

IFMI & ISPEMI 2024

3rd International High-level Forum on High-end Measurement
Instruments & 13th International Symposium on Precision Engineering
Measurements and Instrumentation

8-10 August 2024, Qingdao, China



Sponsors

International Committee on Measurements and Instrumentation (ICMI)

Chinese Society for Measurement (CSM)

China Instrument and Control Society (CIS)

Technical Sponsors

Department of Information and Electronic Engineering, Chinese Academy of Engineering (DIEE-CAE)

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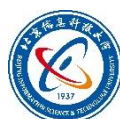
Beijing Information Science and Technology University (BISTU)

China University of Petroleum (UPC)

Hexagon Manufacturing Intelligence (Qingdao) Co., Ltd.

Conference homepage

<http://www.ispemi-icmi.org.cn/>



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About the IFMI & ISPEMI 2024

The International High-level Forum on High-end Measurement Instruments (IFMI) is sponsored by Chinese Academy of Engineering (CAE), and hosted by Harbin Institute of Technology (HIT). The technical sponsor is the Department of Information and Electronic Engineering of CAE. It is a platform for international first-rate scientists, technical specialists, and entrepreneurs working in the fields of metrology, industrial measurement, and instrument R&D to jointly discuss the development strategies of international high-end measurement technology. IFMI is to be held in 2024 for the third time.

The International Symposium on Precision Engineering Measurements and Instrumentation (ISPEMI) is sponsored by the International Committee on Measurements and Instrumentation (ICMI) and Chinese Society for Measurement (CSM). It is hosted by Harbin Institute of Technology (HIT), and jointly organized by the Instrumentation Committee of CSM (IC-CSM) and Beijing Information Science and Technology University (BISTU). Since its establishment in 1999, ISPEMI has been successfully held in different cities in China for 12 times. It has now become an international influential symposium concentrating on academic exchange in the field of measurements and instrumentation.

In 2024, the IFMI and ISPEMI will convene jointly. This collaborative event aims to bring together leading scientists, technical specialists, and entrepreneurs to deliberate on the opportunities and challenges presented by the ongoing scientific and technological revolution and industrial transformation. The primary focus will be on the future landscape of measurement systems, instrument technology, and the instrument industry. By providing a platform for evaluating the direction of both international and national measurement systems, as well as the instrument industries, IFMI & ISPEMI 2024 aims to facilitate insights that anticipate future trends, based on which chart the course for the establishment of robust international and national measurement systems, and to strategize the developmental pathways for emerging instrument technologies and enterprises.

The forthcoming opportunities and challenges are mainly rooted in two key factors. Firstly, the full implementation of the international unit system on the basis of fundamental physical constants in 2019 will definitely lead to a new-round transformation in international and national measurement systems, instrument technology and instrument industry. Secondly, the new round of S&T revolution will bring breakthroughs across various domains, including information technology, biotechnology, new energy technology, new material technology, intelligence manufacturing technology. In particular, the high-end manufacturing industry is on the brink of entering a new era of digitalization, networking and intelligence, generating enormous shocks and challenges for existing international and national measurement systems, as well as the technological and industrial infrastructure of measurement instruments. Simultaneously, it unveils significant opportunities and new missions that demand strategic consideration and proactive engagement.

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Topics of Interest for IFMI & ISPEMI 2024

1. Quantized Definition, and New-Generation International and National Measurement Systems
2. Demand for New-Generation International and National Measurement Systems Brought from Digitalization, Networking and Intelligence of High-end Precision Manufacturing
3. New-Generation of Instrument Technology, and New-Generation International and National Measurement Systems
4. New-Generation Instrument Technology, and Digitalization, Networking and Intelligence in Manufacturing
5. New-Generation Instrumentation Theories and Design Methodologies
6. Measurement for Precision and Ultra-Precision Machining
7. New-Generation Instrument Technology and Measurement System
8. Modern Optical Technology and Instruments for Precision and Ultra-precision Measurement
9. Sensors, Actuators, and Industrial Internet of Things
10. Micro- and Nano- Measurement Technology, Macro- and Micro-scale Measurement Technology
11. Laser Measurement Technology and Instruments
12. Metrology and Online Digital Calibration
13. Online Digital Measurement Technology for High-end Chip Manufacturing
14. Online Digital Measurement Technology for Flat-panel Display
15. Accuracy Theory and Data Processing Methods for New-Generation Measurement System
16. Computational Measurement
17. Digital Measurement and Digital Twin Technology
18. IntelliSense and Networking
19. Embedded Measurement and High-end Precise Equipment
20. Other related topics

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Honorary Chairs

Prof. Guofan Jin, Tsinghua University (China)

Fellow of Chinese Academy of Engineering (China)

Prof. Songlin Zhuang, University of Shanghai for Science and Technology (China)

Fellow of Chinese Academy of Engineering (China)

Prof. Zhonghua Zhang, National Institute of Metrology (China)

Fellow of Chinese Academy of Engineering (China)

Prof. Shenghua Ye, Tianjin University (China)

Fellow of Chinese Academy of Engineering (China)

Prof. Liwei Zhou, Beijing Institute of Technology (China)

Fellow of Chinese Academy of Engineering (China)

Conference Chairs

Chair

Prof. Jiubin Tan, Harbin Institute of Technology (China)

Fellow of Chinese Academy of Engineering (China)

Co-chairs

Prof. Kenneth Grattan, City University of London (U.K.)

Fellow of Royal Academy of Engineering (U.K.)

Prof. Tony Wilson, University of Oxford (U.K.)

Fellow of Royal Academy of Engineering (U.K.)

Prof. Steven Cundiff, University of Michigan (U.S.)

Fellow of the American Physical Society and the Optical Society of America (U.S.)

Prof. Detian Li, Lanzhou Institute of Physics, CAST (China)

Fellow of Chinese Academy of Engineering (China)

Prof. Wei Gao, Tohoku University (Japan)

Fellow of Japanese Academy of Engineering (Japan)

Technical Program Committee

Chair

Prof. Tong Sun, City University of London (U.K.)

Fellow of Royal Academy of Engineering (U.K.)

Co-chairs

Prof. Xiang Fang, National Institute of Metrology (China)

Prof. Ahmed Abou-Zeid, Physikalisch-Technische Bundesanstalt (Germany)

Prof. Fushun Nian, China Electronics Technology Group Corporation (China)

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Members

Prof. Harald Bosse, Physikalisch-Technische Bundesanstalt (Germany)

Prof. Martin Booth, University of Oxford (U.K.)

Prof. Richard Leach, University of Nottingham (U.K.)

Prof. Jens Flügge, Physikalisch-Technische Bundesanstalt (Germany)

Prof. Michael Krystek, Physikalisch-Technische Bundesanstalt (Germany)

Mr. Aiwen Ma, Chinese Society for Measurement (China)

Mr. Tong Zhang, China Instrument and Control Society (China)

Organizing Committee

Chair

Prof. Jian Liu, Harbin Institute of Technology (China)

Co-chairs

Prof. Lianqing Zhu, Beijing Information Science and Technology University (China)

Prof. Liandong Yu, China University of Petroleum (China)

Mr. Zhanjiang Sui, Hexagon Manufacturing Intelligence (Qingdao) Co., Ltd (China)

Prof. Pengcheng Hu, Harbin Institute of Technology (China)

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Prof. Qun Hao, Changchun University of Science and Technology (China)

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Prof. Yong Xu, Changcheng Institute of Metrology & Measurement (China)

Prof. Zhihong Liu, Beijing Oriental Institute of Measurement & Test (China)

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Prof. Yajun Liang, Beijing Aerospace Institute for Metrology and Measurement Technology (China)

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General requirements for papers

Please submit an introduction of the reporter and a structured extended abstract (up to 1 page) before the Abstract Due Date. The structured extended abstract should have figures and sufficient data. Full manuscript is not needed. The forms of the reports on the conference will include plenary/keynote/invited talk and Poster. The IFMI & ISPEMI 2024 will adopt a **hybrid model integrating online and offline**, where all participants are welcomed to **join in person and the inconvenient scholars can participate in the conference online**. To avoid the possible problems caused by the network service, we strongly recommend the online scholars to use "pre-recorded video + online discussion" for conference speeches.

Excellent papers will be recommended for publication in one of the following journals:

1. **Photonics (SCI, IF:2.4)** in the special issue of "Micro-Nano Optics and High-end Measurement Instruments II". https://www.mdpi.com/journal/photonics/special_issues/L6WZ4P1696
2. **Optics and Precision Engineering (EI)**

Critical Dates and Location

Abstract Due Date (extended): July 22, 2024 (CST, UTC+8)

Early registration Deadline: July 25, 2024 (CST, UTC+8)

Conference Registration: August 8, 2024 (CST, UTC+8)

Duration: August 9 - 10, 2024 (CST, UTC+8)

August 9 (Opening ceremony and Plenary speeches)

August 10 (Keynote speeches and Invited speeches)

Venue: SHERATON QINGDAO JIAOZHOU HOTEL, Qingdao, China

Address: No.271 Beijing East Road, Xincheng District, Jiaozhou, Qingdao 266300, China

Registration Fee

Other attendees: 2300 CNY per person. (2000 CNY per person before July 25)

Discount for students: 1800 CNY per person. (1500 CNY per person before July 25)

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Conference Chair

Prof. Jiubin Tan



Fellow of Chinese Academy of Engineering

Deputy Director of Advisory Committee of National Metrological Strategy Experts

Standing Member of the International Commission on Measurement and Instrumentation (ICMI)

Vice President of China Instrumentation Society (CIS)

Director of the Key Laboratory of ultra-precision Instruments and Intelligent Chemical Industry

Director of Institute of Precision Instrument Engineering in Harbin Institute of Technology

Professor Jiubin Tan has very rich experience in the field of ultra-precision measurement and instrument engineering in high-end equipment manufacturing and has studied this field for about fifty years. He received his engineering degree at Harbin Institute of Technology in 1982. After that, he spent several years studying in Department of Precision Instrument and Machinery and got his degree of PhD Engineering from Harbin Institute of Technology in 1991. At the same year, he started his working as associate professor in the department of precision instrument and measurement and control technology at Harbin Institute of Technology. In 1995, He became the professor and director of the department. He has received a lot of awards such as, Discipline leader of China Aerospace Industry Corporation in 1995, Receiving special government allowance from The State Council in 1998, Heilongjiang Province Outstanding Youth Science Fund in 1999, National May Day Labor Medal in 2007. Since 1997, he has won the first prize of the State Technological Invention Award once, the second prize twice and the third prize of National Science and Technology Progress Award once. In 2017, he was named fellow of the Chinese Academy of Engineering. In 2019, he was awarded the title of "Outstanding Scientist in the field of Contemporary Instrumentation and Measurement Control in China".

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Plenary Speech

Prof. Ömer Sahin Ganiyusufoglu



Fellow of German Academy of Engineering

Fellow of the International Academy of Production Engineering, CIRP

Consulting professor at Tongji University

Consultant at Qingdao International Academician Park

Professor Ömer Sahin Ganiyusufoglu, the academician of the German National Academy of Science and Engineering, is one of the pioneers of automation of CNC-machine tools with robots. Dr. Ganiyusufoglu received both his Bachelor of Science degree in 1979. His Ph.D. degree in Mechanical Engineering (with a focus on machine tools and manufacturing technology) from the Technical University of Berlin, Germany in 1984, working as a research associate (Wissenschaftlicher Mitarbeiter) in the Institute for Machine Tools and Manufacturing Technology and Fraunhofer Institute for Production Technology and Design (IPK – Berlin), directed by Prof. Dr. Spur. Dr Ganiyusufoglu is a Visiting Professor of Mechanical Engineering at Tongji University in Shanghai, China. Since 2016 he is Chairman of the Corporate Members Advisory Group (CMAG). He has been a member of the German Engineers' Association (VDI). He is a recipient of the Best Labor Award of the City of Dalian, the Rose Prize of the City of Shenyang, and the Friendship Award of Liaoning Province in China. 2018 he received the Friendship Award of Chinese Government.

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Plenary Speech

Prof. Xuejun Zhang



Fellow of Chinese Academy of Engineering

Director of Changchun Institute of Optics, Fine Mechanics and Physics,
Chinese Academy of Sciences

Fellow of the International Society of Optical Engineering

Fellow of the Chinese Society of Optical Engineering

Fellow of the Chinese Optical Society

Professor Xuejun Zhang has made a series of pioneering work in large-caliber optical processing and testing, and his achievements are mainly reflected in two aspects: The first is to break through and develop high-precision machining equipment, technology and composite testing technology of large aperture aspherical surface. It has successfully developed four generations of large-caliber aspherical surface machining center with independent intellectual property rights, and its technical indicators are equivalent to the highest international level reported, making China the third country with large-caliber space mirror system manufacturing capability after the United States and France. The second is to break through the technical bottleneck of the engineering application of the new optical system represented by the off-axis three-reflection system, and promote the establishment of a new technical system of space remote sensing to Earth in China. A number of models of space cameras and background pre-research projects have adopted the form of off-axis triple reflection optical system that can achieve long focal length and large field of view at the same time, of which 8 cameras have been in orbit service, all of which meet user requirements. Until now, he has obtained 56 authorized invention patents and published 185 papers indexed by SCI and EI. He has won 2 second prizes of National Science and Technology Progress, 2 second prizes of National Technology invention and 1 second prize of National science and Technology Progress, two outstanding scientific and technological achievement Awards of the Chinese Academy of Sciences, two first prizes of military scientific and technological Progress, and two first prizes of Jilin Province Science and Technology.

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Plenary Speech

Prof. Steven Cundiff



Co-Director, Michigan Quantum Research Institute

Harrison M. Randall Collegiate Professor of Physics, University of Michigan

Professor of Electrical Engineering and Computer Science, University of Michigan

JILA Fellow Adjoint

Fellow of Optical Society of America

Fellow of American Physical Society

Fellow of American Association for the Advancement of Science

Fellow of Institute of Electrical and Electronics Engineers

Professor Steven Cundiff's primary research interest is the general area of ultrafast optics. His research areas include the use of ultrafast pulses to study light-matter interactions, as well as their production and manipulation. His primary tool for studying light-matter interaction is multidimensional coherent spectroscopy, which he is currently applying to both semiconductor nanostructures and atomic vapors. He is working on using frequency combs to implement multidimensional coherent spectroscopy and other methods. In 1985, he received his B.A. in physics from Rutgers University. In 1991, he received his M.S. in applied physics from University of Michigan, and his Ph.D. degree in applied physics, also from Michigan, in 1992. To date, Prof. Cundiff has been co-author on over 225 journal papers, 325 contributed conference papers and 150 invited conference presentations. He received University of Michigan Applied Physics Fellowship in 1987 and 1988. In 2001, he received U.S. Department of Commerce Group Gold Medal. In 2005, he was named fellow of the Optical Society of America and American Physical Society. From 2009 to 2013, he won the U.S. Department of Commerce Group Bronze Medal, Alexander von Humboldt Research Award, Meggers Award from the Optical Society of America and US Department of Commerce Silver Medal. In 2004, he was named fellow of IEEE. In 2019, he won the Schawlow Prize in Laser Science from the American Physical Society.

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Plenary Speech

Prof. Sergey Antonovich Chizhik



First Deputy Chairman of the Presidium of the National Academy of Sciences of Belarus

Academician of the National Academy of Sciences of Belarus

Academician of the Belarusian Academy of Engineering

Professor Sergey Antonovich Chizhik works as the Head of the laboratory of the Institute of Heat and Mass Transfer named after A.V. Lykov of the NAS of Belarus. In 1980, he Graduated from Belarusian State University. He obtained the fundamental laws of formation and functioning of precision frictional contact, developed statistical models of contact of multilevel rough surfaces under conditions of effective action of surface forces, which were used in the design of working surfaces in magnetic recording systems, micro-tweezers and micro-electromechanical systems. Under his leadership and with the direct participation of developed methods, created theoretical models and unique equipment for complex analysis of surfaces at the nano level. New procedures in atomic force microscopy have been developed: lateral force spectroscopy, oscillating tribometry, nanowell and drilling. Technologies of membrane-capillary transport were developed to create nano-manipulators based on carbon nanotubes, controlled formation of single nano-objects (particles, wires, nanotubes) on the tip of the probe, followed by evaluation of their physical and mechanical properties. New directions are being developed - nanotomography of the surface layer and cellular nanomechanics. Under his leadership and with direct participation, the development was carried out and for the first time since 1994, production of domestic atomic-force microscopes of the Nanotop and Nanotester series was launched, which are used in dozens of scientific and industrial laboratories of the Republic of Belarus and are also shipped abroad. Member of the editorial boards of the magazines "Proceedings of the National Academy of Sciences of Belarus", "Mechanics of Machines, Mechanisms and Materials", "Mechanical Engineer".

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Plenary Speech

Prof. Seung-Woo Kim



Emeritus Professor, Department of Mechanical Engineering
Korea Advanced Institute of Science and Technology (KAIST)

Professor Seung-Woo Kim obtained his bachelor degree in Mechanical Design from Seoul National University in 1978, and received his MS degree in Mechanical Engineering from the Korea Advanced Institute of Science and Technology (KAIST) in 1980. He went over to United Kingdom in 1981 for further study and obtained his Ph.D. degree in Precision Machine Systems Design from Cranfield University in 1984. He came back to Korea and started his career as a scholar by joining KAIST in 1985. During the last 40 years in the Department of Mechanical Engineering, he has been teaching and leading research graduate students, producing 70 PhD and 39 MSc graduates under his supervision. His professional interests are precision optical technology with specialty on optical-mechanics system synthesis for precision machines design, optical interferometry for 3D surface and thin-film metrology, and ultrafast photonics for nano-scale fabrication and ultra-precision measurements. He has published ~ 250 technical papers in peer-reviewed journals, ~ 650 presentations in conferences, and ~ 80 patents. He has been working as principal investigator for numerous national and industrial research projects including national creative research initiative projects for the development of next generation precision engineering key technologies using femtosecond pulse lasers. He has also actively been involved in international academic societies for organizing on-time conferences for leading-edge precision engineering optical technologies. He was president of the Korea Society of Precision Engineering (KSPE) during the term of 2011 and is a member of Optica (Optical Society of America), SPIE (International Society of Optical Engineering), CIRP (International Academy for Production Engineering), and KSME (Korea Society of Mechanical Engineering).

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Plenary Speech

Prof. Xiang Fang



Chairman of Technical Committee for Gas Analysis, International Organization for Standardization(ISO/TC158)

Chairman of Analytical instrument branch of China Instrumentation Society

Vice President of China Society of Metrology and Testing

Chairman of the Mass Spectrometry Branch of the Chinese Physical Society

Director of National Center for Time and Frequency Measurement

Director of National Research Center for Standard Substances

Professor Xiang Fang graduated from Changchun College of Geology in 1984, and successively served as a researcher of Yichang Institute of Geology and Minerals of the Ministry of Geology and Minerals, deputy director of the National Research Center for Standard Substances, vice president of the Chinese Academy of Metrology Sciences, vice president of the China Institute of Standardization, and Chief engineer and deputy director of the National Standardization Administration in 2007. From 2014 to April 2024, he served as President of the Chinese Academy of Metrology, director of the National Center for Time and Frequency Metrology, and Director of the National Research Center for Standard Substances. He has been engaged in measurement technology and instruments, standardization and stoichiometry for a long time, and is an important discipline leader in mass spectrometry technology research in China. He has presided over a number of national major research tasks, achieved a series of creative research results, independent research and development of mass spectrometers to break foreign monopoly, in ultra-trace substances precision measurement technology and instruments have made a series of breakthroughs. He won two national Science and Technology Progress prizes as the first complete person.

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Plenary Speech

Prof. Jens Flügge



Head of Department 5.2 “Dimensional Nanometrology”, PTB

Coordinator of the EU projects

Associate Editor of the journal “Precision Engineering”

Professor Jens Flügge Jens Flügge was born in 1963. He received the Diploma degree in Electrical Engineering from the Technical University (TU) Braunschweig, Germany, and the Ph.D degree in mechanical engineering from Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen, Germany, in 1988 and 1996 respectively.

He was a co-worker at the Preussag Pure Metals GmbH in 1988 and the Dr. Johannes Heidenhain GmbH, Traunreut from 1994 to 1996. From 1989 to 1994 and in 1996, he joined the Physikalisch-Technischen Bundesanstalt (PTB), Braunschweig, Germany, as a scientific co-worker. From 1999 to 2005, he was a lecturer for operating systems in Technical Computer Science for Mechanical Engineers at the Hannover University of Applied Sciences. From 2011 to 2016, he acted as a coordinator for EU funded joint projects in the EMRP program. From 2016 to 2019, he was associate editor of the journal Precision Engineering. Since 2010, he is head of the department for “Dimensional Nanometrology” at PTB in Braunschweig, Germany.

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Plenary Speech

Prof. Mona Jarrahi



Fellow of IEEE

Honorary Member of IEEE Eta Kappa Nu

Fellow of Institute of Physics

Fellow of Optical Society

Fellow of International Society of Optical Engineers

Fellow of American Physical Society

Professor Mona Jarrahi is the Professor and Northrop Grumman Endowed Chair in Electrical and Computer Engineering and the Director of the Terahertz Electronics Laboratory at UCLA. She received her B.S. degree in Electrical Engineering from Sharif University of Technology in 2000 and her M.S. and Ph.D. degrees in Electrical Engineering from Stanford University in 2003 and 2007. She has made significant contributions to the development of ultrafast electronic and optoelectronic devices and integrated systems for terahertz, infrared, and millimeter-wave sensing, imaging, computing, and communication systems by utilizing novel materials, nanostructures, and quantum structures as well as innovative plasmonic and optical concepts. The outcomes of her research have appeared in more than 300 publications and 270 invited talks and have received several prestigious awards including the Presidential Early Career Award for Scientists and Engineers; Bessel Research Award from Alexander von Humboldt Foundation; Moore Inventor Fellowship from the Gordon and Betty Moore Foundation; Harvey Engineering Research Prize from the Institution of Engineering and Technology; and Aron Kressel Award from IEEE Photonics Society.

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Plenary Speech

Mr. Zhanjiang Sui



President of Hexagon Intelligent Manufacturing Solution Group and executive dean of Academy of Technology

Advisory member of the National Professional Metrology Technical Committee

Vice-chairman of the Shandong Geometrical Measurement Technical Committee

Mr. Zhanjiang Sui has served as director of Product R&D Center, and general manager of Manufacturing Division; Ocean University of China MBA, PhD candidate in advanced manufacturing at Tianjin University; serving as an advisory member of the National Professional Metrology Technical Committee, and vice chairman of the Shandong Geometrical Measurement Technical Committee.

He has more than 20 years of experience in R&D and manufacturing of precision metrology systems. He is responsible for leading the introduction and development of a variety of international high-end CMM product lines. And based on the Chinese market demand, he is also leading the Academy of Technology Team to research and develop the special CMM solutions, automated inspection and processing production lines for new industries and new application scenarios. He is responsible for leading the construction of interconnected Hexmart Smart Factory Management System Platform, and he has been in charge of planning and construction implementation of the Hexagon Qingdao Smart Factory architecture.

He owns about 20 valid precision metrology technology patents, and has participated in the compilation of a number of national standards and group standards, covering the fields of GPS CMM, smart factory, digital supply chain and industrial chain and so on.

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Hotel Room Reservation

The conference provides the accommodation reservation at **SHERATON QINGDAO JIAOZHOU HOTEL, Qingdao, China** for all the attendees with a special discount.

The hotel offers:

Standard Room (Two single beds): 460 RMB per room per night

King-size Room (One double bed): 460 RMB per room per night

All the attendees can make room reservations before July 25, 2024 with an advance payment depending on the room charge per night.

(Through the email ispemi-icmi@outlook.com with subject 'Room Reservation')

Payment

Bank transfer (Mainland China)

Account Holder Name: HC Convention and Exhibition Company

Account Number: 1689 8819 5070

Bank Branch Name: BANK OF CHINA, HEILONGJIANG BRANCH, XIANGFANG SUB-BRANCH

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开户行: 中国银行哈尔滨香坊支行

Important notes: Please attach your name, paper ID, and ISPEMI 2024 with the transfer.

Contact Information

Post Address: P.O.Box 3018, Science Park, Harbin Institute of Technology, No.2 Yikuang Street, Nangang District, Harbin 150080, China

Tel/Fax: +86-451-86402258

Website: <http://www.ispemi-icmi.org.cn/>

E-mail: ispemi-icmi@outlook.com