

제23회 한국반도체학술대회

2016년 2월 22일(월)-24일(수), 강원도 하이원리조트

Room E

컨벤션홀 L(5층)

2016년 2월 24일(수) 11:40-13:00

[WP1] PosterII

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| WP1-1 | 11:40-13:00 | One-Dimensional Electrical Contact To Molybdenum Disulfide Zheng Yang ¹ , Changho Ra ¹ , Faisal Ahmed ² , Daeyeong Lee ¹ , Minsup Choi ¹ , Xiaochi Liu ¹ , Deshun Qu ¹ , and Wonjong Yoo ¹ <i>¹SKKU Advanced Institute of Nano Technology, Sungkyunkwan University, ²Department of Mechanical Engineering, Sungkyunkwan University</i> |
| WP1-2 | 11:40-13:00 | Sensitivity Analysis and Fault Detection of Plasma Monitoring Signals with Multivariate Analysis Kyongbeom Koh ¹ , Hakseung Lee ¹ , Haegyung Jang ² , Honyoung Lee ³ , and Heeyeop Chae ^{1,2} <i>¹School of Chemical Engineering, Sungkyunkwan University, ²SKKU Advanced Institute of Nano Technology, Sungkyunkwan University, ³School of Semiconductor and Display Engineering, Sungkyunkwan University</i> |
| WP1-3 | 11:40-13:00 | Plasma-assisted Decoration of Metal Nanoparticles onto Carbon Nanotubes for Sensing Enhancement Hyoun Woo Kim, Han Gil Na, Yong Jung Kwon, and Sung Yong Kang <i>Department of Materials Science and Engineering, Hanyang University</i> |
| WP1-4 | 11:40-13:00 | Plasma-sputtering of Pt Nanoparticles on ZnO-Branched SnO₂ Nanowires and Their Sensing Characteristics Hyoun Woo Kim, Han Gil Na, Yong Jung Kwon, and Sung Yong Kang <i>Department of Materials Science and Engineering, Hanyang University</i> |
| WP1-5 | 11:40-13:00 | Thickness Control and Surface Potential Changes of MoS₂ by using O₂ Plasma. Suh Hyun Kim, Deshun Qu, Chang Ho Ra, Min Sup Choi, Xiaochi Liu, and Won Jong Yoo <i>SKKU Advanced Institute of Nano Technology, Sungkyunkwan University</i> |
| WP1-6 | 11:40-13:00 | Multi-Level of Directed Self-Assembly Young Joo Choi and Sang Ouk Kim <i>Department of Materials and Science, KAIST</i> |
| WP1-7 | 11:40-13:00 | High Density Plasma Etching of Palladium Thin Films Jae Yong Lee, Su Min Hwang, Adrian Adalberto Garay, Ji Hyun Choi, and Chee Won Chung <i>Department of Chemistry and Chemical Engineering, Center for Design and Applications of Molecular Catalysts, Inha University</i> |

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- WP1-8 11:40-13:00 Effect of Non-Corrosive Gas Mixture on Etching of CoPt Alloys using Inductively Coupled Plasma Reactive Ion Etching**
Su Min Hwang, Adrian Adalberto Garay, Ji Hyun Choi, Jae Yong Lee, and Chee Won Chun
Department of Chemistry and Chemical Engineering, Center for Design and Applications of Molecular Catalysts, Inha University
- WP1-9 11:40-13:00 Etching Characteristics of Ta Thin Films using Inductively Coupled Plasma of Chlorine Gas**
Ji Hyun Choi, Adrian Adalberto Garay, Su Min Hwang, Jae Yong Lee, and Chee Won Chung
Department of Chemistry and Chemical Engineering, Center for Design and Applications of Molecular Catalysts, Inha University
- WP1-10 11:40-13:00 Inductively Coupled Plasma Reactive Ion Etching of CoFeB Magnetic Thin Films and Nanometer-size Patterned Magnetic Tunnel Junction Stacks Using C₂H₅OH/Ar Plasma Chemistries**
Adrian Adalberto Garay, Ji Hyun Choi, Su Min Hwang, Jae Yong Lee, and Chee Won Chung
Department of Chemistry and Chemical Engineering, Center for Design and Applications of Molecular Catalysts, Inha University
- WP1-11 11:40-13:00 Au@Ag Core-Shell Nanoparticle Array by Block Copolymer Self-Assembly for Tunable Plasmonic Properties**
Seung Keun Cha, Jeong Ho Mun, and Sang Ouk Kim
Department of Materials Science and Engineering, KAIST
- WP1-12 11:40-13:00 SOD Thermal Stress로 인한 Wafer Distortion이 Overlay Error에 미치는 영향**
이지은
Research and Development Division, SK hynix Inc.
- WP1-13 11:40-13:00 Etching Characteristics and Mechanisms of Ar addition in Halogen-Based Inductively Coupled Plasmas for Dry Etching TiO₂ Thin Films**
Junmyung Lee¹, ByungJun Lee¹, Alexander Efremov², and Kwang-Ho Kwon¹
¹Department of Control and Instrumentation Engineering, Korea University, ²Department of Electronic Devices and Materials Technology, State University of Chemistry and Technology, Russia
- WP1-14 11:40-13:00 Magnetic Field-Induced Assemblies of Magnetic Nanoparticles into Well-Ordered Lattice Structures**
Myunghwan Byun
Department of Advanced Materials Engineering, Keimyung University
- WP1-15 11:40-13:00 Spatially-Defined Wrinkles in Gradient Stripe-Patterned Polymer Thin Films**
Myunghwan Byun
Department of Advanced Materials Engineering, Keimyung University

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| WP1-16 | 11:40-13:00 | Study on The Improvement of The Hole Pattern Profile with Fluorocarbon Etching Gas Boung Jun Lee ¹ , Byung Jun Lee ² , Ji Woon Yang ¹ , and Kwang Ho Kwon ² <i>¹Department of Electronics and Information Engineering, Korea University, ²Department of Control and Instrumentation Engineering, Korea University</i> |
| WP1-17 | 11:40-13:00 | The Fabrication of Low-loss Si-Photonic Devices by Reducing The Side-wall Roughness at The Dry Etching Process Dong-Eun Yoo and Dong-Wook Lee <i>National Nano Fab Center</i> |
| WP1-18 | 11:40-13:00 | 고차조화파 생성 기반의 Coherent EUV 광원 개발 및 출력 특성 박한용 ^{1,2} , 김용수 ^{1,2} , 김영희 ¹ , 성하민 ³ , 김점술 ³ , 이주한 ² , 박민철 ¹ , 전영민 ¹ <i>¹한국과학기술연구원 센서시스템연구센터, ²서울시립대학교 전자전기 컴퓨터공학과, ³레이저 스펙트라</i> |
| WP1-19 | 11:40-13:00 | Fabrication of Contact-hole Pattern in 193-nm Immersion Lithography Sunhee Lim, Byoungsub Nam, Dongjin Lee, Sangjin Oh, Dongwon Lee, Daesung Kim, Seyoung Oh, Hyunjo Yang, and Donggyu Yim <i>Research and Development Division, SK hynix Inc.</i> |
| WP1-20 | 11:40-13:00 | EUV 리소그래피 시뮬레이션을 통한 SRAF 적용 마스크의 공정 허용도 최적화 장용주 ¹ , 김정식 ¹ , 홍성철 ² , 조한구 ³ , 안진호 ^{1, 2} <i>¹한양대학교 나노반도체공학과, ²한양대학교 신소재공학과, ³한양대학교 나노과학기술연구소</i> |
| WP1-21 | 11:40-13:00 | EUV용 PSM을 통한 SRAF 적용 마진 및 노광공정 마진 향상 연구 김정식 ¹ , 홍성철 ² , 장용주 ¹ , 조한구 ³ , 안진호 ^{1,2} <i>¹한양대학교 나노반도체공학과, ²한양대학교 신소재공학과, ³한양대학교 나노과학기술연구소</i> |
| WP1-22 | 11:40-13:00 | Controlled MoS₂ Layer Etching and Plasma Treatment Kyung Chae Yang, Sung Woo Park, Min Hwan Jeon, Kyong Nam Kim, and Geun Young Yeom <i>Department of Advanced Materials Science and Engineering, Sungkyunkwan University</i> |
| WP1-23 | 11:40-13:00 | Plasma Properties of Ferrite Superimposed Dual Frequency Inductively Coupled Plasma Source S. M. Lee ¹ , T. H. Kim ¹ , C. H. Lee ¹ , J. W. Bae ¹ , K. N. Kim ¹ , and G. Y. Yeom ^{1,2} <i>¹Department of Advanced Materials Science and Engineering, Sungkyunkwan University, ²Sungkyunkwan Advanced Institute of Nano Technology, Sungkyunkwan University</i> |

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| WP1-24 | 11:40-13:00 | Effects of Etch Gases on The Etching of STT-MRAM Sung Woo Park, Kyung Chae Yang, Min Hwan Jeon, Kyong Nam Kim, and Geun Young Yeom <i>Department of Advanced Materials Science and Engineering, Sungkyunkwan University</i> |
| WP1-25 | 11:40-13:00 | Optimizing Process Condition of Inductively Coupled Plasma Etching for Bulk Aluminum Yun-Bin Kim, Chang-Su Seo, Sang-Yeop Jee, Suk-Jin Jung, Sin Keun Park, Jong-Seung Park, Jong Ho Lee, and Cheol Seong Hwang <i>Inter-University Semiconductor Research Center, Seoul National University</i> |
| WP1-26 | 11:40-13:00 | Aspect Ratio Dependent Etching in DRAM Metal Contact Process 황원재, 장경태, 엄정환, 이효창, 이승형 <i>Etch Technology Team, Samsung Electronics Co., Ltd.</i> |
| WP1-27 | 11:40-13:00 | Mechanism of CD Drift in Flash Memory DPT Process 양채영, 방진영, 이효창, 김영주 <i>Etch Technology Team, Samsung Electronics Co., Ltd.</i> |
| WP1-28 | 11:40-13:00 | Growth of Free-standing M-Plane GaN using Hydride Vapor Phase Epitaxy Seohwi Woo ¹ , Sangil Lee ¹ , Uiho Choi ¹ , Hyunjae Lee ² , Minho Kim ² , Jaiyong Han ² , and Okhyun Nam ¹ <i>¹Convergence Center for Advanced Nano Semiconductor, Department of Nano-Optical Engineering, Korea Polytechnic University, ²Lumistal Co., Ltd., Business Incubation Center, Korea Polytechnic University</i> |
| WP1-29 | 11:40-13:00 | Effect of Selenium Doping on The Crystallization Properties of GeSb for Phase Change Memory Applications Jeong-Hoon Kim ¹ , Jeong-Hee Park ² , and Dae-Hong Ko ¹ <i>¹Department of Materials Science and Engineering, Yonsei University, ²Process Development Team, Semiconductor Research and Development Division, Samsung Electronics Co., Ltd.</i> |
| WP1-30 | 11:40-13:00 | Growth Enhancement and Nitrogen Loss in ZnOxNy Atomic Layer Deposition with NH₃ Soo Hyun Kim ¹ , Jung Joon Pyeon ^{1,2} , Woo Cheol Lee ^{1,3} , Jin-Sang Kim ¹ , and Seong Keun Kim ¹ <i>¹Center for Electronic Materials, Korea Institute of Science and Technology, ²Korea University-Korea Institute of Science and Technology, ³Department of Materials Science and Engineering, Seoul National University</i> |
| WP1-31 | 11:40-13:00 | Selective Epitaxial Growth of GaAs on In-situ Profile Formed Si (001) Surface by Metal-Organic Chemical Vapor Deposition Young-Dae Cho ^{1,2} , In-Geun Lee ^{1,2} , Mi-Jin Jung ¹ , Hyunsu Shin ¹ , Dong-Hwan Jun ² , Chan-Soo Shin ² , Kyung-Ho Park ² , Won-Kyu Park ² , Dae-Hyun Kim ³ , and Dae-Hong Ko ¹ <i>¹Department of Materials Science and Engineering, Yonsei University,</i> |

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²Korea Advanced Nano Fab Center, ³School of Electronics Engineering,
Kyungpook National University

- WP1-32** **11:40-13:00** **Formation and Characterization of GaN:TiO₂ PN Junction**
Taeyoung Yang¹ and Jinsub Park²
¹Department of Electronics and Computer Engineering, Hanyang University, ²Department of Electronic Engineering, Hanyang University
- WP1-33** **11:40-13:00** **A Simple Sonochemical Approach of Mn²⁺ Doped ZnO Nanopowder: Structural, Optical and Magnetic Studies**
B. Babu, Dong Su Shin, and Jinsub Park
Department of Electronics and Computer Engineering, Hanyang University
- WP1-34** **11:40-13:00** **Low Temperature Growth of Polycrystalline Gallium Arsenide on SiO₂**
Il-Pyo Roh and Jin-Dong Song
Center for Opto-Electronic Materials and Devices, Korea Institute of Science and Technology
- WP1-35** **11:40-13:00** **Growth of High-Quality Thin InSb on (001) GaAs Substrate Using InAlSb Continuously Graded Buffer Layer**
Sooseok Kang, Sanghoon shin, and Jindong Song
Center for Opto-Electronic Materials and Devices, Korea institute of Science and Technology
- WP1-36** **11:40-13:00** **Formation of InGaAs Nanowires on (111) Si for Antireflection**
H. K. Kang^{1,2} E. H. Lee¹, J. D. Song¹, J. J. Yoon¹, M. H. Bae¹, I. K. Han¹, W. J. Choi¹, S. K. Chang², M. H. Cho², and Y. D. Kim³
¹Center for Opto-Electronic Convergence Systems, Korea Institute of Science and Technology, ²Department of Physics, Yonsei University, ³Nano-Optical Property Laboratory and Department of Physics, Kyung Hee University
- WP1-37** **11:40-13:00** **Fabrication of Photodetector Using CuO-In₂O₃ Arrays**
Inje Cho¹, K. Mageshwari¹, and JinsubPark^{1,2}
¹Department of Electronics and Computer Engineering, Hanyang University, ²Department of Electronic Engineering, Hanyang University
- WP1-38** **11:40-13:00** **Effect of Inter SiO_x Layer Quality on CV Curve of TiN/ HfO₂/ SiO_x/ Si Stack for Backside Illuminated CMOS Image Sensor**
Heedo Na, Jimin Lee, Juyoung Jeong, Jiwon Choi, and Hyunchul Sohn
Department of Materials Science and Engineering, Yonsei University
- WP1-39** **11:40-13:00** **Position Controlled Growth of Quantum Dots and Nanowires**
Suk In Park and Jin Dong Song
Center of Opto-Electronic Material and Devices, Korea Institute of Science and Technology
- WP1-40** **11:40-13:00** **Surface Morphology Control of GaN/AlGaIn Heterostructures for Ultraviolet Light Emitting Diodes**

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Dohyun Kim^{1,2}, Keunman Song², Jehyuk Choi², and Jinsub Park¹
¹Department of Electronics and Computer Engineering, Hanyang University, ²Korea Advanced Nano Fab Center

- WP1-41 11:40-13:00 Single Photon Emission of InAs QD with GaAs/Air-Gap Based Distributed Bragg Reflector**
J. H. Kyhm, I. P. Rho, and J. D. Song
Center for Opto-Electronic Materials and Devices Research Post-Si Semiconductor, Korea Institute of Science and Technology
- WP1-42 11:40-13:00 Epitaxial Growth of The Si_{1-x}Ge_x Fin Structure and Its Strain Relaxation**
Sangmo Koo, Hyunchul Jang, and Dae-Hong Ko
Department of Materials Science and Engineering, Yonsei University
- WP1-43 11:40-13:00 The Effect of The Tellurium Doping on The Surface Roughness of InP Buffer on Si Substrate**
Dong-Hwan Jun, Hae Yong Jeong, and Won-Kyu Park
Korea Advanced Nano-Fab Center
- WP1-44 11:40-13:00 GaN Growth on Poly-crystalline Diamond/Si Substrate by Metal Organic Chemical Vapor Deposition**
Byeongchan So¹, Taemyung Kwak¹, Kyungjae Lee¹, Kwangse Ko¹, Daehong Min¹, Donghwy Park¹, Wookseong Lee², Ilki Han³, Joonyeon Chang², and Okhyun Nam¹
¹Convergence Center for Advanced Nano Semiconductor, Department of Nano-Optical Engineering Korea Polytechnic University, ²Post-Silicon Semiconductor Institute, Korea Institute of Science and Technology, ³Center for Opto-Electronic Materials and Devices, Korea Institute of Science and Technology
- WP1-45 11:40-13:00 Bottom-up Synthesis of Self-Aligned Graphene Nanoribbons on Single-crystal Germanium Surface**
Seog-Gyun Kang¹, Min-Sung Kim², Yong-Seung Shin², Yu-Hwan Hyeon², and Dongmok Whang^{1,2}
¹School of Advanced Materials Science and Engineering, Sungkyunkwan University, ²SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University
- WP1-46 11:40-13:00 Growth of InAs on Patterned Si**
Sooseok Kang, Ilpyo Rho, and Jindong Song
Center for Opto-Electronic Materials and Devices, Korea institute of Science and Technology
- WP1-47 11:40-13:00 Atmospheric Pressure Plasma-Enhance Chemical Vapor Deposition Process for High Throughput and High Quality Si Epitaxy**
Sanghyeon Lee¹, Gwi Hyun Kim¹, Seungwoo Hong¹, Sangmo Koo², Seran Park², Hyunsoo Shin², Hoon-Jung Oh³, Dae-Hong Ko^{2,3}, and Seung Jae Baik¹
¹Department of Electrical, Electronic, and Control Engineering, Hankyong National University, ²Department of Materials Science and

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Engineering, Yonsei University, ³BIOIT Micro Fab Center, Yonsei University

- WP1-48** **11:40-13:00** **Accurate Process Temperature Monitoring in Narrow Gap Plasma-Enhance Chemical Vapor Deposition System**
Gwi Hyun Kim, Sanghyeon Lee, Seungwoo Hong, and Seung Jae Baik
Department of Electrical, Electronic, and Control Engineering, Hankyong National University
- WP1-49** **11:40-13:00** **Solution-Free Synthesis of Low-Dimensional Graphene Encapsulated Nanocomposites in Near-Room Temperature**
Se-Yang Kim¹, Jinsung Kwak¹, Jae Hwan Chu¹, Jeong Beom Kim², Sung Youb Kim³, Kibog Park⁴, and Soon-Yong Kwon^{1,3}
¹School of Materials Science and Engineering, Low Dimensional Carbon Materials Center, Ulsan National Institute of Science and Technology, ²School of Life Science, Max Planck Partner Group-Molecular Biomedicine Laboratory(MPPG-MBL), Ulsan National Institute of Science and Technology, ³School of Mechanical and Nuclear Engineering, Ulsan National Institute of Science and Technology, ⁴Department of Physics, Ulsan National Institute of Science and Technology
- WP1-50** **11:40-13:00** **High Performance Flexible UV Phototransistor using Hybrid Channel of Vertical ZnO Nanorods and Graphene**
Vinh Quang Dang, Tran Quang Trung, Le Thai Duy, Bo-Yeong Kim, Saqib Siddiqui, Wonil Lee, and Nae-Eung Lee
School of Advanced Materials Science and Engineering, Sungkyunkwan University
- WP1-51** **11:40-13:00** **Investigating Gate Metal Induced Reduction of Surface Donor Density in AlGaIn/GaN Heterostructure by Electroreflectance Spectroscopy**
Kyu-Sang Kim¹, Jong-Hoon Shin², and Kwang-Choong Kim²
¹Department of Applied Physics and Electronics, Sangji University, ²IGBT part, System IC Research and Development Laboratory, LG Electronics Inc.
- WP1-52** **11:40-13:00** **AlGaIn/GaN Power HEMTs for Next Generation Radar Systems**
강동민, 김해천, 이종민, 김성일, 안호균, 민병규, 윤형섭, 김동영, 이상흥, 임종원
한국전자통신연구원 RF융합부품연구실
- WP1-53** **11:40-13:00** **Soluble-Processed SiO₂ Gate Dielectrics Fabrication Via UV Photo Annealing Process for Flexible Oxide Transistors**
Hyeonju Seol, Nuri On, Azida Azmi, and Jaekyeong Jeong
Department of Electronic and Computer Engineering, Hanyang University
- WP1-54** **11:40-13:00** **Improvement in High Mobility of Top Gate Zinc Tin Oxide Transistor by Metal Capping Method**
Sang Tae Kim¹, Hyuk Ji², and Jae Kyeong Jeong¹

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¹Department of Electronics and Computer Engineering, Hanyang University, ²Department of Materials Science and Engineering, Inha University

- WP1-55** **11:40-13:00** **Capping Layer Effects on P-GaN Gate HEMT**
Myeong-Kyu Eo, Chan-Yong Jeong, Sang-Hun Song, and Hyuck-In Kwon
School of Electrical and Electronics Engineering, Chung-Ang University
- WP1-56** **11:40-13:00** **Fabrication of Rectangular GaN Schottky Barrier Diode with Low On-State Resistance than Circular GaN Schottky Barrier Diode**
Jihyun Yu¹, Yeji Lee¹, Changju Youn¹, Cheoljong Choi¹, Taehoon Jang¹, and Kyuhwan Shim^{1,2}
¹Department of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, ²Research and Development Division, Sigetronics, Inc.
- WP1-57** **11:40-13:00** **Crystallographic Study on The Lateral GaN Nanowire by Using Two-Step TMAH Wet Etching and HfO₂ Sidewall Spacer**
Ki-Sik Im, Sindhuri Vodapally, Dong-Hyeok Son, Young-Woo Jo, and Jung-Hee Lee
School of Electronics Engineering, Kyungpook National University
- WP1-58** **11:40-13:00** **Temperature Dependence of Current-Voltage Characteristics of Packaged AlGaIn/GaN HEMT on SiC Substrate**
Jong-Min Lee, Cheol-Won Ju, Byoung-Gue Min, Hyung Sup Yoon, Ho-Kyun Ahn, Seong Il Kim, Dong Min Kang, Hae Cheon Kim, Sang-Heung Lee, Dong-Young Kim, Kyu-Jun Jo, Jae-Won Do, Hyun- Uk Jung, Min-Jung Shin, and Jong-Won Lim
RF Convergence Components Research Section, IT Materials and Components Laboratory, Electronics and Telecommunications Research Institute
- WP1-59** **11:40-13:00** **Effect of P-GaN Back Barrier in 2DEG of AlGaIn/GaN HEMTs on SiC Substrate**
Kwangse Ko¹, Kyungjae Lee¹, Byeongchan So¹, Cheon Heo¹, Kyungbae Lee¹ and Okyun Nam¹, Sang-woo Han², and Ho-Young Cha²
¹Convergence Center for Advanced Nano Semiconductor, Department of Nano-Optical Engineering, Korea Polytechnic University, ²School of Electronic and Electrical Engineering, Hongik University
- WP1-60** **11:40-13:00** **Suppression of Current Collapse in AlGaIn/GaN MISHFET with Al₂O₃/AlN Passivation Layer**
Hee-Sung Kang, Chul-Ho Won, Jae-Hong Lee, Jeong-Gil Kim, Do-Kywn Kim, Quan Dai, Yan Dong, Jun-Hyeok Lee, Young Jun Yoon, Vodapally Sindhuri, In Man Kang, and Jung-Hee Lee
School of Electronics Engineering, Kyungpook National University
- WP1-61** **11:40-13:00** **X-band 5W AlGaIn/GaN HEMT Power MMICs**
김성일, 안호균, 이상홍, 이종민, 강동민, 민병규, 임종원
한국전자통신연구원 RF융합부품연구실

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- WP1-62 11:40-13:00 A Study of Stress and Its Effect on Electrical Properties of AlGaIn/GaN HEMT**
Hyun-Wook Jung¹, Sung-Jin An², Min-Jeong Sin¹, Jae-Won Do¹,
Byoung-Gue Min¹, Haecheon Kim¹, Hyung Sup Yoon¹, Ho-Kyun Ahn¹,
Kyu-Jun Cho¹, Mun Seok Jeong², Jong-Won Lim¹, Yong Hwan Kwon¹,
and Eun Soo Nam¹
*¹RF Convergence Component Research Section, Electronics and
Telecommunication Research Institute, ²Department of Energy Science,
Sungkyunkwan University*
- WP1-63 11:40-13:00 Advanced Backend Processing for GaN HEMT Devices: Wafer Thinning, Dicing, and Cleaning**
Jae-Won Do, Min Jeong Shin, Hyun-Wook Jung, Haecheon Kim,
Byoung-Gue Min, Ho-Kyun Ahn, Hyung Sup Yoon, Kyu-Jun Cho,
Jong-Won Lim, Yong Hwan Kwon, and Eun Soo Nam
*RF Convergence Components Research Sector, Electronics and
Telecommunication Research Institute*
- WP1-64 11:40-13:00 Low-Frequency Noise Characteristics of InGaIn-based Light-emitting Diodes Under Photoexcitation**
Chan Hyoung Oh¹, Dong-Soo Shin^{2,3}, and Jong-In Shim¹
*¹Department of Electronics and Communication Engineering,
Hanyang University, ²Department of Applied Physics, Hanyang
University, and ³Department of Bionanotechnology, Hanyang
University*
- WP1-65 11:40-13:00 Improved Pulse Response of AlGaIn/GaN Heterostructure Diode Using N₂ Plasma Treatment and Post Anode Annealing**
Ra-Seong Ki¹, Jun-Seok Jeong¹, Ho-Young Cha², and Kwang-Seok Seo¹
*¹Department of Electrical Engineering and Computer Science, Seoul
National University, ²Department of Electronic and Electrical
Engineering, Hongik University*
- WP1-66 11:40-13:00 고압 수소 열처리 압력에 따른 n-/p-type In_{0.53}Ga_{0.47}As 상의 HfO₂/Al₂O₃ 게이트 유전체 특성**
최성호¹, 송정근¹, 안영서¹, 이창민¹, 방현준², 최리노², 김형섭¹
¹성균관대학교 신소재공학과, ²인하대학교 신소재공학과
- WP1-67 11:40-13:00 Effect of AlN Nucleation Layer on Leakage Current in AlGaIn/GaN HEMTs Grown on 4H-SiC by MOCVD**
Kyeongjae Lee, Kwangse Ko, Cheon Heo, Byeongchan So, and
Okhyun Nam
Department of Nano-Optical Engineering Korea Polytechnic University
- WP1-68 11:40-13:00 Improvement in Transconductance and Hysteresis of E-mode AlGaIn/GaN MIS-HEMTs with Cat-CVD SiNx as Gate Insulator**
Myoung-Jin Kang¹, Gwang-Ho Choi¹, Su-Keun Eom¹, Ho-Young Cha²,
and Kwang-Seok Seo¹
¹Department of Electrical and Computer Engineering and Inter-

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*University Semiconductor Research Center, Seoul National University,
2Department of Electronic and Electrical Engineering, Hongik
University*

- WP1-69** **11:40-13:00** **Improvement of the LEE of the AlGaInP-based VI-LEDs with Wafer-Bonded Si Conductive Substrates using the n-AlGaInP Nanopillars**
Ho-Soung Ryu^{1,2}, Seung Kyu Oh¹, Yu-Jung Cha¹, Yu Lim Lee¹, Hwa-Sub Oh², Jong-Hyeob Baek², and Joon Seop Kwak¹
¹Department of Printed Electronics Engineering, Suncheon National University, ²LED Device Research Center, Korea Photonics Technology Institute
- WP1-70** **11:40-13:00** **Multilayer-Graphene/ITO 투명전극을 적용한 GaN 계 발광다이오드의 특성분석에 관한 연구**
김태경, 이동규, 박현정, 오승규, 곽준섭
순천대학교 인쇄전자공학과
- WP1-71** **11:40-13:00** **Methylammonium Lead Iodide Perovskite-Graphene Hybrid Channels in Flexible Broadband Phototransistors**
Vinh Quang Dang, Gill-Sang Han, Tran Quang Trung, Le Thai Duy, Young-Un Jin, Byeong-Ung Hwang, Hyun-Suk Jung, and Nae-Eung Lee
School of Advanced Materials Science and Engineering, Sungkyunkwan University
- WP1-72** **11:40-13:00** **Effect of Gate Recess Damage to Transconductance and Mobility of AlGaIn/GaN HEMTs**
Gwang-Ho Choi¹, Myoung-Jin Kang¹, Ho-Young Cha², and Kwang-Seok Seo¹
¹Department of Electrical and Computer Engineering and Inter-University Semiconductor Research Center, Seoul National University, ²Department of Electronic and Electrical Engineering, Hongik University
- WP1-73** **11:40-13:00** **The Formation of GaAs Solar Cells Array on Si Substrate Realized by Metal-assisted Wafer Bonding and Epitaxial Lift-off**
Dae-Myeong Geum^{1,2}, Min-Su Park², Chang Zoo Kim³, Sang Hyeon Kim², Won Jun Choi², and Euijoon Yoon¹
¹Department of Materials Science and Engineering, Seoul National University, ² Center for Opto-Electronic Materials and Devices, Korea Institute of Science and Technology, ³Korea Advanced Nano Fab Center
- WP1-74** **11:40-13:00** **Electrical Biomolecular Detection with Silicon Nanomesh via Block Copolymer Nanolithography**
Hyeong Min Jin, Ju Young Kim, Jeong Ho Mun, Seung Keun Cha, Jea Eun Lee, Jun Soo Kim, Sang Ouk Kim
Department of Materials Science and Engineering, KAIST

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- WP1-75** **11:40-13:00** **Influence of O₃ treatment on carrier density of two-dimensional electron gas at a-Al₂O₃/SrTiO₃ interface**
Taehwan Moon¹, Hae Jun Jung², Min Hyuk Park¹, Yu Jin Kim¹, Han Joon Kim¹, Keum Do Kim¹, Young Hwan Lee¹, Seung Dam Hyun¹, Sang Woon Lee², and Cheol Seong Hwang¹
¹*Department of Materials Science and Engineering and Inter-university Semiconductor Research Center, Seoul National University,*
²*Department of Physics and Division of Energy Systems Research, Ajou University*
- WP1-77** **11:40-13:00** **Percolating Behavior in Rrganic Nanocomposite Resistive Memory via Noise Scaling Analysis**
Younggul Song¹, Hyunhak Jeong¹, Jingon Jang¹, Tae-Young Kim¹, Daekyoung Yoo¹, Youngrok Kim¹, Heejun Jeong², and Takhee Lee¹
¹*Department of Physics and Astronomy, Seoul National University,*
²*Department of Applied Physics, Hanyang University*
- WP1-78** **11:40-13:00** **A Block Copolymer with a Huge Block-to-Block Interaction for the Significant Reduction of Line-Edge Fluctuations in Self-Assembled Patterns**
Jong Min Kim, Yoon Hyung Hur, and Yeon Sik Jung
Department of Material Science and Engineering, KAIST
- WP1-79** **11:40-13:00** **Asymmetric Modulation of Electronic Transport Characteristics in the Pentacene Vertical Transistors with Graphene Electrodes**
Wang-Taek Hwang, Hyunhak Jeong, Dongku Kim, Yeonsik Jang, Jun-Woo Kim, and Takhee Lee
Department of Physics and Astronomy, Seoul National University
- WP1-80** **11:40-13:00** **Flexible One Diode-One Phase Change Memory Array Enabled by Block Copolymer Self-Assembly on Plastic Substrates**
Beom Ho Mun, Byoung Kuk You, Se Ryeun Yang, Hyeon Gyun Yoo, Tae Jin Kim, Myunghwan Byun, Yeon Sik Jung, and Keon Jae Lee
Department of Materials Science and Engineering, KAIST
- WP1-81** **11:40-13:00** **Titania Nanosheet with Atomic Thickness Coupled into Graphene as 2D Heterostructures for Enhanced Photocatalytic Activity and Fast Lithium Storage**
Dongjun Li and Sang Ouk Kim
National Creative Research Initiative Center for Multi-Dimensional Directed Nanoscale Assembly Department of Materials Science and Engineering, KAIST
- WP1-82** **11:40-13:00** **Extraction of Schottky Barrier Parameters for Pd/WSe₂/Au Vertical Diode**
Won-Mook Kang, In-Tak Cho, and Jong-Ho Lee
Department of Electrical and Computer Engineering, Seoul National University

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- WP1-83** **11:40-13:00** **Novel Synthesis of PANI-CNT Nanocomposites via N-Doped Sites of Carbon Nanotubes**
Hojin Lee, Atta UI Haq, Joonwon Lim, and Sang Ouk Kim
Department of Material Science and Engineering, KAIST
- WP1-84** **11:40-13:00** **Block Copolymer Lithography Integrated with Inorganic Spacer layer for Sub-10 Nanometer Pattern**
Jun Soo Kim¹, Hyung-Seok Moon², and Sang Ouk Kim¹
¹*Department of Materials Science and Engineering, KAIST,* ²*Korea Institute of Industrial Technology*
- WP1-85** **11:40-13:00** **CVD-Synthesized Monolayer Large-Area MoS₂ Field Effect Transistors with Ink-Jet Printed Source and Drain Contacts**
Tae-Young Kim¹, Seungjun Chung², and Takhee Lee¹
¹*Department of Physics and Astronomy, Seoul National University,* ²*Department of Electrical Engineering and Computer Sciences, University of California, USA*
- WP1-86** **11:40-13:00** **Various Metal Nano-Patterning by Solvent-Annealed Block Copolymer**
Changyun Moon, Jeong Ho Mun, and Sang Ouk Kim
Department of Materials Science and Engineering, KAIST
- WP1-88** **11:40-13:00** **Performance Enhancement in Organic Solar Cells with Gold Nanoparticle Clusters**
Hyung Il Park¹, Seunghoon Lee², Sang Woo Han², and Sang Ouk Kim¹
¹*Department of Materials Science and Engineering, KAIST,* ²*Department of Chemistry and KI for the NanoCentury, KAIST*
- WP1-89** **11:40-13:00** **Liquid Crystal Behavior Induced Large Graphene Oxide in Polydimethylsiloxane Matrix**
Sung Hwan Koo, Kyung Eun Lee, and Sang Ouk Kim
Department of Materials Science and Engineering, KAIST
- WP1-90** **11:40-13:00** **Fermi Level Pinning Between 2D TMDCs and Metal Contact**
김창식¹, 문인용¹, 남승걸², 조연주², 신현진², 박성준², 유원종¹
¹*Samsung-SKKU Graphene Center (SSGC), SKKU Advanced Institute of Nano-Technology (SAINT), Sungkyunkwan University,* ²*Device and System Research Center, Samsung Advanced Institute of Technology*
- WP1-91** **11:40-13:00** **Three-Dimensional, Porous Reduced Graphene Oxide Hydrogel via Unique Interfacial Gelation Principle**
Joonwon Lim, Uday Narayan Maiti, and Sang Ouk Kim
Department of Materials Science and Engineering, KAIST
- WP1-92** **11:40-13:00** **3D Reduced Graphene Oxide Aerogels with High Electrical Conductivity**
In Kyu Moon¹, Seonno Yoon², Kyung Hwan Kim², and Jungwoo Oh²
¹*Yonsei Institute of Convergence Technology, Yonsei University,* ²*School of Integrated Technology and Yonsei Institute of Convergence*

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- Technology, Yonsei University*
- WP1-93** **11:40-13:00** **Fe-Porphyrin Like Carbon Nanotube for Oxygen Reduction Catalysis**
Gil Yong Lee and Sang Ouk Kim
Department of Materials Science and Engineering, KAIST
- WP1-94** **11:40-13:00** **Visible Light Photocatalytic Properties of N-Doped CNT/TiO₂ Nanowires**
Dong Sung Choi and Sang Ouk Kim
Department of Materials Science and Engineering, KAIST
- WP1-95** **11:40-13:00** **Hydrogen Gas Sensor Fabricated by Palladium Decorated Graphene Mesh**
Su Han Kim, Jae Hyung Lee, and Won Il Park
Division of Materials Science Engineering, Hanyang University
- WP1-96** **11:40-13:00** **Interfacial Fast Self-Assembly of Graphene Film on Liquid-Air Interface**
Taeyeong Yun, Jongwon Shim, and Sang Ouk Kim
Department of Material Science, KAIST
- WP1-97** **11:40-13:00** **Anchoring of Cobalt Oxide Nanoparticles on TiO₂ Nanorod/FTO as a Photoanode for Solar Hydrogen Evolution**
Vivek Ramakrishnan, Kim Hyun, and Beelyong Yang
School of Advanced Materials and System Engineering, Kumoh National Institute of Technology
- WP1-98** **11:40-13:00** **Growth mechanism and Characterization of Hexagonal Boron Nitride**
Sung Kyu Jang, Jiyoun Youn, Young Jae Song, and Sungjoo Lee
SKKU Advanced Institute of Nano Technology(SAINT), Sungkyunkwan University
- WP1-99** **11:40-13:00** **Size Separation of Graphene Oxide and Selective Heteroatom Doping for Catalysis**
Kyung Eun Lee and Sang Ouk Kim
Department of Materials Science and Technology, KAIST
- WP1-100** **11:40-13:00** **Schottky Barrier Height Modulation of Ferroelectric Polymer Gated Graphene/ZnO:N Barristor using Electrostatic Force Microscopy**
서광하, 황현준, 양진호, 유지애, 이병훈
School of Material Science and Engineering, Gwangju Institute of Science and Technology
- WP1-101** **11:40-13:00** **고압수소열처리 조건에 따른 그래핀 전계효과소자의 특성 최적화**
김윤지, 김소영, 정육진, 박우진, 이상경, 이병훈
School of Materials Science and Engineering, Gwangju Institute of Science and Technology
- WP1-102** **11:40-13:00** **Transparent Polymer Semiconductor for Fully Transparent and**

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- Flexible Non-Volatile Ferroelectric Polymer Memory**
Kang Lib Kim, Taehyun Park, and Cheolmin Park
Department of Materials Science and Engineering, Yonsei University
- WP1-103 11:40-13:00 Multilevel Resistive Switching Memory based on Two-Dimensional Nanomaterials**
Gwang Hyuk Shin, Byung Chul Jang, Myung Hun Woo, and Sung-Yool Choi
School of Electrical Engineering, KAIST
- WP1-104 11:40-13:00 Highly bright Alternating Current Driven Polymer Electroluminescence Device using Field-Induced Hole Generation Layer**
Ju Han Lee, Eui Hyuk Kim, and Cheolmin Park
Department of Materials Science and Engineering, Yonsei University
- WP1-105 11:40-13:00 Fabrication and Analysis of Black Phosphorus-based Field-Effect Transistor**
Woo-Young Choi and Jin-Hong Park
School of Electronics and Electrical Engineering, Sungkyunkwan University
- WP1-106 11:40-13:00 Composite Transparent Conductive Thin Film using ZnO and Cu Nanowires**
Chansu Moon, Wonki Cho, and Seung Jae Baik
Department of Electrical, Electronic, and Control Engineering, Hankyong National University
- WP1-107 11:40-13:00 Morphology Evolution in P3HT and its Impact on Thin Film Transistor Characteristics**
Yongho Cho, Wonki Cho, Gwihyun Kim, and Seung Jae Baik
Department of Electrical, Electronic, and Control Engineering, Hankyong National University
- WP1-109 11:40-13:00 Transition Metal Dichalcogenide (TMD)-based High Performance Photodetector with Organolead Trihalide Perovskite (MAPbX₃)**
Se-Yong Oh, Dong-Ho Kang, and Jin-Hong Park
School of Electronics and Electrical Engineering, Sungkyunkwan University
- WP1-110 11:40-13:00 Metal Nanoparticle Embedded Floating Gate Memory based on MoS₂ with Polymer Tunneling Dielectric Layer**
Myung Hun Woo¹, Byung Chul Jang¹, Junhwan Choi², Gwang Hyuk Shin¹, Hyejeong Seong², Sung Gap Im², and Sung-Yool Choi¹
¹*School of Electrical Engineering, Graphene Research Center, KAIST,*
²*Department of Chemical and Biomolecular Engineering and KI for NanoCentury, KAIST*
- WP1-111 11:40-13:00 Highly Uniform, Low Power Polymer Memory via Interface Engineering using Multilayer Graphene Barrier Electrode**
Byung Chul Jang¹, Hyejeong Seong², Jong Yun Kim¹, Beom Jun Koo¹,

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Sung Kyu Kim³, Sang Yoon Yang¹, Sung Gap Im², and Sung-Yool Choi¹

¹ School of Electrical Engineering, Graphene Research Center, KAIST, ² Department of Chemical and Biomolecular Engineering, Graphene Research Center, KAIST, ³ Department of Materials Science and Engineering, KAIST

- WP1-112 11:40-13:00 Development of Flexible Wire Grid Polarizer Realized by Nanoscale Polymeric Thin Film Replication**
Jung Hye Lee and Yeon Sik Jung
Department of Materials and Science, KAIST
- WP1-113 11:40-13:00 Solution Processed Self-Assembled Growth of Transition Metal Dichalcogenide Wires and their Electrical Properties**
Seoung-Ki Lee, Jae-Bok Lee, Jyoti Singh, Kuldeep Rana, and Jong-Hyun Ahn
Department of Electrical and Electronic Engineering, Yonsei University
- WP1-114 11:40-13:00 Highly Conformal Graphene Devices and their Performance on Irregular Structure for Wearable Electronics**
Yong Ju Park, Seoung-Ki Lee, Jong-Hyun Ahn
School of Electrical and Electronic Engineering, Yonsei University
- WP1-116 11:40-13:00 PVDF-TrFE의 압전 특성을 이용한 그래핀 Barristor 응용 압전소자**
양진호, 유원범, 심창후, 장경은, 이병훈
School of Material Science and Engineering, Gwangju Institute of Science and Technology
- WP1-117 11:40-13:00 Scalable Growth of Single-Crystal Graphene on Poly-Crystalline Platinum**
Hyeon-Sik Jang¹, Jae-Young Lim², Seong-Soo Lee², Mansu Kim¹, Wonseok Jang¹, and Dongmok Whang^{1,2}
¹School of Advanced Materials Science and Engineering, Sungkyunkwan University, ²SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University
- WP1-118 11:40-13:00 N-Doped Graphene Oxide/Graphene Bilayer for Transparent Conducting Electrodes**
Young-Min Seo¹, Yamujin Jang¹, Seh-Yoon Lim¹, Junyi Wang¹, Hye-Jin Cho¹, and Dongmok Whang^{1,2}
¹School of Advanced Materials Science and Engineering, Sungkyunkwan University, ²SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University
- WP1-119 11:40-13:00 Phonon Transport Suppression of SiGe Alloy Nanowires by Thermally Oxidation**
Su-Ho Jung¹, Jong Woon Lee¹, Eun Kyung Lee², Byoung Lyong Choi³, and Dongmok Whang⁴
¹SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, ²Samsung Advanced Institute of Technology, Computer Aided Engineering Group, Samsung Electronics Co., Ltd., ³ Samsung

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Advanced Institute of Technology, Nano Electronics Lab, Samsung Electronics Co., Ltd., ⁴School of Advanced Materials Science and Engineering, Sungkyunkwan University

- WP1-120 11:40-13:00 Crystallization of CH₃NH₃PbI₃ Perovskite Semiconductor under Humidified Air and its Effect on Photovoltaic Performance**
Beomjin Jeong and Cheolmin Park
Department of Materials Science and Engineering, Yonsei University
- WP1-121 11:40-13:00 Surface Enhanced Raman Scattering on Pt Nanostructures Fabricated by using Self-Aligned Block Copolymer Processing**
Jongsik Oh¹, Ji Soo Oh¹, Dain Sung¹, Jaehee Shin¹, Kyongnam Kim¹, and Geunyoung Yeom^{1,2}
¹Department of Advanced Materials Science and Engineering, Sungkyunkwan University, ²SKKU Advanced Institute of Nano Technology (SAINT), Sungkyunkwan University
- WP1-122 11:40-13:00 Ultraviolet- Assisted Chemical Vapor Deposition of ZnO for Controlled Morphology and Low Temperature Fabrication of Nanostructures**
Bo Soek Kim¹, Hyun Soo Jo¹, and Seung Jae Baik¹
¹Department of Electrical, Electronic and Control Engineering, Hankyong National University
- WP1-123 11:40-13:00 Block Copolymer Hardening Process through Plasma Treatment**
Dain Sung¹, Jongsik Oh¹, Jaehee Shin¹, Kyongnam Kim¹, and Geunyoung Yeom^{1,2}
¹Department of Advanced Materials Science and Engineering, Sungkyunkwan University, ²SKKU Advanced Institute of Nano Technology (SAINT), Sungkyunkwan University
- WP1-124 11:40-13:00 Effective Optical Properties of Multi Pitch Patterned Y₂O₃:Eu³⁺ Thin-Film Phosphors**
Hyojun Kim¹, In Sung Park¹, Ki-Young Ko², and Jinho Ahn¹
¹Department of Materials Science and Engineering, Hanyang University, ²Korea Invention Promotion Association
- WP1-125 11:40-13:00 그래핀/금속 산화물 이종접합 트랜지스터의 이론적 전류 분석 모델**
Jeonghoon Kim and Jin-Hong Park
School of Electronics and Electrical Engineering, Sungkyunkwan University
- WP1-126 11:40-13:00 Fabrication and Characteristics of rGO/Fe₃O₄ Hollow Structure based on Layer-by-Layer Assembly**
Byeong Seok Lim, Bong Kyun Kang, and Dae Ho Yoon
School of Advanced Materials Science and Engineering, Sungkyunkwan University
- WP1-127 11:40-13:00 Synthesis and Characteristics of Spinel NiCo₂O₄ Nanocube via Decomposition of Coordination Polymer with Core-Shell Structure**
Sung Ryul Mang¹, Bong Kyun Kang², Moo Hyun Woo², and Dae Ho

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Yoon^{1,2}

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- WP1-128 11:40-13:00 Controlling the Shape and Size of Self-Assembled Prussian Blue Analogue(PBA) $\text{Ni}_3[\text{Co}(\text{CN})_6]_2$ Nanocubes**
Moo Hyun Woo¹, Bong Kyun Kang¹, Sungryul Mang², and Dae Ho Yoon^{1,2}
¹Department of Advanced Material Science and Engineering, Sungkyunkwan University, ²Sungkyunkwan Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University
- WP1-129 11:40-13:00 Encapsulation Technique of Transition Metal Dichalcogenides (TMDs) Applications with Self-Assembled Monolayer (SAM) Doping**
Hyeong-Jun Kim and Jin-Hong Park
School of electrical and electronic engineering, Sungkyunkwan University
- WP1-130 11:40-13:00 Defect-Mediated Irreversible Response of Graphene-based pH Sensors**
Sun Sang Kwon, Jae Hyeok Shin, Fan Xia, and Won Il Park
Division of Materials Science Engineering, Hanyang University
- WP1-131 11:40-13:00 Characteristics of Organic/Inorganic Nanocomposite Gate Insulators with Self Assembled Layer of Nanoparticles for Organic Thin Film Transistors**
J. S. Kim¹, J. H. Kim², D. I. Kim², and N.-E. Lee^{1,2,3}
¹SKKU Advanced Institute of Nanotechnology(SAINT), Sungkyunkwan University, ²Department of Advanced Materials Science and Engineering, Sungkyunkwan University, ³Samsung Advanced Institute for Health Sciences and Technology(SAIHST), Sungkyunkwan University
- WP1-132 11:40-13:00 Stretchable Layers on Mogul-Patterned Elastomeric Substrate**
Han-Byeol Lee¹, Chan-Wool Bae¹, Le Thai Duy¹, Il-Yung Sohn¹, Do-Il Kim¹, and Nae-Eung Lee^{1,2,3}
¹School of Advanced Materials Science and Engineering, Sungkyunkwan University, ²SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University, ³Samsung Advanced Institute for Health Sciences and Technology (SAIHST), Sungkyunkwan University
- WP1-133 11:40-13:00 Bidirectional Threshold Switching in Ag:Cu₂O-based Multilayer Stack for Cross-Point Selector Application**
Jeonghwan Song, Amit Prakash, Jiyong Woo, Euijun Cha, Sangheon Lee, and Hyunsang Hwang
Department of Materials Science and Engineering, Pohang University of Science and Technology

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- WP1-134 11:40-13:00 Demonstration of Bi-Directional Selector in 8 inch Wafer Process with Fully CMOS Compatibility for ReRAM Cross-Point Array**
Sangheon Lee, Jeonghwan Song, Jiyong Woo, Changhyuk Sung, and Hyunsang Hwang
Department of Materials Science and Engineering, Pohang University of Science and Technology
- WP1-135 11:40-13:00 A Sensing Scheme of STT-MRAM with Cancellation Threshold Voltage Mismatch**
Il-Young Im, Dong-Gi Lee, Ji-su Lee, Saemin Im, and Sang-Gyu Park
Department of Electronic and Computer Engineering, Hanyang University
- WP1-136 11:40-13:00 Phase Change Memory Devices based on Gr-In₂Se₃ Heterostructure**
Min Sup Choi, Chenxi Yang, Chang Ho Ra, and Won Jong Yoo
SKKU Advanced Institute of Nano-Technology, Sungkyunkwan University
- WP1-137 11:40-13:00 Thickness Effect of Ultra-Thin Ta₂O₅ Resistance Switching Layer in 28 nm-Diameter Memory Cell**
Tae Hyung Park¹, Seul Ji Song¹, Hae Jin Kim¹, Soo Gil Kim², Suock Chung², Beom Yong Kim², Kee Jeung Lee², Kyung Min Kim³, Byung Joon Choi⁴, and Cheol Seong Hwang¹
¹*Department of Materials Science and Engineering and Inter-university Semiconductor Research Center, Seoul National University,* ²*SK hynix Inc.,*
³*Hewlett-Packard Laboratories, Hewlett-Packard Company, USA,*
⁴*Department of Materials Science and Engineering, Seoul National University of Science and Technology*
- WP1-138 11:40-13:00 Resistance Controllability and Variability Improvement in a TaO_x-based Resistive Memory for Multilevel Storage Application**
A. Prakash¹, D. Deleruyelle², J. Song¹, and H. Hwang¹
¹*Department of Materials Science and Engineering, Pohang University of Science and Technology,* ²*Im2np, UMR CNRS 7334, Aix-Marseille Université, France*
- WP1-139 11:40-13:00 Characterization of Switching Voltage Dependent Crystallization Time from Various Tuned Amorphous State in Ge₂Sb₂Te₅ Phase Change Memory**
Jun Hyeok Sun, Sanghyeon Lee, and Seung Jae Baik
Department of Electrical, Electronic and Control Engineering, Hankyong National University
- WP1-140 11:40-13:00 Analysis of Read Condition in 1S1R ReRAM Array**
Wen-Liang Ma, Hyunsuk Kang, and Kee-Won Kwon
College of Information and Communication Engineering, Sungkyunkwan University
- WP1-141 11:40-13:00 3x3 멤리스터 시냅스 어레이의 학습을 위한 뉴런 회로의 구현 및**

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양원선, Son Ngoc Truong, Khoa Van Pham, 송재상, 모현선, 민경식
국민대학교 전자공학부

- WP1-142 11:40-13:00 Relation between Resistance and Capacitance in Atomically Dispersed Pt-SiO₂ Thin Films for Multilevel Resistance Switching Memory**
Yoo Rim Kwon, Dong Ha Kim, and Byung Joon Choi
Department of Materials Science and Engineering, Seoul National University of Science and Technology
- WP1-143 11:40-13:00 Influence of Forming Gas Annealing to Pt/HfO₂/Pt Resistors on Resistive Switching Characteristics**
Yong Chan Jung, Sejong Seong, Taehoon Lee, In-Sung Park, and Jinho Ahn
Department of Materials Science and Engineering, Hanyang University
- WP1-144 11:40-13:00 The Resistive Switching Characteristics of Transparent Al/ZnO/ITO/PET Resistor with IPL Treatment**
Taehoon Lee, Yong Chan Jung, Sejong Seong, In-Sung Park, and Jinho Ahn
Department of Materials Science and Engineering, Hanyang University
- WP1-145 11:40-13:00 Effect of Ge Concentration in Ge-As-Te Chalcogenide Glass on the Characteristics of Ovonic Threshold Switching (OTS) Devices**
Taeho Kim, Youngjae Kim, and Hyunchul Sohn
Department of Materials Science and Engineering, Yonsei University
- WP1-146 11:40-13:00 The Reliability and AC Characteristics of Ovonic Threshold Switching Selector based on Chalcogenide ZnTe**
Youngjae Kim, Taeho Kim, Jimin Lee, Daewoo Kim, and Hyunchul Sohn
Department of Materials Science and engineering, Yonsei University
- WP1-147 11:40-13:00 Memory System Architecture using Hardware-based Page Replacement**
Hanjae Lee, Hyeokjun Seo, and Eui-Young Chung
School of Electrical and Electronic Engineering, Yonsei University
- WP1-148 11:40-13:00 Install-time Binary Translation for Reconfigurable Accelerators**
Hongsik Lee, Toan X. Mai, Sangyun Oh, and Jongeun Lee
Department of Computer Science Ulsan National Institute of Science and Technology
- WP1-149 11:40-13:00 오픈 소스 FPGA 검증 툴 기반 Embedded FPGA의 설계 및 프로그래밍**
백승헌, 김재하
서울대학교 전기정보공학부
- WP1-150 11:40-13:00 Test Structure for Measurement of Unit Cell Delay and Delay Mismatch using Modified Ring Oscillator**
신연중, 호민혜, 김영현, 정다래, 오길근, 이준협, 김형태, 이윤우, 김요정

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Samsung Electronics Co., Ltd.

- WP1-151 11:40-13:00** 고성능 리튬 이온 이차전지의 음극 적용을 위한 Co_3O_4 /그래핀 나노복합체의 ex-situ 합성
장경훈, 장재원, 기한길, 오병윤, 함문호
School of Materials Science and Engineering, Gwangju Institute of Science and Technology
- WP1-152 11:40-13:00** Effects of Triple Layer Reflector on Performances of Amorphous Silicon Oxide Thin Film Solar Cells
Jun-Young Jeon¹, Tae-Jun Ha¹, and Dong-Won Kang²
¹Department of Electronic Materials Engineering, Kwangwoon University, ²Department of Solar and Energy Engineering, Cheongju University
- WP1-153 11:40-13:00** Enhancing Organic Solar Cells with Gold Nanoparticle-Carbon Nanotube Hybrid Nanocomposite
Taewoo Jeon, Ju Min Lee, Joonwon Lim, Hyung Il Park, Kyung Eun Lee, and Sang Ouk Kim
Department of Material Science and Engineering, KAIST
- WP1-154 11:40-13:00** 2차원 실리콘 소자에서 도핑과 채널 크기에 따른 Seebeck Effect
조관현¹, 김동현¹, 김수현¹, 오주승¹, 장호균³, 김규태³, 박종혁², 이재우¹
¹ICT Convergence Technology for Health and Safety and Department of Electronics and Information Engineering, Korea University, ²Electronics and Information Engineering, Korea University, ³School of Electrical Engineering, Korea University
- WP1-155 11:40-13:00** Enhanced Optical Pumping of InAs/GaAs Quantum Dot Solar Cell using Distributed Bragg Reflector
HoSung Kim^{1,2}, MinSu Park¹, SangHyeon Kim¹, JinDong Song¹, SangHyuck Kim¹, WonJun Choi¹, and JungHo Park²
¹Center for Opto-Electronic Materials and Devices Research, Korea Institute Science and Technology, ²School of Electrical Engineering, Korea University
- WP1-156 11:40-13:00** ASA Simulation Software를 이용한 태양전지 광 산란 효과 분석
Dongjoo Shin
Department of Electric and Electronic Engineering, Sungkyunkwan University
- WP1-157 11:40-13:00** 고효율 결정질 태양전지를 위한 패시베이션의 특성에 관한 연구
이재홍, 이준신
성균관대학교 정보통신공학부
- WP1-158 11:40-13:00** Nano-Structured Ge Solar Cells Fabricated by Metal-Assisted Chemical Etching
Sunhong Jung, Youngjo Kim, Kangho Kim, and Jaejin Lee
Department of Electrical and computer Engineering, Ajou University
- WP1-159 11:40-13:00** 태양전지 Emitter층의 Doping Profile Model에 관한 연구

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김중휘, 이준신
성균관대학교 정보통신대학 전자전기공학부

- WP1-160 11:40-13:00 ASA Simulation Software를 이용한 Multi-Band Single Junction cell 개발**
최병렬
성균관대학교
- WP1-161 11:40-13:00 얇은 AlGaIn 배리어를 이용한 AlGaIn/GaN MOSHFETs 소자의 비휘발성 메모리 효과에 관한 연구**
금동민, 조강호, 조근호, 조희형, 김형탁
Department of Electronics and Electrical Engineering, Hongik University
- WP1-162 11:40-13:00 마찰 대전소자에서의 SnO₂ 반도체 마찰층의 두께 효과에 관한 연구**
No Ho Lee, Dong Ha Kim, Min Soo Kim, and Byung Joon Choi
Department of Materials Science and Engineering, Seoul National University of Science and Technology
- WP1-163 11:40-13:00 Factors Affecting Voltage of Organic Electrode Materials in Lithium/Sodium Rechargeable Batteries**
Sechan Lee, Jihyun Hong, Ji Eon Kwon, Soo Young Park, and Kisuk Kang
Department of materials science and engineering, Seoul National University
- WP1-164 11:40-13:00 Nanocomposite based Flexible Thin Film Piezoelectric Nanogenerator for Energy Harvesting and Storage**
Saqib Siddiqui¹ and Nae-Eung Lee^{1,2,3}
¹*School of Advanced Materials Science and Engineering, Sungkyunkwan University,* ²*SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University,* ³*Samsung Advanced Institute for Health Sciences and Technology, Sungkyunkwan University*
- WP1-165 11:40-13:00 Synthesis of Co-Ni(OH)₂/Reduced Graphene Oxide Composites for Supercapacitors: Effect of Crystallinity on Capacitance**
Sintayehu Nibret Tiruneh, Bong Kyun Kang, Quang Tran Ngoc, and Dae Ho Yoon
Department of Advanced Material Science and Engineering, Sungkyunkwan University
- WP1-166 11:40-13:00 Phosphorus Diffusion Layer Profile Modification by Surface Concentration and Junction Depth using Diffusion Processing Sequence Optimization**
Gyeongbae Shim¹, Cheolmin Park², Minhan Jeon¹, Jiyeon Kang¹, Donghyun Oh³, and Junsin Yi¹
¹*School of Information and Communication Engineering, Sungkyunkwan University,* ²*Department of Energy Science,*

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*Sungkyunkwan University, ³Department of Energy System,
Sungkyunkwan University*

- WP1-167 11:40-13:00** **Optimized Boron Diffused Layer by Oxygen Treatment and Change of Nitrogen/Oxygen Duration Time in Diffusion Process for n-type c-Si Solar Cell Applications**
Gyeongbae Shim¹, Cheolmin Park², Minhan Jeon¹, Jiyeon Kang¹, Donghyun Oh³, and Junsin Yi¹
¹School of Information and Communication Engineering, Sungkyunkwan University, ²Department of Energy Science, Sungkyunkwan University, ³Department of Energy System, Sungkyunkwan University
- WP1-168 11:40-13:00** **Gate Leakage Current Reduction in Normally Off AlGaIn/GaN Gate Recessed MISHEMT by Work-Function Tuning**
Il-Hwan Hwang and Kwang-Seok Seo
Electrical Engineering and Computer Science, Seoul National University
- WP1-169 11:40-13:00** **Ge₂Sb₂Te₅ Based Nano Scale Phase Change Memory for the Power Reduction**
Soo-Jung Kim¹, Jung-Hye Lee², Sung-Hoon Hong³, Yeon-Sik Jung², and Heon Lee¹
¹Department of Materials Science and Engineering, Korea University, ²Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology