

# International Symposium on Semiconductor Manufacturing



## ISSM2022

Monday, December 12 - Tuesday, December 13

KFC Hall, Tokyo, Japan

Co-Sponsored by

IEEE Electron Devices Society, MINIMAL, Semiconductor Equipment Association of Japan (SEAJ),  
Semiconductor Equipment and Materials International (SEMI) and Taiwan Semiconductor Industry Association (TSIA)  
Endorsement by

The Japan Institute of Electronics Packaging (JIEP), The Japan Society of Applied Physics (JSAP)

JST(UTC+9)	December 12 (Day-1)		December 13 (Day-2)	
	Room1	Room2	Room1	Room2
8:45	Opening Remarks, Conference Outline, Program Schedule		Program Outline	
9:00	<b>Tutorial Session 1</b> <b>Dr.Masaru Hori, Nagoya University</b>		<b>Keynote Speech 3</b> <b>Dr.Nelson Felix, IBM</b>	
9:10	Session Co-Chairs: Ayako Shimazaki, Toshiba Nanoanalysis Tsuyoshi Moriya, Tokyo Electron		Session Chair: Yasutoshi Okuno, SCREEN Semiconductor Solutions	
9:20	Break		Break	
9:30	<b>Tutorial Session 2</b> <b>Dr. Satoshi Hamaguchi, Osaka University</b>		<b>Keynote Speech 4</b> <b>Dr.James Moyné, AMAT/ Univ.of Michigan</b>	
9:40	Session Co-Chairs: Ayako Shimazaki, Toshiba Nanoanalysis Tsuyoshi Moriya, Tokyo Electron		Session Chair: Shuichi Inoue, ATONARP	
9:50	Break		Break	
10:00	<b>A-1</b> <b>Manufacturing Strategy (MS) &amp; Environment, Safety and Health, Carbon Neutral (ES) &amp; Fab Operation Method (FO)</b>		<b>Keynote Speech 5</b> <b>Mr.Timothy Lee, IEEE HIR Chair for 5G Technical Working Group</b>	
10:10	<b>B-1</b> <b>Invited &amp; Process/ Material Optimization (PO)</b>		Session Chair: Kenji Miyake, PMT	
10:20	Session Co-Chairs: Katsutoshi Ozawa, OMRON Takahiro Tsuchiya, United Semiconductor Japan		Session Co-Chairs: Tsuyoshi Moriya, Tokyo Electron Hiroyuki Inoue, Texas Instruments Japan	
10:30	Break		Sponsor Exhibition (On-site) · Vdeo (Silver-Platinum) & Lunch Break	
10:40	Author's interview (On-site) & Break		Break	
10:50	Sponsor Exhibition (On-site) · Vdeo (Silver-Platinum) & Lunch Break		<b>Keynote Speech 6</b> <b>Mr. Michitaka Tokelji, Zeroboard, Inc</b>	
11:00	Break		Session Chair: Hiroshi Akahori, KIOXIA	
11:10	<b>Keynote Speech 1</b> <b>Dr. Masayoshi Yamamoto, Nagoya University</b>		Break	
11:20	Session Chair: Kazunori Kato, Advanced Interface Technology		<b>ISSM2022 AI Contest Award</b> - AI Algorithm Contest Smart Metrology Challenge Using Semiconductor Actual Tool Data - Semiconductor Manufacturing Fab Data AI utilization Idea Contest	
11:30	Break		Session Co-Chairs: Shin-ichi Imai, Hitachi High-Tech Isamu Namose, OMRON	
11:40	<b>LIVE ONLY NO On-Demand Streaming</b> <b>Keynote Speech 2</b> <b>Mr. Yutaka Emoto, TSMC Japan 3DIC R&amp;D Center</b>		Break	
11:50	Session Chair: Kazuhito Matsukawa, SUMCO		Flash Presentation for Poster Speakers Session Co-Chairs: Takanori Kawakami, JSR Toshio Konishi, Toppan Photomask	
12:00	Break		Sponsor Exhibition (On-site) & Break	
12:10	<b>A-2</b> <b>Invited &amp; Highlight AI</b>		<b>A-5</b> <b>Intelligent Data Management (ID)</b>	
12:20	<b>B-2</b> <b>Invited &amp; Process/ Material Optimization (PO)</b>		<b>B-5</b> <b>Process Monitoring &amp; Control Method (PM)</b>	
12:30	Session Co-Chairs: Isamu Namose, OMRON Takatoshi Yasui, Tower Partners Semiconductor		Session Co-Chairs: Masami Aoki, KLA-Tencor Japan Hiroyuki Inoue, Texas Instruments Japan	
12:40	Session Co-Chairs: Kazunori Kato, Advanced Interface Technology Shun-ichiro Ohmi, Tokyo Institute of Technology		Session Co-Chairs: Takahiro Tsuchiya, United Semiconductor Japan Takayuki Matsumoto, United Semiconductor Japan	
12:50	Author's interview & Sponsor Exhibition (On-Site) & Break		Author's interview (On-site) & Break	
13:00	<b>A-3</b> <b>Highlight AI</b>		<b>A-6</b> <b>Intelligent Data Management (ID)</b>	
13:10	<b>B-3</b> <b>Invited &amp; Process/ Material Optimization (PO)</b>		<b>B-6</b> <b>Process Monitoring &amp; Control Method (PM)</b>	
13:20	Session Co-Chairs: Takatoshi Yasui, Tower Partners Semiconductor Masami Aoki, KLA-Tencor Japan		Session Co-Chairs: Yuji Yamada, KIOXIA Takayuki Hisamatsu, Sony Semiconductor Manufacturing	
13:30	Session Co-Chairs: Shun-ichiro Ohmi, Tokyo Institute of Technology Yuji Yamada, KIOXIA		Session Co-Chairs: Shin-ichi Imai, Hitachi High- Tech Tsuyoshi Moriya, Tokyo Electron	
13:40	Author's interview (On-site) & Break		Author's interview (On-site) & Break	
13:50	<b>A-4</b> <b>Invited &amp; Yield &amp; Defect Control (YD) &amp; Manufacturing Technology for Variety Devices (VD)</b>		Author's interview (On-site) & Break	
14:00	<b>B-4</b> <b>Material Informatics (MI) &amp; New Gas, and New Resist Technologies (NM)</b>		<b>Poster Session (On-Site) &amp; Best Paper&amp;Student Awards</b>	
14:10	Session Co-Chairs: Kenji Watanabe, Western Digital Tomio Otsuki, IX Nippon Mining & Metals		Session Co-Chairs: Shinsuke Mizuno, Applied Materials Japan Takanori Kawakami, JSR	
14:20	Author's interview (On-site) & Break			
14:30	Author's interview (On-site) & Break			
14:40	Author's interview (On-site) & Break			
14:50	Author's interview (On-site) & Break			
15:00	Author's interview (On-site) & Break			
15:10	Author's interview (On-site) & Break			
15:20	Author's interview (On-site) & Break			
15:30	Author's interview (On-site) & Break			
15:40	Author's interview (On-site) & Break			
15:50	Author's interview (On-site) & Break			
16:00	Author's interview (On-site) & Break			
16:10	Author's interview (On-site) & Break			
16:20	Author's interview (On-site) & Break			
16:30	Author's interview (On-site) & Break			
16:40	Author's interview (On-site) & Break			
16:50	Author's interview (On-site) & Break			
17:00	Author's interview (On-site) & Break			
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17:50	Author's interview (On-site) & Break			
18:00	Author's interview (On-site) & Break			
18:10	Author's interview (On-site) & Break			
18:20	Author's interview (On-site) & Break			
18:30	Author's interview (On-site) & Break			
18:40	Author's interview (On-site) & Break			



## Message from ISSM 2022 Committee



**Mr. Shozo Saito**  
**Chairman of Organizing Committee of ISSM 2022**

Chairman & CEO  
Device & System Platform Development Center Co., Ltd.

On behalf of the organizing committee, it is my great pleasure to extend to you all a very warm welcome to the International Symposium on Semiconductor Manufacturing (ISSM) 2022. ISSM is an international semiconductor manufacturing forum where the most updated and advanced manufacturing technologies in solid-state and semiconductor fields will be presented. Started in 1992, ISSM 2022 will be the 29<sup>th</sup> edition of the symposium.

Semiconductor, as an indispensable commodity for economic security, has contributed to the development of the digital society in the past and will continue to be a key technology that will provide the foundation for future industrial development.

Distinct types of semiconductors are installed in a wide variety of IT equipment. With the spread of IoT technologies, the amount of information processing in IT devices is dramatically increasing. In the future, all kinds of things will be connected to the network, and the transition from the era of storing data to the era of utilizing data will progress, creating newer services.

Domestic manufacturing is crucial for supply chain resilience and contributes significantly to the development of the Japanese economy. Growth of the semiconductor industry requires revitalization of the domestic IT and digital infrastructure industries. Securing and fostering human resources is necessary for both R&D and semiconductor manufacturing. Japan is one of the few countries that has a complete semiconductor manufacturing ecosystem, with strength in the equipment and materials fields specially.

Our goal is not only to strengthen our technological competitiveness. We have a mission for semiconductors from the perspective of protecting the earth. Aiming to be a game changer in greening semiconductor industry and supply chain, it is necessary to promote integrated research on systems, circuits, devices, processes, equipment, and materials, as well as human resource development, to realize green semiconductors with low environmental impact and other green features.

Today we are together here at ISSM to reaffirm the key role that semiconductor manufacturing and its environment throughout the supply chain, in ensuring our industry's ongoing progress.

Besides the series of technical papers from all over the world, we are honor to have eight marvelous keynote and invited speakers, and two tutorial speakers sharing the view of the distinguished scholars, engineering, and management on the vital semiconductor value chain which are cornerstones for the future digital society.

ISSM has been collaborating with global affiliation including Taiwan Semiconductor Industry Association (TSIA), SEMI, SEAJ, Minimal Fab Promotion Organization (MINIMAL). I would like to express our special appreciation to our partner, TSIA, in Taiwan for their support to ISSM.

ISSM is an excellent opportunity to make connections and explore new collaborations, as we share ideas and perspectives on challenges and opportunities in both technology and manufacturing. I would like to express my deepest gratitude to the sponsored companies, and to all the committee members involved in organizing this symposium. Finally, I offer my best wishes for highly productive information exchange among everyone at ISSM 2022.



**Dr. Ayako Shimazaki**

**Chairman of Executive Committee of ISSM 2022**

Technology Executive  
Toshiba Nanoanalysis Corporation

On behalf of the ISSM 2022 Executive Committee, I would like to thank all of you for your participation in the ISSM 2022.

The digital transformation has been accelerated by 5G, AI, and high-performance computing and we expect to see the change even in a faster pace. 5G and AI will continue to be a driving factor for the global semiconductor industry to grow. It is expected that the global semiconductor industry will grow double to over \$1 trillion US dollars by 2030.

The ISSM executive committee invited global notable keynote speakers to address their deep insights for both application perspectives and manufacturing aspects for the rapidly changing semiconductor technologies and industries. *Prof. Masayoshi Yamamoto of Nagoya University* will cover the demand technique for EV using teardown report of Model 3 (TESLA), Mustang Mach-E (Ford), ID.3 (VW), Taycan (Porsche) and HongGuang Mini EV (Wuling). *Mr. Yutaka Emoto of TSMC Japan 3DIC R&D Center, Inc.* will present chiplet integration through 2.5D and 3D stacking technologies to increase circuit densities through the collaboration with Japanese partners in addition to SoC scaling to follow Moore's Law. *Dr. Nelson Felix of IBM* will cover the strategic goals for the next three years regarding semiconductor research, which suggests the main scaling paths starting to look upward, from stacked FETs to advanced chiplet technology. *Dr. James Moyne of University of Michigan and Applied Material* will present background on the current state of the Digital Twin (DT) space in semiconductor manufacturing. *Mr. Timothy Lee of IEEE and The Boeing Company* will address immense need for the Heterogeneous Integration technology roadmap addressing an Ecosystem Agenda comprising of future vision, difficult challenges and potential solutions to pave the way for Microelectronics Resurgence. *Mr. Michitaka Tokeiji of Zeroboard* will cover the intention behind the disclosure of CO<sub>2</sub> emissions, including Scope 3, and its impact on the entire supply chain, so that it can be used for strategic planning for decarbonization management.

This year, we will also receive talks from presentations at EDTM 2022 and IITC 2022 that have been recommended by their respective committees as outstanding papers. We are looking forward to deepening the cooperation among the societies related to the field of ISSM.

We invited two tutorial speakers. *Prof. Masaru Hori of Nagoya University* will introduce the possibility of environmental innovation in semiconductor manufacturing through the challenge of advanced plasma science and technology for green semiconductor manufacturing. *Prof. Satoshi Hamaguchi of Osaka University* will review the latest development of etching and deposition technologies with atomic-scale accuracy, i.e., atomic-layer etching (ALE) and atomic-layer deposition (ALD)

This year's ISSM will be held as a full hybrid format of in-person and online participation. Through oral presentations, authors' interviews, interactive poster session, and exhibits, we are pleased to offer participants the opportunity to engage in lively communication in a venue. We hope that you will take advantage of the benefits of face-to-face discussions among the participants.

I hope that the participants of ISSM 2022 evaluate the outlook of ISSM committee for preparation of change in this industry.



**Dr. Shin-ichi Imai**  
**Chairman**  
**Program Committee of ISSM 2022**  
Hitachi High-Tech Corporation

Welcome to the 29th International Symposium on Semiconductor Manufacturing (ISSM) 2022.

ISSM is a premiere conference focusing on manufacturing technologies for semiconductor which is a vital core driver to make our society more comfortable.

Semiconductor devices are manufactured by performing various microfabrication processes using huge amounts of tuning parameters to achieve nanometer-order precision. Digital enabler technologies such as Artificial Intelligence (AI), machine learning, cloud computing, and digital twin have been developed one after another and applied to semiconductor manufacturing. Data is the base of machine learning and AI. These results in increasing expectation for higher level of data acquisition and analysis. The mission of ISSM, "*Converting Know-How into Science*" is being put into practice.

ISSM Program Committee consisted by 26 members from 24 affiliations including semiconductor device, equipment and materials manufacturers, revised the areas of the interests and highlighted themes for ISSM 2022 through intimate discussion among members. ISSM 2022 highlights on IoT and AI Solution, Production Innovation in 200-mm Fab, High Reliability Device Process Technology for Automotive and Medical Applications, and Game-Changing Manufacturing Technologies with Heterogeneous Integration.

ISSM 2022 has received an abundance of high-quality abstracts full of insight and useful know-hows. Through tough review process by Program Committee members, 37 papers were selected including 8 papers for Process/Material Optimization (PO), followed by 7 papers for Intelligent Data Management (ID) and Process Monitoring & Control Method (PM), 6 papers for Yield & Defect Control (YD) and 2 papers for Manufacturing Strategy (MS), New Gas, New Liquid, and New Resist Technologies (NM), and Manufacturing Technology for Variety Devices (VD). And 1 paper for Fab Operation Method (FO), Environment, Safety and Health, Carbon Neutral (ES) and Material Informatics (MI). We will also feature 6 keynote speeches by world-renowned industry experts, focusing on topics relevant for today's economic and manufacturing climate. Also 2 tutorial sessions focused on covering a well-defined topic will take place in the morning of the first day. And also 5 invited talks from cooperative conferences, EDTM&IITC.

ISSM 2022 will hold its 2nd "ISSM AI Solution Contests to Revolutionize Semiconductor Manufacturing" aiming to accelerate to adopt AI technologies in the field of semiconductor manufacturing. ISSM committee hope to discover human resources for artificial intelligence and improve motivation for learning and research that spreads from the excellent technologies and ideas among participants at the contests. This is an excellent opportunity for students who want to play an active role by applying the latest information technologies to solve various challenges at semiconductor manufacturing fabs. At the two divisions of the contest, there were 10 entries for ISSM AI Algorithm Contest Smart Metrology Challenge Using Semiconductor Actual Tool Data and 8 entries for Semiconductor Manufacturing Fab Data AI utilization Idea Contest. I would like to encourage all participants to view the presentations for the Fab Data AI utilization Idea Contest and to poll your vote. The winner announcement and the Award Ceremony for both 2 divisions start at 13:00, December 13.

I would like to extend my sincere appreciation to all authors and speakers, sponsors, committee members, moderators, and, last but not least, all the participants. I hope you will enjoy the technical program of ISSM 2022, take this opportunity to network with experts around the world, and bring back good memories with you.

## Keynote Speakers

Monday, December 12<sup>th</sup>



### "Cutting Edge Technologies of Power Semiconductor Device Applications for Electric Vehicle's Power Electronics Systems in Japan, US, Europe and China Case"

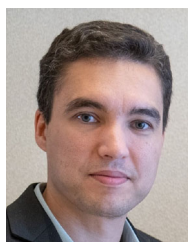
Prof. Masayoshi Yamamoto  
Professor, Institute of Materials and Systems for Sustainability (IMaSS),  
Graduate School of Engineering and School of Engineering,  
Department of Electrical Engineering,  
Nagoya University



### "The Contribution and Expectation of TSMC Japan 3DIC R&D Center to Japan Industry"

Mr. Yutaka Emoto  
Vice President,  
TSMC Japan 3DIC R&D Center, Inc.  
**LIVE ONLY NO-ONDEMAND Available**

Tuesday, December 13<sup>th</sup>



### "The Path to 100 Billion Goes Upward – IBM Research Semiconductors Technology Atlas"

Dr. Nelson Felix  
Director, Process Technology  
IBM



### "A Requirements Driven Digital Twin Framework to Support Semiconductor Manufacturing: Specifications and Opportunities"

Dr. James Moyne, Ph. D.  
Associate Research Scientist, Mechanical Engineering Department  
University of Michigan  
Consultant for Standards and Technology, Advanced Services Engineering , Applied Global Services,  
Applied Materials



### "Heterogeneous Integration Paving the way for Microelectronics Resurgence"

Mr. Timothy Lee  
IEEE Board of Director  
IEEE HIR Chair for 5G Technical Working Group



### "Decarbonization Management to Improve Corporate Value"

Mr. Michitaka Tokeiji  
Founder and CEO, Zeroboard. Inc

## **Tutorial Speakers**

**Monday, December 12<sup>th</sup>**



**"Challenges of Plasma Science and Technology for Green Semiconductor Manufacturing"**

Prof. Masaru Hori

Professor,

Center for Low-temperature Plasma Sciences (cLPS), Nagoya University



**"Atomic-level control of plasma processing toward sub-nm node technologies"**

Prof. Satoshi Hamaguchi

Professor,

Center for Atomic and Molecular Technologies, Osaka University

**Japanese to English simultaneous interpretation will be available ONLY for Tutorial Sessions.**



## Symposium Schedule (Day-1)

### ISSM2022 Monday, December 12<sup>th</sup>, 2022

#### Room: KFC Hall

8:45- 8:50	<b>Opening Remarks</b> Shozo Saito, Chairman of Organizing Committee of ISSM2022 / Device & System Platform Development Center
8:50- 8:55	<b>ISSM 2022</b> Ayako Shimazaki, Chairman of Executive Committee of ISSM2022 / Toshiba Nanoanalysis
8:55- 9:00	<b>ISSM 2022 Program Outline</b> Shin-ichi Imai, Chairman of Program Committee of ISSM2022 / Hitachi High-Tech Corporation
9:00- 10:30	<b>Tutorial Session</b> <i>Session Chair: Ayako Shimazaki, Toshiba Nanoanalysis / Tsuyoshi Moriya, Tokyo Electron</i>
9:00- 9:40	<b>"Challenges of Plasma Science and Technology for Green Semiconductor Manufacturing"</b> Prof. Masaru Hori, Professor, Center for Low-temperature Plasma Sciences (CLPS), Nagoya University
9:40- 9:50	Break
9:50-10:30	<b>"Atomic-level control of plasma processing toward sub-nm node technologies"</b> Prof. Satoshi Hamaguchi, Center for Atomic and Molecular Technologies, Osaka University
10:30-10:40	Break
10:40-12:00	<b>Technical Session A-1 &amp; B-1</b>
12:00-12:50	Sponsor Exhibition (on-site) & Video (Sponsor: Silver-Platinum) / Lunch Break
12:50-13:30	<b>Keynote Speech: "Cutting Edge Technologies of Power Semiconductor Device Applications for Electric Vehicle's Power Electronics Systems in Japan, US, Europe and China Case"</b> Prof. Masayoshi Yamamoto, Professor, Institute of Materials and Systems for Sustainability (IMaSS), Graduate School of Engineering and School of Engineering, Department of Electrical Engineering, Nagoya University <i>Session Chair: Kazunori Kato, Advanced Interface Technology</i>
13:30-13:40	Break
13:40-14:20	<b>Keynote Speech: "The Contribution and Expectation of TSMC Japan 3DIC R&amp;D Center to Japan Industry"</b> Mr. Yutaka Emoto, Vice President, TSMC Japan 3DIC R&D Center, Inc. <i>Session Chair: Kazuhito Matsukawa, SUMCO</i>
14:20-14:30	Break



<b>Room1: KFC Hall</b>	
<b>Session A-1: Manufacturing Strategy (MS) &amp; Environment, Safety and Health, Carbon Neutral (ES) &amp; Fab Operation Method (FO)</b> Session Co-Chairs: Katsutoshi Ozawa, OMRON / Takahiro Tsuchiya, United Semiconductor Japan	
10:40	<b>MS-44 : A Novel Approach to Dynamic Line Balance Control and Scheduling with a Digital Twin Production System</b> Hirofumi Tsuchiyama, INFICON
11:00	<b>ES-62 : Self-tuning optimization to compatible the delivery and low energy consumption</b> Chending MAO, University of Tsukuba
11:20	<b>ONLINE FO-43 : Maintenance Content Reduction and Digitalization for Performance Optimization</b> Christopher Bode, INFICON
11:40	Author's Interview (On-Site ONLY) & Break
12:00	Sponsor Exhibition (on-site) & Video (Sponsor: Silver-Platinum) / Lunch Break
12:50	Plenary Sessions
<b>Session A-2: Invited &amp; Highlight AI</b> Session Co-Chairs: Isamu Namose, OMRON / Takatoshi Yasui, Tower Partners Semiconductor	
14:30	<b>INVITED EDTM-01 : Inter Spike Interval and Stochasticity Engineering of Floating Gate Technology-based Neurons for Spiking Neural Network Hardware</b> Akira Goda, University of Tokyo
14:50	<b>YD-21 : Noise Reduction in SEM Images using Deep Learning</b> Yuki Sato, Tokyo Electron
15:10	<b>ID-6 : Application of Natural Language Processing in Semiconductor Manufacturing</b> Daisuke Kobayashi, Sony Semiconductor Manufacturing Corporation
15:30	Author's Interview & Exhibition (On-Site ONLY) & Break
<b>Session A-3: Highlight AI</b> Session Co-Chairs: Takatoshi Yasui, Tower Partners Semiconductor / Masami Aoki, KLA-Tencor Japan	
16:00	<b>YD-10 : Positive/Negative Decision via Outlier Detection Towards Automatic Performance Evaluation for Defect Detector</b> Toshinori Yamauchi, Hitachi High-Tech
16:20	<b>YD-15 : A Study on Detection Method Using 2-Class Classifiers for Defective Wafer Maps</b> Seima Sakaguchi, Mie University
16:40	<b>ONLINE YD-5 : Yield prediction with Machine Learning and parameter limits in semiconductor production</b> Rebecca Busch, University of Siegen
17:00	Author's Interview (On-Site ONLY) & Break
<b>Session A-4: Invited &amp; Yield &amp; Defect Control (YD) &amp; Manufacturing Technology for Variety Devices (VD)</b> Session Co-Chairs: Kenji Watanabe, Western Digital / Tomio Otsuki, JX Nippon Mining & Metals	
17:20	<b>INVITED ONLINE IITC-01 : Dual Damascene 28nm-Pitch Single Exposure EUV Design Rules Evaluation by Voltage Contrast Characterization</b> Victor M. Carballo, IMEC
17:40	<b>ONLINE YD-35 : Automatic classification of C-SAM voids for root cause identification of bonding yield degradation</b> Julien Baderot, Pollen Metrology
18:00	<b>VD-33 : Hydrogen diffusion behavior of CH4N-molecular-ion-implanted wafers for 3D-stacked CMOS image sensors</b> Ryosuke Okuyama, SUMCO
18:20	Author's Interview & Exhibition (On-Site ONLY) & Break

<b>Room 2: KFC Hall Annex</b>	
<b>Session B-1: Invited &amp; Process/Material Optimization (PO)</b> Session Co-Chairs: Tsuyoshi Moriya, Tokyo Electron / Hiroyuki Inoue, Texas Instruments Japan	
10:40	<b>INVITED EDTM-02 : Experimental Analysis of Process Impacts on Fluorine Incorporated Gate Oxide Film Properties Near Gate Edge Region</b> Shuntaro Fujii, Asahi Kasei
11:00	<b>PO-63 : Nanoimprint Lithography with CO2 Ambient</b> Toshiki ITO, Canon
11:20	<b>PO-11 : Impact of cation vacancies on leakage current on TiN/ZrO2/TiN capacitors studied by positron annihilation</b> Akira Uedono, University of Tsukuba
11:40	Author's Interview (On-Site ONLY) & Break
12:00	Sponsor Exhibition (on-site) & Video (Sponsor: Silver-Platinum) / Lunch Break
12:50	Plenary Sessions
<b>Session B-2: Invited &amp; Process/Material Optimization (PO)</b> Session Co-Chairs: Kazunori Kato, Advanced Interface Technology / Shun-ichiro Ohmi, Tokyo Institute of Technology	
14:30	<b>INVITED ONLINE IITC-02 : TSV fabrication technology using direct electroplating of Cu on the electroless plated barrier metal</b> Shoso Shingubara, Kansai University
14:50	<b>PO-42 : Ultra-fast Etching of Photoresist by Reactive Atmospheric-pressure Micro-Thermal Plasma Jet</b> Hibiki Kato, Hiroshima University
15:10	<b>PO-28 : Optimization of RF frequencies in dual-frequency capacitively coupled plasma apparatus using genetic algorithm (GA) and plasma simulation</b> Shigeyuki Takagi, Tokyo University of Technology
15:30	Author's Interview & Exhibition (On-Site ONLY) & Break
<b>Session B-3: Invited &amp; Process/Material Optimization (PO)</b> Session Co-Chairs: Shun-ichiro Ohmi, Tokyo Institute of Technology / Yuji Yamada, KIOXIA	
16:00	<b>INVITED EDTM-03 : Temperature Dependence of Current-Voltage Characteristics of Ionic Liquid Type Intelligent Connection Device</b> Masakazu Kobayashi, Nagase
16:20	<b>PO-40 : Deposition rate dependence of the 5 nm-thick ferroelectric nondoped HfO2 on MFSFET characteristics</b> Masakazu Tanuma, Tokyo Institute of Technology
16:40	<b>ONLINE PO-55 : Process Optimization for Ge-on-Si depletion mode transistors using mesa architecture</b> Sumit Choudhary, Indian Institute of Technology, (IIT), Mandi
17:00	Author's Interview (On-Site ONLY) & Break
<b>Session B-4: Material Informatics (MI) &amp; New Gas, New Liquid, and New Resist Technologies (NM)</b> Session Co-Chairs: Shinsuke Mizuno, Applied Materials Japan / Takanori Kawakami, JSR	
17:20	<b>ONLINE MI-25 : Systematic search for stabilizing dopants in ZrO2 and HfO2 using first-principles calculations</b> Yosuke Harashima, Nara Institute of Science and Technology
17:40	<b>NM-23 : Recent status of EUV lithography, what is the stochastic issues ?</b> Toru Fujimori, FUJIFILM
18:00	<b>NM-45 : Technology Trends and Characteristics of Patent Information Disclosure in Advanced Semiconductor Photoresist</b> Kosuke Watahiki, Yamaguchi University
18:20	Author's Interview & Exhibition (On-Site ONLY) & Break

# Symposium Schedule (Day-2)

ISSM2022

Tuesday, December 13<sup>th</sup>, 2022

8:30- Registration

## Room: KFC Hall

8:50	<b>Introduction of Day 2 program</b> Shin-ichi Imai, Chairman of Program Committee of ISSM2022 / Hitachi High-Tech Corporation
9:00- 9:40	<b>ONLINE Keynote Speech: "The Path to 100 Billion Goes Upward – IBM Research Semiconductors Technology Atlas"</b> Dr. Nelson Felix, Director, Process Technology, IBM <i>Session Chair: Yasutoshi Okuno, SCREEN Semiconductor Solutions</i>
9:40- 9:50	Break
9:50-10:30	<b>ONLINE Keynote Speech: "A Requirements Driven Digital Twin Framework to Support Semiconductor Manufacturing: Specifications and Opportunities"</b> Dr. James Moyne, Associate Research Scientist, Mechanical Engineering Department, University of Michigan Consultant for Standards and Technology, Advanced Services Engineering, Applied Global Services, Applied Materials <i>Session Chair: Shuichi Inoue, ATONARP</i>
10:30-10:40	Break
10:40-11:20	<b>ONLINE Keynote Speech: "Heterogeneous Integration Paving the way for Microelectronics Resurgence"</b> Mr. Timothy Lee IEEE Board of Director, IEEE HIR Chair for 5G Technical Working Group <i>Session Chair: Kenji Miyake, PMT</i>
11:20-12:10	Sponsor Exhibition & Video (Sponsor: Silver-Platinum) / Lunch Break
12:10-12:50	<b>Keynote Speech: "Decarbonization Management to Improve Corporate Value"</b> Mr. Michitaka Tokeiji, Founder and CEO, Zeroboard. Inc <i>Session Chair: Hiroshi Akahori, KIOXIA</i>
12:50-13:00	Break
13:00-14:00	<b>AI Contest Award</b> Session Co-Chairs: <i>Shin-ichi Imai, Hitachi High-Tech / Isamu Namose, OMRON</i>
14:00-14:10	Break
14:10-14:40	<b>3minutes Summary presentation by Interactive Poster Speakers</b> Session Co-Chairs: <i>Takanori Kawakami, JSR / Toshio Konishi, Toppan Photomask</i>
14:40-15:00	Sponsor Exhibition (On-site) & Break

## Room1: KFC Hall

<b>Session A-5 : Intelligent Data Management (ID)</b> Session Co-Chairs: Masami Aoki, KLA-Tencor Japan / Hiroyuki Inoue, Texas Instruments Japan	
15:00	<b>ID-13 : Advanced Process Control Model for Trench Shape of Power Devices</b> Takumi Ito, TOSHIBA DEVICE & STORAGE
15:20	<b>ID-17 : Principal Component Analysis based GaN transistor live health monitoring</b> Florian Chalvin, Rohm
15:40	<b>ONLINE ID-27 : Application of Big Data Science in High Reliability Automotive Wafer Yield Management System and Failure Analysis</b> Chia-Cheng Kuo, Taiwan Semiconductor Co., Ltd.
16:00	Author's Interview (ON-Site ONLY) & Break
<b>Session A-6 : Intelligent Data Management (ID)</b> Session Co-chairs: Yuji Yamada, KIOXIA / Takayuki Hisamatsu, Sony Semiconductor Manufacturing	
16:20	<b>ID-32 : Equipment Sensor Data Cleansing Algorithm Design for ML-Based Anomaly Detection</b> Shi-Chung Chang, National Taiwan University
16:40	<b>ID-26 : Dynamic AI Computation Tasks with SECS/GEM in Semiconductor Smart Manufacturing</b> Hung H Nguyen, Yield Engineering Systems
17:00	<b>ID-36 : Secure and Reliable Power Monitoring for Low Consumption Factory Equipment via Programmable IoT Devices</b> Sergio Garnica, Fraunhofer Research Institution for Microsystems and Solid State Technologies EMFT
17:20	-
17:40	Author's Interview (ON-Site ONLY) & Break

## Room 2: KFC Hall Annex

<b>Session B-5 : Process Monitoring &amp; Control Method (PM)</b> Session Co-Chairs: Takahiro Tsuchiya, United Semiconductor Japan / Takayuki Matsumoto, United Semiconductor Japan	
15:00	<b>PM-22 : Characterization of light propagation loss in Si Photonics using High-Resolution CDSEM metrology</b> Shimon Halevi, Applied Materials
15:20	<b>PM-41 : In Situ Measurement and Analysis of Low Pressure Gas Concentration Distribution Using 70-dB SNR 1,000 Frames-per-second Absorption Imaging System</b> Yushi Sakai, Tohoku University
15:40	<b>PM-18 : Advanced Process Monitoring through Fault Detection and Classification for Robust Statistical Process Control of Tantalum Nitride Reactive Sputtering</b> Stephanie Y Chang, Skyworks Solutions
16:00	Author's Interview (ON-Site ONLY) & Break
<b>Session B-6 : Process Monitoring &amp; Control Method (PM)</b> Session Co-chairs: Shin-ichi Imai, Hitachi High-Tech / Tsuyoshi Moriya, Tokyo Electron	
16:20	<b>PM-30 : Plasma Process Classification using Causal Discovery Technique</b> Dai Kobayashi, Tokyo Electron
16:40	<b>PM-14 : Practical load impedance monitoring system externally installed in plasma etching equipment</b> Yuji Kasashima, National Institute of Advanced Industrial Science and Technology
17:00	<b>PM-31 : Plasma diagnostics and characteristics of hydrofluorocarbon films in capacitively coupled CF4/H2 plasmas</b> Shih-Nan Hsiao, Nagoya University
17:20	<b>PM-49 : A Study on Robust Noninteracting Control System Design with Disturbance Feedforward for 6-DoF AVIS</b> Thin Huynh, Pukyong National University
17:40	Author's Interview (ON-Site ONLY) & Break

18:00

Poster Session (On-Site) @ Foyer and ISSM2022 Awards @ Room1

## Symposium Schedule (Day-2)

ISSM2022  
Tuesday, December 13<sup>th</sup>, 2022

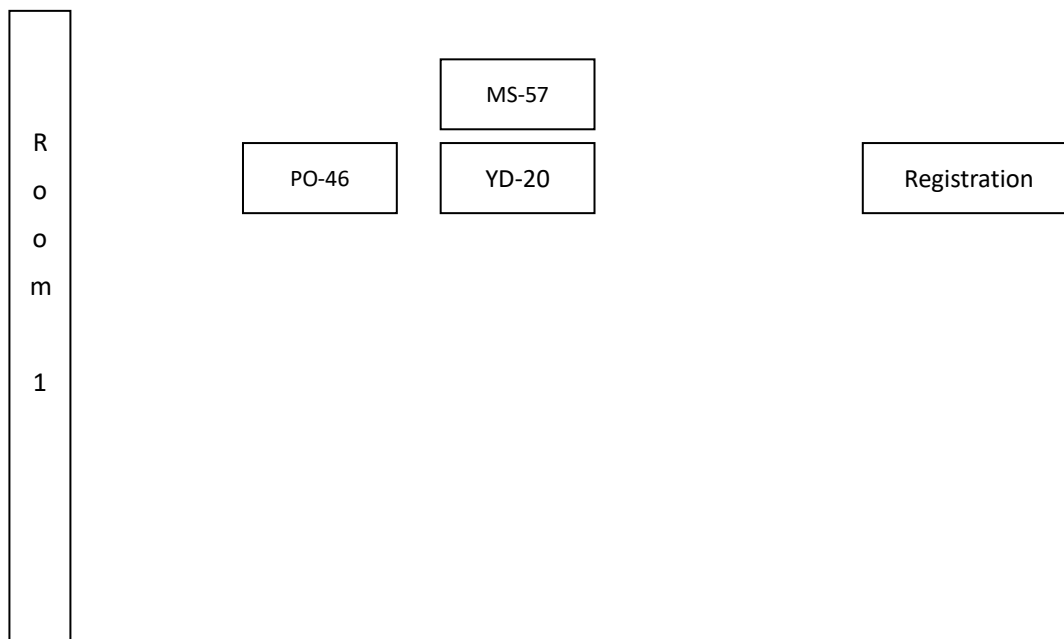
### Interactive Poster Session

14:10-14:40 3-min Flash Presentation for Interactive Poster Session @ Room 1 : KFC Hall

Room1 : KFC Hall	
Session Co-Chairs: Takanori Kawakami, JSR / Toshio Konishi, Toppan Photomask	
<b>MS-57</b>	<b>Data-driven Modeling for Production Dynamics</b> Yu Sasaki, University of Tsukuba
<b>PO-46</b>	<b>Obtaining carbon nanowalls with a specified morphology</b> Yerassyl Yerlanuly, Kazakh-British Technical University
<b>YD-20</b>	<b>Influence of High Temperature N2 Annealing on Photoluminescence of SiC and Si Quantum Dots in SiO2 Layer</b> Koki Murakawa, Kanagawa University
<b>ONLINE PO-59</b>	<b>Experimentally study on the effect of RIE etching power on etching rate of <math>\beta</math>-Ga2O3 thin film</b> Wang Xu, Guizhou University
<b>ONLINE VD-60</b>	<b>Preparation of Uniform SiO2 Insulating Layer on the Inner Wall of TSV by Thermal Oxidation</b> GuoFengJie, Guizhou University

18:00-18:25 Poster Session @ Foyer

#### Poster Layout



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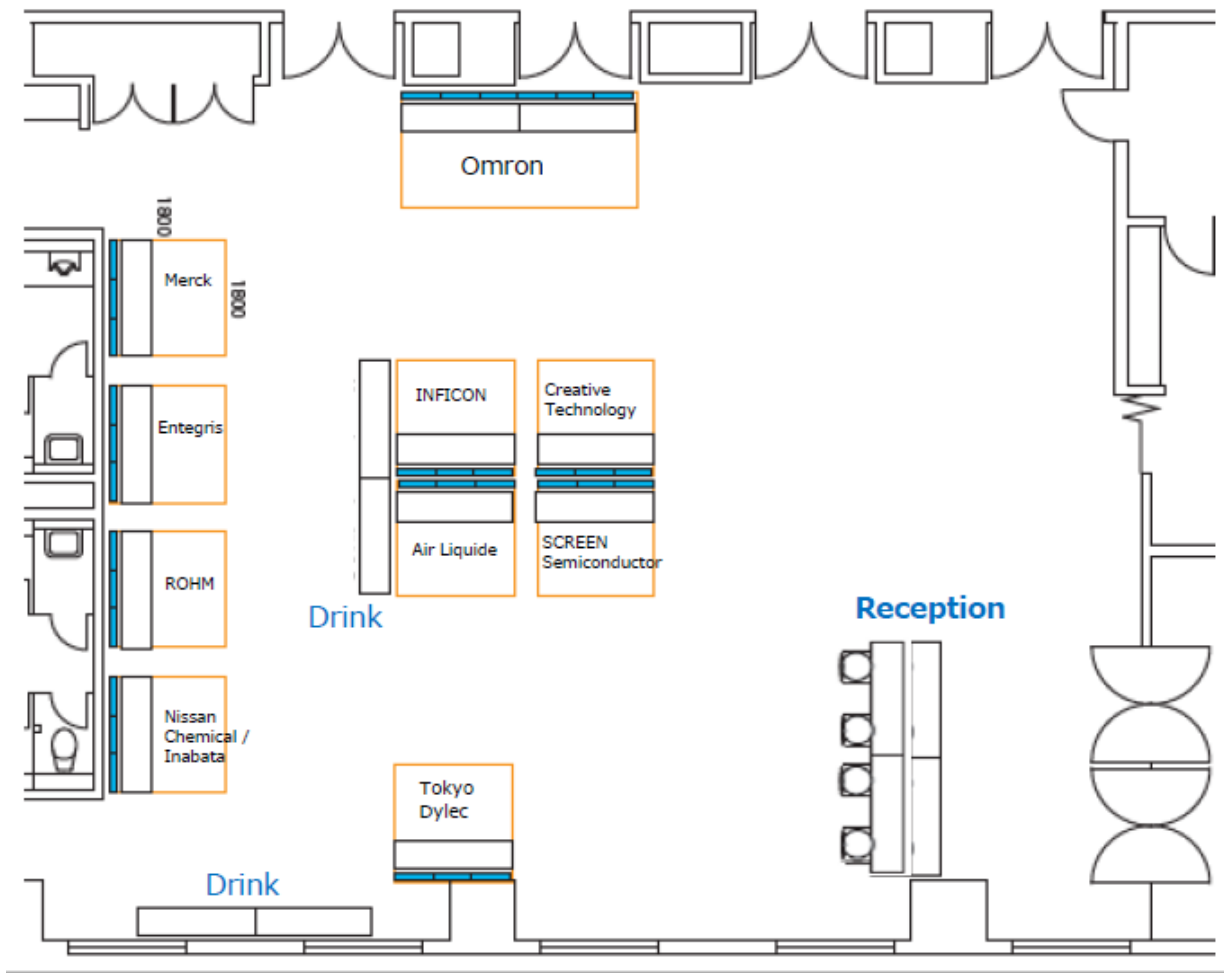
Prof. SC Chang, National Taiwan University

# Floor Layout

Floor Layout 3F of KFC Hall



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