

ALD/ALE 2023 Program Key

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

PROGRAM NUMBERS: They are listed with the Confence topic letters first, the session number second, the Day of the Week, Morning (M) or Afternoon (A) and the presentation slot (e.g., **AA1-TuM-1**).

ALD/ALE 2023 Program Overview

Room /Time	Evergreen Ballroom & Foyer	Grand Ballroom A-C	Grand Ballroom A-G	Grand Ballroom E-G	Grand Ballroom H-K	Regency Ballroom A-C
SuA					TS-SuA: Tutorial Session	
SuP	POSTER SESSIONS (ALE Only)					
MoM			PS-MoM: Plenary Session			
MoA			ALD+ALE-MoA2: Student Awards AF-MoA: Precursors and Processes		ALE-MoA: Metal ALE	NS-MoA: 2D Growth
MoP	POSTER SESSIONS					
TuM		ALD+ALE-TuM: ALD/ALE Session ALE-TuM: Modeling of ALE		AF1-TuM: Precursors & Proc I AF2-TuM: Precursors and Processes II	AA1-TuM: ALD for Batteries AA2-TuM: MEMS, Actuators, Hard Films	AS1-TuM: Surfaces and ASD AS2-TuM: Inhibitors and ASD
TuA		ALE1-TuA: Plasma & Energy-Enhanced ALE ALE2-TuA: Low-Temperature and SiN ALE		AF1-TuA: Plasma ALD I AF2-TuA: Novel ALD Processing	AA1-TuA: Energy: Catalysis and Fuel Cells AA2-TuA: Emerging Materials	AS1-TuA: Polymers NS-TuA: Nanostructures and Membranes
TuP	POSTER SESSIONS					
WeM		ALE1-WeM: Si and SiO ₂ ALE ALE2-WeM: Plasma & Energy-Enhanced ALE		AF1-WeM: In Situ Measurement AF2-WeM: High Aspects	AA1-WeM: Memory RRAM, Neuromorp, NVM AA2-WeM: Memory DRAM	AM-WeM: Manufacturing EM-WeM: EUV Litho Materials
WeA		LB1-WeA: Late Breaking ALD LB2-WeA: Late Breaking Computational Modeling		AF1-WeA: Computational ALD I AF2-WeA: Computational ALD II	AA1-WeA: ULSI, Display, Optics, Metamaterials, and Bio Applications AA2-WeA: Energy Solar	EM1-WeA: Molecular Layer Deposition EM2-WeA: Infiltration Processes

Sunday Afternoon, July 23, 2023

Tutorial Room Grand Ballroom H-K - Session TS-SuA Tutorial Session Moderators: Seán Barry, Carleton University, Canada, Scott Clendenning, Intel Corporation		
1:00pm	INVITED: TS-SuA-1 Design Rules for Precursors and Why You Should Break Them., Seán Barry , Carleton University, Canada	
1:15pm		
1:30pm		
1:45pm	INVITED: TS-SuA-4 A Brief Introduction to Low-Temperature Plasmas: Physics, Diagnostics, and Applications in Atomic Layer Processing, Mari Napari , King's College London, UK	
2:00pm		
2:15pm		
2:30pm	INVITED: TS-SuA-7 The Application of Atomic Layer Deposition for Batteries, Lei Cheng , Argonne National Laboratory	
2:45pm		
3:00pm		
3:15pm	BREAK	
3:30pm	INVITED: TS-SuA-11 Surface Reaction Mechanisms of Thermal and Plasma-Enhanced Atomic Layer Etching (ALE) Processes, Satoshi Hamaguchi , Osaka University, Japan	
3:45pm		
4:00pm		
4:15pm	INVITED: TS-SuA-14 Surface Functionalization of Powder Materials using Fluidized Bed Reactor ALD, Se-Hun Kwon , Pusan National University, Republic of Korea	
4:30pm		
4:45pm		
5:00pm	INVITED: TS-SuA-17 Atomic Layer Deposition of Active and Passive Films for Electronic Devices, John Ekerdt , University of Texas at Austin	
5:15pm		
5:30pm		

Atomic Layer Etching

Room Evergreen Ballroom & Foyer - Session ALE-SuP

Atomic Layer Etching Poster Session

6:00 – 8:00 pm

ALE-SuP-1 Chemical Approaches to Atomically Controlled Etching of Tertiary Materials and van der Waals Solids, *Marissa Pina, M. Whalen, J. Xiao, A. Teplyakov*, University of Delaware

ALE-SuP-2 Electron-Assisted Silicon Etching in an Inductively Coupled CF₄ Plasma via Low-Energy Electron Beam, *Jiwon Jung, C. Lim, C. Chung*, Hanyang University, Republic of Korea

ALE-SuP-3 Damage-Free Graphene Etching by Ultra-Low Electron Temperature Plasma, *Junyoung Park, J. Jung, M. Kim, C. Lim, B. Seo, C. Chung*, Hanyang University, Korea

ALE-SuP-4 Anisotropic Atomic Layer Etching of Molybdenum by Formation of Chloride/Oxychloride, *Yun Jong Jang, D. Kim, H. Kwon, H. Gil, G. Kim, D. Kim, G. Yeom*, Sungkyunkwan University (SKKU), Republic of Korea

ALE-SuP-5 New Oxidants for Cu ALE, *Persi Panariti, A. Hock*, Illinois Institute of Technology

ALE-SuP-6 Atomic Layer Etch Development of Noble Metals Cu and Pt for Mram Technologies, *Omar Melton, R. Opila*, University of Delaware

ALE-SuP-7 Layer-by-Layer Etching of 2D Palladium Diselenide, *Ji Eun Kang, Y. Ji, S. Choi, G. Yeom*, Sungkyunkwan University (SKKU), Republic of Korea

ALE-SuP-8 Cyclic Dry Etch Process of SiO₂ using H/F radicals and Methanol Vapor, *HaeIn Kwon, H. Gil, D. Kim, Y. Jang, D. Kim, G. Kim, D. Kim, G. Yeom*, Sungkyunkwan University, Republic of Korea

ALE-SuP-9 Quantum Chemistry Modeling of Plasmaless Anisotropic Etching of Silicon by F₂ Molecule, *Yuri Barsukov, O. Dwivedi, S. Jubin, I. Kaganovich*, Princeton University Plasma Physics Lab

ALE-SuP-10 Atomic Layer Etching of Mo with Surface Fluorination and Ion Bombardment, *Yongjae Kim, H. Kang, H. Ha, H. Chae*, Sungkyunkwan University (SKKU), Republic of Korea

ALE-SuP-11 Thermal Atomic Layer Etching of Palladium with Chlorination and Ligand Volatilization, *Hojin Kang*, School of Chemical Engineering, Sungkyunkwan University (SKKU), Korea (Democratic People's Republic of); *Y. Kim*, SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University (SKKU), Korea (Democratic People's Republic of); *A. Cho*, Department of Chemical and Biomolecular Engineering Korea Advanced Institute of Science and Technology (KAIST), Korea (Democratic People's Republic of); *H. Jung*, Department of Chemical and Biomolecular Engineering Korea Advanced Institute of Science and Technology (KAIST) Daejeon, 34141, Republic of Korea³, Korea (Democratic People's Republic of); *S. Cho, H. Chae*, School of Chemical Engineering, Sungkyunkwan University (SKKU), Korea (Democratic People's Republic of)

ALE-SuP-12 Plasma Enhanced Atomic Layer Etching of Zirconium Oxide using Plasma Fluorination and Ligand Exchange with TiCl₄, *Hyeongwu Lee, Y. Kim, H. Ha, H. Chae*, Sungkyunkwan University (SKKU), Republic of Korea

Monday Morning, July 24, 2023

<p>Plenary Session Room Grand Ballroom A-G - Session PS-MoM Plenary Session Moderators: Seán Barry, Carleton University, Canada, Scott Clendenning, Intel Corporation, Steven M. George, University of Colorado at Boulder, Thorsten Lill, Lam Research Corporation</p>		
8:45am	ALD OPENING REMARKS	
9:00am	INVITED: PS-MoM-2 ALD Plenary Lecture: Decades of ALD Research – Targets Upside Down, <i>Markku Leskela</i> , University Helsinki, Finland	
9:15am		
9:30am		
9:45am		
10:00am	BREAK & EXHIBITS	
10:15am		
10:15am	ALE OPENING REMARKS	
10:30am	INVITED: PS-MoM-8 ALE Plenary Lecture: The Need for Atomic Layer Etching in the Angstrom Era, <i>Tristan Tronic</i> , Intel Corporation	
10:45am		
11:00am		
11:15am		
11:15am	INVITED: PS-MoM-11 ALD 2023 Innovator Awardee Talk: Not Like an Apple - Progress in Understanding Atomic Level Processing at the Atomic Scale, <i>Simon Elliott</i> , Schrödinger, Ireland	
11:30am		
11:45am	PS-MoM-13 Sponsor Preview	

Monday Afternoon, July 24, 2023

Room Grand Ballroom A-G		
1:30pm	ALD+ALE-MoA2-1 Student Award Finalist Talk: Thermal characterization and Area Selective Deposition of NHCs, <i>Eden Goodwin</i> , Carleton University, Canada; <i>J. Lomax</i> , University of Western Ontario, Canada; <i>M. Aloisio, C. Crudden</i> , Queen's University, Canada; <i>P. Ragogna</i> , University of Western Ontario, Canada; <i>S. Barry</i> , Carleton University, Canada	ALD & ALE Session ALD+ALE-MoA2 Student Awards Moderators: Simon Elliot , Schrödinger, Inc., Markku Leskela , University of Helsinki, Finland
1:45pm	ALD+ALE-MoA2-2 Student Award Finalist Talk: Reaction Mechanism on ALD Process of Ru and Pt, <i>Heta-Elisa Nieminen</i> , <i>M. Putkonen</i> , <i>M. Ritala</i> , University of Helsinki, Finland	
2:00pm	ALD+ALE-MoA2-3 Student Award Finalist Talk: Thermal Atomic Layer Etching of Gold Using Sulfuryl Chloride for Chlorination and Triethylphosphine for Ligand Addition, <i>Jonathan Partridge</i> , <i>J. Murdzek</i> , <i>S. George</i> , University of Colorado at Boulder	
2:15pm	ALD+ALE-MoA2-4 Student Award Finalist Talk: Conformality of Atmospheric-Pressure Plasma-Enhanced Spatial Atomic Layer Deposition of SiO ₂ and TiO ₂ , <i>Mike van de Poll</i> , Eindhoven University of Technology, Netherlands; <i>H. Jain</i> , TNO-Holst Centre & Eindhoven University of Technology, The Netherlands; <i>B. Macco</i> , <i>P. Poodt</i> , <i>E. Kessels</i> , Eindhoven University of Technology, Netherlands	
2:30pm	ALD+ALE-MoA2-5 Student Award Finalist Talk: "Inverted ASD" with High Selectivity: Polymer on SiO ₂ vs. Si-H and Polymer on Si-OH vs. SiO ₂ , <i>Nicholas Carroll</i> , <i>H. Margavio</i> , <i>G. Parsons</i> , North Carolina State University	
2:45pm	ALD+ALE-MoA2-6 Student Award Finalist Talk: Plasma Isotropic ALE of GaN Using SF ₆ Plasma and TMA, <i>Nicholas Chittock</i> , <i>W. Kessels</i> , Eindhoven University of Technology, The Netherlands; <i>H. Knoops</i> , Oxford Instruments Plasma Technology, Netherlands; <i>S. Elliott</i> , Schrödinger, Ireland; <i>A. Mackus</i> , Eindhoven University of Technology, The Netherlands	
3:00pm	ALD+ALE-MoA2-7 Student Award Finalist Talk: Competition between Deposition and Etching Reactions in ALD of Indium Gallium Zinc Oxide (IGZO), <i>Iaen Cho</i> , Hongik University, Republic of Korea; <i>J. Cho</i> , <i>J. Jeong</i> , Hanyang University, Republic of Korea; <i>B. Shong</i> , Hongik University, Republic of Korea	
3:15pm	ALD+ALE-MoA2-8 Student Award Finalist Talk: Atomic Layer Deposition of Semimetallic TiS ₂ Contact Layer on MoS ₂ -based Thin Film Transistor for Contact Resistance Reduction, <i>Jeongwoo Seo</i> , <i>H. Yoon</i> , <i>S. Lee</i> , <i>J. Yoo</i> , Yonsei University, Korea; <i>Y. Nam</i> , <i>J. Lim</i> , Samsung Display Co., Ltd., Republic of Korea; <i>S. Chung</i> , <i>H. Kim</i> , Yonsei University, Korea	
3:30pm	BREAK & EXHIBITS	ALD Fundamentals Session AF-MoA Precursors and Processes Moderators: Seán Barry , Carleton University, Canada, Scott Clendenning , Intel Corporation
3:45pm		
4:00pm	INVITED: AF-MoA-11 Precursors for Photoassisted Area Selective Deposition on Self Assembled Monolayers, <i>B. Das</i> , <i>R. Singh</i> , <i>C. Brewer</i> , University of Florida; <i>R. Holliday</i> , <i>A. Walker</i> , University of Texas at Dallas; <i>Lisa McElwee-White</i> , University of Florida	
4:15pm		
4:30pm	AF-MoA-13 Reductive Thermal ALD of Pd and Au Thin Films, <i>Anton Vihervaara</i> , <i>T. Hatanpää</i> , <i>H. Nieminen</i> , <i>K. Mizohata</i> , <i>M. Chundak</i> , <i>M. Ritala</i> , University of Helsinki, Finland	
4:45pm	AF-MoA-14 Phosphorus Zintl Species as ALD precursors for Metal Phosphide Thin Films, <i>Paul Ragogna</i> , <i>J. Bentley</i> , Western University, Canada; <i>E. Goodwin</i> , Carleton University, Canada; <i>J. Lomax</i> , Western University, Canada; <i>B. Van Ijzendoorn</i> , <i>M. Mehta</i> , University of Manchester, UK; <i>S. Barry</i> , Carleton University, Canada	
5:00pm	AF-MoA-15 Investigation of Discrete Reactant Feeding for Atomic Layer Deposition of In ₂ O ₃ Using Novel Liquid Alkyl-Cyclopentadienyl Indium Precursor, <i>Hae Lin Yang</i> , <i>H. Kim</i> , Hanyang University, Republic of Korea; <i>T. ONO</i> , <i>S. KAMIMURA</i> , <i>A. EIZAWA</i> , <i>T. TERAMOTO</i> , <i>C. DUSSARRAT</i> , Air Liquide Laboratories, Japan; <i>J. Park</i> , Hanyang University, Republic of Korea	
5:15pm	AF-MoA-16 Synthesis and Precursor Property Evaluation of Er Enaminolate Complexes and Deposition of Er ₂ O ₃ Thin Film using Thermal Atomic Layer Deposition (ALD), <i>Chamod Dharmadasa</i> , <i>C. Winter</i> , <i>N. Jayakodiarachchi</i> , Wayne State University; <i>P. Evans</i> , University of Wisconsin-Madison; <i>R. Liu</i> , University of Wisconsin - Madison	
5:30pm	AF-MoA-17 Deposition of CsSnI ₃ Perovskite Thin Films by Atomic Layer Deposition and Pulsed Chemical Vapor Deposition, <i>Alexander Weiß</i> , <i>M. Terletskaia</i> , <i>G. Popov</i> , <i>M. Leskelä</i> , <i>M. Ritala</i> , <i>M. Kemell</i> , University of Helsinki, Finland	

Monday Afternoon, July 24, 2023

Atomic Layer Etching Room Grand Ballroom H-K - Session ALE-MoA Metal ALE Moderators: Thorsten Lill, Lam Research Corporation, Tristan Tronic, Intel Corporation		Nanostructure Synthesis and Fabrication Room Regency Ballroom A-C - Session NS-MoA 2D Growth Moderators: John Conley, Oregon State University, Xiangbo Meng, University of Arkansas	
1:30pm			
1:45pm			
2:00pm			
2:15pm			
2:30pm			
2:45pm			
3:00pm			
3:15pm			
3:30pm	BREAK & EXHIBITS	BREAK & EXHIBITS	
3:45pm			
4:00pm	INVITED: ALE-MoA-11 Wet Atomic Layer Etching of Metals, <i>Paul Abel</i> , Tokyo Electron America, Inc.	INVITED: NS-MoA-11 A Modified ALD-like Approach to Demonstrate Exceptionally Thin Dielectric Layer Growth on 2D Materials, <i>Daire Cott</i> , S. Sergeant, R. Rennen, G. Benjamin, IMEC Belgium; D. Lin, IMEC, Belgium; X. Wu, IMEC Belgium; Z. Lin, IMEC Belgium, Belgium; T. Schram, Q. Smets, I. Asselberghs, P. Morin, IMEC Belgium	
4:15pm			
4:30pm	ALE-MoA-13 Thermal Atomic Layer Etching of Molybdenum Based on Sequential Oxidation and Chlorination Reactions, <i>Taewook Nam</i> , J. Partridge, S. George, University of Colorado at Boulder	NS-MoA-13 Water-free SbO _x -ALD-process for Coating Bi ₂ Te ₃ -particles, <i>Sebastian Lehmann</i> , F. Mitzscherling, S. He, J. Yang, M. Hantusch, A. Bahrami, K. Nielsch, Leibniz Institute for Solid State and Materials Research, Germany	
4:45pm	ALE-MoA-14 Non-Halogen Plasma for Selective Removal of Titanium Compounds Applied in Advanced Atomic Layer Etching, <i>Thi-Thuy-Nga Nguyen</i> , Nagoya University, Japan; K. Shinoda, Hitachi, Ltd., Japan; S. Hsiao, Nagoya University, Japan; H. Hamamura, Hitachi, Ltd., Japan; K. Maeda, K. Yokogawa, M. Izawa, Hitachi High-Tech Corp., Japan; K. Ishikawa, M. Hori, Nagoya University, Japan	NS-MoA-14 2D FeS _x Nanosheets by ALD: Electrocatalytic Properties Towards Hydrogen Evolution Reaction, <i>Raul Zazpe</i> , J. Rodriguez Pereira, S. Thalluri, L. Hromadko, University of Pardubice, Czechia; D. Pavliňák, E. Kolíbalová, Brno University of Technology, Czechia; H. Sopha, J. Macak, University of Pardubice, Czechia	
5:00pm	ALE-MoA-15 Leveraging Surface Nitridation to Enable Plasma-Thermal Atomic Layer Etching of Ni Based Metals, <i>Taylor Smith</i> , J. Chang, University of California, Los Angeles	NS-MoA-15 300 mm Wafer-Scale and Self-limiting Layer Synthesis of 2D MoSe ₂ by Atomic Layer Deposition, A. Zacatzi, M. Miller, R. Kanjolia, <i>Thong Ngo</i> , EMD Electronics	
5:15pm	ALE-MoA-16 Plasma Atomic Layer Etching of Ruthenium with Surface Fluorination and Ion Bombardment for Next-generation Interconnect Metal, <i>Yongjae Kim</i> , H. Kang, M. Choi, H. Ha, H. Chae, Sungkyunkwan University (SKKU), Republic of Korea	NS-MoA-16 Wafer-Scale Controlled Growth of Two-Dimensional Metal Dichalcogenides Through Atomic Layer Deposition and Top-Bottom Epitaxy, <i>Chanyoung Yoo</i> , W. Choi, J. Jeon, B. Park, G. Jeon, S. Jeon, C. Hwang, Department of Materials Science and Engineering and Inter-University Semiconductor Research Center, Seoul National University, Republic of Korea	
5:30pm	ALE-MoA-17 Comparison of Ruthenium ALE based on ICP and Ion Beam, <i>D.S. Kim</i> , H. Kwon, Y. Jang, H. Gil, D. Kim, G. Kim, <i>Geun Young Yeom</i> , Sungkyunkwan University, Republic of Korea		

ALD for Manufacturing

Room Evergreen Ballroom & Foyer - Session AM-MoP

ALD for Manufacturing Poster Session, 5:45 – 7:00 pm

AM-MoP-1 Numerical Analysis on Gas Flow Field for a Sustainable ALD Process Chamber, **Kyung-Hoon Yoo**, Korea Institute of Industrial Technology (KITECH), Republic of Korea; **G. Song**, KUMYOUNG ENG Inc., Republic of Korea; **C. Kim**, TNG Inc., Republic of Korea; **J. Hwang**, **H. Lee**, **S. Lee**, Korea Institute of Industrial Technology, Republic of Korea; **K. Lee**, SAMSUNG DISPLAY, Republic of Korea

AM-MoP-2 Atomic Layer Deposition Reactor for Fixed-Bed Powder Processing with Inert Sample Transfer, **S. Andsten**, **J. Velasco**, **S. Larkiala**, Aalto University, Finland; **K. Salonen**, Elabs Oy engineering, Finland; **C. Gonsalves**, **J. Rask**, **J. Stang**, **V. Miikkulainen**, **S. Jääskeläinen**, **Riikka Puurunen**, Aalto University, Finland

AM-MoP-3 Reverse Templating Effects of Low-Resistivity Ru Ald on Sputtered Ru, **Chenghsuan Kuo**, UCSD, Taiwan; **V. Wang**, UCSD; **R. Kanjolia**, EMD Electronics, USA; **M. Moinpour**, EMD Electronics; **J. Woodruff**, EMD Electronics, USA; **H. Simka**, Samsung Electronics; **A. Kummel**, UCSD

AM-MoP-4 Thermal Evaporation Enhanced Atomic Layer Deposition for Far Ultraviolet Mirror Coatings, **Robin Rodriguez**, **J. Hennessy**, Jet Propulsion Laboratory (NASA/JPL)

AM-MoP-6 Technical Analysis and Solution of Critical Electrostatic Chuck Problem in High Temperature CVD Process through Estimation Model of the Johnsen-Rahbek Chucking Force, **Youngbok Lee**, **S. Han**, **S. Cho**, Samsung Electronics, Republic of Korea; **Y. Kim**, Samsung Electronics

AM-MoP-10 Multi Cycle and Material Deposition for Spatial Atomic Layer Deposition Process, **Atilla Varga**, **M. Carnoy**, **M. Funding la Cour**, **M. Plakhotnyuk**, **I. Kundrata**, ATLANT 3D, Denmark; **J. Bachmann**, Friedrich-Alexander Universität, Germany

AM-MoP-11 Hike Furnace HCD SiN Matching TEL Furnace HCD SiN, **Yuan Hsiao Su**, Taiwan Semiconductor Manufacturing Company, Taiwan

ALD Fundamentals

Room Evergreen Ballroom & Foyer - Session AF-MoP

ALD Fundamentals Poster Session, 5:45 – 7:00 pm

AF-MoP-2 Atomic Layer Deposition of hfo₂ Thin Film Using a Novel Heteroleptic Ethylenediamine Based Hf Precursor, **Chael Wan Park**, **E. Shin**, **E. Cho**, **H. Kim**, **K. Mun**, **K. Lee**, **J. Park**, Hansol Chemical Co., Ltd., Republic of Korea

AF-MoP-4 Al Precursor with Low Growth Rate for Conformal Al₂O₃ Thin Film, **Kyuhyun Yeom**, **H. Lee**, **K. Mun**, **D. Ryu**, **J. Seok**, Hansol chemical, Republic of Korea

AF-MoP-5 Low-Temperature HfO₂ Gate Dielectric for Topological Insulator Devices, **P. Shekhar**, **S. Shamim**, **V. Hock**, Physikalisches Institut (EP3) and Institute for Topological Insulators, Universität Würzburg, Germany; **H. Buhmann**, **Johannes Kleinlein**, Physikalisches Institut and Institute for Topological Insulators, Universität Würzburg, Germany; **L. Molenkamp**, Physikalisches Institut (EP3) and Institute for Topological Insulators, Universität Würzburg, Germany

AF-MoP-6 Silicon Nitride ALD Process Using High Purity Hydrazine for Low Temperature Deposition, **Hayato Murata**, **Y. Koda**, **Y. Wada**, **T. Kameoka**, Taiyo Nippon Sanso Corporation, Japan; **J. Spiegelman**, RASIRC; **N. Tomita**, Taiyo Nippon Sanso Corporation, Japan

AF-MoP-7 ALD Precursor Design for Post-Transition Metal Films, **Atsushi Sakurai**, **N. Yamada**, **T. Yoshino**, **A. Nishida**, **M. Hatase**, **M. Enzu**, **A. Yamashita**, **Y. Ooe**, **C. Mitsui**, ADEKA CORPORATION, Japan

AF-MoP-8 Correlating In-Situ Photoluminescence and Ellipsometry: A Novel approach to Analyze and Optimize ALD Materials for Photovoltaic Applications, **N. HARADA**, **A. LEVTCHENKO**, IPVF, France; **D. COUTANCIER**, CNRS, France; **F. DONSANTI**, IPVF, France; **J. GUILLEMOLES**, CNRS, France; **D. SUCHET**, Ecole Polytechnique - CNRS, France; **G. DELPORT**, **Nathanaelle SCHNEIDER**, CNRS, France

AF-MoP-9 Chemistry of Boronic Acids on Semiconductor Surfaces: Pathways to Organic Monolayer Resists and Single Molecule Inhibitors for AS-ALD, **Dhamelyz Silva Quinones**, **A. Teplyakov**, University of Delaware

AF-MoP-10 Trench Coverage Properties of Oxide Films Deposited at Low Temperature by Pure Ozone ALD, **N. Kameda**, **T. Hagiwara**, **Soichiro Motoda**, MEIDEN NANOPROCESS INNOVATIONS, INC., Japan; **K. Nakamura**, **H. Nonaka**, AIST, Japan

AF-MoP-11 Novel Volatile and Liquid Sc Precursors for Electronic Applications, **M. Kapitein**, **S. Herritsch**, **M. Balmer**, **T. Hepp**, **E. Schlathoelter**, **Oliver Briel**, **J. Koch**, Dockweiler Chemicals, Germany

AF-MoP-12 PEALD Growth of Doped Indium Oxide Films with Control Over the Film Composition and Properties by Supercycle Approach Implementation, **M. Zered**, **Valentina Korchnoy**, **K. Weinfeld**, **G. Frey**, **M. Eizenberg**, Technion - Israel Institute of Technology, Israel

AF-MoP-13 Using Glow-Discharge Optical Emission Spectroscopy to Characterize Polymers Treated Through Vapor Phase Infiltration, **Seancarlos Gonzalez**, **Y. Choe**, **D. Bergsman**, University of Washington

AF-MoP-14 New Approaches for the Thermal Atomic Layer Deposition of Elemental Antimony Thin Films, **Daniel Beh**, Wayne State University; **Z. Devereaux**, **T. Knisley**, Applied Materials; **C. Winter**, Wayne State University

AF-MoP-15 Electron Beam Generation and Precise Control of Beam Energy for Large Area Electron Enhanced Atomic Layer Deposition, **MINSEOK KIM**, **J. Jung**, **J. Park**, **C. Lim**, **B. Seo**, **C. Chung**, Hanyang University, Republic of Korea

AF-MoP-16 Development of Piezo Controlled Vapour Delivery System for Ru ALD Application, **Hiroshi Nishizato**, HORIBA STEC, Co., Ltd., Japan; **G. Krunal**, HORIBA STEC, Co., Ltd., India; **T. Moriyama**, HORIBA STEC, Co., Ltd., Japan; **K. Uesugi**, Hiroshima University, Japan; **G. Rahman**, Hiroshima University, Bangladesh; **P. Lowery**, **T. Freeman**, HORIBA Reno Technology Center; **Y. Amemiya**, **A. Teramoto**, Hiroshima University, Japan

AF-MoP-17 Realization of Conductive Electrodes for Solar Cells by Spatial ALD Using New Coinage Metal Precursors, **N. Boysen**, Ruhr University Bochum, Germany; **T. Hasselmann**, **B. Misimi**, University of Wuppertal, Germany; **M. Karppinen**, Aalto University, Finland; **T. Riedl**, University of Wuppertal, Germany; **Anjana Devi**, Ruhr University Bochum, Germany

AF-MoP-19 Comparative Study of the Surface Reactivity and PEALD of Monoaminosilanes and Cyclic Azasilanes, **Chad Brick**, **T. Ogata**, **J. Collins**, Gelest, Inc

AF-MoP-20 Atomic Layer Deposition of Strontium Oxide on Different Materials, **Marek Eliáš**, CEITEC, Brno University of Technology, Czechia; **A. Harunningtyas**, Osaka University, Japan; **D. Nečas**, **L. Janů**, **E. Dvořáková**, CEITEC, Czechia; **T. Ito**, **P. Vinchon**, **S. Hamaguchi**, Osaka University, Japan; **L. Zajíčková**, CEITEC BUT & Masaryk University, Czechia

AF-MoP-21 Plasma Enhanced Atomic Layer Deposition of Scandium Nitride, **Mark Sowa**, Veeco Instruments Inc.; **M. Chowdhury**, Lehigh University; **A. Kozen**, University of Maryland; **N. Strandwitz**, Lehigh University

AF-MoP-22 Effects of Silicon Surface Termination on the Initial Stages of TiO₂ Deposition by ALD, **Tyler Parke**, **A. Teplyakov**, University of Delaware

AF-MoP-24 Deposition Characteristics Evaluation of New In Precursor for IGZO TFT, **Yong Hee Kwone**, **S. Jeon**, **S. Lee**, **T. Byun**, **Y. Im**, **S. Lee**, DNF Co. LTD., Republic of Korea

AF-MoP-25 Growth Mechanism of Ge-Sb-Te Thin Films by Supercycles of ALD GeTe and Sb₂Te₃, **Okhyeon Kim**, **Y. Kim**, Sejong University, Republic of Korea; **H. Kim**, sejong University, Republic of Korea; **C. Park**, **D. Ahn**, **B. Kuh**, Samsung Electronics Co., Ltd., Republic of Korea; **W. Lee**, Sejong University, Republic of Korea

AF-MoP-27 Atomistic Study of Amorphous Si-O-X Networks for Plasma Enhanced Atomic Layer Deposition-Produced SiO₂ Films: Illuminating the Structure-Composition-Mechanical and Electrical Property Connections, **A. Dervov**, University of Minnesota, USA; **P. Agarwal**, **R. Kumar**, Lam Research Corporation; **Traian Dumitrica**, University of Minnesota, USA

AF-MoP-28 Surface Modification of 2,6 Diamino-Pyrazine-1-Oxide by Atomic Layer Deposition of Al₂O₃, **John Miller**, **R. Reeves**, Lawrence Livermore National Laboratory

AF-MoP-29 Precise Interface Engineering for High Thermoelectric Performance in CuNi Alloys Using Powder ALD, **S. He**, Leibniz Institute for Solid State and Materials Research, Germany; **A. Bahrami**, Helmholtzstraße 20, Germany; **S. Lehmann**, **Kornelius Nielsch**, Leibniz Institute for Solid State and Materials Research, Germany

AF-MoP-30 High-Throughput SiO₂ PEALD Using a Novel Si Precursor, **Jin Sik Kim**, **B. Kim**, **J. Choi**, **W. Koh**, UP Chemical Co., Ltd., Republic of Korea

AF-MoP-31 Oxidation Mechanism of Atomic Layer Deposition of HfO₂ Using O₃, **Soo Hyun Lee**, **B. Shong**, Hongik University, Republic of Korea

AF-MoP-32 Eggshell-Type Catalysts by Atomic Layer Deposition: Distribution of Zinc Oxide Within Mesoporous Alumina Spheres, **Jihong Yim**, Aalto University, Finland; **N. Heikkinen**, VTT Technical Research Centre of Finland; **E. Haimi**, **C. Gonsalves**, **A. Chahal**, **J. Velasco**, **R. Karinen**, Aalto University, Finland; **J. Lehtonen**, VTT Technical Research Centre of Finland; **R. Puurunen**, Aalto University, Finland

AF-MoP-33 Numerical Simulation of Surface Reactions During Plasma-Enhanced Atomic-Layer Deposition (PE-ALD) of Silicon Nitride (SiN), *J. Tercero*, Osaka University, Japan; *M. Krstić*, Karlsruhe Institute of Technology (KIT), Germany; *A. Jaber*, *E. Tinacba*, *N. Mauchamp*, *M. Isobe*, *T. Ito*, *K. Karahashi*, **Satoshi Hamaguchi**, Osaka University, Japan

AF-MoP-34 Effect of Precursor Temperature of 1,4-Phenylene Diisocyanate (PPDI) on the Growth Rate of Polyurea Using Molecular Layer Deposition (MLD), **Jae Seok Lee**, *S. Song*, *B. Choi*, Korea University, Republic of Korea

AF-MoP-35 Multicomponent RuTiO_x Thin Films through Atomic Layer Modulation, *N. L. Trinh*, *C. Nguyen*, *B. Gu*, *H. Lee*, **Mingyu Lee**, Incheon National University, Republic of Korea

AF-MoP-36 Fine-Tuning of Low Surface Energy Substrate Functionality to Lower the Nucleation Delay Inherent for ALD of Noble Metals, *S. Thalluri*, *R. Zazpe*, *J. Rodriguez-Pereira*, *H. Sopa*, **Jan Macak**, University of Pardubice, Czechia

AF-MoP-37 Growth Behaviors and Structural Characterization of PEALD In₂O₃ thin films using Amide-based and Alkyl-Based Novel Indium Precursors, **Gyeong Min Jeong**, *Y. Kim*, *H. Yang*, Hanyang University, Republic of Korea; *M. Kim*, *S. Lee*, *Y. Kwone*, *S. Jeon*, *Y. Im*, DNF, Republic of Korea; *J. Park*, Hanyang University, Republic of Korea

AF-MoP-38 Evaluation of a Zr Precursor and Hf Precursor with Higher Thermal Stability for the Atomic Layer Deposition of ZrO₂ and HfO₂ Films, **Randall Higuchi**, EMD Electronics; *R. Waldman*, *P. Arab*, *C. Chen*, *D. Lee*, EMD Electronics, USA

AF-MoP-39 Hybrid PEALD/PEVCD Reactor Design for Depositing Thick GaN Films on Si, **Biral Kuyel**, *A. Alphonse*, *J. Marshall*, NANO-MASTER, Inc.

AF-MoP-41 ALD Infilling of Macroscopic Nanoporous Solids: Expanding Beyond Al₂O₃, **Benjamin Greenberg**, *K. Anderson*, *A. Jacobs*, *J. Wollmershauser*, *B. Feigelson*, U.S. Naval Research Laboratory

AF-MoP-42 Properties of VHF PEALD Silicon Nitride Film Deposited by Precursors with Different Amino Ligands, **Seung Yup Choi**, *Y. Ji*, *H. Kim*, *J. Kang*, Sungkyunkwan University, Republic of Korea; *A. Ellingboe*, Dublin City University, Ireland; *H. Chandra*, EMD Electronics; *C. Lee*, EMD Electronics, Republic of Korea; *G. Yeom*, sungkyunkwan University, Republic of Korea

AF-MoP-43 Influence of Metal Precursors on the Low-Temperature Crystalline Vanadium Oxide Synthesis Using Oxygen Plasmas, *A. Mohammad*, *K. Joshi*, *D. Rana*, *S. Ilhom*, *B. Wells*, *B. Sinkovic*, University of Connecticut; *A. Okyay*, Stanford University; **Necmi Biyikli**, University of Connecticut

AF-MoP-47 Characterizing TEMAZ and TBTEMT for ALD, **Marjorie Sarad**, *J. Daubert*, *K. Cheatham*, *T. Adam*, *J. Kelliher*, Northrop Grumman

AF-MoP-48 ALD Film Closure and Thickness by Low Energy Ion Scattering, *R. ter Veen*, **Karsten Lamann**, *M. Fartmann*, *B. Hagenhoff*, Tascon, Germany

AF-MoP-49 Development of HF-Free YF₃ ALD Process and Its Dry Etch Resistance, **Sunao Kamimura**, *T. Teramoto*, Air Liquide Laboratories, Japan; *T. Ono*, Air Liquide Advanced Materials; *C. Dussarrat*, Air Liquide Laboratories, Japan; *N. Blasco*, Air Liquide Advanced Materials, France; *N. Gosset*, Air Liquide Laboratories, Japan; *G. Nikiforov*, Air Liquide Advanced Materials

AF-MoP-50 Role of Ga Doping in IZO Films Grown by Atomic Layer Deposition, **Ae-Rim Choi**, *I. Oh*, *Y. Jeong*, *D. Lim*, Ajou University, Republic of Korea; *S. Kim*, *S. Ryu*, *D. Kim*, SK Hynix, Korea

AF-MoP-51 The Effects of in-situ Atomic Layer Annealing on Thermal Atomic Layer Deposited Silicon Nitride, *D. Le*, *S. Hwang*, *J. Kim*, University of Texas at Dallas; *J. Spiegelman*, RASIRC; *J. Kim*, University of Texas at Dallas; *M. Benham*, RASIRC; **Si-Un Song**, University of Texas at Dallas; *R. Choi*, Inha University, Republic of Korea

AF-MoP-52 Low Toxicity Electron Transport Layer of Atomic Layer Deposited TiO₂ and SnO₂ for Sb₂S₃ Thin Film Solar Cells, *Y. Kim*, *P. Pawar*, **Jaeyoung Heo**, Chonnam National University, Republic of Korea

AF-MoP-53 Growth and Crystallization of Conductive SrRuO₃ Films by Atomic Layer Deposition Depending on the Substrates, **Youngsin Kim**, *C. Hwang*, Seoul National University, South Korea

AF-MoP-54 In-Situ Gas Monitoring of ALD Processes Using Remote Optical Emission Spectroscopy, **Nessima Kaabeche**, Gencoa, UK; *C. Guerra*, Swiss Cluster, Switzerland; *J. Brindley*, *D. Monaghan*, Gencoa, UK

AF-MoP-55 The Application of Rare-Earth Metals as ALD Precursors, **Yu-Chieh Pao**, Industrial Technology Research Institute, Taiwan; *B. Lee*, Industrial Technology Research Institute, Taiwan

AF-MoP-57 Characterization of SnOx Thin Films Deposited by Atomic Layer Deposition, **Taekjib Choi**, *S. Lee*, *J. Yun*, Sejong University, Republic of Korea; *I. Choi*, *B. Cho*, *J. Yang*, TES Co., Ltd., Republic of Korea

AF-MoP-58 Laser Diagnostics of Plasma Surface Interactions, **Mruthunjaya Uddi**, Advanced Cooling Technologies; *A. Dogariu*, Texas A&M University; *E. Kudlanov*, Advanced Cooling Technologies; *G. Urdaneta*, Texas A&M University; *Y. Xiao*, *D. Jensen*, *C. Chen*, Advanced Cooling Technologies

AF-MoP-59 Density-Functional Theory Modeling for Thermal Atomic Layer Etching of Cobalt with Hexafluoroacetylacetone Chelation, *S. Chae*, **Sangheon Lee**, Ewha Womans University, Republic of Korea

AF-MoP-60 Study on Phase and Chemical Bonding of Molybdenum Film Grown by Atomic Layer Deposition, **So Young Kim**, *C. Jo*, *H. Shin*, Yonsei University, Republic of Korea; *M. Cheon*, *K. Lee*, *D. Seo*, *J. Choi*, Hanwha Corporation, Republic of Korea; *H. Park*, BIO-IT Micro Fab Center, Republic of Korea; *D. Ko*, Yonsei University, Republic of Korea

AF-MoP-61 Area-Selective Atomic Layer Deposition of Silicon Nitride for NAND Flash Memory with a Very High-Frequency Plasma Source, **Min-Jeong Rhee**, Ajou University, Republic of Korea; *W. Lee*, Pukyong National University, Republic of Korea; *I. Oh*, Ajou University, Republic of Korea; *G. Yoo*, Soongsil University, Seoul, Republic of Korea; *J. Heo*, Ajou University, Suwon, Republic of Korea

Emerging Materials

Room Evergreen Ballroom & Foyer - Session EM-MoP Emerging Materials Poster Session, 5:45 – 7:00 pm

EM-MoP-1 Conformal ALD of Ferromagnetic ε-Fe₂O₃ Thin Films, *T. Jussila*, Aalto University, Finland; **Anish Phillip**, *J. Kinnunen*, *M. Utraiainen*, Chipmetrics Oy, Finland; *M. Karppinen*, Aalto University, Finland

EM-MoP-3 In-situ FTIR Analysis of Molecular Atomic Layer Deposited Hybrid Thin Films for EUV Resist Applications, **Dan Le**, *S. Hwang*, *J. Veyan*, *T. Park*, *J. Kim*, University of Texas at Dallas; *R. Choi*, Inha University, Republic of Korea; *W. Lee*, *A. Subramanian*, Stony Brook University; *N. Tiwale*, *C. Nam*, Brookhaven National Laboratory; *J. Kim*, University of Texas at Dallas

EM-MoP-4 Exploring the Benefits of Reduced Cycle Time in Molecular Layer Deposition (MLD) of Metal-linked 7-(trioxysilyl)heptanoate (M-TOSH), **Jesse Kalliomäki**, *J. Binte Mariam*, *R. Ritasalo*, *T. Sarnet*, Applied Materials, Finland

EM-MoP-5 Low-Temperature Atomic Layer Annealing Deposition of Crystallized Gallium Nitride on Oxide-Free Si (111), **SeongUk Yun**, *A. Kummel*, *P. Lee*, *A. McLeod*, *J. Fammels*, *J. Watson*, *H. Kashyap*, University of California at San Diego; *J. Spiegelman*, RASIRC; *W. Aigner*, *T. Metzger*, Qualcomm Germany RFFE GmbH, Germany

EM-MoP-6 Vapor Deposited MOFs as Low-K Dielectrics for Logic and RF, *J. Watson*, **Dohyun Go**, *A. Kummel*, UCSD

EM-MoP-8 Towards Sequentially Infiltrated Two-Photon Polymerized 3d Photonic Crystals for Mid-IR Spectroscopic Applications, *A. Singhal*, University of Illinois - Chicago; **Ralu Divan**, Argonne National Laboratory; *A. Dalmiya*, *P. Lynch*, University of Illinois - Chicago; *L. Stan*, Argonne National Laboratory; *I. Paprotny*, University of Illinois - Chicago

Tuesday Morning, July 25, 2023

Room Grand Ballroom A-C	
8:00am	INVITED: ALD+ALE-TuM-1 Intensified Atomic Layer Deposition and Atomic Layer Etching, <i>Greg Parsons</i> , North Carolina State University
8:15am	
8:30am	ALD+ALE-TuM-3 Mass Changes During and After Al(CH ₃) ₃ Exposures for Thermal Al ₂ O ₃ ALE at Low Temperatures Using HF and Al(CH ₃) ₃ as Reactants, <i>Andrew S. Cavanagh, S. George</i> , University of Colorado at Boulder
8:45am	ALD+ALE-TuM-4 Crystallinity of Sacrificial Etch Layer Influences Resulting Structure During Simultaneous Deposition and Etching, <i>Hannah R. M. Margavio, L. Keller</i> , North Carolina State University; <i>N. Arellano, R. Wojtecki</i> , IBM Almaden Research Center; <i>G. Parsons</i> , North Carolina State University
9:00am	INVITED: ALD+ALE-TuM-5 There's no Place like a Surface: How Deposition and Etch Chemistry Depend on the Nature of the Surface, <i>Michael Nolan</i> , Tyndall National Institute, University College Cork, Ireland
9:15am	
9:30am	ALD+ALE-TuM-7 Substrate Dependent HfO ₂ Atomic Layer Etch Rate Evolution Observed by In-situ Quartz Crystal Microbalance during Integrated ALD+ALE, <i>Landon Keller, G. Parsons</i> , North Carolina State University
9:45am	ALD+ALE-TuM-8 Al Mirror Passivation with Atomic Layer Etching of Native Oxide and in-Situ Passivation with Atomic Layer Deposition of AlF ₃ or MgF ₂ , <i>Hoon Kim, J. Du, J. Wang, D. Allen, E. Pierce, M. Huang, N. Borgharkar, K. Woo</i> , Corning Research and Development Corporation
10:00am	BREAK & EXHIBITS
10:15am	
10:30am	
10:45am	
11:00am	
11:15am	ALE-TuM-14 Plasma Oxidation of Copper: Molecular Dynamics Study with Neural Network Potentials, <i>Yantao Xia</i> , University of California at Los Angeles; <i>S. Philippe</i> , University of California, Los Angeles
11:30am	ALE-TuM-15 Multi-scale Simulation Study for the Role of High C/F ratio Plasma on Etch Selectivity of SiO ₂ and Si ₃ N ₄ in q-ALE, <i>Hojin Kim, D. Zhang, T. Hisamatsu, A. Ko</i> , TEL Technology Center, America, LLC, USA
11:45am	ALE-TuM-16 Selecting a Method for ALE Modeling, <i>Y. Barsukov, S. Jubin, S. Ethier, Igor Kaganovich</i> , Princeton University Plasma Physics Lab

ALD & ALE
Session ALD+ALE-TuM
ALD/ALE Session
Moderators:
Steven M. George, University of Colorado at Boulder,
Anil Mane, Argonne National Laboratory

Atomic Layer Etching
Session ALE-TuM
Modeling of ALE
Moderators:
Michael Nolan, University College Cork, Ireland,
Thomas Tillocher, GREMI CNRS/Orleans University, France

Tuesday Morning, July 25, 2023

Room Grand Ballroom E-G	
8:00am	INVITED: AF1-TuM-1 Precursor Design Enabling Angstrom Era Semiconductor Manufacturing, <i>Charles Mokhtarzadeh, E. Mattson, S. Lee, S. Clendenning, P. Theofanis</i> , Intel Corporation
8:15am	
8:30am	AF1-TuM-3 Atomic Layer Deposition of Silver Halides, <i>Georgi Popov, T. Hatanpää, A. Weiß, M. Chundak, M. Ritala, M. Kemell</i> , University of Helsinki, Finland
8:45am	AF1-TuM-4 Novel Metal Fluoride ALD Processes, <i>Elisa Atosuo, M. Mäntymäki, M. Heikkilä, K. Mizohata, M. Leskelä, M. Ritala</i> , University of Helsinki, Finland
9:00am	AF1-TuM-5 Halide-free, Low Melting, Volatile, Thermally Stable Mo(O) Precursors for ALD of Mo films, <i>C. K. Barik, A. Leoncini</i> , Applied Materials – National University of Singapore Corporate Lab, Singapore; <i>F. Liu</i> , Applied Materials, Inc.; <i>J. Tang, J. Sudijono</i> , Applied Materials – National University of Singapore Corporate Lab, Singapore; <i>M. Saly</i> , Applied Materials, Inc., Chandan Das , Applied Materials Inc., Singapore
9:15am	AF1-TuM-6 Thermal Atomic Layer Deposition of MoC Thin Films, <i>Paloma Ruiz Kärkkäinen, T. Hatanpää, M. Heikkilä, K. Mizohata, M. Chundak, M. Putkonen, M. Ritala</i> , University of Helsinki, Finland
9:30am	AF1-TuM-7 Precursors and Processes for the Atomic Layer Deposition of Bismuth Metal Thin Films, <i>Daniel Beh</i> , Wayne State University; <i>Z. Devereaux, T. Knisley</i> , Applied Materials; <i>C. Winter</i> , Wayne State University
9:45am	AF1-TuM-8 Atomic Layer Deposition of Tin Oxide Thin Films Using a New Liquid Precursor Bis(ethylcyclopentadienyl) Tin, <i>Makoto Mizui, N. Takahashi, F. Mizutani</i> , Kojundo Chemical Laboratory Co., Ltd., Japan; <i>T. Nabatame</i> , National Institute for Materials Science, Japan
10:00am	BREAK & EXHIBITS
10:15am	
10:30am	
10:45am	
11:00am	AF2-TuM-13 Influence of Plasma Species on the Growth Kinetics, Morphology, and Crystalline Properties of Epitaxial InN Films Grown by Plasma-Enhanced Atomic Layer Deposition, <i>Jeffrey Woodward, D. Boris</i> , U.S. Naval Research Laboratory; <i>M. Johnson</i> , Huntington Ingalls Industries; <i>S. Walton, J. Hite, M. Mastro</i> , U.S. Naval Research Laboratory
11:15am	AF2-TuM-14 Towards Self-Limiting III-Nitride Epitaxy via Hollow-Cathode Nitrogen Plasmas, <i>N. Ibrahimli, S. Ilhom, A. Mohammad, J. Grasso, B. Willis</i> , University of Connecticut; <i>A. Okyay</i> , Stanford University; <i>Necmi Biyikli</i> , University of Connecticut
11:30am	AF2-TuM-15 Thermal Atomic Layer Deposition of Gallium Nitride at 150 - 300°C using Tris(dimethylamido)gallium Precursor and Hydrazine, <i>Adam Bertuch</i> , Veeco Instruments; <i>J. Casamento, J. Maria</i> , Pennsylvania State University
11:45am	AF2-TuM-16 Crystalline Gallium Nitride Deposition on SiO ₂ /Si by RF-Biased Atomic Layer Annealing, <i>Ping-che Lee, A. Mcleod</i> , Univ. of Cal., San Diego; <i>S. Ueda</i> , Materials Science and Engineering Program, Univ. of Cal., San Diego; <i>J. Spiegelman</i> , Rasirc; <i>R. Kanjolia, M. Moinpou</i> , EMD Electronics; <i>A. Kummel</i> , Department of Chemistry and Biochemistry, Univ. of Cal., San Diego

**ALD Fundamentals
Session AF1-TuM
Precursors and Processes I
Moderator:
Charles H. Winter, Wayne State University**

**ALD Fundamentals
Session AF2-TuM
Precursors and Processes II
Moderators:
Paul Poodt, Holst Centre / TNO, Netherlands,
Paul J. Ragogna, University of Western Ontario, Canada**

Tuesday Morning, July 25, 2023

Room Grand Ballroom H-K	
8:00am	INVITED: AA1-TuM-1 Nanoscale Surface Engineering for Battery Electrode and Solid Ionic Electrolytes, <i>Chunmei Ban</i> , CU Boulder
8:15am	
8:30am	AA1-TuM-3 Enabling Fast Charging of Lithium-ion Batteries by Coating of Graphite with ALD, <i>E. Kazyak, K. Chen, Y. Chen, T. Cho, Neil P. Dasgupta</i> , University of Michigan, Ann Arbor
8:45am	AA1-TuM-4 Aluminum Doping of Lithium Phosphate using Atomic Layer Deposition, <i>Daniela Fontecha, K. Gregorczyk, A. Kozen, G. Rubloff</i> , University of Maryland, College Park
9:00am	AA1-TuM-5 Developing High-Performance Nickel-Rich Cathodes of Lithium-ion Batteries via Atomic Layer Deposition, <i>Xiangbo Meng, X. Wang, K. Velasquez Carballo, A. Shao</i> , University of Arkansas; <i>Y. Liu, H. Zhou</i> , Argonne National Laboratory; <i>X. Xiao</i> , Brookhaven National Laboratory
9:15am	AA1-TuM-6 Molecular-Layer-Deposited Zincone Films Induce the Formation of LiF-Rich Interphase for Lithium Metal Anodes, <i>Wei-Min Li</i> , Jiangsu Leadmicro Nano-Technology Co., Ltd., China; <i>S. Chang, A. Li</i> , Nanjing University, China
9:30am	AA1-TuM-7 Deconvoluting the Impacts of Lithium Morphology and SEI Stability on Battery Cyclability Using ALD-Grown Thin Films, <i>Sanzeeda Baig Shuchi, S. Oyakhire, Y. Cui, S. Bent</i> , Stanford University
9:45am	
10:00am	BREAK & EXHIBITS
10:15am	
10:30am	
10:45am	INVITED: AA2-TuM-12 ALD for MEMS Sensors and Actuators, <i>Luca Lamagna</i> , STMicroelectronics, Italy
11:00am	
11:15am	AA2-TuM-14 Applications of Piezoelectric, Ferroelectric, and Antiferroelectric Thin Films Grown by Atomic Layer Deposition, <i>Nicholas Strnad</i> , DEVCOM Army Research Laboratory; <i>G. Fox</i> , Fox Materials Consulting, LLC; <i>T. Tharpe</i> , Oak Ridge Associated Universities; <i>R. Knight, R. Rudy, J. Pulskamp</i> , DEVCOM Army Research Laboratory
11:30am	AA2-TuM-15 Effect of RF Substrate Biasing in Tuning the Tribological Properties of Plasma Enhanced Atomic Layer Deposited Titanium Vanadium Nitride Thin Films, <i>Md Istiaque Chowdhury</i> , Lehigh University; <i>M. Sowa</i> , Veeco Instruments Inc.; <i>K. Van Meter</i> , Florida International University; <i>A. Kozen</i> , University of Maryland, College Park; <i>S. Lazarte, B. Krick</i> , Florida International University; <i>N. Strandwitz</i> , Lehigh University
11:45am	AA2-TuM-16 Towards ALD of hard AlTiN coatings, <i>Pamburayi Mpofu</i> , Linköping University, Sweden; <i>J. Lauridsen, O. Alm, T. Larsson</i> , Seco Tools AB, Sweden; <i>H. Högborg, H. Pedersen</i> , Linköping University, Sweden

ALD Applications Session AA1-TuM ALD for Batteries
Moderators:
Hyeontag Jeon, Hanyang University, Republic of Korea,
Markku Leskela, University of Helsinki, Finland

ALD Applications Session AA2-TuM MEMS, Actuators, Hard Films
Moderators:
Anjana Devi, Ruhr University Bochum, Germany,
Viljami Pore, ASM, Finland

Tuesday Morning, July 25, 2023

Room Regency Ballroom A-C		
8:00am	INVITED: AS1-TuM-1 Advances in the Industrial Adoption of Selective ALD Processes, <i>David Thompson</i> , Applied Materials, Inc.	Area Selective ALD Session AS1-TuM Surfaces and ASD Moderators: Jeffrey W. Elam , Argonne National Laboratory, Adrie Mackus , Eindhoven University, Netherlands
8:15am		
8:30am	AS1-TuM-3 Control of Silanol Density in Silicon Oxide Surfaces via Gas-Phase Treatments to Control Metal Atomic Layer Deposition, <i>Mohammed Alam</i> , University of California at Riverside; <i>F. Zaera</i> , University of California - Riverside	
8:45am	AS1-TuM-4 Inherently Area-Selective Atomic Layer Deposition of Device-Quality $\text{Hf}_{1-x}\text{Zr}_x\text{O}_2$ Thin Films through Catalytic Local Activation, <i>Hyo-Bae Kim</i> , <i>J. Lee</i> , <i>W. Kim</i> , <i>J. Ahn</i> , Hanyang University, Korea	
9:00am	AS1-TuM-5 Targeted Dehydration as a Route to Site-Selective Atomic Layer Deposition at TiO_2 Defects, <i>Jessica Jones</i> , <i>E. Kamphaus</i> , <i>A. Martinson</i> , Argonne National Laboratory	
9:15am	AS1-TuM-6 Inhibitor-Free Area Selective Atomic Layer Deposition based on Atomic Layer Nucleation Engineering and Surface Recovery with a Feature Size of Nearly 10 nm, <i>Yu-Tung Yin</i> , <i>C. Chou</i> , National Taiwan University, Taiwan; <i>W. Lee</i> , <i>C. Chuu</i> , TSMC, Taiwan; <i>C. Hou</i> , Academia Sinica, Taiwan; <i>T. Wang</i> , National Taiwan University, Taiwan; <i>J. Shyue</i> , Academia Sinica, Taiwan; <i>M. Chen</i> , National Taiwan University, Taiwan	
9:30am	AS1-TuM-7 Dopant-selective Choreography of Metal Deposition for Bottom-up Nanoelectronics, <i>Nishant Deshmukh</i> , <i>D. Aziz</i> , <i>A. Brummer</i> , <i>S. Kurup</i> , Georgia Institute of Technology, USA; <i>M. Filler</i> , Georgia Institute of Technology	
9:45am	AS1-TuM-8 Effect of Surface Pretreatment to reduce the Incubation Period of Iridium Thin Film grown by ALD on the Oxide Surface, <i>Myung-Jin Jung</i> , <i>J. Baek</i> , <i>S. Lee</i> , <i>S. Kwon</i> , Pusan National University, Republic of Korea	
10:00am	BREAK & EXHIBITS	
10:15am		
10:30am		
10:45am	AS2-TuM-12 Consequences of Random Sequential Adsorption of Inhibitor Molecules for Loss of Selectivity During ALD, <i>Joost Maas</i> , Eindhoven University of Technology, Netherlands; <i>I. Tezsevin</i> , Eindhoven University of Technology, Turkey; <i>M. Merkkx</i> , <i>E. Kessels</i> , Eindhoven University of Technology, Netherlands; <i>T. Sandoval</i> , Universidad Tecnica Federico Santa Maria, Chile; <i>A. Mackus</i> , Eindhoven University of Technology, Netherlands	Area Selective ALD Session AS2-TuM Inhibitors and ASD Moderator: Stacey Bent , Stanford University
11:00am	AS2-TuM-13 In-Situ Formation of Inhibitor Species Through Catalytic Surface Reactions During Area-Selective Tan ALD, <i>Marc Merkkx</i> , <i>T. Janssen</i> , <i>I. Tezsevin</i> , <i>R. Heinemans</i> , <i>R. Lengers</i> , <i>J.-R. Chen</i> , <i>C.J. Jezewski</i> , <i>S.B. Clendenning</i> , Intel; <i>E. Kessels</i> , Eindhoven University of Technology, Netherlands; <i>T. Sandoval</i> , Universidad Tecnica Federico Santa Maria, Chile; <i>A. Mackus</i> , Eindhoven University of Technology, Netherlands	
11:15am	AS2-TuM-14 Area Selective Atomic Layer Deposition of Ru and W Using W Precursor Inhibitor, <i>Mingyu Lee</i> , <i>T. Nguyen Chi</i> , <i>L. Trinh Ngoc</i> , <i>B. Gu</i> , <i>H. Lee</i> , Incheon National University, Republic of Korea	
11:30am	AS2-TuM-15 Partial Surface Passivation for Controlled Growth and Conformality Improvement on High Aspect Ratio Features Using Small Molecule Inhibitors, <i>Kok Chew Tan</i> , <i>C. Yeon</i> , Soulbrain, Republic of Korea; <i>J. Kim</i> , Hongik University, Republic of Korea; <i>J. Jung</i> , <i>S. Lee</i> , <i>T. Park</i> , <i>Y. Park</i> , Soulbrain, Republic of Korea; <i>B. Shong</i> , Hongik University, Republic of Korea	
11:45am	AS2-TuM-16 Fundamental Surface Chemistry Considerations for Selecting Small Molecule Inhibitors for AS-ALD, <i>A. Mamelí</i> , TNO Science and Industry, the Netherlands; <i>Andrew Teplyakov</i> , University of Delaware	

Tuesday Afternoon, July 25, 2023

Room Grand Ballroom A-C	
1:30pm	INVITED: ALE1-TuA-1 In-Situ Analysis of Surface Reactions on Thin Films in Plasma-Assisted Thermal-Cyclic Atomic Layer Etching, <i>Kazunori Shinoda, N. Miyoshi, H. Kobayashi</i> , Hitachi, Ltd., Japan; <i>M. Izawa</i> , Hitachi High-Tech Corp., Japan; <i>K. Ishikawa, M. Hori</i> , Nagoya University, Japan
1:45pm	
2:00pm	ALE1-TuA-3 Isotropic Atomic Layer Etching Process for HfO ₂ Film, <i>J.H. Kwon, C. Kim, Byung Chul Cho, J. Park, S. Park, J. Chun</i> , Semiconductor R&D Center, WONIK IPS Co., Ltd., Republic of Korea
2:15pm	ALE1-TuA-4 Thermal Atomic Layer Etching of CoO by an "Oxidation-Reduction" Mechanism Using Sequential Reactions of Ozone and Acetylacetone, Aziz Abdulagatov , <i>J. Partridge</i> , University of Colorado at Boulder; <i>V. Sharma</i> , ASM Microchemistry Ltd., Finland; <i>J. Murdzek, A. Cavanagh, S. George</i> , University of Colorado at Boulder
2:30pm	ALE1-TuA-5 Surface Modification with Neutral Gas Cluster Beams and Its Application to Atomic Layer Etching, Noriaki Toyoda , <i>H. Tanaka, M. Takeuchi</i> , University of Hyogo, Japan
2:45pm	ALE1-TuA-6 Development Plasma-Based Atomic Layer Etching of Zinc Oxide by Using Tetrafluoromethane Plasma and Dimethylaluminum Chloride, Chien-Wei Chen , <i>C. Chang</i> , Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan; <i>Y. Jhang</i> , Taiwan Instrument Research Institute, National Applied Research Laboratories, Hsinchu, Taiwan
3:00pm	INVITED: ALE1-TuA-7 Resistive Capillary Array Calorimetry Method for ALD and ALE Processes, Anil Mane , <i>J. Elam</i> , Argonne National Laboratory, USA
3:15pm	
3:30pm	BREAK & EXHIBITS
3:45pm	
4:00pm	INVITED: ALE2-TuA-11 Atomic Layer Etching at Cryogenic Temperature, Thomas Tillocher , <i>G. Antoun, J. Nos</i> , GREMI CNRS/Orleans University, France; <i>C. Cardinaud, A. Girard</i> , IMN CNRS/Nantes University, France; <i>P. Lefaucheux, R. Dussart</i> , GREMI CNRS/Orleans University, France
4:15pm	
4:30pm	ALE2-TuA-13 SiO ₂ ALE based on High Boiling Point Fluorocarbon Physisorption, Dain Sung , <i>G. Yeom, H. Tak, D. Kim</i> , Sungkyunkwan University, Republic of Korea
4:45pm	ALE2-TuA-14 Cryogenically Cooled, Saturating Quasi-ALE of Silicon Nitride, Frank Greer , <i>D. Shanks, R. Ahmed, J. Femi-Oyetoro, A. Beyer</i> , Jet Propulsion Laboratory (NASA/JPL)
5:00pm	INVITED: ALE2-TuA-15 High Throughput SiN ALE and Its Damage Control, Akiko Hirata , Sony Semiconductor Solutions Corporation, Japan
5:15pm	
5:30pm	ALE2-TuA-17 The Atomic Layer Etching Database: A Valuable Crowd-Sourced Platform for the Community, <i>N. Chittock, A. Mackus, H. Knoops, B. Macco, Erwin Kessels</i> , Eindhoven University of Technology, The Netherlands

**Atomic Layer Etching
Session ALE1-TuA
Plasma and Energy-Enhanced ALE
Moderators:
Paul Abel**, Tokyo Electron America, Inc.,

**Atomic Layer Etching
Session ALE2-TuA
Low-Temperature and SiN ALE
Moderators:
Kazunori Shinoda**, Hitachi, Ltd., Japan

Tuesday Afternoon, July 25, 2023

Room Grand Ballroom E-G	
1:30pm	AF1-TuA-1 Plasma Enhanced Atomic Layer Deposition of Silicon Carbonitride, <i>S. Johnson, T. Yang</i> , University of Texas at Austin; <i>J. Zhao, T. Iwao, C. Schlechte, J. Carroll, G. Blankemeyer, P. Ventzek</i> , Tokyo Electron America Inc.; <i>J. Resasco, G. Hwang, John Ekerdt</i> , University of Texas at Austin
1:45pm	AF1-TuA-2 Boron-Carbon Thin Films Deposited via PE-ALD, <i>Neil Richard Innis, C. Marichy, C. Bousige, C. Journet</i> , Laboratoire des Multimatériaux et Interfaces, UMR CNRS 5615, France
2:00pm	AF1-TuA-3 SiO ₂ Electron-Enhanced Atomic Layer Deposition (EE-ALD) at Low Temperature Using Disilane and Ozone or Water as Reactants, <i>J. Gertsch, Z. Sobell, A. Cavanagh</i> , University of Colorado Boulder; <i>H. Simka</i> , Samsung Semiconductor, Inc.; Steven George , University of Colorado Boulder
2:15pm	AF1-TuA-4 ALD of Transition Metal Chalcogenide TaS _x Using TBDDMT Precursor and H ₂ S Plasma, <i>Sanne Deijkers, H. Thepass</i> , Eindhoven University of Technology, The Netherlands; <i>H. Sprey, J. Maes</i> , ASM Belgium; <i>E. Kessels, A. Mackus</i> , Eindhoven University of Technology, The Netherlands
2:30pm	AF1-TuA-5 High Deposition Rate NbN and TiN for Superconducting Resonators for Quantum Devices by PEALD, <i>Louise Bailey, D. Besprozvanny</i> , Oxford Instruments Plasma Technology, UK; <i>R. Renzas</i> , Oxford Instruments Plasma Technology; <i>H. Knoops</i> , Oxford Instruments Plasma Technology, Netherlands; <i>M. Powell</i> , Oxford Instruments Plasma Technology, UK
2:45pm	AF1-TuA-6 Black TiO ₂ Synthesized using Plasma-Enhanced Atomic Layer Deposition (PEALD), <i>S. Berriel, Terrick McNealy-James, B. Butkus, T. Currie, C. Chen, L. Shultz, C. Feit, K. Davis, T. Jurca, P. Banerjee</i> , University of Central Florida
3:00pm	AF1-TuA-7 Optimizing for the Neutral Radicals in Plasma Enhanced ALD, Lauren Otto , Laminera
3:15pm	
3:30pm	BREAK & EXHIBITS
3:45pm	
4:00pm	AF2-TuA-11 Electron-Enhanced ALD and CVD at Low Temperature Using Reactive Background Gas, <i>Z. Sobell, S. George, Andrew S. Cavanagh</i> , University of Colorado at Boulder
4:15pm	AF2-TuA-12 ALD of Multicomponent Films Using Precursor Co-Dosing, Paul Poedt , Eindhoven University of Technology, The Netherlands
4:30pm	AF2-TuA-13 Controlling the Nucleation and Growth in Atomic Layer Deposition of Ruthenium: The Role of Surface Diffusion, Amnon Rothman , <i>A. Werbrouck, S. Bent</i> , Stanford University
4:45pm	AF2-TuA-14 Combining Atomic Layer Deposition Routes and Solvothermal Conversion: Towards Access to Layer Stacking of Porphyrin-Based Mofs, <i>B. Gikonyo, Catherine Marichy, S. Forel, A. Fateeva</i> , Laboratoire des Multimatériaux et Interfaces, CNRS/Université Claude Bernard Lyon 1, France
5:00pm	AF2-TuA-15 Crystal Phase Transition of Atomic Layer Deposited Antimony Telluride Thin Films with Thickness and Substrate-Dependent Orientations, Sangyoon Lee , <i>J. Seo, I. Sohn</i> , Yonsei University, Korea; <i>Y. Kang, C. Lee, W. Yang</i> , Samsung Advanced Institute of Technology, Republic of Korea; <i>S. Chung, H. Kim</i> , Yonsei University, Korea
5:15pm	AF2-TuA-16 Molecular Layer Deposition as a Strategy to Direct Polymer Adsorption and Crystallization, Maurice Brogly , <i>S. Bistac, D. Bindel</i> , Université de Haute Alsace, France
5:30pm	AF2-TuA-17 Optical Monitoring of MoCl ₅ Delivery for Atomic Layer Deposition Applications, Berc Kalanyan , <i>E. Jahrman, J. Maslar</i> , National Institute of Standards and Technology

ALD Fundamentals

Session AF1-TuA

Plasma ALD I

Moderators:

Erwin Kessels, Eindhoven University of Technology, Netherlands,

Christophe Vallee, SUNY POLY, Albany

ALD Fundamentals

Session AF2-TuA

Novel ALD Processing

Moderators:

Agnieszka Kurek, Oxford Instruments Plasma Technology, Netherlands,

Matthias Minjauw, Ghent University, Belgium

Tuesday Afternoon, July 25, 2023

Room Grand Ballroom H-K			
1:30pm	AA1-TuA-1 Surface Texture Design of Pt/C Catalyst to Enhance Oxygen Reduction Reaction by FBR-ALD, <i>J.-H. Baek, M. Jung, S. Lee, S. Kwon, MinJi Kim</i> , Pusan National University, Republic of Korea	ALD Applications Session AA1-TuA Energy: Catalysis and Fuel Cells Moderators: Chang-Yong Nam , Brookhaven National Laboratory,	
1:45pm	AA1-TuA-2 Stabilization of ALD-grown Iridium Species for the OER Activity, <i>Muhammad Hamid Raza</i> , Humboldt-Universität zu Berlin, 2-Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (HZB), Germany; <i>M. Frisch, R. Kraehnert</i> , Department of Chemistry, Technische Universität Berlin, Germany; <i>N. Pinna</i> , Institut für Chemie and IRIS Adlershof, Humboldt-Universität zu Berlin, Germany		
2:00pm	AA1-TuA-3 Atomic Layer Deposited Nickel Sulfide as a (Pre)Catalyst for Oxygen Evolution Reaction, <i>Miika Mattinen, T. Hatanpää, K. Mizohata</i> , University of Helsinki, Finland; <i>S. Bent</i> , Stanford University; <i>M. Ritala</i> , University of Helsinki, Finland		
2:15pm	AA1-TuA-4 Novel Phosphite Doping into ALD SiO ₂ to Improve H ⁺ and H ₂ Permeability in Water Electrolyzers, <i>Sara Harris, M. Weimer</i> , Forge Nano; <i>K. Yim, L. Cohen, D. Esposito</i> , Colombia University; <i>A. Dameron</i> , Forge Nano		
2:30pm	AA1-TuA-5 Atomic Layer Deposition of Copper Catalysts for Electrochemical Recycling of Carbon Dioxide, <i>J.D. Lenef, S. Lee, K. Fuelling, K. Rivera Cruz</i> , University of Michigan, Ann Arbor; <i>A. Prajapati, C. Hahn</i> , Lawrence Livermore National Laboratory; <i>C. McCrory, Neil Dasgupta</i> , University of Michigan, Ann Arbor		
2:45pm	AA1-TuA-6 Stability of Molecular Layer Deposited (MLD) Alucone in Acetonitrile for Photoelectrochemical CO ₂ Reduction Applications, <i>Hyuenwoo Yang</i> , North Carolina State University, Republic of Korea; <i>H. Margavio, L. Keller, G. Parsons</i> , North Carolina State University		
3:00pm	AA1-TuA-7 Enhanced Green Hydrogen Production Using ALD-based Catalysts for Ammonia Decomposition, <i>Yu-Jin Lee, H. Sohn, H. Jeong, S. Nam</i> , Korea Institute of Science and Technology (KIST), Republic of Korea; <i>J. Park</i> , Seoul National University, Republic of Korea; <i>Y. Kim</i> , Korea Institute of Science and Technology (KIST), Republic of Korea		
3:15pm	AA1-TuA-8 Atomic Layer Deposited Silver Catalysts for Anion Exchange Membrane Fuel Cells, <i>Gwon Deok Han, H. Han, F. Prinz</i> , Stanford University; <i>J. Shim</i> , Korea University, Republic of Korea		
3:30pm	BREAK & EXHIBITS		
3:45pm			
4:00pm	INVITED: AA2-TuA-11 Unfolding the Challenges to Prepare Epitaxial Complex Oxide Membranes by Chemical Methods, <i>Mariona Coll, P. Salles</i> , ICMAB-CSIC, Spain	ALD Applications Session AA2-TuA Emerging Materials Moderators: Joel Molina Reyes , Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE), Mexico, Tero Pilvi , Picosun Oy, Finland	
4:15pm			
4:30pm	AA2-TuA-13 Tailoring Lattice Match by Cation Substitution in a Functional Ternary Oxide, <i>M. Rogowska, L. Rykkje, Henrik Sønsteby</i> , University of Oslo, Norway		
4:45pm	AA2-TuA-14 <i>In situ</i> Atomic Layer Doping of Epitaxially Grown β-Ga ₂ O ₃ Films via Plasma-enhanced ALD at 240 °C, <i>S. Ilhom</i> , University of Connecticut; <i>A. Mohammad, N. Ibrahimli, J. Grasso, B. Willis</i> , University of Connecticut; <i>Ali Okyay</i> , Stanford University; <i>N. Biyikli</i> , University of Connecticut		
5:00pm	AA2-TuA-15 Plasma Enhanced Atomic Layer Deposition of Niobium Nitride for Scalable Quantum Device Fabrication, <i>Yi Shu</i> , Oxford Instruments Plasma Technology, UK; <i>C. Lennon</i> , University of Glasgow, UK; <i>Z. Ren</i> , Oxford Instruments Plasma Technology, UK; <i>H. Knoops</i> , Oxford Instruments Plasma Technology, UK, Eindhoven University of Technology, Netherlands; <i>F. Morini, A. Kurek, T. Hemakumara</i> , Oxford Instruments Plasma Technology, UK; <i>R. Hadfield</i> , University of Glasgow, UK		
5:15pm	AA2-TuA-16 Superconducting NbN Thin Films Deposited by Plasma Enhanced Atomic Layer Deposition, <i>Jakob Zessin</i> , SENTECH Instruments GmbH, Germany; <i>M. Hage, T. Reindl, L. Freund</i> , SF Nanostructuring Lab, Max Planck Institute for Solid State Research, Germany; <i>P. Plate</i> , SENTECH Instruments GmbH, Germany; <i>J. Weis</i> , SF Nanostructuring Lab, Max Planck Institute for Solid State Research, Germany		
5:30pm	AA2-TuA-17 Work-Function Modulation using Atomic Layer Deposited TaN and Ternary TaAlN Metal Gate, <i>Moonsuk Choi, B. Ku, S. Kim, C. Chung, C. Choi</i> , Hanyang University, Republic of Korea		

Tuesday Afternoon, July 25, 2023

Room Regency Ballroom A-C		
1:30pm	AS1-TuA-1 The Role of Co-Reactant Reactivity and Surface Passivation During Cu-Doping of NiO ALD, Matthias Minjauw , Ghent University, Belgium; <i>B. Vermeulen</i> , Ferroelectric Memory Company, Germany; <i>A. Illiberi</i> , ASM, Belgium; <i>V. Sharma</i> , ASM Microchemistry Ltd., Finland; <i>M. Givens</i> , ASM, Belgium; <i>J. Dendooven</i> , <i>C. Detavernier</i> , Ghent University, Belgium	Area Selective ALD Session AS1-TuA Polymers Moderator: Han-Bo-Ram Lee , Incheon National University, Republic of Korea
1:45pm	AS1-TuA-2 Elucidating the Role of Functional Groups of Ligands for Selective Metal Blocking via Vapor-Phase Sam Deposition, Chandan Das , Applied Materials Inc., Singapore; <i>B. Bhuyan</i> , Applied Materials Inc.; <i>Z. Li, J. Wu</i> , National University of Singapore; <i>J. Sudijono</i> , Applied Materials Inc., Singapore; <i>M. Saly</i> , Applied Materials Inc.	
2:00pm	AS1-TuA-3 Integrating Area-Selective Ald with Electrohydrodynamic-Jet Printing to Enable Additive Nanomanufacturing, Tae Cho , <i>N. Farjam, T. Newsom, C. Allemang, R. Peterson, K. Barton, N. Dasgupta</i> , University of Michigan, Ann Arbor	
2:15pm	AS1-TuA-4 Enhanced ALD Nucleation on Polymeric Separator for Improved Li Batteries, Giulio D'Acunto , <i>S. Shuchi, M. Mattinen, S. Bent</i> , Stanford University	
2:30pm	AS1-TuA-5 Improved Metal Selectivity via Inherent Orthogonal ASD: Polymer ASD Improves Nucleation Inhibition for Metal ASD, Hwan Oh , North Carolina State University, Republic of Korea; <i>H. Margavio</i> , North Carolina State University; <i>H. Yang</i> , North Carolina State University, Republic of Korea; <i>G. Parsons</i> , North Carolina State University	
2:45pm	AS1-TuA-6 Self-Aligned Patterning by Area-Selective Etching of Polymers and ALD, <i>V. Lasonen, C. Zhang, M. Vehkamäki, A. Vihervaara</i> , University of Helsinki, Finland; <i>L. Mester</i> , attocube systems AG, Germany; <i>M. Karimi</i> , AlixLabs AB, Sweden; <i>Y. Ilarinova</i> , AlixLabs, Sweden; <i>R. Jafari Jam, J. Sundqvist</i> , AlixLabs AB, Sweden; Mikko Ritala , University of Helsinki, Finland	
3:00pm		
3:15pm		
3:30pm	BREAK & EXHIBITS	
3:45pm		
4:00pm	NS-TuA-11 Chemical Vapor Functionalization of Polymer Membranes for Water Treatment, Jeffrey Elam , <i>A. Mane, R. Pathak, R. Shevate, V. Rozyyev</i> , Argonne National Laboratory	Nanostructure Synthesis and Fabrication Session NS-TuA Nanostructures and Membranes Moderators: Christian Dussarat , Air Liquide Laboratories, Japan, Michelle Paquette , University of Missouri-Kansas City
4:15pm	NS-TuA-12 The Molecular Structure of Desalination Polyamides Made by Molecular Layer Deposition, Brian Welch , Technion, Israel; <i>E. Antonio, T. Chaney, O. McIntee</i> , University of Colorado at Boulder; <i>J. Strzalka</i> , Argonne National Laboratory; <i>V. Bright, A. Greenberg, M. Toney</i> , University of Colorado at Boulder; <i>T. Segal-Peretz</i> , Technion, Israel; <i>S. George</i> , University of Colorado at Boulder	
4:30pm	NS-TuA-13 Deposition of an Atomic Layer Inside Microfluidic Channel, Albert Santoso , <i>J. van Ommen, V. van Steijn, M. David, Y. Hounat, R. Zheng, N. Wijers, J. de Roeck</i> , TU Delft, Netherlands	
4:45pm	NS-TuA-14 Tunable and Scalable Synthesis of ZnO Nanostructures using ALD Seed Layers, Alondra M. Ortiz-Ortiz , <i>A. Gayle, J. Wang, D. Delgado, D. Penley, H. Faustyn, K. Fuelling</i> , University of Michigan, Ann Arbor; <i>A. Bielinski</i> , Argonne National Laboratory; <i>C. Sherwood, N. Dasgupta</i> , University of Michigan, Ann Arbor	
5:00pm	NS-TuA-15 Block Copolymer Templated HfOx Nanowires – From Fundamental Understanding to Rational Design, Ruoke Cai , <i>T. Segal-peretz</i> , Technion, Israel	
5:15pm	NS-TuA-16 Compressible Polymer Sponge Electrodes via oMLD of PEDOT onto Polyurethane Sponge Supports, Mahya Mehregan , <i>G. Luebbert, K. Brathwaite, Q. Wyatt, E. Throm, D. Stalla, M. Young</i> , University of Missouri	
5:30pm	NS-TuA-17 Low Cost, Large Area Sers Substrates by All Ald Deposited 3d Porous Filter Papers, Feng Niu , Raytun Photonics	

ALD Applications

Room Evergreen Ballroom & Foyer - Session AA-TuP

ALD Applications Poster Session, 5:45 – 7:00 pm

AA-TuP-1 Improved Properties of the SrRuO₃ Electrode by Controlling Annealing Conditions and Adopting Al-doping, **Junil Lim, C. Hwang**, Seoul National University, Republic of Korea

AA-TuP-2 Yttrium-doping in TiO₂ Films for DRAM Capacitor Applications, **Tae Kyun Kim, C. Hwang**, Seoul National University, South Korea

AA-TuP-3 Non-Diffusive Phenomenon of Al and Y Doping in the ZrO₂/Al₂O₃ and ZrO₂/Y₂O₃ Bilayer Thin-Films and Its Influence on the Field-Induced Ferroelectric Properties, **Haengha Seo, J. Shin, J. Lim, T. Kim, H. Paik, C. Hwang**, Seoul National University, Republic of Korea

AA-TuP-4 Promoted Crystallization of SrTiO₃ Thin Film for DRAM Capacitor by Inserting GeO_x Buffer Layer in Ru/SrTiO₃/RuO₂ Capacitor, **Heewon Paik, C. Hwang**, Seoul National University, Korea

AA-TuP-5 Laterally Resolved LEIS for Surface Coverage Analysis in Porous Materials, **Thomas Grehl, P. Brüner**, IONTOF GmbH, Germany; **S. Saedy**, Chemical Engineering Department, Delft University of Technology, Netherlands; **J. Järvillehto, C. Gonsalves, J. Velasco**, Department of Chemical and Metallurgical Engineering, Aalto University, Finland; **J. van Ommen**, Chemical Engineering Department, Delft University of Technology, Netherlands; **R. Puurunen**, Department of Chemical and Metallurgical Engineering, Aalto University, Finland

AA-TuP-6 Group III-Nitride Semiconductor Materials Made by Plasma Atomic Layer Deposition, **Noureddine Adjeroud**, Luxembourg Institute of Science and Technology (LIST), Luxembourg

AA-TuP-7 High-Temperature High-GPC SiO₂ Gap-Filling by Thermal ALD Using Novel Si Precursors, **Wonyong Koh, J. Kim, B. Kim, J. Choi**, UP Chemical Co., Ltd., Republic of Korea

AA-TuP-9 Molecular Layer Deposition of Lithium-Containing Polymeric Coatings for Superior Lithium Metal Batteries, **X. Wang, Xiangbo Meng**, University of Arkansas

AA-TuP-10 Suppression of Interfacial Layer Formation in ZrO₂-Based Capacitors with TiN Electrode by Adopting MgO Thin Films as an Oxygen Diffusion Barrier, **Seungwoo Lee, D. Han, H. Seol, M. Nam**, Kyung Hee University, Republic of Korea; **D. Kim, H. Oh, H. Kim, Y. Park**, SK Trichem, Republic of Korea; **W. Jeon**, Kyung Hee University, Republic of Korea

AA-TuP-11 Improvement in Dielectric Properties of ZrO₂ Thin Film by Employing Thermal Stability Enhanced Zr Precursor in High-Temperature Atomic Layer Deposition, **Yoona Choi, A. Lee**, Kyunghee univ., Republic of Korea; **H. Oh, Y. Park**, SK trichem, Republic of Korea; **W. Jeon**, Kyunghee univ., Republic of Korea

AA-TuP-12 Enhancing the Electrical Characteristics of ZrO₂-TiSiN Based MIM Capacitor by Introducing Y₂O₃ Inserting Layer, **JongHwan Jeong, A. Lee, W. Jeon**, Kyung Hee University, Republic of Korea

AA-TuP-13 Atomic Layer Deposited Vanadium Oxides with Various Crystallinity for Uncooled IR Sensor Application, **Hyeon Ho Seol**, Kyung Hee University, Republic of Korea; **S. Lee, W. Jeon**, Kyung Hee university, Republic of Korea

AA-TuP-14 Self-Isolation Electrode Formation by Selective Deposition Behavior of MoO₂/MoO₃ Thin Films by Atomic Layer Deposition, **Yewon Kim, J. Park**, Kyunghee university, Korea; **S. Moon, T. Youn, Y. Jung, E. Han, Y. Jang, M. Lee, SK Hynix**, Korea; **W. Jeon**, Kyunghee university, Korea

AA-TuP-15 Formation of Mo Thin Film from ALD-Mo₂N Using Subsequent Reduction Process with Introducing a Mechanical Strain Applying Layer, **Jeong Hyeon Park, Y. Kim, W. Jeon**, Kyunghee university, Republic of Korea

AA-TuP-16 Novel Cyclopentadienyl-Based Yttrium Precursor for Atomic Layer Deposition of Y₂O₃ Thin Films, **Han Sol Oh, H. Kim**, SK Trichem Co. Ltd, Republic of Korea; **S. Lee, Y. Ryu, W. jeon**, Kyung Hee University, Republic of Korea; **Y. Park**, SK Trichem co. ltd, Republic of Korea

AA-TuP-17 Novel Amidinate-Based Yttrium Precursor for Atomic Layer Deposition of Y₂O₃ Thin Films, **Hanbyul Kim, H. Oh**, SK Trichem Co. Ltd., Republic of Korea; **S. Lee, Y. Ryu, W. jeon**, Kyung Hee University, Republic of Korea; **Y. Park**, SK Trichem Co. Ltd., Republic of Korea

AA-TuP-18 Tailoring the Surfaces of Atomic Layer Deposited Metal Oxides for Metal Ion Removal from Aqueous Solutions, **Vepa Rozyyev, R. Pathak, R. Shevate, A. Mane, J. Elam**, Argonne National Laboratory, USA

AA-TuP-20 ALD for Lead-Free Microchannel Plate Fabrication: Optimization of the Thermal Coefficient of Resistance by Modification of the Resistive Layer, **Stefan Cwik, M. Aviles, S. Clarke, M. Foley, C. Hamel, A. Lyashenko, M. Popecki, D. Mensah, S. Shin, M. Stochaj**, Incom Inc.; **A. Mane, J. Elam**, Argonne National Laboratory, USA; **A. Tremsin, O. Siegmund**, UC Berkeley; **M. Minot**, Incom Inc.

AA-TuP-21 New Secondary Electron Emissive Technologies for MCP-PMTs: Optimization of Water and CO₂ Adsorption on Microchannel Plate Surfaces, **Melvin Aviles, S. Clarke**, Incom, Inc.; **S. Cwik, M. Foley, C. Hamel, A. Lyashenko, M. Popecki, D. Mensah, S. Shin, M. Stochaj**, Incom, Inc.; **A. Mane, J. Elam**, Argonne National Laboratory, USA; **M. Minot**, Incom, Inc.

AA-TuP-23 ALD-based Catalysts with TiO₂ Interlayer for Ammonia Decomposition and LOHC Dehydrogenation Reactions, **Yu-Jin Lee**, Korea Institute of Science and Technology (KIST), Republic of Korea; **Y. Kwak**, University of Delaware; **S. Moon**, Ecole Polytechnique Fédérale de Lausanne, Switzerland; **H. Sohn, H. Jeong, S. Nam, Y. Kim**, Korea Institute of Science and Technology (KIST), Republic of Korea

AA-TuP-24 A Co-Design Approach to Optimize Neuromorphic Architectures for High Temperature Computing Integrating Novel ALD Materials, **Angel Yanguas-Gil, S. Madireddy, J. Elam, A. Mane**, Argonne National Laboratory

AA-TuP-25 Forming Voltage-Free Memristive Hafnium Oxide Devices for Non-Polar Switching Applications, **Minjong Lee, Y. Hong, J. Kim, H. Hernandez-Arriaga**, University of Texas at Dallas; **R. Choi**, Inha University, Republic of Korea; **J. Kim**, University of Texas at Dallas

AA-TuP-26 Impact of Oxygen Source and Cocktail Precursor on Ferroelectricity of ALD Hf_{0.5}Zr_{0.5}O₂ Thin Films, **Jin-Hyun Kim, Y. Jung, M. Lee, D. Le, S. Lee**, University of Texas at Dallas; **J. Spiegelman, M. Benham**, RASIRC; **S. Kim**, Kangwon University, Republic of Korea; **R. Choi**, Inha University, Republic of Korea; **J. Kim**, University of Texas at Dallas

AA-TuP-29 Multifunctional Carbon Textile Prepared by Carbothermic Reduction for Energy Materials, **D. Lam, J. Kim, Seung-Mo Lee**, Korea Institute of Machinery and Materials (KIMM), Republic of Korea

AA-TuP-31 Comparison between Doped and Undoped Ferroelectric HfO₂, **Liliane Alrifaj, E. Skopin, N. Guillaume, P. Gonon, A. Bsiesy**, Univ. Grenoble Alpes, CNRS, LTM, France

AA-TuP-32 Control of the Electrical Resistivity and Stress of ALD W for 3d Nand Word Line Applications, **Donguk Kim, C. Suh, I. Sung, W. Choi, S. Jin, C. Kim**, SK Hynix, Korea (Democratic People's Republic of)

AA-TuP-33 Low-Temperature Atomic Layer Deposition of Indium Oxide and Tin Doped Indium Oxide using Ozone, **Huazhi Li, D. Gorelikov**, Arradance LLC.; **A. Agrawal, W. Zhu**, NIST

AA-TuP-34 Thin Titanium Oxynitride Film as Alternative to ITO for Optoelectronic Devices, **Clemence Badie**, Eindhoven University of Technology, The Netherlands; **V. Astie, J. Decams**, Annealsys SAS, France; **B. Sciacca, O. Margeat, L. Santinacci**, Aix-Marseille University, France

AA-TuP-36 Advanced LiNi_{0.8}Mn_{0.1}Co_{0.1}O₂ Cathodes by Sulfide Coating via Atomic Layer Deposition, **Xin Wang, X. Meng**, University of Arkansas

AA-TuP-37 Improved Performance of Li||Nmc Batteries by a Novel Polymeric Coating via Molecular Layer Deposition, **Kevin Velasquez Carballo, X. Wang, X. Meng**, University of Arkansas

AA-TuP-39 Resistivity Engineering of Atomic Layer Deposited Tungsten Carbonitride Thin films via Carbon Concentration Control for 3D VXP Electrodes Applications, **Seunggyu Na, T. Kim, S. Park**, Yonsei University, Korea; **M. Kim**, SK Hynix, Korea; **S. Chung, H. Kim**, Yonsei University, Korea

AA-TuP-40 Broadband Anti-Reflective Coatings on Plastic Optics Using Graded Refractive Index Alumina by Atomic Layer Deposition, **Philip Klement, L. Gumbel, I. Müller, J. Schörmann, S. Chatterjee**, Justus Liebig University Giessen, Germany

AA-TuP-41 Revelation of Ferroelectricity of ALD ZrO₂ Thin Films through a Trace of Ge Incorporation, **Seonyeong Park, S. Na**, Yonsei University, Korea; **W. Choi, B. Kim, C. Jung, H. Lim**, Samsung Electronics Co., Inc., Republic of Korea; **S. Chung, H. Kim**, Yonsei University, Korea

AA-TuP-43 Atomic Layer Deposited TiN Capping Electrode for sub-10 nm Hf_{0.5}Zr_{0.5}O₂ Gate Oxide in Ferroelectric Transistors with 8 nm Gate Length Defined by Helium Ion Beam Lithography, **Yu-Sen Jiang, C. Wang, T. Chang, Z. Huang, M. Chen**, National Taiwan University, Taiwan

AA-TuP-45 Metal Oxide ALD Overlayers Enhance Thermal Stability and Activity of Platinum Catalysts in Propene Oxidation Reaction, **Bang T. Nhan, S. Bent**, Stanford University

AA-TuP-46 ALD for Spatial Control of Redox Reaction Selectivity, *Wilson McNeary*, National Renewable Energy Laboratory; *W. Stinson, D. Esposito*, Columbia University; *K. Hurst*, National Renewable Energy Laboratory

AA-TuP-47 Influence of Oxygen Source on Ferroelectricity of ALD-Hf_{0.5}Zr_{0.5}O₂ Thin Films With and Without Capping Layer, *Hye Ryeon Park*, Kangwon National University, Republic of Korea; *S. Park*, Kangwon National University, Republic of Korea; *J. Kang*, Kangwon National University, Republic of Korea; *J. Kim, Y. Jung, J. Kim*, The University of Texas at Dallas; *S. Kim*, Kangwon National University, Republic of Korea

AA-TuP-48 The Optimizing Mobility-stability Trade-off by Vertically Stacked IGZO/GZO TFT with Controlling of Indium-free GZO Layer via PEALD, *H.-J. Oh, Y. Kim, Jin-Seong Park*, Hanyang University, Korea

AA-TuP-50 Interface Engineering of Porous Cathodes by Spatial ALD for Improved Cycle Retention in Liquid Electrolyte, *Diana Chaykina, N. Huijssen, W. Manders, F. van den Bruele, A. Kronemeijer, M. Ameen*, TNO/Holst Center, Netherlands

AA-TuP-51 Study of Nb₂O₅ high-k Dielectric Material Deposited by Atomic Layer Deposition for Metal-Insulator-Metal Capacitor, *Kou Ihara, C. Labbé, J. Cardin, C. Frilay, M. Philippe*, CIMAP Normandie Université, France; *M. Leménager*, Murata Integrated Passive Solutions, France

AA-TuP-52 Cathode Electrolyte Interphase Development and Residual Lithium Compound Removal via Chemical Vapor Treatment on Nickel-Rich Cathode, *Rajesh Pathak, V. Rozyyev, A. Mane, J. Elam*, Argonne National Laboratory, USA

AA-TuP-53 Pt-Al₂O₃ Metamaterial with Tunable Resistivity, *Ritwik Bhatia*, Veeco Instruments Inc.

AA-TuP-54 Effect of Ar Purge Step Condition on PEALD-TiN Film Properties, *Ju Eun Kang, S. An, S. Hong*, Myongji University, Republic of Korea

AA-TuP-55 Probing the Structural and Chemical Evolution of Interfacial SiO_x Layers Formed During ALD and Post-Deposition Processing, *Ben M. Garland, N. Strandwitz*, Lehigh University

AA-TuP-57 Ultraviolet Bandpass and Wedge Filter ALD Coatings for Astrophysics Instruments, *John Hennessy, R. Rodriguez, A. Jewell*, Jet Propulsion Laboratory (NASA/JPL)

AA-TuP-58 Internal Photoemission (IPE) Spectroscopy Measurement of Interfacial Barriers in Fatigued ALD Ferroelectric Hafnium Zirconium Oxide MFM Devices, *Jessica L. Peterson*, Oregon State University; *T. Mimura, J. Ihlefeld*, University of Virginia; *J. Conley*, Oregon State University

AA-TuP-59 Understanding the Reactions of ALD Precursors on Lithium Metal and Its Application to Lithium Metal Batteries, *Donghyeon Kang, A. Mane, J. Elam*, Argonne National Laboratory

AA-TuP-61 Magnesium-doping in TiO₂ Dielectric Films for DRAM Capacitor Applications, *YU-KYUNG PARK, C. Hwang*, Seoul National University, South Korea

AA-TuP-62 Electrical Characteristics Modification of Dual Gate Oxide Semiconductor Thin-film Transistor, *Sehun Jeong, S. Park*, Korea Advanced Institute of Science and Technology, Republic of Korea

AA-TuP-63 Control of Hydrogen Content via Super-Cycle ALD Deposited Al₂O₃ Gate Insulator, *Hwayoung Kim, S. Park*, Korea Advanced Institute of Science and Technology, Republic of Korea

AA-TuP-64 Atomic Layer Deposited ZnO and Al₂O₃ on Nonwoven Fibre Materials – Improving Antimicrobial Properties and Moisture Resistance, *Laura Keski-Vähli*, VTT Technical Research Centre of Finland; *P. Porri*, University of Helsinki, Finland; *S. Salo, K. Heinonen, A. Harlin*, VTT Technical Research Centre of Finland

AA-TuP-65 Evaluation of Encapsulation Characteristics of Si₃N₄O₂ Thin Film for OLED, *S.Y. Jeon, Y. Kwone, Sang Ick Lee, T. Byun, Y. Im, S. Lee*, DNF Co. LTD., Republic of Korea

Area Selective ALD

Room Evergreen Ballroom & Foyer - Session AS-TuP

Area Selective ALD Poster Session, 5:45 – 7:00 pm

AS-TuP-1 iCVD Polymer as Inhibiting Layer for the Area-Selective ALD of Transparent Conducting Oxide Thin Films, *R. Feugier, C. Guerin, Vincent Jousseume*, Univ. Grenoble Alpes, CEA, LETI, France

AS-TuP-2 Direct Patterning of ZnO Deposition by Atomic-Layer Additive Manufacturing Using a Safe and Economical Precursor, *S. Stefanovic, N. Geshlaghi*, Chemistry of Thin Film Materials, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; *D. Zanders*, Inorganic Materials Chemistry, Ruhr University Bochum, Germany; *I. Kundrata*, ATLANT 3D Nanosystems, Denmark; *Anjana Devi*, Inorganic Materials Chemistry, Ruhr University Bochum, Germany; *J. Bachmann*, Chemistry of Thin Film Materials, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

AS-TuP-3 Density Functional Theory Study on the Passivation of Oxides Surfaces by Inhibitor, *R. Hidayat*, Sejong University, Republic of Korea; *T. Mayangsari*, Universitas Pertamina, Indonesia; *Khabib Khumaini, H. Kim, W. Lee*, Sejong University, Republic of Korea

AS-TuP-4 Selective Deposition on Next-Generation Patterned Carbon/SiO₂ Materials, *Maggy Harake*, Stanford University; *I. Oh*, Ajou University, Korea (Democratic People's Republic of); *S. Bent*, Stanford University

AS-TuP-6 Thermal Assisted Atomic Layer Deposition of Ruthenium by Ru Precursor and O₂ as a Reactant, *Gagi Tauhidur Rahman*, Graduate School of Advanced Science and Engineering, Hiroshima University, Japan; *Y. Amamiya, K. Uesugi, A. Teramoto*, Research Institute for Nanodevices, Hiroshima University, Japan

AS-TuP-7 Enhanced Deposition Selectivity of High-k Dielectrics by Vapor-Dosed Phosphonic Acid Inhibitors Combined with Selective Lift-Off, *Jeong-Min Lee, W. Kim*, Hanyang University, Republic of Korea

AS-TuP-10 Area-Selective Atomic Layer Deposition of Ru Thin Films Using Phosphonic Acid Self-Assembled Monolayers for Metal/Dielectric Selectivity, *Seo-Hyun Lee, J. Lee, W. Kim*, Hanyang University, Korea

AS-TuP-11 Area-Selective Atomic Layer Deposition on Dielectric Substrates via Selective Adsorption of Small Molecule Inhibitors, *Jieun Oh, H. Park, J. Lee, W. Kim*, Hanyang University, Korea

AS-TuP-12 Inline Metrology to Characterize and Improve Process Control of Area Selective Deposition, *Ganesh Vanamu, W. Lee*, Nova Metrology Instruments; *R. Koret, J. Hung*, Nova Measuring Instruments, Israel; *J. Watkins, T. Stoll*, Nova Measuring Instruments

Nanostructure Synthesis and Fabrication

Room Evergreen Ballroom & Foyer - Session NS-TuP

Nanostructures Synthesis and Fabrication Poster Session

5:45 – 7:00 pm

NS-TuP-1 Membrane Property Modification for Energy-efficient Membrane Separations via Vapor Phase Infiltration, *Yuri Choe, M. Ong, D. Bergsman*, University of Washington

NS-TuP-2 Stacking 2D Chalcogenides Utilizing ALD, *D. Shin, J. Yang, F. Krahl, Sebastian Lehmann, K. Nielsch*, Leibniz Institute for Solid State and Materials Research, Germany

NS-TuP-3 Stepwise Growth of Crystalline MoS₂ in Atomic Layer Deposition, *A. Cho, S. Ryu, Seong Keun Kim*, Korea Institute of Science and Technology, Republic of Korea

NS-TuP-4 Electrical Properties of ZnO Nanostructures Derived from Sequential Infiltration Synthesis in Self-Assembled Block Copolymer Patterns: Effects of Alumina Priming, *Won-Il Lee, A. Subramanian*, Stony Brook University/Brookhaven National Laboratory; *N. Tiwale, K. Kisslinger*, Brookhaven National Laboratory; *C. Nam*, Brookhaven National Laboratory and State University of New York at Stony Brook

NS-TuP-5 *in-Situ* XPS Analysis for WO₃ Sulfurization Process, *C.-Y. Chang, B. Liu, Yang-Yu Jhang*, Taiwan Instrument Research Institute, NARlabs, Taiwan

NS-TuP-7 Reversible Electronic Phase Transition in VO₂ Thin Films and Nanostructures, *Jun Peng, D. Hensel*, Center for Hybrid Nanostructures, Universität Hamburg, Germany; *L. Maragno, N. James*, Integrated Materials Systems Group, Institute of Advanced Ceramics, Hamburg University of Technology, Germany; *C. Heyn*, Center for Hybrid Nanostructures, Universität Hamburg, Germany; *K. Furlan*, Integrated Materials Systems Group, Institute of Advanced Ceramics, Hamburg University of Technology, Germany; *R. Blick, R. Zierold*, Center for Hybrid Nanostructures, Universität Hamburg, Germany

NS-TuP-8 Fabrication of 2D-SnS₂ Film Using Atomic Layer Deposition and Hydrogen Sulfide Gas Annealing, *Yeonsik Choi, S. Song, J. Kim, D. Lee, J. Bae, Y. Lee, H. Jeon*, Hanyang University, Korea

NS-TuP-11 Phase Control of Two-Dimensional Tin Sulfide Compounds Deposited by Atomic Layer Deposition, *Dong Geun Kim, J. Lee, J. Choi, J. Ahn*, Hanyang University, Korea

NS-TuP-12 Area-Selective Deposition of 2D-MoS₂ using Self-Assembled Monolayer, *Jeong-hun Choi, D. Kim, S. Lee, J. Ahn*, Hanyang University, Korea

Wednesday Morning, July 26, 2023

Room Grand Ballroom A-C	
8:00am	INVITED: ALE1-WeM-1 Plasma-Enhanced Atomic Layer Etching for Metals and Dielectric Materials, <i>Heeyeop Chae</i> , Sungkyunkwan University (SKKU), Republic of Korea
8:15am	
8:30am	ALE1-WeM-3 Controlling the Hole Profile of High Aspect Ratio Structures in Atomic Layer Etching of SiO ₂ by Utilizing Dc-Superposition in Capacitively Coupled Plasmas, <i>Kang-Yi Lin, E. Hirsch, P. Wang</i> , TEL Technology Center, America, LLC, USA
8:45am	ALE1-WeM-4 Damage Analysis of Reactive Ion and Quasi-Atomic Layer Etched Silicon, <i>A. Karimi</i> , AlixLabs AB, Sweden; <i>M. Alabrash</i> , Lund University, Sweden; <i>R. Jafari Jam</i> , AlixLabs AB, Sweden; <i>D. Lishan</i> , Plasma-Therm LLC; <i>H. Aslan, J. Garnæs</i> , Danish Fundamental Metrology, Denmark; <i>A. Uvarov</i> , Plasma-Therm Europe, France; <i>Y. Ilarionova, Dmitry Suyatin, J. Sundqvist</i> , AlixLabs AB, Sweden; <i>S. Khan</i> , Danish Fundamental Metrology, Denmark; <i>I. Maximov</i> , Lund University, Sweden
9:00am	ALE1-WeM-5 Atomic Layer Etching of SiO ₂ via H ₂ /SF ₆ Plasma and TMA, <i>David Catherall, A. Minnich</i> , California Institute of Technology
9:15am	ALE1-WeM-6 Learnings and Mitigations of Nonuniformity in Oxide Quasi Ale Applied to Contact Patterning, <i>Francois BOULARD, A. RONCO, N. POSSEME</i> , CEA/LETI-University Grenoble Alpes, France
9:30am	ALE1-WeM-7 Adopting a Low Global Warming Potential Fluorocarbon Precursor (C ₆ F ₆) to Atomic Layer Etching of SiO ₂ with Fluorocarbon Plasmas, <i>Inho Seong, Y. You, Y. Lee</i> , Chungnam National University, Republic of Korea; <i>G. Yeom</i> , Sungkyunkwan University, Republic of Korea; <i>S. You</i> , Chungnam National University, Republic of Korea
9:45am	ALE1-WeM-8 Thermal ALE Reactants for Semiconductor Processing, <i>Martin McBriarty</i> , EMD Electronics
10:00am	BREAK & EXHIBITS
10:15am	
10:30am	
10:45am	INVITED: ALE2-WeM-12 Isotropic Plasma-Thermal Atomic Layer Etching of Aluminum Nitride Using SF ₆ Plasma and Al(CH ₃) ₃ , <i>Austin Minnich</i> , Caltech
11:00am	
11:15am	ALE2-WeM-14 Gan Atomic Layer Etching Using SF ₆ and Ar Plasmas Controlled by RFEA and Langmuir Probe Measurements, <i>Remi Dussart</i> , Universite d'Orleans - CNRS, France; <i>L. Hamraoui, T. Zhang, A. Crespi</i> , Universite d'Orleans, France; <i>M. Boufnichel</i> , STMicroelectronics, France; <i>P. Lefauchaux</i> , CNRS, France; <i>T. Tillocher</i> , Universite d'Orleans, France
11:30am	ALE2-WeM-15 Speedy and Smooth Atomic Layer Etching for Silicon Carbide with DC Bias-Pulsing, <i>Julian Michaels</i> , University of Illinois at Urbana-Champaign; <i>N. Deegan</i> , Argonne National Laboratory, USA; <i>Y. Tsaturyan</i> , University of Chicago; <i>R. Renzas</i> , Oxford Instruments; <i>D. Awschalom</i> , University of Chicago; <i>G. Eden</i> , University of Illinois at Urbana-Champaign; <i>J. Heremans</i> , Argonne National Laboratory
11:45am	ALE2-WeM-16 Thermal Atomic Layer Etching of MoS ₂ Films, <i>J. Soares, John Hues</i> , Micron School of Material Science and Engineering, Boise State University; <i>A. Mane, D. Choudhury, S. Letourneau</i> , Applied Materials Division, Argonne National Laboratory; <i>S. Hues</i> , Micron School of Material Science and Engineering, Boise State University; <i>J. Elam</i> , Applied Materials Division, Argonne National Laboratory; <i>E. Graugnard</i> , Micron School of Material Science and Engineering, Boise State University

Atomic Layer Etching Session ALE1-WeM Si and SiO₂ ALE
Moderators:
Austin Minnich, Caltech,
Gregory N. Parsons, North Carolina State University

Atomic Layer Etching Session ALE2-WeM Plasma and Energy-Enhanced ALE
Moderators:
Heeyeop Chae, Sungkyunkwan University (SKKU), Republic of Korea

Wednesday Morning, July 26, 2023

Room Grand Ballroom E-G		
8:00am	INVITED: AF1-WeM-1 Measuring the Time-Resolved Heat of ALD Surface Reactions, Ashley Bielinski , <i>E. Kamphaus, L. Cheng, A. Martinson</i> , Argonne National Laboratory	ALD Fundamentals Session AF1-WeM In Situ Measurement Moderator: Mikko Ritala , University of Helsinki, Finland
8:15am		
8:30am	AF1-WeM-3 HfO ₂ ALD on Si(111) - A Mechanistic in-Situ Study through Time-resolved APXPS, Rosemary Jones , Lund University, Sweden; <i>G. D'Acunto</i> , Stanford University; <i>P. Shayesteh</i> , Lund University, Sweden; <i>J. Gallet, F. Bournel, F. Rochet</i> , Sorbonne Universite, France; <i>I. Pinsard</i> , Lund University, Sweden; <i>A. Head</i> , Brookhaven National Laboratory; <i>J. Schnadt</i> , Lund University, Sweden	
8:45am	AF1-WeM-4 In Situ Reflection High Energy Electron Diffraction Investigations of Epitaxial Growth and Crystallization of Gallium Oxide Thin Films, Alexandra Howzen , <i>N. Strandwitz</i> , Lehigh University	
9:00am	AF1-WeM-5 Surface and Film Stress during ALD of Al ₂ O ₃ and ZnO: <i>In Situ</i> Measurements Using Wafer Curvature Techniques, Ryan B. Vanfleet , <i>E. Sorinto, A. Cavanagh, V. Bright, S. George</i> , University of Colorado at Boulder	
9:15am	AF1-WeM-6 Chemisorption Mechanisms of Aminosilane Precursors during ALD of SiO ₂ : <i>in situ</i> Characterization and ab initio Study, Khabib Khumaini , <i>H. Son, H. Roh, O. Kim, R. Hidayat, H. Kim, W. Lee</i> , Sejong University, Republic of Korea	
9:30am	INVITED: AF1-WeM-7 Seeing It Happen: Insights Into the Surface Chemistry of HfO ₂ and TiO ₂ ALD from <i>Operando</i> Ambient Pressure X-ray Photoelectron Spectroscopy, Joachim Schnadt , Lund University, Sweden	
9:45am		
10:00am	BREAK & EXHIBITS	
10:15am		
10:30am		
10:45am	AF2-WeM-12 Preparation and Characterization of Well-Defined Mixed-Oxide and Metal-Oxide Interfaces in Porous Catalysts using ALD, Francisco Zaera , Department of Chemistry	ALD Fundamentals Session AF2-WeM High Aspects Moderator: Riikka Puurunen , Aalto University, Finland
11:00am	AF2-WeM-13 A Toolbox for Characterization of Film Penetration Depth in High Aspect Ratio Structures, Anish Philip , <i>M. Utraiainen, J. Kinnunen, P. Hyttinen</i> , Chipmetrics Ltd, Finland; <i>V. Korpelainen, B. Sauvet</i> , VTT Technical Research Centre of Finland; <i>W. Kessels, M. Poll, B. Macco</i> , Eindhoven University of Technology, The Netherlands	
11:15am	AF2-WeM-14 Understanding Process Parameters of ALD on Silica Aerogels and Their Effects on Mechanical Properties, Victor Vogt , <i>A. Gayle, Z. Berquist, A. Manon, A. Lenert, N. Dasgupta</i> , University of Michigan	
11:30am	INVITED: AF2-WeM-15 Tuning Properties of ZnO Deposited via ALD for Applications in Sensing and Porous Material Development, <i>A. M. Coclite, Lisanne Demelius</i> , Graz University of Technology, Austria	
11:45am		

Wednesday Morning, July 26, 2023

Room Grand Ballroom H-K		
8:00am	INVITED: AA1-WeM-1 3D Integrated Device Applications of ALD-Grown Ferroelectric and Oxide-Semiconductor Materials, <i>Masaharu Kobayashi</i> , University of Tokyo, Japan	ALD Applications Session AA1-WeM Memory RRAM, Neuromorphic, NVM Moderators: Robert Clark, TEL Technology Center, America, LLC,
8:15am		
8:30am	AA1-WeM-3 Cross-Point Metal-Ferroelectric-Metal Capacitors Array for Compute-in-Memory Applications, <i>Minjong Lee, H. Hernandez-Arriaga, J. Kim, J. Kim</i> , University of Texas at Dallas	
8:45am	AA1-WeM-4 Using ALD to Precisely Place Multiple Transition Metal Impurities to Defect Engineer MIM Diode Performance, <i>Shane Witsell, J. Conley</i> , Oregon State University	
9:00am	AA1-WeM-5 The Impact of Oxygen Source on the Formation of TiN Interface at the Initial Stage ALD process of Hafnia-based Ferroelectrics: An <i>in-situ</i> Analysis, <i>Jin-Hyun Kim, S. Kim, D. Le, Y. Jung, S. Hwang, H. Hernandez-Arriaga, M. Lee, A. Khosravi, K. Tan</i> , University of Texas at Dallas; <i>J. Spiegelman, M. Benham</i> , RASIRC; <i>S. Kim</i> , Kangwon University, Republic of Korea; <i>J. Kim</i> , University of Texas at Dallas	
9:15am	AA1-WeM-6 Performance Enhancement in HZO Based Ferroelectric Memory Devices, <i>Ranjith K. Ramachandran, L. Lukose</i> , ASM Belgium; <i>A. Leonhardt, M. Surman</i> , ASM Microchemistry Ltd., Finland; <i>V. Koladi Mootheri</i> , ASM Belgium; <i>M. Ioana Popovici</i> , IMEC, Belgium; <i>M. Givens, A. Illiberi</i> , ASM Belgium	
9:30am	AA1-WeM-7 Stabilization of Tetragonal Phase of Ti-doped ZrO ₂ Deposited by ALD, <i>Seokhwi Song, Y. Choi, E. Kim, K. Kim, H. Jeon</i> , Hanyang University, Korea	
9:45am	AA1-WeM-8 Three Terminal Synaptic Devices Employing ALD Grown Dual Dielectrics and Their Linear Learning Process, <i>Jung Wook Lim</i> , Electronics and Telecommunications Research Institute, Republic of Korea; <i>J. Kim</i> , ETRI, Republic of Korea	
10:00am	BREAK & EXHIBITS	
10:15am		
10:30am		
10:45am		
11:00am		
11:15am	AA2-WeM-14 Ultra High-k HfZrO ₄ Thin Films Grown by Atomic Layer Deposition using Metal-Organic and Brute HOOH Precursors, <i>Harshil Kashyap, A. Kummel</i> , University of California San Diego; <i>J. Spiegelman, M. Benham</i> , RASIRC	
11:30am	AA2-WeM-15 Achieving Ultra-High Mobility and Reliability of ALD-IGZO TFTs via Selective N ₂ O Plasma Reactant for BEOL Applications, <i>Dong-Gyu Kim</i> , Hanyang University, Republic of Korea; <i>H. Choi</i> , Chungnam National University, Republic of Korea; <i>Y. Kim, D. Lee, H. Oh</i> , Hanyang University, Republic of Korea; <i>J. Lee</i> , Chungnam National University, Republic of Korea; <i>J. Kim</i> , Ulsan National Institute of Science and Technology, Republic of Korea; <i>S. Lee, B. Kuh, T. Kim</i> , Samsung Electronics, Republic of Korea; <i>H. Kim</i> , Chungnam National University, Republic of Korea; <i>J. Park</i> , Hanyang University, Republic of Korea	
11:45am	AA2-WeM-16 Ultrathin and Highly Crystalline Indium Oxide Thin Films Using Novel Liquid In Precursor as a New Channel Material, <i>Su-Hwan Choi, R. Seong-Hwan</i> , Hanyang University, Korea; <i>C. Yeon, J. Jung, Y. Park</i> , Soulbrain, Republic of Korea; <i>J. Park</i> , Hanyang University, Korea	

Wednesday Morning, July 26, 2023

Room Regency Ballroom A-C		
8:00am	INVITED: AM-WeM-1 Atomic Layer Technologies for III-V Nitride Epitaxy, High-K/Metal Gate, Ferroelectric Negative Capacitance, and Area-Selective Deposition, <i>Miin-Jang Chen, C. Chou, T. Chang, W. Lee</i> , National Taiwan University, Taiwan	ALD for Manufacturing Session AM-WeM Manufacturing Moderators: Arrelaine Dameron, Forge Nano, Ganesh Sundaram, Veeco-CNT
8:15am		
8:30am	AM-WeM-3 Optimizing Vessel Design for Pulsed Delivery of Solid Precursors, <i>James Maslar, V. Khromchenko, B. Kalanyan</i> , National Institute of Standards and Technology (NIST)	
8:45am	AM-WeM-4 Accurate Precursor Dose Delivery with Realtime Closed Loop Control, <i>J. Ye, J. Ding, Guy Rosenzweig</i> , MKS Instruments, Inc.	
9:00am	AM-WeM-5 Fast and Efficient Large Format ALD, <i>D. Lindblad, Matthew Weimer, A. Damerson, J. Ragonesi</i> , Forge Nano; <i>O. Snef</i> , Sundew Technologies	
9:15am	AM-WeM-6 Mechatronic Spatial Atomic Layer Deposition for Closed-Loop Process Control, <i>Daniel Penley, T. Cho, A. Brooks, L. Ranshoff, H. Park, E. Herman, O. Trejo, K. Barton, N. Dasgupta</i> , University of Michigan, Ann Arbor	
9:30am	AM-WeM-7 Spatial Atomic Layer Deposition: A New Revolution in Ultra-Fast Production of Conformal Optical Coatings, <i>J. Rönn, S. Virtanen, P. Maydannik, K. Niiranen, Sami Sneek</i> , Beneq, Finland	
9:45am	AM-WeM-8 Spatial ALD of Iridium Oxide Electro-Catalyst Layers for PEM Electrolysis, <i>C. Frijters</i> , SparkNano, Netherlands; <i>J. Shen, M. Ameen</i> , TNO/Holst Center, Netherlands; <i>J. Greer</i> , Air Liquide Advanced Materials, Germany; <i>N. Blasco</i> , Air Liquide Advanced Materials, France; <i>Paul Poedt</i> , SparkNano, Netherlands	
10:00am	BREAK & EXHIBITS	
10:15am		
10:30am		
10:45am	INVITED: EM-WeM-12 Novel Organic-Inorganic Hybrid Thin Films Deposited by Molecular Atomic Layer Deposition (MALD) for EUV Resist Applications, <i>Jiyoung Kim</i> , University of Texas at Dallas	Emerging Materials Session EM-WeM EUV Litho Materials Moderator: Haripin Chandra, EMD Electronics, USA
11:00am		
11:15am	EM-WeM-14 Inorganic Cluster Synthesis and Characterization via Atomically Precise ALD in Polymers, <i>T. Kunene, Alex Martinson</i> , Argonne National Laboratory	
11:30am	EM-WeM-15 Molecular Layer Deposition of Al- and Hf-Based Hybrid Resists for Electron-Beam and EUV Lithography, <i>A. Ravi, J. Shi, J. Lewis, Stacey Bent</i> , Stanford University	
11:45am	EM-WeM-16 High-resolution EUV Lithographic Patterning Characteristics of InO _x -PMMA Hybrid Photoresist Generated by Vapor-phase Infiltration, <i>A. Subramanian</i> , Stony Brook University; <i>N. Tiwale</i> , Brookhaven National Laboratory; <i>W. Lee</i> , Stony Brook University; <i>K. Kisslinger, M. Lu, A. Stein</i> , Brookhaven National Laboratory; <i>J. Kim</i> , University of Texas at Dallas; Chang-Yong Nam , Brookhaven National Laboratory/Stony Brook University	

Wednesday Afternoon, July 26, 2023

Room Grand Ballroom A-C		
1:30pm		<p>Late-breaking Abstracts Session LB1-WeA Late Breaking ALD Moderator: Sumit Agarwal, Colorado School of Mines</p>
1:45pm	<p>LB1-WeA-2 Recent Advances for Spatial Atomic Layer Deposition Process: Microreactor Direct Atomic Layer Processing (μDALP™), Maksym Plakhotnyuk, A. Varga, I. Kundrata, ATLANT 3D, Denmark; J. Bachmann, FreFriedrich-Alexander Universität, Germany</p>	
2:00pm	<p>LB1-WeA-3 Towards Improved Conversion of Wet Waste to Jet Fuel with Atomic Layer Deposition-Coated Hydrodeoxygenation Catalysts, W. Wilson McNeary, J. Miller, S. Tacey, National Renewable Energy Laboratory; J. Travis, Forge Nano; M. Griffin, K. Jungjohann, G. Teeter, National Renewable Energy Laboratory; T. Eralp Erden, Johnson Matthey, UK; C. Farberow, National Renewable Energy Laboratory; L. Tuxworth, M. Watson, Johnson Matthey, UK; A. Dameron, Forge Nano; D. Vardon, Alder Fuels</p>	
2:15pm	<p>LB1-WeA-4 A Kinetic Model for Heterogeneous Nucleation in ALD and CVD, Andreas Werbrouck, S. Bent, Stanford University</p>	
2:30pm	<p>LB1-WeA-5 Intrinsic Area Selective Atomic Layer Deposition of MoS₂ Thin Films, J. Soares, Wesley Jen, Boise State University; J. Wensel, Micron Technology; S. Hues, E. Graugnard, Boise State University</p>	
2:45pm	<p>LB1-WeA-6 Selective Deposition of HfO₂ on Aminosilane-treated TiN/SiO₂ Substrates, Yujin Lee, Stanford University; H. Kim, Samsung Advanced Institute of Technology, Republic of Korea; S. Bent, Stanford University</p>	
3:00pm	<p>LB1-WeA-7 Atomic Layer Deposited Zr-doped HfO₂ (HZO) and Indium Gallium Oxide (IGO) Thin Films for 3D Gate-All-Around FeFET, Boncheol Ku, J. Hur, J. Jeong, C. Choi, Hanyang University, Korea</p>	
3:15pm	<p>LB1-WeA-8 Development of Robust Gate Insulators for MIS-HEMT Structures Based on ALD/PEALD Techniques, Messaoud Bedjaoui, S. Cadot, J. Amiran, R. Contie, A. Thiam, C. Bout, CEA/LETI-University Grenoble Alpes, France; P. Fernandes Paes Pinto Rocha, CEA/LETI-University Grenoble Alpes, Grenoble INP-LTM, France</p>	
3:30PM	BREAK	
3:45pm		
4:00pm	<p>LB2-WeA-11 Exploring the Blocking Mechanism of Small Molecule Inhibitors by Density Functional Theory, Fabian Pieck, R. Tonner-Zech, Wilhelm-Ostwald-Institut Physikalische und Theoretische Chemie, Germany</p>	<p>Late-breaking Abstracts Session LB2-WeA Late Breaking Computational Modeling Moderator: Benjamin Greenberg, Naval Research Laboratory</p>
4:15pm	<p>LB2-WeA-12 Reaction Mechanism of Atomic Layer Deposition of Pt from First Principles, Sylwia Klejna, AGH University of Krakow, Poland</p>	
4:30pm		
4:45pm	CLOSING REMARKS IN GRAND BALLROOM H-K	

Wednesday Afternoon, July 26, 2023

Room Grand Ballroom E-G	
1:30pm	INVITED: AF1-WeA-1 Effect of Inhibitor Adsorption on the Mechanisms for Selectivity Loss, <i>Tania Sandoval</i> , Technical University Federico Santa Maria, Chile
1:45pm	
2:00pm	AF1-WeA-3 Electronic Structure of ALD Al ₂ O ₃ /TiO ₂ Heterointerfaces: A First-principles Study, <i>Hyobin Eom, C. Ahn, J. Park, B. Shong</i> , Hongik University, Republic of Korea
2:15pm	AF1-WeA-4 Reaction Mechanism of Bifunctional Organic Reactants and Diethylzinc for Atomic and Molecular Layer Deposition, <i>Miso Kim, H. Oh, B. Shong</i> , Hongik University, Republic of Korea
2:30pm	AF1-WeA-5 Simulated Conformality of ALD Growth Inside Lateral HAR Channels: Comparison between a Diffusion-Reaction Model and a Ballistic Transport-Reaction Model, <i>J. Järvillehto, J. Velasco, J. Yim, C. Gonsalves, Riikka Puurunen</i> , Aalto University, Finland
2:45pm	AF1-WeA-6 Simulated Conformality of ALD in Lateral High Aspect Ratio Channels: Impact of Knudsen Number on the Saturation Profile, <i>Christine Gonsalves, J. A. Velasco, J. Järvillehto, J. Yim, V. Vuorinen, R. L. Puurunen</i> , Aalto University, Finland
3:00pm	AF1-WeA-7 Atomistic Modeling of Thin-Film Deposition with Carrier Gases, <i>S. Natarajan, P. Khomyakov, J. Wellendorff</i> , Synopsys Denmark; <i>Baiyu Zhang, A. Blom</i> , Synopsys, Inc.
3:15pm	AF1-WeA-8 Chemistry of Plasma-Enhanced and Thermal Atomic Layer Deposition of Metal and Intermetallic Thin Films: The Role of Substrates and Reducing Agent, <i>Ji Liu, M. Nolan</i> , Tyndall National Institute, University College Cork, Ireland
3:30pm	BREAK
3:45pm	
4:00pm	AF2-WeA-11 Revealing Process-Structure Relationships for ALD Amorphous Oxide Semiconductors with XANES and First-Principles Modeling, <i>Orlando Trejo</i> , Applied Materials; <i>T. Cho</i> , University of Michigan, Ann Arbor; <i>S. Sainio</i> , University of Oulu, Finland; <i>N. Dasgupta</i> , University of Michigan, Ann Arbor
4:15pm	AF2-WeA-12 Machine-Learning Aided Understanding of ALD Processes, <i>A. Arunachalam</i> , University of Texas at Dallas; <i>S. Novia Berriel, U. Kumar</i> , University of Central Florida; <i>S. Das</i> , University of Texas at Dallas; <i>S. Seal</i> , University of Central Florida; <i>K. Basu</i> , University of Texas at Dallas; <i>P. Banerjee</i> , University of Central Florida
4:30pm	AF2-WeA-13 Digital Twin and Experimental Platform for AI-Driven Optimization of ALD Processes, <i>Angel Yanguas-Gil, N. Paulson, J. Elam</i> , Argonne National Laboratory
4:45pm	CLOSING REMARKS IN GRAND BALLROOM H-K

**ALD Fundamentals
Session AF1-WeA
Computational ALD I**
Moderators:
Michael Nolan, University College Cork, Ireland,
Atsushi Sakurai, ADEKA CORPORATION, Japan

**ALD Fundamentals
Session AF2-WeA
Computational ALD II**
Moderator:
Tania Sandoval, Technical University Federico Santa Maria, Chile

Wednesday Afternoon, July 26, 2023

Room Grand Ballroom H-K	
1:30pm	<p>AA1-WeA-1 Synthesis of Low-k SiCNO Thin Films by Plasma-enhanced Atomic-molecular Layer Deposition with Tetra-isocyanate-silane (TICS) and Phloroglucinol (Phl). <i>G. Baek, J. Park, G. Park, Hae Lin Yang</i>, Hanyang University, Korea</p>
1:45pm	<p>AA1-WeA-2 Performance and Thermal Stability Improvement of Vertical-Channel Thin-Film Transistor by Controlling Deposition Temperature of Gate Stack Prepared by Atomic Layer Deposition, <i>Dong-Hee Lee</i>, Kyung Hee university, Korea (Democratic People's Republic of); <i>Y. Kwon, N. Seong, K. Choi</i>, NCD. Co., Korea (Democratic People's Republic of); <i>S. Yoon</i>, Kyung Hee University, Korea (Democratic People's Republic of)</p>
2:00pm	<p>AA1-WeA-3 Sequential Design of PEALD In-Ga-Zn-O Active Layer: Sub-cycle Engineering of Indium Oxide Layer for Highly Stable TFT, <i>Taewon Hwang, H. Yang, Y. Kim</i>, Hanyang University, Korea; <i>T. ONO, S. KAMIMURA, A. EIZAWA, T. TERAMOTO, C. DUSSARRAT</i>, Air Liquide Laboratories, Japan; <i>J. Park</i>, Hanyang University, Korea</p>
2:15pm	<p>AA1-WeA-4 Bilayer Channel Combination Strategy via Atomic-Layer Deposition of In-Sn-O/In-Sn-Zn-O Structures for Highly-Functional Oxide Thin-Film Transistors, <i>SHIN HO NOH</i>, Kyunghee University, Republic of Korea; <i>Y. Kwon, N. Seong, K. Choi</i>, NCD Co. Ltd, Korea; <i>S. Yoon</i>, Kyunghee University, Republic of Korea</p>
2:30pm	<p>AA1-WeA-5 Elaboration of Refractory Metamaterials by Atomic Layer Deposition for Tuning Thermal Emission at High Temperature, <i>Syreina Sayegh</i>, European Institute of Membranes, France; <i>A. NZIE, CEMHTI</i>, France; <i>M. Bechelany</i>, European Institute of Membranes, France; <i>O. ROZENBAUM, CEMTHI</i>, France; <i>Q. FLAMANT</i>, Saint Gobain, France</p>
2:45pm	<p>AA1-WeA-6 Optical Properties of Interconnected Plasmonic Nanostructures with sub-10 Nm Nanogaps by Area-Selective Atomic Layer Deposition, <i>Brian Willis, R. Raman, J. Grasso</i>, University of Connecticut</p>
3:00pm	<p>AA1-WeA-7 Electrochemically Active Antibacterial Electrodes for Neural Interfacing Applications, <i>Shahram Amini</i>, Pulse Technologies Inc.; <i>G. Feng, H. Khosla</i>, Villanova University</p>
3:15pm	<p>AA1-WeA-8 Ultrathin TiO₂ ALD Coatings Strongly Enhance Biological Response of Biomedical Materials, <i>Jan Macak</i>, University of Pardubice, Czechia</p>
3:30pm	BREAK
3:45pm	
4:00pm	<p>INVITED: AA2-WeA-11 Atomic Layer Deposition of Highly Stable and Efficient Perovskite Solar Cells (~ 24%), <i>H. Park, S. Shin, P. Nandi, D. Pal, Hyunjung Shin</i>, Sungkyunkwan University (SKKU), Republic of Korea</p>
4:15pm	
4:30pm	<p>AA2-WeA-13 ALD of Niobium Oxide (Nb₂O₅) and Niobium-doped Titanium Oxide (Nb:TiO₂) for Solar Cell Applications, <i>T. VINCENT, IPVF</i>, France; <i>D. COUTANCIER, CNRS</i>, France; <i>P. Dally, M. AL-KATRIB, F. DONSANTI, IPVF</i>, France; <i>A. YAICHE, EDF</i>, France; <i>K. MEDJOUBI, M. PROVOST, IPVF</i>, France; <i>J. ROUSSET, EDF</i>, France; <i>M. BOUTTEMY, ILV</i>, France; <i>Nathanaelle SCHNEIDER, CNRS</i>, France</p>
4:45pm	CLOSING REMARKS

**ALD Applications
Session AA1-WeA
ULSI, Display, Optics, Metamaterials, and Bio
Applications
Moderators:
Charles Dezelah, ASM, Finland,**

**ALD Applications
Session AA2-WeA
Energy Solar
Moderators:
Mike McSwiney, Applied Materials, USA,
Shaibal Sarkar, ITT Bombay, India**

Wednesday Afternoon, July 26, 2023

Room Regency Ballroom A-C		
1:30pm	<p>INVITED: EM1-WeA-1 MLD/ALD of Hybrid Dielectrics for Flexible Electronic Devices, <i>X. Wang</i>, School of Advanced Materials, Shenzhen Graduate School, Peking University, China; <i>Min Zhang</i>, School of Electronic and Computer Engineering, Shenzhen Graduate School, Peking University, China</p>	<p>Emerging Materials Session EM1-WeA Molecular Layer Deposition Moderators: Jiyoung Kim, University of Texas at Dallas</p>
1:45pm		
2:00pm	<p>EM1-WeA-3 The Molecular Evolution of Zn Sequential Infiltration Synthesis, <i>I. Weisbord</i>, <i>M. Barzilay</i>, Department of Chemical Engineering, Technion, Israel; <i>A. Kuzmin</i>, <i>A. Anspoks</i>, Institute of Solid State Physics, University of Latvia; <i>E. Welter</i>, Deutsches Elektronen-Synchrotron, Germany; <i>Tamar Segal-Peretz</i>, Department of Chemical Engineering, Technion, Israel</p>	
2:15pm	<p>EM1-WeA-4 Conformal ALD/MLD of Perfectly Stable Zn-Benzenedithiol Thin Films, <i>T. Jussila</i>, Aalto University, Finland; <i>A. Philip</i>, <i>J. Kinnunen</i>, Chipmetrics Oy, Finland; <i>D. Zanders</i>, Ruhr-University Bochum, Germany; <i>M. Utriainen</i>, Chipmetrics Oy, Finland; <i>A. Devi</i>, Ruhr-University Bochum, Germany; <i>Maarit Karppinen</i>, Aalto University, Finland</p>	
2:30pm	<p>EM1-WeA-5 Recent Developments in Oxidative Molecular Layer Deposition (oMLD), <i>Matthias Young</i>, <i>Q. Wyatt</i>, <i>K. Brathwaite</i>, <i>M. Ardiansyah</i>, <i>N. Paranamana</i>, <i>K. Brorsen</i>, University of Missouri</p>	
2:45pm	<p>EM1-WeA-6 In Situ Analysis of Growth Mechanism During Molecular Layer Deposition of Polyurea, <i>Wallis E. Scholl</i>, Colorado School of Mines; <i>E. Hudson</i>, <i>L. Belau</i>, Lam Research Corporation; <i>S. Agarwal</i>, Colorado School of Mines</p>	
3:00pm	<p>INVITED: EM1-WeA-7 A Chemist's Lego Blocks: Molecular Layer Deposition (MLD) for Nanoelectronic Applications, <i>Michelle Paquette</i>, University of Missouri-Kansas City</p>	
3:15pm		
3:30pm	BREAK	
3:45pm		
4:00pm		
4:15pm		
4:30pm		
4:45pm	CLOSING REMARKS IN GRAND BALLROOM H-K	

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