Harbin Institute of Technology
A City-Level Carbon Emissions Prediction Method Based on Open-Source Data and LIms: A Case Study of 65 Winter Cities Worldwide

Yongxin Liu
Harbin Institute of Technology
Percentage of Dissatisfied Model of Thermal Environment based on Beta Distribution

Workshop 16

Low-carbon Integrated Energy System

Thursday, August 07, 15:45-17:45 Room 412

Chair: Yuchen Ju, Aalto University, Finland
Xiaochen Liu, Tsinghua University, China

Xiaochen Liu (Invited)
Tsinghua University
Research on Energy Systems of Airports for Carbon Neutrality

Shanshan Cai
Huazhong University of Science and Technology
Performance Investigation and Design Principles of PEMFC Integrated Energy Supply Systems Based on Flexible Load Regulation

Yanfeng Wang
Guangdong Power Grid Corporation Limited
Carbon Emission Indicator System and Effectiveness Evaluation of Carbon Reduction Measures in Substation Operational Phase

Chenxin Feng
Zhejiang University
A Two-Stage Optimal Design Framework for Improving the Energy Flexibility of District Energy System

Jianhang Wang
Harbin University of Commerce
Research on Multi-Energy Complementary Heating Systems for Highway Service Area Buildings in Severe Cold Regions

Fu Liang
Harbin University of Commerce
Operational Performance Analysis of an Integrated Solar PV/T and Air Source Heat Pump System

Siqi Wu
Harbin Institute of Technology
Application of Air conditioning Heating Evaluation Indicators in the Low-temperature Transformation of Existing Buildings

Workshop 17

Renewable and Waste Heat Utilization

Thursday, August 07, 15:45-17:45 Room 411

Chair: Xuejing Zheng, Tianjin University, China
Jijin Wang, Qingdao University of Technology, China

Lu Wang
Beijing University of Technology
Experimental Study of a Refrigerator System based on a Double Suction Piston Compressor

Xuwei Zhu
Taiyuan University of Technology
Analysis and Optimization on Flow and Heat Transfer Characteristics of Twisted Oval Shell-And-Tube Heat Exchangers based on Numerical Simulation and Model Prediction

Qiuyan Lu
Huazhong University of Science and Technology
Research on the Collaborative Benefits of Energy Conservation and Emission Reduction in the Blast Furnace Process Technology Based on the CSC Method

Qingwen Xue
Taiyuan University of Technology
A Review of Low-Temperature Waste Heat Recovery Technologies in the Steel Industry

Jinfang He
Qing Dao University of Technology
Comparative Analysis of Heat Transfer Performance of Energy Segment Connections

Xinjie Wang
Qingdao University of Technology
Experimental Study on the Heating of Submarine Tunnel Seepage Seawater Source Heat Pump System

Jiachen Wang
Chang'an University
Operational Optimization of Deep Borehole Heat Exchangers: Numerical Evidence on Cross-seasonal Heat Storage Mitigating Ground Cold Accumulation

Workshop 18

Advanced Ventilation Technologies for Built Environment

Thursday, August 07, 15:45-17:45 Room 408

Chair: Huijun Wu, Guangzhou University, China
Wenhui Ji, Southwest Jiaotong University, China

Xinhua Xu (Invited)
Huazhong University of Science and Technology
Study on a Simplified Heat Transfer Model for the Roof Ventilated Desiccant Bed

Yanqiu Huang (Invited)
Xi'an University of Architecture and Technology
Performance Analysis of Spray-Local Exhaust Ventilation for High-Temperature Smoke Pollutants

Chunwen Xu (Invited)
China University of Petroleum (East China)
Building Ventilation Effects on Human Microenvironments: Mechanisms and Health Analysis

Lingjie Zeng
Tongji University
Dynamic Barrier Airflow against Airborne Contamination in Laminar Flow Operating Rooms

Yuanbo Zheng
Northeast Forestry University
Concept and Performance Study of an Enhanced Cyclone with Split Flow Applied to Ventilation System

Rui Guo
Huazhong University of Science and Technology
Energy Performance Comparison of Diffuse Ceiling Ventilation and Mixing Ventilation Strategies in Heating Conditions

Zhaoyi Liu
Dalian University of Technology
A Nodal Model for Predicting Vertical Air Temperature Difference in a Radiant Floor Cooling Room with Mechanical Ventilation

Mingqi Liu
Tongji University
Comparison of Air Quality between Mechanical Ventilation Systems and Portable Air Cleaners with Synergistic Integration Mechanisms

Technical Visit

There will be two technical visits for general participants to the **Key Laboratory of Cold Region Urban and Rural Human Settlement Environment Science and Technology, Ministry of Industry and Information Technology**, HIT, China **and Space Museum**, HIT**.**

***Note*:**

Please sign up for technical visit for general participants at the Registration Desk.

Technical Visit to Key Laboratory of Cold Region Urban and Rural Human Settlement Environment Science and Technology, Ministry of Industry and Information Technology

8:30—9:30 on August 08 (Friday)

8:30 Departure from Victories Hotel

8:45 Tour the Key Laboratory

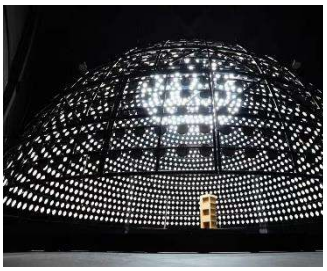
9:30 Leave the Key Laboratory

The Key Laboratory of Cold Region Urban and Rural Human Settlement Environment Science and Technology, Ministry of Industry and Information Technology which is attached to School of Architecture and Design in HIT was founded in April, 2016. The key laboratory covers more than 12,400 square meters and locates on the second campus of HIT. The lab has developed many scientific researches, personnel trainings and technical services to be an international first-class research and technical inspection institution in cold region. There are 5 sub laboratories:

(1) Laboratory of Building Environment & Energy Conservation
(2) Building Acoustic Laboratory
(3) Architecture Lighting Laboratory
(4) Laboratory of Architectural Survey
(5) Laboratory of Building Environment Behavior and Psychology

a) Key Laboratory of Cold Region Urban and Rural Human Settlement Environment Science and Technology, Ministry of Industry and Information Technology

b) Environment Experimental Chamber



c) Artificial Sky

d) Audiometric Room

Various building equipment related to cold regions were used in the Key Laboratory of Cold Region Urban and Rural Human Settlement Environment Science and Technology, Ministry of Industry and Information Technology. We would like to welcome you to the Key Laboratory and show you these equipment and building technologies used.

Technical Visit to Space Museum, HIT

9:30—11:30 on August 08 (Friday)

9:30 Departure from the Key Laboratory

10:00 Tour the Space Museum, HIT

11:00 Leave

11:30 Arrive at the Victories Hotel

The Aerospace Museum of Harbin Institute of Technology, established in 1986, is the largest aerospace-themed exhibition hall in China's universities, featuring the most diverse and numerous exhibits. It is also the only professional exhibition hall in Northeast China that integrates physical and model displays of aerospace technology with popular science education on aerospace knowledge. Currently, the Aerospace Museum is divided into two exhibition areas: the indoor area and the outdoor area. The indoor area spans 5,500 square meters

and comprehensively showcases the development history of human space-flight from different perspectives through hundreds of exhibits. It highlights the leapfrog development of China's space industry from scratch, from small to large, and from weak to strong, under the strong leadership of the CPC Central Committee, as well as its characteristic development path of self-reliance and independent innovation. The Aerospace Museum also features the "Wozhen Cangqiong" outdoor exhibition area, which displays precious physical objects such as the Long March 1 carrier rocket and the Dongfeng 2 missile.

a) Space Museum, HIT

Banquet

19:00-20:30, Wednesday, August 06

The banquet is sponsored by the co-organizer Midea Building Technology. The activities are as follows:

- Award ceremony: Best Paper Awards
  Certificate of Chairs
  Certificate of Volunteers
  Certificate of Sponsorships
- Artistic performance

Tour Information

The Chinese Eastern Railway connecting Harbin and Russia transformed the city of Harbin into the beating heart of commerce and industry in northeast region of China in the early 20th century. So Harbin is famous for its exoticism. And this city is always famous for its severe cold climate. Ice and Snow Sculpture Festival in winter attracts many tourists all around the world. In summer, it is also an appealing attraction owing to its architectural grandeur. There are a few local scenic spots in Harbin urban area for summer tourism.

The Central Street

The Central Street was originally built in 1898. The street is paved with about 870,000 "bread stones." These stones are similar to Russian bread in shape and size. With a total length of 1450 meters, there are 71 European style buildings with Renaissance, Baroque, Eclecticism and Modern style. These buildings make the Central Street an art gallery of western architecture.

The Saint Sophia Cathedral

The Saint Sophia Cathedral was an Orthodox Church, originally built in 1907. It is 53.3 meters (175 feet) high and occupies an area of 721 square meters (7761 square feet). Its huge green onion dome looks like a burning candle, which is a feature of Russian Orthodox Church.

The Sun Island

The Sun Island lies on the north bank of Songhua River, covering an area of 38 square kilometers (14.7 square miles). It is a riverside ecological zone in China. With birch woods, various beautiful flowers and lovely squirrels, the Sun Island is a preferred summer resort for local residents.

Binzhou Railway Bridge

It is the earliest railway bridge over the Songhua River and the first cross-river bridge in Harbin, built in 1901. In 2016, the bridge was renovated as a sightseeing bridge. The bridge is now partly paved with transparent tempered glass. Through the glass, steel beams of previous railway and the Songhua River can be seen directly.

Brief Schedule

Time\Date	Aug. 5	Aug. 6	Aug. 7	Aug. 8
8:30-9:00		Opening Ceremony (Hall V1)	Keynote Speech 6-8 (Hall V1)	Technical Visit
9:00-10:00		Keynote Speech 1-2 (Hall V1)		
10:00-10:15	Sign In (Lobby)	Tea Break		
10:15-12:00		Keynote Speech 3-5 (Hall V1)	Workshop 9 (412) Workshop 10 (411) Workshop 11 (408) Workshop 12 (407)	
12:15-13:00		Lunch (5th Floor Restaurant)	Lunch (5th Floor Restaurant)	
13:30-15:30		Workshop 1 (412) Workshop 2 (411) Workshop 3 (408) Workshop 4 (407)	Workshop 13 (412) Workshop 14 (411) Workshop 15 (408)	
15:30-15:45		Tea Break	Tea Break	
15:45-17:45		Workshop 5 (412) Workshop 6 (411) Workshop 7 (408) Workshop 8 (407)	Workshop 16 (412) Workshop 17 (411) Workshop 18 (408)	
17:45-18:30	Sign In (Lobby) Dinner (5th Floor Restaurant)	Midea Workshop (412) Sponsors Workshop (408)	Dinner (5th Floor Restaurant)	
19:00-21:00		Banquet (Hall V1)		

Note: Locations and Meeting room numbers are in the brackets.