THE 29th INTERNATIONAL SYMPOSIUM

ON SEMICONDUCTOR MANUFACTURING

December 12-13, 2022 (in conjunction with SEMICON Japan 2022)

CALL FOR PAPERS

EXTENDED-ABSTRACT DEADLINE: Monday, September 19, 2022 <PDT 8:00 AM>

Since its start in 1992 in Japan, ISSM has been providing unique opportunities to share semiconductor manufacturing technology" best practices" for the benefit of professionals worldwide. The symposium had been held in Japan and U.S. alternately until 2010, then, with the partnership of Taiwan Semiconductor Industry Association (TSIA) and the e-Manufacturing & Design Collaboration Symposium (eMDC), ISSM has been alternately placed in Japan and Taiwan since 2011. Under the slogan of "Making Know-how to Science," ISSM has nurtured the seeds of new semiconductor manufacturing technology through discussions and exchanges among scientists and engineers worldwide and has created a new trend of making production technology into science-based knowledge.

There have been big changes such as the industry consolidation to smaller number of large-scale players, and the deacceleration of the progress in advanced fine dimension patterns processing technologies as well as large-diameter wafers. On the other hand, new directions, and innovative technologies such as three-dimensional device structures, MEMS, new device physics and new materials, and advanced packaging technologies are being incorporated to achieve high productivity and to promote decarbonization. The effective utilization of legacy fab lines with 6 and 8-inch wafers have been expanding with the introduction of new materials and equipment, the restructuring of production lines for new structural devices, and the evolution of operating formats.

In the application areas including autonomous driving, medical applications, IoT, big data processing, AI, and smart infrastructure, high quality and reliability, integration degree, security, sensing, analysis and performance evaluation is required along with effective operating performance and cost.

With the focus on strengthening supply chain resilience and new directions such as the metaverse of semiconductor factories, there is a need for a common forum for discussion and exchange among companies, academia, and research institutions in the semiconductor value chain.

ISSM2022 will provide a forum for researchers and engineers worldwide to discuss the direction, activities, and management of production technology that anticipates the future.

We invite you to share your professional experiences at the 29th annual International Symposium on Semiconductor Manufacturing.

■ Areas of Interest

Abstract will be accepted for each of following areas of interest.

Fab Management

* Factory Design (FD)
* Material Handling Management (MH)
* Manufacturing Strategy (MS)
* Fab Operation Method (FO)
* Environment, Safety and Health, Carbon Neutral (ES)
* Worker and WIP Control (WC)
* Intelligent Data Management (ID)

Material Technology

* New Gas, New Liquid, and New Resist Technologies (NM)
* Material Informatics (MI)
* New Parts Technology for Process Equipment (NP)

Process Integration

* Process/Material Optimization (PO)
* Process Monitoring & Control Method (PM)
* Yield & Defect Control (YD)
* Ultraclean Technology (UT)
* New Process/Metrology Equipment (PE)
* Manufacturing Technology for Variety Devices (VD)

Final Manufacturing & Packaging

*Heterogeneous Integration and Packaging (HI)
*Improvement of Conventional Final Manufacturing Technology (FM)
*Signal and Power Integrity (SI)

■ Highlighted Theme

Papers on the topics of special interests may be programmed as a special session for highlight themes. Papers on the following topics are especially welcome. See more information on the reverse side.

IoT and AI Solution

-Big Data Science in Fab
-IoT and Sensing Technology
-AI Application

Production Innovation in 200-mm Fab

- Optimization of Legacy Fab
- Fab Management and Utilization of 200mm Fab
- Utilization for Power Devices (IGBT, SiC) Manufacturing

High Reliability Device Process Technology for Automotive and Medical Applications

- Technology for an Effective Screening
- Technology for an Outlier Screening
- Rapid Failure Analysis for an Incident

Game-Changing Manufacturing Technologies with Heterogeneous Integration

-New Packaging Technologies for High-end CPU used for Data Center and HPC (High Performance Computing)
-Signal Integrity
-Power Integrity

■ ISSM Awards

The ISSM Awards to be presented to the excellent papers

■ ISSM Best Papers for IEEE/TSM

Best papers for ISSM will have the chance to submit full papers for IEEE/TSM (Transactions on Semiconductor Manufacturing) which is published quarterly for worldwide distribution. About ten papers are annually selected and reported in ISSM/TSM special session.

Extended Schedule

Abstract Submission Due:	**Mon., Sep. 19, 2022**
Notification of Paper Acceptance:	**Tue. Oct. 11, 2022**
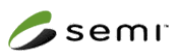
ISSM Sponsors:

◆Details for the Areas of Interest◆

Fab Management

FD: Factory Design
This area focuses on fab design and its key enablers to meet the flexibility, extendibility, and scalability needs of a cost-effective leading-edge fab.

MH: Material Handling Management
This area focuses on challenges and measures for transport system control of equipment, materials, and products.

MS: Manufacturing Strategy
This area focuses on strategy and concepts for more functional fab, and its operation management to meet rapidly changing complex business requirements.

FO: Fab Operation Method
This area focuses on optimization of operating methods such as lot-base progress management, dispatching, and cycle time management for the entire fab.

ES: Environment, Safety and Health, Carbon Neutral
This area focuses on zero greenhouse gas emissions, suppression of energy and materials consumption, recycling, and reuse of materials from the standpoint of the environmental management in a semiconductor factory in order to achieve a decarbonized society.

WC: Worker and Wafer-in-Process (WIP) Control
This area focuses on WIP control system and operator allocation management in wafer processing for cost reduction.

ID: Intelligent Data Management
This area focuses on analysis methods and systems for big data collected in the fab.

Material Technology

NM: New Gas, New Liquid, and New Resist Technologies
This area focuses on new process gases, chemicals, and EUV resist technology.

MI: Material Informatics (MI)
This area focuses on gas process design technologies using AI and machine learning.

NP: New Parts Technology for Process Equipment
This area focuses on new parts technologies for process equipment such as wafer fixing parts.

Process Integration

PO: Process Optimization
This area focuses on process and material optimization from the standpoint of high reliability, cost reduction and environment. The breakthrough technology to improve the productivity of legacy process is contained.

PM: Process Monitoring & Control Method
This area focuses on advanced process control (APC) technology such as visualization of sensor data of manufacturing equipment and virtual metrology.

YD: Yield & Defect Control
This area focuses on probe yield enhancement and its stabilization technology including inspection, analysis and reduction of defects and particles.

UT: Ultraclean Technology
This area focuses on contamination control of wafer backside and bevel, surface cleaning. Energy saving cleaning and molecular level contamination control in advanced wafer fab will be included.

PE: New Process/Metrology Equipment
This area focuses on finer pattern delineation/control. The application of equipment control and engineering system will be highlighted.

VD: Manufacturing Technology for Variety Devices
This area focuses on manufacturing technologies specialized for emerging variety devices in MEMS, power devices, and CMOS sensors areas which can be realized by technologies not limited to miniaturization or large-diameter wafers.

Final Manufacturing & Packaging

HI: Heterogeneous Integration and Packaging
This area focuses on technologies for heterogeneous integration such as chiplets and new packaging technologies for high-end CPU which is used for data center and HPC (High Performance Computing).

FM: Improvement of Conventional Final Manufacturing Technology
This area focuses on improved technologies for Wafer on Wafer, Chip on Wafer, FOWLP (Fan Out Wafer Level Package) and FOPLP (Panel Level Package) . And the other improved technologies for antenna, RF module and magnetic shield will be discussed either.

SI: Signal and Power Integrity
This area focuses on technologies for signal integrity and power integrity.

◆Details for the Highlight Theme◆

IoT and AI Solution
In recent years, the data utilization has become common sense in many manufacturing industries. The IoT for data collection and AI applications using the collected data have received great attention. For more than 30 years in semiconductor manufacturing, research and development and commercialization of various manufacturing technologies utilizing data have been well performed. AI tools and application case studies were introduced at the ISSM Strategy Forum in 2019, under the theme of "Smart Factory with AI! From Machine Learning with Open Source to Applying AI to Semiconductor Manufacturing". Papers related the application of IoT and AI to create breakthrough manufacturing technologies are welcomed.   The scope covers the utilization of semiconductor manufacturing to other manufacturing industries.

Topics may include (but not limited to): Big Data Science in Fab, IoT and Sensing Technology, AI Application, Bayesian Design, Machine Learning, Deep Learning, Material Informatics, AI Tools

Production Innovation in 200-mm Fab
To strengthen device competitiveness specially for emerging IoT devices, it is essential to pursue economics in 200 mm fab and to boost productivity. The strategies and issues of capital equipment for efficient fab will be discussed.

Topics may include (but not limited to): Optimization of Legacy Fab, Fab Management and Utilization of 200mm Fab, Utilization for Power Devices (IGBT, SiC) Manufacturing

High Reliability Device Process Technology for Automotive and Medical Applications
Semiconductor industry considers automotive and medical devices as growing markets. These markets require superior reliability, which makes improving device reliability essential.
Semiconductor manufacturing technology for highly reliable devices shall be the key to revive semiconductor industry.

Topics may include (but not limited to): Technology for an Effective Screening, Technology for an Outlier Screening, Rapid Failure Analysis for an Incident
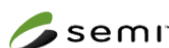
Game-Changing Manufacturing Technologies with Heterogeneous Integration
The heterogeneous integration which is required for high-end CPUs for data center and HPC (High Performance Computing) gets attention. It is considered that the new technology and packaging process will be driven which is not the improvement of conventional packaging technology. These new technologies including how to get high quality signal and power in the package will be discussed.

Topics may include (but not limited to):
Chiplets, Substrate for Chiplets, Chip on Wafer, Signal Integrity, Power Integrity