



[MA1] Symposium GL: III-N Materials and Lighting Devices (1/7)

Session Dae	Oct. 14(Mon.), 2024
Session Time	11:00-12:25
Session Room	Room A (Monterosso, B1F)

[MA1-1] *Keynote **11:00-11:35**

High-Power InGaN-Based Red Micro-LEDs and their Potential to Lasers

Kazuhiro Ohkawa and Daisuke Iida

King Abdullah University of Science and Technology (KAUST), Saudi Arabia

[MA1-2] *Invited **11:35-12:00**

Ultrasmall Blue, Green, and Red InGaN Micro-LEDs

Lai Wang, Luming Yu, Zhibiao Hao, and Yi Luo

Tsinghua University, China

[MA1-3] *Invited **12:00-12:25**

Latest Advances in Green and Red InGaN LEDs

Hee Jin Kim

Lumileds LLC, USA



[MB1] Symposium GE: III-N Materials and Electronic Devices (1/7)

Session Date Oct. 14(Mon.), 2024

Session Time 11:00-12:30

Session Room Room B (Vernazza, 3F)

[MB1-1] *Keynote

11:00-11:35

Controlling Interface States in GaN Power Transistors

Tamotsu Hashizume

Nagoya University, Japan

[MB1-2] *Invited

11:35-12:00

Gate Dielectric Deposition for GaN-Based MIS Devices Using Mist-CVD

Zenji Yatabe¹, Hadirah Radzuan¹, Masaya Fukumitsu¹, Keigo Bito¹, Ryota Ochi², Yusui Nakamura¹, and Taketomo Sato²

¹*Kumamoto University, Japan*, ²*Hokkaido University, Japan*

[MB1-3]

12:00-12:15

Low Noise and High Linearity Millimeter-Wave GaN-Based MIS-HEMTs Fabricated with MOCVD-SiNx as Gate Insulator

Jing Yuan^{1,2}, Xiaojuan Chen^{1,2}, Ke Wei^{1,2}, Guanjun Jing^{1,2}, Jianchao Wang^{1,2}, Liu Wang^{1,2}, Yichuan Zhang¹, Yankui Li¹, Yixu Yao¹, and Sen Huang^{1,2}

¹*Institute of Microelectronics of Chinese Academy of Sciences, China*, ²*University of Chinese Academy of Sciences, China*

[MB1-4]

12:15-12:30

Demonstration of AlGaIn/GaN Planar Channel-Fully-Controlled MIS-HEMT on Si Substrate for Low-Voltage RF Applications

Xinkun Zhang^{1,2}, Quan Dai², Yu Zhou^{1,2}, Qian Li^{1,2}, Xiaoning Zhan^{1,2}, Haoran Qie², Jianxun Liu^{1,2}, Qian Sun^{1,2}, and Hui Yang^{1,2}

¹*University of Science and Technology of China, China*, ²*Chinese Academy of Sciences, China*



[MC1] Symposium SiC: SiC Materials and Devices (1/4)

Session Date	Oct. 14(Mon.), 2024
Session Time	11:00-12:25
Session Room	Room C (Forum 1, 3F)

[MC1-1] *Keynote 11:00-11:35

Review of Resnac SiC Epitaxial Wafers for Power Devices

H. Kanazawa

Resonac Corporation, Japan

[MC1-2] *Invited 11:35-12:00

Recent Research Progress in 200 mm SiC Substrate and Epi Material

Chunjun Liu, Yanfang Lou, Yu Guo, and Jian Yang

TankeBlue Semiconductor Co., Ltd., China

[MC1-3] *Invited 12:00-12:25

Silicon Carbide Innovation and Insights from 200mm Pilot Line at IME, Singapore

N. Singh, U. Chand, S. Kumar, X. S. Nguyen, A.Y. Hannan, V.Q.G. Roth, Y.-C. Chien, P. Vudumula, G. Tang, A. Ranjan, A. Sundaram, L. K. Bera, and S. Chung

*Institute of Microelectronics, Agency for Science, Technology, and Research (A*STAR), Singapore*

**[MA2] Symposium GL: III-N Materials and Lighting Devices (2/7)****Session Date** Oct. 14(Mon.), 2024**Session Time** 13:45-15:40**Session Room** Room A (Monterosso, B1F)**[MA2-1] *Invited****13:45-14:10****Characterizing and Understanding the Performance of Micro-Sized Light-Emitting Diodes**Dong-Soo Shin¹, Hyundon Jung², and Jong-In Shim¹¹Hanyang University, Korea, ²EtaMax Co., Ltd., Korea**[MA2-2]****14:10-14:25****Thermal Influence on the Electro-Optical Characteristics of the InGaN-Based Blue & Green Micro-Light-Emitting Diode**

Shyam Mohan, Joocheol Jeong, Jooyong Park, Joonhyuk Lee, Jaejin Heo, and Okhyun Nam

Tech University of Korea, Korea

[MA2-3]**14:25-14:40****Studies of Deep State Defects Introduced by RIE in the Sidewalls of GaN/InGaN Nano and MicroLEDs and the Effects of Different Treatments in Mitigating the Adverse Impact of Such Defects**Alexander Y. Polyakov¹, In-Hwan Lee², Yeong-Hoon Cho², Luiza A. Alexanyan¹, Mikhail L. Skorikov³, Anton A. Vasilev¹, Andrei A. Romanov¹, Nikolai R. Matros¹, Anastasiia I. Kochkova², and Stephen J. Pearton⁴¹National University of Science and Technology MISiS, Russia, ²Korea University, Korea, ³Russian Academy of Science, Russia, ⁴University of Florida, USA**[MA2-4]****14:40-14:55****Size-Dependent Degradation via Sidewall Defects and Recombination Processes in InGaN-Based Micro LEDs**

Jeonghyeon Park, Won Seok Cho, Jawon Kim, and Jong Kyu Kim

Pohang University of Science and Technology, Korea

[MA2-5]**14:55-15:10****Insight into Gain and Transient Response of High Gain AlGaIn/GaN UV Photodetectors: A Case Study on the Role of Incident UV Light Intensity**Wenxin Li¹, Guangyang Gu¹, Fangfang Ren^{1,2}, Dong Zhou¹, Feng Zhou¹, Weizhong Xu^{1,2}, Rong Zhang^{1,2}, Youdou Zheng¹, and Hai Lu^{1,2}¹Nanjing University, China, ²Hefei National Laboratory, China**[MA2-6]****15:10-15:25****Analysis of GaN-Based Topological Photonic Crystal Resonator in the Visible Light Region**

Takuto Honda and Akihiko Kikuchi

Sophia University, Japan

[MA2-7]**15:25-15:40****Characterization of Efficient Micro-LEDs Using Confocal Raman Spectrometer**

Chuhan Deng, Zhizhong Chen, Boyan Dong, Zuojian Pan, Haodong Zhang, Ling Hu, Weihua Chen, Fei Jiao, Xiangning Kang, Qi Wang, Guoyi Zhang, and Bo Shen

Peking University, China

**[MB2] Symposium GE: III-N Materials and Electronic Devices (2/7)****Session Date** Oct. 14(Mon.), 2024**Session Time** 13:45-16:00**Session Room** Room B (Vernazza, 3F)**[MB2-1] *Keynote****13:45-14:20****Wide/Ultrawide Bandgap Next Generation RF and Power Devices**

Martin Kuball

*University of Bristol, UK***[MB2-2] *Invited****14:20-14:45****Extending GaN Power Devices for Higher Voltages and Higher Frequencies**Jin Wei¹, Junjie Yang¹, Jiawei Cui¹, Maojun Wang¹, Xuelin Yang¹, Meng Zhang², and Bo Shen¹¹*Peking University, China*, ²*Beijing University of Technology, China***[MB2-3]****14:45-15:00****Recess-Free Enhancement-Mode AlGaIn/GaN RF HEMTs on Si Substrate**Tiantian Luan^{1,2}, Sen Huang^{1,2}, Guanjun Jing^{1,2}, Wenwei Zhi^{1,2}, Haibo Yin^{1,2}, Xinguo Gao^{1,2}, Ke Wei^{1,2}, Yankui Li^{1,2}, Qimeng Jiang^{1,2}, Xinhua Wang^{1,2}, Liwen Sang³, and Xinyu Liu^{1,2}¹*Institute of Microelectronics of Chinese Academy of Sciences, China*, ²*University of Chinese Academy of Sciences, China*, ³*Fudan University, China***[MB2-4]****15:00-15:15****Low RF Loss GaN HEMTs Fabrication on AlGaIn/GaN Heterostructure Grown on a Cost-Effective SAB-Bonded SiC-SiC Substrate**Guanjun Jing¹, Xinhua Wang¹, Fengwen Mu², Sen Huang¹, Qimeng Jiang¹, Ke Wei¹, and Xinyu Liu¹¹*Chinese Academy of Sciences, China*, ²*Innovative Semiconductor Substrate Technology Co., Ltd., China***[MB2-5]****15:15-15:30****Suppression of High Gate Leakage Current in Ohmic p-GaN Gate HEMTs**Gokhan Atmaca¹, Min-Gi Jeong², and Ho-Young Cha^{1,2}¹*ChipsK Corporation, Korea*, ²*Hongik University, Korea***[MB2-6]****15:30-15:45****1.48 dB-Noise Figure E-Mode Recessed-Gate GaN MOSHEMT by Neutralized Ion Beam Etching for LNA Applications**

Wenbo Ye, Junmin Zhou, Haowen Guo, Han Gao, and Xinbo Zou

*ShanghaiTech University, China***[MB2-7]****15:45-16:00****Single Crystal GaN Film Grown on Ceramics-AlN Substrates by MOCVD with Graphene Inter-Layer**

Junkang Wu, Xuelin Yang, Zhenghao Chen, Hongcai Yang, Xingyu Fu, Faquan Wu, Haojie Wang, and Bo Shen

Peking University, China



[MC2] Symposium SiC: SiC Materials and Devices (2/4)

Session Date Oct. 14(Mon.), 2024

Session Time 13:45-15:50

Session Room Room C (Forum 1, 3F)

[MC2-1] *Invited **13:45-14:10**

Packaging Approaches for Wide Bandgap Power Semiconductors: Challenges and Efforts

Sang Won Yoon

Seoul National University, Korea

[MC2-2] *Invited **14:10-14:35**

Technologies to Suppress Stacking Fault Expansion in SiC Devices: Stacking Fault Knockdown by High Energy Ion Implantation (SF-KHII) Method

Masashi Kato¹, Shunta Harada², and Hitoshi Sakane³

¹Nagoya Institute of Technology, Japan, ²Nagoya University, Japan, ³SHI-ATEX Co., Ltd., Japan

[MC2-3] **14:35-14:50**

Relationship between Luminescence and Threshold Voltage Shift in SiC MOSFETs under Gate AC Stress

R. Shingo, Y. Enjoji, N. Iwaruro, and H. Yano

University of Tsukuba, Japan

[MC2-4] **14:50-15:05**

Optimizing Electrical Parameters of 650V JBS Structures Using Machine Learning-Enhanced Simulation Techniques

Yan-Yu Wen, Kung-Yen Lee, Chun-Ju Chen, Pei-Chun Liao, and Xue-Fen Hu

National Taiwan University, Taiwan

[MC2-5] **15:05-15:20**

Investigations on Mechanism and Suppression of Gate Voltage Oscillation for SiC Power MOSFET Switching

Zhaoxiang Wei, Guozhi Zhen, Zhaokuan Liu, Jiaying Wei, Siyang Liu, and Weifeng Sun

Southeast University, China

[MC2-6] **15:20-15:35**

A Straightforward Method for Implementing the Static Characteristics of SiC MOSFETs in Spice Modeling

Y.Lee¹, S.Song¹, D.Son², S.Han², J.Lee², and H.Kang¹

¹Korea Institute of Energy Technology, Korea, ²Powermaster Semiconductor, Korea

[MC2-7] **15:35-15:50**

Fabrication of Step Ring Assisted Junction Termination Extension for Edge Termination of 3.3 kV SiC PiN Diode

Sangyeob Kim¹, Hyowon Yoon¹, Gyuhyeok Kang¹, Sumin Park¹, Jinhun Kim¹, Dusan Baek¹, and Ogyun Seok²

¹Kumoh National Institute of Technology, Korea, ²Pusan National University, Korea



[MA3] Symposium GL: III-N Materials and Lighting Devices (3/7)	
Session Date	Oct. 14(Mon.), 2024
Session Time	16:15-18:30
Session Room	Room A (Monterosso, B1F)

[MA3-1] *Keynote **16:15-16:50**
III-Nitrides for MicroLED and Laser Devices for Display, Communication and Quantum Computing
 Steven DenBaars
University of California, Santa Barbara, USA

[MA3-2] *Invited **16:50-17:15**
Recent Progress of Three-Dimensional Structure-Controlled InGaN Light Emitters for Tailored Visible Spectral Control
 Mitsuru Funato, Yoshinobu Matsuda, and Yoichi Kawakami
Kyoto University, Japan

[MA3-3] **17:15-17:30**
Direct One-by-One Nanoscale Correlation of Real Structure and Optical Properties of a UVC/UVB-LED
 Frank Bertram¹, Gordon Schmidt¹, Peter Veit¹, Jürgen Christen¹, Tai Li², Wei Luo³, and Xinqiang Wang²
¹Otto-von-Guericke-University Magdeburg, Germany, ²Peking University, China, ³Songshan Lake Materials Laboratory, China

[MA3-4] **17:30-17:45**
Fabrication of High-Performance UVB LEDs and Dual-Wavelength UV LEDs
 Tai Li^{1,2}, Zhaoying Chen¹, Tao Wang¹, Ye Yuan², Wei Luo², Bo Shen¹, and Xinqiang Wang^{1,2}
¹Peking University, China, ²Songshan Lake Materials Laboratory, China

[MA3-5] **17:45-18:00**
Size Dependent Characteristics of DUV Micro-LEDs for High-Speed Optical Wireless Communication
 Chenglong Xu, Mingyue Lou, Jichun Ye, and Wei Guo
Chinese Academy of Sciences, Ningbo, China

[MA3-6] **18:00-18:15**
Inverse p-GaN Layer in Blue/Green Tandem Structure for Vertically-Stacked Full-Color Micro-LEDs
 Jung-Hong Min, Sung Hoon Jung, Shang Hern Lee, Sungoh Cho, Hwa Sub Oh, and TaeHoon Chung
Korea Photonics Technology Institute, Korea

[MA3-7] **18:15-18:30**
Development of MicroLED/Neural Electrode Hybrid Device
 G. Shinohara¹, A. Okui¹, A. Nishikawa², A. Loesing², T. Kayama³, N. Kuga³, T. Sasaki³, and H. Sekiguchi¹
¹Toyohashi University of Technology, Japan, ²ALLOS Semiconductors GmbH, Germany, ³Tohoku University, Japan

**[MB3] Symposium GE: III-N Materials and Electronic Devices (3/7)****Session Date** Oct. 14(Mon.), 2024**Session Time** 16:15-18:30**Session Room** Room B (Vernazza, 3F)**[MB3-1] *Keynote****16:15-16:50****Thin-Film Diamond Integration for Enhanced Thermal Management in Electronics**

Srabanti Chowdhury

*Stanford University, USA***[MB3-2] *Invited****16:50-17:15****High Performance Normally-Off GaN-Based HEMTs Achieved with Recessed and Regrown Channel Structures**Joel T. Asubar¹, Shogo Maeda¹, Ali Baratov¹, Suguru Terai¹, Takahiro Igarashi¹, Kishi Sekiyama¹, Masaaki Kuzuhara², and Akio Yamamoto¹¹University of Fukui, Japan, ²Kwansei Gakuin University, Japan**[MB3-3]****17:15-17:30****Single Crystalline AlN Heteroepitaxial Growth on Diamond (111) Substrates by Ammonia-Free High-Temperature MOCVD (AFHT-MOCVD)**

X. Q. Shen, H. Kato, Y. Kato, T. Makino, and K. Kojima

*National Institute of Advanced Industrial Science and Technology, Japan***[MB3-4]****17:30-17:45****Thermal Management of GaN-on-Diamond HEMTs through Electro-Thermal Modeling**Changhwan Song¹, Hyeonjin Nam¹, Jisu kim¹, Sukwon Choi², and Jungwan Cho¹¹Sungkyunkwan University, Korea, ²The Pennsylvania State University, USA**[MB3-5]****17:45-18:00****Toward Ultra-Thin GaN Channel on AlGaIn/GaN/AlN DH-HEMTs on AlN Substrates by Hot-Wall MOCVD**Minho. Kim¹, Alexis Papamichail¹, Dat Q. Tran¹, Plamen Paskov¹, and Vanya Darakchieva^{1,2}¹Linköping University, Sweden, ²Lund University, Sweden**[MB3-6]****18:00-18:15****High Power-Performance Multiscale Vertical Scaling-down GaN-Based Heterostructure for 5G/B5G mmWave Applications**

Hao Lu, Ling Yang, Bin Hou, Xiaohua Ma, and Yue Hao

*Xidian University, China***[MB3-7]****18:15-18:30****AlN/GaN/AlN Quantum-Well HEMTs on Single-Crystal AlN Substrates with Silicon Delta Doping**

Eungkyun Kim, Yu-Hsin Chen, Jimmy Encomendero, Debdeep Jena, and Grace Xing

Cornell University, USA

**[MC3] Symposium SiC: SiC Materials and Devices (3/4)****Session Date** Oct. 14(Mon.), 2024**Session Time** 16:15-18:05**Session Room** Room C (Forum 1, 3F)**[MC3-1] *Invited****16:15-16:40****Main Production Methods of Silicon Carbide**

William Wu

*ACME Inc., Taiwan***[MC3-2] *Invited****16:40-17:05****Minority Carrier Lifetime Mapping of Stacking Faults on Photoluminescence Maps from 4H-SiC Epitaxial Wafer by Time-Resolved Photoluminescence**Moonkyong Na¹, Chanhyoun Oh², Donghyun Jang², Hyundon Jung², Hyoung Woo Kim¹, Wook Bahng¹, and Soon-Ku Hong³¹*Korea Electrotechnology Research Institute, Korea*, ²*EtaMax Co., Ltd., Korea*, ³*Chungnam National University, Korea***[MC3-3]****17:05-17:20****Structures and Electronic States of Nitrogen Incorporated 4H-SiC/SiO₂ Interfaces: a First-Principles Study**Toru Akiyama¹, Hiroyuki Kageshima², and Kenji Shiraishi³¹*Mie University, Japan*, ²*Shimane University, Japan*, ³*Nagoya University, Japan***[MC3-4]****17:20-17:35****Evaluation on the Power Performance of SiC PiN Betavoltaic Cell by Using E-Beam Irradiation**Jeongtae Kim^{1,2}, Sangyeob Kim¹, Sumin Park¹, Gyuhyeok Kang¹, Ogyun Seok³, and Dong-Seok Kim²¹*Kumoh National Institute of Technology, Korea*, ²*Korea Atomic Energy Research Institute, Korea*, ³*Pusan National University, Korea***[MC3-5]****17:35-17:50****Superior Switching Characteristics of 1.2 kV MOSFETs by Using Integration SBDs Adjacent Surface of JFET Region**Gyuhyeok Kang¹, Jinhun Kim¹, Yeongeun Park¹, Hyowon Yoon¹, Sangyeob Kim¹, Sumin Park¹, Dusan Baek¹, Jeongtae Kim¹, Kanghee Shin¹, and Ogyun Seok²¹*Kumoh National Institute of Technology, Korea*, ²*Pusan National University, Korea***[MC3-6]****17:50-18:05****Design of a 1200 V 4H-SiC P-Shield MOSFET with the Enhanced Avalanche Ruggedness under the UIS Test**

Ruei-Ci Wu and Kung-Yen Lee

National Taiwan University, Taiwan

**[TA1] Special Session: BN Materials and Devices (1/3)****Session Date** Oct. 15(Tue.), 2024**Session Time** 10:00-12:15**Session Room** Room A (Monterosso, B1F)**[TA1-1] *Keynote****10:00-10:35****The Optical Properties of Various Polytypes of sp^2 -Bonded Boron Nitride**

Bernard Gil

*CNRS-Université de Montpellier, France***[TA1-2] *Invited****10:35-11:00****Recent Progress on Wafer-Scaled Monolayer Hexagonal Boron Nitride Synthesis**

Ki Kang Kim

*Sungkyunkwan University, Korea***[TA1-3] *Invited****11:00-11:25****Probing Deep-Ultraviolet Optoelectronic Processes in Hexagonal Boron Nitride**Jonghwan Kim^{1,2}¹*Pohang University of Science and Technology, Korea*, ²*Institute for Basic Science, Korea***[TA1-4] *Invited****11:25-11:50****Current Status and Challenges in hBN Growth by Chemical Vapor Deposition**

Hyeon Suk Shin

*Sungkyunkwan University, Korea***[TA1-5] *Invited****11:50-12:15****Wafer-Scale AA-Stacked Hexagonal Boron Nitride Grown on GaN Substrate**Seokho Moon¹, Francis Ngome Okello Odongo¹, Adrien Rousseau², Youngjae Kim³, Yunjae Park⁴, Jiye Kim¹, Jaewon Kim⁵, Pierre Valvin², Jaehee Cho⁶, Kenji Watanabe⁷, Takashi Taniguchi⁷, Giorgia Fugallo⁸, Wilfried Desrat², Feng Ding^{4,9}, Jaedong Lee³, Bernard Gil², Guillaume Cassabois^{2,10}, Si-Young Choi¹, and Jong Kyu Kim¹¹*Pohang University of Science and Technology, Korea*, ²*CNRS-University of Montpellier, France*, ³*Daegu Gyeongbuk Institute of Science and Technology, Korea*, ⁴*Ulsan National Institute of Science and Technology, Korea*, ⁵*Samsung Advanced Institute of Technology, Korea*, ⁶*Jeonbuk National University, Korea*, ⁷*National Institute for Materials Science, Japan*, ⁸*University of Nantes, France*, ⁹*Chinese Academy of Science, China*, ¹⁰*Institut Universitaire de France, France*


[TB1] Symposium GE: III-N Materials and Electronic Devices (4/7)
Session Date Oct. 15(Tue.), 2024

Session Time 10:00-12:15

Session Room Room B (Vernazza, 3F)

[TB1-1] *Keynote **10:00-10:35**
The Development and Progress of Monolithic GaN-Based Complementary Metal-Oxide-Semiconductor High-Electron Mobility Transistors

Ching-Ting Lee and Hsin-Ying Lee

National Cheng Kung University, Taiwan
[TB1-2] *Invited **10:35-11:00**
GaN-Based p-channel Devices on High-Electron-Mobility Transistors (HEMT) Platform

 Junting Chen¹, David Zhou², Zuoheng Jiang¹, Haohao Chen¹, Jinjin Tang¹, and Mengyuan Hua¹
¹Southern University of Science and Technology, China ²Shenzhen Pinghu Laboratory, China
[TB1-3] **11:00-11:15**
The Influence of Inadequate Mg Activation on Threshold Voltage Instability in p-GaN Gate HEMTs

X. Liu, C. Feng, J. Wu, D. Mao, R. Du, Z. Cai, X. Zhang, N. Gong, Y. Shi, K. Wu, C. Li, X. Wang, H. Hu, W. Zeng, D. Zhou, and Y. Wan

Shenzhen Pinghu Laboratory, China
[TB1-4] **11:15-11:30**
Electrical Characteristics of p-GaN MIS Capacitors Fabricated *in situ*

Ren Obata, Manato Deki, Hirotaka Watanabe, Yoshio Honda, and Hiroshi Amano

Nagoya University, Japan
[TB1-5] **11:30-11:45**
Advanced Nano-Characterization of Heavily Doped Pulsed Sputtered Grown GaN:Si

 Gordon Schmidt¹, Frank Bertram¹, Jürgen Christen¹, Kohei Ueno², and Hiroshi Fujioka²
¹Otto-von-Guericke-University, Germany, ²The University of Tokyo, Japan
[TB1-6] **11:45-12:00**
Degradation and Recovery of I-V Characteristics of n-GaN Schottky Barrier Diode due to High-Temperature Annealing and Surface Etching Process

Woong Kwon, Yuta Itoh, Seiya Kawasaki, Atsushi Tanaka, Hirotaka Watanabe, Yoshio Honda, and Hiroshi Amano

Nagoya University, Japan
[TB1-7] **12:00-12:15**
Observation of Local Vibrational Modes of MgGa-VN in Mg-Doped GaN

 Yingming Song¹, ZiDong Cai², Shixiong Zhang³, Han Yang¹, Xingyu Fu¹, Xuan Liu¹, Xuelin Yang¹, and Bo Shen¹
¹Peking University, China, ²Shenzhen Pinghu Laboratory, China, ³Hubei Normal University, China

**[TC1] Symposium SiC: SiC Materials and Devices (4/4)****Session Date** Oct. 15(Tue.), 2024**Session Time** 10:00-11:35**Session Room** Room C (Forum 1, 3F)**[TC1-1] *Invited****10:00-10:25****New Investigations of Carrot Defects and Prismatic Stacking Faults in 4HSiC Epitaxial Layers**Soon-Ku Hong¹, Moonkyong Na², Young Heon Kim¹, Chanhyoung Oh³, Jucheol Park⁴, Donghyun Jang³, Sung Beom Cho⁵, Hyundon Jung³, and Wook Bahng²¹Chungnam National University, Korea, ²Korea Electrotechnology Research Institute, Korea, ³EtaMax Co., Ltd., Korea, ⁴Gumi Electronics & Information Technology Research Institute, Korea, ⁵Ajou University, Korea**[TC1-2] *Invited****10:25-10:50****Defect Characterization of Power Device Semiconductor Wafers by Novel Birefringence Method**Shunta Harada¹ and Kenta Murayama²¹Nagoya University, Japan, ²Mipox Corporation, Japan**[TC1-3]****10:50-11:05****Experimental Study on the Influence of Induction Heating Frequency on Top-Seeded Solution Growth of 4H-SiC**

Takeshi Mitani, Shigeyuki Kuboya, Kazuma Eto, and Tomohisa Kato

National Institute of Advanced Industrial Science and Technology, Japan

[TC1-4]**11:05-11:20****Hybridly Packaged White LED Composed of Fluorescent SiC and Nitride-Based near-Ultraviolet LED**T. Mizuno¹, S. Akiyoshi¹, N. Takahashi¹, T. Ban¹, M. Iwaya¹, T. Takeuchi¹, S. Kamiyama¹, A. Suzuki², E. Akazawa², Y.Ou³, J. Wang³, and H. Ou³¹Meijo University, Japan, ²E&E Japan Co., Ltd., Japan, ³Technical University of Denmark, Denmark**[TC1-5]****11:20-11:35****High-Performance 4H-SiC Position Sensitive Detector for Ultraviolet Measurements**Yifu Wang¹, Weizong Xu^{1,2}, Dong Zhou¹, Fangfang Ren^{1,2}, Dunjun Chen¹, Rong Zhang^{1,2}, Youdou Zheng¹, and Hai Lu^{1,2}¹Nanjing University, Korea, ²Hefei Institutes of Physical Science, China



[TA2] Special Session: BN Materials and Devices (2/3)

Session Date Oct. 15(Tue.), 2024

Session Time 13:35-15:10

Session Room Room A (Monterosso, B1F)

[TA2-1] *Invited **13:35-14:00**

Manipulation of Carbon Color Centers in Hexagonal Boron Nitride for Efficient Deep Ultraviolet Light Emission

Young Duck Kim

Kyung Hee University, Korea

[TA2-2] *Invited **14:00-14:25**

Revolutionizing Wafer-Scale Performance based on h-BN

Soo Min Kim

Sookmyung Women's University, Korea

[TA2-3] **14:25-14:40**

Carbon-Related Quantum Emitters Engineering in Hexagonal Boron Nitride

Sofiya Karankova^{1,2}, Yeunjeong Lee^{1,3}, Young Gie Lee^{1,4}, Chaun Jang¹, Young Duck Kim⁴, Yong-Won Song^{1,2}, and Hyowon Moon^{1,2}

¹*Korea Institute of Science and Technology, Korea*, ²*University of Science and Technology, Korea*,

³*Korea University, Korea*, ⁴*Kyung Hee University, Korea*

[TA2-4] **14:40-14:55**

Optically Active Spin Defects in Epitaxial Hexagonal Boron Nitride

K. Ludwiczak, J. Binder, A. K. Dąbrowska, P. Tatarczak, and A. Wyszomłek

University of Warsaw, Poland

[TA2-5] **14:55-15:10**

Analog Switching Memristor based on Hexagonal Boron Nitride Grown on Gallium Nitride Substrate

Jaesub Song, Seokho Moon, Jinho Byun, Jiye Kim, Inyong Hwang, Changwook Ji, Seonghyeon Pak, and Jongkyu Kim

Pohang University of Science and Technology, Korea

**[TB2] Symposium GE: III-N Materials and Electronic Devices (5/7)****Session Date** Oct. 15(Tue.), 2024**Session Time** 13:35-15:10**Session Room** Room B (Vernazza, 3F)**[TB2-1] *Invited****13:35-14:00****Advanced Fabrication Technique and Novel Device Structure for HighPerformance Enhancement-Mode GaN p-MISFET**Qi Zhou, Kuangli Chen, Liyang Zhu, Jinggui Zhou, Shuting Huang, and Bo Zhang
*University of Electronic Science and Technology of China, China***[TB2-2] *Invited****14:00-14:25****Dynamic R_{on} and Buffer Trapping Mechanisms in AlGaIn/GaN HEMTs**Hyun-Seop Kim^{1,2}, Michael J. Uren², and Martin Kuball²
¹*Kunsan National University, Korea*, ²*University of Bristol, UK***[TB2-3]****14:25-14:40****The Impact of Carbon Impurity Ionization on the On-Resistance of GaN HEMTs**Jinwei Zhang, Zhuoran Luo, Qianshu Wu, Miao Zhang, and Yang Liu
*Sun Yat-Sen University, China***[TB2-4]****14:40-14:55****Unraveling the Physical Mechanism of Current Collapse and Threshold Voltage Instability in Heterostructure-Based GaN Power Devices**Kexin Deng^{1,2}, Sen Huang^{1,2}, Xinhua Wang^{1,2}, Qimeng Jiang^{1,2}, and Xinyu Liu^{1,2}
¹*Institute of Microelectronics of Chinese Academy of Sciences, China*, ²*University of Chinese Academy of Sciences, China***[TB2-5]****14:55-15:10****Tuning Composition in Channel of AlGaIn HEMT Grown on AlN / SiC by MOCVD**Joon-Hyuk Lee, Joocheol Jeong, Shyam Mohan, Jooyong Park, Jaejin Heo, and Okhyun Nam
Tech University of Korea, Korea



[TC2] Symposium GaO: Ga₂O₃ Materials and Electronic Devices (1/6)

Session Date Oct. 15(Tue.), 2024

Session Time 13:35-15:15

Session Room Room C (Forum 1, 3F)

[TC2-1] *Keynote **13:35-14:10**

Ultra-Wide Bandgap β -Ga₂O₃ and β -(Al_xGa_{1-x})₂O₃ Single Crystals and their Physical Properties

Zbigniew Galazka

Leibniz Institute of Crystal Growth, Germany

[TC2-2] *Invited **14:10-14:35**

Heteroepitaxial Growth of β -Ga₂O₃ Thin Films on Sapphire Substrates by MOCVD

Ji-Hyeon Park, Hyeong-Yun Kim, and Dae-Woo Jeon

Korea Institute of Ceramic Engineering and Technology, Korea

[TC2-3] *Invited **14:35-15:00**

Unwanted Ga₂O₃ Phases in Thin Epitaxial Films and How to Prevent Them

Celesta S. Chang

Seoul National University, Korea

[TC2-4] **15:00-15:15**

Phase Transition Study of Hetero-Epitaxial Ga₂O₃ Films on c-Plane Sapphire

Hyeong-Yun Kim, Ji-Hyeon Park, and Dae-Woo Jeon

Korea Institute of Ceramic Engineering and Technology, Korea



[TD1] Wide-Bandgap Semiconductor Quantum Devices 1

Session Date Oct. 15(Tue.), 2024

Session Time 13:35-15:15

Session Room Room D (Forum , 3F)

[TD1-1] *Invited **13:35-14:00**

Diamond Vacancies: Engineering, Quantum Control and Applications

Ya Wang

University of Science and Technology of China, China

[TD1-2] *Invited **14:00-14:25**

Enhancing Magnetic Field Sensitivity in a Solid-State Quantum Sensor

Sangwon Oh

Ajou University, Korea

[TD1-3] *Invited **14:25-14:50**

Electrically Detected Photocurrent Dynamics of NV Quantum Sensor

Hiroki Morishita

Tohoku University, Japan

[TD1-4] *Invited **14:50-15:15**

Spin-Photon Hybrid Quantum System based on Nitrogen Vacancy Venter in Diamond

Dongyeon. D. Kang, Yong-su Lee, Ye-eun Choi, Chan-gu Kang, Eunsang Lee, Min-suk Jeon, Junghyun

P. Lee Chulk Kim, Seung-woo Jeon, and Sang-wook Han

Korea Institute for Science and Technology, Korea



[TA3] Special Session: BN Materials and Devices (3/3)

Session Date Oct. 15(Tue.), 2024

Session Time 15:30-16:40

Session Room Room A (Monterosso, B1F)

[TA3-1] *Invited

15:30-15:55

Defect Engineering for Quantum Emissions in Hexagonal Boron Nitride

Hyowon Moon^{1,2}

¹Korea Institute of Science and Technology, Korea, ²University of Science and Technology, Korea

[TA3-2]

15:55-16:10

Uniform Growth of Hexagonal Boron Nitride on 150 mm Silicon

Muzafar Rather¹, Shao-Shiang Hsue¹, Chih-Chieh Lin¹, Yen-Huang Tien¹, Chien-Ting Wu², Kun-Lin Lin²,
Kun-Yu Lai¹, and Jen-Inn Chyi¹

¹National Central University, Taiwan, ²Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan

[TA3-3]

16:10-16:25

Deep Ultraviolet Resonance Raman Spectroscopy of Hexagonal Boron Nitride

Lei Fu¹, Ning Tang¹, Yuqing Hu², Huaiyuan Yang¹, Xionghui Jia¹, Guoping Li¹, Junxi Duan², Weikun Ge¹,
and Bo Shen¹

¹Peking University, China, ²Beijing Institute of Technology, China

[TA3-4]

16:25-16:40

Deterministic Creation of Tip-Induced Nanostructures in Layered Materials

Yeunjeong Lee^{1,2}, Sofiya Karankova^{1,3}, Yong Won Song^{1,3}, Su-Hyun Gong², and Hyowon Moon^{1,3}

¹Korea Institute of Science and Technology, Korea, ²Korea University, Korea, ³University of Science and Technology, Korea



[TB3] Symposium GE: III-N Materials and Electronic Devices (6/7)

Session Date Oct. 15(Tue.), 2024

Session Time 15:30-17:00

Session Room Room B (Vernazza, 3F)

[TB3-1] *Keynote

15:30-16:05

Advanced GaN HEMTs Epitaxy, Terahertz Characterization and Applications

Vanya Darakchieva,^{1,2} Alexis Papamichail², Minho Kim², Hengfang Zhang², Vallery Stanishev², Nerijus Armakavicius², Viktor Rindert¹, Mathias Schubert¹, Dat Q. Tran², Plamen Paskov², Ragnar Ferrand Drake del Castillo³, Mattias Thorsell^{3,4}, and Niklas Rorsman³

¹Lund University, Sweden, ²Linköping University, Sweden, ³Chalmers University of Technology, Sweden

[TB3-2] *Invited

16:05-16:30

Irradiation Effect and Hardened Design on Gallium Nitride Power Devices

Feng Zhou, Can Zou, Junfan Qian, Rong Zhang, Youdou Zheng, and Hai Lu
Nanjing University, China

[TB3-3]

16:30-16:45

Heavy-Ion Irradiation-Induced Single Event Burnout Characteristic and Trap Behavior in AlGaIn/GaN MIS-HEMTs

Can Zou, Feng Zhou, Weizong Xu, Fangfang Ren, Dong Zhou, Dunjun Chen, Rong Zhang, Youdou Zheng, and Hai Lu

Nanjing University, China

[TB3-4]

16:45-17:00

Terahertz Optical Hall Effect in AlScN/GaN and AlYN/GaN HEMT Structures

V. Stanishev¹, I. Streicher², A. Papamichail¹, S. Leone², and V. Darakchieva^{1,3}

¹Linköping University, Sweden, ²Fraunhofer Institute for Applied Solid State Physics IAF, Germany,

³Lund University, Sweden



[TC3] Symposium GaO: Ga₂O₃ Materials and Electronic Devices (2/6)

Session Date Oct. 15(Tue.), 2024

Session Time 15:30-16:50

Session Room Room C (Forum 1, 3F)

[TC3-1] *Invited

15:30-15:55

Self-Assembling of Multilayered Polymorphs in Ga₂O₃

Andrej Kuznetsov

University of Oslo, Norway

[TC3-2] *Invited

15:55-16:20

Gallium Oxide Growth Study for Optoelectronic Device Applications

Gyun Seo Kim¹, Kyung-Ho Kim², Si-Young Bae², Tae-Yong Park³, Boon S. Ooi³, and Jungwook Min^{1,3}

¹*Kumoh National Institute of Technology, Korea*, ²*Korea Institute of Ceramic Engineering and Technology, Korea*, ³*King Abdullah University of Science and Technology, Saudi Arabia*

[TC3-3]

16:20-16:35

Thermal Conductivity Measurements of MOCVD-Grown Ga₂O₃ Heterostructures

Taeyeon Kim¹, Hyeonyun Kim², Hongju Mun¹, Jihyeon Park², Jihyeon Kim¹, Daewoo Jeon², and Jungwan Cho¹

¹*Sungkyunkwan University, Korea*, ²*Korea Institute of Ceramic Engineering and Technology, Korea*

[TC3-4]

16:35-16:50

Point and Extended Defects, and their Pathway to Phase Transformation of Gallium Oxide

Chris Chae, Hsien-lien Huang, and Jinwoo Hwang

The Ohio State University, USA



[TD2] Wide-Bandgap Semiconductor Quantum Devices 2

Session Date Oct. 15(Tue.), 2024

Session Time 15:30-16:35

Session Room Room D (Forum , 3F)

[TD2-1] *Invited

15:30-15:55

Quantum Sensing based on Silicon Vacancy in SiC toward Diagnosis Tool for SiC Power Devices

Takeshi Ohshima^{1,2}, Tomoaki Tanaka¹, and Yuichi Yamazaki¹

¹National Institutes for Quantum Science and Technology, Japan, ²Tohoku University, Japan

[TD2-2] *Invited

15:55-16:20

The Impact of Paramagnetic Defects on the Performance of Quantum Devices in Diamond

Hosung Seo

Ajou University, Korea

[TD2-3]

16:20-16:35

High-Q SiC Photonic Nanocavities near Optical Transition of Color Centers

Heungjoon Kim¹, Bong-Shik Song², Takashi Asano¹, and Susumu Noda¹

¹Kyoto University, Japan, ²Sungkyunkwan University, Korea



[TA4] Symposium GL: III-N Materials and Lighting Devices (4/7)

Session Date Oct. 15(Tue.), 2024

Session Time 17:00-18:10

Session Room Room A (Monterosso, B1F)

[TA4-1] *Invited **17:00-17:25**

Progress and Challenges in GaN Based High Efficiency RGB Micro-LEDs for Comprehensive Applications

Bin Liu¹, Feifan Xu¹, Yimeng Sang¹, Tao Tao¹, Zhe Zhuang¹, Jinchai Li², Kai Huang², and Rong Zhang²

¹Nanjing University, China, ²Xiamen University, China

[TA4-2] **17:25-17:40**

Vertical-Emitting InGaN Tunnel-Junction Nanorod Photonic Crystal Lasing Device

Sung-Un Kim, Min-Seok Lee, Dae-Young Um, Jeong-Kyun Oh, Vignesh Veeramuthu, and Yong-Ho Ra

Jeonbuk National University, Korea

[TA4-3] **17:40-17:55**

Enhancement of Single-Photon Emission Brightness of Position-Controlled GaN Defects in Telecom Range Using Patterned Sapphire Substrates

Hyemin Kim^{1,2}, Yong-Ho Song¹, Young-Ho Ko², and Yong-Hoon Cho¹

¹Korea Advanced Institute of Science and Technology, Korea, ²Electronics and Telecommunications Research Institute, Korea

[TA4-4] **17:55-18:10**

Study on AlN Surface Oxidation for Polarity-Inverted Stacking Structures

Tomohiro Tamano¹, Kanako Shojiki^{1,2}, Ryota Akaike¹, Hiroki Yasunaga¹, Takao Nakamura¹, Masahiro Uemukai³, Tomoyuki Tanikawa³, Ryuji Katayama³, and Hideto Miyake¹

¹Mie University, Japan, ²Kyoto University, Japan, ³Osaka University, Japan

**[TB4] Symposium GE: III-N Materials and Electronic Devices (7/7)****Session Date** Oct. 15(Tue.), 2024**Session Time** 17:00-18:35**Session Room** Room B (Vernazza, 3F)**[TB4-1] *Invited****17:00-17:25****GaN and Wide-Bandgap Semiconductor Devices for Power Electronics Applications**

J.Buckley¹, P.Godignon¹, C.Le Royer¹, E.Nowak¹, R.Escoffier¹, M.El Amrani^{1,4}, V. Ackermann¹, M.Charles¹, H.El Rammouz¹, B.Mohamad¹, T.Labau^{1,2}, C.Masante¹, C. Piotrowicz^{1,3}, J.Zgheib¹, M.Kumar¹, M.Fayolle¹, J.Biscarrat¹, S.Bécu¹, T.Kaltsounis^{1,6}, Z. M Qaddem¹, D.Plaza Arguello¹, S.Torrenco¹, M.Gorisse¹, V.Maurya^{1,4}, C.Gillot¹, and Y.Lamy

¹Grenoble Alpes University, France, ²Delphea, France, ³University of Bordeaux, France, ⁴University of Tours, France, ⁵Côte d'Azur University, France

[TB4-2] *Invited**17:25-17:50****Recent Progress of GaN Power Intergation and Modeling Technology**

Sheng Li, Siyang Liu, Yanfeng Ma, Mingfei Li, Weihao Lu, and Weifeng Sun
Southeast University, China

[TB4-3]**17:50-18:05****Ion Beam Etching Enabled Recessed-Gate E-mode GaN MOS-HEMT with FOM of 701 MW·cm⁻² and Monolithic Integrated Digital Circuit**

Han Gao, Yitian Gu, Yitai Zhu, Wenbo Ye, and Xinbo Zou
ShanghaiTech University, China

[TB4-4]**18:05-18:20****X-Ray Irradiation-Induced Threshold Voltage Instability in Schottky-Gate P-GaN HEMTs**

Yu Rong, Feng Zhou, Weizong Xu, Fangfang Ren, Dong Zhou, Dunjun Chen, Rong Zhang, Youdou Zheng, and Hai Lu
Nanjing University, China

[TB4-5]**18:20-18:35****Surface Morphologies and Electrical Properties of N-type GaN Films Deposited by Two Different Sputtering Methods**

S. Yamada, K. Tanaka, M. Arai, T. Kachi, and J. Suda
Nagoya University, Japan



[TC4] Symposium GaO: Ga₂O₃ Materials and Electronic Devices (3/6)

Session Date Oct. 15(Tue.), 2024

Session Time 17:00-17:50

Session Room Room C (Forum 1, 3F)

[TC4-1] *Invited

17:00-17:25

Machine-Learning Dynamic Model of Complex Ga₂O₃ Polymorphs for Next-Generation Extreme Environment Electronics

Junlei Zhao¹, Mengyuan Hua¹, Jesper Byggmästar², Jiahui Zhang², Kai Nordlund², Flyura Djurabekova², Javier García-Fernández³, Alexander Azarov³, and Andrej Kuznetsov³

¹*Southern University of Science and Technology, China*, ²*University of Helsinki, Finland*, ³*University of Oslo, Norway*

[TC4-2] *Invited

17:25-17:50

Potential of Germanium Dioxide (GeO₂) for Power Devices

Kentaro Kaneko

Ritsumeikan University, Japan



[TD3] Novel Devices

Session Date Oct. 15(Tue.), 2024

Session Time 17:00-17:45

Session Room Room D (Forum , 3F)

[TD3-1]

17:00-17:15

Analysis of Emission Properties of Metal-Semiconductor Micro-Stripe Structures with Respect to the Materials

Daiki Yoshikawa¹, Bojin Lin¹, Hnin Lai Lai Aye¹, Kohei Ueno², Hiroshi Fujioka², Hideto Miyake³, and Yoshihiro Ishitani¹

¹Chiba University, Japan, ²The University of Tokyo, Japan, ³Mie University, Japan

[TD3-2]

17:15-17:30

Thermal Conductivity Measurements of BeO Thin Films Grown by Plasma Enhanced Atomic Layer Deposition

Jihyun Kim¹, Jonghyun Bae², Dongyun Seo¹, Dohwan Jung², Jungwoo Oh², and Jungwan Cho¹

¹Sungkyunkwan University, Korea, ²Yonsei University, Korea

[TD3-3]

17:30-17:45

PEC Water Splitting based on III-Nitride Nanorods for Enhancing Hydrogen Production

Jeong-Kyun Oh, Dae-Young Um, Bagavath Chandran, Sang-Wook Lee, Sung-Un Kim, Cheul-Ro Lee, and Yong-Ho Ra

Jeonbuk National University, Korea

**[WA1] Symposium GL: III-N Materials and Lighting Devices (5/7)****Session Date** Oct. 16(Wed.), 2024**Session Time** 09:00-10:50**Session Room** Room A (Monterosso, B1F)**[WA1-1] *Invited****09:00-09:25****Controlling the Growth Mode of Graphene Assisted Growth via Graphene Defects**Jeongwoon Kim¹, Hyeon Woo Kim^{2,3}, Jongil Kim⁴, Je-Sung Lee¹, Hoe-Min Kwak⁵, Jaeyoung Baik¹, Soo-Young Choi¹, Jinsoo Kim¹, Si-Young Bae³, Sung Beom Cho⁶, Sangho Oh⁴, Young-Joon Hong⁷, and Dong-Seon Lee¹¹Gwangju Institute of Science and Technology, Korea, ²Hanyang University, Korea, ³Korea Institute of Ceramic Engineering and Technology, Korea, ⁴Korea Institute of Energy Technology, Korea, ⁵Electronics and Telecommunications Research Institute, Korea, ⁶Ajou University, Korea, ⁷Sejong University, Korea**[WA1-2] *Invited****09:25-09:50****Atomic Evolution Mechanism and Suppression of Edge Threading Dislocations in Remote Epitaxy**

Chen Qi and Liu zhiqiang

*Chinese Academy of Sciences, China***[WA1-3]****09:50-10:05****Van der Waals Epitaxial High-Quality Wide Bandgap Nitride Thin Film Materials and High-Performance Devices**

Haidi Wu, Jing Ning, Jincheng Zhang, and Yue Hao

*Xidian University, China***[WA1-4]****10:05-10:20****Remote Homoepitaxy of Gr/N-polar GaN for Exfoliation and Deformable Device**

Joonghoon Choi and Young Joon Hong

*Sejong University, Korea***[WA1-5]****10:20-10:35****Quasi-Van Der Waals Epitaxial Growth Of InGaN Quantum Wells on Transferred and As-Grown H-BN via Metal Organic Vapor Phase Epitaxy**Peilong Yang¹, Seokho Moon², Zhibiao Hao¹, Yi Luo¹, Changzheng Sun¹, Bing Xiong¹, Yanjun Han¹, Jian Wang¹, Hongtao Li¹, Lin Gan¹, Jong Kyu Kim², and Lai Wang¹¹Tsinghua University, China, ²Pohang University of Science and Technology, Korea**[WA1-6]****10:35-10:50****AlN with Carbon Buffer for Epitaxial Lift-off of III-Nitride Devices**

Hae-Gon Oh, Young-Jun Choi, and Hae-Yong Lee

LumiGNtech Co., Ltd., Korea



[WB1] Symposium GaO: Ga₂O₃ Materials and Electronic Devices (4/6)

Session Date Oct. 16(Wed.), 2024

Session Time 09:00-10:40

Session Room Room B (Vernazza, 3F)

[WB1-1] *Keynote **09:00-09:35**

Demand and Technology Development Trends for Vehicle Power Semiconductors

Youngkyun Jung

Hyundai Motor Company

[WB1-2] *Invited **09:35-10:00**

Recent Efforts for Commercial Applications of Ga₂O₃ Devices

Shizuo Fujita

Kyoto University, Japan

[WB1-3] *Invited **10:00-10:25**

Beta-Gallium Oxide Nanowire-Based Electronic Devices

Minglei Tang^{1,2}, Siyuan Xu^{1,3}, Guangming Qu^{1,2}, Lining Liu^{1,3}, Guodong Wang², Young Jin Lee⁴, Dae-Woo Jeon⁴, Ji-Hyeon Park⁴, Yiyun Zhang^{1,3}, Xiaoyan Yi^{1,3}, Junxi Wang^{1,3}, and Jinmin Li^{1,2}

¹Chinese Academy of Sciences, China, ²Henan Polytechnic University, China, ³University of Chinese Academy of Sciences, China, ⁴Korea Institute of Ceramic Engineering and Technology, Korea

[WB1-4] **10:25-10:40**

pn Heterojunction Made of Ga₂O₃ and NiO Using RF-Sputtering

Heejoong Ryou¹, Sunjae Kim¹, Minje Kim¹, Dong-Bin Kim², Jongsu Baek², Byung Jin Cho², and Wan Sik Hwang¹

¹Korea Aerospace University, Korea, ²Korea Advanced Institute of Science and Technology, Korea



[WC1] Special Session: Diamond Materials and Devices (1/3)

Session Date Oct. 16(Wed.), 2024

Session Time 09:00-10:40

Session Room Room C (Forum 1, 3F)

[WC1-1] *Keynote

09:00-09:35

Diamond RF Planar and Power Vertical p-FET Using 2D Hole Gas

H. Kawarada¹, K. Ota^{1,2}, K. Kudara¹, N. Oi^{1,2}, and T. Fujishima²

¹Waseda University, Japan, ²Power Diamond Systems, Inc., Japan

[WC1-2] *Invited

09:35-10:00

Two-Inch High Quality Diamond Heteroepitaxial Growth on Sapphire Substrate

Seong-Woo Kim

Orbray Co., Ltd., Japan

[WC1-3] *Invited

10:00-10:25

Diamond Growth on the Heteroepitaxial Diamond Substrate for Future Power and Quantum Device Applications

Taemyung Kwak¹, Geunho Yoo¹, Uiho Choi¹, Seong-Woo Kim², and Okhyun Nam¹

¹Tech University of Korea, Korea, ²Orbray Co., Ltd., Japan

[WC1-4]

10:25-10:40

Coupling X-Ray Beam Induced Current and X-Ray Diffraction Imaging to Characterize Diamond Plates Used as Semiconductor-Based Detectors

F. Lafont¹, M.L. Gallin-Martel², D. Dauvergne², P. Everaere^{1,2}, R. Molle², J. Baruchel¹, and T.N. Tran Caliste¹

¹The European Synchrotron Radiation Facility, France, ²Laboratoire de Physique Subatomique & Cosmologie, France



[WA2] Symposium GL: III-N Materials and Lighting Devices (6/7)

Session Date Oct. 16(Wed.), 2024

Session Time 11:00-12:20

Session Room Room A (Monterosso, B1F)

[WA2-1] *Keynote

11:00-11:35

III-Nitrides for Microphotonics

Andreas Waag

Technische Universität Braunschweig, Germany

[WA2-2]

11:35-11:50

Development of Vertical AlGaIn-Based UV-B Laser Diode Using Substrate Exfoliation Technology by Heated-Pressurized Water

Motoaki Iwaya¹, Yusuke Sasaki¹, Yoshinori Imoto¹, Ryoya Yamada¹, Takumu Saito¹, Rintaro Miyake¹, Shundai Maruyama¹, Shogo Karino¹, Sho Iwayama¹, Satoshi Kamiyama¹, Tetsuya Takeuchi¹, and Hideto Miyake²

¹Meijo University, Japan, ²Mie University, Japan

[WA2-3]

11:50-12:05

Study of Strain-Induced Quantum Wells Shallowing in 230 nm UVC LEDs and their Influence on Hole Overflow

Ping-Jie Zhuang and Yuh-Renn Wu

National Taiwan University, Taiwan

[WA2-4]

12:05-12:20

Demonstration of Full AlGaIn Tunnel Junction Ultraviolet LED

Gaoqiang Deng, Jiaqi Yu, Yunfei Niu, and Yuantao Zhang

Jilin University, China


[WB2] Symposium GaO: Ga₂O₃ Materials and Electronic Devices (5/6)
Session Date Oct. 16(Wed.), 2024

Session Time 11:00-12:20

Session Room Room B (Vernazza, 3F)

[WB2-1] *Invited
11:00-11:25
Atom-Level Mechanisms of Exceptional Radiation Tolerance of Gallium Oxide

 Ru He¹, Huan He^{1,2}, Junlei Zhao³, Huan Liu¹, Ilja Makkonen¹, and Flyura Djurabekova¹
¹University of Helsinki, Finland, ²Xi'an Jiaotong University, China, ³Southern University of Science and Technology, China

[WB2-2] *Invited
11:25-11:50
Putting the Pieces Together for Gallium Oxide Power Devices

M. H. Wong, W. Zhou, Z. Wen, J. Yang, S. Huang, H. Zhou, and Z. Li

Hong Kong University of Science and Technology, Hong Kong S.A.R

[WB2-3]
11:50-12:05
High-Performance Self-Powered UV Photodetector based on p-CuAlO₂/β-Ga₂O₃ Heterojunction

Chowdam Venkata Prasad and You Seung Rim

Sejong University, Korea

[WB2-4]
12:05-12:20
Deep Traps and Electrical Properties of NiO-Ga₂O₃ Heterojunction Diodes Versus Ni Schottky Diodes and Effects of Proton Irradiation

 Anastasiia I. Kochkova¹, Alexander Y. Polyakov¹, Eugene B. Yakimov^{1,2}, Danila S. Saranin¹, Alexey V. Chernykh¹, Anton A. Vasilev¹, Pavel A. Gostishchev¹, Luiza A. Alexanyan¹, Nikolai R. Matros¹, Ivan V. Shchemerov¹, Petr B. Lagov^{1,3}, and Stephen J. Pearton⁴
¹The National University of Science and Technology MISiS, Russia, ²Institute of Microelectronics Technology and High Purity Materials, Russia, ³Laboratory of Radiation Technology, Russia, ⁴University of Florida, USA



[WC2] Special Session: Diamond Materials and Devices (2/3)

Session Date	Oct. 16(Wed.), 2024
Session Time	11:00-12:20
Session Room	Room C (Forum 1, 3F)

[WC2-1] *Invited 11:00-11:25

Recent Progress in Diamond Semiconductors

Hong-Xing Wang

Xi'an Jiaotong University, China

[WC2-2] *Invited 11:25-11:50

Recent Advances in Diamond MOSFET Technologies

Norio Tokuda¹, Tsubasa Matsumoto¹, Xufang Zhang¹, Kai Sato¹, Kazuki Kobayashi¹, Kimiyoshi Ichikawa¹, Kan Hayashi¹, Takao Inokuma¹, Satoshi Yamasaki¹, Christoph E. Nebel^{1,2}, Hiromitsu Kato³, Masahiko Ogura³, Toshiharu Makino³, and Daisuke Takeuchi³

¹*Kanazawa University, Japan*, ²*Diamond and Carbon Applications, Germany*, ³*National Institute of Advanced Industrial Science and Technology, Japan*

[WC2-3] 11:50-12:05

Experimental Measurement of Carrier Velocity in Surface-Transfer-Doped Diamond PFETs

Wesley Turner and Patrick Fay

University of Notre Dame, USA

[WC2-4] 12:05-12:20

Hydrogen-Terminated Diamond MOSFET Fabricated on Heteroepitaxial Grown Diamond

Taemyung Kwak, Yeonghwa Kwon, Seolyoung Oh, Yoonseok Nam, Geunho Yoo, and Okhyun Nam

Tech University of Korea, Korea

**[WA3] Symposium GL: III-N Materials and Lighting Devices (7/7)****Session Date** Oct. 16(Wed.), 2024**Session Time** 13:40-17:15**Session Room** Room A (Monterosso, B1F)**[WA3-1] *Keynote****13:40-14:15****ZOGAN LED: Breakthrough for microLED displays**Y. R. Ryu^{1,2}, Sung K. Hong¹, Moon W. Bang¹, Sung-Ran Jeon², Ja Yeon Kim², Jong-Hyeop Baek², Dong-Min Jeon³, Dong-Soo Shin³, and Jong-In Shim³¹ZOGAN SEMI, Korea, ²Korea Photonics Technology Institute, Korea, ³Hanyang University, Korea**[WA3-2] *Invited****14:15-14:40****Investigation of AlGaIn Heterostructures Grown on h-BN by Molecular Beam Epitaxy for the Fabrication of Deep UV LEDs**J. Brault¹, S. Mitra¹, S. Shetty¹, S. Chenot¹, M. Nemoz¹, A. Zaiter¹, M. Al Khalfioui¹, P. Vuong², V. Ottapilakkal², S. Sundaram², A. Ibanez³, P. Valvin³, G. Cassabois³, B. Gil³, and A. Ougazzaden^{2,4}¹CNRS-CRHEA-Cote Azur University, France, ²Georgia Tech Europe, France, ³University of Montpellier, France, ⁴Georgia Institute of Technology, USA**[WA3-3]****14:40-14:55****Low Temperature Growth of GaN Films with Ion Beam Assisted Magnetron Sputtering**Yongjun Park, Changmin Yun, Seung Yup Baek, Gyulim Kim, Yosep Choi, and In-Hwan Lee
Korea University, Korea**[WA3-4] *Invited****15:00-15:25****Deep-UV LEDs Fabricated on Face-to-Face Annealed Sputter-Deposited AlN Templates**Hideto Miyake, Ryota Akaike, Hiroki Yasunaga, and Takao Nakamura
Mie University, Japan**[WA3-5] *Invited****15:25-15:50****Improvement of Emission Efficiency and Optical Functionality for Visible Light Region by Designing InGaIn-Based Periodic Nanostructures**Takao Oto¹, Koichi Okamoto², Rie Togashi³, Akihiko Kikuchi³, and Katsumi Kishino³¹Yamagata University, Japan, ²Osaka Metropolitan University, Japan, ³Sophia University, Japan**[WA3-6]****15:50-16:05****Reduction of Forward Voltage in 230 nm AlGaIn far-UVC LED Using Polarization Assisted AlGaIn Hole Injection Layer**Fujimoto Kohei^{1,2}, Mitsuhiro Muta³, M. Ajmal Khan¹, Sachie Fujikawa^{1,2}, Hiroyuki Yaguchi², Yasushi Iwaisako³, and Hideki Hirayama¹¹RIKEN, Japan, ²Saitama University, Japan, ³Nippon Tungsten Co., Ltd., Japan**[WA3-7] *Invited****16:10-16:35****Development of UVC LEDs Ranging from 230nm to 275nm**Myeong Seok Oh, Hae Jin Park, Tae Wan Kwon, and Seung Kyu Oh
PhotonWave Co., Ltd., Korea



[WA3-8] *Invited

16:35-17:00

Efficiency Increase in 220-230 nm Far-UVC LEDs and 200 mW Class 230 nm Power LED Module Grown on c-Sapphire

Hideki Hirayama¹, M. Ajmal Khan¹, Mitsuhiro Muta², Yukio Kashima¹, Eriko Matsuura¹, and Yasushi Iwaisako²

¹RIKEN, Japan, ²Nippon Tungsten Co., Ltd.

[WA3-9]

17:00-17:15

Highly Conductive Al-rich n-AlGaN for Deep-Ultraviolet Light Emitters

Jiaming Wang, Fujun Xu, Lisheng Zhang, Jing Lang, Chen Ji, Chengzhi Ji, Xiangning Kang, Zhixin Qin, Weikun Ge, and Bo Shen

Peking University, China


[WB3] Symposium GaO: Ga₂O₃ Materials and Electronic Devices (6/6)
Session Date Oct. 16(Wed.), 2024

Session Time 13:40-15:05

Session Room Room B (Vernazza, 3F)

[WB3-1] *Invited
13:40-14:05
An Avalanche-and-Surge Robust NiO/Ga₂O₃ p-n Heterojunction Power Diode

 Hehe Gong^{1,2}, Feng Zhou¹, Ming Xiao², Hai Lu¹, Yuhao Zhang², and Jiandong Ye¹
¹Nanjing University, China, ²Virginia Tech, USA

[WB3-2]
14:05-14:20
Observation of Temperature-Dependent Capture Cross-Section for Main Deep-Levels in β-Ga₂O₃

 Anton A. Vasilev¹, Anastasiia I. Kochkova¹, Alexander Y. Polyakov¹, Andrei A. Romanov¹, Nikolai R. Matros¹, Luiza A. Alexanyan¹, Ivan V. Shchemerov¹, and Stephen J. Pearton²
¹National University of Science and Technology MISIS, Russia, ²University of Florida, USA

[WB3-3]
14:20-14:35
Temperature-Dependent Electrical and Trap Properties of β-Ga₂O₃ Schottky Barrier Diodes w/o Homoepitaxial Layer

 Jiaxiang Chen^{1,2}, Haolan Qu², Haitao Du², Xing Lu³, Yuxi Wan¹, Daohua Zhang¹, and Xinbo Zou²
¹Shenzhen Pinghu Laboratory, China, ²ShanghaiTech University, China, ³Sun Yat-sen University, China

[WB3-4]
14:35-14:50
Normally-off β-Ga₂O₃ DUV Phototransistor Grown by MOCVD

 Sunjae Kim^{1,2}, Dae-Woo Jeon¹, Wan Sik Hwang², and Ji-Hyeon Park¹
¹Korea Institute of Ceramic Engineering and Technology, Korea, ²Korea Aerospace University, Korea

[WB3-5]
14:50-15:05
Investigation The Characteristics of α-Ga₂O₃ Photodetector upon Soft X-Ray Irradiation

 Huong T. T. Vo¹, Sunjae Kim^{1,2}, Minje Kim¹, Hyeon Gu Cho³, Se Hoon Gihm³, Ji-Hyeon Park², Dae-Woo Jeon², and Wan Sik Hwang¹
¹Korea Aerospace University, Korea, ²Korea Institute of Ceramic Engineering and Technology, Korea, ³AweXome Ray Inc, Korea



[WC3] Special Session: Diamond Materials and Devices (3/3)

Session Date Oct. 16(Wed.), 2024

Session Time 13:40-15:00

Session Room Room C (Forum 1, 3F)

[WC3-1] *Invited

13:40-14:05

Diamond Growth by Chemical Vapor Deposition for Quantum Device Applications

Tokuyuki Teraji

National Institute for Materials Science, Japan

[WC3-2] *Invited

14:05-14:30

Status of CVD Diamond Growth and Engineering for High-End Applications

Jocelyn Achard¹, Alexandre Tallaire^{1,2}, Ovidiu Brinza¹, Riadh Issaoui¹, Lahcene Mehmel¹, Vianney Mille¹, and Fabien Bénédic¹

¹University Sorbonne Paris Nord, France, ²PSL Research University, France

[WC3-3]

14:30-14:45

Thermal Conductivity Modeling of Sub-1 μm Polycrystalline Diamond Thin Films

Jongwon Baek¹, Junyoung Bae¹, Takuma Hori², and Jungwan Cho¹

¹Sungkyunkwan University, Korea, ²Tokyo University of Agriculture and Technology, Japan

[WC3-4]

14:45-15:00

Imaging the Stress Tensor near Dislocation in Diamond Using Solid State Quantum Sensor

Takeyuki Tsuji and Tokuyuki Teraji

National Institute for Materials Science, Japan