

# ALD/ALE 2025 Program Overview

<b>AA</b>	ALD Applications
<b>AF</b>	ALD Fundamentals
<b>ALDALE</b>	ALD & ALE
<b>ALE</b>	Atomic Layer Etching
<b>AM</b>	ALD for Manufacturing
<b>AS</b>	Area Selective ALD
<b>EM</b>	Emerging Materials
<b>NS</b>	Nanostructure Synthesis and Fabrication
<b>PS</b>	Plenary Session
<b>TS</b>	Tutorial

# ALD/ALE 2025 Program Overview

Room /Time	Event Hall	Halla Hall	Samda Hall	Tamna Hall A	Tamna Hall B
SuA		TS-SuA: Tutorial Session			
MoM				PS-MoM: Plenary Session	
MoA		AF1-MoA: ALD on 3D Structures		ALDALE-MoA: Student Award Session AA-MoA: Memory Applications I	AF2-MoA: Precursor Chemistry I
MoP	Poster Sessions				
TuM		AF1-TuM: Mechanism and Theory I AF2-TuM: Mechanism and Theory II	ALE1-TuM: Thermal Gas Phase ALE  ALE2-TuM: ALE Applications I	AA1-TuM: Memory Applications II  AA2-TuM: EUV and Patterning Applications	AF3-TuM: Precursor Chemistry II  EM-TuM: Molecular Layer Deposition & Hybrid Materials I
TuA		AF1-TuA: Analysis  AF2-TuA: Plasma ALD	ALE1-TuA: ALE Tools & ALE Modeling  ALE2-TuA: ALE Applications II	AA-TuA: 3D Semiconductor Devices AS-TuA: Area Selective Deposition I	EM-TuA: Molecular Layer Deposition & Hybrid Materials II NS-TuA: 2D Materials and Devices
TuP	Poster Sessions				
WeM		AA1-WeM: Catalyst and Fuel Cell Applications  AA3-WeM: Other Energy Applications	ALE1-WeM: Plasma and/Energy- Enhanced ALE + Sustainability ALE2-WeM: ALE Applications III	AS1-WeM: Area Selective Deposition II AS2-WeM: Area Selective Deposition III	AA2-WeM: Display Applications  AF-WeM: Material Growth I
WeA		AA1-WeA: Battery Applications I  AA2-WeA: Battery Applications II	AM1-WeA: ALD Equipment I  AM2-WeA: ALD Equipment II	AS-WeA: Area Selective Deposition IV  AA3-WeA: Emerging Applications	AF-WeA: Material Growth II  AA4-WeA: Medical Applications

# Sunday Afternoon, June 22, 2025

<p><b>Tutorial</b>  <b>Room Halla Hall - Session TS-SuA</b>  <b>Tutorial Session</b>  <b>Moderators:</b>  <b>Heeyeop Chae</b>, Sungkyunkwan University (SKKU), Republic of Korea,  <b>Han-Bo-Ram Lee</b>, Incheon National University, Republic of Korea</p>		
1:00pm	<p><b>INVITED: TS-SuA-1</b> ALD for Hydrogen Technology, <i>Jihwan An</i>, POSTECH, Republic of Korea</p>	
1:45pm	<p><b>INVITED: TS-SuA-4</b> ALD Process Optimization Using Machine Learning: A Practical Tutorial for Domain Experts, <i>Pil Sung Jo</i>, Gauss Labs Inc, Republic of Korea</p>	
2:30pm	<p><b>INVITED: TS-SuA-7</b> ALD-Enabled Synthesis of Metal-Organic Framework Thin Films: Fundamentals to Applications, <i>Junjie Zhao</i>, Zhejiang University, China</p>	
3:15pm	<p><b>BREAK</b></p>	
3:30pm	<p><b>INVITED: TS-SuA-11</b> The Importance of Interconnect Technology of Si Devices and The Extension of ALD Processes, <i>Hoonjoo Na</i>, Samsung Electronics, Republic of Korea</p>	
4:15pm	<p><b>INVITED: TS-SuA-14</b> Atomic Layer Etching: Basics, Chemistries, and New Developments, <i>Jane P. Chang</i>, UCLA</p>	
5:00pm	<p><b>INVITED: TS-SuA-17</b> The Era of Atomic Scale Processing: When Area-Selective Deposition Meets Atomic Layer Etching, <i>Silvia Armini</i>, IMEC, Belgium</p>	

# Monday Morning, June 23, 2025

<b>Plenary Session</b> <b>Room Tamna Hall A - Session PS-MoM</b> <b>Plenary Session</b> <b>Moderators:</b> <b>Heeyeop Chae</b> , Sungkyunkwan University (SKKU), Republic of Korea, <b>Han-Bo-Ram Lee</b> , Incheon National University, Republic of Korea		
8:45am	<b>PS-MoM-1</b> ALD Welcome and Introductory Remarks	
9:00am	<b>INVITED: PS-MoM-2</b> ALD Plenary Lecture: The Evolution of DRAM: Scaling Challenges, ALD Innovations, and Future Architectures, <b>Seiyon Kim</b> , SK hynix, Republic of Korea	
9:45am	<b>INVITED: PS-MoM-5</b> ALD 2025 Innovator Awardee Talk: Atomic Layer Deposition of Metal Phosphates and Metal Borates through Thermal and Plasma Activated Approaches, <b>Christophe Detavernier</b> , Ghent University, Belgium	
10:15am	<b>BREAK &amp; EXHIBITS</b>	
10:45am	<b>PS-MoM-9</b> ALE Welcome and Introductory Remarks	
11:00am	<b>INVITED: PS-MoM-10</b> ALE Plenary Lecture: Challenges and Future of ALE Technology in Semiconductor Manufacturing, <b>Chanmin Lee</b> , Samsung Electronics, Republic of Korea	

# Monday Afternoon, June 23, 2025

	<b>ALD Fundamentals</b> <b>Room Halla Hall - Session AF1-MoA</b> <b>ALD on 3D Structures</b> <b>Moderators:</b> <b>Hao Van Bui</b> , Phenikaa University, Viet Nam, <b>Arrelaine Dameron</b> , Forge Nano	<b>Atomic Layer Etching</b> <b>Room Samda Hall - Session ALE-MoA</b> <b>ALD+ALE - Emerging ALE</b> <b>Moderators:</b> <b>Silvia Armini</b> , IMEC Belgium, <b>Huichan Seo</b> , SK hynix, Republic of Korea
1:30pm		
3:30pm	<b>BREAK &amp; EXHIBITS</b>	<b>BREAK &amp; EXHIBITS</b>
4:00pm	<b>INVITED: AF1-MoA-11</b> Continuous Production of Nanocoated Powders, <b>Sébastien Moitzheim</b> , Powall, Netherlands	<b>INVITED: ALE-MoA-11</b> Revolutionizing Semiconductor Scaling with Atomic Layer Etch Pitch Splitting, <b>Jonas Sundqvist</b> , <b>Reza Jam</b> , <b>Robin Athle</b> , <b>Yana Ilarionova</b> , <b>Asif Hassan</b> , <b>Intu Sharma</b> , <b>Amin Karimi</b> , AlixLabs, Sweden; <b>Fred Roozeboom</b> , AlixLabs, Netherlands; <b>Dmitry Suyatin</b> , AlixLabs, Sweden
4:30pm	<b>AF1-MoA-13</b> Plasma-Enhanced Spatial ALD on 2D and 3D Surface Topologies: The Case of Amorphous and Crystalline TiO <sub>2</sub> , <b>Mike van de Poll (Graduate Student)</b> , Eindhoven University of Technology, Netherlands; <b>Jie Shen</b> , Holst Centre / TNO, Netherlands; <b>James Hilfiker</b> , J.A. Woollam Co., Inc.; <b>Marcel Verheijen</b> , <b>Paul Poedt</b> , Eindhoven University of Technology, Netherlands; <b>Fieke van den Bruele</b> , Holst Centre / TNO, Netherlands; <b>Erwin Kessels</b> , <b>Bart Macco</b> , Eindhoven University of Technology, Netherlands	<b>ALE-MoA-13</b> Exploring Atomic Layer Etching Behavior Differences in ZnO Crystallographic Planes and Surface Energy Analysis via DFT, <b>Ji Hyun Gwoen</b> , <b>Hae Lin Yang</b> , <b>Min Chan Kim</b> , <b>Gyeong Min Jeong</b> , Hanyang University, Korea; <b>Cas Visser</b> , <b>Erwin Kessels</b> , Eindhoven University of Technology, The Netherlands; <b>Jin Seong Park</b> , Hanyang University, Republic of Korea
4:45pm	<b>AF1-MoA-14</b> Rapid Test for ALD in High Aspect Ratio Spaces Utilizing Thermally Bonded Chips and Hydrazine with Titanium Tetrachloride for TiN Deposition, <b>Amy Ross</b> , <b>Dipayan Pal</b> , <b>Dohyun Go</b> , <b>Diego Contreras Mora</b> , <b>Ping-Che Lee</b> , UC San Diego; <b>Danish Baig</b> , Georgia Institute of Technology; <b>Adrian Alvarez</b> , RASIRC, USA; <b>Dan Le</b> , <b>Jeffery Spiegelman</b> , RASIRC; <b>Muhannad Bakir</b> , Georgia Institute of Technology; <b>Andrew Kummel</b> , UC San Diego	<b>ALE-MoA-14</b> Investigation of Plasma ALD and ALE of Al <sub>2</sub> O <sub>3</sub> in Nanoscale Structures: Towards Corner Lithography at the sub-20 nm Scale, <b>Nicholas J. Chittock</b> , Oxford Instruments Plasma Technology, UK; <b>Erwin Berenschot</b> , <b>Niels Tas</b> , <b>Melissa J. Goodwin</b> , University of Twente, Netherlands; <b>Marcel A. Verheijen</b> , Eurofins Materials Science, Netherlands; <b>Meghali Chopra</b> , <b>Yang Ban</b> , Sandbox Semiconductor; <b>Erwin Kessels</b> , <b>Adriaan J.M. Mackus</b> , Eindhoven University of Technology, Netherlands
5:00pm	<b>AF1-MoA-15</b> Enhancing Step Coverage in High-Temperature Ald for Advanced Semiconductor Scaling, <b>Seung Hyun Lee</b> , <b>Deok Hyun Kim</b> , Soulbrain Co., Ltd., Republic of Korea; <b>Kok Chew Tan</b> , Soulbrain Co., Ltd., Malaysia; <b>Sung Gi Kim</b> , <b>Gyun Sang Lee</b> , <b>Jung Hun Lim</b> , <b>Jae Sun Jung</b> , Soulbrain Co., Ltd., Republic of Korea	<b>ALE-MoA-15</b> Optimizing EUV Etching with In-Situ Atomic Processing: Where and Why?, <b>Philippe Bezaud</b> , IMEC Belgium; <b>Atefeh Fathzadeh</b> , KU Leuven and Imec, Belgium
5:15pm	<b>AF1-MoA-16</b> ALD as the Solution for Uniform Cu Electroplating in High Aspect Ratio Vias, <b>Matthew Weimer</b> , <b>Sara Harris</b> , Forge Nano; <b>Irina Stateikina</b> , Centre de Collaboration MiQro Innovation (C2MI), Canada; <b>Dane Lindblad</b> , Forge Nano; <b>Marc Guillmain</b> , <b>Xavier Gaudreau-Miron</b> , Centre de Collaboration MiQro Innovation (C2MI), Canada; <b>Arrelaine Dameron</b> , Forge Nano	
5:30pm	<b>AF1-MoA-17</b> Multi-Scale Model for Optimization of Low-Temperature Al <sub>2</sub> O <sub>3</sub> ALD Process Conformality Within High Aspect Ratio Trench, <b>Ivan Petraš</b> , <b>Yury Shustrov</b> , <b>Andrey Smirnov</b> , Semiconductor Technology Research d.o.o. Beograd, Serbia	

# Monday Afternoon, June 23, 2025

<b>Room Tamna Hall A</b>		
1:30pm	<p><b>ALDALE-MoA-1</b> ALD Student Award Finalist Talk: Integrating Machine Learning into Atomic Layer Deposition: A Case Study on Hafnium Oxide Process Optimization, <b>Minjong Lee (Graduate Student)</b>, Doo San Kim, Thi Thu Huong Chu, Dushyant Narayan, Dan Le, Soubhik De, University of Texas at Dallas; Si Joon Kim, Kangwon National University, Republic of Korea; Jiyoung Kim, University of Texas at Dallas</p>	<p><b>ALD &amp; ALE</b>  <b>Session ALDALE-MoA</b>  <b>Student Award Session</b>  <b>Moderators:</b>  <b>Jihwan An</b>, Pohang University of Science and Technology (POSTECH), Republic of Korea,  <b>Parag Banerjee</b>, University of Central Florida</p>
1:45pm	<p><b>ALDALE-MoA-2</b> ALD Student Award Finalist Talk: The AtomicLimits ALD/E Database: Unlocking the Future of ALD/E with Large Language Models, <b>Eleni Poupaki (Graduate Student)</b>, Eindhoven University of Technology, Netherlands; Sameer Sadruddin, Jennifer D'Souza, TIB Leibniz Information Centre for Science and Technology, Germany; Alex Watkins, Bora Karasulu, University of Warwick, UK; Sören Auer, TIB Leibniz Information Centre for Science and Technology, Germany; Adrie Mackus, Erwin Kessels, Eindhoven University of Technology, Netherlands</p>	
2:00pm	<p><b>ALDALE-MoA-3</b> ALD Student Award Finalist Talk: Influence of Hydrocarbon Chain Length in Phenyl(Alkyl)trimethoxysilane Inhibitors on AS-ALD Selectivity: Comparison of Adsorption Mechanisms in Gas-phase and Liquid-phase, <b>Hae Lin Yang (Graduate Student)</b>, Minchan Kim, Hanyang University, Korea; Eun Chong Cho, Sungkyunkwan University, Korea; Seunghwan Lee, Beomseok Kim, Changhwa Jung, Hanjin Lim, Samsung Electronics Co., Inc., Republic of Korea; Jung-Hoon Lee, Youngkwon Kim, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea; Jin-Seong Park, Hanyang University, Korea</p>	
2:15pm	<p><b>ALDALE-MoA-4</b> ALD Student Award Finalist Talk: Molecular Layer Deposition (MLD): A New Platform for Precision Engineering of Water Filtration Membranes, <b>Ruoke Cai (Graduate Student)</b>, Brian Welch, Tamar Segal-Peretz, Technion Israel Institute of Technology, Israel</p>	
2:30pm	<p><b>ALDALE-MoA-5</b> ALD Student Award Finalist Talk: Diffusion Behavior Study for Vapor Phase Infiltration Using Quartz Crystal Microgravimetry and its Application in Energy Storage Materials, <b>Rongliang Shang (Graduate Student)</b>, Jin Xie, ShanghaiTech University, China</p>	
2:45pm	<p><b>ALDALE-MoA-6</b> ALE Student Award Finalist Talk: Lateral Etching of 2D MoS<sub>2</sub> Crystalline Layers Using Sequential Ozone and Thionyl Chloride Exposures, <b>Janine Sempel (Graduate Student)</b>, University of Colorado at Boulder; Taewook Nam, Sejong University, Korea (Democratic People's Republic of); Tianyi Zhang, Jing Kong, Massachusetts Institute of Technology; Steven George, University of Colorado at Boulder</p>	
3:00pm	<p><b>ALDALE-MoA-7</b> ALE Student Award Finalist Talk: A Sustainable and Precise Solution to IGZO Etch Residual Challenges Using Transient-Assisted Processing (TAP), <b>Atefeh Fathzadeh (Graduate Student)</b>, KU Leuven and Imec, Belgium; Philippe Bezard, Thierry Conard, Frank Holsteyns, IMEC Belgium; Stefan De Gendt, KU Leuven and Imec, Belgium</p>	
3:15pm		
3:30pm	<b>BREAK &amp; EXHIBITS</b>	
3:45pm		
4:00pm	<p><b>INVITED: AA-MoA-11</b> Atomic Layer Technology for Ferroelectrics and Resistive Switching Devices: Advances in Epitaxial Growth, Doping, and Defect Control, <b>Miin-Jang Chen</b>, Yu-Sen Jiang, Ting-Yun Wang, Chen-Hsiang Ling, Department of Materials Science and Engineering, National Taiwan University, Taiwan</p>	<p><b>ALD Applications</b>  <b>Session AA-MoA</b>  <b>Memory Applications I</b>  <b>Moderators:</b>  <b>Hanmei Choi</b>, Samsung Electronics, Republic of Korea,  <b>Robert Clark</b>, TEL Technology Center, America, LLC</p>
4:30pm	<p><b>AA-MoA-13</b> Atomic-Scale Processing of Ruthenium Thin Films via ALD and ALE for Advanced Interconnects, <b>ChangHwan Choi</b>, <b>YoungSeo Na (Graduate Student)</b>, HyunJin Lim, SangKuk Han, HyoJin Ahn, YehBeen Im, WonJae Choi, Hanyang University, Korea</p>	
4:45pm	<p><b>AA-MoA-14</b> ALD of ferroelectric TiN/Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub>/TiN stacks; growth and interfacial oxidation studied by <i>in situ</i> spectroscopic ellipsometry, <b>Stijn van der Heijden (Graduate Student)</b>, Eindhoven University of Technology, Netherlands; Florian Wunderwald, Uwe Schroeder, Namlab, Germany; Marcel Verheijen, Erwin Kessels, Bart Macco, Eindhoven University of Technology, Netherlands</p>	
5:00pm	<p><b>AA-MoA-15</b> Stable Synaptic Function and Orientation Selectivity Recognition Under Strain in Bilayer Stretchable Memristors via Atomic Layer Deposition, <b>Ying-Jie Ma (Graduate Student)</b>, Ai-Dong Li, Nanjing University, China</p>	
5:15pm	<p><b>AA-MoA-16</b> P-Type Tellurium Thin Film Transistor with Sacrificial Atomic Layer Deposition, <b>Wonho Choi (Graduate Student)</b>, Byongwoo Park, Seungjae Yoon, Jeong Woo Jeon, Gwangsik Jeon, Sangmin Jeon, Sungjin Kim, Seoul National University, South Korea; Chanyoung Yoo, Hongik University, Republic of Korea; Cheol Seong Hwang, Seoul National University, South Korea</p>	

# Monday Afternoon, June 23, 2025

Room Tamna Hall B		
1:30pm		<b>ALD Fundamentals</b> <b>Session AF2-MoA</b> <b>Precursor Chemistry I</b> <b>Moderators:</b> <b>Seán Barry</b> , Carleton University, Canada, <b>Haripin Chandra</b> , EMD Electronics, USA
3:30pm	<b>BREAK &amp; EXHIBITS</b>	
4:00pm	<b>INVITED: AF2-MoA-11</b> The Emergence of New Ligands for ALD Precursor Development, <b>Anjana Devi</b> , Leibniz Institute for Solid State and Materials Research, Germany	
4:30pm	<b>AF2-MoA-13</b> Perspective on Beryllium Compounds as Precursors for ALD Applications, <b>Dominik Naglav-Hansen</b> , Ruhr University Bochum, Germany; <b>Magnus Buchner</b> , University of Marburg, Germany; <b>Martin Wilken</b> , Ruhr University Bochum, Germany; <b>Deniz F. Bekiş</b> , University of Marburg, Germany	
4:45pm	<b>AF2-MoA-14</b> Anhydrous Hydrogen Iodide Source for ALD of CsI and Other Metal Halides, <b>Georgi Popov</b> , <b>Alexander Weiß</b> , <b>Anton Vihervaara</b> , <b>Kenichiro Mizohata</b> , <b>Mikko Ritala</b> , <b>Marianna Kemell</b> , University of Helsinki, Finland	
5:00pm	<b>AF2-MoA-15</b> Evaluating Trisilylamine and Diiodosilane as Silicon Precursors for PEALD of Silicon Nitride in Front-End-of-Line Applications, <b>Keerthi Dorai Swamy Reddy</b> , <b>Marco Lisker</b> , IHP - Leibniz Institut fuer innovative Mikroelektronik, Germany	
5:15pm	<b>AF2-MoA-16</b> Precursor Design for Thermal ALD of Silver Metal, <b>David Emslie</b> , <b>Nick Hoffman</b> , McMaster University, Canada	
5:30pm	<b>AF2-MoA-17</b> A Novel Liquid Cocktail Precursor for Atomic Layer Deposition of Hafnium-Zirconium-Oxide Films for Ferroelectric Devices, <b>Akihiro Nishida</b> , <b>Tsukasa Katayama</b> , <b>Takashi Endo</b> , <b>Yasutaka Matsuo</b> , Hokkaido University, Japan	

## ALD for Manufacturing

### Room Event Hall - Session AM-MoP

#### ALD for Manufacturing Poster Session

5:45 – 7:00 pm

**AM-MoP-1** Low-Temperature Atomic Layer Deposition of Silicon Nitride Films Using Space-Division Equipment, **Jae-Min Park**, Taeho Jeon, Sung-Eun Lee, Hajin Nam, Hyeong Wook Kim, Hyunsik Hwang, Changhee Han, Heonhyeong Lim, Sangjoon Park, WONIK IPS Co., Ltd., Republic of Korea

**AM-MoP-2** Assessing the Potential of Non-Pyrophoric  $\text{Zn}(\text{Dmp})_2$  for the Fast Deposition of ZnO Functionalcoatings by Spatial Atomic Layer Deposition, **David Muñoz-Rojas**, CNRS, France; Liam Johnston, LMGP, France; Jorit Obenlünenschloß, RUB, Germany; Anjana Devi, IFW, Dresden, Germany; Daniel Bellet, Grenoble INP, France

**AM-MoP-3** A Novel Microwave ECR Plasma System for Damage-Free PEALD, **Paul Dreher**, Dominik Hartmann, Evatec AG, Switzerland; Julian Pilz, Silicon Austria Labs, Austria; Jörg Patscheider, Evatec AG, Switzerland

**AM-MoP-4** Optimization of the showerhead for Atomic Layer Deposition by Computational Fluid Dynamics, **Seunghoon Lee (Graduate Student)**, Dongkun Song, Gyeongwon Min, Doyoung Jung, Jungeon Park, Jeongmin Han, Dahye Geum, Hyeondo Han, Seungwan Bae, Hyeon Lee, Guyoung Cho, Dankook University, Republic of Korea

**AM-MoP-5** Very High Frequency Plasma-Enhanced ALD: System Configuration and Thin Film Property Analysis, **Jae Yeon Han**, Hyung Min Kim, Da Eun Bae, Jae Ho Choi, Jae Hack Jeong, CN1 Co., Ltd, Republic of Korea

**AM-MoP-6** Pneumatic Optimization Utilizing Predictive Analytics Within Embedded Systems for Dose Control of Fast Pulsing Valves., **Frank Horvat**, Swagelok Company

**AM-MoP-7** Fast Deposition of High-Quality ALD Materials Using the PlasmaPro ASP System, **Yi Shu**, Arpita Saha, Dmytro Besprozvanny Besprozvanny, Michael Powell Powell, Agnieszka Kurek, Oxford Instruments Plasma Technology, UK; Harm Knoops, Oxford Instruments Plasma Technology, UK, Eindhoven University of Technology, Netherland, UK

**AM-MoP-8** Non-Destructive Characterization of Alumina Film Thickness and Fractional Coverage Utilizing XPS and StrataPHI Modeling, **Amy Ferryman**, Norb Biderman, Kateryna Artyushkova, Physical Electronics

**AM-MoP-9** Optimization of Liquid Fluidization Design for Temperature Control on the Showerhead, **Eunsun Jung**, Tae S Cho, Eungseo Kim, Bonuk Koo, WONIK IPS, Republic of Korea

**AM-MoP-10** XPS Metrology for Area Selective Deposition Applications in Semiconductor Manufacturing, **Kangwon Kim**, Hyung Keun Yoo, Samsung Electronics, Republic of Korea; Heechang Yang, Sunho Kim, Nova Measuring Instruments Korea, Ltd., Republic of Korea; Wei Ti Lee, Torsten Stoll, Nova Measuring Instruments, Inc.

**AM-MoP-12** A Remote Plasma Spectroscopy Diagnostic for Monitoring of Atomic Layer Deposition Processes, **Marcus Law**, Gencoa Ltd., UK

**AM-MoP-13** Early Detection of Process Window Shifts in ALD Processes by PillarHall Lateral High Aspect Ratio Test Structures, **Jani Karttunen**, Chipmetrics Oy, Finland; Anish Philip, Aalto University, Finland; Jussi Kinnunen, Kalle Eskelinen, Feng Gao, Mikko Utriainen, Chipmetrics Oy, Finland

**AM-MoP-14** Optical Monitoring of  $\text{MoCl}_5$  and  $\text{MoOCl}_4$  Vapor Delivery for Atomic Layer Deposition Applications, **Berc Kalanyan**, James Maslar, NIST-Gaithersburg

**AM-MoP-15** Process Monitoring via Time-of-Flight Mass Spectrometry based on Isotopic Patterns, **Hye-Young Kim**, **Sung Kyu Jang**, **Seul-Gi Kim**, **Yoonjeong Shin**, **Jong Hyun Choi**, **Hyeongkeun Kim**, Korea Electronics Technology Institute, Republic of Korea

## ALD Fundamentals

### Room Event Hall - Session AF-MoP

#### ALD Fundamentals Poster Session

5:45 – 7:00 pm

**AF-MoP-1** Atomic Layer Deposition of P-type Oxide Semiconductor Thin Films Using a Novel Precursor for Transistor Applications, **Sol-Hee Jo (Graduate Student)**, Jung-Hoon Lee, Jimin Seo, Bo Keun Park, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea

**AF-MoP-2** Silicon Nitride ALD Process Using Diiodosilane and Hydrazine for Low Temperature Deposition, **Hayato Murata**, Takuya Yoshikawa, Yoshifumi Wada, Hideharu Shimizu, Taiyo Nippon Sanso Corporation, Japan

**AF-MoP-3** Characterization of Novel Precursors for Improved ALD Performance in  $\text{HfO}_2$  Films, **Dahyun Lee**, Hohoon Kim, Sejin Jang, Seonah Kim, Donggeun Lee, Merck KGaA, Darmstadt, Republic of Korea; **Khang Ngo**, **Randall Higuchi**, Merck KGaA, Darmstadt

**AF-MoP-4** Effect of Impurities in Trimethylaluminum on Conformality of  $\text{Al}_2\text{O}_3$  Thin Film on Patterned Substrate Grown by ALD, **Shuya Ikemura**, Kohei Iwanaga, TOSOH Corporation, Japan

**AF-MoP-5** Thermolysis of Silicon Precursors for High-Temperature Atomic Layer Deposition Processes, **Tanzia Chowdhury**, Okhyeon Kim, Hye-Lee Kim, Sejong University, Republic of Korea; **Jung Woo Park**, Hansol Chemical Co., Ltd., Republic of Korea; **Won-Jun Lee**, Sejong University, Republic of Korea

**AF-MoP-6** On an Initial Incubation Process of Thermal ALD Pt on  $\text{ALD Al}_2\text{O}_3$  Measured by Temperature Stabilized In-line QCM, **Masafumi Kumano**, Micro System Integration Center, Tohoku University, Japan; **Makoto Shimizu**, Graduate School of Engineering, Department of Mechanical Systems Engineering, Tohoku University, Japan; **Takuma Yamamoto**, Graduate School of Engineering, Department of Mechanical Engineering, Tohoku University, Japan; **Shuji Tanaka**, Graduate School of Engineering, Department of Robotics, Japan

**AF-MoP-7** Oxide Film ALD Using Oh Radicals Generated by Mixing Pure Ozone Gas with Hydrogen-Included Molecular Gas Over  $200^\circ\text{C}$ , **Naoto Kameda**, MEIDENSHA Corp., Japan; **Kenichi Uehara**, **Shigeo Yasuhara**, Japan Advanced Chemicals Corp., Japan; **Soichiro Motoda**, **Tetsuya Nishiguchi**, MEIDEN NANOPROCESS INNOVATIONS Inc., Japan

**AF-MoP-8** Novel Indium Precursor with Improved Physical Properties and ALD Window for Atomic Layer Deposition of Indium Oxide, **Randall Higuchi**, **Khang Ngo**, Merck KGaA, Darmstadt; **Lukas Mai**, **Paul Mehlmann**, Merck KGaA, Darmstadt, Germany; **Daniel Moser**, **Bhushan Zope**, Merck KGaA, Darmstadt; **Holger Heil**, Merck KGaA, Darmstadt, Germany

**AF-MoP-9** Atomistic Modeling Methodologies for Atomic Layer Deposition, **Yong-Ju Kang**, Synopsys Korea Inc., Republic of Korea; **Suresh Kondati Natarajan**, Synopsys Inc., Denmark; **Rafshan Ul Atik**, Synopsys India Pvt. Ltd., India; **Jess Wellendorf**, **Søren Smidstrup**, Synopsys Denmark ApS, Denmark

**AF-MoP-10** Unraveling the Influence of Substrate Surface and Temperature on Microstructural Evolution of Crystalline  $\text{MoS}_2$  in Atomic Layer Deposition, **Seung Ho Ryu (Graduate Student)**, **Seong Keun Kim**, Korea University, Republic of Korea

**AF-MoP-11** Novel Alkoxy-Bridged Silicon Precursor for Plasma Enhanced Chemical Vapor Deposition of Low-k  $\text{SiCOH}$  Spacer Thin Film, **Jongryul Park**, **Sooyoung Jung**, **Seokhee Shin**, **Yongjoo Park**, SK Trichem, Republic of Korea

**AF-MoP-12** High Temperature Atomic Layer Deposition of Hafnium Oxide Film using Novel Liquid Hf Precursor Deposition, **Kim Daeyeong**, SK Trichem, Republic of Korea; **Oh Jieun**, **Lee Seo-Hyun**, **Kim Woo Hee Kim**, Hanyang University, Korea; **Park Yongjoo**, SK Trichem, Republic of Korea

**AF-MoP-13** Analysis of Plasma Characteristics and Substrate Damage Using a Dual-Frequency PE-ALD Process with 13.56 MHz and 100 MHz, **Da-Eun Bae**, **Hyung Min Kim**, **Jae Yeon Han**, **Jae Ho Choi**, **Jae Hack Jeong**, CN1 Co., Ltd., Republic of Korea

**AF-MoP-14** High-Temperature, High-Growth Rate Atomic Layer Deposition of Silicon Oxide Thin Films Using a Novel Precursor, **Changgyu Kim (Graduate Student)**, **Mi-Soo Kim**, **Okhyeon Kim**, **Jihwan Lee**, Sejong University, Republic of Korea; **Seunggyun Hong**, **Byung-Kwan Kim**, **Jin Sik Kim**, **Wonyong Koh**, UP Chemical Co., Ltd., Republic of Korea; **Hye-Lee Kim**, **Won-Jun Lee**, Sejong University, Republic of Korea

**AF-MoP-15** Development of New Group 3 Metal and Lanthanide Precursors with Volatility and Thermal Stability for ALD, **Yongmin Go (Graduate Student)**, **Bo Keun Park**, 141, Gajeong-ro, Yuseong-gu, Republic of Korea

**AF-MoP-16** Exploring Ultrathin  $\text{SnO}_2$  Films via Atomic Layer Deposition for Facilitating the Formation of the Rutile  $\text{TiO}_2$  Phase, **InHwan Baek**, **YooHyeon Jung**, **InHong Hwang**, Inha University, Republic of Korea

**AF-MoP-17** Novel ALD Indium Precursor for  $\text{In}_2\text{O}_3$  Thin Film Fabrication, **Dong Hyeon Bang (Graduate Student)**, **Bo Keun Park**, **Yongmin Go**, **Sunyoung Shin**, **Ji Yeon Ryu**, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea

**AF-MoP-18** Optimization of ALD Processes and High-Quality Thin Film Formation Using the Liquid Aluminum Precursor 1,5-Dimethyl-1-Alumina 5-Azacyclooctane, **Sangick Lee**, **Sanghun Lee**, **Yunsik Park**, **Sejin Jang**, **JoongJin Park**, **Sangyong Jeon**, **JunHee Cho**, DNF, Korea (Democratic People's Republic of)

**AF-MoP-19** Low-Resistivity Molybdenum Thin Films Deposited by ALD Using Molybdenum(0) Organometallic Compounds and Iodine-Containing Reactant, **Sang Ick Lee**, **Ji Hyeon Yoon**, **Yo Han Jo**, **Won Mook Chae**, **Sang Yong Jeon**, **Joong Jin Park**, **Se Jin Jang**, DNF Co., Ltd., Republic of Korea

**AF-MoP-20** Valence-state Controlled Growth of P-type Tin(II) Monoxide Films by Atomic Layer Deposition using a Novel Sn Precursor, *Jeong Hwan Han, Jeong Eun Shin (Graduate Student)*, Seoul National University of Science and Technology, Republic of Korea; *Heesun Kim, Bo Keun Park*, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea

**AF-MoP-21** Synthesis and Characterization of Ge and Sn ALD Precursors with Aminoketone Ligands, *Chang Min Lee (Graduate Student)*, *Bo Keun Park, Heesun Kim, Ji Min Seo, Yongmin Go*, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea; *Seung Uk Son*, Sungkyunkwan University, Korea; *Ji Yeon Ryu, Taek Mo Chung*, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea

**AF-MoP-22** M(II) (M = Ni, Cu, Ge, Sn) ALD Precursors Using N-tert-butylformamide Ligand, *Mi Jeong Kim (Graduate Student)*, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea; *Ji Min Seo*, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea; *Heesun Kim*, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea; *Yongmin Go*, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea; *Seung Uk Son*, Sungkyunkwan University, Korea; *Ji Yeon Ryu, Taek-Mo Chung, Bo Keun Park*, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea

**AF-MoP-23** Reaction Pathway of Copper Atomic Layer Deposition via Time-of-Flight Mass Spectrometry, *Camilla Minzoni, Caroline Hain, Krzysztof Mackosz*, Empa, Swiss Federal Laboratories for Materials Science and Technology, Thun, Switzerland; *Andreas Werbrauck*, Thin Film Coatings and Materials Electrochemistry Lab, University of Missouri-Columbia, Missouri, USA; *Carla Frege, Bensaoula Abdel*, Tofwerk AG, Thun, Switzerland; *Patrik Hoffmann, Ivo Utke*, Empa, Swiss Federal Laboratories for Materials Science and Technology, Thun, Switzerland

**AF-MoP-24** Bimetal Thin Film Deposition Using Novel Organometallic Dinuclear RuCo Complex, *Kazuaru Suzuki, Tomohiro Tsugawa, Subhabrata Das, Yohei Uchiyama, Ryosuke Harada, Hirofumi Nakagawa*, Tanaka Precious Metal Technologies Co. Ltd., Japan

**AF-MoP-25** Atomic Layer Deposition of Composition Engineered Nitrogen-Doped SnOx Films for Enhanced Performance of Thin-Film Transistor, *Jeong Hwan Han, Hyun Hak Lee (Undergraduate)*, *Jeong Eun Shin, Na Yeon Lee*, Seoul National University of Science and Technology, Republic of Korea

**AF-MoP-26** Atomic Layer Deposition of Molybdenum Using a Dual-Purpose Molybdenum Precursor for Advanced Metallization, *David Mandia, Matthew Griffiths, Youness Alvandi, Arya Shafiefarhood*, Lam Research Corporation

**AF-MoP-27** Demonstration of ALD Hf<sub>x</sub>Zr<sub>1-x</sub>O<sub>2</sub> Using Various Oxidant Sources Over Ultra-High Aspect-Ratio Structure for Memory Applications, *Dan Le, RASIRC; Jin-Hyun Kim, Thi Thu Huong Chu, Soubhik De, Dushyant Narayan, Minjong Lee*, University of Texas at Dallas; *Walter Hernandez, Josh Garretson, Adrian Alvarez, Jeffrey Spiegelman, RASIRC; Jiyoung Kim*, University of Texas at Dallas; *Lorenzo Diaz*, RASIRC

**AF-MoP-28** Bottleneck-Effect on Thin-Film Conformality in High Aspect Ratio ALD, *Mikko Utrainen, Jussi Klunnunen, Jani Karttunen, Feng Gao*, Chipmetrics, Finland; *Anish Philip*, Aalto University, Finland

**AF-MoP-29** Low Temperature Deposition of SiO<sub>2</sub> and SiOC Films, *Chad Brick, Gelest, Inc; Tomoyuki Ogata*, Mitsubishi Chemical Corporation, Japan

**AF-MoP-30** Vanadium-Sulphide Layers with Atomic Layer Deposition, *Zsófia Baji, Zsófia Bérces*, Centre for energy research, Hungary; *Zoltán Szabó, Zolt Fogarassy, Péter Vancsó*, Centre for Energy Research, Hungary

**AF-MoP-31** Film and Surface Stress Measurements during Tungsten Atomic Layer Deposition, *Ryan B. Vanfleet (Graduate Student)*, *Steven M. George*, University of Colorado at Boulder

**AF-MoP-32** Modifying Vanadium Oxide by Atomic Layer Plasma Treatment, *Ritwik Bhatia, Mohammad Saghayezhian, Veeco Instruments; Ganesh Sundaram*, Veeco

**AF-MoP-33** Prediction of Adsorption/Desorption Equilibrium Constants and Surface Reaction Rate Constants Using Neural Network Potentials for ALD Process Design, *Noboru Sato, Naoki Tamaoki, Atsuhiko Tsukune, Yukihiko Shimogaki*, The University of Tokyo, Japan

**AF-MoP-34** In Situ Synchrotron Hard X-Ray Scattering Studies of the Structural Evolution of InAlN During Growth by PEALD, *Jeffrey Woodward*, U.S. Naval Research Laboratory; *Kenneth Evans-Lutterodt*, Brookhaven National Laboratory; *David Boris, Michael Johnson*, U.S. Naval Research Laboratory; *Zachary Robinson*, University of Rochester Laboratory for Laser Energetics; *Ruipeng Li, Masafumi Fukuto*, Brookhaven National Laboratory; *Karl Ludwig*, Boston University; *Charles Eddy, Scott Walton*, U.S. Naval Research Laboratory

**AF-MoP-35** Thermal ALD Vanadium Nitride (VN) as Next-Generation Electrode, *Antony Jan, Hae Young Kim*, Eugenius, Inc.

**AF-MoP-37** Atomic Layer Deposition of a Low Carbon Hafnium Oxide Using (2-methylindanyl)tris(dimethylamido)hafnium and Ozone, *Drew Hood, Rong Zhao*, Entegris

**AF-MoP-38** Rapid Low-Temperature Atomic Layer Deposition of HfO<sub>2</sub>, *Xianhu Liang, Volkmar Hock, Hartmut Buhmann, Johannes Kleinlein, Laurens W. Molenkamp*, University of Wuerzburg, Germany

**AF-MoP-39** Innovative Advanced Deposition Material (ADM) Technique for Low-Resistivity, High-Conformality Metal and Barrier Thin Films, *Kok Chew Tan, Changbong Yeon, Deok Hyun Cho, Jung Hun Lim, Jaesun Jung*, Soulbrain, Republic of Korea

**AF-MoP-40** Evaluation of a Hafnium Precursor with Higher Thermal Stability for the Atomic Layer Deposition of Hafnium Oxide Films, *Randall Higuchi, Khang Ngo, Bhushan Zope*, Merck KGaA, Darmstadt; *Joo-Yong Kim, Dong-Geun Lee*, Merck KGaA, Darmstadt, Republic of Korea

**AF-MoP-41** Modulation of Hf<sub>x</sub>Zr<sub>1-x</sub>O<sub>2</sub> Thin Film Characteristics via ALD and ALE, *Ming-Kuan Fan (Graduate Student)*, National Tsing Hua University, Taiwan ; Taiwan Instrument Research Institute, Taiwan; *Yi-Cheng Chen*, National Tsing Hua University, Taiwan; *Chien-Wei Chen, Yang-Yu Jhang, Sheng-De Wong*, Taiwan Instrument Research Institute, Taiwan; *Hong-Luen Lin*, Tokyo Electron Taiwan Limited, Taiwan; *Ying-Hao Chu*, National Tsing Hua University, Taiwan

**AF-MoP-42** Atomic Layer Deposition of Lanthanum Oxide Using New La Precursors, *Junhyun Song, Seungmin Han, Jungwon Hwang*, Air Liquide, Republic of Korea

**AF-MoP-43** Ozone-Based Atomic Layer Deposition of Indium Oxide Thin Films: Impact on the Growth Rate and Its Uniformity of N<sub>2</sub> Supply in Ozone Generation, *Seung-Youl Kang, Jaehyun Moon*, Electronics and Telecommunication Research Institute (ETRI), Republic of Korea; *Changbong Yeon, Jaesun Jung*, Soulbrain Co., Ltd., Republic of Korea; *Jong-Heon Yang, Chi-Sun Hwang, Seong-Mok Cho, Yang Hae Kim, Jae-Eun Pi, Seong-Deok Ahn*, Electronics and Telecommunication Research Institute (ETRI), Republic of Korea

**AF-MoP-44** Promising ALD Precursor for Next-Generation Circuit Material: A Novel Ru-Based ALD Precursor with Lower Vaporization Temperature, *ziyu Yan, Yong-Jay Lee*, Industrial Technology Research Institute, Taiwan

**AF-MoP-45** Low-Temperature ALD of Silicon Nitride Films Using Dis and Tis Precursors: A Strategy for Substrate Protection and High-Density Films, *Myeonghun Lee (Graduate Student)*, *Taeheon Kim, Minchan Kim, Changkyun Park, Jinseong Park*, Hanyang University, Korea

**AF-MoP-46** Thermal Atomic Layer Deposition of Silicon Carbonitride Using Carbon-Containing Silicon Precursor, *Okhyeon Kim (Graduate Student)*, *Tanzia Chowdhury, Mi-Soo Kim, Changgyu Kim, Hye-Lee Kim, Jeong Woo Han, Jae-Seok An, Jung Woo Park, Won-Jun Lee*, Sejong University, Republic of Korea

**AF-MoP-47** Atomic Layer Deposition of High-Quality SnO Thin Films Using Sn(EtCp)<sub>2</sub> Precursor, *Fumikazu Mizutani, Nobutaka Takahashi*, Kojundo Chemical Laboratory Co., Ltd., Japan; *Tomomi Sawada*, National Institute for Materials Science,, Japan; *Toshihide Nabatame*, National Institute for Materials Science, Japan

**AF-MoP-48** Damage-Free XPS Analysis of ALD HfO<sub>2</sub>, ZrO<sub>2</sub> and HfZrOx Films Using Ar Cluster Ions, *Seungwook Choi (Graduate Student)*, *Ansoon Kim*, Korea Research Institute of Standards and Science (KRISS), Republic of Korea

**AF-MoP-49** Steric Hindrance of Hf Precursors and Film Growth of HfO<sub>2</sub> Atomic Layer Deposition: Comparative Kinetic Monte Carlo Simulation, *Yanwei Wen, Haojie Li, Bin Shan, Rong Chen*, Huazhong University of Science and Technology, China

**AF-MoP-50** In-Situ Spectroscopic Ellipsometry for Transition Metal Oxide Growth Control in Remote Plasma ALD Processes, *Yousra Traouli, Ufuk Kilic*, University of Nebraska - Lincoln; *Mathias Schubert, Eva Schubert*, University of Nebraska-Lincoln, USA

**AF-MoP-52** A Theoretical Study on High-Temperature ALD of TiN Using CP(CH<sub>3</sub>)<sub>2</sub>Ti(Ome)<sub>3</sub> as a Precursor, *Jae Min Jang (Graduate Student)*, Hongik University, Republic of Korea; *Hye Won Park*, Incheon National University, Republic of Korea; *Soo-Hyun Kim*, Ulsan National Institute of Science and Technology, Republic of Korea; *Han-Bo-Ram Lee*, Incheon National University, Republic of Korea; *Bonggeun Shong*, Hongik University, Republic of Korea

**AF-MoP-53** Adsorption of Hf Ald Precursor on Pristine HfO<sub>2</sub> Surface Without Hydroxyl Groups, *Woong Pyo Jeon (Graduate Student)*, *Miso Kim, Jinwoo Lee, Bonggeun Shong*, Hongik University, Republic of Korea

**AF-MoP-54** Sequential Adsorption of Dimethyl Zinc and Trimethylaluminum and Its Application to Zinc Aluminum Oxide Atomic Layer Deposition, *Haruto Suzuki, Satoshi Suzuki, Hibiki Takeda, Ryo Miyazawa, Bashir Ahmmad, Fumihiko Hirose*, Yamagata University, Japan

**AF-MoP-55** A Study on Laterally Controlled Distribution of Elements in InZnO Thin Films by Atomic Layer Modulation, *Dong-Hyun Lim (Graduate Student)*, Ajou University, Republic of Korea; *Kyung-Won Park, Ji-Hye Choi*, ATIK CO., LTD., Republic of Korea; *Il-Kwon Oh*, Ajou University, Republic of Korea

**AF-MoP-56** Comparative Study on the Impacts of Anhydrous and Hydrrous H<sub>2</sub>O<sub>2</sub> on ALD Hafnium Oxide Growth on Titanium Nitride Surface, **Dan Le**, RASIRC; *Jin-Hyun Kim, Thi Thu Huong Chu, Soubhik De, Dushyant Narayan, Minjong Lee*, University of Texas at Dallas; *Walter Hernandez, Josh Garretson, Adrian Alvarez, Jeffrey Spiegelman*, RASIRC; *Jiyoung Kim*, University of Texas at Dallas

**AF-MoP-57** Computation of Al<sub>2</sub>O<sub>3</sub> ALD by Trimethylaluminum with Kinetic Monte Carlo and Neural Network Potential, **Yichen Zou (Graduate Student)**, *Yuxuan Wu*, The University of Tokyo, China; *Jun Yamaguchi, Noboru Sato, Atsuhiko Tsukune, Yukihiko Shimogaki*, The University of Tokyo, Japan

**AF-MoP-58** Comparison of ALD SiN Film Properties Based on Synthesis Precursor, Process Temperature, and Conditions, **Jaeyoung Lim**, *Hanseong Kim, Sunki Min, Kang-sub Yim, Sun Jung Kim*, Samsung Electronics Semiconductor R&D center Semiconductor Processing Development, Republic of Korea

**AF-MoP-59** The Application of Diiodosilane to Deposit SiN Film as Insulation Layer, **Yun-Chih Chiang (Graduate Student)**, *Yong-Jay Lee*, Industrial Technology Research Institute, Taiwan

**AF-MoP-60** Effects of Parameter Control and Post-Thermal Treatment on Impurity Control in Molybdenum Compound Films Grown by ALD with a Liquid Precursor, **So Young Kim (Graduate Student)**, Yonsei University, Republic of Korea; *Tai-su Park*, Justem Corporation Ltd., Republic of Korea; *Dae-Hong Ko*, Yonsei University, Republic of Korea

**AF-MoP-61** Influence of Surface Cleaning Treatments on Atomic Layer Deposition of Al<sub>2</sub>O<sub>3</sub> and ZnO Thin Films on Silicon Substrates, **Amnon Rothman**, Ben-Gurion University, Israel

**AF-MoP-62** Molecular Dynamics Simulations of HF Etching Using Universal Graph Neural Network Potential, **Akihiro Nagoya**, *Yusuke Asano, Taku Watanabe*, Preferred Computational Chemistry, Inc., Japan

## Atomic Layer Etching

### Room Event Hall - Session ALE-MoP

#### Atomic Layer Etching Poster Session

5:45 – 7:00 pm

**ALE-MoP-1** Study on High-Selectivity Atomic Layer Etching (ALE) of SiO<sub>2</sub>/Si<sub>3</sub>N<sub>4</sub> Using Ar/C<sub>4</sub>F<sub>8</sub> Plasma, **Kyongnam Kim**, Daejeon University, Republic of Korea; **Jinwoo Choi (Graduate Student)**, Daejeon University, Republic of Korea; *ByeongHo Song, Jeongwoon Bae*, Daejeon University, Republic of Korea

**ALE-MoP-2** Improving Process Stability in Atomic Layer Etching for Next-Generation Microfabrication, **Suyoung Jang (Graduate Student)**, *Junyeob Lee, Dohyeon Kim, Jeongwoon Bae, Taehyung Kim, Kyongnam Kim*, Daejeon University, Republic of Korea; *Jihyun Kim*, WONIK IPS, Republic of Korea

**ALE-MoP-3** Synergy in Thermal Atomic Layer Etching: Interplay between Individual Reactions, **Marcel Junige, Andrew S. Cavanagh, Steven M. George**, University of Colorado Boulder

**ALE-MoP-4** Atomic Layer Etching of ZrO<sub>2</sub>, HfO<sub>2</sub> and HfZrO<sub>4</sub> Thin Films via Metal-Free Ligand Exchange using Hydrogen Fluoride and Acetylacetone, **Kyoung-Mun Kim**, *Joo-Yong Kim*, Merck KGaA, Darmstadt, Republic of Korea

**ALE-MoP-5** Isotropic Atomic Layer Etching of Crystalline HfO<sub>2</sub> Thin Films Using F Radical and Al(CH<sub>3</sub>)<sub>2</sub>Cl, **Jehwan Hong (Graduate Student)**, *Gyejun Cho, Changgyu Kim, Hye-Lee Kim*, Sejong University, Republic of Korea; *Byungchul Cho, Min Su Kim, Ju Hwan Park, Min Kim*, Wonik IPS, Republic of Korea; *Won-Jun Lee*, Sejong University, Republic of Korea

**ALE-MoP-6** Atomic Layer Etching of Al<sub>2</sub>O<sub>3</sub> Film by Using Different Metal Precursor for Ligand Exchange, **Chan Lee**, *Chang Kyu Lee, Byung Chul Cho, Ju Hwan Park, Min Kim*, WONIK IPS, Republic of Korea; *Misoo Kim, Khabib Khumaini, Hye-Lee Kim, Won-Jun Lee*, Sejong University, Republic of Korea

**ALE-MoP-7** Fabrication of Ultrathin Ruthenium Films via a Top-Down Approach Using Thermal Atomic Layer Etching, **Jeong Hwan Han, Eun Ji Ju (Graduate Student)**, *Jae Hyeon Lee*, Seoul National University of Science and Technology, Republic of Korea

**ALE-MoP-8** Thermal Atomic Layer Etching of ZrO<sub>2</sub> Using Chlorine-Based Precursor, **Sang-ik Lee, Yong-won Kim**, DNF Co., Ltd, Republic of Korea; *jun-hee Cho, Joong-jin Park*, DNF Co., Ltd., Republic of Korea

**ALE-MoP-9** Highly Precise Atomic Layer Etching of SiO<sub>2</sub> with SF<sub>6</sub> Radicals and TMA Surface Modification, **Min Kyun Sohn**, *Seong Hyun Lee, Jieun Kim, Sun Kyu Jung, Min-A Park, Jin Ha Kim, Jaeseoung Park, Jeong Woo Park, Dongwoo Suh*, ETRI, Republic of Korea

**ALE-MoP-10** Plasma Atomic Layer Etching of SiO<sub>2</sub>, Si<sub>3</sub>N<sub>4</sub>, and Si by Forming Ammonium Fluorosilicate Followed by Argon Ion Bombardment, **Heeyeop Chae, Taeseok Jung (Graduate Student)**, *Hyeongwu Lee, Hojin Kang, Minsung Jeon*, Sungkyunkwan University (SKKU), Republic of Korea

**ALE-MoP-11** Tailored Waveforms for Ion Energy Control in Ale Applications, **Sebastian Mohr**, Quantemol.Ltd, Germany; **HyungSeon Song**, Quantemol.Ltd, Republic of Korea

**ALE-MoP-12** Understanding Fluorocarbon Thin Film Growth through CF<sub>x</sub>Radical Adsorption on Amorphous Si<sub>3</sub>N<sub>4</sub>, **Mihyeon Jo (Graduate Student)**, *Sangheon Lee*, Ewha Womans University, Republic of Korea

**ALE-MoP-13** Study of Low GWP Gas Decomposition and Fluorocarbon Film Created gas Deposition on SiO<sub>2</sub>, **Minji Kim (Undergraduate)**, *Sangheon Lee*, Ewha Woman's University, Republic of Korea

**ALE-MoP-14** Low-Damage Plasma Atomic Layer Etching of Silicon Dioxide and Nitride via DC Substrate Bias and Remote Inductively Coupled Plasma Source, **Hee Chul Lee, HongHee Jeon (Undergraduate)**, *SoWon Kim*, Tech University of Korea

**ALE-MoP-15** SiO<sub>2</sub> Atomic Layer Etching with Ultra-Low Electron Temperature Plasma, **Junyoung Park**, *Nayeon Kim, Jung-Eun Choi, Yujin Yeo, Min-Seok Kim, Chang-Min Lim, Beom-Jun Seo, Chin-Wook Chung*, Hanyang University, Korea

**ALE-MoP-16** Selective Generation of CF<sub>2</sub> Radicals in Ar/CF<sub>4</sub> Plasma with a Dc-Biased Grid for High-Precision Atomic Layer Etching, **Minseok Kim (Graduate Student)**, *Hyunho Nahm, Yujin Yeo, Chinwook Chung*, Hanyang University, Republic of Korea

**ALE-MoP-17** Low-Temperature Atomic Layer Etching Characteristics of Nitride Surfaces Using C<sub>4</sub>F<sub>8</sub> Gas, **GwangHo Lee (Graduate Student)**, KwangWoon University, Korea; *GiChung Kwon, ChangHee Lee, JaeHyeon Kim, YeJun Cheon, GaEun Hwang, InHyeok Kho, HeeSam Cheon, YoonJoo Jeong, InYoung Bang, HyoJong Shin, JiHwan Kim, Yujin Heo*, Kwangwoon University, Republic of Korea

**ALE-MoP-18** Investigation on Ar Sputtering Etch Rate of Silicon Oxide at Low Temperature, **Yujin Heo (Graduate Student)**, Kwangwoon University, Korea; *GiChung Kwon*, KwangWoon University, Korea; *JiHwan Kim*, Kwangwoon University, Korea; *InYoung Bang*, KwangWoon University, Korea; *JaeHyeon Kim, GwangHo Lee*, Kwangwoon University, Korea; *ChangHee Lee*, KwangWoon University, Korea; *HyoJong Shin*, Kwangwoon University, Korea; *YoonJoo Jeong, InHyeok Kho, HeeSam Cheon, YeJun Cheon, GaEun Hwang*, KwangWoon University, Korea

**ALE-MoP-19** Transient Etching Characteristics of SiO<sub>2</sub> at Low Temperature using CH<sub>2</sub>F<sub>2</sub>/Ar Plasma in an Inductively Coupled Plasma System, **JiHwan Kim (Graduate Student)**, *Gi-Chung Kwon, JaeHyeon Kim, InYoung Bang, ChangHee Lee, YeJun Cheon, GaEun Hwang, InHyeok Kho, HeeSam Cheon, YoonJoo Jeong, HyoJong Shin, GwangHo Lee, Yujin Heo*, Kwangwoon University, Republic of Korea

**ALE-MoP-20** Real-time Temperature Monitoring of Wafer Chuck and Focus Ring, **JaeHyeon Kim (Graduate Student)**, *GI-CHUNG KWON, In Young Bang, GwangHo Lee, JiHwan Kim, ChangHee Lee, YoonJoo Jeong, InHyeok Kho, Yujin Heo, HyoJong Shin, HeeSam Cheon, Ga Eun Hwang, YeJun Cheon*, Kwangwoon University, Republic of Korea

**ALE-MoP-21** Real-Time Plasma Density Measurement Using a Capacitance Measurement Sensor Embedded in an Electrostatic Chuck and Comparison with Other Diagnostic Techniques, **ChangHee Lee (Graduate Student)**, *GiCheong Kwon, JiHwan Kim, InYoung Bang, JaeHyeon Kim, GwangHo Lee, HyoJong Shin, YoonJoo Jeong, InHyeok Kho, Yujin Heo, HeeSam Cheon, YeJun Cheon, GaEun Hwang*, Kwangwoon University, Republic of Korea

**ALE-MoP-22** Low-Temperature Dielectric Etching Characteristics Using CH<sub>2</sub>F<sub>2</sub>/NO<sub>2</sub> Inductively Coupled Plasma, **HyoJong Shin (Graduate Student)**, *GiChung Kwon, JiHwan Kim, InYoung Bang, JaeHyeon Kim, GwangHo Lee, ChangHee Lee, InHyeok Kho, YoonJoo Jeong, Yujin Heo, HeeSam Cheon, GaeEun Hwang, YeJun Cheon*, Kwangwoon University, Republic of Korea

**ALE-MoP-23** Study on Cryogenic Etching Characteristics of Dielectrics Using NF<sub>3</sub>/NO/Ar Inductively Coupled Plasma, **YoonJoo Jeong (Graduate Student)**, *GiChung Kwon, JiHwan Kim, InYoung Bang, JaeHyeon Kim, GwangHo Lee, ChangHee Lee, HyoJong Shin, InHyeok Kho, Yujin Heo, HeeSam Cheon, GaeEun Hwang, YeJun Cheon*, Kwangwoon University, Republic of Korea

**ALE-MoP-24** Atomic Layer Etching of Ga<sub>2</sub>O<sub>3</sub>, **Jihye Kim, Dohoe Kim, Nguyen Quang, Minji Jeong**, ISAC Research Inc., Republic of Korea

## Nanostructure Synthesis and Fabrication

### Room Event Hall - Session NS-MoP

#### Nanostructure Synthesis and Fabrication Poster Session

5:45 – 7:00 pm

**NS-MoP-1** Structural Modifications of Porous Templates with Pbte ALD Coatings, **Haifeng Cong, Helmut Baumgart**, Old Dominion University

# Monday Evening, June 23, 2025

**NS-MoP-2** Area-Selective Solid-State Synthesis of Nickel Silicide Nanostructures, *Gabriele Botta*, Nanogune, Italy; *Mato Knez*, nanogune, Croatia

**NS-MoP-3** Atomic Layer Deposition by Pressure-Driven Convective Flow Through 3D Nanocomposite Structures, *Austin Cendejas*, *Benjamin Greenberg*, *Kevin Anderson*, *Boris Feygelson*, US Naval Research Laboratory

**NS-MoP-4** Atomic Layer Deposition for Novel Nanocomposite Solids with New Functionalities, *Boris Feygelson*, *Benjamin Greenberg*, *Kevin Anderson*, *James Wollmershauser*, U.S. Naval Research Laboratory; *Austin Cendejas*, American Society of Engineering Education, postdoc residing at U.S. Naval Research Lab; *Sarshad Rommel*, *Mark Aindow*, Department of Materials Science and Engineering, Institute of Materials Science, University of Connecticut

**NS-MoP-5** Nanostructure and Conductivity of SiO<sub>2</sub>/ZnO:Al Nanocomposites Fabricated by ALD Infiltration and Pressure-Assisted Sintering, *Benjamin Greenberg*, *Kevin Anderson*, *Alan Jacobs*, *Joseph Prestigiacomo*, *Zoey Warecki*, *Todd Brintlinger*, U.S. Naval Research Laboratory; *Austin Cendejas*, ASEE Fellow Residing at U.S. Naval Research Laboratory; *Eric Patterson*, *James Wollmershauser*, *Boris Feigelson*, U.S. Naval Research Laboratory

**NS-MoP-6** Creation of Nanowire-Bundled Grain Boundaries in Bi<sub>2</sub>Te<sub>3</sub>-Based Thermoelectric Materials via Atomic Layer Deposition, *Gwang Min Park (Graduate Student)*, *Seunghyeok Lee*, Korea Institute of Science and Technology (KIST), Republic of Korea; *Jinseok Hong*, *Seokho Nahm*, Hanyang University, Korea; *Seung-Hyub Baek*, *Jin-Sang Kim*, Korea Institute of Science and Technology (KIST), Republic of Korea; *Seung-Yong Lee*, Hanyang University, Korea; *Seong Keun Kim*, Korea Institute of Science and Technology (KIST), Republic of Korea

**NS-MoP-7** Surface Engineered Polymeric Membranes for Improved Fouling Resistance and Superior Oil-Water Separation, *Bratin Sengupta*, *Yining Liu*, *Seth Darling*, *Jeffrey Elam*, Argonne National Laboratory

**NS-MoP-8** Interface Engineering of 2D MoS<sub>2</sub> Devices through ALD Oxidant Selection, *Si Eun Yu*, *Thi Thu Huong Chu*, *Minjong Lee*, *Dushyant M. Narayan*, *Doo San Kim*, *Dan N. Le*, University of Texas at Dallas; *Rino Choi*, Inha University, Republic of Korea; *Jiyoung Kim*, University of Texas at Dallas

**NS-MoP-9** Facile Synthesis of Copper Germanium Oxide with Carbon Shell for Lithium Ion Battery Anode Applications, *Deug Hyun Nam*, *Chan Woong Na*, *Yoon Myung*, Korea Institute of Industrial Technology, Republic of Korea

**NS-MoP-10** Amorphous Boron Nitride Deposited on MoS<sub>2</sub> Monolayers by Thermal Atomic Layer Deposition for High-Performance Two-Dimensional Electronics, *Yu-Chuan Lin*, National Yang Ming Chiao Tung University (NYCU), Taiwan

# Tuesday Morning, June 24, 2025

Room Halla Hall		
8:00am	<b>AF1-TuM-1</b> The Mechanism of Thermal ALD of Silicon Carbonitride from Chloroalkylsilanes and Ammonia – Theory Meets Experiment, <i>Simon Elliott</i> , Schrödinger, Ireland; <i>Jiyeon Kim, Paul Lemaire, Dennis Hausmann</i> , Lam Research	<b>ALD Fundamentals Session AF1-TuM Mechanism and Theory I</b> <b>Moderators:</b> <b>Christophe Vallée</b> , University of Albany, <b>Charles H. Winter</b> , Wayne State University
8:15am	<b>AF1-TuM-2</b> Mechanistic Studies on Area Selective ALD of Iridium, <i>Heta-Elisa Nieminen, Matti Putkonen, Mikko Ritala</i> , University of Helsinki, Finland	
8:30am	<b>AF1-TuM-3</b> ALD Outstanding Presentation Award Finalist: Like Boots or Hearts: The Kinetics of Precursor Decomposition, <i>Sean Barry</i> , Carleton University, Canada	
8:45am	<b>AF1-TuM-4</b> Reaction Mechanism of Atomic Layer Deposition of Zirconium Oxide Using Tris(dimethylamino)cyclopentadienyl Zirconium, <i>Yong Richard Sriwijaya (Graduate Student), Hye-Lee Kim, Okhyeon Kim, Khabib Khumaini</i> , Sejong University, Republic of Korea; <i>Romel Hidayat</i> , PT PLN, Indonesia; <i>Won-Jun Lee</i> , Sejong University, Republic of Korea	
9:00am	<b>AF1-TuM-5</b> A Study on the Correlation of Surface Chemistry to Electrical Properties of Ultra-thin Oxide Semiconductors by Atomic Layer Deposition: A Case Study of Indium Oxides Thin Films, <i>Joohyeon Lee (Graduate Student)</i> , Ajou University, Republic of Korea; <i>Dohee Kim, Ja Yong Kim, Jong Young Lee, Seung Wook Ryu</i> , SK hynix, Republic of Korea; <i>Il Kwon Oh</i> , Ajou University, Republic of Korea	
9:15am	<b>AF1-TuM-6</b> Catalytic Role of Silane(SiH <sub>4</sub> ) in Enhancing Titanium Nitride(TiN) Atomic Layer Deposition(ALD), <i>Hu Li</i> , Tokyo Electron America Inc.; <i>Taichi Monden, Masaaki Matsukuma</i> , Tokyo Electron Technology Solutions Ltd., Japan; <i>Jianping Zhao</i> , Tokyo Electron America Inc.; <i>Yoshitada Morikawa</i> , Osaka University, Japan; <i>Peter Ventzek</i> , Tokyo Electron America Inc.	
9:30am	<b>AF1-TuM-7</b> Correlation of Hydroxyl Group and Growth Characteristics in Atomic Layer Deposition of Ternary Oxide Depending on Growth Temperature, <i>Sanghun Lee (Graduate Student)</i> , Yonsei University, Republic of Korea; <i>Il-Kwon Oh</i> , Ajou University, Republic of Korea; <i>Hyungjun Kim</i> , Yonsei University, Republic of Korea	
9:45am	<b>AF1-TuM-8</b> Atomistic Modeling of Oxygen Recombination Reactions in the ALD of SiO <sub>2</sub> and Al <sub>2</sub> O <sub>3</sub> , <i>Suresh Kondati Natarajan</i> , Synopsys Inc., Denmark; <i>Rafshan Ul Atik</i> , Synopsys India Pvt. Ltd., India; <i>Yong-Ju Kang</i> , Synopsys Korea Inc., Republic of Korea; <i>Jess Wellendorff, Søren Smidstrup</i> , Synopsys Denmark ApS, Denmark	
10:00am	<b>BREAK &amp; EXHIBITS</b>	
10:45am	<b>AF2-TuM-12</b> Screening Volatile Metal Complex for ALD Precursor by Modified COSMO-SAC Method and Estimating Its Reactivity by Atomistic Simulator Using Neural Network Potential, <i>Noboru Sato</i> , The University of Tokyo, Japan; <i>Naoyuki Hoshiya, Akiyoshi Yamauchi, Shigehito Sagisaka, Yosuke Kishikawa</i> , DAIKIN INDUSTRIES, LTD., Japan; <i>Yuxuan Wu, Jun Yamaguchi, Atsuhiko Tsukune, Yukihiko Shimogaki</i> , The University of Tokyo, Japan	<b>ALD Fundamentals Session AF2-TuM Mechanism and Theory II</b> <b>Moderators:</b> <b>Atsushi Sakurai</b> , ADEKA CORPORATION, Japan, <b>Tania Sandoval</b> , Technical University Federico Santa Maria, Chile
11:00am	<b>AF2-TuM-13</b> Ion Effects on Plasma-induced Surface Composition Changes during SiCN Atomic Layer Deposition: A Combined Ab-Initio and Monte Carlo Approach, <i>Ting-Ya Wang (Graduate Student)</i> , University of Texas at Austin, Taiwan; <i>Hu Li</i> , Tokyo Electron America, Inc., China; <i>Peter Ventzek, Jianping Zhao</i> , Tokyo Electron America, Inc.; <i>Gyeong Hwang</i> , University of Texas at Austin, Korea (Democratic People's Republic of)	
11:15am	<b>AF2-TuM-14</b> Benchmarking Large Language Models for Atomic Layer Deposition, <i>Angel Yanguas-Gil, Matthew Dearing, Jeffrey Elam, Jessica Jones, Sungjoon Kim, Anan Mohammad, Chi Thang Nguyen, Bratin Sengupta</i> , Argonne National Laboratory	
11:30am	<b>AF2-TuM-15</b> Adsorption State Study of Trimethylaluminum Using Neural Network Potential Computation and High Accuracy in-situ Quartz Crystal Microbalance, <i>Yuxuan Wu (Graduate Student)</i> , The University of Tokyo, Japan, China; <i>Jun Yamaguchi, Noboru Sato, Atsuhiko Tsukune, Yukihiko Shimogaki</i> , The University of Tokyo, Japan	
11:45am	<b>AF2-TuM-16</b> Atomistic Insights into the Surface Chemistry Driving ALD of IGZO Films from First-Principles and Machine-Learning Simulations, <i>Alex Watkins (Graduate Student)</i> , University of Warwick, UK	

# Tuesday Morning, June 24, 2025

Room Samda Hall		
8:00am	<b>INVITED: ALE1-TuM-1</b> Thermal Atomic Layer Etching in Next Generation 3D Devices, <i>Younghee Lee</i> , Lam Research Corporation	<b>Atomic Layer Etching Session ALE1-TuM Thermal Gas Phase ALE Moderators: Steven M. George</b> , University of Colorado at Boulder, <b>Chanmin Lee</b> , Samsung Electronics, Republic of Korea
8:30am	<b>ALE1-TuM-3</b> Atomic Layer Etching of SiCO Films with Surface Modification by O <sub>2</sub> and CF <sub>4</sub> /NH <sub>3</sub> /Ar Plasmas and Desorption by IR Annealing, <i>Nicholas McDowell</i> , Hitachi High Technologies America Inc.; <i>Nobuya Miyoshi</i> , Hitachi, Ltd., Japan; <i>Phuc Phan</i> , <i>Ritchie Scott-McCabe</i> , Hitachi High Technologies America Inc.; <i>Hiroyuki Kobayashi</i> , Hitachi High Technologies, Japan	
8:45am	<b>ALE1-TuM-4</b> Thermal Atomic Layer Etching of Mo with NbCl <sub>5</sub> and O <sub>2</sub> , <i>Juha Ojala (Graduate Student)</i> , <i>Mykhailo Chundak</i> , <i>Anton Vihervaara</i> , <i>Marko Vehkamäki</i> , <i>Mikko Ritala</i> , University of Helsinki, Finland	
9:00am	<b>ALE1-TuM-5</b> Film and Surface Stress During Thermal Atomic Layer Etching of Al <sub>2</sub> O <sub>3</sub> and Tungsten, <i>Ryan B. Vanfleet (Graduate Student)</i> , <i>Steven M. George</i> , University of Colorado at Boulder	
9:15am	<b>ALE1-TuM-6</b> The Invention of Atomic Layer Etching: on the Conception of Cycled Exposures of Silicon to Halogens and Pulses of Heat, Ions, and More, by Seiichi Iwamatsu, <i>Fred Roozeboom</i> , University of Twente, Netherlands; <i>Dmitry Suyatin</i> , <i>Jonas Sundqvist</i> , <i>AlixLabs A.B.</i> , Sweden; <i>Kuniyuki Kakushima</i> , Tokyo Institute of Technology, Japan	
9:30am	<b>ALE1-TuM-7</b> Isotropic Atomic Layer Etching of HfO <sub>2</sub> using Plasma Fluorination with NF <sub>3</sub> and Ligand Exchange with BCl <sub>3</sub> , <i>Hyeongwu Lee (Graduate Student)</i> , <i>Heeju Ha</i> , <i>Daeun Hong</i> , <i>Heeyeop Chae</i> , Sungkyunkwan University (SKKU), Republic of Korea	
9:45am		
10:00am	<b>BREAK &amp; EXHIBITS</b>	
10:45am	<b>INVITED: ALE2-TuM-12</b> Enhancing 3D NAND Flash Memory Production: Addressing High Aspect Ratio Etching Challenges with Atomic Layer Etching, <i>Jaewon Lee</i> , <i>Huichan Seo</i> , SK hynix Inc., Republic of Korea	<b>Atomic Layer Etching Session ALE2-TuM ALE Applications I Moderators: Eric A. Joseph</b> , IBM Research Division, T.J. Watson Research Center, <b>Jonas Sundqvist</b> , BALD Engineering AB, Sweden
11:00am		
11:15am	<b>ALE2-TuM-14</b> Controlled Electron-Enhanced Silicon Etching with H <sub>2</sub> Background Gas and Positive Sample Voltage, <i>Sumaira Yasmeen</i> , University of Colorado at Boulder; <i>Harsono Simka</i> , Samsung Semiconductor; <b>Steven George</b> , University of Colorado at Boulder	
11:30am	<b>ALE2-TuM-15</b> Suppressing Surface Roughness in Tungsten Wet Atomic Layer Etching using Halogenation, <i>Tulashi Dahal</i> , <i>Kate Abel</i> , Tokyo Electron America Inc.,; <i>Karthik Pillai</i> , TEL Technology Center, America, LLC; <i>Trace Hurd</i> , <i>Antonio Rotondaro</i> , Tokyo Electron America Inc.,	
11:45am	<b>ALE2-TuM-16</b> Plasma-Enhanced Isotropic Atomic Layer Etching of Molybdenum with Fluorocarbon Layer Formation Followed by Plasma Oxidation, <i>Heeju Ha (Graduate Student)</i> , <i>Hyeongwu Lee</i> , <i>Heeyeop Chae</i> , Sungkyunkwan University (SKKU), Republic of Korea	

# Tuesday Morning, June 24, 2025

Room Tamna Hall A		
8:00am	<b>AA1-TuM-1</b> Effect of Ga Doping on Coercive Field Reduction and Endurance Enhancement in Atomic Layer Deposited HfO <sub>2</sub> -based Thin Film for FeRAM Applications, <b>Zi-Ying Huang</b> , Yu-Chun Li, Fudan University, China; <b>Ming Li</b> , Peking University, China; Ye Zhu, Hong Kong Polytechnic University, China; <b>David Wei Zhang</b> , Hong-Liang Lu, Fudan University, China	<b>ALD Applications Session AA1-TuM Memory Applications II</b> <b>Moderators: Pinyen Lin</b> , TSMC, Taiwan, <b>Seung Wook Ryu</b> , SK hynix, Republic of Korea
8:15am	<b>AA1-TuM-2</b> Realization of Selector-Only Memory via Supercycle Atomic Layer Deposition of Ge-Sb-Se Ternary Alloy, <b>Jeongwoo Seo (Graduate Student)</b> , Minu Cho, Inkyu Sohn, Yonsei University, Korea; <b>Youngjae Kang</b> , Jong-bong Park, Kiyeon Yang, Wooyoung Yang, Samsung Advanced Institute of Technology, Republic of Korea; <b>Hyungjun Kim</b> , Yonsei University, Korea	
8:30am	<b>AA1-TuM-3</b> Atomic-Scale Thickness Control of Antiferroelectric ZrO <sub>2</sub> via Morphotropic Phase Boundary Engineering for Enhanced Ferroelectricity, <b>Chun-Ho Chuang (Graduate Student)</b> , Ting-Yun Wang, Yu-Sen Jiang, Miin-Jang Chen, Department of Materials Science and Engineering, National Taiwan University, Taiwan	
8:45am	<b>AA1-TuM-4</b> Metastable Rutile TiO <sub>2</sub> Growth on Non-Lattice-Matched Substrates via a Sacrificial Layer Strategy, <b>Jeon Jihoon</b> , Kim Seong Keun, Korea Institute of Science and Technology (KIST), Republic of Korea	
9:00am	<b>AA1-TuM-5</b> EWF Modulation and Electrical Performance Enhancement Using Fluorine Surface Treatment in Yttrium Oxide-based Dipole-First Gate Stack, <b>Sangkuk Han (Graduate Student)</b> , Changhwan Choi, Wonjae Choi, Hanyang University, Korea	
9:15am	<b>AA1-TuM-6</b> Reconfigurable Memristor Crossbar for Graphlet Computing, <b>Kyung Seok Woo</b> , Sandia National Laboratories; <b>Nestor Ghenzi</b> , Seoul National University; <b>Hyungjun Park</b> , Seoul National University, Republic of Korea; <b>A. Alec Talin</b> , Sandia National Laboratories; <b>Cheol Seong Hwang</b> , Seoul National University, Republic of Korea; <b>R. Stanley Williams</b> , <b>Suhas Kumar</b> , Sandia National Laboratories	
9:30am	<b>AA1-TuM-7</b> Tuning of Effective Work Function in Cl Free TiAlN ALD Through Fine Al Doping Process for Gate Electrode Application, <b>Gyeong Min Jeong (Graduate Student)</b> , Hae Dam Kim, Jin-Seong Park, Hanyang University, Republic of Korea	
9:45am	<b>AA1-TuM-8</b> Optimizing Grain Structure in Mo-Ru Alloys for High Conductivity, Changhwan Choi, <b>Hyunjin Lim (Graduate Student)</b> , Youngseo Na, Yeh Been Im, Hanyang University, Korea	
10:00am	<b>BREAK &amp; EXHIBITS</b>	
10:45am	<b>AA2-TuM-12</b> Defect-free Carbon based EUV Pellicle by using Bi-layer Capping with Atomic Layer Deposition, <b>Park Jihoon (Undergraduate)</b> , Yoon Hwi, Yonsei University, Korea; <b>Wi Seong Ju</b> , Lee Yunhan, Lee Byunghoon, Bae Sukjong, Choi Jin, Samsung Electronics, Republic of Korea; <b>Kim Hyungjun</b> , Yonsei University, Korea	<b>ALD Applications Session AA2-TuM EUV and Patterning Applications</b> <b>Moderators: Jiyoung Kim</b> , University of Texas at Dallas, <b>Hanjin Lim</b> , Samsung Electronics Co., Inc., Republic of Korea
11:00am	<b>AA2-TuM-13</b> Three-Step Plasma-Enhanced ALD of Ultra-Thin SiN <sub>x</sub> with Enhanced Etch Resistance for EUV Pellicle Applications, <b>Hye-Young Kim (Undergraduate)</b> , Hyun-Mi Kim, Yoonjeong Shin, Jonghyuk Yoon, Korea Electronics Technology Institute, Republic of Korea; <b>Ji-Beom Yoo</b> , Sungkyunkwan University (SKKU), Republic of Korea; <b>Seul-Gi Kim</b> , <b>Hyeongkeun Kim</b> , Korea Electronics Technology Institute, Republic of Korea	
11:15am	<b>AA2-TuM-14</b> Mo <sub>2</sub> C-Coated CNT with Hydrogen Radical Resistance for EUVL Pellicles, <b>Hyeongkeun Kim</b> , <b>Su Min Lee</b> , Yongkyung Kim Kim, Jonghyuk Yoon, Kihun Seong, Heongyu Lee, Sun Gil Kim, Hyun-Mi Kim, Korea Electronics Technology Institute (KETI), Republic of Korea; <b>Gu Young Cho</b> , Dankook University, Republic of Korea; <b>Seul-Gi Kim</b> , Korea Electronics Technology Institute (KETI), Republic of Korea	
11:30am	<b>AA2-TuM-15</b> ALD Outstanding Presentation Award Finalist: Vapor-Phase Infiltration of Hafnium in Poly(Methyl Methacrylate) Thin Films for Extreme Ultraviolet Lithography Applications, <b>Md Istiaque Chowdhury</b> , <b>Xinpei Wu</b> , Brookhaven National Laboratory; <b>Won-Il Lee</b> , <b>Mueed Ahmad</b> , Stony Brook University; <b>J. Anibal Boscoboinik</b> , <b>Kim Kisslinger</b> , <b>Aaron Stein</b> , <b>Nikhil Tiwale</b> , Brookhaven National Laboratory; <b>Jiyoung Kim</b> , University of Texas at Dallas; <b>Chang-Yong Nam</b> , Brookhaven National Laboratory	

# Tuesday Morning, June 24, 2025

Room Tamna Hall B	
8:00am	<b>AF3-TuM-1</b> ALD of SnO <sub>2</sub> Thin Films using Tin(IV) Acetate as a Novel Precursor, <b>Anjan Deb (Graduate Student)</b> , Miika Mattinen, Mikko J. Heikkilä, Mykhailo Chundak, Anton Vihervaara, Kenichiro Mizohata, Mikko Ritala, Matti Putkonen, University of Helsinki, Finland
8:15am	<b>AF3-TuM-2</b> Bridging the Gap: Volachem's Mission to Advance ALD Precursor Development, <b>Martin Wilken</b> , Dominik Naglav-Hansen, Andreas Ostendorf, Ruhr Universität Bochum, Germany; <b>Anjana Devi</b> , Leibniz Institute for Solid State and Materials Research, Germany
8:30am	<b>AF3-TuM-3</b> Revealing the Effect of Defect and Hydrogenation on Borazine-based Atomic Layer Deposition using First Principles Calculations, <b>Tsung-Hsuan Yang</b> , Tokyo Electron America; <b>Gyeong Hwang</b> , University of Texas at Austin; <b>Hu Li, Jianping Zhao, Peter Ventzek</b> , Tokyo Electron America
8:45am	<b>AF3-TuM-4</b> Novel Heteroleptic Precursors for Oxide Semiconductor Films (In-, Ga-, Zn-, Sn-Ox), Aimed at Co-dosing Process and Cocktail Precursor, <b>Nana Okada</b> , Ryota Fukushima, Keisuke Takeda, Masaki Enzu, Tomoharu Yoshino, Atsushi Yamashita, Yoshiki Oe, Akio Saito, Yutaro Aoki, Akihiro Nishida, Atsushi Sakurai, ADEKA CORPORATION, Japan
9:00am	<b>AF3-TuM-5</b> Investigation of Fluorinated Copper and Gold Alkoxides as Precursors for Atomic Layer Deposition, <b>Nick A. Hoffman (Graduate Student)</b> , David J. H. Emslie, McMaster University, Canada
9:15am	<b>AF3-TuM-6</b> ALD of Al <sub>2</sub> O <sub>3</sub> for Gas Barrier Applications: Impact of Al Precursors, <b>Jean-Pierre Glauber (Graduate Student)</b> , Leibniz Institute for Solid State and Materials Research, Germany; <b>Maximilian Gebhard, Lukas Mai</b> , Ruhr University Bochum, Germany; <b>Harish Parala, Anjana Devi</b> , Leibniz Institute for Solid State and Materials Research, Germany
9:30am	<b>AF3-TuM-7</b> Atomic Layer Deposition of Nb <sub>2</sub> O <sub>5</sub> using New Nb Precursor, <b>Daehyeon Kim, Suhyun Kim, Jinhyung Park</b> , Air Liquide, Republic of Korea
9:45am	<b>AF3-TuM-8</b> Atomic Layer Deposition of Mo Thin Film using Metal Organic Mo Precursor, <b>Han-Bo-Ram Lee, Bonwook Gu</b> , Incheon National University, Republic of Korea; <b>T. Barry Sean, Kieran Lawford</b> , Carleton University, Canada; <b>Kwangyong An (Undergraduate)</b> , incheon National University, Republic of Korea
10:00am	<b>BREAK &amp; EXHIBITS</b>
10:45am	<b>INVITED: EM-TuM-12</b> Zeolite-Like Frameworks Created by ALD/MLD as an All-Dry Resist Technology, <b>Howard Fairbrother</b> , Department of Chemistry, Johns Hopkins University; <b>Peter Corkery, Kayley Waltz</b> , Department of Chemical and Biomolecular Engineering, Johns Hopkins University; <b>Patrick Eckhart</b> , Department of Chemistry, Johns Hopkins University; <b>Michael Tsapatsis</b> , Department of Chemical and Biomolecular Engineering, Johns Hopkins University
11:15am	<b>EM-TuM-14</b> Atomic Layer Regulation of MIL-53 Metal-Organic Framework as Interconnect Low-k Dielectrics, <b>Fan Yang</b> , Luoyu Road 1037, Wuhan, China; <b>Jisheng Song, Rong Chen</b> , Huazhong University of Science and Technology, China
11:30am	<b>EM-TuM-15</b> Nanolaminated Films with Negative Capacitance Fabricated by ALD, <b>Xiang Yang Kong</b> , School of Materials Science Engineering Shanghai Jiao Tong University, Shanghai 200240, China
11:45am	<b>EM-TuM-16</b> Thermal Annealing of Molecular Layer-Deposited Tincone : Unveiling Sulfur's Structural Impacts in Graphitic Carbon Formation, <b>Jin-Seong Park, Gi-Beom Park (Graduate Student)</b> , Hyolim Jung, Hae Lin Yang, Ji-Min Kim, Hanyang University, Korea

**ALD Fundamentals  
Session AF3-TuM  
Precursor Chemistry II**  
**Moderators:**  
**Venkateswara Pallem**, AirLiquide,  
**Paul Williams**, Pegasus Chemicals

**Emerging Materials  
Session EM-TuM  
Molecular Layer Deposition & Hybrid Materials I**  
**Moderators:**  
**Jin-Seong Park**, Hanyang University, Republic of Korea,  
**Henrik Pedersen**, Linköping University, Sweden

# Tuesday Afternoon, June 24, 2025

Room Halla Hall		
1:30pm	<b>AF1-TuA-1</b> Interface Evolution in ALD of HfO <sub>2</sub> on TiN: LEIS and XPS in Vacuo Studies, <b>Mykhailo Chundak</b> , Heta-Elisa Nieminen, Marko Vehkamäki, Laura Keränen, Matti Putkonen, Mikko Ritala, University of Helsinki, Finland	<b>ALD Fundamentals</b> <b>Session AF1-TuA</b> <b>Analysis</b> <b>Moderators:</b> <b>Christophe Detavernier</b> , Ghent University, Belgium, <b>Adrie Mackus</b> , Eindhoven University, Netherlands
1:45pm	<b>AF1-TuA-2</b> In Situ Ambient Pressure X-ray Photoelectron Spectroscopy Study of Atomic Layer Deposition of Hafnium Oxide on (Ag,Cu)(In,Ga)Se <sub>2</sub> Absorbers Relevant for Thin Film Solar Cells, <b>Natalia M. Martin</b> , Uppsala University, Angstrom Laboratory, Sweden	
2:00pm	<b>AF1-TuA-3</b> Development of a Home-Built Atomic Layer Deposition Reactor for <i>in-Situ</i> Synchrotron GISAXS and XAS Characterization, <b>Marina Armengol-Profitós</b> , Jordi Prat, Montserrat Prieto, Zbigniew Reszela, Cristián Huck-Iriart, Massimo Tallarida, Eduardo Solano, Carlos Escudero, ALBA synchrotron light source, Spain	
2:15pm	<b>AF1-TuA-4</b> Evaluation of Initial Nucleation of Co-ALD by CCTBA Using in-Situ Reflectance Monitoring and Atomistic Simulator Based on Neural Network Potential, <b>Naoki Tamaoki</b> , The University of Tokyo, Japan; <b>Yubin Deng</b> , The University of Tokyo, China; <b>Jun Yamaguchi</b> , <b>Noboru Sato</b> , <b>Atsuhiko Tsukune</b> , <b>Yukihiro Shimogaki</b> , The University of Tokyo, Japan	
2:30pm	<b>AF1-TuA-5</b> Low Energy Ion Scattering Analysis of GC/IrOX /SiO <sub>2</sub> Layer Structure, <b>Philipp Brüner</b> , Thomas Grehl, IONTOF GmbH, Germany; <b>Rens Kamphorst</b> , <b>Katherine S. Encalada Flores</b> , <b>Ruud Kortlever</b> , <b>Ruud van Ommen</b> , TU Delft, Netherlands	
2:45pm	<b>AF1-TuA-6</b> Tailoring Interface and Bulk Properties: An Oxidant Co-Dosing Approach to ALD Growth of Hafnia Thin Films, <b>Dushyant Narayan</b> , <b>Dan Le</b> , <b>Soham Shirodkar</b> , <b>Soubhik De</b> , <b>Geon Park</b> , <b>Minjong Lee</b> , <b>Thi Thu Huong Chu</b> , <b>Jin-Hyun Kim</b> , The University of Texas at Dallas; <b>Walter Hernandez</b> , <b>Adrian Alvarez</b> , <b>Josh Garretson</b> , <b>Jeffrey Spiegelman</b> , RASIRC; <b>Jiyoung Kim</b> , The University of Texas at Dallas	
3:00pm	<b>AF1-TuA-7</b> Mechanical Properties and Wear Resistance of Atomic Layer Deposited Ternary Cr-Hf-O Films: A Comparative Study with Binary Chromium Oxide and Hafnium Oxide Films, <b>Mahtab Salari Mehr (Graduate Student)</b> , <b>Lauri Aarik</b> , <b>Taivo Jõgi</b> , <b>Hugo Mändar</b> , University of Tartu, Estonia	
3:15pm	<b>AF1-TuA-8</b> In-situ X-ray photoelectron spectroscopy for determining oxidation state, composition, and morphology of ALD-based CeO <sub>x</sub> , SnO <sub>x</sub> , and Ce <sub>1-x</sub> Sn <sub>x</sub> O <sub>y</sub> deposits, <b>Rudi Tschammer (Graduate Student)</b> , <b>Dominic Guttman</b> , BTU Cottbus, Germany; <b>Marcel Schmickler</b> , <b>Anjana Devi</b> , Leibniz Institute for Solid State and Materials Research, Germany; <b>Karsten Henkel</b> , <b>Carlos Morales</b> , <b>Jan Ingo Flege</b> , BTU Cottbus, Germany	
3:30pm	<b>BREAK &amp; EXHIBITS</b>	
4:00pm	<b>AF2-TuA-11</b> Controlling the Crystalline Nature of PEALD Thin Films Through Tuning of Plasma Characteristics, <b>Peter Litwin</b> , Naval Research Laboratory, USA; <b>Marc Currie</b> , <b>Neeraj Nepal</b> , <b>Maria Sales</b> , <b>David Boris</b> , US Naval Research Laboratory; <b>Michael Johnson</b> , Naval Research Laboratory, USA; <b>Scott Walton</b> , <b>Virginia Wheeler</b> , US Naval Research Laboratory	<b>ALD Fundamentals</b> <b>Session AF2-TuA</b> <b>Plasma ALD</b> <b>Moderators:</b> <b>Ruud van Ommen</b> , Delft University of Technology, Netherlands, <b>Seung-Yeul Yang</b> , Samsung, Republic of Korea
4:15pm	<b>AF2-TuA-12</b> Comparative Study of CeO <sub>2</sub> Thin Films Prepared by Plasma-Enhanced and Thermal Atomic Layer Deposition Using a New Liquid Ce Precursor, <b>Yewon Seo (Graduate Student)</b> , <b>Sang Bok Kim</b> , <b>Soo-Hyun Kim</b> , Graduate School of Semiconductor Materials and Devices Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Republic of Korea	
4:30pm	<b>AF2-TuA-13</b> Tuning Crystallinity of Plasma-Enhanced Atomic Layer Deposited Aluminum Nitride Thin Films using an Electron Cyclotron Resonance Microwave Source, <b>Julian Pilz</b> , <b>Tai Nguyen</b> , Silicon Austria Labs, Austria; <b>Paul Dreher</b> , Evatec AG, Switzerland; <b>Marco Deluca</b> , Silicon Austria Labs, Austria	
4:45pm	<b>AF2-TuA-14</b> Plasma-Enhanced Atomic Layer Deposition of High-Quality InN Thin Films Using a Novel In Precursor and NH <sub>3</sub> Plasma, <b>Yejun Kim (Graduate Student)</b> , <b>Chaehyun Park</b> , <b>Minjeong Kweon</b> , <b>Soo-Hyun Kim</b> , Ulsan National Institute of Science & Technology, Republic of Korea	
5:00pm	<b>AF2-TuA-15</b> Insights Into Tuning TiO <sub>2</sub> Film Property Distribution in 3D Structures During Peald Process, <b>Takashi Hamano</b> , <b>Nobuyuki Kuboi</b> , <b>Hiroyasu Matsugai</b> , <b>Shoji Kobayashi</b> , <b>Yoshiya Hagimoto</b> , <b>Hayato Iwamoto</b> , Sony Semiconductor Solutions Corporation, Japan	
5:15pm	<b>AF2-TuA-16</b> Plasma-Enhanced ALD Process for Boron Carbide Films: Towards Tunable B:C Ratio, <b>Catherine Marichy</b> , <b>Neil Richard Innis</b> , <b>Abdulhamid Afolabi</b> , <b>Olivier Boisron</b> , <b>Didier Leonard</b> , <b>Colin Bousige</b> , <b>Catherine Journet</b> , Universite Claude Bernard Lyon 1, France	

# Tuesday Afternoon, June 24, 2025

Room Samda Hall		
1:30pm	<b>INVITED: ALE1-TuA-1</b> Isotropic and Anisotropic ALE: Tool Aspects, Processes, and Applications, <i>Harm Knoops</i> , Oxford Instruments Plasma Technology, UK	<b>Atomic Layer Etching Session ALE1-TuA ALE Tools &amp; ALE Modeling Moderators:</b> <b>Dmitry Suyatin</b> , AlixLabs A.B., Sweden, <b>Takayoshi Tsutsumi</b> , Nagoya University, Japan
2:00pm	<b>ALE1-TuA-3</b> Study on Plasma Induced Damaged Layer Formation Using Molecular Dynamics, <i>Junghwan Um, Sung-Il Cho</i> , Samsung Electronics Co., Republic of Korea	
2:15pm	<b>ALE1-TuA-4</b> Theoretical Analysis on Crystalline Phase-Dependent Surface Fluorination of HfO <sub>2</sub> for Atomic Layer Etching, <i>Sujin Kwon (Graduate Student), Bonggeun Shong</i> , Hongik University, Republic of Korea	
2:30pm	<b>ALE1-TuA-5</b> Removal Reaction Mechanisms During Thermal Atomic Layer Etching of Aluminum Oxide: A First-Principles Study, <i>Khabib Khumaini, Gyejun Cho, Hye-Lee Kim, Won-Jun Lee</i> , Sejong University, Republic of Korea	
2:45pm	<b>ALE1-TuA-6</b> Multiscale Modeling of Gallium Nitride Atomic Layer Etching in Chlorinated Plasmas: A Combined Dynamic Global Model, Ab-initio and Kinetic Monte Carlo Approaches, <i>Tojo Rasoanarivo (Graduate Student), Cédric Mannequin, Isabelle Braems</i> , Institut des Matériaux de Nantes Jean Rouxel, France; <i>Fabrice Roqueta, Mohamed Boufnichel</i> , STMicroelectronics, France; <i>Ahmed Rhallabi</i> , Institut des Matériaux de Nantes Jean Rouxel, France	
3:00pm	<b>ALE1-TuA-7</b> Utilization of Molecular Dynamics Simulations and a Reduced Order Model to Analyze the Atomic Layer Etching Window of the Si-Cl <sub>2</sub> -Ar <sup>+</sup> System, <i>Joseph Vella</i> , TEL Technology Center, America, LLC, USA; <i>David Graves</i> , Department of Chemical and Biological Engineering, Princeton University	
3:15pm	<b>ALE1-TuA-8</b> Characteristics of the Power Delivery System of Transformer-Coupled Plasma Source for Remote Plasma Process in Semiconductor Manufacturing, <i>Tae S. Cho, Hakmin Kim, Giwon Shin, Jaehoon Choi, Sooyoung Hwang, Jihyun Kim</i> , Wonik IPS, Republic of Korea	
3:30pm	<b>BREAK &amp; EXHIBITS</b>	
4:00pm	<b>ALE2-TuA-11</b> Development of an Atomic Layer Etching Process Dedicated to Diamond Material, <i>Marine Régnier (Graduate Student)</i> , Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel; Institute of Applied Physics, University of Tsukuba; Japanese-French Laboratory for Semiconductor Physics and Technology J-FAST, CNRS, Univ. Grenoble Alpes, University of Tsukuba, France; <i>Aboulaye Traoré</i> , LSPM, CNRS, Université Sorbonne Paris Nord, France; <i>Marceline Bonvalot</i> , Univ. Grenoble Alpes, CNRS, Grenoble INP, LTM; Japanese-French Laboratory for Semiconductor Physics and Technology J-FAST, CNRS, Univ. Grenoble Alpes, University of Tsukuba, France; <i>Etienne Gheeraert</i> , Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel; Institute of Applied Physics, University of Tsukuba; Japanese-French Laboratory for Semiconductor Physics and Technology J-FAST, CNRS, Univ. Grenoble Alpes, University of Tsukuba, France	<b>Atomic Layer Etching Session ALE2-TuA ALE Applications II Moderators:</b> <b>Harm C.M. Knoops</b> , Oxford Instruments Plasma Technology, Netherlands, <b>Jaewon Lee</b> , SK hynix, Republic of Korea
4:15pm	<b>ALE2-TuA-12</b> Atomic Layer Etching of MgO-doped Lithium Niobate Using Sequential Plasma Exposures, <i>Austin Minnich, Ivy Chen (Graduate Student), Jennifer Solgaard, Ryoto Sekine, Azmain Hossain, Anthony Ardizzi, David Catherall, Alireza Marandi, Caltech; James Renzas</i> , University of Nevada, Reno; <i>Frank Greer</i> , Jet Propulsion Laboratory (NASA/JPL)	
4:30pm	<b>ALE2-TuA-13</b> Comparison of Gas-Pulsing Atomic Layer Etching (ALE) Characteristics Between Low-GWP Alternative Gases C <sub>4</sub> F <sub>6</sub> , C <sub>4</sub> H <sub>2</sub> F <sub>6</sub> and a Conventional Gas C <sub>4</sub> F <sub>8</sub> , <i>Shinjae You</i> , Department of Physics, Chungnam National University and Institute of Quantum Systems (IQS), Chungnam National University, Republic of Korea; <i>Dongki Lee (Graduate Student), Inho Seong</i> , Department of Physics, Chungnam National University, Republic of Korea; <i>Young-seok Lee</i> , Tokyo Electron Korea Ltd., Republic of Korea; <i>Sijun Kim</i> , Laboratoire de Physique des Plasmas (LPP), CNRS, Sorbonne Université, École Polytechnique, Institut Polytechnique de Paris, Republic of Korea; <i>Chul_Hee Cho, Wannyoung Jeong</i> , Department of Physics, Chungnam National University, Republic of Korea; <i>Ehsanul Haque Jami</i> , Department of Physics, Chungnam National University, Bangladesh; <i>Min-su Choi, Byeongyeop Choi, Seonghyun Seo, Isak Lee, Woobeen Lee, Wonyun Park, Jinhyeok Jang</i> , Department of Physics, Chungnam National University, Republic of Korea	
4:45pm	<b>ALE2-TuA-14</b> The Influence of Laminar Doping of Atomic Layer Etching of Zinc Oxide, <i>Sabir Hussain, Emily Duggan, Lynette Keeney, Jun Lin, Ian Povey</i> , Advanced Materials and Surfaces Group, Tyndall National Institute, University College Cork, Lee Maltings Complex, Dyke Parade, Ireland; <i>Mark Sowa, Laurent Lecordier</i> , Veeco Instruments	
5:00pm	<b>ALE2-TuA-15</b> Ale of Tin Using Sf <sub>6</sub> :H <sub>2</sub> Plasma: The Role of H, F, and Hf in Defining the Ale Window, <i>Guillaume Krieger, Silke Peeters, Erwin Kessels</i> , Eindhoven University of Technology, The Netherlands; <i>Harm Knoops</i> , Oxford Instruments Plasma Technology, UK, Eindhoven University of Technology, Netherlands	
5:15pm	<b>ALE2-TuA-16</b> Atomic Layer Etching of Ruthenium Using Surface Oxidation with O <sub>2</sub> Plasma and Chelation with Formic Acid, <i>Hojin Kang (Graduate Student), Eunsu Lee, Minsung Jeon, Heeyeop Chae</i> , Sungkyunkwan University (SKKU), Republic of Korea	

# Tuesday Afternoon, June 24, 2025

Room Tamna Hall A	
1:30pm	<p><b>INVITED: AA-TuA-1</b> Characteristics of ALD IGZO for the application in Stackable DRAM Cell, <i>Seung Wook Ryu</i>, R&amp;D Process, R&amp;D division SK hynix Inc, Republic of Korea</p>
2:00pm	<p><b>AA-TuA-3</b> 5 nm Thick Indium Nitride Channel Layers Fabricated by PEALD for 3D Transistor Architectures, <i>Doo San Kim, Minjong Lee, Min Gyeong Jo, Thi Thu Huong Chu, Dushyant Narayan, Dan Le</i>, The University of Texas at Dallas; <i>Youngbae Ahn, Ja-Yong Kim, Seung Wook Ryu</i>, SK hynix, Republic of Korea; <i>Jiyoung Kim</i>, The University of Texas at Dallas</p>
2:15pm	<p><b>AA-TuA-4</b> Bottom-Up Mo Fill for Metal Interconnect Applications: Selective and Superconformal Approaches, <i>Matthew Griffiths, Arya Shafiefarhood, David Mandia, Justin Kim, Aleksandr Plokhikh, Youness Alvandi, Nick De Marco, Ben Natinsky, Andrew Melton, Jennifer O'Loughlin</i>, Lam Research Corporation</p>
2:30pm	<p><b>AA-TuA-5</b> Thermal Atomic Layer Deposition of Sn-incorporated MoO<sub>2</sub> Electrode Films for High-performance TiO<sub>2</sub>-based DRAM Capacitors, <i>Jae Hyeon Lee (Undergraduate)</i>, <i>Jeong Hwan Han</i>, Seoul National University of Science and Technology, Republic of Korea</p>
2:45pm	<p><b>AA-TuA-6</b> Highly Ordered Crystalline ALD-InGaO Thin Films with High Mobility and Thermal Stability for Next-Generation 3D Memory Devices, <i>Seong-Hwan Ryu (Graduate Student)</i>, <i>Hye-Mi Kim, Dong-Gyu Kim, Jin-Seong Park</i>, Hanyang University, Korea</p>
3:00pm	<p><b>AA-TuA-7</b> Amino Acid-Based Biomimetic Organic-Inorganic Hybrid Memristors by Molecular Layer Deposition for Neuromorphic Applications, <i>Lin Zhu, Ai-Dong Li, Song Sun</i>, Nanjing University, China; <i>Yan-Qiang Cao</i>, Nanjing University of Science and Technology, China</p>
3:15pm	<p><b>AA-TuA-8</b> Design of Crystalline InGaO Channels with High-Temperature Stability via Thermal ALD Process Parameter Variations, <i>Hye-Jin Oh (Graduate Student)</i>, Hanyang University, Korea; <i>Dong-Gyu Kim</i>, Hanyang University, Republic of Korea; <i>Tae Woong Cho, Hae Lin Yang</i>, Hanyang University, Korea; <i>Jihyun Kho, Yurim Kim, Bong Jin Kuh</i>, Samsung Electronics Co., Republic of Korea; <i>Jin-Seong Park</i>, Hanyang University, Korea</p>
3:30pm	<p><b>BREAK &amp; EXHIBITS</b></p>
4:00pm	<p><b>INVITED: AS-TuA-11</b> Surface Chemistry Characterization for Area-Selective Atomic Layer Deposition of Ruthenium, <i>Eun-Hyoung Cho</i>, 2D Device TU(SAIT)/Samsung Electronics, Republic of Korea; <i>Young Min Lee, Yunseong Lee, Youngchul Leem, Giyoung Jo, Jeong Yub Lee, Kyung-Eun Byun, Jung Yeon Won, Bongsu Kim, Byeong Yub Chae</i>, Samsung Advanced Institute of Technology, Republic of Korea; <i>Kyeongmin Min, Han-Bo-Ram Lee</i>, Incheon National University, Republic of Korea; <i>Iaen Cho, Myeong Kyun Nam, Bonggeun Shong</i>, Hongik University, Republic of Korea</p>
4:30pm	<p><b>AS-TuA-13</b> Dopant-Selective Atomic Layer Deposition (DS-ALD) for Fabrication of Electronic Devices, <i>Daniel Aziz (Graduate Student)</i>, <i>Nishant Deshmukh</i>, Georgia Institute of Technology, USA; <i>Ryugo Shimamura</i>, University of Tokyo, Japan; <i>Amy Brummer</i>, Georgia Institute of Technology, USA; <i>Kaifan Yue</i>, University of Michigan, Ann Arbor; <i>Siddharth Kurup</i>, Georgia Institute of Technology, USA; <i>Kira Barton</i>, University of Michigan, Ann Arbor; <i>Eric Vogel</i>, Georgia Institute of Technology; <i>Michael Filler</i>, Georgia Institute of Technology, USA</p>
4:45pm	<p><b>AS-TuA-14</b> ALD Outstanding Presentation Award Finalist: High Temperature Area Selective ALD SiN by in-Situ Selective Surface Fluorination, <i>Haonan Liu, Ken Okoshi, Hiroki Murakami, Yamato Tonegawa</i>, Tokyo Electron Technology Solutions Ltd., Japan</p>
5:00pm	<p><b>AS-TuA-15</b> Multifunctional Ru/ZnO Bilayer for Sustainable Cu Interconnects using Area-Selective Atomic Layer Deposition of barrier with Small Molecule Inhibitor, <i>Minwoo Kim (Graduate Student)</i>, <i>Yeseul Son, Sang Bok Kim, Soo-Hyun Kim</i>, Ulsan National Institute of Science and Technology (UNIST), Republic of Korea</p>
5:15pm	<p><b>AS-TuA-16</b> Technological Promise of a Frustratingly Elusive Ni<sup>(tbu<sub>2</sub>DAD)</sup><sub>2</sub>—Yet the Challenge is Part of the Breakthrough, <i>Gabriele Botta</i>, Nanogune, Italy</p>

**ALD Applications  
Session AA-TuA  
3D Semiconductor Devices  
Moderators:  
Dennis Hausmann, Lam Research,  
Jonas Sundqvist, BALD Engineering AB, Sweden**

**Area Selective ALD  
Session AS-TuA  
Area Selective Deposition I  
Moderators:  
Stacey Bent, Stanford University,  
Mikko Ritala, University of Helsinki, Finland**

# Tuesday Afternoon, June 24, 2025

<b>Room Tamna Hall B</b>		
1:30pm	<p><b>INVITED: EM-TuA-1</b> Vapor Phase Infiltration for Membrane Modification, <i>David Bergsman</i>, University of Washington</p>	<p><b>Emerging Materials</b>  <b>Session EM-TuA</b>  <b>Molecular Layer Deposition &amp; Hybrid Materials II</b>  <b>Moderators:</b>  <b>Jolien Dendooven</b>, Ghent University, Belgium,  <b>Chang-Yong Nam</b>, Brookhaven National Laboratory</p>
2:00pm	<p><b>EM-TuA-3</b> Dry Developing Process of Molecular Layer Deposited Hf-Based Hybrid Thin Films for EUV Lithography, <i>Minki Choe (Graduate Student)</i>, <i>Dan Le</i>, <i>Thi Thu Huong Chu</i>, <i>Hyunah Sung</i>, University of Texas at Dallas; <i>Nikhil Tiwale</i>, Brookhaven National Laboratory; <i>In-Hwan Baek</i>, <i>Rino Choi</i>, Inha University, Republic of Korea; <i>Chang-Yong Nam</i>, Brookhaven National Laboratory; <i>Jiyoung Kim</i>, University of Texas at Dallas</p>	
2:15pm	<p><b>EM-TuA-4</b> Inverted Living Molecular Layer Deposition: Rapid Conformal Polymer Coatings through Vapor-Phase Living Polymerization, <i>Karina Ashurbekova</i>, <i>Mato Knez</i>, CIC nanoGUNE, Spain</p>	
2:30pm	<p><b>EM-TuA-5</b> ALD Outstanding Presentation Award Finalist: Recent Advancement of Inorganic-Organic Hybrid Resist Thin Films Deposited via Molecular Atomic Layer Deposition for Dry EUV Resist Platforms, <i>Dan N. Le</i>, <i>Thi Thu Huong Chu</i>, <i>Hyunah Daniela Sung</i>, <i>Minki Choe</i>, <i>Minjong Lee</i>, University of Texas at Dallas; <i>Won-Il Lee</i>, Stony Brook University; <i>Nikhil Tiwale</i>, Brookhaven National Laboratory; <i>Jean-Francois Veyan</i>, <i>Doo San Kim</i>, University of Texas at Dallas; <i>Chang-Yong Nam</i>, Brookhaven National Laboratory; <i>Jiyoung Kim</i>, University of Texas at Dallas</p>	
2:45pm	<p><b>INVITED: EM-TuA-6</b> Rethinking Thermoelectrics: The „Power” of Hybrids Engineered by Vapor Phase Infiltration, <i>Kristina Ashurbekova</i>, CIC nanoGUNE, Spain; <i>Maksim Naumochkin</i>, <i>Heiko Reith</i>, <i>Kornelius Nielsch</i>, Leibniz Institute for Solid State and Materials Research, Germany; <i>Mato Knez</i>, CIC nanoGUNE, Spain</p>	
3:15pm	<p><b>EM-TuA-8</b> Plasma-Pretreated ALD Growth of Platinum Catalysts on Carbon Nanotubes for Polymer Electrolyte Membrane Fuel Cell Applications, <i>Junmo Koo</i>, Korea Maritime and Ocean University, Republic of Korea; <i>Joon Hyung Shim</i>, Korea University, Republic of Korea</p>	
3:30pm	<p><b>BREAK &amp; EXHIBITS</b></p>	
4:00pm	<p><b>INVITED: NS-TuA-11</b> Towards Low-Resistance P-Type Contacts to 2D Transition Metal Dichalcogenides Using Plasma-Enhanced Atomic Layer Deposition, <i>Ageeth Bol</i>, University of Michigan, Ann Arbor</p>	
4:30pm	<p><b>NS-TuA-13</b> Selective Passivation of 2D TMD Surface Defects by Atomic Layer Deposition for Enhancing Recovery Rate of Gas Sensor, <i>Minji Kim (Graduate Student)</i>, <i>Inkyu Sohn</i>, <i>Dain Shin</i>, <i>Sangyoon Lee</i>, <i>Hwi Yoon</i>, <i>Jisang Yoo</i>, <i>Seung-min Jung</i>, <i>Hyunjun Kim</i>, Yonsei University, Korea</p>	
4:45pm	<p><b>NS-TuA-14</b> Beyond the conventional AB process: Advanced ALD approaches for controlling the properties and growth of MoS<sub>2</sub> and WS<sub>2</sub> 2D Materials, <i>Cindy Lam</i>, <i>Eryk Gruszecki</i>, <i>Erwin Kessels</i>, <i>Bart Macca</i>, Eindhoven University of Technology, The Netherlands</p>	
5:00pm	<p><b>NS-TuA-15</b> Deposition and Characterization of Transition Metal Oxide/2d Transition Metal Dichalcogenide Quantum Wells, <i>Shih-Hao Tseng (Graduate Student)</i>, <i>Yu-Chuan Lin</i>, Department of Materials Science and Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan</p>	
5:15pm	<p><b>NS-TuA-16</b> Engineering Al<sub>2</sub>O<sub>3</sub> Interlayer via Atomic Layer Deposition for Enhancing Contact Properties of MoS<sub>2</sub>-Based FET, <i>Minu Cho (Undergraduate)</i>, <i>Hwi Yoon</i>, <i>Sanghun Lee</i>, <i>Seongyeong Park</i>, <i>Inkyu Sohn</i>, <i>Hyunjun Kim</i>, Yonsei University, Korea</p>	

## ALD Applications

### Room Event Hall - Session AA-TuP

#### ALD Applications Poster Session

5:45 – 7:00 pm

**AA-TuP-1** The Role of Al<sub>2</sub>O<sub>3</sub> ALD Coating on Sn-Based Intermetallic Anodes for Rate Capability and Long-Term Cycling in Lithium-Ion Batteries, **Nilofar Soltani, Amin Bahrami, Daria Mikhailova, Kornelius Nielsch**, Leibniz Institute for Solid State and Materials Research, Germany

**AA-TuP-2** ALD on Particulate Materials: A Data-Driven Review of Technologies, Materials and Applications from the Bottom Up, **Peter M. Piechulla, Mingliang Chen**, Delft University of Technology, Netherlands; **Riikka L. Puurunen**, Aalto University, Finland; **J. Ruud van Ommen, Aris Goulas**, Delft University of Technology, Netherlands

**AA-TuP-3** Atomic Layer Deposition of Silver Catalysts for Hydroxide Exchange Membrane Fuel Cells, **Gwon Deok Han**, Sookmyung Women's University, Republic of Korea; **Beum Geun Seo**, Korea University, Republic of Korea; **Hyung Jong Choi**, Stanford University; **Junmo Koo**, Korea Maritime & Ocean University, Republic of Korea; **Fritz Prinz**, Stanford University; **Joon Hyung Shim**, Korea University, Republic of Korea

**AA-TuP-4** A Study on the Development of a New Ga Precursor for IGZO Thin Films and the Characteristics of Thin Films Using the Same, **Kyung-eun Lee, Min-hyuk Nim, Taek Seung Yang**, Iakematerials, Republic of Korea

**AA-TuP-5** A Study on the Characteristics of Thin-Film Using New in Producers for IGZO Thin-Film, **HAN-BOM KIM, MIIN-HYUK NIM, Taek Seung Yang**, Iakematerials, Republic of Korea

**AA-TuP-6** A Study on the Characteristics of IGZO Thin Films Using New Ga and In Precursors, **Yeon-Soo Kim, Kyung-Eun Lee, Min-Hyuk Nim, Taek Seung Yang, Chang Ho Song**, LAKE MATERIALS CO., LTD., Republic of Korea; **Nam Eun Kim, Ki-Seok An**, KRICT, Republic of Korea

**AA-TuP-7** Effect of Al<sub>2</sub>O<sub>3</sub> Passivation Layer on Atomic Layer Deposited ZnSnO and Al-doped ZnSnO Thin-Film Transistors with Remarkable Bias-Stress Stability, **Jinheon Choi (Graduate Student), Sahngik Mun, Juneseong Choi, Jaewon Ham, Hyungjeung Kim, Shihyun Kim, Subin Moon, Cheol Seong Hwang**, Seoul National University, Korea (Democratic People's Republic of)

**AA-TuP-8** Ferroelectric-Like Tunnel Switch Behavior of an Antiferroelectric/Dielectric Hf<sub>1-x</sub>Zr<sub>x</sub>O<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> Bilayer Structure, **Seunghoon Choi (Graduate Student), Seunghyong Byun, Han Sol Park, Cheol Seong Hwang**, Seoul National University, Republic of Korea

**AA-TuP-9** Demonstration of Amorphous Oxide Semiconductor Thin Film Transistors with Mold Structure via Channel-Last Process, **Cheol Seong Hwang, Subin Moon (Graduate Student), Sukin Kang, Jinheon Choi, Sahngik Aaron Mun, Juneseong Choi, Jaewon Ham, Hyungjeung Kim, Shihyun Kim**, Seoul National University, South Korea

**AA-TuP-10** Utilizing Ethanol as a Pre-reducing Agent for Atomic Layer Deposition MoO<sub>3</sub>/TiO<sub>2</sub>-Based Metal-Insulator-Metal Capacitors to Enhance Electrical Properties, **Soomin Yoo (Graduate Student)**, Kyunghee University, Republic of Korea; **Seungwoo Lee**, Kyunghee University, Republic of Korea; **Chaeyeong Hwang, Woojin Jeon**, Kyunghee University, Republic of Korea

**AA-TuP-11** Nontemplate *in-Situ* Crystallization of Atomic Layer Deposited Molybdenum Dioxide via Substitutional Doping of Ruthenium, **Chaeyeong Hwang (Graduate Student)**, Kyunghee university, Republic of Korea; **Myeong Ho Kim, Yoon-A Park, Jin-Sik Kim**, R&D Team 1, UP Chemical Co., Ltd., Republic of Korea; **Woojin Jeon**, Kyunghee University, Republic of Korea

**AA-TuP-12** Comprehensive Study on ALD HfO<sub>2</sub>-based RRAM with Next-Generation Ru Electrodes for High-Performance Memory Technology, **Yunsur Kim (Graduate Student), Jiyong Woo**, Kyungpook National University, Republic of Korea

**AA-TuP-13** Effect of the Number and Distribution of Al<sub>2</sub>O<sub>3</sub> Atomic Layer Deposition Cycles Within HfO<sub>2</sub> Layer on Ferroelectric Characteristics, **Hyoungjin Park (Graduate Student), Jiyong Woo**, School of Electronic and Electrical Engineering, Kyungpook National University, Republic of Korea

**AA-TuP-14** Atomic Layer Deposited Single-Atom Catalysts of Pt/Co<sub>3</sub>O<sub>4</sub> for Improved Electrocatalytic Hydrogen Evolution Reaction Performance, **Yue Huang, Ying-Jie Ma (Graduate Student), Ai-Dong Li**, Nanjing University, China

**AA-TuP-15** Atomic Layer Deposited Amorphous High-entropy Oxide Protective Layer for Stable Zinc Metal Anode, **Li-Ling Fu, Ai-Dong Li**, Nanjing University, China

**AA-TuP-16** Transforming Waste Textiles into VC/V<sub>2</sub>O<sub>3-x</sub>-Decorated Porous Carbon for Flexible Battery Hosts, **Viet Phuong Nguyen, Seung Mo Lee**, Korea Institute of Machinery & Materials (KIMM), Republic of Korea

**AA-TuP-17** Dual Ferroelectric Stack by ALD with Tunable Coercive Voltage for High-Density 3D Memory Applications, **Jiyong Woo, Jiae Jeong (Graduate Student)**, Kyungpook National University, Republic of Korea

**AA-TuP-18** Inducing the Tetragonal-Phase HfO<sub>2</sub> in ZrO<sub>2</sub>/HfO<sub>2</sub> Stack by Introducing the Controlled Interfacial Layer, **Woo Young Park**, WONIKIPS, Republic of Korea

**AA-TuP-19** Boosting SERS Performance of MoO<sub>3</sub> Substrates via ALD Surface Modifications, **Yanqiang Cao, Wenyue Yin**, Nanjing University of Science and Technology, China

**AA-TuP-20** Seed-layer Induced Crystallization of Hf<sub>1-x</sub>Zr<sub>x</sub>O<sub>2</sub> with Energy Barrier Lowering Effect of the Ferroelectric Orthorhombic Phase Transition, **Kyongjae Kim (Graduate Student), Eunseo Jo, Myeonggeun Yoo, Youseung Rim**, Sejong University, Republic of Korea

**AA-TuP-21** Highly Conductive Transparent Hybrid Superlattices with Excellent Gas-Barrier Properties and Flexibility, **Myung Mo Sung**, Hanyang University, Korea; **Quang Khanh Nguyen (Graduate Student)**, Hanyang University, Korea, Viet Nam

**AA-TuP-22** Enhanced Growth Stability of ZrO<sub>2</sub>, HfO<sub>2</sub>, and In<sub>2</sub>O<sub>3</sub> Deposited by Liquid Injection Atomic Layer Deposition, **Ji-Kwon Oh, Soon-Kyeong Park (Graduate Student), Ji-Won Jang**, Ajou University, Republic of Korea

**AA-TuP-23** Enhanced Cryogenic Stability and Endurance of CMOS-Compatible ALD HfZrO<sub>2</sub> FeCAPs with Optimized WO Interfacial Layer, **Eunjin Kim (Graduate Student), Jiyong Woo**, Kyungpook National University, Republic of Korea

**AA-TuP-24** Thermal Atomic Layer Deposition of Ru-incorporated Molybdenum Carbide Thin Films via Inter-ligand Reaction for Advanced Copper Metallization, **Jeong Hwan Han, Ji Sang Ahn (Graduate Student)**, Seoul National University of Science and Technology, Republic of Korea

**AA-TuP-25** Stabilization of Metastable Rutile TiO<sub>2</sub> Through Engineering of the Upper Layer for Memory Applications, **Jeon Ji Hoon, Kim Seong Keun**, Korea Institute of Science and Technology (KIST), Republic of Korea

**AA-TuP-26** Enhancing Plasma Resistance in Semiconductor Equipment with Atomic Layer Deposition Thin Films, **Young Yeon Ji, Bongjun Koo, Changsup Kwon, In-rae Park**, Hansol IONES, Republic of Korea

**AA-TuP-27** Crystallization Annealing-Free Ferroelectric Tunnel Junctions with ZrO<sub>2</sub> Seed-layer and HfO<sub>2</sub>-ZrO<sub>2</sub> Superlattice, **Kwang Min Jeong, You Seung Rim**, Department of Semiconductor Systems Engineering and Convergence Engineering for Intelligent Drone, Sejong University, Republic of Korea

**AA-TuP-31** Evaluation of Molybdenum Oxidation for the Growth of Rutile TiO<sub>2</sub>, **Jin Tae Noh, Kyong Min Kim, Byeong Hyeon Kang, Seokjun Han, Seok Nam Koh, Tae Wan Lee**, Wonik IPS, Republic of Korea

**AA-TuP-32** Fast, Remote Plasma ALD of Highly Conductive TiN for Quantum Applications, **Arpita Saha, Dmytro Besprozvannyi, Yi Shu, Agnieszka Kurek**, Oxford Instruments Plasma Technology, UK; **Harm Knoops**, Oxford Instruments Plasma Technology, UK, Eindhoven University of Technology, UK

**AA-TuP-33** Optimized Interface Engineering of ALD SrTiO<sub>3</sub> for DRAM Capacitors, **Seong Keun Kim, Seung Wan Ye (Graduate Student), Hong Keun Chung, Jeon Jihoon**, Korea Institute of Science and Technology (KIST), Republic of Korea

**AA-TuP-34** Urea Production from Polluted Seawater by Atomic Layer Deposited Catalytic Layers, **Rens Kamphorst, Peter M. Piechulla, Ruud J. van Ommen**, Delft University of Technology, Netherlands

**AA-TuP-35** Tailoring the Scavenging Effect of ALD-Al<sub>2</sub>O<sub>3</sub> Passivation Layer via Oxidant Engineering for High-Performance Tellurium Transistors, **Jaeyoon Shim (Undergraduate), Jaemin Jung, In-Hwan Baek**, Inha University, Korea (Democratic People's Republic of)

**AA-TuP-36** Selective Surface Passivation for Ultrathin and Continuous Metallic Films via Atomic Layer Deposition, **Seong Keun Kim**, KU-KIST Graduate School of Convergence Science & Technology, Korea University, Republic of Korea; **Han Kim, Taeseok Kim, Minseok Kim (Graduate Student), Jihoon Jeon, Gwang Min Park**, KU-KIST Graduate School of Convergence Science and Technology, Korea University, Republic of Korea; **Sung-Chul Kim, Sung Ok Won**, Korea Institute of Science and Technology (KIST), Republic of Korea; **Ryosuke Harada**, TANAKA, Japan; **Sangtae Kim**, Department of Nuclear Engineering, Hanyang University, Republic of Korea

**AA-TuP-37** Atomic Layer Deposition-Enabled Lateral Conversion of Transition Metal Dichalcogenides for Electrochemical Hydrogen Generation, **Asem Jakyp (Graduate Student), Nazarbayev University, Kazakhstan; Aidar Kemelbay, Lawrence Berkeley National Laboratory; Arman Tuigynbek, Alexander Tikhonov, Nazarbayev University, Kazakhstan**

**AA-TuP-38** Low-Temperature Thermal Atomic Layer Deposition of Gallium Nitride Thin Films, **Jian Heo (Graduate Student)**, Yerim Choi, Hyeji Kim, Okhyeon Kim, Hye-Lee Kim, Won-Jun Lee, Sejong University, Republic of Korea

**AA-TuP-39** High-Performance p-Type SnO Thin Film Transistor with Raised Source/Drain using Dry Etching Method, **Jaemin Jung, Jaeyoon Shim, InHwan Baek**, InHa University, Korea (Democratic People's Republic of)

**AA-TuP-40** Gain Enhancement of Microchannel Plate Detectors via ALD Coatings Inside the Channels, **Sun Gil Kim, Min Seop Song (Graduate Student)**, Hyun Mi Kim, Ki Hun Seong, Sung Kyu Jang, Jong Hyun Choi, Korea Electronics Technology Institute (KETI), Republic of Korea; Yu Bin Nam, Kyonggi University, Republic of Korea; Jeong Gil Na, Kyung Hwan Jeong, JJ CNS, Republic of Korea; Seul Gi Kim, Hyeong Keun Kim, Korea Electronics Technology Institute (KETI), Republic of Korea

**AA-TuP-41** Effects of Alkali-Metal Doping on Aluminum-Silicate Coated Titanium Oxide Thin Film Transistors Prepared by Atomic Layer Deposition, **Ryo Miyazawa (Graduate Student)**, Haruto Suzuki, Hibiki Takeda, Bashir Ahmad Arima, Fumihiko Hirose, Graduate School of Science and Engineering, Yamagata University, Japan

**AA-TuP-42** Influence of Atomic-layer-deposited MoNx Layers on Ferroelectric Properties of HF-Zr-O Capacitors, **Jeong Hwan Han, Jeong min Han (Undergraduate)**, Wangu Kang, Seoul National University of Science and Technology, Republic of Korea

**AA-TuP-43** Enhanced Stability of Ultrathin Mo-Passivated RuO<sub>2</sub> Bottom Electrodes for TiO<sub>2</sub>-Based DRAM Capacitors, **Jeong Hwan Han, Seon Gu Choi (Graduate Student)**, Jae Hyeon Lee, Seoul National University of Science and Technology, Republic of Korea

**AA-TuP-44** Towards Ultra-Low Resistivity of Titanium Nitride PEALD Layers Grown on an Amorphous SiO<sub>2</sub> Substrate with Aluminum Nitride Interfacial Layer, **Valentina Korchnoy**, Technion Israel Institute of Technology, Israel; Inna Popov, The Hebrew University of Jerusalem, Israel; Yael Etlinger, Technion Israel Institute of Technology, Israel; Michael Lisiansky, Tower Semiconductors, Israel

**AA-TuP-45** High-Performance Tio<sub>2</sub> Hardmask for sub-10 Nm Advanced Memory Patterning, **Heongyu Lee (Graduate Student)**, Seul-Gi Kim, Cheongha Kim, sumin Lee, Hyun-mi Kim, Sun Gil Kim, Jong Hyun Choi, Hyeongkeun Kim, Korea Electronics Technology Institute (KETI), Republic of Korea

**AA-TuP-46** Machine Learning-Driven Thermal Budget Analysis for Ferroelectric Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Capacitors, **Minjong Lee (Graduate Student)**, University of Texas at Dallas; Jongmug Kang, Kangwon National University, Republic of Korea; Dushyant Narayan, Geon Park, Dan Le, University of Texas at Dallas; Seungbin Lee, Hyeonghong Min, Gwanghyeon Jang, Si Joon Kim, Kangwon National University, Republic of Korea; Jiyoung Kim, University of Texas at Dallas

**AA-TuP-48** Atomic Layer Deposition of Ru-Ir Binary Alloy Thin Films for Advanced Interconnects, **Se-Hun Kwon, Yeong-Seo Cho (Graduate Student)**, Myung-Jin Jung, Pusan National University, Republic of Korea

**AA-TuP-49** Nanolaminated Al<sub>2</sub>O<sub>3</sub>/ZrO<sub>2</sub> film using Atomic Layer Deposition to enhance corrosion resistance on SUS304 steel, **Se-Hun Kwon, Jae-Hyun Kim (Graduate Student)**, Pusan National University, Republic of Korea

**AA-TuP-50** Impact of Al Gradient Doping on HfO<sub>2</sub> Based Metal – Insulator – Metal DRAM Capacitor, **Taelim Lee, Jungwoo Bong, Hosung Lee, Seongmin Jin, Keun Heo**, Jeonbuk National University, Republic of Korea

**AA-TuP-51** Aero-TiO<sub>2</sub> Three-Dimensional Nanoarchitecture for Photocatalytic Degradation of Tetracycline, **Sebastian Lehmann, Kornelius Nielsch**, Leibniz Institute for Solid State and Materials Research, Germany; Vladimir Ciobanu, Tatiana Galatnova, Tudor Braniste, Ion Tiginyanu, National Centre for Materials Study and Testing, Moldova (Republic of)

**AA-TuP-52** Enhanced Reliability and Low-Voltage Operation in Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub>/ZrO<sub>2</sub>/Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Stack Compatible with Back-End of Line Process, **Yinchi Liu, Hao Zhang, Jining Yang, Xun Lu, Shiyu Li, Yeye Guo, Yiwen Yu, Hao Zhu, Lin Chen, Hongliang Lu, Shijin Ding, Wenjun Liu**, Fudan University, China

**AA-TuP-54** Advancements in ALD for DRAM: High-Performance Films for Capacitor and Electrode Applications, **Tejinder Singh**, Eugenius, Inc.

**AA-TuP-55** Optimization of Low-Temperature PEALD for High-Performance TiO<sub>2</sub>/SiO<sub>2</sub> Optical Coatings, **Duy Thanh Cu (Graduate Student)**, Guan-Yu Ke, National Central University, Taiwan; Wen-Hao Cho, Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan; Chien-Cheng Kuo, National Central University, Taiwan

**AA-TuP-56** Analysis of the Ambipolar Conduction of Atomic-layer-deposited Tin Monoxide Thin-Film Transistors with Indium Tin Oxide Electrodes, **Cheolseong Hwang, Sahngik Mun (Graduate Student)**, Seoryong Park, Yonghee Lee, Sukin Kang, Jinheon Choi, Jaewon Ham, Juneseong Choi, Seoul National University, Republic of Korea

**AA-TuP-57** Catalyst Engineering and Synthesis via Atomic Layer Deposition, **Xinhua Liang**, Washington University in St. Louis

**AA-TuP-58** Enhancement of Stress Distribution through Patterned Island Design Using Atmospheric Pressure Spatial-ALD, **Min-Seo Kim, Won-Bum Lee, Chi-Hoon Lee, Jin-Seong Park**, Hanyang University, Korea

**AA-TuP-59** Demonstration of Reliable Ferroelectric Memory with Optimized 4 Nm-Thick Hf<sub>1-x</sub>Zr<sub>x</sub>O<sub>2</sub> Films and an Ultra-Thin Al<sub>2</sub>O<sub>3</sub> Capping Layer, **Han Sol Park, Cheol Seong Hwang**, Seoul National University, Republic of Korea

**AA-TuP-60** Zirconium Carbide (ZrC<sub>x</sub>) Thin Films as Next-generation Diffusion Barriers for Cu and Ru Interconnects Prepared by Plasma Enhanced Atomic Layer Deposition, **Minjeong Kweon (Graduate Student)**, Chaehyun Park, Sang bok Kim, Soo-Hyun Kim, Ulsan National Institute of Science and Technology (UNIST), Republic of Korea

**AA-TuP-61** Centralized Bulk Precursor Delivery by Means of Direct Liquid Injection, **Ehsan Mohseni, Johannes Grübler, Joerg Koch**, SEMPA SYSTEMS GmbH, Germany

**AA-TuP-62** Highly-Conductive ALD-WC<sub>x</sub> Thin Films Using a New Fluorine-Free W Precursor for Cu & Ru Interconnects, **Dongbeom Seo (Graduate Student)**, Soo-Hyun Kim, Sang Bok Kim, Ulsan National Institute of Science and Technology, UNIST, Republic of Korea

**AA-TuP-63** Germanium Doping for Electrical Modulation of Ferroelectric HfZrO<sub>4</sub> Using Atomic Layer Deposition, **Jared McWilliams, Sunil Ghimire, Charlene Chen, Ray Meck, Nguyen Vu**, Merck KGaA, Darmstadt

**AA-TuP-64** Trap Density Reduction in High-k Dielectrics: A Dual Approach with ALD Optimization and HPDA, **Taewon Hwang (Undergraduate)**, Su-Hwan Choi, Chang-Kyun Park, Jin-Seong Park, Hanyang University, Korea

**AA-TuP-65** ALD-Al<sub>2</sub>O<sub>3</sub> Buffer Layer, a Key Component for Realizing Stretchable Thin Film Transistor Arrays, **Jaehyun Moon, Bock Soon Na**, Electronics and Telecommunication Research Institute (ETRI), Republic of Korea; Sangmin Lee, Taek-Soo Kim, Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea; Seong-Deok Ahn, Seung-Youl Kang, Electronics and Telecommunication Research Institute (ETRI), Republic of Korea

**AA-TuP-66** Optimization of High-k Gate Insulators for Amorphous IGZO channel-based 3D DRAM: Materials and Process Development, **Seonyeong Park (Graduate Student)**, Jisang Yoo, Yonsei University, Korea; Jeongwoo Park, Pilsang Yun, Daewon Ha, Samsung Electronics Co., Republic of Korea; Hyungjun Kim, Yonsei University, Korea

**AA-TuP-67** Polarity-Induced Threshold Voltage Shift in Ovonic Threshold Switch Device Based on Atomic Layer Deposited Germanium Selenide for Vertical Three-Dimensional Selector-Only Memory, **Jeong Woo Jeon, Byongwoo Park, Sangmin Jeon, Sungjin Kim, Wonho Choi, Gwangsik Jeon**, Seoul National University, South Korea; Junyoung Lim, Yonghun Sung, David Ahn, SK hynix, Republic of Korea; Cheol Seong Hwang, Seoul National University, South Korea

**AA-TuP-68** Designing Low-Thermal-Budget Hafnia-Based Ferroelectrics Capacitors, **Peng Yuan, Xufang Zhang, Jing Zhang**, North China University of Technology, China

**AA-TuP-69** Low Resistivity Amorphous/Polycrystalline Titanium Nitride Multilayer Thin Films by Plasma-Enhanced Atomic Layer Deposition for Metal Diffusion Barrier, **Christophe Vallee, Van Long Nguyen, Natalya Tokranova**, University at Albany-SUNY

**AA-TuP-70** Influence of Thermal Annealing on Interdiffusion and Electrical Characteristics of Ferroelectric FETs Interface of IGZO/HZO, **Hyeloo Kang (Graduate Student)**, Ajou University, Republic of Korea; Seung Wook Ryu, Dohee Kim, Jongyoung Lee, SK hynix, Republic of Korea; Il-Kwon Oh, Ajou University, Republic of Korea

**AA-TuP-71** Plasma Enhanced Atomic Layer Deposition of HfO<sub>2</sub> with Applying DC Bias, **Hee Jun Yoon (Graduate Student)**, Taeyoon Lee, Hyeongtag Jeon, Hanyang University, Korea; Yoon Soo Hyun, Hanyang University, Republic of Korea

**AA-TuP-72** Development of High-Performance 2 nm In<sub>2</sub>O<sub>3</sub> Thin-Film Transistors via BEOL-Compatible ALD Process Using DBADMI precursors, **In-Hwan Baek, InHong Hwang**, Inha University, Republic of Korea

**AA-TuP-73** Influence of Process Conditions on Stability and Plasma Resistance of ALD Y<sub>2</sub>O<sub>3</sub> Thin Films, **Min Joo Koo, Hyun Mi Kim, Hye Young Kim**, Korea Electronics Technology Institute, Republic of Korea; Chang sub Park, Yong Soo Lee, KoMiCo, Republic of Korea; Sung Kyu Jang, Jong Hyun Choi, Seul Gi Kim, Sun Gil Kim, Hyeong keun Kim, Ji hun Kim, Korea Electronics Technology Institute, Republic of Korea

**AA-TuP-74** Increasing Quality of ALD-Grown Nitrides Through Atomic Layer Annealing, **Bas van Asten**, TU Delft, Netherlands

**AA-TuP-75** Plasma-Enhanced and Thermal Atomic Layer Deposition of Superconducting Nitride Thin Films, **Zahra Ahali**, Sanaz Zarabi, Beneq Oy, Finland; Ziyang Wang, Peter Liljeroth, Aalto University, Finland; **Otto Laitinen**, Beneq Oy, Finland

**AA-TuP-76** Effect of Interfacial Layer on Ferroelectricity of  $\text{Hf}_{1-x}\text{Zr}_x\text{O}_2$  Thin Films in MFIS Structure, **Hyo-Bae Kim (Graduate Student)**, Ji-Hoon Ahn, Hanyang University, Republic of Korea

**AA-TuP-77** Lanthanum ALD Precursors for the Application of High-k Gate Dielectrics, **I-Cheng Tseng**, Yong-Jay Lee, Industrial Technology Research Institute, Taiwan

**AA-TuP-78** Charge Trapping Memory Structure with Low Interface Defect Density of  $<10^{12} \text{ cm}^{-2} \text{ eV}^{-1}$  via Remote Plasma-Based Hydrogen Post-Treatment, **ChanHee Lee (Graduate Student)**, Hee chul Lee, Department of Advanced Materials Engineering, Tech university of Korea

**AA-TuP-81** Mitigating Crystallinity Degradation and Leakage Current of Rutile  $\text{TiO}_2$  Dielectric Thin Films via Mg Doping, **Seungwoo Lee (Graduate Student)**, Soomin Yoo, Chaeyeong Hwang, Kyung Hee University, Republic of Korea; **Hansol Oh**, Daeyeong Kim, Yongjoo Park, SK Trichem, Republic of Korea; **Woojin Jeon**, Kyung Hee University, Republic of Korea

**AA-TuP-83** The Impact of Chromium Ion Implantation on ALD Lead Chalcogenide Thin Films, **Haifeng Cong**, Old Dominion University; **Charlotte Poterie**, Jean Francois Barbot, Universite de Poitiers-CNRS, France; **Helmut Baumgart**, Old Dominion University

**AA-TuP-84** Atomic Layer Deposition of Zirconia and Titania Inhibit Sintering in Pt Catalysts Under Oxidative Reaction Conditions, **Bang Nhan (Graduate Student)**, Department of Chemistry, Stanford University; **Shyama Mandal**, Department of Chemical Engineering and SUNCAT Center for Interface Science and Catalysis, Stanford University; **Jacob Smith**, Oak Ridge National Laboratory; **Gennaro Liccardo**, Department of Chemical Engineering and SUNCAT Center for Interface Science and Catalysis, Stanford University; **Sydney Richardson**, Mechanical Engineering, Stanford University; **Frank Abild-Pedersen**, SLAC National Accelerator Laboratory; **Miaofang Chi**, Oak Ridge National Laboratory; **Matteo Cargnello**, Stacey Bent, Department of Chemical Engineering and SUNCAT Center for Interface Science and Catalysis, Stanford University

**AA-TuP-85** Thin Conductive Cu Films by Post-Reduction of Atomic Layer Deposited  $\text{CuO}$ , **Maria Gabriela Sales**, Neeraj Nepal, Peter Litwin, David Boris, Scott Walton, Virginia Wheeler, U.S. Naval Research Laboratory

**AA-TuP-86** Enhanced Dielectric Properties of  $\text{HfO}_2$  Thin Films Produced Via Novel Catalytic Atomic Layer Deposition Process, **Sara Harris**, Dane Lindblad, Aaron Wang, Arrelaine Dameron, Matthew Weimer, Forge Nano

**AA-TuP-87**  $\text{MoO}_2\text{Cl}_2$ : how the first large volume solid precursor has been enabled for HVM, **Jeffrey Yoder**, Air Liquide

**AA-TuP-88** Mitigation of Surface Dielectric Loss in Superconducting Quantum Devices via Combined Atomic Layer Etching and Deposition, **Neha Mahuli**, Joaquin Minguzzi, Jiansong Gao, Omar Reyna, Sandra Diez, Victor Ly, Guillaume Marcaud, Matthew Hunt, Jefferson Rose, Loren Swenson, Oskar Painter, Ignace Jarrige, Amazon

**AA-TuP-89** Study of Resistivity in  $\text{TiN}$  Films with  $\text{SiH}_4$  Doping in the Thermal ALD Process, **Siun Song**, Chaewon Kwak, Yoosong Kim, Kyubeom Lee, Dongwon Seo, Hanwha Semitech, Republic of Korea

**AA-TuP-90** Atomic Layer Deposition of  $\text{Al}_2\text{O}_3$  and  $\text{ZrO}_2$  Coatings on Single-Crystal NCM Cathodes: A Parametric Study for Enhanced Lithium-Ion Battery Performance, **Sung Eun Jo (Graduate Student)**, Woosong Kim, Hyongjune Kim, Pohang University of Science and Technology (POSTECH), Republic of Korea; **Jungwoo Park**, POSCO Holdings, Republic of Korea; **Jihwan An**, Pohang University of Science and Technology (POSTECH), Republic of Korea

**AA-TuP-91** Effect of Tungsten Insertion Layer on the Electrical Properties of PEALD  $\text{HfO}_2$  Thin Films for Semiconductor Memory Applications, **Hee Chul Lee**, Ha Jeong Kim, **Jea Hyuk Choi**, Semicon Plasma Process LAB, Republic of Korea

**AA-TuP-92** Implementation of Firing Type Threshold Device Using Atomic Layer Deposited Vanadium Oxide, **Yong Tae Kim (Graduate Student)**, Jaeyeong Heo, Chonnam National University, Republic of Korea; **Pyeongkang Hur**, Junwoo Son, Seoul National University, Republic of Korea

**AA-TuP-93** Introducing a Surface Acoustic Wave-Based Miniaturized Aerosol Source for Controlled Liquid Precursor Delivery in ALD Processes, **Mehrzad Roudini**, Andreas Winkler, IFW, Germany

**AA-TuP-94** Enhancing Stability and Performance of LMBs Through  $\text{Al}_2\text{O}_3$ -Assisted SEI Protection on  $\text{SnO}_2$ -Coated Cu Current Collectors by ALD, **Roy Byungkyu Chung**, Kyungpook national university; **Dawon Lee (Graduate Student)**, Jiseop Byeon, Kyungpook national university, Republic of Korea

**AA-TuP-95** Low-Temperature Processed Al-Doped  $\text{HfO}_2/\text{IGZO}$  Ferroelectric Thin Films for High-Performance Non-Volatile Memory Devices, **Lee Gahong (Graduate Student)**, Sungkyunkwan University, Korea (Democratic People's Republic of)

**AA-TuP-96** Effect of Proton Irradiation on the Electrical Performance on  $\text{SnO}_2$  Thin Film Transistor with ITO Electrodes, **Huiseung Kim (Graduate Student)**, Suhyeon Park, Dawon Lee, Jiseop Byeon, Jeongin Seo, Kyungpook National University, Daegu, Republic of Korea; **Jeongtae Kim**, Dong-seok Kim, Korea Atomic Energy Research Institute, Republic of Korea; **Roy Byungkyu Chung**, Kyungpook National University, Daegu, Republic of Korea

**AA-TuP-97** Fabrication of p-type  $\text{SnO}$  Thin Films via Thermal ALD, **Suhyeon Park (Graduate Student)**, Huiseung Kim, Dawon Lee, Jiseop Byeon, Jeongin Seo, Roy Byung Kyu Chung, Kyungpook National University, Daegu, Republic of Korea

**AA-TuP-98** Enabling Uniform Lithiation in Solid-State Synthesis by Preventing Pre-Matured Surface Grain Coarsening Through Grain Boundary Engineering, **Yifan Wu (Graduate Student)**, Jin Xie, ShanghaiTech University, China

**AA-TuP-99** Atomic Layer Infiltration of  $\text{ZnO}$  on Polyimide Substrates for Flexible Encapsulation Hybrid Film, **Ji Ho Jeon (Undergraduate)**, Jeong Hwan Han, Byung Joon Choi, Su Min Eun, Si Eun Jung, Ye Jin Jung, Seoul National University of Science and Technology, Republic of Korea; **Kwanhyuck Yoon**, Woo Yong Sung, Samsung, Republic of Korea

**AA-TuP-100** Effect of Different Counter Reactants on Interfacial Oxidation and Electrical Properties of  $\text{HfO}_2$  Grown on  $\text{TiN}$  by Atomic Layer Deposition, **Aravind H. Patil**, Byung Chan Lee, Seoung won Shim, Su min An, Minhyeok Lee, Young-ho Kang, Han-Bo-Ram Lee, Incheon National University, Republic of Korea

## Area Selective ALD

### Room Event Hall - Session AS-TuP

### Area Selective ALD Poster Session

5:45 – 7:00 pm

**AS-TuP-1** Advancing AS-ALD of  $\text{WSe}_2$  Through Nature-Inspired Engineering, **Kylee Lamberson (Graduate Student)**, Chih-hung Chang, Oregon State University

**AS-TuP-2** Advancements in Area-Selective Deposition by Merck: From Fundamental Principles to Industrial Applications, **Isiah Liu**, Merck KGaA, Darmstadt, Taiwan; **Lanxia Cheng**, Tingmin Wang, Matthew MacDonald, Bhushan Zope, Merck KGaA, Darmstadt; **Chang-won Lee**, Merck KGaA, Darmstadt, Korea (Democratic People's Republic of); **Masashi Jinguji**, Xinjian Lei, Merck KGaA, Darmstadt

**AS-TuP-3** Comparative Study of Experimental and DFT Calculations of Trimethylaluminum Adsorption on  $\text{SiO}_2$ ,  $\text{SiN}$ , and  $\text{Si}$  for Area-Selective Deposition, **Genki Hayashi**, Ni Zeyuan, Yumiko Kawano, Shinichi Ike, Shuji Azumo, Tokyo Electron Technology Solutions Limited, Japan

**AS-TuP-4** An Automated Adsorption Simulation Workflow for Efficient High-Throughput Molecule Screening for Area-Selective Deposition, **Zeyuan Ni**, Michitaka Aita, Tokyo Electron Technology Solutions Ltd., Japan; **Ayuta Suzuki**, TEL Technology Center, America, LLC; **Genki Hayashi**, Yumiko Kawano, Shinichi Ike, Shuji Azumo, Tokyo Electron Technology Solutions Ltd., Japan

**AS-TuP-5** Self-Assembled Inhibitor for Area-Selective Deposition on Cu Interconnects to Lower Contact Resistance, **Yun Ki Kim**, Samsung Electronics, Republic of Korea; **Sang Chul Youn**, Samsung Electronics Co., Republic of Korea

**AS-TuP-6** Optimization of Small Molecular Inhibitors for Area-Selective Atomic Layer Deposition by Controlling Alkyl Chain Length, **EunChong Cho (Graduate Student)**, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea; **Hae Lin Yang**, Hanyang University, Korea; **Jung-Hoon Lee**, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea; **Jin-Seong Park**, Hanyang University, Korea; **Youngkwon Kim**, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea

**AS-TuP-7** Area-Selective Atomic Layer Deposition of Amino Silane-Based Small Molecule Inhibitor for Enhancement of Selectivity, **Jae Hun Hwang (Graduate Student)**, EunChong Cho, Youngkwon Kim, Korea Research Institute of Chemical Technology (KRICT), Republic of Korea

**AS-TuP-8** Substrate-Driven Selectivity in Area-Selective Atomic Layer Deposition of  $\text{ZnO}$ : A Theoretical Investigation, **Semin Kim (Graduate Student)**, Yeseul Son, Taeyoung Kim, Soo-Hyun Kim, Byungjo Kim, UNIST, Republic of Korea

**AS-TuP-9** Inherent Area-Selective Atomic Layer Deposition of Molybdenum Carbide for Bottom-up Semiconductor Manufacturing, **Jeong Hwan Han**, **Min Seok Kim (Undergraduate)**, Ji Sang Ahn, Seoul National University of Science and Technology, Republic of Korea

**AS-TuP-10** Photo-Assisted Atomic Layer Deposition of Metallic Nickel, **Yupu Tang (Graduate Student)**, Ion Lambrou, Ville Jokinen, Ville Miikkulainen, Aalto University, Finland

**AS-TuP-11** Logic Applications of Area Selective Deposition beyond 1.4nm, *Hoon Seok Seo, Kang Sub Yim*, Samsung Electronics, Republic of Korea

**AS-TuP-12** Impurity-Free Accelerators in Atomic Layer Deposition: Driving the Growth of Low-Resistivity Ultrathin Iridium Films, *Se-Hun Kwon, Myung-Jin Jung (Graduate Student)*, Pusan National University, Republic of Korea

**AS-TuP-13** Area-Selective Atomic Layer Deposition of High-K Dielectric Oxides on Self-Assembled Monolayer Functionalized Nitride Substrates, *Ting-I Wu (Graduate Student), Shih-Hao Tseng*, Department of Materials Science and Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan; *Thanh Danh La Duc*, Department of Materials Science and Engineering, National Yang Ming Chiao Tung University, Hsinchu, Viet Nam; *Yu-Chuan Lin, Hong-Cheu Lin, Yung-Jung Hsu*, Department of Materials Science and Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan

**AS-TuP-14** Stabilization of Metal Coated Silicon Photocathodes for Light Assisted CO<sub>2</sub> Conversion by Area Selective-Atomic Layer Deposition, *Encarnacion Torralba Penalver, Harsh Chaliyawala, Nikola Ilic*, CNRS-ICMPE, France; *Damien Coutancier*, CNRS-IPVF, France; *Stephane Bastide, Kadiatou Bah, Christine Cachet-Vivier*, CNRS-ICMPE, France; *Negar Naghavi, Nathanaelle Schneider*, CNRS-IPVF, France

**AS-TuP-15** Molecular Design of ALD Precursors Through Atomic-Level Simulation and Their Reactivity Analysis, *Yusuke Asano, Kota Matsumoto, Makoto Sato*, Preferred Computational Chemistry, Japan

**AS-TuP-16** Photocatalytic Surface Initiation for Area-Selective Deposition of Polymer Thin Films and Sustainable Nanomanufacturing, *Yuanhao Shen (Graduate Student), Xinlei He, Xiaocheng Huang, Pengzhe Cai, Delong Liu, Junjie Zhao*, Zhejiang University, China

**AS-TuP-17** Atomistic Modeling of Selective SiO<sub>2</sub> Deposition: Inhibiting Si<sub>3</sub>N<sub>4</sub> with Benzaldehyde, *Seungwon Shim (Graduate Student), Byung Chan Lee, Youngho Kang*, Incheon National University, Republic of Korea; *Soo-Hyun Kim*, Ulsan National Institute of Science and Technology, Republic of Korea; *Han-Bo-Ram Lee*, Incheon National University, Republic of Korea

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## Emerging Materials

### Room Event Hall - Session EM-TuP

#### Emerging Materials Poster Session

5:45 – 7:00 pm

**EM-TuP-1** A Novel Topological Semi-Metal: MoP Pathfinding for Future Interconnects at Nanoscale, *Jeong-Seok Na, Kyle Blakeney, David Mandia, Jeremie Dalton*, LAM Research

**EM-TuP-2** Vapor Phase Infiltration of Poly(1-Trimethylsilyl-1-Propyne) with Trimethylaluminum, *Jonathan Jenderny*, Applied Electrodynamics and Plasma Technology, Ruhr-University Bochum, Germany; *Nils Boysen*, Fraunhofer Institute for Microelectronic Circuits and Systems, Duisburg, Germany; *Florian Preischel*, Inorganic Materials Chemistry, Ruhr-University Bochum, Germany; *Teresa de los Arcos*, Technical and Macromolecular Chemistry, Paderborn University, Germany; *Aleksander Kostka*, Center for Interface-Dominated High-Performance Materials, Ruhr-University Bochum, Germany; *Peter Awakowicz*, Applied Electrodynamics and Plasma Technology, Ruhr-University Bochum, Germany; *Jean-Pierre Glauber*, Leibniz Institute for Solid State and Materials Research, Germany; *Harish Parala*, Institute for Materials Chemistry, Leibniz Institute for Solid State and Materials Research, IFW Dresden, Germany; *Anjana Devi*, Institute for Materials Chemistry, Leibniz Institute for Solid State and Materials Research, Germany

**EM-TuP-3** Study of (TaN)<sub>1-x</sub>C<sub>x</sub> Electrode to Investigate Its Impact on OTS Selector Devices, *Minkyu Lee (Graduate Student), Taeyoon Lee*, Yonsei University, Korea

**EM-TuP-4** Study for Deposition of CuI onto Indium-Gallium-Zinc-Oxide for Light Detection Application, *Woosuk Sohn (Graduate Student), Taeyoon Lee*, Yonsei University, Korea

**EM-TuP-5** Networking Density Effects on the Patterning Performance of Resists Deposited via Hybrid MLD, *Long Viet Than (Graduate Student), Giulio D'Acunto, Stacey F Bent*, Stanford University

# Wednesday Morning, June 25, 2025

Room Halla Hall	
8:00am	<p><b>INVITED: AA1-WeM-1</b> Atomic Layer Deposition for Highly Durable Hydrogen Fuel Cells: from Catalyst to Cell, <i>Xiao Liu, Hang Liu, Yuxin Gao, Jianhua Wu, Rong Chen</i>, Huazhong University of Science and Technology, China</p>
8:30am	<p><b>AA1-WeM-3</b> Interfacial Properties of ALD-Grown In<sub>2</sub>S<sub>3</sub> Catalysts in CO<sub>2</sub> Electroreduction, <i>Järi Van den Hoek</i>, University of Antwerp, Belgium; <i>Femi Mathew, Ruben Blomme</i>, Ghent University, Belgium; <i>Lieven Hintjens, Brend De Coen</i>, University of Antwerp, Belgium; <i>Eduardo Solano</i>, ALBA synchrotron, Spain; <i>Matthias Minjauw</i>, Ghent University, Belgium; <i>Nick Daems, Daniel Choukroun</i>, University of Antwerp, Belgium; <i>Christophe Detavernier</i>, Ghent University, Belgium; <i>Tom Breugelmans</i>, University of Antwerp, Belgium; <i>Jolien Dendooven</i>, Ghent University, Belgium</p>
8:45am	<p><b>AA1-WeM-4</b> Scaling Up Platinum on Carbon Catalyst Fabrication for Proton Exchange Membrane Water Electrolysis, <i>Peter Michael Piechulla, Mingliang Chen, Sophie van Beusekom</i>, Delft University of Technology, Netherlands; <i>Mena-Alexander Kräenbring, Fatih Özcan, Doris Segets</i>, University of Duisburg-Essen, Germany; <i>Ruud van Ommen</i>, Delft University of Technology, Netherlands</p>
9:00am	<p><b>AA1-WeM-5</b> Platinum Promoted Cobalt based Fischer-Tropsch Thin-Film Catalysts, <i>Muhammad Hamid Raza, Avela Kunene, Imane El Arrouji</i>, PVcomB, Helmholtz-Zentrum Berlin für Materialien und Energie (HZB), Berlin, Germany; <i>Catalina E. Jiménez</i>, Department Interface Design, HZB, Berlin, Germany; <i>Alexander Steigert, Martin Muske, Tobias Köhler, Ali Shan Malik</i>, PVcomB, Helmholtz-Zentrum Berlin für Materialien und Energie (HZB), Berlin, Germany; <i>Marcus Bär</i>, Department Interface Design, HZB, Berlin, Germany. Helmholtz Institute Erlangen-Nürnberg for Renewable Energy (HI ERN), Erlangen, Germany. Dept. Chemistry and Pharmacy, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Erlangen, Germany; <i>Nicola Pinna</i>, Department of Chemistry and The Center for the Science of Materials Berlin, Humboldt-Universität zu Berlin, Berlin, Germany; <i>Rutger Schlatmann, Daniel Amkreutz</i>, PVcomB, Helmholtz-Zentrum Berlin für Materialien und Energie (HZB), Berlin, Germany</p>
9:15am	<p><b>AA1-WeM-6</b> Selectively Located Pt Clusters on Au/CeO<sub>2</sub> for Highly Robust Water-Gas Shift Reaction via Atomic Layer Deposition, <i>Xiao Liu, Yuanting Tang, Bin Shan, Rong Chen</i>, Huazhong University of Science and Technology, China</p>
9:30am	<p><b>AA1-WeM-7</b> Fluorine-Free and Freestanding Bipolar Membranes Based on Metal-Oxide Ald-Coated Electrospun Nanofibers for Water Electrolysis and Fuel Cells, <i>Arnaud Demore (Graduate Student)</i>, Damien Voiry, IEM - CNRS, France; <i>Philippe Miele</i>, IEM - ENSCM, France; <i>Mikhael Bechelany</i>, IEM - CNRS, France</p>
9:45am	<p><b>AA1-WeM-8</b> Efficient Alkaline Hydrogen Evolution Reaction with Iridium Nanostructures synthesized by Atomic Layer Deposition, <i>Jhonatan Rodriguez Pereira (Graduate Student)</i>, Raul Zazpe, Jan Macak, University of Pardubice, Czechia</p>
10:00am	<p><b>BREAK &amp; EXHIBITS</b></p>
10:45am	<p><b>INVITED: AA3-WeM-12</b> Using Area-Selective Ald for Dual Site Catalysis for Photocatalytic Water Splitting, <i>Katherine Hurst, Wilson McNeary</i>, National Renewable Energy Laboratory; <i>William Stinson</i>, Columbia University; <i>Shane Ardo</i>, University of California Irvine; <i>Daniel Esposito</i>, Columbia University</p>
11:15am	<p><b>AA3-WeM-14</b> Impact of Tetrakis(dimethylamido)tin(IV) Degradation on Atomic Layer Deposition of Tin Oxide Films and Perovskite Solar Cells, <i>Shuang Qui, Augusto Amaro</i>, University of Victoria, Canada; <i>Diana Fabulyak</i>, Avantor, Canada; <i>Julien Appleby-Millette</i>, University of Victoria, Canada; <i>Cassidy Conover</i>, Avantor, Canada; <i>Dongyang Zhang, Vishal Yeddu, I. Teng Cheong, Irina Paci, Makhud Saidaminov</i>, University of Victoria, Canada</p>
11:30am	<p><b>AA3-WeM-15</b> Ultrathin Oxygen Deficient SnOx Films as Electron Extraction Layers for Perovskite Solar Modules, <i>Helen Hejin Park</i>, Korea research Institute of Chemical Technology (KRICT), Korea (Democratic People's Republic of); <i>Joshua Sraqu Adu (Graduate Student)</i>, Korea Research Institute of Chemical Technology (KRICT), Korea (Democratic People's Republic of)</p>
11:45am	<p><b>AA3-WeM-16</b> Charge Transport Layers Rafted by Atomic Layer Deposition for Large-Area Perovskite-Based Solar Modules, <i>Femi Mathew</i>, Institut Photovoltaïque d'Ile-de-France (IPVF), France; <i>Damien Coutancier</i>, CNRS-IPVF, France; <i>Getaneh Gesesse, Marion Provost, Nadia Nazi</i>, Institut Photovoltaïque d'Ile-de-France (IPVF), France; <i>Nathanaelle Schneider</i>, CNRS-IPVF, France</p>

**ALD Applications  
Session AA1-WeM  
Catalyst and Fuel Cell Applications  
Moderators:**  
**Ji Hwan Ahn**, POSTECH, Republic of Korea,  
**Hao Van Bui**, Phenikaa University, Viet Nam

**ALD Applications  
Session AA3-WeM  
Other Energy Applications  
Moderators:**  
**Rong Chen**, Huazhong University of Science and Technology, China,  
**Hyeontag Jeon**, Hanyang University, Republic of Korea

# Wednesday Morning, June 25, 2025

Room Samda Hall	
8:00am	<p><b>INVITED: ALE1-WeM-1</b> Centering Sustainability in Future Plasma-Enhanced ALE Processes, <i>Nathan Marchack, Robert Bruce, Eric Joseph</i>, IBM Research Division, T.J. Watson Research Center</p>
8:30am	<p><b>ALE1-WeM-3</b> Cryogenic Atomic Layer Etching of SiO<sub>2</sub> by Physisorption of HF/C<sub>2</sub>H<sub>5</sub>OH and Ar Plasmas, <i>Shih-Nan Hsiao, Makoto Sekine</i>, Nagoya University, Japan; <i>Yoshihide Kihara</i>, Tokyo Electron Miyagi Limited, Japan; <i>Masaru Hari</i>, Nagoya University, Japan</p>
8:45am	<p><b>ALE1-WeM-4</b> Cryogenic ALE of SiO<sub>2</sub> using CF<sub>4</sub> Plasma, <i>Madjid Adjabi, Jack Nos, Sylvain Iseni</i>, GREMI - CNRS/Orleans University, France; <i>Gilles Cunge, Martin Kogelschatz</i>, LTM - CNRS/Grenoble Alpes University/Grenoble-INP, France; <i>Philippe Lefauchaux, Loic Becerra</i>, GREMI - CNRS/Orleans University, France; <i>Emilie Despiiau-Pujo</i>, LTM - CNRS/Grenoble Alpes University/Grenoble-INP, France; <b>Thomas Tillocher</b>, Rémi Dussart, GREMI - CNRS/Orleans University, France</p>
9:00am	<p><b>ALE1-WeM-5</b> Atomic Layer Etching of Indium Oxide Thin Films via Ligand Addition and O<sub>2</sub> Plasma Reactions, <b>Minchan Kim (Graduate Student)</b>, <i>Jihyun Gwoen, Hae Lin Yang, Jin-Seong Park</i>, Hanyang University, Korea</p>
9:15am	<p><b>ALE1-WeM-6</b> Development of a Novel Magnetically-Confined Plasma Source for Advanced Semiconductor Manufacturing, <i>Tae S Cho, Wonik IPS; Jihyun Kim, Giwon Shin, Hakmin Kim, Jeonghun Kim, Sooyoung Hwang, Jaehoon Choi</i>, Wonik IPS, Republic of Korea</p>
9:30am	
9:45am	
10:00am	<b>BREAK &amp; EXHIBITS</b>
10:45am	<p><b>INVITED: ALE2-WeM-12</b> In-Situ Observation of Surface Reaction and Advanced Process for Damage-Less Atomic Layer Etching, <i>Takayoshi Tsutsumi</i>, Nagoya University, Japan</p>
11:15am	<p><b>ALE2-WeM-14</b> Isotropic ALE of 2D Crystalline MoS<sub>2</sub> using SF<sub>6</sub>:H<sub>2</sub> Plasma and O<sub>2</sub> Plasma, <b>Sanne Deijkers (Graduate Student)</b>, <i>Christian Palmer, Nick Chittock, Guillaume Krieger, Silke Peeters, Marcel Verheijen</i>, Eindhoven University of Technology, The Netherlands; <i>Harm Knoops</i>, Oxford Instruments Plasma Technology, Netherlands; <i>Erwin Kessels, Adrie Mackus</i>, Eindhoven University of Technology, The Netherlands</p>
11:30am	<p><b>ALE2-WeM-15</b> Design of Multi-Coil Single-Switch Induction Heating System with PI-Based Burst Mode Control for ALD/ALE Processes to Achieve High Efficiency and Rapid Transient Response, <b>Sang-Wook Ryu (Graduate Student)</b>, Dongguk University, Republic of Korea; <i>Jihyun Kim, Hakmin Kim</i>, Wonik IPS, Republic of Korea; <i>Tae S. Cho</i>, Wonik IPS; <i>KWANGSEON JIN</i>, Wonik IPS, Republic of Korea</p>
11:45am	<p><b>ALE2-WeM-16</b> Enhanced Plasma Ignition and Sustaining of Transformer-Coupled Plasma Source with a Secondary Coil, <i>Tae S Cho, Jae Hoon Choi, Hak Min Kim, Gi Won Shin, Soo Young Hwang, Ji Hyun Kim</i>, Wonik IPS, Republic of Korea</p>

**Atomic Layer Etching  
Session ALE1-WeM  
Plasma and/Energy-Enhanced ALE + Sustainability  
Moderators:**  
**Jane P. Chang**, University of California, Los Angeles,  
**Sung-II Cho**, Samsung Electronics, Republic of Korea

**Atomic Layer Etching  
Session ALE2-WeM  
ALE Applications III  
Moderators:**  
**Keun Hee Bai**, Samsung Electronics Co., Republic of Korea,  
**Younghee Lee**, Lam Research Corporation, Republic of Korea

# Wednesday Morning, June 25, 2025

Room Tamna Hall A	
8:00am	<p><b>INVITED: AS1-WeM-1</b> Area-selective ALD of ZnS on Atomic Layer Etched (ALE) Substrates via Growth Modulation, <i>Taewook Nam</i>, Sejong University, Republic of Korea</p>
8:30am	<p><b>AS1-WeM-3</b> Passivation of Nitride Surface Using Aldehyde Inhibitor for Area Selective Atomic Layer Deposition of SiNx on Oxide Surface, <i>Summal Zoha (Graduate Student)</i>, <i>Ngoc Le Trinh</i>, <i>Bonwook Gu</i>, <i>Han-Bo-Ram Lee</i>, Incheon National University, Republic of Korea</p>
8:45am	<p><b>AS1-WeM-4</b> Blocking Effects of Small Molecule Inhibitors in Atomic Layer Deposition: An Off-lattice Kinetic Monte Carlo Study, <i>Zhaojie Wang (Graduate Student)</i>, <i>Yanwei Wen</i>, <i>Rong Chen</i>, <i>Bin Shan</i>, Huazhong University of Science and Technology, China</p>
9:00am	<p><b>AS1-WeM-5</b> Controlling the Surface Chemistry of Silicon Nitride Using a Plasma Pretreatment for Area-Selective Deposition, <i>Marc Merckx</i>, <i>Pengmei Yu</i>, Eindhoven University of Technology, Netherlands; <i>Jhon González</i>, Universidad Tecnica Federico Santa Maria, Chile; <i>Ilker Tezsevin</i>, eindhoven University of Technology, Netherlands; <i>Rachel Nye de Casto</i>, <i>Dennis Hausmann</i>, Lam Research Corporation; <i>Erwin Kessels</i>, Eindhoven University of Technology, Netherlands; <i>Tania Sandoval</i>, Universidad tecnica Federico Santa Maria, Chile; <i>Adriaan Mackus</i>, eindhoven University of Technology, Netherlands</p>
9:15am	<p><b>AS1-WeM-6</b> Enhancing Area Selective Deposition Through Sub-saturated ALD: A Pathway to High Volume Manufacturing, <i>Nupur Bihari</i>, Lam Research Corporation</p>
9:30am	<p><b>AS1-WeM-7</b> Inherent Area-Selective Deposition of Low-Resistivity Molybdenum Carbide Films by Thermal Atomic Layer Deposition, <i>Jeong Hwan Han</i>, <i>Ji Sang Ahn (Graduate Student)</i>, Seoul National University of Science and Technology, Republic of Korea</p>
9:45am	
10:00am	<b>BREAK &amp; EXHIBITS</b>
10:45am	<p><b>INVITED: AS2-WeM-12</b> Industrial ALD/ASD Perspectives: Atomic Level Process Control for Semiconductor Devices, <i>HanJin Lim</i>, Samsung Electronics, Republic of Korea</p>
11:15am	<p><b>AS2-WeM-14</b> Area-Selective Deposition for Dielectric Films on Metal Substrates: Coupon to Full Wafer, <i>Rachel Nye de Castro</i>, <i>Paul Lemaire</i>, <i>Alexander Fox</i>, <i>Joel Smith</i>, <i>Nupur Bihari</i>, <i>Bill Nunn</i>, <i>Kevin McLaughlin</i>, <i>Dennis Hausmann</i>, LAM Research</p>
11:30am	<p><b>AS2-WeM-15</b> Redox-coupled Inherently Selective Atomic Layer Deposition of SiO<sub>2</sub> on SiO<sub>2</sub>/Si<sub>3</sub>N<sub>4</sub> for 3D NAND structure, <i>Kun Cao</i>, <i>Zilian Qi</i>, <i>Eryan Gu</i>, <i>Rong Chen</i>, Huazhong University of Science and Technology, China</p>
11:45am	<p><b>AS2-WeM-16</b> Area-selective Atomic Layer Deposition of Ruthenium via Plasma Surface Modification, <i>In-Hwan Baek</i>, <i>Dahui Jeon (Graduate Student)</i>, Inha university, Republic of Korea</p>

**Area Selective ALD Session AS1-WeM Area Selective Deposition II**  
**Moderators:**  
**Anjana Devi**, Ruhr University Bochum, Germany,  
**Il-Kwon Oh**, Ajou University, Republic of Korea

**Area Selective ALD Session AS2-WeM Area Selective Deposition III**  
**Moderators:**  
**Rick Chen**, Merck KGaA, Darmstadt, Germany,  
**Kivin Im**, SK hynix, Republic of Korea

# Wednesday Morning, June 25, 2025

<b>Room Tamna Hall B</b>	
8:00am	<b>AA2-WeM-1</b> Remarkable Productivity and Performance of OLED Encapsulation through Growth Dynamics Control via Atmospheric Pressure Spatial Atomic Layer Deposition, <i>Chi-Hoon Lee (Graduate Student)</i> , Kwang Su Yoo, Daejung Kim, Ji-Min Kim, Jin-Seong Park, Hanyang University, Republic of Korea
8:15am	<b>AA2-WeM-2</b> Crystallinity Control through Composition Engineering for High-Performance MgIn <sub>x</sub> O <sub>y</sub> TFTs via Thermal Atomic Layer Deposition, <i>Ji-Su Bae (Graduate Student)</i> , Chi-Hoon Lee, Hanyang University, Republic of Korea; Sung-Hae Lee, Entegris, Republic of Korea; Jin-Seong Park, Hanyang University, Republic of Korea
8:30am	<b>AA2-WeM-3</b> Nitrogen-Doped SiO <sub>2</sub> Gate Insulator for Enhanced Stability in ALD-IGZO TFTs, <i>Tae-Heon Kim (Graduate Student)</i> , Dong-Gyu Kim, Jin-Seong Park, Hanyang University, Republic of Korea
8:45am	<b>AA2-WeM-4</b> Engineering Hydrogen Content in SiN <sub>x</sub> Thin Films via Precursor Control for Improved Oxide TFTs Characteristics, <i>Sang-Hyun Kim (Graduate Student)</i> , Tae Heon Kim, Jin-Seong Park, Hanyang University, Korea
9:00am	<b>AA2-WeM-5</b> Remarkable Stability and Hydrogen Resistance on High-Mobility Oxide TFTs via N <sub>2</sub> O Plasma Reactant in Atomic Layer Deposition, <i>So Young Lim (Undergraduate)</i> , Sang-Hyun Kim, Yoon-Seo Kim, Taewon Hwang, Tae Heon Kim, Haklim Koo, Jin-Seong Park, Hanyang University, Korea
9:15am	<b>AA2-WeM-6</b> Highly Stable Fluorine-Anion Engineered ALD Indium Oxide Thin-Film Transistors towards BEOL Integration, <i>Jinxiong Li (Graduate Student)</i> , Xinwei Wang, School of Advanced Materials, Peking University, Shenzhen 518055, China
9:30am	<b>AA2-WeM-7</b> High-Pressure Atomic Layer Deposition of Elemental Tellurium for Enhanced P-Type Semiconductors, <i>Myung Mo Sung, Dai Tran Cuong (Graduate Student)</i> , Hanyang University, Korea
9:45am	<b>AA2-WeM-8</b> Ultrathin Sn-Doped In <sub>2</sub> O <sub>3</sub> Films for Scalable Semiconductor Transistors, <i>Seung Ho Ryu (Graduate Student)</i> , Korea University, Republic of Korea; Taiky Kim, Korea Institute of Science and Technology (KIST), Republic of Korea; Taeseok Kim, Seong Keun Kim, Korea University, Republic of Korea
10:00am	<b>BREAK &amp; EXHIBITS</b>
10:45am	<b>AF-WeM-12</b> High Crystallinity Yttrium-Doped ZrO <sub>2</sub> under 2 nm Through Atomic Layer Modulation, <i>Ngoc Le Trinh (Graduate Student)</i> , Bonwook Gu, Wonjoong Kim, Minhyeok Lee, Incheon National University, Republic of Korea; Byung-ha Kwak, Ajou University, Republic of Korea; Hyun-Mi Kim, Hyeongkeun Kim, Korea Electronics Technology Institute, Republic of Korea; Youngho Kang, Incheon National University, Republic of Korea; Il-Kwon Oh, Ajou University, Republic of Korea; Han-Bo-Ram Lee, Incheon National University, Republic of Korea
11:00am	<b>AF-WeM-13</b> ALD Outstanding Presentation Award Finalist: Ultrahigh Purity Plasma-Enhanced Atomic Layer Deposition and Electrical Properties of Epitaxial Scandium Nitride, <i>Bruce Rayner</i> , Noel O'Toole, Kurt J. Lesker Company; Bangzhi Liu, Jeffrey Shallenberger, The Pennsylvania State University; Jiadi Zhu, Tomas Palacios, Piush Behera, Suraj Cheema, Massachusetts Institute of Technology; Blaine Johs, Film Sense; Nicholas Strnad, DEVCOM Army Research Laboratory
11:15am	<b>AF-WeM-14</b> Microwave Enhanced (ME) ALD of HfO <sub>2</sub> , <i>Jessica Haglund-Peterson, John Conley</i> , Oregon State University
11:30am	<b>AF-WeM-15</b> Atomic Level Engineering of Dy-doped HfO <sub>2</sub> Ultra-thin Films via Controlling Lateral and Vertical Mixing, <i>Byung-Ha Kwak (Graduate Student)</i> , Ajou University, Republic of Korea; Ngoc Le Trinh, Incheon National University, Viet Nam; Bonwook Gu, Han-Bo-Ram Lee, Incheon National University, Republic of Korea; Il-Kwon Oh, Ajou University, Republic of Korea
11:45am	<b>AF-WeM-16</b> Process-Structure-Properties of Atomic Layer Deposited Niobium Nitride and Evolution of Strain with Plasma Chemistry, <i>Neeraj Nepal</i> , Joseph C Prestigiacomo, Maria Gabriela Sales, Peter M Litwin, Vikrant J Gokhale, Virginia D Wheeler, U.S. Naval Research Laboratory

**ALD Applications  
Session AA2-WeM  
Display Applications  
Moderators:  
Angel Yanguas-Gil, Argonne National Lab,  
Junjie Zhao, Zhejiang University, China**

**ALD Fundamentals  
Session AF-WeM  
Material Growth I  
Moderators:  
John Conley, Oregon State University,  
Gregory N. Parsons, North Carolina State University**

# Wednesday Afternoon, June 25, 2025

Room Halla Hall	
1:30pm	<b>AA1-WeA-1</b> Atomic Layer Deposition and Molecular Layer Deposition for Li and Na Metal Anodes, <i>Yang Zhao</i> , University of Western Ontario, Canada
1:45pm	<b>AA1-WeA-2</b> Low Temperature Spatial Atomic Layer Deposition of LiF Films for Li-Ion Batteries, <i>Joost van Himste</i> , SparkNano, Netherlands; <i>Niels Hoogendoorn</i> , Eindhoven University of Technology, The Netherlands; <i>Jamie Greer</i> , Air Liquide Advanced Materials, Germany; <i>Nicolas Blasco</i> , Air Liquide Advanced Materials, France; <i>Paul Poedt</i> , SparkNano, and Eindhoven University of Technology, Netherlands
2:00pm	<b>AA1-WeA-3</b> Advancing Nickel-Rich Layered Oxide Cathodes via Atomic-Scale Synthesis and Surface Engineering, <i>Jin Xie</i> , ShanghaiTech University, China
2:15pm	<b>AA1-WeA-4</b> Unveiling the Unconventional ALD Chemistry of Trimethylaluminum (TMA) on Battery Materials, <i>Donghyeon Kang</i> , <i>Kyobin Park</i> , <i>Jeffrey Elam</i> , Argonne National Laboratory
2:30pm	<b>AA1-WeA-5</b> Novel Li-Precursor for Interface Engineering in Li-Ion Batteries, <i>Meike Pieters (Graduate Student)</i> , <i>Cristian van Helvoirt</i> , <i>Lina Bartel</i> , <i>Niels Hoogendoorn</i> , <i>Mariadriana Creatore</i> , Eindhoven University of Technology, The Netherlands
2:45pm	<b>AA1-WeA-6</b> Oxidative Molecular Layer Deposition of Polypyrrole on High Surface Area Powder Substrates for Li-ion Battery Applications, <i>Brandon Woo</i> , <i>Jaime DuMont</i> , <i>Markus Groner</i> , <i>Casey Christopher</i> , <i>Drew Lewis</i> , <i>Jessica Burger</i> , <i>Greg Pach</i> , <i>Wyatt Blevins</i> , Forge Nano; <i>Malachi Noked</i> , <i>Ortal Shalev</i> , Bar Ilan University, Israel; <i>Arrelaine Dameron</i> , Forge Nano
3:00pm	<b>AA1-WeA-7</b> Taming Lithium Nucleation and Growth on Cu Current Collector by Electrochemical Activation of ZnF <sub>2</sub> Layer, <i>Viet Phuong Nguyen</i> , <i>Jae-Hyun Kim</i> , <i>Seung-Mo Lee</i> , Korea Institute of Machinery & Materials (KIMM), Republic of Korea
3:15pm	<b>AA1-WeA-8</b> Atomic Layer Deposition of Aluminum Phosphorus Oxynitride and Its Application as Passivation Layers on Aluminum Metal Anode, <i>Jian Liu</i> , <i>Li Tao</i> , University of British Columbia, Canada
3:30pm	<b>BREAK</b>
4:00pm	<b>AA2-WeA-11</b> Novel Atomic and Molecular Layer Deposition Processes for Robust Battery Interfaces, <i>Xiangbo Meng</i> , <i>Kevin Velasquez Carballo</i> , <i>Kang Lu</i> , <i>Aiyong Shao</i> , University of Arkansas
4:15pm	<b>AA2-WeA-12</b> Role of the Precursor'S Stability for ALD Lithium-Containing Films, <i>Nicolas Massoni</i> , <i>Manon Letiche</i> , <i>Sylvain Poulet</i> , CEA/LETI-University Grenoble Alpes, France; <i>Katharina Märker</i> , <i>Pierre-Alain Bayle</i> , CEA-University Grenoble Alps, IRIG, France; <i>Névine Rochat</i> , CEA/LETI-University Grenoble Alpes, France; <i>Olivier Hernandez</i> , Nantes Université, CNRS, Institut des Matériaux de Nantes Jean Rouxel, IMN, France; <i>Messaoud Bedjaoui</i> , CEA/LETI-University Grenoble Alpes, France
4:30pm	
4:45pm	<b>AA2-WeA-14</b> Closing Remarks and Awards in Tamna Hall A

**ALD Applications  
Session AA1-WeA  
Battery Applications I  
Moderators:**  
**Wei-Min Li**, Jiangsu Leadmicro Nano-Equipment Technology Ltd., China,  
**Keith Wong**, Applied Materials

**ALD Applications  
Session AA2-WeA  
Battery Applications II  
Moderators:**  
**Il-Kwon Oh**, Ajou University, Republic of Korea,  
**Junjie Zhao**, Zhejiang University, China

# Wednesday Afternoon, June 25, 2025

<b>Room Samda Hall</b>		
1:30pm	<p><b>INVITED: AM1-WeA-1</b> Spatial Atomic Layer Deposition of Cu-Based Thin Films, <i>David Muñoz-Rojas</i>, CNRS, France</p>	<p><b>ALD for Manufacturing Session AM1-WeA</b>  <b>ALD Equipment I</b>  <b>Moderators:</b>  <b>Eun-Hyoung Cho</b>, 2D Device TU(SAIT)/Samsung Electronics, Republic of Korea,  <b>Woo Jae Lee</b>, KNU, Republic of Korea</p>
2:00pm	<p><b>AM1-WeA-3</b> Visualization of Precursor Transport in Vapor Deposition Systems: Measurements and Simulations, <i>James Maslar</i>, <i>Vladimir Khromchenko</i>, <i>Berc Kalanyan</i>, NIST-Gaithersburg</p>	
2:15pm	<p><b>AM1-WeA-4</b> Atomic Layer Deposition on Highly Cohesive Granular Material in Fluidized Beds, <i>Rens Kamphorst</i>, Delft University of Technology, Netherlands; <i>Kaiqiao Wu</i>, Delft University of Technology, China; <i>Saeed Saedy</i>, <i>Gabrie M.H. Meesters</i>, <i>J. Ruud van Ommen</i>, Delft University of Technology, Netherlands</p>	
2:30pm	<p><b>AM1-WeA-5</b> From the Research Lab to the Fab: Comparison of Vapor Generation by Bubbler and Direct Liquid Injection Vapor Delivery Systems, <i>David Curran</i>, 5910 Rice Creek Parkway Suite 300</p>	
2:45pm	<p><b>AM1-WeA-6</b> Advancing Fast Spatial Atomic Layer Deposition: Optimizing Precursor Control and Atmospheric Effects for Functional Oxide Thin Films, <i>Viet Huong Nguyen</i>, Faculty of Materials Science and Engineering, Phenikaa University, Hanoi 12116, Viet Nam., Viet Nam</p>	
3:00pm	<p><b>AM1-WeA-7</b> High Deposition Rate TiO PEALD Process for Semiconductor Industry, <i>Sungbae Kim</i>, <i>Yeahyun Gu</i>, <i>Hyunchul Kim</i>, <i>Hyungjoo Shin</i>, ASM, Republic of Korea</p>	
3:15pm	<p><b>AM1-WeA-8</b> Spatial ALD Deposited Functional Layers for Large-Area Inverted Perovskite Solar Modules, <i>Xuwei Jiang (Graduate Student)</i>, Huazhong University of Science and Technology, China; <i>Fan Yang</i>, Luoyu Road 1037, Wuhan, China; <i>Bin Shan</i>, <i>Rong Chen</i>, Huazhong University of Science and Technology, China</p>	
3:30pm	<p><b>BREAK</b></p>	
4:00pm	<p><b>AM2-WeA-11</b> Spatial Atomic Layer Deposition of Nanolaminate Barrier Coatings Enables Sustainable Packaging, <i>Denys Vidish (Graduate Student)</i>, University of Waterloo, Canada; <i>Soumyadeep Saha</i>, <i>Louis Delumeau</i>, <i>Tristan Grovu</i>, Nfinite Nanotechnology Inc., Canada; <i>Kevin Musselman</i>, University of Waterloo, Canada</p>	<p><b>ALD for Manufacturing Session AM2-WeA</b>  <b>ALD Equipment II</b>  <b>Moderators:</b>  <b>Sang In Lee</b>, Synos Foundation,  <b>Tae Wook Nam</b>, Sejong University, Republic of Korea</p>
4:15pm	<p><b>AM2-WeA-12</b> Advancing Atomic Layer Processing for Next Generation Devices: Atlant 3d'S Direct Atomic Layer Processing (Dalp™), <i>Mira Baraket</i>, ATLANT 3D Nanosystems, Denmark</p>	
4:30pm	<p><b>AM2-WeA-13</b> Analysis of Controllable Coil Patterns to Improve Temperature Uniformity of Inducted-Heated Susceptor, <i>Jihyun Kim</i>, <i>Hakmin Kim</i>, <i>Kwangson Jin</i>, <i>Tae S. Cho</i>, Wonik IPS, Republic of Korea</p>	
4:45pm	<p><b>AM2-WeA-14</b> Closing Remarks and Awards in Tamna Hall A</p>	

# Wednesday Afternoon, June 25, 2025

Room Tamna Hall A	
1:30pm	<p><b>INVITED: AS-WeA-1</b> Polypeptoid Brushes as Growth-Promoting Monolayers: Advancing Area-Selective Deposition for EUV Lithography, <i>Beihang Yu</i>, Lawrence Berkeley National Laboratory; <i>Maggy Harake</i>, <i>Yujin Lee</i>, <i>Stacey Bent</i>, Stanford University; <i>Ricardo Ruiz</i>, Lawrence Berkeley National Laboratory</p>
2:00pm	<p><b>AS-WeA-3</b> Area Selective Deposition of SiAlO<sub>x</sub> Films for Self-Aligned Dielectric-on-Dielectric Application, <i>Eryan Gu</i>, <i>Wang Li</i>, <i>Kun Cao</i>, <i>Rong Chen</i>, Huazhong University of Science and Technology, China</p>
2:15pm	<p><b>AS-WeA-4</b> Control of Three-Color Area-Selective Deposition of PEDOT Conjugated Polymer on SiN vs SiO<sub>2</sub> and Si-H by Adjustment of Pre-Treatment Sequence, <i>Jeremy Thelven (Graduate Student)</i>, <i>Nicholas Carroll</i>, <i>Gregory Parsons</i>, North Carolina State University</p>
2:30pm	<p><b>AS-WeA-5</b> Annealing PEDOT Thin Films to Generate a Selectively Deposited Etching Hard Mask Layer, <i>Nicholas Carroll (Graduate Student)</i>, <i>Carwynn Rivera</i>, <i>Man Hou Vong</i>, <i>Hannah Margavio</i>, North Carolina State University; <i>Hwan Oh</i>, Brookhaven National Laboratory; <i>Gregory Parsons</i>, North Carolina State University</p>
2:45pm	<p><b>AS-WeA-6</b> Ring-Opening Enhanced Etching of Cyclosiloxanes for Area-Selective MLD of SiOC(H) Thin Films, <i>Xiaocheng Huang (Graduate Student)</i>, <i>Weiwei Du</i>, <i>Yuanhao Shen</i>, <i>Pengzhe Cai</i>, <i>Delong Liu</i>, <i>Junjie Zhao</i>, Zhejiang University, China</p>
3:00pm	<p><b>AS-WeA-7</b> Area-Selective Molecular Layer Deposition of Polymer Thin Films for Contact Hole/Trench Shrinking, <i>Pengzhe Cai (Graduate Student)</i>, <i>Junjie Zhao</i>, Zhejiang University, China</p>
3:15pm	<p><b>AS-WeA-8</b> Catalytic Oxygen Dissociation for Area-Selective HfO<sub>2</sub> Deposition on Cobalt through Selective PMMA Etching, <i>Enzo Novoselic (Graduate Student)</i>, <i>Christophe Vallée</i>, <i>Natalya Tokranova</i>, University at Albany-SUNY</p>
3:30pm	<b>BREAK</b>
4:00pm	<p><b>AA3-WeA-11</b> Atomic Layer Deposition for Self-Healing Stone Cultural Heritage Preservation, <i>Ancy Mini Vibin Lal Nayakom Mini</i>, <i>Gabriele Botta</i>, <i>Mato Knez</i>, <i>Aranzazu Sierra Fernández</i>, CIC nanoGUNE, Spain</p>
4:15pm	<p><b>AA3-WeA-12</b> Surface Modification of Additive Manufacturing Feedstocks, <i>Chris Gump</i>, <i>Brandon Castro</i>, <i>Joeseoph Gauspohl</i>, Forge Nano; <i>Anthony Manerino</i>, <i>Jeremy Iten</i>, Elementum3D; <i>Guillermo Rojas</i>, <i>Casey Christopher</i>, <i>Markus Groner</i>, <i>Dane Lindblad</i>, <i>Brandon Woo</i>, <i>Arrelaine Dameron</i>, Forge Nano</p>
4:30pm	<p><b>AA3-WeA-13</b> Energy Storage Performance of Field-Induced Ferroelectric Al<sub>2</sub>O<sub>3</sub>-Inserted Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Thin Films for Electrostatic Supercapacitors, <i>Jonghoon Shin (Graduate Student)</i>, <i>Dong Hoon Shin</i>, <i>Haengha Seo</i>, <i>Kyung Do Kim</i>, <i>Seungheon Choi</i>, <i>Tae Kyun Kim</i>, <i>Heewon Paik</i>, <i>Haewon Song</i>, <i>Seungyong Byun</i>, <i>In Soo Lee</i>, <i>Cheol Seong Hwang</i>, Seoul National University, South Korea</p>
4:45pm	<b>AA3-WeA-14</b> Closing Remarks and Awards

**Area Selective ALD  
Session AS-WeA  
Area Selective Deposition IV  
Moderators:  
Jeffrey W. Elam**, Argonne National Laboratory,  
**Benjamin Greenberg**, Naval Research Laboratory

**ALD Applications  
Session AA3-WeA  
Emerging Applications  
Moderators:  
Bong Jin Kuh**, Samsung Electronics, Republic of Korea,  
**Han-Bo-Ram Lee**, Incheon National University, Republic of Korea

# Wednesday Afternoon, June 25, 2025

<b>Room Tamna Hall B</b>		
1:30pm	<p><b>INVITED: AF-WeA-1</b> ALD of Nitride Semiconductors, <i>Henrik Pedersen</i>, Linköping University, Sweden</p>	<p><b>ALD Fundamentals</b>  <b>Session AF-WeA</b>  <b>Material Growth II</b>  <b>Moderators:</b>  <b>Ageeth Bol</b>, University of Michigan, Ann Arbor,  <b>Erwin Kessels</b>, Eindhoven University of Technology, Netherlands</p>
2:00pm	<p><b>AF-WeA-3</b> Low-Temperature Atomic Layer Deposition of (001)-Oriented Elemental Bismuth, <i>Amin Bahrami</i>, <i>Jorge Luis Vazquez-Arce</i>, <i>Alessio Amoroso</i>, <i>Nicolas Perez</i>, Leibniz Institute for Solid State and Materials Research, Germany; <i>Jaroslav Charvot</i>, University of Pardubice, Czechia; <i>Dominik Naglav-Hansen</i>, Ruhr-University Bochum, Germany; <i>Panpan Zhao</i>, <i>Jun Yang</i>, <i>Sebastian Lehmann</i>, <i>Angelika Wrzesińska-Lashkova</i>, Leibniz Institute for Solid State and Materials Research, Germany; <i>Fabian Pieck</i>, <i>Ralf Tonner-Zech</i>, Leipzig University, Germany; <i>Filip Bureš</i>, University of Pardubice, Czechia; <i>Annalisa Acquesta</i>, University of Napoli Federico II, Italy; <i>Yana Vaynzof</i>, <i>Anjana Devi</i>, <i>Kornelius Nielsch</i>, Leibniz Institute for Solid State and Materials Research, Germany</p>	
2:15pm	<p><b>AF-WeA-4</b> High-Quality ALD-Ru Process Using Thermally Stable ALD Ru Precursor, <i>Hideaki Nakatsubo</i>, TANAKA PRECIOUS METAL TECHNOLOGIES Co., Ltd. / UNIST, Japan; <i>Jeongha Kim</i>, <i>Soo-Hyun Kim</i>, UNIST, Korea (Democratic People's Republic of)</p>	
2:30pm	<p><b>AF-WeA-5</b> The Development of Ultralow-Dielectric Constant Boron Nitride Film by Novel Plasma Atomic Layer Deposition, <i>Kazuki Goto</i>, <i>Yoshihiro Kato</i>, <i>Shuichiro Sakai</i>, <i>Hiroki Murakami</i>, <i>Yamato Tonogawa</i>, Tokyo Electron Technology Solutions Ltd, Japan</p>	
2:45pm	<p><b>AF-WeA-6</b> Thermal Atomic Layer Deposition of InN using Hot-wire-activated NH<sub>3</sub> and Hydrazine Reactants, <i>Bonwook Gu (Graduate Student)</i>, <i>Kwangyong An</i>, <i>Han-Bo-Ram Lee</i>, Incheon National University, Republic of Korea</p>	
3:00pm	<p><b>AF-WeA-7</b> Electron-Enhanced ALD and CVD of Titanium-, Silicon- and Tungsten-Containing Films at Low Temperatures Using Metal Precursors with Various Reactive Background Gases, <i>Zachary C. Sobell</i>, <i>Andrew S. Cavanagh</i>, <i>Steven M. George</i>, University of Colorado at Boulder</p>	
3:15pm		
3:30pm	<b>BREAK</b>	
4:00pm	<p><b>AA4-WeA-11</b> Room-Temperature Atmospheric Pressure ALD for Pharmaceutical Powder Coating: Tailoring Surface Properties and Controlling Drug Release, <i>Viet Phuong Cao</i>, <i>Kim Hue Dinh</i>, <i>Phi Huu Bui</i>, <i>Truong Duc Dinh</i>, <i>Quoc Viet Hoang</i>, <i>Diem Quyen Nguyen</i>, <i>Tuan Hiep Tran</i>, <i>Hao Van Bui</i>, Phenikaa University, Viet Nam</p>	<p><b>ALD Applications</b>  <b>Session AA4-WeA</b>  <b>Medical Applications</b>  <b>Moderators:</b>  <b>Junsoo Kim</b>, SK hynix, Republic of Korea,  <b>Se-Hun Kwan</b>, Pusan National University, Republic of Korea</p>
4:15pm	<p><b>AA4-WeA-12</b> Atomic Layer Deposition for Medical Applications, <i>J. Ruud van Ommen</i>, <i>Alina Y. Rwei</i>, <i>Antonia G. Denkova</i>, <i>Volkert van Steijn</i>, Delft University of Technology, Netherlands</p>	
4:30pm	<p><b>AA4-WeA-13</b> Recent Advances in Multifunctional Antibacterial Neural Interfacing Electrodes Manufactured via Atomic Layer Deposition and Hierarchical Surface Restructuring, <i>Shahram Armini</i>, Pulse Technologies; <i>Henna Khosla</i>, Villanova University; <i>Wesley Seche</i>, Pulse Technologies; <i>Daniel Ammerman</i>, Rowan University; <i>Matthew Maniscalco</i>, <i>Alexander Blagojevic</i>, <i>Pouya Tavousi</i>, University of Connecticut; <i>Sahar Elyahoodayan</i>, University of Southern California; <i>Gregory A. Caputo</i>, <i>Jeffrey Hettinger</i>, Rowan University; <i>Sina Shahbazmohamadi</i>, University of Connecticut; <i>Gang Feng</i>, Villanova University</p>	
4:45pm	<p><b>AA4-WeA-14</b> Closing Remarks and Awards in Tamna Hall A</p>	

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