nanoMan / ICMTE 2026

April 12 SUN-15 WED, 2026

ST Center, Seoul, Korea

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KSMTE Korean Society of Manufacturing Technology Engineers

ISNM

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50 KIMM since 1976 Machinery Moves the World

METERLAB Advanced Optical Sensing

JS PRECISION ULTRA PRECISION TOTAL SOLUTION

TechMAC Co., Ltd. Advanced Precision System

SIMTOS 2026 4.13(Mon)-17(Fri) KINTEX

(주)네오나노텍

KATECH KOREA AUTOMOTIVE TECHNOLOGY INSTITUTE 한국자동차연구원

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Welcome Message

Dear nanoMan/ICMTE 2026 Participants,

On behalf of the Conference Committee, I would like to warmly welcome you to the conference being held at ST Center, Seoul Korea, from 12 to 15 of April, 2026.

The nanoMan conference is organized by the International Society for Nanomanufacturing (ISNM). It has been successfully held 9 times since the first nanoMan at Singapore in 2008 founded by Professor Fengzhou Fang. An excellent platform will be provided in nanoMan2026 for scientists, engineers and students working/learning to exchange the newest ideas on nanomanufacturing, which is an important discipline of manufacturing. Fortunately, this year's nanoMan conference will be a joint event with the 12th International Conference of Manufacturing Technology Engineers (ICMTE 2026) where the extreme precision of nanotechnology (nanoMan) meets the robust scalability of manufacturing engineering (ICMTE). This joint conference is not just two events sharing a venue. I believe the synergistic effect of these two conferences will bridge the gaps between advanced manufacturing and traditional manufacturing, as well as to create new ideas for future manufacturing technologies.

I would like to take this opportunity to sincerely thank the organizers from ICMTE side; Prof. Jae-Woong Youn of Daegu University, Korea, Prof. Seong Chan Jun of Yonsei University, and Dr. Jooho Hwang of KIMM for their collaborative work that makes this joint event possible.

For colleagues from nanoMan side, I would like to first thank Dr. Seung-Kook Ro of KIMM, who has been continuously devoted himself in the organizing work since four years ago when he made the first proposal on nanoMan2026. Dr. Ro is a very professional, responsible and reliable person. He is one of the "key men" to make this conference successful. I would like to thank my co-chairs: Prof. Enrico Savio from University of Padova, Italy, Dr. Yeong-Eun Yoo of KIMM, Korea, Prof. Takahashi Satoru of The University of Tokyo, Japan, Prof. XiaoKang Liu of Chongqing University of Technology, China, as well as all the committee members for their supportive work on this conference. I would also like to thank the secretary team; Ms. JiSookKim, Ms. Ji Eun Lee, and Ms. Hye-WonKimfor their excellent work.

Finally, I would like to thank the Plenary/Keynote/Invited Speakers and all the authors of the papers in the technical sessions for coming across the world to share their state-of-the-art research work covering a wide range of nanomanufacturing and other manufacturing technologies. The work of all the reviewers for reviewing the papers is also appreciated.

Seoul is a beautiful and dynamic city with friendly people and delicious food, as well as the peak of spring in April – making it the perfect place and season for nanoMan/ICMTE 2026! Let's enjoy the conference and our stay in Seoul!

Best regards,

nanoMan/ICMTE 2026 Conference Chair
Wei Gao, Tohoku University, Japan

Welcome Message

Welcome Message

On behalf of the Korean Society of Manufacturing Technology Engineers (KSMTE), it is our great pleasure to invite you to join the 12th International Conference of Manufacturing Technology Engineers (ICMTE 2026), to be held in Seoul, Korea.

ICMTE 2026, as a convergence of manufacturing and nano-microtechnology, aims to provide a dynamic platform for sharing new ideas, recent technological advancements, and future research directions. The conference brings together experts from academia, research institutions, and industry to foster meaningful discussions and collaborations across a wide range of fields, including advanced manufacturing, nanotechnology, robotics, and intelligent production systems.

In an era of accelerated digital transformation driven by the integration of artificial intelligence, data-driven systems, and hyper-connectivity, manufacturing technologies are rapidly evolving. As global industries face increasingly complex challenges, the demand for innovative solutions—such as autonomous and smart manufacturing—continues to grow. In this context, the importance of interdisciplinary research and international collaboration has become more critical than ever.

Seoul, the capital of Korea, is a vibrant city where tradition and innovation coexist, offering an inspiring setting for academic exchange and international collaboration. Located just north of Seoul, Goyang is one of the largest satellite cities in the capital region and the host city of SIMTOS 2026. With its dynamic cultural atmosphere and modern infrastructure, Goyang offers visitors a unique blend of industrial innovation and leisure experiences. We hope that your visit to both Seoul and Goyang will be professionally rewarding as well as personally enjoyable.

We look forward to welcoming you.

Thank you very much.

nanoMan/ICMTE 2026 Conference Chair
Jae-Woong Youn, Daegu University, Korea

Conference Venue

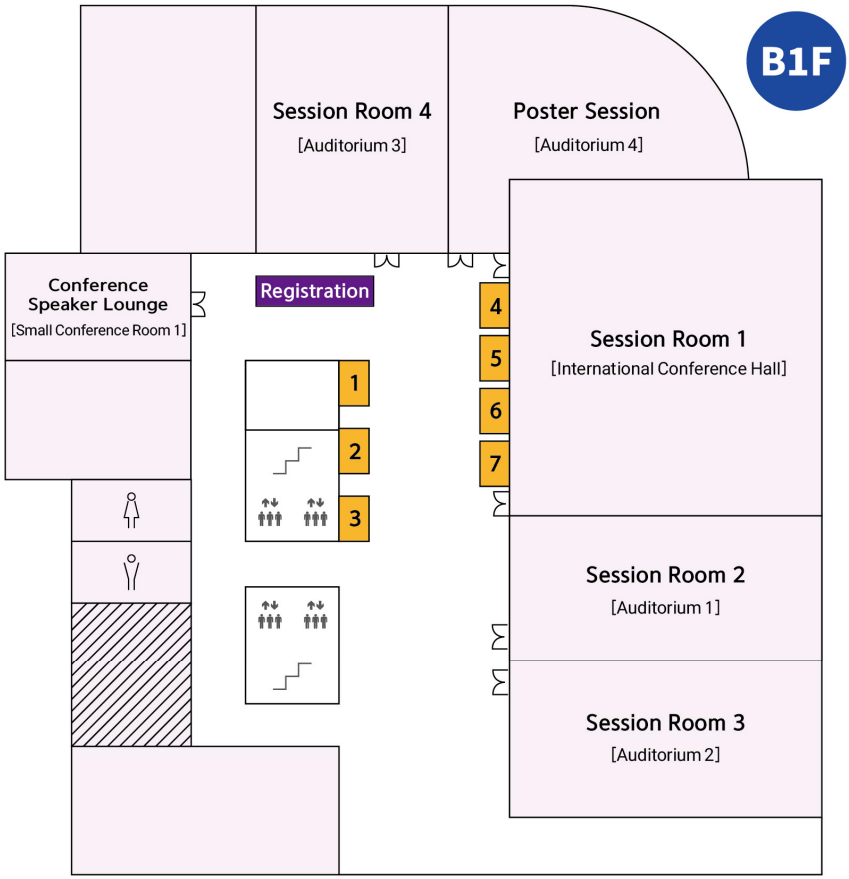
◉ **ST Center** (Science and Technology Convention Center)

[Address] B1F, The Korea Science and Technology Center Building I, 22, 7gil, Teheran-ro, Gangnam-gu, Seoul 06130, Korea

Place – ST Center

Place		
Registration	April 12 (Sun)	Main Lobby (1F)
	April 13-14 (Mon-Tue)	Lobby (B1F)
Opening Ceremony & Plenary Speech 1, 2, 3, 4		International Conference Hall (B1F)
Session Room 1		International Conference Hall (B1F)
Session Room 2		Auditorium 1 (B1F)
Session Room 3		Auditorium 2 (B1F)
Session Room 4		Auditorium 3 (B1F)
Industry Session		International Conference Hall (B1F)
Poster Session		Auditorium 4 (B1F)
Council Meeting [April 12 (Sun)]		Small Conference Room 1 (B1F)
Conference Speaker Lounge [April 13-14 (Mon-Tue)]		Small Conference Room 1 (B1F)
Lunch [April 13-14 (Mon-Tue)]		International Conference Hall (B1F)
Welcome Reception [April 12 (Sun)]		"Busan Samjung (부산 삼정)" - Korean restaurant
Conference Banquet [Conference Dinner, April 13 (Mon)]		"FLOATING ISLAND - Anniversary Hall"
Technical Tour		SIMTOS 2026 - KINTEX, Goyang (Ilsan)

Floor Plan & Exhibition Booth



Booth No	Organization	Booth No	Organization
1	NEO NANOTECH	5	Meter-Lab. Inc.
2	Korea Institute of Machinery & Materials	6	JS Precision
3	Korea Automotive Technology Institute	7	Springer Nature
4	TechMAC		

Program at a Glance

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(Sun)</th><th>April 13
(Mon)</th><th>April 14
(Tue)</th><th>April 15
(Wed)</th></tr>
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&
Welcome</td><td>Registration
(ST Center)</td><td>Registration
(ST Center)</td><td></td></tr>
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including keynote
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(09:00-10:50)</td><td>Transportation to
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<tr><td>10:00-11:00</td><td>Plenary Speech 1 & 2
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(11:00-11:05)
Tea Break
(11:05-11:20)
Plenary Speech 3
(11:20-12:00)</td><td rowspan="3">Poster Session II
and
Industry Session
(10:50-12:00)</td></tr>
<tr><td>12:00-13:00</td><td>Lunch Break</td><td>Lunch Break</td><td>Lunch Break</td></tr>
<tr><td>13:00-14:00</td><td>ISNM General
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(Parallel session
including keynote
and invited speech)
(13:00-15:00)</td><td>Back to
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(Parallel session
including keynote
and invited speech)
(15:20-17:45)</td><td>Technical Session IV
(Parallel session
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and invited speech)
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<tr><td>17:00-18:00</td><td>Closing remarks
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<tr><td>18:00-19:00</td><td rowspan="2">Welcome
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(18:00-20:00)</td><td>Transportation
(First bus starts on 17:25)
(17:25-18:30)</td><td rowspan="2"></td></tr>
<tr><td>19:00-20:00</td><td>Conference Banquet
(including Awards)
(18:30-20:30)</td></tr>
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Registration Information

◉ **Date / Place**

April 12 (Sun) 16:00-18:00 / ST Center main lobby, 1F

April 13-14 (Mon-Tue) 08:50-16:30 / ST Center lobby, B1F

◉ **Registration Fee**

Category		Regular	Student	ISNM Member
On-Site Registration	KRW	950,000	475,000	760,000
	USD	700	350	560

- On-site registration is available by credit card or cash (KRW).
- Please check your registration at the Registration Desk using your name.

Welcome Reception

◉ **Date:** April 12 (Sun) | 18:00-20:00

◉ **Place:** Busan Samjeong (부산 삼정) - Korean restaurant

◉ **Address:** 1F, IBC Officetel, 8, Teheran-ro 7-gil, Gangnam-gu, Seoul 06133, Korea

◉ **Location:** 2-minute walk from the conference venue (ST Center)

Lunch

◉ **Date:** April 13-14 (Mon-Tue) | 12:00-13:00

◉ **Place:** ST Center B1F - International Conference Hall

- A lunch box will be provided in the International Conference Hall and should be exchanged for a lunch coupon.
- Lunch coupons cannot be exchanged for other dates.
- An additional lunch coupon can be purchased at the registration desk by credit card & cash. (KRW 20,000)

Conference Banquet

◉ **Date:** April 13 (Mon) | 18:30-20:30

◉ **Place:** FLOATING ISLAND - Anniversary Hall

◉ **Address:** 2085-14, Olympic-daero, Seocho-gu, Seoul 06500, Korea

- A banquet coupon will be provided to all registered participants and those who have separately purchased a banquet coupon. Additional banquet coupons can be purchased at the registration desk by credit card or cash (KRW).

◉ **Best Paper Awards Ceremony**

- The Best Paper Awards ceremony will be held during the banquet.

◉ **Transportation to the banquet (shuttle bus) - 2 times**

- **Place:** ST Center - Main Lobby (1F)
- **Date:** April 13 (Mon)
  - ① First bus starts on 17:25
  - ② Second bus starts on 17:50

- Approximately 20-25 minutes will be required.
- After the banquet, the bus will depart from the Floating Island parking lot at 20:30, with drop-off available at Sinnonhyeon Station, Gangnam Station and Yeoksam Station.

Special Session

◉ Special Session

Session Chair: Prof. Fengzhou Fang (Tianjin University, China)

Plenary Speech 1

Speech title : Feynman's and Faraday's Legacy to Nanomanufacturing
Speaker : Prof. J. A. McGeough (The University of Edinburgh, UK)
Place : International Conference Hall
Date : April 13 (Mon), 09:40-10:20

Session Chair: Prof. Wei Gao (Tohoku University, Japan)

Plenary Speech 2

Speech title : Metal-Polymer Multi Materials Using Nano/Micro Textures
Speaker : Prof. Yusuke Kajihara (The University of Tokyo, Japan)
Place : International Conference Hall
Date : April 13 (Mon), 10:20-11:00

Session Chair: Prof. Shuming Yang (Xian Jiaotong University, China)

Plenary Speech 3

Speech title : Advancing from Classical to Quantum Precision Displacement Measurement: State-of-the-Art and Atomic Time Grating Sensors
Speaker : Prof. Xiaokang Liu (Chongqing University of Technology, China)
Place : International Conference Hall
Date : April 13 (Mon), 11:20-12:00

Session Chair: Dr. Seung-Kook Ro (Korea Institute of Machinery & Materials, Korea)

Plenary Speech 4

Speech title : Ultra Precision Story in KIMM
Speaker : Dr. Chun-Hong Park (Korea Institute of Machinery & Materials, Korea)
Place : International Conference Hall
Date : April 13 (Mon), 14:00-14:40

Technical Session

◉ Technical Session 1

Session Chairs: Dr. RONGYAN SUN (The University of Osaka, Japan),
Prof. Hui Deng (Southern University of Science and Technology, China)

Keynote Speech 1

Speech title : Atomic and close-to-atomic scale manufacturing processes
Speaker : Prof. Xichun Luo (University of Strathclyde, UK)
Place : International Conference Hall
Date : April 13 (Mon), 15:20-15:50

Invited Speech 1

Speech title : Atomic-scale manufacturing through enzymatic hydrolysis machining
Speaker : Prof. Hui Deng (Southern University of Science and Technology, China)
Place : International Conference Hall
Date : April 13 (Mon), 15:50-16:10

Session Chairs: Dr. So Ito (Toyama Prefectural University, Japan),
Prof. Kai Meng (Nanjing University of Aeronautics and Astronautics, China)

Keynote Speech 2

Speech title : Deep Learning Enabling Intelligent Fringe Structured Light 3D Measurement
Speaker : Prof. Xinghui Li (Tsinghua University, China)
Place : Auditorium 1
Date : April 13 (Mon), 15:20-15:50

Invited Speech 2

Speech title : Optical overlay metrology for semiconductor manufacturing
Speaker : Prof. Kai Meng (Nanjing University of Aeronautics and Astronautics, China)
Place : Auditorium 1
Date : April 13 (Mon), 15:50-16:10

Session Chairs: Dr. Yang Yin (Southwest Jiaotong University, China),
Prof. Masaki Michihata (The University of Tokyo, Japan)

Keynote Speech 3

Speech title : Material-Specific Transient Near-Surface Modulation Strategies for Advancing Ultra-Precision Machinability
Speaker : Prof. Hao Wang (National University of Singapore, Singapore)
Place : Auditorium 2
Date : April 13 (Mon), 15:20-15:50

Invited Speech 3

Speech title : Fluorescence-based on-machine surface metrology for mechanical machining
Speaker : Prof. Masaki Michihata (The University of Tokyo, Japan)
Place : Auditorium 2
Date : April 13 (Mon), 15:50-16:10

Session Chairs: Prof. Seokmin Kim (Chung-Ang University, Korea),
Prof. Honggang Zhang (Beijing University of Technology, China)

Keynote Speech 4

Speech title : Laser interference lithography for the fabrication of further flexible fine pattern structures
Speaker : Prof. Yuki Shimizu (Hokkaido University, Japan)
Place : Auditorium 3
Date : April 13 (Mon), 15:20-15:50

Invited Speech 4

Speech title : Leap from conventional ultra-precision electroforming to digital twin electroforming
Speaker : Prof. Honggang Zhang (Beijing University of Technology, China)
Place : Auditorium 3
Date : April 13 (Mon), 15:50-16:10

◉ Technical Session 2

Session Chairs: Dr. Zili Zhang (The Hong Kong Polytechnic University, Hong Kong, China), Prof. Young Hak Cho (Seoul National University of Science and Technology, Korea)

Keynote Speech 5

Speech title : Plasma-Assisted Polishing as a Game-Changing Technology for Diamond Substrate Manufacturing
Speaker : Prof. Kazuya Yamamura (The University of Osaka, Japan)
Place : International Conference Hall
Date : April 14 (Tue), 09:00-09:30

Session Chairs: Dr. Zexiao Li (Tianjin University, China), Prof. Ryo Sato (Tohoku University, Japan)

Keynote Speech 6

Speech title : Nano probes for the measurement of structured surfaces
Speaker : Prof. Shuming Yang (Xi'an Jiaotong University, China)
Place : Auditorium 1
Date : April 14 (Tue), 09:00-09:30

Invited Speech 5

Speech title : Dual-detection confocal probes for precision measurements
Speaker : Prof. Ryo Sato (Tohoku University, Japan)
Place : Auditorium 1
Date : April 14 (Tue), 09:30-09:50

Session Chairs:
Prof. Kaiyuan You (University of Electronic Science and Technology of China, China),
Prof. Lei Chen (Southwest Jiaotong University, China)

Keynote Speech 7

Speech title : Synergistic Tuning of Mechanical Performance via Atomic-Scale Surface Precision and Modification
Speaker : Prof. Lei Chen (Southwest Jiaotong University, China)
Place : Auditorium 2
Date : April 14 (Tue), 09:00-09:30

Invited Speech 6

Speech title : Modeling and control of material removal uniformity in silicon wafer polishing
Speaker : Prof. Urara Satake (The University of Osaka, Japan)
Place : Auditorium 2
Date : April 14 (Tue), 09:30-09:50

Session Chairs: Prof. Kenta Nakazawa (Shizuoka University, Japan),
Prof. Jianlei Cui (Xi'an Jiaotong University, China)

Keynote Speech 8

Speech title : From Scalable Nanomanufacturing to ACSM: Bridging Structural Design and Molecular Regulation for Bio-inspired Functional Interfaces
Speaker : Prof. Jining Sun (Dalian University of Technology, China)
Place : Auditorium 3
Date : April 14 (Tue), 09:00-09:30

Invited Speech 7

Speech title : Research on Laser High Performance Manufacturing Method and Mechanism of Carbon-based Transistors
Speaker : Prof. Jianlei Cui (Xi'an Jiaotong University, China)
Place : Auditorium 3
Date : April 14 (Tue), 09:30-09:50

◉ Technical Session 3

Session Chair: Dr. Sung Joon Kim (Korea Institute of Machinery & Materials, Korea)

Keynote Speech 9

Speech title : Additive Manufacturing into Mainstream Manufacturing Processing
Speaker : Prof. Patrick Kwon (San Diego State University, United States)
Place : International Conference Hall
Date : April 14 (Tue), 13:00-13:30

Invited Speech 8

Speech title : Study on Using Hybrid Neural Networks and Transfer Learning for Tool Remaining Useful Life Monitoring Method and System
Speaker : Prof. Shih-Ming Wang (National Chung Hsing University, Taiwan)
Place : International Conference Hall
Date : April 14 (Tue), 13:30-13:50

Session Chairs: Dr. Changshuai Fang (Tianjin University, China),
Prof. Yangjin Kim (Pusan National University, Korea)

Invited Speech 9

Speech title : Phase calculation theory from fringe patterns for precision interferometric measurement
Speaker : Prof. Yangjin Kim (Pusan National University, Korea)
Place : Auditorium 1
Date : April 14 (Tue), 13:00-13:20

Session Chair: Dr. Mincheol Kim (Korea Basic Science Institute, Korea)
Dr. Zhichao Geng (University College Dublin, Ireland)

Keynote Speech 10

Speech title : Ultra-precision Machining (UPM) for Optical Applications
Speaker : Prof. Kui Liu (Nanjing University of Aeronautics & Astronautics, China)
Place : Auditorium 2
Date : April 14 (Tue), 13:00-13:30

Invited Speech 10

Speech title : Enhancing the Fabrication Efficiency of Ultra-Precision X-ray Mirrors through a Spatial Frequency-Based Refinement Model
Speaker : Dr. Mincheol Kim (Korea Basic Science Institute, Korea)
Place : Auditorium 2
Date : April 14 (Tue), 13:30-13:50

Session Chair: Prof. Ming-Chyuan Lu (National Chung Hsing University, Taiwan)
Dr. Yasutomo Sugisawa (Toyama Prefectural University, Japan)

Keynote Speech 11

Speech title : Advanced monitoring and measurement technologies for ultra-precision machining
Speaker : Prof. Yuan-Liu Chen (Zhejiang University, China)
Place : Auditorium 3
Date : April 14 (Tue), 13:00-13:30

Keynote Speech 12

Speech title : Ultra-precision Manufacturing of Optical Materials for Advanced Photonic Devices
Speaker : Prof. Yasuhiro Kakinuma (Keio University, Japan)
Place : Auditorium 3
Date : April 14 (Tue), 13:30-14:00

◉ Technical Session 4

Session Chairs: Dr. Tianyu Guan (University College Dublin, Ireland),
Prof. Jong G. Ok (Seoul National University of Science and Technology, Korea)

Keynote Speech 13

Speech title : S.M.A.R.T. (Scalable, Mechanical, Agile, Reproducible, Thrifty) Manufacturing of Precision Architectures
Speaker : Prof. Jong G. Ok (Seoul National University of Science and Technology, Korea)
Place : International Conference Hall
Date : April 14 (Tue), 15:20-15:50

Session Chairs: Dr. Jooho Hwang (Korea Institute of Machinery & Materials, Korea)
Dr. Tsutomu Uenohara (The University of Osaka, Japan)

Invited Speech 11

Speech title : Efficient ultrashort pulse laser processing of diamond
Speaker : Prof. Reina Yoshizaki (The University of Tokyo, Japan)
Place : Auditorium 1
Date : April 14 (Tue), 15:20-15:40

Industry Session

◉ **Date:** April 14 (Tue) | 11:00-12:00

◉ **Place:** ST Center B1F - International Conference Hall

◉ **Session Chair :** Dr. Jooho Hwang (Korea Institute of Machinery and Materials, Korea)

Time	Title	Presenter (Affiliation)
11:00-11:20	**[Keynote Speech]** Industrial needs and related optical measurement technologies for Advanced Semiconductor Packaging	CEO Joonho You (Nexensor Inc.)
11:20-11:30	Optical Metrology for Advanced Manufacturing: Our Technologies and Applications	Senior researcher Jaeseok Bae (Meter-Lab. Inc.)
11:30-11:40	Introduction of Ultra Precision Machine	Head of R&D Center Won-Jae Lee (JS Precision, co., Ltd.)
11:40-11:50	Total In-house Solutions : From Precision Systems to High-Performance PCD Micro drill	Senior researcher Sangjin Lee (TechMAC, co., Ltd.)
11:50-12:00	Advanced Microfluidic Platform for Scaling Lipid Nanoparticle Production	CEO Sunghoon Kim (NEO NANOTECH)

Technical Tour - SIMTOS 2026

SIMTOS 2026 is the largest manufacturing technology exhibition in Korea, showcasing the latest machinery, manufacturing technologies, and industrial solutions in one comprehensive platform. The exhibition will be held from **April 13–17, 2026**, at **KINTEX, Goyang (Ilsan), Korea**, featuring advanced manufacturing technologies such as AI-driven autonomous manufacturing and smart factories, along with various concurrent events.

◉ **Date & Time:** April 15 (Wed), 09:00-14:00

◉ **Venue :** KINTEX, Goyang (Ilsan), Korea

◉ **Transportation Options**

- **Chartered Bus** (Departure together from ST Center (main lobby 1F) on 08:50)
- **Public Transportation** (Individual travel)

⊙ Session Room 1 - International Conference Hall

Session Chairs: Dr. Rongyan Sun (The University of Osaka, Japan),
Prof. Hui Deng (Southern University of Science and Technology, China)

Atomic and Close-to-Atomic Scale Machining (ACSM) I **International Conference Hall**

15:20-15:50 Keynote Atomic and close-to-atomic scale manufacturing processes
Hanyu Wang (University of Strathclyde, UK),
Jian Gao (University of Strathclyde, UK; NWO-I Institute AMOLF, Netherlands)
Atiye Khosavi, Hifza Hafeez, Zhengjian Wang, Xichun Luo* (University of Strathclyde, UK)

15:50-16:10 Invited Atomic-scale manufacturing through enzymatic hydrolysis machining
Hui Deng* (Southern university of Science and Technology, China)

16:10-16:25 P00006 Polishing characteristics of aluminum nitride ceramics by plasma-assisted polishing
Rongyan Sun*, Tong Tao, Yuji Ohkubo, Kazuya Yamamura (The University of Osaka, Japan)

16:25-16:40 P00076 A novel method for efficient and high-quality mechanical polishing of polycrystalline diamond assisted by oxygen ion implantation
Xiang Zhou*, Han Zhang, Yang Wang (Southwest Jiaotong University, China)

16:40-16:55 P00154 Study on the plasma-assisted cutting of matels and alloys by grain-size control and near-surface purification
Peng Lyu* (Chinese Academy of Sciences, China),
Yuexiang Wang, Wenjia Wang, Fengzhou Fang (Tianjin University, China)

16:55-17:10 P00163 Achieving ultra-smooth and damage-free surface on deep structure through understanding the material removal mechanism of the modification layer
Haixiang Hu*, Fengwei Guan, Lingtong Zhang, Longxiang Li, Wenhao Li
(CIOMP, Chinese Academy of Sciences, China)

17:10-17:25 P00066 Atomistic study of material removal behavior during ultrasonic vibration assisted nanoscratching of single-crystal AlN
Chen Xiao* (Southwest Jiaotong University, China)

April 13 (Mon) Oral Session

Session Chairs: Dr. So Ito (Toyama Prefectural University, Japan),
Prof. Kai Meng (Nanjing University of Aeronautics and Astronautics, China)

Measurement & Metrology I — Auditorium 1

15:20-15:50 **Keynote** Deep Learning Enabling Intelligent Fringe Structured Light 3D Measurement
Xinghui Li* (Tsinghua Shenzhen International Graduate School, China), Yiming Li (Pengcheng Laboratory, China), Hao Wang (Tsinghua Shenzhen International Graduate School, Pengcheng Laboratory, China)

15:50-16:10 **Invited** Optical overlay metrology for semiconductor manufacturing
Kai Meng*, Kai Wang, Daiyi Hu, Haohao Wang, Jiahao Lu (Nanjing University of Aeronautics and Astronautics, China)

16:10-16:25 **P00028** Near-Atomic-Scale Conjugate Self-Calibration of a Large-scale Planar Two-Dimensional Variable-line-spacing Grating via Laser Phase-Shifting Interferometry
Xin Xiong*, Chong Chen, Yijun Guo, Zhiyin He, Ziran Chen (Chongqing University of Technology, China)

16:25-16:40 **P00007** Form measurement of hand-scraped surfaces using an Abramson oblique-incident interferometer
So Ito*, Takumi Yamagishi, Kenta Matsumoto, Kimihisa Matsumoto, Kazuhide Kamiya (Toyama Prefectural University, Japan)

16:40-16:55 **P00096** Nanoscale Thermal Characterization of Metal Thin Films with Varying Thickness Using Passive Scattering-Type Scanning Near-Field Optical Microscopy
Yongzhi Wang*, Kuan-ting Lin (The University of Tokyo, Japan), Guokang Zhang (The University of Tokyo, Japan; Fudan University, China), Yusuke Kajihara (The University of Tokyo, Japan)

16:55-17:10 **P00034** Three-Axis surface encoder based on Littrow Configuration
Zhi-Yang Zhang*, Yu-Ta Yoshimura, Yi-Fan Hong, Ryo Sato, Wei Gao (Tohoku University, Japan)

17:10-17:25 **P00168** Fabrication and growth properties of spherical diamond shell through microwave plasma chemical vapor deposition
Hui Li*, Shiquan Liu, Wei Lv, Ruiyang Xiao, Yuan-Liu Chen (Zhejiang University, China)

17:25-17:40 **P00017** High-Precision Measurement of Complex Reflective Surfaces Based on Mobile Multi-Line Projection
Xinyuan Cao*, Changshuai Fang, Xiaodong Zhang (Tianjin University, China)

⊙ Session Room 3 - Auditorium 2

Session Chairs: Dr. Yang Yin (Southwest Jiaotong University, China),
Prof. Masaki Michihata (The University of Tokyo, Japan)

Micro/Nano - Machining I **Auditorium 2**

15:20-15:50 Keynote Material-Specific Transient Near-Surface Modulation Strategies for Advancing Ultra-Precision Machinability

Hao Wang* (National University of Singapore, Singapore)

15:50-16:10 Invited Fluorescence-based on-machine surface metrology for mechanical machining

Masaki Michihata* (The University of Tokyo, Japan)

16:10-16:25 P00060 Ultra-Precision Manufacturing of Silicon Carbide Crystals and Composite Materials for High-Performance Applications

Yang Yin*, Lei Chen, Linmao Qian (Southwest Jiaotong University, China)

16:25-16:40 P00133 Integrating Coating Technology and Nanometer-level Polishing for High-Performance Polymer-Metal Hydraulic Tribopairs

Duoxun Fang*, Lei Chen (Southwest Jiaotong University, China)

16:40-16:55 P00158 Cup Wheel Material Removal Mechanism Based on Trochoidal Model: Transition from Scratching to Grinding

Pengcheng Zhao*, Bin Lin (Tianjin University, China),
Feifei Zhao (China Aerodynamics Research and Development Center, China),
Jingguo Zhou, Tianyi Sui (Tianjin University, China)

16:55-17:10 P00048 Study on manufacture approach of optical freeform surfaces by performance evaluation

Xianlei Liu* (Tianjin University, China)

April 13 (Mon) Oral Session

⊙ Session Room 4 - Auditorium 3

Session Chairs: Prof. Seokmin Kim (Chung-Ang University, Korea),
Prof. Honggang Zhang (Beijing University of Technology, China)

Micro/Nano - Patterning I — **Auditorium 3**

15:20-15:50 Keynote Laser interference lithography for the fabrication of further flexible fine pattern structures
Yuki Shimizu* (Hokkaido University, Japan)

15:50-16:10 Invited Leap from conventional ultra-precision electroforming to digital twin electroforming
Tianyu Zhan (Beijing University of Technology, China),
Chengwei Kang (Xi'an Jiaotong University, China),
Honggang Zhang* (Xi'an Jiaotong University, China)

16:10-16:25 P00033 Fabrication of anti-reflective nano-lens array on chalcogenide glass by novel glass- to-glass molding
Tao Zhu*, K. S. Li, F. Gong (Shenzhen University, China)

16:25-16:40 P00063 Anti-bacterial surface with micro-grooves from ultra-precision machining for public lifts
Yang Lam Gladys Chan*, Suet To (The Hong Kong Polytechnic University, Hong Kong, China),
Yang Xu, Mitch Li (The Hong Kong University of Science and Technology, China, Hong Kong, China)

16:40-16:55 P00084 Interference Lithography for Standing Wave Suppression Based on Spatial Polarization Modulation
Tianshi Lu*, Hao Lv, Xinghui Li (Tsinghua University, China)

16:55-17:10 P00155 Genetic-Algorithm-Based Research on Key Technologies for Motion System Calibration and Error Control for the Precision Marking System
Jiang Li*, Xiaodong Zhang (Tianjin University, China)

17:10-17:25 P00167 Coaxial Laser Confocal Measurement for In-situ Surface Topography in Ultrafast Laser Processing
Ruiyang Xiao*, Chong-Kuong Ng, Xiaoying Zhang, Yuan-Liu Chen (Zhejiang University, China)

17:25-17:40 P00042 Enhanced Fluorescence Microarray Platform Using Selectively Fabricated Ag Nanorods on Micropost Arrays for Multiplex Biomarker Quantification
Seongmin Lee, Seok-min Kim* (Chung-Ang University, Korea)

⊙ Session Room 1 - International Conference Hall

Session Chairs: Dr. Zili Zhang (The Hong Kong Polytechnic University, Hong Kong, China), Prof. Young Hak Cho (Seoul National University of Science and Technology, Korea)

Atomic and Close-to-Atomic Scale Machining (ACSM) II — **International Conference Hall**

09:00-09:30 Keynote Plasma-Assisted Polishing as a Game-Changing Technology for Diamond Substrate Manufacturing

Kazuya Yamamura* (The University of Osaka, Japan)

09:30-09:45 P00026 Atomic-scale Insights into the Generation of Atomically Smooth Diamond Surfaces via Microwave Plasma-Assisted Polishing

Chunhong Li*, Jinhao Zhang, Yongjie Zhang, Hui Deng (Southern University of Science and Technology, China)

09:45-10:00 P00040 Novel submerged air-driven chemical mechanical jet polishing for achieving atomic and close-to-atomic scale accuracy

Zili Zhang*, Benny Chi Fai Cheung, Lai Ting Ho, Chunjin Wang (The Hong Kong Polytechnic University, Hong Kong, China)

10:00-10:15 P00046 Research on Atomic-Level Composite Polishing Method for Large-Size Polycrystalline Diamond Wafers

Junkai Ren*, Hui Deng (Southern University of Science and Technology, China)

10:15-10:30 P00115 Frontiers in atomic and close-to-atomic scale manufacturing: electroforming replication

Zubair Akbar* (Beijing University of Technology, China), Qi Zhou (Beijing Institute of Technology, China), Honggang Zhang (Beijing University of Technology, China)

April 14 (Tue) Oral Session

Session Chair: Dr. Sung Joon Kim (Korea Institute of Machinery & Materials, Korea)

Smart Manufacturing I — **International Conference Hall**

13:00-13:30 Keynote Additive Manufacturing into Mainstream Manufacturing Processing
Patrick Kwon* (San Diego State University, United States)

13:30-13:50 Invited Study on Using Hybrid Neural Networks and Transfer Learning for Tool Remaining Useful Life Monitoring Method and System
Shih-Ming Wang*, Chi-Chang Tseng, Tzu-Yuan Chiang, Ming-Chyuan Lu (National Chung Hsing University, Taiwan), Yao-Yang Tsai (National Taiwan University, Taiwan)

13:50-14:05 P00062 Analytical rake face thermal model in ultra-precision diamond turning considering tool-edge effect
Yuhan Li*, Wai Sze Yip, Suet Sandy To (The Hong Kong Polytechnic University, Hong Kong, China)

14:05-14:20 P00050 Research on the Relationship Between Processing Parameters and Mechanical Properties of SLM-formed 316L Stainless Steel
Zhe Lu*, Min Lai (Tianjin University, China)

14:20-14:35 P00142 Vision-Based Grasp Stability Monitoring for Autonomous Manufacturing Using Autoencoder-Based Anomaly Detection
Sung Joon Kim*, Gyuho Kim, Chang-Ju Kim (Korea Institute of Machinery & Materials, Korea)

Session Chairs: Dr. Tianyu Guan (University College Dublin, Ireland),
Prof. Jong G. Ok (Seoul National University of Science and Technology, Korea)

Micro/Nano – Manufacturing **International Conference Hall**

15:20-15:50 Keynote S.M.A.R.T. (Scalable, Mechanical, Agile, Reproducible, Thrifty) Manufacturing of Precision Architectures

Jong G. Ok* (Seoul National University of Science and Technology, Korea)

15:50-16:05 P00061 Dimensional Tolerance in Microfluidic Manufacturing: Implications for Lipid Nanomedicine Performance

Tianyu Guan*, Eoghan Gilmore, Jun Lin, Mingzhi Yu, Allen Mathew (University College Dublin, Ireland), Dongsheng Liu (University College Dublin, South East Technological University, Ireland), Nan Zhang (University College Dublin, Ireland)

16:05-16:20 P00019 Laser-Diffraction Microscopy for On-Chip Characterization of Microfluidic Droplet Generation

Shuzo Masui*, Masaki Michihata, Satoru Takahashi (The University of Tokyo, Japan), Yusuke Kanno, Takasi Nisisako (Institute of Science Tokyo, Japan)

16:20-16:35 P00011 Active Wavefront-controlled Laser Interference Lithography for Fine Pattern Fabrication

Nozomu Takahiro*, Dong Wook Shin, Yuki Shimizu (Hokkaido University, Japan)

16:35-16:50 P00044 High-Efficiency and High-Precision Wafer Thickness Correction Using a Multi-jet Plasma System

Zhixian Chen*, Hui Deng (Southern University of Science and Technology, China)

16:50-17:05 P00039 Theoretical investigation for surface profile measurement by confocal probe

Ryo Sato*, Chen Li, Wei Gao (Tohoku University, Japan)

17:05-17:20 P00104 Investigation of Refractive Index Measurement near a Surface using Scattering Light from Specular Roughness in Evanescent Field

Yuuki Ohta*, Panart Khajornrungruang, Jong-Hoon Huh, Ryusei Tsubawara (Kyushu Institute of Technology, Japan)

April 14 (Tue) Oral Session

⊙ Session Room 2 - Auditorium 1

Session Chairs : Dr. Zexiao Li (Tianjin University, China),
Dr. Ryo Sato (Tohoku University, Japan)

Measurement & Metrology II — **Auditorium 1**

09:00-09:30 Keynote Nano probes for the measurement of structured surfaces
Shuming Yang* (Xi'an Jiaotong University, China)

09:30-09:50 Invited Dual-detection confocal probes for precision measurements
Ryo Sato* (Tohoku University, Japan)

09:50-10:05 P00071 Uncertainty Evaluation in CG-Trained Fringe Projection Profilometry for Shiny Objects Using Input Perturbation
Yuki Sawada*, Kanami Ikeda, Osanori Koyama, Makoto Yamada (Osaka Metropolitan University, Japan)

10:05-10:20 P00087 High Precision Position of LTO Magnetic Track by Four-dimensional Topographic Measuring
Zexiao Li*, Bo Zhang, Weisheng Cheng, Xiaodong Zhang (Tianjin University, China)

10:20-10:35 P00036 Feasibility Investigation about Self-Calibration of a Large-Area Variable-Line-Spacing Grating Using a Fizeau Interferometer
Jindi Zhang*, Chenguang Yin (Tohoku University, Japan),
Xin Xiong (Chongqing University of Technology, China), Ryo Sato, Wei Gao (Tohoku University, Japan)

10:35-10:50 P00021 Straightness Measurement with Laser Beam and Deep Learning
Ukyo Takata*, Dong Wook Shin, Yuki Shimizu (Hokkaido University, Japan),
Yuki Kosuge, Masato Aketagawa (Nagaoka University of Technology, Japan),
Yohei Yamada, Toshinori Yasuhara, Kohsei Terao (CHUO PRECISION INDUSTRIAL Co., Ltd, Japan)

10:50-11:05 P00051 High speed measurement of surface topography for semiconductor wafer based on wavefront metrology
Benny Chi Fai Cheung*, Bo Wang (The Hong Kong Polytechnic University, Hong Kong, China;
PolyU-Wenzhou Technology and Innovation Research Institute, China),
Fan Zhang, Ze Li (The Hong Kong Polytechnic University, Hong Kong, China),
Shuai Bao (PolyU-Wenzhou Technology and Innovation Research Institute, China),
Liu Tao (Xi'an Jiaotong University, China),
Lai Ting, Ho (The Hong Kong Polytechnic University, Hong Kong, China;
PolyU-Wenzhou Technology and Innovation Research Institute, China)

Session Chairs: Dr. Changshuai Fang (Tianjin University, China),
Prof. Yangjin Kim (Pusan National University, Korea)

Measurement & Metrology III **Auditorium 1**

13:00-13:20 Invited Phase calculation theory from fringe patterns for precision interferometric measurement

Yangjin Kim*, Jurim Jeon (Pusan National University, Korea), Kenichi Hibino (National Institute of Advanced Industrial Science and Technology, Japan), Naohiko Sugita, Mamoru Mitsuishi (The University of Tokyo, Japan)

13:20-13:35 P00009 Development of an Optical Head for Rapid and On-machine Scan for the Calibration of a Diffraction Scale Grating

Naoya Tashiro*, Yuya Yamazaki, Dong Wook Shin, Yuki Shimizu (Hokkaido University, Japan)

13:35-13:50 P00043 Unequal-Force Stress-Superposition Analysis of Spacing-Dependent Damage in Double Scratching of Single-Crystal CaF_2

Lingwen Tan*, Zhenting Zhang, LiMin Zhu (Shanghai Jiao Tong University, China)

13:50-14:05 P00047 Full-Profile Measurement Method for an Inner Wall with Narrow-Aperture and Large-Cavity Parts Based on Line-Structured Light Rotary Scanning

Changshuiai Fang*, Xiaodong Zhang (Tianjin University, China)

14:05-14:20 P00078 Study on Performance-based Surface Errors in Off-axis Optical Reflection Systems: A Combined Approach Using Phase-Measuring Deflectometry and Zemax Simulation

Yingmo Wan*, Yuqiang Chen (Chinese Academy of Sciences, China), Shan Wu, Zihao Li (Tianjin University, China)

14:20-14:35 P00077 Near-field thermal spectroscopy on different semiconductor material in a long-wavelength infrared

Zheyuan Zhou*, Megumi Yamamoto, Kuan-Ting Lin (The University of Tokyo, Japan), Qianchun Weng (The Chinese Academy of Sciences, China), Yusuke Kajihara (The University of Tokyo, Japan)

April 14 (Tue) Oral Session

Session Chairs: Dr. Jooho Hwang (Korea Institute of Machinery & Materials, Korea)
Dr. Tsutomu Uenohara (The University of Osaka, Japan)

Laser Micro/Nano Processing — **Auditorium 1**

15:20-15:40 Invited Efficient ultrashort pulse laser processing of diamond
Reina Yoshizaki*, Shogo Kitamura, Yuta Teshima, Naohiko Sugita (The University of Tokyo, Japan)

15:40-15:55 P00014 Effect of wavelength on laser ablation using a photonic nanojet
Tsutomu Uenohara*, Yasuhiro Mizutani, Yasuhiro Takaya (The University of Osaka, Japan)

15:55-16:10 P00018 Nanoscale prediction of laser-processed surface morphology via deep learning based on on-machine white-light interferometry
Iori Watanabe*, Yuta Teshima, Yanming Zhang, Reina Yoshizaki, Kentaro Furuichi (The University of Tokyo, Japan), Yahui Zhang (Imperial College London, UK), Naohiko Sugita (The University of Tokyo, Japan)

16:10-16:25 P00031 Comparison of the replication accuracy of rigid and elastomeric thermoplastics in micro-injection molding of durable functionalized surfaces
Marco Sorgato*, Giacomo Baruffa, Giovanni Lucchetta (University of Padova, Italy)

16:25-16:40 P00023 Measurement of high-reflectivity surfaces by phase-measuring profilometry based on off-axis projection
Zihao Li* (Tianjin University, China), Yingmo Wang (Chinese Academy of Sciences, China), Fengzhou Fang (Tianjin University, China)

16:40-16:55 P00134 Water-Jet Guided Laser Processing of Diamond Materials - Fabrication of Milling Tools and Heat Dissipation Components
Junyun Chen*, Shilong Chen (Yanshan University, China)

16:55-17:10 P00035 Investigations of confocal probes employing a second harmonic generation
Chen Li*, Ryo Sato, Wei Gao (Tohoku University, Japan)

⊙ Session Room 3 - Auditorium 2

Session Chairs:
Prof. Kaiyuan You (University of Electronic Science and Technology of China, China),
Prof. Lei Chen (Southwest Jiaotong University, China)

Micro/Nano - Machining II **Auditorium 2**

09:00-09:30 Keynote Synergistic Tuning of Mechanical Performance via Atomic-Scale Surface Precision and Modification
Yang Yin, Lei Chen* (Southwest Jiaotong University, China)

09:30-09:50 Invited Modeling and control of material removal uniformity in silicon wafer polishing
Urara Satake* (The University of Osaka, Japan)

09:50-10:05 P00008 Research on the temperature control system for in-situ laser-vibration hybrid assisted diamond turning
Zhe-wen Cao, Wei Wang, Kai-yuan You*
(University of Electronic Science and Technology of China, China)

10:05-10:20 P00065 3D Printing of Transparent Microfluidic Chips via "Sacrificial Scaffold" Vat Photopolymerisation (VPP)
Xinhui Wang* (Southwest Jiaotong University China; University College Dublin, Ireland),
Michael D. Gilchrist (University College Dublin, Ireland),
Fengzhou Fang (University College Dublin, Ireland; Tianjin University, China),
Nan Zhang (University College Dublin, Ireland)

10:20-10:35 P00032 Establishing a robust process chain for integrating anticounterfeiting features into injection molds using two-photon polymerization lithography
Giacomo Baruffa*, Giovanni Lucchetta, Enrico Savio, Marco Sorgato (University of Padova, Italy)

10:35-10:50 P00024 Improved reproducibility of 3D microfabrication by laser-assisted electrophoretic deposition using machine learning
Ryosuke Kuma*, Kenta Nakazawa, Futoshi Iwata (Shizuoka University, Japan)

April 14 (Tue) Oral Session

Session Chairs: Dr. Mincheol Kim (Korea Basic Science Institute, Korea),
Prof. Zhichao Geng(University College Dublin)

Ultra-Precision Machining — Auditorium 2

13:00-13:30 **Keynote** Ultra-precision Machining (UPM) for Optical Applications
Kui Liu* (Nanjing University of Aeronautics & Astronautics, China)

13:30-13:50 **Invited** Enhancing the Fabrication Efficiency of Ultra-Precision X-ray Mirrors through a Spatial Frequency-Based Refinement Model
Mincheol Kim* (Korea Basic Science Institute, Korea)

13:50-14:05 **P00030** Visualization and Anomaly Detection of Tool Path Trajectories for Five-Axis Polishing Machine
Zhichao Geng* (University College Dublin, Ireland),
Fanwei Meng, Shaoqing Qin (Northeastern University, China),
Fengzhou Fang (University College Dublin, Ireland)

14:05-14:20 **P00038** Nanogroove fabrication of 4H-SiC along varying crystal orientation
Hingwai Tsang*, Hanqiang Wu (Southern University of Science and Technology, China)

14:20-14:35 **P00054** In-situ Halbach Array magnetic field-assisted slow tool servo diamond cutting micro-lens arrays on single crystal copper
Linhe Sun* (The Hong Kong Polytechnic University, Hong Kong, China; Southern University of Science and Technology, China),
Yuhan Li, Jianpeng Wang, Juan Chen (The Hong Kong Polytechnic University, Hong Kong, China),
Hanqiang Wu, Yongbo Wu (Southern University of Science and Technology, China),
Suet To, WaiSze Yip (The Hong Kong Polytechnic University, Hong Kong, China)

14:35-14:50 **P00013** Enhancing surface quality of difficult-to-machine materials through particulate electrolyte-mediated electrochemical-mechanical polishing
Chengwei Kang* (Xi'an Jiaotong University, China)

Session Chair: Dr. Zhicheng Xu (The Hong Kong Polytechnic University, Hong Kong, China), Prof. Kuan-Jung Chung (National Changhua University of Education, Taiwan)

Smart Manufacturing II **Auditorium 2**

15:20-15:35 P00135 Physics-Informed Robust Fault Diagnosis for Variable-Speed Grinding Processes Integrating EMRM Tensor Mapping and Frequency-Decoupled Data Augmentation

Kuan-Jung Chung*, Hsuan-Chen Yi, Yi Tsung Lin (National Changhua University of Education, Taiwan)

15:35-15:50 P00075 Deep learning-driven intelligent surface quality prediction of ultra-precision milling

Zhicheng Xu*, Wai Sze Yip, Suet To (The Hong Kong Polytechnic University, Hong Kong, China)

15:50-16:05 P00027 High-Efficiency Atmospheric-Pressure Plasma Jet Figuring via Auxiliary Shielding Gas

Zhe Fan*, Guang-Zheng Li, Zhou-Long Li, Li-Min Zhu (Shanghai Jiao Tong University, China)

16:05-16:20 P00113 Representation learning-Based Fault Diagnosis of Machine Tool Spindle Bearings

Dung Minh Nguyen* (University of Science and Technology, Korea), Sung Joon Kim (Korea Institute of Machinery & Materials, Korea), Jooho Hwang (University of Science and Technology, Korea Institute of Machinery & Materials, Korea)

16:20-16:35 P00083 A Wide Range Precision 3DOF Grating Autocollimator Enabled by CMOS Detectors and Deep-learning

Linbin Luo*, Yupeng Wu, Timotius Kelvin, Xinghui Li (Tsinghua University, China)

16:35-16:50 P00037 Evaluation of the yaw error motion of a stage and the local slope error of scale grating using a laser autocollimation-based pitch deviation measurement system

Hyunsung Lim*, Naoya Tashiro, Dong Wook Shin, Yuki Shimizu (Hokkaido University, Japan)

April 14 (Tue) Oral Session

⊙ Session Room 4 - Auditorium 3

Session Chairs : Prof. Kenta Nakazawa (Shizuoka University, Japan),
Prof. Jianlei Cui (Xi'an Jiaotong University, China)

Micro/Nano - Patterning II — **Auditorium 3**

09:00-09:30 Keynote From Scalable Nanomanufacturing to ACSM: Bridging Structural Design and Molecular Regulation for Bio-inspired Functional Interfaces
Jining Sun* (Dalian University of Technology, China)

09:30-09:50 Invited Research on Laser High Performance Manufacturing Method and Mechanism of Carbon-based Transistors
Jianlei Cui* (Xi'an Jiaotong University, China)

09:50-10:05 P00108 Fabrication-Oriented Design of Phase-Engineered MoS_2@rGO Hybrid Electrodes via Controlled Reduction
Teajong Hwang*, Yun Ji Hwang, Hye Gyu Cha, Seong Chan Jun (Yonsei University, Korea)

10:05-10:20 P00058 Temperature compensation of micro-mirrors using artificial neural network
Kenta Nakazawa*, Gen Hashiguchi, Futoshi Iwata (Shizuoka University, Japan)

10:20-10:35 P00045 Multiphysics-informed generative modeling of transient material removal for coupled structural-process parameter optimization in grinding
Jie Pan* (Huazhong University of Science and Technology, China),
Fan Chen (Huazhong University of Science and Technology,
Jiangsu JITRI-Hust Intelligent Equipment Technology Co., Ltd, China)

10:35-10:50 P00082 Performance Customization Strategy for Selective Laser Melted Porous Metal- bonded Diamond Grinding Tools in Specific Functional Regions
Guangyao Han* (Huaqiao University, China)

Session Chairs : Prof. Ming-Chyuan Lu (National Chung Hsing University, Taiwan)
Dr. Yasutomo Sugisawa (Toyama Prefectural University, Japan)

Process Monitoring and Quality Control **Auditorium 3**

13:00-13:30 Keynote Advanced monitoring and measurement technologies for ultra-precision machining

Yuan-Liu Chen* (Zhejiang University, China)

13:30-14:00 Keynote Ultra-precision Manufacturing of Optical Materials for Advanced Photonic Devices

Yasuhiro Kakinuma*, Taiki Nishiguchi, Tatsuya Uchikawa, Kazuma Miura (Keio University, Japan)

14:00-14:15 P00022 High-Precision Inner Pipe Wall Defect Detection Using a Single-Camera Catadioptric Imaging System with Ray-Tracing Optimization

Chunliu Wang*, Xiaodong Zhang (Tianjin University, China)

14:15-14:30 P00012 In-situ monitoring of underwater laser machining using Raman-based characterization

Reza Aulia Rahman* (The University of Osaka, Japan; University of Muhammadiyah Malang, Indonesia), Tsutomu Uenohara, Yasuhiro Mizutani, Yasuhiro Takaya (The University of Osaka, Japan)

14:30-14:45 P00041 Compensation method for roundness error in CMM using neural networks

Yasutomo Sugisawa*, So Ito, Tatsuki Tsuda, Kenta Matsumoto, Kazuhide Kamiya (Toyama Prefectural University, Japan)

14:45-15:00 P00074 Grinding process of fused silica hemispherical resonators monitored by acoustic emission

Chuanzhen Ma*, Henan Liu, Jian Cheng, Zican Yang, Ruiyang Guo, Mingjun Chen (Harbin Institute of Technology, China)

April 14 (Tue) Oral Session

Session Chairs : Dr. Seungman Kim (Korea Institute of Machinery & Materials, Korea),
Dr. Dong Wook Shin (Hokkaido University, Japan)

Optics and Interferometry — Auditorium 3

15:20-15:35 **P00020** Performance Evaluation of Fabry-Pérot Etalon Angle Sensor Using Mode-locked Femtosecond Laser in Relation to Angular Positions
Dong Wook Shin*, Yuki Shimizu (Hokkaido University, Japan), Ryo Sato, Wei Gao (Tohoku University, Japan)

15:35-15:50 **P00015** Deep Learning-Driven Interferogram Visibility Enhancement for One-Shot Profiling of Highly Reflective Surfaces
Jurim Jeon*, Yangjin Kim (Pusan National University, Korea)

15:50-16:05 **P00016** Research on Assembly and Adjustment Technology of Off-Axis Reflection System Based on Deep Learning
Fuqi Sun*, Xiaodong Zhang (Tianjin University, China)

16:05-16:20 **P00010** A two-axis absolute positioning sensor with a light source having multiple longitudinal wavelength modes
Keita Nakaoka*, Dong Wook Shin, Yuki Shimizu (Hokkaido University, Japan)

16:20-16:35 **P00136** Development of a Littrow configuration surface encoder for three-axis measurement
Yuta Yoshimura*, Zhiyang Zhang, Ryo Sato, Wei Gao (Tohoku University, Japan)

16:35-16:50 **P00093** Three-Dimensional Surface Measurement Method Based on Fringe Projection Profilometry with Virtual- Real Integration
Shuai Fu*, Zonghua Zhang (Hebei University of Technology, China)

16:50-17:05 **P00029** Investigation of Accommodation Target Using Badal Optics for Ophthalmic Instruments
Gaofeng Hou*, Yilei Zhang, Fengzhou Fang (Tianjin University, China)

Poster Session

Place: Auditorium 4

Presentation Time	
1st: April 13 (Mon), 14:40 – 15:20 2nd: April 14 (Tue), 10:50 – 12:00	
Poster Setup	**Poster Removal**
By April 13 (Mon) 12:00	After April 14 (Tue) 15:00

3D Printing

P00150 Probabilistic Estimation of Contact Tip-to-Work Distance from Infrared Arc Image in Wire-Arc Additive Manufacturing

Bong-Gyeong Park (Korea Advanced Institute of Science and Technology, Korea Institute of Machinery & Materials, Korea), Hyun-Joon Kim (Kyungpook National University, Korea), Huitaek Yun (Korea Advanced Institute of Science and Technology, Korea), Segon Heo (Korea Institute of Machinery & Materials, Kyungpook National University, Korea)

P00092 Evaluation of Tensile Strength Characteristics by Lattice Geometry in DLP 3D-Printed Specimens

Geum-Jeong Park, Chan-Young Jeong, Moon Gu Lee, Yongho Jeon (Ajou University, Korea)

P00080 Fabrication of Copper-Containing Titanium Implants with Laser Powder Bed Fusion: Segregation of Copper and its Suppression

Hirotaka Murakami, Chieko Kuji, Masayoshi Mizutani (Tohoku University, Japan)

Advanced Machine Tools

P00140 Rapid CNN-based Object Detection for Digital Twin Synchronization in an Autonomous Machining Cell

Gyuho Kim, Sung Joon Kim, Chang-Ju Kim (Korea Institute of Machinery & Materials, Korea), Seong-In Noh, Huitaek Yun (Korea Advanced Institute of Science and Technology, Korea)

P00132 Improvement of Accuracy for Stability Lobe Diagram in Turning Process Considering Process Dependent Fluctuation of Cutting Force Coefficient

Jiwon Choi, Eunseok Nam, Kyung-Hee Park, Soohyun Nam (Korea Institute of Industrial Technology, Korea)

P00131 Proposal for a cutting parameter selection strategy to maximize machining efficiency

Doyeon Kim, Hyein Kim, Kyung-Hee Park, Sung-Ho Nam, Soohyun Nam (Korea Institute of Industrial Technology, Korea)

P00121 Development of Real-time Auxiliary Device Control for Energy Reduction in Machine Tools and Machine Learning-based Energy Consumption Prediction Technology

Donghyeok Park, Jaehak Lee (Korea Institute of Industrial Technology, Korea)

P00119 Development of a Robust Bin Picking System Integrating Structured-Light 3D Scanning and Simulation- Based Grasp Optimization

Jaehak Lee (Korea Institute of Industrial Technology, Korea)

Advanced Nanomaterials

P00165 Impedance-Engineered Elastic Fabry-Perot Cavity Using Elastic Metamaterials for Enhanced Elastic Wave Emission

Jinseob Shin (Kangwon National University, Korea),
Hyuk Lee (Korea Institute of Machinery & Materials, Korea),
Hong Min Seung (Korea Research Institute of Standards and Science, Korea),
Byeong Hee Kim (Kangwon National University, Korea),
Yoon Young Kim (Sookmyung Women's University, Korea),
Chung Il Park (Kangwon National University, Korea)

Carbon Convergence

P00095 Optimization of ultramicropore structures in chemically activated carbon fibers for enhanced CO_2 adsorption

Seung Joo Lim, Seonbyoeng Kim, Wang Kyu Choi, Sang Hun Lee,
Yessika Natalia Chelsie (Korea Atomic Energy Research Institute, Korea)

P00094 Enhanced water vapor adsorption on activated carbon fibers using electron beam treatment: Roles of surface chemistry and textural properties

Seung Joo Lim, Seonbyoeng Kim, Wang Kyu Choi, Sang Hun Lee,
Yessika Natalia Chelsie (Korea Atomic Energy Research Institute, Korea)

Design and CAE

P00101 AI-Based Optimization of Vacuum Cooling Channels for High-Integration Semiconductor Packaging and AI Chip Thermal Management

Jewoo Lee, Yong Tae Kim, Jun Seok Lee, Minsub Lee, Jong G. Ok
(Seoul National University of Science and Technology, Korea)

Design and Engineering for Manufacturing

P00100 Manufacturable Polygonal Through-Glass Vias for Hybrid Bonding with Multi-Objective Optimization and Rapid Prediction

Jun Seok Lee, Yong Tae Kim, Minsub Lee, Jewoo Lee, Jong G. Ok
(Seoul National University of Science and Technology, Korea)

Integrated Manufacturing

P00088 A Perovskite Crystal based Radiation Detector

Changhyun Roh, Sion Kim, Bum Kyoung Seo (Korea Atomic Energy Research Institute, Korea),
Sngik Lee, Jung Rye Jung (Zerom, Korea)

Laser Micro/Nano Processing

P00149 Semiconductor isolation with water guided laser process

Sanghoon Ahn, Soojin Choi, Dohyun Kim, Philgong Choi, Geon Lim
(Korea Institute of Machinery & Materials, Korea)

P00105 Comparative Analysis of Femtosecond and Nanosecond pulsed Laser-Induced Forward Transfer Mechanisms for High-Productivity Micro-LED Display Assembly

Jaeseung Lim (Korea Institute of Machinery & Materials,
Korea National University of Science and Technology, Korea),
Sung-uk Yoon, Seongheum Han, Jae-hak Lee, Seungman Kim
(Korea Institute of Machinery & Materials, Korea)

Medical/Bio Engineering

P00081 Ultrafine Bubble Accumulation and Ultrasound-Induced Collapse Relevant to the Sterilization of Pseudomonas aeruginosa

Makoto Iwado, Chieko Kuji, Masayoshi Mizutani (Tohoku University, Japan)

Micro/Nano-Machining

P00152 Laser-Assisted Manufacturing Strategies for Scalable 2D Neuromorphic Devices

Min-Ah Yoon, Sung Yong Kim (Korea Textile Machinery Convergence Research Institute, Korea)

P00107 Multistacked CNT Scaffolds Homogeneously Hybridized with BTO-P(VDF-TrFE) forHigh-Performance Piezoelectric Nanogenerators

Jongwon Park, Kwangjun Kim, Minwook Kim, Jong G. Ok
(Seoul National University of Science and Technology, Korea)

P00098 Continuous Microgroove Machining on Metals by Direct Scribing with Johnson Cook-Based Deformation Modeling

Minwook Kim (Seoul National University of Science and Technology, Korea),
Dae Bo Sim (Soongsil University, Korea),
Yong Tae Kim (Seoul National University of Science and Technology, Korea),
Bo Hyun Kim (Soongsil University, Korea),
Jong G. Ok (Seoul National University of Science and Technology, Korea)

P00070 Study on tribochemical reaction behavior induced by abrasives scratching in SiC wafer backside thinning

Qiufa Luo (Huaqiao University, China)

Micro/Nano-Patterning

P00120 Control of Optical Characteristics Across Visible and Infrared Regions via Oxidation Degree Modulation

Huijae Park, Guho Choi, Seung Hwan Ko (Seoul National University, Korea)

Micro/Nano-Electromechanical Systems

P00109 Decoupling Nucleation and Growth Kinetics via Dynamic Temperature Hydrothermal Synthesis for Refined MnO_x Nanostructures

Minsub Lee, Seongjun Ko, Rahul S Ingole, Snehal L Kadam, Yong Tae Kim,
Jun Seok Lee, Jewoo Lee, Jong G. Ok (Seoul National University of Science and Technology, Korea)

P00103 Correlation between Structural Evolution of VS_4 and Electrochemical Performance Depending on Solvent Properties

Seongjun Ko, Minsub Lee, Rahul S. Ingole, Snehal L. Kadam, Minwook Kim, Kwangjun Kim, Jong G. OK (Seoul National University of Science and Technology, Korea)

Micro-Featured Surfaces & Surface Modification

P00086 Mask-assisted jet biomachining for the fabrication of superhydrophobic surfaces on H62 brass

Weibin Shi, Yongjie Liu, Hui Huang (Huaqiao University, China)

P00073 Effect of Wire-Sawing-Induced Saw-Mark Microstructures on the Wettability of Aluminum Surfaces

Xinjiang Liao, Rongzhen Ye, Hui Huang (Huaqiao University, China)

Nano/Micro Systems

P00164 Design and Wettability Control of High-Efficiency Heat Transfer Surfaces Using Hybrid Nanostructures

In Sik Choi, Beom Su Kim, Young Ho Seo, Byeong Hee Kim (Kangwon National University, Korea)

P00102 Position-Controlled Metal Nanodot Decoration on ZnO Nanorods via UV-Assisted Room-Temperature Photoreduction

Kwangjun Kim, Minwook Kim, Yong Tae Kim, Jun Seok Lee, Jongwon Park, Minsub Lee, Seongjun Ko, Jewoo Lee, Jong G. Ok (Seoul National University of Science and Technology, Korea)

Optical Machining & Measurement

P00160 Development and Application of Large-Scale and High-Precision Gratings

Wenhao Li, Fengwei Guan, Lingtong Zhang, Haixiang Hu, Longxiang Li, Wei Zhang (Chinese Academy of Sciences, China)

P00090 Single-Shot Structured Light 3D Reconstruction with Pose and Depth Priors from a Vision Foundation Model

Yiming Li, Xiaojun Xiao (Pengcheng Laboratory, China), Xinghui Li (Tsinghua University, China)

P00059 Continuous-Scan Structured Illumination Microscopy with Dynamic Exposure Integration for High- Throughput Surface Metrology

Tong Qu, Dongguang Li, Zimin An, Haiyu Zhao, Xiaojun Liu (Huazhong University of Science and Technology, China)

P00049 Achieving 6-DOF Surface Registration at the Roughness Scale: A registration pipeline for Large-Area Surface Texture Measurement

Filippo Mioli, Sofia Catalucci, Enrico Savio (Università degli Studi di Padova, Italy)

Optics and Interferometry

P00055 Nonlinear Error Compensation in Fiber-Optic Sinusoidal Phase Modulation Interferometer Based on Coarse-to-Fine Adaptive Ellipse Fitting Correction

Dongguang Li, Tong Qu, Haiyu Zhao, Zimin An, Xiaojun Liu
(Huazhong University of Science and Technology, China)

P00025 High-Accuracy Self-Calibration Method for Constant-pitch and Variable-line-spacing Diffraction Gratings Using Laser Phase-Shifting Interferometry

Xie Bing, Xin Xiong, Chong Chen, Yijun Guo, Zhiying He, Ziran Chen
(Chongqing University of Technology, China)

Polymer Processing

P00125 Microfluidic Channel Sealing and Electrical Contact Resistance in Injection-Molded Microfluidic Chips with Embedded Electrical Traces

Yeun-Jung Jung, Kwanoh Kim, Jae-Sung Yoon, Do-hyun Kang, Young-Eun Yoo
(UST, Korea Institute of Machinery & Materials, Korea)

P00097 Development of High-Strength Resin-Based Solid Electrolytes for Structural Batteries via UV/Thermal Dual Curing

Yunjae Hwang, Hyung Wook Park (Ulsan National Institute of Science and Technology, Korea)

Process Monitoring and Quality Control

P00147 Deep Learning-based Welding Quality Prediction System

Seungmin Lee (Korea National University of Transportation, Korea),
Wooyoung Jeong (Korea Automotive Technology Institute, Korea),
Heesung Lee (Korea National University of Transportation, Korea),
Beomseong Kim (Gyeonggi University of Science and Technology, Korea)

P00123 Fresnel Based Optical Estimation of SiO_2 Thickness for Endpoint Detection in Single Wafer Wet Etching

Jong-Ho Park, Seong-min Lee, Yoon-Sun Choi, Jae-Heon Shim, Jang-Heon Kim
(Tech University of Korea, Korea)

P00091 Unsupervised Learning-Based Classification of Welding Defects Using Acoustic Emission Signals

Chan-Young Jeong (Ajou University, Korea),
Won Gi Lee (Institute for Advanced Engineering, Korea),
Yongho Jeon, Moon Gu Lee (Ajou University, Korea)

Robots and Automation

P00153 Robotic Machining Vibration Suppression Using a Gyroscopic Spindle Actuator

Jongyoup Shim, Jooho Hwang, Seung-Kook Ro (Korea Institute of Machinery & Materials, Korea)

P00118 Probe Wable Noise Reduction Using Signal Variation

Min Geon Ku, Hyun Soo Kim, Yong Hyuk Kim (DH Ntec, Korea)

P00117 Change in ECT signal of heat transfer tube support plate due to blockage of flow path

Min Geon Ku, Hyun Soo Kim, Yong Hyuk Kim (DH Ntec, Korea)

Smart Machine Tools

P00166 Investigation of modeling and cutting force calibration for a strain-based measurement system

Tien Duc Cu, Seung-Kook Ro (Korea Institute of Machinery & Materials, Korea)

P00111 In-Process Stability Evaluation in CNC Milling Using Welch PSD Features and a Chatter Index

Jose Antonio Moran, Jooho Hwang (Korea Institute of Machinery & Materials, Korea), Cong Chi Dang (ASPL. Inc., Korea)

Smart Manufacturing

P00099 Optimization of Laser-Assisted Wafer-Level Carrier Debonding Based on Physics-Informed Neural Network for Advanced Semiconductor Packaging

Yong Tae Kim, Jun Seok Lee, Jewoo Lee, Minsub Lee, Jong G. Ok (Seoul National University of Science and Technology, Korea)

P00128 A Joint Classification and Regression for Tool Wear Prediction with State-aware Attention

Hyein Kim, Soohyun Nam, Bohyun Kim, Eunseok Nam (Korea Institute of Industrial Technology, Korea)

Ultra-Precision Machines

P00005 Gain Scheduled PID-based Internal Air Temperature Control for Ultra-precision Machining Systems

Seung-Kook Ro (Korea Institute of Machinery & Materials, University of Science and Technology, Korea), Jong-Won Yun (WiPowerOne, Korea)

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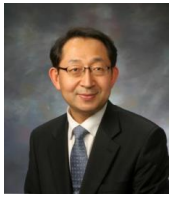

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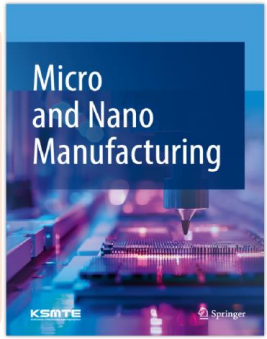

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