D. Thin Film Process Technology 분과

2021년 1월 25일(월), 09:00-10:30 / Room A

▶ [MA1-D] Ferroelectric Films Ⅰ

MA1-D-1 **09:00-09:15**	**고농도 P 도핑 Si 박막 표면에서 엑스선 광전자 분광법을 이용한 전기적으로 활성화 된 P 원자의 화학적 결합 특성 분석** 류화연, 신현수, 고대홍 *연세대학교 신소재공학과*
MA1-D-2 **09:15-09:30**	**Investigation on Interfacial Charge Compensation of HZO-based MFIS Capacitors for Enhanced Memory Window** Yong Bin Lee[1,2], Hyeon Woo Park[1,2], Seung Dam Hyun[1,2], Beom Yong Kim[1,2], Suk Hyun Lee[1,2], Minsik Oh[1,2], Seung Kyu Ryu[1,2], In Soo Lee[1,2], Seung Ryong Byun[1,2], Soo Jin Jo[1,2], Do Sup Shim[1,2], and Cheol Seong Hwang[1,2] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*
MA1-D-3 **09:30-09:45**	**Effect of Defects on Ferroelectricity in Hafnia Based Thin Films** Dong Hyun Lee, Kun Yang, Ju Yong Park, and Min Hyuk Park *School of Materials Science and Engineering, Pusan National University*
MA1-D-4 **09:45-10:00**	**Ferroelectric Al-doped HfO_2 Thin Film Transistors for Analog Synaptic Device** Duho Kim, Boncheol Ku, Tae Hun Kim, and Changhwan Choi *Division of Materials Science & Engineering, Hanyang University*
MA1-D-5 **10:00-10:15**	**Investigation on Ferroelectric Polarization Switching Kinetics of Al-doped HfO2 Thin Films Deposited with ALD Using H_2O as Oxygen Source** Jin-Ju Kim and Sung-Min Yoon *Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University*
MA1-D-6 **10:15-10:30**	**Ferroelectric Properties of $Hf_{1-x}Zr_xO_2$ Thin Films Deposited by Atomic Layer Deposition Using Cyclopentadienyl Cocktail-precursor Without Annealing Process** Hyo-Bae Kim[1], Moonyoung Jung[2], Seung Won Lee[1], Dongseok Suh[2], and Ji-Hoon Ahn[1] *[1]Department of Materials Science and Chemical Engineering, Hanyang University, [2]Department of Energy Science, Sungkyunkwan University*

J. Nano-Science & Technology 분과

2021년 1월 25일(월), 09:00-10:30 / Room B

▶ [MB1-J] Nanofabrication Techninque

MB1-J-1 **09:00-09:30**	**[초청]** **Non-planar Near-field Photolithography with an Elastomeric Photomask** Wooyoung Shim *Department of Materials Science and Engineering, Yonsei University*
MB1-J-2 **09:30-09:45**	**Polarizing and Depolarizing Charge Injection through a Thin Dielectric Layer in a Ferroelectric-dielectric Bilayer** Hyeon Woo Park[1,2], Seung Dam Hyun[1,2], Yong Bin Lee[1,2], In Soo Lee, Minsik Oh[1,2], Beom Yong Kim[1,2], Suk Hyun Lee[1,2], Seung Gyu Ryoo[1,2], and Cheol Seong Hwang[1,2] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*
MB1-J-3 **09:45-10:00**	**Metal Doping on ZIF-8/Nano-porous Carbon Paper for Enhancing the CO_2 Reduction Performance** Jin Hyuk Cho and Soo Young Kim *School of Materials Science and Engineering, Korea University*
MB1-J-4 **10:00-10:15**	**All-solution-processed Shape-Versatile Organic Thermoelectrics on a Flexible Substrates** Seongkwon Hwang[1,2,3], Inho Jeong[1], Jeonghun Kwak[2,3], and Seungjun Chung[1] *[1]Soft Hybrid Materials Research Center, KIST, [2]Department of Electrical and Computer Engineering, Seoul National University, [3]Inter-university Semiconductor Research Center, Seoul National University*
MB1-J-5 **10:15-10:30**	**Guidelines for Carbon Nanotube Transistors with Underlap and Overlap Structures** Jueun Kim[1], Yongwoo Lee[1], Ju Won Jeon[1], Dae Hwan Kim[1], Dong Myong Kim[1], Min-Ho Kang[2], and Sung-Jin Choi[1] *[1]School of Electrical Engineering, Kookmin University, [2]Department of Nano-process, NNFC*

O. System LSI Design 분과

2021년 1월 25일(월), 09:00-10:30 / Room C

▶ [MC1-O] System LSI Design I

MC1-O-1 **09:00-09:15**	**클리핑 효과를 고려한 고속의 이진화된 신경망 학습** 류창호, 이형석, 김태환 *한국항공대학교 항공전자정보공학부*
MC1-O-2 **09:15-09:30**	**Inference of the Single Spike Temporal-coded Data in Spiking Neural Networks** Seongbin Oh, Dongseok Kwon, Jiseong Im, Joon Hwang, Byung-Gook Park, and Jong-Ho Lee *Department of Electrical and Computer Engineering, Seoul National University*
MC1-O-3 **09:30-09:45**	**V_{th} Effect of TFT-Type Flash Devices on Accuracy in Neuromorphic System Capable of On-Chip Training** Dongseok Kwon[1,2], Soochang Lee[1,2], Seongbin Oh[1,2], Chul-Heung Kim[1,2], and Jong-Ho Lee[1,2] *[1]Department of Electrical and Computer Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*
MC1-O-4 **09:45-10:00**	**Design of CMOS Image Sensor for Edge Detection** Soyeon Lee, Minkyu Song, and Soo Youn Kim *Department of Semiconductor Science, Dongguk University*
MC1-O-5 **10:00-10:30**	**[초청]** **TBA** 김지훈 *이화여자대학교*

S. Chip Design Contest 분과

2021년 1월 25일(월), 09:00-10:30 / Room D

▶ [MD1-S] Chip Design Contest

MD1-S-1 **09:00-09:15**	**Low Power ADC Design for Mixed Signal Convolutional Layer Accelerator** JungYeon Lee, DaeHu Park, Malik-Summair Asghar, and HyungWon kim *Department of Electronic Engineering, Chungbuk National University*
MD1-S-2 **09:15-09:30**	**Secure RISC-V SoC for Neural Processing System** Sunyoung Park[1], Hyunji Kim[1], Sung Yeon Kim[2], Wooseok Byun[3], and Ji-Hoon Kim[1] *[1]Department of Electronic and Electrical Engineering, Ewha Womans University, [2]Synopsys Korea, [3]Information and Electronics Research Institute, KAIST*
MD1-S-3 **09:30-09:45**	**A High-Linearity Capacitively Coupled Continuous-Time Delta-Sigma Modulator for Sensor Readout ICs** Chaegang Lim, Yohan Choi, and Chulwoo Kim *Department of Electrical Engineering, Korea University*
MD1-S-4 **09:45-10:00**	**Fully Differential Class-D Audio Amplifier with Bridge-Tied Load Half-Side Switching Mode Achieving Low Standby Quiescent Current of 660μA** Ji-Hun Lee and Hyun-Sik Kim *School of Electrical Engineering, KAIST*
MD1-S-5 **10:00-10:15**	**A Class-AB OTA with Slew-Rate Enhancement Technique for High speed Discrete-Time Delta-Sigma Modulator** Seokjae Song and Jeongjin Roh *Division of Electrical Engineering, Hanyang University*
MD1-S-6 **10:15-10:30**	**Time-interleaved Noise-shaping SAR ADC with Redundancy Error Correction Technique** Kihyun Kim[1], Younggyun Oh[2], Seungjun Lee[1], and Hyungil Chae[1] *[1]Department of Electrical Engineering, Konkuk University, [2]Department of Electrical Engineering, Kookmin University*

D. Thin Film Process Technology 분과

2021년 1월 25일(월), 10:45-12:15 / Room A

▶ [MA2-D] Ferroelectric Films Ⅱ

MA2-D-1 **10:45-11:00**	**Pulsed I-V Method for Characterizations on Genuine Ferroelectric FieldEffects of the MFMIS-FETs Using Hf-Zr-O Gate Insulators** Tae-Hyun Ryu, Dae-Hong Min, and Sung-Min Yoon *Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University*
MA2-D-2 **11:00-11:15**	**The Effect of Bottom Electrodes on Ferroelectricity of ALD-$Hf_{0.5}Zr_{0.5}O_2$ Films** Namhun Kim[1,2], Jaidah Mohan[1], Yong Chan Jung[1], Heber Hernandez-Arriaga[1], Kihyun Kim[1,2], Hye-Won Kim[2], Si Joon Kim[3], Rino Choi[2], and Jiyoung Kim[1] *[1]Department of Materials Science and Engineering, The University of Texas at Dallas, [2]Department of Material Science and Engineering, Inha University, [3]Department of Electrical and Electronics Engineering, Kangwon National University*
MA2-D-3 **11:15-11:30**	**Defect Engineering을 통한 TiN/$H_{0.5}Z_{0.5}O_2$/TiN 커패시터의 Wake-up Effect와 강유전성 개선** Hyungwoo Kim[1,2], Alireza Kashir[1,2], Seungyeol Oh[1,2], and Hyunsang Hwang[1,2] *[1]Center for Single Atom-based Semiconductor Device, POSTECH, [2]Department of Materials Science and Engineering, POSTECH*
MA2-D-4 **11:30-11:45**	**Seed Layer Effect of HZO Nanolaminate Structure on Tungsten Electrode** Seung-Min Han[1,2], Dae-Hwan Ahn[1], Woo-Young Choi[2], and Jae-Hoon Han[1] *[1]Center for Opto-Electronic Materials and Devices, KIST, [2]Department of Electrical and Electronic Engineering, Yonsei University*
MA2-D-5 **11:45-12:00**	**Laser Drilling Via Process for 3-D Flexible Integrated Circuits** Suwon Seong, Seongmin Park, Jueun Kim, and Yoonyoung Chung *Department of Electrical Engineering, POSTECH*
MA2-D-6 **12:00-12:15**	**Study of Ferroelectric Characteristics of $Hf_{0.5}Zr_{0.5}O_2$ Thin Films Grown on Sputtered or Atomic-layer Deposited TiN Bottom Electrodes** Beom Yong Kim[1,2,3], Hyeon Woo Park[1,2], Seung Dam Hyun[1,2], Yong Bin Lee[1,2], Suk Hyun Lee[1,2], Minsik Oh[1,2], Seung Kyu Ryu[1,2], In Soo Lee[1,2], Seung Yong Byun[1,2], Soo Jin Jo[1,2], Do Sup Shim[1,2], and Cheol Seong Hwang[1,2] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University, [3]R&D Division, SK Hynix Inc.*

J. Nano-Science & Technology 분과

2021년 1월 25일(월), 10:45-12:15 / Room B

▶ [MB2-J] Functional Electronic Materials

MB2-J-1 **10:45-11:15**	**[초청]** **Ultra-flexible Self-powered Electronic Devices for Bio-medical Applications** Sungjun Park *Department of Electronic Engineering, Ajou University*
MB2-J-2 **11:15-11:30**	**Low-Temperature Crystallization of Solution-Processed Vanadium Dioxide Films via Photocombustion on Flexible Substrates with Phase-Transition Reliability** Won-June Lee, Yong-Ryun Jo, Bong-Joong Kim, and Myung-Han Yoon *GIST*
MB2-J-3 **11:30-11:45**	**Asymmetric Optical Camouflage: Tunable Reflective Color Accompanied by the Optical Janus Effect** Eui-Sang Yu[1], Taehyun Kim[1], Young-Gyu Bae[2], Jongsu Lee[1], In Soo Kim[3], Seok Chung[4], Seung-Yeol Lee[2], and Yong-Sang Ryu[1] *[1]Sensor System Research Center, KIST, [2]School of Electronics and Engineering, Kyungpook National University, [3]Nanophotonics Research Center, KIST, [4]School of Electronics and Engineering, Korea University*
MB2-J-4 **11:45-12:00**	**Terahertz Emission from Ultrafast Spin-to-charge Conversion of Topological Insulator Bi2Se3** Hanbum Park[1], Kwangsik Jeong[1], InHee Maeng[2], Chul Kang[3], and Mann-Ho Cho[1] *[1]Department of Physics, Yonsei University, [2]YUHS-KRIBB, Medical Convergence Research Institute, College of Medicine, Yonsei University, [3]Advanced Photonics Research Institute, GIST*
MB2-J-5 **12:00-12:15**	**Rapid Thermal Annealed Carbon Nanotube Network Transistors for Physical Unclonable Function Applications** Yongwoo Lee[1], Ju Won Jeon[1], Jueun Kim[1], Dae Hwan Kim[1], Dong Myong Kim[1], Min-Ho Kang[2], and Sung-Jin Choi[1] *[1]School of Electrical Engineering, Kookmin University, [2]Department of Nano-process, NNFC*

O. System LSI Design 분과

2021년 1월 25일(월), 10:45-12:15 / Room C

▶ [MC2-O] System LSI Design II

MC2-O-1 **10:45-11:00**	**FPGA에 구현한 링 오실레이터 기반의 실 난수 발생기의 구조 분석** 최소연, 유호영 *충남대학교 전자공학과*
MC2-O-2 **11:00-11:15**	**On-the-Fly LUT 기반 BDS B1C 코드 생성기** 박지운, 유호영 *충남대학교 전자공학과*
MC2-O-3 **11:15-11:45**	**[초청]** **Co-Designing Architectures, Algorithms, and Memory Systems for Deep Learning Hardware Accelerators** Hyun Kim *Electrical and Information Engineering, Seoul National University of Science and Technology*
MC2-O-4 **11:45-12:15**	**[초청]** **TBA** 최웅 *숙명여자대학교*

N. VLSI CAD 분과

2021년 1월 25일(월), 10:45-12:15 / Room D

▶ [MD2-N] Design Automation and Optimization

MD2-N-1 **10:45-11:15**	**[초청]** **Circuit Timing Optimization through Selective Use of Airgap IMD** Daijoon Hyun *Cheongju University*
MD2-N-2 **11:15-11:30**	**A GAAFET Library Development at 3nm Node** Tae Hak Kim[1] and Taigon Song[1,2] *[1]School of Electronic and Electrical Engineering, Kyungpook National University, [2]School of Electronics Engineering, Kyungpook National University*
MD2-N-3 **11:30-11:45**	**Artificial Netlist Generator for Machine Learning Applications in EDA** Daeyeon Kim, Kyungjun Min, and Seokhyeong Kang *POSTECH*
MD2-N-4 **11:45-12:00**	**Low Power Spiking Neural Network (SNN) Hardware with Prediction Scheme for Embedded Environments** Jeonggyu Yang[1] and Taigon Song[1,2] *[1]School of Electronic and Electrical Engineering, Kyungpook National University, [2]School of Electronics Engineering, Kyungpook National University*
MD2-N-5 **12:00-12:15**	**Performance Improvement of Deep-learning HW Using Bit-Level Sparsity** Seunggyu Lee, Eunji Kwon, Yesung Kang, and Seokhyeong Kang *POSTECH*

D. Thin Film Process Technology 분과

2021년 1월 27일(수), 09:00-10:30 / Room A

▶ [WA1-D] Metallic Films

WA1-D-1 **09:00-09:15**	**Controlled Growth Saturation Behavior of Ultrathin Ru Film Using Electric Field/Potential Assisted Atomic Layer Deposition (EA-ALD)** Yoon Jeong Kim, Ji Won Han, and Tae Joo Park *Department of Materials Science and Chemical Engineering, Hanyang University*
WA1-D-2 **09:15-09:30**	**Atomic Layer Deposition of Metal Thin Film Using Discrete Feeding Method (DFM) and Electric Field/Potential Assisted-Atomic Layer Deposition (EA-ALD)** Ji Won Han, Hyun Soo Jin, Yoon Jung Kim, and Tae Joo Park *Department of Materials Science and Chemical Engineering, Hanyang University*
WA1-D-3 **09:30-09:45**	**ALD TaAlN Metal Gate Using $TaCl_5$ and TMA Precursors** Moonsuk Choi, Juhyeon Lee, Minhyuk Kim, Wei Nan Jin, Seon Woong Jung, and Changhwan Choi *Division of Materials Science and Engineering, Hanyang University*
WA1-D-4 **09:45-10:00**	**Co Liner Impact on Microstructure of Cu(Mn) Alloy Interconnects** Byeong Hwa Jeong[1,3], Seung Han Lee[3], Sang Ho Lee[3], and Geun Young Yeom[1,2] *[1]School of Advanced Materials Science and Engineering, Sungkyunkwan University, [2]SKKU Advanced Institute of Nano Technology (SAINT), Sungkyunkwan University, [3]Korea Institute for Super Materials, ULVAC KOREA, Ltd.*
WA1-D-5 **10:00-10:15**	**Low-resistivity Molybdenum Nitride Thin Films Deposited by Atomic Layer Deposition Using a New Precursor** Min-Ji Ha, Jeong-Hun Choi, and Ji-Hoon Ahn *Department of Materials Science and Chemical Engineering, Hanyang University*
WA1-D-6 **10:15-10:30**	**Enhanced Selectivity of Atomic Layer Deposited Ru Thin Films through the Discrete Feeding of Aminosilane Inhibitor Molecules** Jeong-Min Lee, Jinseon Lee, Ji Won Han, Tae Joo Park, and Woo-Hee Kim *Department of Materials Science and Chemical Engineering, Hanyang University*

J. Nano-Science & Technology 분과

2021년 1월 27일(수), 09:00-10:30 / Room B

▶ [WB1-J] Hybrid Perovskite Materials

WB1-J-1 **09:00-09:30**	**[초청]** **Highly Efficient Perovskite/Si Tandem Solar Cells** Ik Jae Park[1,2], Su Geun Ji[1], Jae Hyun Park[1], and Jin Young Kim[1] *[1]Deparment of Materials Science and Engineering, Seoul National University, [2]Sookmyung Women's University*
WB1-J-2 **09:30-09:45**	**Structural Evolution and Optical Characterization of Mechanochemically Synthesized Cesium Lead Halide Perovskites** Kyeong-Yoon Baek[1], Woocheol Lee[1], Jeongjae Lee[2], Jonghoon Lee[1], Heebeom Ahn[1], Junwoo Kim[1], Jaeyoung Kim[1], Keehoon Kang[1], and Takhee Lee[1] *[1]Department of Physics and Astronomy, Seoul National University, [2]School of Earth and Environmental Sciences, Seoul National University*
WB1-J-3 **09:45-10:00**	**FACsPbI$_3$ Perovskite Applied to Perovskite Solar Cells and Memristors** Do Yeon Heo and Soo Young Kim *Department of Materials Science and Engineering, Korea University*
WB1-J-4 **10:00-10:15**	**Current Noise Analysis on MAPbI$_3$ Perovskite Resistive Switching Memory** Heebeom Ahn, Keehoon Kang, Woocheol Lee, Jae-Keun Kim, Junwoo Kim, Jonghoon Lee, Kyeong-Yoon Baek, and Takhee Lee *Department of Physics and Astronomy, Seoul National University*
WB1-J-5 **10:15-10:30**	**Atomistic Mechanism of MoS$_2$ Oxidation Induced by Reactive Superoxide and Ozone Treatment: A First-principles Study** Min Jong Noh[1], Muhammad Ejaz Khan[2], and Yong-Hoon Kim[1] *[1]School of Electrical Engineering, KAIST, [2]Department of Computer Engineering, NUTECH*

E. Compound Semiconductors 분과

2021년 1월 27일(수), 09:00-10:30 / Room C

▶ [WC1-E] Compound Semiconductors I

WC1-E-1 **09:00-09:15**	**L_g = 19 nm $In_{0.8}Ga_{0.2}As$ Composite-Channel High-Electron Mobility Transistors with Record f_T = 738 GHz** Hyeon-Bhin Jo[1], Seung-Won Yun[1], Jun-Gyu Kim[1], Dae-Hyun Kim[1], Takuya Tsutsumi[2], Hiroki Sugiyama[2], and Hideaki Matsuzaki[2] *[1]School of Electronic and Electrical Engineering, Kyungpook National University, [2]NTT Device Technology Laboratories*
WC1-E-2 **09:15-09:30**	**High Breakdown Voltage and Low Current Dispersion in AlGaN/GaN HEMTs with High Quality AlN Buffer Layer** Jeong-Gil Kim[1], Chuyoung Cho[2], Eunjin Kim[1], Jae Seok Hwang[2], Kyung-Ho Park[2], and Jung-Hee Lee[1] *[1]School of Electronic and Electrical Engineering, Kyungpook national university [2]KANC*
WC1-E-3 **09:30-09:45**	**High-Frequency InGaAs-On-Insulator HEMTs for Monolithic 3D Integrated RF Applications** Jaeyong Jeong[1], Seong Kwang Kim[1], Jongmin Kim[3], Dae-Myeong Geum[1], Juyeong Park[2], Jae-Hyung Jang[2], and Sanghyeon Kim[1] *[1]School of Electrical Engineering, KAIST, [2]School of Electrical Engineering and Computer Science, GIST, [3]Division of Device Technology, KANC*
WC1-E-4 **09:45-10:00**	**Growth and Characterization of AlGaN/GaN/AlN Double-Hetero Structure High Electron Mobility Transistors Grown on SiC Substrate by HT-MOCVD** Minho Kim, Uiho Choi, Donghyeop Jung, Keono Kim, and Okhyun Nam *Department of Nano Optical Engineering, Korea Polytechnic University*
WC1-E-5 **10:00-10:15**	**High Performances of AlGaN/GaN MISHEMTs on Silicon with In-situ SiN Passivation Layer** Seung-Hyeon Kang, Jeong-Gil Kim, Quan Dai, Terirama Thingujam, Woo-Hyun Ahn, Eun-Jin Kim, and Jung-Hee Lee *School of Electronics Engineering, Kyungpook National University*
WC1-E-6 **10:15-10:30**	**Suppression of Short Channel Effect in GaN Vertical GAA for Low-voltage Application** Terirama Thingujam, Quan Dai, Woo-Hyun Ahn, Seung-Hyeon Kang, and Jung-Hee Lee *School of Electrical and Electronics Engineering, Kyungpook National University*

G. Device & Process Modeling, Simulation and Reliability 분과

2021년 1월 27일(수), 09:00-10:30 / Room D

▶ [WD1-G] DTCO and Memory Devices

WD1-G-1 **09:00-09:30**	**[초청]** **Toward the Material-Device-circuit Co-design of the Oxide Semiconductor-based Artificial Intelligence: from Transistor, Memory, and Sensor to Modeling, Simulation, and Reliability** Dae Hwan Kim *School of Electrical Engineering, Kookmin University*
WD1-G-2 **09:30-09:45**	**Design Optimization of FeFET-based TCAM Cell Using Compact Model Combining Ferroelectric Switching and Conventional MOSFETs** Boram Yi[1], Tae Woo Oh[2], Seong-Ook Jung[2], Sanghun Jeon[3], and Ji-Woon Yang[1] *[1]Department of Electronic and Information Engineering, Korea University, [2]School of Electrical and Electronic Enginnering, Yonsei University, [3]School of Electrical Engineering, KAIST*
WD1-G-3 **09:45-10:00**	**Novel Trap Profiling in Nitride Layer Using Space Program for 3-D NAND Flash Memory** Jounghun Park, GilSang Yoon, Jaeseok Jin, DongHyun Go, and Jeong-Soo Lee *Department of Electrical Engineering, POSTECH*
WD1-G-4 **10:00-10:15**	**A Finite Element Simulation of a Full Switching Cycle in Resistive Memory** Dongmyung Jung and Yongwoo Kwon *Department of Materials Science and Engineering, Hongik University*
WD1-G-5 **10:15-10:30**	**Investigation of Trap Profiles of Tunneling and Blocking Layers after P/E Cycling Stress in 3-D VNAND Flash Memory** Gilsang Yoon, DongHyun Go, Jaeseok Jin, Jounghun Park, and Jeong-Soo Lee *Department of Electrical Engineering, POSTECH*

D. Thin Film Process Technology 분과

2021년 1월 27일(수), 10:45-12:15 / Room A

▶ [WA2-D] Thin Film Process I

WA2-D-1 **10:45-11:00**	**Comparative Study between Cyclopentadienyl Titanium Trimethoxide and Cyclopentadienyl Titanium Tris(dimethylamide) for Atomic Layer Deposition of Titanium Oxide** Hye-Lee Kim, Romel Hidayat, Yeongchan Choi, Jaemin Kim, and Won-Jun Lee *Department of Nanotechnology and Advanced Materials Engineering, Sejong University*
WA2-D-2 **11:00-11:15**	**수소 플라즈마를 이용한 저온(≤ 150 °C) 고품질 sputtered SiO_2 박막 형성** Taewon Seo, Gilsu Jeon, Hyuk Park, Juyoung Yun, Seongmin Park, Suwon Seong, and Yoonyoung Chung *Department of Electrical Engineering, POSTECH*
WA2-D-3 **11:15-11:30**	**Reaction Mechanism of Atomic Layer Deposition of SiO_2 Using Bis(diethylamino)silane and Ozone** Hyeonsu Roh, Hye-Lee Kim, Donggeon Shin, and Won-Jun Lee *Department of Nanotechnology and Advanced Materials Engineering, Sejong University*
WA2-D-4 **11:30-11:45**	**Area-selective Atomic Layer Deposition Assisted by Short-chain Alkanethiols Self-assembled Monolayers** Jeongbin Lee, Jinseon Lee, Jeong-Min Lee, Tae Joo Park, and Woo-Hee Kim *Department of Materials Science and Chemical Engineering, Hanyang University*
WA2-D-5 **11:45-12:15**	**[초청]** **Directional Ionic Transport across the Oxide Interface Enables Low-temperature Epitaxy of Rutile TiO_2** Junwoo Son *Department of Materials Science and Engineering, POSTECH*

J. Nano-Science & Technology 분과

2021년 1월 27일(수), 10:45-12:00 / Room B

▶ [WB2-J] Neuromorphic System

WB2-J-1 **10:45-11:15**	**[초청]** **Electrical Synapse and Neuron Devices and Their Neuromorphic Computing Applications** Kyung Min Kim *Department of Materials Science and Engineering, KAIST*
WB2-J-2 **11:15-11:30**	**Hardware Implementation of Titanium Oxide Memristor Array for Neuromorphic Computing** Jingon Jang, Sanghyeon Choi, and Gunuk Wang *KU-KIST Graduate School of Converging Science and Technology, Korea University*
WB2-J-3 **11:30-11:45**	**SiO_x Nanorod Memristor for Stochastic Artificial Neuron and its Application** Sanghyeon Choi[1], Gwang Su Kim[1,2], Haein Cho[1], Jehyeon Yang[1], Chong-Yun Kang[1,2], and Gunuk Wang[1] *[1]KU-KIST Graduate School of Converging Science and Technology, Korea University, [2]Center for Electronic Materials, KIST*
WB2-J-4 **11:45-12:00**	**Side Chain Engineering for Modulation of Synaptic Decay of Diketopyrrolopyrrol Semiconducting Copolymer-based Ion-gel-gated Organic Synaptic Transistors** Hea-Lim Park[1], Naryung Kim[1], Yun-Hi Kim[2,3], Hoichang Yang[4], and Tae-Woo Lee[1] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Department of Chemistry, Gyeongsang National University, [3]Research Institute of Nature Science (RINS), Gyeongsang National University, [4]Department of Chemical Engineering, Inha*

E. Compound Semiconductors 분과

2021년 1월 27일(수), 10:45-12:15 / Room C

▶ [WC2-E] Compound Semiconductors II

WC2-E-1 **10:45-11:00**	**High Performance Flexible InAs Photodetectors for Advanced Imaging System** Seungwan Woo[1,3], Geunhwan Ryu[1], Soo Seok Kang, Namgi Hong[1], Rafael Jumar Chu[1,2], In-Hwan Lee[3], Daehwan Jung[1,2], and Won Jun Choi[1] *[1]Center for Opto-electronic Materials and Devices, KIST, [2]Division of Nano and Information Technology, KIST School at University of Science and Technology, [3]Department of Materials Science and Engineering, Korea University*
WC2-E-2 **11:00-11:15**	**Lasing Characteristic of Quantum Dot Laser Diode Transferred onto Silicon via Epitaxial Lift-Off** Jae-Hoon Han[1], Daehwan Jung[1,2], GeunHwan Ryu[1], Jin-Dong Song[1,2], and Won Jun Choi[1] *[1]Center for Opto-Electronic Materials and Devices, KIST, [2]UST*
WC2-E-3 **11:15-11:30**	**Investigation of Proton Effects on AlGaN/GaN HEMTs with Various Buffer Structure** Eunjin Kim[1], Jeong-Gil Kim[1], Seung-Hyeon Kang[1] Dong-Seok Kim[2], and Jung-Hee Lee[1] *[1]School of Electronic and Electrical Engineering, Kyungpook National University, [2]KAERI*
WC2-E-4 **11:30-11:45**	**Opto-electrical Characteristics of Wafer-bonded InGaAs PhotoFET on Si** Soo Seok Kang, Dae-Hwan Ahn, Jindong Song, and Jae-Hoon Han *Center for Opto-Electronic Materials and Devices, KIST*
WC2-E-5 **11:45-12:00**	**Vertical Homo-Junction $In_{0.53}Ga_{0.47}As$ TFETs With S_{min} = 52 mV/decade** Ji-Min Baek[1], Tae-Woo Kim[2], and Dae-Hyun Kim[1] *[1]School of Electronic and Electrical Engineering, Kyungpook National University, [2]University of Ulsan*
WC2-E-6 **12:00-12:15**	**Analytical Channel Charge Model of $In_{0.7}Ga_{0.3}As$ Quantum-Well Heterostructure-FETs from Subthreshold to Inversion** Hyeon-Seok Jeong, Hyun-Jeong Jung, Wan-Soo Park, Hyeon-Bhin Jo, In-Guen Lee, and Dae-Hyun Kim *School of Electronics Engineering, Kyungpook National University*

G. Device & Process Modeling, Simulation and Reliability 분과

2021년 1월 27일(수), 10:45-12:15 / Room D

▶ [WD2-G] Neural Network and Advanced Modeling

WD2-G-1 **10:45-11:15**	**[초청]** **Atomistic Molecular Dynamics Simulation for Semiconductor Processes Using Neural Network Potentials** Kyeongpung Lee, Jisu Jung, Wonseok Jeong, Dongheon Lee, and Seungwu Han *Department of Materials Science and Engineering, Seoul National University*
WD2-G-2 **11:15-11:30**	**Learning to Generate an Approximate Electrostatic Potential Profile of a MOSFET with an Unstructured Mesh** Seung-Cheol Han and Sung-Min Hong *School of Electrical Engineering and Computer Science, GIST*
WD2-G-3 **11:30-11:45**	**Novel Method of Training High-Current 1S1R Crossbar Array for Hardware Neural Networks** Jihun Kim[1,2], Hyocheon Woo[1,2], Gil Seop Kim[1,2], Chanyoung Yoo[1,2], and Cheol Seong Hwang[1,2] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*
WD2-G-4 **11:45-12:00**	**Extraction of Interface Traps over the Bandgap through Photovoltaic and Photoconductive Effects in Si MOSFETs under Optical Excitation** Ji Hee Ryu, Han Bin Yoo, Jintae Yu, Haesung Kim, Jong-Ho Bae, Sung-Jin Choi, Dae Hwan Kim, and Dong Myong Kim *School of Electrical Engineering, Kookmin University*
WD2-G-5 **12:00-12:15**	**High-Field Transport Properties in $(Al_xGa_{1-x})_2O_3/Ga_2O_3$ Based Modulation Doped Heterostructures** Suhyeong Cha and Sung-Min Hong *School of Electrical Engineering and Computer Science, GIST*

D. Thin Film Process Technology 분과

2021년 1월 27일(수), 13:00-14:30 / Room A

▶ [WA3-D] Thin Film Process Ⅱ

WA3-D-1 **13:00-13:15**	**Advanced Atomic Layer Deposition of Metal Oxide Films with Discrete Feeding Method** Jae Chan Park[1], Sang Gil Lee[2], Seung Jo Yoo[2], Ji Hyeon Lee[2], Jae Hyuck Jang[2], Woo-Hee Kim[1], and Tae Joo Park[1] *[1]Department of Materials Science and Chemical Engineering, Hanyang University, [2]Center for Research Equipment, KBSI*
WA3-D-2 **13:15-13:30**	**Atomic Layer Deposition of Titanium Dioxide Thin Films Using $Cp^*Ti(OMe)_3$ as a Precursor** Hong Keun Chung[1,2], Tae Joo Park[2], and Seong Keun Kim[1] *[1]Electronic Materials Research Center, KIST, [2]Department of Materials Science and Chemical Engineering, Hanyang University*
WA3-D-3 **13:30-13:45**	**Integrating SiO_2 Selective Deposition Process to Atomic Layer Etching of Ru for Self-aligned Nanofabrication** Sumaira Yasmeen, Byeongguk Ko, Bon Wook Gu, and Han-Bo-Ram Lee *Incheon National University*
WA3-D-4 **13:45-14:00**	**Atomic Layer Deposition of Tin Selenide (Sn_xSe_{1-x}) Thin Films Using $Sn^{IV}(NMe_2)_4$ and $Se(SiMe_3)_2$ with NH_3 Co-reagent** Jeong Woo Jeon[1,2], Chanyoung Yoo[1,2], Woohyun Kim[1,2], Wonho Choi[1,2], Byongwoo Park[1,2], Eui-sang Park[1,2], Manick Ha[1,2], Yoon Kyeung Lee[3], and Cheol Seong Hwang[1,2] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University, [3]Division of Advanced Materials Engineering, Jeonbuk National University*
WA3-D-5 **14:00-14:15**	**Selective Wet Etching of Si Versus $Si_{1-x}Ge_x$ in Single- and Multi-Layer with TMAH Etchant** 최용준, 변대섭, 조충희, 이기석, 윤동민, 고대홍 *연세대학교 신소재공학과*
WA3-D-6 **14:15-14:30**	**Area Selective Atomic Layer Deposition of Al_2O_3 Using Self-Assembled Monolayers** Hye Jin Cho, Chan Ho Kim, Se Jin Ahn, Seung Woo Lee, Wung Sun Eo, and Sung Min Cho *School of Chemical Engineering, Sungkyunkwan University*

J. Nano-Science & Technology 분과

2021년 1월 27일(수), 13:00-14:30 / Room B

▶ [WB3-J] Van der Waals Heterostructure Devices

WB3-J-1 **13:00-13:30**	**[초청]** **Van der Waals Heterostructure Devices for Tunneling Phototransistor and Electronic Spectroscopy** Heejun Yang *Department of Energy Science, Sungkyunkwan University*
WB3-J-2 **13:30-13:45**	**Layered Two-Dimensional Materials Showing Extremes of Heat Transport** Hyejin Jang *[1]Department of Materials Science and Engineering, Seoul National University*
WB3-J-3 **13:45-14:00**	**A Study on Van der Waals Contact Electrodes of 2-Dimensional Layered Materials Using Low Frequency Noise** Hyunjin Ji[1], Byoung Hee Moon[2], Donnhwan Choi[3], and Jung Jun Bae[4] *[1]Department of Electrical engineering, University of Ulsan, [2]Department of Physics, Incheon National University, [3]Center for Integrated Nanostructure Physics, IBS*
WB3-J-4 **14:00-14:15**	**Polarity Control and Weak Fermi Level Pinning in $PdSe_2$ Transistor** Jae Eun Seo, Dongwook Seo, Tanmoy Das, and Jiwon Chang *School of Electrical and Computer Engineering, UNIST*
WB3-J-5 **14:15-14:30**	**Molecular Selector Realized by Molecular Heterojunction with 2DSemiconductors** Jung Sun Eo, Jaeho Shin, and Gunuk Wang *KU-KIST Graduate School of Converging Science & Technology, Korea University*

A. Interconnect & Package 분과

2021년 1월 27일(수), 13:00-14:30 / Room C

▶ [WC3-A] Emerging Interconnect Ⅰ

WC3-A-1 **13:00-13:30**	**[초청]** **New Materials and Processes for Interconnect Scaling, and Beyond the Scaling Limit** 안상훈 *삼성전자*
WC3-A-2 **13:30-14:00**	**[초청]** **Suppression of Volmer-Weber Metallic Growth via Surface Modification of Oxide Substrate for the Applications in Transparent Electrodes and Transparent Heaters** Dooho Choi *Advanced Materials Engineering, Dong-Eui University*
WC3-A-3 **14:00-14:15**	**DC Magnetron Sputter 방식으로 증착한 비정질 탄소막의 내에칭 특성연구** Sungtae Kim, Cheol Kim, Seung-Hyun Oh, and Young-Chang Joo *Department of Materials Science Engineering, Seoul National University*
WC3-A-4 **14:15-14:30**	**Co-sputtered CoAl Thin Films as an Alternative Material for VLSI Interconnects** Kyeong-Youn Song[1] and Hoo-Jeong Lee[1,2] *[1]SKKU Advanced Institute of Nano Technology (SAINT), Sungkyunkwan University, [2]School of Advanced Materials Science and Engineering, Sungkyunkwan University*

K. Memory (Design & Process Technology) 분과

2021년 1월 27일(수), 13:00-14:30 / Room D

▶ [WD3-K] NAND Flash Memory

WD3-K-1 **13:00-13:15**	**D_2 High Pressure Annealing Effect on Silicon Nitride in Flash Memory** Jae-Young Sung, Jun-Kyo Jeong, Woon-San Ko, Ki-Ryung Nam, and Ga-Won Lee *Department of Electronics, Chungnam National University*
WD3-K-2 **13:15-13:30**	**Silicon Oxynitride Charge Trap Layer 스퍼터링 시 기판 바이어스가 Trap Distribution에 미치는 효과** 박성민, 서태원, 정윤영 *Department of Electrical Engineering, POSTECH*
WD3-K-3 **13:30-13:45**	**Analysis of Memory Characteristics Change According to the Roughness of the Layer** Jun-Kyo Jeong, Jae-Young Sung, Woon-San Go, Ki-Ryeong Nam, and Ga-Won Lee *Department of Electronic Engineering, Chungnam National University*
WD3-K-4 **13:45-14:00**	**평균트랩거리를 변수로 사용한 전하 트랩 플래시 메모리의 프로그램 모델** 김건웅, 백승재 *Faculty of Electronic and Electrical Engineering, Hankyong National University*
WD3-K-5 **14:00-14:15**	**CTF (Charge-Trap Flash) 메모리 기반 채널 적층형 3차원 시냅스 어레이** Jung Nam Kim, Hyun-Seok Choi, Boram Kim, Ji-Hoon Ahn, Jun Park, and Yoon Kim *Department of Electrical and Computer Engineering, University of Seoul*
WD3-K-6 **14:15-14:30**	**Demonstration of Multi-layered Macaroni Filler for Improvement of Erase Efficiency in 3-D V-NAND** Dae-Han Jung[1], Dae-Hwan Yun[2], Hagyoul Bae[3], and Jun-Young Park[1] *[1]Chungbuk National University, [2]SK Hynix Inc., [3]Purdue University*

D. Thin Film Process Technology 분과

2021년 1월 27일(수), 14:45-16:15 / Room A

▶ [WA4-D] Thin Film Transistors

WA4-D-1 **14:45-15:15**	**[초청]** **Functionalized Parylene Gate-dielectrics for Flexible Electronics** Seong Cheol Jang[1], Jaehyun Kim[2], Kyung Jin Lee[2], and Hyun-Suk Kim[1] *[1]Department of Materials Science and Engineering, Chungnam National University, [2]Department of Chemical Engineering and Applied Chemistry, Chungnam National University*
WA4-D-2 **15:15-15:30**	**Optimized P-type Thin-film Transistor With Atomic-layer-deposited SnO Channel Layer** Myeong Gil Chae[1], Jina Kim[1], Bo Keun Park[2], Taek-Mo Chung[2], and Jeong Hwan Han[1] *[1]Department of Materials Science and Engineering, Seoul National University of Science and Technology, [2]Division of Advanced Materials, KRICT*
WA4-D-3 **15:30-15:45**	**Enhanced Mechanical Flexibility of Self-Aligned Coplanar In-Ga-Zn-O TFT with Island Configuration Using Organic Inter-Layer Dielectric** Hyo-Eun Kim[1], Hye-Won Jang[1], Mamoru Furuta[2], and Sung-Min Yoon[1] *[1]Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University, [2]Department of Environmental Science and Engineering, Kochi University of Technology*
WA4-D-4 **15:45-16:00**	**Low Temperature (<100 ℃) Atomic Layer Deposition Of Polycrystalline SnO_2 Using $Sn(dmamp)_2$ And H_2O Plasma** Jong Hyeon Won[1], Seong Ho Han[2], Bo Keun Park[2], Take-Mo Chung[2], and Jeong Hwan Han[1] *[1]Department of Materials Science and Engineering, Seoul National University of Science and Technology, [2]Dvision of Advanced Materials, KRICT*
WA4-D-5 **16:00-16:15**	**RF Magnetron Sputtering 기반 p-type 반도체 Tellurium Oxide 박막 특성 분석 및 소자 제작** Insoo An[1,2], Byeong-Kwon Ju[2], and Sung-Hwan Choi *[1]KITECH, [2]School of Electrical and Electronic Engineering, Korea University*

J. Nano-Science & Technology 분과

2021년 1월 27일(수), 14:45-16:15 / Room B

▶ [WB4-J] 2D Materials

WB4-J-1 **14:45-15:15**	**[초청]** **Ultralow-dielectric-constant Amorphous Boron Nitride** Hyeon Suk Shin[1,2] *[1]Department of Chemistry, UNIST, [2]Low-Dimensional Carbon Materials Center, UNIST*
WB4-J-2 **15:15-15:30**	**Ultrastrong Light-Matter Interactions in Two-dimensional Materials Enabled by Surface Polaritons** In-Ho Lee *KIST*
WB4-J-3 **15:30-15:45**	**Large-Area Selective Flash Annealing of Transition Metal Dichalcogenides toward Electronic Devices** Seoungwoong Park[1,2], Byung Hee Hong[2], and Seoung-Ki Lee[1] *[1]KIST, [2]Seoul National University*
WB4-J-4 **15:45-16:00**	**Large-area Growth of 2D Layered Materials: Chalcogenides, Oxides, and Halides** Kibum Kang *Department of Materials Science and Engineering, KAIST*
WB4-J-5 **16:00-16:15**	**2D to 3D: Atomically Thin Crystal Assembly** Seong-Jun Yang[1], Eunsook Lee[2], Edmund Han[3], Ju-Hyun Jung[1], Min-Yeong Choi[1], Daesung Jung[4], Namjo Kim[1], Shinyoung Choi[1], Jun-Ho Park[1], Siwoo Noh[2], Ki-Jeong Kim[2], Pinshane Y. Huang[3], Chan-Cuk Hwang[2], and Cheol-Joo Kim[1] *[1]Department of Chemical Engineering, POSTECH, [2]Beamline Research Division, Pohang Accelerator Laboratory, [3]Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, [4]Convergence Research Center for Energy and Environmental Sciences, Sungkyunkwan University*

A. Interconnect & Package 분과

2021년 1월 27일(수), 14:45-16:15 / Room C

▶ [WC4-A] Emerging Interconnect Ⅱ

WC4-A-1 **14:45-15:15**	**[초청]** **Mechanism of Selective Cobalt Capping Process for Copper Interconnects: A DFT Study** Romel Hidayat[1], Tanzia Chowdhury[1], Hye-Lee Kim[1], Sang-Ick Lee[2], and Won-Jun Lee[1] *[1]Departments of Nanotechnology and Advanced Materials Engineering, Sejong University, [2]DNF Co., Ltd.*
WC4-A-2 **15:15-15:30**	**Effect of Complexing Agents on Co Surface Modification for Chemical-Mechanical Polishing (CMP) and Post-CMP Cleaning Process** Jinuk Byun[1], Ohsung Kwon[2], Kyong Kyu Myong[1], KiHo Bae[3], and Jae Jeong Kim[1,4] *[1]School of Chemical and Biological Engineering, Seoul National University, [2]Department of Chemical and Biomolecular Engineering, University of Illinois at Urbana-Champaign, [3]Semiconductor R&D Center, Samsung Electronics Co., Ltd., [4]School of Chemical and*
WC4-A-3 **15:30-15:45**	**Mechanical Planarization of Polymer Dielectrics for FOWLP** Hyeokjin Chu[1], Hyunjoo Kim[2], and Sungdong Kim[1] *[1]Department of Mechanical System Design, Seoul National University of Science and Technology, [2]Department of Chemistry & Biology, Seoul National University of Science and Technology*
WC4-A-4 **15:45-16:00**	**High Bandwidth Memory 의 현재와 미래** 손호영, 이강욱 *SK 하이닉스*
WC4-A-5 **16:00-16:15**	**Mechanism of Grain Size and Mechanical Properties of Sn-57.6Bi-0.4Ag Solder Joint by Using the Nanoindentation** Jun-Ho Jang, Kyung Deuk Min, Choong-Jae Lee, Jae-Ha Kim, Dong Gil Kang, and Seung-Boo Jung *School of Advanced Materials Science and Engineering, Sungkyunkwan University*

K. Memory (Design & Process Technology) 분과

2021년 1월 27일(수), 14:45-16:15 / Room D

▶ [WD4-K] Devices for Neuromorphic Computing Ⅰ

WD4-K-1 **14:45-15:15**	**[초청]** **Flash-type Synaptic Device with Improved Nonlinear Weight Updates** Joon Young Kwak *KIST*
WD4-K-2 **15:15-15:30**	**Improvement of the Linearity of Synaptic Behavior of IGZO Memristor by Combining the IGZO Synaptic Transistor** Woo Sik Choi, Jun Tae Jang, Tae Jun Yang, Sung-Jin Choi, Jong-Ho Bae, Dong Myong Kim, and Dae Hwan Kim *School of Electrical Engineering, Kookmin University*
WD4-K-3 **15:30-15:45**	**Atomic Layer Deposited N-doped GeSe for Leaky-Integrate-and-Fire Neuron Application** Woohyun Kim[1,2], Manick Ha[1,2], Chanyoung Yoo[1,2], Jeong Woo Jeon[1,2], Wonho Choi[1,2], Byongwoo Park[1,2], Gil Seop Kim[1,2], Kyung Seok Woo[1,2], Jihun Kim[1,2], Yoon Ho Jang[1,2], Eui-Sang Park[1,2], Yoon Kyeung Lee[3], and Cheol Seong Hwang[1,2] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University, [3]Division of Advanced Materials Engineering, Jeonbuk National University*
WD4-K-4 **15:45-16:00**	**자체 적응형 뉴로모픽 시스템을 위한 온-칩 적응형 매칭 학습 방법** 안지훈, 최현석, 김윤 *서울시립대학교 전자전기컴퓨터공학부*
WD4-K-5 **16:00-16:15**	**Structure Engineering of CBRAM-synaptic Devices for Improved Gradual Switching and Long-term Stability** Jun-Hwe Cha[1], Jungyeop Oh[1], Changhyeon Lee[2], Sangsu Park[3], Sung Gap Im[2], and Sung-Yool Choi[1] *[1]School of Electrical Engineering, KAIST, [2]Department of Chemical and Biomolecular Engineering, KAIST, [3]Future Memory Research, SK Hynix Inc.*

B. Patterning 분과

2021년 1월 27일(수), 16:30-18:00 / Room A

▶ [WA5-B] Photolithograpy

WA5-B-1 **16:30-17:00**	**[초청]** **Progress on EUVL Mask and Pellicle Research** Jinho Ahn *[1]Department of Materials Science and Engineering, Hanyang University, [2]EUV-IUCC (Industry University Collaboration Center)*
WA5-B-2 **17:00-17:15**	**파티클로 인한 EUV 펠리클의 열-기계적 거동 변화의 실험적 검증** 장용주[1,4], 위성주[2,4], 김하늘[2,4], 김창수[3,4], 안진호[1,2,3,4] *[1]한양대학교 나노반도체공학과, [2]한양대학교 신소재공학과, [3]한양대학교 나노융합과학과, [4]한양대학교 EUV-IUCC*
WA5-B-3 **17:15-17:30**	**니켈을 활용한 고개구수 극자외선 노광공정용 고흡수도 마스크 연구** 정동민[1,3], 한윤종[2,3], 김득규[2,3], 김연수[1,3], 안진호[1,2,3] *[1]한양대학교 신소재공학과, [2]한양대학교 나노반도체공학과, [3]한양대학교 EUV-IUCC*
WA5-B-4 **17:30-17:45**	**Cascade Domino Lithography for Single-Digit-Nanometer Scale Patterning** Inki Kim[1] and Junsuk Rho[1,2] *[1]Department of Mechanical Engineering, POSTECH, [2]Department of Chemical Engineering, POSTECH*
WA5-B-5 **17:45-18:00**	**Modeling of Stochastic Defects in the Extreme Ultra Violet Lithography** Sang-Kong Kim *The Faculty of Liberal Arts, Hongik University*

L. Analog Design 분과

2021년 1월 27일(수), 16:30-18:00 / Room B

▶ [WB5-L] Analog Design

WB5-L-1 **16:30-17:00**	**[초청]** **아날로그 연산기 기반의 학습 가능한 신경망 시스템** 손현우 *경상대학교*
WB5-L-2 **17:00-17:15**	**An APD-based Optoelectronic Integrated Circuit for LiDAR Sensors** Ji-Eun Joo[1], M. J. Lee[2], and Sung Min Park[1] *[1]Department of Electronic and Electrical Engineering, Ewha Womans University, [2]Post-Silicon Semiconductor Institute, KIST*
WB5-L-3 **17:15-17:30**	**Digital Control Readout Integrated Circuit(ROIC) For Gas Sensor** Joo-Hwan Jin[1], Juyong Lee[1], Seungjun Lee[1], Kihyun Kim[1], Younggyun Oh[2], and Hyungil Chae[1] *[1]Department of Electronic Engineering, Konkuk University, [2]Department of Electronic Engineering, Kookmin University*
WB5-L-4 **17:30-17:45**	**A Design of LDO Based Supply Modulator for 5.8GHz DSRC Transceiver Power Amplifier's Amplitude Modulation** Young-Uk Kim, Sung-Jin Kim, and Kang-Yoon Lee *Department of Electrical and Computer Engineering, Sungkyunkwan University*
WB5-L-5 **17:45-18:00**	**A Design of Ultra Low Power 12-bit SAR ADC with Full-Range Input and Single-ended / Differential-ended Hybrid Mode for Battery Monitoring IC** Dae-Young Choi, Young-Uk Kim, Sung-Jin Kim, and Kang-Yoon Lee *Department of Electrical and Computer Engineering, Sungkyunkwan University*

P. Device for Energy (Solar Cell, Power Device, Battery, etc.) 분과

2021년 1월 27일(수), 16:30-18:00 / Room C

▶ [WC5-P] Solar Energy Conversion Device

WC5-P-1 **16:30-17:00**	**[초청]** **Defect Engineering for Stable and Efficient Perovskite Solar Cells** Jin-Wook Lee *Sungkyunkwan University Advanced Institute of Nanotechnology and Department of Nanoengineering, Sungkyunkwan University*
WC5-P-2 **17:00-17:30**	**[초청]** **Infrared Optoelectronics Using Colloidal Quantum Dots** Se-Woong Baek *Department of Chemical and Biological Engineering, Korea University*
WC5-P-3 **17:30-17:45**	**Vertically Aligned MoS2 Thin Film Catalysts Decorated with Metal Sulfide for Efficient Solar Water Splitting** Changyeon Kim, Seokhoon Choi, and Ho Won Jang *Department of Materials Science and Engineering, Seoul National University*
WC5-P-4 **17:45-18:00**	**Near-Complete Charge Separation in $BiVO_4$-Based Heterostructure Photoanodes toward Spontaneous Solar Water Oxidation** Jin Wook Yang and Ho Won Jang *Department of Materials Science and Engineering, Seoul National University*

H. Display and Imaging Technologies 분과

2021년 1월 27일(수), 16:30-18:00 / Room D

▶ [WD5-H] 차세대 디스플레이 백플레인 소자와 구동

WD5-H-1 **16:30-17:00**	**[초청]** **초고해상도 디스플레이용 백플레인 기술** 황치선[1], 김용해[1], 양종헌[1], 피재은[1], 최지훈[1], 김기현[1], 김주연[1], 이원재[1], 김희옥[1], 이광흠[2], 이승희[2], 박상희[2], 성낙진[3], 최규정[3] *[1]한국전자통신연구원, [2]한국과학기술원, [3]NCD㈜*
WD5-H-2 **17:00-17:30**	**[초청]** **Oxide TFT Technology and Process for Next Generation Display** 임준형 *삼성디스플레이*
WD5-H-3 **17:30-18:00**	**[초청]** **Adaptive Refresh Rate 기술을 활용한 초저전력 디스플레이 구동 방법** 유봉현 *삼성디스플레이*

B. Patterning 분과

2021년 1월 28일(목), 09:00-10:15 / Room A

▶ [TA1-B] Photolithography & Etching Technology

TA1-B-1 **09:00-09:30**	**[초청]** **불소화 단분자 극자외선 레지스트 개발** 이진균[1], 오현택[1], 우지훈[1], 김강현[2], 이상설[2] *[1]인하대학교, 고분자공학과, [2]POSTECH, 신소재공학과*
TA1-B-2 **09:30-10:00**	**[초청]** **Realistic 3D Profile Simulation Toward Next-generation High Aspect Ratio Etching Process** Yeon Ho Im *Jeonbuk National University*
TA1-B-3 **10:00-10:15**	**Influence of Additive Gases to Organic Chelators on Etch Characteristics of Copper Thin Films Using Inductively Coupled Plasma Reactive Ion Etching** Eun Taek Lim, Mun Hwan Cha, Ji Soo lee, Sung Yong Park, and Chee Won Chung *Department of Chemical Engineering, Inha University*

C. Material Growth & Characterization 분과

2021년 1월 28일(목), 09:00-10:30 / Room B

▶ [TB1-C] Wide Bandgap Materials

TB1-C-1 **09:00-09:30**	**[초청]** **Bulk-Rashba Effect in the Non-Centrosymmetric Artificial Superlattice** Sanghoon Kim *Department of Physics, University of Ulsan*
TB1-C-2 **09:30-09:45**	**Heteroepitaxial Diamond Substrate Using Microwave Plasma Chemical Vapor Deposition** Taemyung Kwak[1], Uiho Choi[1], Jonggun Lee[1], Sanghun Han[1], Geunho Yoo[1], Seong-woo Kim[2], and Okhyun Nam[1] *[1]Department of Nano & Semiconductor Engineering, Korea Polytechnic University, [2]Namiki Precision Jewel Co., Ltd.*
TB1-C-3 **09:45-10:00**	**Boron-doped Diamond Metal-semiconductor Field-effect Transistor Grown on Hetero-epitaxial Diamond Substrate** Uiho Choi[1], Taemyung Kwak[1], Jonggun Lee[1], Sanghun Han[1], Geunho Yoo[1] Seongwoo Kim[2], and Okhyun Nam[1] *[1]Convergence Center for Advanced Nano Semiconductor, Department of Nano & Semiconductor Engineering, Korea Polytechnic University, [2]Adamant Namiki Precision Jewel Co., Ltd.*
TB1-C-4 **10:00-10:15**	**Effect of Doping on the Threading Dislocation Density of GaAs Layer Epitaxially Grown on Si** Geunhwan Ryu[1], Seungwan Woo[1,2], Rafael Chu[1], In-Hwan Lee[2], Daehwan Jung[1], and Won Jun Choi[1] *[1]Center for Opto-electronic Materials and Devices, KIST, [2]Department of Materials Science and Engineering, Korea University*
TB1-C-5 **10:15-10:30**	***Ab initio* Approach on the Anisotropic Growth of GaAs: from DFT to Growth Kinetics** In Won Yeu[1], Gyuseung Han[1,2,3], Cheol Seong Hwang[2,3], and Jung-Hae Choi[1] *[1]Electronic Materials Research Center, KIST, [2]Department of Materials Science and Engineering, Seoul National University, [3]Inter-University Semiconductor Research Center, Seoul National University*

P. Device for Energy (Solar Cell, Power Device, Battery, etc.) 분과

2021년 1월 28일(목), 09:00-10:30 / Room C

▶ [TC1-P] High Performance Energy Materials and Devices

TC1-P-1 **09:00-09:15**	**Transparent Flexible Electromagnetic Shielding Film Using ITO Nanobranches by Internal Multi-Reflection** Youngho Kim[1,2] and Hak Ki Yu[1,2] *[1]Department of Materials Science and Engineering, Ajou University, [2]Department of Energy Systems Research, Ajou University*
TC1-P-2 **09:15-09:30**	**Terracing α-Mo_2C Electrocatalyst for pH-Universal Hydrogen Evolution Reaction** Jangwon Bang, In Kyu Moon, and Jungwoo Oh *School of Integrated Technology, Yonsei University*
TC1-P-3 **09:30-09:45**	**Enhancing Solar Water-Splitting Performance Using Ultrathin $LaAlO_3$ Polar Interlayer** Min-Ju Choi, Taemin Ludvic Kim, Tae Hyung Lee, Woonbae Sohn, and Ho Won Jang *Seoul National University*
TC1-P-4 **09:45-10:00**	**Hetero-junction Metal Oxide Coated ITO Nano-branches for Gas Sensors** Noeul Kim[1,2] and Hak Ki Yu[1,2] *[1]Department of Energy Systems Research, Ajou University, [2]Department of Materials Science and Engineering, Ajou University*
TC1-P-5 **10:00-10:15**	**NiFe Layered Double Hydroxides on n-Si, Stabilized by Activated TiO_2 Interlayer for Efficient Photoanode** Sungkyun Choi and Ho Won Jang *Seoul National University*
TC1-P-6 **10:15-10:30**	**Direct Synthesis of Molybdenum Phosphide Nanorods on Silicon Using Graphene at the Heterointerface for Efficient Photoelectrochemical Water Reduction** Sang Eon Jun and Ho Won Jang *Research Institute of Advanced Materials, Seoul National University*

G. Device & Process Modeling, Simulation and Reliability 분과

2021년 1월 28일(목), 09:00-10:30 / Room D

▶ [TD1-G] Ab Initio Simulation and Quantum Transport

TD1-G-1 **09:00-09:15**	**A Full-stack Modeling Study on Si-base Controlled-NOT Quantum Logic Gate Devices: Exploring the Fidelity of Entangled Computations** Hoon Ryu, Junghee Ryu, and Ji-Hoon Kang *KISTI*
TD1-G-2 **09:15-09:30**	**First-principles Study of Lateral WSe_2 *p-n* Junction** Tae Hyung Kim, Juho Lee, Jun Seong Lee, and Yong-Hoon Kim *School of Electrical Engineering, KAIST*
TD1-G-3 **09:30-09:45**	**Non-Equilibrium Green's Function Simulation of Nanosheet MOSFETs with Various Cross-sections** Phil-Hun Ahn and Sung-Min Hong *School of Electrical Engineering and Computer Science, GIST*
TD1-G-4 **09:45-10:00**	**First-Principles Study of Vertical Van der Waals Heterojunction-Based Tunnel Field-Effect Transistors** Juho Lee and Yong-Hoon Kim *School of Electrical Engineering, KAIST*
TD1-G-5 **10:00-10:15**	**Quantum Transport Simulation on Ferroelectric Tunnel Junctions with 2D Layered Ferroelectric $CuInP_2S_6$** Eunyeong Yang and Jiwon Chang *School of Electrical and Computer Engineering, UNIST*
TD1-G-6 **10:15-10:30**	**First-principles Study of the MXene-electrode Based Molecular Junctions** Hyeonwoo Yeo, Juho Lee, and Yong-Hoon Kim *School of Electrical Engineering, KAIST*

B. Patterning 분과

2021년 1월 28일(목), 10:45-12:00 / Room A

▶ [TA2-B] Atomic Layer Etching

TA2-B-1 **10:45-11:15**	**[초청]** **2D MoS_2 소자제조에의 ALE 응용** 염근영 *성균관대학교*
TA2-B-2 **11:15-11:30**	**Etch Characteristics of Ovonic Threshold Switch (OTS) Materials by Hydrogen Based Reactive Ion Etching (RIE)** Doo San Kim[1] and Geun Young Yeom[1,2] *[1]School of Advanced Materials Science and Engineering, Sungkyunkwan University, [2]SKKU Advanced Institute of Nano Technology (SAINT), Sungkyunkwan University*
TA2-B-3 **11:30-11:45**	**Atomic Layer Etching of SiO_2 with Fluoroether and Fluoroalcohol Compounds** Yongjae Kim[1], Yebin Lee[2], Seonghyeon Lee[2], and Heeyeop Chae[1,2] *[1]SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University, [2]School of Chemical Engineering, Sungkyunkwan University*
TA2-B-4 **11:45-12:00**	**A DFT Study on the Oxidative Etching of Ruthenium** Neung-Kyung Yu and Bonggeun Shong *Chemical Engineering, Hongik University*

C. Material Growth & Characterization 분과

2021년 1월 28일(목), 10:45-12:15 / Room B

▶ [TB2-C] Wide Bandgap Materials II

TB2-C-1 **10:45-11:15**	**[초청]** **The Growth of 0D and 1D III-V Semiconductor Materials for Quantum Information Technology** Jin Dong Song and coworkers in KIST *Center for Opto-Electronic Convergence Systems, KIST*
TB2-C-2 **11:15-11:30**	**Epitaxial Growth Technology Powered by Artificial Intelligence : GaN Epiwafer Production for DC and RF Power Devices** Young-Kyun Noh *IVWorks Co., Ltd.*
TB2-C-3 **11:30-11:45**	**High-quality InGaN Based Nanowire Photocatalysts For Solar-water Splitting Applications** Sung-Un Kim[1,2], Hye-Young Kown[1], Dong-Wook Shin[2], and Yong-Ho Ra[1] *[1]KICET, [2]Hanyang University*
TB2-C-4 **11:45-12:00**	**Theoretical Understanding of the Effects of Composition and Configuration on the Ferroelectric Properties of Wurtzite Structure (Al, Sc)N** Kun Hee Ye[1,2,3], Gyuseung Han[1,2,3], In Won Yeu[1], Cheol Seong Hwang[2,3], and Jung-Hae Choi[1] *[1]Center for Electronic Materials, KIST, [2]Department of Materials Science and Engineering, Seoul National University, [3]Inter-University Semiconductor Research Center, Seoul National University*
TB2-C-5 **12:00-12:15**	**Punctuated Growth of InAs Quantum Dashes-in-a-well on InP for 2μm Emission** Rafael Jumar Chu[1,2], Geunhwan Ryu[1], Seungwan Woo[1,3], Yeonhwa Kim[1,2], In-Hwan Lee[3], Won Jun Choi[1], and Daehwan Jung[1,2] *[1]Center for Opto-electronic Materials and Devices, KIST, [2]Division of Nano and Information Technology, KIST School at University of Science and Technology, [3]Department of Materials Science and Engineering, Korea University*

P. Device for Energy (Solar Cell, Power Device, Battery, etc.) 분과

2021년 1월 28일(목), 10:45-12:15 / Room C

▶ [TC2-P] Special Session for Next Generation Battery Devices

TC2-P-1 **10:45-11:15**	**[초청]** **Layered Structure Cathodes; Prejudice, Inverse Concept and New Possibility** Yong-Mook Kang *Department of Materials Science and Engineering, Korea University*
TC2-P-2 **11:15-11:45**	**[초청]** **High-Energy Silicon/Graphite Composite Anodes in Lithium-Ion Batteries** Hyun-Wook Lee *School of Energy and Chemical Engineering, UNIST*
TC2-P-3 **11:45-12:15**	**[초청]** **Inorganic Nanoporous Materials with Tailored Structures and Morphologies for Energy Storage Applications** Jongkook Hwang *Department of Chemical Engineering, Ajou University*

G. Device & Process Modeling, Simulation and Reliability 분과

2021년 1월 28일(목), 10:45-12:15 / Room D

▶ [TD2-G] Thin Film Transistors and Device Modeling

TD2-G-1 **10:45-11:00**	**Influence of the Oxygen Content on Hot Carrier Effects in the Bottom-gate Amorphous InGaZnO Thin-film Transistors** Je-Hyuk Kim, Jun Tae Jang, Dong Myong Kim, Sung-Jin Choi, Jong-Ho Bae, and Dae Hwan Kim *School of Electrical Engineering, Kookmin University*
TD2-G-2 **11:00-11:15**	**The Analysis of Band-gap State of Tensile Strained a-IGZO TFT Dependent on the Bending Direction and Channel Length** Yunyeong Choi[1], Jisun Park[1,2], and Hyungsoon Shin[1,2] *[1]Department of Electronic and Electrical Engineering, Ewha Womans University, [2]Smart Factory Multidisciplinary Program, Ewha Womans University*
TD2-G-3 **11:15-11:30**	**Experimental Observation of the Variation of Oxygen Vacancy-Related Density of States in InGaZnO TFTs under the Negative Bias Illumination Stress** Ga Won Yang, Jingyu Park, Sungju Choi, Dong Myong Kim, Sung-Jin Choi, Jong-Ho Bae, and Dae Hwan Kim *School of Electrical Engineering, Kookmin University*
TD2-G-4 **11:30-11:45**	**Compact Model of Cylindrical Gate-all-around MOSFETs based on the Density-gradient Equation** Kwang-Woon Lee and Sung-Min Hong *School of Electrical Engineering and Computer Science, GIST*
TD2-G-5 **11:45-12:00**	**Gate Voltage-dependent Extraction and Modeling for Junction Capacitance of MOSFETs** Jinwook Kuk and Seonghearn Lee *Department of Electronics Engineering, Hankuk University of Foreign Studies*
TD2-G-6 **12:00-12:15**	**BJT의 Base 구조에 따른 Matching 특성 분석** Seong-Hyun Kim, Hyun-Jin Shin, Ki-Woo Song, and Hi-Deok Lee *Chungnam National University*

D. Thin Film Process Technology 분과

2021년 1월 28일(목), 13:00-14:30 / Room A

▶ [TA3-D] 2D Materials

TA3-D-1 **13:00-13:30**	**[초청]** **Two-dimensional Electron Gas at the Interface of Oxide Heterostructure and Its Applications to Memories and Transistors** Sang Woon Lee *Department of Energy Systems Research and Department of Physics, Ajou University*
TA3-D-2 **13:30-13:45**	**Enlargement of Two-Dimensional SnS Grains at Low Temperatures via Substrate Surface Modification** In-Hwan Baek[1,2,3], Ah-Jin Cho[1], Sangtae Kim[4], Ga Yeon Lee[5], Jeong Hwan Han[6], Taek-Mo Chung[5], Cheol Seong Hwang[2,3], and Seong Keun Kim[1] *[1]Electronic materials Research Center, KIST, [2]Department of Materials Science and Engineering, Seoul National University, [3]Inter-University Semiconductor Research Center, Seoul National University, [4]Department of Nuclear Engineering, Hanyang University, [5]Division of Advanced Materials, KRICT, [6]Department of Materials Science and Engineering, Seoul National University of Science and Technology*
TA3-D-3 **13:45-14:00**	**Low Temperature Growth of Wafer-scale 2D MoS_2 Thin Films by Pulsed Metal-organic Chemical Vapor Deposition** Jeong-Hun Choi, Min-Ji Ha, and Ji-Hoon Ahn *Department of Materials Science and Chemical Engineering, Hanyang University*
TA3-D-4 **14:00-14:15**	**Flexible P-channel SnO Thin Film Transistor Fabricated by Low Temperature Atomic Layer Deposition and Intense Pulsed Light Annealing** Jina Kim[1], Myeong Gil Chae[1], Jun Choi[2], Kwan Hyun Cho[3], Woongkyu Lee[4], and Jeong Hwan Han[1] *[1]Department of Materials Science and Engineering, Seoul National University of Science and Technology, [2]Human Convergence Technology Group, KITECH, [3]Micro/Nano Scale Manufacturing R&D Group, KITECH, [4]Department of Electrical Engineering, Myongji Universit*
TA3-D-5 **14:15-14:30**	**Three-Dimensional Multi-Stacked Field-Effect Transistor Using Improved Two-Dimensional Electron Gas at the Interface of Al_2O_3/ZnO Ultra-Thin Film Heterostructures** Ji Hyeon Choi[1], Tae Jun Seok[1], Jae Hyun Yoon[1], Yuhang Liu[1], Sang Woon Lee[2], and Tae Joo Park[1] *[1]Department of Materials Science and Chemical Engineering, Hanyang University, [2]Department of Energy Systems Research and Department of Physics, Ajou University*

F. Silicon and Group-IV Devices and Integration Technology 분과

2021년 1월 28일(목), 13:00-14:30 / Room B

▶ [TB3-F] Advanced Nano-Device Technology

TB3-F-1 **13:00-13:30**	**[초청]** **Improvement in Self-heating Characteristic by Incorporating Hetero-Gate-Dielectric in Gate-All-Around MOSFET** Jang Hyun Kim *School of Electrical Engineering, Pukyong National University*
TB3-F-2 **13:30-14:00**	**[초청]** **Si Gate-All-Around Nanosheet FET: the Key Enabler of 3nm Technology Node** Rock-Hyun Baek *Department of Electrical Engineering, POSTECH*
TB3-F-3 **14:00-14:15**	**Improvement of Self-heating Effect by Effective Heat Sink of Lightly Doped Drain in Asymmetric MOSFET** Young Suh Song[1,2], and Jang Hyun Kim[3] *[1]Seoul National University, [2]Korea Military Academy, [3]Pukyong National University*
TB3-F-4 **14:15-14:30**	**Highly-Scalable and Variation-Immune Fin-Based High Electron Mobility Transistor with Improved RF Characteristics** Sung-Ho Kim, Yoo Bin Song, Jong Yul Park, and Kyung Rok Kim *Department of Electrical Engineering, UNIST*

I. MEMS & Sensor Systems 분과

2021년 1월 28일(목), 13:00-14:30 / Room C

▶ [TC3-I] Gas Sensing Technology

TC3-I-1 **13:00-13:15**	**Effect of Post-deposition Annealing Atmosphere on NO_2 Gas Sensing and Low-frequency Noise in IGZO Thin-film Chemiresistor Gas Sensor** Wonjun Shin, Joowon Kwon, Daehee Kwon, Minjeong Ryu, Seongbin Hong, Yujeong Jeong, Gyuweon Jung, Jinwoo Park, Donghee Kim, and Jong-Ho Lee *Department of Electrical and Computer Engineering, Seoul National University*
TC3-I-2 **13:15-13:30**	**Effects of Oxygen Gas Flow on the Response of FET-type Gas Sensor with Sputtered WO_3 Sensing Layer** Yujeong Jeong[1,2], Seongbin Hong[1,2], Gyuweon Jung[1,2], Wonjun Shin[1,2], Jinwoo Park[1,2], Donghee Kim[1,2], and Jong-Ho Lee[1,2] *[1]Department of Electrical Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*
TC3-I-3 **13:30-13:45**	**Effects of Sputtering Pressure on Li_3PO_4 and Li_2CO_3 Thin Films and its Performance Evaluation for Electrochemical CO_2 Sensor** Junyeop Lee[1,2], Eunji Choe[1], Na Ri Kim[1], Nam Gon Do[1,2], Dong Geon Jung[1], Sae-Wan Kim[1], Hyeon Su Lee[1], Jae Keon Kim[1,2], Yeong Sam Kim[1,2], Seong Ho Kong[2], and Daewoong Jung[1] *[1]KITECH, [2]School of Electronics Engineering, Kyungpook National University*
TC3-I-4 **13:45-14:00**	**H_2S Gas Sensing Characteristics of Si FET-type Gas Sensor with Localized Micro-heater** Gyuweon Jung[1], Seongbin Hong[1], Yujeong Jeong[1], Wonjun Shin[1], Jinwoo Park[1], Donghee Kim[1], Jong-Ho Bae[2], Byung-Gook Park[1], and Jong-Ho Lee[1] *[1]Seoul National University, [2]Kookmin University*
TC3-I-5 **14:00-14:15**	**H_2S Gas Sensing Properties in Polysilicon Control-Gate FET Gas Sensor** Jinwoo Park[1,2], Seongbin Hong[1,2], Yujeong Jeong[1,2], Gyuweon Jung[1,2], Wonjun Shin[1,2], Donghee Kim[1,2], and Jong–Ho Lee[1,2] *[1]Department of Electrical and Computer Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center (ISRC), Seoul National University*
TC3-I-6 **14:15-14:30**	**Macroscopic Analysis and Design of Si HFGFET Gas Sensor for Sensitive Gas Detection** Seongbin Hong[1,2], Yujeong Jeong[1,2], Gyuweon Jung[1,2], Wonjun Shin[1,2], Jinwoo Park[1,2], Donghee Kim[1,2], and Jong-Ho Lee[1,2] *[1]Department of Electrical and Computer Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*

K. Memory (Design & Process Technology) 분과

2021년 1월 28일(목), 13:00-14:30 / Room D

▶ [TD3-K] Devices for Neuromorphic Computing II

TD3-K-1 **13:00-13:30**	**[초청]** **Device and Selector Optimization of Vertical RRAM and Its Application for Neuromorphic Computing** Batyrbek Alimkhanuly, Arman Kadyrov, Yongsu Choi, and Seunghyun Lee *Department of Electronic Engineering, Kyung Hee University*
TD3-K-2 **13:30-13:45**	**Process-in-memory Performance Demonstration of Self-Rectifying Resistive Memory in an Integrated Crossbar Array** Kanghyeok Jeon[1,2], Jin Joo Ryu[1], Seung-Jong Yoo[1,2], Min Kyu Yang[3], Doo Seok Jeong[2], and Gun Hwan Kim[1] *[1]Division of Advanced Materials, KRICT, [2]Division of Materials Science and Engineering, Hanyang University, [3]Department of Computer Car Mechatronics, Sahmyook University*
TD3-K-3 **13:45-14:00**	**Artificial Van-der-Waals Hybrid Synapse for Brain-Inspired Parallel Computing** Seunghwan Seo[1] and Jin-Hong Park[1,2] *[1]Department of Electrical and Computer Engineering, Sungkyunkwan University, [2]Sungkyunkwan University Advanced Institute of Nanotechnology, Sungkyunkwan University*
TD3-K-4 **14:00-14:15**	**Short-term and Long-term Memory Operations of a-IGZO Synaptic TFTs with the Low-temperature ALD Al_2O_3 Gate Insulator and Metal Floating Gate** Dongyeon Kang, Jun Tae Jang, Dong Myong Kim, Sung-Jin Choi, Jong-Ho Bae, and Dae Hwan Kim *School of Electrical Engineering, Kookmin University*
TD3-K-5 **14:15-14:30**	**Atomic Layer Chemical Vapor Deposition of SiO_2 Thin Film Using Chlorine-free Silicon Precursor for 3D NAND Application** Ji-hoon Baek[1], GeonHo Baek[2], Hye-mi Kim[1], Seunghwan Lee[1], Yusung Jin[3], Hyung Soon Park[3], Deok-Sin Kil[3], Sangho Kim[4], Yongjoo Park[4], and Jin-Seong Park[1,2] *[1]Division of Materials Science and Engineering, Hanyang University, [2]Division of Nanoscale Semiconductor Engineering, Hanyang University, [3]Materials Development White Team, SK Hynix Inc., [4]Advanced Research Development Team, SK Trichem Co., Ltd.*

D. Thin Film Process Technology 분과

2021년 1월 28일(목), 14:45-16:15 / Room A

▶ [TA4-D] Emerging Devices Ⅰ

TA4-D-1 **14:45-15:15**	**[초청]** **Highly Reliable Heterosynaptic Plasticity of Low-powered Memtransistor for Neuromorphic Applications** Byungjin Cho *Department of Advanced Material Engineering, Chungbuk National University*
TA4-D-2 **15:15-15:30**	**Wafer-scale Striped Carbon Nanotube Network Transistor** Ju Won Jeon[1], Yongwoo Lee[1], Geon-Hwi Park[1], Jueun Kim[1], Dong Myong Kim[1], Dae Hwan Kim[1], Min-Ho Kang,[2] and Sung-Jin Choi[1] *[1]School of Electrical Engineering, Kookmin University, [2]Department of Nano-process, NNFC*
TA4-D-3 **15:30-15:45**	**Implementation of In-Ga-Zn-O Thin-Film Transistors with Vertical Channel Structures Designed with Silicon Spacer Steps** Se-Na Choi and Sung-Min Yoon *Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University*
TA4-D-4 **15:45-16:00**	**Impact of Vertical-Channel Structure for Charge-Trap Memory Thin Film Transistors Using In-Ga-Zn-O Active and Coated SiO_2 Spacer Layers** Soo Hyun Bae, Hyun Joo Ryu, and Sung Min Yoon *Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University*
TA4-D-5 **16:00-16:15**	**Atomic-Layer-Deposited Li Compound-Based Two-Terminal Artificial Synapse Devices** Hye-Rim Kim[1], Hyun Seung Choi[1], Gun Hwan Kim[2], and Tae Joo Park[1] *[1]Department of Materials Science and Chemical Engineering, Hanyang University, [2]Division of Advanced Materials, KRICT*

F. Silicon and Group-IV Devices and Integration Technology 분과

2021년 1월 28일(목), 14:45-16:15 / Room B

▶ [TB4-F] NCFET/TFET Technology

TB4-F-1 **14:45-15:00**	**Suppression of Reverse Drain Induced Barrier Lowering in Negative Capacitance Field-effect Transistor Using Hetero-dielectric Structure** Dong-Oh Kim[1,2], Kitae Lee[1,2], Changha Kim[1,2], Sihyun Kim[1,2], Hyun-Min Kim[1,2], Daewoong Kwon[3], and Byung-Gook Park[1,2] *[1]Inter-University Semiconductor Research Center (ISRC),Seoul National University, [2]Department of Electrical and Computer Engineering, Seoul National University, [3]Department of Electrical Engineering, Inha University*
TB4-F-2 **15:00-15:15**	**Investigation on Negative Differential Resistance (NDR) of Negative Capacitance Tunnel Field-effect Transistor (NC-TFET)** Shinhee Kim and Sangwan Kim *Department of Electrical and Computer Engineering, Ajou University*
TB4-F-3 **15:15-15:30**	**Optimization of Sidewall Spacer to Enhance Negative Capacitance Field-effect Transistor (NCFET) Electrical Characteristics** Jae Yeon Park and Sangwan Kim *Department of Electrical and Computer Engineering, Ajou University*
TB4-F-4 **15:30-15:45**	**Impact of Spacer Materials and Gate Underlap on Double Gate Negative Capacitance Tunnel Field-effect Transistor (DGNC-TFET)** Seungwon Go and Sangwan Kim *Department of Electrical and Computer Engineering, Ajou University*
TB4-F-5 **15:45-16:00**	**Design and Characterization of Complementary Tunneling Field-Effect Transistors Integrated in a Single Device** Md. Hasan Raza Ansari, Daehwan Kim, and Seongjae Cho *Department of Electronic Engineering, Gachon University*
TB4-F-6 **16:00-16:15**	**Compact Model of Metal-Ferroelectric-Insulator-Semiconductor (MFIS) Negative Capacitance FETs** Ha Rim Jeon[1], Yoon-Suk Kim[2], Uihui Kwon[2], and Woo Young Choi[1] *[1]Department of Electronic Engineering, Sogang University, [2]Device Solution Business, Samsung Electronics Co., Ltd.*

I. MEMS & Sensor Systems 분과

2021년 1월 28일(목), 14:45-16:00 / Room C

▶ [TC4-I] MEMS and Sensor Systems for Biomedical Applications

TC4-I-1 **14:45-15:15**	**[초청]** **One-dimensional Soft Electronic Sensing Systems for Wearable and Implantable Applications** Jaehong Lee *Soft Biomedical Devices Lab, Department of Robotics Engineering, DGIST*
TC4-I-2 **15:15-15:30**	**Fabrication of Nanoparticle-Deposited Flexible Electrode and Its Application on Biopotential Sensing** Jinpyeo Jeung, Inyeol Yun, and Yoonyoung Chung *Department of Electrical Engineering, POSTECH*
TC4-I-3 **15:30-15:45**	**Silicon Nanosheet ISFET Sensor based on Poly-LaF_3 Sensing Membrane for Highly Sensitive Fluoride Ion Detection** Hyeon-Tak Kwak[1], Hyeonsu Cho[2], and Chang-Ki Baek[2] *[1]Department of Electrical Engineering, POSTECH, [2]Department of Creative IT Engineering, POSTECH*
TC4-I-4 **15:45-16:00**	**The IGZO-based Correlated Color Temperature Sensor for Measuring the Melatonin Suppression and the Circadian Disturbance** Hyunkyu Lee, Jingyu Park, Sung-Jin Choi, Jong-Ho Bae, Dong Myong Kim, and Dae Hwan Kim *School of Electrical Engineering, Kookmin University*

K. Memory (Design & Process Technology) 분과

2021년 1월 28일(목), 14:45-16:15 / Room D

▶ [TD4-K] Ferroelectric Memory

TD4-K-1 **14:45-15:15**	**[초청]** **Reliability Problem and Improvement Strategy of Ferroelectric Memory Device** Jong-Ho Bae *School of Electrical Engineering, Kookmin University*
TD4-K-2 **15:15-15:30**	**Memory Window Enhancement Effect in Metal–ferroelectric–insulator-semiconductor Capacitor with High-k Dielectrics** Yeriaron Kim[1,2], Seung Youl Kang[1], Jiyong Woo[3], Jeong Hun Kim[1], Jong-Pil Im[1], Sung-Min Yoon[2], and Seung Eon Moon[1] *[1]ETRI, [2]Kyung Hee University, [3]Kyungpook National University*
TD4-K-3 **15:30-15:45**	**The Effect of Metal Electrodes on Hafnia Based Ferroelectricity** Yongsun Lee, Youngin Goh, Junghyeon Hwang, and Sanghun Jeon *School of Electrical Engineering, KAIST*
TD4-K-4 **15:45-16:00**	**Self-selective Ferroelectric Random Access Memory based on Graphene Field Effect Transistor** Sungchul Jung[1], Jinyoung Park[2], Junhyung Kim[3], Wonho Song[2], Jaehyeong Jo[2], Seok-Hyung Kang[4], Muhammad Sheeraz[5], Tae-Heon Kim[5], and Kibog Park[2,3] *[1]SK Hynix Inc., [2]Department of Physics, UNIST, [3]Department of Electrical Engineering, UNIST, [4]Department of Electrical Engineering, POSTECH, [5]Department of Physics, University of Ulsan*
TD4-K-5 **16:00-16:15**	**The Effect of TiN Top and Bottom Electrodes on the Ferroelectric Properties of $Hf_{0.5}Zr_{0.5}O_2$ Thin Films** Hyo Jeong Kim[1], Yong Chan Jung[2], Jaidah Mohan[2], Jeong Gyu Yoo[1], Young In Kim[1], Yonghwan An[1], Jiyoung Kim[2], and Si Joon Kim[1] *[1]Department of Electrical and Electronics Engineering, Kangwon National University, [2]Department of Materials Science and Engineering, The University of Texas at Dallas*

D. Thin Film Process Technology 분과

2021년 1월 28일(목), 16:30-18:00 / Room A

▶ [TA5-D] Emerging Devices Ⅱ

TA5-D-1 **16:30-17:00**	**[초청]** **Semiconductor and Oxide Engineering for Heterogeneous Opto-Electronic Devices** Jae-Hoon Han *Center for Opto-Electronic Materials and Devices, KIST*
TA5-D-2 **17:00-17:15**	**Improved Dielectric and Leakage Properties of $BaTiO_3$ Film on $SrRuO_3$ Buffer Electrode** Eun Chong Ko, Wangu Kang, and Jeong Hwan Han *Department of Materials Science and Engineering, Seoul National University of Science and Technology*
TA5-D-3 **17:15-17:30**	**Growth of Low-leakage $BaTiO_3$ Thin Film on Polycrystalline Seed Layer by rf Magnetron Sputtering** Wangu Kang, Ji Sang Ahn, and Jeong Hwan Han *Department of Materials Science and Engineering, Seoul National University of Science and Technology*
TA5-D-4 **17:30-17:45**	**Work-function Engineering and Improved Stability Using PEALD TiCoN Metal Gate for HKMG Device** Juhyeon Lee, Moonsuk Choi, Minhyuk Kim, Jin Wei Nan, and Changhwan Choi *Division of Materials Science and Engineering, Hanyang University*
TA5-D-5 **17:45-18:00**	**Demonstration on Incremental Modulations in Channel Conductance of Charge-Trap Oxide Synapse TFT with Dual-Gate Configuration** Hyun-Joo Ryoo and Sung-Min Yoon *Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University*

F. Silicon and Group-IV Devices and Integration Technology 분과

2021년 1월 28일(목), 16:30-18:00 / Room B

▶ [TB5-F] Reliability/Variability Characterization

TB5-F-1 **16:30-16:45**	**Visibly Transparent Amorphous Silicon via Passivation of Dangling Bonds Enabling Low-Loss Photonic Platforms at the Visible Frequencies** Younghwan Yang[1], Gwanho Yoon[1], Sunghak Park[2], Ki Tae Nam[2], and Junsuk Rho[1] *[1]Department of Mechanical Engineering, POSTECH, [2]Department of Material Science and Engineering, Seoul National University*
TB5-F-2 **16:45-17:00**	**Modeling of Statistical Variation Effects on DRAM Sense Amplifier Offset Voltage** Kyung Min Koo[1], Woo Young Chung[2], Sang Yi Lee[2], Gyu Han Yoon[1], and Woo Young Choi[1] *[1]Department of Electronic Engineering, Sogang University, [2]Department of DRAM Sensing & Advanced Analysis, SK Hynix Inc.*
TB5-F-3 **17:00-17:15**	**Effects of Deuterium on the Random Telegraph Signal Noise Characteristics of FD-SOI pTFETs** Hyun-Jin Shin, Ki-Woo Song, Hyun-Woong Choi, Seong-Hyun Kim, and Hi-Deok Lee *Department of Electronics Engineering, Chungnam National University*
TB5-F-4 **17:15-17:30**	**A New Approach to Estimate the Process-Induced Random Variation in Current-voltage Characteristic of FinFET: Machine-Learning Technique** Jinwoong Lee and Changhwan Shin *Department of Electrical and Computer Engineering, Sungkyunkwan University*
TB5-F-5 **17:30-17:45**	**Effects of High-Energy Electron Injection on MOSFET Reliability** Daehwan Kim[1], Jae Hoon Park[2], Chang Kyun Kim[2], and Seongjae Cho[1] *[1]Department of Electronic Engineering, Gachon University, [2]The Attached Institute of ETRI*
TB5-F-6 **17:45-18:00**	**Hot Carrirer Injection Analysis of Tunnel Field Effect Transistors** Jae Seung Woo, Jang Woo Lee, and Woo Young Choi *Department of Electronic Engineering, Sogang University*

I. MEMS & Sensor Systems 분과

2021년 1월 28일(목), 16:30-18:00 / Room C

▶ [TC5-I] Advanced MEMS and Sensor Systems

TC5-I-1 **16:30-17:00**	**[초청]** **Flexible Power Source for Wearable Pressure Sensor Systems** Hyeok Kim[1,2] *[1]Institute of Information Technology, University of Seoul, [2]Sensor System Research Center, SENSOMEDI, Co., Ltd.*
TC5-I-2 **17:00-17:15**	**Battery-free Sensor System based on Wireless Power Supply** Sung-Gu Kang, Min-Su Song, Joon-Woo Kim, and Jeonghyun Kim *Department of Electronics Convergence Engineering, Kwangwoon University*
TC5-I-3 **17:15-17:30**	**Multi-Scale, Large Area Dry Transfer Printing by Thermal Expansion Mismatch** Seungkyoung Heo[1], Jeongdae Ha[1], Hohyun Keum[2], and Kyung-In Jang[1] *[1]DGIST, [2]KITECH*
TC5-I-4 **17:30-17:45**	**Effect of Sensing Layer Length on H_2S Gas Sensing and Low-frequency Noise in Resistor-type Gas Sensor** Donghee Kim[1,2], Wonjun Shin[1,2], Seongbin Hong[1,2], Yujeong Jeong[1,2], Gyuweon Jung[1,2], Jinwoo Park[1,2], and Jong-Ho Lee[1,2] *[1]Department of Electrical and Computer Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*
TC5-I-5 **17:45-18:00**	**실내 광 흡수 기반 센서상시전원용 고안정성 역구조 유기 태양전지** 이형원, 이용주, 김 혁 *서울시립대학교 전자전기컴퓨터공학부*

K. Memory (Design & Process Technology) 분과

2021년 1월 28일(목), 16:30-18:00 / Room D

▶ [TD5-K] Emerging Memory Ⅰ

TD5-K-1 **16:30-17:00**	**[초청]** **Device Requirements and Applications of Memristor-Based Artificial Neural Network Hardware** Shinhyun Choi, Taeryong Kim, Beomjin Kim, and Sion Park *The School of Electrical Engineering, KAIST*
TD5-K-2 **17:00-17:15**	**Superlattice-like GeTe/Sb_2Te_3 Phase Change Material Synthesized by Atomic Layer Deposition and Its Electrical Performance** Chanyoung Yoo[1,2], Eui-sang Park[1,2], Woohyun Kim[1,2], Jeong Woo Jeon[1,2], Wonho Choi[1,2], Byongwoo Park[1,2], Gyuseung Han[1,2,3], Yoon Kyeung Lee[4], and Cheol Seong Hwang[1,2] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University, [3]Center for Electronic Materials, KIST, [4]Division of Advanced Materials Engineering, Jeonbuk National University*
TD5-K-3 **17:15-17:30**	**Memristive Reservoir Computing for Medical Diagnosis** Yoon Ho Jang[1,2], Ji Hun Kim[1,2], Jeong Woo Jeon[1,2], Woo Hyun Kim[1,2], and Cheol Seong Hwang[1,2] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*
TD5-K-4 **17:30-17:45**	**Synaptic Weight Enhanced IGZO Nanofiber Channel Transistor with Ta_2O_5-Barrier Stacked Chitosan-Electric-Double Layer** Sung-Hun Kim and Won-Ju Cho *Department of Electronic Materials Engineering, Kwangwoon University*
TD5-K-5 **17:45-18:00**	**Interface Dipole Modulation Device: The New Candidate of Non-volatile Memory** Giuk Kim and Sanghun Jeon *School of Electrical Engineering, KAIST*

M. RF and Wireless Design 분과

2021년 1월 29일(금), 09:00-10:30 / Room A

▶ [FA1-M] RF Circuits and Wireless Systems

FA1-M-1 **09:00-09:30**	**[초청]** **Low-power Low-noise CMOS Oscillator Design for IoT Sensor Nodes** Junghyup Lee *Information and Communication Engineering, DGIST*
FA1-M-2 **09:30-10:00**	**[초청]** **NB-IoT and GNSS All-in-One SOC integrating RF Transceiver, 23dBmCMOS PA, PMIP, and Clock System** Jongsoo Lee, Jaeyeol Han, Chi-lun LO, Jongmi Lee, Wan Kim, Seungjin Kim, Byoungjoong Kang,Juyoung Han, Sangdon Jung, Takahiro Nomiyama, Jongwoo Lee, Thomas B. Cho, and Inyup Kang *Samsung Electronics Co., Ltd.*
FA1-M-3 **10:00-10:15**	**A 2.4-GHz Low-Power RF-to-BB-Current-Reuse BLE Receiver for IoT Applications** Beomyu Park and Kuduck Kwon *Department of Electronics Engineering and Graduate Program in BIT Medical Convergence, Kangwon National University*
FA1-M-4 **10:15-10:30**	**A Compact 28 GHz Stacked-FET Power in 28-nm FD-SOI CMOS with Adaptive Back-gate Control for Improving Linearity** Kyunghwan Kim[1], Kangseop Lee[1], Sungmin Cho[1], Gibeom Shin[2], and Ho-Jin Song[1] *[1]Department of Electrical Engineering, POSTECH, [2]Samsung Electronics Co., Ltd.*

F. Silicon and Group-IV Devices and Integration Technology 분과

2021년 1월 29일(금), 09:00-10:30 / Room B

▶ [FB1-F] Neuromorphic Technology

FB1-F-1 **09:00-09:15**	**Demonstration of Integrate-and-fire Neuron Circuit for Spiking Neural Networks** Sung Yun Woo[1,2], Won-Mook Kang[1,2], Young-Tak Seo[1,2], Soochang Lee[1,2], Seongbing Oh[1,2], and Jong-Ho Lee[1,2] *[1]Department of Electrical and Computer Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*
FB1-F-2 **09:15-09:30**	**Impact of Leakage Current of Synapse Array on Spiking Neural Networks** Bosung Jeon, Seunghwan Song, Taejin Jang, and Byung-Gook Park *Department of Electrical and Computer Engineering, Seoul National University*
FB1-F-3 **09:30-09:45**	**Effect of Layer-specific Synaptic Retention Characteristics on the Accuracy of Deep Neural Networks** Ho-Nam Yoo, Min-Kyu Park, and Jong-Ho Lee *School of ECE and ISRC, Seoul National University*
FB1-F-4 **09:45-10:00**	**Multi-level Synaptic Array based on AND-type Flash Memory for Hardware-based Neural Network** Soochang Lee[1,2], Seongbin Oh[1,2], and Jong-Ho Lee[1,2] *[1]Department of Electrical and Computer Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*
FB1-F-5 **10:00-10:15**	**Neuron Circuit with Capacitive Transimpedance Amplifier Integrator for Improving Output Linearity in Spiking Neural Networks** Youngsan Cha, Kyungchul Park, and Byung-Gook Park *Department of Electrical and Computer Engineering, Seoul National University*
FB1-F-6 **10:15-10:30**	**Analysis of Line Resistance Effect on Neuromorphic System** Jonghyuk Park[1,2], Taejin Jang[1,2], Sungmin Hwang[1,2], Bosung Jeon[1,2], and Byung-Gook Park[1,2] *[1]Inter-university Semiconductor Research Center, Seoul National University, [2]Department of Electrical and Computer Engineering, Seoul National University*

E. Compound Semiconductors 분과

2021년 1월 29일(금), 09:00-10:30 / Room C

▶ [FC1-E] Compound Semiconductors III

FC1-E-1 **09:00-09:15**	**SiC 파워 모듈 적용을 위한 고방열 나노/마이크론급 Cu Sintering Paste 무가압 접합** 배현철[1,2], 오애선[1], 백범규[3], 박웅비[3], 최소영[4], 김영훈[4] *[1]한국전자통신연구원 DMC융합연구단 국방전력/센서모듈연구실, [2]과학기술연합대학원대학교 ETRI스쿨 차세대소자공학과, [3]㈜경동엠텍, [4]㈜제엠제코*
FC1-E-2 **09:15-09:30**	**Effect of GaAs Buffer Thickness on InAs Quantum Dots Epitaxially Grown on Si Substrate** Yeonhwa Kim[1,2], Seungwan Woo[3], Rafael Chu[1,2], Geunhwan Ryu[1], Jae-Hoon Han[1], In-Hwan Lee[3], Won Jun Choi[1], and Daehwan Jung[1,2] *[1]Center for Opto-electronic Materials and Devices, KIST, [2]Division of Nano and Information Technology, KIST School at UST, [3]Department of Materials Science and Engineering, Korea University*
FC1-E-3 **09:30-09:45**	**Perovskite LED 소자의 특성에 끼치는 Nanocrystal 합성 및 MABr precursor 함량비율 영향성 분석** Jeongcheol Jang[1,2], Kunsik An[1], Byeong-Kwon Ju[2], and Sung-Hwan Choi[1] *[1]KITECH, [2]School of Electrical and Electronic Engineering, Korea University*
FC1-E-4 **09:45-10:00**	**Phase Change Characteristics and Stable Device Behavior Caused by Carbon Bonding with Ge and Sb in $Ge_2Sb_2Te_5$** Jeong Hwa Han[1], Hun Jeong[1], Han Jin Park[2], Young-Kyun Kwon[2], and Mann-HoCho[1] *[1]Department of Physics, College of Natural Science, Yonsei University, [2]Department of Physics and Research Institute for Basic Sciences, Kyung Hee University*
FC1-E-5 **10:00-10:15**	**고방열 DBC/AMB기판 및 고열전도 접합 소재를 이용한 SiC 파워 모듈의 열 해석** 김동환[1,2], 오애선[1], 안현식[1], 박은영[1], 김경현[1], 전성재[3], 배현철[1,2] *[1]한국전자통신연구원 DMC융합연구단 국방전력/센서모듈연구실, [2]과학기술연합대학원대학교 차세대소자공학, [3]한국기계연구원 나노융합장비연구부 나노역학장비연구실*
FC1-E-6 **10:15-10:30**	**Cumulative Effect on the Degradation of AlGaN/GaN HEMTs by Proton Irradiation** Dong-Seok Kim[1], Young Jun Yoon[1], Jae Sang Lee[1], Jeong-Gil Kim[2], and Jung-Hee Lee[2] *[1]Korea Multi-Purpose Accelerator Complex, KAERI, [2]School of Electronic and Electrical Engineering, Kyungpook National University*

H. Display and Imaging Technologies 분과

2021년 1월 29일(금), 09:00-10:30 / Room D

▶ [FD1-H] CMOS Image Sensor & X-ray Detector

FD1-H-1 **09:00-09:30**	**[초청]** **Study on the Noise in CMOS Image Sensor; How to Improve It** Manlyun Ha *CIS Process Development Team, Fab², DB HiTek*
FD1-H-2 **09:30-10:00**	**[초청]** **Flat Panel X-ray Detectors and Their Applications** Kyung Hun Yoon *Vieworks Co., Ltd.*
FD1-H-3 **10:00-10:15**	**Design Consideration of In-pixel Bias Transistor in Voltage-Domain Global Shutter CMOS Image Sensor** Dae-Hoon Kim, Dongseok Cho, Seung Sik Kim, Jonghyun Go, Jae-kyu Lee, and Chang-Rok Moon *Samsung Electronics Co., Ltd.*
FD1-H-4 **10:15-10:30**	**The Impact of the Sidewall Oxidation in Pixel Transistors on the Image Performance** Manlyun Ha, YoungHwan Hyun, ChangHun Han, and YongChan Kim *CIS Process Development Team, Fab², DB HiTek*

Q. Metrology, Inspection, Analysis, and Yield Enhancement 분과

2021년 1월 29일(금), 10:45-12:15 / Room A

▶ [FA2-Q] Metrology, Inspection, and Yield Enhancement I

FA2-Q-1 **10:45-11:15**	**[초청]** **Digital X-ray Sources based on Carbon Nanotube Field Emitters for Semiconductor Inspections** Yoon-Ho Song *Materials and Components Division, ICT Creative Research Laboratory, ETRI*
FA2-Q-2 **11:15-11:45**	**[초청]** **Real-time Monitoring of Contamination Particles in Semiconductor Process** Jihun Mun[1], and Sang-Woo Kang[1,2] *[1]Advanced Instrumentation Institute, KRISS, [2]Science of Measurement, UST*
FA2-Q-3 **11:45-12:00**	**A Hybrid Metrology & Inspection Solution for Semiconductor Manufacturing Process** Wookrae Kim, Gwangsik Park, Changhyeong Yoon, Jinseob Kim, Daehoon Han, Jaehwang Jung, and Myungjun Lee *MI Equipment R&D Team, Mechatronics R&D Center, Samsung Electronics Co., Ltd.*
FA2-Q-4 **12:00-12:15**	**An Instance Selection Algorithm under the Unsupervised Condition for a Virtual Metrology of Critical Dimension in Semiconductors** In Seok Park[1], JunHui Lee[1], Min Su Kim[1], Wan Sik Nam[2], Heeyoon Han[2], Sooseok Lee[2], Chihoon Lee[2], and PooGyeon Park[1] *[1]Department of Electrical Engineering, POSTECH, [2]Measurement & Inspection Team, Memory Business, Samsung Electronics Co., Ltd.*

F. Silicon and Group-IV Devices and Integration Technology 분과

2021년 1월 29일(금), 10:45-12:15 / Room B

▶ [FB2-F] New Device Technology

FB2-F-1 **10:45-11:00**	**Physical Modeling of Plasma-Wave Transistors for Both Resonant and Non-Resonant THz Detection Mechanism** Jong Yul Park, Min Woo Ryu, Sung-Ho Kim, Yoo Bin Song, and Kyung Rok Kim *Department of Electrical Engineering, UNIST*
FB2-F-2 **11:00-11:15**	**Single Transistor Latch Using Fully-depleted Silicon-On-Insulator Device** Gisu Youm and Changhwan Shin *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FB2-F-3 **11:15-11:30**	**Impact of Using HfO_2/Al_2O_3 Multilayer on the Performance of Threshold Switching Device** Sojin Jeong and Changhwan Shin *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FB2-F-4 **11:30-11:45**	**Content-Addressable Memory (CAM) based on Nanoelectromechanical (NEM) Memory Switches for Low-Energy and High-Speed Operation** Jae Seong Lee and Woo Young Choi *Department of Electronic Engineering, Sogang University*
FB2-F-5 **11:45-12:00**	**Effects of Nanosecond Laser Annealing on Highly-Phosphorus Doped Silicon** Hyunsu Shin, Eunjung Ko, Juhee Lee, Hwa-yeon Ryu, and Dae-Hong Ko *Department of Material Science and Engineering, Yonsei University*
FB2-F-6 **12:00-12:15**	**Experimental Study of Boosting Effect in Metal-Ferroelectric-Metal Capacitor** Gwon Kim and Changhwan Shin *Department of Electrical and Computer Engineering, Sungkyunkwan University*

E. Compound Semiconductors 분과

2021년 1월 29일(금), 10:45-12:15 / Room C

▶ [FC2-E] Compound Semiconductors IV

FC2-E-1 **10:45-11:00**	**Normally-off Unidirectional Operation of p-GaN Gate AlGaN/GaN Heterojunction Structure with Multi-Drain Electrode** Tae-Hyeon Kim, Jun-Hyeok Yim, Won-Ho Jang, and Ho-Young Cha *School of Electronic and Electrical Engineering, Hongik University*
FC2-E-2 **11:00-11:15**	**Thin barrier AlGaN/GaN HEMT 의 2DEG 특성 개선을 위한 AlN 박막 연구** Won-Ho Jang, Jun-Hyeok Yim, Tea-Hyun Kim, and Ho-Young Cha *School of Electrical and Electronic Engineering, Hongik University*
FC2-E-3 **11:15-11:30**	**고온 질화 열처리 NO 가스 비에 따른 탄화규소 금속-산화막-반도체 계면 결함 제어 효과** 김인규[1,2], 김형우[1], 방욱[1], 양창헌[3], 강예환[3], 윤승복[3], 박기철[2], 문정현[1] *[1]한국전기연구원 전력반도체연구센터, [2]경상대학교 시스템 및 반도체공학과, [3]예스파워테크닉스 연구소*
FC2-E-4 **11:30-11:45**	**Compact Modeling of Extrinsic Transconductance in InGaAs/InAlAs HEMTs** Seung-Won Yun, Hyeon-Bhin Jo,Jun-Gyu Kim, and Dae-Hyun Kim *School of Electronic and Electrical Engineering, Kyungpook National University*
FC2-E-5 **11:45-12:00**	**Effects of Proton Irradiation on Current Characteristics of SiN-passivated AlGaN/GaN MIS-HEMTs with TMAH-based Treatment Process** Young Jun Yoon, Jae Sang Lee, and Dong-Seok Kim *Korea Multi-purpose Accelerator Complex, KAERI*
FC2-E-6 **12:00-12:15**	**Enhancement-modeβ– Ga_2O_3 MOSFET 연구** Chan-hee Jang, June-heang Choi, Gokhan Atmaca, and Ho-Young Cha *School of Electronic and Electrical Engineering, Hongik University*

H. Display and Imaging Technologies 분과

2021년 1월 29일(금), 10:45-12:15 / Room D

▶ [FD2-H] Emerging Display 소재, 공정, 소자기술

FD2-H-1 **10:45-11:00**	**Simulation-Based Low Power Driving Technology Using Variable Potential for Large Panel Display** Seokha Hong, Dongjoon Kwag, Yongseok Choi, Joonchul Goh, and Bonghyun Yu *Display Electronics Research Team, Samsung Display Co., Ltd.*
FD2-H-2 **11:00-11:15**	**Asymmetric Gate Field Effect to Overcome High Exciton Binding Energy of 2D TMDCs Materials** Hyun-Soo Ra[1,2], Jongtae Ahn[1,2], and Do Kyung Hwang[1,2] *[1]Center of Opto-Electronic Materials and Devices, KIST, [2]Post-Silicon Semiconductor Institute, KIST*
FD2-H-3 **11:15-11:30**	**자기조립 단분자막 도입을 통한 PbS – IGZO 광 센서 반응 속도의 개선** Gilsu Jeon, Taewon Seo, Hyungmin Ko, and Yoonyoung Chung *Department of Electrical Engineering, POSTECH*
FD2-H-4 **11:30-11:45**	**Ferroelectric TFT Synaptic Device and Array for Spiking Neural Networks** Sang Min Yu, Taeho Lee, Kihwan Kim, and Saeroonter Oh *Department of Electrical and Electronic Engineering, Hanyang University*
FD2-H-5 **11:45-12:00**	**Detachment of Polymeric Substrate Using CO_2 Point Laser for Large-area Flexible Display: An Alternative Approach for Laser Lift-Off** Hyuk Park, Suwon Seong, Seongmin Park, Taewon Seo, and Yoonyoung Chung *Electrical Engineering, POSTECH*
FD2-H-6 **12:00-12:15**	**High-Performance 2D $MoTe_2/MoS_2$ Semi-Vertical Heterojunction Photodiodes for Visible–Invisible Multiband Detection and Imaging** Jongtae Ahn, Hyun-soo Ra, and Do Kyung Hwang *Center of Opto-Electronic Materials and Devices, Post-Silicon Semiconductor Institute, KIST*

Q. Metrology, Inspection, Analysis, and Yield Enhancement 분과

2021년 1월 29일(금), 13:00-14:30 / Room A

▶ [FA3-Q] Metrology, Inspection, and Yield Enhancement II

FA3-Q-1 **13:00-13:30**	**[초청]** **In Situ TEM Probing and Electron Tomography for Semiconductor Material and Device Characterization** Gyeong-Su Park *Department of Materials Science and Engineering, Seoul National University*
FA3-Q-2 **13:30-14:00**	**[초청]** **EUV Mask Defect Inspection and Repair using In-line AFM** Byoung-Woon Ahn, Ah-Jin Jo, and Sang-Joon Cho *Park Systems Co., Ltd.*
FA3-Q-3 **14:00-14:15**	**VRS Test로부터 TDDB 메커니즘에 기반한 Gate Oxide 품질 특성 추출 방법** Hakgyun Kim, Bumsuk Chung, Yuchul Hwang, and Namhyun Lee *Samsung Electronics Co., Ltd.*
FA3-Q-4 **14:15-14:30**	**대용량 및 중용량 터보분자펌프 핵심 성능 평가 플랫폼 개발** 심섭[1], 문지훈[1], 박재서[1,2], 송선민[1,3], 임종연[1], 제갈원[1], 강상우[1,2] *[1]한국표준과학연구원 첨단측정장비연구소, [2]과학기술연합대학원대학교 측정과학전공, [3]대전대학교 신소재공학과*

C. Material Growth & Characterization 분과

2021년 1월 29일(금), 13:00-14:30 / Room B

▶ [FB3-C] 2D Materials (& Characterization)

FB3-C-1 **13:00-13:30**	**[초청]** **TBA** 서준기 *UNIST*
FB3-C-2 **13:30-14:00**	**[초청]** **Developing Picowatt Resolution Calorimeters for Quantized Thermal Conductance Measurements** Sunghoon Hur *KIST*
FB3-C-3 **14:00-14:15**	**Electrical Characterization for Evaluating Average Grain Size of Polycrystalline Graphene** Jaewoon Kang, Junyeong Lee, Honghwi Park, Hyowoong Noh, Chang-Ju Lee, and Hongsik Park *School of Electronic and Electrical Engineering, Kyungpook National University*
FB3-C-4 **14:15-14:30**	**Two-dimensional Layered Catalysts by Coherent Heteroepitaxial Stacking for Robust Hydrogen Evolution** Yeoseon Sim[1,2,3], Aram Yoon[1,2,3], Hee Seong Kang[4], Jinsung Kwak[1,2], Se-Yang Kim[1,2], Yongsu Jo[1,2], Daeseong Choe[1,2], Woong Ki Na[5], Min Hee Lee[6], Seunguk Song[1,2], Jung-Woo Yoo[1,2], Hyeonsik Cheong[5], Jae Sung Lee[6], Chul-Ho Lee[4], Zonghoon Lee[1,2,3], and Soon-Yong Kwon[1,2] *[1]School of Materials Science and Engineering, UNIST, [2]Center for Future Semiconductor Technology(FUST), UNIST, [2]Center for Multidimensional Carbon Materials (CMCM), IBS, [3]KU-KIST Graduate School of Converging Science and Technology, Korea University, [4]Department of Physics, Sogang University, [5]School of Energy and Chemical Engineering, UNIST*

A. Interconnect & Package 분과

2021년 1월 29일(금), 13:00-14:30 / Room C

▶ [FC3-A] Advanced Package

FC3-A-1 **13:00-13:30**	**[초청]** **TSV Products Tend in Subscription Economy** 이웅선 *SK하이닉스*
FC3-A-2 **13:30-13:45**	**Micro Bump 에서의 Cu Plating Chemical 의 Bump 형상에 대한 연구** 정성목, 손호영, 김성규, 윤성원, 안재용, 정진욱 *SK 하이닉스*
FC3-A-3 **13:45-14:00**	**Fine Pitch Cu/SnAg Pillar Bump Interconnects on Nickel-less Electroless Palladium Immersion Gold (EPIG) Surface Finish** Tae-Young Lee[1,2], Jungsoo Kim[1], So Yeon Jun[1], Young-Ho Kim[2], and Sehoon Yoo[1] *[1]KAIST, [2]Hanyang University*
FC3-A-4 **14:00-14:15**	**Development of Active Matrix (AM) Digital Signage Modules Using Laser-assisted Bonding (LAB) Technology** Kwang-Seong Choi[1], Jiho Joo[1], Ki-seok Jang[1], Chanmi Lee[1], Yong-Sung Eom[1], Gwang-Mun Choi[1],Ho-Gyeong Yun[1], Seok Hwan Moon[1], Jong-Sun Kim[2], Mingyun Oh[2], Ji-Hoon Choi[3], Ji-Woong Choi[3], Sung-Yun, Cho[3], and Sang-Ki Kim[4] *[1]ICT Creative Laboratory, ETRI, [2]SiliconInside Co., Ltd., [3]AQLASER Co., Ltd., [4]HS Semicon*
FC3-A-5 **14:15-14:30**	**Ar/N_2 플라즈마 조건에 따른 Cu-Cu 직접접합부의 미세조직 및 계면접착에너지 평가 및 분석** 최성훈[1], 김가희[1], 서한결[2], 김사라은경[2], 박영배[1] *[1]안동대학교 신소재공학부 청정에너지소재기술연구센터, [2]서울과학기술대학교 나노 IT 디자인융합대학원*

K. Memory (Design & Process Technology) 분과

2021년 1월 29일(금), 13:00-14:30 / Room D

▶ [FD3-K] Emerging Memory II

FD3-K-1 **13:00-13:30**	**[초청]** **Neuromorphic Computing for Spiking Neural Network** Minsuk Koo *Incheon National University*
FD3-K-2 **13:30-13:45**	**Improved Resistive Switching Reliability in a Hybridized SnS_2-TiO_2 Based Device** Seung-Jong Yoo[1,2], Kanghyeok Jeon[1,2], Jin Joo Ryu[1], Doo Seok Jeong[2], and Gun Hwan Kim[1] *[1]Division of Advanced Materials, KRICT, [2]Division of Materials Science and Engineering, Hanyang University*
FD3-K-3 **13:45-14:00**	**Deposition of Chalcogenide-based Thin Films Using the PEALD System for Selector Device** Jin Joo Ryu[1,2], Hyunchul Sohn[2], and Gun Hwan Kim[1] *[1]Division of Advanced Materials, KRICT, [2]Department of Materials Science and Engineering, Yonsei University*
FD3-K-4 **14:00-14:15**	**The Effect of Oxygen Content on the Optical Power- and Wavelength-Dependencies of the IGZO Memristor-Based Photodetector** Tae Jun Yang, Jun Tae Jang, Woo Sik Choi, Donguk Kim, Jong-Ho Bae, Sung-Jin Choi, Dong Myong Kim, and Dae Hwan Kim *School of Electrical Engineering, Kookmin University*
FD3-K-5 **14:15-14:30**	**Electrothermal Model-Based Analysis for Novel Phase-Change Memory Structure with Decoupled Program and Read Paths** Inhyuk Choi and Sangbum Kim *Department of Materials Science and Engineering, Seoul National University*

Q. Metrology, Inspection, Analysis, and Yield Enhancement 분과

2021년 1월 29일(금), 14:45-16:15 / Room A

▶ [FA4-Q] Nanoanalysis and Characterization

FA4-Q-1 **14:45-15:15**	**[초청]** **반도체 공정 플라즈마 정밀 측정기술 및 소재/부품/장비 정량화 평가기술** 이효창, 김정형 *한국표준과학연구원*
FA4-Q-2 **15:15-15:30**	**Semiconductor Analysis Techniques at NNFC** Jun-Mo Yang *Nano-Convergence Technology Division, NNFC*
FA4-Q-3 **15:30-15:45**	**Development of Optical Characterization Equipment for Si Wafer Monitoring in Ion Implantation Process** YoungMin Park[1], HyunDon Jung[1], DongHan Kim[1], JungMin Kim[1], YongHee Jeon[1], GyuHyeong Cho[1], Sung-Jin Chang[2], Woo Sik Soun[2], Chil Seong Jeong[2], Jong-Bum You[2], and Jin Su Kim[2] *[1]Etamax Co., Ltd, [2]National Nanofab Center*
FA4-Q-4 **15:45-16:00**	**Analysis of Ferroelectric Modulation Structurein MOS structure** Min Baik[1], Deok Joon Eom[2], Jonghoon Kim[1], Hyeon-Sik Kim[1], Kwang-Sik Jeong[1], Jin Dong Song[3], Hyoungsub Kim[2], and Mann-Ho Cho[1] *[1]Department of Physics, Yonsei University, [2]School of Advanced Materials Science and Engineering, Sungkyunkwan University, [3]Center of Opto-electronic Materials, KIST*
FA4-Q-5 **16:00-16:15**	**지능형 반도체의 고속 동작 특성 평가용 테스트 패턴** 최현웅, 김성현, 송기우, 이희덕 *충남대학교 전자공학과*

C. Material Growth & Characterization 분과

2021년 1월 29일(금), 14:45-16:15 / Room B

▶ [FB4-C] Oxides

FB4-C-1 **14:45-15:15**	**[초청]** **High Infrared Transparency up to an 8-μm Wavelength of Correlated Vanadium Wadsley Conductors** Songhee Choi and Shinbuhm Lee *Department of Emerging Materials Science, DGIST*
FB4-C-2 **15:15-15:30**	**Influence of Post-Cooling Process on the Ferroelectric Properties of Lanthanum-Doped Hafnium Oxide (La:HfO_2) Thin Film** Yooncheol Shin, Boncheol Ku, Youngjun Lee, Taeheun Kim, and Changhwan Choi *Division of Materials Science & Engineering, Hanyang University*
FB4-C-3 **15:30-15:45**	**Atomistic Design of $Be_{0.25}Mg_{0.75}O$ Superlattice-like Structure as a High-κ Dielectric Layer** Gyuseung Han[1,2,3], In Won Yeu[1], Kun Hee Ye[1,2,3], Seung-Cheol Lee[4], Cheol Seong Hwang[2,3], and Jung-Hae Choi[1] *[1]Center for Electronic Materials, Korea Institute of Science and Technology, [2]Department of Materials Science and Engineering, Seoul National University, [3]Inter-University Semiconductor Research Center, Seoul National University, [4]Indo-Korea Science and Technology Center, Bengaluru*
FB4-C-4 **15:45-16:00**	**Controllable Bias Field of Tensile Strained $BaTiO_3$ Epitaxial Film** Jun Han Lee[1], Nguyen Xuan Duong[2], Min-Hyoung Jung[3], Junhyung Kim[4], Ahyoung Kim[5], Gye-Hyeon Kim[6], Byeong-Gwan Cho[7], Hyun-Jae Lee[8], Daehwan Park[1], Young-Min Kim[3], Jun Hee Lee[8], Tae-Yeong Koo[7], Changhee Sohn[1,6], Sang Mo Yang[5], Kibog Park[1,4], Hu Young Jeong[9], Tae Heon Kim[2], and Yoon Seok Oh[1] *[1]Department of Physics, UNIST, [2]Department of Physics and Energy Harvest Storage Research Center (EHSRC), University of Ulsan, [3]Department of Energy Science, Sungkyunkwan University, [4]School of Electrical and Computer Engineering, UNIST, [5]Department of Physics, Sogang University, [6]School of Natural Science, UNIST, [7]Pohang Accelerator Laboratory, POSTECH, [8]School of Energy and Chemical Engineering, UNIST, [9]UNIST Central Research Facilities, UNIST*
FB4-C-5 **16:00-16:15**	**Direct Visualization of Temperature-Dependent Local Conductance Change in an Epitaxial VO_2 Film Using Conductive-Atomic Force Microscopy** Ahyoung Kim[1], Jung Hyun Park[2], Soo Yeon Lim[1], Jin-Seok Chung[2], Hyeonsik Cheong[1], Changhyun Ko[3], Jong-Gul Yoon[4], and Sang Mo Yang[1] *[1]Department of Physics, Sogang University, [2]Department of Physics, Soongsil University, [3]Department of Physics, Sookmyung Women's University, [4]Department of Physics, University of Suwon*

R. Semiconductor Software 분과

2021년 1월 29일(금), 14:45-16:15 / Room C

▶ [FC4-R] S/W Techniques for SSDs

FC4-R-1 **14:45-15:15**	**[초청]** **TBA** 황주영 *삼성전자*
FC4-R-2 **15:15-15:30**	**KV-SSD를 이용한 운영체제의 대용량 해싱 구조 활용** Jung Bin Kim[1], Young Je Moon[1], and Sam H. Noh[1,2] *[1]Department of Computer Science Engineering, UNIST, [2]Graduate School of Artificial Intelligence, UNIST*
FC4-R-3 **15:30-15:45**	**ZNS SSD를 위한 키-밸류 스토어 데이터 배치 최적화 기법** Gijun Oh and Sungyong Ahn *Pusan National University*
FC4-R-4 **15:45-16:00**	**SSD-Internal Buffer Management under Partial Power-loss Protection** Sanghyun Nam and Eunji Lee *Soongsil University*
FC4-R-5 **16:00-16:15**	**키-밸류 스토어에서 선택적 내구성 보장 기법을 이용한 SSD PLP(Power Loss Protection) 전력소비 개선** JunSeok Yang and Sungyong Ahn *Pusan National University*

K. Memory (Design & Process Technology) 분과

2021년 1월 29일(금), 14:45-16:15 / Room D

▶ [FD4-K] Emerging Memory Ⅲ

FD4-K-1 **14:45-15:00**	**28nm Highly Reliable Embedded Flash Memory Logic Process for Automotive Grade-1 (-40~150℃) Application** GaYoung Lee, DongHyun Kim, JongSung Woo, KyongSik Yeom, YongSeok Chung, MinJi Seo, Youngcheon Jeong, Changmin Jeon, SangJin Lee, and YongKyu Lee *Foundry Business, Samsung Electronics Co., Ltd.*
FD4-K-2 **15:00-15:15**	**Simulations of PCM's ISPP Characteristics by Comparing Different Materials and Cell Architectures** Hwanwook Lee, Ho Thi Thu Trang, and Yongwoo Kwon *Material Science and Engineering, Hongik University*
FD4-K-3 **15:15-15:30**	**Effect of the ALD Temperature on Switching Characteristic in Cu-based CBRAM with the Solid Electrolyte of Al_2O_3** Inseok Chae, Jun Tae Jang, Shinyoung Park, Woo Sik Choi, Jong-Ho Bae, Sung-Jin Choi, Dong Myong Kim, and Dae Hwan Kim *School of Electrical Engineering, Kookmin University*
FD4-K-4 **15:30-15:45**	**Ensemble of Stochastic Memristive Neural Network to Mitigate Synaptic Device Non-idealities** Hanchan Song, Hyun Soo Nam, Jae Hyun In, Gwangmin Kim, Woon Hyung Cheong, Do Hoon Kim, and Kyung Min Kim *Department of Materials Science and Engineering, KAIST*
FD4-K-5 **15:45-16:00**	**nvSRAM을 위한 자동저장회로 개발** 고운산, 정준교, 성재영, 남기령, 이가원 *충남대학교 전자공학과*
FD4-K-6 **16:00-16:15**	**A Diffusive-Memristor-Based True Random Number Generator** Kyung Seok Woo[1,2], Jae Hyun Kim[1,2], and Cheol Seong Hwang[1,2] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Inter-University Semiconductor Research Center, Seoul National University*