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ISMNM 2025

The 3rd International Symposium on Micro & Nano Manufacturing

12.9 (Tue) - 12 (Fri), 2025

Paradise Hotel, Busan, South Korea

Program Book



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3rd International Symposium on Micro & Nano Manufacturing

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Welcome Message

3rd International Symposium on Micro & Nano Manufacturing

Welcome Message

We are thrilled to extend a warm invitation to the 3rd International Symposium on Micro and Nano Manufacturing (ISMNM 2025), which will be held from Dec. 9 to 12, 2025, at Paradise Hotel, Busan, South Korea. The Korean Society of Manufacturing Technology Engineers (KSMTE) is proud to organize this symposium, which focuses on the latest advancements and emerging research areas related to micro- and nano-manufacturing.

This symposium presents a unique opportunity for members from around the world to come together to exchange professional experiences, expand their networks, and gain insights into the latest advances in science and technology related to micro/nano-technology, micro/nano-fabrication, and their applications across multiple engineering fields.

We have an engaging lineup of programs, including distinguished presentations and networking events that promise to foster fruitful and enriching discussions and facilitate interdisciplinary collaborations for advancing your research.

The symposium will be held in Busan, one of Korea's most popular tourist destinations, where you can immerse yourself in the wonders of Korea's beautiful coastal scenery. We have also planned exciting social activities to support participants' interests and help you enjoy the beauty of Busan.

We encourage you to mark your calendars and join us in Busan this December. We hope this symposium will be an excellent opportunity to showcase our journal, Micro & Nano Manufacturing.

We are excited to welcome you to Busan, and the organizing committee looks forward to meeting you soon.

Best regards,

Yeong-Eun Yoo

Conference Chair of ISMNM 2025

Inkyu Park

Organizing Committee Chair of ISMNM 2025

ISMNM 2025 Program

3rd International Symposium on Micro & Nano Manufacturing

	9-Dec. (Tue)	10-Dec. (Wed)	11-Dec. (Thu)	12-Dec. (Fri)
09:00~09:30	Arrival & Welcome	Registration	Oral Session 3	Pannel Discussion
09:30~10:00				
10:00~10:40				
10:40~10:50			Break	
10:50~12:05			Oral Session 4	
12:05~12:30		Oral Session 1	Lunch	
12:30~13:00				
13:00~13:30			Poster Session	
13:30~14:00				
14:00~14:50			Oral Session 5	
14:50~15:00		Keynote Session & Opening Ceremony		
15:00~15:15		Break		
15:15~15:30		Oral Session 2	Oral Session 6	
15:30~16:30				
16:30~16:40		Break	Award & Closing Ceremony	
16:40~		(Joint Program with KSMTE Autumn Conf.)		

Place & Registration

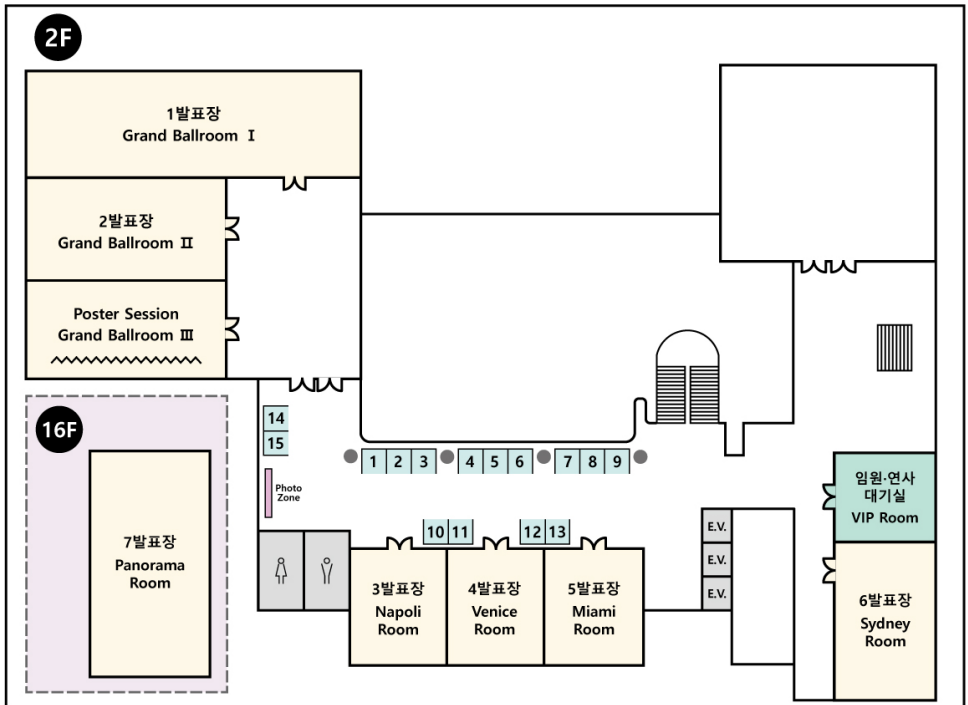
3rd International Symposium on Micro & Nano Manufacturing

Place	
Registration	Lobby (1F)
Keynote Session & Opening Ceremony	Panorama Room (16F)
Oral Session 1, 2	Panorama Room (16F)
Oral Session 3, 4, 5, 6	Grand Ballroom I (2F)
Poster Session	Grand Ballroom III (2F)
Banquet	Grand Ballroom I (2F)
Award & Closing Ceremony	Grand Ballroom I (2F)

Registration Fee			
Category		Regular	Student
On-Site Registration	KRW	700,000	400,000
	USD	580	330
Registration for KSMTE Autumn Conference Participant	KRW	330,000	140,000

Floor Guide

3rd International Symposium on Micro & Nano Manufacturing



● **Keynote Session (Dec. 10, Wed)**

Keynote Session & Opening Ceremony

Panorama Room (16F)

15:00-15:30 **KN-01** Advances in MEMS/NOEMS Technology –Towards AI Sensors, Edge AI and AIoT Sensing

Chengkuo Lee* (National University of Singapore, Singapore)

Program

⦿ Invited Oral Session 1 (Dec. 10, Wed)

Chairman: Inkyu Park (Korea Advanced Institute of Science and Technology, Korea)

Oral Session 1

Panorama Room (16F)

13:00-13:25 **OP-01** Performance Analysis of CuO-Doped Carbon Fiber Composites: Thermal Conductivity and Piezoresistivity

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

13:25-13:50 **OP-02** Advances in Self-Powered Sensing: Triboelectric Nanosensors for Selective and Versatile Detection

Zong-Hong Lin* (National Taiwan University, Taiwan)

13:50-14:15 **OP-03** Sustainable manufacturing of optical metasurfaces with engineered optical materials

Junsuk Rho* (Pohang University of Science and Technology, Korea)

14:15-14:40 **OP-04** Mass-production method of moth-eye structured film and fabrication of micro-nano hybrid structure using moth-eye structure

Jun Taniguchi* (Tokyo University of Science, Japan)

⦿ Invited Oral Session 2 (Dec. 10, Wed)

Chairman: Seok-min Kim (Chung-Ang University, Korea)

Oral Session 2

Panorama Room (16F)

15:30-15:55 **OP-05** Plasma Synthesis and Modification of Catalytic Materials for Sustainable Energy Systems

Sungho Lee, Oi Lun Helena Li* (Pusan National University, Korea)

15:55-16:20 **OP-06** Micro/nano-enabled wearable/flexible sensors for smart healthcare and medical applications

Inkyu Park* (Korea Advanced Institute of Science and Technology, Korea)

Program

◉ Invited Oral Session 3 (Dec. 11, Thu)

Chairman: Jun Sae Han (Korea Institute of Machinery and Materials, Korea)

Oral Session 3

Grand Ballroom I (2F)

- 09:00-09:25 **OP-07** Battery-Free, Wireless Multimodal Sensors for Advanced Biomedical Applications
Yong Suk Oh* (Changwon National University, Korea)
-
- 09:25-09:50 **OP-08** MEMS Gas Sensors with Wafer Level Fabrication and Testing Techniques
Fei Wang* (Southern University of Science and Technology, China)
-
- 09:50-10:15 **OP-09** Learned microscopy for high-throughput depth-enhanced imaging
Younghoon Kim, Yewon Kim, Chulmin Joo* (Yonsei University, Korea)
-
- 10:15-10:40 **OP-10** Biomimetic Optoelectronics and Sensors for Future Embodied AI
Zhiyong Fan* (The Hong Kong University of Science and Technology, Hong Kong SAR, China)
-

◉ Invited Oral Session 4 (Dec. 11, Thu)

Chairman: Chulmin Joo (Yonsei University, Korea)

Oral Session 4

Grand Ballroom I (2F)

- 10:50-11:15 **OP-11** Advanced spectral optical metrology and its industrial applications
Daesuk Kim*, Saeid Kheiryzadehkhaghah, Gukhyeon Hwang, Yatana Adolphe Gbogbo,
Cheongsong Kim, Jinhwan An, Asifa Zehra, Jaemin Kim (Jeonbuk National University, Korea)
-
- 11:15-11:40 **OP-12** Nanoparticle Arrays Fabrication for Raman Enhancing and Electrochemical
Sensors in Bio and Environmental Detection
Ting-Yu Liu* (Ming Chi University of Technology & Chang Gung University, Taiwan)
Kuan-Syun Wang, Yun-Chu Chen (Ming Chi University of Technology, Taiwan)
-
- 11:40-12:05 **OP-13** Roll-to-Roll Film-Type Molding Process for Large Area Electronic Device
Encapsulation
Jun Sae Han* (Korea Institute of Machinery and Materials
& University of Science and Technology, Korea)
-

Program

⦿ Invited Oral Session 5 (Dec. 11, Thu)

Chairman: Jiseok Lim (Yeungnam University, Korea)

Oral Session 5

Grand Ballroom I (2F)

14:00-14:25 **OP-14** Intelligent optical system with focus control

Seong Chan Jun* (Yonsei University, Korea)

14:25-14:50 **OP-15** Manufacturing and mechanical-electrical characterization of high-performance PENGs based on multi-stackable, domino-overlapped CNT scaffolds

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

14:50-15:15 **OP-16** Metal-Enhanced Fluorescence Biochip Using Ag Nanorods on Micropost Arrays for Multiplex Quantitative Biomarker Detection

Seok-min Kim* (Chung-Ang University, Korea)

⦿ Invited Oral Session 6 (Dec. 11, Thu)

Chairman: Seok-min Kim (Chung-Ang University, Korea)

Oral Session 6

Grand Ballroom I (2F)

15:25-15:50 **OP-17** Large-area Nanoimaging and Nanolithography

Wooyoung Shim* (Yonsei University, Korea)

15:50-16:15 **OP-18** Development of animal testing alternatives using organoids

Jiseok Lim* (Yeungnam University, Korea)

16:15-16:40 **OP-19** Semiconductor Nanomembranes for Organ-on-Chips, Wearables, and Implantable Applications

Hoang-Phuong Phan* (University of New South Wales, Australia)

Program

● Poster Session (Dec. 11, Thu)

Setup 11:30~ / Presentation time 13:00~14:00

Poster Session

Grand Ballroom III

- PP-01** Fabrication of a nanocomposite metallic surface for condensation suppression and enhanced heat transfer
Beomsu Kim, Insik Choi, Youngho Seo, Byeonghee Kim (Kangwon National University, Korea)
-
- PP-02** Conductive MOF Films Integrated with Micro-LEDs for gas sensing
Kichul Lee (Korea Advanced Institute of Science and Technology, Korea),
Myung Sung Sohn (Korea University, Korea),
Young-Moo Jo (Kyungpook National University, Korea),
Inkyu Park (Korea Advanced Institute of Science and Technology, Korea)
-
- PP-03** Fabrication and Optimization of Slanted Diffraction Gratings Using Machine Learning and UV Imprinting Technology for AR/VR Applications
Tasadduq Hussian, Muzahir Ali, Seong-Min Lee, Seok-min Kim (Chung-Ang University, Korea)
-
- PP-04** Fabrication of transparent electrode on glass substrate using vitreous carbon nano-mold
Ali Azfar, Bupjin Lee, Jung-ho Lee, Muzahir Ali, Seok-min Kim (Chung-Ang University, Korea)
-
- PP-05** Moiré pattern vision-based tactile sensor: A robust solution for multidirectional force detection and subtle 3D object recognition
Gandha Satria Adi (Korea Advanced Institute of Science and Technology, Korea),
Yongrok Jeong (Kyungpook National University, Korea),
Inkyu Park (Korea Advanced Institute of Science and Technology, Korea)
-
- PP-06** Raman Detection Platform with Dual-Mode Electrokinetic Preconcentration for Trace-Level Waterborne Bacteria
Jihyo Park (Korea Institute of Machinery and Materials & Seoul National University, Korea), Yeong-Eun Yoo,
Jae Sung Yoon (Korea Institute of Machinery and Materials & University of Science and Technology, Korea),
Do Hyun Kang (Korea Institute of Machinery and Materials, Korea),
Heung Nam Han (Seoul National University, Korea),
Kwanoh Kim (Korea Institute of Machinery and Materials & University of Science and Technology, Korea)
-
- PP-07** Multimodal Optical Sensor Array using Addressable Light Emitting Diode
Seungtaek Jang (Korea Advanced Institute of Science and Technology, Korea),
Jungrak Choi (Electronics and Telecommunications Research Institute, Korea),
Inkyu Park (Korea Advanced Institute of Science and Technology, Korea)
-

Program

- PP-08** Surface-Conformable Hybrid Adhesive Patch for Strong and Directional Attachment
Seongjin Park, Dong Kwan Kang, Jichul Park, Hoon Eui Jeong
(Ulsan National Institute of Science and Technology, Korea)
-
- PP-09** Conformal Contactable Tessellated Skin Patches with Switchable Adhesion for Wearable Electronics
Hwi So Ahn, Hee Jin Lee, Dong Kwan Kang, Sang-Woo Lee, Jinseo Kim,
Hoon Eui Jeong (Ulsan National Institute of Science and Technology, Korea)
-
- PP-10** Study on functional surface with nanostructures for antireflective and superhydrophobic properties
Sunmok Kwon, Donghyun Kim, Jeehyeon Lee, Eunjoo Chae (Yonsei University, Korea),
Taeho Lee, Janghyun Lee, Myungyung Jung (ESPn Medic Corp., Korea),
Shinill Kang (Yonsei University, Korea)
-
- PP-11** Development of an Integrated Wearable Sensing Platform for Pressure Injury Management
Nam Hyeong Lee, Yong suk Oh (Changwon National University, Korea)
-
- PP-12** Battery-Free, Wireless Graphene Pressure Sensor for Machine Learning-assisted Posture Classification and VR/AR Visualization in Smart Healthcare Environments
Younghan Kim (Changwon National University, Korea),
Myungwoo Choi (Korea Electrotechnology Research Institute, Korea),
Hyeonseok Han (Korea Advanced Institute of Science and Technology, Korea),
Gongkyu Byeon, Yonghee Lee, Sangbin Lee, Sunjin Yu (Changwon National University, Korea),
Seokwoo Jeon (Korea University, Korea),
Dongwhi Cho (Korea Research Institute of Chemical Technology, Korea),
Inkyu Park (Korea Advanced Institute of Science and Technology, Korea),
Yong Suk Oh (Changwon National University, Korea)
-
- PP-13** Manufacturing of a CNT microstructure-based gas preconcentrator for advanced gas chromatography system
Kwangjun Kim (Seoul National University of Science and Technology, Korea), Kwang Min Sim (Hongik University, Korea),
Gyeongyun Han (Seoul National University of Science and Technology, Korea), Sun Hyuk Yu (Hongik University, Korea),
Minwook Kim, Ju Hyeok Lee, Taeyeon Kim, Jeong Min Park, Jachyeok Yang,
Wonjun Lee, Jimin Lee (Seoul National University of Science and Technology, Korea),
Jung Hwan Seo (Hongik University, Korea), Jong G. Ok (Seoul National University of Science and Technology, Korea)
-
- PP-14** High-Throughput Binary-State Scanning Probe Microscopy with Cantilever-Free Tip Arrays
Seungyeon Kim, Gwangmook Kim, Wooyoung Shim (Yonsei University, Korea)
-
- PP-15** Elastomeric Photomask-Enabled Near-Field Photolithography for Sub-Diffraction Patterning on Non-Planar Substrates

Program

- PP-16** Enhancing Linearity in Flexible Capacitive Pressure Sensors via Hierarchical Buckling of Dual-Pore Polyurethane Structures
Jae Yeong Jang, Jaemin Choi, Young Jung (Pukyong National University, Korea)
-
- PP-17** Precipitation and Filtration-Based Wet Preprocessing to Enhance Airborne Hazardous Substance Detection Efficiency
Yeun-Jung Jung (University of Science and Technology & Korea Institute of Machinery and Materials, Korea),
Do-Hyun Kang (Korea Institute of Machinery and Materials, Korea),
Kwanoh Kim, Jae-Sung Yoon, Young-Eun Yoo
(University of Science and Technology & Korea Institute of Machinery and Materials, Korea)
-
- PP-18** Spectral Coherence Function Extraction Methods for Long-Term Stable $\Psi(\lambda)$ Measurement in Dynamic Spectroscopic Ellipsometry
Jinhwan An, Yatana Adolphe Gbogbo, Cheongsong Kim, Jaemin Kim,
Asifa Zehra, Daesuk Kim (Jeonbuk National University, Korea)
-
- PP-19** Mid-infrared spectroscopic polarization measurement based on a monolithic polarizing interferometric module
Cheongsong Kim, Jayakumar Paul Madhan, Sukhyun Choi, Yatana Adolphe Gbogbo,
Jinhwan An, Jaemin Kim, Daesuk Kim (Jeonbuk National University, Korea)
-
- PP-20** Mechanical characterization and FEA correlation of DLP 3D-Printed lattice structures
Geum-Jeong Park, Chan-Young Jeong, Moon-Gu Lee, Yongho Jeon (Ajou University, Korea)
-
- PP-21** Scalable DLP-Based Additive Manufacturing of Ni-P Doped Porous Carbon Microlattices for Alkaline Hydrogen Evolution
Muzahir Ali, Seong Min Lee, Tasadduq Hussain, Seok-min Kim (Chung-Ang University, Korea)
-
- PP-22** Micro-scale 3D structural vitreous carbon manufacturing and PEMFC flow field development using 3D printing technology
Seongmin Lee, Muzahir Ali, Seok-min Kim (Chung-Ang University, Korea)
-
- PP-23** Photochemical Synthesis of Silver Nanoparticles on Metal Oxide Nanostructures for Plasmonic Gas Sensing
Jehee Yu, Kichul Lee, Inkyu Park (Korea Advanced Institute of Science and Technology, Korea)
-
- PP-24** Structural and dynamic analysis for enhancing the rail straightness of a rail grinding machine
Dong-Youn Kuk, Young-Man Choi (Ajou University, Korea)
-

Program

- PP-25** Fabrication of Double-Sided Microlens Arrays by UV Imprinting
Jong-Beom Kim, Jung-Ho Lee, Young-Kyu Kim, Seok-min Kim (Chung-Ang University, Korea)
-
- PP-26** 3D Thermoformed Three-Axial Sensor with Laser-Patterned Electrodes
Changjoon Lee, Donho Lee, Inkyu Park (Korea Advanced Institute of Science and Technology, Korea)
-
- PP-27** Fabrication of Vitreous Carbon Molds via CNC-Patterned PI Film for Micro Imprinting Processes
Hyeon-Seung Jo, Seok-min Kim (Chung-Ang University, Korea)
-
- PP-28** Prediction and process control of plastic deformation in continuous metal surface micropatterning based on the Johnson-Cook model
Minwook Kim (Seoul National University of Science and Technology, Korea), Dae Bo Sim (Soongsil University), Yong Tae Kim (Seoul National University of Science and Technology, Korea), Bo Hyun Kim (Soongsil University), Jong G. Ok (Seoul National University of Science and Technology, Korea)
-
- PP-29** Marker-Based Measurement of Shrinkage-Induced Misalignment in Double-Sided Glass Imprinting using VC Molds
Jung-Ho Lee, Young-Kyu Kim, Seok-min Kim (Chung-Ang University, Korea)
-
- PP-30** Combined Nanoimprinting and Oblique Angle Deposition for Low-Cost Tilted Nanogratings in Augmented Reality Glasses
Young-Kyu Kim, Seok-min Kim (Chung-Ang University, Korea)
-
- PP-31** Battery-free, Wireless Multi-sensing Platform for Comprehensive Management of Pressure Injury and Hygiene
Sang Won Kim (Changwon National University, Korea),
Myungwoo Choi (Korea Electrotechnology Research Institute, Korea),
Sunwoo Lee (Korea Research Institute of Chemical Technology & Korea University, Korea),
Donghwi Cho (Korea Research Institute of Chemical Technology, Korea),
Yong Suk Oh (Changwon National University, Korea)
-
- PP-32** Spatial resolution enhancement of dynamic spectroscopic imaging ellipsometry employing a monolithic polarizing interferometric module
Gukhyeon Hwang, Jinhwan An, Cheongsong Kim, Daesuk Kim (Jeonbuk National University, Korea)
-
- PP-33** Video-rate depth enhanced computational microscopy for metrology via co-learned binary phase filter and cascaded deconvolution
Younghun Kim, Yewon Kim, Juwon Choi, Chulmin Joo (Yonsei University, Korea)
-

Program

WE-MEET Poster Session

Grand Ballroom III

- WP-01** Localized Fluorination Patterning of Monolayer Graphene via Strain-Induced Buckling Instability
Byeongjun Ham, Youngwoo Jeong, Ga-Hee Kim, Jung-Ki Kim (Chung-Ang University, Korea),
Jangyup Son (Korea Institute of Science and Technology, Korea),
Jae-Hyung Yu (Chung-Ang University, Korea)
-
- WP-02** Advanced Metamaterial Design for Extreme Vibration Attenuation
Jun Sung Sun, Hyeon Sik Won, Gi Jung Lee, Dong Su Lee (Kangwon National University, Korea),
Joo Hwan Oh (Seoul National University, Korea), Chung Il Park (Kangwon National University, Korea)
-
- WP-03** Shear-Thickening Electrolytes for Stress-Adaptive Interfacial Regulation Enabling Ultra-Stable Aqueous Zn Metal Batteries (>\$10,000 h)
Seung-Hyun Baek, Ik-Hwan Choi, Se-Chan Lee, Ha-Yeon Lee, In-Ho Nam
(Chung-Ang University, Korea)
-
- WP-04** A PFAS-Less Dual-Binder Architecture for Sustainable and High-Performance Dry Battery Electrodes
Subin Park, Yunjae Jang, Inho Nam (Chung-Ang University, Korea)
-
- WP-05** Low-Temperature Sintered Copper Paste for High-Temperature Die-Attach Applications
Ji-Min Jung, Hae-Eun Jeong, Ji-Won Lee (Hannam University, Korea),
Kyung-Soo Sung, Hye-Won Cho (Protavic Korea, Korea), Nam-Il Kim (Hannam University, Korea)
-
- WP-06** High-Performance Si Anodes Using Recycled Hot-Packs for Li-Ion Batteries
Han-Na Um, Da-Eun Kim, Ga-Eun Lee, Cheol-Min Park
(Kumoh National Institute of Technology, Korea)
-
- WP-07** Design and Optimization of the Rinsing Process for High-Resolution 3D Photolithography
Seungwoo Lee, Jeonghun Shin, Soonwoo Kwon, Kunyoung Yoon, Heeun Choi,
Junyong Park (Kumoh National Institute of Technology, Korea)
-
- WP-08** Development of Nanostructured Sensors and Adsorbents for Heavy Metal Detoxification in Water and Oil
Yubin Choi, Daeun Kim, Hwiyoung Kwon, Hyejin Kim, Haeri Lee (Hannam University, Korea)
-
- WP-09** Household-microwave Synthesis of Ir-Ni Bimetallic Electrocatalysts for the Oxygen Evolution Reaction in Alkaline Electrolyte
Yohan Na, Hanbin Yang, Jaemoo Lee, Yoonwon Kang, Jiyeon Lee, Jaekeun Lee,
Yeeun Kim (Hannam University, Korea), Bok Ki Min (Lasengrapn, Korea),
Seong K. Kim (Hannam University, Korea)
-
- WP-10** Development of an Electrolyte Additive Controlling Anode and Cathode Interphase in Lithium-Ion Batteries
Yujin Lee, Hyobin Kim, Minseo Jang, Heonwoo Ha, Inho Nam (Chung-Ang University, Korea)
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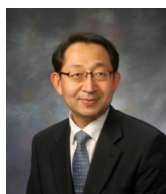
Micro and Nano Manufacturing

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Scope included but is not limited to

- Bottom-up micro/nano structuring
- Micro/nano machining (mechanical, thermal, chemical, photochemical, electrochemical, etc)
- Micro/nano replication (polymer, metal, ceramic, composite material)
- Micro/Nano additive manufacturing
- Atomic (scale) manufacturing
- MEMS & NEMS
- Simulation of micro/nano manufacturing process
- Micro/Nano manufacturing equipment
- Measurement/inspection for micro/nano structures
- Design for micro/nano manufacturing
- Artificial Intelligence technology related with micro/nano manufacturing
- Applications of micro/nano manufacturing: (Flexible electronics, Bio/Medical engineering, Photonics/Optics, Display, Semiconductor/Memory/Data storage Mechanical system, Energy, Defense & Surveillance Heavy industry application, etc.)

Editors-in-Chief



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(Yonsei Univ. KOR)



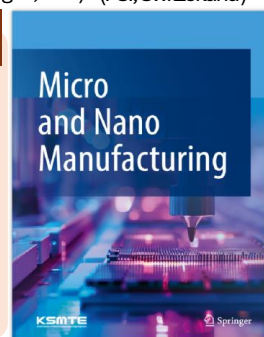
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