

Advance program

The 9th Asia-Pacific Workshop on Widegap Semiconductors (APWS2019)



November 10-15, 2019

Okinawa Kariyushi Urban Resort Hotel & Okinawa Institute of Science and Technology
Graduate University (OIST), Okinawa, Japan

<http://www.apws2019.jp/>

Sponsored by



The 162nd Committee on Wide Bandgap Semiconductor Photonic and
Electronic Devices, Japan Society for the Promotion of Science

Co-sponsored by



“Materials Science and Advanced Electronics Created by Singularity”,
MEXT-KAKENHI on Innovative Areas, FY2016-2020



Okinawa Institute of Science and Technology Graduate University
(OIST)

Endorsed by



The Japan Society of Applied Physics



The Japanese Association for Crystal Growth

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	Nov. 10 (Sun)	Nov. 11 (Mon)			Nov. 12 (Tue)			Nov. 13 (Wed)		Nov. 14 (Thu)			Nov. 15 (Fri)			
	Okinawa Kariyushi Urban Resort	Auditorium	Meeting Room	Tunell Gallery	Auditorium	Meeting Room	Tunell Gallery	Auditorium	Meeting Room	Auditorium	Meeting Room	Tunell Gallery				
8:00		Gathering and transit to OIST			Registration			Registration		Registration			Transit to Naha and departure			
9:00					Plenary 2					GR4 Novel Process Technology	ED3 Novel Electronic Devices	OD5 UV Devices 2		GR5 Bulk Growth		
10:00		Introduction			Break			Break		Break						
11:00		Plenary 1			ED2 HEMT	GR3 Vapor Phase Epitaxy		OD4 MicroLED	CH3 Optical Characterization 2	ED4 Power Devices	CH4 Physical Properties					
12:00		Lunch		Poster + Exhibition	Lunch			Lunch			Poster + Exhibition					
13:00		ED1 Vertical Power Devices	GR1 Nanostructures		Lunch			Lunch			Poster + Exhibition					
14:00		Break			OD2 Visible & Novel Devices	CH1 Optical Characterization 1		Excursion			Plenary 3					
15:00		Break			Break						Plenary 3					
16:00		OD1 Photonic Devices	GR2 Novel Growth Technology		Break						Closing					
17:00	Registration				OD3 UV Devices 1	CH2 Extended Defects					Transit					
18:00	Opening Session										Banquet (ANA Hotel)					
19:00	Welcome reception										Banquet (ANA Hotel)					
20:00											Banquet (ANA Hotel)					

Important dates

- Deadline of early registration: **September 30, 2019**
- APWS2019: **November 10-15, 2019**

Program at a glance

- Registration and welcome reception on November 10 will be held in Naha.
- Chartered buses will transport the participants from Kariyushi Urban Resort Naha to OIST at around 8:00 on November 11.
- Chartered buses will transport the participants from four official hotels to Naha Airport in the morning on November 15.

Scope of the Workshop

The 9th Asia-Pacific Workshop on Widegap Semiconductors (APWS2019) will be held in Onna-son, Okinawa, Japan, from November 10 to 15, 2019. The eight previous workshops were held in Awajishima, Japan (APWS2003), Hsinchu, Taiwan (APWS2005), Jeonju, Korea (APWS2007), Zhangjiajie, China (APWS2009), Toba, Japan (APWS2011), New Taipei, Taiwan (APWS2013), Seoul, Korea (APWS2015), and Qingdao, China (APWS2017). Researchers from the Asia and Pacific region will join those from other parts of the world in stimulating discussions on widegap semiconductors.

Widegap semiconductors, including III-nitrides, silicon carbide, oxides, and diamond, have excellent physical properties. There are many obstacles on the road to high-performance optical and electronic devices, including difficulties in epitaxy and device processing. The objective of this workshop is to share high-level research results, spread the understanding of widegap semiconductors through in-depth discussions, and contribute to breakthroughs that can overcome critical technological barriers to improve the performance of widegap semiconductor devices.

Format of the Workshop

APWS2019 consists of plenary sessions and a series of two parallel oral sessions that include invited and contributed presentations, as well as poster sessions, an excursion, a banquet, and industrial exhibitions.

Workshop topics

APWS2019 focuses on the science and technology of widegap semiconductors, including III-nitrides, silicon carbide, oxides, diamond and so forth. Research has led to developments in optical and electronic devices, including those for environmental and energy applications. The following topics will be discussed:

✓ Growth

Bulk growth, epitaxial growth, doping and point defects, growth methods, and related technology

✓ Characterization

Optical and electrical properties, structural analysis, and theory and simulation

✓ Optical Devices

Visible, UV, and white LEDs, micro LEDs, laser diodes, solar cells, detectors, and related optical devices

✓ Electronic Devices

Transistors, diodes, high-power and high-frequency devices, device processing, contacts, and reliability

Plenary and invited speakers

Plenary speakers

- Hiroshi Amano (Nagoya University, Japan)

“Wide-bandgap semiconductors as key materials in realizing zero emission of greenhouse gases”

- Euijoon Yoon (Seoul National University, Korea)

“Self-passivated high-efficiency micro-LEDs using sapphire nano-membrane technology”

- Bo Shen (Peking University, China)

“Recent progress on the large lattice-mismatched hetero-epitaxy and physical investigation of III-nitride thin films and quantum structures”

- Hideo Hosono (Tokyo Institute of Technology, Japan)

“Materials Designing Novel Wide Gap Semiconductors”

- Tsutomu Miyasaka (Toin University of Yokohama, Japan)

“Progress of halide perovskite semiconductors in high performance photovoltaics”

Invited speakers

- Bernard Gil (CNRS University Montpellier)

“Boron nitride from its physics to advanced photonic applications”

- Hajime Fujikura (SCIOCS, Japan)

“HVPE for GaN and AlN epi-layer growth”

- Yutaka Mikawa (Mitsubishi Chemical, Japan)

“Acidic Ammonothermal Growth of Bulk GaN”

- Michal Bockowski (UNIPRESS/Nagoya Univ., Poland)

“Bulk growth of GaN. How to overcome the equilibrium crystal shape?”

- Hideto Miyake (Mie University, Japan)

“Threading Dislocation Reduction of Sputter-deposited AlN/sapphire by High-Temperature Annealing”

- Motoaki Iwaya (Meijo University, Japan)

“Toward the realization of AlGa_N-based UVB laser diodes”

- Susumu Noda (Kyoto University, Japan)

“Recent Progress in High-Brightness Photonic-Crystal Lasers”

- Tim Wernicke (Technical University of Berlin, Germany)

“Growth and characterization of AlGa_N based UV-emitters”

- Zlatko Sitar (North Carolina State University, USA)

“A pathway toward low threshold UVC laser diodes”

- Jin Min Li (Institute of Semiconductors, Chinese Academy of Science, China)

“Emerging new techniques for efficient AlGa_N DUV LEDs: from 2D to 3D”

- Okhyun Nam (Korea Polytechnic University, Korea)

“Growth and characterization of widegap III-nitride based optoelectronic and electronic devices using HT-MOCVD”

- Yong Hoon Cho (KAIST, Korea)

“Group III-nitride semiconductor nanostructures for room-temperature quantum photonic devices”

- Kei May Lau (Hong Kong University of Science and Technology, China)

“Ga_N-based integrated micro LED research”

- Chih Chung Yang (National Taiwan University, Taiwan)

“Enhancement of LED Color Conversion Efficiency through Surface Plasmon Coupling”

- Yun-Li Li (PlayNitride, Taiwan)

“Development of Transparent MicroLED Display”

- Shinya Takashima (Fuji Electric, Japan)

“Demonstration of vertical Ga_N planar MOSFET fabricated by all ion implantation process”

- Kevin Chen (Hong Kong University of Science and Technology, China)

“Integration on Ga_N-on-Si p-Ga_N gate HEMT Platform”

- Yang Shu (Zhejiang University, China)

“Dynamic Performance and Surge Current Capability of Vertical Ga_N-on-Ga_N Power Devices”

- Shinsuke Harada (AIST, Japan)

“Outstanding potential of SiC superjunction MOSFET as a next generation 1.2 kV-class power transistor”

- Noboru Ohtani (Kwansei Gakuin University, Japan)

“Development of 4H-SiC single crystal substrates for power device applications”

- Nam Kyun Kim (KERI, Korea)

“Development of SiC power devices with low on-resistance”

- Takeyoshi Onuma (Kogakuin University, Japan)

“Deep UV cathodoluminescence properties of rocksalt-structured MgZnO alloys”

- Yoshinao Kumagai (Tokyo University of Agriculture and Technology, Japan)

“Homoepitaxial growth of β-Ga₂O₃ by halide vapor phase epitaxy for the preparation of epitaxial wafers for vertical power device application”

- Zhou Hong (Xidian University, China)

“Ga₂O₃ Power Device Potential Investigation Based on Its Nano-membrane Channels”

- Tsubasa Matsumoto (Kanazawa University, Japan)

“Recent progress for inversion channel mobility improvement in diamond MOSFETs”

- Shinya Ohmagari (AIST, Japan)

“Control and annihilation of dislocation propagation in diamond by metal-assisted termination”

- Tomoyuki Tanikawa (Osaka University, Japan)

“Nondestructive defect characterization of widegap semiconductors using multiphoton-excitation photoluminescence”

- Mathias Schubert (University of Nebraska, USA)

“Phonons, free charge carriers, excitons and band-to-band transitions in β-Ga₂O₃ and related alloys determined by ellipsometry and optical Hall effect”

- Tadek Suski (UNIPRESS, Poland)

“New features of polar InGa_N/Ga_N quantum wells and emitters induced by manipulation of built-in electric field”

- Jianfeng Wang (Suzhou Institute of Nano-tech and Nano-bionics Chinese Academy of Sciences, Suzhou Nanowin Science and Technology, China)

“Bulk Ga_N substrate growth by HVPE technology for Ga_N-on-Ga_N devices”

Social activities

1. Opening session and welcome reception

Sunday evening, Nov. 10, 2019

An opening session and welcome reception will be held at Okinawa Kariyushi Urban Resort Naha. At the welcome reception, there will be tasting of Okinawa special product “Awamori”, and “Miss Okinawa” and “Queen of Awamori” will also visit, so please join. All participants and accompanying persons are invited to attend the reception free of charge.



Okinawa Kariyushi Urban Resort Naha

2. Excursion

Wednesday afternoon, Nov. 13, 2019

The workshop will organize a tour to Okinawa Churaumi Aquarium, the second largest aquarium in the world. After the tour, a buffet dinner including barbecue will be served in Rizzan Sea Park hotel, which is in front of the beautiful sea coast. The excursion is optional and requires booking when registering through the website.



Okinawa Churaumi Aquarium

3. Banquet

Thursday evening, Nov. 14, 2019

A workshop banquet will be held at the ANA InterContinental Manza Beach Resort. The banquet is also optional and must be booked when registering through the website.



ANA InterContinental Manza Beach Resort

Registration

All attendees and presenters of contributed papers are subject to the relevant registration fees.

Category	Early	Normal	On site
	Until Sept. 30	On/after Oct. 1-Oct. 27	
General	50,000 JPY (~435 US\$)	70,000 JPY (~610 US\$)	80,000 JPY (~696 US\$)
Student	25,000 JPY (~220 US\$)	35,000 JPY (~305 US\$)	40,000 JPY (~350 US\$)
Exhibition	40,000 JPY (~350 US\$)	50,000 JPY (~435 US\$)	
Accompany	11,000 JPY (~95 US\$)	13,000 JPY (~110 US\$)	
Banquet	8,000 JPY (~70 US\$)		
Excursion	3,000 JPY (~26 US\$)		

An exchange rate of 115 JPY/US\$ was used.

- General and student registration fees include:
 - Attendance of all technical sessions.
 - Conference packets, including the technical digest.
 - Attendance of the welcome reception.
- Exhibitor registration fee is for those who plan to exhibit at the workshop.
- Accompanying person fee includes admittance of the welcome reception, banquet, and excursion.
- Registration fees do not include lunch.
- Accompanying persons cannot participate in any technical sessions.

Payment

Online payment will be accepted via credit card (VISA, Master, AMEX, and JCB only). Limited on-site registration will be available; however, we recommend paying online in advance. All payments must be made in **Japanese yen**.

Cancellation

In the case of cancellation, the registrant should notify the registration desk using the cancellation form provided on the workshop website. The following cancellation fees apply:

Before Sept. 30, 2019: 5,000 JPY

On/after Oct. 1, 2019: 100% of the registration fee (no refund)

Passport and visa

All foreign visitors entering Japan must possess a valid passport. Participants from countries requiring a visa to enter Japan should obtain one from the nearest Japanese embassy or consulate. If documents issued by the workshop committee are necessary for the visa application (e.g., an invitation letter), please contact Art Tourist, which is the official travel agency in APWS2019. Further details will be provided on the workshop website.

Accommodation

Participants are encouraged to stay in Naha on Nov. 10 for the welcome reception and in Onna-son on Nov. 11-15 for the workshop sessions. A limited number of rooms have been secured at local hotels (e.g., Okinawa Kariyushi Urban Resort Naha, Rizzan Sea-Park Hotel).

November 10 (Sun)

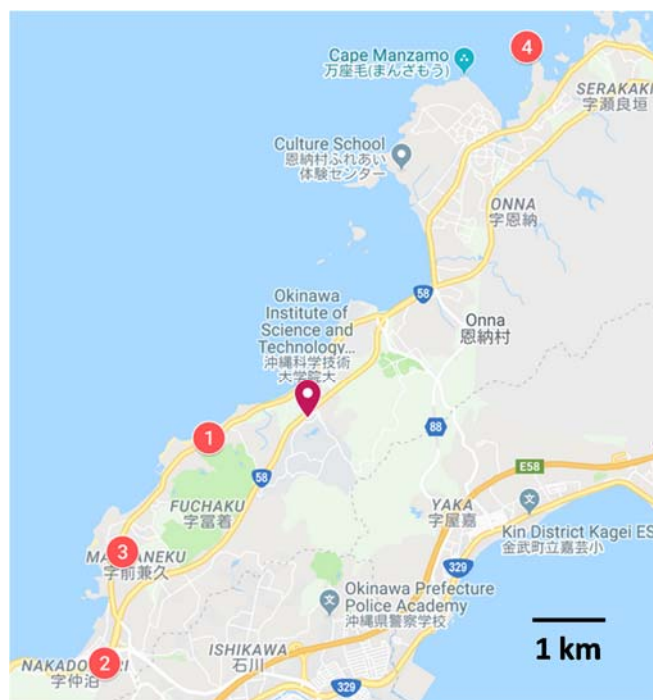
N-1: Okinawa Kariyushi Urban Resort Naha

N-2: Hotel Route-Inn Naha Tomari Port

N-3: Smile Hotel Okinawa Naha



Hotels in Naha (N-1-3, Nov. 10)



Hotels in Onna-son (O-1-4, Nov. 11-15)

November 11 (Mon)-15 (Fri)

O-1: Rizzan Sea-Park Hotel Tancha-Bay

O-2: Hotel Sunset Hill

O-3: Kanehide Onna Marineview Palace

O-4: ANA InterContinental Manza Beach Resort

Shuttle buses will transport participants between these hotels (O-1, O-2, O-3, O-4) and OIST on November 11-14.

Official registration desk

Art Tourist is the official travel agency during the workshop and will handle registration, VISA applications, and hotel accommodations.

ART TOURIST CO., LTD

TEL: +81-75-252-2234, FAX: +81-75-252-2244

E-mail: apws2019@art-tourist.co.jp

Venue

Okinawa is one of the 47 prefectures of Japan. It is comprised of over 160 islands, 47 of which are inhabited. Okinawa Island is the largest in Okinawa prefecture. The island is approximately 110 km long and on average 11 km wide. By taking advantage of our geographic location - the closest region in Japan to Southeast Asian countries - as well as our experience with cultural exchanges that we have cultivated with other countries, we are striving to develop an open region to serve as the center for international exchanges.

Okinawa is different from other prefectures in Japan, with its unique history, food, art, and beautiful ocean. Through this workshop, participants can enjoy both urban areas (near Okinawa Kariyushi Urban Resort Naha) and a beautiful ocean (near OIST). Kokusai street is a popular place near Okinawa Kariyushi Urban Resort Naha. It is home to about 600 shops, including department stores, restaurants, accessory shops, hotels, and souvenir stores. For more details, please visit <https://naha-kokusaidori.okinawa/en/>. Starting on the second day of this workshop, participants will see the beautiful sea of Okinawa in Onna-son. There are many beautiful beaches and capes in Onna-son.

November is very convenient season to visit Okinawa. Average temperature is about 24 °C, and rainfall is relatively low. Average sea water temperature is 26°C, and one can swim. Actually, many beautiful beaches are there in Onna-son.

For more about Okinawa and preparations for an Okinawa visit, please visit:

<https://www.visitokinawa.jp/>

<https://www.pref.okinawa.lg.jp/site/chijiko/kohokoryu/foreign/english/index.html>

To know about Okinawa and prepare for Okinawa visit, please visit:

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<https://www.pref.okinawa.lg.jp/site/chijiko/kohokoryu/foreign/english/index.html>



Multicultural "Kokusai Street"



Beautiful beach and capes in Onna-son

Transportation

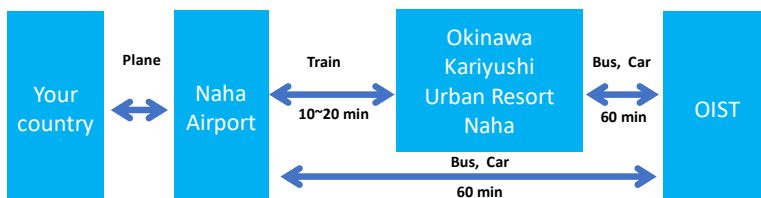
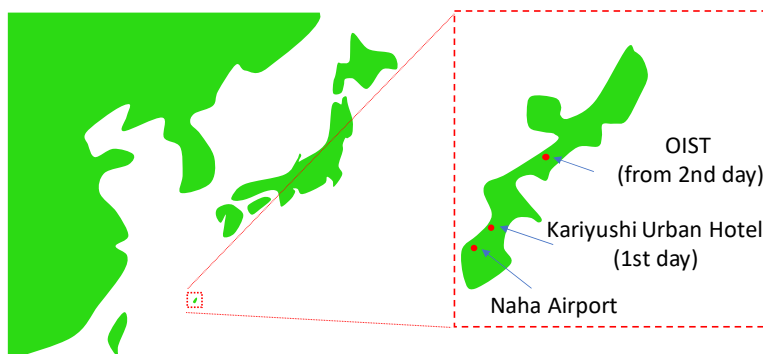
Okinawa (Naha) can only be reached by flight from abroad. Naha is accessible from Tokyo (approximately 160 min).

From Naha Airport to Okinawa Kariyushi Urban Resort Naha:

Take the train (Yui Rail) from Naha Airport Station to Miebashi Station. It is 10 minutes by foot from Miebashi Station to Okinawa Kariyushi Urban Resort Naha.

From Okinawa Kariyushi Urban Resort Naha to OIST:

The most convenient way is to take the shuttle bus arranged for APWS2019. Please come to the front lobby of Okinawa Kariyushi Urban Resort Naha at 8:00 on November 11.



From Naha Airport to OIST:

There are no trains or direct buses between Naha Airport and OIST. There are several ways to travel between airport and OIST by taking buses.

Please visit

<https://www.oist.jp/directions-southern-okinawa>

Shuttle Bus provided by APWS2019

APWS2019 will provide shuttle buses between Naha, OIST, and four hotels in Onna-son supported by APWS2019 (Rizzan Sea-Park Hotel, Hotel Sunset Hill, Kanehide Onna Marineview Palace, ANA InterContinental Manza Beach Resort). All the attendees can take our shuttle buses without additional charge. Further information will be provided at the conference website: <http://www.apws2019.jp>.

Tentative schedule is as follows:

November 11 (AM):

Routes: Okinawa Kariyushi Urban Resort Naha to OIST (Departure time: 8:00)

November 11 (PM) – November 14:

Routes: Circulating between four hotels and OIST

November 15 (AM):

Routes: Hotels to Naha international Airport. The first bus leaves at 7:30. If you use this shuttle bus, please make a reservation for a flight departing after 10:30 (Domestic) and 11:30 (International).

※ You can take following general services (charged).

Other Shuttle Buses

Okinawa Airport Shuttle: <https://www.okinawa-shuttle.co.jp/en/>

Okinawa bus: <http://okinawabus.com/wp/>

OIST Shuttle bus: <https://www.oist.jp/oist-shuttle-bus>

TAXI

Japan TAXI APP:

<https://app.adjust.com/19hpvr0> (App Store)

<https://app.adjust.com/vw034by> (Google Play)

Rental car

Rental cars are available. Note that there is no parking space at OIST. Please take the conference shuttle bus or taxi.

<https://www.visitokinawa.jp/transportation/transportation-in-okinawa/rental-car>

Further information

Please visit <http://www.apws2019.jp> for details on registration and other information. Please contact the APWS2019 secretariat.

E-mail: secretary@apws2019.jp

Exhibition and sponsorship

Sponsorships, exhibitors, and advertisements are solicited at APWS2019. The exhibition will take place from Nov. 11–14 at OIST conference center. The exhibition fee is 150,000 JPY which includes the exhibition booth, one-page advertisement and two person's exhibitor registration fees. The additional registration will be required for every one of more than three exhibitors. The only one-page advertisement is also acceptable in 20,000 JPY. The advisement will be printed with color in abstract book. Further information can be found on the workshop website.

Secretary of exhibition and sponsorship

Dr. Yoshio Honda

Institute of Material and Systems for Sustainability, Nagoya University

Furo-cho, Chikusa-ku, Nagoya 464-8601, Japan

Tel: +81-52-789-5275

E-mail: honda@nagoya-u.jp

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Graduate School of Science and Technology for Innovation, Yamaguchi University

2-16-1 Tokiwadai, Ube, Yamaguchi 755-8611, Japan

Tel: +81-836-85-9411

E-mail: nokada@yamaguchi-u.ac.jp

Special thanks

- Okinawa Prefecture

November 10 (Sunday)

Opening Session

Okinawa Kariyushi Urban Resort Naha 18:00-18:30

Anniversary Section reviewing Widegap Conferences

Okinawa Kariyushi Urban Resort Naha 18:30-19:00

Welcome Reception

Okinawa Kariyushi Urban Resort Naha 19:00-20:30

November 11 (Monday)

Introduction of this Workshop

Auditorium 09:50-10:10

Plenary

Auditorium 10:10-11:50

PL-1 (Plenary)

10:10 - 11:00

Materials Designing Novel Wide Gap Semiconductors

Hideo Hosono

Tokyo Institute of Technology, Japan

PL-2 (Plenary)

11:00 - 11:50

Recent progress on the large lattice-mismatched hetero-epitaxy and physical investigation of III-nitride thin films and quantum structures

Bo Shen

Research center of wide bandgap semiconductors and the State key laboratory of artificial microstructures and mesoscopic physics, Peking University, China

Poster Session A

Tunnel Gallery 11:50-13:50

MoP-GR-1 (Poster)

11:50 - 13:50

HVPE GaN Growth using Hydrogen Radical

Mei Kanda* and Hiroshi Nagayoshi

Department of Electronic Engineering, National Institute of Technology, Tokyo College, Japan

MoP-GR-2 (Poster)

11:50 - 13:50

The Electronic Structure of Dislocation in GaN with Mg Impurities

Takashi Nakano,^{*1} Yosuke Harashima,² Kenta Chokawa,² Masaaki Araidai,^{1,2} Kenji Shiraishi,^{1,2} Atsushi Oshiyama,² Akira Kusaba,³ Yoshihiro Kangawa,^{2,4} Atsushi Tanaka,² Yoshio Honda,^{1,2} and Hiroshi Amano^{1,2}

¹Graduate School of Engineering, Nagoya University, Japan, ²Institute of Materials and Systems for Sustainability, Nagoya University, Japan, ³Computer Centre, Gakushuin University, Japan, ⁴Research Institute for Applied Mechanics, Kyushu University, Japan

MoP-GR-3 (Poster)

11:50 - 13:50

Epitaxial growth of high quality GaN layer on boron nitride nanotubes as intermediate layer

Gun Hee Lee,¹ Chil-Hyoung Lee,² Jae Won Jeong,² Su Jin Kim,² Eun Mi Kim,² Young-Baek Kim,² Gi-Seok Heo,² Jongho Lee,² Eun-Kyung Suh,¹ and Tae Hoon Seo^{*,2}

¹School of semiconductor and Chemical Engineering, Chonbuk National University, Republic of Korea, ²Nano-Photonics Convergence Technology Group, Korea Institute of Industrial Technology, Republic of Korea

MoP-GR-4 (Poster)

11:50 - 13:50

Critical thickness of GaN film in controllable stress-induced self-separation for preparing 2-inch native GaN substrates

Mengda Li,^{*,1} Yutian Cheng,¹ Tongjun Yu,¹ Jiejun Wu,¹ Jinmi He,² Nanliu Liu,³ Tong Han,¹ and Guoyi Zhang^{1,2,3}

¹School of Physics, Peking University, China, ²Sino Nitride Semiconductor CO., LTD., China, ³Dongguan Institute of Optoelectronics, Peking University, China

MoP-GR-5 (Poster)

11:50 - 13:50

Computer simulation of bulk GaN crystal growth from Na-Ga solution

Andrei Vorob'ev,¹ Alexey Kondratyev,¹ Vladimir Kalaev,¹ and Yuji Mukaiyama^{*,2}

¹STR Group - Soft Impact, Ltd, Russia, ²STR Japan K.K, Japan

MoP-GR-6 (Poster)

11:50 - 13:50

The optical properties of GaN crystal grown by ammonothermal

Tengkun Li,^{*,1,2} Guoqiang Ren,^{1,2} Xujun Su,² Jingjing Yao,² Xiaodong Gao,² and Ke Xu^{1,2,3}

¹School of Nano Technology and Nano Bionics, University of Science and Technology of China, China, ²Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, China, ³Suzhou Nanowin Science and Technology Co, Ltd., China

MoP-GR-7 (Poster)

11:50 - 13:50

Study on Transferable GaN Grown on Improved AlN/Graphene Composite Substrate

Yanqing Jia,^{*} Jing Ning, Chaochao Yan, Jincheng Zhang, and Yue Hao

Department of Micro Electronic, Xidian University, China

MoP-GR-8 (Poster)

11:50 - 13:50

Reduction of trench defects in InGaN epilayers using Ga-migration-enhanced epitaxy

Hai-Long WANG,^{*,1} Ze -Sheng Lv,¹ and Hao JIANG^{1,2}

¹School of Electronics and Information Technology, Sun Yat-sen University, China, ²State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-sen University, China

MoP-GR-9 (Poster)

11:50 - 13:50

High Crystal Quality AlN Film Grown on Hexagonal Nano-circle Concave Patterned Si (111) Substrate

Jianfei Shen,^{*} Xuelin Yang, Jie Zhang, Yuxia Feng, and Bo Shen

School of Physics, Peking University, China

MoP-GR-10 (Poster)

11:50 - 13:50

HVPE growth of AlN on stripe patterned sapphire substrates with sputter-deposited annealed AlN film

Taichi Nishimori,^{*}¹ Kazuki Yoshimura,¹ Shiyu Xiao,² Kanako Shojiki,¹ and Hideto Miyake^{1,2}

¹Grad. School of Eng, Mie University, Japan, ²Grad. School of RIS, Mie University, Japan

MoP-GR-11 (Poster)

11:50 - 13:50

Crystal growth of AlN on Ni-Al solution

Arata Kanbara,^{*} Adachi Masayoshi, and Hiroyuki Fukuyama

Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan

MoP-GR-12 (Poster)

11:50 - 13:50

Evaluation of BGaN growth temperature dependence and fabrication of neutron semiconductor detectors

Yuri Takahashi,^{*}¹ Takayuki Maruyama,¹ Natsuki Yamada,¹ Kazushi Ebara,¹ Yuto Ohta,¹ Hisaya Nakagawa,¹ Shigeyoshi Usami,² Yoshio Honda,³ Hiroshi Amano,^{3,4} Kazunobu Kojima,⁵ Shigefusa Chichibu,^{3,5} Yoku Inoue,¹ Toru Aoki,⁶ and Takayuki Nakano^{1,6}

¹Shizuoka University, Japan, ²Nagoya University, Japan, ³IMaSS, Nagoya University, Japan, ⁴Akasaki Research Center, Japan, ⁵IMRAM, Tohoku University, Japan, ⁶R.I.E. Shizuoka University, Japan

MoP-GR-13 (Poster)

11:50 - 13:50

Growth and Characterization of Ultra-Wide Bandgap Gallium Oxide Homoepitaxial Layers Prepared by Plasma-Assisted Molecular-Beam Epitaxy

SOON-KU HONG,^{*} TRONG SI NGO, and DUC DUY LE

Department of Materials Science and Engineering, Chungnam National University, Daejeon 34134, Republic of Korea

MoP-GR-14 (Poster)

11:50 - 13:50

Comparison of thermodynamics on growth of In₂O₃ and Ga₂O₃ by halide vapor phase epitaxy using mono- and tri-halides

Nami Tanaka,^{*}¹ Yuya Saimoto,¹ Kenta Nagai,¹ Rie Togashi,² Nao Takekawa,¹ Ken Goto,¹ and Yoshinao Kumagai^{1,3}

¹Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Japan, ²Department of Engineering and Applied Sciences, Sophia University, Japan, ³Institute of Global Innovation Research, Tokyo University of Agriculture and Technology, Japan

MoP-GR-15 (Poster)

11:50 - 13:50

Formation and Characterization of Novel Green Phosphor of Semiconductive Nanoporous ZnMnO:P

Sejoon Lee,^{*}^{1,2} Youngmin Lee,² and Deuk Young Kim^{1,2}

¹Department of Semiconductor Science, Dongguk University - Seoul, Seoul 04623, Republic of Korea, ²Quantum-functional Semiconductor Research Center, Dongguk University - Seoul, Seoul 04623, Republic of Korea

MoP-GR-16 (Poster)

11:50 - 13:50

Analysis of -Ga₂O₃ (0001) surface structure using first-principles calculations

Hayato Oyama^{*} and Takahiro Kawamura

Graduate School of Engineering, Mie University, Japan

MoP-GR-17 (Poster)

11:50 - 13:50

Pyramid formation by high pressure and high temperature processing of diamond

Rei Fukuta,^{*}¹ Yohei Murakami,¹ Ken Otsuyama,¹ Fumitaro Ishikawa,^{1,2} Masafumi Matsushita,^{1,2} Toru Shinmei,² Hiroaki Ohfuji,² and Tetsuo Irifune²

¹Ehime University, Japan, ²Ehime University Geodynamics Research center, Japan

MoP-CH-1 (Poster)

11:50 - 13:50

Investigation on the size effects of micro-Raman scattering in single cone-shape GaN microrod

Hui Liao,^{*} Peijun Wen, Guo Yu, Rui Lang, and Xiaodong Hu

State Key Laboratory for Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, China

MoP-CH-2 (Poster)

11:50 - 13:50

Enhanced High Temperature Performance Using by InGaN-Channel

Hao Lu,^{*}¹ Xiaohua Ma,¹ Ling Yang,² Bin Hou,¹ Meng Zhang,² Qing Zhu,² Mei Wu,¹ Sheng Wu,¹ Jielong Liu,² and Yue Hao¹

¹School of Microelectronics, Xidian University, China, ²School of Advanced Materials and nanotechnology, Xidian University, China

MoP-CH-3 (Poster)

11:50 - 13:50

Intersubband optical absorption in InGaN/GaN quantum dot with hydrogenic impurity

Yan Xing

School of Physical Science and Technology, Inner Mongolia University, China

MoP-CH-4 (Poster)

11:50 - 13:50

Influence of Dipole Scattering to Level Broadening and Carrier Transport in AlGaIn-based Superlattice Structures

Joosun Yun^{*} and Hideki Hirayama

RIKEN, Japan

MoP-CH-5 (Poster)

11:50 - 13:50

Sub-quantum-well effect on radiative dynamics of Dislocation-free DUV AlGaIn/AlGaIn-based Multiple-Quantum-Wells

Idris Aja,¹ Dhaifallah Almalawi,¹ Zhiqiang Liu,² and Iman S. Roqan^{*,1}

¹Physical Science and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal 23955, Saudi Arabia, Saudi Arabia, ²Institute of Semiconductors, Chinese Academy of Science, Beijing 100083, China, China

MoP-CH-6 (Poster)

11:50 - 13:50

Optical Phonons and Their Transformation in Cylindrical Wurtzite Nitride Core-Multishell Nanowires with Ternary Mixed Crystal Effect

JianXia Wang, Yuan Qu,^{*} and Shiliang Ban

Inner Mongolia University, China

MoP-CH-7 (Poster)

11:50 - 13:50

Height of potential barrier formed around V-pits in InGaN/GaN quantum wells on moderate-temperature GaN layer

Satoshi Kurai,^{*}¹ Kohei Okawa,¹ Ryoga Makio,¹ Junji Gao,¹ Genki Nobata,¹ Naoya Hayashi,¹ Kohei Sugimoto,^{1,2} Narihito Okada,¹ Kazuyuki Tadamoto,¹ and Yoichi Yamada¹

¹Yamaguchi University, Japan, ²Ube Industries, Ltd., Japan

MoP-CH-8 (Poster)

11:50 - 13:50

Optical and electrical characterizations of the V-shaped defects in Fe-doped bulk GaN

Yumin Zhang,^{*}^{1,2} Jianfeng Wang,^{1,2} Demin Cai,² Yu Xu,^{1,2} Mingyue Wang,^{1,2} Xiaojian Hu,^{1,2} and Ke Xu^{1,2}

¹Suzhou Institute of Nano-tech and Nano-Bionics, Chinese Academy of Sciences, China, ²Suzhou Nanowin Science and Technology Co., Ltd., China

MoP-CH-9 (Poster)

11:50 - 13:50

Relationship between the band gap of InN/AlN SLs and lattice distortion

Yuya Hamaji,^{*}¹ Takahiro Kawamura,¹ Toru Akiyama,¹ and Yoshihiro Kangawa²

¹Mie Univ., Japan, ²RIAM, Kyushu Univ., Japan

MoP-CH-10 (Poster)

11:50 - 13:50

Bonding Strength of Polarity-Inverted GaN Structure Fabricated by Surface-Activated Bonding

Ryo Tanabe,^{*} Naoki Yokoyama, Masahiro Uemukai, Tomoyuki Tanikawa, and Ryuji Katayama

Osaka University, Japan

MoP-CH-11 (Poster)

11:50 - 13:50

Current mapping of non-polar AlGaIn/GaN heterjunction structure

Jinjuan Du and Shengrui Xu^{*}

School of Microelectronics, Xidian University, China

MoP-CH-12 (Poster)

11:50 - 13:50

Nonradiative Recombination Centers in UVB AlGaIn Quantum Well and Their Temperature Dependence Revealed by Below-Gap Excitation Light

M. Ismail Hossain,^{*}^{1,2} Yuri Itokazu,^{1,3} Shunsuke Kuwaba,^{1,3} Norihiko Kamata,¹ Noritoshi Maeda,³ and Hideki Hirayama³

¹Graduate School of Science and Engineering, Saitama University, Saitama 338-8570, Japan, ²Department of Physics, University of Rajshahi, Rajshahi-6205, Bangladesh, ³Quantum Optodevice Lab., RIKEN, Wako, Saitama 351-0198, Japan

MoP-CH-13 (Poster)

11:50 - 13:50

Study on the Two channel effects in C, Fe co-doped 0.15 um AlGaIn/GaN HEMTs

Zhan GAO,^{*} Fabiana Rampazzo, Carlo De Santi, Matteo Meneghini, Gaudenzio Meneghesso, Enrico Zanoni, Francesca Chiochetta, and Mehdi Rzin

Dipartimento di Ingegneria dell'Informazione, Università di Padova, Italy

MoP-CH-14 (Poster)

11:50 - 13:50

Resistivity of High-Purity Semi-Insulating 4H-SiC Substrates

Chansoon Koo,^{*} Mitsuaki Kaneko, and Tsunenobu Kimoto

Kyoto University, Japan

MoP-CH-15 (Poster)

11:50 - 13:50

Evaluation of heavily B doped HPHT crystals for power device application

Shinichi Shikata,* Kosuke Miyajima, and Naoya Akashi

School of Science and Technology, Kwansai Gakuin University, Japan

MoP-CH-16 (Poster)

11:50 - 13:50

Abnormal Capacitance-Voltage Behavior of 4H-SiC Trench MOS Capacitor with TEOS Oxide

In Ho Kang,* Ogyun Seok, Jeong Hyun Moon, Moon Kyong Na, Hyoung Woo Kim, Sang Cheol Kim, Wook Bahng, and Nam Kyun Kim

Power Semiconductor Research Center, Korea Electrotechnology Research Institute, Republic of Korea

MoP-CH-17 (Poster)

11:50 - 13:50

Influence of strong acid on structural and photoluminescence properties of nano-amorphous graphitic carbon nitride dispersed in nitric acid

Takahiro Watanabe,¹ Masaaki Hirai,² Ken-ichi Takarabe,² and Naoki Ohtani*¹

¹Department of Electronics, Doshisha University, Japan, ²Faculty of Science, Okayama University of Science, Japan

MoP-OD-1 (Poster)

11:50 - 13:50

Effect of p-AlGa_N / GaN superlattice on InGa_N/GaN multiple quantum wells light-emitting diodes

wenkai yue,* zhimin li, peixian li, xiaowei zhou, and xiaoshun luo

School of Advanced Materials and Nanotechnology, Xidian University, China

MoP-OD-2 (Poster)

11:50 - 13:50

Dual-Wavelength Light-Emitting Diodes with InGa_N/Ga_N Quantum Wells and Mesh-Like Top Electrode

Irina Khmyrova,*¹ Yohei Nishidate,¹ Yulia Kholopova,² Ivan Maximov,³ and Sergei Shapoval²

¹University of Aizu, Japan, ²Russian Academy of Sciences, Russia, ³Lund University, Sweden

MoP-OD-3 (Poster)

11:50 - 13:50

Study of Light Field Distribution in GaN Triangular Ridge

Cheng Ge,*¹ Menghan Liu,¹ Ru Xu,¹ Jing Zhou,¹ Yunfei Yang,¹ Yimeng Li,¹ Haocheng Peng,¹ Peng Chen,^{1,2} Bin Liu,¹ Zili Xie,¹ Rong Zhang,¹ and Youdou Zheng¹

¹Jiangsu Province Key Laboratory of Advanced Photonic and Electronic Materials and School of Electronic Science and Engineering, Nanjing University, China, ²Institute of Optoelectronics of Yangzhou, Nanjing University, China

MoP-OD-4 (Poster)

11:50 - 13:50

Improved performance of AlGa_N based ultraviolet LEDs using selective-area grown p-Ga_N contact layer

Yanan Guo,*^{1,2} Jianchang Yan,^{1,2} Yun Zhang,^{1,2} Junxi Wang,^{1,2} and Jinmin Li^{1,2}

¹Institute of Semiconductors, Chinese Academy of Sciences, China, ²University of Chinese Academy of Sciences, China

MoP-OD-5 (Poster)

11:50 - 13:50

Smoothing AlGa_N surface by photoelectrical chemical etching

Zhongming Zheng,*¹ Hao Long,¹ Samuel Matta,² Mathieu Leroux,² Julien Brault,² Lerying Ying,¹ Zhiwei Zheng,¹ and Baoping Zhang¹

¹Department of Electronic Engineering, Xiamen University, China, ²Université Côte d'Azur, CNRS, CRHEA, Valbonne, France

MoP-OD-6 (Poster)

11:50 - 13:50

Enhancement of the electrical and optical properties in GaN-based flip-chip LEDs by optimizing electrode structures

Jong-Ho Kim,^{*,1} Yong Won Lee,² Hyeong-seop Im,¹ and Tae-Yeon Seong^{1,2}

¹Department of Material Science & Engineering, Korea University, Seoul 02841, South Korea, Republic of Korea,

²Department of Nanophotonics, Korea University, Seoul 02841, South Korea, Republic of Korea

MoP-OD-7 (Poster)

11:50 - 13:50

Whispering-gallery-mode (WGM) lasing from microdisk GaN obtained by selective area growth

Jiean Jiang, Houqiang Xu, Wei Guo,^{*} and Jichun Ye

Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, China

MoP-OD-8 (Poster)

11:50 - 13:50

Improvement of light output power of 1024 pixelated flip-chip micro-LED arrays for automotive smart head lamp

Cheol Jeong,^{*} Jea hyeok Lee, Jea Min Lee, Sung Min Cho, Moon Uk Cho, Tae Kyoung Kim, Yu-Jung Cha, Abu Bashar Mohammad Hamidul Islam, and Joon Seop Kwak

sunchon national university, Republic of Korea

MoP-OD-9 (Poster)

11:50 - 13:50

The influence of different sidewall traps for Micro Light Emitting Diodes

Te-Jen Kung^{*,1} and Yuh-Renn Wu^{1,2}

¹Electronic and Optoelectronic System Research Laboratories, Industrial Technology Research Institute, Taiwan,

²Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering, National Taiwan University, Taiwan

MoP-OD-10 (Poster)

11:50 - 13:50

PA-MBE grown III-nitride nanowires on ITO-coated amorphous silica substrate for perovskite solar cell application

Jung-Wook Min,^{*,1} Kwang Jae Lee,² Aditya Prabaswara,¹ Jung-Hong Min,¹ Bekir Türedi,² Yeong Jae Kim,³ Huaan Zhang,¹ Davide Priante,¹ Jian-Wei Liang,¹ Young Min Song,³ Tien Khee Ng,¹ Osman M. Bakr,² and Boon S. Ooi¹

¹Photonics Laboratory, King Abdullah University of Science and Technology (KAUST), Saudi Arabia, ²Catalysis Center, King Abdullah University of Science and Technology (KAUST), Saudi Arabia, ³School of Electrical Engineering and Computer Science, Gwangju Institute of Science and Technology (GIST), Republic of Korea

MoP-OD-11 (Poster)

11:50 - 13:50

Emission characteristics of AlGaIn / AlGaIn MQWs by improving n-type AlGaIn layer

Kengo Nagata,^{*,1,2} Taiji Yamamoto,^{1,2} Hiroaki Makino,^{1,2} Keita Kataoka,³ Tetsuo Narita,³ and Yoshiki Saito^{1,2}

¹TOYODA GOSEI Co., Ltd., Japan, ²TS Opto Co., Ltd., Japan, ³Toyota Central R&D Labs. Inc., Japan

MoP-OD-12 (Poster)

11:50 - 13:50

Vertical Hybrid Heterojunction for Broadband, Self-powered and Transparent Photodetector

Krishnendu Sarkar,¹ Pooja Devi,^{*,2} and Praveen KUMAR¹

¹Indian Association for the Cultivation of Science, Kolkata, 700032, India, ²Central Scientific Instruments Organization, Sector-30C, Chandigarh- India-160030, India, India

MoP-OD-13 (Poster)

11:50 - 13:50

Fabrication of UVC AlGaIn LEDs on DC-sputtered AlN templates with high-temperature annealing

Yosuke Mogami,^{*,1,2} Atsushi Osawa,³ Kazuto Osaki,³ Yukitake Tanioka,³ Atsushi Maeoka,³ Yuri Itokazu,^{1,2} Shunsuke Kuwaba,^{1,2} Masafumi Jo,¹ Noritoshi Maeda,¹ Hiroyuki Yaguchi,² and Hideki Hirayama¹

¹RIKEN, Japan, ²Department of Science and Engineering, Saitama University, Japan, ³SCREEN Finetech Solutions Co. Ltd., Japan

MoP-OD-14 (Poster)

11:50 - 13:50

Fabrication process development on group III-nitride based three-dimensional light emitting diodes for reduced leakage current

Kie Young Woo,^{*} Young Chul Sim, Kwanjae Lee, Seung-Hyuk Lim, and Yong-Hoon Cho

Department of Physics, Korea Advanced Institute of Science and Technology, Republic of Korea

MoP-OD-15 (Poster)

11:50 - 13:50

Optical-isolation of micro-LED pixels integrated in Si micro-cup substrate

Kohta Sato,^{*,1} Yoshihumi Kamei,¹ Ryosuke Nawa,¹ Shinya Aikawa,² Yasuhisa Usida,³ Takeyoshi Onuma,¹ Tomohiro Yamaguchi,¹ and Tohru Honda¹

¹Department of Applied Physics, School of Advanced Engineering and Department of Electrical Engineering and Electronics, Graduate School of Engineering, Kogakuin University, Japan, ²Department of Electrical and Electronic Engineering, Faculty of Engineering, Kogakuin University, Japan, ³Institute of Materials and Systems for Sustainability (IMass), Nagoya University, Japan

MoP-OD-16 (Poster)

11:50 - 13:50

Full-duplex light communication system with OFDM modulation using In-GaN/GaN multiple-quantum-well diodes and waveguide

Yan Jiang,^{*} Linning Wang, Mingyuan Xie, Zheng Shi, Yuan Jiang, and Yongjin Wang

Peter Grünberg Research Centre, Nanjing University of Posts and Telecommunications, China

MoP-OD-17 (Poster)

11:50 - 13:50

Spatial Non-uniform Avalanche Multiplication in 4H-SiC p-i-n APDs

Linlin Su,^{*} Hai Lu, Xiaolong Cai, Dong Zhou, Dunjun Chen, Fangfang Ren, Rong Zhang, and Youdou Zheng

Nanjing University, China

MoP-OD-18 (Poster)

11:50 - 13:50

Low-Leakage-current SiC Schottky barrier photodiode for DUV and EUV detection

Zhiyuan Wang,^{*} Dong Zhou, Weizong Xu, Fangfang Ren, Dunjun Chen, Rong Zhang, Youdou Zheng, and Hai Lu

School of Electronic Science and Engineering, Nanjing University, China

MoP-OD-19 (Poster)

11:50 - 13:50

Fabrication of ZnO-based UV photodetector by arc discharge deposition of ZnO nanorods

Shahab Sharifi Malvajardi,^{*,1} Masoud Abrari,¹ Morteza Ahmadi,¹ Vahid Karimi,¹ Morteza Asemi,¹ Reza Taheri Ghahrizjani,¹ Majid Ghanaatshoar,¹ and Seyed Majid Mohseni²

¹Laser and Plasma Research Institute, Shahid Beheshti University, Iran, ²Faculty of Physics, Shahid Beheshti University, Iran

MoP-OD-20 (Poster)

11:50 - 13:50

Improved thermal characteristics and reliability of blue light-emitting diodes by using via-hole type flip-chip packaging

Won Jung Kim,^{*,1,2} Chang Man Lim,² Ki Seok Kim,² Jeong Tak Oh,² Hwan-Hee Jeong,² June-O Song,¹ Tae-Yeon Seong,¹ and Hiroshi Amano³

¹Department of Materials Science and Engineering, Korea University, Republic of Korea, ²LED Divisio., LG Innotek Co. Ltd., Paju, Gyeonggi 10842, Republic of Korea, ³Nagoya University, Japan

MoP-ED-1 (Poster)

11:50 - 13:50

High Breakdown Voltage Vertical GaN p-n Junction Diodes with Reversible Characteristics

Hiroshi Ohta,¹ Naomi Asai,¹ Fumimasa Horikiri,² Yoshinobu Narita,² Takehiro Yoshida,² and Tomoyoshi Mishima^{*,1}

¹Hosei University, Japan, ²SCIOCS Co. Ltd., Japan

MoP-ED-2 (Poster)

11:50 - 13:50

Surface activated bonding between GaN and SiC with an ultralow TBR

Fengwen Mu,^{*,1,4} Zhe Cheng,² Seongbin Shin,¹ Samuel Graham,^{2,3} and Tadatomo Suga¹

¹Collaborative Research Center, Meisei University, Japan, ²George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, United States of America, ³School of Materials Science and Engineering, Georgia Institute of Technology, United States of America, ⁴Kagami Memorial Research Institute for Materials Science and Technology, Waseda University, Japan

MoP-ED-3 (Poster)

11:50 - 13:50

Dependence of Breakdown Voltage Enhancement on Gate-to-Drain Distance of AlGaIn/GaN HEMTs with High-k Passivation Layer

Ryo Tomita,^{*} Shingo Ueda, Yuki Kawada, and Kazushige Horio

Faculty of Systems Engineering, Shibaura Institute of Technology, Japan

MoP-ED-4 (Poster)

11:50 - 13:50

Irradiation traps induced by 2060-MeV ⁸⁶Kr²⁶⁺ ions in AlGaIn/GaN HEMTs

Xiao yan Yan,^{*} Ling Lv, and Zheng zhao Lin

Department of Materials Science and Engineering, Xidian University, China

MoP-ED-5 (Poster)

11:50 - 13:50

Modelling of Trap Mechanism in AlGaIn/GaN Fin-HEMT Current Collapse

Kailin Ren,^{*,1} Yung Chii Liang,¹ Chih-Fang Huang,² and Xiao Gong¹

¹Department of Electrical & Computer Engineering, National University of Singapore, Singapore, ²Department of Electrical Engineering, National Tsing Hua University, Taiwan

MoP-ED-6 (Poster)

11:50 - 13:50

Normally-Off AlGaIn/GaN MISHEMT Using Charge Storage Technique

Ping-Cheng Han,^{*,1} Zong-Zheng Yan,² Jui-Sheng Wu,² Chia-Hsun Wu,² and Edward Yi Chang^{1,2}

¹International College of Semiconductor Technology, National Chiao Tung University, Taiwan, ²Department of Materials Science & Engineering, National Chiao Tung University, Taiwan

MoP-ED-7 (Poster)

11:50 - 13:50

Suppression of Current Collapse in AlGaIn/GaN HEMTs Using a Bilayer SiN Passivation

Jielong Liu,^{*}¹ Lixiang Chen,¹ Qing Zhu,¹ Fuchun Jia,² Hao Lu,² Siyu Liu,¹ Jiejie Zhu,^{1,2} Ling Yang,^{1,2} Xiaohua Ma,² and Yue Hao²

¹School of Advanced Materials and Nanotechnology, Xidian University, China, ²State Key Discipline Laboratory of Wide Bandgap Semiconductor Technology, Xidian University, China

MoP-ED-8 (Poster)

11:50 - 13:50

GaN Lateral Schottky Barrier with Anode Engineering Technique for Improved Leakage Current and Breakdown Voltage

Tao Zhang,^{*} Jincheng Zhang, Hong Zhou, and Yue Hao

School of Microelectronics, Xidian University, China

MoP-ED-9 (Poster)

11:50 - 13:50

Precise control in recessed-gate etching for AlGaIn/GaN HEMTs by utilizing photo-electrochemical reactions

Yuto Komatsu,^{*} Masachika Toguchi, and Taketomo Sato

Hokkaido University, Japan

MoP-ED-10 (Poster)

11:50 - 13:50

Investigation of Tri-gate and Dual-gate AlGaIn/GaN Fin-HEMTs

Meng Zhang,^{*} Ling Yang, Minhan Mi, Bin Hou, Mei Wu, Qing Zhu, Sheng Wu, Yunlong He, and Xiaohua Ma

Xidian University, China

MoP-ED-11 (Poster)

11:50 - 13:50

Termination and Passivation Solutions towards High Avalanche Capability and Ruggedness in Vertical GaN p-i-n Power Diodes

Kaiwen Nie,^{*} Weizong Xu, Fangfang Ren, Dong Zhou, Dunjun Chen, Rong Zhang, Youdou Zheng, and Hai Lu

School of Electronic Science and Engineering, Nanjing University, Nanjing 210093, China

MoP-ED-12 (Poster)

11:50 - 13:50

Influence of the Surface Charges on the Edge Fringing Capacitance in GaAs and GaN Schottky Barrier Diodes

Beatriz Orfao,¹ Beatriz G. Vasallo,¹ Diego Moro-Melgar,² Tomás González,¹ and Javier Mateos^{*,1}

¹Universidad de Salamanca, Spain, ²ACST GmbH, Germany

MoP-ED-13 (Poster)

11:50 - 13:50

High-power-figure-of-merit AlGaIn/GaN Schottky Barrier Diode Based on Barrier Recess and Low-temperature Annealing

Yu Lu,^{*} Weizong Xu, Fang-Fang Ren, Dong Zhou, Dunjun Chen, Rong Zhang, Youdou Zheng, and Hai Lu

School of Electronic Science and Engineering, Nanjing University, China

MoP-ED-14 (Poster)

11:50 - 13:50

High Breakdown Voltage of AlGa_N/Ga_N HEMTs with Field Plate for RF Application

Chun Wang,*¹ Heng-Tung Hsu,^{2,3,4} Ke-Yow Chen,² Ting-Jui Huang,² and Yi Chang^{1,2,3,4}

¹Department of Material Science Engineering, National Chiao Tung University, Taiwan, ²International College of Semiconductor Technology, National Chiao Tung University, Taiwan, ³Department of Electrical Engineering, National Chiao Tung University, Taiwan, ⁴Center for Smart Semiconductor Technologies, National Chiao Tung University, Taiwan

MoP-ED-15 (Poster)

11:50 - 13:50

Influence of crystal orientation on the formation of Schottky junctions on gallium oxide

Roman Yatskiv,* Stanislav Tiagulskyi, and Jan Grym

Institute of Photonics and Electronics, CAS, Prague, Czech Republic, Czech Republic

MoP-ED-16 (Poster)

11:50 - 13:50

Detector Mechanism of ZnGa₂O₄ Sensors for NO Gas

SHU-HSIEN LIN,*¹ MIN-RU WU,¹ WEI-ZHONG LI,¹ CHIUNG-YI HUANG,² and RAY-HUA HORNG¹

¹Institute of Electronics, National Chiao Tung University, Taiwan, ²Graduate Institute of Precision Engineering, National Chung Hsing University, Taiwan

MoP-ED-17 (Poster)

11:50 - 13:50

Modelling native defects in transparent conducting oxides using the hybrid QM/MM embedded cluster technique

Qing hou,* John Buckeridge, Alexey A. Sokol, Jingcheng Guan, and Richard A. Catlow

Kathleen Lonsdale Materials Chemistry, Department of Chemistry, University College London, United Kingdom

ED1 Vertical Power Devices

Auditorium 13:50-15:05

ED1-1 (Invited)

13:50 - 14:20

Demonstration of vertical Ga_N planar MOSFET fabricated by all ion implantation process

Shinya Takashima,* Ryo Tanaka, Hideaki Matsuyama, Yuta Fukushima, and Masaharu Edo

Fuji Electric Co., Ltd, Japan

ED1-2 (Invited)

14:20 - 14:50

Outstanding potential of SiC superjunction MOSFET as a next generation 1.2 kV-class power transistor

Shinsuke Harada,* Takeyoshi Masuda, Yusuke Kobayashi, Shinya Kyogoku, Tadao Morimoto, Yusuke Yamashiro, Teruaki Kumazawa, Manabu Takei, and Hajime Okumura

National Institute of Advanced Industrial Science and Technology, Japan

ED1-3 (Oral)

14:50 - 15:05

High-Voltage and Low on-resistance Vertical GaN Schottky Barrier Diode with Reverse p-n Junction Termination

Ru Xu,^{*,1} Menghan Liu,¹ Jing Zhou,¹ Yunfei Yang,¹ Yimeng Li,¹ Cheng Ge,¹ Haocheng Peng,¹ Peng Chen,^{1,2} Bin Liu,¹ Zili Xie,¹ Rong Zhang,¹ and Youdou Zheng¹

¹School of Electronic Science and Engineering, Nanjing University, China, ²Institute of Optoelectronics of Yangzhou, Nanjing University, China

GR1 Nanostructures

Meeting Room 13:50-15:05

GR1-1 (Invited)

13:50 - 14:20

Group III-nitride semiconductor nanostructures for room-temperature quantum photonic devices

Yong-Hoon Cho

Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea

GR1-2 (Oral)

14:20 - 14:35

Low-cost fabrication technique of shape-controlled ultra-fine GaN nanostructures by mask-less hydrogen environment anisotropic thermal etching (HEATE) method with ammonia addition

Yusei Kawasaki,^{*,1} Yuki Ooe,¹ Yusuke Moriya,¹ Daichi Ito,¹ and Akihiko Kikuchi^{1,2}

¹Sophia University, Japan, ²Sophia Photonics Research Center, Japan

GR1-3 (Oral)

14:35 - 14:50

Observation of down-conversion behavior in ZnO:TM,Yb/ZnO core-shell nanowires

Jun Tatebayashi,^{*} Tokuhito Nakajima, Masao Mishina, Dolf Timmerman, Shuhei Ichikawa, and Yasufumi Fujiwara

Osaka University, Japan

GR1-4 (Oral)

14:50 - 15:05

Red Emitting InGaN-based Ordered Nanocolumns Exhibiting Photonic Crystal Effects at 671 nm

Keiji Takimoto,^{*,1} Kazuki Narita,¹ Keigo Yoshida,³ Takao Oto,⁴ Tomohiro Yamaguchi,³ Tohru Honda,³ Takeyoshi Onuma,³ Rie Togashi,¹ Ichiro Nomura,^{1,2} and Katsumi Kishino^{1,2}

¹Sophia University, Japan, ²Sophia Nanotechnology Center, Japan, ³Kogakuin University, Japan, ⁴Yamagata University, Japan

Break

15:05 - 15:35

OD1 Photonic Devices

Auditorium 15:35-17:05

OD1-1 (Invited)

15:35 - 16:05

Recent Progress in High-Brightness Photonic-Crystal Lasers

Susumu Noda* and Menaka De Zoysa
Kyoto University, Japan

OD1-2 (Oral)

16:05 - 16:20

Continuous-Wave Electrically Injected GaN-on-Si Microdisk Laser Diodes

Jin Wang,^{*,1,2} Meixin Feng,² Jianxun Liu,² Yingnan Huang,² Xiujian Sun,² Qian Sun,² Xinhe Zheng,¹ and Hui Yang²

¹University of Science and Technology Beijing, China, ²Key Laboratory of Nano-devices and Applications, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, China

OD1-3 (Oral)

16:20 - 16:35

Design and Fabrication of GaN Doubly-Resonant Waveguide Microcavity SHG Device

Takumi Nagata,^{*,1} Masahiro Uemukai,¹ Toshiki Hikosaka,² Shinya Nunoue,² Takaya Morikawa,¹ Yasufumi Fujiwara,¹ Tomoyuki Tanikawa,¹ and Ryuji Katayama¹

¹Osaka University, Japan, ²Toshiba Corporation, Japan

OD1-4 (Oral)

16:35 - 16:50

Effects of lateral optical confinement in GaN VCSELs with double dielectric DBRs

Rongbin Xu,^{*,1} Yang Mei,¹ Huan Xu,¹ Leiyong Ying,¹ Zhiwei Zheng,¹ Hao Long,¹ Jianping Liu,² and Baoping Zhang¹

¹Department of Electronic Engineering, Xiamen University, China, ²Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, China

OD1-5 (Oral)

16:50 - 17:05

GaN quantum dots on deep-UV distributed Bragg reflector

Frank Bertram,^{*,1} Hannes Schürmann,¹ Gordon Schmidt,¹ Christoph Berger,¹ Sebastian Metzner,¹ Peter Veit,¹ Armin Dadgar,¹ Andre Strittmatter,¹ Jürgen Christen,¹ Stefan Kalinowski,² Stefan Jagsch,² and Axel Hoffmann²

¹Institute of Physics, Otto-von-Guericke-University Magdeburg, Germany, ²Institute of Solid-State Physics, Technical University Berlin, Germany

GR2 *Novel Growth Technology*

Meeting Room 15:35-17:05

GR2-1 (Invited)

15:35 - 16:05

Homoepitaxial growth of β -Ga₂O₃ by halide vapor phase epitaxy for the preparation of epitaxial wafers for vertical power device application

Yoshinao Kumagai,^{*}1,2 Ken Goto,¹ Keita Konishi,³ Hisashi Murakami,^{1,2} Akito Kuramata,³ Shigenobu Yamakoshi,⁴ Bo Monemar,⁵ and Masataka Higashiwaki⁶

¹Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Japan, ²Institute of Global Innovation Research, Tokyo University of Agriculture and Technology, Japan, ³Novel Crystal Technology, Inc., Japan, ⁴Tamura Corporation, Japan, ⁵Department of Physics, Chemistry and Biology, Linköping University, Sweden, ⁶National Institute of Information and Communications Technology, Japan

GR2-2 (Invited)

16:05 - 16:35

Development of 4H-SiC single crystal substrates for power device applications

Noboru Ohtani

Kwansei Gakuin University, School of Science and Technology, Japan

GR2-3 (Oral)

16:35 - 16:50

Comparative Study of Low-Temperature Grown Hexagonal Boron Nitride on Sapphire by Continuous Flow Mode and Pulsed Flow Mode Epitaxy

Muzafar Ahmad Rather,^{*}1 Loganathan Ravi,¹ Kun-Lin Lin,² Chien-Ting Wu,² Tung-Yuan Yu,² and Jen-Inn Chyi¹

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

GR2-4 (Oral)

16:50 - 17:05

High-temperature annealing induced evolution of strain in AlN epitaxial films grown on sapphire substrates

Mingxing Wang,^{*} Fujun Xu, Zhixin Qin, Jiaming Wang, Yuanhao Sun, Nan Xie, Na Zhang, Jing Lang, and Bo Shen

State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, China

November 12 (Tuesday)

Plenary

Auditorium 09:00-10:40

PL-2 (Plenary)

09:00 - 09:50

Wide-bandgap semiconductors as key materials in realizing zero emission of greenhouse gases

Hiroshi AMANO

Nagoya University, Japan

PL-3 (Plenary)

09:50 - 10:40

Self-passivated high-efficiency micro-LEDs using sapphire nano-membrane technology

Euijoon Yoon,^{*,1,2,3} Jongmyeong Kim,¹ Seungmin Lee,¹ Jehong Oh,¹ Jungel Ryu,¹ and Yongjo Park¹

¹Department of Materials Science and Engineering, Seoul National University, Republic of Korea, ²Research Institute of Advanced Materials, Seoul National University, Republic of Korea, ³Inter-university Semiconductor Research Center, Seoul National University, Republic of Korea

Break

10:40 - 11:10

ED2 HEMT

Auditorium 11:10-12:40

ED2-1 (Invited)

11:10 - 11:40

Integration on GaN-on-Si p-GaN gate HEMT Platform

Kevin Jing Chen* and Jin Wei

The Hong Kong University of Science and Technology, Hong Kong

ED2-2 (Oral)

11:40 - 11:55

Improved Device Performance by Integrating Schottky p-GaN Gate Diode and E-mode p-GaN Gate HEMT for 650 V Application

Yi-nan Zhong,¹ Wei-Cheng Ho,¹ Yu-Chen Lai,¹ Yue-ming Hsin,^{*,1} Yuan-Ta Hsieh,² Hann-Huei Tsai,² and Ying-Zong Juang²

¹Department of Electrical Engineering, National Central University, Taiwan, ²Taiwan Semiconductor Research Institute, National Applied Research Laboratories, Taiwan

ED2-3 (Oral)

11:55 - 12:10

A Method Based on Transitional-Recessed-Gate Technology to Improve HEMTs' Gain and Linearity Characteristics

Wu Sheng,* Mi Minhan, Ma Xiaohua, Yang Ling, Zhang Meng, Wu Mei, Lu Yang, Zhang Hengshuang, Yi Chupeng, and Hao Yue

Xidian University, Xi'an 710071, China, China

ED2-4 (Oral)

12:10 - 12:25

Impact of selective thermal etching in NH₃/H₂ mixed atmosphere on crystal quality of AlGaIn/GaN heterostructures

Yuki Yoshiya,* Takuya Hoshi, Hiroki Sugiyama, and Hideaki Matsuzaki

NTT Device Technology Labs, NTT Corporation, Japan

ED2-5 (Oral)

12:25 - 12:40

Evaluation of Interfacial Charges at GaN/AlGaIn Interfaces Grown by MOVPE using Triethylgallium

Takuya Hoshii,*¹ Hiromasa Okita,¹ Taihei Matsuhashi,¹ Indraneel Sanyal,² Yu-Chih Chen,² Ying-Hao Ju,² Akira Nakajima,³ Kuniyuki Kakushima,¹ Hitoshi Wakabayashi,¹ Jen-Inn Chyi,² and Kazuo Tsutsui¹

¹Tokyo Tech, Japan, ²National Central Univ., Taiwan, ³AIST, Japan

GR3 Vapor Phase Epitaxy

Meeting Room 11:10-12:40

GR3-1 (Invited)

11:10 - 11:40

HVPE for GaN and AlN epi-layer growth

Hajime Fujikura,* Taichiro Konno, Takeshi Kimura, Fumimasa Horikiri, and Takehiro Yoshida

SCIOCS, Japan

GR3-2 (Invited)

11:40 - 12:10

Bulk GaN substrate growth by HVPE technology for GaN-on-GaN devices

Jianfeng Wang,*^{1,2} Ke Xu,^{1,2} Guoqiang Ren,^{1,2} Yu Xu,^{1,2} Demin Cai,² Yumin Zhang,^{1,2} Mingyue Wang,^{1,2} Zongyao Li,² and Xiaojian Hu^{1,2}

¹Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, China, ²Suzhou Nanowin Science and Technology Co. Ltd., China

GR3-3 (Oral)

12:10 - 12:25

Impact of the Growth Temperature on GaN Crystal Characteristics by Trihalide Vapor Phase Epitaxy

Erina Miyata,*¹ Syoma Ohtaki,¹ Kenji Iso,^{1,2} Hisashi Murakami,¹ and Akinori Koukitu¹

¹Department of engineering, Tokyo University of Agriculture and Technology, Japan, ²Mitsubishi Chemical Corporation, Japan

GR3-4 (Oral)

12:25 - 12:40

Study on halide vapor phase epitaxy growth of twin-free cubic-indium oxide and its carrier properties

Ken Goto,^{*}¹ Kenta Nagai,¹ Yuya Saimoto,¹ Nami Tanaka,¹ Nao Takekawa,¹ Rie Togashi,² and Yoshinao Kumagai^{1,3}

¹Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Japan, ²Department of Engineering and Applied Science, Sophia University, Japan, ³Institute of Global Innovation Research, Tokyo University of Agriculture and Technology, Japan

Poster Session B

Tunnel Gallery 12:40-14:40

TuP-GR-1 (Poster)

12:40 - 14:40

AlN growth behaviors in ammonia-free high temperature MOVPE

XUQIANG SHEN,^{*} K. Kojima, and H. Okumura

National Institute of Advanced Industrial Science and Technology (AIST), Japan

TuP-GR-2 (Poster)

12:40 - 14:40

Characterization of AlN Microspheres Grown by HVPE method

Gang Seok Lee,^{*}¹ Kyoung Hwa Kim,¹ Hyung Soo Ahn,¹ Min Yang,¹ Sam Nyung Yi,¹ Injun Jeon,² Chae Ryong Cho,² Jae Hak Lee,³ and Suck-Whan Kim⁴

¹Department of Electronic Materials Engineering, Korea Maritime and Ocean University, Republic of Korea, ²Department of Nanoenergy Engineering and Department of Nano Fusion Technology, Pusan National University, Republic of Korea, ³KDMC Co., Ltd, Republic of Korea, ⁴Department of Physics, Andong National University, Republic of Korea

TuP-GR-3 (Poster)

12:40 - 14:40

Growth of Al_{0.55}Ga_{0.45}N thick films on AlN templates with nano-sized patterned grooves

Shohei Teramura,^{*}¹ Yusuke Sakuragi,¹ Shinji Yasue,¹ Shunya Tanaka,¹ Yuya Ogino,¹ Motoaki Iwaya,¹ Tetsuya Takeuti,¹ Satoshi Kamiyama,¹ Sho Iwayama,^{1,3} Isamu Akasaki,^{1,2} and Hideto Miyake³

¹Department of Materials Science and Engineering Meijo University, Japan, ²Akasaka Research Center, Nagoya University, Japan, ³Graduate School of Regional Innovation Studies, Mie University, Japan

TuP-GR-4 (Poster)

12:40 - 14:40

Development of 2-Inch AlN Single Crystal Substrates

Rafael Dalmau,^{*} Jeffrey Britt, and Raoul Schlessler

HexaTech, Inc., United States of America

TuP-GR-5 (Poster)

12:40 - 14:40

Effect of the miscut angle of GaN substrate on InGaN/GaN MQW grown by metalorganic vapor phase epitaxy

Zhibin Liu,^{*}^{1,3,4} Shugo Nitta,² Yoshio Honda,² Markus Pristovsek,² and Hiroshi Amano²

¹Department of Electrical Engineering and Computer Science, Nagoya University, Japan, ²Institute of Materials and Systems for Sustainability, Nagoya University, Japan, ³Institute of Semiconductors, Chinese Academy of Science, China, ⁴University of Chinese Academy of Sciences, China

TuP-GR-6 (Poster)

12:40 - 14:40

Mechanism of AlN Fabrication by Substitutional Reaction between Al Layer and GaN Substrate

Marsetio Noorprajuda,* Makoto Ohtsuka, Masayoshi Adachi, and Hiroyuki Fukuyama
Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, , Japan

TuP-GR-7 (Poster)

12:40 - 14:40

High crystallinity GaN film growth by sputtering with low oxygen concentration GaN target

Yuya Tsuchida,*¹ Yuya Suemoto,¹ Masami Mesuda,¹ Hideto Kuramochi,¹ Liwen Sang,² and Takahiro Nagata²
¹Tosoh corporation, Japan, ²National Institute for Materials Science, Japan

TuP-GR-8 (Poster)

12:40 - 14:40

Effects of Adatom Kinetics on Facet Formation of GaN during Metalorganic Vapor Phase Epitaxy

Yuki Seta,* Abdul Muizz Pradipto, Toru Akiyama, Kohji Nakamura, and Tomonori Ito
Department of Physics Engineering, Mie University, Japan

TuP-GR-9 (Poster)

12:40 - 14:40

Thick AlN epilayer grown by using mixed-source hydride vapor phase epitaxy method

Kyong Hwa Kim,*¹ Sang Woo Kim,¹ Gang Seok Lee,¹ Hyung Soo Ahn,¹ Min Yang,¹ Sam Nyung Yi,¹ Injun Jeon,² Chae Ryong Cho,² and Suck-Whan Kim³

¹Department of Electronic Materials Engineering, Korea Maritime and Ocean University, Republic of Korea,

²Department of Nanoenergy Engineering and Department of Nano Fusion Technology, Republic of Korea,

³Department of Physics, Andong National University, Republic of Korea

TuP-GR-10 (Poster)

12:40 - 14:40

Theoretical study for the adsorption-desorption behavior of stepped III-nitrides during MOVPE growth

Takumi Ohka,* Toru Akiyama, Abdul Muizz Pradipto, Kohji Nakamura, and Tomonori Ito
Department of Physics Engineering, Mie University, Japan

TuP-GR-11 (Poster)

12:40 - 14:40

AlN Epitaxial Growth with Very High Growth Rate by HT MOCVD

Byoungtak Lee, Sain Hong, Hwanuk Shin, Taesanbukdoo Lim, and Minho Choi*
TOP Engineering, Republic of Korea

TuP-GR-12 (Poster)

12:40 - 14:40

Carbon and aluminum co-treatment at high temperatures for surface p-type conduction of AlN

Katsuhiro Kishimoto,* Mitsuru Funato, and Yoichi Kawakami
Department of Electronic Science and Engineering, Kyoto University, Japan

TuP-GR-13 (Poster)

12:40 - 14:40

Formation of 3C-SiC thin film by Si surface carbonization for growth of GaN on Si substrates

Jianwei Wang,* Yifu Zhu, Takeshi Momose, Yukihiro Shimogaki, and Momoko Deura
Department of Material Engineering, University of Tokyo, Japan

TuP-GR-14 (Poster)

12:40 - 14:40

Numerical study on impact of solidification kinetic for β -Ga₂O₃ crystal growth by Czochralski method

Yuji Mukaiyama,^{*}¹ Masaya Iizuka,¹ Andrei Vorob'ev,² Vladimir Artemyev,² Vasif Mamedov,² and Vladimir Kalaev²

¹STR Japan K.K, Japan, ²STR Group - Soft Impact, Ltd, Russia

TuP-GR-15 (Poster)

12:40 - 14:40

Removal Process of Residual Si Impurities on Ga₂O₃ Substrate by CF₄ Reactive Ion Etching Treatment

Yoshiaki Nakata and Masataka Higashiwaki^{*}

National Institute of Information and Communications Technology, Japan

TuP-GR-16 (Poster)

12:40 - 14:40

Solid-liquid interface control and optimization of Ga₂O₃ crystal growth by EFG method

Zhitai Jia,^{*} Wenxiang Mu, Bo Fu, Jin Zhang, and Xutang Tao

State key lab of crystal materials, Shandong Univeristy, China

TuP-GR-17 (Poster)

12:40 - 14:40

Crystal structure of MgZnO deposited by RF sputtering

Maki Kushimoto,^{*}¹ Tadayoshi Sakai,¹ Manato Deki,² Yoshio Honda,^{2,3} and Hiroshi Amano^{2,4}

¹Dept. of Electronics, Nagoya Univ., Japan, ²IMaSS, Japan, ³Institute of Advanced Resarch, Japan, ⁴Akasaki RC, Japan

TuP-CH1 (Poster)

12:40 - 14:40

Optical characterization of light extraction behaviors on the light emitting diodes grown on the different patterning substrates

SangMook KIM^{*} and Jong Hyeob Baek

Korea Photonics Technology Institute, Republic of Korea

TuP-CH2 (Poster)

12:40 - 14:40

Modulation of nanochannel geometry on self-heating in Tri-gate Nanowire GaN HEMTs on Silicon Substrate

Mei Wu,^{*} Qing Zhu, Meng Zhang, Xinchuang Zhang, Ling Yang, Xiaohua Ma, and Yue Hao

State Key Discipline Laboratory of Wide Band-Gap Semiconductor Technology, Xidian University, China

TuP-CH3 (Poster)

12:40 - 14:40

Carrier Dynamics of Removing Excitation Pulse in InGaN Quantum Dots

Ming Tian,^{*}^{1,2} Honghui Liu,¹ Jianping Liu,³ Hui Yang,³ and Zhe Chuan Feng^{1,2}

¹Laboratory of optoelectronic materials & detection technology, Guangxi Key Laboratory for the Relativistic Astrophysics, School of Physics Science & Technology, Guangxi University, China, ²Center on Nanoenergy Research, Guangxi University, China, ³Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, China

TuP-CH4 (Poster)

12:40 - 14:40

Optical Properties of GaN-Based Triangular Ridge Structures under High Excitation

Jing Zhou,^{*} Menghan Liu, Ru Xu, Yunfei Yang, Cheng Ge, Haocheng Peng, Peng Chen, Bin Liu, Zili Xie, Rong Zhang, and Youdou Zheng

School of Electronic Science and Engineering, Nanjing University, China

TuP-CH5 (Poster)

12:40 - 14:40

Carrier dynamics in enhanced MQW light emitting diode structures via V-pits

Idris Aja,¹ Zhiqiang Liu,² Paul Edwards,³ Robert W. Martin,³ and Iman S. Roqan*,¹

¹Physical Science and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal 23955, Saudi Arabia, Saudi Arabia, ²Institute of Semiconductors, Chinese Academy of Science, Beijing 100083, China, China, ³Department of Physics, SUPA, University of Strathclyde, Glasgow, G4 0NG, United Kingdom, United Kingdom

TuP-CH6 (Poster)

12:40 - 14:40

Evaluation of dislocations in AlN single crystal substrates

Yongzhao YAO*,¹ Yukari ISHIKAWA,¹ Yoshihiro SUGAWARA,¹ Narihito OKADA,² and Kazuyuki TADATOMO²

¹Japan Fine Ceramics Center, Japan, ²Yamaguchi Univ., Japan

TuP-CH7 (Poster)

12:40 - 14:40

Leakage Current Mechanisms of Fully Recessed GaN SBDs with Low Turn-ON Voltage

Yanni Zhang,* Jincheng Zhang, Hong Zhou, Tao Zhang, and Yue Hao

State Key Discipline Laboratory of Wide Band Gap Semiconductor Technology, School of Microelectronics, Xidian University, China

TuP-CH8 (Poster)

12:40 - 14:40

Study of single-crystalline GaN converted from β -Ga₂O₃ film

Yuewen Li,* Xiangqian Xiu, Xuemei Hua, Zili Xie, Peng Chen, Bin Liu, Dunjun Chen, Rong Zhang, and Youdou Zheng

School of Electronic Science and Engineering, Nanjing University, China

TuP-CH9 (Poster)

12:40 - 14:40

Surface Plasmon Coupling around Lateral Interface toward InGaN Nanocolumn Based Plasmonic LEDs with High Efficiencies

Michitaka Oigawa*,¹ Koichi Okamoto,² Rie Togashi,³ Katsumi Kishino,⁴ and Takao Oto¹

¹Yamagata University, Japan, ²Osaka Prefecture University, Japan, ³Sophia University, Japan, ⁴Sophia Nanotechnology Research Center, Japan

TuP-CH10 (Poster)

12:40 - 14:40

Development of AlGaIn Photodiode for UV-C detection

Thu Thi Thuy Pham,* Hyungtak Kim, Ho-Kyoung Lee, Hyunsik Shin, and Ho-Young Cha

Department of Electronic and Electrical Engineering, Hongik University, Republic of Korea

TuP-CH11 (Poster)

12:40 - 14:40

Electronic structures of InGaIn alloys

Masataka Imura*,¹ and Yuichi Ota²

¹National Institute for Material Science, Japan, ²Tokyo Metropolitan Industrial Technology Research Institute, Japan

TuP-CH12 (Poster)

12:40 - 14:40

Influence of Carbon Doping on the Background n-type Impurity in GaN

Zhen xing Liu*,¹ Liu an Li,¹ Ya wen Zhao,¹ Tao tao Que,¹ Jin wei Zhang,¹ Xin Gu,¹ Qiu ling Qiu,¹ Qian shu Wu,¹ and Yang Liu^{1,2}

¹School of Electronics and Information Technology, Sun Yat-Sen University, China, ²State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-sen University, China

TuP-CH13 (Poster)

12:40 - 14:40

Surface passivation effect by various oxidation treatment on InGaN/GaN nanostructures fabricated by HEATE

Daichi Ito,^{*}¹ Yuki Ooe,¹ Yusei Kawasaki,¹ Yuta Moriya,¹ and Akihiko Kikuchi^{1,2}

¹Sophia University, Japan, ²Sophia Photonics Research Center, Japan

TuP-CH14 (Poster)

12:40 - 14:40

Control of the composition range for bipolar doping in Ni_xCd_{1-x}O alloys by oxygen stoichiometry and Li doping

Kingsley Onyekachi Egbo,^{*}¹ Chao Ping Liu,^{1,2} and Kin Man Yu^{1,3}

¹Department of Physics, City University of Hong Kong, Hong Kong, ²Department of Physics, College of Science, Shantou University, China, ³Department of Materials Science and Engineering, City University of Hong Kong, Hong Kong

TuP-CH15 (Poster)

12:40 - 14:40

VUV Exciton Emission Spectra of MgO Single Crystals

Kanta Kudo,^{*}¹ Shoma Hoshi,² Mizuki Ono,¹ Yuki Fujiwara,¹ Kentaro Kaneko,^{2,3,4} Tomohiro Yamaguchi,¹ Tohru Honda,¹ Shizuo Fujita,^{2,4} and Takeyoshi Onuma¹

¹Department of Applied Physics, School of Advanced Engineering, Graduate School of Engineering, Kogakuin University, Japan, ²Department of Electronic Science and Engineering, Kyoto University, Japan, ³Engineering Education Research Center, Kyoto University, Japan, ⁴Engineering Education Research Center, Kyoto University, Japan

TuP-CH16 (Poster)

12:40 - 14:40

Theoretical Study of Band Structure Effects on Impact Ionization Coefficients in Wide-bandgap Semiconductors

Hajime Tanaka,^{*}^{1,2} Nobuya Mori,² and Tsunenobu Kimoto¹

¹Kyoto University, Japan, ²Osaka University, Japan

TuP-OD-1 (Poster)

12:40 - 14:40

Flexible metal mesh/ultrathin ITO hybrid transparent electrode and their application for GaN-based light-emitting diodes

Woo-Lim Jeong,^{*} Jung-Hong Min, Hoe-Min Kwak, and Dong-Seon Lee

Gwangju Institute of Science and Technology, Republic of Korea

TuP-OD-2 (Poster)

12:40 - 14:40

High-gain visible-blind AlGaIn/GaN heterojunction phototransistor with a polarization-doped p-type base

Lijie Sun,¹ Zesheng Lv,¹ and Hao JIANG^{*}^{1,2}

¹School of Electronics and Information Technology, Sun Yat-sen University, China, ²State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-sen University, China

TuP-OD-3 (Poster)

12:40 - 14:40

Simulation of light extraction efficiency in multi-quantum-shell-LED fabricated on patterned sapphire substrate (PSS)

Mizuki Terazawa,^{*}¹ Masaki Ohya,^{1,3} Kazuyoshi Iida,^{1,3} Naoki Sone,^{1,4} Nanami Goto,¹ Hideki Murakami,¹ Yu Okamoto,¹ Weifang Lu,¹ Satoshi Kamiyama,¹ Tetsuya Takeuchi,¹ Motoaki Iwaya,¹ and Isamu Akasaki^{1,2}

¹Meijo University, Japan, ²Akasaka Research Center, Nagoya University, Japan, ³Toyoda Gosei Co., Ltd, Japan, ⁴Koito Manufacturing CO., LTD, Japan

TuP-OD-4 (Poster)

12:40 - 14:40

Ni/NiOx nanocatalyst coated n-GaN for efficient photoelectrochemical water splitting

Yen-Hsien Yeh,* Chi-Huang Chuang, Tzu-Yi Yu, and Yuh-Jen Cheng
Research Center for Applied Sciences, Academia Sinica, Taiwan

TuP-OD-5 (Poster)

12:40 - 14:40

Ultraviolet C Light-Emitting Diode with Active Mesa Stripes and Inclined Sidewalls for Enhanced TM mode Light Emission

Wei En Chang,^{1,2} Chia Lung Tsai,*¹ Yuh Renn Wu,¹ Hsueh Hsing Liu,¹ Yi Keng Fu,¹ and Chia Feng Lin²
¹Electronic and Optoelectronic System Research Laboratories, Industrial Technology Research Institute, Taiwan,
²Department of Materials Science and Engineering, National Chung Hsing University, Taiwan

TuP-OD-6 (Poster)

12:40 - 14:40

The application of inverted polarity domains in AlGaIn ultraviolet LEDs and HEMT devices

Wei Guo,*¹ Houqiang Xu,¹ Jiean Jiang,¹ Xiaohang Li,² and Jichun Ye¹
¹Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, China, ²King Abdullah University of Science and Technology (KAUST), Thuwal, 23955, Saudi Arabia

TuP-OD-7 (Poster)

12:40 - 14:40

Enhanced TE polarization and light extraction efficiency of nanostructure patterned deep ultraviolet MQWs with bi-axial strains

Houqiang Xu,*¹ Hanling Long,² Jiean Jiang,¹ Wei Guo,¹ Jiangnan Dai,² Changqing Chen,² and Jichun Ye¹
¹Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, China, ²Huazhong University of Science and Technology, Wuhan, 430074, China, China

TuP-OD-8 (Poster)

12:40 - 14:40

Fabrication of nonpolar InGaIn/GaN single-quantum-well-based nanopillar green light-emitting diode using self-assembled nanodots

Abu Bashar Mohammad Hamidul Islam,* Min Joo Park, Yu-Jung Cha, and Joon Seop Kwak
Sunchon National University, Republic of Korea

TuP-OD-9 (Poster)

12:40 - 14:40

Mg ion-implantation based GaN p-i-n photodiode for visible-blind ultraviolet detection

Weizong Xu,* Yating Shi, Fangfang Ren, Dong Zhou, Linlin Su, Qing Liu, Jiandong Ye, Dunjun Chen, Rong Zhang, Youdou Zheng, and Hai Lu
School of Electronic Science and Engineering, Nanjing University, China

TuP-OD-10 (Poster)

12:40 - 14:40

Improved performance of GaN-based green laser diodes by using ITO cladding layers

Jianping Liu
Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Science, China

TuP-OD-11 (Poster)

12:40 - 14:40

Effects of the AlGaIn/GaN superlattice electron blocking layer on efficiency characteristics of green light emitting diodes

Ruoshi Peng, Shengrui Xu,* and Hongchang Tao

Wide Bandgap Semiconductor Technology Disciplines State Key Laboratory, Xidian University, China

TuP-OD-12 (Poster)

12:40 - 14:40

Design of Deep Ultraviolet Second Harmonic Generation Device with Double-Layer Polarity-Inverted AlN Waveguide

Asahi Yamauchi,*¹ Tenta Komatsu,¹ Kazuhisa Ikeda,¹ Kenjiro Uesugi,² Kanako Syojiki,² Hideto Miyake,² Toshiaki Hikosaka,³ Sinya Nunoue,³ Takaya Morikawa,¹ Yasufumi Fujiwara,¹ Masahiro Uemukai,¹ Tomoyuki Tanikawa,¹ and Ryuji Katayama¹

¹Osaka Univ., Japan, ²Mie Univ., Japan, ³Toshiba Corp., Japan

TuP-OD-13 (Poster)

12:40 - 14:40

Improved emission performance of N-polar GaN-based blue-violet light-emitting diodes with a polarization-induced tunneling junction

Yuantao Zhang,* Gaoqiang Deng, Ye Yu, Yang Wang, and Baolin Zhang

State Key Laboratory of Integrated Optoelectronics, College of Electronic Science and Engineering, Jilin University, China

TuP-OD-14 (Poster)

12:40 - 14:40

Optical control of room temperature exciton polariton condensate in one-dimensional structure

Hyun Gyu Song,* Sunghan Choi, Min Sik Kwon, Kie Young Woo, Chung Hyun Park, and Yong-Hoon Cho

Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea

TuP-OD-15 (Poster)

12:40 - 14:40

Dual-functional InGaIn/GaN MQW Diode for Auto Brightness Control

Xumin Gao,* Xinyu Xu, Kang Fu, Linning Wang, Yuan Jiang, and Yongjin Wang

College of Telecommunications and Information Engineering, Nanjing University of Posts and Telecommunications, China

TuP-OD-16 (Poster)

12:40 - 14:40

Modulation of Circadian Rhythm and Growth Rate of Neurospora Crassa by Using Green Light LED

PEIJUN WEN,*^{1,2} FUYUN TAN,^{1,2} HUI LIAO,^{1,2} and XIAODONG HU^{1,2}

¹School of Physics, Peking University, China, ²Research Center For Wide Gap Semiconductor of Peking University, China

TuP-OD-17 (Poster)

12:40 - 14:40

Room-temperature Weak X-ray Detection Based on 25 mm² 4H-SiC p-i-n Diodes

Qing Liu,* Weizong Xu, Heng Zhang, Hao Dong, Dong Zhou, Fangfang Ren, Dunjun Chen, Rong Zhang, Youdou Zheng, and Hai Lu

School of Electronic Science and Engineering, Nanjing University, China

TuP-OD-18 (Poster)

12:40 - 14:40

Ion implantation effect on DUV photodetectors performance of Ga₂O₃ epilayer grown by MOCVD

PENG HSUAN HUANG,* YUAN CHU SHEN, LIANG HSING LAI, and RAY HUA HONG

Institute of Electronics Engineering, National Chiao Tung University, Taiwan

TuP-OD-19 (Poster)

12:40 - 14:40

Realization of a Self-powered InGaZnO MSM UV photodetector by UV-induced asymmetric Schottky Barrier

Yu-Ru Liu and Chun-Ying Huang*

Department of Applied Materials and Optoelectronics Engineering, National Chi Nan University, Taiwan

TuP-OD-20 (Poster)

12:40 - 14:40

Intramolecular energy transfer effect of Erbium complexes doped optical waveguide amplifier pumped by LED

Dan Zhang,*¹ Hong Zhan,¹ Zhensheng Lin,¹ Wang Fan,¹ Zhongming Zheng,¹ Hao Long,¹ Zhiwei Zheng,¹ Leiying Ying,¹ Baoping Zhang,¹ and Guomei He²

¹*School of Electronic Science and Engineering(National Model Microelectronics College), Xiamen University, China,*

²*Department of Materials Science and Engineering, College of Materials, Xiamen University, China*

TuP-ED-1 (Poster)

12:40 - 14:40

Simple Photoelectrochemical Etching for GaN HEMT Application

Fumimasa Horikiri,*¹ Noboru Fukuhara,¹ Yoshinobu Narita,¹ Takehiro Yoshida,¹ Masachika Toguchi,² Kazuki Miwa,² and Taketomo Sato²

¹*SCIOCS Co. Ltd, Japan,* ²*Hokkaido Univ., Japan*

TuP-ED-2 (Poster)

12:40 - 14:40

Enhancement of channel conductivity and suppression of current collapse in C-doped GaN buffer by using the Si δ -doped AlGaN back barrier

Ling Yang,*¹ Meng Zhang,¹ Bin Hou,² Minhan Mi,² Mei Wu,² Qing Zhu,¹ Jiejie Zhu,² Xiaohua Ma,² and Yue Hao²

¹*School of advanced materials and nanotechnology, Xidian University, China,* ²*School of Microelectronics, Xidian University, China*

TuP-ED-3 (Poster)

12:40 - 14:40

Effects of Surface Oxide Reduction Prior to Metallization on Electrical Properties of GaN-on-GaN Schottky Diodes

Kazuki Isobe* and Masamichi Akazawa

Hokkaido University, Japan

TuP-ED-4 (Poster)

12:40 - 14:40

Fin-Gated Nanochannel Array GaN-based Metal-Oxide-Semiconductor High-Electron Mobility Transistors

Ching-Ting Lee*^{1,2} and Hsin-Ying Lee²

¹*Department of Electrical Engineering, Yuan Ze University, Taoyuan 320, Taiwan, Republic of China, Taiwan,*

²*Department of Photonics, National Cheng Kung University, Tainan 701, Taiwan, Republic of China, Taiwan*

TuP-ED-5 (Poster)

12:40 - 14:40

Evaluation of Radical Production Rate from $S_2O_8^{2-}$ ions for GaN Etching

Masachika Toguchi,^{*1} Kazuki Miwa,¹ Fumimasa Horikiri,² Noboru Fukuhara,² Yoshinobu Narita,² Takehiro Yoshida,² and Taketomo Sato¹

¹Hokkaido University, Japan, ²SCIOCS Co. Ltd., Japan

TuP-ED-6 (Poster)

12:40 - 14:40

A GaN Power Amplifier MMIC for Ka band Satellite Communication

Chupeng Yi,^{*1} Yang Lu,² Hengshuang Zhang,² Ziyue Zhao,¹ Xiaohua Ma,^{2,3} and Yue Hao^{2,3}

¹School of Advanced Materials and Nanotechnology, Xidian University, China, ²School of Microelectronics, Xidian University, China, ³Key Laboratory of Wide Band-Gap Semiconductor Technology, Xidian University, China

TuP-ED-7 (Poster)

12:40 - 14:40

MOVPE-grown GaInN laser diodes with GaN tunnel junctions

Ryosuke Iida,^{*1} Kohei Miyoshi,² Yuki Kato,¹ Kei Arakawa,¹ Tetsuya Takeuchi,¹ Satoshi Kamiyama,¹ Motoaki Iwaya,¹ and Isamu Akasaki^{1,3}

¹Meijo University, Japan, ²USHIO OPTO SEMICONDUCTORS, INC, Japan, ³Nagoya University, Japan

TuP-ED-8 (Poster)

12:40 - 14:40

Migration Energies of 5-7 Edge Dislocations in GaN

Jesse Chiam Anderson,^{*1} Masato Oda,^{1,2} Jun Nara,² and Tsuyoshi Miyazaki²

¹Wakayama University, Japan, ²National Institute for Materials Science, Japan

TuP-ED-9 (Poster)

12:40 - 14:40

The effects of PDA on the interface characteristics of GaN-based MIS-HEMTs in different atmosphere and temperature

Siyu Liu,^{*1} Mi Ma,² Jielong Liu,¹ Fuchun Jia,² Qing Zhu,¹ Jiejie Zhu,^{1,2} Ling Yang,^{1,2} Xiaohua Ma,² and Yue Hao²

¹School of Advanced Materials and Nanotechnology, Xidian University, China, ²State Key Discipline Laboratory of Wide BandGap Semiconductor Materials and Devices, School of Microelectronics, Xidian University, China

TuP-ED-10 (Poster)

12:40 - 14:40

Comparison of device characteristics between recessed and regular Al-GaN/GaN SBDs

Ge Liu,^{*} Jincheng Zhang, Shenglei Zhao, Weihang Zhang, and Yue Hao

Key Laboratory of Wide Band Gap Semiconductor Materials and Devices, School of Microelectronics, Xidian University, China

TuP-ED-11 (Poster)

12:40 - 14:40

AlGaIn/GaN HFET with Thin AlGaIn Barrier Fabricated Using PECVD SiN_x Passivation

Hyun-Seop Kim,^{*1} Myoung-Jin Kang,² Won-Ho Jang,¹ Kwang-Seok Seo,² Hyungtak Kim,¹ Ho-Kyoung Lee,¹ Hyungsik Shin,¹ and Ho-Young Cha¹

¹School of Electronic and Electrical Engineering, Hongik University, Republic of Korea, ²Department of Electrical and Computer Engineering, Seoul National University, Republic of Korea

TuP-ED-12 (Poster)

12:40 - 14:40

Temperature Dependence of Microwave Responsivity of Gated and Ungated Self-Switching Diodes Based on GaN

Javier Mateos,^{*}¹ Elsa Pérez-Martín,¹ Héctor Sánchez-Martín,¹ Daniel Vaquero,¹ Gaudencio Paz,¹ José Antonio Novoa-López,¹ Susana Pérez,¹ Nicolas Defrance,² Christophe Gaquière,² Guillaume Ducournau,² Tomás González,¹ and Ignacio Rodríguez-de-la-Torre¹

¹Universidad de Salamanca, Spain, ²IEMN, University of Lille 1, France

TuP-ED-13 (Poster)

12:40 - 14:40

Room temperature NDR in digital alloy AlGaIn barrier RTDs

Xinqiang Wang,^{*}¹ Ding Wang,^{1,2} Zhaoying Chen,¹ Tao Wang,¹ Wei Tan,³ Siping Guo,⁴ Jian Zhang,³ and Bo Shen²

¹School of Physics, Peking University, China, ²Department of Engineering Physics, Tsinghua University, China, ³Microsystem and Terahertz Research Center, China, ⁴Advanced Micro-Fabrication Equipment Inc, China

TuP-ED-14 (Poster)

12:40 - 14:40

Significant Image Force Lowering at Metal/Heavily-Doped SiC Interfaces

Masahiro Hara,^{*} Satoshi Asada, Takuya Maeda, and Tsunenobu Kimoto
Department of Electronic Science and Engineering, Kyoto University, Japan

TuP-ED-15 (Poster)

12:40 - 14:40

Hybrid Conductive Filaments Characteristic of the (In, N) co-doped ZnO Memory Device

Sih-Sian Li^{1,2} and Yan-Kuin Su^{*,1,2}

¹Institute of Microelectronics, Department of Electrical Engineering, Department of Photonics, National Cheng Kung University, Taiwan, ²Green Energy Technology Research Center, Department of Electrical Engineering, Kun Shan University, Taiwan

TuP-ED-16 (Poster)

12:40 - 14:40

Electrical and photocurrent properties of polycrystalline Sn-doped β -Ga₂O₃ thin film with thickness of 100 nm

Younbgin Yoon,^{*}¹ Sunjae Kim,² In Gye Lee,² Byung Jin Cho,³ Myunghun Shin,¹ and Wan Sik Hwang²

¹Department of Electronics and Information Engineering, Korea Aerospace University, Republic of Korea, ²Department of Materials Engineering, Korea Aerospace University, Republic of Korea, ³School of Electrical Engineering, KAIST, Republic of Korea

TuP-ED-17 (Poster)

12:40 - 14:40

Diamond SAW devices made by Minimal-fab

Ayano Nakasone,^{*}¹ Satoshi Fujii,¹ Sommawan Khumpuang,² Shiro Hara,² Haruki Toonoe,³ and Yasunori Shiba³

¹National Institute of Technology, Okinawa College, Japan, ²AIST, Japan, ³Yokogawa Solution Service, Japan

TuP-ED-18 (Poster)

12:40 - 14:40

Al₂O₃/TiO₂-Passivated In_{0.17}Al_{0.83}N/AlN/GaN Γ -Gate MOS-HFETs

Ching-Sung Lee Lee,^{*}¹ Wei-Chou Hsu,² Yun-Jung Lin,¹ and Xue-Cheng Yao¹

¹Department of Electronic Engineering, Feng Chia University, Taiwan, ²Institute of Microelectronics, National Cheng Kung University, Taiwan

OD2 Visible & Novel Devices

Auditorium 14:40-15:55

OD2-1 (Invited)

14:40 - 15:10

Enhancement of LED Color Conversion Efficiency through Surface Plasmon Coupling

Wen-Yen Chang, Yao-Tseng Wang, Cheng-Jin Cai, Ruei-Nan Wu, Chia-Chun Ni, Chun-Han Lin, Hsin-Chun Chiang, Yu-Feng Yao, Chi-Chung Chen, Wai Fong Tse, Yang Kuo, Yean-Woei Kiang, and Chih-Chung Yang*
National Taiwan University, Taiwan

OD2-2 (Oral)

15:10 - 15:25

The Role of Surface Defects in Efficiency Degradation of GaInN-based Green Light-emitting Diodes

Dong-Pyo Han,^{*,1} Seiji Ishimoto,¹ Ryoya Mano,¹ Weifang Lu,¹ Motoaki Iwaya,¹ Tetsuya Takeuchi,¹ Satoshi Kamiyama,¹ and Isamu Akasaki^{1,2}
¹Faculty of Science and Technology, Meijo University, Japan, ²Akasaki Research Center, Nagoya University, Japan

OD2-3 (Oral)

15:25 - 15:40

Demonstration of near-infrared light-emitting diodes with ultra-stable emission wavelength based on Tm-doped GaN

Naoki Yoshioka,^{*} Shuhei Ichikawa, Jun Tatebayashi, and Yasufumi Fujiwara
Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University, Japan

OD2-4 (Oral)

15:40 - 15:55

The enhanced light output of ODR based UV-LEDs using porous SiO₂ layer

Jeong-won Lee^{*} and Tae-yeon Seong
Department of Nanophotonics Engineering, Korea University, Republic of Korea

CH1 Optical Characterization 1

Meeting Room 14:40-15:55

CH1-1 (Invited)

14:40 - 15:10

New features of polar InGaN/GaN quantum wells and emitters induced by manipulation of built-in electric field

Tadek Suski,^{*,1} Grzegorz Staszczak,¹ Grzegorz Muziol,¹ Krzysztof Korona,² Anna Kafar,^{1,4} Szymon Stanczyk,¹ Czesław Skierbiszewski,^{1,3} and Piotr Perlin^{1,3}
¹Institute of High Pressure Physics, Polish Academy of Sciences, Poland, ²Institute of Experimental Physics, Warsaw University, Poland, ³TopGaN Ltd., Poland, ⁴Kyoto University, Japan

CH1-2 (Oral)

15:10 - 15:25

Origin and dynamic properties of intrinsic nonradiative recombination centers in bulk and epitaxial ZnOShigefusa F. Chihibu,^{*,1} Kazunobu Kojima,¹ Kazuto Koike,² Mitsuaki Yano,² Shun-ichi Gonda,³ Shoji Ishibashi,⁴ and Akira Uedono⁵¹Tohoku University, Japan, ²Osaka Institute of Technology, Japan, ³Osaka University, Japan, ⁴National Institute of Advanced Industrial Science and Technology, Japan, ⁵University of Tsukuba, Japan

CH1-3 (Oral)

15:25 - 15:40

Red emission enhancement from InGaN using nanocolumn plasmonic crystals with honeycomb and kagome latticesAoto Aihara,^{*,1} Kazuma Kikuchi,² Koichi Okamoto,⁴ Rie Togashi,² Katsumi Kishino,³ and Takao Oto¹¹Yamagata University, Japan, ²Sophia University, Japan, ³Sophia Nanotechnology Research Center, Japan, ⁴Osaka Prefecture University, Japan

CH1-4 (Oral)

15:40 - 15:55

High-temperature promoted nonradiative recombination at threading dislocations in blue-emitting InGaN quantum wellRyota Ishii,^{*} Yuji Koyama, Mitsuru Funato, and Yoichi Kawakami

Department of Electronic Science and Engineering, Kyoto University, Japan

Break

15:55 - 16:25

OD3 UV Devices 1

Auditorium 16:25-17:55

OD3-1 (Invited)

16:25 - 16:55

Toward the realization of AlGaIn-based UVB laser diodesMotoaki Iwaya,^{*,1} Kosuke Sato,^{1,2} Sho Iwayama,^{1,3} Tetsuya Takeuchi,¹ Satoshi Kamiyama,¹ Isamu Akasaki,^{1,4} and Hideto Miyake³¹Department of Materials Science and Engineering, Meijo Univ., Japan, ²Asahi-Kasei Corporation, Japan, ³Graduate School of Regional Innovation Studies, Mie University, Japan, ⁴Akasaki Research Center, Nagoya University, Japan

OD3-2 (Invited)

16:55 - 17:25

A pathway toward low threshold UVC laser diodesZlatko Sitar,^{*,1,2} Ronny Kirste,² Seiji Mita,² Pramod Reddy,² Qiang Guo,¹ Biplab Sarkar,¹ Doug Irving,¹ and Ramon Collazo¹¹North Carolina State University, United States of America, ²Adroit Materials, United States of America

OD3-3 (Oral)

17:25 - 17:40

42mW light power from AlGaIn-based 302nm-band UVB LEDs: a way forward for UVB LDsMuhammad Ajmal Khan,^{*,1,2} Noritoshi Maeda,¹ Masafumi Jo,¹ Sachie Fujikawa,^{1,4} Yoichi Yamada,³ and Hideki Hirayama^{1,2}¹RIKEN Center for Advanced Photonics (RAP), Japan, ²RIKEN Cluster for Pioneering Research, Japan, ³Faculty of Engineering, Yamaguchi University, Japan, ⁴Tokyo Denki University, Japan

OD3-4 (Oral)

17:40 - 17:55

High performance of AlGa_N deep-ultraviolet light emitting diodes due to improved vertical carrier transport by delta-accelerating quantum barriers

Jing Lang,* Fujun Xu, Weikun Ge, Baiyin Liu, Na Zhang, Yuanhao Sun, Jiaming Wang, Mingxing Wang, Nan Xie, and Bo Shen

Peking University, China

CH2 *Extended Defects*

Meeting Room 16:25-17:55

CH2-1 (Invited)

16:25 - 16:55

Control and annihilation of dislocation propagation in diamond by metal-assisted termination

Shinya Ohmagari,* Hideaki Yamada, Nobuteru Tsubouchi, Hitoshi Umezawa, Akiyoshi Chayahara, and Daisuke Takeuchi

National Institute of Advanced Industrial Science and Technology, Japan

CH2-2 (Invited)

16:55 - 17:25

Nondestructive defect characterization of widegap semiconductors using multiphoton-excitation photoluminescence

Tomoyuki Tanikawa,* Masahiro Uemukai, and Ryuji Katayama

Osaka University, Japan

CH2-3 (Oral)

17:25 - 17:40

Vacancy assistant dislocation engineering for continuous 10.2 μm -thick GaN films on Si substrates

Jie Zhang, Xuelin Yang,* Jianfei Shen, and Bo Shen

School of Physics, Peking University, China

CH2-4 (Oral)

17:40 - 17:55

Defect structure analysis of OVPE grown homoepitaxial GaN thick film

Tetsuya Tohei,*¹ Miki Manabe,¹ Junichi Takino,² Tomoaki Sumi,² Masayuki Imanishi,³ Yusuke Mori,³ and Akira Sakai¹

¹Graduate School of Engineering Science, Osaka University, Japan, ²Panasonic Corporation, Japan, ³Graduate School of Engineering, Osaka University, Japan

November 13 (Wednesday)

GR4 Novel Process Technology

Auditorium 09:00-10:45

GR4-1 (Invited)

09:00 - 09:30

Threading Dislocation Reduction of Sputter-deposited AlN/sapphire by High-Temperature Annealing

Hideo Miyake,^{*1,2} Kenjiro Uesugi,^{1,3} Kanako Shojiki,² Shiyu Xiao,¹ Haruhiko Koizumi,³ and Shigeyuki Kuboya³

¹Graduate School of Regional Innovation Studies, Mie University, Japan, ²Graduate School of Engineering, Mie University, Japan, ³Organization for Promotion of Regional Innovation, Mie University, Japan

GR4-2 (Invited)

09:30 - 10:00

Growth and characterization of widegap III-nitride based optoelectronic and electronic devices using HT-MOCVD

Okhyun Nam

Korea Polytechnic University, Republic of Korea

GR4-3 (Oral)

10:00 - 10:15

Enhanced doping efficiency of p-GaN grown on free standing GaN substrates

liwen sang,^{*} Bing Ren, Raimu Endo, Takuya Masuda, Toshihide Nabatame, Masatomo Sumiya, Yasuo Koide, and Meiyong Liao

National Institute for Materials Science, Japan

GR4-4 (Oral)

10:15 - 10:30

The polarity reversal of the N-polar inversion domains from AlN buffer layers during the growth of Al_xGa_{1-x}N layers by ammonia MBE

Igor Vasilievich Osinnykh,^{*1,2} Timur Valerievich Malin,¹ and Konstantin Sergeevich Zhuravlev^{1,2}

¹Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences, Russia,

²Novosibirsk State University, Russia

GR4-5 (Oral)

10:30 - 10:45

Highly controllable self-assembled AlGaIn-quantum wires grown on sapphire with large miscut angle

Yuanhao Sun,^{*} Fujun Xu, Mingxing Wang, Jing Lang, Na Zhang, and Bo Shen

State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking university, China

ED3 **Novel Electronic Devices**

Meeting Room 09:00-10:45

ED3-1 (Invited)

09:00 - 09:30

Recent progress for inversion channel mobility improvement in diamond MOSFETs

Tsubasa Matsumoto,^{*}¹ Ukyo Sakurai,³ Tomoya Yamakawa,³ Hiromitsu Kato,² Toshiharu Makino,² Masahiko Ogura,² Daisuke Takeuchi,² Satoshi Yamasaki,^{1,2} Takao Inokuma,² and Norio Tokuda^{1,2}

¹Nanomaterials Research Institute, Kanazawa University, Japan, ²Advanced Power Electronics Research Center, AIST, Japan, ³Graduate School of Natural Science and Technology, Kanazawa University, Japan

ED3-2 (Invited)

09:30 - 10:00

Ga₂O₃ Power Device Potential Investigation Based on Its Nano-membrane Channels

Hong Zhou,^{*} Jincheng Zhang, and Yue Hao

Xidian University, China

ED3-3 (Oral)

10:00 - 10:15

Very high sensitive AlGa_N/Ga_N HEMT sensor for hydrogen detection at room temperature

Kyung-Ho Park,^{*} Chu-Young Cho, Hae-Yong Jeong, Hyeong-Ho Park, Jeong-Min Ju, and Young-Jae Jo

Devices Technology Division, Korea Advanced Nano Fab Center (KANC), Republic of Korea

ED3-4 (Oral)

10:15 - 10:30

Flexible electrochromic transistor

Takaki Onozato,^{*}¹ Hai Jun Cho,^{1,2} and Hiromichi Ohta^{1,2}

¹Graduate School of Information Science and Technology (IST), Hokkaido University, Japan, ²Research Institute for Electronic Science (RIES), Hokkaido University, Japan

ED3-5 (Oral)

10:30 - 10:45

Lateral Ga_N SBD for 5.8GHz Microwave Rectifier with A Peak Efficiency of 71% at Input Power of 33.96 dBm

Kui Dang,^{*} Jincheng Zhang, Hong Zhou, and Yue Hao

Xidian University, China

Break

10:45 - 11:15

OD4 MicroLED

Auditorium 11:15-13:00

OD4-1 (Invited)

11:15 - 11:45

Development of Transparent MicroLED Display

Ying-Tsang Liu, Kuan-Yung Liao, Yu-Hung Lai, and Yun-Li Li*
PlayNitride Inc., Taiwan

OD4-2 (Invited)

11:45 - 12:15

GaN-based integrated micro LED research

Kei May Lau
Department of Electronic and Computer Engr., Hong Kong U. of Science & Technology, Hong Kong

OD4-3 (Oral)

12:15 - 12:30

Fabrication of Needle-Shaped GaN- μ LED Neural Probe for Optogenetics

Hiroki Yasunaga,^{*}¹ Masahiro Ohsawa,² and Hiroto Sekiguchi^{1,3}
¹Toyohashi Tech, Japan, ²Nagoya city Univ., Japan, ³JST PRESTO, Japan

OD4-4 (Oral)

12:30 - 12:45

Full-color monolithic micro-LEDs fabricated with QDs inside nanoporous GaN

Jie Song,^{*}^{1,2} Joowon Choi,^{1,2} Jin-ho Kang,² and Jung Han²
¹Saphlux Inc., United States of America, ²Yale University, United States of America

OD4-5 (Oral)

12:45 - 13:00

Integration of GaN LED and Si-CMOS on 200 mm Si Platform

Li Zhang,^{*}¹ Kwang Hong Lee,¹ Kenneth Lee,¹ Chuan Seng Tan,^{1,2} Soo Jin Chua,^{1,3} and Eugene A. Fitzgerald^{1,4}
¹Singapore-MIT Alliance for Research and Technology, Singapore, ²School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, ³Department of Electrical and Computer Engineering, National University of Singapore, Singapore, ⁴Department of Materials Science and Engineering, Massachusetts Institute of Technology, United States of America

CH3 Optical Characterization 2

Meeting Room 11:15-13:00

CH3-1 (Invited)

11:15 - 11:45

Phonons, free charge carriers, excitons and band-to-band transitions in beta Ga₂O₃ and related alloys determined by ellipsometry and optical Hall effect

M. Schubert,^{*}1,2,3 A. Mock,⁴ S. Knight,¹ M. Hilfiker,¹ M. Stokey,¹ V. Darakchieva,² A. Papamichail,² R. Korlacki,¹ M.J. Tadjer,⁵ Z. Galazka,⁶ G. Wagner,⁶ N. Blumenschein,⁷ A. Kuramata,⁸ K. Goto,^{8,9} H. Murakami,⁹ Y. Kumagai,⁸ M. Higashiwaki,¹⁰ A. Mauze,¹⁰ Y. Zhang,¹¹ and J. S. Speck¹¹

¹Department of Electrical and Computer Engineering, University of Nebraska, United States of America, ²Department of Physics, Chemistry and Biology (IFM), Linköping University, Sweden, ³Leibniz Institute for Polymer Research, Germany, ⁴National Research Council Postdoctoral Fellow, residing at U.S. Naval Research Laboratory, United States of America, ⁵U.S. Naval Research Laboratory Electronics Science and Technology Division, United States of America, ⁶Leibniz-Institut für Kristallzüchtung, Germany, ⁷Department of Electrical and Computer Engineering, North Carolina State University, United States of America, ⁸Novel Crystal Technology, Inc., Japan, ⁹Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Japan, ¹⁰National Institute of Information and Communications Technology, Japan, ¹¹Materials Department, University of California Santa Barbara, United States of America

CH3-2 (Invited)

11:45 - 12:15

Deep UV cathodoluminescence properties of rocksalt-structured MgZnO alloys

Takeyoshi Onuma,^{*}1 Mizuki Ono,¹ Kanta Kudo,¹ Kyohei Ishii,² Kentaro Kaneko,^{2,3,4} Shizuo Fujita,^{2,4} and Tohru Honda¹

¹Department of Applied Physics and Graduate School of Engineering, Kogakuin University, Japan, ²Department of Electronic Science and Engineering, Kyoto University, Japan, ³Engineering Education Research Center, Kyoto University, Japan, ⁴Photonics and Electronics Science and Engineering Center, Kyoto University, Japan

CH3-3 (Oral)

12:15 - 12:30

Luminescence enhancement of N-polar InGaN/GaN multiple quantum wells grown by flow modulation epitaxy

Chengguo Li

Guangdong Institute of Semiconductor Industrial Technology, China

CH3-4 (Oral)

12:30 - 12:45

Radiative and Nonradiative Recombination Rates of Excitons and Their Effects on Internal Quantum Efficiency of AlGaIn-based UV-B MQWs

Hideaki Murotani,^{*}1,2 Hiroyuki Miyoshi,¹ Ryohei Takeda,¹ Muhammad Ajmal Khan,³ Noritoshi Maeda,³ Masafumi Jo,³ Hideki Hirayama,³ and Yoichi Yamada¹

¹Department of Electrical and Electronic Engineering, Yamaguchi University, Japan, ²National Institute of Technology, Tokuyama College, Japan, ³RIKEN Cluster for Pioneering Research, Japan

CH3-5 (Oral)

12:45 - 13:00

Simulation and growth of GaN/AlGaIn based terahertz quantum cascade structures

Ke Wang,^{*}1,2 Li Wang,² Tsung-Tse Lin,² Koichi Fukuda,² Rong Zhang,¹ and Hideki Hirayama²

¹School of Electronic Science and Engineering, Nanjing University, China, ²Terahertz Quantum Device team, RAP, RIKEN, Japan

Excursion

13:00 - 18:00

DRAFT

November 14 (Thursday)

OD5	<i>UV Devices 2</i>	Auditorium	09:00-10:15
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OD5-1 (Invited)

09:00 - 09:30

Emerging new techniques for efficient AlGaN DUV LEDs: from 2D to 3D

Jinmin Li

Institute of Semiconductors, Chinese Academy of Science, China

OD5-2 (Invited)

09:30 - 10:00

Growth and characterization of AlGaN based UV-emitters

Tim Wernicke

Technical University of Berlin, Germany

OD5-3 (Oral)

10:00 - 10:15

High current operation of UV-B devices fabricated on low dislocation and relaxed AlGaN

Shinji Yasue,^{*} Kosuke Sato,^{1,2} Yusuke Sakuragi,¹ Yuya Ogino,¹ Syunya Tanaka,¹ Shohei Teramura,¹ Sho Iwayama,^{1,4} Motoaki Iwaya,¹ Takeuchi Tetsuya,¹ Satoshi Kamiyama,¹ Isamu Akasaki,^{1,3} and Hideto Miyake⁴

¹Department of Materials Science and Engineering, Meijo University, Japan, ²Asahi-Kasei Corporation, Japan, ³Akasaki Research Center, Nagoya University, Japan, ⁴Graduate School of Regional Innovation Studies, Mie University, Japan

GR5	<i>Bulk Growth</i>	Meeting Room	09:00-10:15
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GR5-1 (Invited)

09:00 - 09:30

Acidic Ammonothermal Growth of Bulk GaN

Yutaka Mikawa,^{*} Takayuki Ishinabe, Yuji Kagamitani, Hiroataka Ikeda, and Tae Mochizuki

Mitsubishi Chemical Corporation, Japan

GR5-2 (Invited)

09:30 - 10:00

Bulk growth of GaN. How to overcome the equilibrium crystal shape?

Michal Stanislaw Bockowski

¹IHPP PAS, Poland, ²CIRFE, IMaSS, Nagoya University, Japan

GR5-3 (Oral)

10:00 - 10:15

GaN crystal growth by basic ammonothermal method

Guoqiang Ren,^{*,1} Tengkun Li,¹ Xujun Su,¹ Jingjing Yao,¹ Xiaodong Gao,¹ and Ke Xu^{1,2}

¹Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, China, ²Suzhou Nanowin Science and Technology Co, Ltd., China

Break

10:15 - 10:45

ED4 **Power Devices**

Auditorium 10:45-12:30

ED4-1 (Invited)

10:45 - 11:15

Development of SiC power devices with low on-resistance

Nam Kyun KIM

Korea Electrotechnology Research Institute (KERI), Republic of Korea

ED4-2 (Invited)

11:15 - 11:45

Dynamic Performance and Surge Current Capability of Vertical GaN-on-GaN Power Devices

Shu Yang,^{*} Shaowen Han, and Kuang Sheng

College of Electrical Engineering, Zhejiang University, China

ED4-3 (Oral)

11:45 - 12:00

Impacts of Channel Length on Electrical Characteristics in Side-Gate SiC JFETs

Masashi Nakajima,^{*} Qimin Jin, Mitsuaki Kaneko, and Tsunenobu Kimoto

Kyoto University, Japan

ED4-4 (Oral)

12:00 - 12:15

Investigation of thin-AlGaN/GaN MOS-HFETs on the AlGaN back-barrier structure for normally-off operation

Jumpei Tajima,^{*} Toshiki Hikosaka, and Shinya Nunoue

Corporate Research & Development Center, Toshiba Corporation, Japan

ED4-5 (Oral)

12:15 - 12:30

Depth Profiles of Defects Generated by RIE in 4H-SiC Characterized by Deep-level Transient Spectroscopy

Kazutaka Kanegae,^{*,1} Takafumi Okuda,¹ Masahiro Horita,^{1,2} Jun Suda,^{1,2} and Tsunenobu Kimoto¹

¹Kyoto Univ., Japan, ²Nagoya Univ., Japan

CH4 Physical Properties

Meeting Room 10:45-12:30

CH4-1 (Invited)

10:45 - 11:15

Boron nitride from its physics to advanced photonic applications

Bernard GIL

CNRS & University Montpellier, France

CH4-2 (Oral)

11:15 - 11:30

Electrical spin injection into bulk GaN with Co/MgO spin injectorXingchen liu,¹ Ning Tang,^{*1} C. Fang,² Xiaoyue Zhang,¹ Hongming Guan,¹ Yunfan Zhang,¹ C.H Wan,² Weikun Ge,¹ X.F Han,² and Bo Shen¹¹State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, China, ²Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, University of Chinese Academy of Sciences, Chinese Academy of Sciences, China

CH4-3 (Oral)

11:30 - 11:45

RF sputtering deposition of Mg-doped h-BN films on Al_{0.7}Ga_{0.3}N templateGUODONG HAO,^{*} Manabu Taniguchi, Sachiko Tsuzuki, and Shin-ichiro Inoue

National Institute of Information and Communications Technology (NICT), Japan

CH4-4 (Oral)

11:45 - 12:00

Energy distributions of interface state density originating from tail states of the conduction band in SiC MOS structuresKoji Ito,^{*} Takuma Kobayashi, and Tsunenobu Kimoto

Kyoto University, Japan

CH4-5 (Oral)

12:00 - 12:15

Zn-IV-nitrides for integration in electronic and photonic devicesNicholas Lloyd Adamski,^{*1} Darshana Wickramaratne,² and Chris G. Van de Walle³¹Department of Electrical and Computer Engineering, University of California, Santa Barbara, United States of America, ²US Naval Research Laboratory, United States of America, ³Materials Department, University of California, Santa Barbara, United States of America

CH4-6 (Oral)

12:15 - 12:30

In-situ observation of stacking faults expansion in 4H-SiC at high temperatures by synchrotron X-ray topographyFumihiro Fujie,^{*1} Shunta Harada,¹ Hiromasa Suo,² Tomohisa Kato,³ and Toru Ujihara¹¹Nagoya University, Japan, ²Showa Denko K.K., Japan, ³National Institute of Advanced Industrial Science and Technology (AIST), Japan

Poster **Poster Session C**

Tunnel Gallery 12:30-14:30

ThP-GR-1 (Poster)

12:30 - 14:30

In-plane misfits' localization in GaN via graphene-ELOG technologyYu Xu,^{*,1,2} Xujun Su,¹ Bing Cao,^{3,4} Zongyao Li,² Yi Liu,^{3,4} Demin Cai,² Yumin Zhang,^{1,2} Jianfeng Wang,^{1,2} Chinghua Wang,^{3,4} and Ke Xu^{1,2}¹Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), Chinese Academy of Sciences (CAS), Suzhou 215123, China, ²Suzhou Nanowin Science and Technology Co., Ltd., Suzhou 215123, China, ³School of Optoelectronic Science and Engineering & Collaborative Innovation Center of Suzhou Nano Science and Technology, Soochow University, Suzhou 215006, China, ⁴Key Lab of Advanced Optical Manufacturing Technologies of Jiangsu Province & Key Lab of Modern Optical Technologies of Education Ministry of China, Soochow University, Suzhou 215006, China

ThP-GR-2 (Poster)

12:30 - 14:30

Study on p-GaN shell in nanowire core-shell LEDNanami Goto,^{*,1} Naoki Sone,^{1,2} Kazuyoshi Iida,^{1,3} Weifang Lu,¹ Hideki Murakami,¹ Mizuki Terazawa,¹ Jun Uzuhashi,⁴ Tadakatsu Ohkubo,⁴ Kazuhiro Hono,⁴ Masaki Ohya,^{1,3} Satoshi Kamiyama,¹ Tetsuya Takeuchi,¹ Motoaki Iwaya,¹ and Isamu Akasaki^{1,5}¹Meijo University, Japan, ²Koito Manufacturing CO., Ltd, Japan, ³Toyoda Gosei Co., Ltd, Japan, ⁴National Institute for Materials Science, Japan, ⁵Akasaka Research Center, Nagoya Univ., Japan

ThP-GR-3 (Poster)

12:30 - 14:30

Theoretical Study of the Origins of Carbon Impurities on GaN MOVPE from a Gas Phase Reaction Perspective ~Incorporation of Ga and C Related Molecules~Yuto Okawachi,^{*,1} Kenta Chokawa,¹ Masaaki Araidai,² Akira Kusaba,⁴ Yoshihiro Kangawa,^{2,3} Koichi Kakimoto,³ Zheng Ye,¹ Yoshio Honda,^{1,2} Shugo Nitta,^{1,2} Hiroshi Amano,^{1,2} and Kenji Shiraishi^{1,2}¹Graduate School of Engineering, Nagoya Univ, Japan, ²IMaSS, Nagoya Univ, Japan, ³RIAM, Kyushu Univ, Japan, ⁴Computer Center, Gakushuin Univ, Japan

ThP-GR-4 (Poster)

12:30 - 14:30

Numerical Modeling of Carbon Doping and Experimental Validation in GaN Epitaxial Growth by MOVPE methodMasaya Iizuka,^{*,1} Yuji Mukaiyama,¹ A. V. Lobanova,² R. A. Talalaev,² and W. Lundin³¹STR Japan K.K, Japan, ²STR Group - Soft Impact Ltd, Russia, ³Ioffe Physical Technical institute, Russia

ThP-GR-5 (Poster)

12:30 - 14:30

Effect of temperature gradient on AlN crystal growth by PVT methodLei Zhang,^{*,1} Guodong Wang,¹ Yong Wang,¹ Yongliang Shao,¹ Chengmin Chen,² Yongzhong Wu^{*,1} and Xiaopeng Hao^{*,1}¹State Key Lab of Crystal Materials, Shandong University, China, ²Energy Research Institute, Qilu University of Technology (Shandong Academy of Sciences), China

ThP-GR-6 (Poster)

12:30 - 14:30

Realization of p-type gallium nitride by magnesium ion implantationYating Shi,^{*} Weizong Xu, Xuanhu Chen, Fangfang Ren, Dong Zhou, Jiandong Ye, Dunjun Chen, Rong Zhang, Youdou Zheng, and Hai Lu

School of Electronic Science and Engineering, Nanjing University, China

ThP-GR-7 (Poster)

12:30 - 14:30

3-inch Homogeneous GaN Single Crystal Grown by Na Flux Method

Zong-liang Liu,^{*,1} Hong Gu,¹ Xiao-ming Dong,¹ Guo-qiang Ren,¹ Jian-feng Wang,^{1,2} and Ke Xu^{1,2}

¹Suzhou Institute of Nano-tech and Nano-bionics, CAS, China, ²Suzhou Nanowin Science and Technology Co., Ltd., China

ThP-GR-8 (Poster)

12:30 - 14:30

In-situ observation of AlN crystal growth on Fe-Al melts

Takefumi Yamagata,^{*} Masayoshi Adachi, and Hiroyuki Fukuyama

Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan

ThP-GR-9 (Poster)

12:30 - 14:30

GaN growth on SiC buffer layer formed by carbonization on Si substrates

Yifu Zhu,^{*} Jianwei Wang, Takeshi Momose, Yukihiro Shimogaki, and Momoko Deura

The University of Tokyo, Japan

ThP-GR-10 (Poster)

12:30 - 14:30

Laser slicing techniques for cutting out GaN substrate

Atsushi Tanaka,^{*,1,2} Yasunori Igasaki,¹ and Hiroshi Amano^{1,2,3,4}

¹Institute of Materials and Systems for Sustainability, Nagoya University, Japan, ²National Institute for Materials Science, Japan, ³Akasaki Research Center, Japan, ⁴Venture Business Laboratory, Japan

ThP-GR-11 (Poster)

12:30 - 14:30

Optical characterization of GaN-QPM crystal fabricated by DP-SAG in MOVPE

Kai Matsuhisa,^{*,1} Yuto Kobayashi,¹ Hiroki Ishihara,¹ Mako Sugiura,¹ Atsushi Sugita,¹ Yoku Inoue,¹ and Takayuki Nakano^{1,2}

¹Shizuoka Univ., Japan, ²R.I.E. Shizuoka Univ., Japan

ThP-GR-12 (Poster)

12:30 - 14:30

Investigation of AlGaIn/AlN interface structure and annealing effect for control of strain relaxation

Yuri Itokazu,^{*,1,2} Shunsuke Kuwaba,^{1,2} Jo Masafumi,¹ Norihiko Kamata,² and Hideki Hirayama¹

¹RIKEN, Japan, ²Department of Functional Materials Science, Saitama University, Japan

ThP-GR-13 (Poster)

12:30 - 14:30

Analysis of Solution Structure in Solution growth of SiC with Na flux

Takuro Murata^{*} and Takahiro Kawamura

Graduate School of Engineering, Mie University, Japan

ThP-GR-14 (Poster)

12:30 - 14:30

Solid Phase Epitaxy of AB₂O₄ Complex Oxides: ZnGa₂O₄ as an Example

Po-Wei Chen, Shiau-Yuan Huang, Shuo-Huang Yuan, and Dong-Sing Wu^{*}

Department of Materials Science and Engineering, National Chung Hsing University, Taiwan

ThP-GR-15 (Poster)

12:30 - 14:30

Influence of substrate constraint on the emergence of metastable α -Ga₂O₃

Chika Ohashi,^{*} Takashi Kamo,¹ Ryo Miura,¹ Nao Takekawa,¹ Rie Togashi,² Ken Goto,¹ and Yoshinao Kumagai^{1,3}

¹Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Japan, ²Department of Engineering and Applied Sciences, Sophia University, Japan, ³Institute of Global Innovation Research, Tokyo University of Agriculture and Technology, Japan

ThP-GR-16 (Poster)

12:30 - 14:30

Growth Control of α -Ga₂O₃ Thin Films using Chloride-Based Gallium Source Solutions in Mist Chemical Vapor Deposition

Kazuyuki Uno,^{*} Kazutoshi Matsumoto, and Ichiro Tanaka
Wakayama University, Japan

ThP-GR-17 (Poster)

12:30 - 14:30

Carrier density control of epitaxial NiO thin films grown using mist CVD method

Takumi Ikenoue,^{*} Masao Miyake, and Tetsuji Hirato
Graduate School of Energy Science, Kyoto University, Japan

ThP-CH-2 (Poster)

12:30 - 14:30

Studies on Internal Quantum Efficiency and Carrier Dynamics of AlGaN Ultraviolet Radiation B introduced by Lateral-Polarity Structure

Yingda Qian,^{*} Wei Guo,² Kaiyan He,¹ and Zhe Chuan FENG¹

¹School of Physical Science & Technology, Guangxi University, China, ²Ningbo Institute of Materials Technology and Engineering (NIMTE), Chinese Academy of Sciences, China

ThP-CH-3 (Poster)

12:30 - 14:30

Three Dimensional Optical Characterization of GaN-based Light Emitting Diode Grown on Patterned Sapphire Substrate

Hui-Yu Cheng,¹ Wei-Liang Chen,¹ Yi-Hsin Huang,¹ Tien-Chang Lu,² and Yu-Ming Chang^{*,1}

¹Center for Condensed Matter Sciences, National Taiwan University, Taiwan, ²Department of Photonics, National Chiao Tung University, Taiwan

ThP-CH-4 (Poster)

12:30 - 14:30

InGaN single quantum well intersected by individual dislocations

Gordon Schmidt, Frank Bertram,^{*} Peter Veit, Sebastian Metzner, Christoph Berger, Armin Dadgar, André Strittmatter, and Jürgen Christen

Institute of Physics, Otto-von-Guericke-University Magdeburg, Germany

ThP-CH-5 (Poster)

12:30 - 14:30

Unfolding band structures of BAlN and B GaN alloys

Yuichi Ota

Tokyo Metropolitan Industrial Technology Research Institute, Japan

ThP-CH-6 (Poster)

12:30 - 14:30

Engineering of emission wavelength of InGaN quantum wells by fabrication of spatial off-cut variation

Anna Kafar,^{*}1,2 Ryota Ishii,¹ Szymon Stanczyk,² Krzysztof Gibasiewicz,² Szymon Grzanka,^{2,3} Tadeusz Suski,² Piotr Perlin,^{2,3} Mitsuru Funato,¹ and Yoichi Kawakami¹

¹Kyoto University, Japan, ²Institute of High Pressure Physics PAS, Poland, ³TopGaN Ltd., Poland

ThP-CH-7 (Poster)

12:30 - 14:30

Active Efficiency as an Effective Quality Indicator for the Active Layer of Light-Emitting Diodes

Chan-Hyoung Oh,¹ Jong-In Shim,^{*}2 Dong-Soo Shin,^{2,3} and Hyundon Jung⁴

¹Department of Electronics and Communication Engineering, Hanyang University ERICA, Republic of Korea, ²Department of Photonics and Nanoelectronics, Hanyang University ERICA, Republic of Korea, ³ Department of Bionanotechnology, Hanyang University ERICA, Republic of Korea, ⁴EtaMax Co. Ltd. , Republic of Korea

ThP-CH-8 (Poster)

12:30 - 14:30

Influence of the growth direction for SCAAT™ on annealing effects

Kenji Iso,^{*} Yutaka Mikawa, Hiroataka Ikeda, Kazuriho Hotta, Tae Mochizuki, and Satoru Izumisawa
Mitsubishi Chemical, Japan

ThP-CH-9 (Poster)

12:30 - 14:30

Fabrication of GaN nanowires by wet processes using electrodeless photo-assisted electrochemical etching and alkaline solution treatment

Michihito Shimauchi,^{*}1,2 Kazuki Miwa,¹ Masachika Toguchi,^{1,2} Taketomo Sato,¹ and Junichi Motohisa²

¹Research Center for Integrated Quantum Electronics, Hokkaido University, Japan, ²Graduate School of Information Science and Technology, Hokkaido University, Japan

ThP-CH-10 (Poster)

12:30 - 14:30

Microscopic analysis of heat transport at GaInN/GaN heterointerface with misfit dislocations by two-wavelength Raman measurements

Shungo Okamoto,¹ Bei Ma,¹ Ken Morita,¹ Daisuke Iida,² Kazuhiro Ohkawa,² and Yoshihiro Ishitani^{*}1

¹Chiba University, Japan, ²King Abdullah University of Science and Technology, Saudi Arabia

ThP-CH-11 (Poster)

12:30 - 14:30

Hydrogen sensing comparison for GaN HEMT-based sensors with and without SiNx post-passivation

Tuan Anh Vuong^{*} and Hyungtak Kim

Hongik University, Republic of Korea

ThP-CH-12 (Poster)

12:30 - 14:30

Size-dependent optical characteristics of single InGaN quantum wire grown on c-plane GaN template by MOCVD

Hwan-Seop Yeo,^{*}1 Kwanjae Lee,¹ Young Chul Sim,¹ Seoung-Hwan Park,² and Yong-Hoon Cho¹

¹Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea,

²Department of Electronics Engineering, Catholic University of Daegu, Republic of Korea

ThP-CH-13 (Poster)

12:30 - 14:30

Impact of high-temperature nitrogen annealing on interface properties of p-type 4H-SiC/SiO₂

Keita Tachiki,* Kazutaka Kanegae, and Tsunenobu Kimoto
Kyoto University, Japan

ThP-CH-14 (Poster)

12:30 - 14:30

Investigation of Etching Characteristics of HVPE-Grown In₂O₃ Layers by Hydrogen-Environment Anisotropic Thermal Etching

Ryo Kasaba,*¹ Yuki Ooe,¹ Kenta Nagai,² Ken Goto,² Rie Togashi,¹ Akihiko Kikuchi,¹ and Yoshinao Kumagai²
¹Department of Engineering and Applied Sciences, Sophia University, Japan, ²Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Japan

ThP-CH-15 (Poster)

12:30 - 14:30

The Change of Band Gap Energy for the WS_xSe_y Monolayer

Yung-Huang Chang,*¹ Yuan-Tsung Chen,² Chien-Sheng Huang,³ and Cheng-Jia Tang³
¹Bachelor Program in Interdisciplinary Studies, National Yunlin University of Science and Technology, Taiwan, ²Graduate School of Materials Science, National Yunlin University of Science and Technology, Taiwan, ³Department of Electronic Engineering, National Yunlin University of Science and Technology, Taiwan

ThP-OD-1 (Poster)

12:30 - 14:30

Light Emitting Characteristics of P-GaN on Al_{0.32}Ga_{0.68}N/Al_{0.07}Ga_{0.93}N HEMT

Chih-Yao Chang,* Jun-Lin Wu, and Chih-Fang Huang
Institute of Electronics Engineering, National Tsing Hua University, Taiwan

ThP-OD-2 (Poster)

12:30 - 14:30

Development of Chip-Scale Package GaN-Based Light-Emitting Diodes with Varistor-embedded Ceramic Substrate

Byongjin Ma,*¹ Kwanhun Lee,¹ Young Jun An,² and Kyung-Whan Woo²
¹Korea Electronics Technology Institute (KETI), Republic of Korea, ²Amosense Co. Ltd., Republic of Korea

ThP-OD-3 (Poster)

12:30 - 14:30

Excitation dynamics and efficiency of luminescence of Eu in GaN

Dolf Timmerman,*¹ Masaaki Ashida,² and Yasufumi Fujiwara¹
¹Graduate School of Engineering, Osaka University, Japan, ²Graduate School of Engineering Science, Osaka University, Japan

ThP-OD-4 (Poster)

12:30 - 14:30

Enhanced Resonance of Luminescence in GaN-based Square Microdisks

Menghan Liu,* Peng Chen, Ru Xu, Jing Zhou, Yimeng Li, Cheng Ge, Haocheng Peng, Xiaokang Mao, Zili Xie, Bin Liu, Rong Zhang, and Youdou Zheng
Jiangsu Provincial Key Laboratory of Advanced Photonic and Electronic Materials, School of Electronic Science and Engineering, Nanjing University, China

ThP-OD-5 (Poster)

12:30 - 14:30

Blue light hazard optimization for multi-chip dynamic white light emitting diodes with high color fidelity

Jingxin Nie,^{*}1 Zhizhong Chen,¹ and Fei Jiao^{1,2}

¹State Key Laboratory for Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, China, ² State Key Laboratory of Nuclear Physics and Technology, School of Physics, Peking University, China

ThP-OD-6 (Poster)

12:30 - 14:30

Study of trench defects in green laser diodes

Aiqin Tian,^{*}1,2 Jianping Liu,^{1,2} Renlin Zhou,^{1,2} Liqun Zhang,^{1,2} Siyi Huang,^{1,2} Wei Zhou,^{1,2} Masao Ikeda,^{1,2} Shuming Zhang,^{1,2} Deyao Li,^{1,2} Lingrong Jiang,^{1,2} and Hui Yang^{1,2}

¹Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, China, ²Key Laboratory of Nanodevices and Applications, Chinese Academy of Sciences, China

ThP-OD-7 (Poster)

12:30 - 14:30

Study on the size dependent radiative recombination of GaN-based flip-chip micro light-emitting-diodes

Tae Kyoung Kim,^{*} Abu Bashar Mohammad Hamidul Islam, Moon Uk Cho, Yu-Jung Cha, Jae Hyeok Lee, Jae Min Lee, Cheol Jeong, and Joon Seop Kwak

sunchon national university, Republic of Korea

ThP-OD-8 (Poster)

12:30 - 14:30

Conformational change from V_{Ga} to $N_{Ga}-V_N$ complex in GaN

Taishi Kakihara and Masato Oda^{*}

Department of Applied Physics, Wakayama University, Japan

ThP-OD-9 (Poster)

12:30 - 14:30

Low threshold and high efficiency GaN-based blue laser diodes with ITO cladding layers

Lei Hu,^{*}1,2 Xiaoyu Ren,² Jianping Liu,^{1,2} Aiqin Tian,² Liqun Zhang,^{1,2} and Hui Yang^{1,2}

¹School of Nano Technology and Nano Bionics, USTC, China, ²Suzhou Institute of Nano-Tech and Nano-Bionics, CAS, China

ThP-OD-10 (Poster)

12:30 - 14:30

Investigation of the output power of green light-emitting diodes as functions of chip and V-pit sizes

Da Hoon Lee,^{*}1 Daesung Kang,² Sang-Youl Lee,² Hyeong-Seop Im,³ Tae-Yeon Seong,^{1,3} and Hiroshi Amano⁴

¹Department of Nanophotonics, Korea University, Seoul 02841, Republic of Korea, ²LED Division, LG Innotek Co., Ltd., Paju, Gyeonggi 10842, Republic of Korea, ³Department of Materials Science and Engineering, Korea University, Seoul 02841, Republic of Korea, ⁴Center for Integrated Research of Future Electronics, and Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya 464-8603, Japan

ThP-OD-11 (Poster)

12:30 - 14:30

Modified III-nitrides Nanostructures for Next-generation Energy Harvesters

Praveen KUMAR^{*}1 and Pooja Devi²

¹Indian Association for the Cultivation of Science-Kolkata, India, ²CSIR-Central Scientific Instruments Organisation, Chandigarh, India

ThP-OD-12 (Poster)

12:30 - 14:30

AlN tunneling layer enhanced photo-detection in graphene heterojunction photodetectors

Lian Liu, Jun Yin,* Jing Li, and Junyong Kang
Xiamen University, China

ThP-OD-13 (Poster)

12:30 - 14:30

Experimental Study on Semipolar ($\bar{1}\bar{1}2\bar{2}$) LEDs toward Polar-Plane-Free Faceted InGaN LEDs on ($\bar{1}\bar{1}2\bar{2}$)

Yoshinobu Matsuda,* Mitsuru Funato, and Yoichi Kawakami
Kyoto University, Japan

ThP-OD-14 (Poster)

12:30 - 14:30

Development of GaN Waveguide Wavelength Filter for Quantum Optical Application

Tenta Komatsu,*¹ Masafumi Kihira,¹ Toshiki Hikosaka,² Shinya Nunoue,² Masahiro Uemukai,¹ Tomoyuki Tanikawa,¹ and Ryuji Katayama¹

¹Graduate School of Engineering, Osaka University, Japan, ²Corporate R&D Center, Toshiba Corporation, Japan

ThP-OD-15 (Poster)

12:30 - 14:30

Dual-functioning subwavelength vertical-structure LED

Kang Fu,* Xumin Gao, Jialei Yuan, Linning Wang, Xinyu Xu, and Yongjin Wang
College of Telecommunications and Information Engineering, Nanjing University of Posts and Telecommunications, China

ThP-OD-16 (Poster)

12:30 - 14:30

Improving performance of GaN-based ultraviolet LEDs with Double ITO layers

Xiaomeng Fan* and Shengrui Xu
Wide Band-Gap Semiconductor Technology Disciplines State Key Laboratory, Xi'dian University, China

ThP-OD-17 (Poster)

12:30 - 14:30

Effect of Very High-Fluence Proton Radiation on 40 mm² 6H-SiC Photoconductive Proton Detectors

Qing Liu,*¹ Dong Zhou,¹ Weizong Xu,¹ Ming Qi,² Dunjun Chen,¹ Fangfang Ren,¹ Rong Zhang,¹ Youdou Zheng,¹ and Hai Lu¹

¹School of Electronic Science and Engineering, Nanjing University, China, ²School of Physics, Nanjing University, China

ThP-OD-18 (Poster)

12:30 - 14:30

Effect of DEZn flow rate modulation to phototransistors based on ZnGa₂O₄ epilayers grown by MOCVD

PENG HSUAN HUANG,* YUAN CHU SHEN, CHIUNG YI HUANG, and RAY HUA HONG
Institute of Electronics Engineering, National Chiao Tung University, Taiwan

ThP-OD-19 (Poster)

12:30 - 14:30

Successive Formation of Metal Oxide and Cesium Lead Halide Perovskites Thin Films Using a Mist Deposition Method for All-Inorganic Perovskite Solar Cells

Yuki Haruta,* Takumi Ikenoue, Masao Miyake, and Tetsuji Hirato
Graduate School of Energy Science, Kyoto University, Japan

ThP-OD-20 (Poster)

12:30 - 14:30

Enhancement-mode Light Emitting AlGaIn/GaN HEMT

Chih-Yao Chang,* Shao-Hsiang Huang, and Chih-Fang Huang
Institute of Electronics Engineering, National Tsing Hua University, Taiwan

ThP-OD-21 (Poster)

12:30 - 14:30

Optimization of p-Cladding Layer for Improvement of Deep Ultraviolet Light Emitting Diode performance

Yuji Tomita,*¹ Akira Mishima,² Yuya Yamaoka,¹ Tadanobu Arimura,¹ Shuuichi Koseki,¹ Yoshiki Yano,¹ Kou Matsumoto,¹ and Hideki Hirayama³

¹Taiyo Nippon Sanso Corporation, Japan, ²TNCSE, Japan, ³RIKEN, Japan

ThP-ED-1 (Poster)

12:30 - 14:30

Reduction of Self-Heating in GaN HEMT with Micro-Trench Structure on Silicon Substrate

Srikant Kumar Mohanty and Ray Hua Horng*
Institute of Electronics, National Chiao Tung University, Taiwan

ThP-ED-3 (Poster)

12:30 - 14:30

Stability of all-solid-state AlGaIn/GaN based pH sensors integrated a quasi-reference electrode

Jieying Xing,¹ Yaqiong Dai,*¹ Dejie Huang,¹ Yuebo Liu,¹ Yuan Ren,¹ Xiaobiao Han,¹ Zhisheng Wu,² Yang Liu,^{1,2} and Baijun Zhang^{1,2}

¹School of Electronics and Information Technology, Sun Yat-sen University, China, ²State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-sen University, China

ThP-ED-4 (Poster)

12:30 - 14:30

Simulation Design of GaN Vertical Junction Barrier Schottky Diode with High-K/Low-K Compound Dielectric Structure

Kuiyuan Tian, Jiangfeng Du,* Qi Xin, Yong Liu, and Qi Yu
State Key Laboratory of Electronic Thin Films and Integrated Devices, University of Electronic Science and Technology of China, China

ThP-ED-5 (Poster)

12:30 - 14:30

Effects of Long-Term Low-Temperature Annealing on Mg-Ion Implanted GaN

Shunta Murai,* Ryo Kamoshida, and Masamichi Akazawa
Hokkaido University, Japan

ThP-ED-6 (Poster)

12:30 - 14:30

Design of an L Band GaN Power Amplifier Based on the Transconductance Modified Model

Ziyue Zhao,^{*}1,3 Yang Lu,^{2,3} Hengshuang Zhang,^{2,3} Chupeng Yi,^{1,3} Yuchen Wang,^{1,3} Xiaohua Ma,^{2,3} and Yue Hao^{2,3}

¹School of Advanced Materials and Nanotechnology, Xidian University, China, ²School of Microelectronics, Xidian University, China, ³Key Laboratory for Wide Band-Gap Semiconductor Materials and Devices, Xidian University, China

ThP-ED-7 (Poster)

12:30 - 14:30

High performance Lateral GaN Schottky Barrier Diode with W and Ni Anodes

Yi Wang,^{*} Tao Zhang, JIncheng Zhang, Hong Zhou, and Yue Hao

School of Microelectronics, Xidian University, China

ThP-ED-8 (Poster)

12:30 - 14:30

An enhancement mode MOSFET on GaN-on-silicon for monolithic OEIC

Jiabin Yan,^{*} Jinlong Piao, and Yongjin Wang

Peter Grunberg Research Center, Nanjing University of Posts and Telecommunications, China

ThP-ED-9 (Poster)

12:30 - 14:30

Trapping and temperature effect on performance of GaN vertical nanowire transistor

Terirama Thingujam,^{*} Dong-Hyeok Son, Woo-Hyun Ahn, and Jung-Hee Lee

School of Electronics Engineering, Kyungpook National University, Republic of Korea

ThP-ED-10 (Poster)

12:30 - 14:30

Highly enhanced gate stability in p-GaN gate HEMTs with post-annealing process catalyzed by Ni gate metal

Changkun Zeng,^{*} Weizong Xu, Fangfang Ren, Dong Zhou, Dunjun Chen, Rong Zhang, Youdou Zheng, and Hai Lu

School of Electronic Science and Engineering, Nanjing University, China

ThP-ED-11 (Poster)

12:30 - 14:30

Temperature effects of pre-passivation on P-GaN gated AlGaIn/GaN HEMT

Won-Ho Jang,^{*} Hyun-Seop Kim, Dac Duc Chu, Hyungtak Kim, Ho-Kyoung Lee, Hyunsik Shin, and Ho-Young Cha

School of Electronic and Electrical Engineering, Hongik University, Republic of Korea

ThP-ED-12 (Poster)

12:30 - 14:30

Degradation analysis of SiN_x/GaN MIS-HEMTs under negative gate voltage and drain voltage stress

Tao tao Que,^{*}1 Ya wen Zhao,¹ Liu an Li,¹ Zhen xing Liu,¹ Jin wei Zhang,¹ Xin Gu,¹ Liang He,¹ and Yang Liu^{1,2}

¹School of Electronics and Information Technology, Sun Yat-Sen University, China, ²State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-sen University, China

ThP-ED-13 (Poster)

12:30 - 14:30

Performance of NO₂ gas sensor based on Pd-AlGaIn/GaN HEMT at high temperatures

Cuong Van Nguyen,^{*} Anh Tuan Vuong, Dongmin Keum, and Hyungtak Kim

School of electronic and electrical engineering, Hongik University, Republic of Korea

ThP-ED-14 (Poster)

12:30 - 14:30

Impact Ionization Coefficients for 4H-SiC on a-face (11-20) and their Temperature Variations

Dionysios Stefanakis,* Xilun Chi, Takuya Maeda, Mitsuaki Kaneko, and Tsunenobu Kimoto
Dept. of Electronic Sci. & Eng., Kyoto University, Japan

ThP-ED-16 (Poster)

12:30 - 14:30

Recessed β -Ga₂O₃ Schottky barrier diode

June-Heang Choi* and Ho-Young Cha
School of Electronic and Electrical Engineering, Hongik University, Seoul, Republic of Korea

ThP-ED-17 (Poster)

12:30 - 14:30

Electrical characteristics of Gallium dopant-induced reduced graphene oxide/GaN Schottky diodes

Beo Deul Ryu,* Min Han, Kang Bok Ko, Gun Hee Lee, and Chang-Hee Hong
Chonbuk National University, Republic of Korea

Plenary

Auditorium 14:30-15:20

PL-5 (Plenary)

14:30 - 15:20

Progress of halide perovskite semiconductors in high performance photovoltaics

Tsutomu Miyasaka
¹Toin University of Yokohama, Japan, ²Peccell Technologies, Inc., Japan

Closing

Auditorium 15:20-15:50