

## [TuA1] Growth and Characterization of BN

**Date / Time** May 24 (Tue.), 2022 / 14:15–16:15  
**Place** Convention Hall A  
**Session Chair** Jong-Hwan Kim (POSTECH, Korea)

### [TuA1-1] Invited Talk

**Online** 14:15–14:45

#### The Emergence of Hexagonal Boron Nitride Material as an Enabler for Next Generation III–Nitride Devices

Suresh Sundaram<sup>1,2,3</sup>, Phuong Vuong<sup>2</sup>, Soufiane Karrakchou<sup>1,2</sup>, Adama Mballo<sup>2</sup>, Ashutosh Srivastava<sup>1,2</sup>, Gilles Patriarche<sup>4</sup>, Paul L. Voss<sup>1,2</sup>, Jean Paul Salvestrini<sup>1,2,3</sup>, Abdallah Ougazzaden<sup>1,2</sup>

<sup>1</sup>Georgia Institute of Technology, USA, <sup>2</sup>CNRS, France, <sup>3</sup>Georgia Tech Lorraine, France,

<sup>4</sup>University of Paris–Saclay, France

### [TuA1-2] Oral

**Online** 14:45–15:05

#### The Optical Properties of Polytypes of $sp^2$ -Bonded Boron Nitride

Bernard Gil<sup>1</sup>, James H. Edgar<sup>2</sup>, Jiahan Li<sup>2</sup>, Matthieu Moret<sup>1</sup>, Adrien Rousseau<sup>1</sup>, Pierre Valvin<sup>1</sup>, Guillaume Cassabois<sup>1</sup>, Wilfried Desrat<sup>1</sup>, Sachin Sharma<sup>3</sup>, Laurent Souqui<sup>4</sup>, Henrik Pedersen<sup>3</sup>, Hans Högberg<sup>3</sup>

<sup>1</sup>CNRS–The University of Montpellier, France, <sup>2</sup>Kansas State University, USA, <sup>3</sup>Linköping University, Sweden, <sup>4</sup>University of Illinois Urbana–Champaign, USA

### [TuA1-3] Oral

**Online** 15:05–15:25

#### Novel 2D Layered Boron Rich B(Al)N Ternary Alloys: Epitaxial Growth and Materials Characterization

P. Vuong<sup>1</sup>, A. Mballo<sup>1</sup>, S. Sundaram<sup>1,2,3</sup>, G. Patriarche<sup>4</sup>, Y. Halfaya<sup>5</sup>, T. Moudakir<sup>5</sup>, S. Gautier<sup>5</sup>, P. L. Voss<sup>1,2</sup>, J. P. Salvestrini<sup>1,2,3</sup>, A. Ougazzaden<sup>1,2</sup>

<sup>1</sup>CNRS, France, <sup>2</sup>Georgia Institute of Technology, USA, <sup>3</sup>Georgia Tech Lorraine, France,

<sup>4</sup>University of Paris–Saclay, France, <sup>5</sup>Institut Lafayette, France

### [TuA1-4] Oral

**Offline** 15:25–15:45

#### Epitaxial Growth of Large–Area Single–Crystal Few–Layer Hexagonal Boron Nitride Film on Ni (111)

Kyung Yeol Ma<sup>1,2</sup>, Leining Zhang<sup>1,2</sup>, Rodney S. Ruoff<sup>1,2</sup>, Manish Chhowalla<sup>3</sup>, Feng Ding<sup>1,2</sup>, Hyeon Suk Shin<sup>1,2</sup>

<sup>1</sup>Ulsan National Institute of Science and Technology, Korea, <sup>2</sup>Institute for Basic Science, Korea,

<sup>3</sup>University of Cambridge, UK

### [TuA1-5] Invited Talk

**Offline** 15:45–16:15

#### Growth of Monolayer and Few–Layer Hexagonal Boron Nitride by Chemical Vapor Deposition

Hyeon Suk Shin

Ulsan National Institute of Science and Technology, Korea

## [TuA2] Optical Properties of BN

**Date / Time** May 24 (Tue.), 2022 / 16:30–18:30

**Place** Convention Hall A

**Session Chair** Hyeon Suk Shin (UNIST, Korea)

### [TuA2-1] Invited Talk

**Online** 16:30–17:00

#### Efficient Light–Matter Interaction in Hexagonal Boron Nitride

Guillaume CASSABOIS

*CNRS–The University of Montpellier, France*

### [TuA2-2] Invited Talk

**Offline** 17:00–17:30

#### Probing Deep–Ultraviolet Optoelectronic Processes in Hexagonal Boron Nitride

Jonghwan Kim

*Pohang University of Science and Technology, Korea*

### [TuA2-3] Oral

**Online** 17:30–17:50

#### First Observation of Bernal Boron Nitride Single Crystals

Rousseau Adrien<sup>1</sup>, Valvin Pierre<sup>1</sup>, Cassabois Guillaume<sup>1</sup>, Gil Bernard<sup>1</sup>, James H. Edgar<sup>2</sup>, Jiahan Li<sup>2</sup>, Eli Janzen<sup>2</sup>

*<sup>1</sup>CNRS–The University of Montpellier, France, <sup>2</sup>Kansas State University, USA*

### [TuA2-4] Oral

**Online** 17:50–18:10

#### Deep–Ultraviolet Electroluminescence in Van der Waals Heterostructures of Hexagonal Boron Nitride

Sangho Yoon<sup>1,2</sup>, Su–Beom Song<sup>1,2</sup>, So Young Kim<sup>1,2</sup>, Sera Yang<sup>1</sup>, Seung–Young Seo<sup>1,2</sup>, Soonyoung Cha<sup>1,2</sup>, Hyeon–Woo Jeong<sup>1</sup>, Kenji Watanabe<sup>3</sup>, Takashi Taniguchi<sup>3</sup>, Gil–Ho Lee<sup>1</sup>, Jun Sung Kim<sup>1,2</sup>, Moon–Ho Jo<sup>1,2</sup>, Jonghwan Kim<sup>1,2</sup>

*<sup>1</sup>Pohang University of Science and Technology, Korea, <sup>2</sup>Institute for Basic Science, Korea,*

*<sup>3</sup>National Institute for Materials Science, Japan*

### [TuA2-5] Oral

**Online** 18:10–18:30

#### Deep–Ultraviolet Photoluminescence Excitation Spectroscopy of Hexagonal Boron–Nitride Crystals

Su–Beom Song<sup>1,2</sup>, Sangho Yoon<sup>1,2</sup>, So Young Kim<sup>1,2</sup>, Sera Yang<sup>1</sup>, Seung–Young Seo<sup>1,2</sup>, Soonyoung Cha<sup>1,2</sup>, Hyeon–Woo Jeong<sup>1</sup>, Kenji Watanabe<sup>3</sup>, Takashi Taniguchi<sup>3</sup>, Gil–Ho Lee<sup>1</sup>, Jun Sung Kim<sup>1,2</sup>, Moon–Ho Jo<sup>1,2</sup>, Jonghwan Kim<sup>1,2</sup>

*<sup>1</sup>Pohang University of Science and Technology, Korea, <sup>2</sup>Institute for Basic Science, Korea,*

*<sup>3</sup>National Institute for Materials Science, Japan*

## [WeA1] Ultra-Wide Bandgap Gallium Oxide: Growth and Devices

**Date / Time** May 25 (Wed.), 2022 / 10:00–12:00  
**Place** Convention Hall A  
**Session Chair** Ho-Young Cha (Hongik University, Korea)

### [WeA1-1] Invited Talk

**Online** 10:00–10:30

#### $\beta$ -Ga<sub>2</sub>O<sub>3</sub>: Growth, Doping, and Device Design

A. Mauze, T. Itoh, E. Farzana, Y. Zhang, J. Speck  
*University of California, USA*

### [WeA1-2] Invited Talk

**Online** 10:30–11:00

#### NiO/Ga<sub>2</sub>O<sub>3</sub> p-n Heterojunction Based Bipolar Devices

Jiandong Ye, Hehe Gong, Feng Zhou, Hai Lu, Fangfang Ren, Shulin Gu, Rong Zhang  
*Nanjing University, China*

### [WeA1-3] Oral

**Online** 11:00–11:20

#### Heteroepitaxial Growth of (AlGa)<sub>2</sub>O<sub>3</sub> Thin Films on Sapphire Substrates by Plasma-Assisted Pulsed Laser Deposition

Zewei Chen<sup>1</sup>, Makoto Arita<sup>2</sup>, Katsuhiko Saito<sup>1</sup>, Tooru Tanaka<sup>1</sup>, Qixin Guo<sup>1</sup>  
<sup>1</sup>Saga University, Japan, <sup>2</sup>Kyushu University, Japan

### [WeA1-4] Oral

**Offline** 11:20–11:40

#### Enhancement Mode $\beta$ -(Al<sub>0.19</sub>Ga<sub>0.81</sub>)<sub>2</sub>O<sub>3</sub>/Ga<sub>2</sub>O<sub>3</sub> HFETs with Superlattice Back-Barrier: A TCAD Modeling and Comprehensive Investigation

Gokhan Atmaca, Ho-Young Cha  
*Hongik University, Korea*

### [WeA1-5] Oral

**Online** 11:40–12:00

#### Flexible Ga<sub>2</sub>O<sub>3</sub> Electronics: From Vdw Epitaxy to Membrane Exfoliation

Yi Lu, Shibin Krishna, Che-Hao Liao, Alaa Almushaikeh, Xiao Tang, Xiaohang Li  
*King Abdullah University of Science and Technology, Saudi Arabia*

## [WeB1] UV Lasers and Photodetectors

**Date / Time** May 25 (Wed.), 2022 / 10:00–12:00  
**Place** Convention Hall B  
**Session Chair** Myeong Seok Oh (Photon Wave Co., Ltd., Korea)

### [WeB1-1] Invited Talk

**Online** 10:00–10:30

#### AlGaN-Based UV-B Laser Diodes Fabricated on Lattice-Relaxed AlGaIn Formed on Sapphire Substrates

Motoaki Iwaya<sup>1</sup>, Sho Iwayama<sup>1,2</sup>, Tetsuya Takeuchi<sup>1</sup>, Satoshi Kamiyama<sup>1</sup>, Hideto Miyake<sup>1</sup>  
*<sup>1</sup>Meijo University, Japan, <sup>2</sup>Mie University, Japan*

### [WeB1-2] Invited Talk

**Online** 10:30–11:00

#### Semipolar AlGaIn-Based Solar-Blind Ultraviolet Photodetectors with Fast Response

Tongbo Wei, Yaqi Gao, Jiankun Yang, Jianchang Yan, Junxi Wang, Jinmin Li  
*Chinese Academy of Sciences, China*

### [WeB1-3] Oral

**Online** 11:00–11:20

#### Effect of Oxygen Vacancies in Heteroepitaxial $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Thin Film Solar Blind Photodetectors

R.Xu, X.C.Ma, Y.H.Chen, Y.Mei, L.Y.Ying, B.P.Zhang, H.Long  
*Xiamen University, China*

### [WeB1-4] Oral

**Online** 11:20–11:40

#### Gain Characteristic of AlGaIn-Based Optically Pumped Lasers with SQW Active Region Emitting at 275 nm

Giulia Cardinali<sup>1</sup>, Bernd Witzigmann<sup>2</sup>, Markus Blonski<sup>1</sup>, Norman Susilo<sup>1</sup>, Daniel Hauer Vidal<sup>1</sup>, Martin Guttman<sup>1</sup>, Felix Nippert<sup>1</sup>, Tim Wernicke<sup>1</sup>, Markus R. Wagner<sup>1</sup>, Michael Kneissl<sup>1</sup>  
*<sup>1</sup>The Technical University of Berlin, Germany, <sup>2</sup>University of Erlangen-Nuremberg, Germany*

### [WeB1-5] Oral

**Online** 11:40–12:00

#### Performances of AlGaIn-Based UV-B Laser Diode Fabricated on Periodic Concavo-Convex AlN Patterns

R. Kondo<sup>1</sup>, T. Omori<sup>1</sup>, K. Yamada<sup>1</sup>, R. Hasegawa<sup>1</sup>, A. Yabutani<sup>1</sup>, E. Matsubara<sup>1</sup>, S. Iwayama<sup>1,2</sup>, M. Iwaya<sup>1</sup>, T. Takeuchi<sup>1</sup>, S. Kamiyama<sup>1</sup>, H. Miyake<sup>2</sup>  
*<sup>1</sup>Meijo University, Japan, <sup>2</sup>Mie University, Japan*

## [WeA2] Ultra-Wide Bandgap Gallium Oxide: Growth and Properties

**Date / Time** May 25 (Wed.), 2022 / 13:00–14:40

**Place** Convention Hall A

**Session Chair** Si-Young Bae (KICET, Korea)

### [WeA2-1] Invited Talk

**Online** 13:00–13:30

#### Potentials of Future Ultra-Wide Bandgap Oxide Semiconductors

Shizuo Fujita<sup>1</sup>, Kentaro Kaneko<sup>1</sup>, Takeyoshi Onuma<sup>2</sup>

<sup>1</sup>Kyoto University, Japan, <sup>2</sup>Kogakuin University, Japan

### [WeA2-2] Invited Talk

**Offline** 13:30–14:00

#### Structural Defects in Monoclinic $\beta$ -Ga<sub>2</sub>O<sub>3</sub>

Ngo Si Trong<sup>1</sup>, Hyeon Woo Kim<sup>2</sup>, Sung Beom Cho<sup>2</sup>, Young Heon Kim<sup>1</sup>, Nguyen Quoc Vuong<sup>1</sup>,  
Hu Young Jeong<sup>3</sup>, SoonKu Hong<sup>1</sup>

<sup>1</sup>Chungnam National University, Korea, <sup>2</sup>Korea Institute of Ceramic Engineering and Technology, Korea,  
<sup>3</sup>Ulsan National Institute of Science and Technology, Korea

### [WeA2-3] Oral

**Online** 14:00–14:20

#### In-Plane Crystalline Anisotropy of $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Bulk

Xiaocui Ma, Rui Xu, Leiying Ying, Yang Mei, Hao Long, Baoping Zhang  
*Xiamen University, China*

### [WeA2-4] Oral

**Online** 14:20–14:40

#### Electrical Properties of $\alpha$ -Ga<sub>2</sub>O<sub>3</sub> Films Grown by HVPE on Sapphire with $\alpha$ -Cr<sub>2</sub>O<sub>3</sub> Buffers

Alexander Polyakov<sup>1</sup>, Vladimir Nikolaev<sup>2,3</sup>, Sergey Stepanov<sup>3</sup>, Alexey Pechnikov<sup>3</sup>, Alexey Almaev<sup>4</sup>,  
Eugene Yakimov<sup>1,5</sup>, Bohdan Kushnarev<sup>4</sup>, Ivan Shchemerov<sup>1</sup>, Mikhail Sheglov<sup>2</sup>, Alexey Chernykh<sup>1</sup>,  
Anton Vasilev<sup>1</sup>, Anastasiya Kochkova<sup>1</sup>, Stephen Pearton<sup>6</sup>

<sup>1</sup>National University of Science and Technology MISiS, Russia, <sup>2</sup>IOFFE Institute, Russia,

<sup>3</sup>Perfect Crystals LLC, USA, <sup>4</sup>National Research Tomsk State University, Russia,

<sup>5</sup>Russian Academy of Sciences, Russia, <sup>6</sup>University of Florida, USA

## [WeB2] Applications of UV LEDs

**Date / Time** May 25 (Wed.), 2022 / 13:00–14:40  
**Place** Convention Hall B  
**Session Chair** Okhyun Nam (Tech University of Korea, Korea)

### [WeB2-1] Invited Talk

**Offline** 13:00–13:30

#### Current Status and Future Works of High-Power Deep UV LEDs

Rakjun Choi, Kyoung-Hoon Kim, Sung-Jin Son  
*SL Vionics Co., Ltd., Korea*

### [WeB2-2] Invited Talk

**Online** 13:30–14:00

#### Deep Ultraviolet Micro-LEDs Exhibiting High Output Power and Broad Bandwidth Simultaneously

Xinqiang Wang<sup>1</sup>, Duo Li<sup>1</sup>, Shangfeng Liu<sup>1</sup>, Junjie Kang<sup>2</sup>, Pengfei Tian<sup>3</sup>, Bo Shen<sup>1</sup>

<sup>1</sup>*Peking University, China*, <sup>2</sup>*Songshan Lake Materials Laboratory, China*, <sup>3</sup>*Fudan University, China*

### [WeB2-3] Oral

**Online** 14:00–14:20

#### Spectrally Pure Far-UVC Emission from AlGaIn-Based LEDs Using Dielectric Band Pass Filters for Skin-Tolerant UV Antisepsis

Martin Guttman<sup>1,2</sup>, Neysha Lobo-Ploch<sup>2</sup>, Heiko Gundlach<sup>1</sup>, Frank Mehnke<sup>1</sup>, Marcel Schilling<sup>1</sup>, Luca Sulmoni<sup>1</sup>, Tim Wernicke<sup>1</sup>, Hyun Kyong Cho<sup>2</sup>, Thomas Filler<sup>2</sup>, Ulrike Woggon<sup>1</sup>, Indira K pplinger<sup>3</sup>, Thomas Ortlepp<sup>3</sup>, Johannes Schleusener<sup>4</sup>, Martina C. Meinke<sup>4</sup>, Paula Zwicker<sup>5</sup>, Axel Kramer<sup>5</sup>, Sven Einfeldt<sup>2</sup>, Michael Kneissl<sup>1,2</sup>

<sup>1</sup>*The Technical University of Berlin, Germany*, <sup>2</sup>*Ferdinand-Braun-Institut, Germany*,

<sup>3</sup>*CiS Forschungsinstitut f r Mikrosensorik GmbH, Germany*, <sup>4</sup>*Charity-University Medicine Berlin, Germany*,

<sup>5</sup>*Greifswald University Hospital, Germany*

### [WeB2-4] Oral

**Online** 14:20–14:40

#### Simultaneous Improvement of the Reliability and Efficiency of UV LEDs

J. Ruschel<sup>1</sup>, J. Glaab<sup>1</sup>, T. Kolbe<sup>1</sup>, N. Susilo<sup>2</sup>, A. Knauer<sup>1</sup>, M. Schilling<sup>2</sup>, S. Hagedorn<sup>1</sup>, T. Wernicke<sup>2</sup>, M. Weyers<sup>1</sup>, M. Kneissl<sup>1,2</sup>, S. Einfeldt<sup>1</sup>

<sup>1</sup>*Ferdinand-Braun-Institut, Germany*, <sup>2</sup>*The Technical University of Berlin, Germany*

## [WeA3] Diamond Power Semiconductors: Growth and Devices

**Date / Time** May 25 (Wed.), 2022 / 14:55–16:25  
**Place** Convention Hall A  
**Session Chair** Soon-Ku Hong (Chungnam National University, Korea)

### [WeA3-1] Invited Talk

**Online** 14:55–15:25

#### Two-Inch High Quality Diamond Heteroepitaxial Growth on Sapphire for Power Devices

Seong-Woo Kim<sup>1</sup>, Makoto Kasu<sup>2</sup>

<sup>1</sup>Adamant Namiki Precision Jewel Co., Ltd., Japan, <sup>2</sup>Saga University, Japan

### [WeA3-2] Oral

**Online** 15:25–15:45

#### High Breakdown Voltage of Boron-Doped Diamond Metal Semiconductor Field Effect Transistor Grown on Freestanding Heteroepitaxial Diamond Substrate

Uiho Choi<sup>1</sup>, Taemyung Kwak<sup>1</sup>, Sanghun Han<sup>1</sup>, Seongwoo Kim<sup>2</sup>, Okhyun Nam<sup>1</sup>

<sup>1</sup>Tech University of Korea, Korea, <sup>2</sup>Adamant Namiki Precision Jewel Co., Ltd., Japan

### [WeA3-3] Oral

**Offline** 15:45–16:05

#### Diamond Schottky Barrier Diode Fabricated on High-Quality Misoriented Heteroepitaxial Diamond Substrate Using Microwave Plasma Chemical Vapor Deposition

Taemyung Kwak<sup>1</sup>, Uiho Choi<sup>1</sup>, Sanghun Han<sup>1</sup>, Seong-woo Kim<sup>2</sup>, Okhyun Nam<sup>1</sup>

<sup>1</sup>Tech University of Korea, Korea, <sup>2</sup>Adamant Namiki Precision Jewel Co., Ltd., Japan

### [WeA3-4] Oral

**Offline** 16:05–16:25

#### Phonons, Isotope Effects, and Point Defects in $\beta$ - and $\kappa/\epsilon$ -Ga<sub>2</sub>O<sub>3</sub>

B. M. Janzen<sup>1</sup>, P. Mazzolini<sup>2,3</sup>, R. Gillen<sup>4</sup>, A. Falkenstein<sup>5</sup>, V. F. S. Peltason<sup>1</sup>, H. Tornatzky<sup>1</sup>, L. P. Grote<sup>1</sup>, M. Martin<sup>5</sup>, J. Maultzsch<sup>4</sup>, R. Fornari<sup>3</sup>, Z. Galazka<sup>6</sup>, O. Bierwagen<sup>2</sup>, M. R. Wagner<sup>1</sup>

<sup>1</sup>Technical University of Berlin, Germany, <sup>2</sup>Paul-Drude-Institut für Festkörperelektronik, Germany,

<sup>3</sup>University of Parma, Italy, <sup>4</sup>University of Erlangen-Nuremberg, Germany, <sup>5</sup>RWTH Aachen University, Germany, <sup>6</sup>Leibniz-Institut für Kristallzüchtung, Germany

## [WeB3] Efficiency Improvement of UV LEDs

**Date / Time** May 25 (Wed.), 2022 / 14:55–16:55  
**Place** Convention Hall B  
**Session Chair** Rak-Jun Choi (SL Vionics, Korea)

### [WeB3-1] Invited Talk

**Online** 14:55–15:25

#### Growth, Fabrication and Applications of Far-UVC LEDs with Emission below 240 nm

Tim Wernicke

*The Technical University of Berlin, Germany*

### [WeB3-2] Invited Talk

**Online** 15:25–15:55

#### Interband Tunnel Junctions for AlGaIn Ultra-Violet Light Emitting Diodes

Agnes Maneesha Dominic Xavier, Arnob Ghosh, Mohammad Ifatur Rahman, Zane Jamal-Eddine, Shamsul Arafin, Siddharth Rajan

*The Ohio State University, USA*

### [WeB3-3] Oral

**Offline** 15:55–16:15

#### Improving Light Extraction of AlGaIn-Based Deep-UV LEDs By Using Highly Reflective Electrode

Youn Joon Sung, Seung Kyu Oh, Giljoon Lee, Chan Young Park, Hae Jin Park, Tae Wan Kwon, Myeong Seok Oh

*Photon Wave Co., Ltd., Korea*

### [WeB3-4] Oral

**Online** 16:15–16:35

#### Remarkable Light Extraction Enhancement in 304nm-Band AlGaIn UVB LED via Engineering of NanoPSS and Photonic Crystal in p-AlGaIn Contact Layer

M. Ajmal Khan<sup>1,2</sup>, E. Matsuura<sup>1,3</sup>, Y. Kashima<sup>1</sup>, M. Maeda<sup>1</sup>, M. Jo<sup>1</sup>, K. Iimura<sup>2</sup>, Hideki Hirayama<sup>1</sup>

<sup>1</sup>RIKEN, Japan, <sup>2</sup>Farmroid Co., Ltd., Japan, <sup>3</sup>Marubun Corporation, Japan

### [WeB3-5] Oral

**Offline** 16:35–16:55

#### UV-B LED Performance with Transparent p-AlGaIn Layer

Won Ho Kim, Tae Wan Kwon, Hyun Chul Lim

*Photon Wave Co., Ltd., Korea*



## [ThA1] UV Photonics and Photonic Devices I

**Date / Time** May 26 (Thu.), 2022 / 09:00–10:40

**Place** Convention Hall A

**Session Chair** Yong-Hoon Cho (KAIST, Korea)

### [ThA1-1] Invited Talk

**Online** 09:00–09:30

#### High-Efficiency AlGaN Homojunction Tunnel-Junction Deep-UV LEDs

Kengo Nagata<sup>1,2</sup>, Taichi Matsubara<sup>1</sup>, Satoshi Anada<sup>3</sup>, Yoshiki Saito<sup>2</sup>, Maki Kushimoto<sup>1</sup>, Yoshio Honda<sup>1</sup>, Tetsuya Takeuchi<sup>4</sup>, Kazuo Yamamoto<sup>3</sup>, Tsukasa Hirayama<sup>1,3</sup>, Hiroshi Amano<sup>1</sup>

<sup>1</sup>Nagoya University, Japan, <sup>2</sup>Toyoda Gosei Co., Ltd., Japan, <sup>3</sup>Japan Fine Ceramics Center, Japan,

<sup>4</sup>Meijo University, Japan

### [ThA1-2] Invited Talk

**Online** 09:30–10:00

#### High Internal Quantum Efficiency of AlGaN UV-C MQWs on Face-to-Face Annealed Sputter-Deposited AlN Templates

Hideaki Murotani<sup>1</sup>, Yoichi Yamada<sup>2</sup>

<sup>1</sup>Tokuyama College, Japan, <sup>2</sup>Yamaguchi University, Japan

### [ThA1-3] Oral

**Online** 10:00–10:20

#### Single Photon Emission and Carrier Dynamics in GaN/AlN Quantum Dots

J. Stachurski, G. Callsen, S. Tamariz, R. Butté, N. Grandjean

Swiss Federal Institute of Technology Lausanne, Switzerland

### [ThA1-4] Oral

**Offline** 10:20–10:40

#### Improvement of Single-Photon Purity and Linewidth of Near-Ultraviolet InGaN Quantum Emitters Using Quasi-Resonant Excitation

Seongmoon Jun<sup>1</sup>, Minho Choi<sup>1</sup>, Martina Morassi<sup>2</sup>, Maria Tchernycheva<sup>2</sup>, Noëlle Gogneau<sup>2</sup>, Yong-Hoon Cho<sup>1</sup>

<sup>1</sup>Korea Advanced Institute of Science and Technology, Korea, <sup>2</sup>Paris-Sud University, France

## [ThB1] Nanostructures and Nanodevices

**Date / Time** May 26 (Thu.), 2022 / 09:00–10:40  
**Place** Convention Hall B  
**Session Chair** Young Joon Hong (Sejong University, Korea)

### [ThB1-1] Invited Talk

**Online** 09:00–09:30

#### Understanding and Improving the Efficiency of hBN and AlGaN Light Emitters through Predictive Atomistic Calculations

Emmanouil Kioupakis  
*University of Michigan, USA*

### [ThB1-2] Invited Talk

**Online** 09:30–10:00

#### Luminescence Properties for III-Nitride Semiconductor Nanostructures and Optoelectronic Devices with Wavelength Range from Visible to Ultraviolet

Bin Liu<sup>1</sup>, Tao Tao<sup>1</sup>, Ting Zhi<sup>1</sup>, Yan Yu<sup>1</sup>, Zili Xie<sup>1</sup>, Fangfang Ren<sup>1</sup>, Dunjun Chen<sup>1</sup>, Hai Lu<sup>1</sup>, Huang Kai<sup>2</sup>, Jinchai Li<sup>2</sup>, Rong Zhang<sup>1,2</sup>  
<sup>1</sup>*Nanjing University, China*, <sup>2</sup>*Xiamen University, China*

### [ThB1-3] Oral

**Offline** 10:00–10:20

#### Deep UV LEDs with Quantum Dots Active Regions

J. Brault<sup>1</sup>, A. Zaiter<sup>1</sup>, M. Leroux<sup>1</sup>, M. Al Khalfioui<sup>1</sup>, N. Nikitskiy<sup>1</sup>, S. Matta<sup>1,2,3</sup>, A. Courville<sup>1</sup>, V. Brändli<sup>1</sup>, P. Genevet<sup>1</sup>, T.-H. Ngo<sup>2</sup>, P. Valvin<sup>2</sup>, B. Gil<sup>2</sup>, J.-H. Cho<sup>4</sup>, S.-H. Lim<sup>4</sup>, M. Choi<sup>4</sup>, Y.-H. Cho<sup>4</sup>  
<sup>1</sup>*CNRS-CRHEA, France*, <sup>2</sup>*CNRS-The University of Montpellier, France*, <sup>3</sup>*RIBER S.A, France*, <sup>4</sup>*Korea Advanced Institute of Science and Technology, Korea*

### [ThB1-4] Oral

**Offline** 10:20–10:40

#### Direct Growth of Wafer Scale Hexagonal Boron Nitride on Silicon Based Substrate by MOCVD for Silicon Electronics

Jiye Kim, Chang-Won Choi, Seokho Moon, Doh Kyung Yeon, Hokyong Jeong, Jaewon Kim, Dong-Hwan Yang, Donghwa Lee, Si-Young Choi, Jong Kyu Kim  
*Pohang University of Science and Technology, Korea*

## [ThA2] UV Photonics and Photonic Devices II

**Date / Time** May 26 (Thu.), 2022 / 10:55–12:05

**Place** Convention Hall A

**Session Chair** Dong-Seon Lee (GIST, Korea)

### [ThA2-1] Invited Talk

**Online** 10:55–11:25

#### Harmful Role of Hydrogen in Deep UV Materials and Devices

Duanjun Cai<sup>1</sup>, Shiqiang Lu<sup>1</sup>, Zhibai Zhong<sup>1</sup>, Bin Guo<sup>1</sup>, Zefeng Lin<sup>1</sup>, Xiaohong Chen<sup>1</sup>, Feiya Xu<sup>1</sup>, Fuchun Xu<sup>1</sup>, Shuping Li<sup>1</sup>, Junyong Kang<sup>1</sup>, June Key Lee<sup>2</sup>

<sup>1</sup>Xiamen University, China, <sup>2</sup>Chonnam National University, Korea

### [ThA2-2] Oral

**Online** 11:25–11:45

#### One-Dimensional Confinement of Excitons in GaN/AlN Nanostructures Formed on Bunched Steps

Mitsuru Funato, Yoichi Kawakami

*Kyoto University, Japan*

### [ThA2-3] Oral

**Offline** 11:45–12:05

#### Color-Converting Phosphor with Metal-Organic Frameworks Based Mixed-Matrix Membrane for High-Speed Ultraviolet-Light Optical Wireless Communication

Yue Wang, Jian-Xin Wang, Omar Alkhazragi, Chun Hong Kang, Zyad O. F. Mohammed, Tien Khee Ng, Omar F. Mohammed, Boon S. Ooi

*King Abdullah University of Science and Technology, Saudi Arabia*

## [ThB2] AlN Bulk Crystals and Templates-1 (Strain Engineering)

**Date / Time** May 26 (Thu.), 2022 / 10:55-12:05

**Place** Convention Hall B

**Session Chair** Si-Young Bae (KICET, Korea)

### [ThB2-1] Invited Talk

**Online** 10:55-11:25

#### AlGaN Strain-Quality Engineering on Low Dislocation Density AlN Templates for High-Power UVC LEDs

Chia-Yen Huang<sup>1</sup>, Sebastian Walde<sup>2</sup>, Chia-Lung Tsai<sup>3</sup>, Wen-Hsuang Hsieh<sup>1</sup>, Yi-Keng Fu<sup>3</sup>, Sylvia Hagedorn<sup>2</sup>, Tien-Chang Lu<sup>1</sup>, Markus Weyers<sup>2</sup>

<sup>1</sup>National Yang Ming Chiao Tung University, Taiwan, <sup>2</sup>Ferdinand-Braun-Institut, Germany, <sup>3</sup>Industrial Technology Research Institute, Taiwan

### [ThB2-2] Oral

**Online** 11:25-11:45

#### Hexagonal BN-Assisted Growth of Strain-Free AlN Films for Deep-Ultraviolet Light-Emitting Diodes

Lulu Wang<sup>1,2</sup>, Tongbo Wei<sup>1,2</sup>, Yanfeng Zhang<sup>3</sup>, Fan Zhou<sup>3</sup>, Junxi Wang<sup>1,2</sup>, Jinmin Li<sup>1,2</sup>

<sup>1</sup>Chinese Academy of Sciences, China, <sup>2</sup>University of Chinese Academy of Sciences, China, <sup>3</sup>Peking University, China

### [ThB2-3] Oral

**Online** 11:45-12:05

#### High-Quality Semipolar (10-13) AlN Epilayers Grown on M-Plane Sapphire Substrates by NH<sub>3</sub>-Free High Temperature MOCVD

X. Q. Shen, K. Kojima

National Institute of Advanced Industrial Science and Technology, Japan

## [ThA3] Growth and Properties of AlGaN Heterostructures

**Date / Time** May 26 (Thu.), 2022 / 13:00–15:00  
**Place** Convention Hall A  
**Session Chair** Jong-In Shim (Hayang University, Korea)

### [ThA3-1] Invited Talk

**Offline** 13:00–13:30

#### Strategies of AlGaN Heterostructure Design and Growth for UVC Optoelectronic and Electronic Device Applications

Uiho Choi<sup>1</sup>, Minho Kim<sup>1</sup>, Byeongchan So<sup>2</sup>, Okhyun Nam<sup>1</sup>

<sup>1</sup>Tech University of Korea, Korea, <sup>2</sup>Karlsruhe Institute of Technology, Germany

### [ThA3-2] Invited Talk

**Offline** 13:30–14:00

#### Nanoscale Characterization of Novel AlGaN/GaN-Based Nanostructures

Juergen Christen, Gordon Schmidt, Frank Bertram  
*Otto von Guericke University Magdeburg, Germany*

### [ThA3-3] Oral

14:00–14:20

Withdrawn

### [ThA3-4] Oral

**Offline** 14:20–14:40

#### Development of High Power 345nm AlGaN-Based UVA LEDs Grown on AlN Template

Hae Jin Park, Yoon Joon Sung, Seung Kyu Oh, Myeong Seok Oh  
*Photon Wave Co., Ltd., Korea*

### [ThA3-5] Oral

**Online** 14:40–15:00

#### Atomic-Scale Mechanism of Spontaneous Polarity Inversion in Nitrides on Sapphire Substrate Grown by MOCVD

Liu Zhiqiang<sup>1</sup>, Gao Peng<sup>2</sup>

<sup>1</sup>Chinese Academy of Sciences, China, <sup>2</sup>Peking University, China

## [ThB3] AlN Bulk Crystals and Templates–2 (Crystalline Quality)

**Date / Time** May 26 (Thu.), 2022 / 13:00–14:40  
**Place** Convention Hall B  
**Session Chair** Hae–Yong Lee (LumiGNtech Co., Ltd., Korea)

### [ThB3–1] Invited Talk

**Online** 13:00–13:30

#### Fabrication of Face-to-Face Annealed Sputter-Deposited AlN for High EQE 265 nm LEDs

Kenjiro Uesugi<sup>1</sup>, Shigeyuki Kuboya<sup>1</sup>, Takao Nakamura<sup>1,2</sup>, Kanako Shojiki<sup>1</sup>, Shiyu Xiao<sup>1</sup>, Masataka Kubo<sup>1</sup>, Hideto Miyake<sup>1</sup>

<sup>1</sup>Mie University, Japan, <sup>2</sup>The University of Tokyo, Japan

### [ThB3–2] Invited Talk

**Offline** 13:30–14:00

#### High-Temperature Annealed Al(Ga)N Templates for UV LEDs–Opportunities and Challenges

Sylvia Hagedorn, Tim Kolbe, Arne Knauer, Anna Mogilatenko, Markus Weyers  
*Ferdinand–Braun–Institut, Germany*

### [ThB3–3] Oral

**Online** 14:00–14:20

#### Crystalline Quality Improvement of N-Polar AlN Films Sputtered on 4H-SiC Substrates

Ruijie Zhang<sup>1,2</sup>, Yanan Guo<sup>1,2</sup>, Tingsong Cai<sup>1,2</sup>, Zhibin Liu<sup>1,2</sup>, Jianchang Yan<sup>1,2</sup>, Jinmin Li<sup>1,2</sup>, Junxi Wang<sup>1,2</sup>  
<sup>1</sup>Chinese Academy of Sciences, China, <sup>2</sup>University of Chinese Academy of Sciences, China

### [ThB3–4] Oral

**Online** 14:20–14:40

#### Crystalline Quality and Surface Morphology Improvement of Face to Face Annealed MBE-Grown AlN on h-BN

Aly Zaiter<sup>1</sup>, Adrien Michon<sup>1</sup>, Aimeric Courville<sup>1</sup>, Maud Nemoz<sup>1</sup>, Philippe Vennéguès<sup>1</sup>, Phuong Vuong<sup>2</sup>, Suresh Sundaram<sup>2</sup>, Abdallah Ougazzaden<sup>2,3</sup>, Julien Brault<sup>1</sup>

<sup>1</sup>CNRS–CRHEA, France, <sup>2</sup>Georgia Tech Lorraine, France, <sup>3</sup>Georgia Institute of Technology, USA

## [ThA4] Physical Properties of Wide Bandgap Materials

**Date / Time** May 26 (Thu.), 2022 / 15:15–16:45  
**Place** Convention Hall A  
**Session Chair** Dong-Soo Shin (Hayang University, Korea)

[ThA4-1] Invited

15:15–15:45

Withdrawn

[ThA4-2] Oral

Online 15:45–16:05

**Band Alignment and Electronic Properties of Orthorhombic Ga<sub>2</sub>O<sub>3</sub> with GaN and AlN Semiconductors**

Shibin Krishna, Yi Lu, Che-Hao Liao, Vishal Khandelwal, Xiaohang Li  
*King Abdullah University of Science and Technology, Saudi Arabia*

[ThA4-3] Oral

Online 16:05–16:25

**Analyses of Band Alignment in Rocksalt-Structured MgZnO/MgO Interface**

Masaki Matsuda<sup>1</sup>, Kotaro Ogawa<sup>1,2</sup>, Yuichi Ota<sup>3</sup>, Tomohiro Yamaguchi<sup>1</sup>, Kentaro Kaneko<sup>4</sup>, Shizuo Fujita<sup>4</sup>,  
Tohru Honda<sup>1</sup>, Takeyoshi Onuma<sup>1</sup>

<sup>1</sup>Kogakuin University, Japan, <sup>2</sup>ORC Manufacturing Co., Ltd., Japan, <sup>3</sup>Tokyo Metropolitan Industrial  
Technology Research Institute, Japan, <sup>4</sup>Kyoto University, Japan

[ThA4-4] Oral

Offline 16:25–16:45

**Dislocation Analysis of GaN-Based Light Emitting Diodes Using High Resolution Raman Spectroscopy**

YoungMin Park<sup>1</sup>, HyunDon Jung<sup>1</sup>, Dong-Soo Shin<sup>2</sup>, Jong-In Shim<sup>2</sup>

<sup>1</sup>Etamax Co., Ltd., Korea, <sup>2</sup>Hanyang University, Korea

## [ThB4] UV Characterization Techniques

**Date / Time** May 26 (Thu.), 2022 / 15:15–16:35  
**Place** Convention Hall B  
**Session Chair** Jung-Hoon Song (Kongju National University, Korea)

### [ThB4-1] Oral

**Online** 15:15–15:35

#### A Study on Verification of Effectiveness of Vehicle Interior UVC LED Microorganism Control System

Jun Ho Song<sup>1</sup>, Chan Hee Kang<sup>1</sup>, Min jeong Shin<sup>2</sup>

<sup>1</sup>Hyundai Research Institute, Korea, <sup>2</sup>Seoul National University, Korea

### [ThB4-2] Oral

**Online** 15:35–15:55

#### Luminescence Studies of Nearly Lattice-Matched C-Plane AlInN/GaN Heterostructures

Liyang Li<sup>1</sup>, Kohei Shima<sup>1</sup>, Mizuki Yamanaka<sup>2</sup>, Takashi Egawa<sup>2</sup>, Tetsuya Takeuchi<sup>3</sup>, Makoto Miyoshi<sup>2</sup>, Shigefusa F. Chichibu<sup>1</sup>

<sup>1</sup>Tohoku University, Japan, <sup>2</sup>Nagoya Institute of Technology, Japan

### [ThB4-3] Oral

**Online** 15:55–16:15

#### Hyperspectral Cryo-Microscopy for Advanced Optical Characterization in the UV-C: The Example of Hexagonal Boron Nitride

Rousseau Adrien, Valvin Pierre, Cassabois Guillaume, Gil Bernard

CNRS-The University of Montpellier, France

### [ThB4-4] Oral

**Online** 16:15–16:35

#### Reduction of Polishing-Induced Surface Recombination Centers of ZnO Single Crystals Grown by the Hydrothermal Method

T. Kasuya, K. Shima, S. F. Chichibu

Tohoku University, Japan