The 15th International Symposium on
Measurement Technology and Intelligent Instruments

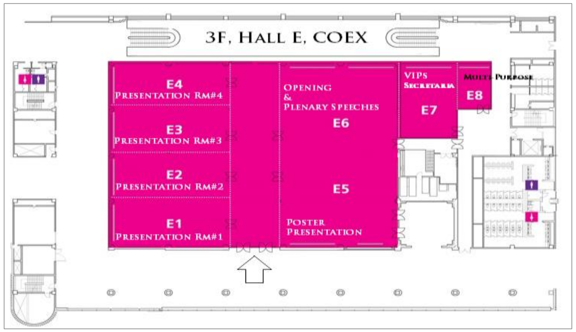
ISMTII 2023

COEX, Seoul, South Korea
September 17 Sun. ~ 20 Wed., 2023

Summary and Statistics

History

ISMTII 2027	Hong Kong, China
ISMTII 2025	25–28 May 2025, East Lake Hotel, Wuhan, China
ISMTII 2023	**17–20 September 2023, COEX, Seoul, Korea**
ISMTII 2019	1–4 September 2019, Niigata, Japan
ISMTII 2017	22–25 September 2017, Xi'an, China
ISMTII 2015	22–25 September 2015, Taipei, Taiwan
ISMTII 2013	1–5 July 2013, RWTH, Aachen, Germany
ISMTII 2011	29 June – 2 July 2011, KAIST, Daejeon, Korea
ISMTII 2009	29 June – 2 July 2009, St. Petersburg, Russia
ISMTII 2007	24–27 September 2007, Sendai, Japan
ISMTII 2005	6–8 September 2005, Huddersfield, UK
ISMTII 2003	28 November – 1 December 2003, Hong Kong SAR, China
ISMTII 2001	25–29 September 2001, Cairo, Egypt
ISMTII 1998	2–4 September 1998, Miskolc–Lillafured, Hungary
ISMTII 1996	30 September – 3 October 1996, Hayama, Kanagawa, Japan
ISMTII 1993	29 October – 5 November 1993, Wuhan, Chin
ISMTII 1989	15–17 May 1989, Wuhan, China



Organization

Organized by

KIMM KOREA INSTITUTE OF MACHINERY & MATERIALS

ICMI International Committee on Measurements and Instrumentation

Co-organized by

KAIST Korea Advanced Institute of Science and Technology

KRISS Korea Research Institute of Standards and Science

Supported by

KSPE Korean Society for Precision Engineering

Financially Supported by

KIMM KOREA INSTITUTE OF MACHINERY & MATERIALS

SEOUL METROPOLITAN GOVERNMENT

KOREA TOURISM ORGANIZATION

INTEK PLUS Integrated Measurement System

3D LMI TECHNOLOGIES

MARPOSS

NanoSystem www.nanosystemz.com

nexensor

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Scope & Registration Fee

Symposium Scope

- Intelligent measurement and instrumentation
- In-process and on-line measurement
- Machine tool metrology
- Material characterization
- Micro/nano-metrology
- Optical metrology and inspection
- Sensors and actuators
- Signal processing and machine learning
- Uncertainty, traceability and calibration
- Frequency comb: fundamentals and applications

Registration Fee

Category	Early Registration	Late & On-Site Registration
Date	July 30, 2023	
Regular	USD 600 / KRW 720,000	USD 700 / KRW 840,000
Student	USD 300 / KRW 360,000	USD 400 / KRW 480,000
Banquet	USD 100 / KRW 120,000 * 'Student Registration' DOSE NOT include 'Banquet'	

Program at a Glance

DAY 1 / September 17 Sun., 2023

Time	
16:00~17:00	**Registration** (Room 402, 4F)
17:00~19:00	**Welcome Reception** (Room 402, 4F)
19:00~	**ICMI Member Meeting** (Conference Room E4)

DAY 2 / September 18 Mon., 2023

Time	Room E1 Session A	Room E2 Session B	Room E3 Session C	Room E4 Session D	Room E5 Session E, F	Lobby
08:30~09:00	**Opening Ceremony** (Room E5)					Registration (08:00~18:00)
09:00~10:30	**Keynote Session-1 (Keynote 1, 2&3)** (Room E5)					
10:30~10:45	Coffee Break					
10:45~12:10	**A-1** In-Process Measurement - I	**B-1** Dimensional Metrology - I	**C-1** Optical Interferometry - I	**D-1** Laser Material Processing - I	**E-1** Precision Metrology - I	
12:10~13:50	Lunch					
13:50~15:15	**A-2** In-Process Measurement - II	**B-2** Frequency Comb - I	**C-2** Optical Interferometry - II	**D-2** Laser Material Processing - II	**E-2** Precision Metrology - II	
15:15~16:25	Post Only Session & Coffee Break					Poster Only
16:25~18:00	**A-3** Intelligent Measurement - I	**B-3** Frequency Comb - II	**C-3** Metrology & Inspection - I	**D-3** Material Characterization	**F-1** Machine Learning & Signal Processing I	

DAY 3 / September 19 Tue., 2023

Time	Room E1 Session A	Room E2 Session B	Room E3 Session C	Room E4 Session D, E	Room E5 Session F	Lobby
08:30~10:30	**Keynote Session-2 (Keynote 4, 5, 6&7)** (Room E5)					Registration (08:00~17:00)
10:30~10:45	Coffee Break					
10:45~12:10	**A-4** Intelligent Measurement - II	**B-4** Dimensional Metrology - II	**C-4** Microscopy & Profilometry - I	**D-4** Sensors & Actuators	**F-2** Machine Learning & Signal Processing II	
12:10~14:00	Lunch					
14:00~15:25	**A-5** Intelligent Measurement - III	**B-5** Frequency Comb - III	**C-5** Metrology & Inspection - II	**E-3** Precision Metrology - III	**F-3** Machine Learning & Signal Processing III	
15:25~15:40	Coffee Break					
15:40~17:15	**A-6** Intelligent Measurement - IV	**B-6** Uncertainty, Traceability & Calibration	**C-6** Microscopy & Profilometry - II	**E-4** Precision Metrology - IV	**F-4** Machine Learning & Signal Processing IV	
17:45~20:30	**Banquet** (Cheonggyesan Yettgol Fortress Restaurant)					

DAY 4 / September 20 Wed., 2023

Time	
08:30~13:00	**Technical Tour** (Korea Institute of Industrial Technology)
09:00~13:00	**Culture Tour** (Gyeongbokgung Palace)

Symposium Statistics

Total: 209 Presentations

- 7 Keynote Presentations
- 37 Invited Presentations
- 165 Regular Presentations (Oral 99, Poster 66)

Total: 291 Participants from 16 Countries

- 174 Regular Participants, 117 Students
- South Korea(161), China(54), Japan(39), Taiwan(10), UK(5), USA(5), Germany(4), Croatia(3), Singapore(2), UAE(2), Hong Kong(1), Canada(1), Belgium(1), Italy(1), India(1), Thailand(1)

Keynote Presentation(7)

Han Haitjema

Professor

- KU Leuven (Belgium)
- Department of Mechanical Engineering

Title

Metrologic characteristics and uncertainty evaluation of surface texture measurements

Sang-Yoon LEE

CEO

- INTEKPLUS (South Korea)

Title

Industrial use cases of 3D optical metrology

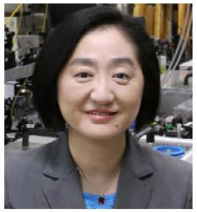
Eberhard Manske

Professor

- Technische Universität Ilmenau (Germany)
- Institute of Process Measurement and Sensor Technology

Title

Nanopositioning and nanomeasuring machines with a direct link to the unit of time



Kaoru Minoshima

Professor

- University of Electro-Communications (Japan)
- Department of Engineering Science

Title

Precision measurements beyond frequency metrology using versatile control of optical waves with optical frequency comb

Laura Sinclair

Doctor

- National Institute of Standards and Technology (USA)
- Fiber Sources and Applications Group

Title

Pushing the boundaries of ranging and time transfer through precise control of optical frequency combs

Liandong Yu

Professor

- China University of Petroleum (UPC) (China)
- College of Control Science and Engineering

Title

Microfluidic sensor on the early diagnostic of cancer diseases

Peter de Groot

Doctor

- Chief Scientist, Zygo Corporation (USA)

Title

Interferometric metrology solutions for digital optical immersive displays

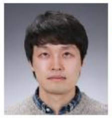
Invited Presentation(37)

Florian Pollinger
Doctor
- Physikalisch-Technische Bundesanstalt (Germany)

Title
Multi-wavelength interferometry for geodesy and large volume metrology
B-1
Sep. 18 (Mon.) / 10:45~11:10
Room E2

Satoru Takahashi
Professor
- The University of Tokyo (Japan)

Title
Super resolution optical measurement for functional microstructures beyond the diffraction limit
C-4
Sep. 19 (Tue.) / 10:45~11:10
Room E3



Kye-Sung Lee
Doctor
- Korea Basic Science Institute (South Korea)

Title
Tissue culture monitoring using line-field fluorescence microsocpy combined with optical coherence microscopy
C-4
Sep. 19 (Tue.) / 11:10~11:35
Room E3

Byung-Seon Chun
Doctor
- Nanoscope Systems, Inc. (South Korea)

Title
Thermoreflectance microscopy for steady-state and transient thermal analysis of electronic devices in microscopic scale
C-3
Sep. 18 (Mon.) / 16:25~16:50
Room E3

Dong-Wook Lee
Doctor
- Advanced Materials Research Center, Technology Innovation Institute (UAE)

Title
Deep learning-based stress intensity factors analysis of bi-material interface crack from photoelastic images
F-2
Sep. 19 (Tue.) / 10:45~11:10
Room E5

Wanxin Sun
Doctor
- Bruker Singapore Pte Ltd. (Singapore)

Title
Nano scale physical and chemical property characterization by scanning probe techniques
D-3
Sep. 18 (Mon.) / 16:25~16:50
Room E4

Liang-Chia Chen
Professor
- National Taiwan University (Taiwan)

Title
Current advances and challenges in optical metrology for advanced semiconductor packaging
A-1
Sep. 18 (Mon.) / 10:45~11:10
Room E1

Masato Aketagawa
Professor
- Nagaoka University of Technology (Japan)

Title
Picometer displacement/length measurement using regular crystalline lattice and super-resolution interferometry
B-1
Sep. 18 (Mon.) / 11:10~11:35
Room E2

Chi Ho Ng
Vice President of Technology
- LMI Technologies (Canada)

Title
Simplified solutions in an increasingly complicated market
A-4
Sep. 19 (Tue.) / 10:45~11:10
Room E1

ChaBum Lee
Professor
- Texas A&M University (USA)

Title
Wafer-level metrology and inspection for advanced electronics packaging
A-3
Sep. 18 (Mon.) / 16:25~16:50
Room E1

In-Ho Lee
Doctor
- Korea Research Institute of Standards and Science (South Korea)

Title
Designing and exploring super functional materials and devices using evolutionary and deep learning methods
F-4
Sep. 19 (Tue.) / 15:40~16:05
Room E5

Yang Lu
Professor
- China University of Petroleum (UPC) (China)

Title
Ultrafast holographic microscopy based on fs laser for wavefront inspection and biological applications
B-4
Sep. 19 (Tue.) / 10:45~11:10
Room E2

Guanhao Wu
Professor
- Tsinghua University (China)

Title
Dual-comb-based distance and multi-degree-of-freedom measurements
B-2
Sep. 18 (Mon.) / 13:50~14:15
Room E2

Daewook Kim
Professor
- University of Arizona (USA)

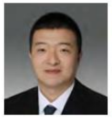
Title
Deflectometry and Interferometry
C-1
Sep. 18 (Mon.) / 11:10~11:35
Room E3

Matteo Bosi
President
- Marposs Korea (Italy)

Title
A capacitor coupling-based instrument to assess in a more reliable way the quality of insulation in mass-produced electric stators and motors
B-6
Sep. 19 (Tue.) / 15:40~16:05
Room E2

Youjian Song
Professor
- Tianjin University (China)

Title
Time-of-flight measurement of micro-structures based on electronically controlled optical sampling
B-2
Sep. 18 (Mon.) / 14:15~14:40
Room E2



Rongke Gao
Professor
- China University of Petroleum (UPC) (China)

Title
The SERS measurements on micro-nano interface substrate integrated microfluidic biosensor
C-5
Sep. 19 (Tue.) / 14:25~14:50
Room E3

Ruitao Yang
Professor
- Harbin Institute of Technology (China)

Title
Real-time suppression of random phase drift for optical frequency comb ranging with high-frequency intermode beats
B-4
Sep. 19 (Tue.) / 11:10~11:35
Room E2

Sang-Joon Cho
Vice President
- Park Systems (South Korea)

Title
Automated Nano-Metrological AFM with Intelligent Data Preparation
E-3
Sep. 19 (Tue.) / 14:00~14:25
Room E4

Chao Zuo
Professor
- Nanjing University of Science and Technology (China)

Title
Learning based fringe projection profilometry
C-5
Sep. 19 (Tue.) / 14:00~14:25
Room E3

Byoung-Ho Lee
Doctor
- Hitachi High-tech (Japan)

Title
MI (Metrology & Inspection): essential technology for future devices
C-3
Sep. 18 (Mon.) / 16:50~17:15
Room E3

Taejoong Kim
Doctor
- Samsung Electronics (South Korea)

Title
Massive overlay metrology solution by realizing imaging Mueller matrix spectroscopic ellipsometry
C-1
Sep. 18 (Mon.) / 10:45~11:10
Room E3

Kai Ni
Professor
- Tsinghua University (China)

Title
Dual-comb spectroscopy and ranging based on mechanical sharing mode-locked fiber lasers
B-3
Sep. 18 (Mon.) / 16:50~17:15
Room E2

Akifumi Asahara
Professor
- University of Electro-Communications (Japan)

Title
Dual-comb spectroscopy extended for spatiotemporal measurement applications using OAM light
B-3
Sep. 18 (Mon.) / 16:25~16:50
Room E2

Invited Presentation(37)

Takashi Kato

Professor

- University of Electro-Communications (Japan)

Title

Optical phased array with phase-controlled optical frequency comb

B-5

Sep. 19 (Tue.) / 14:00~14:25
Room E2

Jiao Jiannan

Professor

- Shenzhen University (China)

Title

Generation of non-divergent surface third-harmonics with a two-photon-polymerized phase-type diffractive micro axicon

B-5

Sep. 19 (Tue.) / 14:25~14:50
Room E2

Jindong Tian

Professor

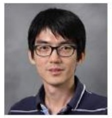
- Shenzhen University (China)

Title

Quantitative phase imaging for dynamic processes

C-2

Sep. 18 (Mon.) / 14:15~14:40
Room E3



Huitaek Yun

Professor

- Korea Advanced Institute of Science and Technology (South Korea)

Title

Virtual reality based human-machine interface for human-AI collaboration

F-1

Sep. 18 (Mon.) / 16:25~16:50
Room E5

Jiyeon Choi

Doctor

- Korea Institute of Machinery & Materials (South Korea)

Title

Ultrafast laser processing for advanced packaging of glass-based devices

D-1

Sep. 18 (Mon.) / 10:45~11:10
Room E4

Sangbaek Park

Professor

- Chungnam National University (South Korea)

Title

Laser-patterned energy storage devices integrated with wearable electronics

D-2

Sep. 18 (Mon.) / 13:50~14:15
Room E4

Hyung Cheoul Shim

Doctor

- Korea Institute of Machinery & Materials (South Korea)

Title

Advanced characterization of the active materials for lithium Ion batteries using TEM techniques to promote mechanism understanding

D-2

Sep. 18 (Mon.) / 14:15~14:40
Room E4

Soongeun Kwon

Doctor

- Korea Institute of Machinery & Materials (South Korea)

Title

Laser processing of graphene materials for high-performance energy storage devices

D-1

Sep. 18 (Mon.) / 11:10~11:35
Room E4

In Sung Kang

Doctor

- KOH YOUNG TECHNOLOGY, INC. (South Korea)

Title

Optical 3D inspection technologies

A-2

Sep. 18 (Mon.) / 13:50~14:15
Room E1

Ki Joon Heo

Professor

- Chonnam National University (South Korea)

Title

Real-time monitoring of airborne microbial colony forming unit based on on-chip cell imaging platform with continuous aerosol-to-hydrosol transfer

C-6

Sep. 19 (Tue.) / 15:40~16:05
Room E3

Sungho Suh

Doctor

- Deutsches Forschungszentrum für Künstliche Intelligenz (Germany)

Title

Remaining useful life prediction of lithium-ion batteries using spatio-temporal transformers

A-3

Sep. 18 (Mon.) / 16:50~17:15
Room E1

Martin Tangari Larrategui

Doctor

- University of Arizona (USA)

Title

Advancements in non-null surface figure measurement interferometry

C-2

Sep. 18 (Mon.) / 13:50~14:15
Room E3

Ilkoo Kim

Doctor

- Gauss Labs (USA)

Title

Universal denoising method for boosting the throughput of semiconductor image metrology

F-3

Sep. 19 (Tue.) / 14:00~14:25
Room E5

Best Paper Award(18)

No.	Paper Title	Authors	Affiliation (1st Author)
1	Single-shot deflectometry for dynamic measurement of specular surfaces using high carrier-frequency diagonal pattern	Manh The Nguyen, Jaehyun Lee, Young-Sik Ghim, Hyug-Gyo Rhee	Korea Research Institute of Standards and Science
2	Femtosecond-laser-induced graphene formation on textile for E-textile applications	Dongwook Yang, Han Ku Nam, Younggeun Lee, Young-Ryeul Kim, Le Dinh Truong Son, Seung-Woo Kim, Young-Jin Kim	Korea Advanced Institute of Science and Technology
3	Vertical registration of in-process topography data with post-process volumetric data	Afaf Remani, Fernando Peña, Arianna Rossi, Adam Thompson, John Dardis, Nick Jones, Nicola Senin, Richard Leach	University of Nottingham
4	An on-line surface quality detection method for wide cold-rolled strip based on normalizing flow	Pan Jiang, Zhenying Xu, Liling Han, Yun Wang, Ziqian Wu	Jiangsu University
5	Improving period accuracy of planar diffraction gratings fabricated in a Lloyd's mirror exposure system	Shen Sitong, Zeng Lijiang	Tsinghua University
6	Stroboscopic sampling moiré microscope for investigation of MEMS' full surface in-plane vibration	Mona Yadi, Tsutomu Uenohara, Yasuhiro Mizutani, Yoshiharu Morimoto, Yasuhiro Takaya	Osaka University
7	High-precision roll measurement method based on laser polarization	Fei Long, Fajia Zheng, Yibin Qian, Jiakun Li, Qibo Feng	Beijing Jiaotong University
8	Wavefront sensing and control using an approximate point-spread function model in the sensorless adaptive optics	Jinsung Kim, Hwan Hur	Korea Basic Science Institute
9	Super-resolution imaging of sub-diffraction-limited pattern with superlens based on deep learning	Yizhao Guan, Shuzo Masui, Shotaro Kadoya, Masaki Michihhata, Satoru Takahashi	The University of Tokyo

Best Paper Award(18)

No.	Paper Title	Authors	Affiliation (1st Author)
10	Spectroscopic ellipsometry for ultra-thin film with sub-10 nm thickness	Honggang Gu, Shiyuan Liu	Huazhong University of Science and Technology
11	Stitching interferometry method for the pitch evaluation of a large-scale variable-line-spacing diffraction grating by using a Fizeau interferometer	Chenguang Yin, Xin Xiong, Ryo Sato, Hiraku Matsukuma, Wei Gao	Tohoku University
12	Chromatic confocal sensor based on a geometric phase lens	Min Kwan Song, Ki-Nam Joo	Chosun University
13	Conductive carbon nanowire produced by using femtosecond laser irradiation with acetylene gas	Rakibul Islam, Sangseon Lee, Seungsik Shin, Jaeseung Lim, Daeseop Kim, Seongwon Choi, Seunghwoi Han	Chonnam National University
14	In-process observation of physical phenomena inside the workpiece processed by water jet guided laser	Shoichi Ui, Mayuko Osawa, Ryota Washio, Shotaro Kadoya, Masaki Michihata, Satoru Takahashi	The University of Tokyo
15	Influence of laser fabricating parameters on the surface hydrophobicity of laser-induced graphene on wood	Manping Wang, Tongmei Jing, Han Ku Nam, Truong-Son Dinh Le, Yang Lu, Seung-Woo Kim, Liandong Yu, Young-Jin Kim	China University of Petroleum
16	High-resolution repairing process of metal patterns using laser ablation for fine-patterned advanced packaging	Hakyung Jeong, Seung Man Kim, Jae Hak Lee, Jun-Yeob Song, Seongheum Han, Ah-Young Park, Sumin Kang, Hayoung Youn	Korea Institute of Machinery and Materials
17	Predicting the critical dimensions of HAR TSV structures using joint training models and electromagnetic simulation tools	Jia-Wei Li , Chong-Han Hsu, Jiao-Kai Wang, Bo-En Tsai, Yong-Jing Su, Chao-Ching Ho	National Taipei University of Technology
18	An AI-powered diffraction imaging approach for optical critical dimension metrology	Fu-Sheng Yang, Yen-Hung Hung, Min-Ru Wu, Zih-Ying Fu, Chen-Yu Liao, Liang-Chia Chen	National Taiwan University

Journal Recommendation

28 papers are recommended for Journal Publication

- IJPEM : 22 papers
- NMME : 5 papers
- Metrology : 1 paper

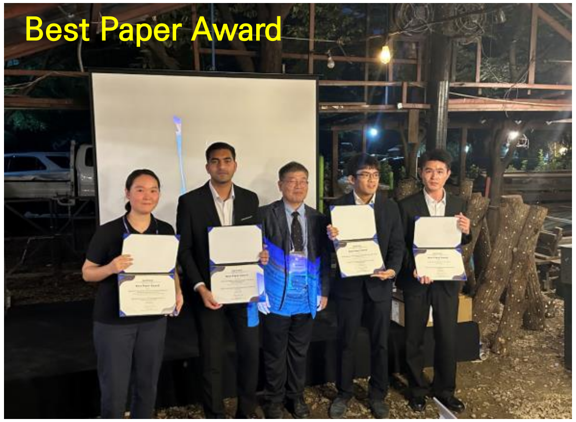
● **Participated Journals**

metrology

Banquet

- **Cheonggyesan Yettgol Fortress Restaurant**


Thanks to Staffs


Best Paper Award


Lucky Draw

Tour

- **Technical Tour (30)**

  Korea Institute of Industrial Technology

- **Cultural Tour (20)**

  Gyeongbokgung Palace

We appreciate your support and participation.