

## [MoA1] Wide-bandgap materials and applications I

Date July 2, 2018 (Monday)

Time 13:30~15:00

Room Room A (Ramada Ballroom 1)

Chairs Gerhard Klimeck (Purdue University, USA)

Mee-Yi Ryu (Kangwon National University, Korea)

### MoA1-1

13:30~14:00

#### [Invited] Performance Improvements in AlGaIn-based Deep-UV LEDs Using AlN/Al Reflectors

Tae Ho Lee, Tae Hoon Park (*Korea University, Korea*), Hideki Hirayama (*RIKEN, Japan*), and Tae Geun Kim\* (*Korea University, Korea*)

### MoA1-2

14:00~14:30

#### [Invited] High Efficiency Deep-UV AlGaIn MQW Structure Emitter

Jinwan Kim, Byeongchan So, Uiho Choi, and Okhyun Nam\* (*Korea Polytechnic University, Korea*)

### MoA1-3

14:30~14:45

#### Fabrication of Nano-cavity Patterned Sapphire Substrates and their Application to the Growth of GaN

Donghyun Lee, Jehong Oh, Seungmin Lee, Giwoong Kim, Jongmyeong Kim, Jeonghwan Jang, Daeyoung Moon, Yongjo Park, and Euijoon Yoon\* (*Seoul National University, Korea*)

### MoA1-4

14:45~15:00

#### Broad Ultraviolet Light Emitter Using GaN Quantum Dots Grown on Multi-facet Three-dimensional Structures

Jong-Hoi Cho, Seung-Hyuk Lim, Min-Ho Jang, Chulwon Lee, Hwan-Seop Yeo, Young Chul Sim, Je-Hyung Kim (*KAIST, Korea*), Samuel Matta, Blandine Alloing, Mathieu Leroux, (*Centre National de la Recherche Scientifique, France*), Seoung-Hwan Park (*Catholic University of Daegu, Korea*), Julien Brault (*Centre National de la Recherche Scientifique, France*), and Yong-Hoon Cho\* (*KAIST, Korea*)

## Technical Program

### [MoB1] Flexible and wearable devices I

Date July 2, 2018 (Monday)

Time 13:30~15:00

Room Room B (Ramada Ballroom 2)

Chair Xing Sheng (Tsinghua University, China)

#### MoB1-1

13:30~14:00

##### [Invited] Biocompatible Sensing Platforms

Ahyeon Koh\* (*Binghamton University – State University of New York, USA*)

#### MoB1-2

14:00~14:30

##### [Invited] Hacking Nervous System: Opportunities in Soft Wireless Bioelectronics

W. Kim, R. Liu, and S. Park\* (*Texas A&M University, USA*)

#### MoB1-3

14:30~14:45

##### Two-dimensional Titanium Carbide Sheets Based High Performance Flexible Wire Type Solid State Supercapacitors

Parthiban Pazhamalai, Karthikeyan Krishnamoorthy, Surjit Sahoo, and Sang-Jae Kim\* (*Jeju National University, Korea*)

#### MoB1-4

14:45~15:00

##### Highly Flexible and Stretchable Organic-inorganic Electrode Prepared by Co-sputtering for Wearable Devices

Ji-Eun Lim and Han-Ki Kim\* (*Sungkyunkwan University, Korea*)

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**[MoC1] Organic semiconductors and colloidal quantum dots I**

Date July 2, 2018 (Monday)

Time 13:30~14:45

Room Room C (Ramada Ballroom 3)

Chair Gang Li (Hong Kong polytechnic University, Hong Kong)

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**MoC1-1****13:30~14:00****[Invited] The Effect of Shape Anisotropy and Materials Composition on the Optical Gain Properties of Colloidal Semiconductor Nanoparticles**

Yinthal CHAN\* (*National University of Singapore, Institute of Materials Research & Engineering, Singapore*)

**MoC1-2****14:00~14:30****[Invited] 3D-Configurational Organic Field-Effect Transistors via Self-Organization of Organic Semiconductors: Insulating Polymer Blends**

Jung Ah Lim\* (*Korea Institute of Science and Technology, Korea*)

**MoC1-3****14:30~14:45****Metal-atom Distribution and its Effects on Carrier Transport in Organic Semiconductors**

Yoko Tomita\* (*Shibaura Institute of Technology, Chiba University, Japan*), Kohei Kawabata, and Takashi Nakayama (*Chiba University, Japan*)

## Technical Program

### [MoD1] Nano-bio-materials and devices

Date July 2, 2018 (Monday)

Time 13:30~14:45

Room Room D (Ramada Ballroom 4)

Chair Wan Soo Yun (Sungkyunkwan University, Korea)

#### MoD1-1

13:30~14:00

#### [Invited] Design of Conductive and Non-biodegradable Hydrogel Using Supramolecular Self-assembling Peptide for Brain Probe

Jiyoung Nam and Yong Ho Kim\* (Sungkyunkwan University, Korea)

#### MoD1-2

14:00~14:15

#### Cell Drug Reaction Measured by Temperature/Impedance Sensor

Tae-kyun Yoo, Jun-hee Park, Ji-seung Lee, Chan-hum Park, and Moongyu Jang\* (Hallym University, Korea)

#### MoD1-3

14:15~14:30

#### High-efficiency $\text{Eu}^{3+}$ -doped $\text{BiF}_3$ Red-emitting Nanoparticles for Solid-state Lighting and Field Emission Displays

Peng Du and Jae Su Yu\* (Kyung Hee University, Korea)

#### MoD1-4

14:30~14:45

#### Parameter Controls for Enhanced Peak-to-Valley Current Ratio in $\text{MoS}_2/\text{MoTe}_2$ Van der Waals Heterostructure

Ngoc Thanh Duong, Seung Ho Bang, Seong Chu Lim\*, and Mun Seok Jeong\* (Sungkyunkwan University, Korea)

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**[MoE1] Sejong Special Session: GRI-TPC IRC Workshop I**

Date July 2, 2018 (Monday)

Time 13:30~15:10

Room Room E (Mara Room)

Chair Y. J. Hong (Sejong University, Korea)

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**MoE1-1****13:40~14:10****[Invited] Integrable Narrow Spectral Linewidth Surface Grating DBR Diode Lasers**

J.J. Coleman\* (*The University of Texas at Dallas, USA*)

**MoE1-2****14:10~14:40****[Invited] Monolayer WS<sub>2</sub> Photonic Crystal Lasers**

Xiaochen Ge (*University of Texas at Arlington, USA*), Momchil Minkov (*Stanford University, USA*), Xiuling Li (*University of Illinois Urbana-Champaign, USA*), Shanhui Fan (*Stanford University, USA*), and Weidong Zhou\* (*University of Texas at Arlington, USA*)

**MoE1-3****14:40~15:10****[Invited] Au/MoS<sub>2</sub> Contacts: Charge Transfer and Interfacial Band Alignment**

D.-W. Kim\*, A. Sohn (*Ewha Womans University, Korea*), K.-A. Min (*Sejong University, Korea*), S. Kwon, E. Kim, S. W. Lee, S. Yoon (*Ewha Womans University, Korea*), and S. Hong (*Sejong University, Korea*)

## Technical Program

### [MoA2] Compound semiconductors

Date July 2, 2018 (Monday)

Time 15:30~17:00

Room Room A (Ramada Ballroom 1)

Chair Tae Geun Kim (Korea University, Korea)

#### MoA2-1

15:30~16:00

#### [Invited] Opportunities of III-V/Si Hybrid Integration for Optical Modulation and Switching

M. Takenaka\*, Q. Li, J. Han, and S. Takagi (*The University of Tokyo, Japan*)

#### MoA2-2

16:00~16:30

#### [Invited] Semiconductor Nanowires for Optoelectronic and Energy Applications

H.H. Tan\* (*The Australian National University, Australia*)

#### MoA2-3

16:30~16:45

#### Effects of Thermal and Electrical Stress on Defect Generation in InAs

Min Baik (*Yonsei University, Korea*), Hang-Kyu Kang (*Yonsei University, Korea Institute of Science and Technology, Korea*), Yu-Seon Kang (*Yonsei University, SAMSUNG, Korea*), Kwang-Sik Jeong (*Yonsei University, Korea*), Changmin Lee, Hyoungsub Kim (*Sungkyunkwan University, Korea*), Jin-Dong Song (*Korea Institute of Science and Technology, Korea*), and Mann-Ho Cho\* (*Yonsei University, Korea*)

#### MoA2-4

16:45~17:00

#### Investigation of Optical Properties of InAs/GaSb Multiple Quantum Wells by Photoreflectance Spectroscopy

Somaya Alyamani, Hyun-Jun Jo, Mo Geun So, Jong Su Kim\*, Tae Hyeon Ku, Jae Cheol Shin (*Yeungnam University, Korea*), Sang Jun Lee, Jun Oh Kim (*Korea Research Institute of Standards and Science, Korea*), Vinita Dahiya, and Sanjay Krishna (*Ohio State University, USA*)

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## **[MoB2] Flexible and wearable devices II**

Date July 2, 2018 (Monday)

Time 15:30~17:00

Room Room B (Ramada Ballroom 2)

Chair Jin Pyo Hong (Hanyang University, Korea)

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### **MoB2-1**

**15:30~16:00**

#### **[Invited] High Performance Mechanically Flexible CMOS Technology for System Moore Integration**

Emmanuel Dubois, Justine Philippe (*Univ. Lille, CNRS, Centrale Lille, ISEN, Univ. Valenciennes, France*), Arun Bhaskar (*Univ. Lille, CNRS, Centrale Lille, ISEN, Univ. Valenciennes, STMicroelectronics, France*), Flavie Braud, Jean-François Robillard (*Univ. Lille, CNRS, Centrale Lille, ISEN, Univ. Valenciennes, France*), and Daniel Gloria (*STMicroelectronics, France*)

### **MoB2-2**

**16:00~16:30**

#### **[Invited] Two Dimensional Materials for Human Interactive Wearable Electronics**

Jong-Hyun Ahn\* (*Yonsei University, Korea*)

### **MoB2-3**

**16:30~16:45**

#### **Doped Graphene Layers as Anode and Cathode Electrodes for Semitransparent and Flexible Solar Cells**

Chan Wook Jang and Suk-Ho Choi\* (*Kyung Hee University, Korea*)

### **MoB2-4**

**16:45~17:00**

#### **Hardness Control of Plastic Frameworks to Develop Polyhedral Image Sensor**

Hun Soo Jang, Gi-Gwan Kim, Seong Hyeon Kang, Yeongmin Kim, Jung Il Yoo, Seonggwang Yoo, Kun-Kook Kim, Changsoo Jung, and Heung Cho Ko\* (*Gwangju Institute of Science and Technology, Korea*)

## Technical Program

### **[MoC2] Organic semiconductors and colloidal quantum dots II**

Date July 2, 2018 (Monday)

Time 15:30~17:00

Room Room C (Ramada Ballroom 3)

Chairs Yinthai Chan (National University of Singapore, Singapore)  
Clare C. Byeon (Kyungpook National University, Korea)

#### **MoC2-1**

**15:30~16:00**

#### **[Invited] Exploring Solution Processible Solar Cells – Interface & Architecture**

Gang Li\* (*The Hong Kong Polytechnic University, Hong Kong*)

#### **MoC2-2**

**16:00~16:30**

#### **[Invited] Nanocrystal Conversion Chemistry Confined within a Nano-sized Solid-State Medium**

In Su Lee\* (*Pohang University of Science and Technology, Korea*)

#### **MoC2-3**

**16:30~16:45**

#### **Degradation Mechanism Analysis of Localized Region of Perovskite Films Using the Photo Thermal Induced Resonance Technique**

Hyang Mi Yu, Hye Min Oh, and Mun Seok Jeong\* (*Sungkyunkwan University, Korea*)

#### **MoC2-4**

**16:45~17:00**

#### **Energy Transfer from CdSe/ZnS Quantum Dots to Organic-inorganic Mixed Halide Perovskite**

Il-Wook Cho, Bom Lee, and Mee-Yi Ryu\* (*Kangwon National University, Korea*)



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## **[MoD2] Topological matters I**

Date July 2, 2018 (Monday)

Time 15:30~17:00

Room Room D (Ramada Ballroom 4)

Chair Bohm Jung Yang (Seoul National University, Korea)

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### **MoD2-1**

**15:30~16:00**

#### **[Invited] Emergence of Weyl Semimetals in Topological Phase Transitions**

Shuichi Murakami\* (*Tokyo Institute of Technology, Japan Science and Technology Agency, Japan*)

### **MoD2-2**

**16:00~16:30**

#### **[Invited] Chiral Hinge States and Surface Quantum Anomalous Hall Effect in Ferro-magnetic Axion Insulators**

Xi Dai\* (*Hong Kong University of Science and Technology, Chinese Academy of Science, China*)

### **MoD2-3**

**16:30~17:00**

#### **[Invited] Violation of Ohm's Law as a Signature of the Three-dimensional Weyl Metal**

Heon-Jung Kim\* (*Daegu University, Korea*)

## Technical Program

### [MoE2] Sejong Special Session: GRI-TPC IRC Workshop II

Date July 2, 2018 (Monday)

Time 15:40~17:10

Room Room E (Mara Room)

Chair Weidong Zhou (University of Texas at Arlington, USA)

**MoE2-1**

**15:40~16:10**

#### [Invited] Atomic and Electronic Structures of 2D Semiconductors

Kyeongjae (KJ) Cho\* (*The University of Texas at Dallas, USA*)

**MoE2-2**

**16:10~16:40**

#### [Invited] Rapid Chemical Vapor Deposition of Graphene for Continuous Growth

Keun Soo Kim\* (*Sejong University, Korea*)

**MoE2-3**

**16:40~17:10**

#### [Invited] Gate Modulation of Spin-orbit Interaction in Graphene/ $WS_2$ Heterostructure and Its Applications

Amir M. Afzal, M. Farooq Khan, Ghazanfar Nazir, Ghulam Dastgeer, Sikandar Aftab, Kuen Hong Min, Byung Min Go, and Jonghwa Eom\* (*Sejong University, Korea*)

## [P1] Poster Session I

Date July 2, 2018 (Monday)  
Time 17:00~18:30  
Place Convention Lobby (2F)

### P1-1

#### **Band Bending and Light-induced Changes on Grain Boundaries in High-efficient $\text{Cu}_2\text{ZnSn(S,Se)}_4$ Thin-films with High Photo-conversion Efficiency**

Juran Kim, Jayeong Kim, Seokhyun Yoon (*Ewha Womans University, Korea*), Jun-Hyoung Sim, Kee-Jeong Yang, Dae-Hwan Kim, Jin-Kyu Kang (*Daegu Gyeongbuk Institute of Science & Technology, Korea*), and William Jo\* (*Ewha Womans University, Korea*)

### P1-2

#### **Characterization of Conductive $\text{SrVO}_3$ Thin Films Grown on Various Substrates by RF Magnetron Sputtering**

Dae Ho Jung, Hyeon Seob So, Sang bin Hwang, and Hosun Lee\* (*Kyung Hee University, Korea*)

### P1-3

#### **ZnS Buffer Layers Grown by Modified Chemical Bath Deposition for CIGS Solar Cells**

Dongchan Lee, Heejin Ahn, and Youngho Um\* (*University of Ulsan, Korea*)

### P1-4

#### **Semi-transparent Organic Solar Cells for Tandem with CIGS Solar Cells**

Heejin Ahn, Dongchan Lee, and Youngho Um\* (*University of Ulsan, Korea*)

### P1-5

#### **Role of Ag, In and Te in $\text{AgInSbTe}$ for Superior Phase-Change Material**

Dasol Kim\*, JeongHwa Han, Hoon Jung, Soobin Hwang, Donghyeok Lim, Min Ahn, Wonjun Yang, Jaehoon Jung, Hanbum Park, and Mann-ho Cho (*Yonsei University, Korea*)

### P1-6

#### **Temperature Dependence of Dielectric Function of $\text{Bi}_{1.85}\text{Gd}_{0.15}\text{Te}_3$ by Modeling**

Hoang Tung Nguyen (*Kyung Hee University, Korea, Vietnam Academy of Science and Technology, Vietnam*), Tae Jung Kim\*, Han Gyeol Park (*Kyung Hee University, Korea*), Van Long Le, Xuan Au Nguyen (*Kyung Hee University, Korea, Vietnam Academy of Science and Technology, Vietnam*), Min Ji Jeoung, and Young Dong Kim\* (*Kyung Hee University, Korea*)

## Technical Program

### P1-7

#### **Influence of Growth Temperature on the Crystallinity of AlN Films Grown by Pulsed Sputtering Deposition**

Junseck Choi, Dongwan Ko, Sungmin Cho, Sangtae Lee, and Jiho Chang\* (*Korea Maritime and Ocean University, Korea*)

### P1-8

#### **Improved Performance of Zinc Oxide Thin Film Transistors with Reduced Graphene Oxide Embedded Active Layers**

Sungmin Oh, Myung-Sic Chae, Ju Hyun Park, Dong Su Jeon, Dae Yun Kang, Ho Jin Lee, Donghyun Kim, Ji Hwan Lee, and Tae Geun Kim\* (*Korea University, Korea*)

### P1-9

#### **Effect of Ge Doping in the Electrical and Optical Properties of Zn-Sn-O Semiconductor**

Dami Kim, Abhishek Sharma, and Sang-Im Yoo\* (*Seoul National University, Korea*)

### P1-10

#### **Enhancement of Thermal Stability and Operation Energy in Sb<sub>2</sub>Te<sub>3</sub> Induced by Ag Doping**

Soobin Hwang, Dasol Kim, and Mann-Ho Cho\* (*Yonsei University, Korea*)

### P1-11

#### **Gallium-doped Zinc Oxide as Highly Stable Electron Transport Layer for n-i-p Perovskite Solar Cells**

Hae-Jun Seok (*Sungkyunkwan University, Korea*), Myung-Joo Cha, Jung-Hwa Seo (*Dong-A University, Korea*), and Han-Ki Kim\* (*Sungkyunkwan University, Korea*)

### P1-12

#### **Study of Plasma Optical Emission Spectra during Deposition of Titanium Dioxide Thin Films**

Hyeok Jee, Jin-Soo Kim (*Jeju National University, Korea*), Hyo-Jung Kim, Sang-min Chae, Ahra Yi (*Pusan National University, Korea*), Yun-Sang Lee (*Soongsil University, Korea*), Young-Hun Yu, and Hye-Won Seo\* (*Jeju National University, Korea*)

### P1-13

#### **Growth of Titanium Suboxide Thin Films by Reactive DC Magnetron Sputtering**

Jin-Soo Kim, Hyeok Jee, and Hye-Won Seo\* (*Jeju National University, Korea*)

## P1-14

### **Effect of Ar Ion Beam Treatment on PET Substrate with the Mechanical and Electrical Stability of Flexible IWO Electrode Grown by Roll-to-roll Sputtering System**

Jae-Hoon Lee and Han-Ki Kim\* (*Sungkyunkwan University, Korea*)

## P1-15

### **Electrical and Optical Properties of Amorphous Vanadium-doped Indium Oxide Thin Films Studied with Spectroscopic Ellipsometry**

Hyeon Seob So, Dae Ho Jung, Jeong-Il Park, Han-Ki Kim, and Hosun Lee\* (*Kyung Hee University, Korea*)

## P1-16

### **Device Performance of $(\text{NH}_4)_2\text{S}_x$ -passivated GaAs and InGaAs Solar Cells**

Thuy Thi Nguyen (*Korea Research Institute of Standards and Science, Chungnam National University, Korea, Vietnam Academy of Science and Technology, Vietnam*), Yeongho Kim (*Korea Research Institute of Standards and Science, Korea*), SuHo Park (*Korea Research Institute of Standards and Science, University of Science & Technology, Korea*), Jun Oh Kim (*Korea Research Institute of Standards and Science, Korea*), Eui Tae Kim (*Chungnam National University, Korea*), Quang Liem Nguyen (*Vietnam Academy of Science and Technology, Vietnam*), and Sang Jun Lee\* (*Korea Research Institute of Standards and Science, University of Science & Technology, Korea*)

## P1-17

### **Study on Mid-Wavelength Infrared Light Emitting Diode (MWIR-LED)**

T. D. Nguyen (*Korean Research Institute of Standards and Science, Korea*), V. M. More (*Korean Research Institute of Standards and Science, Yeungnam University, Korea*), J. Hwang, J. Jeon, C. G. Won, J. O. Kim, and S. J. Lee\* (*Korean Research Institute of Standards and Science, Korea*)

## P1-18

### **Multi-layered Structure with Glancing Angle Deposition for Anti-reflection on InGaAsP-based Solar Cells**

Gyujin Oh, Seung Yun Lee, and Eun Kyu Kim\* (*Hanyang University, Korea*)

## P1-19

### **Luminescence Properties of GaN Nanowires Grown on Si Substrate**

Bom Lee, Il-Wook Cho (*Kangwon National University, Korea*), Sangmoon Han, Jin Soo Kim (*Chonbuk National University, Korea*), and Mee-Yi Ryu\* (*Kangwon National University, Korea*)

## Technical Program

### P1-20

#### High Hole Mobility p-type InGaSb with the Compressive Strain

Il-Pyo Roh (*Hanyang University, Korea Institute of Science and Technology, Korea*), SangHyeon Kim (*Korea Institute of Science and Technology, Korea*), YunHeub Song (*Hanyang University, Korea*), and Jin-Dong Song\* (*Korea Institute of Science and Technology, Korea*)

### P1-21

#### Growth and Properties of $\text{In}_{0.2}\text{Ga}_{0.8}\text{As}$ Nanowires for the Anti-reflection Effect and Hybrid Energy Harvesting Characteristics

H. -K. Kang (*Yonsei University, Korea Institute of Science and Technology, Korea*), S. S. Kang (*Korea Institute of Science and Technology, Korea*), M. -H. Cho\* (*Yonsei University, Korea*), and J. D. Song\* (*Korea Institute of Science and Technology, Korea*)

### P1-22

#### Growth and Properties of InAs Photodetector on GaAs (001)

S. S. Kang (*Korea Institute of Science and Technology, Kyung Hee University, Korea*), D. M. Geum, W. J. Choi (*Korea Institute of Science and Technology, Korea*), S. H. Choi (*Kyung Hee University, Korea*), and J. D. Song\* (*Korea Institute of Science and Technology, Korea*)

### P1-23

#### Influence of Substrate Misorientation on the Properties of InGaP/GaAs and InAlP/GaAs Heterostructures

SuHo Park (*Korea Research Institute of Standards and Science, University of Science & Technology, Korea*), In-Young Jung, Seungwoo Song, Nguyen Thi Thuy, Yeongho Kim, Jun Oh Kim, Chang Soo Kim (*Korea Research Institute of Standards and Science, Korea*), and Sang Jun Lee\* (*Korea Research Institute of Standards and Science, University of Science & Technology, Korea*)

### P1-24

#### Coaxial $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ MQDs with Quaternary Capping Layer Grown on n-GaN NW by MOCVD System for Blue Emission

Dae-Young Um, Raju Nandi, San Kang, Jae-Kwan Sim, Suel Lee, Jun-Yong Jo, Pil-Jun Kim, Jung Hoon Yang, Dae Han Jung, Jieun Yoo, and Cheul-Ro Lee\* (*Chonbuk National University, Korea*)

### P1-25

#### Fabrication of AlGaN Having Unique Nanostructure on Si Substrate via MOCVD for the Photoconductive Ultraviolet-C Photodetector

Pil-Jun Kim, Dae-Young Um, Raju Nandi, San Kang, Jae-Kwan Sim, Suel Lee, Jun-Yong Jo, Jung Hoon Yang, Dae Han Jung, Jieun Yoo, and Cheul-Ro Lee\* (*Chonbuk National University, Korea*)

## P1-26

### **Investigation of Optical Properties for InSb/GaSb Quantum Dots Grown by Droplet Epitaxy**

Mo Geun So, Hyun-Jun Jo, Jong Su Kim\* (*Yeungnam University, Korea*), Vinita Dahiya (*The University of New Mexico, USA*), Sanjay Krishna (*The Ohio State University, USA*), Sang Jun Lee, and Jun Oh Kim (*Korea Research Institute of Standards and Science, Korea*)

## P1-27

### **Demonstration of Hybrid Nano-architecture Comprising Uniaxial and Coaxial InGaN/GaN MQWs on n-GaN Nanowires by MOCVD**

Jung Hoon Yang, Dae-Young Um, Raju Nandi, San Kang, Jae-Kwan Sim, Suel Lee, Jun-Yong Jo, Pil-Jun Kim, Dae Han Jung, Jieun Yoo, and Cheul-Ro Lee\* (*Chonbuk National University, Korea*)

## P1-28

### **Sputtering Duration and Annealing Effects on the Structure and Local Electronic Structure of MgO Thin Films**

Jitendra Pal Singh, Weon Cheol Lim (*Korea Institute of Science and Technology, Korea*), Manish Kumar, Ik-Jae Lee (*Pohang Accelerator Laboratory, Korea*), Jonghan Song, and Keun Hwa Chae\* (*Korea Institute of Science and Technology, Korea*)

## P1-29

### **Electrical Observation of Effective Mass in a $WTe_2$ Film**

Jeehoon Jeon (*Korea Institute of Science and Technology, Korea University, Korea*), Tae-Eon Park (*Korea Institute of Science and Technology, Korea*), Taeyueb Kim (*Korea Research Institute of Standards and Science, Korea*), Chaun Jang (*Korea Institute of Science and Technology, Korea*), Jinki Hong\* (*Korea University, Korea*), and Hyun Cheol Koo\* (*Korea Institute of Science and Technology, Korea University, Korea*)

## P1-30

### **Atomistic Simulations on Dynamics of a Magnetic Skyrmion: Role of Atomic Defects in the Breathing Mode**

Namkyu Kim, Hee-Sung Han, Daehan Jung, and Ki-Suk Lee\* (*Ulsan National Institute of Science and Technology, Korea*)

## P1-31

### **Spin Ordering on a Boron-doped $Si(111)-\sqrt{3} \times \sqrt{3}$**

Chang-Youn Moon, Daejin Eom, and Ja-Yong Koo (*Korea Research Institute of Standards and Science, Korea*)

## Technical Program

### P1-32

#### **Antiferromagnetic Oscillator Using Interfacial Spin-Orbit Coupling**

Dong-Kyu Lee (*Korea University, Korea*), Byong-Guk Park (*KAIST, Korea*), and Kyung Jin Lee\* (*Korea University, Korea*)

### P1-33

#### **Fluorescence Sensor Application of the Surface Capped Colloidal ZnS:Mn Nanocrystals with L-Cysteine for the Detection of Zinc (II) Cations in Aqueous Solution**

Mi Choi and Cheong-Soo Hwang\* (*Dankook University, Korea*)

### P1-34

#### **Electronic Synapses Based on Silk/Poly(Methyl Methacrylate) Nanocomposites**

Myoung Kyun Choi, Chaoxing Wu, and Tae Whan Kim\* (*Hanyang University, Korea*)

### P1-35

#### **Microscale Patterned RGB Full-color Quantum Dot Light-emitting Devices**

ShinYoung Jeong (*Korea Institute of Science and Technology, Korea University, Korea*), Soonkyu Cha (*Korea Institute of Science and Technology, Korea*), Jihoon Kyhm (*Dongguk University, Korea*), Byeong-Kwon Ju (*Korea University, Korea*), and Il Ki Han\* (*Korea Institute of Science and Technology, Korea*)

### P1-36

#### **Short Wave Infrared Field-effect Phototransistor Using PbS Colloidal Quantum Dots with Glutathione**

Soonkyu Cha (*Korea Institute of Science and Technology, Kyung Hee University, Korea*), Shinyoung Jeong (*Korea Institute of Science and Technology, Korea University, Korea*), Young Dong Kim (*Kyung Hee University, Korea*), and Il Ki Han\* (*Korea Institute of Science and Technology, Korea*)

### P1-37

#### **Diagnostics of Long-term Degradation of Photovoltaic Performance of Organic Solar Cells Using Absorption and Photo-luminescent Spectroscopy**

Erkin A. Zakhidov\*, Sherzod Q. Nematov, Vakhobjon O. Quvondikov, Mukhibjon Kh. Imomov, Ilkhom I. Tajibaev, and Aziz A. Saparbaev (*Institute of Ion-Plasma and Laser Technologies, Uzbekistan*)



## P1-38

### **Comparison of Characteristics for Structured Illumination Microscopy(SIM) with a Spatial Filter**

Jeongheon Han (*Korea Institute of Science and Technology, Korea University, Korea*), Kisung Kwak (*Korea Institute of Science and Technology, Korea*), Ji-Hoon Kang (*Korea Institute of Science and Technology, Korea University, Korea*), Byeong-Kwon Ju (*Korea University, Korea*), and Min-Chul Park\* (*Korea Institute of Science and Technology, Korea*)

## P1-39

### **Ion-intercalation Assisted Solvothermal Synthesis and Optical Characterization of MoS<sub>2</sub> Quantum Dots**

Luqman ALI, Seok Jae BANG, Yong Joong LEE, and Clare Chisu BYEON\* (*Kyunpook National University, Korea*)

## P1-40

### **Characteristics of p-type Sb-doped Cu<sub>2</sub>O Hole Injection Layer Grown by RF Magnetron Sputtering**

Hyeong-Jin Seo, Ji-eun Lee, and Han-Ki Kim\* (*Sungkyunkwan University, Korea*)

## P1-41

### **Sputter-processed Li-doped Cu<sub>2</sub>O as an Efficient Hole-injection Layer (HIL) for QDLEDs**

Ji-Eun Lee, Hyeong-Jin Seo, and Han-Ki Kim\* (*Sungkyunkwan University, Korea*)

## P1-42

### **Studying of Vibration Modes in CH<sub>3</sub>NH<sub>3</sub>PbBr<sub>3</sub> Single Crystals by Raman Scattering**

Trang Thi Thu Nguyen, Yejin Kim, Hye Ri Jung, William Jo (*Ewha Womans University, Korea*), Won Seok Woo, Chang Won Ahn, Shinuk Cho, Ill Won Kim (*University of Ulsan, Korea*), and Seokhyun Yoon\* (*Ewha Womans University, Korea*)

## P1-43

### **Broadband Emission of Plasmon-coupled Quantum Dots**

Quinton Rice (*Hampton University, USA*), Sangram Raut (*University of North Texas Health Science Center, Texas Christian University, USA*), Rahul Chib (*University of North Texas Health Science Center, USA*), Zygmunt Gryczynski (*University of North Texas Health Science Center, Texas Christian University, USA*), Ignacy Gryczynski (*University of North Texas Health Science Center, USA*), Andrew Wang (*Ocean NanoTech., USA*), William W. Yu (*Louisiana State University, USA*), Bagher Tabibi, and Felix Jaetae Seo\* (*Hampton University, USA*)

## Technical Program

### P1-44

#### **Exploiting Polar Solvent Vapor Treatment for the Organometallic Halide Perovskite Based Light Emitter Applications**

Sang-Hyun Chin (*Gwangju Institute of Science and Technology, Chonbuk National University, Korea*), Jin Woo Choi, Hee Chul Woo (*Gwangju Institute of Science and Technology, Korea*), Jong H. Kim (*Ajou University, Korea*), Hong Seok Lee\* (*Chonbuk National University, Korea*), and Chang-Lyoul Lee\* (*Gwangju Institute of Science and Technology, Korea*)

### P1-45

#### **Absorption Background and Time-resolved Photoluminescence of Colloidal CdSe Quantum Dots**

Sung Hun Kim, Minh Tan Man, and Hong Seok Lee\* (*Chonbuk National University, Korea*)

### P1-46

#### **Semi-transparent Reverse Structure Organic Solar Cell with High Stability and Performance through Electron Transport Layer Modification**

Seungik Son, Soyeon Kim, and Dongchan Lim\* (*Korea Institute of Materials Science, Korea*)

### P1-47

#### **Improving Magnetic Characteristics of Nano-Ferrite Particles by Controlling Particle Size for Biomedical Applications**

Minhong Jeun (*Korea Institute of Science and Technology, Korea*), Sungwook Park, Jaewon Choi, and Kwan Hyi Lee\* (*Korea Institute of Science and Technology, University of Science and Technology, Korea*)

### P1-48

#### **Improvement of Superhydrophobic Property Based on Cellulose Aerogel Using Cationic Polymers**

Myung-Joon Jeong (*Chonbuk National University, Korea*), Bong Suk Yang, and Kyu-Young Kang\* (*Dongguk University, Korea*)

### P1-49

#### **Preparation of Cellulose Aerogels as a Biomaterial Using High Degree of Polymerization Cellulose Derived from Bast Fibers of Paper Mulberry**

Bong Suk Yang, Youngkyun Park (*Dongguk University, Korea*), Myung-Joon Jeong (*Chonbuk National University, Korea*), and Kyu-Young Kang\* (*Dongguk University, Korea*)

### P1-50

#### **Growth of Silicon Oxide Nanowires Using Silicon-Rich Oxide Films**

Jong-Hwan Yoon\* (*Kangwon National University, Korea*)

## P1-51

### **Ultra-sensitive Detection of Hemagglutinin by Integrated Nanotrap Sensor**

Cho Yeon Lee, Seok Cheol Kim, Dae Keun Park, Ayeon Kang, and Wan Soo Yun\*  
(Sungkyunkwan University, Korea)

## P1-52

### **Enzymatic Electrochemical Biosensor Based on Interdigitated Microgap Electrodes for Detection of Hemagglutinine**

Ayeon Kang, Jiho Ryu, Hyewon Choi, Seunghun Kim, Cho Yeon Lee, and Wan Soo Yun\*  
(Sungkyunkwan University, Korea)

## P1-53

### **Control of Attachment and Detachment of Gecko-inspired Dry Adhesive Using Shape Memory Polymer**

Jihoon Lee, Sung Ho Lee, and Moon Kyu Kwak\* (Kyungpook National University, Korea)

## P1-54

### **Super-resolution Optical Fluctuation Imaging with Speckle Patterns Illumination**

Young Choi, Min-Kwan Kim, Chung-Hyun Park, and Yong-Hoon Cho\* (KAIST, Korea)

## P1-55

### **Linearly Polarized Photoluminescence of Anisotropically Strained c-plane GaN Grown on Stripe-Shaped Cavity-engineered Sapphire Substrate**

J. Kim, D. Moon, S. Lee, D. Lee, D. Yang, Y. Park\*, and E. Yoon\* (Seoul National University, Korea)

## P1-56

### **Thickness Dependence of Thermal Conductivity of 2D Materials**

Minkyu Park (University of Science and Technology, Korea) and Yong-Sung Kim\* (Korea Research Institute of Standards and Science, Korea)

## P1-57

### **Defect Mitigation for EUV Voxel-taking Lithography**

S.-W. Yoon and S.-K. Kim\* (Hongik University, Korea)

## P1-58

### **Fabrication of Chromatic Electronic Textiles Synthesized by Conducting Polymer**

Jun Woo Jeon, Songlee Han, Hyun-Seok Jang, Won Taek Jung, Dae Soon Im, Min Gun Lee, Jin Young Kim, and Byung Hoon Kim\* (Incheon National University, Korea)

## Technical Program

### P1-59

#### **The Growth of Discrete GaN Array with Micro Size Using Sapphire Nanomembrane**

S. Lee, D. Moon, D. Choi, H. Lim, Y. Park\*, and E. Yoon\* (*Seoul National University, Korea*)

### P1-60

#### **Stretchable Ag Nanowire Network/PEDOT:PSS Hybrid Electrodes for Stretchable Polymer-dispersed Liquid Crystal-based Smart Windows**

Jin-Yeong Park and Han-Ki Kim\* (*Sungkyunkwan University, Korea*)

### P1-63

#### **Interfacial Reliability of Printed Ag Interconnects on Flexible Polyimide Substrate for Wearable Device Applications**

Young-Bae Park\* (*Andong National University, Korea*)

### P1-64

#### **Analysis of Encapsulation Characteristics of Aluminum Zinc Oxide Deposited on a Flexible Substrate by ALD**

Boram Kim (*Korea Electronics Technology Institute, Korea*), SungHee Kim (*Sungkyunkwan University, Korea*), Kyu Hyun Lee, JunYoung Lee, and Hyeongkeun Kim\* (*Korea Electronics Technology Institute, Korea*)

### P1-65

#### **Al<sub>2</sub>O<sub>3</sub>/SiN<sub>x</sub> Multilayer Thin Films Grown by ALD and Sputter Deposition for Encapsulation of Flexible Display**

SungHee Kim (*Sungkyunkwan University, Korea*), Seung-Iel Park (*SUKWON CO., Ltd.*), Boram Kim, MinJung Na, Kyu Hyun Lee (*Korea Electronics Technology Institute, Korea*), JunYoung Lee (*Sungkyunkwan University, Korea*), and Hyeongkeun Kim\* (*Korea Electronics Technology Institute, Korea*)

### P1-67

#### **The Actuation of Paraffin-infiltrated Multi-wall Carbon Nanotube Yarns**

Dang Xuan Dang\*, Thuy Kieu Truong\*, Seong Chu Lim, and Dongsoek Suh (*Sungkyunkwan University, Korea*)

### P1-68

#### **Effects of Annealing Temperature on the UV Light Emission of CaO-decorated ZnO Nanorods**

Sangmin Lee, Jae Kyung Lee, Woo Seok Lee, Soong-Keun Hyun, and Chongmu Lee\* (*Inha University, Korea*)

## P1-69

### **Study of Mass Evaluation Methods between X-ray and Quartz Crystal Microbalance**

Jiseok Kim\* (*Korea Atomic Energy Research Institute, Hanyang University, Korea*), Hanrim Lee, and Hani Baek (*Korea Atomic Energy Research Institute, Korea*)

## P1-70

### **Lens-less Reflection Digital Holographic Microscope for Three Dimensional Measurement of Optical Component**

Sanghoon Shin (*Kanghae Precision System, Korea*) and Younghun Yu\* (*Jeju National University, Korea*)

## P1-71

### **Direct Three Dimensional Measurement of Optical Component Using Transmission Deflectometry**

Silin Na (*Kanghae Precision System, Korea*), Doocheol Kim, and Younghun Yu\* (*Jeju National University, Korea*)

## P1-72

### **Characterization of Photoresist Layer and Investigation of Dry Strip Process through Real-time Monitored Variable Temperature Control**

JH. Ryu\*, YY Lee, BH. Kim, and SJ. Yoon (*PSK Inc., Korea*)

## P1-73

### **Thermal Annealing Effect on Nonvolatile Memory Characteristics of ZnO/SiO<sub>x</sub> Multilayer ReRAM Devices**

Jisoo Kim, Minho Im, Jung Hyun Sok, and Kyoungwan Park\* (*University of Seoul, Korea*)

## P1-74

### **Resistive Switching Effects of Zinc Silicate Thin Films for Nonvolatile Memory Applications**

Minho Im, Jisoo Kim, Jung Hyun Sok, and Kyoungwan Park\* (*University of Seoul, Korea*)

## P1-75

### **Study on Fabrication of GaAs/AlGaAs QWIPs on Si Substrates Using Metal Wafer Bonding**

Seung-yeop Ahn, Ho-sung Kim (*Korea Institute of Science and Technology, Korea*), Geunhwan Iyu (*Inha University, Korea*), and Won-jun Choi\* (*Korea Institute of Science and Technology, Korea*)

## Technical Program

### P1-76

#### **Nano-micro ZnO Structures for Highly Selective Hydrogen Gas Sensor**

Umesh T. Nakate, Rafiq Ahmad, Gun Hee Lee, Y.B. Hahn, Y.T. Yu, and Eun-kyung Suh\* (*Chonbuk National University, Korea*)

### P1-77

#### **Development of Vanadium Oxide-based Micro-bolometer with Infrared Absorbing Layer**

Hye Jin Lee (*Ulsan National Institute of Science and Technology, Korea Institute of Science and Technology, Korea*), Jeong Min Baik (*Ulsan National Institute of Science and Technology, Korea*), and Won Jun Choi\* (*Korea Institute of Science and Technology, Korea*)

### P1-78

#### **Improved Reliability of Amorphous In-Ga-Zn-O TFT Sensor with a Bilayered Active**

Hyun Woo Son, Myung-Sic Chae, Ju Hyun Park, Song Kyu Kang, Jae Wan Park, and Tae Geun Kim\* (*Korea University, Korea*)

### P1-79

#### **Ionic Liquid Sensing Properties of Printed CNT: Metal Layers**

Dongwan Ko, Minjun Kim, Minsang Lee, Jihyun Sim, Junseck Choi, Sangtae Lee, and Jiho Chang\* (*Korea Maritime and Ocean University, Korea*)

### P1-80

#### **Triboelectric Pressure Sensor Based on Al Wire Particles**

Jinhyoung Park, Maeum Han, Hongseok Jang, Young Jung, and Hanchul Cho\* (*Korea Institute of Industrial Technology, Korea*)

### P1-81

#### **Trans-linear Circuits for Optical Beam Deflection Scheme Toward Improving the Detection Bandwidth of Atomic Force Microscopy**

Bernard Ouma Alunda, Luke Oduor Otieno, Clare Chisu Byeon\*, and Yong Joong Lee\* (*Kyungpook National University, Korea*)

### P1-82

#### **A Dual Function Piezoelectric Nanogenerator Device Based on Bio-polymers**

Venkateswaran Vivekananthan, Nagamalleswara Rao Alluri, Yuvasree Purusothaman, Arunkumar Chandrasekhar, and Sang-Jae Kim\* (*Jeju National University, Korea*)

## P1-83

### **Ultrathin Metal Oxide Semiconductors-based Electrochemical Transistors by Using Solution Process**

Yun Young Choi, Joon Hui Park, and You Seung Rim\* (*Sejong University, Korea*)

## P1-84

### **Synthesis and Temperature Sensing Behavior of BaGd<sub>2</sub>O<sub>4</sub>:Er<sup>3+</sup> Green-emitting Phosphors**

Peng Du and Jae Su Yu\* (*Kyung Hee University, Korea*)

## P1-85

### **Metallole Nanoaggregates as Explosive Sensing Materials**

Bomina Shin and Honglae Sohn\* (*Chosun University, Korea*)

## P1-86

### **Efficient Foster Resonance Energy Transfer Between Semiconducting Polymer and Benzothiadiazole Derivatives**

Kyung Kuk Koh and Honglae Sohn\* (*Chosun University, Korea*)

## P1-87

### **High-performance Resistive Memory Devices Using Controllable Formation of Nanofilaments via Tip-enhanced Electric Fields**

Youngjin Kim (*Korea Institute of Science and Technology, Korea*) and Keun-Young Shin\* (*Hallym University, Korea*)

## P1-88

### **Thickness Dependence of Cantilever in Q-factor at Si-based NC-AFM Probe**

S.B. Bahn (*Incheon National University, Korea*), H.Y. Jeong, K.H. Park (*Korea Advanced Nano fab Center, Korea*), and S.B. Choi\* (*Incheon National University, Korea*)

## P1-89

### **Non-destructively Assembled Single-walled Carbon Nanotube Biotransistor with Sub-nanomolar Sensitivity**

Kyowook Hwang, Sung Gu Lee, Kwangrok Park, Dongwook Lee, Sangwon Lee, Hokyeong Kim, Taekyeong Kim (*Seoul National University of Science and Technology, Korea*), Eun-Hee Lee\* (*Ewha Womans University, Korea*), and Seung-Woo Lee\* (*Seoul National University of Science and Technology, Korea*)

## Technical Program

### P1-90

#### **Study on the Morphology of n-GaN NWs with Various TMGa Flow Using the MOCVD Process**

Dae Han Jung, Dae-Young Um, Raju Nandi, San Kang, Jae-Kwan Sim, Suel Lee, Jun-Yong Jo, Pil-Jun Kim, Jung Hoon Yang, Jieun Yoo, and Cheul-Ro Lee\* (*Chonbuk National University, Korea*)

### P1-91

#### **Optical Properties of InAs/GaAs<sub>1-x</sub>Sb<sub>x</sub> Submonolayer Quantum Dots**

Minseak Kim, Hyun-Jun Jo, Mo Geun So, Byoungsoo Ko, Jong Su Kim\* (*Yeungnam University, Korea*), Yeongho Kim, Sang Jun Lee (*Korea Research Institute of Standards and Science, Korea*), Seung Hyun Lee (*The Ohio State University, USA*), and Christiana B. Honsberg (*Arizona State University, USA*)

### P1-92

#### **Doping Inhomogeneity along Single Mg-doped p-GaN Rod Studied by Strong Correlation among Componential, Electrical, and Optical Analyses**

Sunghan Choi, Min-Ho Choi, Hyun Gyu Song, Yang-Seok Yoo, Chulwon Lee, Kie Young Woo, and Yong-Hoon Cho\* (*KAIST, Korea*)

### P1-93

#### **Fabrication of Electrically Driven Phosphor-free White Light Emitting Diodes Based on III-nitride Three Dimensional Structures with High Electrical Efficiency**

Kie Young Woo, Young Chul Sim, Kwanjae Lee, Yongho Song, Seung-Hyuk Lim, and Yong-Hoon Cho\* (*KAIST, Korea*)

### P1-94

#### **Terahertz Cyclotron Resonance in AlGaIn/GaN Heterostructures**

D. Kindole\*, Y. Imanaka (*National Institute for Materials Science, Hokkaido University, Japan*), K. Takehana, L. Sang, and M. Sumiya (*National Institute for Materials Science, Japan*)

### P1-95

#### **Study of Highly Sensitive Flexible Photodetector Using Self-assembled SnS Nanoflake and Graphene**

Hak Dong Cho, Ganesan Mohan Kumar, Xiao Fu, Pugazhendi Ilanchezhian, Shavkat U. Yuldashev, Dong Jin Lee, Im Taek Yoon, Juwon Lee, Tae Won Kang, and Deuk Young Kim\* (*Dongguk University, Korea*)



### P1-96

#### **Gate Modulation of the Spin-orbit Interaction in Bilayer Graphene Encapsulated by WS<sub>2</sub> Films**

Amir M. Afzal, M. Farooq Khan, Ghazanfar Nazir, Ghulam Dastgeer, Sikandar Aftab, Keun Hong Min, Byung Min Go, and Jonghwa Eom\* (*Sejong University, Korea*)

### P1-97

#### **Investigations of Interfaces of 2D-MoS<sub>2</sub> and 3D-GaN Heterostructures: First-principles Study**

Dongchul Sung, Kyung-Ah Min, and Suklyun Hong\* (*Sejong University, Korea*)

### P1-98

#### **Toward Continuous Production of Graphene by CVD: Key Issue?**

Dong Yun Lee, Imbok Lee, Jungtae Nam (*Sejong University, Korea*), Jiho Kim, E. J. Choi (*University of Seoul, Korea*), and Keun Soo Kim\* (*Sejong University, Korea*)

### P1-99

#### **Electrical Detection of Inverse Spin Hall Effect in Multi-layer WS<sub>2</sub>**

Ghulam Dastgeer, M. Farooq Khan, Ghazanfar Nazir, Amir M. Afzal, Sikandar Aftab, Kuen Hong Min, Byung Min Go, and Jonghwa Eom\* (*Sejong University, Korea*)

### P1-100

#### **Metal-semiconductor Contact Behaviors Between MnPS<sub>3</sub> and Au Using First-principles Calculations**

Hyunsoo Choi, Kyung-Ah Min, and Suklyun Hong\* (*Sejong University, Korea*)

### P1-101

#### **Density Functional Theory Calculations of Electric-field Effect on WS<sub>2</sub>/BP Heterostructures**

Janghwan Cha, Kyung-Ah Min, and Suklyun Hong\* (*Sejong University, Korea*)

### P1-102

#### **First-principles Study of Atomic and Electronic Structure of Metal Monochalcogenides on Si(111)**

Junghwan Kim, Kyung-Ah Min, Janghwan Cha, and Suklyun Hong\* (*Sejong University, Korea*)

### P1-103

#### **Epitaxy of ZnO Microwire Arrays on Graphene-coated ZnO Layer**

Junseok Jeong and Young Joon Hong\* (*Sejong University, Korea*)

### P1-104

#### **First-principles Study of Electric-field Dependence of Electronic Structure in p-Si/n-WS<sub>2</sub> Heterojunction**

Kyung-Ah Min and Suklyun Hong\* (*Sejong University, Korea*)

### P1-105

#### **Van der Waals Heterojunction Diode Composed of WS<sub>2</sub> Flake Placed on p-type Si Substrate**

Sikandar Aftab, M. Farooq Khan, Ghazanfar Nazir, Amir Muhammad Afazl, Ghulam Dastgeer, Kuen Hong Min, Byung Min Go, and Jonghwa Eom\* (*Sejong University, Korea*)

### P1-106

#### **Improvement of Light Extraction Efficiency for AlGaIn-based Deep UV LEDs**

Changqing Chen\*, Hangling Long, Shuai Wang, Jiangnan Dai, Yi Zhang, and Renli Liang (*Huazhong University of Science and Technology, China*)

### P1-107

#### **Effect of SiN<sub>x</sub> Interlayers on the in-plane Anisotropic Properties of Nonpolar a-plane AlGaIn**

Yi Zhang, Jun Zhang, and Changqing Chen\* (*Huazhong University of Science and Technology, China*)

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## **[TuA1] Wide-bandgap materials and applications II**

Date July 3, 2018 (Tuesday)

Time 10:30~12:00

Room Room A (Ramada Ballroom 1)

Chair Jin Dong Song (Korea Institute of Science and Technology, Korea)

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**TuA1-1**

**10:30~11:00**

### **[Invited] NEMO5: Multi-Scale, Multi-Physics, Atomistic Modeling of Superlattice LEDs and Global Impact on nanoHUB.org**

Gerhard Klimeck\*, Junzhe Geng, KuangChung Wang, Prasad Sarangapani, and Tillmann Kubis (*Purdue University, USA*)

**TuA1-2**

**11:00~11:30**

### **[Invited] Sapphire Nano-membrane: A New Platform for GaN-based Devices**

Euijoon Yoon\* (*Seoul National University, Korea*)

**TuA1-3**

**11:30~11:45**

### **Growth and Optical Characterization of a Three-fold Symmetric III-nitride Quantum Dot at the Apex of Pyramidal Structure**

Hwan-Seop Yeo, Kwanjae Lee, Sunghan Choi, Min-Ho Choi, Jong-Hoi Cho, Young Chul Sim, Yongho Song, and Yong-Hoon Cho\* (*KAIST, Korea*)

**TuA1-4**

**11:45~12:00**

### **Study of Epitaxial Growth and Device Fabrication of AlGaIn-based Deep Ultraviolet LED**

Jun Zhang, Yi Zhang, Shuai Wang, Jing Wen Chen, Ren Li Liang, Jiang Nan Dai, and Chang Qing Chen\* (*Huazhong University of Science and Technology, China*)

## Technical Program

### [TuB1] Flexible and wearable devices III

Date July 3, 2018 (Tuesday)

Time 10:30~12:00

Room Room B (Ramada Ballroom 2)

Chairs Emmanuel Dubois (Univ. Lille, CNRS, Centrale Lille, ISEN, Univ. Valenciennes, France)

Sung Il Park (Texas A&M University, USA)

#### TuB1-1

10:30~11:00

#### [Invited] Microscale, Implantable Optoelectronic Devices for Optical Neural Interfaces

Xing Sheng\* (*Tsinghua University, China*)

#### TuB1-2

11:00~11:30

#### [Invited] Optoelectronics using Quantum-dots/Metal-nanoparticles for Transparent and Soft Interactive Devices

Seong Jun Kang\* (*Kyung Hee University, Korea*)

#### TuB1-3

11:30~12:00

#### [Invited] Wearable Textile-driven Energy Harvesting Device

Jin Pyo Hong\* (*Hanyang University, Korea*)

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## **[TuC1] Sensors and applications I**

Date July 3, 2018 (Tuesday)

Time 10:30~11:45

Room Room C (Ramada Ballroom 3)

Chairs Sunho Jeong (Korea Research Institute of Chemical Technology, Korea)  
Sang-Hee Ko Park (KAIST, Korea)

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### **TuC1-1**

**10:30~11:00**

#### **[Invited] Smart and Connected Bioelectronics for Persistent Human-Machine Interfaces**

W. Hong Yeo\* (*Georgia Institute of Technology, Emory University, USA*)

### **TuC1-2**

**11:00~11:30**

#### **[Invited] Transient Electronics**

Suk-Won Hwang\* (*Korea University, Korea*)

### **TuC1-3**

**11:30~11:45**

#### **Electrochemical Performance of Ag Nanowires Coated Carbon Cloth Supported Bimetallic Layered Double Hydroxide for Supercapacitor Applications**

S. Chandra Sekhar, Goli Nagaraju, and Jae Su Yu\* (*Kyung Hee University, Korea*)

## Technical Program

### [TuD1] Topological matters II

Date July 3, 2018 (Tuesday)

Time 10:30~12:00

Room Room D (Ramada Ballroom 4)

Chairs Shuichi Murakami (Tokyo Institute of Technology, Japan)  
Heon-Jung Kim (Daegu University, Korea)

#### TuD1-1

10:30~11:00

#### [Invited] Quasiparticle Interference and Impurity Resonances in Type II Weyl Semimetal $WTe_2$

Euyheon Hwang\* (*Sungkyunkwan University, Korea*)

#### TuD1-2

11:00~11:30

#### [Invited] Nodal Line Semimetals with Z2 Monopole Charge

Junyeong Ahn (*Seoul National University, Korea*), Youngkuk Kim (*Sungkyunkwan University, Korea*), and Bohm-Jung Yang\* (*Seoul National University, Korea*)

#### TuD1-3

11:30~11:45

#### Searching for Semimetallic Carbon Allotropes in Mixed $sp^2$ - $sp^3$ Bonding Networks

Ha-Jun Sung, W.-H. Han (*KAIST, Korea*), Sunghyun Kim (*Imperial College London, UK*), In-Ho Lee (*Korea Research Institute of Standards and Science, Korea*), and K. J. Chang (*KAIST, Korea*)

#### TuD1-4

11:45~12:00

#### From ab-initio Calculations Towards Topological Insulators Nanostructures by Ion Beam Sputtering Deposition

S. Ferreira-Teixeira\*, A. L. Pires, and A. M. Pereira (*University of Porto, Portugal*)

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## [TuB2] Spintronics I

Date July 3, 2018 (Tuesday)

Time 15:00~16:30

Room Room B (Ramada Ballroom 2)

Chairs Kaiyou Wang (CAS, University of Chinese Academy of Science, China)  
Byong-Guk Park (KAIST, Korea)

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### TuB2-1

15:00~15:30

#### [Invited] Spin Torque Switching and Magnetoresistive Detection in Antiferromagnets

Takahiro Moriyama\* (*Kyoto University, Japan*)

### TuB2-2

15:30~16:00

#### [Invited] Antiferromagnetic Domain Wall Dynamics in GdFeCo Ferrimagnets

Kab-Jin Kim\* (*KAIST, Korea*)

### TuB2-3

16:00~16:15

#### Theoretical Study of Strain-assisted Synthetic Anti-ferromagnetic Free Layer Based Magnetic Tunnel Junction Switching

S. Noh, D. H. Kang, and M. Shin\* (*KAIST, Korea*)

### TuB2-4

16:15~16:30

#### Antiferromagnetic Magnonic Crystals with Alternating Dzyaloshinskii-Moriya Interaction

Seung-Jae Lee and Kyung-Jin Lee\* (*Korea University, Korea*)

## Technical Program

### [TuC2] Sensors and applications II

Date July 3, 2018 (Tuesday)

Time 15:00~16:30

Room Room C (Ramada Ballroom 3)

Chair Suk-Won Hwang (Korea University, Korea)

#### TuC2-1

15:00~15:30

#### [Invited] Electrostatically-assembled Composite Materials for 3D-Printed Strain Pressure Sensor Devices

Sunho Jeong\* (*Korea Research Institute of Chemical Technology, Korea*)

#### TuC2-2

15:30~16:00

#### [Invited] Pressure Sensors Based on Capacitor and Transistor Devices with Printed Silver Nanowire Buckling Structures

Yongtaek Hong\*, Yoonshik Joo, and Jaeyoung Yoon (*Seoul National University, Korea*)

#### TuC2-3

16:00~16:15

#### Fabrication and Mechanoluminescence Properties of CaZnOS with Layer Structure for Visualization of Stress

Zhijun Zhang, Shaolin Zhang, Jung Woo Shin, and Woochul Yang\* (*Dongguk University, Korea*)

#### TuC2-4

16:15~16:30

#### Novel Multi-Level-Cell Resistive Random Access Memory Based Reconfigurable Physical Unconable Functions

Gyo Sub Lee and Hyunsu Ju\* (*Korea Institute of Science and Technology, University of Science and Technology, Korea*)



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## [TuD2] 2D materials and heterostructures I

Date July 3, 2018 (Tuesday)

Time 15:00~16:30

Room Room D (Ramada Ballroom 4)

Chairs Mikito Koshino (Osaka University, Japan)

Wonbong Choi (University of North Texas, USA)

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### TuD2-1

15:00~15:30

#### [Invited] Ultrafast Graphene Light Emitters

Young Duck Kim\* (*Kyung Hee University, Korea*) and James Hone (*Columbia University, USA*)

### TuD2-2

15:30~16:00

#### [Invited] Electronic Interferometer on GaAs/AlGaAs 2DEG

Hyungkook Choi\* (*Chonbuk National University, Korea*)

### TuD2-3

16:00~16:15

#### Highly Enhanced Photoresponsivity of Monolayer WSe<sub>2</sub> Photodetector with Nitrogen-doped Graphene Quantum Dots

Duc Anh Nguyen, Hye Min Oh\*, Ngoc Thanh Duong, Seung Ho Bang, Seok Jun Yoon, and Mun Seok Jeong\* (*Sungkyunkwan University, Korea*)

### TuD2-4

16:15~16:30

#### Temperature Induced Crossing in the Optical Bandgap of Mono and Bilayer MoS<sub>2</sub> on SiO<sub>2</sub>

Yongchul Kim, Youngsin Park (*Ulsan National Institute of Science and Technology, Korea*), Namme Kim (*Soongsil University, Korea*), Yongcheol Jo, Seung W. Lee, Woochul Yang, Hyunsik Im\* (*Dongguk University, Korea*), and Geunsik Lee\* (*Ulsan National Institute of Science and Technology, Korea*)

## Technical Program

### [TuE2] Sejong Special Session: GRI-TPC IRC Workshop III

Date July 3, 2018 (Tuesday)

Time 15:00~16:30

Room Room E (Mara Room)

Chair Anvar Zakhidov (The University of Texas at Dallas, USA)

**TuE2-1**

**15:00~15:30**

#### [Invited] Spectral Behavior of Mode-locked Quantum Dot Lasers

A. C. Coleman\* (*The University of Texas at Dallas, USA*)

**TuE2-2**

**15:30~16:00**

#### [Invited] Topological Valleytronics: Brought to Light

Fan Zhang\* (*The University of Texas at Dallas, USA*)

**TuE2-3**

**16:00~16:30**

#### [Invited] Semiconductor Nanowire Heterostructure Arrays Grown on Two-dimensional Atomic Layer Substrate for Flexible Light Emitting Device Applications

Y. J. Hong\* (*Sejong University, Korea*)

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### [TuB3] Spintronics II

Date July 3, 2018 (Tuesday)

Time 16:50~18:20

Room Room B (Ramada Ballroom 2)

Chair Ki-Suk Lee (Ulsan National Institute of Science and Technology, Korea)

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#### TuB3-1

16:50~17:20

#### [Invited] Control Ferromagnets at Room Temperature without External Magnetic Field

Kaiyou Wang\* (CAS, University of Chinese Academy of Science, China)

#### TuB3-2

17:20~17:35

#### Complementary Spin Logic Operations

Seung-heon Chris Baek, Kyung-Woong Park (KAIST, SK Hynix Inc., Korea), Kyung-Jin Lee (Korea University, Korea), and Byong-Guk Park\* (KAIST, Korea)

#### TuB3-3

17:35~17:50

#### Manipulation of Domain Wall Motion Controlled by Spin-orbit Torque in Magnetic Tunnel Junctions and Its Synaptic Behavior

SeungMo Yang, Jinhung Choi, Wonsup Shin, and JinPyo Hong\* (Hanyang University, Korea)

#### TuB3-4

17:50~18:05

#### Enhanced Spin-orbit Torque by Engineering Pt Resistivity in Pt/Co/AIO<sub>x</sub> Structures

Jae Wook Lee, Young-Wan Oh, and Byong-Guk Park\* (KAIST, Korea)

#### TuB3-5

18:05~18:20

#### An Accurate Analytical Method of Harmonic Hall Voltage Measurement for Spin-orbit Torque

Seok Jin Yun (Korea University, KAIST, Korea), Eun-Sang Park, Kyung-Jin Lee, and Sang Ho Lim\* (Korea University, Korea)

## Technical Program

### [TuC3] Sensors and applications III

Date July 3, 2018 (Tuesday)

Time 16:50~18:20

Room Room C (Ramada Ballroom 3)

Chairs W. Hong Yeo (Georgia Institute of Technology, USA)  
You Seung Rim (Sejong University, Korea)

#### TuC3-1

16:50~17:20

##### [Invited] Capacitive Type Fingerprint Sensor for Biometrics Application

Seung Hee Lee, Guk-Jin Jeon (KAIST, Korea), Hongchae Kim (TRAIS, Korea), Il-Suk Kang (Korea Advanced Nano fab Center, Korea), and Sang-Hee Ko Park\* (KAIST, Korea)

#### TuC3-2

17:20~17:50

##### [Invited] Visco-Poroelastics: New Strategy for Ultrasensitive Electronic Skin

Do Hwan Kim\* (Hanyang University, Korea)

#### TuC3-3

17:50~18:05

##### Effect of Doping on Gas Sensing Properties of GaN Nanorods

Reddeppa Maddaka, Byung-Guon Park, Hoang Hai Nguyen, Jong-beom Lim, Thi Kim Phung Nguyen, Moon-Deock Kim\* (Chungnam National University, Korea), Jae-Eung Oh (Hanyang University, Korea), and Song-Gang Kim (Joongbu University, Korea)

#### TuC3-4

18:05~18:20

##### Effect of Hydrogen Plasma Treatment on Downward Band Bending Energy of InN Nanorods: NO<sub>x</sub> Gas Sensing Properties

Byung-Guon Park, Reddeppa Maddaka, Hoang Hai Nguyen, Jong-beom Lim, Thi Kim Phung Nguyen, Moon-Deock Kim\* (Chungnam National University, Korea), Jae-Eung Oh (Hanyang University, Korea), and Song-Gang Kim (Joongbu University, Korea)

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## **[TuD3] 2D materials and heterostructures II**

Date July 3, 2018 (Tuesday)

Time 16:50~18:20

Room Room D (Ramada Ballroom 4)

Chairs Anindya Das (Indian Institute of Science, India)

Hyungkook Choi (Chonbuk National University, Korea)

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### **TuD3-1**

**16:50~17:20**

#### **[Invited] Electronic Properties of Incommensurate 2D Crystals**

Mikito Koshino\* (*Osaka University, Japan*)

### **TuD3-2**

**17:20~17:50**

#### **[Invited] Integrated Freestanding 2D Transition Metal Dichalcogenites**

G. Lerondel\* (*University of Technology of Troyes, France, Sungkyunkwan University, Korea*)

### **TuD3-3**

**17:50~18:20**

#### **[Invited] Hetero-junction of 2D-van der Waals Sheets and Trigonal Polarized Oxide Lattices**

Hye-Jin Jin, Woo Young Yoon, Su Hyoun Kwon, and William Jo\* (*Ewha Womans University, Korea*)

## Technical Program

### [TuE3] Sejong Special Session: GRI-TPC IRC Workshop IV

Date July 3, 2018 (Tuesday)

Time 16:50~18:20

Room Room E (Mara Room)

Chair D.-W. Kim (Ewha Womans University)

**TuE3-1**

**16:50~17:20**

#### [Invited] Ionically Switchable P-I-N Diode in Perovskite Light Emitting Solar Cells

Anvar Zakhidov\* (*The University of Texas at Dallas, USA & ITMO University, Russia & NUST-MISIS, Russia*), Dmitry Getz, Arthur Ishteev (*ITMO University, Russia*), Danila Saranin (*NUST-MISIS, Russia*), and Ross Haroldson (*The University of Texas at Dallas, USA*)

**TuE3-2**

**17:20~17:50**

#### [Invited] Extremely Small Iron-Sulfide Nanocrystals for High-Performance Na-Ion Batteries

Jongsoon Kim\* (*Sejong University, Korea*)

**TuE3-3**

**17:50~18:20**

#### [Invited] Interferometric Scattering Microscopy to Capture the Orientation of Nanometric Objects and to Visualize Subcellular Structures

I.-B. Lee (*Institute for Basic Science, Korea University, Korea*), J.-S. Park (*Institute for Basic Science, Korea*), H.-M. Moon, J.-H. Joo, K.-H. Kim, S.-C. Hong\*, and M. Cho\* (*Institute for Basic Science, Korea University, Korea*)

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## [WeA1] Spintronics III

**Date** July 4, 2018 (Wednesday)

**Time** 10:30~12:00

**Room** Room A (Ramada Ballroom 1)

**Chairs** Takahiro Moriyama (Kyoto University, Japan)  
Kab-Jin Kim (KAIST, Korea)

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### WeA1-1

10:30~11:00

#### [Invited] Observation of 3D Magnetic Structure and Its Control

Sooseok Lee, Hee-Sung Han, Namkyu Kim (*Ulsan National Institute of Science and Technology, Korea*), Mi-Young Im (*Lawrence Berkeley National Laboratory, USA*), and Ki-Suk Lee\* (*Ulsan National Institute of Science and Technology, Korea*)

### WeA1-2

11:00~11:15

#### Effect of Isovalent Doping on the Magnetic Properties of ZnMnO Diluted Magnetic Semiconductors

Z. A. Yunusov, Sh. U. Yuldashev\*, S. J. Lee, Y. H. Kwon, H. C. Jeon, and T. W. Kang (*Dongguk University, Korea*)

### WeA1-3

11:15~11:30

#### Unidirectional Magnetoresistance in CoGd-ferrimagnet/Pt-heavy Metal Bilayers Across the Magnetization Compensation Point

Soogil Lee\*, Jae-Wook Lee, Jeong-Mok Kim (*KAIST, Korea*), Sanghoon Kim (*University of Ulsan, Korea*), Nyun Jong Lee, Seung-Young Park (*Korea Basic Science Institute, Korea*), Byong-Guk Park, and Kab-Jin Kim (*KAIST, Korea*)

### WeA1-4

11:30~11:45

#### Asymmetric Hall Effect Induced by Canted State in Epitaxial Co/Pt

Jeongchun Ryu\* (*Tohoku University, Japan & KAIST, Korea*), Can Onur Avci (*MIT, USA*), Makoto Kohda (*Tohoku University, Japan*), Geoffrey S. D. Beach (*MIT, USA*), and Junsaku Nitta (*Tohoku University, Japan*)

### WeA1-5

11:45~12:00

#### Transverse Spin Nernst Magnetoresistance in Heavy Metal/Ferromagnet Bilayer

Dong-Jun Kim, Jeong-Mok Kim, Chul-Yeon Jeon, Jong-Guk Choi, Jae Wook Lee (*KAIST, Korea*), Srivathsava Surabhi, Jong-Ryul Jeong (*Chungnam National University, Korea*), Kyung-Jin Lee (*Korea University, Korea*), and Byong-Guk Park\* (*KAIST, Korea*)

## Technical Program

### [WeB1] Special Session: SKKU IBS-Center for Integrated Nanostructure Physics Session I

Date July 4, 2018 (Wednesday)

Time 10:30~12:10

Room Room B (Ramada Ballroom 2)

Chair Mun Seok Jeong (Sungkyunkwan University, Korea)

#### WeB1-1

10:30~11:10

##### [Invited] Optical Properties of All-inorganic Perovskite Nanocrystals

Tom Gregorkiewicz\* (*University of Amsterdam, The Netherlands*)

#### WeB1-2

11:10~11:40

##### [Invited] Van der Waals Interfaces for Optoelectronics in 2D Semiconductors

Hyun Seok Lee\* (*Chungbuk National University and Center for Integrated Nanostructure Physics (CINAP) IBS, Korea*) and Young Hee Lee (*Center for Integrated Nanostructure Physics (CINAP) IBS, Korea*)

#### WeB1-3

11:40~12:10

##### [Invited] Raman Spectroscopy of Van der Waals Heterostructures

Duhee Yoon\* (*Center for Integrated Nanostructure Physics (CINAP) IBS, Korea*)



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## **[WeC1] Plasmonics, meta-materials and optoelectronics I**

Date July 4, 2018 (Wednesday)

Time 10:30~12:00

Room Room C (Ramada Ballroom 3)

Chair Doo Jae Park (Hallym University, Korea)

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### **WeC1-1**

**10:30~11:00**

#### **[Invited] Anomalous Optoelectronic Properties of Hybrid Halide Perovskites as Probed by Wavelength-dependent Nonlinear Optical Spectroscopy**

J. I. Jang\* (*Sogang University, Korea*) and M. G. Kanatzidis (*Northwestern University, USA*)

### **WeC1-2**

**11:00~11:30**

#### **[Invited] Tin Rich Perovskite Solar Cell with Optimal Band Gap**

Yang Yang\* (*Zhejiang University, China*)

### **WeC1-3**

**11:30~12:00**

#### **[Invited] Tip-enhanced Raman Spectroscopy (TERS)**

Yung Doug Suh\* (*Korea Research Institute of Chemical Technology and Sungkyunkwan University, Korea*)

## Technical Program

### [WeD1] 2D materials and heterostructures III

Date July 4, 2018 (Wednesday)

Time 10:30~12:00

Room Room D (Ramada Ballroom 4)

Chairs Gilles Lerondel (University of Technology of Troyes, France)  
Young Duck Kim (Kyung Hee University, Korea)

#### WeD1-1

10:30~11:00

#### [Invited] Large-scale Assembly of 2D Atomic Layers and Their Applications in Opto-electronics and Energy Storages

Wonbong Choi\* (*University of North Texas, USA*)

#### WeD1-2

11:00~11:15

#### Photo-doping of Graphene Enhanced by Stable Perovskite and Hole Transfer Layer

Sang Hoon Kim, Sergey Menabde, and Min Seok Jang\* (*KAIST, Korea*)

#### WeD1-3

11:15~11:30

#### Self-energy and Quasiparticle Spectral Function in Black Phosphorene

I.V. Sankar and Euyheon Hwang\* (*Sungkyunkwan University, Korea*)

#### WeD1-4

11:30~11:45

#### A New Phosphorus Allotrope with Tunable Direct Band Gap and High Mobility

Woo Hyun Han\* (*KAIST, Korea*), Sunghyun Kim (*Imperial College London, UK*), In-Ho Lee (*Korea Research Institute of Standards and Science, Korea*), and Kee Joo Chang (*KAIST, Korea*)

#### WeD1-5

11:45~12:00

#### Selective Growth of Monolayer-bilayer Graphene Patterns on Oxygen and Ar Plasma Pre-treated Cu Surface

M. D. S. L. Wimalananda, J. K. Kim, and J. M. Lee\* (*Sunchon National University, Korea*)

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## **[WeA2] Energy harvesting and storage I**

Date July 4, 2018 (Wednesday)

Time 15:00~16:30

Room Room A (Ramada Ballroom 1)

Chairs Boon Ooi (King Abdullah University of Science and Technology, Saudi Arabia)  
Jae Su Yu (Kyung Hee University, Korea)

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### **WeA2-1**

**15:00~15:30**

#### **[Invited] Microwatt Silicon Thin-films Thermoelectric Harvesters**

Jean-François Robillard (*Univ. Lille, CNRS, Centrale Lille, ISEN, Univ. Valenciennes, France*),  
Thierno-Moussa Bah (*Univ. Lille, CNRS, Centrale Lille, ISEN, Univ. Valenciennes, STMicroelectronics, France*),  
Stanislav Didenko, Di Zhou, Emmanuel Dubois (*Univ. Lille, CNRS, Centrale Lille, ISEN, Univ. Valenciennes, France*),  
and Stéphane Monfray (*STMicroelectronics, France*)

### **WeA2-2**

**15:30~16:00**

#### **[Invited] Silicon Thermoelectric Devices**

Moongyu Jang\* (*Hallym University, Korea*)

### **WeA2-3**

**16:00~16:15**

#### **Inorganic 2-D Transition Metal Dichalcogenides Charge Transport Layers for MAPbI<sub>3</sub> Perovskite Solar Cells**

Bora Kim, Nguyen Duc Anh, Dae Young Park, Hye Ryung Byun, and Mun Seok Jeong\* (*Sungkyunkwan University, Korea*)

### **WeA2-4**

**16:15~16:30**

#### **Photo-induced Alteration of Band Bending in Perovskite Halide Photovoltaic Materials**

Hye Ri Jung, Bich Phuong Nguyen, and William Jo\* (*Ewha Womans University, Korea*)

## Technical Program

### [WeB2] Special Session: SKKU IBS-Center for Integrated Nanostructure Physics Session II

Date July 4, 2018 (Wednesday)

Time 15:00~16:30

Room Room B (Ramada Ballroom 2)

Chair Duhee Yoon (Sungkyunkwan University, Korea)

#### WeB2-1

15:00~15:30

#### [Invited] Raman Spectroscopy of Antiferromagnetic Ordering in 2-Dimensional Materials

Kangwon Kim, Jae-Ung Lee, Sooyeon Lim (*Sogang University, Korea*), Sungmin Lee (*Seoul National University, Institute for Basic Science, Korea*), Tae Yun Kim, Ji Hoon Ryoo (*Seoul National University, Korea*), Kisoo Park (*Seoul National University, Institute for Basic Science, Korea*), Soonmin Kang, Pilkwang Kim (*Seoul National University, Korea*), Gun Sang Jeon (*Ewha Womans University, Korea*), Cheol-Hwan Park (*Seoul National University, Korea*), Je-Geun Park (*Seoul National University, Institute for Basic Science, Korea*), and Hyeonsik Cheong\* (*Sogang University, Korea*)

#### WeB2-2

15:30~16:00

#### [Invited] Structural Phase Transition and Superconductivity in MoTe<sub>2</sub>

Suyeon Cho\* (*Ewha Womans University, Korea*)

#### WeB2-3

16:00~16:30

#### [Invited] Probing Defect Dynamics in Monolayer MoS<sub>2</sub> via Noise Nanospectroscopy

Seung Hyun Song, Min-Kyu Joo, Michael Neumann, Hyun Kim, and Young Hee Lee\* (*Center for Integrated Nanostructure Physics (CINAP) IBS and Sungkyunkwan University, Korea*)

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## **[WeC2] Plasmonics, meta-materials and optoelectronics II**

Date July 4, 2018 (Wednesday)

Time 15:00~16:30

Room Room C (Ramada Ballroom 3)

Chairs Yang Yang (Zhejiang University, China)

Joon Ik Jang (Sogang University, Korea)

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### **WeC2-1**

**15:00~15:30**

#### **[Invited] Theory and Applications of Plasmon Enhanced Luminescence Upconversion**

Won Park\* (*University of Colorado, USA*)

### **WeC2-2**

**15:30~16:00**

#### **[Invited] Mid-infrared Tunable Plasmonics in Graphene**

M. S. Jang\* (*KAIST, Korea*)

### **WeC2-3**

**16:00~16:15**

#### **Efficiency Enhancement in Flexible Photovoltaic Cell via Plasmonic Metal Nanoparticles**

Sanjeev Gautam\*, Amardeep Bharti, and Navdeep Goyal (*Panjab University, India*)

### **WeC2-4**

**16:15~16:30**

#### **Polariton Condensates in Spatially Modulated Excitation**

Daegwang Choi, Min-Sik Kwon, Byoung Yong Oh, Su-Hyun Gong (*KAIST, Korea*), Hang Kyu Kang, Sooseok Kang, Jin Dong Song (*Korea Institute of Science and Technology, Korea*), Hyoungsoon Choi, and Yong-Hoon Cho\* (*KAIST, Korea*)

## Technical Program

### [WeD2] 2D materials and heterostructures / Quantum information

Date July 4, 2018 (Wednesday)

Time 15:00~16:30

Room Room D (Ramada Ballroom 4)

Chairs Seigo Tarucha (The University of Tokyo, Japan)

Euyheon Hwang (Sungkyunkwan University, Korea)

#### WeD2-1

15:00~15:30

#### [Invited] The Andreev Reflection at the Junction of Graphene Quantum Hall State and Superconductor

Anindya Das (*Indian Institute of Science, India*)

#### WeD2-2

15:30~15:45

#### Monolayer MoS<sub>2</sub> on Sub-100-nm SiO<sub>2</sub>/Si: Interface-interference-mediated Absorption Enhancement

E. Kim (*Ewha Womans University, Korea*), J.-W. Cho (*Kyung Hee University, Korea*), T. T. T. Nguyen (*Ewha Womans University, Korea*), S.-K. Kim (*Kyung Hee University, Korea*), S. Yoon, and D.-W. Kim\* (*Ewha Womans University, Korea*)

#### WeD2-3

15:45~16:15

#### [Invited] Coherence and Indistinguishability of Single Photons Emitted from Nitrogen Impurity Centers in GaAs

Michio Ikezawa\*, Liao Zhang, Ruoxi Wang, Ryota Fukushima (*University of Tsukuba, Japan*), and Yoshiki Sakuma (*National Institute for Materials Science, Japan*)

#### WeD2-4

16:15~16:30

#### Integration of Quantum Light Sources on a Si Chip

Je-Hyung Kim\* (*Ulsan National Institute of Science and Technology, Korea, University of Maryland, USA*), Shahriar Aghaeimeibodi, Christopher J. K. Richardson, Richard P. Leavitt (*University of Maryland, USA*), Dirk Englund (*Massachusetts Institute of Technology, USA*), and Edo Waks (*Joint Quantum Institute, University of Maryland and the National Institute of Standards and Technology, USA*)

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## **[WeA3] Energy harvesting and storage II**

Date July 4, 2018 (Wednesday)

Time 16:50~18:20

Room Room A (Ramada Ballroom 1)

Chairs Jean-François Robillard (Univ. Lille, CNRS, Centrale Lille, ISEN, Univ. Valenciennes, France)

Sang-Wan Ryu (Chonnam National University, Korea)

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### **WeA3-1**

**16:50~17:20**

#### **[Invited] III-Nitride Nanowire Based Piezoelectric Generators for Supplying Nomad Microelectronic Devices**

N. Gogneau\*, N. Jamond (*Université Paris-Saclay, France*), P. Chrétien, F. Houzé (*Université Paris-Sud et UPMC, France*), L. Lu, M. Morassi, N. Jegenyés, E. Lefeuvre, F. Julien, and M. Tchernycheva (*Université Paris-Saclay, France*)

### **WeA3-2**

**17:20~17:50**

#### **[Invited] Facile Synthesis of Metal Oxide Nanostructures with Versatile Morphologies for High-performance Supercapacitors**

Jae Su Yu\*, Goli Nagaraju, and S. Chandra Sekhar (*Kyung Hee University, Korea*)

### **WeA3-3**

**17:50~18:05**

#### **Battery-free Electronic Smart Toys: A Step toward the Commercialization of Sustainable Triboelectric Nanogenerators**

Arunkumar Chandrasekhar and Sang-Jae Kim\* (*Jeju National University, Korea*)

### **WeA3-4**

**18:05~18:20**

#### **Synthesis and Characterization of Multiple Cation Rb(MAFA) Perovskite Single Crystals**

Hyojung Kim, Hye Ryung Byun, Chul Ho Park, and Mun Seok Jeong\* (*Sungkyunkwan University, Korea*)

## Technical Program

### [WeB3] Special Session: SKKU IBS-Center for Integrated Nanostructure Physics Session III

Date July 4, 2018 (Wednesday)

Time 16:50~18:20

Room Room B (Ramada Ballroom 2)

Chair Seung Hyun Song (Sungkyunkwan University, Korea)

#### WeB3-1

16:50~17:20

#### [Invited] Interplay Between Lattices, Topology, and Orbitals in Two-dimensional Crystals

Young-Woo Son\* (*Korea Institute for Advanced Study, Korea*)

#### WeB3-2

17:20~17:50

#### [Invited] Device Performance of MoS<sub>2</sub> Field Effect Transistor Depending on Junction Structure and Channel Thickness

Seong Chu Lim\* (*Center for Integrated Nanostructure Physics (CINAP) IBS and Sungkyunkwan University, Korea*)

#### WeB3-3

17:50~18:20

#### [Invited] Hexagonal-BN (h-BN) as an Ideal Substrate for MoS<sub>2</sub> Electronics

Min-Kyu Joo\* (*Sookmyung Women's University, Korea*), Byoung Hee Moon (*Center for Integrated Nanostructure Physics (CINAP) IBS, Korea*), and Young Hee Lee (*Center for Integrated Nanostructure Physics (CINAP) IBS, Sungkyunkwan University, Korea*)



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### **[WeC3] Plasmonics, meta-materials and optoelectronics III**

Date July 4, 2018 (Wednesday)

Time 16:50~18:20

Room Room C (Ramada Ballroom 3)

Chair Teun-Teun Kim (Sungkyunkwan University, Korea)

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#### **WeC3-1**

**16:50~17:20**

##### **[Invited] Development and Key Technologies of GaN-on-Si LEDs**

J. Kim\* (*Hanyang University, Korea*)

#### **WeC3-2**

**17:20~17:50**

##### **[Invited] Highly Compliant Guided-Mode Resonance 1D and 2D Gratings for Sensing Applications**

Jeong-Bong Lee\* (*The University of Texas at Dallas, USA*)

#### **WeC3-3**

**17:50~18:05**

##### **Experimental Verification of High-performance Linear Polarizer Using Stacked 1D Subwavelength Gratings**

Jehwan Hwang (*Korea Research Institute of Standards and Science, Hanyang University, Korea*), Boram Oh (*Korea Research Institute of Standards and Science, Korea & Indiana University–Purdue University Indianapolis, USA*), Eun Kyu Kim (*Hanyang University, Korea*), Yeongho Kim, Jun Oh Kim, Won Chegal, Sang-Woo Kang (*Korea Research Institute of Standards and Science, Korea*), David Czaplewski (*Argonne National Laboratory, USA*), Jong Eun Ryu (*Indiana University–Purdue University Indianapolis, USA*), Jiangfeng Zhou (*University of South Florida, USA*), Augustine Urbas, Zahun Ku\* (*Wright-Patterson Air Force Base, USA*), and Sang Jun Lee\* (*Korea Research Institute of Standards and Science, Korea*)

#### **WeC3-4**

**18:05~18:20**

##### **Direct Observation of Quantum Tunneling Charge Transfers between Molecules and Semiconductors for SERS**

Jayoeng Kim (*Ewha Womans University, Korea*), Nam-Jung Kim, Jun-Beom Park (*Seoul National University, Korea*), Hyemin Kim (*Ewha Womans University, Korea*), Gyu-Chul Yi (*Seoul National University, Korea*), and Seokhyun Yoon\* (*Ewha Womans University, Korea*)

## Technical Program

### [WeD3] Quantum information I

Date July 4, 2018 (Wednesday)

Time 16:50~18:35

Room Room D (Ramada Ballroom 4)

Chair Taeyoung Choi (Ewha Womans University, Korea)

#### WeD3-1

16:50~17:20

##### [Invited] Spin Qubits in Silicon MOS Quantum Dots

C. H. Yang\* and A. S. Dzurak (*The University of New South Wales, Australia*)

#### WeD3-2

17:20~17:50

##### [Invited] The Quantum Dot Hybrid Qubit: A Spin Qubit with Tunable Coupling to Electric Fields

Mark A. Eriksson\* (*University of Wisconsin-Madison, USA*)

#### WeD3-3

17:50~18:20

##### [Invited] Holonomic Quantum Control of Geometric Spin Qubits in Diamond

Hideo Kosaka\* (*Yokohama National University, Japan*)

#### WeD3-4

18:20~18:35

##### Current Antiresonance in Spin-orbit Coupled Double Quantum Dots

G. Giavaras\* and Y. Tokura (*University of Tsukuba, Japan*)

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## **[ThA1] Si and group IV semiconductors**

Date July 5, 2018 (Thursday)

Time 09:00~10:15

Room Room A (Ramada Ballroom 1)

Chair Moongyu Jang (Hallym University, Korea)

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**ThA1-1**

**09:00~09:30**

### **[Invited] Functional Designs of Si Photovoltaics and Transparent Photoelectrics**

Joondong Kim\*, Malkeshkumar Patel, Hong-Sik Kim, and Mohit Kumar (*Incheon National University, Korea*)

**ThA1-2**

**09:30~10:00**

### **[Invited] Ultra-thin and Single Crystal Si and Ge Wafers for Next Generation Photovoltaics**

Jihun Oh\* (*KAIST, Korea*)

**ThA1-3**

**10:00~10:15**

### **Influence of Si Intermixing on Optical Properties of Ge-on-Si**

Chulwon Lee (*KAIST, Korea*), Bugeun Ki (*Yonsei University, Korea*), Yang-Seok Yoo, Min-Ho Jang, Seung-Hyuk Lim, Jong-Hoi Cho, Hyun-Gyu Song (*KAIST, Korea*), Jungwoo Oh (*Yonsei University, Korea*), and Yong-Hoon Cho\* (*KAIST, Korea*)

## Technical Program

### **[ThB1] Compound semiconductors / Energy harvesting and storage**

Date July 5, 2018 (Thursday)

Time 09:00~10:30

Room Room B (Ramada Ballroom 2)

Chairs Noelle Gogneau (C2N, CNRS, France)

Jong Su Kim (Yeungnam University, Korea)

#### **ThB1-1**

**09:00~09:30**

#### **[Invited] Toward the Performance Enhancement of Semitransparent Ultra-thin CIGSe Solar Cells**

J. H. Park\* (*Korea Institute of Energy Research, Korea*), M. Saifullah, J.-S. Cho, and J. H. Yun (*Korea Institute of Energy Research, University of Science and Technology, Korea*)

#### **ThB1-2**

**09:30~09:45**

#### **Nanorod Array Structure through Nano-mold Process for AVR Display**

Je Won Kim\* (*Namseoul University, Korea*)

#### **ThB1-3**

**09:45~10:15**

#### **[Invited] Towards Highly Efficient Photoelectrolysis Systems: InGaN-based Nanowires on Conductive Substrates**

Mohamed Ebaid, Jung-Wook Min, Huafan Zhang, Chao Zhao, Tien Khee Ng, Hicham Idriss, and Boon S. Ooi\* (*King Abdullah University of Science and Technology, Saudi Arabia*)

#### **ThB1-4**

**10:15~10:30**

#### **Towards GaN Hybrid Heterostructure Photoanodes for Photoelectrochemical Water Splitting Devices**

Santosh S Patil, Mostafa A. Hassan, Muhammad A. Johar, and Sang-Wan Ryu\* (*Chonnam National University, Korea*)

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## [ThC1] Plasmonics, meta-materials and optoelectronics IV

Date July 5, 2018 (Thursday)

Time 09:00~10:00

Room Room C (Ramada Ballroom 3)

Chairs Mun Seok Jeong (Sungkyunkwan University, Korea)  
Seong Chu Lim (Sungkyunkwan University, Korea)

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**ThC1-1**

**09:00~09:30**

### [Invited] Graphene Based Active Metadevices

Teun-Teun Kim\* (*Sungkyunkwan University, Korea*)

**ThC1-2**

**09:30~09:45**

### Extended Whispering Gallery Polariton Condensate from GaN Single Hexagonal Wire at Room Temperature

Hyun Gyu Song, Sunghan Choi, Min Sik Kwon, Kie Young Woo, ChungHyun Park, and Yong-Hoon Cho\* (*KAIST, Korea*)

**ThC1-3**

**09:45~10:00**

### Adaptive Multispectral Detection Using IR Transmission Spectra through Quasi-3D Circular Coaxial Aperture Array

Jiyeon Jeon (*Korea Research Institute of Standards and Science, Sejong University, Korea*), Deok-kee Kim (*Sejong University, Korea*), Jun Oh Kim, Won Chegal (*Korea Research Institute of Standards and Science, Korea*), Jiangfeng Zhou (*University of South Florida, USA*), Augustine Urbas, Zahyun Ku\* (*Wright-Patterson Air Force Base, USA*), and Sang Jun Lee\* (*Korea Research Institute of Standards and Science, Korea*)

## Technical Program

### [ThD1] Quantum information II

Date July 5, 2018 (Thursday)

Time 09:00~10:30

Room Room D (Ramada Ballroom 4)

Chair Jehyung Kim (Ulsan National Institute of Science and Technology, Korea)

#### ThD1-1

09:00~09:30

#### [Invited] Coherent Quantum Control and Magnetism on Atoms on Surfaces

Taeyoung Choi\* (*Ewha Womans University, Korea*)

#### ThD1-2

09:30~10:00

#### [Invited] High-fidelity and Scale-up of Quantum Gates in Spin-based Quantum Computing with Quantum Dots

Seigo Tarucha\* (*The University of Tokyo, Japan*)

#### ThD1-3

10:00~10:30

#### [Invited] Generation of Bright Single Photon and Entangled Photon Pair Using Semiconductor Quantum Dot

Y. D. Jang, J. S. Baek, D. H. Ahn, H. J. Ahn, J. M. Oh, V. Devaraj (*Chungnam National University, Korea*), J. D. Song (*KIST, Korea*), Y. H. Lee (*KAIST, Korea*), and D. Lee\* (*Chungnam National University, Korea*)

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## [P2] Poster Session II

Date July 5, 2018 (Thursday)

Time 11:00~12:30

Place Convention Lobby (2F)

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### P2-1

#### Coherent Single Photon Emission with Small Inhomogeneous Broadening from an InGaN Single Quantum-dot in a Nano-pyramid

Jong-Hoi Cho, Y. M. Kim, Hwan-Seop Yeo, Seung-Hyuk Lim, Se-Jeong Kim, Su-Hyun Gong, and Yong-Hoon Cho\* (KAIST, Korea)

### P2-2

#### Band Gap Dependent on Temperature in Epitaxial Films of Perovskite $\text{Ba}_{1-x}\text{La}_x\text{SnO}_3$

Jae Ha Kim, Taek Sun Jung, Kyung Ik Sim, Jong Hyeon Kim (Yonsei University, Korea), Taewoo Ha (Sungkyunkwan University, Korea), Young Mo Kim, Kook Rin Char (Seoul National University, Korea), and Jae Hoon Kim (Yonsei University, Korea)

### P2-3

#### Highly Efficient Phosphor-free Warm White Light Emitting Diodes Based on InGaN/GaN Ring Structures Fabricated by Selective Area Growth and Wet Etching

Young Chul Sim, Sunghan Choi, Hwan-Seop Yeo, Ki-Young Woo, Sangwon Lee, Hyun Gyu Song, and Yong-Hoon Cho\* (KAIST, Korea)

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