

ALD/ALE 2024 Program Key

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

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 2024 Program Overview

| Room /Time | Hall 3 | Hall 3A | Hall 3D | Hall 3E | Hall 3F | Hall 5A |
|------------|----------------------------|---|---|--|---|------------------------------|
| SuA | | TS-SuA: Tutorial and Perspective Session (Separate Registration Required) | | | | |
| SuP | POSTER SESSIONS (ALE Only) | | | | | |
| MoM | | | | | | PS-MoM: Plenary Session |
| MoA | | AF-MoA: Precursors and Chemistry: Precursor Design, New Precursors, Process Development I | AA1-MoA: Energy: Batter & Energy Storage AA2-MoA: Applications in ULSI FEOL: Gate Electrodes & Contact Metals, High-K, and 3D Transistor Fabrication | AS-MoA: Selective ALD by Area-Deactivation | ALE-MoA: ALD+ALE and Emerging Topics in ALE | ALDALE-MoA: Student Awardees |
| MoP | POSTER SESSIONS | | | | | |
| TuM | | AF1-TuM: Precursors and Chemistry: Prec Design, New Prec, Process Development II AF2-TuM: Growth & Char: Plasma Enhanced ALD I | AA1-TuM: Applications in ULSI BEOL: Interconnects, Diffusion Barriers, & DRAM AA2-TuM: Energy: Solar Energy Materials | AM-TuM: Equipment Design, Precursor Delivery, and Spatial/R2R/Fast ALD AS-TuM: Selective ALD | ALE1-TuM: ALE Applications and Methodologies ALE2-TuM: Thermal Gas-phase ALE | |
| TuA | | AF1-TuA: Precursors and Chemistry: Prec Design, New Prec, Process Dev III AF2-TuA: Precursors & Chem: Simul, Model, & Mach Learning for ALD | AA1-TuA: Energy: Solar Energy Materials II AA2-TuA: Energy: Catalysis and Fuel Cells | NS-TuA: 2D Nanomaterials by ALD (Including Transition Metal Dichalcogenides) EM-TuA: Vapor Phase Infiltration | ALE1+AM-TuA: ALE & Sustainability ALE2+AM-TuA: A.I. for ALD and ALE, and Wet-Chemical ALE | |
| TuP | POSTER SESSIONS | | | | | |
| WeM | | AF1-WeM: Growth and Char: High Aspect Ratio/High Surf Area/ Powder ALD and Char of ALD Films AF2-WeM: Growth & Char: Low Temp ALD | AA1-WeM: Flash and Ferroelectric Memories AA2-WeM: Memory Applications: RRAM & Neuromorphic, MIM Capacitors | EM-WeM: Molecular Layer Deposition of Organic Materials and Organic-Inorganic Hybrid Materials AA3-WeM: Other Emerging Applications | ALE1-WeM: Plasma and Energy-Enhanced ALE ALE2-WeM: Selectivity, Metrology and Diagnostics in ALE | |
| WeA | | AF1-WeA: Growth and Char: <i>In-situ</i> and <i>in-vacuo</i> Analysis, Surface Science of ALD I AF2-WeA: Growth and Characterization: <i>In-situ</i> and <i>in-vacuo</i> | AA1-WeA: More than Moore Applications AA2-WeA: Emerging: Optics/Optoelectronics | EM-WeA: Other Emerging Materials AA3-WeA: Display Applications | ALE-WeA: Modeling in Atomic Layer Etching AF3-WeA: Growth and Characterization: Plasma Enhanced ALD II | |

Sunday Afternoon, August 4, 2024

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| <p>Tutorial Room Hall 3A - Session TS-SuA Tutorial and Perspective Session (Separate Registration Required) Moderators: Markku Leskelä, University of Helsinki, Finland, Mikko Ritala, University of Helsinki, Finland, Fred Roozeboom, University of Twente and Carbyon B.V., The Netherlands, Dmitry Suyatin, AlixLabs A.B., Sweden</p> | | |
| 1:00pm | <p>INVITED: TS-SuA-1 Thermal Atomic Layer Deposition of Electropositive Metal and Element Films and Assessment of Inherently Selective Growth on Substrates, Charles Winter, Wayne State University, USA</p> | |
| 1:15pm | | |
| 1:30pm | | |
| 1:45pm | <p>INVITED: TS-SuA-4 Area Selective Atomic Layer Deposition: What, What for, and What Next?, Stacey Bent, Stanford University, USA</p> | |
| 2:00pm | | |
| 2:15pm | | |
| 2:30pm | <p>INVITED: TS-SuA-7 ALE: Basics, New Developments & Applications, Thorsten Lill, Clarycon Nanotechnology Research, Inc., USA</p> | |
| 2:45pm | | |
| 3:00pm | | |
| 3:15pm | Break | |
| 3:30pm | <p>INVITED: TS-SuA-11 Thin Film Process Technologies for the Atomic Scale Era, Robert Clark, TEL, USA</p> | |
| 3:45pm | | |
| 4:00pm | | |
| 4:15pm | <p>INVITED: TS-SuA-14 ALD for PV, Current State and Future Prospects, Wei-Min Li, Jiangsu Leadmicro Nano Technology Co. Ltd., China</p> | |
| 4:30pm | | |
| 4:45pm | | |
| 5:00pm | <p>INVITED: TS-SuA-17 Sustainable Atomic Layer Processing for Semiconductor Applications, Job Soethoudt, IMEC, Belgium</p> | |
| 5:15pm | | |
| 5:30pm | | |

Atomic Layer Etching

Room Hall 3 - Session ALE-SuP

Atomic Layer Etching Poster Session

6:00pm

ALE-SuP-1 Removing Defects from InGaP Surfaces Using Thermal Atomic Layer Etching (ALE), *R. Edel, Andrew Cavanagh, T. Nam, S. George*, University of Colorado Boulder, USA

ALE-SuP-2 Tailored Waveforms for CCP Discharges in ALE Applications, *Anna Nelson, S. Mohr*, Quantemol Ltd., UK

ALE-SuP-3 Atomic Layer Control of 2D WS₂ Through the Formation of Volatile Tungsten Oxychloride, *Hye Won Han, J. Kang, J. Kim, G. Yeom*, Sungkyunkwan University, Republic of Korea

ALE-SuP-4 Thermal Atomic Layer Etching of Ternary Indium Gallium Phosphide Based on Fluorination and Ligand-Exchange Reactions, *TAEWOOK NAM, S. George*, University of Colorado Boulder, USA

ALE-SuP-5 Spontaneous Etching of Group V and VI Metal Oxides by Deoxychlorination Using Thionyl Chloride, *Troy Collieran, S. George*, University of Colorado at Boulder, USA

ALE-SuP-6 Phase Transition of Molybdenum Disulfide by Controlled Ion Beam ALE Method, *Ji Eun Kang, H. Han, J. Kim, G. Yeom*, Sungkyunkwan University (SKKU), Republic of Korea

ALE-SuP-7 The Role of Surface Passivation in Facet-Selective Etching and the Surface Roughness, *Yuri Barsukov, I. Kaganovich*, Princeton University Plasma Physics Lab, USA

ALE-SuP-8 Ab Initio Investigation of Chelation on Amorphous CoCl₂ Films for Atomic Layer Etching, *Eugene Huh, S. Lee*, Ewha Womans University, Republic of Korea

ALE-SuP-9 Selective Isotropic Atomic Layer Etching of Silicon Nitride over Silicon Oxide with Surface Fluorination using CF₄/H₂O Plasma and Heating, *Daeun Hong, H. Lee, M. Jeon, H. Chae*, Sungkyunkwan University (SKKU), Republic of Korea

ALE-SuP-10 Selective Thermal Atomic Layer Etching of Molybdenum & Other Metals for Semiconductor Metallization, *M. McBriarty, N. Vu, Bhushan Zope*, Merck KGaA, Darmstadt, Germany, USA

ALE-SuP-11 Theoretical investigation on Plasma Decomposition and Recombination Reaction Characteristics of C₄F₈O Isomers as Alternatives to HFC, *Mihyeon Jo, S. Lee*, Ewha Womans University, Republic of Korea

ALE-SuP-12 Plasma-Enhanced Atomic Layer Etching of Aluminum Oxide Using Trimethylaluminium and Nitrogen Trifluoride, *Ole Bieg, M. Kraut, T. Mikolajick*, Technische Universität Dresden, Institute of Semiconductors and Microsystems, Germany

ALE-SuP-13 A Theoretical Study of Low Gwp Fluoro Gas Decomposition Properties, *Minji Kim, S. Lee*, Ewha Woman's University, Republic of Korea

ALE-SuP-14 Enhancing Doping Efficiency in 2D Semiconductors using Cyclic Doping Method, *Ji Min Kim, J. Kang, H. Han, G. Yeom*, Sungkyunkwan University, Republic of Korea

ALE-SuP-15 Repairing Defects in Organosilane Self-Assembled Monolayers, *Yasuharu Miyamoto, Y. Yoshida*, SCREEN Holdings Co., Ltd., Japan; *T. Utsunomiya*, Kyoto University, Japan; *K. Sawada, S. Kunieda, Y. Ueda*, SCREEN Holdings Co., Ltd., Japan; *H. Sugimura*, Kyoto University, Japan

ALE-SuP-16 Damage-Free Plasma Enhanced ALE of SiO₃ *Daniil Shibanov*, Lomonosov Moscow State University; *D. Lopaev*, Lomonosov Moscow State University, *Y. Zaseev, V. Varakin, D. Kostyukov*, JSC Research Institute of Precision Machine Manufacturing; *A. Rakhimov*, Lomonosov Moscow State University

Monday Morning, August 5, 2024

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| <p>Plenary Session Room Hall 5A - Session PS-MoM Plenary Session Moderators: Markku Leskelä, University of Helsinki, Finland, Mikko Ritala, University of Helsinki, Finland, Fred Roozeboom, University of Twente and Carbyon, B.V., The Netherlands, Dmitry Suyatin, AlixLabs A.B., Sweden</p> | | |
| 8:45am | PS-MoM-1 ALD Welcome and Introductory Remarks, <i>Mikko Ritala, Markku Leskelä</i> , University of Helsinki, Finland | |
| 9:00am | INVITED: PS-MoM-2 Opening Remarks: 50 Years of ALD, <i>Tuomo Suntola</i> , .. Finland | |
| 9:15am | INVITED: PS-MoM-3 ALD: A Disruptive Technology Enabling New Device Architectures, <i>Ivo Raaijmakers</i> , ASM, Netherlands | |
| 9:30am | | |
| 9:45am | | |
| 10:00am | INVITED: PS-MoM-6 ALD 2024 Innovator Awardee Talk: To Grow <i>and</i> Not To Grow: Exploring Mechanisms during Atomic Layer Deposition, <i>Annelies Delabie</i> , imec and KU Leuven (University of Leuven), Belgium | |
| 10:15am | | |
| 10:30am | Break & Exhibits | |
| 10:45am | | |
| 11:00am | PS-MoM-10 ALE Welcome and Introductory Remarks, <i>Fred Roozeboom</i> , University of Twente and Carbyon B.V., The Netherlands; <i>Dmitry Suyatin</i> , AlixLabs A.B., Sweden | |
| 11:15am | INVITED: PS-MoM-11 Atomic Layer Precision Process to Enable Advanced Patterning toward High-NA EUV era, <i>Eric Liu</i> , Tokyo Electron America | |
| 11:30am | | |
| 11:45am | | |

Monday Afternoon, August 5, 2024

| Room Hall 3A | |
|--------------|--|
| 1:30pm | ALD Fundamentals Session AF-MoA Precursors and Chemistry: Precursor Design, New Precursors, Process Development I Moderators: Charles Dezelah , ASM, Finland, Charles H. Winter , Wayne State University, USA |
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| 4:00pm | AF-MoA-11 ALD of Copper and Bismuth Using Pinacolborane as a Reducing Agent, Anton Vihervaara , T. Hatanpää, K. Mizohata, M. Ritala, University of Helsinki, Finland |
| 4:15pm | AF-MoA-12 Ligand Optimization of Volatile Cobalt-Alkoxide ALD Precursor, Atsushi Sakurai , A. Yamashita, T. Yoshino, Y. Ooe, K. Takeda, M. Enzu, M. Hatase, A. Nishida, ADEKA CORPORATION, Japan |
| 4:30pm | AF-MoA-13 Expanding the tert-Butylimido Framework Beyond Molybdenum: New Refractory Metals and Ligands, Kieran Lawford , Carleton University, Canada; M. Land , Dalhousie University, Canada; E. Goodwin , Carleton University, Canada; K. Robertson , St. Mary's University, Canada; S. Barry , Carleton University, Canada |
| 4:45pm | AF-MoA-14 Alkoxide Complexes as Precursors for Coinage Metal and Main Group Element Thermal ALD, David Emslie , Department of Chemistry, Canada; M. Al Hareri , N. Hoffman, McMaster University, Canada |
| 5:00pm | AF-MoA-15 Fluorinated Silver Alkoxides as Precursors for Atomic Layer Deposition, Nick A. Hoffman , D. Emslie, McMaster University, Canada |
| 5:15pm | AF-MoA-16 Atomic Layer Deposition of Niobium Carbonitride Thin Films, Paloma Ruiz Kärkkäinen , T. Hatanpää, K. Mizohata, M. Putkonen, M. Ritala, University of Helsinki, Finland |
| 5:30pm | AF-MoA-17 Advancements in N-Heterocyclic Carbene-Based Precursors for ALD of Copper and Silver, Ilamparathy Selvakumar , Inorganic Materials chemistry, Ruhr-Universität Bochum, Germany; A. Devj , Leibniz Institute for Solid State and Materials research, TU Dresden and Ruhr-University Bochum, Germany |

Monday Afternoon, August 5, 2024

| Room Hall 3D | | |
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| 1:30pm | AA1-MoA-1 Enabling Fast Charging of Lithium-ion Batteries at Sub-Zero Temperatures with ALD coatings, <i>T. Cho, Y. Chen, D. Liao</i> , University of Michigan, USA; <i>E. Kazyak</i> , University of Wisconsin, USA; <i>D. Penley, Neil P. Dasgupta</i> , University of Michigan, USA | ALD Applications Session AA1-MoA Energy: Batteries and Energy Storage Moderators: Christian Dussarat , Air Liquide Laboratories, Japan, Jin-Seong Park , Hanyang University, Republic of Korea |
| 1:45pm | AA1-MoA-2 Atomic Layer Deposition of Lithium Borate and Borophosphate Thin Films for Lithium-ion Battery Applications, <i>Tippi Verhelle, A. Dhara, L. Henderick</i> , Ghent University, Belgium; <i>J. Meersschaut</i> , IMEC Belgium; <i>J. Dendooven, C. Detavernier</i> , Ghent University, Belgium | |
| 2:00pm | AA1-MoA-3 Fluorine-free ALD Process Produces Fluorine-rich Cathode Electrolyte Interphase for Lithium Batteries, <i>Giulio D'Acunto, S. Shuchi</i> , Department of Chemical Engineering, Stanford University, USA; <i>Y. Cui</i> , Department of Materials Science and Engineering, Stanford University; Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory; Department of Energy Science and Engineering, Stanford University, USA; <i>S. Bent</i> , Department of Chemical Engineering, Stanford University; Department of Energy Science and Engineering, Stanford University, USA | |
| 2:15pm | AA1-MoA-4 Atomic Layer Deposition of Interface-Engineered Li ₄ Ti ₅ O ₁₂ : Toward High-Capacity 3D Thin-Film Batteries, <i>Jan Speulmanns, S. Bönhardt, M. Czernohorsky, W. Weinreich</i> , Fraunhofer Institute for Photonic Microsystems IPMS, Germany | |
| 2:30pm | AA1-MoA-5 ALD for Advanced Lithionic Devices: Hybrid Ultrathin Solid-State Electrolytes, <i>Ilyass GHANDARI, N. GAUTHIER, S. POULET</i> , CEA-LETI, France; <i>M. BECHELANY</i> , CNRS, France; <i>M. BEDJAOUI</i> , CEA-LETI, France | |
| 2:45pm | AA1-MoA-6 Low Temperature ALD of Vanadium Sulfide (Ultra)thin Films for Nanotubular Supercapacitors, <i>Raul Zazpe, M. Sepulveda, J. Rodriguez-Pereira, L. Hromadko, M. Kurka, H. Sopha, J. Macak</i> , University of Pardubice, Czechia | |
| 3:00pm | AA1-MoA-7 Boosted Zn ²⁺ Storage Performance of Hydrated V ₂ O ₅ by Defect and Heterostructure, <i>V. Nguyen, J. Kim, Seung-Mo Lee</i> , Korea Institute of Machinery & Materials (KIMM), Republic of Korea | |
| 3:15pm | AA1-MoA-8 High Throughput Atomic Layer Deposition of Niobium Oxide Thin Film for Lithium-ion Battery Application, <i>Sunao Kamimura, C. Dussarat</i> , Air Liquide Laboratories, Japan; <i>N. Blasco</i> , Air Liquide Advanced Materials, France | |
| 3:30pm | Break & Exhibits | |
| 3:45pm | | |
| 4:00pm | AA2-MoA-11 Thermal Atomic Layer Deposition of Boron Containing Oxide Films as Solid Sources for Doping of Advanced Memory Devices, <i>Yongqing Shen</i> , Beijing Superstring Academy of Memory Technology, China; <i>S. Yang</i> , Institute of Microelectronics, China; <i>J. Xiang</i> , Beijing Superstring Academy of Memory Technology, China; <i>J. Liu, J. Gao</i> , Institute of Microelectronics, China; <i>G. Wang, C. Zhao</i> , Beijing Superstring Academy of Memory Technology, China | ALD Applications Session AA2-MoA Applications in ULSI FEOL: Gate Electrodes & Contact Metals, High-K, and 3D Transistor Fabrication Moderators: Scott Clendenning , Intel Corporation, USA, Christian Wenger , IHP - Leibniz Institut fuer innovative Mikroelektronik, Germany |
| 4:15pm | AA2-MoA-12 Plasma-Enhanced ALD of Thin Conductive Cu Films, <i>Maria Gabriela Sales, N. Nepal, P. Litwin, D. Boris, S. Walton, V. Wheeler</i> , U.S. Naval Research Laboratory, USA | |
| 4:30pm | AA2-MoA-13 Selective Atomic Layer Deposition of Ultra-Thin Ru on W for Metal Contact, <i>Rong Chen, Z. Qi, E. Gu</i> , State Key Laboratory of Intelligent manufacturing Equipment and Technology, School of Mechanical Science and Engineering, Huazhong University of Science and Technology, China; <i>B. Shan</i> , State Key Laboratory of Materials Processing and Die & Mould Technology, School of Materials Science and Engineering, Huazhong University of Science and Technology, China; <i>K. Cao</i> , State Key Laboratory of Intelligent manufacturing Equipment and Technology, School of Mechanical Science and Engineering, Huazhong University of Science and Technology, China | |
| 4:45pm | AA2-MoA-14 Effect of High Precursor Dose on the IZO Film Property Uniformity Within Wafer Deposited by Thermal ALD, <i>Yuting Chen, P. Yuan, X. Ma, Z. Jiao, Y. Shen, L. Chai, J. Xiang, M. Zeng, H. Sun, G. Wang, C. Zhao</i> , Beijing Superstring Academy of Memory Technology, China | |
| 5:00pm | AA2-MoA-15 Development of ALD Gate Dielectrics for TMD Nanosheet FETs, <i>T. Lee, B. Chao, Y. Chung, Y. Su</i> , TSMC, Taiwan; <i>B. Liu, C. Su, C. Kei</i> , Taiwan Instrument Research Institute, Taiwan; <i>C. Cheng, Pinyen Lin, I. Radu</i> , TSMC, Taiwan | |
| 5:15pm | INVITED: AA2-MoA-16 ALD in Semiconductor Logic Manufacturing: Challenges Met and Opportunities Ahead, <i>David Towner</i> , Intel Corp., USA | |
| 5:30pm | | |

Monday Afternoon, August 5, 2024

| Area Selective ALD Room Hall 3E - Session AS-MoA Selective ALD by Area-Deactivation Moderators: Stacey Bent , Stanford University, USA, Cathleen Crudden , Queen's University, Canada | | Atomic Layer Etching Room Hall 3F - Session ALE-MoA ALD+ALE and Emerging Topics in ALE Moderators: Robert Clark , TEL Technology Center, America, LLC, USA, Dmitry Suyatin , AlixLabs A.B., Sweden | |
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| 3:30pm | Break & Exhibits | Break & Exhibits | |
| 3:45pm | | | |
| 4:00pm | INVITED: AS-MoA-11 <i>Revealing New AS-ALD Chemistries with Ab Initio Approaches: From Interpretation to Prediction</i> , Ralf Tonner-Zech , Leipzig University, Germany | INVITED: ALE-MoA-11 <i>Atomic Layer Materials Engineering Driving Next Generation Semiconductor Scaling</i> , Bala Haran , Applied Materials Inc., USA | |
| 4:15pm | | | |
| 4:30pm | INVITED: AS-MoA-13 <i>Area Selective Atomic Layer Deposition Using a Size Cutter</i> , Han-Bo-Ram (Boram) Lee , Incheon National University, Republic of Korea | ALE-MoA-13 <i>Thermal ALE and ALD to Passivate Aluminum for Ultraviolet Optical Applications</i> , John Hennessy , R. Rodriguez , A. Jewell , Jet Propulsion Laboratory (NASA/JPL), USA | |
| 4:45pm | | ALE-MoA-14 <i>Deposition and Etchback Approach for Ultrathin ZrO₂ Coatings on TiO₂/ZrO₂ Core/Shell Nanoparticles</i> , J. Sempel , M. Kaariainen , T. Collieran , University of Colorado at Boulder, USA; A. Lifschitz , Meta Reality Labs, USA; Steven George , University of Colorado at Boulder, USA | |
| 5:00pm | AS-MoA-15 <i>Ald Grown Self-Assembled Monolayers: Using Area-Selective Deposition to Characterize Molecular Scale Pinholes</i> , Sakari Lepikko , R. Ras , Aalto University, Finland | ALE-MoA-15 <i>Study of Depositing Si₃N₄ on Si Wafers Using PEALD and Atomic Scale Removal of Underlying Native Oxide Using PALE in the Same Chamber Without Ion Bombardment Damage</i> , Birol Kuyel , A. Alphonse , J. Alex , Nano-Master, USA | |
| 5:15pm | AS-MoA-16 <i>Area-Selective Etching of Poly(lactic acid) via Hydrogenolysis for Self-Aligned ALD</i> , Valtteri Lasonen , M. Ritala , University of Helsinki, Finland | ALE-MoA-16 <i>N-Heterocyclic Carbenes for Area Selective Atomic Smoothing</i> , Eden Goodwin , Carleton University, Canada; M. Davies , P. Ragogna , M. Karttunen , Western University, Canada; S. Barry , Carleton University, Canada; C. Crudden , Carbon To Metal Coating Institute / Queens University, Canada | |
| 5:30pm | AS-MoA-17 <i>Selective Surface Fluorination to Enable ASD of Polymer and Metal Oxide on SiN vs. SiO₂</i> , Jeremy Thelven , H. Oh , H. Margavio , C. Oldham , G. Parsons , North Carolina State University, USA | ALE-MoA-17 <i>Quasi-ALE Process Transfer from Lab to 300mm Line and Its Optimisation</i> , Jenefa Kannan , M. Rudolph , Fraunhofer IPMS-CNT, Germany; R. Jam , A. Karimi , D. Suyatin , J. Sundqvist , AlixLabs, Sweden | |

Monday Afternoon, August 5, 2024

| Room Hall 5A | |
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| 1:30pm | <p>ALDALE-MoA-1 ALD Student Award Finalist Talk: Gas Phase Deposition of ALF-MOF for Selective CO₂ Capture: A Molecular Layer Deposition Study, <i>Maram Bakiro, S. Barry</i>, Carleton University, Canada</p> |
| 1:45pm | <p>ALDALE-MoA-2 ALD Student Award Finalist Talk: Surface Functionalization of Poly-Si and SiO₂ Nongrowth Surfaces with Small Inhibitor Molecules to Enable Area-Selective Atomic Layer Deposition of Al₂O₃, <i>Andrew Kaye</i>, Colorado School of Mines, USA; <i>H. Chandra, R. Pearlstein, X. Lei, A. Derecskei, B. Zope</i>, Merck KGaA, USA; <i>S. Agarwal</i>, Colorado School of Mines, USA</p> |
| 2:00pm | <p>ALDALE-MoA-3 ALE Student Award Finalist Talk: Precursor Mobility Through W Thin Films and sub-Surface Etching of Patterned TiO₂ via Atomic Layer Etching, <i>Hannah Margavio</i>, North Carolina State University, USA; <i>N. Arellano, I. Singh, R. Wojtecki</i>, IBM Almaden Research Center, USA; <i>G. Parsons</i>, North Carolina State University, USA</p> |
| 2:15pm | <p>ALDALE-MoA-4 ALD Student Award Finalist Talk: Unravelling the Role of Stoichiometry of ALD Nickel Cobalt Oxides on their Electrocatalytic Activity, <i>Renee van Limpt</i>, Eindhoven University of Technology, Netherlands; <i>M. Lao, M. Tsampas</i>, Dutch Insitute for Fundamental Energy Research (DIFFER), Netherlands; <i>M. Creatore</i>, Eindhoven University of Technology, Netherlands</p> |
| 2:30pm | <p>ALDALE-MoA-5 ALD Student Award Finalist Talk: First-Principles Screening of Precursor Reactivity for ALD of GeAsSe Thin Films for OTS Applications, <i>Bram van der Linden</i>, KU Leuven, and IMEC, Belgium; <i>G. Pourtois, L. Nyns, A. Delabie</i>, IMEC, Belgium</p> |
| 2:45pm | <p>ALDALE-MoA-6 ALE Student Award Finalist Talk: Investigating Patterning of MgZnO by Atomic Layer Etch mode, used For Compute and Memory Applications, <i>Leila Ghorbani</i>, KU Leuven and Imec, Belgium; <i>S. Kundu</i>, IMEC, Belgium; <i>S. De Gendt</i>, KU Leuven and Imec, Belgium</p> |
| 3:00pm | <p>ALDALE-MoA-7 ALD Student Award Finalist Talk: In-situ FTIR Study of Oxygen Source Mixing for Hafnium Oxide Atomic Layer Deposition on Titanium Nitride, <i>Jin-Hyun Kim, D. Le, M. Lee, T. Chu, D. Kim, J. Veyan</i>, University of Texas at Dallas, USA; <i>M. Benham, J. Spiegelman</i>, RASIRC, USA; <i>S. Kim</i>, Kangwon University, Republic of Korea; <i>J. Kim</i>, University of Texas at Dallas, USA</p> |
| 3:15pm | <p>ALDALE-MoA-8 ALD Student Award Finalist Talk: A New Low Temperature ALD Process for Magnesium Oxide, <i>Florian Preischel, D. Rogalla, A. Devi</i>, Ruhr University Bochum, Germany</p> |
| 3:30pm | <p>Break & Exhibits</p> |
| 3:45pm | |

ALD & ALE
Session ALDALE-MoA
Student Awardees
Moderators:
Annelies Delabie, IMEC, Belgium,
Ivo Raaijmakers, ASM, Netherlands

ALD for Manufacturing

Room Hall 3 - Session AM-MoP

ALD for Manufacturing Poster Session

5:45pm

AM-MoP-1 Thin-Film-Transistor Based ALD Sensors, *K. Yamano, H. Takeda, R. Miyazawa, M. Miura, B. Ahmad, Fumihiko Hirose*, Graduate School of Science and Engineering, Yamagata University, Japan

AM-MoP-2 Accurate and Fast Wafer Level Conformality Analysis Method for ALD Films in Manufacturing, *Thomas Werner*, Chipmetrics OY, Germany; *M. Zaheer, J. Kinnunen, A. Philip*, Chipmetrics OY, Finland; *K. Kühnel, N. Haufe*, Fraunhofer IPMS, Germany

AM-MoP-3 In-Situ Gas Monitoring of ALD Processes Using Remote Optical Emission Spectroscopy, *Erik Cox, J. Brindley*, Gencoa, UK; *D. Monaghan*, Gencoa, USA

AM-MoP-4 Batch Coating of Gas Lines by Atomic Layer Deposition, *Lassi Leppilähti, D. Nevstrueva*, Beneq, Finland

AM-MoP-5 Implementing of ALD in Post-CMOS-Compatible 200 Mm Wafer Processes, *Rahel-Manuela Neubieser, M. Michel, A. Litke, N. Boysen*, Fraunhofer IMS, Germany; *A. Devi*, Ruhr Universität Bochum, Germany

AM-MoP-6 Optimization and Scale-Up of MgO Thin Film Production via Thermal Atomic Layer Deposition for Industrial Applications, *Muhammad Ahmad, N. Lamminmäki, E. Manninen, P. Kaur*, Picosun Oy, Finland

AM-MoP-7 Method to Evaluate Vapor and Droplet Content from a Direct Liquid Injection Vaporizer using Fourier Transform Infrared Spectroscopy, *David Curran*, MSP--A Division of TSI, USA

AM-MoP-9 Effect of Gas Injection Design on Conformality in High Aspect Ratio Structures in Batch ALD Reactor, *A. Smirnov, Yury Shustrov, I. Petras*, Semiconductor Technology Research d.o.o. Beograd, Serbia

AM-MoP-10 Optical Monitoring of MoCl₅ and MoOCl₄ Vapor Delivery for Atomic Layer Deposition Applications, *Berc Kalanyan, J. Maslar*, National Institute of Standards and Technology (NIST), USA

AM-MoP-11 Visualizing Precursor Flow During ALD Processes, *James Maslar, B. Kalanyan*, National Institute of Standards and Technology (NIST), USA

ALD Fundamentals

Room Hall 3 - Session AF-MoP

ALD Fundamentals Poster Session

5:45pm

AF-MoP-1 Depositing a Uniform Thin Film of Al₂O₃ Using Atomic Layer Deposition (ALD) onto 2D Electronics to Provide Protective Capping and Surface Passivation, *Sangwoo Lee, J. Lee, A. Cho, R. Haa, H. Chung, K. Kim, T. Choi*, Sejong University, Republic of Korea

AF-MoP-2 Developments in Processing Large Area 2D Materials and Metals via ALD, *Nils Boysen, R. Neubieser*, Fraunhofer IMS, Germany; *F. Zimmermann, K. Brinkmann*, University of Wuppertal, Germany; *M. Michel*, Fraunhofer IMS, Germany; *T. Riedl*, University of Wuppertal, Germany; *A. Devi*, Ruhr University Bochum, Germany

AF-MoP-3 Sacrificial Copper Nitride Layer for PEALD of Copper, *Sakari Kettunen*, University of Helsinki, Finland; *M. Schalk*, Eindhoven University of Technology, Netherlands; *M. Chundak*, University of Helsinki, Ukraine; *M. Ritala, M. Putkonen*, University of Helsinki, Finland

AF-MoP-4 Characteristics of Silicon Nitride Thin Films Deposited Using a Two-Step Plasma Enhanced ALD Process at Very High Frequencies, *DA EUN BAE, H. KIM*, CN1 Co., Ltd., Republic of Korea; *S. LEE, DNF Co., Ltd.*, Republic of Korea; *J. CHOI, J. JEONG*, CN1 Co., Ltd., Republic of Korea

AF-MoP-5 Analysis of ALD Thin Films by Combining MEIS and ERDA Techniques, *Aqsa Ashraf, K. Mizohata*, Helsinki Accelerator Laboratory, University of Helsinki, Finland; *M. Ritala*, HelsinkiALD, University of Helsinki, Finland

AF-MoP-6 Novel Liquid Lanthanide Precursors with Low Viscosity and High Volatility for Atomic Layer Deposition of Lanthanide Oxide Thin Films, *Hanbyul Kim*, SK Trichem, Republic of Korea; *H. Oh*, SK trichem, Republic of Korea; *B. Ryu, Y. Park*, SK Trichem, Republic of Korea

AF-MoP-7 Novel Amidinate Ligand-based Scandium Precursor for Atomic Layer Deposition of Sc₂O₃ Thin Films, *Hansol Oh*, SK trichem, Republic of Korea; *H. Kim, B. Ryu*, SK Trichem, Republic of Korea; *W. Jeon*, Kyunghee University, Republic of Korea; *Y. Park*, SK Trichem, Republic of Korea

AF-MoP-8 Process Development of Cobalt Metal ALD on Novel ALD Machine, *Mathias Franz, L. KaBner*, Fraunhofer ENAS, Germany; *C. Thurm*, University of Technology Chemnitz, Germany; *L. Jäckel*, Fraunhofer ENAS, Center for Microtechnologies (ZfM), Chemnitz University of Technology, Germany; *M. Daniel*, scia Systems GmbH, Germany; *F. Stahr*, Forschungs- und Applikationslabor Plasmatechnik GmbH, Germany; *S. Schulz*, Fraunhofer ENAS, Center for Microtechnologies (ZfM), University of Technology Chemnitz, Germany

AF-MoP-9 High Quality TiN Plasma Enhanced Atomic Layer Deposition on SiO₂ Substrate with AlN Interfacial Layer via in situ Atomic Layer Annealing, *Valentina Korchnoy*, Technion Israel Institute of Technology, Israel; *I. Popov*, The Hebrew University of Jerusalem, Israel; *M. Koifman Khristosov*, Technion Israel Institute of Technology, Israel; *M. Lisiansky*, Tower Semiconductor, Israel

AF-MoP-10 Turning Online ALD and ALE Databases Into AI-Ready Tools for Development of New Sustainable Materials and Fabrication Processes, *Adrie Mackus, B. Macco*, Eindhoven University of Technology, Netherlands; *B. Karasulu*, University of Warwick, UK; *J. D'Souza, S. Auer*, L3S Research Center at Leibniz University of Hannover, Germany; *E. Kessels*, Eindhoven University of Technology, Netherlands

AF-MoP-11 ALD Process Characterization, Development, and Monitoring Using an Electron Impact Time-of-Flight Mass Spectrometer, *Abdelhak Bensaoula, C. De Koning, C. Frege*, TOFWERK, Switzerland; *T. Nelis*, BFH, Switzerland; *C. Hain*, Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland; *C. Guerra*, Swiss Cluster, Switzerland

AF-MoP-12 Tailoring Cobalt Precursors Through Molecular Engineering, *Jean-Pierre Glauber, J. ObenluneschloB, D. Zanders*, Ruhr University Bochum, Germany; *S. Barry*, Carleton University, Canada; *A. Devi*, Ruhr University Bochum, Germany

AF-MoP-14 Optimization of the Growth of Atomic Layer Deposited Ta₂O₅ Thin Films for Large Area Electronics, *Xiao Chen, K. Niang, B. Bakhit, Y. Jeon, J. Driscoll, A. Flewitt*, University of Cambridge, UK

AF-MoP-15 Bismuth Alkoxides for Deposition of Bismuth Chalcogenides, *Jaroslav Charvat*, University of Pardubice, Czechia; *R. Parkhomenko, M. Knez*, CIC nanoGUNE, Spain; *A. Bahrami, K. Nielsch*, IFW Dresden, Germany; *F. Bureš*, University of Pardubice, Czechia

AF-MoP-16 From Microscopic to Macroscopic: How Morphology Impacts ALD and CVD Nucleation Kinetics, *Andreas Werbrouck, A. Shearer, S. Bent*, Stanford University, USA

AF-MoP-17 Novel Imido Cyclopentadienyl-based Niobium Precursors for Atomic Layer Deposition of Nb₂O₅ Thin Films, *Dong Hun Shin, H. Oh, J. Chun*, SK trichem, Republic of Korea; *S. Lee, W. Jeon*, Kyung Hee University, Republic of Korea; *Y. Park*, SK trichem, Republic of Korea

AF-MoP-18 Atomic Layer Deposition of In₂O₃ Thin Films Using New In Precursor, *Donghyun Kim, H. Oh*, SK Trichem, Republic of Korea; *Y. Choi, W. Jeon*, Kyung Hee University, Republic of Korea; *Y. Park*, SK Trichem, Republic of Korea

AF-MoP-19 Reductive Surface Chemistry with Plasma Electrons, *Pentti Niiränen, D. Lundin, H. Pedersen*, Linköping University, IFM, Sweden

AF-MoP-20 Surface Chemistry of Atomic Layer Deposited Gallium Nitride Films at Different Process Temperatures, *houyem hafdi, P. Mpofu, H. Pedersen*, Linköping University, IFM, Sweden

AF-MoP-21 Tuning the Wet Etch Rate of Silicon Dioxide Deposited by Plasma-Enhanced Atomic Layer Deposition, *Keerthi Dorai Swamy Reddy, M. Lisker*, IHP - Leibniz Institut fuer innovative Mikroelektronik, Germany

AF-MoP-22 Ruthenium Metal ALD from Versatile Diazadienyl Precursor, *Jorit ObenluneschloB, D. Zanders, J. Klimars*, Inorganic Materials Chemistry, Ruhr University Bochum, Bochum, Germany; *M. Gock*, Heraeus Precious Metals GmbH & Co. KG, 63450 Hanau, Germany; *A. Devi*, Inorganic Materials Chemistry, Ruhr University Bochum, Bochum, Germany

AF-MoP-23 ALD of Nd₂O₃ and ALD/MLD of Nd-Organic Thin Films Using New Precursor Combinations, *Florian Preischel*, Ruhr University Bochum, Germany; *A. Ghazy*, Aalto University, Finland; *J. Debus*, TU Dortmund, Germany; *D. Rogalla*, Ruhr University Bochum, Germany; *M. Karppinen*, Aalto University, Finland; *A. Devi*, Ruhr University Bochum, Germany

AF-MoP-24 Thermal Atomic Layer Deposition of Aluminum Nitride Films Using Tris(dimethylamido)aluminum and NH₃, *O. Kim, H. Han, Jian Heo, Y. Choi, C. Kim, H. Kim*, Sejong University, Republic of Korea; *H. Kim, J. Park*, Hansol Chemical Co., Ltd., Republic of Korea; *W. Lee*, Sejong University, Republic of Korea

AF-MoP-25 High-Temperature Atomic Layer Deposition of Silicon Oxide Thin Films Using Tris(dimethylamino)silane and Ozone, *O. Kim, Y. Choi, Changgyu Kim, H. Kim, W. Lee*, Sejong University, Republic of Korea

AF-MoP-26 Ozone-based Atomic Layer Deposition of Titanium Dioxide (TiO₂) using TTIP, *Dharsana Pulikkottil Dinesh, O. Nilsen, H. Sønsteby*, University of Oslo, Norway

AF-MoP-27 Design and Installation of an Advanced Reactor for in-Situ Studies of ALD and ALE by the TU/E Technical Team, *Caspar van Bommel, M. Merckx, J. Zeebregts, C. van Helvoirt, F. van Uittert, E. Kessels, A. Mackus*, Eindhoven University of Technology, Netherlands

AF-MoP-28 Novel Hybrid Ligand Liquid Ta Precursor for High Temperature (> 480 °C) ALD Ta₂O₅/TaN Process, *Hyunju Jung, K. Cho, S. Baik, W. Choi, S. Kim, J. Jeong, H. Kim, H. Lee, J. Kim*, EGTM R&D, Republic of Korea

AF-MoP-30 Impact of TMA Precursor Flow Rate on ALD-Processed Al₂O₃ Thin Films: Experimental and Simulation Insights, *Júlia Karnopp*, Aeronautic Institute of Technology, Brazil; *N. Azevedo Neto, T. Vieira*, Aeronautics Institute of Technology, Brazil; *J. Sagás*, Santa Catarina State University, Brazil; *R. Pessoa*, Aeronautics Institute of Technology, Brazil

AF-MoP-31 Lab-Scale Fixed Bed Reactor for Atomic Layer Deposition on Particulate Materials: Initial Results, *Jorge A. Velasco, M. Ossama, C. Gonsalves, S. Larkiala, S. Andsten*, Aalto University, Finland; *K. Salonen*, ELabs Oy Engineering, Finland; *J. Rask, J. Stang, V. Miikkulainen, S. Jääskeläinen, R. Puurunen*, Aalto University, Finland

AF-MoP-32 Low Energy Ion Scattering Analysis of ALD 2D Materials, *Philipp Brüner, T. Grehl*, IONTOF GmbH, Münster, Germany; *D. Shin, A. Ruiz de Clavijo, S. Lehmann*, Leibniz Institute for Solid State and Materials Research, Dresden, Germany

AF-MoP-33 Plasma-Enhanced Atomic Layer Deposition Processes for Low-Temperature SiN_x with Aminosilane Precursors, *Hyeonjin Choi, J. Kim, Y. Ko, H. Chae*, Sungkyunkwan University (SKKU), Republic of Korea

AF-MoP-34 Characterization of Sticking Probability for Various ALD Chemistries Relevant for Artificial Solid Electrolyte Interphases, *Léo Lapeyre, K. Mackosch, W. Szymt, L. Pethő, J. Michler*, Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland; *P. Raynaud*, LAPLACE, France; *I. Utke*, Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland

AF-MoP-35 Deposition of High Quality Aluminium Fluoride Layers through Optimization of a PEALD Process using Al(CH₃)₃ and SF₆, *Eamon O'Connor, F. Steger, C. Sturzenegger, D. Schachtler, H. Thomé*, RhySearch, Switzerland

AF-MoP-36 Characterization of Elemental Composition of ALD Films Using Ion Beam Analysis, *Jaakko Julin, M. Laitinen, S. Kinnunen, T. Sajavaara*, University of Jyväskylä, Finland

AF-MoP-37 Atomic Layer Deposition of Ga₂O₃ from GaI₃ and O₃: Effect of Substrates on the Film Growth and Structure, *Aivar Tarre, L. Aarik, H. Mändar, J. Aarik*, Institute of Physics, University of Tartu, Estonia

AF-MoP-38 Chemstream: An HPC Cloud Platform for Deposition Simulations, *Scott Sides*, Tech-X Corporation, USA

AF-MoP-39 On the Trail Ancient Worlds: Comparative Study of Commercial Scandium and Yttrium Precursors, Asgard, Midgard, Vanaheim and Olympus, *Martin Wilken*, Ruhr Universität Bochum, Germany; *T. Hepp, O. Briel*, Dockweiler Chemicals GmbH, Germany; *A. Muriqi*, Tyndall National Institute, University College Cork, Ireland; *C. Cho*, Ruhr Universität Bochum, Germany; *M. Nolan*, Tyndall National Institute, University College Cork, Ireland; *A. Devi*, Leibniz Institute for Solid State and Materials Research, Germany

AF-MoP-40 Design and Study of N-heterocyclic Carbenes as ALD Precursors, *Mark Aloisio, E. Desroche, F. Tumino, C. Crudden*, Queen's University, Canada

AF-MoP-41 ALD at 50: Collaborations, Topic Modeling, and Intersection with Atomic Layer Etching and Area Selective Deposition, *E. Alvaro*, Northwestern University, USA; *Angel Yanguas-Gil*, Argonne National Laboratory, USA

AF-MoP-42 MoO₂ DRAM Bottom Electrode by Thermal ALD Using a New Liquid Mo Precursor, *Myeongho Kim, Y. Yi, I. Lee, J. Kim, H. Ryu, W. Koh*, UP Chemical Co., Ltd., Republic of Korea; *C. Hwang, W. Jeon*, Kyung Hee University, Republic of Korea

AF-MoP-43 The Role of Substrate Temperature on the Self-limiting Growth of Highly (200) Oriented Cubic NiO Films via Hollow-cathode Plasma-assisted Atomic Layer Deposition, *F. Bayansal, S. Allaby, H. Saleh, B. Willis, Necmi BIYIKLI*, University of Connecticut, USA

AF-MoP-44 2D and 3D Growth Competition in ALD Super-cycles Process: Fe_xNi_yO_z and Fe_xCo_yO_z, *Estelle Jozwiak*, Humboldt University Berlin, Germany

AF-MoP-45 Surface Morphology Analysis for WO_x Thin Film after Post-Sulfurization, *C. Chang, B. Liu, H. Chen, K. Chiu, C. Su, Y. Lin, Yang-Yu Jhang, Y. Pu*, Taiwan Instrument Research Institute, NARlabs, Taiwan

AF-MoP-46 Low-Temperature Atomic Layer Deposition Process of SnSe₂ Thin Films, *Alejandra Ruiz-Clavijo*, Institute for Metallic Materials, Leibniz Institute for Solid State and Materials Research, Germany

AF-MoP-47 Conformality Characterization of Al-Doped ZnO Films Grown by Atomic Layer Deposition on Lateral High-Aspect-Ratio Test Structures, *Eero Haimi*, Aalto University, Finland; *A. Philip*, Aalto University, India; *J. Velasco*, Aalto University, Bolivia (Plurinational State of); *M. Karppinen, R. Puurunen*, Aalto University, Finland

AF-MoP-48 Advancing Plasma Processes: Insights from Retarding Field Energy Analyzers in Ald/Ale Applications, *Angus McCarter, T. Gilmore, A. Verma*, Impedans Ltd., Ireland

AF-MoP-49 Precision Interface Engineering of CuNi Alloys by Powder ALD Toward Better Thermoelectric Performance, *Amin Bahrami, S. He*, Leibniz-Institut für Festkörper- und Werkstofforschung Dresden, Germany; *C. Jung*, Max-Planck-Institut für Eisenforschung GmbH, Germany; *R. He*, Leibniz-Institut für Festkörper- und Werkstofforschung Dresden, Germany; *Z. Ren*, University of Houston, USA; *S. Zhang*, Max-Planck-Institut für Eisenforschung GmbH, Germany; *K. Nielsch*, Leibniz-Institut für Festkörper- und Werkstofforschung Dresden, Germany

AF-MoP-50 Advances in Rare Earth Precursors for ALD, *Dominik Naglav-Hansen*, Ruhr Universität Bochum, Germany

AF-MoP-51 New Non-pyrophoric Metalorganic Precursor for ALD of Ga₂O₃, *Marcel Schmickler, F. Preischel, A. Devi*, Ruhr University Bochum, Germany

AF-MoP-52 Novel Molybdenum Precursor for Chemical Vapor Deposition and Atomic Layer Deposition, *Yuma Dote, A. Yao, A. Kikuchi*, Central Glass Co., Ltd., Japan

AF-MoP-53 Role of Indium and Tin Elements in Zinc-Based Ternary Oxide Thin Films Grown by Atomic Layer Deposition, *Dong-Hyun Lim, I. Oh, A. Choi*, Ajou University, Republic of Korea

AF-MoP-54 Ultra-Low Electron Temperature Plasma for Damage-Free Atomic Layer Deposition of Titanium Nitride Films: Advancements in PEALD Process Applications, *MINSEOK KIM, S. Kim, C. Lim, D. Kim, C. Chung*, Hanyang University, Korea

AF-MoP-55 Surface Saturation from First Principles, *Timo Weckman*, University of Jyväskylä, Finland

AF-MoP-56 Ultra Thin Diffusion Barrier Development by Utilizing Advanced Deposition Materials in ALD, *Changbong Yeon, D. Cho, J. Jung*, Soulbrain, Republic of Korea; *K. Tan*, Soulbrain, Malaysia; *J. Lim, Y. Park*, Soulbrain, Republic of Korea

AF-MoP-57 A Novel Liquid Ruthenium Precursor and Its Successful Implementation in ALD, *Niklas Huster*, Ruhr University Bochum, Germany; *I. Selvakumar*, Ruhr University Bochum, India; *F. Preischel, J. Obenlueschloß*, Ruhr University Bochum, Germany; *M. Gock, M. Unkrig-Bau, F. Eweiner*, Heraeus Precious Metals GmbH & Co. KG, Germany; *D. Rogalla*, RUBION - Ruhr University Bochum, Germany; *A. Devi*, Ruhr University Bochum, Germany

AF-MoP-58 Tailoring the Properties of Oxide Films by Doping Using Atomic Layer Deposition Method, *Mahtab Salari Mehr, L. Aarik, T. Jõgiaas, H. Mändar*, University of Tartu, Estonia

AF-MoP-59 Low-Temperature Atomic Layer Deposition of Vanadium Oxide: Unveiling the Nucleation and Growth Mechanism, Characterization, and Its Application in Perovskite Solar Cells, *NIRANJAN SINGH BAGHEL, S. Sarkar*, Indian Institute of Technology Bombay, India

AF-MoP-60 Fermi Level Tuning of ZnO Films through Mn Doping via Atomic Layer Deposition Supercycles, *Carolina Bohórquez Martínez*, Center of Nanoscience and Nanotechnology-UNAM, Mexico; *M. Dominguez de la Vega*, Institute for Research into Electronic Microscopy and Materials-UCA, Spain

AF-MoP-61 Atomic Layer Deposition of HfO₂ Thin Film Using a Novel Pyrrole Based Hf Precursor, *Hyunwoo Jeong, C. Park, K. Park, H. Kim, K. Lee, J. Park*, Hansol Chemical Co., Ltd., Republic of Korea

AF-MoP-62 Low-Carbon Silicon Oxynitride Films with Trisilylamine, *Youngju Ko, H. Choi, J. Kim, N. Kim, H. Chae*, Sungkyunkwan University (SKKU), Republic of Korea

AF-MoP-63 Falp® (Fast Atomic Layer Processing) a Chamber for Combined PEALD and ALE Processes. First Data from 300mm E-Chuck Version, *Stephan Wege*, Heinrich-Heine-Strasse 2b, Germany

AF-MoP-64 High-Temperature Atomic Layer Deposition of SiO₂ Using Metalorganic Si Precursor, *Sojeong Eom, S. Lee, H. Yoon, S. Park, S. Na, J. Yoo, S. Jung, H. Kim*, Yonsei University, Korea

AF-MoP-65 Tailoring Crystal and Electrical Characteristics of Indium Oxide via Oxygen Reactants and Substrate Temperature Control in Atomic Layer Deposition, *Seong-Hwan Ryu, T. Hong, S. Choi*, Hanyang University, Korea; *K. Yeom, D. Ryu, J. Seok*, Hansol Chemical, Republic of Korea; *J. Park*, Hanyang University, Korea

AF-MoP-67 Understanding Selectivity Loss in Area-Selective ALD - a DFT Investigation of the SMI Layer Disintegration Mechanisms, *Philipp Wellmann, R. Tonner-Zech, Wilhelm-Ostwald-Institut, Universität Leipzig, Germany*

AF-MoP-68 Nucleation of Copper ALD Films Studied with *In Situ* Synchrotron Measurements, *Aleksandra Figura-Jagoda, S. Klejna, M. Marzec, AGH University of Krakow, Academic Centre for Materials and Nanotechnology, Poland; E. Kokkonen, Max IV Laboratory, Sweden; A. Kwiatkowski, AGH University of Krakow, Faculty of Physics and Applied Computer Science, Poland; K. Maćkosz, C. Minzoni, Empa, Swiss Federal Laboratories for Materials Science and Technology, Thun, Switzerland; A. Szkudlarek, AGH University of Krakow, Academic Centre for Materials and Nanotechnology, Poland; I. Utke, Empa, Swiss Federal Laboratories for Materials Science and Technology, Thun, Switzerland; M. Sikora, AGH University of Krakow, Academic Centre for Materials and Nanotechnology, Poland*

AF-MoP-69 In-Situ Investigation of Oxidant Influence on Materials Properties of Ultrathin Cerium Oxide Films Using Novel Ce(Dpdmg)₃ Precursor, *Rudi Tschammer, J. Kosto, C. Morales, BTU Cottbus, Germany; M. Schmickler, Ruhr Universität Bochum, Germany; K. Henkel, BTU Cottbus, Germany; A. Devi, Ruhr Universität Bochum, Germany; J. Flege, BTU Cottbus, Germany*

AF-MoP-70 Impact of the Knudsen Number on the ALD Saturation Profile Characteristics – Extended Slope Method, *Christine Gonsalves, J. Velasco, J. Yim, J. Järvielhto, V. Vuorinen, R. Puurunen, Aalto University, Finland*

AF-MoP-71 Atomic Layer Deposition of Hafnium Oxide for Ferroelectric Devices, *Stijn van der Heijden, B. Macco, E. Kessels, Eindhoven University of Technology, The Netherlands*

AF-MoP-72 Analysing Growth Behaviour of Low Temperature ALD ZnO Films on Meso-porous Si Gr Battery Anodes for Improved Performance SEI, *Boris Hudec, Institute of Electrical Engineering, Slovak Academy of Sciences, Slovakia; P. Sahoo, A. Güneren, M. Precnerová, Centre for Advanced Materials Application, Slovak Academy of Sciences, Slovakia; M. Pecz, Institute of Electrical Engineering, Slovak Academy of Sciences, Slovakia; K. Fröhlich, Centre for Advanced Materials Application, Slovak Academy of Sciences, Slovakia*

AF-MoP-73 Rapid ALD by Forced Flow Through 3-Dimensional Macroscopic Nanoporous Solids, *Austin Cendekas, ASEE Postdoctoral Fellow Residing at U.S. Naval Research Laboratory, USA; B. Greenberg, K. Anderson, B. Feygelson, U.S. Naval Research Laboratory, USA*

AF-MoP-74 QCM the UiO Way, a Tutorial, *Ola Nilsen, University of Oslo, Norway*

AF-MoP-75 Sticking Coefficients in Atomic Layer Deposition Processes, *Martin Knaut, O. Bieg, T. Mikolajick, TU Dresden, Germany*

AF-MoP-76 A Data-Driven Approach to Analyzing Chemical Reactions and Predicting Film Properties in SiO₂N_y ALD Processes, *Sung Kyu Jang, H. Kim, J. Jeon, H. Kim, Korea Electronics Technology Institute, Republic of Korea; H. Kim, SurplusGLOBAL, Republic of Korea; S. Kim, H. Kim, W. Lee, S. Kim, Korea Electronics Technology Institute, Republic of Korea*

AF-MoP-77 ALD of Two-Dimensional Gallium Sulfide: Understanding the Nucleation and Strain Evolution During Growth, *O. Massmeyer, R. Günkel, S. Kachel, Philipps Universität, Germany; P. Klement, Justus Liebig University Giessen, Germany; J. Belz, Philipps Universität, Germany; S. Chatterjee, Justus Liebig University Giessen, Germany; M. Gottfried, Kerstin Volz, Philipps Universität, Germany*

AF-MoP-78 In-situ Quartz Crystal Microbalance Measurement of Adsorption Equilibrium for Trimethylaluminum, *Yuxuan Wu, The University of Tokyo, Japan; J. Yamaguchi, N. Sato, A. Tsukune, Y. Shimogaki, The University of Tokyo, Japan*

AF-MoP-79 Influence of N₂/Ar Plasma Exposure Time on the Growth Kinetics of Epitaxial In₂S₃ Studied by *In Situ* Grazing Incidence Small-Angle X-Ray Scattering, *Jeffrey Woodward, U.S. Naval Research Laboratory, USA; S. Rosenberg, Lockheed Martin Advanced Technology Center, USA; D. Boris, M. Johnson, U.S. Naval Research Laboratory, USA; Z. Robinson, SUNY Brockport, USA; S. Johnson, Honeywell, USA; N. Nepal, U.S. Naval Research Laboratory, USA; K. Ludwig, Boston University, USA; S. Walton, C. Eddy, U.S. Naval Research Laboratory, USA*

AF-MoP-80 Theoretical Explorations of Vapour Phase Infiltration, *Karl Rönnby, Tyndall National Institute, University College Cork, Ireland; M. Perego, CNR-IMM, Unit of Agrate Brianza, Italy; M. Nolan, Tyndall National Institute, University College Cork, Ireland*

AF-MoP-81 Synthesis and Characterization of Group III Precursors for Atomic Layer Deposition, *Dexter Dimova, S. Barry, Carleton University, Canada*

Nanostructure Synthesis and Fabrication

Room Hall 3 - Session NS-MoP

Nanostructures Synthesis and Fabrication Poster Session

5:45pm

NS-MoP-1 Interfacial Distortion of Sb₂Te₃-Sb₂Se₃ Multilayers via ALD for Enhanced Thermoelectric Properties, *Jun Yang, A. Bahrami, S. Lehmann, K. Nielsch, Leibniz IFW-Dresden, Germany*

NS-MoP-2 Effect of Ga₂O₃ Doping in Atomic Layer Deposited SnO₂ Thin Films, *J. Bae, T. Lee, D. Lee, Hyeonntag Jeon, Hanyang University, Republic of Korea*

NS-MoP-3 Lateral Conversion Synthesis of TMDs from Lithographically Patterned ALD Films, *Teveye Kuykendall, Lawrence Berkeley National Laboratory, USA; A. Kemelbay, Lawrence Berkeley National Laboratory, Kazakhstan; S. Aloni, Lawrence Berkeley National Laboratory, USA*

NS-MoP-4 Low Temperature SiO₂ Deposition in a Fluidized Bed to Improve the Colloid Stability of Polymer Microspheres, *Rens Kamphorst, Delft University of Technology, Netherlands*

NS-MoP-5 ALD on Particulate Materials: A Comprehensive Review of Processes, Support Materials and Applications, *Peter M. Piechulla, M. Chen, Delft University of Technology, Netherlands; R. Puurunen, Aalto University, Finland; J. van Ommen, A. Goulas, Delft University of Technology, Netherlands*

NS-MoP-6 Al₂O₃ and HfO₂ Thin Layers by ALD on 1L-MoS₂: from Nucleation to Structural/Electrical Properties, *Emanuela Schilirò, S. Panasci, B. Galizia, A. Mio, G. Nicotra, CNR-IMM, Catania, Italy; S. Agnello, Department of Physics and Chemistry, University of Palermo; ATeN Center, Palermo, Italy; B. Pecz, G. Radnoczi, Institute for Technical Physics and Materials Science, Centre for Energy Research, HAS, Hungary; I. Deretzis, A. La Magna, F. Roccaforte, R. Lo Nigro, F. Giannazzo, CNR-IMM, Catania, Italy*

NS-MoP-7 Atomic Layer Deposition of Ruthenium Nanoparticles on Low Surface Energy Carbon Supports and Titania Nanotube Layers for Alkaline Hydrogen Evolution Reaction, *S. Mouli Thalluri, J. Rodriguez-Pereira, R. Zazpe, H. Sopher, University of Pardubice, Czechia; Jan Macak, University of Pardubice, Brno University of Technology, Czechia*

NS-MoP-8 Iridium Nanoparticles for Alkaline Hydrogen Evolution Reaction Synthesized by Atomic Layer Deposition on Titania Nanotube Layers and Carbon Supports, *Jhonatan Rodriguez-Pereira, B. Bawab, R. Zazpe, J. Macak, University of Pardubice, Czechia*

NS-MoP-9 Improving Thermoelectric Performance in Bi-Te Powders through Precision Control of TiO₂-induced Interface via Atomic Layer Deposition, *Su Min Eun, B. Choi, Seoul National University of Science and Technology, Republic of Korea*

NS-MoP-10 Selective Deposition of Pt Nanoparticles on 2D WS₂ for Enhanced Photodetection, *Hwi Yoon, D. Shin, I. Sohn, Yonsei University, Republic of Korea; T. Nakazawa, TANAKA Kikinokogyo K.K, Japan; S. Chung, H. Kim, Yonsei University, Republic of Korea*

NS-MoP-11 Demonstrating Graphene Hall Sensor Device Stability via Encapsulation Layer Optimization, *Jaspreet Kainth, R. Coleman, R. Baines, H. Glass, Paragraf, UK*

Tuesday Morning, August 6, 2024

| Room Hall 3A | | |
|--------------|---|---|
| 8:00am | AF1-TuM-1 Navigating the Semiconductor Market for ALD Precursors - in the Past and in the Future, <i>Jonas Sundqvist</i> , TECHCET LLC CA, Germany | ALD Fundamentals Session AF1-TuM Precursors and Chemistry: Precursor Design, New Precursors, Process Development II Moderators: Seán Barry , Carleton University, Canada, Atsushi Sakurai , ADEKA CORPORATION, Japan |
| 8:15am | AF1-TuM-2 Improvement of COSMO-SAC Method for Estimating Vapor Pressure of ALD Precursors, <i>Noboru Sato</i> , The University of Tokyo, Japan; <i>Y. Wu</i> , The University of Tokyo, Japan, China; <i>J. Yamaguchi</i> , <i>A. Tsukune</i> , <i>Y. Shimogaki</i> , The University of Tokyo, Japan | |
| 8:30am | AF1-TuM-3 Development of Precursors and Reactivity for Thermal Atomic Layer Deposition (ALD) of Main Group Elements, <i>Majeda Al Hareri</i> , <i>D. Emslie</i> , McMaster University, Canada | |
| 8:45am | AF1-TuM-4 A New ALD Process for Elemental Tellurium, <i>Paavo Porri</i> , <i>T. Hatanpää</i> , <i>H. Nieminen</i> , <i>K. Mizohata</i> , <i>M. Putkonen</i> , <i>M. Ritala</i> , University of Helsinki, Finland | |
| 9:00am | AF1-TuM-5 Development of an Innovative Method to Find New Efficient Gallium ALD Precursors, <i>Eva Pugliese</i> , <i>D. Coutancier</i> , <i>J. Hervochon</i> , <i>P. Pavard</i> , CNRS-IPVF, France; <i>C. Gosmini</i> , Ecole Polytechnique - CNRS, France; <i>V. Lair</i> , Cimie ParisTech PSL, France; <i>A. Ringuede</i> , Chimie ParisTech PSL, France; <i>M. Bouttemy</i> , Institut Lavoisier de Versailles, France; <i>A. Auffrant</i> , Ecole Polytechnique - CNRS, France; <i>N. Schneider</i> , CNRS-IPVF, France | |
| 9:15am | AF1-TuM-6 Insights into Reactive Oxygen Species and Film Properties of Atomic Layer Deposited Al ₂ O ₃ using Different Plasma-Activated Waters as Co-reactant, <i>J. Karnopp</i> , Aeronautics Institute of Technology, Brazil; <i>F. Miranda</i> , Universidade Estadual Paulista (UNESP), Brazil; <i>N. Azevedo Neto</i> , Aeronautics Institute of Technology, Brazil; <i>L. Daiane Pereira Leite</i> , Universidade Estadual Paulista (UNESP), Brazil; <i>D. Marcel Leite</i> , <i>C. Alves Junior</i> , <i>A. da Silva Sobrinho</i> , <i>Rodrigo Sávio Pessoa</i> , Aeronautics Institute of Technology, Brazil | |
| 9:30am | AF1-TuM-7 The Effect of Co-Reactants on Interfacial Oxidation in Atomic Layer Deposition of Oxides on Metal Surfaces, <i>J. Swarup</i> , <i>H. Chuang</i> , <i>A. You</i> , James Engstrom , Cornell University, USA | |
| 9:45am | AF1-TuM-8 Atomic Layer Deposition of Co ₂ P Thin Films, <i>Elisa Atosuo</i> , <i>P. Deminskyi</i> , ASM Microchemistry Ltd., Finland; <i>K. Mizohata</i> , <i>T. Hatanpää</i> , <i>M. Ritala</i> , University of Helsinki, Finland | |
| 10:00am | Break & Exhibits | |
| 10:15am | | |
| 10:30am | | |
| 10:45am | AF2-TuM-12 Plasma-Enhanced ALD of Ga ₂ O ₃ and GaN with Remote CCP-Plasma, Short Cycle Times, and Substrate Biasing, Roel Theeuwes , Eindhoven University of Technology, Netherlands; <i>L. Gutmann</i> , Eindhoven University of Technology, Germany; <i>H. Knoops</i> , Oxford Instruments Plasma Technology, Eindhoven University of Technology, Netherlands; <i>E. Kessels</i> , Eindhoven University of Technology, Netherlands | ALD Fundamentals Session AF2-TuM Growth and Characterization: Plasma Enhanced ALD I Moderators: Hyeontag Jeon , Hanyang University, Republic of Korea, Erwin Kessels , Eindhoven University of Technology, Netherlands |
| 11:00am | AF2-TuM-13 Y ₂ C Thin Films Prepared by Plasma Enhanced Atomic Layer Deposition as a Diffusion Barrier and Glue Layer for Cu & Ru Interconnects, Minjeong Kweon , <i>C. Park</i> , <i>S. Kim</i> , <i>S. Kim</i> , Ulsan National Institute of Science and Technology (UNIST), Republic of Korea | |
| 11:15am | AF2-TuM-14 Plasma Enhanced Atomic Layer Deposition of Boron Nitride, Marc Reynaud , University of Texas at Austin, USA; <i>J. Zhao</i> , <i>J. Carroll</i> , <i>G. Blankemeyer</i> , <i>P. Ventzek</i> , Tokyo Electron America, Inc., USA; <i>J. Warner</i> , <i>J. Ekerdt</i> , University of Texas at Austin, USA | |
| 11:30am | AF2-TuM-15 Time-Resolved Study of OH Radicals During PEALD of Al ₂ O ₃ by Advanced Laser Spectroscopy, Antoine Salden , TU / Eindhoven, Netherlands; <i>M. Ceppelli</i> , <i>L. Martini</i> , University of Trento, Italy; <i>R. Engeln</i> , <i>H. Knoops</i> , <i>E. Kessels</i> , TU / Eindhoven, Netherlands | |
| 11:45am | AF2-TuM-16 Engineering of Vo _x Properties Through Control of Plasma Characteristics During Plasma-Enhanced Atomic Layer Deposition, Peter Litwin , U.S. Naval Research Laboratory, USA; <i>M. Currie</i> , <i>N. Nepal</i> , <i>M. Sales</i> , <i>D. Boris</i> , <i>S. Walton</i> , <i>V. Wheeler</i> , US Naval Research Laboratory, USA | |
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Tuesday Morning, August 6, 2024

| Room Hall 3D | | |
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| 8:00am | AA1-TuM-1 Leakage Control of DRAM High-k Capacitor Stack by Ald Sc_2O_3 , Y_2O_3 Inter-Layer, <i>R. Higuchi, A. Babadi, C. Chen, Bhushan Zope</i> , Merck KGaA, Darmstadt, Germany, USA | ALD Applications Session AA1-TuM Applications in ULSI BEOL: Interconnects, Diffusion Barriers, & DRAM Moderators: Mike McSwiney , Applied Materials, USA, David Towner , Intel Corp., USA |
| 8:15am | AA1-TuM-2 ALD Deposited IGO with High Thermal Stability (~ 800 °C) by Controlling Crystallinity for Multi-bit Operation 2T0C DRAM, <i>Jae-Hyeok Kwag, S. Choi, J. Sim, T. Cho, C. Park, Y. Song, J. Park</i> , Hanyang University, Republic of Korea | |
| 8:30am | AA1-TuM-3 Improving Electrical Properties of ZrO_2 Dielectric Films Without Sacrificing Tetragonal Crystallinity via Gd Doping, <i>Seungwoo Lee, Y. Choi, J. Jeong, J. Nam</i> , Kyung Hee University, Republic of Korea; <i>H. Oh, H. Kim, Y. Park</i> , SK trichem, Republic of Korea; <i>W. Jeon</i> , Kyung Hee University, Republic of Korea | |
| 8:45am | INVITED: AA1-TuM-4 Area Selective Co ALD for Highly Reliable ULSI Interconnect System and the Establishment of ALD Process Design Framework, <i>Yukihiko Shimogaki</i> , The University of Tokyo, Japan | |
| 9:00am | | |
| 9:15am | AA1-TuM-6 Atomic Layer Deposition (ALD) of Transition Metal Dichalcogenides (TMDS) Layers as Metal Diffusion Barriers for Back-End-of-Line (BEOL) Applications, <i>Anil Mane, S. Katta, J. Morris, C. Phatak, J. Elam</i> , Argonne National Laboratory, USA | |
| 9:30am | AA1-TuM-7 High-Quality Co Thin Film by Thermal ALD Using CCTBA Precursor by Controlling H_2 Dose, <i>Jun Yamaguchi, N. Sato, A. Tsukune, T. Momose, Y. Shimogaki</i> , The University of Tokyo, Japan | |
| 9:45am | AA1-TuM-8 Improved Properties of Atomic Layer Deposited Ru Films by Providing Additional Reactant for Cu Alternative Interconnects, <i>Jeongha Kim, K. Sang Bok</i> , Ulsan National Institute of Science and Technology (UNIST), Republic of Korea; <i>T. Cheon</i> , Daegu Gyeongbuk Institute of Science & Technology (DGIST), Republic of Korea; <i>S. Kim</i> , Ulsan National Institute of Science and Technology (UNIST), Republic of Korea | |
| 10:00am | Break & Exhibits | |
| 10:15am | | |
| 10:30am | | |
| 10:45am | INVITED: AA2-TuM-12 ALD Layers and Interfaces in Next Generation Photovoltaics, <i>Mariadriana Creatore</i> , TU Eindhoven, Netherlands | ALD Applications Session AA2-TuM Energy: Solar Energy Materials I Moderators: Wei-Min Li , Jiangsu Leadmicro Nano-Equipment Technology Ltd., China, Nathanaelle Schneider , CNRS-IPVF, France |
| 11:00am | | |
| 11:15am | AA2-TuM-14 Utilizing Low-Temperature Ald Technique to Investigate Perovskite Nickelates for Photovoltaic Applications, <i>Anjali Choubey, H. Hovde Sønsteby</i> , University of Oslo, Norway; <i>H. von Wenckstern</i> , University of Oslo, Germany; <i>O. Nilsen</i> , University of Oslo, Norway | |
| 11:30am | AA2-TuM-15 Atomic Layer Deposition of Defect-Engineered TiO_x and TaO_x Protective Coatings for Photoelectrochemistry, <i>Tim Rieth, O. Biemek, J. Kühne, I. Sharp</i> , Walter Schottky Institut, Technische Universität München, Germany | |
| 11:45am | AA2-TuM-16 Ultrathin $\text{TiN/TiO}_2/\text{Ti}$ Solar Absorbers Enabled by Atomic Layer Deposition, <i>Luca Mascaretti</i> , Czech Technical University in Prague, Czech Republic; <i>A. Naldoni</i> , University of Turin, Italy; <i>L. Kalvoda, I. Richter</i> , Czech Technical University in Prague, Czech Republic | |

Tuesday Morning, August 6, 2024

| Room Hall 3E | | |
|--------------|---|--|
| 8:00am | INVITED: AM-TuM-1 Development of a Modular Manufacturing Equipment Architecture for Application Tailored Process Options, <i>Jacques Kools</i> , Encapsulix SAS, France | ALD for Manufacturing Session AM-TuM Equipment Design, Precursor Delivery, and Spatial/R2R/Fast ALD Moderators: Dennis Hausmann, Lam Research, USA, Ganesh Sundaram, Veeco-CNT, USA |
| 8:15am | | |
| 8:30am | AM-TuM-3 Optimizing Precursor Utilization for Spatial ALD in High Surface Area Substrates, <i>J. van Himste</i> , SparkNano B.V., Netherlands; Paul Poodt , SparkNano B.V. and Eindhoven University of Technology, Netherlands | |
| 8:45am | AM-TuM-4 Development and Scale-up of ALD onto Synthetic Graphite Powder in a Continuous Vibrating Reactor for Battery Applications, <i>B. Castro</i> , Forge Nano Inc, USA; <i>A. Broerman</i> , <i>C. Gump</i> , Arrelaine Dameron , Forge Nano, USA | |
| 9:00am | AM-TuM-5 Ultra High Speed Spatial PEALD Using a Novel Precursor Separation Method, Eric Dickey , Lotus Applied Technology, USA | |
| 9:15am | AM-TuM-6 An Innovative 3D Solution for High Throughput Roll-to-Roll ALD, Diederick Spee , Kalpana Systems, Netherlands; <i>A. Ghazy</i> , Kalpana systems, Netherlands | |
| 9:30am | AM-TuM-7 A Novel Technique for Pulsed Liquid Source Vapor Delivery in ALD and Short-Pulse CVD, Kathleen Erickson , <i>T. Sandbakken</i> , MSP - A Division of TSI, USA | |
| 9:45am | AM-TuM-8 In-situ Spectroscopic Ellipsometry During Spatial ALD of Al ₂ O ₃ , ZnO, and SnO ₂ , Melika Motaghian , <i>M. van de Poll</i> , <i>S. Ratnasingham</i> , Eindhoven University of Technology, Netherlands; <i>H. de Vries</i> , SALD B.V., Netherlands; <i>P. Poodt</i> , Eindhoven University of Technology, Netherlands; <i>J. Hilfiker</i> , J.A. Woollam Co., Inc., USA; <i>E. Kessels</i> , <i>B. Macco</i> , Eindhoven University of Technology, Netherlands | |
| 10:00am | Break & Exhibits | |
| 10:15am | | |
| 10:30am | | |
| 10:45am | INVITED: AS-TuM-12 Novel Carbon-based Ligands on Planar Metal Surfaces: Self Assembled Monolayers and Applications in Atomic Layer Deposition, Cathleen Crudden , Queen's University, Canada | Area Selective ALD Session AS-TuM Selective ALD Moderators: Han-Bo-Ram Lee, Incheon National University, Republic of Korea, Angel Yanguas-Gil, Argonne National Lab, USA |
| 11:00am | | |
| 11:15am | AS-TuM-14 Enhancing Selectivity for AS-ALD of MoO ₂ through Hydrogen Treatment: Strategy of Surface Cleaning and Expanding Deactivated Areas, Hae Lin Yang , <i>J. Kwon</i> , <i>C. Park</i> , Hanyang University, Korea; <i>S. Lee</i> , <i>B. Kim</i> , <i>C. Jung</i> , <i>H. Lim</i> , Samsung Electronics Co., Inc., Republic of Korea; <i>J. Park</i> , Hanyang University, Korea | |
| 11:30am | AS-TuM-15 Contra-Selective Deposition of SiO ₂ on Metals, Chad Brick , <i>T. Ogata</i> , Gelest, Inc, USA | |
| 11:45am | AS-TuM-16 Photoluminescent Graphene-Lanthanide Heterostructures via Direct Laser Writing and Area-Selective Atomic-Molecular Layer Deposition, Aleksei Emelianov , <i>K. Mentel</i> , University of Jyväskylä, Finland; <i>A. Ghazy</i> , Aalto University, Finland; <i>A. Johansson</i> , University of Jyväskylä, Finland; <i>M. Karppinen</i> , Aalto University, Finland; <i>M. Pettersson</i> , University of Jyväskylä, Finland | |

Tuesday Morning, August 6, 2024

| Room Hall 3F | | |
|--------------|---|---|
| 8:00am | INVITED: ALE1-TuM-1 Current Status of ALE in Semiconductor Processes, <i>Keun Hee Bai</i> , Samsung Electronics Co., Republic of Korea | Atomic Layer Etching Session ALE1-TuM ALE Applications and Methodologies Moderators: Hannah Margavio , North Carolina State University, USA, Fred Roozeboom , University of Twente and Carbyon, B.V., The Netherlands |
| 8:15am | | |
| 8:30am | ALE1-TuM-3 ALE Preparation of Diamond Surfaces for Materials and Device Applications, <i>Jeffrey Daulton</i> , <i>M. Geis</i> , <i>M. Polking</i> , MIT Lincoln Laboratory, USA | |
| 8:45am | ALE1-TuM-4 Comparison of Different PEALE Modes on AlGaN/GaN Heterostructures, <i>Christian Miersch</i> , <i>S. Seidel</i> , Fraunhofer Institute for Integrated Systems and Device Technology IISB, Germany; <i>A. Schmid</i> , <i>J. Heitmann</i> , Department of Applied Physics, Technical University of Freiberg, Germany; <i>F. Beyer</i> , Fraunhofer Institute for Integrated Systems and Device Technology IISB, Germany | |
| 9:00am | ALE1-TuM-5 Quasi-ALE Process for GaN: High Etching Rate Without Compromising the Surface Roughness, <i>P. Mouriño-Miñambres</i> , <i>R. Resta-López</i> , <i>F. Martin-Romero</i> , <i>Miguel Sinusia Lozano</i> , <i>V. Gómez</i> , Nanophotonics Technology Center - Universitat Politècnica de València, Spain | |
| 9:15am | ALE1-TuM-6 A New Challenge for Developing Novel Atomic Layer Etching: Applying the Leidenfrost Effect to Obtain Floating Nanomist-Assisted Vapor Etching, <i>Thi-Thuy-Nga Nguyen</i> , Nagoya University, Japan; <i>Y. Yamaguchi</i> , <i>K. Shinoda</i> , Hitachi, Ltd., Japan; <i>K. Sun</i> , Nagoya University, Japan; <i>K. Maeda</i> , <i>K. Yokogawa</i> , <i>M. Izawa</i> , Hitachi High-Tech Corp., Japan; <i>K. Ishikawa</i> , <i>M. Hori</i> , Nagoya University, Japan | |
| 9:30am | ALE1-TuM-7 Electron-Enhanced Etching of Molybdenum Using Sequential O ₂ and HCl Reactive Background Gases to Form Volatile Molybdenum Oxochlorides, <i>Michael Collings</i> , <i>S. George</i> , University of Colorado, Boulder, USA | |
| 9:45am | ALE1-TuM-8 Impact of Activation Strategies for SiO ₂ Atomic Layer Etching Applied to Contact Patterning, <i>Antoine Ronco</i> , <i>F. Boulard</i> , <i>S. Leclercq</i> , Univ. Grenoble Alpes, CEA, Leti, France; <i>N. Possème</i> , ST Microelectronics, France | |
| 10:00am | Break & Exhibits | |
| 10:15am | | |
| 10:30am | | |
| 10:45am | INVITED: ALE2-TuM-12 Thermal Etching of Metals and Metallic Materials for Gate-All-Around Devices, <i>Dimitri Kioussis</i> , <i>S. Karumuri</i> , <i>M. Uddin</i> , <i>S. Barnhill</i> , <i>Y. Huang</i> , <i>B. Erickson</i> , Intel Corporation, USA | Atomic Layer Etching Session ALE2-TuM Thermal Gas-phase ALE Moderators: Heeyeop Chae , Sungkyunkwan University (SKKU), Republic of Korea, Jean-François de Marneffe , IMEC, Belgium |
| 11:00am | | |
| 11:15am | ALE2-TuM-14 Low Temperature, Conversion-Free Thermal Atomic Layer Etching of Zinc Oxide using Hydrofluoric Acid and Trimethylgallium, <i>Taewook Nam</i> , <i>D. Zywojko</i> , <i>J. Partridge</i> , <i>S. George</i> , University of Colorado Boulder, USA | |
| 11:30am | ALE2-TuM-15 Thermal Atomic Layer Etching of the Indium Gallium Zinc Oxide (IGZO) Family by Fluorination and Ligand-Substitution Hydrogen-Transfer Reactions, <i>Troy Collieran</i> , <i>J. Partridge</i> , <i>A. Abdulgatov</i> , <i>S. George</i> , University of Colorado at Boulder, USA | |
| 11:45am | ALE2-TuM-16 Designing an ALE Process and Uncovering the Etching Mechanism for a 2D van Der Waals Material: Ternary Transition Metal Chalcogenide CrPS ₄ , <i>Marissa Pina</i> , <i>M. Whalen</i> , <i>J. Xiao</i> , <i>A. Teplyakov</i> , University of Delaware, USA | |
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Tuesday Afternoon, August 6, 2024

| Room Hall 3A | | |
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| 1:30pm | AF1-TuA-1 New Class of Tin Precursors Targeting Low Temperature ALD Processing, <i>Jean-Pierre Glauber</i> , A. Devi, Ruhr University Bochum, Germany | ALD Fundamentals Session AF1-TuA Precursors and Chemistry: Precursor Design, New Precursors, Process Development III Moderators: Anjana Devi , Ruhr University Bochum, Germany, Paul Williams , Pegasus Chemicals, USA |
| 1:45pm | AF1-TuA-2 Novel Synthesis Route for Atomic Layer Epitaxy of BaSnO ₃ , <i>Andreas Alstad</i> , H. Sønsteby, University of Oslo, Norway | |
| 2:00pm | AF1-TuA-3 Microwave Enhanced ALD of Al ₂ O ₃ , <i>B. Kupp</i> , A. Schraner, <i>John Conley</i> , Oregon State University, USA | |
| 2:15pm | AF1-TuA-4 Atomic Layer Deposition of SnO Film Using Liquid Sn(EtCp) ₂ Precursor and Combinations of H ₂ O and H ₂ Plasma, <i>Fumikazu Mizutani</i> , N. Takahashi, Kojundo Chemical Laboratory Co., Ltd., Japan; <i>T. Nabatame</i> , National Institute for Materials Science, Japan | |
| 2:30pm | AF1-TuA-5 A New Water Assisted ALD Process for Sc ₂ O ₃ Using a Volatile Liquid Precursor, <i>Martin Wilken</i> , Ruhr Universität Bochum, Germany; <i>T. Hepp</i> , O. Briel, Dockweiler Chemicals GmbH, Germany; <i>A. Muriqi</i> , Tyndall National Institute, University College Cork, Ireland; <i>C. Cho</i> , Ruhr Universität Bochum, Germany; <i>M. Nolan</i> , Tyndall National Institute, University College Cork, Ireland; <i>A. Devi</i> , Leibniz Institute for Solid State and Materials Research, Dresden (IFW), Germany | |
| 2:45pm | AF1-TuA-6 Atomic Layer Deposition of Crystalline Molybdenum Trioxide and Suboxide Thin Films, <i>Alexey Ganzhinov</i> , M. Putkonen, M. Ritala, University of Helsinki, Finland | |
| 3:00pm | AF1-TuA-7 Promising Precursor Chemistry for ALD of Lithium-Based Thin Films, <i>Jorit Obenlünenschloß</i> , Inorganic Materials Chemistry, Ruhr University Bochum, Bochum, Germany; <i>N. Boysen</i> , Fraunhofer Institute for Microelectronic Circuits and Systems, Duisburg, Germany; <i>U. Brokmann</i> , Inorganic Non-metallic Materials, Technische Universität Ilmenau, Ilmenau, Germany; <i>D. Rogalla</i> , RUBION, Ruhr University Bochum, Bochum, Germany; <i>E. Rädlein</i> , Inorganic Non-metallic Materials, Technische Universität Ilmenau, Ilmenau, Germany; <i>A. Devi</i> , Inorganic Materials Chemistry, Ruhr University Bochum, Bochum, Germany | |
| 3:15pm | AF1-TuA-8 Benchmarking 4 Different Cobalt Precursors for Atomic Layer Deposition of Complex Cobalt Oxides, <i>Yani Amedjkouh</i> , H. Sønsteby, University of Oslo, Norway | |
| 3:30pm | Break & Exhibits | |
| 3:45pm | | |
| 4:00pm | INVITED: AF2-TuA-11 Machine Learning Assisted Surface Reaction Study of Al(Me) ₃ and Water on OH/Si(111), <i>H. Nakata</i> , <i>Cheol Ho Choi</i> , Kyungpook National University, Republic of Korea | ALD Fundamentals Session AF2-TuA Precursors and Chemistry: Simulation, Modeling, and Machine Learning for ALD Moderators: Michael Nolan , University College Cork, Ireland, Ralf Tonner-Zech , Leipzig University, Germany |
| 4:15pm | | |
| 4:30pm | AF2-TuA-13 Quantum Chemical Investigation on the Reaction Mechanism of Atomic Layer Deposition of ZrO ₂ from Heteroleptic CpZr(N(CH ₃) ₂) ₃ Precursor and Ozone, <i>Rabi Khanal</i> , R. Joe, A. Dip, Tokyo Electron America, Inc., USA | |
| 4:45pm | AF2-TuA-14 Microkinetic Modelling to Reveal How the Atomic-Scale Mechanism of Deposition or Etch Plays Out at Feature and Reactor Scale, <i>Simon D. Elliott</i> , Schrödinger, Ireland; <i>T. Hughes</i> , T. Ludwig, Schrödinger, USA; <i>J. Gavartin</i> , Schrödinger, UK | |
| 5:00pm | AF2-TuA-15 First-Principles Based Comprehensive Surface Kinetic Modeling for Molybdenum ALD Film Growth, <i>Toshihiko Iwao</i> , K. Lee, J. Cha, J. Hong, J. Son, S. Kang, Etch/CLN Equipment R&D Team, Samsung Electronics, Republic of Korea | |
| 5:15pm | AF2-TuA-16 Modelling the Ligand Exchange Process for the Atomic Layer Deposition of Metal and Metal Oxide Thin Films, <i>Ji Liu</i> , Tyndall National Institute, University College Cork, Ireland; <i>H. Sønsteby</i> , University of Oslo, Norway; <i>M. Nolan</i> , Tyndall National Institute, University College Cork, Ireland | |

Tuesday Afternoon, August 6, 2024

| Room Hall 3D | | |
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| 1:30pm | INVITED: AA1-TuA-1 Toward All-ALD Halide Perovskite Solar Cells, <i>G. Popov, A. Weiss, M. Ritala, M. Leskelä, Marianna Kemell</i> , University of Helsinki, Finland | ALD Applications Session AA1-TuA Energy: Solar Energy Materials II Moderators: Arrelaine Dameron , Forge Nano, USA, Neil Dasgupta , University of Michigan, USA |
| 1:45pm | | |
| 2:00pm | AA1-TuA-3 Investigation of ALD-Al ₂ O ₃ Growth Mechanism on Hybrid Perovskites for Efficient and Stable Solar Cells, <i>Chittaranjan Das, M. Kedia</i> , Forschungszentrum Jülich GmbH, Germany; <i>T. Nguyen</i> , IPV, University of Stuttgart, Germany; <i>M. Saliba</i> , Forschungszentrum Jülich GmbH, Germany | |
| 2:15pm | AA1-TuA-4 Hybrid Solar Cells Comprising Inorganic and Organic Materials Through Vapor Phase Infiltration, <i>K. Ashurbekova</i> , 1. CIC nanoGUNE, Spain; <i>Mato Knez</i> , CIC nanoGUNE, Spain | |
| 2:30pm | AA1-TuA-5 Mitigating the Cross-Ion Migration Towards Perovskite Using a Conformal Layer of Alumina via Atomic Layer Deposition, <i>Mayank Kedia, C. Das, M. Saliba</i> , Forschungszentrum Jülich GmbH, Germany | |
| 2:45pm | AA1-TuA-6 Thermoelectric Properties of Sb ₂ Te ₃ -based Ferecrystals based on Atomic Layer Deposition, <i>J. Yang, D. Shin, S. Lehmann, A. Bahrami, Korneli Nielsch</i> , Leibniz Inst. of Solid State and Materials Research / IFW-Dresden, Germany | |
| 3:00pm | INVITED: AA1-TuA-7 Atomic Layer Deposition for Photoelectrochemical Solar Fuel Production, <i>Lionel Santinacci</i> , CNRS/Aix-Marseille Univ., France | |
| 3:15pm | | |
| 3:30pm | Break & Exhibits | |
| 3:45pm | | |
| 4:00pm | AA2-TuA-11 How Instability Can Be Beneficial for Electrocatalysis: The Case of Nickel Sulfide Oxygen Evolution Reaction Precatalyst, <i>Miika Mattinen</i> , University of Helsinki, Finland; <i>J. Schröder, G. D'Acunto, T. Jaramillo</i> , Stanford University, USA; <i>M. Burke Stevens</i> , SLAC National Accelerator Laboratory, USA; <i>M. Ritala</i> , University of Helsinki, Finland; <i>S. Bent</i> , Stanford University, USA | ALD Applications Session AA2-TuA Energy: Catalysis and Fuel Cells Moderators: Riikka Puurunen , Aalto University, Finland, Ruud van Ommen , Delft University of Technology, Netherlands |
| 4:15pm | AA2-TuA-12 Diffusion–Reaction Modeling for Atomic Layer Deposition on Spheres: Comparison with Experimental Data, <i>Niko Heikkinen</i> , VTT Technical Research Centre of Finland; <i>J. Yim, J. Järvilehto</i> , Aalto University, Finland; <i>S. Saedy</i> , Delft University of Technology, Netherlands; <i>P. Brüner, T. Grehl</i> , IONTOF GmbH, Netherlands; <i>E. Haimi, J. Velasco, C. Gonsalves</i> , Aalto University, Finland; <i>R. van Ommen</i> , Delft University of Technology, Netherlands; <i>J. Lehtonen</i> , VTT Technical Research Centre of Finland; <i>R. Puurunen</i> , Aalto University, Finland | |
| 4:30pm | AA2-TuA-13 Highly Durable Pt Based Fuel Cell Catalysts via Atomic Layer Deposition, <i>Xiao Liu, H. Liu, Y. Gao</i> , State Key Laboratory of Intelligent manufacturing Equipment and Technology, School of Mechanical Science and Engineering, Huazhong University of Science and Technology, China; <i>B. Shan</i> , State Key Laboratory of Materials Processing and Die & Mould Technology, School of Materials Science and Engineering, Huazhong University of Science and Technology, China; <i>R. Chen</i> , State Key Laboratory of Intelligent manufacturing Equipment and Technology, School of Mechanical Science and Engineering, Huazhong University of Science and Technology, China | |
| 4:45pm | AA2-TuA-14 Catalyst on Top? Importance of the Final Layer of an ALD Deposited Catalyst. Ni-Fe Catalysts Deposited by ALD, <i>Ruben Blomme</i> , Ghent University, Belgium; <i>R. Ramesh</i> , Ghent University, Belgium, India; <i>L. Henderick, M. Minjauw, P. Vereecke, M. Adriaens, C. Detavernier, J. Dendoven</i> , Ghent University, Belgium | |
| 5:00pm | AA2-TuA-15 Enhanced Oxygen Evolution Reaction Catalysts by PE-ALD: Atomically Dispersed Co ₁ and Fe ₁ Supported on Ultra-thin Films of Doped NiO _x , <i>Ina Oestrom</i> , University of New South Wales, Australia; <i>M. Favaro</i> , Helmholtz Zentrum Berlin, Germany; <i>P. Burr, B. Hoex</i> , University of New South Wales, Australia | |
| 5:15pm | AA2-TuA-16 Optimization of Photocurrent Response of Atomic Layer Deposited Ti _x Fe _{2-x} O ₃ Photoanodes, <i>Anjan Deb, A. Vihervaara, G. Popov, M. Chundak, M. Heikkilä, M. Kemell, M. Ritala, M. Putkonen</i> , University of Helsinki, Finland | |

Tuesday Afternoon, August 6, 2024

| Room Hall 3E | | |
|---------------------|---|--|
| 1:30pm | NS-TuA-1 Combining ALD Infiltration and Pressure-Assisted Sintering for Fabrication of Electrically Conductive Nanocomposites, <i>Benjamin Greenberg, K. Anderson, A. Jacobs, A. Cendejas, E. Patterson, J. Wollmershauser, B. Feigelson</i> , U.S. Naval Research Laboratory, USA | <p>Nanostructure Synthesis and Fabrication Session NS-TuA 2D Nanomaterials by ALD (Including Transition Metal Dichalcogenides) Moderators: Jeffrey W. Elam, Argonne National Laboratory, USA, Chang-Yong Nam, Brookhaven National Laboratory, USA</p> |
| 1:45pm | NS-TuA-2 Growth of ALD Gold Nanoparticles on Oxide Surfaces, <i>Mari Napari, H. Cossey</i> , King's College London, UK; <i>A. Werbrouck</i> , University of Missouri, USA; <i>J. Julin</i> , University of Jyväskylä, Finland; <i>S. Barry</i> , Carleton University, Canada; <i>A. Zayats</i> , King's College London, UK | |
| 2:00pm | NS-TuA-3 Tuning MoCl ₅ Self-Etching Effect for Deposition of 2D MoS ₂ on 300mm Wafer by Thermal ALD, <i>Angelica Azcatl-Zacatzi, N. Vu, D. Lee, T. Ngo, R. Kanjolia</i> , Merck KGaA, Darmstadt, Germany | |
| 2:15pm | NS-TuA-4 Low-Temperature ALD of SbO _x /Sb ₂ Te ₃ Multilayers with Boosted Thermoelectric Performance, <i>J. Yang</i> , IFW Dresden, Germany; <i>S. Mukherjee</i> , Iio Institute, India; <i>Sebastian Lehmann, K. Nielsch</i> , IFW Dresden, Germany | |
| 2:30pm | NS-TuA-5 Enhancing Electrical Properties of 2D WS ₂ Grown by ABC PE-ALD with Ion Energy Dose Control, <i>Cindy Lam, E. Kessels, B. Macco</i> , Eindhoven University of Technology, Netherlands | |
| 2:45pm | NS-TuA-6 Impact of ALD Precursor Choice on Nucleation and Growth of Dielectrics on 2D Materials, <i>Alexander Shearer, J. Ko, K. Saraswat, E. Pop, S. Bent</i> , Stanford University, USA | |
| 3:00pm | NS-TuA-7 Noble Metal Nanoparticles Functionalized 2D Transition Metal Dichalcogenides by Atomic Layer Deposition for Enhanced Sensing Properties Toward Amino Acids, <i>Jisang Yoo, S. Lee, J. Kim, I. Sohn, S. Jung, H. Kim</i> , Yonsei University, Korea | |
| 3:15pm | NS-TuA-8 Surface Modification of Polyolefin Nonwoven Fabric Through Atomic Layer Deposition (ALD) and Molecular Layer Deposition (MLD), <i>Jae Seok Lee, S. Song, B. Choi</i> , Korea University, Republic of Korea | |
| 3:30pm | Break & Exhibits | |
| 3:45pm | | |
| 4:00pm | EM-TuA-11 Selective Deposition of Al ₂ O ₃ on Patterned Polymer Substrates using Vapor Phase Infiltration, <i>Maggy Harake, Y. Lee</i> , Stanford University, USA; <i>B. Yu</i> , Lawrence Berkeley National Laboratory, USA; <i>G. D'Acunato</i> , Stanford University, USA; <i>R. Ruiz</i> , Lawrence Berkeley National Laboratory, USA; <i>S. Bent</i> , Stanford University, USA | <p>Emerging Materials Session EM-TuA Vapor Phase Infiltration Moderators: Jolien Dendooven, Ghent University, Belgium, Sang In Lee, Synos Foundation, USA</p> |
| 4:15pm | EM-TuA-12 Sequential Infiltration Synthesis of Al ₂ O ₃ in PMMA and PLA Thin Films: Convergence of Results Across Experimental Data and Theoretical Studies, <i>Michele Perego</i> , CNR-IMM, Agrate unit, Italy; <i>A. Motta, G. Seguíni, C. Wiemer</i> , CNR-IMM, Agrate Unit, Italy; <i>K. Ronnby, M. Nolan</i> , Tyndall National Institute, University College Cork, Ireland | |
| 4:30pm | INVITED: EM-TuA-13 Expanding the Toolbox of Vapor Phase Infiltration Processes, <i>Tamar Segal-Peretz</i> , Technion Israel Institute of Technology, Israel | |
| 4:45pm | | |
| 5:00pm | EM-TuA-15 Organic-Inorganic Hybrid Thermoelectric Materials Through Vapor Phase Infiltration, <i>Kristina Ashurbekova</i> , CIC nanoGUNE, Spain; <i>M. Naumochkin, H. Reith, K. Nielsch</i> , Leibniz Institute for Solid State and Materials Research (IFW), Germany; <i>M. Knez</i> , CIC nanoGUNE, Spain | |
| 5:15pm | EM-TuA-16 Surprising, Simultaneously Enhanced H ₂ /CO ₂ Selectivity and H ₂ Permeability in Polymer Gas Separation Membranes by 1-Cycle Alumina Atomic Layer Deposition: The Effects of Inadvertent Vapor-Phase Infiltration, <i>L. Hu</i> , University at Buffalo, USA; <i>W. Lee, A. Subramanian</i> , Stony Brook University, USA; <i>E. Deng</i> , University at Buffalo, USA; <i>K. Kisslinger</i> , Brookhaven National Laboratory, USA; <i>S. Fan</i> , University of Colorado Boulder, USA; <i>V. Bui</i> , University at Buffalo, USA; <i>Y. Ding</i> , University of Colorado Boulder, USA; <i>H. Lin</i> , University at Buffalo, USA; Chang-Yong Nam , Brookhaven National Laboratory, USA | |

Tuesday Afternoon, August 6, 2024

| Room Hall 3F | |
|--------------|---|
| 1:30pm | INVITED: ALE1+AM-TuA-1 Centering Sustainability in Future Plasma-Enhanced ALE Processes, <i>Nathan Marchack</i> , IBM Research, USA |
| 1:45pm | |
| 2:00pm | ALE1+AM-TuA-3 Life Cycle Assessment of GaN ALD, <i>Houyem Hafdi, A. Carlson, H. Pedersen</i> , Linköping University, IFM, Sweden |
| 2:15pm | ALE1+AM-TuA-4 Specialization of Atomic Layer Etching to Address Sustainability Challenges, <i>Philippe BEZARD</i> , IMEC, Belgium; <i>A. Fathzadeh</i> , KU LEUVEN, Belgium |
| 2:30pm | ALE1+AM-TuA-5 Thermal Al ₂ O ₃ Atomic Layer Etching Using HF and Hacac Reactants: Etch Enhancement from Re-fluorination by Product HF During Hacac Reaction, <i>Andrew S. Cavanagh, T. Collieran, A. Abdulagatov, S. George</i> , University of Colorado at Boulder, USA |
| 2:45pm | ALE1+AM-TuA-6 Elucidating Gas Phase and Surface Reactions of Atomic Layer Etching, <i>Taylor G. Smith</i> , University of California, Los Angeles, USA; <i>E. Crumlin</i> , Lawrence Berkeley National Laboratory, USA; <i>J. Chang</i> , University of California, Los Angeles, USA |
| 3:00pm | ALE1+AM-TuA-7 Thermal Atomic Layer Etching of Ta with NbCl ₅ and O ₂ , <i>Juha Ojala, M. Chundak, M. Vehkamäki, A. Vihervaara, M. Ritala</i> , University of Helsinki, Finland |
| 3:15pm | ALE1+AM-TuA-8 Atomic Layer Etching of Tantalum: Unlocking the Etching Mechanism by in-Vacuo XPS Studies, <i>Mykhailo Chundak, J. Ojala, M. Putkonen, M. Ritala</i> , University of Helsinki, Finland |
| 3:30pm | Break & Exhibits |
| 3:45pm | |
| 4:00pm | INVITED: ALE2+AM-TuA-11 Application of Machine Learning to Atomic-Scale Process Development, <i>Satoshi Hamaguchi</i> , Osaka University, Japan |
| 4:15pm | |
| 4:30pm | ALE2+AM-TuA-13 Surrogate Models for One-Shot ALD and ALE Process Transfer Across Reactors and High Aspect Ratio Substrates, <i>Angel Yanguas-Gil, J. Elam</i> , Argonne National Laboratory, USA |
| 4:45pm | ALE2+AM-TuA-14 Ligand-Assisted Surface Layer Formation in Wet Atomic Layer Etching of Molybdenum, <i>Tulashi Dahal, K. Abel</i> , Tokyo Electron America Inc., USA; <i>N. Levtschin</i> , TEL Manufacturing and Engineering of America, Inc., USA; <i>T. Hurd</i> , Tokyo Electron America Inc., USA; <i>A. Rotondaro</i> , Tokyo Electron America Inc., USA |
| 5:00pm | ALE2+AM-TuA-15 Wet Atomic Layer Etching of Ruthenium, <i>Kate Abel</i> , Tokyo Electron America, Inc., USA |
| 5:15pm | ALE2+AM-TuA-16 Combined Dry-Wet ALE for Tungsten: A Surface Characterization Study, <i>Cinzia Chan</i> , KULeuven, Imec, Italy; <i>J. de Marneffe</i> , IMEC, Belgium; <i>C. Gort</i> , TU Darmstadt, Germany; <i>J. Serron, M. Agati</i> , IMEC, Belgium; <i>J. Hofmann</i> , TU Darmstadt, Germany; <i>S. De Gendt</i> , KULeuven, Imec, Belgium; <i>D. van Dorp</i> , IMEC, Belgium |

**Atomic Layer Etching
Session ALE1+AM-TuA
ALE & Sustainability
Moderators:**
Keun Hee Bai, Samsung Electronics Co., Republic of Korea,
Leila Ghorbani, KU Leuven and Imec, Belgium

**Atomic Layer Etching
Session ALE2+AM-TuA
A.I. for ALD and ALE, AND Wet-Chemical ALE
Moderators:**
Eric Liu, Tokyo Electron America, USA,
Kazunori Shinoda, Hitachi, Ltd., Japan

ALD Applications

Room Hall 3 - Session AA-TuP

ALD Applications Poster Session

5:45pm

AA-TuP-1 Scalable Fabrication of Catalysts for Proton Exchange Membrane Water Electrolysis, *P. Piechulla, M. Chen*, Delft University of Technology, Netherlands; *M. Kräenbring, F. Özcan, D. Segets*, University of Duisburg-Essen, Germany; **J. Ruud van Ommen**, Delft University of Technology, Netherlands

AA-TuP-3 Synergetic Effects of Nanoscale ALD-HfO₂ Coatings and Bionic Microstructures for Anti-Adhesive Surgical Electrodes: Improved Cutting Performance, Antibacterial Property, and Biocompatibility, *Jahra Mariam*, Picosun Oy, Finland

AA-TuP-4 Plasma Enhanced Atomic Layer Deposition of Hafnium Oxide (HfO₂) Thin Films for MIS and MIM Devices, *Pallabi Paul, E. Brusaterra, I. Ostermay, E. Bahat Treidel, F. Brunner, O. Krüger*, Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (FBH), Germany

AA-TuP-5 Improving the Thermoelectric Properties of α -MgagSb Through Powder Atomic Layer Deposition, *Irene Garcia, A. Bahrami, P. Ying, K. Nielsch*, Leibniz Institute for Solid State and Materials Research, Germany

AA-TuP-6 Industrially Scalable Atomic Layer Deposition of Superconducting Thin Films of Tin on Large Area Wafer Substrates with Applied® Picosun® Morpher™, *Shashank Shukla, A. Ghosh, J. Mariam, S. Datta, S. Muhammad, S. Younis, A. Soad*, Applied Materials Inc., Finland

AA-TuP-7 High-performance Dichroic Filters by Atomic Layer Deposition for Large-Scale Neutrino Detectors, *Y. Hu*, Raytium Photonics, Inc, USA; **Feng Niu**, S. Lekarz, W. Lu, Raytium Photonics, inc., USA

AA-TuP-8 Remarkable Productivity and Performance of Flexible Indium Zinc Oxide Thin Film Transistors through Composition Engineering via Atmospheric Pressure Spatial Atomic Layer Deposition, *Chi-Hoon Lee, K. Yoo, D. Kim, C. Park, J. Park*, Hanyang University, Korea

AA-TuP-9 Investigation into ALD-Cu_x as a Precatalyst for Electrochemical CO₂ Reduction, *M. Suominen*, Aalto University, Finland; *Miia Mäntymäki, M. Mattinen*, University of Helsinki, Finland; *J. Sainio*, Aalto University, Finland; *M. Putkonen*, University of Helsinki, Finland; *T. Kallio*, Aalto University, Finland

AA-TuP-10 Organic-Inorganic Hybrid Multilayer EUV Resist with Vertical Molecular Wire Structure for Exceptionally Low Line Edge Roughness in sub-10 nm Lithography, *Jaehyuk Lee, H. Ji, C. Kim, M. Sung*, Hanyang University, Republic of Korea

AA-TuP-11 In-Situ Crystallization of Atomic Layer Deposited TiO₂/MoO_x Stack for Metal-Insulator-Metal Capacitor Application, *Chaeyeong Hwang, W. Jeon*, Kyung Hee University, Republic of Korea

AA-TuP-12 Metal-Organic Sulfur Based Inorganic-Organic Hybrid Artificial Solid Electrolyte Interphase Using ALD-MLD, *Chaerim Kim, J. Lee, H. Ji, M. Sung*, Hanyang University, Korea

AA-TuP-13 ALD SiO₂ Provides Efficient Ge Surface Passivation with a Tailorable Charge Polarity, *Oskari Leiviskä*, Aalto University, Finland; *H. Liu*, Aalto University, Finland, China; *J. Fung*, Aalto University, Finland, Hong Kong; *J. Isometsä, V. Vähänissi, H. Savin*, Aalto University, Finland

AA-TuP-14 Optimization of Thin Film Encapsulation Layers by ALD and SALD for Perovskite-Silicon Tandem Solar Cells, *Aubin Parmentier, D. Coutancier*, Institut Photovoltaïque d'Île de France (IPVF), France; *T. Bejat, S. Cros*, Commissariat aux Energies Atomique et Alternatives (CEA) Liten, France; *D. Muñoz-Rojas*, Université Grenoble Alpes, CNRS, Grenoble INP, LMGP, France; *N. Schneider*, Institut Photovoltaïque d'Île de France (IPVF), France

AA-TuP-15 Atomic Layer Deposition of Thermoelectric Al -Doped ZnO (AZO) Films on Flexible Ion Track Etched PET Templates, *Esa Alakoski*, JAMK University of Applied Sciences, Institute of New Industry, Jyväskylä Finland; *S. Kinnunen*, University of Jyväskylä, Department of Physics, Jyväskylä, Finland; *T. Laine*, JAMK University of Applied Sciences, Institute of New Industry, Jyväskylä, Finland; *T. Girish*, Aalto University, Department of Chemistry and Materials Science, Finland; *J. Julin*, University of Jyväskylä, Department of Physics, Jyväskylä, Finland; *M. Karppinen*, Aalto University, Department of Chemistry and Materials Science, Finland

AA-TuP-16 Improvement of Interfacial Properties of ZrO₂/Al₂O₃/TiN Capacitors Grown by Atomic Layer Deposition through Ar Plasma Treatment, *Hyeonjun Kim, H. Yang, W. Lee*, Soongsil University, Republic of Korea

AA-TuP-17 Enhancing Resistive Switching Properties of TiO₂ Thin Films Grown by Atomic Layer Deposition through Pyramid-Structured PDMS Substrate, *Jaeyun Lee, K. Lyu, W. Lee*, Soongsil University, Republic of Korea

AA-TuP-18 Time-Dependent Defect Passivation of Perovskite Solar Cells by Atomic Layer Deposited Al₂O₃, *Mayank kedia*, Forschungszentrum Jülich GmbH, Germany; *T. Nguyen*, IPV, University of Stuttgart, Germany; *C. Das, M. Saliba*, Forschungszentrum Jülich GmbH, Germany

AA-TuP-19 Nucleation of Ald Grown Gate Dielectrics on WS₂ Using Low Temperature Oxygen Plasma Pretreatment, *Robert Grubbs, D. Cott, J. Swerts, B. Groven, T. van Pelt, S. Nemeth, P. Morin, C. de la Rosa, G. Kar*, IMEC, Belgium

AA-TuP-20 Low Temperature Crystallization of Atomic-Layer-Deposited SrTiO₃ Films for Next-Generation Dram Capacitors, *H. Chung*, Korea Institute of Science and Technology, Republic of Korea; *T. Park*, Hanyang University, Republic of Korea; **Seong Keun Kim**, Korea Institute of Science and Technology, Republic of Korea

AA-TuP-21 New Method for Ohmic Metal to Si Contact Formation Utilizing Highly Charged ALD Dielectric, *Lassi Lahtiluoma, O. Setälä, H. Savin, V. Vähänissi*, Aalto University, Finland

AA-TuP-22 Co metal ALD on Cu with Cyclic clean by Peroxide and Hydrazine for Inverse Hybrid Metal Bonding, *Cheng-Hsuan Kuo, A. Kummel*, University of California at San Diego, USA

AA-TuP-23 Atomic Layer Deposition of Titanium-Sulfide Films- a Study of Growth, Crystallinity, and Electric Properties, *Zsófia Baji*, Centre for Energy Research, Hungary

AA-TuP-24 An Opportunity for Testing Nanomaterials in Space- the Space Rider Experiment, *Karolin Laud, K. Aab, K. Kukli*, University of Tartu, Estonia; *M. Merisalu*, Captain Corrosion Ltd., Estonia

AA-TuP-25 Improved Mechanical Integrity of Li-ion Battery Anode Materials Coated with Al₂O₃ by ALD, *Liliana Stan, X. Zhou, D. Hou*, Argonne National Laboratory, USA; *H. Xiong*, Boise State University, USA; *L. Zhu*, Purdue University, USA; *Y. Liu*, Argonne National Laboratory, USA

AA-TuP-27 Superior Reproducibility of Forming-Free Memristive Operation in Carbon Doped HfO_x Film, *Minjong Lee, Y. Hong, J. Kim, D. Le, D. Kim*, University of Texas at Dallas, USA; *R. Choi*, Inha University, Republic of Korea; *J. Rohan, G. Yeric*, Cerfe Labs, USA; *J. Kim*, University of Texas at Dallas, USA

AA-TuP-28 Atomic Layer Deposition of Niobium Oxide using (Tert-butylimido)tris(diethylamino)niobium and Anhydrous Hydrogen Peroxide for Ferroelectric Hafnia Applications, *Jin-Hyun Kim, T. Ford, M. Lee, D. Le, T. Chu, D. Kim*, University of Texas at Dallas, USA; *M. Benham, J. Spiegelman*, RASIRC, USA; *S. Kim*, Kangwon University, USA; *J. Kim*, University of Texas at Dallas, USA

AA-TuP-29 Atomic Layer Deposition of Cobalt Phosphide for Efficient Water Splitting, *Haajie Zhang, S. Parkin*, Max Planck Institute of Microstructure Physics, Germany; *R. Wehrspohn*, Institute of Physics, Martin Luther University Halle-Wittenberg, Germany

AA-TuP-30 SnS₂ Thin Film with in-Situ and Controllable Sb Doping via Atomic Layer Deposition for Optoelectronic Applications, *Dongho Shin*, IFW Dresden, Republic of Korea; *J. Yang*, IFW Dresden, China; *A. Bahrami*, IFW Dresden, Iran (Islamic Republic of); *S. Lehmann, K. Nielsch*, IFW Dresden, Germany

AA-TuP-31 Effects of Alkali-Metal Doping on Current Amplification of Titanium Oxide Thin Film Transistors Prepared by Atomic Layer Deposition, *Ryo Miyazawa, H. Suzuki, H. Takeda, M. Miura, B. Ahmad Arima, F. Hirose*, Graduate School of Science and Engineering, Yamagata University, Japan

AA-TuP-32 Area-selective Deposition μ DALP™. Precision Coatings for Next Gen Devices, *Mira Baraket*, ATLANT 3D Nanosystems, Denmark

AA-TuP-33 Development of Antibacterial Neurostimulation Electrodes via Hierarchical Surface Restructuring and Atomic Layer Deposition, *Shahram Amini*, Pulse Technologies Inc., USA

AA-TuP-34 Construction of PDMS/Al₂O₃ Hybrid Encapsulation for Wearable Electronics via Atomic Layer Infiltration and UV Curing, *Fan Yang, D. Wen, R. Yuan, R. Chen*, State Key Laboratory of Intelligent Manufacturing Equipment and Technology, School of Mechanical Science and Engineering, Huazhong University of Science and Technology, China

AA-TuP-35 Stabilization of Ni-YSZ Fuel Electrodes using an ALD-Grown Aluminum Titanate Interlayer, *Katherine Hansen*, Radiation Monitoring Devices, USA; *Z. Feng*, University of Pennsylvania, USA; *H. Bhandari*, Radiation Monitoring Devices, USA; *J. Vohs*, University of Pennsylvania, USA; *R. Hayden*, Radiation Monitoring Devices, USA

AA-TuP-36 ALD-NiOx Thin Film Growth using Ni(dmb)₂ Precursor for FaPbI₃-based Perovskite Solar Cells, *HYO SIK CHANG*, Chungnam National University, Republic of Korea

AA-TuP-37 Atomic Layer Deposition of Ultra Low-K Amorphous Boron Nitride for Futuristic Inter Metal Dielectric, *Inkyu Sohn, J. Park, S. Lee, J. Seo, J. Yoo, S. Chung, H. Kim*, Yonsei University, Korea

AA-TuP-38 Approach to Quantitatively Imaging the Equivalent Oxide Thickness of a High-K Oxide Film on Silicon: A Dc-Free Scanning Capacitance Microscopic Method, *Mao-Nan CHANG*, Department of Physics, NCHU, Taiwan; C. WANG, Institute of Nanoscience, NCHU, Taiwan

AA-TuP-39 Investigation of Thermal Atomic Layer Deposition for Vertical-Channel IGZO FET with Good Performance and Thermal Stability, *J. Xiang*, Beijing Superstring Academy of Memory Technology, China; *Xinlv Duan*, Institute of Microelectronics of the Chinese Academy of Sciences, China; *X. Ma, P. Yuan, Y. Chen, L. Chai, Z. Jiao, Y. Shen, G. Wang*, Beijing Superstring Academy of Memory Technology, China; *D. Geng*, Institute of Microelectronics of the Chinese Academy of Sciences, China; *C. Zhao*, Beijing Superstring Academy of Memory Technology, China

AA-TuP-40 Improved Stability of Pt Catalyst for Sustainable Hydrogen Generation, *Mingliang Chen, P. Piechulla*, TU Delft, Netherlands; *M. Kräenbring, F. Özcan, D. Segets*, University of Duisburg-Essen, Germany; *J. van Ommen*, TU Delft, Netherlands

AA-TuP-41 Atomic Layer Deposition of Palladium Nanoparticles for Catalytic Applications, *Bilal Bawab, R. Zazpe, J. Rodriguez-Pereira, J. M. Macak*, University of Pardubice, Czechia

AA-TuP-43 Optimizing Izo Tft Performance Through Al Doping Cycle Control via Atmospheric Pressure Spatial Atomic Layer Deposition, *Kwang Su Yoo, D. Kim, C. Lee, D. Kim, C. Park, J. Park*, Hanyang University, Korea

AA-TuP-44 Effect of One ZrO₂/HfO₂ Thickness of ZrO₂/HfO₂ (Zr/Hf=1/1) Laminate on Characteristics for Non-volatile DRAM, *Tomomi Sawada, T. Nabatame*, National Institute for Materials Science, Japan; *T. Onaya*, The University of Tokyo, Japan; *H. Miura, M. Miyamoto, K. Tsukagoshi*, National Institute for Materials Science, Japan

AA-TuP-45 Plasma-enhanced Atomic Layer Deposition of Niobium Carbide using a New Nb Precursor and H₂ Plasma and its Application to Diffusion Barrier for Cu and Ru Interconnects, *Chaehyun Park, M. Kweon, S. Kim, S. Kim*, Ulsan National Institute of Science and Technology (UNIST), Republic of Korea

AA-TuP-46 Ultrahigh Plasma Resistance of Y₂O₃ Thin Films Prepared by Atomic Layer Deposition for Uniform 3D Coatings, *Jun-Hyeok Jeon, H. Kim, S. Jang, H. Kim*, Korea Electronics Technology Institute (KETI), Republic of Korea; *C. Park, Y. Lee, KoMiCo Ltd.*, Republic of Korea; *G. Yeom, J. Choi*, Sungkyunkwan University (SKKU), Republic of Korea; *S. Kim, S. Kim, H. Kim*, Korea Electronics Technology Institute (KETI), Republic of Korea

AA-TuP-47 Atomic Layer Deposition of Copper Metal: Promising Cathode in Thin-Film Lithium-Ion Batteries, *Niloofar Soltani, A. Bahrami, M. Hantusch, E. Dmitrieva, K. Nielsch, D. Mikhailova*, Leibniz-Institut für Festkörper- und Werkstoffforschung Dresden, Germany

AA-TuP-48 Novel Nitride Conversion for Low-Temperature Thermal ALD of Titanium Nitride and Effect on Film Properties and Morphology, *Dane Lindblad, M. Weimer, S. Harris, A. Dameron*, Forge Nano, USA

AA-TuP-49 Phosphite Doping of ALD SiO₂ Membranes Significantly Enhances Proton Conductivity for PEM Water Electrolysis, *Matthew Weimer, S. Harris*, Forge Nano, USA; *J. Jin, Z. Lin, K. Yim, L. Cohen, D. Esposito*, Columbia University, USA; *A. Dameron*, Forge Nano, USA

AA-TuP-50 Deposition of Pt Nanodot on Carbon Powder Using Noble Pt Precursor and Stabilization of Nanodots, *Takashi Teramoto, C. Dussarrat*, K.K. Air Liquide Laboratories, Japan; *N. Blasco*, Air Liquide Advanced Materials, France

AA-TuP-51 Enhancing Charge Trapping Performance of Hafnia Thin Films by using Sequential Plasma Atomic Layer Deposition, *SoWon Kim, J. Yu, W. Park, H. Lee*, Tech University of Korea

AA-TuP-52 Hydrophilic Treatment of Porous PTFE Filter Membranes for Aggressive Chemical Environments, *Rubab Zahra, P. Kauranen*, LUT University, Finland; *M. Putkonen*, University of Helsinki, Finland

AA-TuP-53 Influence of Atomic Layer Deposition Tin Oxide Properties on the Performance of Perovskite Solar Cells, *Bhavya Rakheja, A. Hultqvist*, Uppsala University, Angstrom Laboratory, Sweden; *T. Törndahl*, Uppsala University, Sweden

AA-TuP-54 Atomic Layer Deposition of Copper-Zinc Catalysts on Gas Diffusion Layers for the Electrochemical Reduction of CO₂, *Lovelle Manpatilan, S. Bianco, E. Tressa, S. Porro, J. Zeng*, Politecnico di Torino, Italy

AA-TuP-55 Plasma-enhanced Atomic Layer Deposition of Tunable Cobalt Nitride Thin Films Enabled by Sequential N₂ Plasma Exposure, *Matthias Kuhl*, Technical University Munich, Germany; *L. Kohlmaier*, Technical University Munich, Austria; *I. Sharp*, Technical University Munich, USA; *J. Eichhorn*, Technical University Munich, Germany

AA-TuP-56 New ALD materials for DRAM/3D-DRAM scaling, *Tejinder Singh*, Eugenius, Inc., USA

AA-TuP-57 Low Temperature Plasma-Enhanced Atomic Layer Deposited Boron Nitride Thin Films for Low-k Dielectric Applications, *D. Le, S. De, T. Chu, J. Kim, D. Kim, M. Lee, M. Markevitch, Jiyoung Kim*, University of Texas at Dallas, USA

AA-TuP-58 Atomic Layer Deposited Molybdenum Nitride Film, *Min Heon, S. Jung, S. Lee, T. Singh*, Eugenius, Inc., USA

AA-TuP-59 Promising ALD Precursor for 1 nm Process: Ru-Based ALD Precursors, *Z. Yan, Bryan Yong-Jay Lee, Y. Pao*, Industrial Technology Research Institute, Taiwan

AA-TuP-60 Ultra-Thin Magnesium Oxide as a Hydroxyl ‘Reservoir’ for Enhancing Ruthenium Nucleation via Atomic Layer Deposition Technique, *M. YANG, X. WU, S. DING, B. LUO, Bo Wen WANG*, Fudan University, China

AA-TuP-61 Carrier Conduction Mechanisms in MIS Capacitors with Ultra-Thin Al₂O₃ at Cryogenic Temperatures, *Joel Molina-Reyes*, National Institute of Astrophysics, Optics and Electronics, Mexico

AA-TuP-62 High Responsivity Plasmon Thin Film Transistors of VW-Mode Au Nanoparticles, *Tsong-Sheng Lay, C. Su*, National Chung Hsing University, Taiwan

AA-TuP-63 Alumina Coating of Diamond Filler Using Atomic Layer Deposition to Produce Thermal Interface Material, *Hiroya Ishida, K. Shibuta*, Sekisui Chemical Co., Ltd., Japan; *M. Groner, J. Gauspohl*, FORGE NANO, Inc., USA

AA-TuP-64 Modulation Acceptor Doping of Silicon Nanowires using a SiO₂-shell doped with ALD Metal Oxide Monolayers, *Daniel Hiller*, Institute of Applied Physics (IAP), TU Bergakademie Freiberg, Germany; *S. Nagarajan*, Nanoelectronic Materials Laboratory (NaMLab) gGmbH, Dresden, Germany; *I. Ratschinski, S. Shams*, Institute of Applied Physics (IAP), TU Bergakademie Freiberg, Germany; *M. Venzke*, Physikalisch-Technische Bundesanstalt (PTB), Berlin, Germany; *P. Hönicke*, Helmholtz-Zentrum Berlin (HZB), Berlin & Physikalisch-Technische Bundesanstalt (PTB), Berlin, Germany; *T. Mikolajick*, Nanoelectronic Materials Laboratory (NaMLab) gGmbH, Dresden & Institute of Semiconductors and Microsystems, TU Dresden, Germany; *J. Trommer*, Nanoelectronic Materials Laboratory (NaMLab) gGmbH, Dresden, Germany; *D. König*, Integrated Materials Design Lab (IMDL), Australian National University (ANU), Canberra, Australia

AA-TuP-65 Hf-Doped IGZO/IZO Heterojunction Thin-Film Transistors Fabricated by Atomic Layer Deposition for OLED Display, *T. Kim, Kang Min Lee*, Korea University, Republic of Korea

AA-TuP-66 Precise Tuning of Tamm Plasmon-Polaritons Resonances with sub-Nanometer Accuracy by Atomic Layer Deposition, *Mantas Drazdys, E. Bužavaitė-Vertelienė, D. Astrauskytė, Z. Balevičius*, Center for Physical Sciences and Technology, Lithuania

AA-TuP-67 Rotating Drum ALD – an Alternative Approach for ALD Coating of Powders, *Mario Krug, M. Radehaus, M. Höhn*, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany; *P. Heizmann*, University of Freiburg, Germany

AA-TuP-69 Improving Ferroelectricity of Hafnia-Based Ferroelectrics by Adopting Anti-Ferroelectric Interfacial Layer, *Dae Haa Ryu, J. Lee, T. Choi*, Sejong University, Republic of Korea

AA-TuP-70 Atomic Layer Deposited p-type SnO Thin Film Transistors: Effect of Deposition Temperature on Device Performance and Stability, *Kham M. Niang, B. Bakht*, University of Cambridge, UK; *J. Parish*, University of Bath, U.K.; *J. Driscoll*, University of Cambridge, UK; *A. Johnson*, University of Bath, UK; *A. Flewitt*, University of Cambridge, UK

AA-TuP-71 The Role of ALD Complex Oxides in Moore's Law Scaling, *Sudarath Lee, C. Lin, S. Chang, I. Tung, K. Oguz, C. Jezewski, A. Sen Gupta, S. Clendenning, M. Metz, U. Avci*, Intel Corporation, USA

AA-TuP-72 Oxide Based Neuron Devices Employing ALD Grown Dielectrics and Channel Layer, *Jung Wook Lim*, YUSEONG-GU GAJEONGDONG 218 ETRI, Republic of Korea; *J. Lee, C. Yu*, UST, Republic of Korea

AA-TuP-73 MgF₂-Based Conformal Anti-Reflection Coatings on Highly Curved Lenses by Atomic Layer Deposition, *Yuma Sugai*, Shincron Co., Ltd., Japan; *H. Sugata, T. Sugawara*, Shincron Co. Ltd., Japan; *S. Muhammad, J. Hämäläinen, N. Lamminmäki, J. Kostamo*, Picosun Oy, an Applied Materials company, Finland

AA-TuP-74 Enhanced Uniformity of Optical Films on Highly Curved Lenses using Atomic Layer Deposition for Small to Mid-Sized Batch Production, *Hironori Sugata, Y. Sugai, R. Sugawara, T. Sugawara, Shincron Co., Ltd., Japan*

AA-TuP-75 Enhancing the Stability of p-Type Tin Monoxide Thin Film Transistor Through 2D Structure Optimization via Discrete Feeding Method, *Haklim Koo, H. Kim, S. Choi, W. Lee, S. Kim, J. Park, Hanyang University, Korea*

AA-TuP-76 Resistive Switching in Hafnium-Titanium-Oxide Thin Films Grown by Atomic Layer Deposition, *Toomas Daniel Viskus, J. Merisalu, A. Kasikov, L. Aarik, K. Kukli, University of Tartu, Estonia*

AA-TuP-77 Ultrathin HfO₂-ZrO₂ Multilayers Structures by ALD for Embedded Ferroelectric Non-Volatile Memories, *Amanda Mallmann Tonelli, J. Mercier, N. Vaxelaire, Y. Mazel, Z. Saghi, N. Gauthier, S. Martin, L. Grenouillet, V. Jousseau, M. Bedjaoui, CEA-Leti, France*

AA-TuP-78 Comparative Study of ZrAl₂O_y - based MIM Decoupling Capacitors with high-κ Dielectric Grown by 3 Generations of Metalorganic ALD Zr-precursors, *Konstantinos Efstathios Falidas, K. Kühnel, A. Viegas, M. Czernohorsky, Fraunhofer Institute for Photonic Microsystems (IPMS), Germany*

AA-TuP-79 ALD Capping Layers for Copper Redistribution Lines, *Ritwik Bhatia, Veeco, USA; E. Chery, imec, Belgium; G. Sundaram, Veeco, USA; N. Pinho, E. Beyne, imec, Belgium*

AA-TuP-80 Incipient Ferroelectric Properties in as-Deposited Hafnium Zirconium Oxide for BEOL Applications, *Alison Erlene Viegas, Fraunhofer Institute for Photonic Microsystems (IPMS) - CNT, Germany; K. Kuehnel, Fraunhofer Institute for Photonic Microsystems (IPMS) - CNT, Germany; S. Yang, K. Falidas, Fraunhofer Institute for Photonic Microsystems (IPMS) - CNT, Germany; M. Czernohorsky, Fraunhofer Institute for Photonic Microsystems (IPMS) - CNT, Germany*

AA-TuP-81 Enhanced Transmittance of Stacked 3D Micro-Optics by Atomic Layer Deposition, *Darija Astrauskyte, Center for Physical Sciences and Technology, Lithuania; K. Galvanauskas, D. Gailevičius, Vilnius University, Lithuania; M. Drzdys, Center for Physical Sciences and Technology, Lithuania; M. Malinauskas, Vilnius University, Lithuania; L. Grineviciute, Center for Physical Sciences and Technology, Lithuania*

AA-TuP-82 Exploring Brookite Phase Formation in Vanadium Oxides by Atomic Layer Deposition for Uncooled Infrared Sensor Applications, *Hyeonho Seol, S. Lee, Kyung Hee university, Republic of Korea; W. Jeon, Kyung Hee University, Republic of Korea*

AA-TuP-83 In-Situ ALD Fabrication of Heterogeneous Gate Insulators for Improved Reliability in High-Mobility IGZO Transistors, *Taewon Hwang, Y. Kim, H. Oh, J. Park, Hanyang University, Korea*

AA-TuP-84 Broadband Anti-Reflective Coatings with Graded Refractive Index on Plastic Optics, *Philip Klement, M. Zscherp, H. Spielvogel, A. Hens, S. Chatterjee, Justus Liebig University Giessen, Germany*

AA-TuP-85 Effects of Gamma Radiation on the Electrical and Structural Properties of Ferroelectric Hafnium Oxide-Based Capacitors, *Samantha Jaszewski, M. Henry, Sandia National Laboratories, USA*

AA-TuP-86 Effect of Sn-doping on Atomic-Layer-Deposited Ultrathin In-Sn-O Thin-Film Transistors, *Binbin Luo, S. Ding, Fudan University, China*

AA-TuP-87 Processing and Performance of Piezoelectric Lead Hafnate-Titanate Thin Films Grown by Atomic Layer Deposition for 3D MEMS Actuators, *Nicholas Strnad, DEVCOM Army Research laboratory, USA; R. Knight, R. Rudy, DEVCOM Army Research Laboratory, USA; A. Parrish, D. Wang, A. Shkel, University of California, Irvine, USA; J. Pulskamp, DEVCOM Army Research Laboratory, USA*

AA-TuP-88 Stacked ALD Deposited Metal Oxide Films as Reliable Sensing Films for Organic Semiconductor-Based LAPS, *Chia-Ming Yang, Y. Yang, Chang Gung University, Taiwan; B. Jiang, C. Chen, Ming-Chi University of Technology, Taiwan*

AA-TuP-89 Effects of TiO₂ Incorporation via Atomic Layer Deposition on Yttria-Stabilized Zirconia Electrolyte for Energy Storage, *Jorge Luis Vazquez Arce, El Centro de Investigación Científica y de Educación Superior de Ensenada, Baja California, Mexico; C. Bohórquez Martínez, UNAM, Mexico; A. Bahrami, Leibniz Institute for Solid State and Materials Research, Germany; E. Blanco, Universidad de cadiz, Spain; M. Dominguez, Universidad de Cadiz, Spain; K. Nielsch, Leibniz Institute for Solid State and Materials Research, Germany; G. Soto Herrera, H. Tiznado, UNAM, Mexico*

AA-TuP-90 Dynamic Color Shifting of Green Organic Light-Emitting Diodes Utilizing Distributed Bragg Reflector Mirror Fabricated via Atomic Layer Deposition, *Junbeom Song, J. Bi, Korea University, Republic of Korea; Y. Park, Sun Moon University, Republic of Korea; B. Ju, Korea University, Republic of Korea*

Area Selective ALD

Room Hall 3 - Session AS-TuP

Area Selective ALD Poster Session

5:45pm

AS-TuP-1 Selective Metal Blocking using Vapor-Phase Self-Assembled Monolayers for Area-Selective Atomic Layer Deposition of Dielectrics, *Jeong-Min Lee, W. Kim, Hanyang University, Republic of Korea*

AS-TuP-2 Area-Selective ALD of Transparent Conductive Oxides by Using Polymer Patterns Generated with High-Precision Capillary Printing, *Ludovic Hahn, CEA-LETI, France; M. Pascual, A. Guittou, K. Farmand, A. M'Barki, Hummink, France; T. Jullien, L. Golanski, C. Guerin, V. Jousseau, CEA-LETI, France*

AS-TuP-3 Photo-Enhanced Selective Area Atomic Layer Deposition, *Paul Butler, Walter Schottky Institut, Technische Universität München, Germany; L. Sortino, Ludwig-Maximilians-University of Munich, Germany; S. Maier, Monash University, Australia; I. Sharp, Walter Schottky Institut, Technische Universität München, Germany*

AS-TuP-4 Area-Selective Atomic Layer Deposition of Bilayer Materials Using Polymethylmethacrylate Thin Films as Blocking Layers, *Aditya Chalishazar, N. Poonkottil, C. Detavernier, J. Dendooven, Ghent University, Belgium*

AS-TuP-5 Density Functional Theory Study on Selective Silylation of SiO₂ Against Cu Using Dimethylaminotrimethylsilane, *Misoo Kim, K. Khumaini, R. Hidayat, H. Kim, W. Lee, Sejong University, Republic of Korea*

AS-TuP-6 Self-Aligned Patterning of Tantalum Oxide on Cu/SiO₂ with Inherent Selective Atomic Layer Deposition, *Kun Cao, Z. Qi, State Key Laboratory of Intelligent manufacturing Equipment and Technology, School of Mechanical Science and Engineering, Huazhong University of Science and Technology, China; B. Shan, State Key Laboratory of Materials Processing and Die & Mould Technology, School of Materials Science and Engineering, Huazhong University of Science and Technology, China; R. Chen, State Key Laboratory of Intelligent manufacturing Equipment and Technology, School of Mechanical Science and Engineering, Huazhong University of Science and Technology, China*

AS-TuP-7 Bottom-up Plasma-Enhanced Atomic Layer Deposition of SiO₂ in High Aspect Ratio Trenches using NF₃ Inhibitor, *Martial Santorelli, Université Grenoble Alpes, CNRS, LTM, STMicroelectronics, France; J. Tortai, Université Grenoble Alpes, CNRS, LTM, France; M. Querré, STMicroelectronics, France; M. Bonvalot, Université Grenoble Alpes, CNRS, LTM, J-FAST, Institute of Applied Physics, Faculty of Pure and Applied Sciences, University of Tsukuba, Japan*

AS-TuP-8 What Happens to Small Molecule Inhibitors after the Selectivity Is Lost: 4-Fluorophenylboronic Acid Functionalization of Silicon Surface to Inhibit TiO₂ Deposition, *Andrew Teplyakov, D. Silva-Quinones, J. Mason, R. Norden, University of Delaware, USA*

AS-TuP-9 Modelling the Reactivity of Small Molecule Inhibitors by Density Functional Theory, *Fabian Pieck, R. Tonner-Zech, Wilhelm-Ostwald Institut for Physical and Theoretical Chemistry, Leipzig University, Germany*

AS-TuP-10 A Novel SMI for AS-ALD, *Molly Alderman, A. Upadhyay, Carleton University, Canada; M. Griffiths, K. Blakeney, D. Agnew, P. Lemaire, J. Smith, D. Hausmann, D. Mandia, LAM Research, USA; S. Barry, Carleton University, Canada*

AS-TuP-11 Atomic Layer Plasma Treatment for Area-Selective Atomic Layer Deposition of High-Quality SiO₂ Thin Film, *Sanghun Lee, S. Seo, T. Kim, H. Yoon, S. Park, S. Na, J. Seo, Yonsei University, Republic of Korea; W. Noh, Air Liquide, Republic of Korea; S. Chung, H. Kim, Yonsei University, Republic of Korea*

AS-TuP-12 The Formation of a Bottomless ZnO Barrier Using Inherent ZnO AS-ALD Process for Advanced Metallization, *Yuki Mori, TANAKA Precious Metals, Japan; Y. Son, S. Kim, S. Kim, Ulsan National Institute of Science and Technology (UNIST), Republic of Korea*

AS-TuP-13 Area-Selective Atomic Layer Deposition by Sputter Yield Amplification on Heavy Elements, *Arthur de Jong, M. Bär, M. Merckx, E. Kessels, A. Mackus, Eindhoven University of Technology, Netherlands*

AS-TuP-14 Theoretical Investigation on Impurity Formation Mechanism During Area-Selective Atomic Layer Deposition Using Organic Inhibitors, *Jiwon Kim, B. Shong, Hongik University, Republic of Korea*

AS-TuP-15 Using ALD Precursors as Inhibitors During Area-selective ALD, *Marc Merckx, P. Yu, S. van der Werf, A. de Jong, E. Kessels, Eindhoven University of Technology, Netherlands; T. Sandoval, Universidad Tecnica Federico Santa Maria, Chile; A. Mackus, Eindhoven University of Technology, Netherlands*

Emerging Materials

Room Hall 3 - Session EM-TuP

Emerging Materials Poster Session

5:45pm

EM-TuP-1 Atomic Layer Memory Switching for Power-Efficient Neuromorphic Computing, *Hyunho Seok, S. Son, T. Kim*, Sungkyunkwan University, Republic of Korea

EM-TuP-2 Electron-Enhanced Atomic Layer Deposition (EE-ALD) of TiCN Ternary Nitrides with Tunable Composition, *Z. Sobell, Michael Collings, S. George*, University of Colorado at Boulder, USA

EM-TuP-3 Low-Temperature Atomic-Molecular Layer Deposition of Air-Stable and Conformal Zn-Benzenedithiol Thin Films, *Anish Philip, T. Jussila*, Aalto University, Finland; *J. Obenlueschloss, D. Zanders, F. Preischel*, Ruhr University Bochum, Germany; *J. Kinnunen*, Chipmetrics Ltd, Finland; *A. Devi*, Ruhr University Bochum, Germany; *M. Karppinen*, Aalto University, Finland

EM-TuP-4 Tin Oxide-Organic Superlattices for Flexible Thermoelectric Applications by Atomic/Molecular Layer Deposition, *Mari Heikkinen*, Aalto University, Finland; *N. Huster, A. Devi*, Ruhr-University Bochum, Germany; *M. Karppinen*, Aalto University, Finland

EM-TuP-5 Low Temperature Plasma Synthesis of Layer controlled MoS₂ for Flexible AI Accelerator, *Sihoon Son, H. Seok, D. Lee, H. Choi, T. Kim*, Sungkyunkwan University (SKKU), Republic of Korea

EM-TuP-6 Efficient Scaling of Ruthenium Thin Films by ALD for High-Volume Manufacturing, *Parmish Kaur, B. Eychenne, M. Kääriä, A. Sood*, Picosun Oy, Finland

EM-TuP-7 Luminescent Lanthanide-Organic Hybrid Materials by Atomic/Molecular Layer Deposition, *Melania Rogowska, P. Hansen, O. Nilsen*, University of Oslo, Norway

EM-TuP-8 Influence of the Gas Flow Rate on the Crack Formation of AlCoCrNi High-Entropy Metallic Film, *Hae Jin Park*, Sejong University, Republic of Korea; *J. Lee*, Kongju National University, Republic of Korea; *H. Lee*, Korea Institute of Industrial Technology, Republic of Korea; *T. Choi, K. Kim*, Sejong University, Republic of Korea

EM-TuP-9 Direct Growth of Bi₂SeO₅ Thin Films by Intermediate Enhanced Atomic Layer Deposition, *Taeyong Eom*, 34114, Republic of Korea

EM-TuP-10 Structural and Electrical Properties of Ta-Doped TiO₂ Prepared by Supercycle Atomic Layer Deposition, *Iqtidar Wasif*, FHR Anlagenbau GmbH, Semiconductor Physics, Chemnitz University of Technology, Germany; *H. Bryja, A. Muhammad, S. Simon*, FHR Anlagenbau GmbH, Germany; *N. Balayeva*, Semiconductor Physics, Chemnitz University of Technology, Germany; *J. Barzola Quiquia, M. Reinfried*, FHR Anlagenbau GmbH, Germany; *D. Zahn*, Semiconductor Physics, Chemnitz University of Technology, Center for Materials, Architectures, and Integration of Nanomembranes (MAIN), Chemnitz University of Technology, Germany

EM-TuP-11 Molecular Layer Deposition of Ferrocene-Based Thin Films, *Justin Lomax*, University of Western Ontario, Canada; *E. Goodwin*, Carleton University, Canada; *J. Bentley, J. Bosso*, University of Western Ontario, Canada; *C. Crudden*, Queen's University, Canada; *S. Barry*, Carleton University, Canada; *P. Ragogna*, University of Western Ontario, Canada

EM-TuP-12 Epsilon Near Zero Doped ZnO Films Grown via Atomic Layer Deposition, *Emily Duggan, J. Lin*, Tyndall National Institute, University College Cork, Ireland; *I. Povey*, tyndall National Institute, University College Cork, Ireland

EM-TuP-13 Atomic-Layer Deposition Techniques to the Deposition and Post-Synthesis Modification of Metal-Organic Frameworks, *Catherine Marichy, B. Gikonyo, S. De, A. Fateeva, C. Journet*, laboratoire des multimatériaux et interfaces (LMI), France

EM-TuP-14 A New Step Towards Crystalline III/V Semiconductors by ALD, *Thilo Hepp*, Philipps Universität Marburg / Dockweiler Chemicals GmbH, Germany; *P. Ludewig*, Philipps-Universität Marburg / Dockweiler Chemicals GmbH, Germany; *O. Briel, J. Koch*, Dockweiler Chemicals GmbH, Germany; *K. Volz*, Philipps-Universität Marburg, Germany

EM-TuP-15 Pushing the Boundaries: Advancing Resist Technology for Beyond EUV Lithography Application, *Dan Le, T. Chu*, University of Texas at Dallas, USA; *W. Lee*, stony Brook University, USA; *N. Tiwale*, Brookhaven National Laboratory, USA; *J. Veyan, J. Kim, D. Kim, M. Lee*, University of Texas at Dallas, USA; *C. Nam*, Stony Brook University/Brookhaven National Laboratory, USA; *J. Kim*, University of Texas at Dallas, USA

EM-TuP-16 Multistep Inorganic Synthesis of Redox-Active THz Phononic Structure, *Norifusa Satah*, National Institute for Materials Science, Japan; *R. Gordon*, Harvard University, USA

EM-TuP-17 Modelling the Growth of Zincone ALD/MLD Hybrid Thin Films: A DFT Study, *Mario Mäkinen, K. Laasonen*, Aalto University, Finland

EM-TuP-18 Impact of Vapour Phase Infiltration using Trimethylaluminium on Structure and Permeance of Poly(1-trimethylsilyl-1-propyne), *Jonathan Jenderny*, Ruhr-University Bochum, Germany; *N. Boysen*, Fraunhofer Institute for Microelectronic Circuits and Systems, Germany; *J. Rubner*, RWTH Aachen University, Germany; *F. Zysk*, Paderborn University, Germany; *F. Preischel*, Ruhr-University Bochum, Germany; *T. de los Arcos, V. Raj Damerla*, Paderborn University, Germany; *A. Kostka*, Ruhr-University Bochum, Germany; *J. Franke, R. Dahlmann*, RWTH Aachen University, Germany; *T. Kühne*, Helmholtz Zentrum Dresden-Rossendorf, Germany; *Paderborn University, Germany; Technical University Dresden, Germany; M. Wessling*, RWTH Aachen University, Germany; *P. Awakowicz*, Ruhr-University Bochum, Germany; *A. Devi*, Ruhr-University Bochum, Germany; *Fraunhofer Institute for Microelectronic Circuits and Systems, Germany; Leibniz Institute for Solid State and Materials Research, Germany*

EM-TuP-19 Tuning the Diffusivity of DEZ During Vapor Phase Infiltration in Photopatternable Polyacrylates by Increasing the Polymer Network's Flexibility, *Lisanne Demelius, A. Coclite*, Graz University of Technology, Austria; *M. Losego*, Georgia Institute of Technology, USA

EM-TuP-20 Tailoring Pore Size and Surface Hydrophilicity in Ceramic Membranes: The Case of MLD-Grown Titanicene Layers, *Harpreet Sodhi, A. Nijmeijer*, Inorganic Membranes, University of Twente, Netherlands; *A. Kovalgin*, Integrated Devices and Systems, University of Twente, Netherlands; *F. Roozeboom, M. Luiten-Olieman*, Inorganic Membranes, University of Twente, Netherlands

EM-TuP-21 Flexible Conductive Hybrid: Indium Oxide-ParyleneC Obtained by Optimized Vapor Phase Infiltration, *Oksana Yurkevich*, CIC NanoGUNE, Spain; *E. Modin*, CIC nanoGUNE, Spain; *I. Šarić Janković, R. Peter, M. Petravić*, Department of Physics and Centre for Micro- and Nanosciences and Technologies University of Rijeka, Croatia; *M. Knez*, CIC nanoGUNE, IKERBASQUE Basque Foundation for Science, Department of Physics and Centre for Micro- and Nanosciences and Technologies University of Rijeka, Spain

EM-TuP-22 ALD Ternary Films and Nanolaminates Based on Al₂O₃, ZrO₂ and ZnO, *Piotr Polak, J. Jankowska-Słowińska, L. Stańco, J. Maleszyk, A. Łaszcz, Łukasiewicz Research Network - Institute of Microelectronics and Photonics, Poland; A. Wolska, M. Klepka, K. Jabłońska*, Institute of Physics, Polish Academy of Sciences, Poland; *H. Stadler*, Bruker Nano Surfaces, Germany; *K. Kosiel, Łukasiewicz Research Network - Institute of Microelectronics and Photonics, Poland*

EM-TuP-23 Some Physical Properties and Comparison of Atomic Layer Deposited and Thermally Grown Silicon Oxides, *Taivo Jõgiias, O. Vanker, T. Viskus, S. Tolbin, A. Tarre, K. Kukli*, University of Tartu, Estonia

EM-TuP-24 Thin Film Composite Desalination Membranes by Molecular Layer Deposition, *Brian Welch, R. Cai*, Technion Israel Institute of Technology, Israel; *V. Rozyyev, J. Elam*, Argonne National Laboratory, USA; *T. Segal-Peretz*, Technion Israel Institute of Technology, Israel

EM-TuP-25 Complex Materials for Next Generation Electronics and Photonics - ALD will Prevail!, *Henrik H. Sønsteby*, University of Oslo, Norway

EM-TuP-26 Nanomolecularly-Induced Effects on the Synthesis and Stability of Multilayered Titania/Organophosphonate Interfaces, *Collin Rowe*, Rensselaer Polytechnic Institute, USA; *A. Kashyap*, Indian Institute of Technology, Mandi, India; *G. Sharma*, Rensselaer Polytechnic Institute, USA; *N. Goyal*, Indian Institute of Science, Bangalore, India; *J. Alauzun*, University of Montpellier, France; *S. Barry*, Carleton University, Canada; *N. Ravishankar*, Indian Institute of Science, Bangalore, India; *A. Soni*, Indian Institute of Technology, Mandi, India; *P. Eklund, H. Pedersen*, Linköping University, Sweden; *G. Ramanath*, Rensselaer Polytechnic Institute, USA

EM-TuP-27 Comparative Analysis of Film Growth in Molecular Layer Deposition: Siloxane-Bridged Silane Precursor vs. Methylene-Bridged Silane Precursor, *Man Hou Vong, M. Dickey, G. Parsons*, North Carolina State University, USA

EM-TuP-28 Atomic Layer Deposition within Polymers Templates for Doped Materials, *Rotem Azoulay, T. Segal-Peretz*, Israel Institute of Technology, Israel

EM-TuP-29 III-Nitride Group Semiconductor Materials Made by Low Temperature Plasma Atomic Layer Deposition, *Noureddine Adjroud*, LIST, Luxembourg

Wednesday Morning, August 7, 2024

| Room Hall 3A | | |
|--------------|--|--|
| 8:00am | AF1-WeM-1 Conformality of Ternary Oxides by Spatial ALD: Monte Carlo Simulations and Experimental Study, <i>Mike van de Poll, S. van der Heijden, P. Poodt, E. Kessels, B. Macco</i> , Eindhoven University of Technology, Netherlands | ALD Fundamentals Session AF1-WeM Growth and Characterization: High Aspect Ratio/High Surface Area/Powder ALD and Characterization of ALD Films Moderators: Noureddine Adjeroud , Luxembourg Institute of Science and Technology (LIST), Luxembourg, Viljami Pore , ASM, Finland |
| 8:15am | AF1-WeM-2 Reusable Macroscopic HAR Test Kit Enabling Fast, Routine Characterization of Film Conformality, <i>Jesse Kalliomaki, I. Manninen, J. Jarvilehto</i> , Applied Materials, Finland | |
| 8:30am | AF1-WeM-3 Superconformal ALD Using a Heavy Inert Diffusion Additive, <i>Arun Haridas Choolakkal, P. Mpofo, P. Niiranan, J. Birch, H. Pedersen</i> , Linköping University, Sweden | |
| 8:45am | AF1-WeM-4 Ald of Alumina-Silica Multilayers on Carbon Microfiber Fabrics: Microstructure and Potential as Refractory Oxygen Diffusion Barriers, <i>Elise des Ligneris, D. Samélor</i> , CIRIMAT-INPT, France; <i>A. Sekkat</i> , CNRS, France; <i>C. Vahlas</i> , CIRIMAT-INPT, France; <i>B. Caussat</i> , CNRS, France | |
| 9:00am | AF1-WeM-5 Pillarhall Lateral High Aspect Ratio Assisted Unveiling of Secondary Growth Front and Background Reaction Mechanism in Atomic Layer Deposition, <i>Anish Philip</i> , Chipmetrics Ltd, Finland; <i>S. Elliott</i> , Schrödinger, Germany; <i>J. Kinnunen</i> , Chipmetrics Ltd, Finland; <i>A. Mirhamed</i> , Park Systems GmbH, Germany; <i>M. Zaheer, M. Utraiinen</i> , Chipmetrics Ltd, Finland | |
| 9:15am | AF1-WeM-6 Helium Ion Microscopy on ALD Thin Films, <i>Sami Kinnunen</i> , University of Jyväskylä, Finland; <i>E. Alakoski, T. Laine</i> , JAMK University of Applied Sciences, Finland; <i>T. Sajavaara</i> , University of Jyväskylä, Finland | |
| 9:30am | AF1-WeM-7 Understanding the Amorphous Structure of Al- and Zn- Doped TiO ₂ with an Automated 4D-STEM Analysis Pipeline, <i>Andreas Werbrouck, N. Paranamana, X. He, M. Young</i> , University of Missouri-Columbia, USA | |
| 9:45am | AF1-WeM-8 Non-Destructive Characterization of ALD Thin Films Using Angle-resolved XPS and Structure Modeling, <i>Kateryna Artyushkova, N. Biderman, W. Betz</i> , Physical Electronics USA | |
| 10:00am | Break & Exhibits | |
| 10:15am | | |
| 10:30am | | |
| 10:45am | AF2-WeM-12 Low-Temperature ALD of Metallic Cobalt for 3D Structures, <i>Mathias Franz, L. KaBner</i> , Fraunhofer ENAS, Germany; <i>C. Thurm</i> , University of Technology Chemnitz, Germany; <i>X. Hu</i> , Fraunhofer ENAS, University of Technology Chemnitz, Germany; <i>M. Daniel</i> , scia systems GmbH, Germany; <i>F. Stahr</i> , Forschungs- und Applikationslabor Plasmatechnik GmbH, Germany; <i>S. Schulz</i> , Fraunhofer ENAS, Center for Microtechnologies (ZfM), University of Technology Chemnitz, Germany | ALD Fundamentals Session AF2-WeM Growth and Characterization: Low Temperature ALD Moderators: John Conley , Oregon State University, USA, Henrik Pedersen , Linköping University, Sweden |
| 11:00am | AF2-WeM-13 Towards Deposition of Metallic Molybdenum Films from Molybdenum Hexacarbonyl in a Process Involving an Intermediate ALD Step and Subsequent Reduction, <i>Kees van der Zouw, M. Sturm, T. Aarnink, A. Kovalgin</i> , University of Twente, the Netherlands | |
| 11:15am | AF2-WeM-14 Growth of Metallic Ru Film by Oxidant-Free Atomic Layer Deposition Below 100 °C, <i>Kyeongmin Min, H. Lee</i> , Incheon National University, Republic of Korea; <i>C. Nguyen</i> , Incheon National University, Viet Nam | |
| 11:30am | AF2-WeM-15 Unveiling the Effect of the Starting Precursor on Ge ₂ Sb ₂ Te ₅ Atomic Layer Deposition, <i>Jyoti Sinha</i> , KU Leuven, IMEC Belgium; <i>J. Innocent, A. Illiberi, M. Givens</i> , ASM, Belgium; <i>L. Nyns, A. Delabie</i> , IMEC Belgium | |
| 11:45am | AF2-WeM-16 Atomic Layer Deposition Equipment Vendors Market and Technology, <i>Taguhi Yeghoyan</i> , Yole Group, France | |
| | | |

Wednesday Morning, August 7, 2024

| Room Hall 3D | |
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| 8:00am | INVITED: AA1-WeM-1 Ferroelectric Doped HfO ₂ : From Ald Processing to Device Applications, <i>Uwe Schroeder</i> , Namlab, Germany |
| 8:15am | |
| 8:30am | AA1-WeM-3 Interfacial Layer Engineering by Tungsten Oxide for Ferroelectric La-Doped Hf _{0.5} Zr _{0.5} O ₂ Layer, <i>Dae Seon Kwon, M. Popovici, J. Bizindavyi</i> , imec, Belgium; <i>G. De, A. Delabie</i> , KU Leuven, imec, Belgium; <i>A. Belmonte, G. Sankar Kar</i> , imec, Belgium; <i>J. Van Houdt</i> , KU Leuven, imec, Belgium |
| 8:45am | AA1-WeM-4 Performance Improvement of Hf _{0.45} Zr _{0.55} O _x Ferroelectric Field Effect Transistor Memory with Ultrathin Al-O Bonds-Modified InO _x Channels, <i>Meng Wei, X. Dongqi, L. Binbin, W. Xiaohan, Z. Bao, L. Wen-Jun, D. Shi-Jin</i> , Fudan University, China |
| 9:00am | AA1-WeM-5 In-situ Crystallization of Ferroelectric Hf _{0.5} Zr _{0.5} O ₂ Thin Films with Record-high 2P _r (56μC/cm ²) at Low Thermal Budget (300°C) Towards Full BEOL-compatibility, <i>Peng Yuan</i> , Beijing Superstring Academy of Memory Technology, China; <i>L. Tai</i> , Shandong University, China; <i>X. Ma, J. Xiang</i> , Beijing Superstring Academy of Memory Technology, China; <i>G. Wang</i> , Shandong University, China; <i>J. Chen</i> , Shandong University, China; <i>C. Zhao</i> , Beijing Superstring Academy of Memory Technology, China |
| 9:15am | AA1-WeM-6 Enhancement of Ferroelectric Phase Formation of HfO ₂ /ZrO ₂ Nanolaminate Films by Tuning HfO ₂ and ZrO ₂ Thicknesses Using Atomic Layer Deposition, <i>Takashi Onaya, Y. Sakuragawa, K. Kita</i> , The University of Tokyo, Japan |
| 9:30am | AA1-WeM-7 Investigating the Impact of Process Parameters on the In-plane Strain of Ultra-Thin H-f,Zr _{1-x} O ₂ Films, <i>Florian Wunderwald</i> , Namlab, Germany; <i>B. Xu</i> , Namlab, China; <i>P. Vishnumurthy</i> , Namlab, India; <i>S. Enghardt</i> , TU Dresden, Germany; <i>K. Holsgrove</i> , Queen's University Belfast, UK; <i>A. Kersch</i> , University of Applied Sciences Munich, Germany; <i>T. Mikolajick, U. Schroeder</i> , Namlab, Germany |
| 9:45am | AA1-WeM-8 Thermal ALD IGO Channel Layer with High-thermal Stability (> 800 °C) for New Hybrid (Poly-Si/IGO) Vertical 3D NAND Application, <i>Su-Hwan Choi, J. Sim, C. Park, Y. Song, J. Park</i> , Hanyang University, Korea |
| 10:00am | Break & Exhibits |
| 10:15am | |
| 10:30am | |
| 10:45am | INVITED: AA2-WeM-12 Towards Neuromorphic Computing Using ALD Grown HfO ₂ Based Memristive Devices, <i>Christian Wenger</i> , IHP - Leibniz Institut fuer innovative Mikroelektronik, Germany |
| 11:00am | |
| 11:15am | AA2-WeM-14 Novel Carbon-Doped HfO _x Memristor with Born-ON Characteristics Synthesized via ALD/MLD Combined Technique, <i>Minjong Lee, Y. Hong, J. Kim, D. Le, D. Kim</i> , University of Texas at Dallas, USA; <i>R. Choi</i> , Inha university, Republic of Korea; <i>J. Rohan, G. Yeric</i> , Cerfe Labs, USA; <i>J. Kim</i> , University of Texas at Dallas, USA |
| 11:30am | AA2-WeM-15 Evolution of Structural Order in Doped Hafnia Thin Films by Atomic Layer Deposition for Emerging Device Applications, <i>Mohammad Hassan Sultani, F. Cüppers</i> , Forschungszentrum Juelich GmbH, Germany; <i>A. Dippel, O. Gutowski</i> , Deutsches Elektronen Synchrotron DESY, Germany; <i>A. Besmehn, D. Müller, S. Hoffmann-Eifert</i> , Forschungszentrum Juelich GmbH, Germany |
| 11:45am | AA2-WeM-16 ALD HfZrO ₂ Films from Ferroelectric to High-k Applications, <i>Alessandra Leonhardt</i> , ASM, Finland; <i>R. Ramachandran</i> , ASM, Belgium; <i>M. Surman</i> , ASM, Finland; <i>R. John, F. Tang, M. Balseanu</i> , ASM, USA; <i>A. Illiberi</i> , ASM, Belgium |

**ALD Applications
Session AA1-WeM
Flash and Ferroelectric Memories
Moderators:**
Haripin Chandra, EMD Electronics, USA,
Matti Putkonen, University of Helsinki, Finland

**ALD Applications
Session AA2-WeM
Memory Applications: RRAM & Neuromorphic,
MIM Capacitors
Moderators:**
Uwe Schröder, Namlab, Germany,
Seung-Yeol Yang, Samsung, Republic of Korea

Wednesday Morning, August 7, 2024

| Room Hall 3E | | |
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| 8:00am | EM-WeM-1 Resolving Composition and Crystal Structure of Fundamentally Novel MOF-Like Fe-Terephthalate Thin Films, <i>Topias Jussila, A. Philip</i> , Aalto University, Finland; <i>V. Rubio-Giménez</i> , Katholieke Universiteit Leuven, Belgium; <i>K. Eklund</i> , Aalto University, Finland; <i>S. Vasala</i> , ESRF - The European Synchrotron, France; <i>A. J. Karttunen</i> , Aalto University, Finland; <i>R. Ameloot</i> , Katholieke Universiteit Leuven, Belgium; <i>M. Karppinen</i> , Aalto University, Finland | Emerging Materials Session EM-WeM Molecular Layer Deposition of Organic Materials and Organic-Inorganic Hybrid Materials Moderators: Christophe Detavernier , Ghent University, Belgium, Paul Poedt , SparkNano, Netherlands |
| 8:15am | EM-WeM-2 Molecular Layer Deposition of Metal Organophosphonate Thin Films, <i>Aditya Chalisehar</i> , A. Dhara, J. Dendooven, C. Detavernier, Ghent University, Belgium | |
| 8:30am | EM-WeM-3 Europium-Organic Luminescent Thin Films for Bioimaging Applications, <i>Amr Ghazy</i> , Aalto University, Finland; <i>J. Ylönen, N. Subramaniam</i> , Xfold imaging oy, Finland; <i>M. Karppinen</i> , Aalto University, Finland | |
| 8:45am | EM-WeM-4 Inverted Living Molecular Layer Deposition: An Empowering Technique for Biomedical Applications, <i>Karina Ashurbekova, M. Knez</i> , CIC nanoGUNE BRTA, Spain | |
| 9:00am | INVITED: EM-WeM-5 Hybrid Multilayer EUV Photoresist with Vertical Molecular Wire Structure, <i>Myung Mo Sung</i> , Hanyang University, Republic of Korea | |
| 9:15am | | |
| 9:30am | EM-WeM-7 Chemical Transformations Mediated by Low-Energy Electrons within Vapor Phase Synthesized Al-based Hybrid Thin Films for Advanced Resist Applications: An In-Situ Investigation, <i>Dan Le, T. Chu</i> , University of Texas at Dallas, USA; <i>W. Lee</i> , Stony Brook University, USA; <i>N. Tiwale</i> , Brookhaven National Laboratory, USA; <i>J. Veyan, J. Kim, D. Kim, M. Lee</i> , University of Texas at Dallas, USA; <i>C. Nam</i> , Stony Brook University/Brookhaven National Laboratory, USA; <i>J. Kim</i> , University of Texas at Dallas, USA | |
| 9:45am | EM-WeM-8 Molecular Layer Deposition of Phosphorus Thin Films Using Bis- α -aminophosphine Chemistry, <i>Justin Lomax, J. Bentley, P. Ragogna</i> , University of Western Ontario, Canada | |
| 10:00am | Break & Exhibits | |
| 10:15am | | |
| 10:30am | | |
| 10:45am | AA3-WeM-12 Tunable Superconducting Nb _x Ti _{1-x} N by Fast Plasma-enhanced ALD for Quantum Applications, <i>Silke Peeters, L. Nelissen</i> , Eindhoven University of Technology, Netherlands; <i>D. Besprozvanny</i> , Oxford Instruments Plasma Technology, UK; <i>M. Verheijen</i> , Eindhoven University of Technology, Netherlands; <i>M. Powell, L. Bailey</i> , Oxford Instruments Plasma Technology, UK; <i>E. Kessels</i> , Eindhoven University of Technology, Netherlands; <i>H. Knoops</i> , Oxford Instruments Plasma Technology, UK | ALD Applications Session AA3-WeM Other Emerging Applications Moderators: Sumit Agarwal , Colorado School of Mines, USA, Parag Banerjee , University of Central Florida, USA |
| 11:00am | AA3-WeM-13 Atomic Layer Deposited Metal Nitrides (TiN and InN) and Metal Semiconductor Heterojunctions for Quantum Applications, <i>Neeraj Nepal, J. Prestigiacomo, M. Sales, P. Litwin, T. Growden, V. Wheeler</i> , US Naval Research Laboratory, USA | |
| 11:15am | AA3-WeM-14 Ceramic Thin-Film Composite Membranes with Tunable Subnanometer Pores for Molecular Sieving by Atomic Layer Deposition, <i>X. Zhou</i> , Yale University, USA; <i>R. Shevate, A. Mane, Jeffrey Elam</i> , Argonne National Laboratory, USA; <i>J. Kim, M. Elimelech</i> , Yale University, USA | |
| 11:30am | AA3-WeM-15 Recent Developments and Emerging Applications in Atmospheric-Pressure Atomic Layer Deposition of High-Porosity Materials, <i>M. Chen</i> , TU Delft, China; <i>M. Nijboer, A. Kovalgin, A. Nijmeijer, F. Roozeboom, Mieke Luiten-Olieman</i> , University of Twente, The Netherlands | |
| 11:45am | AA3-WeM-16 Atomic Layer Deposition of Self-Healing Protective Coatings for Stone Cultural Heritage Conservation, <i>Aranzazu Sierra Fernández</i> , CIC nanoGUNE, Donostia-San Sebastián, Spain; <i>M. Knez</i> , CIC nanoGUNE, Donostia-San Sebastián and IKERBASQUE, Basque Foundation for Science, Spain | |

Wednesday Morning, August 7, 2024

| Room Hall 3F | | |
|---------------------|---|---|
| 8:00am | <p>INVITED: ALE1-WeM-1 Anisotropic and Isotropic Plasma-Enhanced Atomic Layer Etching Processes for Metals and Dielectric Materials for Semiconductor Devices, <i>Heeyeop Chae</i>, Sungkyunkwan University (SKKU), Republic of Korea</p> | <p>Atomic Layer Etching Session ALE1-WeM Plasma and Energy-Enhanced ALE Moderators: Dmitri Kioussis, Intel Corporation, USA, Christophe Vallée, University of Albany, USA</p> |
| 8:15am | | |
| 8:30am | <p>ALE1-WeM-3 Transient Assisted Plasma Etching (TAPE), <i>Atefeh Fathzadeh</i>, KU Leuven/ IMEC, Belgium; <i>P. Bezard, F. Lazzarino</i>, IMEC, Belgium; <i>S. De Gendt</i>, KU Leuven/ IMEC, Belgium</p> | |
| 8:45am | <p>ALE1-WeM-4 Isotropic Plasma Atomic Layer Etching of Nickel Aluminide Binary Intermetallic Using a Super-Cycle Sequence Based on Hhfac and Al(CH₃)₃, <i>Ali Mohamed Ali</i>, IMEC Belgium; <i>G. Krieger</i>, TU / Eindhoven, Netherlands; <i>J. Soulié, C. Pashartis</i>, IMEC Belgium; <i>C. Detavernier</i>, Ghent University, Belgium; <i>H. C. M. Knoops, E. Kessels</i>, TU / Eindhoven, Netherlands; <i>S. De-Gendt, F. Lazzarino, S. Kundu, J. de Marneffe</i>, IMEC Belgium</p> | |
| 9:00am | <p>ALE1-WeM-5 Surface Effects in Quasi-ALE of Si: A Correlation with Ar⁺ Ion Energy, <i>Oscar Danielsson</i>, Lund University, Sweden; <i>A. Karimi, M. Asif</i>, AlixLabs AB, Sweden; <i>S. Khan</i>, Danish Fundamental Metrology Institute, Denmark; <i>I. Maximov</i>, Lund University, Sweden</p> | |
| 9:15am | <p>ALE1-WeM-6 Atomic Layer Etching Study of Polycrystalline, Epitaxial and Doped ZnO Films Using <i>in Situ</i> Spectroscopic Ellipsometry, <i>Terrick McNealy-James, N. Berriel, B. Butkus, T. Currie, T. Jurca, P. Banerjee</i>, University of Central Florida, USA</p> | |
| 9:30am | <p>ALE1-WeM-7 Atomic Layer Etching of Diamond for Epitaxy Preparation, <i>Julian Michaels</i>, University of Illinois at Urbana-Champaign, USA; <i>N. Deegan</i>, Argonne National Laboratory, USA; <i>Y. Tsaturyan</i>, University of Chicago, USA; <i>J. Renzas</i>, Oxford Instruments Plasma Technology, USA; <i>D. Awschalom</i>, University of Chicago, USA; <i>J. Eden</i>, University of Illinois at Urbana-Champaign, USA; <i>F. Heremans</i>, Argonne National Laboratory, USA</p> | |
| 9:45am | <p>ALE1-WeM-8 Plasma Atomic Layer Etching of Titanium Nitride with Surface Fluorination or Chlorination and Ar Ion Bombardment, <i>Heeju Ha, H. Lee, M. Jeon, H. Chae</i>, Sungkyunkwan University (SKKU), Republic of Korea</p> | |
| 10:00am | <p>Break & Exhibits</p> | |
| 10:15am | | |
| 10:30am | | |
| 10:45am | | |
| 11:00am | <p>INVITED: ALE2-WeM-12 Interest and Potential of Atomic Layer Etching for Selective Deposition, <i>Thierry Chevolleau</i>, CEA/LETI-University Grenoble Alpes, France; <i>M. Jaffal</i>, University Grenoble Alpes, CNRS, LTM, France; <i>R. Gassilloud</i>, CEA/LETI-University Grenoble Alpes, France; <i>N. Possème</i>, ST Microelectronics, France; <i>C. Vallée</i>, University of Albany, USA; <i>M. Bonvalot</i>, University Grenoble Alpes, CNRS, LTM, France</p> | <p>Atomic Layer Etching Session ALE2-WeM Selectivity, Metrology and Diagnostics in ALE Moderators: Adrie Mackus, Eindhoven University, Netherlands, Gregory N. Parsons, North Carolina State University, USA</p> |
| 11:15am | <p>ALE2-WeM-14 Insight into SF₆/H₂ Plasma Mixtures to Expand the Capabilities of ALE, <i>Guillaume Krieger, S. Peeters, B. Vonken, N. Chittock, A. Mackus, E. Kessels</i>, Eindhoven University of Technology, The Netherlands; <i>H. Knoops</i>, Oxford Instruments Plasma Technology, The Netherlands</p> | |
| 11:30am | <p>ALE2-WeM-15 Retarding-Field Energy Analyzer as a Tool to Find the Process Window for Plasma-Assisted Atomic Layer Etching and Quasi-Atomic Layer Etching, <i>Yoana Ilarionova, R. Jam, I. Sharma, O. Danielson, S. Ju, A. Muhammad, D. Suyatin, A. Karimi, J. Sundqvist</i>, AlixLabs AB, Sweden</p> | |

Wednesday Afternoon, August 7, 2024

| Room Hall 3A | | |
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| 1:30pm | AF1-WeA-1 Triggering Nucleation of Pt ALD through UV-illumination, <i>J. Santo Domingo Peñaranda, Jolien Dendooven</i> , Ghent University, Belgium; <i>V. Miikkulainen</i> , Aalto University, Finland; <i>S. Klejna</i> , AGH University of Science and Technology, Poland; <i>E. Solano</i> , ALBA synchrotron, Spain; <i>M. Rosenthal</i> , ESRF, Grenoble, France; <i>Z. Hens, C. Detavernier</i> , Ghent University, Belgium | ALD Fundamentals Session AF1-WeA Growth and Characterization: <i>In-situ</i> and <i>in-vacuo</i> Analysis, Surface Science of ALD I Moderators: Simon D. Elliott , Schrödinger, Ireland, Hyungjun Kim , Yonsei University, Korea |
| 1:45pm | AF1-WeA-2 Reaction Pathway of Copper Atomic Layer Deposition via Time-of-Flight Mass Spectrometry, <i>Camilla Minzoni, K. Mackosz, C. Hain</i> , Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland; <i>C. Frege</i> , TOFWERK AG, Switzerland; <i>I. Utke, P. Hoffmann</i> , Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland | |
| 2:00pm | AF1-WeA-3 <i>in vacuo</i> Cluster Tool for Studying Reaction Mechanisms in ALD and ALE Processes, <i>Marko Vehkamäki, M. Chundak, H. Nieminen, M. Putkonen, M. Ritala</i> , University of Helsinki, Finland | |
| 2:15pm | AF1-WeA-4 Understanding the Dual-Source Behavior of LiHMDS for Si-Free Li-Containing Films, <i>Meike Pieters, L. Bartel, C. van Helvoirt, M. Creatore</i> , Eindhoven University of Technology, The Netherlands | |
| 2:30pm | AF1-WeA-5 Combining in Situ Photoluminescence and Ellipsometry : A New Approach to Analyse and Optimize Ald Materials for Photovoltaic Applications, <i>Navid MOUHAMED</i> , IPVF, France; <i>N. SCHNEIDER</i> , CNRS-IPVF, France; <i>N. HARADA, M. LEVILLAYER</i> , IPVF, France; <i>A. Delamarre, S. Collin, C2N, France; B. Berenguer, G. Delpont</i> , CNRS-IPVF, France | |
| 2:45pm | AF1-WeA-6 Self-Limiting Deposition of Copper from Copper Beta-Diketonates and Plasma Electrons, <i>Premrudee Promdet, P. Niiranen, A. Haridas Choolakkal, D. Lundin, H. Pedersen</i> , Linköping University, IFM, Sweden | |
| 3:00pm | AF1-WeA-7 Exploring Nucleation Phenomena in Ultra-Thin ALD and PE-Ald Films on NMC 811 Substrates: An in Situ Quartz Crystal Microbalance Study, <i>Léo Lapeyre, L. Pethö, J. Michler</i> , Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland; <i>P. Raynaud</i> , LAPLACE, France; <i>I. Utke</i> , Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland | |
| 3:15pm | AF1-WeA-8 The Role of the Oxidizing Co-Reactant in Pt Growth by Atomic Layer Deposition Using MeCpPtMe ₃ and O ₂ /O ₃ /O ₂ -Plasma, <i>Jin Li</i> , Ghent University, Belgium, China; <i>S. Klejna</i> , AGH University of Krakow, Poland; <i>M. Minjauw, J. Dendooven, C. Detavernier</i> , Ghent University, Belgium | |
| 3:30pm | Break | |
| 3:45pm | | |
| 4:00pm | AF2-WeA-11 In vacuo XPS Growth Studies During ALD of ErNiO ₃ , <i>Matthias Minjauw</i> , Ghent University, Belgium; <i>A. Illiberi, M. Givens</i> , ASM, Belgium; <i>A. Leonhardt, I. Issah, L. Bottiglieri</i> , ASM, Finland; <i>J. Dendooven, C. Detavernier</i> , Ghent University, Belgium | ALD Fundamentals Session AF2-WeA Growth and Characterization: <i>In-situ</i> and <i>in-vacuo</i> Analysis, Surface Science of ALD II Moderators: Markku Leskelä , University of Helsinki, Finland, Mikko Ritala , University of Helsinki, Finland |
| 4:15pm | AF2-WeA-12 Surface Chemistry of Aluminum Nitride ALD, <i>Pamburayi Mpofo, H. Hafji, H. Pedersen</i> , Linköping University, Sweden | |
| 4:30pm | AF2-WeA-13 Investigating Hf Oxide Growth with Ambient Pressure XPS and Ozone as Co-Reactant, <i>Esko Kokkonen</i> , Max IV Laboratory, Sweden; <i>R. Jones</i> , Lund University, Sweden; <i>V. Miikkulainen</i> , Aalto University, Finland; <i>C. Eads, A. Klyushin</i> , Max IV Laboratory, Sweden; <i>J. Schnadt</i> , Lund University, Sweden | |
| 4:45pm | AF2-WeA-14 ALD/ALE 2024 Closing Remarks, <i>Mikko Ritala, Markku Leskelä</i> , University of Helsinki, Finland, <i>Fred Roozeboom</i> , University of Twente and Carbyon B.V., The Netherlands, <i>Dmitry Suyatin</i> , AlixLabs A.B., Sweden | |

Wednesday Afternoon, August 7, 2024

| Room Hall 3D | | |
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| 1:30pm | INVITED: AA1-WeA-1 ALD Solutions for Compound Semiconductor Devices, Mikko Söderlund , A. Voznyi, T. Ivanova, A. Perros, P. Rabinzohn, Beneq Oy, Finland | ALD Applications Session AA1-WeA More than Moore Applications Moderators: Benjamin Greenberg , Naval Research Laboratory, USA, Sami Sneck , Beneq, Finland |
| 1:45pm | | |
| 2:00pm | AA1-WeA-3 Plasma Effects on the Epitaxial Growth of Aluminum Nitride Thin Films on (0001)4H-SiC by PE-ALD, Bruno Galizia , P. Fiorenza, C. Bongiorno, Consiglio Nazionale delle Ricerche, Istituto per la Microelettronica e Microsistemi (CNR-IMM), Italy; B. Pécz, Z. Fogarassy, Centre for Energy Research, Institute of Technical Physics and Materials Science, Hungary; G. Greco, F. Giannazzo, Consiglio Nazionale delle Ricerche - Istituto per la Microelettronica e Microsistemi (CNR-IMM), Italy; F. Roccaforte, Consiglio Nazionale delle Ricerche - Istituto per la Microelettronica (CNR-IMM), Italy; R. Lo Nigro, Consiglio Nazionale delle Ricerche - Istituto per la Microelettronica e Microsistemi (CNR-IMM), Italy | |
| 2:15pm | AA1-WeA-4 Novel Low Temperature Thermal ALD of Aluminum Nitride Utilizing a Non-Metal Catalyst, Sara Harris , M. Weimer, D. Lindblad, A. Dameron, Forge Nano, USA | |
| 2:30pm | AA1-WeA-5 Thermal and Plasma Enhanced ALD growth of functional Al ₂ O ₃ /AlN dielectric stacks for silicon carbide MOSFETs, Raffaella Lo Nigro , B. Galizia, P. Fiorenza, E. Schilirò, F. Roccaforte, Consiglio Nazionale delle Ricerche – Istituto per Microelettronica e Microsistemi (CNR-IMM), Italy | |
| 2:45pm | AA1-WeA-6 Reduction of Defects at or Near ALD-Al ₂ O ₃ /GaN Interfaces for Improved Electrical Performance of GaN Power Devices, Caleb Glaser , B. Rummel, J. Klesko, M. Meyerson, P. Dickens, A. Binder, R. Kaplar, Sandia National Laboratories, USA; D. Fezell, University of New Mexico, USA | |
| 3:00pm | AA1-WeA-7 Fabrication of RuS ₂ Photodetector Via Post Sulfurization of Atomic Layer Deposition Ru Thin Film, Jaehyoek Kim , Yonsei University, Korea; N. Tatsuya, TANAKA Kikinzoku Kogyo K.K, Japan; D. Kim, Samsung Advanced Institute of Technology, Republic of Korea; K. Yohei, TANAKA Kikinzoku Kogyo K.K, Japan; S. Chung, Yonsei University, Korea; S. Kim, Ulsan National Institute of Science and Technology, Republic of Korea; H. Kim, Yonsei University, Korea | |
| 3:15pm | AA1-WeA-8 Spatial Atomic Layer Deposition: A New Revolution in Ultra-Fast Production of Conformal and High-Quality Optical Coatings, John Rönn , P. Maydannik, S. Virtanen, K. Niiranen, S. Sneck, Beneq, Finland | |
| 3:30pm | Break | |
| 3:45pm | | |
| 4:00pm | AA2-WeA-11 Deposition and Characterization of Electro-Optic ALD K(Ta _x Nb _{1-x})O ₃ Films for Photonics, Eric Martin , Ohio State University, USA; J. Bickford, Army Research Laboratory, USA; H. Sønsteby, University of Oslo, Norway; R. Hoffman, Army Research Laboratory, USA; R. Reano, Ohio State University, USA | ALD Applications Session AA2-WeA Emerging: Optics/Optoelectronics Moderators: Tero Pilvi , Picosun Oy, Finland, Tania Sandoval , Technical University Federico Santa Maria, Chile |
| 4:15pm | AA2-WeA-12 Advances in Plasma-based Atomic Layer Processing of AlF ₃ for the Passivation of FUV Mirrors, Virginia Wheeler , M. Sales, D. Boris, Naval Research Laboratory, USA; L. Rodriguez de Marcos, Catholic University of America and NASA Goddard Space Flight Center, USA; J. del Hoyo, NASA Goddard Space Flight Center, USA; A. Lang, S. Walton, Naval Research Laboratory, USA; E. Wollack, M. Quijada, NASA Goddard Space Flight Center, USA | |
| 4:30pm | AA2-WeA-13 Plasma-Enhanced Atomic Layer Deposition with RF Substrate Biasing to Tune the Performance of Superconducting Nanowire Single-Photon Detectors in the Mid-Infrared, Ciaran Lennon , Oxford Instruments Plasma Technology, University of Glasgow, UK; D. Morozov, University of Glasgow, UK; Y. Shu, Oxford Instruments Plasma Technology, UK; H. Knoops, Oxford Instruments Plasma Technology, UK, Eindhoven University of Technology, Netherlands; K. Hore, Oxford Instruments Plasma Technology, UK; R. Hadfield, University of Glasgow, UK | |

Wednesday Afternoon, August 7, 2024

| Room Hall 3E | | |
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| 1:30pm | EM-WeA-1 Atomic-Scale Homogeneous PtRu Alloy Thin Films Prepared by Atomic Layer Modulation (ALM), Yeseul Son , S. Kim, Ulsan National Institute of Science and Technology, Republic of Korea; T. Cheon, Daegu Gyeongbuk Institute of Science and Technology, Republic of Korea; S. Kim, Ulsan National Institute of Science and Technology, Republic of Korea | Emerging Materials Session EM-WeA Other Emerging Materials Moderators: Jiyoung Kim , University of Texas at Dallas, USA, Mato Knez , CIC nanoGUNE, Spain |
| 1:45pm | EM-WeA-2 A New Approach to the Synthesis of Nb@TiO ₂ Core-Shell Composite for Oxide Dispersion Strengthened Alloy via Atomic Layer Deposition, Ji Young Park , E. Lee, M. Jeong, J. Byun, B. Hwang, S. Oh, B. Choi, Seoul National University of Science and Technology, Republic of Korea | |
| 2:00pm | EM-WeA-3 Influence of an Artificial Structure on the Mechanical Properties of Atomic Layer Deposited Al ₂ O ₃ and Ta ₂ O ₅ Composite Thin Films, Helle-Mai Piirsoo , T. Jõgiaas, K. Kukli, University of Tartu, Estonia | |
| 2:15pm | EM-WeA-4 Phosphorus-Rich Metal Phosphide Thin Films Using Zintl Ions, Jordan Bentley , University of Western Ontario, Canada; B. van Ijzendoorn, Manchester Metropolitan University, UK; J. Lomax, University of Western Ontario, Canada; M. Bakiro, S. Barry, Carleton University, Canada; M. Mehta, Manchester Metropolitan University, UK; P. Ragogna, University of Western Ontario, Canada | |
| 2:30pm | EM-WeA-5 Improved Crystallinity and Polarity Determination of Gallium Nitride on Si (111) Using Atomic Layer Annealing, SeongUk Yun , P. Lee, University of California San Diego, USA; A. Mcleod, University of California at San Diego, USA; J. Spiegelman, RASIRC, USA; A. Kummel, University of California at San Diego, USA | |
| 2:45pm | EM-WeA-6 Self-limiting Epitaxy of GaN and InN Films on Sapphire Substrates, S. Allaby, N. Ibrahimli, F. Bayansal, H. Saleh, B. Willis, Necmi BIYIKLI , University of Connecticut, USA | |
| 3:00pm | EM-WeA-7 Epitaxial Rare-Earth Orthoferrites by Atomic Layer Deposition, Linn Rykkje , H. Sønsteby, O. Nilsen, University of Oslo, Norway | |
| 3:15pm | EM-WeA-8 Area Selectivity and Crystallographic Orientation of ZIF-8 Films Deposited by Molecular Layer Deposition, Jorid Smets , V. Rubio-Giménez, KU Leuven, Belgium; S. Armini, IMEC Belgium; R. Ameloot, KU Leuven, Belgium | |
| 3:30pm | Break | |
| 3:45pm | | |
| 4:00pm | AA3-WeA-11 Atomic Layer Deposition for Stable On-Chip Quantum Dot LEDs: Hybrid Quantum Dot Pockets, Robin Petit , R. Özdemir, H. Van Avermaet, J. Kuhs, A. Werbrouck, J. Dendooven, Z. Hens, P. Smet, C. Detavernier, Ghent University, Belgium | ALD Applications Session AA3-WeA Display Applications Moderators: Marianna Kemell , University of Helsinki, Finland, Sehinde Owoseni , Intel Corporation |
| 4:15pm | AA3-WeA-12 A Comparative Study on Cation distribution effects in Heterogeneous channel IGZO TFTs via Atomic Layer Deposition Supercycle Design, Hye-Jin Oh , H. Kim, C.-K. Park, J. Park, Hanyang University, Korea | |
| 4:30pm | AA3-WeA-13 Characteristics of PEALD IGZO Films Using Tetrahydrofuran-Adducted In & Ga Precursors, Sang Ick Lee , S. Jeon, S. Lee, Y. Kwone, Y. Im, T. Byun, DNF Co. Ltd., Republic of Korea | |

Wednesday Afternoon, August 7, 2024

| Room Hall 3F | | |
|--------------|--|---|
| 1:30pm | ALE-WeA-1 Modeling of Plasma-Assisted Cryogenic Etching of SiO ₂ , <i>Yuri Barsukov, I. Kaganovich</i> , Princeton University Plasma Physics Lab, USA | Atomic Layer Etching Session ALE-WeA Modeling in Atomic Layer Etching Moderators: Steven M. George , University of Colorado at Boulder, USA, Dmitry Suyatin , AlixLabs A.B., Sweden |
| 1:45pm | ALE-WeA-2 Utilizing Thermodynamic Analysis to Screen Material and Precursor Selection for Selective Thermal Atomic Layer Etching, <i>Landon Keller</i> , North Carolina State University, USA; <i>M. McBriarty, B. Zope, M. Moinpour, R. Kanjolia</i> , Merck KGaA, Darmstadt, Germany, USA; <i>G. Parsons</i> , North Carolina State University, USA | |
| 2:00pm | ALE-WeA-3 Atomistic Surface Processing Simulations: ALE of Transition Metal Dichalcogenides, <i>Suresh Kondati Natarajan, N. Pandey, J. Schneider, J. Wellendorff</i> , Synopsys Denmark ApS, Denmark | |
| 2:15pm | ALE-WeA-4 Gas-Phase Etching Mechanism of Amorphous Hydrogenated Silicon Nitride by Hydrogen Fluoride: A Theoretical Study, <i>Khabib Khumaini, Y. Kim, R. Hidayat, T. Chowdhury, H. Kim</i> , Sejong University, Republic of Korea; <i>B. Cho, S. Park</i> , Wonik IPS, Republic of Korea; <i>W. Lee</i> , Sejong University, Republic of Korea | |
| 2:30pm | ALE-WeA-5 Dynamic Global Model of Cl ₂ /Ar Plasmas for Atomic Layer Etching of GaN, <i>Tojo RASOANARIVO, C. Mannequin</i> , Nantes Université, CNRS, Institut des Matériaux de Nantes Jean ROUXEL, France; <i>F. ROQUETA, M. BOUFNICHEL</i> , STMicroelectronics, France; <i>A. RHALLABI</i> , Nantes Université, CNRS, Institut des Matériaux de Nantes Jean ROUXEL, France | |
| 2:45pm | ALE-WeA-6 A Transient Surface Site Balance Model for Si-Cl ₂ -Ar Atomic Layer Etching, <i>Joseph Vella</i> , Princeton Plasma Physics Laboratory, USA; <i>D. Graves</i> , Department of Chemical and Biological Engineering Princeton University and Princeton Plasma Physics Laboratory, USA | |
| 3:00pm | ALE-WeA-7 Theoretical Analysis on Halogenation of Transition Metal Surfaces toward Thermal Atomic Layer Etching, <i>Hyun Cho, M. Kim, B. Shong</i> , Hongik University, Republic of Korea | |
| 3:15pm | | |
| 3:30pm | Break | |
| 3:45pm | | |
| 4:00pm | AF3-WeA-11 UHP PEALD Growth and High Field Dielectric Testing of κ-Ga ₂ O ₃ Films, <i>Bangzhi Liu</i> , The Pennsylvania State University, USA | ALD Fundamentals Session AF3-WeA Growth and Characterization: Plasma Enhanced ALD II Moderators: Matti Putkonen , University of Helsinki, Finland, Mikko Söderlund , Beneq Oy, Finland |
| 4:15pm | AF3-WeA-12 Crystalline Phase Control of Manganese Oxide Films by Plasma Enhanced Atomic Layer Deposition, <i>Zhongwei Liu, J. Ren, H. Fang, L. Sang</i> , Beijing Institute of Graphic Communication, China | |
| 4:30pm | AF3-WeA-13 Superconducting Ultrathin Niobium Nitride Films for Quantum Application, <i>Mario Ziegler, E. Knehr, E. Mutsenik, S. Linzen, G. Oeslner, E. Il'ichev, R. Stolz</i> , Leibniz Inst. of Photonic Technology, Germany | |

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