

Program Key

Conference Topics

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

Program Overview

Room /Time	Plaza ABC	Plaza D	Plaza E	Plaza Exhibit	Plaza F
SaP				Poster Sessions	
SuM	<p>PS1-SuM: Sunday Plenary Session I</p> <p>PS2-SuM: Sunday Plenary Session II</p>				
SuA	<p>NS+EM-SuA: 2D Materials (1:30-3:30 pm)/ Laminate, Multicomponent, and Emerging Materials (4:00-5:30 pm)</p>	<p>ALE-SuA: Atomic Layer Etching Session I (1:30-3:30 pm) and II (4:00-5:30 pm)</p>	<p>AF-SuA: ALD Fundamentals: Precursors and Mechanisms (1:30-3:30 pm)/High Aspect Ratios & High Surface Areas (4:00-5:30 pm)</p>		<p>AS-SuA: Area Selective Deposition I: Deactivation (1:30-3:30 pm)/Inherent Selectivity, Activation, Deactivation (4:00-5:30 pm)</p>
SuP				Poster Sessions	
MoM	<p>AA-MoM: Solar Materials I (8:00-10:00 am)/Solar Materials II (10:45 am-12:00 pm)</p>	<p>ALE-MoM: Atomic Layer Etching Session III (8:00-10:00 am) and Session IV (10:45 am-12:00 pm)</p>	<p>AA+NS-MoM: Energy: Catalysis and Fuel Cells I (8:00-10:00 am)/Nanoparticles and Nanostructures (10:45 am-12:00 pm)</p>		<p>AF+AA-MoM: ALD Fundamentals: Plasma ALD (8:00-10:00 am)/Emerging Applications (10:45 am-12:00 pm)</p>
MoA	<p>AA-MoA: Memory and MIM I (1:30-3:30 pm)/ Memory and MIM II (4:00-5:30 pm)</p>	<p>ALE+AF-MoA: Atomic Layer Etching Session V (1:30-3:30 pm)/ ALD Fundamentals: Process Development (4:00-5:45 pm)</p>	<p>EM+AA-MoA: Organic-Inorganic Hybrid Materials & MLD (1:30-3:30 pm)/ Catalysis and Fuel Cells II (4:00-5:30 pm)</p>		<p>AF-MoA: ALD Fundamentals: Characterization (1:30-3:30 pm)/Mechanisms and Surface Science (4:00-5:00 pm)</p>
MoP				Poster Sessions	
TuM	<p>AA-TuM: Batteries I (8:00-10:00 am)/Emerging Apps II (10:45 am-12:00 pm)</p>	<p>AF2-TuM: ALD Fundamentals: Theory & Mechanism (8:00-10: am)/Emerging Materials and Devices (10:45 am-12:00 pm)</p>	<p>AF1-TuM: ALD Fundamentals: Precursors and Process Development (8:00-10:00 am)/Precursors and Mechanism (10:45am-12:00 pm)</p>		<p>AA+AF-TuM: Displays and Flexible Applications (8:00-10:00 am)/ALD Fundamentals: In-Situ Monitoring and Analysis (10:45 am-12:00 pm)</p>
TuA	<p>AA1-TuA: Batteries II (1:30-3:30 pm)/Emerging Apps III (4:00-5:00 pm)</p>		<p>AA2-TuA: ULSI, High-k and III-V I (1:30-3:30 pm)/ ULSI, High-k and III-V II (4:00-5:00 pm)</p>		<p>AM+EM-TuA: ALD for Manufacturing (1:30-3:30 pm)/MLD II (4:00-5:00 pm)</p>

Atomic Layer Etching

Room Plaza Exhibit - Session ALE-SaP

Atomic Layer Etching Poster Session

6:00pm

ALE-SaP1 Quasi-Atomic Layer Etching of Silicon Nitride with Tunable Directionality and Ultra-high Selectivity, **Sonam Sherpa**, *A. Ranjan*, Tokyo Electron

ALE-SaP2 Atomic Layer Etching with Gas Cluster Ion Beam Irradiation in Reactive Gas Vapor, **Noriaki Toyoda**, University of Hyogo, Japan; *A. Ogawa*, University of Hyogo; *I. Yamada*, University of Hyogo

ALE-SaP3 Thermal Atomic Layer Etching of TiO₂ using Sequential Exposures of WF₆ and BCl₃, *P. Lemaire*, **Gregory N. Parsons**, North Carolina State University

ALE-SaP4 Etch Profile Control of ALD-SiO₂ Film Assisted by Alternating ALE Process of Fluorocarbon Deposition and O₂ Plasma Etching, **Masaru Zaitzu**, ASM, Japan; *T. Tsutsumi*, Nagoya University, Japan; *A. Kobayashi*, ASM; *H. Kondo*, M. Hori, Nagoya University, Japan; *T. Nozawa*, *N. Kobayashi*, ASM

ALE-SaP5 *In Situ* Mass Spectrometer Studies of Volatile Etch Products During Thermal Al₂O₃ Atomic Layer Etching Using HF and Trimethylaluminum, **Joel Clancey**, *S.M. George*, University of Colorado - Boulder

ALE-SaP6 Cyclic Plasma Cleaning Process of SiO₂ Layers using Surface Fluorination, **Kyongbeom Koh**, *H. Chae*, Sungkyunkwan University (SKKU), Republic of Korea

ALE-SaP7 Low Damage Cyclical Etching of GaN and AlGaN, *A. Goodyear*, Oxford Instruments Plasma Technology, UK; *P. Abrami*, University of Bristol, UK; **Mike Cooke**, *M. Loveday*, Oxford Instruments Plasma Technology

ALE-SaP8 Thermal Atomic Layer Etching of ZnO by "Conversion-Etch" Using Hydrogen Fluoride and Trimethylaluminum, **David Zywojtko**, *S.M. George*, University of Colorado - Boulder

ALE-SaP9 Cryogenic Atomic Layer Etching of SiO₂, *N. Holtzer*, **Thomas Tillocher**, *P. Lefauchaux*, *R. Dussart*, GREMI Université d'Orléans/CNRS, France

ALE-SaP10 SF₄ as a New Fluorine Reagent for Thermal ALE: Application to Al₂O₃ and VO₂ ALE, **Jonas Gertsch**, *N. Johnson*, *V. Bright*, *S.M. George*, University of Colorado - Boulder

ALE-SaP11 Demonstrating Manufacturability of Atomic Level Etch (ALE) through Accelerated Neutral Atom Beam (ANAB) Processing, **Daniel Steinke**, *B. Sapp*, *S. PapaRao*, SUNY Polytechnic Institute; *E. Barth*, SEMATECH; *V. Kaushik*, *M. Rodgers*, *C. Hobbs*, SUNY Polytechnic Institute; *M. Walsh*, *S. Kirkpatrick*, *R. Svruga*, Neutral Physics Corporation

ALE-SaP12 Etching with Low Te Plasmas, **Scott Walton**, *D. Boris*, U.S. Naval Research Laboratory; *S. Hernández*, U.S. Naval Research Laboratory; *H. Miyazoe*, *A. Jagtiani*, *S. Engelmann*, *E. Joseph*, IBM TJ Watson Research Center

ALE-SaP13 Surface Cleaning of Gallium Antimonide Oxides: The Role of Hydrogen Atoms, Argon Ions, and Temperature, **Thomas Larrabee**, *S. Prokes*, Naval Research Laboratory

ALE-SaP14 Aluminum Native Oxide Surface Cleaning and Passivation in an Atmospheric Plasma System, **John Mudrick**, *M. Pohl*, *K. Knisely*, Sandia National Laboratories

ALE-SaP15 Atomic Layer Etching in Reactive Ion Etching System for Nanoscale Pattern Transfer, *S. Khan*, **Dmitry Suyatin**, *M. Graczyk*, *A. Kvennefors*, Lund University, Sweden; *E. Kauppinen*, Aalto University, Finland; *M. Huffman*, *I. Maximov*, Lund University, Sweden; *J. Sundqvist*, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany

ALE-SaP16 Selective Fluorocarbon-based Atomic Layer Etching in a Conventional Parallel-Plate, Capacitively Coupled Plasma, **Stefano Dallorto**, Ilmenau University of Technology; *A. Goodyear*, Oxford Instruments Plasma Technology, UK; *M. Cooke*, Oxford Instruments Plasma Technology; *S. Dhuey*, *A. Schwartzberg*, *S. Sassolini*, Lawrence Berkeley National Laboratory; *C. Ward*, Oxford Instruments; *D. Olynick*, Lawrence Berkeley National Laboratory; *I. Rangelow*, Ilmenau University of Technology; *S. Cabrini*, Lawrence Berkeley National Laboratory

ALE-SaP17 RF Plasma Electrostatics: The Influence on Film Morphology and Carbon Incorporation, **K. Scott Butcher**, Meaglow Ltd, Canada; *P. Terziyska*, Institute of Solid State Physics, Bulgarian Academy of Sciences, Bulgaria; *V. Georgiev*, Meaglow Ltd, Canada; *D. Georgieva*, Semiconductor Research Lab, Lakehead University, Canada; *R. Gergova*, Central Laboratory of Solar Energy and New Energy Sources, Bulgarian Academy of Sciences, Bulgaria; *P. Binsted*, *S. Skergetc*, Semiconductor Research Lab, Lakehead University, Canada

ALE-SaP18 Atomic Layer Etching of Amorphous Silicon with Selectivity Towards MoS₂, **Markus Heyne**, KU Leuven, Belgium; *A. Goodyear*, Oxford Instruments Plasma Technology, UK; *J.-F. de Marneffe*, IMEC, Belgium; *M. Cooke*, Oxford Instruments Plasma Technology, UK; *I. Radu*, IMEC, Belgium; *E. Neyts*, University of Antwerp, Belgium; *S. De Gendt*, KU Leuven, Belgium

ALE-SaP19 Simulation of New Material-Systems for Directional Atomic Layer Etching, **Ivan Berry**, *K.J. Kanarik*, *T. Lill*, *V. Vahedi*, *R. Gottscho*, Lam Research Corp.

Sunday Morning, July 16, 2017

Plenary Session Room Plaza ABC - Session PS1-SuM Sunday Plenary Session I Moderators: John Conley, Oregon State University, Charles Dezelah, EMD Performance Materials		Plenary Session Room Plaza ABC - Session PS2-SuM Sunday Plenary Session II Moderators: Steven M. George, University of Colorado - Boulder, Keren J. Kanarik, Lam Research Corp.	
8:00am			
8:15am	OPENING REMARKS: John Conley, Oregon State University, Charles Dezelah, EMD Performance Materials		
8:30am	PLENARY: PS1-SuM3 Future Applications and Challenges for ALD in Microelectronics, <i>Suvi Haukka</i> , ASM, Finland		
8:45am	Plenary talk continues.		
9:00am	Plenary talk continues.		
9:15am	PLENARY: PS1-SuM6 Future Trends of Deposition Technologies in Semiconductor Industry, <i>Mei Chang</i> , Applied Materials		
9:30am	Plenary talk continues.		
9:45am	Invited talk continues.		
10:00am	Coffee Break & Exhibits	Coffee Break & Exhibits	
10:15am	Coffee Break & Exhibits	Coffee Break & Exhibits	
10:30am		OPENING REMARKS: Steven M. George, University of Colorado-Boulder, Keren J. Kanarik, Lam Research Corp.	
10:45am		PLENARY: PS2-SuM12 Atomic Layer Etching – An Overview of Possibilities and Limitations, <i>Richard Gottscho</i> , Lam Research Corp.	
11:00am		Plenary talk continues.	
11:30-11:45 am	ALD Innovation Award Presentation		
11:45 am-12:00 pm	Sponsor Preview		

Sunday Afternoon, July 16, 2017

	ALD Fundamentals Room Plaza E - Session AF-SuA ALD Fundamentals: Precursors and Mechanisms (1:30-3:30 pm)/High Aspect Ratios & High Surface Areas (4:00-5:30 pm) Moderators: Roy Gordon, Harvard University, Charles H. Winter, Wayne State University, Mato Knez, CIC nanoGUNE, Ola Niilsen, University of Oslo	Atomic Layer Etching Room Plaza D - Session ALE-SuA Atomic Layer Etching Session I (1:30-3:30 pm) and II (4:00-5:30 pm) Moderators: Geun Young Yeom, Sung Kyun Kwan University
1:30pm	INVITED: AF-SuA1 Atomic Layer Deposition of Silicon Dielectrics: Precursors, Processes and Plasmas, Dennis Hausmann , Lam Research	INVITED: ALE-SuA1 Atomic Layer Processes to Enable the Atomic Scale Era, Robert Clark , K. Tapily , J. Smith , N. Mohanty , S. Kal , D. Newman , S. Consiglio , D. O'Meara , K. Maekawa , A. Mosden , A. deVilliers , P. Biolsi , T. Hurd , C. Wajda , G. Leusink , TEL Technology Center, America, LLC
1:45pm	Invited talk continues.	Invited talk continues.
2:00pm	AF-SuA3 Atomic Layer Deposition of Carbon Doped Silicon Oxide by Precursor Design and Process Tuning, Meiliang Wang , H. Chandra , A. Mallikarjunan , K. Cuthill , M. Xiao , X. Lei , Versum Materials, Inc	ALE-SuA3 Thermal Atomic Layer Etching of SiO ₂ by a "Conversion-Etch" Mechanism, J. DuMont , A. Marquardt , A. Cano , Steven M. George , University of Colorado
2:15pm	AF-SuA4 Evaluation of Silicon Precursors for Low Temperature Silicon Nitride Deposition, Shuang Meng , B. Hendrix , T. Baum , Entegris Inc.; D. Hausmann , Lam Research	INVITED: ALE-SuA4 The Challenges and Opportunities in Plasma Etching of Functionally Enhanced Complex Material Systems, Jane Chang , UCLA
2:30pm	AF-SuA5 Atomic Layer Deposition of SiO ₂ Using Tris(dimethylamino)Aminosilane Precursor and Ozone, Charith Nanayakkara , EMD Performance Materials; A. Dangerfield , University of Texas at Dallas; G. Liu , C. Dezelah , EMD Performance Materials; Y. Chabal , University of Texas at Dallas; R. Kanjolia , EMD Performance Materials	Invited talk continues.
2:45pm	AF-SuA6 <i>In situ</i> Infrared Absorption Study of Plasma-Enhanced ALD of Silicon Nitride using Di-sec-butylaminosilane and Bis(t-butylamino)silane on Silicon and Silicon Nitride Surfaces, Fabian Pena , E. Mattson , C. Nanayakkara , Y. Chabal , University of Texas at Dallas; A. Mallikarjunan , H. Chandra , M. Xiao , X. Lei , R. Pearlstein , A. Derecskei-Kovacs , Versum Materials, Inc	ALE-SuA6 A Novel Process for Atomic Layer Etching of ZnO using Acetylacetone and Remote O ₂ Plasma, Alfredo Mameli , M. Verheijen , A. Mackus , W.M.M. Kessels , F. Roozeboom , Eindhoven University of Technology and TNO, Netherlands
3:00pm	AF-SuA7 First-Principles Understanding of Reaction Mechanisms in Plasma Enhanced Atomic Layer Deposition of Silicon Nitride, Gregory Hartmann , G. Hwang , The University of Texas at Austin; P. Ventzek , Tokyo Electron America; T. Iwao , K. Ishibashi , Tokyo Electron Tohoku, Ltd., Japan	INVITED: ALE-SuA7 Determining the Benefits and Limitations of Atomic Layer Etching: A Modeling Investigation, C. Huard , University of Michigan; Y. Zhang , S. Sriraman , A. Paterson , Lam Research Corp.; Mark Kushner , University of Michigan
3:15pm	AF-SuA8 Atomic Layer Deposition of AlN from AlCl ₃ using NH ₃ and Ar/NH ₃ Plasma as Co-reactant, Ville Rontu , P. Sippola , M. Broas , Aalto University, Finland; T. Sajavaara , University of Jyväskylä, Finland; M. Paulasto-Kröckel , H. Lipsanen , S. Franssila , Aalto University, Finland	Invited talk continues.
3:30pm	Coffee Break & Exhibit	Coffee Break & Exhibit
3:45pm	Coffee Break & Exhibit	Coffee Break & Exhibit
4:00pm	AF-SuA11 Nanoscale Gettering of Excess O in CuO Nanowires via ALD Al ₂ O ₃ , S. Banerjee , Z. Gao , Y. Myung , Parag Banerjee , Washington University, St. Louis	INVITED: ALE-SuA11 ALE TBD 2, Nitin Ingle , Applied Materials
4:15pm	AF-SuA12 Temperature Dependent Growth of Alumina on Tungsten Nano-Powder, Kedar Manandhar , J. Wollmershauser , B. Feigelson , U.S. Naval Research Laboratory	Invited talk continues.
4:30pm	AF-SuA13 Critical Aspects in Fluid Bed ALD, Markus Bosund , R. Peltonen , E. Maiorov , Beneq Oy, Finland; M. Jauhiainen , Beneq Oy; E. Salmi , Beneq Oy, Finland; S. Sneck , Beneq Oy	ALE-SuA13 Significant Improvements of CD Uniformity and ARDE in ODL Mask Etching using a Self-limiting Cyclic Etch Approach, Barton Lane , P. Ventzek , Tokyo Electron America; A. Ranjan , V. Rastogi , TEL Technology Center, America, LLC
4:45pm	AF-SuA14 Super-Conformal Growth by ALD, Roy Gordon , Harvard University, USA; J. Feng , Harvard University	INVITED: ALE-SuA14 Nanometer-Scale III-V 3D MOSFETS, Jesus del Alamo , Lu , Zhao , Choi , Vardi , MIT
5:00pm	AF-SuA15 Thin Film Conformality Profile Analysis with Microscopic All-Silicon Lateral High Aspect Ratio Structures, Riikka Puurunen , O. Ylivaara , K. Grigoros , M. Ylilampi , VTT Technical Research Centre of Finland	Invited talk continues.
5:15pm	INVITED: AF-SuA16 ALD onto Particles: Batch and Continuous Processes for Industry, Joseph Spencer II , ALD NanoSolutions, Inc.	ALE-SuA16 Atomic Layer Etch Processes Developed in an ICP/RIE Etching System for Etching III-V Compound Semiconductor Materials, Xu Li , Y.-C. Fu , S. Peralagu , S.-J. Cho , K. Floros , D. Hemakumara , M. Smith , University of Glasgow, UK; I. Guiney , University of Cambridge, UK; D. Moran , University of Glasgow, UK; C. Humphreys , University of Cambridge, UK; I. Thayne , University of Glasgow, UK
5:30pm	Invited talk continues.	ALE-SuA17 Enhanced Thermal ALE of Aluminum Oxide Combined with ALD for UV Optical Applications, John Hennessy , Jet Propulsion Laboratory, California Institute of Technology; C. Moore , University of Colorado - Boulder; K. Balasubramanian , A. Jewell , Jet Propulsion Laboratory, California Institute of Technology; K. France , University of Colorado - Boulder; S. Nikzad , Jet Propulsion Laboratory, California Institute of Technology

Sunday Afternoon, July 16, 2017

	Area Selective ALD Room Plaza F - Session AS-SuA Area Selective Deposition I: Deactivation (1:30-3:30 pm)/Inherent Selectivity, Activation, Deactivation (4:00-5:30 pm) Moderators: Suvi Haukka, ASM, Finland, David Thompson, Applied Materials, Erwin Kessels, Eindhoven University of Technology, Adriaan Mackus, Eindhoven University of Technology	Nanostructure Synthesis and Fabrication Room Plaza ABC - Session NS+EM-SuA 2D Materials (1:30-3:30 pm)/Laminate, Multicomponent, and Emerging Materials (4:00-5:30pm) Moderators: Jiyoung Kim, University of Texas at Dallas, Sumit Agarwal, Colorado School of Mines, Dennis Hausmann, Lam Research
1:30pm	INVITED: AS-SuA1 Area Selective Deposition Using Spatial ALD and Polymer Patterns, <i>Carolyn Ellinger</i> , Eastman Kodak Company	NS+EM-SuA1 Plasma-enhanced Atomic Layer Deposition of Large-area MoS ₂ : From 2-D Monolayers to 3-D Vertical Fins, <i>Akhil Sharma, S. Karwal, V. Vandalon, M. Verheijen</i> , Eindhoven University of Technology, Netherlands; <i>H. Knoops, R. Sundaram</i> , Oxford Instruments Plasma Technology; <i>W.M.M. Kessels, A. Bol</i> , Eindhoven University of Technology, Netherlands
1:45pm	Invited talk continues.	NS+EM-SuA2 Low-Temperature Atomic Layer Deposition of MoS ₂ Films, <i>Michael Moody, T. Jurca, A. Henning, J. Emery, B. Wang, J. Tan, T. Lohr, T. Marks, L. Lauhon</i> , Northwestern University
2:00pm	AS-SuA3 Area-selective ALD of Silicon Oxide using Acetylacetone as Inhibitor in a Three-step Cycle, <i>Adrie Mackus, A. Marni, M. Merckx, B. Karasulu, W.M.M. Kessels</i> , Eindhoven University of Technology, Netherlands	NS+EM-SuA3 Dielectric-MoS ₂ Interfaces Grown by Atomic Layer Deposition, <i>Steven Letourneau</i> , Boise State University; <i>A. Mane, J. Elam</i> , Argonne National Laboratory; <i>E. Graungard</i> , Boise State University
2:15pm	AS-SuA4 Evaluation of Different Nanoimprint Resists for a use in Area-selective Atomic Layer Deposition of Selected Materials, <i>R. Ritasalo</i> , Picosun Oy, Finland; <i>M. Messerschmidt</i> , Micro Resist Technology GmbH; <i>K. Grigoras, VTT</i> ; <i>S. Ek</i> , Picosun Oy, Finland; <i>E. Østreng</i> , Picosun Oy; <i>M. Prunnilla, VTT</i> ; <i>Tero Pilvi</i> , Picosun Oy	NS+EM-SuA4 Plasma-Enhanced Atomic Layer Deposition of sub-5 nm high- k Dielectrics on 2D Crystals, <i>Katherine Price, F. McGuire, A. Franklin</i> , Duke University
2:30pm	AS-SuA5 Developing a Full Wafer-scale Approach Towards High ALD Selectivity on Copper vs Low-K (and Oxides) using a Single ALD/SAMS Platform, <i>Laurent Lecordier</i> , Ultratech; <i>S. Armini, s. Herregods</i> , IMEC, Belgium	NS+EM-SuA5 Novel <i>in-situ</i> Electrical Characterization of the Atomic Layer Deposition Process on 2D Transition Metal Dichalcogenides Transistors, <i>Antonio Lucero, J. Lee, L. Cheng, H. Kim, J. Lee, S.J. Kim, J. Kim</i> , University of Texas at Dallas
2:45pm	AS-SuA6 Fabrication of Large-area Nanolines by Area-selective Atomic Layer Deposition, <i>J. Ekerdt, Zizhuo Zhang</i> , University of Texas at Austin	NS+EM-SuA6 Deposition of MoS ₂ and WS ₂ from bis(tert-butylimido)-bis(dialkylamido) Compounds and 1-Propanethiol, <i>Berc Kalanyan, J. Maslar, W. Kimes, B. Sperling</i> , National Institute of Standards and Technology; <i>R. Kanjolia</i> , EMD Performance Materials
3:00pm	AS-SuA7 Nanoscale Selective Deposition of TiO ₂ using e-beam Patterned Polymeric Inhibition Layers and TDMAT Precursor, <i>A. Haider, M. Yilmaz, P. Deminskyi</i> , Bilkent University, Turkey; <i>Hamit Eren</i> , Delft University of Technology, Netherlands; <i>N. Bijikli</i> , Utah State University	NS+EM-SuA7 Direct Growth of Layered Boron Nitride Films on MoS ₂ using Atomic Layer Deposition for 2D Based Nano-electronics, <i>Jaebeom Lee, L. Cheng, H. Zhu, A.V. Ravichandran, A. Lucero, M. Catalano, M. Kim, R. Wallace, L. Colombo, J. Kim</i> , University of Texas at Dallas; <i>Z. Che</i> , The University of Texas at Dallas
3:15pm	AS-SuA8 Area-selective Atomic Layer Deposition using Inductively Coupled Plasma Polymerized Fluorocarbon Layer: A Case Study for Metal-Oxides and Metals, <i>Ali Haider, P. Deminskyi, T. Khan</i> , Bilkent Univ., Turkey; <i>H. Eren</i> , Delft Univ. of Technology, Netherlands; <i>N. Bijikli</i> , Utah State Univ.	NS+EM-SuA8 Fabrication of Functional Complex Nanostructures Based on Novel Atomic Layer Deposition Approach of Boron Nitride, <i>Wenjun Hao, C. Marichy, C. Journet, A. Brioude</i> , Univ Lyon, France
3:30pm	Coffee Break & Exhibit	Coffee Break & Exhibit
3:45pm	Coffee Break & Exhibit	Coffee Break & Exhibit
4:00pm	INVITED: AS-SuA11 Adventures and Advances in Selective Deposition, <i>David Thompson</i> , Applied Materials	INVITED: NS+EM-SuA11 When There is no Bulk: Growth and Structure of Dielectric and Semiconductor Oxide Nanolaminates, <i>Angel Yanguas-Gil</i> , Argonne National Laboratory
4:15pm	Invited talk continues.	Invited talk continues.
4:30pm	AS-SuA13 Direct-write ALD of Transparent Conductive Oxides: Micro- and Nanoscale Patterned In ₂ O ₃ :H and ZnO, <i>Alfredo Marni, B. Karasulu, B. Barcones Campo, M. Verheijen, A. Mackus, W.M.M. Kessels, F. Roozeboom</i> , Eindhoven University of Technology and TNO, Netherlands	NS+EM-SuA13 Perfecting Single-Crystal Ternary Perovskite YAlO ₃ Epitaxial Growth on GaAs(111)A Utilizing Atomic Layer Deposited Sub-Nano-Laminated Y ₂ O ₃ /Al ₂ O ₃ , <i>Lawrence Boyu Young, C.-K. Cheng, K.-Y. Lin, Y.-H. Lin, H.-W. Wan</i> , National Taiwan University, Republic of China; <i>M.-Y. Li</i> , National Nano Device Laboratories, Republic of China; <i>R.-F. Cai, S.-C. Lo</i> , Industrial Technology Research Institute, Republic of China; <i>C.-H. Hsu</i> , National Synchrotron Radiation Research Center, Republic of China; <i>J. Kwo</i> , National Tsing Hua University, Republic of China; <i>M. Hong</i> , National Taiwan Univ., Republic of China
4:45pm	AS-SuA14 Inherent Substrate-Selective Growth of Cobalt and Nickel Metal Films by Atomic Layer Deposition, <i>Marissa M. Kerrigan, C.H. Winter</i> , Wayne State University	NS+EM-SuA14 Thermal Coefficient of Resistance (TCR) Measurements for Atomic Layer Deposited Metal-Metal Oxide Nanocomposites, <i>Anil Mane, J. Avila, Y. Zhang, J. Elam</i> , Argonne National Laboratory
5:00pm	AS-SuA15 Delayed Nucleation of HfO ₂ and TiO ₂ ALD on Carbon via Cyclic Plasma Treatments for Application in Selective-Area Deposition, <i>Eric Stevens</i> , North Carolina State University, USA; <i>Y. Tomczak, BT. Chan, E. Altamirano-Sanchez</i> , IMEC, Belgium; <i>G.N. Parsons</i> , North Carolina State University, USA; <i>A. Delabie</i> , IMEC, Belgium	NS+EM-SuA15 Phase Control of Ga ₂ O ₃ Films Deposited by Atomic Layer Epitaxy, <i>Virginia Wheeler, N. Nepal, D. Meyer, C.R. Eddy, Jr.</i> , U.S. Naval Research Laboratory
5:15pm	INVITED: AS-SuA16 Selective Deposition Process Combining PEALD and ALE, <i>Christophe Vallée</i> , Univ. Grenoble Alpes, CNRS, France; <i>R. Gassilloud</i> , CEA-Leti, France; <i>R. Vallat</i> , Univ. Grenoble Alpes, CNRS, France; <i>C. Mannequin, A. Uedono</i> , University of Tsukuba; <i>V. Pesce</i> , Univ. Grenoble Alpes, CNRS, France; <i>N. Posseme</i> , CEA-Leti, France; <i>P. Gonon, A. Bsiesy</i> , Univ. Grenoble Alpes, CNRS, France	NS+EM-SuA16 High Quality SiN and SiO ₂ Films Produced by PEALD with Microwave ECR Plasma Below 200 °C, <i>Jesse Kalliomaki</i> , Picosun Oy, Finland; <i>V. Kilpi, T. Maline</i> , Picosun Oy; <i>H. Enami, N. Mise</i> , Hitachi High-Technologies Corp., Japan; <i>H. Hamamura, T. Usui</i> , Hitachi R&D Group

Sunday Afternoon, July 16, 2017

5:30pm

Invited talk continues.

NS+EM-SuA17 Tertiary Butyl Hydrazine as a Reducing Agent for Low-Temperature Atomic Layer Deposition of Low-Resistivity Copper Thin Films, *Katja Väyrynen*, *K. Mizohata*, *J. Räsänen*, University of Helsinki, Finland; *D. Peeters*, *A. Devi*, Ruhr-University Bochum, Germany; *M. Ritala*, *M. Leskelä*, University of Helsinki, Finland

ALD Applications

Room Plaza Exhibit - Session AA-SuP

ALD Applications Poster Session

5:30pm

AA-SuP1 Atomic Layer Deposition Surface Functionalized Adsorbents for Adsorption of Metal Ions and Organic Pollutants, *Xiaofeng Wang, X. Liang*, Missouri University of Science and Technology

AA-SuP2 Supported Ni Nanoparticle Catalysts Synthesized by Atomic Layer Deposition for Dry Reforming of Methane, *Zeyu Shang, X. Liang*, Missouri University of Science and Technology

AA-SuP3 Wear Behavior of Annealed Atomic Layer Deposited Alumina Thin Films, *Zakaria Hsain, G. Zeng, B. Krick, N. Strandwitz*, Lehigh University

AA-SuP4 Surface Enhanced Raman Scattering Effect on Various Pt Nanostructures by using Self-aligned Block Co-Polymer Template, Pt Atomic Layer Deposition, *Won-Kyun Yeom, J.-H. Shin, D.-I. Sung, J.-S. Oh, J.-S. Oh, G.Y. Yeom*, Sung Kyun Kwan University, Republic of Korea

AA-SuP5 Effect of Post-annealing on the Performance of Ultraviolet Photodetectors with Atomic-Layer-Deposited ZnO Semiconductor, *Jian Gao, W.-J. Liu, S.-J. Ding*, Fudan University, China

AA-SuP6 Density and Origin of Pinhole-Defects in ALD Barrier Coatings on Steel Substrates, *Tim Poljansek, S. Klein, Robert Bosch GmbH, Germany; J. Bartha*, TU Dresden, Germany

AA-SuP7 Room-Temperature Atomic Layer Deposition of Al₂O₃ for Anticorrosion Coatings, *Kensaku Kanomata, M. Ishikawa, M. Miura, B. Ahmad, S. Kubota, F. Hirose*, Yamagata University, Japan

AA-SuP8 Structural and Optical Properties of SnS and SnSe Thin Films Grown by Atomic Layer Deposition for Photovoltaic Applications, *Ji Hye Kim, Y.D. Tak, H.S. Park*, ISAC Research Inc., Republic of Korea

AA-SuP9 Characterization of the Alumina-Alucone Multilayer Thin Film for a Flexible Transparent Electrode by Atomic Layer and Molecular Layer Depositions, *Sung Tae Hwang, S.H. Song, G.B. Lee, B.-H. Choi*, Korea University, Republic of Korea

AA-SuP10 Investigation of Pure Antimony Films Grown by PALD, *Bodo Kalkofen, M. Silinskas, R. Balasubramanian, B. Garke*, Otto von Guericke University, Germany; *H. Gargouri*, Sentech Instruments, Germany; *E. Burté*, Otto von Guericke University, Germany

AA-SuP11 Fabrication of Hollow Structures Using Plasma Enhanced Atomic Layer Deposition, *Masayuki Nakamura, T. Kobayashi, T. Sagawa, T. Tatsuta, S. Motoyama*, Samco Inc., Japan; *P. Wood*, Samco Inc.; *O. Tsuji*, Samco Inc., Japan

AA-SuP12 PALD of Germanium Antimony Tellurium Compounds, *Mindaugas Silinskas, B. Kalkofen, R. Balasubramanian, N. Harmgarth*, Otto von Guericke University, Germany; *H. Gargouri*, Sentech Instruments, Germany; *E. Burté*, Otto von Guericke University, Germany

AA-SuP13 Flexible Alucone/Al₂O₃/Alucone Hybrid Dielectric Layers using *in-situ* ALD/MLD Techniques, *Dong-Won Choi, S.-H. Lee, J.-H. Lee*, Hanyang University, Korea; *J.-S. Park*, Hanyang University, Republic of Korea

AA-SuP14 Characteristics of Low-k Film at Low Temperature Using SDP System, *Minho Cheon, D.-Y. Lee*, JUSUNG Engineering, Republic of Korea

AA-SuP15 High Quality ALD of Silicon Nitride Films via Microwave Plasma, *Kihyun Kim*, Samsung Electronics, Republic of Korea; *J. Provine, P. Schindler, F. Prinz*, Stanford University

AA-SuP16 Improved Corrosion Resistance and Mechanical Properties of CrN Hard Coatings with an Atomic Layer Deposited Al₂O₃ Interlayer, *Zhixin Wan, S.-W. Park, S.-H. Kwon*, Pusan National University, Republic of Korea

AA-SuP17 ALD Thin-Films for Micro-Channel Plate based Detectors, *Nitin Deepak*, University of Liverpool, UK; *S. Harada, T. Conneely*, Photek Ltd., UK; *R. Potter*, University of Liverpool, UK; *J. Milnes*, Photek Ltd., UK

AA-SuP18 The Effect of SiO_x/SiN_x Multilayer Structure using Low Temperature Plasma Enhanced Atomic Layer Deposition for Gas Diffusion Barrier, *Ju-Hwan Han*, Hanyang University, Republic of Korea; *C.-H. Kim, K.-S. Lim, S.-K. Lee, H.-C. Choi*, LG Display, Republic of Korea; *J.-S. Park*, Hanyang University, Republic of Korea

AA-SuP19 Reduced Thermal Conductivity of ALD Synthesized PbTe/PbSe Nanolaminates Grown on Nanopatterned Substrates, *Xin Chen*, Old Dominion University; *M. DeCoster*, University of Virginia; *P. Lin, K. Zhang*, Old Dominion University; *P. Hopkins*, University of Virginia; *H. Baumgart*, Old Dominion University

AA-SuP20 The Effect of Titanium Tetrachloride-based Plasma Enhanced ALD TiN on the Threshold Voltage of Gate Last-Like Processed FD-SOI MOSFET with ALD HfO₂ Gate Dielectric, *Y.J. Kim, M.G. Chae, Changhwan Choi*, Hanyang University, Korea

AA-SuP21 Atomic Layer Deposition of Transition Metal Dichalcogenide MoS₂ Thin Films, *M. Zeng*, George Mason University; *Kai Zhang, X. Chen, P. Lin*, Old Dominion University; *Q. Li*, George Mason University; *C. McCleese, C. Kolodziej, C. Burda*, Case Western Reserve University; *H. Baumgart*, Old Dominion University

AA-SuP22 The Impact on GaN MOS Capacitor Performance of *in-situ* Processing in a Clustered ALD/ICP/RIE Tool, *Dilini Hemakumara, X. Li, S.J. Cho, K. Floras*, University of Glasgow, UK; *I. Guiney*, University of Cambridge, UK; *D. Moran*, University of Glasgow, UK; *C. Humphreys*, University of Cambridge, UK; *A. O'Mahony, H. Knaops*, Oxford Instruments Plasma Technology, UK; *I. Thayne*, University of Glasgow, UK

AA-SuP23 Plasma-Enhanced ALD of Dielectrics on Aluminum and *in-situ* FUV Spectroscopy, *Brianna Eller, R. Nemanich, P. Scowen*, Arizona State University

AA-SuP24 ALD on Textiles for Wearable Electronics, *Wade Ingram, J. Jur*, North Carolina State University

AA-SuP25 Enhancement of ZnO Nanorod Gas Sensors with AZO Nanolaminate Coating by Atomic Layer Deposition, *Pengtao Lin, X. Chen, K. Zhang, H. Baumgart*, Old Dominion University

AA-SuP26 A Comparison Study of Atomic Layer Deposition (ALD) of Ceria (CeO₂) Films using Ce(PrCp)₂ (Pr-amd) and Ce(PrCp)₃ Precursors, *Maryam Golalikhani, P. Van Buskirk, J. Roeder*, Sonata LLC

AA-SuP27 Theoretical Study of Si-N Film Atomic Layer Deposition Mechanism with Hydrazine and Dichlorosilane Precursors and their Derivatives, *Alexander Goldberg, M. Halls, H. Kwak, T. Seidel*, Schrodinger, Inc.

AA-SuP28 Nucleation and Growth Characterization of Metallic Ruthenium Films Grown by PEALD on Surface Treated Si (100) at Low Substrate Temperatures, *Nicholas Strnad*, University of Maryland; *G. Rayner*, The Kurt J. Lesker Company; *D. Potrepka*, U.S. Army Research Laboratory; *B. Liu*, The Pennsylvania State University; *J. Pattison*, University of Maryland; *M. Rivas*, University of Connecticut; *R. Polcawich*, U.S. Army Research Laboratory

AA-SuP29 Challenge the Productivity of ALD for High Volume Manufacturing of High Efficiency Solar Cells, *Wei-Min Li, X. Li*, Jiangsu Leadmicro Nano-Equipment Technology Ltd., P.R. China

AA-SuP30 Role of Cu in ALD Grown Cu:ZnS *p*-type Transparent Conductor, *Shaibal Sarkar, N. Mahuli*, Indian Institute of Technology Bombay, India

AA-SuP31 *In-situ* Investigation of Electrical Properties in Cu Incorporated ZnS Thin Films Grown by Atomic Layer Deposition, *Debabrata Saha, S. Sarkar*, Indian Institute of Technology Bombay, India

AA-SuP32 All ALD Hybrid Photoelectrochemical Systems Based on Self-Organized TiO₂ Nanotubes Coated with Chalcogenides, *Jan Macák*, University of Pardubice, Czech Republic

AA-SuP33 Electrical, Optical and Mechanical Properties of ALD-Ti doped ZnO Thin Films prepared on Corning® Willow® Glass for the Application of Flexible Transparent Oxide Substrate, *Woo-Jae Lee, C. Kim, Y.D. Kim, S.-H. Kwon*, Pusan National University, Republic of Korea

AA-SuP34 Surface Passivation of Nanoparticle via Rotation Fluidization Coupled Atomic Layer Deposition Reactor, *K. Qu, C.L. Duan, K. Cao*, Huazhong University of Science and Technology, China; *Rong Chen*, Huazhong University of Science and Technology, P.R. China

AA-SuP35 Atomic Layer Deposition of Doped Zinc Oxide as an Alternative to Fluorine Doped Tin Oxide for Transparent Contacts in Perovskite Solar Cells, *Louise Ryan*, Tyndall National Institute, Ireland; *A. Walsh, M. McCarthy*, Tyndall National Institute, University College Cork, Ireland; *S. Monaghan, M. Mondreanu*, Tyndall National Institute, Ireland; *S. O'Brien, M. Pemble, I. Povey*, Tyndall National Institute, University College Cork, Ireland

AA-SuP36 Oxides Nanomembranes Deposited by Atomic Layer Deposition for Lithium Ion Batteries, *Gaoshan Huang, Y. Zhao, Y. Mei*, Fudan University, China

AA-SuP37 Enhanced Photoelectrochemical Efficiency of Self-Organized TiO Nanotubes Films due to Secondary Materials, *Jan Macák*, University of Pardubice, Czech Republic

AA-SuP38 Atomic Layer Deposition of Ru and RuO₂ on Powder, *Jaehong Yoon*, Yonsei University, Korea; *Y. Lee*, Incheon National University; *H. Kim*, Yonsei University, Republic of Korea; *H.B.R. Lee*, Incheon National University, Republic of Korea

Sunday Evening Poster Sessions, July 16, 2017

AA-SuP39 Plasma-free Atomic Layer Deposition of Nickel and Nickel-based Alloy Thin Films for Nickel Silicide, *Shunichi Nabeya, S. Jung, S.-H. Kim*, Yeungnam University, Republic of Korea

AA-SuP40 Room Temperature Atomic Layer Deposition of Al₂Si_{1-x}O and its Application for Dye Sensitized Solar Cells, *T. Imai, K. Kanomata, M. Miura, B. Ahmad, S. Kubota, Fumihiko Hirose*, Yamagata University, Japan

AA-SuP41 Tungsten Thin Films Nucleation, Adhesion and Conductivity Improvement using Nanocomposite Barrier Layer Grown by Atomic Layer Deposition, *Anil Mane, J. Elam*, Argonne National Laboratory

AA-SuP42 Textile-based Heater Fabricated by Atomic Layer Deposition for Artificial Muscles, *Jong Seo Park, I.-K. Oh*, Yonsei University, Republic of Korea; *T.-H. Han*, Incheon National University, Republic of Korea; *H. Kim*, Yonsei University, Republic of Korea; *H.B.R. Lee*, Incheon National University, Republic of Korea

AA-SuP43 Bio-Templated *Morpho* Butterfly Wings by ALD for Photocatalysis, *Robin Rodriguez, S.P. Agarwal, D. Das*, University of Michigan; *W. Shang*, Shanghai Jiao Tong University, China; *R. Goubert, R. Skye, E. Kazayak*, University of Michigan; *T. Deng*, Shanghai Jiao Tong University, China; *N. Dasgupta*, University of Michigan

AA-SuP44 Atomic Layer Deposition of ZrSiO₄ and HfSiO₄ Thin Films using a Newly Designed DNS-Zr and DNS-Hf Bimetallic Precursors for High-Performance Logic Devices, *Da-Young Kim, S.-H. Kwon*, Pusan National University, Republic of Korea; *S.Y. Jeon, H.D. Lim, S.W. Jo, J.J. Park, W.M. Chae, S.J. Yim, J.H. Park*, DNF.Co.Ltd, Republic of Korea; *S.I. Lee, M.W. Kim*, DNF Co. Ltd, Republic of Korea

AA-SuP45 Enhanced Thermal Stability and Catalytic Activity of Metal Oxide Coated Platinum Catalyst via Atomic Layer Deposition, *J.M. Cai*, Huazhong University of Science and Technology; *K. Cao, B. Shan*, Huazhong University of Science and Technology, China; *Rong Chen*, Huazhong University of Science and Technology, P.R. China

AA-SuP46 Selective Atomic Layer Deposition of Bimetallic Core Shell Nanoparticles Towards PROX Reactions Modulated with Pt Shell Thickness, *Y. Lang, J.Q. Yang, K. Cao, J. Zhang, B. Shan*, Huazhong University of Science and Technology, China; *Rong Chen*, Huazhong University of Science and Technology, China, P.R. China

AA-SuP47 Deposition of Tungsten Carbide and Tungsten Nitride Films from Halogen-Free Tungsten Precursors, *Moo-Sung Kim*, Versum Materials Korea, Republic of Korea; *S. Yabut, S. Ivanov*, Versum Materials

AA-SuP48 Improvement of Corrosion and Mechanical Properties of NiTi Implants by using Atomic Layer Deposited TiO₂ Protective Coating, *Chi-Chung Kei, Y.H. Yu*, National Applied Research Laboratories, Republic of China; *D. Vokoun, J. Racek, L. Kadeřávek*, Institute of Physics of the ASC Prague

AA-SuP49 UV Reflectance Measurement Results of ALD-ALE Modified Al Mirrors for Future Astronomical Missions, *Christopher Moore*, University of Colorado - Boulder; *J. Hennessy*, Jet Propulsion Laboratory, California Institute of Technology; *C. Carter*, University of Colorado - Boulder; *A. Jewell, S. Nickzad*, Jet Propulsion Laboratory, California Institute of Technology; *K. France*, University of Colorado - Boulder

AA-SuP50 Modification of Borohydride Materials for Hydrogen Storage by ALD, *Katherine Hurst, S. Christensen, P. Parilla, T. Gennett*, National Renewable Energy Laboratory

AA-SuP51 Color Modification of Metal Surfaces by Transparent ALD Film Stacks, *Ritwik Bhatia, A. Bertuch*, Ultratech

AA-SuP52 Fabrication of New Type Electrode Based TiO₂-coated Metal Foam using ALD Process for Decomposition of Methane Gas for Fuel Cell Application, *Sung Pil Woo*, Yonsei University, Republic of Korea; *K.S. Lee, Y.N. Lee, I.Y. Kim, J.H. Ko, S. Shin, Y.S. Yoon*, Gachon University, Republic of Korea

AA-SuP53 Plasma-assisted ALD of Ru Nanoparticles on Electrospun Polymeric Nanofibers for Catalysis, *K. Ranjith, A. Haider*, Bilkent University, Turkey; *Necmi Biyikli*, Utah State University; *T. Uyar*, Bilkent University, Turkey

AA-SuP54 The Adhesion of Thermal ALD to Metal Surfaces at Low Temperatures, *J. Kelliher, William Sweet, N. Crain, C. Roske*, Northrop Grumman

AA-SuP55 ALD-Frequency Multiplied Fresnel Zone Plates for Hard X-rays Focusing, *Nicolaie Moldovan, H. Zeng*, Advanced Diamond Technologies; *R. Divan, L. Ocola, V. De Andrade*, Argonne National Laboratory

AA-SuP56 Synthesis of Highly Dispersed and Highly Stable Supported Au-Pt Bimetallic Catalysts by a Two-step Method, *Xiaofeng Wang, X. Liang*, Missouri University of Science and Technology

AA-SuP57 Atomic Layer Deposited Cobalt Oxide Thin Films as Photoanodes for Photoelectrochemical Water Splitting, *Soonyoung Jung, B. Jang*, Yeungnam University, Republic of Korea; *S. Oh, Y.H. Lee, J. Oh*, KAIST, Republic of Korea; *S.-H. Kim*, Yeungnam University, Republic of Korea

AA-SuP58 ALD of Nanolaminated Doped Electron Transport Layers for Perovskite Solar Cells, *Melissa McCarthy, A. Walsh, L. Ryan*, Tyndall National Institute, University College Cork, Ireland; *A. Walter, B. Kamino*, Centre Suisse d'Electronique et de Microtechnique; *J. Werner*, Ecole Polytechnique Fédérale de Lausanne; *S.-J. Moon, S. Nicolay*, Centre Suisse d'Electronique et de Microtechnique; *C. Ballif*, Ecole Polytechnique Fédérale de Lausanne; *F. Laffir*, University of Limerick; *S. O'Brien, M. Pemble, I. Povey*, Tyndall National Institute, University College Cork, Ireland

AA-SuP59 ALD TiO₂ Coating on Nanostructured Silicon with Enhanced Photoelectrochemical Efficiency and Stability, *Xudong Wang, Y. Yu*, University of Wisconsin-Madison

AA-SuP60 Fabrication of Lithium Titanate inside TiO₂-Coated SUS Foam as a Binder-free Anode Material for All-Solid-State Battery, *Sung Pil Woo*, Yonsei University, Republic of Korea; *K.S. Lee, Y.N. Lee, I.Y. Kim, J.H. Ko, S. Shin*, Gachon University, Republic of Korea; *J.-D. Kim*, Hallym University, Republic of Korea; *J.H. Shim*, Korea University, Republic of Korea; *W. Lee*, Yonsei University, Republic of Korea; *Y.S. Yoon*, Gachon University, Republic of Korea

AA-SuP61 ALD-Y₂O₃/GaAs(001) Having Extremely High Thermal Stability at 900 °C and Very Low Interfacial Trap Densities - Comparative Studies with ALD-Al₂O₃ and HfO₂ Gate Dielectrics, *Yen-Hsun Lin, H.-W. Wan, L.B. Young, C.-K. Cheng, K.-Y. Lin*, National Taiwan University, Republic of China; *Y.-T. Cheng*, National Chia-Yi University, Republic of China; *W.-S. Chen*, National Synchrotron Radiation Research Center, Republic of China; *C.-P. Cheng*, National Chia-Yi University, Republic of China; *T.-W. Pi*, National Synchrotron Radiation Research Center, Republic of China; *J. Kwo*, National Tsing Hua University, Republic of China; *M. Hong*, National Taiwan University, Republic of China

AA-SuP62 PEALD of Nickel Thin Film using bis(1,4-di-iso-propyl-1,4-diazabutadiene) Nickel, *Jae-Min Park, S. Kim*, Sejong University, Republic of Korea; *J. Hwang, J. Kim*, Sejong University; *J.-W. Lee, W.S. Han, W. Koh*, UP Chemical Co., Ltd., Republic of Korea; *W.-J. Lee*, Sejong University, Republic of Korea

AA-SuP63 Lifetime and Gain Improvement in MCP-based Detectors with ALD Thin-films for High-energy Particle Detection Applications, *Nitin Deepak*, University of Liverpool, UK; *S. Harada, T. Conneely*, Photek Ltd., UK; *R. Potter*, University of Liverpool, UK; *J. Milnes*, Photek Ltd., UK

AA-SuP64 Durability of Silver Mirrors Protected with Combinations of Evaporated and ALD Barrier Overlayers, *David Fryauf, J. Diaz Leon*, University of California Santa Cruz; *A. Phillips*, University of California Observatories; *N. Kobayashi*, University of California Santa Cruz

AA-SuP65 Atomic Layer Deposition onto Carbon Fiber Fabrics, *C. Miltzer, P. Dill, Werner Goedel*, Chemnitz University of Technology, Germany

AA-SuP66 Increasing Li-ion Battery Performance by Spatial ALD Coating of Separator Membranes with Al₂O₃, *E. Balder, L. Haverkate*, TNO/Holst Center, Netherlands; *Y. Creyghton*, TNO, Netherlands; *P. Poort*, TNO/Holst Center, Netherlands; *Fred Roozeboom*, TNO/Holst Center, The Netherlands; *S. Unnikrishnan*, TNO/Holst Center, Netherlands

AA-SuP67 Total-Dose Radiation Response of Atomic Layer Deposition Al₂O₃ Films, *C. Nixon, B. Triggs*, Semicoa; *N. Sullivan, Huazhi Li*, Arradance

AA-SuP68 Tuning the Switching Properties of ZnO Thin Film Memristors by Al Doping via ALD, *Cecilia Giovino, S. Porro, C. Ricciardi*, Polytechnic of Turin, Italy

AA-SuP69 Atomic Layer Deposition of Bulk Layered Heterojunctions for Efficient Electrocatalyst, *Changdeuck Bae, T.A. Ho, H. Shin*, Sungkyunkwan University

AA-SuP70 Atomic Layer Deposited Ultra-thin Ta-Ni-N Films for Cu Diffusion Barriers, *Yong-Ping Wang, Z.-J. Ding, W.-J. Liu, S.-J. Ding*, Fudan University, China

AA-SuP71 Improved Electrical Properties of ZrO₂/ZrSiO₄/ZrO₂ (ZSZ) based MIM Capacitors using DNS-Zr Bimetallic Precursor, *Sang Yong Jeon*, DNF.co.Ltd, Republic of Korea; *H.D. Lim*, DNF Co. Ltd, Republic of Korea; *S.W. Jo*, DNF.co.Ltd, Republic of Korea; *J.J. Park*, DNF Co. Ltd, Republic of Korea; *W.M. Chae, S.J. Yim*, DNF.co.Ltd, Republic of Korea; *J.H. Park*, DNF Co. Ltd, Republic of Korea; *S.I. Lee*, DNF.Co.Ltd, Republic of Korea; *M.W. Kim*, DNF Co. Ltd, Republic of Korea; *D.-Y. Kim, S.-H. Kwon*, Pusan National University, Republic of Korea

AA-SuP72 ALD Metal Oxides for Passivation of Si/SiO₂ Interface in BSI CMOS Image Sensors, *Evan Oudot, M. Gros-Jean, K. Courouble*, STMicroelectronics, France; *C. Vallée*, Univ. Grenoble Alpes, CNRS, France; *F. Bertin*, LETI, France

Sunday Evening Poster Sessions, July 16, 2017

AA-SuP73 Graphene-based Flexible Electrode Preparation with Aid of ALD Layer and its Electrochemical Applications, **Yeekyung Kim, D. Lee, J.W. Seo, S.J. Lee, K.-P. Hong, S.H. Chang, S. Cho, H. Kim**, Korea Electronics Technology Institute, Republic of Korea

AA-SuP74 Teaching Perovskites to Swim: ALD Oxide Overcoating for Liquid Water- and Heat-Resistant Photovoltaics, **I.S. Kim, Alex Martinson**, Argonne National Laboratory

AA-SuP75 Highly Stable High Mobility Oxide Thin-film Transistor with N₂O Plasma Treatment and Gate Insulator by Means of Atomic Layer Deposition, **Jong Beom Ko, K.W. Park, Y. Nam, S.-H. Lee, S.-H. Park**, Korea Advanced Institute of Science and Technology, Republic of Korea

AA-SuP76 Zinc Oxide Infiltration of Two-Photon Polymerized Structures, **Jacek Lechowicz**, University of Illinois at Chicago; **L. Ocola, R. Divan**, Argonne National Laboratory; **I. Paprotny**, University of Illinois at Chicago

AA-SuP77 Investigating Li-ions Transport Through ALD Al₂O₃ Coatings on NMC Cathode in a Li-ion Battery, **M. Laskar, David Jackson, S. Xu, Y. Guan**, University of Wisconsin-Madison; **M. Dreibelbis**, Dow Chemicals; **R. Hamers**, University of Wisconsin-Madison; **M. Mahanthappa**, University of Minnesota; **D. Morgan, T. Kuech**, University of Wisconsin-Madison

Nanostructure Synthesis and Fabrication

Room Plaza Exhibit - Session NS-SuP

Nanostructures Synthesis and Fabrication Poster Session 5:30pm

NS-SuP1 Refractive Index and Bandgap Variation in Al₂O₃-ZnO Ultrathin Multilayers Prepared by Atomic Layer Deposition, **Javier López Medina**, CONACYT - Centro de Nanociencias y Nanotecnología - UNAM, Mexico; **E. Solorio, H. Borbón, F. Castillon, R. Machorro**, Centro de Nanociencias y Nanotecnología - Universidad Nacional Autónoma de México; **N. Nedev**, Universidad Autónoma de Baja California, Mexico; **M. Farias, H. Tiznado**, Centro de Nanociencias y Nanotecnología - Universidad Nacional Autónoma de México

NS-SuP2 Controlled and Selective Etches for Gate All-Around Device Fabrication, **Subhadeep Kal, J. Smith, N. Mohanty, Y. Su, C. Pereira, A. Mosden, P. Biolsi, T. Hurd**, Tokyo Electron

NS-SuP3 Wafer-Scale Synthesis of High-Quality and Few-Layer WS₂ Films on Si/SiO₂ Substrates, **Yung-Ching Chu**, National Chiao Tung University, Republic of China; **C.-A. Jong**, NARLabs, Republic of China; **Y.-T. Ho**, National Chiao Tung University, Republic of China; **P. Lu**, UCLA; **C.-W. Zhong**, National Chiao Tung University, Republic of China; **H.-R. Hsu**, ITRI, Republic of China; **Y.-Y. Tu**, National Chiao Tung University, Republic of China; **J. Woo**, UCLA; **E.-Y. Chang**, National Chiao Tung University, Republic of China

NS-SuP4 Towards Producing Bulk Monolithic Core/Shell Nanocomposites, **Boris Feigelson, J. Wollmershauser, K. Manandhar**, U.S. Naval Research Laboratory

NS-SuP5 Nanolaminate Copper Barriers of Ru/TaN_x Thin Films by Inductively Coupled Plasma Enhanced Atomic Layer Deposition, **Bo-Heng Liu, W.-H. Cho, C.-C. Kei**, National Applied Research Laboratories, Republic of China

NS-SuP6 On the Possibility of the Development of Vicinal Superlattices in Quantum Wires on Semiconductor Low - Index Surfaces, **Victor Petrov**, Russian Academy of Science, Russian Federation

NS-SuP7 Rational Design of Hyperbranched Nanowire Systems for Tunable Superomniphobic Surfaces Enabled by Atomic Layer Deposition, **Ashley Bielinski, M. Boban**, University of Michigan, USA; **Y. He**, University of Pittsburgh; **E. Kazyak, D.H. Lee**, University of Michigan, USA; **C. Wang**, Pacific Northwestern National Laboratory; **A. Tuteja, N. Dasgupta**, University of Michigan, USA

NS-SuP8 Designing Low Density Foams by ALD Templating, **Monika Biener**, Lawrence Livermore National Laboratory

NS-SuP9 Fully CMOS-Compatible Synthesis and Photodetector-Integration of Ultrathin, Parallel-Aligned ZnO Nanowire Arrays by Infiltration Synthesis, **Chang-Yong Nam, A. Stein**, Brookhaven National Laboratory

NS-SuP10 Monodispersed, Highly Interactive Facet Oriented Pd Nanograins Grown by ALD onto Electrospun Polymeric Nanofibers, **Kugalur Ranjith, A. Celebioglu**, Bilkent University, Turkey; **H. Eren**, Delft University of Technology, Netherlands; **N. Biyikli**, Utah State University; **T. Uyar**, Bilkent University, Turkey

NS-SuP11 Structural and Electronic Properties of MoS₂ Grown using a 300mm Commercial Atomic Layer Deposition (ALD) Reactor, **J. Connolly**, Applied Materials and Tyndall National Institute-University College Cork, Ireland; **S. Monaghan, R. Nagle, J. Lin, F. Gity, I.M. Povey and Paul K. Hurley**, Tyndall National Institute-University College Cork, Ireland; **V. Nicolosi, C. Downing, N. McEvoy**, CRANN, Trinity College Dublin, Ireland; **G.S. Duesberg**, CRANN, Trinity College Dublin, Ireland and Universität der Bundeswehr München, Germany

Room Plaza Exhibit - Session ALE-SuP

Atomic Layer Etching Poster Session

6:00pm

ALE-SaP1 Quasi-Atomic Layer Etching of Silicon Nitride with Tunable Directionality and Ultra-high Selectivity, **Sonam Sherpa, A. Ranjan**, Tokyo Electron

ALE-SaP2 Atomic Layer Etching with Gas Cluster Ion Beam Irradiation in Reactive Gas Vapor, **Noriaki Toyoda**, University of Hyogo, Japan; **A. Ogawa**, University of Hyogo; **I. Yamada**, University of Hyogo

ALE-SaP3 Thermal Atomic Layer Etching of TiO₂ using Sequential Exposures of WF₆ and BCl₃, **P. Lemaire, Gregory N. Parsons**, North Carolina State University

ALE-SaP4 Etch Profile Control of ALD-SiO₂ Film Assisted by Alternating ALE Process of Fluorocarbon Deposition and O₂ Plasma Etching, **Masaru Zaitzu**, ASM, Japan; **T. Tsutsumi**, Nagoya University, Japan; **A. Kobayashi**, ASM; **H. Kondo, M. Hori**, Nagoya University, Japan; **T. Nozawa, N. Kobayashi**, ASM

ALE-SaP5 In Situ Mass Spectrometer Studies of Volatile Etch Products During Thermal Al₂O₃ Atomic Layer Etching Using HF and Trimethylaluminum, **Joel Clancey, S.M. George**, University of Colorado - Boulder

ALE-SaP6 Cyclic Plasma Cleaning Process of SiO₂ Layers using Surface Fluorination, **Kyongbeom Kah, H. Chae**, Sungkyunkwan University (SKKU), Republic of Korea

ALE-SaP7 Low Damage Cyclical Etching of GaN and AlGaN, **A. Goodyear**, Oxford Instruments Plasma Technology, UK; **P. Abrami**, University of Bristol, UK; **Mike Cooke, M. Loveday**, Oxford Instruments Plasma Technology

ALE-SaP8 Thermal Atomic Layer Etching of ZnO by "Conversion-Etch" Using Hydrogen Fluoride and Trimethylaluminum, **David Zywotko, S.M. George**, University of Colorado - Boulder

ALE-SaP9 Cryogenic Atomic Layer Etching of SiO₂, **N. Holtzer, Thomas Tillocher, P. Lefaucheux, R. Dussart**, GREMI Université d'Orléans/CNRS, France

ALE-SaP10 SF₄ as a New Fluorine Reagent for Thermal ALE: Application to Al₂O₃ and VO₂ ALE, **Jonas Gertsch, N. Johnson, V. Bright, S.M. George**, University of Colorado - Boulder

ALE-SaP11 Demonstrating Manufacturability of Atomic Level Etch (ALE) through Accelerated Neutral Atom Beam (ANAB) Processing, **Daniel Steinke, B. Sapp, S. PapaRao**, SUNY Polytechnic Institute; **E. Barth**, SEMATECH; **V. Kaushik, M. Rodgers, C. Hobbs**, SUNY Polytechnic Institute; **M. Walsh, S. Kirkpatrick, R. Svruga**, Neutral Physics Corporation

ALE-SaP12 Etching with Low Te Plasmas, **Scott Walton, D. Boris**, U.S. Naval Research Laboratory; **S. Hernández**, U.S. Naval Research Laboratory; **H. Miyazoe, A. Jagtiani, S. Engelmann, E. Joseph**, IBM TJ Watson Research Center

ALE-SaP13 Surface Cleaning of Gallium Antimonide Oxides: The Role of Hydrogen Atoms, Argon Ions, and Temperature, **Thomas Larrabee, S. Prokes**, Naval Research Laboratory

ALE-SaP14 Aluminum Native Oxide Surface Cleaning and Passivation in an Atmospheric Plasma System, **John Mudrick, M. Pohl, K. Knisely**, Sandia National Laboratories

ALE-SaP15 Atomic Layer Etching in Reactive Ion Etching System for Nanoscale Pattern Transfer, **S. Khan, Dmitry Suyatin, M. Graczyk, A. Kvennefors**, Lund University, Sweden; **E. Kauppinen**, Aalto University, Finland; **M. Huffman, I. Maximov**, Lund University, Sweden; **J. Sundqvist**, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany

ALE-SaP16 Selective Fluorocarbon-based Atomic Layer Etching in a Conventional Parallel-Plate, Capacitively Coupled Plasma, **Stefano Dallorto**, Ilmenau University of Technology; **A. Goodyear**, Oxford Instruments Plasma Technology, UK; **M. Cooke**, Oxford Instruments Plasma Technology; **S. Dhuey, A. Schwartzberg, S. Sassolini**, Lawrence Berkeley National Laboratory; **C. Ward**, Oxford Instruments; **D. Olynick**, Lawrence Berkeley National Laboratory; **I. Rangelow**, Ilmenau University of Technology; **S. Cabrini**, Lawrence Berkeley National Laboratory

Sunday Evening Poster Sessions, July 16, 2017

ALE-SaP17 RF Plasma Electrostatics: The Influence on Film Morphology and Carbon Incorporation, *K. Scott Butcher*, Meaglow Ltd, Canada; *P. Terziyska*, Institute of Solid State Physics, Bulgarian Academy of Sciences, Bulgaria; *V. Georgiev*, Meaglow Ltd, Canada; *D. Georgieva*, Semiconductor Research Lab, Lakehead University, Canada; *R. Gergova*, Central Laboratory of Solar Energy and New Energy Sources, Bulgarian Academy of Sciences, Bulgaria; *P. Binsted*, *S. Skergetc*, Semiconductor Research Lab, Lakehead University, Canada

ALE-SaP18 Atomic Layer Etching of Amorphous Silicon with Selectivity Towards MoS₂, *Markus Heyne*, KU Leuven, Belgium; *A. Goodyear*, Oxford Instruments Plasma Technology, UK; *J.-F. de Marneffe*, IMEC, Belgium; *M. Cooke*, Oxford Instruments Plasma Technology, UK; *I. Radu*, IMEC, Belgium; *E. Neyts*, University of Antwerp, Belgium; *S. De Gendt*, KU Leuven, Belgium

ALE-SaP19 Simulation of New Material-Systems for Directional Atomic Layer Etching, *Ivan Berry*, *K.J. Kanarik*, *T. Lill*, *V. Vahedi*, *R. Gottscho*, Lam Research Corp.

Monday Morning, July 17, 2017

	ALD Applications Room Plaza E - Session AA+NS-MoM Energy: Catalysis and Fuel Cells I (8:00-10:00 am)/ Nanoparticles and Nanostructures (10:45 am-12:00 pm) Moderators: Riikka Puurunen, VTT Technical Research Centre of Finland, Necmi Biyikli, Utah State University, Joseph Spencer II, ALD NanoSolutions, Inc.	ALD Applications Room Plaza ABC - Session AA-MoM Solar Materials I (8:00-10:00 am)/Solar Materials II (10:45 am-12:00 pm) Moderators: Christian Dussarrat, Air Liquide, Mariadriana Creatore, Eindhoven University of Technology, Jeffrey Elam, Argonne National Laboratory, Neil Dasgupta, University of Michigan
8:00am	AA+NS-MoM1 Performance of Promoted Rh Catalysts for C ₂ - Oxygenate Production, <i>Arun Asundi, N. Yang, C. Maclsaac, S.F. Bent</i> , Stanford University	INVITED: AA-MoM1 Atomic Layer Deposition Processing for Perovskite Solar Cells: Research Status, Opportunities and Challenges, <i>Mariadriana Creatore</i> , Eindhoven University of Technology, Netherlands
8:15am	AA+NS-MoM2 Facile Synthesis of Three-Dimensional Pt-TiO ₂ Nano-networks: A Highly Active Catalyst for the Hydrolytic Dehydrogenation of Ammonia-Borane, <i>Hamit Eren</i> , Delft University of Technology, Netherlands; <i>N. Biyikli</i> , Utah State University; <i>M. Guler</i> , Northwestern University	Invited talk continues.
8:30am	AA+NS-MoM3 Cobalt/Alumina Interactions in ALD Synthesized Catalysts for Fischer-Tropsch Synthesis, <i>Jacob Clary, S. Van Norman, H. Funke, J. Falconer, C. Musgrave, A. Weimer</i> , University of Colorado - Boulder	AA-MoM3 Atomic Layer Deposition of NbC-Al ₂ O ₃ Nanocomposite Films for Efficient Solar Selective Coatings, <i>Jason Avila</i> , Argonne National Laboratory; <i>A. Peters</i> , Northwestern University; <i>A. Mane, J. Libera, A. Yanguas-Gil</i> , Argonne National Laboratory; <i>O. Farha, J. Hupp</i> , Northwestern University; <i>J. Elam</i> , Argonne National Laboratory, USA
8:45am	AA+NS-MoM4 ALD of Platinum on Metal Organic Framework Nodes: Toward Single Site Synthesis and Sinter-Resistant Catalysts, <i>I.S. Kim</i> , Argonne National Laboratory, USA; <i>Alex Martinson</i> , Argonne National Laboratory	AA-MoM4 Refractory Solar Selective Nanocomposite Coatings for Concentrated Solar Power Receivers, <i>Jeffrey Elam, A. Mane, J. Avila, A. Yanguas-Gil, J. Libera</i> , Argonne National Laboratory; <i>J. Hupp, J. Liu</i> , Northwestern University; <i>U. Sampathkumaran, K. Yu</i> , InnoSense LLC; <i>R. Buck, F. Sutter</i> , German Aerospace Center - DLR
9:00am	AA+NS-MoM5 Particle Atomic Layer Deposition for Stabilization of Pt/C Fuel Cell Catalysts, <i>William McNeary, A. Lubers, M. Maguire</i> , University of Colorado - Boulder; <i>S. van Rooij</i> , Ecole Polytechnique Fédérale de Lausanne, Switzerland; <i>S. Bull, A. Weimer</i> , University of Colorado - Boulder	AA-MoM5 P-type Bismuth Sulfide (Bi ₂ S ₃) Grown by Atomic Layer Deposition, <i>Neha Mahuli, D. Saha, S. Sarkar</i> , Indian Institute of Technology Bombay, India
9:15am	AA+NS-MoM6 ALD CeO ₂ to Improve Catalytic Activity and Thermal Stability of Low Temperature SOFC Electrodes, <i>J.G. Yu, S. Oh</i> , Seoul National University of Science and Technology, Republic of Korea; <i>W. Noh</i> , Air Liquide Laboratories Korea; <i>Jihwan An</i> , Seoul National University of Science and Technology, Republic of Korea	AA-MoM6 Role of Fixed Charge in the Modification of Schottky Barrier Height of Metal Insulator Semiconductor Tunnel Structures, <i>Roderick Marstell, N. Strandwitz</i> , Lehigh University
9:30am	AA+NS-MoM7 Atomic Layer Deposition of Metal Oxide Thin Films and Metal Nanoparticles for Improving the Electrode Performance in Photoelectrochemical Applications, <i>Valerio Di Palma, M. Verheijen</i> , Eindhoven University of Technology, Netherlands; <i>R. Sinha, G. Zafeiropoulos, A. Bieberle, M. Tsampas</i> , DIFFER, Dutch Institute for Fundamental Energy Research; <i>W.M.M. Kessels, M. Creatore</i> , Eindhoven University of Technology, Netherlands	AA-MoM7 Determination of Energy Barrier Heights between Amorphous Metals and ALD Dielectrics using Internal Photoemission Spectroscopy, <i>Melanie Jenkins, T. Klarr, D. Austin, J. McGlone</i> , Oregon State University; <i>L. Wei, N. Nguyen</i> , National Institute of Standards and Technology; <i>J. Wager, J. Conley</i> , Oregon State University
9:45am	AA+NS-MoM8 Carbon-templated Nb:TiO ₂ Nanostructures as Oxygen Evolution Catalyst Supports for PEM Electrolyzers, <i>Alexander Hufnagel, D. Böhm, S. Häringer, D. Fattakhova-Rohlfing, T. Bein</i> , University of Munich (LMU), Germany	AA-MoM8 ALD Window and Buffer Layers in Thin Film Solar Cells, <i>A. Palmstrom, K. Bush, M. McGehee, A. Hultqvist, T. Sone, Stacey F. Bent</i> , Stanford University
10:00am	Coffee Break & Exhibits	Invited talk continues.
10:15am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:30am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:45am	AA+NS-MoM12 Atomic Layer Deposition Route to Tailor Nanoalloys of Noble and Non-Noble Metals, <i>Ranjith Karuparambil Ramachandran, J. Dendooven, M. Filez, V. Galvita, H. Poelman, E. Solano, M. Minjauw, K. Devloo-Casier</i> , Ghent University, Belgium; <i>E. Fonda</i> , Synchrotron SOLEIL, SAMBA Beamline, France; <i>D. Hermida-Merino, W. Bras</i> , Netherlands Organisation for Scientific Research, DUBBLE@ESRF; <i>G. Marin, C. Detavernier</i> , Ghent University, Belgium	AA-MoM12 Atomic Layer Deposition of Bismuth Vanadate Photoanodes, <i>Ashley Bielinski, J. Brancho, B. Bartlett, N. Dasgupta</i> , University of Michigan, USA
11:00am	AA+NS-MoM13 Aggregative Growth of Noble-Metal Nanoparticles in Atomic Layer Deposition: Effect of Temperature, Partial Pressure, Exposure Time, Coreactant, and Substrate, <i>Fabio Grillo, H. Van Bui, J. Moulijin, M. Kreutzer, J.R. van Ommen</i> , Delft University of Technology, Netherlands	AA-MoM13 High-Efficiency Perovskite Solar Cells with Humidity-Stability beyond 60 Days Achieved via Atomic Layer Deposition, <i>Dibyashree Koushik, Y. Kuang</i> , Eindhoven University of Technology, Netherlands; <i>V. Zardetto</i> , TNO-Solliance, High Tech Campus, Netherlands; <i>W. Verhees, S. Veenstra</i> , ECN-Solliance, High Tech Campus, Netherlands; <i>M. Verheijen, W.M.M. Kessels, M. Creatore, R. Schropp</i> , Eindhoven University of Technology, Netherlands
11:15am	AA+NS-MoM14 <i>In situ</i> Grazing Incidence Small Angle X-ray Scattering Study of the ALD Growth and Thermal Stability of Pt Nanoparticles, <i>Jolien Dendooven, E. Solano, R.K. Ramachandran, M. Minjauw</i> , Ghent University, Belgium; <i>A. Coati</i> , Synchrotron SOLEIL, France; <i>D. Hermida-Merino</i> , ESRF, France; <i>C. Detavernier</i> , Ghent University, Belgium	AA-MoM14 Efficient Surface Passivation of Black Silicon Using Spatial ALD, <i>I. Heikkinen</i> , Beneq Oy, Finland; <i>P. Repo, V. Vähänissi, T. Pasanen</i> , Aalto University, Finland; <i>V. Malinen, Emma Salmi</i> , Beneq Oy, Finland; <i>H. Savin</i> , Aalto University, Finland
11:30am	AA+NS-MoM15 High-Precision Growth of Metal Oxide Nanoparticles on Carbon Composites for Energy Related Applications, <i>F. Yang, Mato Knez</i> , CIC nanoGUNE, Spain	AA-MoM15 Enhancing Water Oxidation Activity of α-hematite Through Atomic Layer Deposition, <i>C. Du, J. Wang, R. Chen, Y.W. Wen, Bin Shan</i> , Huazhong University of Science and Technology, China
11:45am	AA+NS-MoM16 Tuning the Isoelectric Point of Conical Nanochannel Surfaces by Atomic Layer Deposition of Al ₂ O ₃ , TiO ₂ , and SiO ₂ to Tailor Selective Ion Transport, <i>Nils Ulrich, A. Spende</i> , GSI Helmholtz Center, Germany; <i>N. Sobel</i> , TU Darmstadt, Germany; <i>M.E. Toimil-Molaes, C. Trautmann</i> , GSI Helmholtz Center, Germany	AA-MoM16 ALD Stabilization Layers for Quantum Dot Solar Energy Conversion, <i>Theodore Kraus, B. Parkinson</i> , University of Wyoming

Monday Morning, July 17, 2017

	<p>ALD Fundamentals Room Plaza F - Session AF+AA-MoM ALD Fundamentals: Plasma ALD (8:00-10:00 am)/Emerging Applications (10:45 am-12:00 pm) Moderators: Charles Dezelah, EMD Performance Materials, Yves Chabal, Univ. Texas Dallas, Virginia Wheeler, U.S. Naval Research Laboratory, Angel Yanguas-Gil, Argonne National</p>	<p>Atomic Layer Etching Room Plaza D - Session ALE-MoM Atomic Layer Etching Session III (8:00-10:00 am) and Session IV (10:45 am-12:00 pm) Moderators: Fred Roozeboom, Eindhoven University of Technology, Sumit Agarwal, Colorado School of Mines</p>
8:00am	INVITED: AF+AA-MoM1 ALD - From Ideal to Real, <i>Ola Nilsen</i> , University of Oslo, Norway	INVITED: ALE-MoM1 Selectivity in Thermal Atomic Layer Etching, <i>Younghee Lee, S.M. George</i> , University of Colorado
8:15am	Invited talk continues.	Invited talk continues.
8:30am	AF+AA-MoM3 Atomistic View of the ALD of Zinc Oxide, <i>Timo Weckman</i> , Aalto University, Finland; <i>M. Shirazi</i> , Eindhoven University of Technology, Netherlands; <i>S. Elliott</i> , Tyndall National Institute, University College Cork, Ireland; <i>K. Laasonen</i> , Aalto University, Finland	ALE-MoM3 Modeling the Chemical Mechanism of Thermal ALE of Alumina by HF and Tin Acetylacetonate, <i>Simon Elliott</i> , Tyndall National Institute, University College Cork, Ireland
8:45am	AF+AA-MoM4 Selective Deposition of Single Site Vanadium Oxide at Specific Functional Groups of Carbon Supports for Catalytic Applications, <i>Paxcal Düngen, N. Pfänder</i> , Max Planck Institute for Chemical Energy Conversion; <i>X. Huang</i> , Fritz Haber Institute of the Max Planck Society; <i>K.H. Böhm</i> , Max Planck Institute for Chemical Energy Conversion; <i>S. Buller</i> , Max Planck Institute for Chemical Energy Conversion, Germany; <i>R. Schlögl</i> , Max Planck Institute for Chemical Energy Conversion	INVITED: ALE-MoM4 Integrating Atomic Layer Deposition and Etching to Achieve Selective Growth, <i>Stacey F. Bent</i> , Stanford University
9:00am	AF+AA-MoM5 Surface Modification of V-VI Semiconductors using Exchange Reactions within Atomic Layer Deposition Half-cycle., <i>Christoph Wiegand</i> , Leibniz Institute for Solid State and Materials Research Dresden (IFW Dresden), Germany; <i>R. Zierold, R. Faust</i> , Universität Hamburg, Germany; <i>D. Pohl, A. Thomas, B. Rellinghaus, K. Nielsch</i> , Leibniz Institute for Solid State and Materials Research Dresden (IFW Dresden), Germany	Invited talk continues.
9:15am	AF+AA-MoM6 Interface Dipole of High k -Y ₂ O ₃ on GaAs(001) Attained using Cycle-by-Cycle ALD and Synchrotron Radiation Photoelectron Spectroscopy, <i>Wan-Sin Chen</i> , National Synchrotron Radiation Research Center, Republic of China; <i>K.-Y. Lin, L.B. Young</i> , National Taiwan University, Republic of China; <i>Y.-T. Cheng</i> , National Chia-Yi University, Republic of China; <i>Y.-H. Lin, H.-W. Wan</i> , National Taiwan University, Republic of China; <i>C.-Y. Yang</i> , National Tsing Hua University, Republic of China; <i>C.-P. Cheng</i> , National Chia-Yi University, Republic of China; <i>T.-W. Pi</i> , National Synchrotron Radiation Research Center, Republic of China; <i>R. Kwo</i> , National Tsing Hua University, Republic of China; <i>M. Hong</i> , National Taiwan University, Republic of China	INVITED: ALE-MoM6 ALE and ALC: Computational Assessment of Opportunities and Challenges in Nanoelectronic Applications, <i>Sumeet C. Pandey</i> , Micron
9:30am	AF+AA-MoM7 Surface Reactions during Three-step ALD of SiC _x N _y using Si ₂ Cl ₆ , CH ₃ NH ₂ , and N ₂ Plasma, <i>Rafael Ovanesyan, N. Leick</i> , Colorado School of Mines; <i>K. Kelchner</i> , Lam Research Corporation; <i>D. Hausmann</i> , Lam Research; <i>S. Agarwal</i> , Colorado School of Mines	Invited talk continues.
9:45am	AF+AA-MoM8 A Comparative Study on PEALD Grown Nanolaminates on polypropylene: Influence of precursor and plasma variation, <i>Maximilian Gebhard, F. Mitschker, P. Awakowicz, A. Devi</i> , Ruhr-University Bochum, Germany	ALE-MoM8 Reactor Scale Uniformity Enabled by Atomic Layer Etching, <i>Chad Huard, S. Lanham, M. Kushner</i> , University of Michigan
10:00am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:15am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:30am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:45am	AF+AA-MoM12 A Dual Action Optical Sensor Using Metal and Dielectric ALD Layers, <i>Sean Barry</i> , Carleton University, Canada	INVITED: ALE-MoM12 Thermal Atomic Layer Etching of Cobalt Metal Films, <i>Charles H. Winter, W. Waduge</i> , Wayne State University
11:00am	AF+AA-MoM13 Disentangling Photochromism and Electrochromism by Blocking Hole Transfer at the Electrolyte Interface, <i>Omid Zandi, Y. Wang, J. Kim</i> , University of Texas at Austin; <i>Z. Gao</i> , Washington University, St. Louis; <i>S. Heo</i> , University of Texas at Austin; <i>P. Banerjee</i> , Washington University, St. Louis; <i>D. Milliron</i> , University of Texas at Austin	Invited talk continues.
11:15am	AF+AA-MoM14 Atomic Layer Deposition of Electro-optically Active Ferroelectric Barium Titanate Films, <i>Edward Lin, E. Ortmann</i> , The University of Texas at Austin; <i>S. Abel</i> , IBM Research-Zurich; <i>A. Posadas</i> , The University of Texas at Austin; <i>J. Pompeyrine</i> , IBM Research-Zurich; <i>A. Demkov, J. Ekerdt</i> , The University of Texas at Austin	ALE-MoM14 WO ₃ and W Thermal Atomic Layer Etching Using "Conversion-Fluorination" and "Oxidation-Conversion-Fluorination" Etching Mechanisms, <i>Nicholas Johnson, S.M. George</i> , University of Colorado
11:30am	AF+AA-MoM15 Laser Spike Annealing of ALD VO ₂ , <i>Alexander Kozen</i> , U.S. Naval Research Laboratory; <i>R. Bell</i> , Cornell University; <i>B. Downey, M. Currie</i> , U.S. Naval Research Laboratory; <i>M. Thompson</i> , Cornell University; <i>V. Wheeler, C.R. Eddy, Jr.</i> , U.S. Naval Research Laboratory	INVITED: ALE-MoM15 Plasma-Enhanced Atomic Layer Etching of TiN and TaN with Organic Masks, <i>Nathan Marchack, J. Papalia, R. Bruce, S. Engelmann, E. Joseph</i> , IBM TJ Watson Research Center
11:45am	AF+AA-MoM16 Improving Processability of Poorly Flowing Pharmaceutical Powders by Atomic Layer Deposition, <i>Tommi Kääriäinen</i> , University of Helsinki, Finland; <i>J. Nyman</i> , Åbo Akademi University, Finland; <i>M.-L. Kääriäinen, P. Hoppu</i> , NovaldMedical Ltd Oy, Finland; <i>N. Sandler</i> , Åbo Akademi University, Finland; <i>S.M. George</i> , University of Colorado; <i>M. Ritala, M. Leskelä</i> , University of Helsinki, Finland	Invited talk continues.

Monday Afternoon, July 17, 2017

	ALD Applications Room Plaza ABC - Session AA-MoA Memory and MIM I (1:30-3:30 pm)/Memory and MIM II (4:00-5:30 pm) Moderators: Uwe Schroeder, Namlab, Germany, John Smythe, Micron Technology, John Conley, Oregon State University, Robert Clark, TEL Technology Center, America, LLC	ALD Fundamentals Room Plaza F - Session AF-MoA ALD Fundamentals: Characterization (1:30-3:30 pm)/Mechanisms and Surface Science (4:00-5:00 pm) Moderators: Mikko Ritala, University of Helsinki, David Emslie, McMaster University, Simon Elliott, Tyndall National Institute, University College Cork
1:30pm	AA-MoA1 Atomic Layer Deposited Ta-doped ZrO ₂ for DRAM Capacitors, <i>Bo-Eun Park, I.-K. Oh, J.S. Park, S. Seo, H. Kim</i> , Yonsei University, Republic of Korea	AF-MoA1 FTIR and NMR Analysis of ALD Al ₂ O ₃ on poly-L-lactone Acid Powder and Electrospun Fibres, <i>Laura Svärd, T. Virtanen, M. Putkonen, E. Kenttä, H. Rautkoski, P. Heikkilä, P. Simeil</i> , VTT Technical Research Centre of Finland
1:45pm	AA-MoA2 High Capacitance 3D MIM Structures Achieved by ALD Deposited TiO ₂ for Advanced DRAM Applications, <i>Ahmad Chaker, P. Szkutnik, P. Gonon, C. Vallée, A. Bsiesy</i> , Univ. Grenoble Alpes, CNRS, France	AF-MoA2 Bulge Testing of Freestanding ALD Thin Film Membranes, <i>Olli Yliivaara</i> , VTT Technical Research Centre of Finland; <i>P. Törmä</i> , HS Foils, Finland; <i>I. Stuns, J. Saarialhti, R. Puurunen</i> , VTT Technical Research Centre of Finland
2:00pm	AA-MoA3 Seed-layer Effects on the Crystallization and Electrical Characteristics of ALD-grown Ta ₂ O ₅ Thin Films, <i>Jae Hyoung Choi</i> , Samsung Electronics, Korea, Republic of Korea; <i>S.Y. Kang, S.J. Chung, C.M. Cho, S.H. Oh, Y. Kim, K. Yoon, H.-J. Lim, K. Hwang, H.-K. Kang</i> , Samsung Electronics, Republic of Korea	AF-MoA3 Infiltrated Zinc Oxide in Polymethylmethacrylate: An Atomic Cycle Growth Study, <i>Leonidas Ocola</i> , Argonne National Laboratory; <i>A. Connolly</i> , Vassar College; <i>D. Gosztola</i> , Argonne National Laboratory; <i>R. Schaller</i> , Argonne National Laboratory, Northwestern University; <i>A. Yanguas-Gil</i> , Argonne National Laboratory
2:15pm	AA-MoA4 Electrode Induced Variation in Voltage Nonlinearity of ALD Al ₂ O ₃ and HfO ₂ Metal-Insulator-Metal Capacitors (MIMCAPs), <i>Dustin Austin, K. Holden, J. Hinz, C. Remple, J. Conley</i> , Oregon State University	AF-MoA4 Study on Atomic-Layer-Deposited Al ₂ O ₃ Dielectric Films with a New Small Angle X-Ray Scattering Method, <i>Chao Li, F. Shahriarian, M. Goorsky</i> , University of California Los Angeles
2:30pm	AA-MoA5 High-Voltage Nanolaminate Metal-Insulator-Insulator-Metal (MIIM) Tunnel Diodes using ALD Al ₂ O ₃ and Ta ₂ O ₅ , <i>D. Austin, M. Jenkins, Konner Holden, J. Conley</i> , Oregon State University	AF-MoA5 Evaluating Mechanical Properties of Free-standing ALD Al ₂ O ₃ , <i>Junmo Koo</i> , Korea University, Republic of Korea; <i>S.M. Lee, T.-S. Kim</i> , Korea Advanced Institute of Science and Technology, Republic of Korea; <i>J.H. Shim</i> , Korea University, Republic of Korea
2:45pm	AA-MoA6 Capacitance Maximization of Ultra-thin Si-capacitors by Atomic Layer Deposition of Anti-ferroelectric HfO ₂ in High Aspect Ratio Structures, <i>Stefan Riedel, W. Weinreich, C. Mart, J. Müller</i> , Fraunhofer IPMS, Germany	AF-MoA6 Secondary Electron Yield of Nano-oxide Thin Films Measured by Spherical Collector with Pulsed Electron Irradiation, <i>Baojun Yan, S.L. Liu, K.L. Wen</i> , Institute of High Energy Physics of Chinese Academy of Sciences, China
3:00pm	AA-MoA7 Ferroelectricity in Ternary HfO ₂ -ZrO ₂ -La ₂ O ₃ Mixed Oxide Grown by ALD, <i>Anna Chernikova, M. Kozodaev, A. Markeev</i> , Moscow Institute of Physics and Technology, Russian Federation	AF-MoA7 Electrical Characterization of Platinum Thin Films Deposited by Plasma-Enhanced ALD and Magnetron Sputtering, <i>Martin Winterkorn, H.J. Kim, K. Kaplan, J. Provine, T. Kenny, F. Prinz</i> , Stanford University
3:15pm	AA-MoA8 A Study on the Oxygen Source and Annealing Temperature Effects of Atomic Layer Deposited Ferroelectric Hf _{0.5} Zr _{0.5} O ₂ Thin Films, <i>Si Joon Kim, D. Narayan, J.-G. Lee, J. Mohan</i> , University of Texas at Dallas; <i>S. Summerfelt</i> , Texas Instruments; <i>J. Kim</i> , University of Texas at Dallas	AF-MoA8 A Facile Control of Major Carriers on Atomic Layer Deposited SnO _x Thin Film by using Various Oxygen Reactants, <i>Jung-Hoon Lee</i> , Hanyang University, Republic of Korea; <i>J.W. Park, J.R. Park</i> , Hansol Chemical, Republic of Korea; <i>J.-S. Park</i> , Hanyang University, Republic of Korea
3:30pm	Coffe Break & Exhibits	Coffe Break & Exhibits
3:45pm	Coffe Break & Exhibits	Coffe Break & Exhibits
4:00pm	AA-MoA11 Thickness Dependence of Polarization Response in (Hf,Zr)O ₂ , <i>Sean Smith, M. Rodriguez, D. Henry, M. Brumbach, J. Ihlefeld</i> , Sandia National Laboratories	AF-MoA11 Activation of Metal Amidinate ALD Precursors on Surfaces and Implications for Film Growth, <i>B. Chen</i> , University of California, Riverside; <i>Y. Duan</i> , University of Delaware; <i>Y. Yao</i> , University of California, Riverside; <i>J. Coyle, S. Barry</i> , Carleton University, Canada; <i>A. Tepljakov</i> , University of Delaware; <i>Francisco Zaera</i> , University of California, Riverside
4:15pm	INVITED: AA-MoA12 ALD as a Primary Contributor Towards Enabling Key Materials in the Memory Roadmap, <i>John Smythe</i> , Micron Technology	AF-MoA12 Surface Chemistry during Atomic-Layer Deposition of Pt Studied with Vibrational Sum-frequency Generation, <i>Vincent Vandalon, A. Mackus, W.M.M. Kessels</i> , Eindhoven University of Technology, Netherlands
4:30pm	Invited talk continues.	AF-MoA13 Mechanistic Study of the Atomic Layer Deposition of Titanium Dioxide Films from Ethylcyclopentadienyltris(dimethylamido)titanium and Ozone or Water, <i>Joseph Klesko, R. Rahman, A. Dangerfield, C. Nanayakkara, T. L'Esperance</i> , University of Texas at Dallas; <i>C. Dezelah, R. Kanjolia</i> , EMD Performance Materials; <i>Y. Chabal</i> , University of Texas at Dallas
4:45pm	AA-MoA14 Plasma-Enhanced Atomic Layer Deposition of Oxygen Deficient TaOx Thin Films for Resistive Switching Memory Applications, <i>Konstantin Egorov, D. Kuzmichev, Y. Lebedinskii</i> , Moscow Institute of Physics and Technology, Russian Federation; <i>C.S. Hwang</i> , Seoul National University, Korea; <i>A. Markeev</i> , Moscow Institute of Physics and Technology, Russian Federation	AF-MoA14 The Role of Surface Chemical Functionality in the Initial Stages of Deposition for Copper and Silver Precursors, <i>Andrew Tepljakov</i> , University of Delaware
5:00pm	AA-MoA15 Monitoring Resistive Switching Properties of ALD Grown Al ₂ O ₃ /HfO ₂ Nanolaminate ReRAM Structures by <i>in-situ</i> Reducing Plasma Treatments, <i>Marceline Bonvalot, B. Eychenne, P. Gonon</i> , LETI-LTM, France	AF-MoA15 Reaction Mechanism of ALD Zirconium Oxide using Alkylamido-Cyclopentadienyl Zirconium Precursors, <i>Jae-Min Park, T.R. Mayangari, S. Kim, Y. Kim</i> , Sejong University, Republic of Korea; <i>W.S. Han, B.-S. Yoo, W. Koh</i> , UP Chemical Co., Ltd., Republic of Korea; <i>W.-J. Lee</i> , Sejong University, Republic of Korea
5:15pm	AA-MoA16 Properties of ALD Ferroelectric Si-doped HfO ₂ Characterized with Noncontact Corona-Kelvin Metrology, <i>Dmitriy Marinskiy</i> , Semilab SDI; <i>P. Polakowski</i> , Fraunhofer IPMS, Germany; <i>A. Findlay, P. Edelman, M. Wilson, J. Lagowski</i> , Semilab SDI; <i>J. Metzger, R. Binder</i> , GLOBALFOUNDRIES, Germany; <i>J. Müller</i> , Fraunhofer IPMS, Germany	AF-MoA16 Elucidation of Distinct Electric Characteristics of ALD Oxides on Highly Ordered GaAs(001) and In _{0.53} Ga _{0.47} As(001) Surfaces using Synchrotron Radiation Photoelectron Spectroscopy, <i>Yi-Ting Cheng</i> , National Chia-Yi University, Republic of China; <i>W.-S. Chen</i> , National Synchrotron Radiation Research Center, Republic of China; <i>K.-Y. Lin, L.B. Young, Y.-H. Lin, H.-W. Wan</i> , National Taiwan University, Republic of China; <i>T.-W. Pi</i> , National Synchrotron Radiation Research Center, Republic of China; <i>M. Hong</i> , National Taiwan University, Republic of China; <i>C.-P. Cheng</i> , National Chia-Yi University, Republic of China; <i>J. Kwo</i> , National Tsing Hua University, Republic of China

Monday Afternoon, July 17, 2017

Atomic Layer Etching Room Plaza D - Session ALE+AF-MoA Atomic Layer Etching Session V (1:30-3:30 pm)/ALD Fundamentals: Process Development (4:00-5:45 pm) Moderator: Mike Cooke, Oxford Instruments Plasma Technology		Emerging Materials Room Plaza E - Session EM+AA-MoA Organic-Inorganic Hybrid Materials & MLD (1:30-3:30 pm)/Catalysis and Fuel Cells II (4:00-5:30 pm) Moderators: Sang In Lee, Synos Foundation, Yongfeng Mei, Fudan University, China, Ville Miikkulainen, University of Helsinki	
1:30pm	INVITED: ALE+AF-MoA1 <i>In situ</i> Spectroscopic Methods for Atomic Layer Etching and Atomic Layer Deposition, Yves Chabal , J. Klesko, A. Dangerfield, J.-F. Veyan, University of Texas at Dallas	INVITED: EM+AA-MoA1 Unique Inorganic-Organic Hybrid Materials by ALD/MLD as Enablers of Next-generation Applications?, Maarit Karppinen , Aalto University, Finland	
1:45pm	Invited talk continues.	Invited talk continues.	
2:00pm	ALE+AF-MoA3 An <i>in situ</i> Optical Diagnostic Study of the Process Conditions that Affect the Etch per Cycle in ALE of SiO ₂ , S. Agarwal , Ryan Gasvoda , N. Leick , Colorado School of Mines; A. van de Steeg , Eindhoven University of Technology, Netherlands; R. Ovanesyan , J. Klein , Colorado School of Mines; R. Bhowmick , E. Hudson , Lam Research Corp.	EM+AA-MoA3 Atomic/molecular Layer Deposition of Luminescent Inorganic-Organic Hybrid Erbium Pyridine Dicarboxylate Thin Films, Lukas Mai , Ruhr-University Bochum, Germany; Z. Giedraityte , Aalto University, Finland; M. Schmidt , D. Rogalla , S. Scholz , A. Wieck , Ruhr-University Bochum, Germany; M. Karppinen , Aalto University, Finland; A. Devi , Ruhr-University Bochum, Germany	
2:15pm	INVITED: ALE+AF-MoA4 New Innovative Etching Approaches for Future Generation by Controlling the Surface Reaction at Atomic-Level, Masanobu Honda , T. Katsunuma , Tokyo Electron Miyagi Ltd., Japan	EM+AA-MoA4 Molecular Layer Deposition of Manganese-Ethylene Glycol Hybrid Films, David Bergsman , J. Baker , N. Yang , C. MacIsaac , A. Strickler , M. Lillethorup , S.F. Bent , Stanford University	
2:30pm	Invited talk continues.	EM+AA-MoA5 Synthesis, Characterization, and Electrochemistry of Molybdenum-1,2-Ethanedithiol Hybrid ALD Films, Callisto MacIsaac , R. Closser , J. Schneider , T. Hellstern , D. Bergsman , S.F. Bent , Stanford University	
2:45pm	ALE+AF-MoA6 Controlled Layer-by-Layer Etching of ALD Grown Ta ₂ O ₅ Thin Films, Anil Mane , J. Elam , Argonne National Laboratory	EM+AA-MoA6 Ultrahigh Elastic Strain Energy Storage in Metal-Oxide-Infiltrated Polymer Nanopillars Generated by Infiltration Synthesis, Chang-Yong Nam , Brookhaven National Laboratory; K. Dusoe , University of Connecticut; A. Stein , X. Ye , K. Kissinger , Brookhaven National Laboratory; S.-W. Lee , University of Connecticut	
3:00pm	ALE+AF-MoA7 Atomic Layer Etching Mechanism of 2D MoS ₂ Layers, Ki Seok Kim , K.H. Kim , Y.J. Ji , G.Y. Yeom , Sung Kyun Kwan University, Republic of Korea	EM+AA-MoA7 Kinetics of Vapor Phase Infiltration: Fitting Theory to Experimental Measurements, C. Leng , Mark Losego , Georgia Institute of Technology	
3:15pm	ALE+AF-MoA8 ALD & Quasi-ALE Patterning Application in EUV Contact Etch, Hongyun Cottle , D. O'Meara , A. Metz , Tokyo Electron Limited; P. Biolsi , TEL Technology Center, America, LLC; S. Nakamura , T. Yang , Tokyo Electron Limited; M. Honda , Tokyo Electron Miyagi Ltd., Japan; S. Morikita , Tokyo Electron Limited	EM+AA-MoA8 Vapor Phase Infiltration for Doping Conducting Polymers, W. Wang , F. Yang , CIC nanoGUNE, Spain; C. Chen , Y. Qin , Chinese Academy of Sciences, China; Mato Knez , CIC nanoGUNE, Spain	
3:30pm	Coffe Break & Exhibits	Coffe Break & Exhibits	
3:45pm	Coffe Break & Exhibits	Coffe Break & Exhibits	
4:00pm	ALE+AF-MoA11 Boron Nitride Growth at Room Temperature Using Electron Enhanced Atomic Layer Deposition (EE-ALD), Jaclyn Sprenger , H. Sun , A. Cavanagh , S.M. George , University of Colorado - Boulder	EM+AA-MoA11 Catalysts Modified by ALD for Harsh Biomass Conversion Processes, Steven Christensen , K. Hurst , M. Griffin , D. Vardon , National Renewable Energy Laboratory	
4:15pm	ALE+AF-MoA12 Catalyzed Atomic Layer Deposition of Silicon Oxide at Ultra-low Temperature using Alkylamines, Tirta Rona Mayangsari , J.-M. Park , L. Yusup , J. Gu , Sejong University, Republic of Korea; J.-H. Yoo , H.-D. Kim , JUSUNG Engineering, Republic of Korea; W.-J. Lee , Sejong University, Republic of Korea	EM+AA-MoA12 Effects of Alumina Incorporation by Particle Atomic Layer Deposition on Sintering and Microstructure of Ytria-Stabilized Zirconia (8YSZ), Christopher Bartel , R. O'Toole , M. Kodas , A. Drake , A. Horrell , University of Colorado - Boulder; R. Hall , ALDNanoSolutions, Inc.; C. Musgrave , A. Weimer , University of Colorado - Boulder	
4:30pm	ALE+AF-MoA13 Low Resistance ALD TiN from Low Temperature Thermal N ₂ H ₄ + TiCl ₄ , Steven Wolf , M. Kavrik , J. Park , University of California San Diego; R. Holmes , D. Alvarez , J. Spiegelman , RASIRC; A. Kummel , University of California San Diego	EM+AA-MoA13 Low-Temperature ALD Cobalt Sulfide for High-Efficient Hydrogen Evolution Textiles, Donghyun Kim , J. Park , H. Kim , Yonsei University, Republic of Korea	
4:45pm	ALE+AF-MoA14 Study of the Isotropic Behavior of AZO Conductivity Deposited by Atomic Layer Deposition - Effect of Film Thickness, Benoit Dugrenil , Microoled - CEA Leti, France; S. Guillamet , M. Thomschke , Microoled Company; M. Tournaire , B. Aventurier , L. Mollard , T. Maindran , CEA-Leti, France	EM+AA-MoA14 Atomic Layer Deposition of Platinum: An Avenue to the Scalable Synthesis of Ultra-low-loading Fuel Cell Catalysts?, A. Goulas , Delft IMP B.V., Netherlands; F. Grillo , A. Dokania , Delft University of Technology, Netherlands; D. Valdesueiro , Delft IMP B.V., Netherlands; H. Van Bui , Delft University of Technology, Netherlands; Bart van Limpt , Delft IMP B.V., Netherlands; J. Moulijn , J.R. van Ommen , Delft University of Technology, Netherlands	
5:00pm	ALE+AF-MoA15 Growth Behaviour and Stability of Atomic Layer Deposited MoO ₃ by Mo(CO) ₆ and H ₂ O/O ₃ Precursors, Perttu Sippola , Aalto University, Finland; Z. Zhu , Beneq Oy ; T. Sajavaara , University of Jyväskylä, Finland; H. Lipsanen , Aalto University, Finland	EM+AA-MoA15 Pd-Ag Bimetallic Nanograin-Decorated Nylon Nanofibers: Efficient Catalytic Reduction of 4-Nitrophenol, K. Ranjith , A. Celebioglu , Bilkent University, Turkey; H. Eren , Delft University of Technology, Netherlands; N. Biyikli , Utah State University; Tamer Uyar , Bilkent University, Turkey	
5:15pm	ALE+AF-MoA16 Characterization of Al ₂ O ₃ and HfO ₂ Grown on Metal Surfaces with Thermal and Plasma Enhanced Atomic Layer Deposition, Haiping Zhou , Y.-C. Fu , M. Mirza , University of Glasgow, UK	EM+AA-MoA16 Size-Selective Catalysts with an Ultra-Thin Porous Shell Prepared by Molecular Layer Deposition, Zeyu Shang , X. Liang , Missouri University of Science and Technology	

ALD Fundamentals

Room Plaza Exhibit - Session AF-MoP

ALD Fundamentals Poster Session

5:30pm

AF-MoP1 Template-Free Vapor-Phase Growth of Patrónite (VS₄) by Atomic Layer Deposition, **Matthew Weimer**, **R. McCarthy**, Argonne National Laboratory; **J. Emery**, **M. Bedzyk**, Northwestern University; **F. Sen**, **A. Kinaci**, **M. Chan**, **A. Hock**, **A. Martinson**, Argonne National Laboratory

AF-MoP2 Novel Approach to Deposit Carbon Doped Silicon Oxide Film with High Carbon Content via Thermal ALD, **Harijin Chandra**, **K. Cuthill**, Versum Materials, Inc; **M. MacDonald**, **G. Sanchez**, Versum Materials, Inc.; **A. Mallikarjunan**, Versum Materials, Inc

AF-MoP3 A New Reducing Co-Reagent and Challenges in Thermal Atomic Layer Deposition of Electropositive Metal Films, **Kyle Blakeney**, **C.H. Winter**, Wayne State University

AF-MoP4 Volatile Rare Earth Metal Alkoxides for ALD precursors, **Atsushi Sakurai**, ADEKA Corporation, Japan; **N. Sugiura**, **M. Hatase**, **A. Nishida**, **A. Yamashita**, ADEKA Corporation

AF-MoP5 Enabling Smooth and Conformal Film Growth via Separate Surface Treatment during Atomic Layer Deposition of Cobalt, **Jeong-Seok Na**, Lam Research Corp.

AF-MoP6 Comparative Study of ALD SiO₂ Films, **Andy Zauner**, Air Liquide R&D, France; **J.-M. Girard**, Air Liquide Advanced Materials, France

AF-MoP7 B₂O₃ ALD for Advanced Doping Applications: The Roles of Free Radical Precursors and Surface Composition, **A. Pilli**, **J. Jones**, **Jeffrey Kelber**, University of North Texas; **F. Pasquale**, **A. LaVoie**, Lam Research Corp.

AF-MoP8 High-aspect Ratio Anodic TiO₂ Nanotube Layers: Unprecedented Ability of ALD to add a Functionality, **Raul Zazpe**, **J. Pířkryl**, **H. Sophia**, **L. Hromadko**, **J. Macák**, University of Pardubice, Czech Republic

AF-MoP9 PEALD Ga₂O₃ as Dielectric Interlayer on GaN, **Mei Hao**, **R. Nemanich**, **S. Chowdhury**, Arizona State University

AF-MoP10 Effect of Deposition Temperature and Plasma Condition on Film Quality of TiO₂ Deposited by Plasma-Enhanced Atomic Layer Deposition, **Munehito Kagaya**, Tokyo Electron Limited, Japan; **S. Iwashita**, Tokyo Electron Yamanashi Limited, Japan; **Y. Suzuki**, **Y. Sakamoto**, Tokyo Electron Limited, Japan; **A. Uedono**, University of Tsukuba, Japan; **T. Mitsunari**, Tokyo Electron Limited, Japan; **N. Shindo**, **M. Yamasaka**, **N. Noro**, **T. Hasegawa**, Tokyo Electron Yamanashi Limited, Japan; **T. Moriya**, Tokyo Electron Limited, Japan

AF-MoP11 Atom Probe Tomography of Platinum and Ruthenium Atomic Layer Deposition Films, **Daniel Potrepka**, **B. Hornbuckle**, U.S. Army Research Laboratory; **N. Strnad**, University of Maryland

AF-MoP12 Nitrogen Doped Al₂O₃ Films with High Doping Uniformity and Low Film Roughness Grown by Plasma Enhanced Atomic Layer Deposition, **Hong-Yan Chen**, **H.-L. Lu**, Fudan University, China

AF-MoP13 Study on the Gate Sidewall Spacer Silicon-Nitride ALD Process at Low Temperature by High Density Multiple ICP Sources, **Ho-Hyun Song**, **H.-Y. Chang**, **Y. Seol**, KAIST, Republic of Korea

AF-MoP14 Effect of Revolution and Rotating Substrate for ALD SiO₂ Film at Low Temperature Using SDP System, **Jin-Hyuk Yoo**, **B.H. Cho**, JUSUNG Engineering, Republic of Korea

AF-MoP15 Breakthrough Trace Element Analysis for Challenging ALD Film Precursors, **Lisa Mey-Ami**, **J. Wang**, **H. Gotts**, **F. Li**, Air Liquide - Balazs NanoAnalysis

AF-MoP16 New Technology Advances of Electromechanical Valve Technology for Precision-Controlled Millisecond Pulsed Delivery in ALD/ALE Applications, **Patrick Lowery**, HORIBA; **H. Nishizato**, Horiba Stec, Japan; **J. Dick**, **T. Hoke**, HORIBA

AF-MoP17 Band Alignment at the Interface of Atomic Layer Deposition Al₂O₃ and Ga-Polar GaN under Ultraviolet/Ozone Treatment, **K. Kim**, **J.H. Ryu**, **J. Kim**, **S.J. Cho**, **D. Liu**, **J. Park**, **I. Lee**, University of Wisconsin-Madison; **B. Moody**, HexaTech, Inc.; **W. Zhou**, University of Texas at Arlington; **J. Albrecht**, Michigan State University; **Zhenqiang Ma**, University of Wisconsin-Madison

AF-MoP18 Raman Spectrum Characterization of Ti-based ALD Thin Films Treated with Ultra-high Vacuum Annealing, **Chengchun Tang**, **X.S. Jia**, **C.Z. Gu**, **J.J. Li**, Institute of Physics, Chinese Academy of Sciences, China

AF-MoP20 Complete Analytical Characterization of Surface, Interfacial and Bulk Layers of ALD Films: The Path to Improved and Reliable Deposition Processes, **Yagnaseni Ghosh**, **C. Langland**, **W. Rivello**, **F. Li**, Air Liquide - Balazs NanoAnalysis

AF-MoP21 Sequential Exposures of N₂H₄ + BCl₃ on Copper, HOPG and Si_{0.7}Ge_{0.3} Surfaces, **Steven Wolf**, **M. Breeden**, **M. Edmonds**, **K. Sardashti**, **M. Clemons**, University of California San Diego; **E. Yieh**, **H. Ren**, **S. Nemani**, Applied Materials; **D. Alvarez**, RASIRC; **A. Kummel**, University of California San Diego

AF-MoP22 Plasma Enhanced ALD of BN, B-doped SiN and B-doped TiN, **Moo-Sung Kim**, Versum Materials Korea, Republic of Korea; **X. Lei**, Versum Materials, Inc; **S.-H. Yang**, Versum Materials Korea, Republic of Korea

AF-MoP23 Scale-Up of Atomic Layer Deposition on Powders in Fixed Bed Reactors, **Kristian Knemeyer**, **V.E. Stempel**, **P. Ingale**, **R. Naumann d'Alnoncourt**, BasCat, UniCat BASF JointLab, Technische Universität Berlin, Germany; **A. Thomas**, **M. Driess**, Institut für Chemie, Technische Universität Berlin, Germany; **F. Rosowski**, BASF SE, Germany

AF-MoP24 Measurement and Control of Stress of ALD Films and Nanolaminates Measured by Interferometry, **Ritwik Bhatia**, Ultratech

AF-MoP25 Temperature Dependent Kinetics of ALD Reaction: SiN PEALD Study, **Triratna Muneshwar**, **C. Cadien**, University of Alberta, Canada

AF-MoP26 Process Development and Characterization of the Atomic Layer Deposited MoS₂, **Tian-Bao Zhang**, **J. Xu**, **Y. Wang**, **L. Chen**, **Q.-Q. Sun**, **H. Zhu**, **S.-J. Ding**, **D.W. Zhang**, Fudan University, China

AF-MoP27 Low Energy Ion Scattering (LEIS) Analysis of ALD Deposited GaSb Films on SiO₂, **Philipp Brüner**, ION-TOF GmbH, Germany; **T. Grehl**, ION-TOF GmbH; **R. ter Veen**, Tascon GmbH, Germany; **M. Fartmann**, Tascon GmbH; **T. Blomberg**, **M. Tuominen**, ASM, Finland

AF-MoP28 Alternative Plasma Gas Chemistries for Plasma Enhanced Atomic Layer Deposition and the 2016 PEALD Publication Review, **Plasma-ALD Guy**, www.plasma-ald.com

AF-MoP29 Characterization of Ultra-thin ALD Coating in Mesoporous Silicon Layers, **Andras Kovacs**, **U. Mescheder**, Furtwangen University, Germany

AF-MoP30 Hydrogen Impurities in Al₂O₃ Thin Films using TMA and Heavy Water as Precursors, **Sami Kinnunen**, **K. Arstila**, **M. Lahtinen**, **T. Sajavaara**, University of Jyväskylä, Finland

AF-MoP31 Density Functional Theory Calculation on the Reaction Between Different Nitriding Agents and Chlorine-terminated Silicon Nitride Surface, **Luchana Yusup**, **T.R. Mayangsari**, **J.-M. Park**, Sejong University, Republic of Korea; **Y.-K. Kwon**, Kyung Hee University, Republic of Korea; **W.-J. Lee**, Sejong University, Republic of Korea

AF-MoP32 Edge-On MoS₂ Thin Films by Direct Atomic Layer Deposition for Hydrogen Evolution Reaction, **Changdeuck Bae**, **T.A. Ho**, **H. Shin**, Sungkyunkwan University

AF-MoP33 Role of Initial Precursor Chemisorption on Incubation Delay for Molybdenum Oxide Atomic Layer Deposition, **Charith Nanayakkara**, EMD Performance Materials; **A. Vega**, University of Texas at Dallas; **G. Liu**, **C. Dzelah**, **R. Kanjolia**, EMD Performance Materials; **Y. Chabal**, University of Texas at Dallas

AF-MoP34 Precursor Screening for Low Temperature Atomic Layer Deposition of SiO₂ using Ozone, **Ding kai Guo**, **B. Hendrix**, **T. Baum**, Entegris Inc.

AF-MoP35 Surface Treatments on Vertically Aligned Carbon Nanotube Forests for Atomic Layer Deposition, **David Kane**, **R. Vanfleet**, **R. Davis**, Brigham Young University

AF-MoP36 Quantum Chemical Design for Kinetically Enhanced ALD Precursors, **Thomas Mustard**, Schrodinger, Inc.; **C.H. Winter**, Wayne State University, USA; **M. Halls**, Schrodinger, Inc.

AF-MoP37 QDB: A Database of Plasma Process Data, **C. Hill**, **S. Rahimi**, **D. Brown**, **Anna Dzarasova**, Quantemol Ltd, UK; **J. Hamilton**, **K. Wren-Little**, University College London, UK; **S. Mohr**, Quantemol Ltd, UK; **J. Tennyson**, University College London, UK

AF-MoP38 Surface Functionalization of Few-layer MoS₂ for Atomic Layer Deposition using Gold Chloride Salts, **Jaron Kropp**, **T. Gougousi**, University of Maryland, Baltimore County

AF-MoP39 Atomic layer deposition of ZrO₂ thin film using a novel linked cyclopentadienyl-amido Zr precursor, **Mira Park**, **J.H. Kwon**, **Y. Lee**, **J.R. Park**, **S. Kim**, **H. Ahn**, **S. Yun**, **J.W. Park**, Hansol Chemical, Republic of Korea

Monday Evening Poster Sessions, July 17, 2017

AF-MoP40 Surface Oxidation of Titanium Oxynitride Films Prepared by PEALD, *J. Lobaza, M. Kot*, Brandenburg University of Technology Cottbus-Senftenberg, Germany; *F. Naumann, Hassan Gargouri*, Sentech Instruments, Germany; *K. Henkel, D. Schmeißer*, Brandenburg University of Technology Cottbus-Senftenberg, Germany

AF-MoP41 Characterization of SiN_x Plasma Enhanced Atomic Layer Deposition Process, *Sun Jung Kim, S.H. Yang, H. Chae*, Sungkyunkwan University (SKKU), Republic of Korea

AF-MoP42 Transient Response of ALD-QCM with Synchronized Back Pressure Control of Sensor Head, *S. Tanaka*, Tohoku University, Japan; *K. Hikichi*, Techofine Co., Japan; *Masafumi Kumano*, Tohoku University, Japan

AF-MoP43 Precise Thickness Controllable Al₂O₃ Thin Film Using Non-Pyrophoric Al Precursors and Atomic Layer Deposition, *Donghak Jang, S.J. Yeo, K.-Y. Mun*, Hansol Chemical; *J.W. Park*, Hansol Chemical, Republic of Korea

AF-MoP44 Diagnostic ALD Reactor with Multiple Modes of FT-IR Spectroscopy, *B. Sperling, James Maslar, B. Kalanyan*, National Institute of Standards and Technology

AF-MoP45 Leveraging Atomistic Modeling for Insights into Nucleation of Cobalt Precursors on Various Substrates, *Andrew Adamczyk, A. Cooper*, Versum Materials; *M.-S. Kim*, Versum Materials Korea, Republic of Korea; *S. Ivanov*, Versum Materials

AF-MoP46 Crystalline AlN Films on Si(100) with Sharp Interface and Good Uniformity at Low Temperature by Plasma Enhanced ALD, *Xinhe Zheng, S. Liu, Y. He, M. Li, J. Wang, C. Hou*, University of Science and Technology Beijing, China

AF-MoP47 Comparison between PEALD-TiN Films using TiCl₄ or TDMAT as Ti-precursor, *Hans-Dieter Schnabel*, Westsächsische Hochschule Zwickau, Germany; *T. Junghans, U. Reinhold, C. Reinhold*, Westsächsische Hochschule Zwickau

AF-MoP48 High-speed Spectroscopic Ellipsometry for ALD Applications, *Gai Chin*, ULVAC Inc., Japan

AF-MoP49 UHV FT-IR Spectroscopy for Atomic Layer Deposition: An Instrumental Contribution, *X. Stammer*, Bruker Optics, Ettlingen, Germany; *Richard Merk, S. Shilov*, Bruker Optics

AF-MoP50 New Tungsten Precursors at Scale - Properties and ALD Application, *Andreas Wilk, A. Rivas Nass, R. Ramon-Müller, O. Briel*, Umicore AG & Co. KG, Germany

AF-MoP51 The Effect of Precursor Ligands and Substitution Chemistry on the Nucleation and Structure of Layered Chalcogenides, *H. Zhang, Adam Hock*, Illinois Institute of Technology

ALD for Manufacturing

Room Plaza Exhibit - Session AM-MoP

ALD for Manufacturing Poster Session

5:30pm

AM-MoP1 Anhydrous Hydrogen Peroxide Gas Delivery for Semiconductor Manufacturing: Optimal Delivery Conditions for ALD Processes, *D. Alvarez, J. Spiegelman, Keisuke Andachi, R. Holmes, Z. Shamsi*, RASIRC

AM-MoP2 OpenALD - A Framework for an Open Source ALD Reactor, *Vivek Dwivedi*, NASA

AM-MoP3 Multilayer ALD Metal Oxide Films Deposited by Spatially Resolved ALD Processes for Moisture Barrier Films, *Sang Heon Yong, S.J. Kim, H. Chae*, Sungkyunkwan University (SKKU), Republic of Korea

AM-MoP4 A Green Precleaning Process in Wettability Improvement for Thinner and Uniform ALD Al₂O₃ Film Deposition on Layered MoS₂ Film, *Cheng-Ying Wang*, National Taiwan Normal University, Taiwan; *Y.-T. Ho, Y.-C. Chu*, National Chiao Tung University, Republic of China; *H.-R. Hsu*, ITRI, Republic of China; *B.-M. Chen, P.-S. Chen*, Minghsin University of Science & Technology, Taiwan; *M.-H. Lee*, National Taiwan Normal University, Taiwan; *C.-A. Jong*, NARLabs, Republic of China

AM-MoP5 Highly Sensitive Ion Trap Mass Spectrometer for Inline Process Control, *Ruediger Reuter, V. Derpmann, G. Fedosenko, A. Laue, T. Graber, M. Aliman, H.Y. Chung*, Carl Zeiss SMT GmbH, Germany

AM-MoP6 STD-PEALD Equipment Design and Evaluation of Nano Thin-Film Characteristics, *M.H. Jeong*, Korea Electronics Technology Institute, Republic of Korea; *T.Y. Ryu*, Sung Kyun Kwan University; *K.-P. Hong*, Korea Electronics Technology Institute, Republic of Korea; *J. Choi*, Sung Kyun Kwan University; *C.K. Song, M. Koo*, LEED Corp.; *Yekyung Kim, S.H. Chang*, Korea Electronics Technology Institute, Republic of Korea; *I. Jeong*, LEED Corp.; *H. Kim*, Korea Electronics Technology Institute, Republic of Korea

AM-MoP7 Demonstration of a Correlation between Barrier Property and Defect Visualization of ALD(Al₂O₃)/Graphene Film, *K.-P. Hong, M.H. Jeong, D. Lee, J.W. Seo, S.J. Lee*, Korea Electronics Technology Institute, Republic of Korea; *J. Choi*, Sung Kyun Kwan University; *I. Jeong*, LEED Corp.; *S.H. Chang, Yekyung Kim, H. Kim*, Korea Electronics Technology Institute, Republic of Korea

AM-MoP8 Transport and Kinetics of a Remote DBD Plasma for ALD Processing of Metal Oxides, *T. Beekman, Yves Creyghton, J. Emmelkamp*, Solliance/TNO, Netherlands; *A. Sobota*, Eindhoven University of Technology, Netherlands

AM-MoP9 Effects of Sealing Components on ALD Film Quality, *Fred Pourmirzaie*, Flodynamix

Area Selective ALD

Room Plaza Exhibit - Session AS-MoP

Area Selective ALD Poster Session

5:30pm

AS-MoP1 Area-selective ALD using Vapor and Solution-Phase Synthesized Perfluorodecyltrichlorosilane (FDTs) SAMs as Growth Inhibition Layers, *Ali Haider*, Bilkent University, Turkey; *S. Altuntas*, TOBB University of Economics & Technology, Turkey; *P. Deminskyi, T. Khan*, Bilkent University, Turkey; *F. Buyukserin*, TOBB University of Economics & Technology, Turkey; *N. Biyikli*, Utah State University

AS-MoP2 Nanoscale Patterning of C₆F₈ Plasma Polymer Blocking Layers via Femtosecond Pulsed Laser Processing for Selective Deposition of Noble Metals, *Petro Deminskyi, I. Pavlov, S. Ilday, O. Tokel*, Bilkent University, Turkey; *H. Eren*, Delft University of Technology, Netherlands; *A. Haider, F. Ilday*, Bilkent University, Turkey; *N. Biyikli*, Utah State University

AS-MoP3 Feasibility Study of Single and Multi-layered Graphene as Plasma-compatible Deactivation Layers for Selective Deposition of III-Nitride Materials, *Petro Deminskyi, E. Kovalska, A. Haider, C. Kocabas*, Bilkent University, Turkey; *N. Biyikli*, Utah State University

AS-MoP4 Electroless Noble Metal Deposition - A New Approach for Highly Selective Surface Controlled Deposition Process, *Stanko Brankovic*, University of Houston; *D. Solanki, D. Wu*, University of Houston; *Y. Dordi, A. Joi*, Lam Research

AS-MoP5 Inherently Selective Plasma-assisted ALD: A Feasibility Study for III-Nitride Materials, *Necmi Biyikli*, Utah State University; *A. Haider, P. Deminskyi*, Bilkent University, Turkey

Emerging Materials

Room Plaza Exhibit - Session EM-MoP

Emerging Materials Poster Session

5:30pm

EM-MoP1 ALD of Copper(I) Halide Direct Bandgap Semiconductors, *T. Homola, R. Krumpolec, David Cameron*, Masaryk University, Czech Republic; *R. Zazpe, J. Píkrýl, J. Macák*, University of Pardubice, Czech Republic; *P. Maydannik*, Lappeenranta University of Technology, Finland; *G. Natarajan*, Indira Gandhi Centre for Atomic Research, India

EM-MoP2 Atomic Layer Deposition of Topological Insulator Selenides and Tellurides, *Tommi Tynell, C. Wiegand, A. Thomas, K. Nielsch*, Leibniz Institute for Solid State and Materials Research Dresden (IFW Dresden), Germany

EM-MoP3 New precursor for low temperature deposition of SiO₂ layer using thermal and plasma enhanced ALD techniques, *Hima Lingam, V. Chitturi, P. Cobb*, Nova-Kem; *M. Boleslawski, D. Suh, C. Choi, H. Jeong*, Wonik Materials

EM-MoP4 Modeling of the Reactions of Hexachlorodisilane on NH and NH₂ Functionalized Silicon Nitride Surface, *X. Wang*, The Dow Chemical Company; *Xiaobing Zhou, B. Hwang*, The Dow Chemical Company; *B. Ketola, B. Reken, T. Sunderland, A. Millward, M. Telgenhoff, V. Shamamian, C. Lee, Y. Ahn, W. Chung*, The Dow Chemical Company

EM-MoP5 New Silicon precursor for Low Temperature SiN_x ALD Applications, *H. Lingam, Venkateswara Chitturi*, Nova-Kem; *M. Boleslawski, C. Choi, H. Jeong, D. Suh*, Wonik Materials

EM-MoP6 Structure and Growth Behavior of MLD Films Using Cyclic Azasilanes, Maleic Anhydride, Trimethylaluminum and Water, *Ling Ju, N. Strandwitz*, Lehigh University

EM-MoP7 Divalent Group IV Precursors for Atomic Layer Deposition Features, *M.H. Nim, Hyunkee Kim, K.-Y. Mun, J.R. Park, J.W. Park*, Hansol Chemical, Republic of Korea

Monday Evening Poster Sessions, July 17, 2017

EM-MoP8 Plasma Enhanced Atomic Layer Deposition of Aluminium Sulphide, *J. Kuhs, Z. Hens, Christophe Detavernier*, Ghent University, Belgium

EM-MoP9 The Film Property of Super-cycled $\text{Al}_2\text{O}_3/\text{SnO}_x$ Atomic Layer Deposition and the Associated Thin Film Transistor Performance, *Seung-Hwan Lee, S.-J. Choi*, Hanyang University, Korea; *J.-S. Park*, Hanyang University, Republic of Korea

EM-MoP10 Optical Properties and XPS Analyses of $\text{Ti}_x\text{Si}_{(1-x)}\text{O}_2$ Films Prepared by ALD and Comparison to ab-initio Predictions, *Marek Elias*, CEITEC, Brno University of Technology, Czech Republic; *P. Ondracka*, Masaryk University, Czech Republic; *D. Necas*, CEITEC, Masaryk University, Czech Republic; *J. Vida*, Masaryk University, Czech Republic; *E. Kedronova, L. Zajickova*, CEITEC, Masaryk University, Czech Republic

EM-MoP11 Atomic Layer Deposition of $\text{MoO}_x\text{:N}$ films: Electrical and Electrochemical Properties, *Arpan Dhara, D. Saha, S. Sarkar*, Indian Institute of Technology Bombay, India

EM-MoP12 *In Situ* Characterization of Thin Film Molybdenum Carbide using Spectroscopic Ellipsometry, *Adam Bertuch*, Ultratech; *J. Hoglund*, SemiLab; *L. Makai*, SemiLab; *J. Byrnes*, SemiLab; *J. McBee, G. Sundaram*, Ultratech

EM-MoP13 Molecular Layer Deposition of Boron Carbide from Carboranes, *Michelle Paquette, L. Dorsett, S. Malik, A. Caruso*, University of Missouri-Kansas City; *J. Bielefeld, S. King*, Intel Corporation

EM-MoP14 Sub-10 nm Scalable Hybrid Dielectric Engineering on MoS_2 for 2D Materials Based Devices, *Lanxia Cheng, J. Lee, H. Zhu, A.V. Ravichandran, Q. Wang, A. Lucero, M. Kim, R. Wallace*, University of Texas at Dallas; *L. Colombo*, Texas Instruments, USA; *J. Kim*, University of Texas at Dallas

EM-MoP15 Critical Layer Thickness Determination for GaN Thin Films Grown on Sapphire Substrate via Hollow-Cathode Plasma-assisted Atomic Layer Deposition, *Mustafa Alevli, N. Gungor*, Marmara University; *N. Biyikli*, Utah State University

EM-MoP16 Digital Doping of ALD VO_2 for Thermochromic Applications, *Alexander Kozen, M. Currie*, U.S. Naval Research Laboratory; *K. Jungjohann*, Sandia National Laboratory; *B. Downey, C.R. Eddy, Jr., V. Wheeler*, U.S. Naval Research Laboratory

EM-MoP17 Characterization and Comparison of ALD Laminate Structures with $\text{HfO}_2 + \text{SiO}_2$ as MIM Capacitor Dielectric for GaAs HBT Device, *Yao-Ting Shao, C.-H. Hua*, WIN Semiconductors Corp., Republic of China

EM-MoP18 Atomic Layer Deposition of Mo-doped VO_2 Thin Films by Nanolamination of VO_2/MoO_3 Alternating Layers, *Xinrui Lv, Y. Yu, Y. Cao*, Chinese Academy of Sciences, China

EM-MoP19 Trace Metal Analysis on SiC Wafers using ICP-MS, *Jaya Chowdhury*, ChemTrace

EM-MoP23 Atomic Layer Deposited Single Crystal High-k Y-doped Cubic HfO_2 on GaAs(001) Utilizing $\text{HfO}_2/\text{Y}_2\text{O}_3$ Super-cycles, *Lawrence Boyu Young, C.-K. Cheng, Y.-H. Lin, K.-Y. Lin*, National Taiwan University, Republic of China; *C.-H. Hsu*, National Synchrotron Radiation Research Center, Republic of China; *J. Kwo*, National Tsing Hua University, Republic of China; *M. Hong*, National Taiwan University, Republic of China

Room Plaza Exhibit - Session ALE-MoP

Atomic Layer Etching Poster Session

6:00pm

ALE-SaP1 Quasi-Atomic Layer Etching of Silicon Nitride with Tunable Directionality and Ultra-high Selectivity, *Sonam Sherpa, A. Ranjan*, Tokyo Electron

ALE-SaP2 Atomic Layer Etching with Gas Cluster Ion Beam Irradiation in Reactive Gas Vapor, *Noriaki Toyoda*, University of Hyogo, Japan; *A. Ogawa*, University of Hyogo; *I. Yamada*, University of Hyogo

ALE-SaP3 Thermal Atomic Layer Etching of TiO_2 using Sequential Exposures of WF_6 and BCl_3 , *P. Lemaire, Gregory N. Parsons*, North Carolina State University

ALE-SaP4 Etch Profile Control of ALD- SiO_2 Film Assisted by Alternating ALE Process of Fluorocarbon Deposition and O_2 Plasma Etching, *Masaru Zaitzu*, ASM, Japan; *T. Tsutsumi*, Nagoya University, Japan; *A. Kobayashi*, ASM; *H. Kondo, M. Hori*, Nagoya University, Japan; *T. Nozawa, N. Kobayashi*, ASM

ALE-SaP5 *In Situ* Mass Spectrometer Studies of Volatile Etch Products During Thermal Al_2O_3 Atomic Layer Etching Using HF and Trimethylaluminum, *Joel Clancey, S.M. George*, University of Colorado - Boulder

ALE-SaP6 Cyclic Plasma Cleaning Process of SiO_2 Layers using Surface Fluorination, *Kyongbeom Koh, H. Chae*, Sungkyunkwan University (SKKU), Republic of Korea

ALE-SaP7 Low Damage Cyclic Etching of GaN and AlGaN, *A. Goodyear*, Oxford Instruments Plasma Technology, UK; *P. Abrami*, University of Bristol, UK; *Mike Cooke, M. Loveday*, Oxford Instruments Plasma Technology

ALE-SaP8 Thermal Atomic Layer Etching of ZnO by "Conversion-Etch" Using Hydrogen Fluoride and Trimethylaluminum, *David Zywotko, S.M. George*, University of Colorado - Boulder

ALE-SaP9 Cryogenic Atomic Layer Etching of SiO_2 , *N. Holtzer, Thomas Tillocher, P. Lefaucheux, R. Dussart*, GREMI Université d'Orléans/CNRS, France

ALE-SaP10 SF_4 as a New Fluorine Reagent for Thermal ALE: Application to Al_2O_3 and VO_2 ALE, *Jonas Gertsch, N. Johnson, V. Bright, S.M. George*, University of Colorado - Boulder

ALE-SaP11 Demonstrating Manufacturability of Atomic Level Etch (ALE) through Accelerated Neutral Atom Beam (ANAB) Processing, *Daniel Steinke, B. Sapp, S. PapaRao*, SUNY Polytechnic Institute; *E. Barth*, SEMATECH; *V. Kaushik, M. Rodgers, C. Hobbs*, SUNY Polytechnic Institute; *M. Walsh, S. Kirkpatrick, R. Surluga*, Neutral Physics Corporation

ALE-SaP12 Etching with Low Te Plasmas, *Scott Walton, D. Boris*, U.S. Naval Research Laboratory; *S. Hernández*, U.S. Naval Research Laboratory; *H. Miyazoe, A. Jagtiani, S. Engelmann, E. Joseph*, IBM TJ Watson Research Center

ALE-SaP13 Surface Cleaning of Gallium Antimonide Oxides: The Role of Hydrogen Atoms, Argon Ions, and Temperature, *Thomas Larrabee, S. Prokes*, Naval Research Laboratory

ALE-SaP14 Aluminum Native Oxide Surface Cleaning and Passivation in an Atmospheric Plasma System, *John Mudrick, M. Pohl, K. Knisely*, Sandia National Laboratories

ALE-SaP15 Atomic Layer Etching in Reactive Ion Etching System for Nanoscale Pattern Transfer, *S. Khan, Dmitry Suyatin, M. Graczyk, A. Kvennefors*, Lund University, Sweden; *E. Kauppinen*, Aalto University, Finland; *M. Huffman, I. Maximov*, Lund University, Sweden; *J. Sundqvist*, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany

ALE-SaP16 Selective Fluorocarbon-based Atomic Layer Etching in a Conventional Parallel-Plate, Capacitively Coupled Plasma, *Stefano Dallorto*, Ilmenau University of Technology; *A. Goodyear*, Oxford Instruments Plasma Technology, UK; *M. Coake*, Oxford Instruments Plasma Technology; *S. Dhuey, A. Schwartzberg, S. Sassolini*, Lawrence Berkeley National Laboratory; *C. Ward*, Oxford Instruments; *D. Olynick*, Lawrence Berkeley National Laboratory; *I. Rangelow*, Ilmenau University of Technology; *S. Cabrini*, Lawrence Berkeley National Laboratory

ALE-SaP17 RF Plasma Electrostatics: The Influence on Film Morphology and Carbon Incorporation, *K. Scott Butcher*, Meaglow Ltd, Canada; *P. Terziyska*, Institute of Solid State Physics, Bulgarian Academy of Sciences, Bulgaria; *V. Georgiev*, Meaglow Ltd, Canada; *D. Georgieva*, Semiconductor Research Lab, Lakehead University, Canada; *R. Gergova*, Central Laboratory of Solar Energy and New Energy Sources, Bulgarian Academy of Sciences, Bulgaria; *P. Binsted, S. Skergetc*, Semiconductor Research Lab, Lakehead University, Canada

ALE-SaP18 Atomic Layer Etching of Amorphous Silicon with Selectivity Towards MoS_2 , *Markus Heyne*, KU Leuven, Belgium; *A. Goodyear*, Oxford Instruments Plasma Technology, UK; *J.-F. de Marneffe*, IMEC, Belgium; *M. Cooke*, Oxford Instruments Plasma Technology, UK; *I. Radu*, IMEC, Belgium; *E. Neyts*, University of Antwerp, Belgium; *S. De Gendt*, KU Leuven, Belgium

ALE-SaP19 Simulation of New Material-Systems for Directional Atomic Layer Etching, *Ivan Berry, K.J. Kanarik, T. Lill, V. Vahedi, R. Gottscho*, Lam Research Corp.

Tuesday Morning, July 18, 2017

	<p>ALD Applications Room Plaza F - Session AA+AF-TuM Displays and Flexible Applications (8:00-10:00 am)/ALD Fundamentals: In-Situ Monitoring and Analysis (10:45 am-12:00 pm) Moderators: Hyungjun Kim, Yonsei University, Jin-Seong Park, Hanyang University, Han-Jin Lim, Samsung Electronics, Tom Knisley, Applied Materials</p>	<p>ALD Applications Room Plaza ABC - Session AA-TuM Batteries I (8:00-10:00 am)/Emerging Apps II (10:45 am-12:00 pm) Moderators: Christophe Detavernier, Ghent University, Christophe Vallee, LETI-LTM, France, Tero Pilvi, Picosun Oy</p>
8:00am	<p>INVITED: AA+AF-TuM1 Functional Materials using Atomic Layer Deposition for Emerging Display Applications, <i>Jin-Seong Park</i>, Hanyang University, Republic of Korea</p>	<p>INVITED: AA-TuM1 Designing of Surface and Interface of Electrodes for Highly-stable Li Ion Batteries, Li-S Batteries and Metal-Air Batteries, <i>Xueliang Sun</i>, University of Western Ontario, Canada</p>
8:15am	Invited talk continues.	Invited talk continues.
8:30am	<p>AA+AF-TuM3 Flexible Platinum Nanoparticle-based Piezoresistive Transducers Elaborated by Atomic Layer Deposition, <i>Etienne Puyoo, C. Malhaire, D. Thomas, R. Rafaël</i>, Institut des Nanotechnologies de Lyon, France; <i>M. R'Mili, A. Malchère, L. Roiban, S. Koneti, M. Bugnet</i>, MATEIS, France; <i>A. Sabac, M. Le Berre</i>, Institut des Nanotechnologies de Lyon, France</p>	<p>AA-TuM3 ALD Vanadium Oxides for 3D Thin-film Lithium Ion Batteries, <i>Felix Mattelaer</i>, Ghent University, Belgium; <i>K. Geryl, T. Dobbelaere, G. Rampelberg, J. Dendooven</i>, Ghent University; <i>C. Detavernier</i>, Ghent University, Belgium</p>
8:45am	<p>AA+AF-TuM4 Color Coating of Electronic Textiles via Control of Refractive Index by Atomic Layer Deposition, <i>Hyun Gu Kim, W.H. Kwon, H.B.R. Lee</i>, Incheon National University, Republic of Korea</p>	<p>AA-TuM4 PE-ALD of Transition Metal Phosphates as Lithium-Ion Battery Electrode Materials, <i>T. Dobbelaere, F. Mattelaer, J. Dendooven</i>, Ghent University, Belgium; <i>P. Vereecken</i>, Imec, Belgium; <i>Christophe Detavernier</i>, Ghent University, Belgium</p>
9:00am	<p>AA+AF-TuM5 Comprehensive Studies of Atomic Layer Deposited InGaO Thin Films using InCA-1, TMGa and H₂O₂ for Oxide Semiconductor Thin Film Transistor Applications, <i>Jiazhen Sheng</i>, Hanyang University, Republic of Korea; <i>B. Shong</i>, Chungnam National University, Republic of Korea; <i>J.-S. Park</i>, Hanyang University, Republic of Korea</p>	<p>AA-TuM5 Comparing Temporal and Spatial Atomic Layer Deposition for Enhanced Performance of Li Ion Battery Electrodes, <i>Alexander Yersak, A. Dameron</i>, University of Colorado - Boulder; <i>X. Li, Y. Yang</i>, Colorado School of Mines; <i>K. Hurst, R. Tenet</i>, National Renewable Energy Laboratory; <i>S.M. George</i>, University of Colorado – Boulder</p>
9:15am		<p>AA-TuM6 All-Solid-State Thin-Film Battery with a Novel Organic Cathode Material by Atomic/Molecular Layer Deposition, <i>Mikko Nisula, M. Karpinen</i>, Aalto University, Finland</p>
9:30am	<p>AA+AF-TuM7 Highly Sensitive VOCs Sensor Based on Atomic Layer Deposition of TiO₂ on Carbon Nanotubes, <i>Michela Sainato</i>, University of Illinois at Chicago; <i>R. Divan, L. Stan, Y. Liu</i>, Argonne National Laboratory; <i>I. Paprotny</i>, University of Illinois at Chicago</p>	<p>AA-TuM7 Atomic Layer Deposition of Hierarchical CNTs@FePO₄ Architecture as a 3D Electrode for Lithium-Ion and Sodium-Ion Batteries, <i>Jian Liu</i>, The University of British Columbia, Canada; <i>B. Wang, Q. Sun, R. Li, T.-K. Sham, X. Sun</i>, University of Western Ontario, Canada</p>
9:45am		<p>AA-TuM8 Unravelling The Role of ALD Al₂O₃ and TiO₂ Protective Coatings on Lithium-Ion Battery Electrodes., <i>Felix Mattelaer</i>, Ghent Univ., Belgium; <i>M. Kurttepel, University of Antwerp</i>; <i>S. Deng</i>, Ghent Univ., Belgium; <i>D. Cott, P. Vereecken</i>, IMEC, Belgium; <i>J. Dendooven</i>, Ghent Univ., Belgium; <i>S. Bals</i>, Univ. of Antwerp; <i>C. Detavernier</i>, Ghent Univ., Belgium</p>
10:00am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:15am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:30am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:45am	<p>AA+AF-TuM12 <i>In-situ</i> Real-time and <i>in-vacuo</i> Study of the Temperature Impact on the Al₂O₃ ALD Nucleation upon Pristine Monolayer Graphene, <i>Marcel Junige</i>, Technische Universität Dresden, Germany; <i>J. Kitzmann, C. Chavarin</i>, IHP GmbH, Leibniz-Institut für Innovative Mikroelektronik; <i>M. Geidel, J. Reif, M. Albert</i>, Technische Universität Dresden, Germany; <i>G. Lupina, C. Wenger</i>, IHP GmbH, Leibniz-Institut für Innovative Mikroelektronik, Germany; <i>J. Bartha</i>, Technische Universität Dresden, Germany</p>	<p>AA-TuM12 ALD Layer Opportunities for Reversible Bonding of Ultrathin Glass Substrates, <i>Messaoud Bedjaoui, S. Poulet</i>, LETI, France</p>
11:00am	<p>AA+AF-TuM13 Investigation of the Influence of Plasma Parameters During Aluminum Nitride Atomic Layer Epitaxy using Grazing Incidence Small Angle X-ray Scattering, <i>Virginia Anderson, N. Nepal, S. Johnson, D. Boris, S. Walton</i>, U.S. Naval Research Lab.; <i>Z. Robinson</i>, SUNY College at Brockport; <i>A. Kozen</i>, U.S. Naval Research Lab.; <i>A. Nath</i>, George Mason University; <i>S. Rosenberg</i>, U.S. Naval Research Lab.; <i>C. Wagenbach</i>, Boston University; <i>J. Hite</i>, U.S. Naval Research Lab.; <i>K. Ludwig</i>, Boston University; <i>C.R. Eddy, Jr.</i>, U.S. Naval Research Lab.</p>	<p>AA-TuM13 Atomic Layer Deposition and Precursor Development for Chemoresistive Gas Sensing Materials, <i>Rachel Wilson, C. Blackman, C. Carmalt</i>, University College London, UK</p>
11:15am	<p>AA+AF-TuM14 Studies of Surface Structure and Surface Chemistry During Plasma-Assisted Atomic Layer Epitaxial Growth of InN Semiconductor Thin Films on GaN Substrates, <i>Samantha Rosenberg</i>, U.S. Naval Research Laboratory; <i>D. Pennachio</i>, UCSB; <i>V. Anderson, N. Nepal</i>, U.S. Naval Research Laboratory; <i>C. Wagenbach</i>, Boston University, <i>A. Kozen</i>, U.S. Naval Research Laboratory; <i>Z. Robinson</i>, SUNY College at Brockport; <i>J. Logan, S. Choi</i>, UCSB; <i>J. Hite</i>, U.S. Naval Research Laboratory; <i>K. Ludwig</i>, Boston University; <i>C. Palmstrøm</i>, UCSB; <i>C.R. Eddy, Jr.</i>, U.S. Naval Research Laboratory</p>	<p>AA-TuM14 Physics with and Physics of Atomic Layer Deposited Nanofilms, <i>Neal Sullivan</i>, Arradance; <i>A. Lehmann</i>, Universitat Erlangen-Numberg; <i>A. Brandt</i>, University of Texas at Arlington</p>
11:30am	<p>AA+AF-TuM15 Plasma Gas Chemistry Influence on Growth of InN Films by Atomic Layer Epitaxy, <i>Neeraj Nepal, V. Anderson, S. Johnson, S. Rosenberg, A. Kozen</i>, U.S. Naval Research Laboratory; <i>C. Hoskin</i>, Boston University; <i>D. Meyer, B. Downey, J. Hite, V. Wheeler</i>, U.S. Naval Research Laboratory; <i>R. Zachary</i>, SUNY College at Brockport; <i>D. Boris, S. Walton</i>, U.S. Naval Research Laboratory; <i>K. Ludwig</i>, Boston University, USA; <i>C.R. Eddy, Jr.</i>, U.S. Naval Research Laboratory</p>	<p>AA-TuM15 Highly Resistive ALD Coatings for Microchannel Plates Operating at Cryogenic Temperatures, <i>Till Cremer, B. Adams, M. Aviles, J. Bond, C. Craven, M. Foley, A. Lyashenko, M. Minot, M. Popecki, M. Stochaj, W. Worstell</i>, Incom Inc.; <i>J. Elam, A. Mane</i>, Argonne National Laboratory; <i>O. Siegmund, C. Ertley</i>, University of California, Berkeley</p>
11:45am	<p>AA+AF-TuM16 Spectroscopic Ellipsometry of WO₃ Thin Films from ALD: <i>In-situ</i> Layer-by-Layer Growth Monitoring and <i>ex-situ</i> Optical Characterization, <i>Ufuk Kilic, D. Sekora, A. Mock, M. Schubert</i>, University of Nebraska Lincoln</p>	<p>AA-TuM16 Reactions on ALD TiO₂, ZnO, and Al₂O₃ Metal Oxides during Nucleation of UiO-66-NH₂ MOF Thin Films as Hydrolysis Catalysts for Chemical Warfare Agent Simulants., <i>Dennis Lee, J. Zhao, C. Oldham</i>, North Carolina State University; <i>G. Peterson</i>, Edgewood Chemical Biological Center; <i>G.N. Parsons</i>, North Carolina State University</p>

Tuesday Morning, July 18, 2017

	ALD Fundamentals Room Plaza E - Session AF1-TuM ALD Fundamentals: Precursors and Process Development (8:00-10:00 am)/Precursors and Mechanism (10:45am-12:00 pm) Moderators: Sean Barry, Carleton University, Canada, Simon Rushworth, EpiValence, UK, Markku Leskela, University of Helsinki, Finland, Ravi Kanjolia, EMPD Performance Materials	ALD Fundamentals Room Plaza D - Session AF2-TuM ALD Fundamentals: Theory & Mechanism (8:00-10: am)/Emerging Materials and Devices (10:45 am-12:00 pm) Moderators: Hyeongtag Jeon, Hanyang University, Harm Knoops, Oxford Instruments Plasma Technology, Iain Buchanan, Versum Materials, UK, Dustin Austin, Oregon State University
8:00am	INVITED: AF1-TuM1 Photo-assisted ALD of Oxides and Metals, <i>Ville Miikkulainen</i> , K. Väyrynen, University of Helsinki, Finland; V. Kilpi, Picosun Oy, Finland; K. Mizohata, J. Räisänen, M. Ritala, University of Helsinki, Finland	AF2-TuM1 Tuning Material Properties by Ion Energy Control during Remote Plasma-ALD on Planar and 3D Substrates, <i>Tahsin Faraz</i> , Eindhoven University of Technology, Netherlands; H. Knoops, Oxford Instruments Plasma Technology; M. Verheijen, C. van Helvoirt, S. Karwal, A. Sharma, Eindhoven University of Technology, Netherlands; D. Hausmann, J. Henri, Lam Research; A. Bol, M. Creatore, W.M.M. Kessels, Eindhoven University of Technology, Netherlands
8:15am	Invited talk continues.	AF2-TuM2 Stress Control of Plasma ALD Films Deposited at Low Temperature by Application of Substrate Biasing, <i>Thomas Miller</i> , Oxford Instruments Plasma Technology, UK; A. Kurek, A. O'Mahony, H. Knoops, O. Thomas, R. Gunn, Oxford Instruments Plasma Technology
8:30am	AF1-TuM3 Oxidation State Discrimination in the Atomic Layer Deposition of Vanadium Oxides, <i>Matthew Weimer</i> , I.S. Kim, P. Guo, Argonne National Laboratory; R. Schaller, Argonne National Laboratory, Northwestern University; A. Martinson, A. Hock, Argonne National Laboratory	AF2-TuM3 Benefits of an O ₂ Plasma in a Bi ₂ O ₃ ALD Process, <i>Matthias Müller</i> , K. Komander, C. Höhn, R. van de Krol, Helmholtz Zentrum Berlin, Germany; A. Bronneberg, Dutch Institute for Fundamental Energy Research, Netherlands
8:45am	AF1-TuM4 Controlled B Doping in ZnO Atomic Layer Deposition using Boric Acid in Methanol as the B Source, <i>Yan Zhang</i> , A. Mane, Argonne National Laboratory; J. Liu, O. Farha, Northwestern University; K.K. Kovi, Argonne National Laboratory; J. Hupp, Northwestern University; J. Elam, Argonne National Laboratory	AF2-TuM4 High Quality Thin Films Produced by Innovative PEALD Equipment with Microwave ECR Plasma, <i>Hirokichi Enami</i> , N. Mise, Hitachi High-Technologies Corp., Japan; H. Hamamura, T. Usui, Hitachi R&D Group; J. Kalliomaki, V. Kilpi, T. Malinen, Picosun Oy
9:00am	AF1-TuM5 Atomic Layer Deposition of Cobalt(II) Oxide/Hydroxide Thin Films, <i>Tomi Iivonen</i> , E. Tirkkonen, K. Mizohata, K. Meinander, M. Leskelä, University of Helsinki, Finland	AF2-TuM5 ALD of Aluminum Fluoride using Al(CH ₃) ₃ and SF ₆ Plasma, <i>Martijn Vos</i> , Eindhoven University of Technology, Netherlands; H. Knoops, Oxford Instruments Plasma Technology, UK; W.M.M. Kessels, A. Mackus, Eindhoven University of Technology, Netherlands
9:15am	AF1-TuM6 High Purity Indium Oxide Films Prepared by Modified ALD using Liquid Ethylcyclopentadienyl Indium, <i>Fumikazu Mizutani</i> , S. Higashi, Kojundo Chemical Laboratory Co.,Ltd., Japan; T. Nabatame, National Institute for Materials Science	AF2-TuM6 Ferroelectricity in Undoped ZrO ₂ Thin Films on Pt Electrode without Post-Annealing Treatment, <i>M.-J. Chen</i> , <i>Po-Hsien Cheng</i> , National Taiwan University, Taiwan
9:30am	AF1-TuM7 A New Scandium Precursor for the ALD of Scandium Oxide, <i>Jean-Sébastien Lehn</i> , C. Dezelah, D. Moser, R. Kanjolia, EMD Performance Materials	AF2-TuM7 Improving the Conductivity (<10 ⁻³ Ω cm) of HfN _x by Ion Energy Control during Plasma-assisted ALD, <i>Saurabh Karwal</i> , B. Karasulu, M. Verheijen, J. Niemelä, T. Faraz, W.M.M. Kessels, M. Creatore, Eindhoven University
9:45am	AF1-TuM8 ALD Y ₂ O ₃ Film Using Liquid Yttrium Precursor and Water, <i>Akihiro Nishida</i> , A. Yamashita, M. Hatase, T. Yoshino, M. Enzu, ADEKA Corporation, Japan	AF2-TuM8 Plasma Technology for Spatial ALD of Conductive Layers, <i>Yves Creyghton</i> , A. Illiberi, F. Roozeboom, Solliance/TNO, Netherlands
10:00am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:15am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:30am	Coffee Break & Exhibits	Coffee Break & Exhibits
10:45am	AF1-TuM12 Thermal ALD of Gold Thin Films, <i>M. Mäkelä</i> , T. Hatanpää, K. Mizohata, J. Räisänen, M. Leskelä, <i>Mikko Ritala</i> , University of Helsinki, Finland	AF2-TuM12 Atomic Layer Deposition of Lithium Titanate on Planar and 3D-Structured 200 mm Silicon Substrates, <i>Sascha Bänhardt</i> , S. Zybll, W. Weinreich, Fraunhofer IPMS, Germany; C. Hoßbach, V. Neumann, Technische Universität Dresden, Germany
11:00am	AF1-TuM13 Nucleation Behavior of Ru on SiO ₂ by Atomic Layer Deposition Using Cyclopentadienylethyl(dicarbonyl)Ruthenium and Oxygen, <i>Guo Liu</i> , EMD Performance Materials; C. Dezelah, EMD Performance Materials, USA; D. Moser, R. Kanjolia, EMD Performance Materials	AF2-TuM13 Nano-ceramic Composite Separator Modified by ALD for Lithium Ion Batteries of Improved Safety and Reliability, <i>Erik Østreng</i> , R. Ritasalo, S. Ek, Picosun Oy; R. Dominko, National Institute of Chemistry
11:15am	AF1-TuM14 Mechanistic Aspects of Ru ALD Based on Ru(DMBD)(CO) ₃ using Downstream Quadrupole Mass Spectrometry, <i>Zhengning Gao</i> , Washington University, St. Louis; R. Kanjolia, EMD Performance Materials; P. Banerjee, Washington University, St. Louis	AF2-TuM14 Physical and Electrical Characteristics of ALD Tin Disulfide Multilayer, <i>Juhyun Lee</i> , G. Ham, S. Shin, H. Kim, S. Lee, H. Choi, H. Jeon, Hanyang University, Republic of Korea
11:30am	AF1-TuM15 Atomic Layer Deposition for Rhenium Based Materials, <i>Jani Hämäläinen</i> , M. Mattinen, M. Vehkamäki, K. Mizohata, K. Meinander, J. Räisänen, M. Ritala, M. Leskelä, University of Helsinki, Finland	AF2-TuM15 PEALD Platinum Nano-island SET Fabrication and Electrical Characterization, <i>Daniel Thomas</i> , E. Puyoo, M. Le Berre, Institut des Nanotechnologies de Lyon, France; L. Militaru, S. Koneti, A. Malchère, L. Roiban, INSA de Lyon, France; A. Sabac, Institut des Nanotechnologies de Lyon, France; K. Ayadi, C. Chevalier, J. Grégoire, F. Calmon, B. Gautier, INSA de Lyon, France
11:45am	AF1-TuM16 Plasma-enhanced Atomic Layer Deposition of Silver using the Ag(fod)(PEt ₃)-precursor and NH ₃ -plasma, <i>Matthias Minjauw</i> , E. Solano, Ghent University, Belgium; S.P. Sree, KU Leuven, Belgium; R. Asapu, University of Antwerp, Belgium; M. Van Daele, R.K. Ramachandran, Ghent University, Belgium; S. Verbruggen, S. Lenaerts, University of Antwerp, Belgium; J. Martens, KU Leuven, Belgium; C. Detavernier, J. Dendooven, Ghent University, Belgium	AF2-TuM16 Thermal Annealing Effects on Electron Emission Properties of ALD MgO, <i>Violeta Prodanovic</i> , H.W. Chan, Delft University of Technology, Netherlands; A. Mane, J. Elam, Argonne National Laboratory, USA; L. Sarro, H. v.d. Graaf, Delft University of Technology, Netherlands

Tuesday Afternoon, July 18, 2017

	ALD Applications Room Plaza ABC - Session AA1-TuA Batteries II (1:30-3:30 pm)/Emerging Apps III (4:00-5:00 pm) Moderators: Ganesh Sundaram, Ultratech, Andy Sun, University of Western Ontario, Canada, Erik Østreng, Picosun Oy, Nicholas Strandwitz, Lehigh University,	ALD Applications Room Plaza E - Session AA2-TuA ULSI, High-k and III-V I (1:30-3:30 pm)/ULSI, High-k and III-V II (4:00-5:00 pm) Moderators: Scott Clendenning, Intel, USA, Elton Graungard, Boise State University, Sven Van Elshocht, IMEC
1:30pm	AA1-TuA1 Highly Improved Performance of High Voltage ALD Coated Cathodes Showing Minimal Capacity/Voltage Fade at 4.8V, Lamuel David , D. Mohanty, Oak Ridge National Laboratory; K. Dahlberg, Xalt Energy LLC; D. King, Forge Nano (a PneumatiCoat Company); D. Wood III, Oak Ridge National Laboratory	INVITED: AA2-TuA1 ALD as an Enabler of Self-aligned Multiple Patterning Schemes, Sven Van Elshocht , Z. Tao, J.-L. Everaert, S. Demuyne, E. Altamirano-Sanchez, IMEC, Belgium
1:45pm	AA1-TuA2 Physical and Electrochemical Effects of Post-deposition Annealing on Atomic Layer Deposited Al ₂ O ₃ Coatings on LiNi _{0.5} Mn _{0.3} Co _{0.2} O ₂ , David Jackson , T. Kuech, University of Wisconsin-Madison	Invited talk continues.
2:00pm	AA1-TuA3 Novel Mechanism of Atomic Layer Deposition Al ₂ O ₃ on LiMn ₂ O ₄ for High Capacity Lithium-ion Batteries, Lin Chen , Illinois Institute of Technology; Argonne National Laboratory; R. Warburton, Purdue University; K.-S. Chen, Northwestern University; J. Libera, Argonne National Laboratory; M. Hersam, Northwestern University; J. Greeley, Purdue University; J. Elam, Argonne National Laboratory, USA	AA2-TuA3 Thin Film Dopant Sources Grown by PALD for Shallow Semiconductor Doping, Bodo Kalkofen , M. Silinskas, Otto von Guericke University, Germany; M. Lisker, IHP GmbH, Leibniz-Institut für Innovative Mikroelektronik; Y.S. Kim, Lam Research Corporation
2:15pm	AA1-TuA4 Atomic Layer Deposition of Superionic Solid-State Electrolytes for Lithium Batteries, Xiangbo Meng , University of Arkansas; J. Connell, P. Lopes, J. Libera, Argonne National Laboratory, USA; K. Zavadil, Sandia National Laboratory; J. Zhang, Pacific Northwest National Laboratory; J. Elam, Argonne National Laboratory, USA	AA2-TuA4 Effective Work-Function of PEALD Metal Nitrides and its Tuning by Co-deposition, Ekaterina Zoubenko , I. Krylov, B. Pokroy, M. Eizenberg, Technion - Israel Institute of Technology, Israel
2:30pm	AA1-TuA5 Cubic Garnet Li ₇ La ₃ Zr ₂ O ₁₂ Solid Lithium Electrolyte by ALD, Eric Kazyak , K. Wood, K.-H. Chen, A. Bielinski, A. Davis, T. Thompson, J. Sakamoto, N. Dasgupta, University of Michigan	AA2-TuA5 Surface Morphology, Crystallinity and Electrical Properties of Some Rare-earth Oxide ALD Films, Satu Ek , Picosun Oy, Finland; R. Ritasalo, T. Sarnet, Picosun Oy; J. Kalliomaki, Picosun Oy, Finland; E. Østreng, Picosun Oy; S. Vangelista, A. Lamperti, S. Spiga, CNR-IMM - MDM Laboratory; R. Piagge, G. Ghidini, STMicroelectronics
2:45pm	AA1-TuA6 Improving Interfacial Stability of Sulfide-Based Lithium-Ion-Conducting Solid Electrolytes with ALD, Jasmine Wallas , A. Heist, S. Lee, S.M. George, University of Colorado - Boulder	AA2-TuA6 Atomic Layer Deposition of High-k Oxide Films from La(NO ₃) ₃ ·6H ₂ O Solution Oxidant, In-Sung Park , S.Y. Kim, T. Lee, S. Seong, Y.C. Jung, J. Ahn, Hanyang University, Republic of Korea; J.-K. An, J.-Y. Yun, Korea Research Institute of Standard and Science (KRISS), Korea
3:00pm	AA1-TuA7 Atomic Layer Deposition of Solid-State Electrolytes for All-Solid-State Lithium Ion Batteries, Biqiong Wang , J. Liu, Y. Zhao, A. Lushington, R. Li, T.-K. Sham, X. Sun, University of Western Ontario, Canada	AA2-TuA7 Great Enhancement of Dielectric Constant via High Temperature Annealing ALD Bi-layered Oxides, Keng-Yung Lin , L.B. Young, C.-K. Cheng, Y.-H. Lin, H.-W. Wan, National Taiwan University, Republic of China; R.-F. Cai, S.-C. Lo, Industrial Technology Research Institute, Republic of China; M. Hong, National Taiwan University, Republic of China; J. Kwo, National Tsing Hua University, Republic of China
3:15pm	AA1-TuA8 Highly Stable WS ₂ Thin Film Anode Grown by Plasma-enhanced Atomic Layer Deposition (PEALD) for Na-ion Battery, Dip Nandi , Yeungnam University, Republic of Korea; S. Yeo, Yonsei University, Republic of Korea; M.Z. Ansari, Yeungnam University, Republic of Korea; H. Kim, Yonsei University, Republic of Korea; T. Song, S.-H. Kim, Yeungnam University, Republic of Korea	AA2-TuA8 Atomic Layer Deposition of Novel Interface Layers on III-V Channel Devices, F. Tang , Xiaoqiang Jiang , ASM; Q. Xie, ASM, Belgium; M. Givens, ASM; J. Maes, ASM, Belgium; S. Sioncke, I. Tsvetan, L. Nyns, D. Lin, N. Collaert, IMEC, Belgium
3:30pm	Coffee Break	Coffee Break
3:45pm	Coffee Break	Coffee Break
4:00pm	AA1-TuA11 ALD-Tin Oxide as Impermeable Electron Extraction Layers for Temperature Stable Roll-to-Roll-Compatible Perovskite Solar Cells, Lukas Hoffmann , University of Wuppertal, Germany; K.O. Brinkmann, University of Wuppertal; J. Zhao, T. Hu, Nanchang University, China; D. Schlamm, J. Malerczyk, T. Becker, D. Theirich, University of Wuppertal; S. Olthof, K. Meerholz, University of Cologne; H. Gargouri, Sentech Instruments, Germany; B. Cheng, Y. Chen, Nanchang University, China; T. Riedl, University of Wuppertal	AA2-TuA11 ZnO ₂ as a High-k Gate Dielectric for Enhancement-mode AlGaIn/GaN MOS HEMTs, Charles R. Eddy, Jr. , V. Wheeler, U.S. Naval Research Laboratory; D. Shahin, University of Maryland; T. Anderson, M. Tadjer, A. Koehler, K. Hobart, U.S. Naval Research Laboratory; A. Christou, University of Maryland; F. Kub, U.S. Naval Research Laboratory
4:15pm	AA1-TuA12 Nano-Structured Ceramic ALD Coatings to Stabilize SiC Against Reaction in High Temperature Steam, Amanda Hoskins , A. Coffey, C. Musgrave, A. Weimer, University of Colorado - Boulder	AA2-TuA12 Investigation of High-quality Silicon Nitride (SiN _x) Thin Film Grown by Low-temperature Hollow Cathode Plasma-Enhanced ALD as a Gate Dielectric for AlGaIn/GaN MIS-HEMTs, Xin Meng , Y.-C. Byun, J.-G. Lee, H. Kim, J. Lee, A. Lucero, L. Cheng, J. Kim, University of Texas at Dallas
4:30pm	AA1-TuA13 Mechanical, Physical, and Electrical Properties of Plasma-Enhanced Atomic Layer Deposition of TiVN, Mark Sowa , Ultratech; N. Strandwitz, L. Ju, Lehigh University; A. Kozen, U.S. Naval Research Laboratory; B. Krack, Lehigh University	AA2-TuA13 Atomic Layer Annealing for Atomic Layer Epitaxy of AlN Ultrathin Films at a Low Growth Temperature, Wei-Hao Lee , H.-Y. Shih, W.-C. Kao, National Taiwan University, Taiwan; Y.-C. Chuang, National Taiwan University, Taiwan; R.-M. Lin, Chang Gung University, Taiwan; H.-C. Lin, National Taiwan University, Taiwan; M. Shiojiri, Kyoto Institute of Technology, Japan
4:45pm	CLOSING REMARKS	

Tuesday Afternoon, July 18, 2017

<p>ALD for Manufacturing Room Plaza F - Session AM+EM-TuA ALD for Manufacturing (1:30-3:30 pm)/MLD II (4:00-5:00 pm) Moderators: Maarit Karppinen, Aalto University, Paul Ma, Applied Materials, Mike McSwiney, Intel, USA, Sean Smith, Sandia National Laboratories</p>	
1:30pm	AM+EM-TuA1 Large Area Spatial Atmospheric ALD, Corné Frijters , F.J. van den Bruele, F. Grob, A. Illiberi, P. Poodt, TNO/Holst Center, Netherlands
1:45pm	AM+EM-TuA2 Low Resistivity Titanium Nitride ALD: Low Temperature Enabled by the Use of Ultra-High Purity Hydrazine, Daniel Alvarez , J. Spiegelman, K. Andachi, R. Holmes, RASIRC; A. Kummel, S. Wolf, M. Kavrik, UCSD; M. Raynor, H. Shimizu, Matheson Tri-Gas
2:00pm	AM+EM-TuA3 Modeling Ampoule Performance for Low Vapor Pressure Precursor Delivery, James Maslar , W. Kimes, B. Sperling, National Institute of Standards and Technology; W. Kimmerle, K. Kimmerle, NSI
2:15pm	AM+EM-TuA4 An innovative chamber designed for ALD, PECVD and FAST [®] SiO ₂ processes: towards high throughput and conformal deposition at low temperature, Laetitia Bonnet , F. Pierrat, J. Vitiello, KOBUS, France
2:30pm	AM+EM-TuA5 Growth Rates During Silicon Spatial Electron-Enhanced Atomic Layer Deposition: Role of Dangling Bond Lifetime, Andrew Cavanagh , S.M. George, University of Colorado
2:45pm	AM+EM-TuA6 Spatial Atomic Layer Deposition of Gate Encapsulation Silicon Nitride for Self-Aligned Contact Enablement, Jiehui Shu , S. Mehta, J. Chang, X. Qiu, J. Liu, GLOBALFOUNDRIES U.S. Inc.
3:00pm	AM+EM-TuA7 Fast Atomic Layer Deposition Process for Thin-Film Encapsulation of Organic Light-Emitting Diodes, Tony Maindron , C. Lopez, S. Meunier Della-Gatta, M. Tournaire, B. Caulfield, M. Gontier, CEA-Leti, France; J.C.S. Kools, L. Baril, Encapsulix, France
3:15pm	AM+EM-TuA8 Flexible Functional Devices at Mass Production Level with the FLEx R2R sALD Platform, Diederick Spee , W. Boonen, E. Clerckx, D. Borsas, Meyer Burger B.V., Netherlands
3:30pm	Coffee Break
3:45pm	Coffee Break
4:00pm	AM+EM-TuA11 All-Organic Spatial MLD: Troubleshooting Deposition onto Porous Substrates, Daniel Higgs , ALD NanoSolutions, Inc.; Y. Wang, GE; E. Chan, National Institute of Standards and Technology; H. Wang, GE; C. Stafford, National Institute of Standards and Technology; S.M. George, University of Colorado - Boulder
4:15pm	AM+EM-TuA12 Graphene Oxide Functionalization by Molecular Layer Deposition, Mercedes Vila Juarez , Coating Technologies S.L., Spain; A. Jaggernauth, M.A. Neto, CICECO, University of Aveiro; M.J. Hortiguela, G. Gonçalves, M. Singh, TEMA-NRD, University of Aveiro, Portugal; F. Oliveira, R. Silva, CICECO, University of Aveiro
4:30pm	AM+EM-TuA13 Contrast Enhancement of Biological Nanoporous Materials with Zinc Oxide Infiltration for Electron and X-ray Nanoscale Microscopy, Leonidas Ocola , Argonne National Laboratory; V. Sampathkumar, University of Chicago; N. Kasthuri, R. Winarski, Argonne National Laboratory