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Program Book

ISPSA 2022

The 20th
International Symposium on the Physics of Semiconductors and Applications

"Past-, current-, and future-semiconductors"

July 17 (Sun.) ~ **21** (Thu.), **2022**

Ramada Plaza Jeju Hotel, Jeju, Korea / Hybrid Symposium

Hosted by
Semiconductor Physics Division, The Korean Physical Society

Organized by
BRL (Control of Quantum Properties of Exciton Nanostructures), Ewha Womans University
Center for Berry Curvature-based New Phenomena (BeCaP SRC), Chung-Ang University
Center for Integrated Nanostructure Physics (CINAP), Sungkyunkwan University
Graphene Research Institute, Sejong University
Gwangju Institute of Science and Technology
Institute for Wearable Convergence Electronics, Kyung Hee University
IQS, Chungnam National University
Korea Advanced Institute of Science and Technology
Korea Institute of Science and Technology
Novel Functional Materials & Devices Lab., Department of Physics, Hanyang University
P-CoE, Daegu Gyeongbuk Institute of Science and Technology
Quantum Technology Research Center, Electronics and Telecommunications Research Institute
Semiconductor Nanophotonics Lab., Hanyang University
Seoul Women's University
Solid-State Quantum Architecture Lab., Ulsan National Institute of Science and Technology
University of Seoul
van der Waals Materials Research Center(SRC), Yonsei University

Supported by
Korea Tourism Organization
Jeju Convention & Visitors Bureau

Table of Clontents

Welcome Message

It is my great pleasure to welcome you to the 20th International Symposium on the Physics of Semiconductors and Applications (ISPSA 2022) to be held during July 17~21, 2022 in Jeju, Korea.

This biennial conference, hosted by the Semiconductor Physics Division, Korean Physical Society, was started in 1982 for the first time to report and discuss the state of the art in semiconductor physics and applications. Following the 40-year long journey of the ISPSA with the scientific heritage on traditional semiconductor physics, emerging research fields, such as artificial intelligence, quantum information, spintronics, energy materials, and industrial semiconductor applications, will newly enrich the 20th ISPSA in one of the most dynamic places for semiconductor physics, Korea.

This symposium will contain the plenary lectures, tutorial lectures, invited talks, oral and poster presentations. I sincerely hope that all participants will use this valuable time to produce deep and profound discussions on the field of semiconductor physics and applications and make lasting friendships and future colleagues with all our prestigious researchers.

I would like to convey my sincere gratitude to the organizing and program committee members and to the advisory committee for their heartfelt efforts in making this symposium a great success. Also, my gratitude to all the sponsors, for their generous support of ISPSA 2022, can never be expressed enough.

The venue of ISPSA 2022, Jeju Island is a worldwide unique place as UNESCO world natural heritage site. Jeju Island also provides all elements for global natural sight themes, including islands, volcanos, waterfalls, beaches, national parks, caves, and forests.

I wish you all a stimulating and fruitful meeting as well as a great time in ISPSA 2022. With your active participation and support, this symposium will achieve a resounding success. I assure you that this symposium will be an academically enriching, socially enjoyable, and truly memorable experience for all delegates and accompanying persons. Please enjoy attending symposium and social activities this week in Jeju!

Thank you for your participation and welcome to the ISPSA 2022.

Yong-Hoon Cho
General Chair, ISPSA 2022
Dean, College of Natural Sciences, KAIST
Vice President, The Korean Physical Society
Chair, Semiconductor Physics Division, The Korean Physical Society

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	Jun-Mo Yang (NNFC, Korea)
	Min Gyu Lim (Magnachip Semiconductor, Korea)

On-site Registration

Registration will be open July 17~21 in the lobby(2F) of Ramada Plaza Jeju Hotel. On-site payments can be made by credit card (Visa, MasterCard, or AMEX) or cash (USD and KRW only). The registration desk will be open during the symposium according to the following schedule.

Location	Lobby (2F), Ramada Plaza Jeju Hotel
Date	**Time**
July 17 (Sun.)	12:00 ~ 18:00
July 18 (Mon.)	08:00 ~ 18:00
July 19 (Tue.)	08:00 ~ 18:00
July 20 (Wed.)	08:00 ~ 18:00
July 21 (Thu.)	08:00 ~ 12:00

* Those who have not registered for the Tutorial course can register it on the on-site desk.

Name badge

For security purposes, participants, accompanying persons, and exhibitors must wear their name badges during the symposium. If your badge needs any correction, please visit the registration desk for a replacement. There will be staff to check your badge at every gate of session rooms.

Lunches

All registrants of ISPSA 2022 can have the lunch at the Tammora (1F), Ramada Plaza Hotel.

Location	Tammora (1F), Ramada Plaza Jeju Hotel
Date	**Time**
July 18 (Mon.)	11:30 ~ 13:00
July 19 (Tue.)	12:00 ~ 13:30
July 20 (Wed.)	12:00 ~ 13:30

Coffee Break

Coffee will be provided at the following times.

Location:	Lobby (2F), Ramada Plaza Jeju Hotel
Date	**Time**
July 17 (Sun.)	15:00~15:15
July 18 (Mon.)	14:30~15:00 / 16:30~17:00
July 19 (Tue.)	10:30~11:00 / 14:30~15:00 / 16:30~17:00
July 20 (Wed.)	10:30~11:00 / 15:00~15:30 / 17:00~17:30
July 21 (Thu.)	10:30~11:00

Lost and Found

Please visit the Secretariat Office for any lost and found items.

Secretariat Office

Location:	Biyang (2F), Ramada Plaza Jeju Hotel
Operating Hours	
Date	Time
July 17 (Sun.)	10:00~18:00
July 18 (Mon.)	08:00~19:00
July 19 (Tue.)	08:00~19:00
July 20 (Wed.)	08:00~19:00
July 21 (Thu.)	08:00~13:00

Welcome Reception

The Welcome Reception will be held for all participants before the symposium starts day. It will be an excellent opportunity to catch up with old colleagues and make new friends while enjoying some Korean food. Come and join this entertaining ice-breaker to expand professional networks and form partnerships.

Location	Tamna (8F), Ramada Plaza Jeju Hotel
Date & Time	July 17 (Sun.) / 18:00~19:30

Opening Ceremony

All registered participants are cordially invited to join and celebrate the official opening of the ISPSA 2022. The ceremony will be held during 09:00~09:30, July 18 (Mon.) in Room A (Ramada Ballroom 1), Please join us and celebrating this symposium.

Location:	Ramada Ballroom 1 (2F), Ramada Plaza Jeju Hotel
Date & Time	July 18 (Mon.) / 09:00~09:30

Banquet

Banquet is a key networking event in the symposium. This will be a great opportunity to relax with wonderful entertainment while also giving us the time to know each other better. Also, you will have unforgettable impression and memory through this Banquet. Also, you can enjoy the special performance full of wit and laughter. This event promises to be an unforgettable evening in ISPSA 2022, Jeju, Korea!

Location:	Ramada Ballroom (2F), Ramada Plaza Jeju Hotel
Date & Time	July 19 (Tue.) / 18:30~20:30

Closing Ceremony

A Closing Ceremony will be held to celebrate success of the symposium and to cherish the memories from the ISPSA 2022. We invite you to celebrate the success of the symposium for 5 days and say goodbye to Korea and to thank the many people who made this exciting event happen!

Location:	Ramada Ballroom 1 (2F), Ramada Plaza Jeju Hotel
Date & Time	July 21 (Thu.) / 12:30~12:50

Information on Technical Program

We highly recommend presenters to follow the instructions noted below carefully. You need to check your presentation file in advance to confirm all fonts read correctly and all embedded video clips play smoothly within your presentation.

How to understand the Session Identification Number

For Invited talks

Day.		Room		Session Order	
Mo	Monday	A	Room A	1	First Session
Tu	Tuesday	B	Room B	2	Second Session
We	Wednesday	C	Room C	3	Third Session
Th	Thursday	D	Room D		
		E	Room E		
		F	Room F		
		G	Room G		

*Example) WeA2: Second session of Room A on Wednesday

For Contributed Oral Presentation

- The presentation code for the Contributed Oral Presentation is listed as "Topic_O_Abstract No."

* Example) LDS_O_1234: Contributed Oral Presentation with abstract No. 1234 of LDS

For On-site Poster Presentation

- The presentation code for the Poster is listed as "Presentation Topic_Poster Session 1 or 2_Abstract No."

* Example) AS_P1_1234: Poster Session 1 with Abstract No. 1234 of AS

For E-poster presentation

- The presentation code for the Poster is listed as "Presentation Topic_P_Abstract No."

* Example) AS_P_1234: E-poster presentation with Abstract No. 1234 of PO (E-poster session can be checked at only virtual website.)

Plenary and Invited Talks

• **Presentation Time**

- Plenary Talk: 60 min. including 5 min. Q&A
- Invited Talk: 30 min. including 5 min. Q&A

• **For speakers for on-site presentations**

- Presentation file in PowerPoint or PDF. No need to submit a pre-recorded video or presentation file in advance.
- Use the conference computer for presentation to avoid wasting time to connect personal laptops.

- Prepare a backup version of your presentation file (both in ppt and pdf) in a separate USB flash memory to avoid possible software issues.
- Copy your presentation file and test it in the conference computer during the break time before your session.
- Arrive in the session room at least 10 minutes before the start of your session.

• **For speakers for online presentations**
- Real time presentation is strongly encouraged.
- Participate in the Q&A session after your presentation.
- Check your mic and camera before your session starts.

Contributed Oral Presentation

Contributed Oral Presentation is delivered with a pre-recorded video through virtual platform at **https://online.ispsa.or.kr.** If you have any questions about the presentation, you can leave a message in the comments at the bottom of the video, and the presenter should answer the questions in the comments.

Poster Presentation

On-site presenters are expected to print and post their own posters. They were also encouraged to upload the PDF of their poster, so e-poster files can be checked in the virtual website during dedicated period on the virtual website (online.ispsa.or.kr). If you have any questions about the presentation, you can leave a message in the comments at the bottom of the video, and the presenter should answer the questions in the comments.

Poster Presentation

On-site

- Display your poster throughout the day of your session and discuss with participants. No webcasts of on-site posters.
- Prepare your poster and display it on the designated panel provided by the symposium.

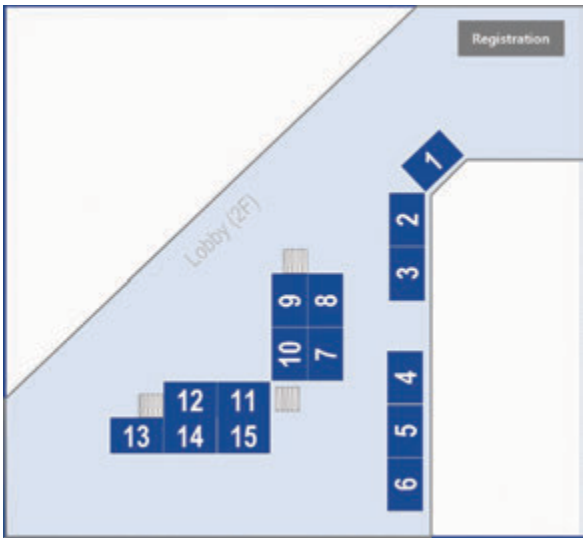
* Poster presenters must set-up or take-down their poster presentation as follows.

Session	Poster Session I	Poster Session II
Date	July 18 (Mon.)	July 19 (Tue.)
Put-up Time	10:00 ~ 15:00	10:00 ~ 15:00
Presentation Time	17:00 ~ 18:30	17:00 ~ 18:30
Take-down Time	18:30 ~ 19:30	18:30 ~ 19:30

Online

Please join the discussion with other participants using the Q&A comment box during the session.

Exhibition



Booth No.	Exhibitors
1	NANOBASE
2	LIGHT CONVERSION
3	McScience
4	KOS, Inc.
5	UniNanoTech Co., Ltd.
6	MS TECH
7	WizOptics
8	Park Systems
9	Withus Inc.
10	NANOSYSTEMS LTD.
11	Applied Science Korea
12	Attocube Systems AG
13	STANDARD SCIENCE, Inc.
14	ZYGO
15	Nano Convergence

* The tutorial will be provided in Korean only for on-site participation only, but not streamed virtually.

Tutorial I	
Date / Time	July 17 (Sun.) / 13:30~15:00
Room	Room A (Ramada Ballroom 1)
Chair	Jin Pyo Hong (Hanyang University)

Recent Technology of NAND Flash Memory

Yun Heub Song (Hanyang University, Korea)

In recent, the main product in NAND market is moving from 2D to 3D architecture. In this course, general technologies of NAND flash memory including 3D NAD flash memory are introduced and reviewed. The contents consist of (1) Introduction of flash memory and device structure & operation basic, (2) 2D NAND technology and scaling issue, (3) current technology of 3D NAND flash technology.

Tutorial II	
Date / Time	July 17 (Sun.) / 15:15~16:45
Room	Room A (Ramada Ballroom 1)
Chair	Jin Pyo Hong (Hanyang University)

Challenging History of DRAM

Inho Nam (Hanyang University, Korea)

DRAM is one of the most widely used memory device for computers and smart phones. Currently, DRAM products with feature size of 10 nm are emerging, and their market occupied $ 50 billion in the world. As AI and IoT technologies are coming, we believe the global market will continue to grow.
DRAM Cell is comprised of a transistor and a capacitor. Although the principle of DRAM has been remained same, the structures of transistor and capacitor have been changed.
In this tutorial, we will review (1) the basic operation principle and device structures of DRAM, (2) the development history of the DRAM cell transistor and the DRAM cell capacitor to overcome scaling limit. Finally, we will briefly touch (3) advanced technological issues and prospective for next-generation DRAM technology.

Plenary Talk I	
Date / Time	July 18 (Mon.) / 09:30~10:30
Room	Room A (Ramada Ballroom 1)
Chair	Ki Kang Kim (Sungkyunkwan University, Korea)

Mark C. Hersam
Northwestern University, USA

Fundamentals and Applications of Mixed-Dimensional van der Waals Heterostructures

Layered two-dimensional (2D) materials interact primarily via van der Waals bonding, which has created new opportunities for heterostructures that are not constrained by epitaxial growth. By realizing that any passivated, dangling bond-free surface interacts with another via non-covalent forces, layered 2D materials can also be integrated with a diverse range of other materials, including those of different dimensionality, to form mixed-dimensional van der Waals heterostructures. Furthermore, chemical functionalization provides additional opportunities for tailoring the properties of 2D materials and the degree of coupling across heterointerfaces. In order to efficiently explore the vast phase space for mixed-dimensional heterostructures, our laboratory employs solution-based assembly. In particular, constituent nanomaterials (e.g., carbon nanotubes, graphene, transition metal dichalcogenides, black phosphorus, boron nitride, and indium selenide) are isolated in solution, and then deposited into thin films with scalable additive manufacturing methods. By achieving high levels of nanomaterial monodispersity, a variety of electronic and energy applications can be enhanced including digital logic circuits, photodetectors, lithium-ion batteries, and solid-state electrolytes. Furthermore, by integrating multiple nanomaterials into heterostructures, unprecedented device function is realized including anti-ambipolar transistors, gate-tunable photovoltaics, and neuromorphic memtransistors. This talk will also explore several fundamental phenomena including band alignment, doping, trap states, and charge/energy transfer across previously unexplored mixed-dimensional heterointerfaces, which are enabling emerging applications in quantum information science and non-von-Neumann computing architectures.

Plenary Talk II	
Date / Time	July 18 (Mon.) / 10:30~11:30
Room	Room A (Ramada Ballroom 1)
Chair	Kunook Chung (Ulsan National Institute of Science and Technology, Korea)

Daniel Lau Shu Ping
The Hong Kong Polytechnic University, Hong Kong

Ferroelectricity in Two-Dimensional Heterobilayers

As a rising star in the family of two-dimensional (2D) materials, black phosphorus (BP) has recently attracted tremendous attention all over the world and demonstrated great potential in energy applications owing to its direct and narrow bandgap, high carrier mobility and theoretical capacity, as well as anisotropic structure. Solution exfoliation of BP reveals superior advances when compared with mechanical exfoliation. Remarkably, liquid-phase exfoliated BP flakes and quantum dots (QDs) exhibit exciting properties in batteries, solar cells, electronic, and optical devices. The exfoliation of BP in diverse solvents have been demonstrated. The solution exfoliated BP flakes can be an effective electron transport layer in organic photovoltaics (OPVs). The BP QDs can be incorporated in the active layer of OPV to boost its power conversion efficiencies. Furthermore, it can also enhance the performance of Li-S batteries significantly.

Plenary Talk III	
Date / Time	July 19 (Tue.) / 11:00~12:00
Room	Room A (Ramada Ballroom 1)
Chair	Saeroonter Oh (Hanyang University, Korea)

H.-S. Philip Wong
Stanford University, USA

Materials, Devices, and Process Technology for AI Compute

21st century applications are going to be data-centric. Data analytics, machine learning, and AI applications are going to dominate, from data center to mobile and IoT, from collecting and processing, to curating the data to derive information. Many systems will need to learn and adapt on the fly.
Three dimensional integration is one of the major technology directions for integrated circuits. I will give an overview of the new materials and device technologies that may need to be developed to realize monolithic 3D integration with multiple logic transistor and memory device layers. I will give examples of compute-in-memory chips that feature memory integration with CMOS logic as an illustration of how future 3D systems may be designed.

Plenary Talk IV	
Date / Time	July 19 (Tue.) / 13:30~14:30
Room	Room A (Ramada Ballroom 1)
Chair	Yongmin Kim (Dankook University, Korea)

Young Hee Lee
Sungkyunkwan University, Korea

Flatland in van der Waals Materials and Heterostructures

Recent development of two-dimensional layered materials such as graphene, hexagonal BN, and transition metal dichalcogenides have drawn much attention due to their fascinating unveiled physical and chemical properties. Weak van der Waals interaction between layers with free of dangling bonds allow for robust exfoliation of each layer. I like to discuss these interesting features of 2D materials and manifestation of exotic physical phenomena in several materials and heterostructures, in particular, our core research targets of carrier multiplication beyond Shockley limit, 2D ferromagnetic semiconductors at room temperature, electron-hole pair transistor for ultimate dissipation-less power, and furthermore challenges and perspectives.

Plenary Talk V	
Date / Time	July 20 (Wed.) / 11:00-12:00
Room	Room A (Ramada Ballroom 1)
Chair	Hong-Gyu Park (Korea University, Korea)

Yuri Kivshar
Australian National University, Australia

Metaphotonics and Metasurfaces Governed by Mie Resonances

Metamaterials---artificial electromagnetic media that are structured on the subwavelength scale---were initially suggested for the realisation of negative-index media, and later they became a paradigm for engineering electromagnetic space and control¬ling propagation of waves. However, applications of metamaterials in optics are limited due to inherent losses in metals employed for the realisation of artificial optical magnetism. Recently, we observe the emergence of a new field of all-dielectric Mie-resonant metaphotonics aiming at the manipulation of strong optically-induced electric and magnetic Mie-type resonances in dielectric and semiconductor nanostructures with relatively high refractive index. Unique advantages of dielectric resonant nanostructures over their metallic counterparts are low dissipative losses and the enhancement of both electric and magnetic fields that provide competitive alternatives for plasmonic structures including optical nanoantennas, efficient biosensors, passive and active metasurfaces, and functional metadevices. This talk will summarize the recent advances in all-dielectric Mie-resonant metaphotonics including active photonics as well as the recently emerged fields of biosensing, topological photonics, and nonlinear metasurfaces.

Plenary Talk VI	
Date / Time	July 20 (Wed.) / 17:30-18:30
Room	Room A (Ramada Ballroom 1)
Chair	Sang-Yun Lee (Gwangju Institute of Science and Technology, Korea)

Joerg Wrachtrup
Stuttgart University and Max Planck Institute for Solid State Research, Germany

Semiconductor Defects for Quantum Applications

Spin defect in wide band gap semiconductors are a leading contender in various areas of quantum technology. Most notably they have established themselves as a novel tool for nanoscale sensing and as major hardware for long distance quantum entanglement, necessary for quantum repeater structures. I will discuss these applications and outline future perspectives. While an increasing number of paramagnetic defects in 3D materials have been identified in the past so far this has not been the case for 2D materials. I will present novel defects in 3D materials with potentially superior optical and spin properties. In addition, I will describe results on recently found electron paramagnetic defects in 2D materials.

[MoA1] Low Dimensional Semiconductors I

Date / Time	July 18, 2022 (Mon.) / 13:00-14:30
Room	Room A (Ramada Ballroom 1)
Chair	Yongmin Kim (Dankook University, Korea)

MoA1-1 **13:00-13:30**

Invited **Toward Epitaxial Growth of Single-Crystal 2D Semiconductors**

Wen-Hao Chang[1,2]*

[1]Research Center for Applied Sciences, Taiwan, [2]National Yang Ming Chiao Tung University, Taiwan

MoA1-2 **13:30-14:00**

Invited **Synthesis of Hexagonal Boron Nitride From Monolayer to Multilayer Films**

Soo Min Kim*

Sookmyung Women's University, Korea

MoA1-3 **14:00-14:30**

Invited **Scalable Production of Single Crystal 2D Materials**

Ji-Yun Moon and Jae-Hyun Lee*

Ajou University, Korea

[MoB1] Advanced Semiconductors I

Date / Time	July 18, 2022 (Mon.) / 13:00-14:30
Room	Room B (Ramada Ballroom 2)
Chair	Daehwan Jung (Korea Institute of Science and Technology, Korea)

MoB1-1 **13:00-13:30**

Invited **Low Operating Energy Lasers on Si**

Shinji Matsuo*

NTT Corporation, Japan

MoB1-2 **13:30-14:00**

Invited **Heterointerface Engineering in van der Waals Heterostructures by Interlayer Interaction**

Gwan-Hyoung Lee*

Seoul National University, Korea

MoB1-3 **14:00-14:30**

Invited **Ultrafast Spectroscopy of Topological Phases of Matters**

Hyunyong Choi*

Seoul National University, Korea

[MoC1] Artificial Intelligence Materials and Devices I

Date / Time	July 18, 2022 (Mon.) / 13:00-14:30
Room	Room C (Ramada Ballroom 3)
Chairs	Byung Chul Jang (Kyungpook National University, Korea) Jiyong Woo (Kyungpook National University, Korea)

MoC1-1 **13:00-13:30**

Invited **System-Technology Co-optimization for Memristor-based Neuromorphic Computing Chip**

Bin Gao*, Peng Yao, Wenqiang Zhang, Jianshi Tang, He Qian, and Huaqiang Wu
Tsinghua University, China

MoC1-2 **13:30-14:00**

Invited **Artificial Synaptic Materials and Neuromorphic System**

Yu-Rim Jeon, Boncheol Ku, Chulwon Chung, Le Van Luong, Yu Jeong Choi, and Changhwan Choi*
Hanyang University, Korea

MoC1-3 **14:00-14:30**

Invited **Versatile Neuromorphic Application of Ion-gel Gated Synaptic Transistors: From Neuromorphic Computing to Nervetronics**

Yeongjun Lee[1], Dae-Gyo Seo[1], Gyeong-Tak Go[1], Zhenan Bao[2], and Tae-Woo Lee[1]*
[1]Seoul National University, Korea, [2]Stanford University, USA

[MoD1] Satellite Session: Van Der Waals Materials and Physics I

Date / Time	July 18, 2002 (Mon.) / 13:00-14:30
Room	Room D (Ramada Ballroom 4)
Chair	Duong Dinh Loc (Sungkyunkwan University, Korea)

MoD1-1 **13:00-13:30**

Invited **Stochastic Magnetic Tunnel Junction for Probabilistic Bit and Circuit**

S. Fukami[1,2]*
[1]Tohoku University, Japan, [2]Inamori Research Institute for Science, Japan

MoD1-2 **13:30-14:00**

Invited **Integration of 2D Materials on Silicon Photonics Towards a Novel Platform of Information Processing**

Sanghoon Chae*
Nanyang Technological University, Singapore

MoD1-3 **14:00-14:30**

Invited **Probing the Magnetic States of the $MnBi_2Te_4$ Family**

Yu Ye*
Peking University, China

[MoE1] Quantum Information I

Date / Time	July 18, 2022 (Mon.) / 13:00-14:30
Room	Room E (Mara Hall)
Chair	Yonuk Chong (Sungkyunkwan University, Korea)

MoE1-1 **13:00-13:30**

Invited **Engineering Quantum Systems of Superconducting Qubits**

William Oliver*
Massachusetts Institute of Technology, USA

MoE1-2 **13:30-14:00**

Invited **High-fidelity iToffoli Gate for Fixed-frequency Transmon Qubits**

Yosep Kim[1,2]*, Alexis Morvan[2], Long B. Nguyen[2], Ravi K. Naik[2,3], Christian Jünger[2], Larry Chen[3], John Mark Kreikebaum[1,3], David I. Santiago[2,3], and Irfan Siddiqi[1,2,3]
[1]Korea Institute of Science and Technology, Korea, [2]Lawrence Berkeley National Laboratory, USA, [3]University of California, USA

MoE1-3 **14:00-14:30**

Invited **Lamb Shifts of a Microwave-dressed Artificial Atom Coupled to a Single-mode Vacuum**

Byoung-moo Ann*
Korea Research Institute of Standards and Science, Korea

[MoF1] Energy Materials and Devices I

Date / Time	July 18, 2022 (Mon.) / 13:00-14:30
Room	Room F (Udo Hall)
Chairs	Sohee Jeong (Sungkyunkwan University, Korea)
	Ji-Sang Park (Kyungpook National University, Korea)

MoF1-1 **13:00-13:30**

Invited **Highly Efficient and Stable Perovskite Photovoltaics : Semiconducting Property of Hybrid Organic-Inorganic Metal Halides**

Hyunjung Shin*
Sungkyunkwan University, Korea

MoF1-2 **13:30-14:00**

Invited **Ligand Engineering in Halide Perovskites**

Soo Young Kim*
Korea University, Korea

MoF1-3 **14:00-14:30**

Invited **Toward Electrically Pumped Colloidal Quantum Dot Lasers**

Young-Shin Park*
Korea Advanced Institute of Science and Technology, Korea

[MoG1] Novel Functional Spintronics I

Date / Time	July 18, 2022 (Mon.) / 13:00-14:30
Room	Room G (Chuja Hall)
Chair	Ji-Wan Kim (Kunsan National University, Korea)

MoG1-1 **13:00-13:30**

Invited **A Study of Nanomagnetism Using Synchrotron X-rays**

Zi. Q. Qiu *
University of California at Berkeley, USA

MoG1-2 **13:30-14:00**

Invited **Magnetic Skyrmion Season 2**

Chanyong Hwang*
Korea Research Institute of Standards and Science, Korea

MoG1-3 **14:00-14:30**

Invited **Helical Magnetism and Spin Transport of the $Fe_{5-x}GeTe_2$ Crystal**

S. Kim*
University of Ulsan, Korea

[MoA2] Low Dimensional Semiconductors II

Date / Time	July 18, 2022 (Mon.) / 15:00-16:30
Room	Room A (Ramada Ballroom 1)
Chair	Byung Jin Cho (Chungbuk National University, Korea)

MoA2-1 **15:00-15:30**

Invited **High Temperature Synthesis of Boron Nitride Nanotubes and Their Applications**

Myung Jong Kim*
Gachon University, Korea

MoA2-2 **15:30-16:00**

Invited **Atomic Layer Deposition Techniques "for" the 2D Material and "on" the 2D Material**

Woojin Jeon*
Kyung Hee University, Korea

MoA2-3 **16:00-16:30**

Invited **Novel Properties of 2D-Materials-Based Heterostructures and Device Applications**

Suk-Ho Choi*
Kyung Hee University, Korea

[MoB2] Advanced Semiconductors II

Date / Time	July 18, 2022 (Mon.) / 15:00-16:30
Room	Room B (Ramada Ballroom 2)
Chairs	Kibog Park (Ulsan National Institute of Science and Technology, Korea) Kunook Chung (Ulsan National Institute of Science and Technology, Korea)

MoB2-1 15:00-15:30

Invited **Multi-value Logic Devices Using Mobility Edge Quantized Conduction in Ultrathin ZnO**

Byoung Hun Lee*
Pohang University of Science and Technology, Korea

MoB2-2 15:30-16:00

Invited **Coherent Motion of Electron Wave Packet in a Quantum Dot Under High Magnetic Fields**

Sung Un Cho[1], Bum-Kyu Kim[2], Wanki Park[1], Byeong-Sung Yu[2,3], MinKy Seo[2], Sungguen Ryu[1], DongSung T. Park[1], Hyung-KooK Choi[3], Yunchul Chung[4], Ju-Jin Kim[3], Nam Kim[2], Heung-Sun Sim[1], and Myung-Ho Bae[2,5]*
[1] Korea Advanced Institute of Science and Technology, Korea, [2]Korea Research Institute of Standards and Science, Korea, [3]Jeonbuk National University, Korea, [4]Pusan National University, Korea, [5]University of Science and Technology, Korea

MoB2-3 16:00-16:30

Invited **Advanced Nanoscale Characterization of Nitride-based Quantum Structures**

Frank Bertram*, Gordon Schmidt, and Jürgen Christen
University of Magdeburg, Germany

[MoC2] Artificial Intelligence Materials and Devices II

Date / Time	July 18, 2022 (Mon.) / 15:00-16:30
Room	Room C (Ramada Ballroom 3)
Chairs	Byung Chul Jang (Kyungpook National University, Korea) Jiyong Woo (Kyungpook National University, Korea)

MoC2-1 **15:00-15:30**

Invited **Ferroelectric Materials for Memory and Neuromorphic Device Applications**

Jang-Sik Lee*
Pohang University of Science and Technology, Korea

MoC2-2 **15:30-16:00**

Invited **Charge Trap Memristor and Its Application to the Neural Network**

W. H. Cheong, J. B. Jeon, Geunyoung Kim, Hanchan Song, and Kyung Min Kim*
Korea Advanced Institute of Science and Technology, Korea

MoC2-3 **16:00-16:30**

Invited **Implementation of Neuromodulatory Synaptic Plasticity with Memristive Devices**

Keonhee Kim[1,2], Dae Cheol Kang[1], Yeonjoo Jeong[1], Suyoun Lee[1], Joonyoung Kwak[1], Jongkil Park[1], Jaewook Kim[1], Jong Keuk Park[1], and Inho Kim[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Korea University, Korea

[MoD2] Satellite Session: Van Der Waals Materials and Physics II

Date / Time	July 18, 2022 (Mon.) / 15:00-16:30
Room	Room D (Ramada Ballroom 4)
Chair	Chandan Biswas (Sungkyunkwan University, Korea)

MoD2-1 **15:00-15:30**

Invited **Synthesis and Phase Engineering of Metal Chalcogenides**

S.S. Guo, B.J. Tang, and Z. Liu*
Nanyang Technological University, Singapore

MoD2-2 **15:30-16:00**

Invited **Momentum-resolved Ultrafast Dynamics of Excitons, Electrons and Phonons in Low-dimensional Materials and Heterostructures**

S. Dong[1], T. Pincelli[1,2], S. Beaulieu[1], M. Dendzik[1], J. Maklar[1], D. Zahn[1], H. Seiler[1], M. Puppin[1], A. Neef[1], V. Taylor[1], Y.W. Windsor[1,2], M. Wolf[1,2], L. Rettig, and R. Ernstorfer[1,2],*
[1]Fritz Haber Institute of the Max Planck Society, Germany, [2]TU Berlin, Germany

MoD2-3 **16:00-16:30**

Invited **Spin Interactions in 2D Quantum Materials and Heterostructures**

Saroj Prasad Dash*
Chalmers University of Technology, Sweden

[MoE2] Quantum Information II

Date / Time	July 18, 2022 (Mon.) / 15:00-16:30
Room	Room E (Mara Hall)
Chair	Hojoong Jung (Korea Institute of Science and Technology, Korea)

MoE2-1 15:00-15:30

Invited **Nanophotonics for Quantum Information and Quantum Sensing**

H. Takashima, A. Fukuda, H. Kawaguchi, K. Fukushige, K. Shimazaki, T. Tashima, and S. Takeuchi[1]*
Kyoto University, Japan

MoE2-2 15:30-16:00

Invited **Non-Conventional Photon-Pair Generation in Fiber and Silicon Waveguide**

Heedeuk Shin*
Pohang University of Science and Technology, Korea

MoE2-3 16:00-16:30

Invited **On-chip Single-photon Quantum Technology**

Xiaosong Ma*
Nanjing University, China

[MoF2] Energy Materials and Devices II

Date / Time	July 18, 2022 (Mon.) / 15:00-16:30
Room	Room F (Udo Hall)
Chair	Younghoon Kim (Kookmin University, Korea)

MoF2-1 15:00-15:30

Invited **Organic Cation Intercalation Improves Crystal Orientation and Bandedge Integrity in Reduced-dimensional Perovskites**

Zhenyu (Kevin) Yang*
Sun Yat-Sen University, China

MoF2-2 15:30-16:00

Invited **First-principles Understanding of Polycrystalline Nature of Halide Perovskites**

Ji-Sang Park*
Kyungpook National University, Korea

MoF2-3 16:00-16:30

Invited **Highly Efficient Perovskite based Tandem Solar Cells Enabled by 2-dimensional Additive Engineering**

D. H. Kim[1]*
Korea University, Korea

[MoG2] Novel Functional Spintronics II

Date / Time	July 18, 2022 (Mon.) / 15:00-16:30
Room	Room G (Ramada Ballroom 1)
Chair	Chanyong Hwang (Korea Research Institute of Standards and Science, Korea)

MoG2-1 **15:00-15:30**

Invited **Efficient Spin-orbit Torque Switching Driven by W-based Alloys**

G. W. Kim[1], I. H. Cha[1], T. Kim[1], M. H. Lee[1], Y. J. Kim[1], and Young Keun Kim[1]*
Korea University, Korea

MoG2-2 **15:30-16:00**

Invited **Coupled Spin-Charge Transport in Noncentrosymmetric Systems**

Jung-Woo Yoo*
Ulsan National Institute of Science and Technology, Korea

MoG2-3 **16:00-16:30**

Invited **Electrical Control of Magnetization in Magnetic Insulators**

Can Onur Avci*
ETH Zurich, Switzerland

[MoB3] Materials for Future-Semiconductors

Date / Time	July 18, 2022 (Mon.) / 17:00~18:30
Room	Room B (Ramada Ballroom 2)
Chair	Kwun-Bum Chung (Dongguk University, Korea)

MoB3-1 **17:00-17:15**

New Copper Sulfide Electrodes for Electronics and Optoelectronics Applications

Sangyeon Pak*
Hongik University, Korea

MoB3-2 **17:15-17:30**

Machine-Learning-Guided Prediction Models and Materials Discovery for High Tc Cuprates

Sooran Kim*
Kyungpook National University, Korea

MoB3-3 **17:30-17:45**

Transition Metal Compounds for Highly Efficient Hydrogen and Oxygen Generation Reactions

J. Hong[1]* and J. I. Sohn[2]
[1]*Kookmin University, Korea,* [2]*Dongguk University, Korea*

MoB3-4 **17:45-18:00**

Low-cost Plasmonic Color Film Based on Bacteriophage: A Platform for Color-based VOCs Detection

Jong-Min Lee[1]* and Jin-Woo Oh[2]
[1]*Hallym University, Korea,* [2]*Pusan National University, Korea*

MoB3-5 **18:00-18:15**

Organic/inorganic Hybrid Light Emitting Transistors for Backplane/Driverfree Display Applications

Jung Hwa Seo*
University of Seoul, Korea

[MoC3] Devices for Future-Semiconductors

Date / Time	July 18, 2022 (Mon.) / 17:00~18:30
Room	Room C (Ramada Ballroom 3)
Chair	Jungyup Yang (Kunsan National University, Korea)

MoC3-1 **17:00-17:15**

Toward Single Photon Source with High Emission Rates at Telecom C-band

H. S. Kim[1]*
Electronics and Telecommunications Research Institute, Korea

MoC3-2 **17:15-17:30**

Bio-inspired Imaging System for Machine Vision Applications

C. Choi*
Korea Institute of Science and Technology, Korea

MoC3-3 **17:30-17:45**

3D Printed Optoelectronic Devices

Sung Hyun Park*
Korea Institute of Industrial Technology, Korea

MoC3-4 **17:45-18:00**

Effect of Energetics on Charge Dynamics in Organic and Perovskite/BHJ Integrated Solar Cells

Jinho Lee*
Incheon National University, Korea

MoC3-5 **18:00-18:15**

Elucidating the Long-range Charge Carrier Mobility of Metal Halide Perovskite via Transient Photo-conductivity

W. Lee and J. Lim*
Chungnam National University, Korea

[MoD3] Characterizations for Future-Semiconductors

Date / Time	July 18, 2022 (Mon.) / 17:00~18:30
Room	Room D (Ramada Ballroom 4)
Chairs	Chang-Hee Cho (Daegu Gyeongbuk Institute of Science and Technology, Korea)

MoD3-1 **17:00-17:15**

Modulating Optical Properties in Layered and Low-dimensional Materials

T.-G. Kim and J.-W. Kang*
Mokpo National University, Korea

MoD3-2 **17:15-17:30**

Hole-doping on Ultrathin $MoTe_2$ for Highly Stable Unipolar Field-effect Transistor

Hye Min Oh*
Kunsan National University, Korea

MoD3-3 **17:30-17:45**

A Cascade Quantum Hall Transition in Graphene Twisting Systems

Youngwook Kim*
Daegu Gyeongbuk Institute of Science and Technology, Korea

MoD3-4 **17:45-18:00**

THz Nanoslot Antennas for Characterization and Application of Carrier Dynamics on Photo-excited Semiconductors

Geunchang Choi*
Chung-Ang University, Korea

MoD3-5 **18:00-18:15**

Visualizing Surface Phonon Polaritons of Low Dimensional Hyperbolic Material at Nanoscale

J. Jahng* and E. S. Lee*
Korea Research Institute of Standards and Science, Korea

MoD3-6 **18:15-18:30**

Control of Optical Properties in a Single Coupled Quantum Dot Molecule

Heedae Kim[1]*, Jong Su Kim[2], and Jindong Song[3]
[1]Jeonbuk National University, Korea, [2]Yeungnam University, Korea, [3]Korea Institute of Science and Technology, Korea

[MoF3] Quantum Information and Low Dimensional Systems I

Date / Time	July 18, 2022 (Mon.) / 17:00-18:30
Room	Room F (Udo Hall)
Chair	Jeil Jung (University of Seoul, Korea)

MoF3-1 **17:00-17:30**

Invited **Elements of Density Functional Theory**

Berge Englert*
National University of Singapore, Singapore

MoF3-2 **17:30-18:00**

Invited **A Brief Introduction to Quantum Algorithms with Examples in Optimization, Machine Learning, and Finance**

Patrick Rebentrost*
National University of Singapore, Singapore

MoF3-3 **18:00-18:30**

Invited **Stimulating Matter with Quantum Computers**

Dmitry Angelakis*
National University of Singapore, Singapore

[TuA1] Low Dimensional Semiconductors III

Date / Time	July 19, 2022 (Tue.) / 09:00-10:30
Room	Room A (Ramada Ballroom 1)
Chair	Ki Kang Kim (Sungkyunkwan University, Korea)

TuA1-1 09:00-09:30

Invited **Rhombohedral Graphene: from Semiconductor to Electron Correlation Physics**

Long Ju*
Massachusetts Institute of Technology, USA

TuA1-2 09:30-10:00

Invited **One-step Synthesis and Property Control of the Nitrogenated Graphene Quantum Dots**

Byung Joon Moon and Sukang Bae*
Korea Institute of Science and Technology, Korea

TuA1-3 10:00-10:30

Invited **Memristors in van der Waals Integration**

Woo Jong Yu*
Sungkyunkwan University, Korea

[TuB1] Advanced Semiconductors III

Date / Time	July 19, 2022 (Tue.) / 09:00-10:30
Room	Room B (Ramada Ballroom 2)
Chairs	Daehwan Jung (Korea Institute of Science and Technology, Korea) Daesu Lee (Pohang University of Science and Technology, Korea)

TuB1-1 09:00-09:30

Invited **Graphene Quantum Electrical Metrology for National Measurement Standards**

Randolph E. Elmquist[1]*, Mattias Kruskopf[2], Dinesh K. Patel[3], I-Fan Hu[3], Chieh-I Liu[1,4], Albert F. Rigosi[1], Alireza R. Panna[1], Shamith U. Payagala[1], and Dean G. Jarrett[1]
[1]National Institute of Standards and Technology, USA, [2]Physikalisch-Technische Bundesanstalt, Germany, [3]National Taiwan University, Taiwan, [4]University of Maryland, USA

TuB1-2 09:30-10:00

Invited **Engineering Nitride Fins and Demonstration of Record Linearity in HEMTs and Varactors**

Shadi A. Dayeh*, Po Chun Chen, Tianhai Wu, Woojin Choi, Atsunori Tanaka, Renjie Chen, and Peter M. Asbeck
University of California San Diego, USA

TuB1-3 10:00-10:30

Invited **Two-dimensional Transport Phenomena in Complex Oxide Heterostructures**

Hyungwoo Lee*
Ajou University, Korea

[TuC1] Artificial Intelligence Materials and Devices III

Date / Time	July 19, 2022 (Tue.) / 09:00-10:00
Room	Room C (Ramada Ballroom 3)
Chairs	Sangbum Kim (Seoul National University, Korea) Huichan Seo (SK Hynix, Korea)

TuC1-1 09:00-09:30

Invited **Memristive Materials and Devices for Unconventional Computing**

J. Joshua Yang*
University of Massachusetts, USA

TuC1-2 09:30-10:00

Invited **Analog AI: Deep Learning with Non-volatile Memory**

Geoffrey W. Burr*, Pritish Narayanan, Stefano Ambrogio, Hsinyu Tsai, Charles Mackin, Katherine Spoon, An Chen, Alexander Friz, and Andrea Fasoli
IBM Research, USA

[TuD1] Satellite Session: Van Der Waals Materials and Physics III

Date / Time	July 19, 2022 (Tue.) / 09:00-10:30
Room	Room D (Ramada Ballroom 4)
Chair	Ji-Hee Kim (Sungkyunkwan University, Korea)

TuD1-1 09:00-09:30

Invited **Ultrafast Probing of Low-energy Electrodynamics in a Correlated van der Waals Insulator**

Carina A. Belvin[1], Edoardo Baldini[1], Emre Ergeçen[1], Batyr Ilyas[1], Mehmet B. Yilmaz[1], Ilkem Ozge Ozel[1], Dan Mao[1], Hoi Chun Po[1], Clifford J. Allington[1], Suhan Son[2,3], Beom Hyun Kim[4], Jonghyeon Kim[5], Inho Hwang[2,3], Jae Hoon Kim[5], Je-Geun Park[2,3], T. Senthil[1], and Nuh Gedik[1*]
[1]Massachusetts Institute of Technology, USA, [2]Institute for Basic Science, Korea, 3Seoul National University, Korea, 4Korea Institute for Advanced Study, Korea, 5Yonsei University, Korea

TuD1-2 09:30-10:00

Invited **Intelligent Sensing Enabled by Tunable Moiré Quantum Geometry**

Fengnian Xia*
Yale University, USA

TuD1-3 10:00-10:30

Invited **Isotope Effect on the Thermal and Optical Properties of Atomically Thin 2D Materials**

Yiling Yu[1], Volodymyr Turkowski[2], Xufan Li[1], Alexander A. Puretzky[1], Christopher Rouleau[1], David B. Geohegan[1], and Kai Xiao[1]*
[1]Oak Ridge National Laboratory, USA, [2]University of Central Florida, USA

[TuE1] Quantum Information III

Date / Time	July 19, 2022 (Tue.) / 09:00-10:30
Room	Room E (Mara Hall)
Chair	Junho Suh (Korea Research Institute of Standards and Science, Korea)

TuE1-1 **09:00-09:30**

Invited **Graphene-based Josephson Junction Microwave Bolometer**

Gil-Ho Lee[1,2], Dmitri K. Efetov[3], Leonardo Ranzani[4], Evan D. Walsh[1,5], Thomas A. Ohki[4], Takashi Taniguchi[6], Kenji Watanabe[6], Philip Kim[1], Dirk Englund[5], and Kin Chung Fong[4]*
[1]Harvard University, USA, [2]Pohang University of Science and Technology, Korea, [3]ICFO-Institut de Ci`encies Fot`oniques, Spain, [4]Raytheon BBN Technologies, USA, [5]Massachusetts Institute of Technology, USA, [6]National Institute for Materials Science, Japan

TuE1-2 **09:30-10:00**

Invited **Fractional Josephson Effects in Topological Insulator Nanoribbons**

Yong-Joo Doh*
Gwangju Institute of Science and Technology, Korea

TuE1-3 **10:00-10:30**

Invited **A Roadmap Towards Quantum Advantage**

Hanhee Paik*
IBM – Thomas J. Watson Research Center, USA

[TuF1] Energy Materials and Devices III

Date / Time	July 19, 2022 (Tue.) / 09:00-10:30
Room	Room F (Udo Hall)
Chair	Gee Yeong Kim (Korea Institute of Science and Technology, Korea)

TuF1-1 **09:00-09:30**

Invited **A Carrier-Resolved Photo-Hall Effect: Unlocking a 140-year-old Secret in Hall Effect**

Oki Gunawan1* and Byungha Shin2
[1]IBM T. J. Watson Research Center, USA, [2]Korea Advanced Institute of Science and Technology, Korea

TuF1-2 **09:30-10:00**

Invited **Van der Waals Material Memory and Computing Devices**

Han Wang*
University of Southern California, USA

TuF1-3 **10:00-10:30**

Invited **Long-Term Stable Perovskite Solar Cells**

Hui-Seon Kim*
Inha University, Korea

[TuG1] Novel Functional Spintronics III

Date / Time	July 19, 2022 (Tue.) / 09:00-10:30
Room	Room G (Chuja Hall)
Chair	Byong-Guk Park (Korea Advanced Institute of Science and Technology, Korea)

TuG1-1 **09:00-09:30**

Invited **Spintronics for Alternative Computing**

Nitin Prasad[1], Prashansa Mukim[1], Advait Madhavan[1], and Mark D. Stiles[2]*
[1]University of Maryland, USA, [2]National Institute of Standards and Technology, USA

TuG1-2 **09:30-10:00**

Invited **Chiral Effects in Magnetic Multilayers with a Broken Inversion Symmetry**

Dong-Soo Han*
Korea Institute of Science and Technology, Korea

TuG1-3 **10:00-10:30**

Invited **Topological Magnons**

Se Kwon Kim*
University of Missouri, USA

[TuA2] Low Dimensional Semiconductors IV

Date / Time	July 19, 2022 (Tue.) / 15:00-16:30
Room	Room A (Ramada Ballroom 1)
Chairs	Young Duck Kim (Kyung Hee University, Korea) Bae Ho Park (Konkuk University, Korea)

TuA2-1 15:00-15:30

Invited **Single-crystalline 2D Semiconductor Growth and Device Technology**

Xinran Wang*
Nanjing University, China

TuA2-2 15:30-16:00

Invited **Electrical Characterization of a 2D Ferromagnetic Material**

Changgu Lee[1]*, Jinhwan Lee[1], Cheng Tan[2], Lan Wang[2], Chanyong Hwang[3], Giang Nguyen[4], and An-Ping Li[4]
[1]Sungkyunkwan University, Korea, [2]RMIT, Australia, [3]Korea Research Institute of Standards and Science, Korea, [4]ORNL, USA

TuA2-3 16:00-16:30

Invited **Optical Characterizations of Atomically Thin Transition Metal Dichalcogenides**

J.-U. Lee*
Ajou University, Korea

[TuB2] Advanced Semiconductors IV

Date / Time	July 19, 2022 (Tue.) / 15:00-16:30
Room	Room B (Ramada Ballroom 2)
Chairs	Kunook Chung (Ulsan National Institute of Science and Technology, Korea) Kibog Park (Ulsan National Institute of Science and Technology, Korea)

TuB2-1 15:00-15:30

Invited **Atomic Origin of Two-dimensional Homologous Organic-Inorganic Perovskite Quantum Wells**

Ya-Ping Chiu[1]*, Min-Chuan Shih[1], Hung-Chang Hsu[1], and Chun-Wei Chen[1,2]
[1]National Taiwan University, Taiwan, [2]Ministry of Science and Technology, Taiwan

TuB2-2 15:30-16:00

Invited **C_{60}-Nanowire Two-State Resistance Switching**

Kazuhito Tsukagoshi[1,2]*, Hiroshi Suga[1,2], Yukiya Umeta[1,2], and Mihiro Takeuchi[1,2]
[1]National Institute for Materials Science, Japan, [2]Chiba Institute of Technology, Japan

TuB2-3 16:00-16:30

Invited **Vibrant Structural Colors from Metal-semiconductor Hybrid Mie Resonators**

Jerome K. Hyun*
Ewha Womans University, Korea

[TuC2] Artificial Intelligence Materials and Devices IV

Date / Time	July 19, 2022 (Tue.) / 15:00-16:30
Room	Room C (Ramada Ballroom 3)
Chairs	Joon Young Kwak (Korea Institute of Science and Technology, Korea) Huichan Seo (SK Hynix, Korea)

TuC2-1 **15:00-15:30**

Invited **Neuromorphic Devices and Materials for AI Computation**

Seyoung Kim*
Pohang University of Science and Technology, Korea

TuC2-2 **15:30-16:00**

Invited **Alkali Ion-Based Memristors for Neuromorphic Computing Applications**

Hong-Sub Lee*
Kangwon National University, Korea

TuC2-3 **16:00-16:30**

Invited **Hardware Implementation of Artificial Neural Network with Electronic Devices**

J. Park, Y. Hwang, S. Youn, G. H. Lee, M. S. Song, and H. Kim*
Inha University, Korea

[TuD2] Plasmonics and Optoelectronics I

Date / Time	July 19, 2022 (Tue.) / 15:00-16:30
Room	Room D (Ramada Ballroom 4)
Chairs	Chang-Hee Cho (Daegu Gyeongbuk Institute of Science and Technology, Korea) Jang-Won Kang (Mokpo National University, Korea)

TuD2-1 **15:00-15:30**

Invited **Tailoring Light-matter Interaction for Low-dimensional Semiconductors in Hyperbolic Media**

Kwang Jun Ahn*
Ajou University, Korea

TuD2-2 **15:30-16:00**

Invited **Deep Subwavelength Control of Circularly Polarized Light by Using Cathodoluminescence Nanoscopy**

Zheyu Fang[1]*
Peking University, China

TuD2-3 **16:00-16:30**

Invited **Perturbation of Single Metal Nanoparticles on a Single Terahertz Nanoresonator**

Young-Mi Bahk[1], Kyoung-Ho Kim[2], Kwang Jun Ahn[3], Dai-Sik Kim[4], and Hyeong-Ryeol Park[4]*
[1]Incheon National University, Korea, [2]Chungbuk National University, Korea, [3]Ajou University, Korea, [4]Ulsan National Institute of Science and Technology, Korea

[TuE2] Quantum Information IV

Date / Time	July 19, 2022 (Tue.) / 15:00-16:30
Room	Room E (Mara Hall)
Chair	Jehyung Kim (Ulsan National Institute of Science and Technology, Korea)

TuE2-1 **15:00-15:30**

Invited **2D Materials for Integrated Quantum Photonic Circuit**

Sejeong Kim*
University of Melbourne, Australia

TuE2-2 **15:30-16:00**

Invited **Spin-Based Coding of Optical Imaging Systems**

Donggyu Kim*
Korea Advanced Institute of Science and Technology, Korea

TuE2-3 **16:00-16:30**

Invited **Photophysics of Single Solid State Emitters for Quantum Sensing Applications**

K.-G. Lee[1]* and C. Lee[2]
[1]Hanyang University, Korea, [2]Korea Research Institute of Standards and Science, Korea

[TuF2] Energy Materials and Devices IV

Date / Time	July 19, 2022 (Tue.) / 15:00-16:30
Room	Room F (Udo Hall)
Chairs	Sohee Jeong (Sungkyunkwan University, Korea) Hyesung Park (Ulsan National Institute of Science and Technology, Korea)

TuF2-1 **15:00-15:30**

Invited **Defects and Defect Tolerance in Bismuth-Based Perovskite-Inspired Materials**

R. L. Z. Hoye[1]*
Imperial College London, UK

TuF2-2 **15:30-16:00**

Invited **Designing and Synthesizing n-type Nanomaterials for High-performance Hybrid Perovskite Solar Cells**

Songyuan Dai[1]*, Yong Ding[1], Molang Cai[1], Xuepeng Liu[1], Xu Pan[2], and Linhua Hu[2]
[1]North China Electric Power University. China, [2]Hefei Institute of Physical Science, China

TuF2-3 **16:00-16:30**

Invited **Ionic Transport in Lead Halide Perovskite: Marriage with Solid State Ionics and Semiconductor**

Gee Yeong Kim*
Korea Institute of Science and Technology, Korea

[TuG2] Novel Functional Spintronics IV

Date / Time	July 19, 2022 (Tue.) / 15:00-16:30
Room	Room G (Chuja Hall)
Chair	Se-Kwon Kim (Korea Advanced Institute of Science and Technology, Korea)

TuG2-1 15:00-15:30

Invited **Interfacial Dzyaloshinskii-Moriya Interaction in Metallic Magnetic Thin Films**

Yong-Keun Park[1], Hyun–Seok Whang[1], and Sug-Bong Choe[1]*
Seoul National University, Korea

TuG2-2 15:30-16:00

Invited **Efficient Field-free Spin-orbit Torque Switching of Perpendicular Magnetization**

Byong-Guk Park*
Korea Advanced Institute of Science and Technology, Korea

TuG2-3 16:00-16:30

Invited **Memristor Controlled Mutual Synchronization of Spin Hall Nano-Oscillators**

J. Åkerman[1]*, M. Zahedinejad[1], A. A. Awad[1], H. Fulara[2], S. Muralidhar[1], A. Houshang[1], R. Khymyn[1], S. Fukami[3], S. Kanai[3], and H. Ohno[3]
[1]University of Gothenburg, Sweden, [2]Indian Institute of Technology Roorkee, India, [3]Tohoku University, Japan

[TuE3] Satellite Session: BeCaP SRC Satellite Session I

Date / Time	July 19, 2022 (Tue.) / 17:00-18:30
Room	Room E (Mara Hall)
Chair	Sug-Bong Choe (Seoul National University, Korea)

TuE3-1 17:00-17:30

Invited **Infinite Magnetoresistance and Evidence for Diode Effects in Chalcogenidebased Superconducting Switches**

Hisa Matsuki[1], Laura Gorzawski[1], Nadia Stelmashenko[1], Lesley Cohen[2], and Jason Robinson[1]*
[1]University of Cambridge, UK, [2]Imperial College London, UK

TuE3-2 17:30-18:00

Invited **Spin-orbit Torque Switching between Reversed Antiferromagnetic State and its Electrical Detection**

Jörg Wunderlich*
University of Regensburg, Germany

TuE3-3 18:00-18:30

Invited **Long-range Supercurrents Through a Chiral Non-collinear Antiferromagnet in Lateral Josephson Junctions**

Kun-Rok Jeon*
Chung-Ang University, Korea

[TuF3] Satellite Session: Quantum Information and Low Dimensional Systems II

Date / Time	July 19, 2022 (Tue.) / 17:00-18:30
Room	Room F (Udo Hall)
Chair	Soojoon Lee (Kyung Hee University, Korea)

TuF3-1 17:00-17:30

Invited **Quantum Resource Theories and the Role of Complex Numbers in Quantum Mechanics**

Alexander Streltsov*
University of Warsaw, Poland

TuF3-2 17:30-18:00

Invited **Quantum Machine Learning with Optimized Random Features: Applications of Exponential Speedup without Sparsity and Low-Rankness Assumptions**

Hayata Yamasaki*
Austrian Academy of Sciences and Technische Universitat Wien, Austria

TuF3-3 18:00-18:30

Invited **Relation between Quantum Coherence and Quantum Entanglement in Quantum Measurements**

Ho-Joon Kim and Soojoon Lee
Kyung Hee University, Korea

[TuG3] Satellite Session: Standardization of Carbon Nanotube/2D Materials	
Date / Time	July 19, 2022 (Tue.) / 16:40-18:30
Room	Room G (Chuja Hall)
Chairs	Ha-Jin Lee (Seoul Women's University, Korea) Hyojung Kim (Sungkyunkwan University, Korea)

16:40-16:45

Opening Remark

Ha-Jin Lee
Seoul Women's University, Korea

TuG3-1 **16:45-17:10**

Invited **Emerging Industrial Applications of Nanomaterials and International Standardization Activities of IEC TC 113**

Won-Kyu Park*
Sungkyunkwan University, Korea

TuG3-2 **17:10-17:30**

Invited **Evaluation of the Reduction Degree of Graphene Oxide using Raman Spectroscopy**

Hyojung Kim[1]*, Hye Min Oh[2], and Mun Seok Jeong[3]
[1]Sungkyunkwan University, Korea, [2]Kunsan National University, Korea, [3]Hanyang University, Korea

TuG3-3 **17:30-17:50**

Invited **International Standardization on Density and Thermal Diffusivity Measurements for Vertically Aligned Carbon Nanotubes**

Kei Noda*
Keio University, Japan

TuG3-4 **17:50-18:10**

Invited **International Standardization on Carbon Nanomaterials for Electrodes of Next-generation Energy Storage Devices**

JoonHo Bae*
Gachon University, Korea

TuG3-5 **18:10-18:30**

Invited **Defect Density Measurement and Calculation for Graphene Materials Using the STEM-EELS Method**

Wonki Lee and Jun Yeon Hwang*
Korea Institute of Science and Technology, Korea

[WeA1] Low Dimensional Semiconductors V

Date / Time	July 20, 2022 (Wed.) / 09:00-10:30
Room	Room A (Ramada Ballroom 1)
Chairs	Chul-Ho Lee (Korea University, Korea) Bae Ho Park (Konkuk University, Korea)

WeA1-1 **09:00-09:30**

Invited **Straintronics Enabled by Interfacial Slip in 2D Material Heterostructures**

Arend van der Zande*
University of Illinois at Urbana-Champaign, USA

WeA1-2 **09:30-10:00**

Invited **Strong Anisotropy of Black Phosphorus Visualized by Electron Microscopy: Etching and Surface Diffusion**

Kwanpyo Kim*
Yonsei University, Korea

WeA1-3 **10:00-10:30**

Invited **Solution-based Patterned Synthesis of 2D Heterostructure and its Application**

Seoung-Ki Lee*
Korea Institute of Science and Technology, Korea

[WeB1] Advanced Semiconductors V

Date / Time	July 20, 2022 (Wed.) / 09:00-10:30
Room	Room B (Ramada Ballroom 2)
Chairs	Yong Soo Kim (University of Ulsan, Korea) Young-Jun Yu (Chungnam National University, Korea)

WeB1-1 09:00-09:30

Invited **Bulk Photovoltaic Effect Induced by Spontaneous Polarization in Rhombohedral MoS_2**

Ziliang Ye*
University of British Columbia, Canada

WeB1-2 09:30-10:00

Invited **Tuning the Excitonic Properties with Semiconductor-based Optical Cavities**

Chang-Hee Cho*
Daegu Gyeongbuk Institute of Science and Technology, Korea

WeB1-3 10:00-10:30

Invited **Coherent Phonon Oscillations and Transient Critical-point Parameters in Femtosecond Pump-probe Ellipsometry Spectra**

S. Zollner[1]*, C. Emminger[1,2,3,4], S. Espinoza[5], S. Richter[3,5,6], M. Rebarz[5], O. Herrfurth[3,7], M. Zahradnik[5], R. Schmidt-Grund[8], and J. Andreasson[5]
[1]New Mexico State University, USA, [2]Masaryk University, Czech Republic, [3]Universität Leipzig, Leipzig, Germany, [4]Humboldt Universität zu Berlin, Germany, [5]ELI Beamlines, Dolni Brezany, Czech Republic, [6]Lund University, Sweden, [7]Active Fiber Systems GmbH, Germany

[WeC1] Artificial Intelligence Materials and Devices V

Date / Time	July 20, 2022 (Wed.) / 09:00-10:30
Room	Room C (Ramada Ballroom 3)
Chairs	Sangbum Kim (Seoul National University, Korea) Gunuk Wang (Korea University, Korea)

WeC1-1 **09:00-09:30**

Invited **Random Nanowire Networks for Neuromorphic Applications**

E. Adams and C. G. Rocha*
University of Calgary, Canada

WeC1-2 **09:30-10:00**

Invited **Engineering Memristive Devices for Neuromorphic Computing**

Sangmin Yoo, Yuting Wu, Yongmo Park, and Wei D. Lu*
University of Michigan, USA

WeC1-3 **10:00-10:30**

Invited **Development and Applications of Memristor-Based Artificial Neurons and Synapses**

See-On Park, Taehoon Park, Hakcheon Jeong, Seokho Seo, and Shinhyun Choi*
Korea Advanced Institute of Science and Technology, Korea

[WeD1] Plasmonics and Optoelectronics II

Date / Time	July 20, 2022 (Wed.) / 09:00-10:30
Room	Room D (Ramada Ballroom 4)
Chairs	Kwang Jun Ahn (Ajou University, Korea) Heesuk Rho (Jeonbuk National University , Korea)

WeD1-1 **09:00-09:30**

Invited **Utilizing Geometry and Topology for Enabling Integrated Chiral Photonics**

Ritesh Agarwal*
University of Pennsylvania, USA

WeD1-2 **09:30-10:00**

Invited **Valley Information-preserved Light-matter Interaction in 2D Semiconductors**

Su-Hyun Gong*
Korea University, Korea

WeD1-3 **10:00-10:30**

Invited **Topological Control of 2D Perovskite Emission via Polaritonic Bound States in the Continuum**

Young Chul Jun*

[WeE1] Quantum Information V

Date / Time	July 20, 2022 (Wed.) / 09:00-10:30
Room	Room E (Mara Hall)
Chair	Sang-Yun Lee (Gwangju Institute of Science and Technology, Korea)

WeE1-1 **09:00-09:30**

Invited **Coherence Improvement of Semiconductor Spin Qubits via Active Noise Cancelling**

T. Nakajima*
RIKEN, Japan

WeE1-2 **09:30-10:00**

Invited **High Fidelity Quantum Control and Measurement of Multi-spin States in Semiconductor Quantum Dots**

Dohun Kim*
Seoul National University, Korea

WeE1-3 **10:00-10:30**

Invited **Exploration of Si-based Multi-Qubit Logic Designs with TCAD Modeling**

Hoon Ryu[1]*
Korea Institute of Science and Technology Information, Korea

[WeF1] Energy Materials and Devices V

Date / Time	July 20, 2022 (Wed.) / 09:00-10:30
Room	Room F (Udo Hall)
Chairs	Sohee Jeong (Sungkyunkwan University, Korea) Hyesung Park (Ulsan National Institute of Science and Technology, Korea)

WeF1-1 **09:00-09:30**

Invited **Three-dimensional Holey-graphene and Their Composites Architectures for Electrochemical Energy Storage Devices**

Imran Shakir[1,2]*
[1]King Saudi University, Saudi Arabia, [2]University of California, USA

WeF1-2 **09:30-10:00**

Invited **New Generation Low-dimensional Nanomaterials for Advanced Energy Storage Devices**

Yang Hui Ying*
Singapore University of Technology and Design, Singapore

WeF1-3 **10:00-10:30**

Invited **Photoelectrochemical Solar Energy Conversion from Hetero-interface Engineering**

Jong Hyeok Park*

[WeG1] Novel Functional Spintronics V

Date / Time	July 20, 2022 (Wed.) / 09:00-10:30
Room	Room G (Chuja Hall)
Chair	Chun-Yeol You (Daegu Gyeongbuk Institute of Science and Technology, Korea)

WeG1-1 09:00-09:30

Invited **Spin-orbitronics in Semiconductor Nano-structures**

Junsaku Nitta*
Tohoku University, Japan

WeG1-2 09:30-10:00

Invited **MRAM In-memory Computing Crossbar Array**

Sang Joon Kim*
Samsung Electronics, Korea

WeG1-3 10:00-10:30

Invited **Spin-dependent Potentials and Their Application to Logic Devices**

Hyun Cheol Koo[1,2]*, Joo-hyeon Lee[1,2], Seong Been Kim,[1,2], Seokmin Hong[1], Dong Soo Han[1], Hyung-jun Kim[1], and Joonyeon Chang[1]
[1]*Korea Institute of Science and Technology, Korea,* [2]*Korea University, Korea*

[WeA2] Low Dimensional Semiconductors VI

Date / Time	July 20, 2022 (Wed.) / 13:30-15:00
Room	Room A (Ramada Ballroom 1)
Chair	Keun Su Kim (Yonsei University, Korea)

WeA2-1 **13:30-14:00**

Invited **Infrared Properties of Few-layer Black Phosphorus**

Hugen Yan*
Fudan University, China

WeA2-2 **14:00-14:30**

Invited **Thickness-Controlled Black Phosphorus Tunnel Field-Effect Transistor for Low Power Switches**

Seungho Kim[1], Kenji Watanabe[2], Takashi Taniguchi[2], and Sungjae Cho[1]*
[1]Korea Advanced Institute of Science and Technology, Korea, [2]National Institute for Materials Science, Japan

WeA2-3 **14:30-15:00**

Invited **Nano Energy Applications of 2D TMD FETs and Diodes**

Seongil Im*, Sung Jin Yang, Yeonsu Jung, Sungjae Hong, and LJ Widiapradja
Yonsei University, Korea

[WeB2] Advanced Semiconductors VI

Date / Time	July 20, 2022 (Wed.) / 13:30-15:00
Room	Room B (Ramada Ballroom 2)
Chairs	Jeongyong Kim (Sungkyunkwan University, Korea) Yong Soo Kim (University of Ulsan, Korea)

WeB2-1 **13:30-14:00**

Invited **Nanoscale Investigation of Electronic Transport in Complex Oxide Films using Scanning Probe Microscopy**

S. M. Yang*
Sogang University, Korea

WeB2-2 **14:00-14:30**

Invited **Circularly Polarized Electroluminescence Induced by Strain Effect**

Taishi Takenobu*
Nagoya University, Japan

WeB2-3 **14:30-15:00**

Invited **Non-Covalent Epitaxy of Semiconductors for Fabricating Transferable, Deformable, and Multi-Functional Optoelectronic Devices**

Young Joon Hong*
Sejong University, Korea

[WeC2] Artificial Intelligence Materials and Devices VI

Date / Time	July 20 (Wed.) / 13:30-14:30
Room	Room C (Ramada Ballroom 3)
Chairs	Joon Young Kwak (Korea Institute of Science and Technology, Korea) Gunuk Wang (Korea University, Korea)

WeC2-1 **13:30-14:00**

Invited **Reliability and Variability of Semiconductor Devices and Their Effect on Artificial Neural Networks**

Jong-Ho Bae*
Kookmin University, Korea

WeC2-2 **14:00-14:30**

Invited **Oxide Memristor Research for Neuromorphic Computing Applications**

J. H. Yoon*
Korea Institute of Science and Technology, Korea

[WeD2] Plasmonics and Optoelectronics III

Date / Time	July 20, 2022 (Wed.) / 13:30-15:00
Room	Room D (Ramada Ballroom 4)
Chair	Ji-Hun Kang (Kongju National University, Korea)

WeD2-1 **13:30-14:00**

Invited **Unraveling Optical Modes in Photonic Molecules**

Kyoung-Ho Kim*
Chungbuk National University, Korea

WeD2-2 **14:00-14:30**

Invited **2D Semiconductor–Metal Hybrid Metasurfaces for Plasmonic and Photonic Applications**

Shangjr Gwo*
National Tsing-Hua University, Taiwan

WeD2-3 **14:30-15:00**

Invited **Tailoring Thermal Radiation and its Applications**

Sun-Kyung Kim*
Kyung Hee University, Korea

[WeE2] Quantum Information VI

Date / Time	July 20, 2022 (Wed.) / 13:30-15:00
Room	Room E (Mara Hall)
Chair	Hosung Seo (Ajou University, Korea)

WeE2-1 **13:30-14:00**

Invited **Dopant Qubits in Silicon: Simulation Driven Optimization**

R. Rahman*
University of New South Wales, Australia

WeE2-2 **14:00-14:30**

Invited **Quantum Nonlinear Spectroscopy via Quantum Sensors**

Ren-Bao Liu*
The Chinese University of Hong Kong. Hong Kong

WeE2-3 **14:30-15:00**

Invited **Quantum Sensing and Ultra-long Spin Coherence of NV Centers in Diamond Semiconductor**

Norikazu Mizuochi*
Kyoto University, Japan

[WeF2] Energy Materials and Devices VI

Date / Time	July 20, 2022 (Wed.) / 13:30-14:30
Room	Room F (Udo Hall)
Chairs	Sohee Jeong (Sungkyunkwan University, Korea) Hyesung Park (Ulsan National Institute of Science and Technology, Korea)

WeF2-1 **13:30-14:00**

Invited **Finding Efficient Catalyst Designs to Boost the Oxygen Evolution Activity in Water Splitting Technologies**

Hee Jun Kim, Chen Tian Cao, Sang Heon Kim, Rahul Purbia, and Jeong Min Baik*
Sungkyunkwan University, Korea

WeF2-2 **14:00-14:30**

Invited **Expanding the Electrochemical Stability Window of Lithium Titanate Oxides based Anodes Through Formation of Surface Defect Using Microwave-assisted Synthesis**

Segi Byun*, Wanuk Choi, Iyan Subiyanto, Changho Yeon, Yuhyen Son, Chanwoo Lee, Seongok Han, and Hyunuk Kim
Korea Institute of Energy Research, Korea

[WeG2] Novel Functional Spintronics VI

Date / Time	July 20, 2022 (Wed.) / 13:30-15:00
Room	Room G (Chuja Hall)
Chair	Sanghoon Kim (University of Ulsan, Korea)

WeG2-1 13:30-14:00

Invited **Control of Exchange-Biased Domain Wall Motion via Antiferromagnet Switching**

H.-J. Kim[1], K.-W. Moon[1], J.-I. Hong[2]*, and C. Hwang[1]*
[1]Korea Research Institute of Standards and Science, Korea ,[2]Daegu Gyeongbuk Institute of Science and Technology, Korea

WeG2-2 14:00-14:30

Invited **Topological Properties of Families of Magnetic Skyrmions**

Soong-Geun Je*
Chonnam National University, Korea

WeG2-3 14:30-15:00

Invited **Valley-spintronics in 2D Materials and Moiré Superlattices**

Wang Yao*
The University of Hong Kong, China

[WeA3] Low Dimensional Semiconductors VII	
Date / Time	July 20, 2022 (Wed.) / 15:30-17:00
Room	Room A (Ramada Ballroom 1)
Chair	Young Duck Kim (Kyung Hee University, Korea)

WeA3-1 **15:30-16:00**

Invited **Controllable Valley-isospin Conductance Oscillations and Formation of Valley Quantum Dots in Strained Grraphene**

M. Son[1], H. C. Park[2], H. Choi[3], and N. Myoung[1]*
[1]Chosun University, Korea, [2]Institute for Basic Science, Korea, [3]Jeonbuk National University, Korea

WeA3-2 **16:00-16:30**

Invited **High Electromechanical Conversion Properties of III-Nitride Nanowires for Piezoelectric Energy Harvesting: Towards the Development of Batteryless Wireless Micro-devices**

N. Gogneau*, P. Chrétien, M. Morassi, T. Sodhi, L. Travers, J.C. Harmand, F. H. Julien, E. Lefeuvre, M. Tchernycheva, and F. Houzé
Université Paris-Saclay, France

WeA3-3 **16:30-17:00**

Invited **Advanced Integration of 2D Materials**

G. Lerondel*
University of Technology of Troyes, France

[WeB3] Satellite Session: The 10th German-French-Korean Workshop on Quantum and Nanophotonics I	
Date / Time	July 20, 2022 (Wed.) / 15:10-17:15
Room	Room B (Ramada Ballroom 2)
Chair	Jin Dong Song (Korea Institute of Science and Technology, Korea)

15:10-15:15

Opening Remark

Yong Hee Lee
Korea Advanced Institute of Science and Technology, Korea

WeB3-1 **15:15-15:45**

Invited **Semiconductor Quantum Dots as Resource for Photonic Quantum Technologies**

Ł. Dusanowski, M. Moczała-Dusanowska, S. Klembt, C. Schneider, T. Huber, and S. Höfling*
Physikalisches Institut und Röntgen Center for Complex Material Systems, Germany

WeB3-2 **15:45-16:05**

Invited **Strategies for High-Brightness Broadband Quantum-Dot Single Photon Sources**

D. H. Ahn[1], Y. D. Jang[1], J. S. Baek[1], H. J. Ahn[1], S. I. Park[2], J. D. Song[2], C. Schneider[3], S. Hoefling[4], and D. Lee[1]*
[1]Chungnam National University, Korea, [2]Korea Institute of Science and Technology, Korea, [3]University of Oldenburg, Germany, [4]Universität Würzburg, Germany

WeB3-3 **16:05-16:25**

Invited **Efficient Photonic Interfaces for Solid-state Quantum Emitters**

J.-H. Kim*
Ulsan National Institute of Science of Technonlogy, Korea

WeB3-4 **16:25-16:55**

Invited **Telecom Wavelength InP-based Photonic Structures for Quantum Communication**

M. Benyoucef*
University of Kassel, Germany

WeB3-5 **16:55-17:15**

Invited **Controlled Coherent-coupling and Dynamics of Excitons in Semiconductor Nanostructures**

Jacek Kasprzak*
Institut Néel, France

[WeC3] Satellite Session: Institute for Wearable Convergence Electronics

Date / Time	July 20, 2022 (Wed.) / 15:00-17:30
Room	Room C (Ramada Ballroom 3)
Chair	Sanghoek Kim (Kyung Hee University, Korea)

WeC3-1 **15:00~15:30**

Invited **Fluidic Self-assembly of Micro-LED Chips with Shaped Magnetic Heads and InGaP/InAlGaP Red LEDs with Plasmonic Nanohole Structures: Toward Micro-LED Displays**

G. C. Kim, T. H. Kim, and I. H. Lee*
Korea University, Korea

WeC3-2 **15:30~16:00**

Invited **Skin-mountable Soft Electronics**

Dae-Hyeong Kim*
Seoul National University, Korea

WeC3-3 **16:00~16:30**

Invited **Unconventional Band Pass Filters for Bioelectronics**

Byeonghak Park and Tae-il Kim*
Sungkyunkwan University, Korea

WeC3-4 **16:30~17:00**

Invited **Nature-Inspired Approaches to Flexible Electronics and Photonics**

Jong-Souk Yeo*
Yonsei University, Korea

WeC3-5 **17:00~17:30**

Invited **Hierarchical Nickel-Cobalt-Based Nanostructured Asymmetric Supercapacitors for Energy Storage Applications**

Jae Su Yu*, Bhimanaboina Ramulu, and Anki Reddy Mule
Kyung Hee University, Korea

[WeD3] Plasmonics and Optoelectronics IV

Date / Time	July 20, 2022 (Wed.) / 15:30-17:00
Room	Room D (Ramada Ballroom 4)
Chairs	Su Hyun Gong (Korea University, Korea) Jongchul Lim (Chungnam National University, Korea)

WeD3-1 15:30-16:00

Invited **Magic-angle Lasers in Nanostructured Moiré Superlattice**

Ren-Min Ma*
Peking University, China

WeD3-2 16:00-16:30

Invited **TM Mode Photonic Crystal Nanobeam Laser**

Jin-Kyu Yang*
Kongju National University, Korea

WeD3-3 16:30-17:00

Invited **Wave-Chaos Effect on Light Absorption Enhancement in Chaotic-Nanowires in a Array**

Chil-Min Kim*
Daegu Gyeongbuk Institute of Science and Technology, Korea

[WeE3] Satellite Session: BeCaP SRC Satellite Session II

Date / Time	July 20, 2022 (Wed.) / 15:30-17:00
Room	Room E (Mara Hall)
Chair	Jun Woo Choi (Korea Institute of Science and Technology, Korea)

WeE3-1 15:30-16:00

Invited **Chiral Symmetry Breaking, Extended Flat Band and Ultrafast Dynamics of a Kekulé-ordered Graphene**

Shuyun Zhou*
Tsinghua University, China

WeE3-2 16:00-16:30

Invited **Single-crystalline 2D Chalcogenide Films and Their Electronic Structures**

Young Jun Chang*
University of Seoul, Korea

WeE3-3 16:30-17:00

Invited **Electronic Structures and Effective Hamiltonian of Twisted Few-layer Black Phosphorus**

Hyoung Joon Choi*
Yonsei University, Korea

[WeF3] Satellite Session: GRI-TPC IRC Workshop I

Date / Time	July 20, 2022 (Wed.) / 15:30-17:00
Room	Room F (Udo Hall)
Chair	Suklyun Hong (Sejong University, Korea)

WeF3-1 **15:30-16:00**

Invited **Anomalous Magnon Dynamics in van der Waals Honeycomb Ferromagnets**

Jae-Ho Chung*
Korea University, Korea

WeE3-2 **16:00-16:30**

Invited **Magnetic Effects in Graphene**

Choongyu Hwang*
Pusan National University, Korea

WeE3-3 **16:30-17:00**

Invited **Charge Doping, Strain, and Heating Effects in Two-Dimensional Structures**

Heesuk Rho*
Jeonbuk National University, Korea

[WeG3] Satellite Session: Exotic Quantum Phenomena in 2D Electronic Systems I

Date / Time	July 20, 2022 (Wed.) / 15:30-17:00
Room	Room G (Chuja Hall)
Chair	Doohee Cho (Yonsei University, Korea)

WeG3-1 **15:30-16:00**

Invited **Atomic Adsorbate as a Mott Identifier**

Jinwon Lee*
Leiden University, Netherlands

WeG3-2 **16:00-16:30**

Invited **Imaging Quantum Spin Liquid Behavior in Single-layer 1T-$TaSe_2$**

Wei Ruan*
Fudan University, China

WeG3-3 **16:30-17:00**

Invited **Artificial Heavy Fermions in van der Waals Heterostructures**

Peter Liljeroth*
Aalto University, Finland

[WeB4] Satellite Session: The 10th German-French-Korean Workshop on Quantum and Nanophotonics II

Date / Time	July 20, 2022 (Wed.) / 19:30-21:10
Room	Room B (Ramada Ballroom 2)
Chair	Jacek Kasprzak (Institut Néel, France)

WeB4-1 19:30-19:55

Invited **Graphene-based Broadband Nonlinear Photonics**

F. Rotermund*
Korea Advanced Institute of Science and Technology, Korea

WeB4-2 19:55-20:20

Invited **Investigation of Polariton-polariton Interactions in Monolayer $MoSe_2$**

P. Stepanov[1], A. Vashisht[1], M. Klaas[2], N. Lundt[2], S. Tongay[3], M. Blei[3], S. Höfling[2], T. Volz[4], A. Minguzzi[1], C. Schneider[5], M. Richard[1], and J. Renard[1]*
[1]Univ. Grenoble Alpes, France, [2]Universität Würzburg, Germany, [3]Arizona State University, USA, [4]Macquarie University, Australia, [5]University of Oldenburg, Germany

WeB4-3 20:20-20:45

Invited **Non-Hermitian System based on Room Temperature Exciton Polariton**

Hyun Gyu Song[1] and Yong-Hoon Cho[2]*
[1]Korea Institute of Science and Technology, Korea, [2]Korea Advanced Institute of Science and Technology, Korea

WeB4-4 20:45-21:10

Invited **Inducing Micromechanical Motion by Optical Excitation of a Single Quantum Dot**

J. Kettler[1,2], N. Vaisha[2], L. Mercier de Lépinay[1], B. Besga[3], P.L. de Assis[4], O. Bourgeois[1], A. Auffèves[1,2], M. Richard[1,2], J. Claudon[1], J.M. Gérard[1], B. Pigeau[1], O. Arcizet[1], P. Verlot[5], and J.P. Poizat[1,2]*
[1]Univ. Grenoble Alpes, France, [2]Inst. NEEL, France, [3]Univ. Lyon, France, [4]University of Campinas, Brazil, [5]University of Nottingham, UK

[ThA1] Industrial Semiconductor Applications I

Date / Time	July 21, 2022 (Thu.) / 09:00-10:30
Room	Room A (Ramada Ballroom 1)
Chair	SeungNam Cha (Sungkyunkwan University, Korea)

ThA1-1 **09:00-09:30**

Invited **Development of AlGaN/GaN HEMT based Sensor Platform**

Kyung-Ho Park*, Chu-Young Cho, and Hae-Yong Jeong
Korea Advanced Nano Fab Center, Korea

ThA1-2 **09:30-10:00**

Invited **Introduction to Core Technologies of Key Foundry Leading 8-inch Foundry Business**

Hyunchul Kim, Sibum Kim*, and Junghwan Lee
Key Foundry Corp., Korea

ThA1-3 **10:00-10:30**

Invited **In-mold Flexible Hybrid Electronics (iFHE) Based on Holistic System Integration with FOWLP, 3D-IC/TSV, and Chiplets**

Takafumi Fukushima*
Tohoku University, Japan

[ThB1] Satellite Session: The 10th German-French-Korean Workshop on Quantum and Nanophotonics III

Date / Time	July 21, 2022 (Thu.) / 08:30-10:40
Room	Room B (Ramada Ballroom 2)
Chair	Sven Höfling (University Würzburg, Germany)

ThB1-1 08:30-09:00

Invited **1550nm InAs QDs by Molecular Beam Epitaxy**

P. A. Wroński[1], B. Yavas-Aydin[1], P. Wybroski[2], A. Musiał[2], P. Podemski[2], G. Sęk[2], S. Hoefling[1], and F. Jabeen[1]*

[1]University of Würzburg and Wilhelm-Conrad-Röntgen-Research Center for Complex Material Systems, Germany, [2]Wrocław University of Science and Technology, Poland

ThB1-2 09:00-09:20

Invited **Nanophotonic Platforms for Quantum Applications**

Hojoong Jung[1]*, Hyungjun Heo[1], Hyeong-Soon Jang[1,2], Kiwon Kwon[1,3], and Sangwook Han[1]

[1]Korea Institute of Science and Technology, Korea, [2]Ajou University, Korea, [3]Pohang University of Science and Technology, Korea

ThB1-3 09:20-09:50

Invited **Excitons in Two-dimensional Lead Halide Perovskite Nanocrystals**

Victor Guilloux[1], Amal Ghribi[2], Rim Ben Aich[2], Kaïs Boujdaria[2], Thierry Barisien[1], Laurent Legrand[1], E. Lhuillier[1], Christophe Testelin[1], and Maria Chamarro[1]

[1]Sorbonne Université, France, [2]Université de Carthage, Tunisia

ThB1-4 09:50-10:10

Invited **Non-Hermitian Band Structures of Floquet Media**

Jagang Park[1], Hyukjoon Cho[1], Seojoo Lee[1], Kyungmin Lee[1], Kanghee Lee[1], Hee Chul Park[2], Jung-Wan Ryu[2], Namkyoo Park[3], Sanggeun Jeon[4], and Bumki Min[1]*

[1]Korea Advanced Institute of Science and Technology, Korea, [2]Institute for Basic Science, Korea, [3]Seoul National University, Korea, [4]Korea University, Korea

ThB1-5 10:10-10:40

Invited **Polariton-dark Exciton Interaction in Bistable Semiconductor Microcavities**

E. Rozas[1]*, E. Sedov[2,3,4], Y. Brune[1], C. Schneider[5], S. Höfling[6], A. Kavokin[2,3,7], and M. Aßmann[1]

[1]Technische Universität Dortmund, Germany, [2]Westlake University, China, [3]St. Petersburg State University, Russia, [4]Vladimir State University, Russia, [5]Carl von Ossietzky University, Germany, [6]Physikalisches Institut and Univ.Würzburg, Germany, [7]Russian Qu

[ThD1] Plasmonics and Optoelectronics V

Date / Time	July 21, 2022 (Thu.) / 09:00-10:30
Room	Room D (Ramada Ballroom 4)
Chair	Jong-Soo Lee (Daegu Gyeongbuk Institute of Science and Technology, Korea)

ThD1-1 09:00-09:30

Invited **Surface/Interface Engineering of 2D Materials via Chemical Functionalization**

J. Son[1,2]*
[1]Korea Institute of Science and Technology, Korea, [2]KIST School University of Science and Technology, Korea

ThD1-2 09:30-10:00

Invited **Boosting Quantum Yields of 2D Materials and 2D Material-Derived Quantum Dots**

Jeongyong Kim*
Sungkyunkwan University, Korea

ThD1-3 10:00-10:30

Invited **Harnessing Acoustic Plasmons in Graphene for Ultrasensitive Infrared Spectroscopy**

In-Ho Lee, Daehan Yoo, Phaedon Avouris, Tony Low, and Sang-Hyun Oh*
University of Minnesota Twin Cities, USA

[ThE1] Satellite Session: Quantum Technologies with Semiconductors and Point Defects I

Date / Time	July 21, 2022 (Thu.) / 09:00-10:30
Room	Room E (Mara Hall)
Chair	Yong-Joo Doh (Gwangju Institute of Science and Technology, Korea)

ThE1-1 09:00-09:30

Invited **Creation on Silicon Vacancy in Silicon Carbide and its Application for Quantum Sensing**

T. Ohshima*, Y. Yamazaki, and T. Tanaka
National Institutes for Quantum Science and Technology, Japan

ThE1-2 09:30-10:00

Invited **Spin-optical Dynamics Study and Approach to Quantum Electronics for Quantum Applications of Silicon Vacancy in SiC**

N. Morioka[1]*, D. Liu[2], T. Nishikawa[1], Öney. O. Soykal[3], H. Morishita[1], I. Gediz[2], C. Babin[2], R. Stöhr[2], H. Abe[4], T. Ohshima[4], N. T. Son[5], J. Ul-Hassan[5], F. Kaiser[2], J. Wrachtrup[2], and N. Mizuochi[1]
[1]Kyoto University, Japan, [2]University Stuttgart, Germany, [3]Booz Allen Hamilton, USA, [4]National Institutes for Quantum Science and Technology, Japan, [5]Linköping University, Sweden

ThE1-3 10:00-10:30

Invited **Quantitative Analysis of Magnetic Properties in Nanowires based on Wide-field Diamond NV Magnetometry**

Donghun Lee*
Korea University, Korea

[ThF1] Satellite Session: GRI-TPC IRC Workshop II

Date / Time	July 21, 2022 (Thu.) / 09:00-10:30
Room	Room F (Udo Hall)
Chair	Keun Soo Kim (Sejong University, Korea)

ThF1-1 **09:00-09:30**

Invited **Mid-infrared Plasmonics in Nanostructures**

Kyoung-Ho Kim*
Chungbuk National University, Korea

ThF1-2 **09:30-10:00**

Invited **Silicon-based Reconfigurable Photodiode for in-sensor Image Processing**

Houk Jang[1,2]*
[1]Harvard University, USA, [2]Brookhaven National Laboratory, USA

ThF1-3 **10:00-10:30**

Invited **Anomalous Transport Properties in a Weyl Metal**

Jeehoon Kim*
Pohang University of Science and Technology, Korea

[ThG1] Satellite Session: Exotic Quantum Phenomena in 2D Electronic Systems II

Date / Time	July 21, 2022 (Thu.) / 09:00-10:30
Room	Room G (Chuja Hall)
Chair	Keun Su Kim (Yonsei University, Korea)

ThG1-1 **09:00-09:30**

Invited **Tip-enhanced Cavity-spectroscopy**

Kyoung-Duck Park*
Pohang University of Science and Technology, Korea

ThG1-2 **09:30-10:00**

Invited **Spectroscopic Evidence for Unconventional Superconductivity in Magic-angle Twisted Bilayer Graphene**

Myungchul Oh[1]*, Kevin P. Nuckolls[1], Dillon Wong[1], Ryan L. Lee[1], Xiaomeng Liu[1], Kenji Watanabe[2], Takashi Taniguchi[2], and Ali Yazdani[1]
[1]Princeton University, USA, [2]National Institute for Materials Science, Japan

ThG1-3 **10:00-10:30**

Invited **Electronic-structure Study of Interaction Effects in Two-dimensional Materials: Graphene Moiré Superlattices and Surface-doped FeSe**

Young Woo Choi*
University of California, USA

[ThA2] Industrial Semiconductor Applications II

Date / Time	July 21, 2022 (Thu.) / 11:00-12:00
Room	Room A (Ramada Ballroom 1)
Chair	Moongyu Jang (Hallym University, Korea)

ThA2-1 11:00-11:30

Invited **Heat Transfer in Silicon Nano-membranes: Application to Thermoelectricity**

J.-F. Robillard[1]*, H. Ikzibane1, T. M. Bah[1,2], A. M. Massoud[3,4], V. Lacatena[1,2], M. Haras[1,2], S. Didenko[1,2], S. Monfray[1,2], J.-M. Bluet[3], P.-O. Chapuis[4], and E. Dubois[1]
[1]Univ. Polytechnique Hauts-de-France, France, [2]STMicroelectronics, France, [3]Institut des Nanotechnologies de Lyon, CNRL, France, [4]Université Claude Bernard Lyon 1, France

ThA2-2 11:30-12:00

Invited **The Potential of Inline Automated Defect Review of Mechanical Property and Electrical Characterization by AFM**

Sang-Joon Cho*, Seong-Oh Kim, Moses Lee, and Yoonkyoung Lee
Park Systems Corp., Korea

[ThB2] Satellite Session: The 10th German-French-Korean Workshop on Quantum and Nanophotonics IV

Date / Time	July 21, 2022 (Thu.) / 11:00-12:50
Room	Room B (Ramada Ballroom 2)
Chair	Yong Hee Lee (Korea Advanced Institute of Science and Technology, Korea)

ThB2-1 **11:00-11:20**

Invited **Exciton-polaritons in Phase-changing Lead Halide Perovskites**

Chang-Hee Cho*
Daegu Gyeongbuk Institute of Science and Technology, Korea

ThB2-2 **11:20-11:50**

Invited **Coherently Driven Photonic Crystal Nanocavity "dimer"**

B. Garbin[1], A. Giraldo[2], K. J. H. Peters[3], N. G. R. Broderick[2], A. Spakman[3], F. Raineri[1,4], A. Levenson[1]*, S. R. K. Rodriguez[3], B. Krauskopf[2], and A. M. Yacomotti[1]
[1]Université Paris-Saclay, France, [2]The University of Auckland, New Zealand, [3]AMOLF, The Netherlands, [4]Institut de Physique de Nice, France

ThB2-3 **11:50-12:10**

Invited **Ultrafast Electronic Processes of Dirac Semiconductors**

J.D. Lee*
Daegu Gyeongbuk Institute of Science and Technology, Korea

ThB2-4 **12:15-12:40**

Invited **Topological Insulator Vertical-cavity Laser Array**

A. Dikopoltsev[1], T. H Harder[2], E. Lustig[1], O. A. Egorov[3], J. Beierlein[2], A. Wolf[2], Y. Lumer[1], M. Emmerling[2], C. Schneider[4], S. Höfling[2], M. Segev[1], and S. Klembt[2]*
[1]Technion, Israel, [2]Universität Würzburg, Germany, [3]Friedrich-Schiller-Universität Jena, Germany, [4]University of Oldenburg, Germany

12:40-12:50

Closing Remark

Sven Höfling
Physikalisches Institut und Röntgen Center for Complex Material Systems, Germany

[ThD2] Plasmonics and Optoelectronics VI

Date / Time	July 21, 2022 (Thu.) / 11:00-12:30
Room	Room D (Ramada Ballroom 4)
Chairs	Jeongyong Kim (Sungkyunkwan University, Korea) Jangyup Son (Korea Institute of Science and Technology, Korea)

ThD2-1 11:00-11:30

Invited **High Sensitive Phototransistor Based on TMDC Heterostrucutures**

Jong-Soo Lee*
Daegu Gyeongbuk Institute of Science and Technology, Korea

ThD2-2 11:30-12:00

Invited **Controlled Atomic Spalling of Graphene and Other 2D Materials**

Seok-Kyun Son*
Mokpo National University, Korea

ThD2-3 12:00-12:30

Invited **Optical Properties of Surface Polaritons Propagating along Low-Dimensional Materials**

Ji-Hun Kang*
Kongju National University, Korea

[ThE2] Satellite Session: Quantum Technologies with Semiconductors and Point Defects II

Date / Time	July 21, 2022 (Thu.) / 11:00-12:30
Room	Room E (Mara Hall)
Chair	Sang-Yun Lee (Gwangju Institute of Science and Technology, Korea)

ThE2-1 11:00-11:30

Invited **Electrically Controlled Photon Transfer Between High-Q Nanocavities**

T. Asano[1]* and S. Noda[1]
Kyoto University, Japan

ThE2-2 11:30-12:00

Invited **First-principles Theory of Extending the Spin Qubit Coherence Time in Hexagonal Boron Nitride**

Jaewook Lee, Huijin Park, and Hosung Seo*
Ajou University, Korea

ThE2-3 12:00-12:30

Invited **Spin Relaxation and Related Applications in Silicon Carbide**

Viktor Ivády[1,2]*
[1]Max Planck Institute for the Physics of Complex Systems, Germany, [2]Linköping University, Sweden

[ThF2] Satellite Session: GRI-TPC IRC Workshop III

Date / Time	July 21, 2022 (Thu.) / 11:00-12:30
Room	Room F (Udo Hall)
Chair	Young-Jun Yu (Chungnam National University, Korea)

ThF2-1 11:00-11:30

Invited **Rydberg Quantum Computing of NP-complete Problems**

Jaewook Ahn*
Korea Advanced Institute of Science and Technology, Korea

ThF2-2 11:30-12:00

Invited **2-Dimensional Electron Gases at Oxide Hetero-interfaces and Related Quantum Devices**

Yong-su Kwak[1], Seung Ran Lee[2], Joonsung Lee[3], Jinhee Kim[2], and Jonghyun Song[1]*
[1]Chungnam National University, Korea, [2]Korea Research Institute of Standard and Science, Korea, [3]Korea University, Korea

ThF2-3 12:00-12:30

Invited **Role of the Electrnic Effectrs in the Catalytic Reaction of CO on the Pt-Sn Alloy Surface**

Jongkeun Jung[1], Sungwoo Kang[1], Laurent Nicolaï[2], Jisook Hong[3], Ján Minár[2], Inkyung Song[1], Wonshik Kyung[1], Soohyun Cho[4], Beomseo Kim[1], Jonathan D. Denlinger[5], Francisco José Cadete Santos Aires[6], Eric Ehret[6], Philip Ross[5], Jihoon Shim[3], Slavomir Nemšák[5], Doyoung Noh[7], Seungwu Han[1], Changyoung Kim[1]*, and Bongjin Simon Mun[7]
[1]Seoul National University, Korea, [2]University of West Bohemia, Czech Republic, [3]Pohang University of Science and Technology, Korea, [4]Chinese Academy of Sciences, China, [5]Lawrence Berkeley National Lab, USA, [6]Université de Lyon, France, [7]Gwangju Institute of Science and Technology, Korea

Contributed Oral Presentation

Online (Virtual Website)

Advanced Semiconductors (AS)

AS_O_1319

Multi-level Phase Change Memory Devices with BixGe1-xTe Layers: Formation of Rhombohedral and Cubic Structure

Changwoo Lee, Sewong Oh, Dasol Kim, Hyeonwook Lim, and Mann-Ho Cho*
Yonsei University, Korea

AS_O_1326

Reshaping Operating Region for Phase Change Memory

Dasol Kim[1], Soobin Hwang[1], Taek Sun Jung[1], Changwoo Lee[1], Hyeonwook Lim[1], Juhwan Park[2], Jae Hoon Kim[1], Byung Joon Choi[2], and Mann-Ho Cho[1]*
[1]Yonsei University, Korea, [2]Seoul National University of Science and Technology, Korea

AS_O_1424

Material and Device Characterization of Wavelength-extended 2.6 μm $InAs_{0.85}P_{0.15}$ Homogenous Photodetector

Suho Park[1,2], Yeongho Kim[1,2], and Sang Jun Lee[1,2]*
[1]Korea Research Institute of Standards and Science, Korea ,[2]University of Science and Technology, Korea

AS_O_1443

Frequency Dependence of NIH 3T3 Cells with Pattern Width and Spacing Variations of Impedance Biosensors

Yeeun Kim, Jisoo Choi, Dahyun Kang, Seokgyu Kim, Jaehun Jeong, Gayoung Lee, and Moongyu Jang*
Hallym University, Korea

AS_O_1460

Electro-optical Properties of the InGaAsSb/AlGaSb nbn Infrared Detector

Sanam SaeidNahaei[1], Jaedu Ha[1], Jong Su Kim[1]*, More Vivek Mohan[2], Yeongho Kim[2], and Sang Jun Lee[2]
[1]Yeungnam University, Korea, [2]Korea Research Institute of Standard and Science, Korea

AS_O_1540

Device Growth and Characterization of e-SWIR InGaAs/InAsSbP Light-emitting Diode on InAsP Metamorphic Buffers

Phuc Dinh Nguyen[1,2], Suho Park[1,2], Minkyeong Kim[1,3], Yeongho Kim[1,2], and Sang Jun Lee[1,2]*
[1]Korea Research Institute of Standards and Science, Korea, [2]University of Science and Technology, Korea, [3]Chonnam National University, Korea

AS_O_1565

Self-Selective Non-Destructive Read-Out for Ferroelectric Memory Based on Field Effect Transistor with Graphene Channel

Sungchul Jung[1], Jinyoung Park[2], Junhyung Kim[2], Wonho Song[2], Jaehyeong Jo[2], Hyunjae Park[2], Myong Kong[3], Seokhyeong Kang[3], Muhammad Sheeraz[4], Ill Won Kim[4], Tae Heon Kim[4], and Kibog Park[2]
[1]SK Hynix, Korea, [2]Ulsan National Institute of Science and Technology, Korea, [3]Pohang University of Science and Technology, Korea, [4]University of Ulsan, Korea

AS_O_1572

Piezoelectric Semiconductor ZnO Based Force-sensing Transistors for High Resolution, Real-time Force Imaging

Hongseok Oh[1]*, Michael Yip[2], Gyu-Chul Yi[3], Shadi A. Dayeh[2]
[1]Soongsil University, Korea, [2]University of California San Diego, USA, [3]Seoul National University, Korea

AS_O_1580

Neuromorphic Memory Development Through Advanced Interfacial Phase Change Material

Hyeon-Wook Lim, Da-sol Kim, Chang-woo Lee, Young-Sam Kim, Eun-Ji Slm*, and Mann-Ho Cho*
Yonsei University, Korea

AS_O_1601

Resonance-enhanced Tunneling Currents at Quantum-well-embedded Si-pn Junctions

Sanghun Cho* and Takashi Nakayama
Chiba University, Japan

AS_O_1685

IR & THz Correlation Nanoscopy of Functional Semiconductor Nanostructures

A. J. Huber* and N. Hartmann
Attocube Systems AG, Germany

AS_O_1726

Highly Sensitive Low Energy Inverse Photoemission Spectroscopy for the Transport Gap Measurement of Organic Semiconductors

Jong-Am Hong, Kyu-Myung Lee, Ji-Woong Choi, and Yongsup Park*
Kyung Hee University, Korea

AS_O_1752

Epitaxial Graphene Grown on 4H-SiC with Excess Electrons Injected by Electron Beam Irradiation

Hanbyul Jin[1], Jaehyeong Jo[2], Junhyung Kim[2], Kyuhyung Mo[2], Jung-Yong Lee[3], Sung Youb Kim[2], Hosik Lee[2], and Kibog Park[2]*
[1]Applied Materials, Santa Clara, USA, [2]Ulsan National Institute of Science and Technology, Korea, [3]Korea Development Bank, Korea

AS_O_1855

Grain Boundary Passivation Through Balancing Feedback of Hole Barrier Height Modulation in HfO_{2-x} for Flexible Electronics

Yeon Soo Kim, Harry Chung, Suhyoun Kwon, Jihyun Kim, and William Jo*
Ewha Womans University, Korea

AS_O_1890

Self-limited Growth for Controlling InGaN Quantum Dot on GaN Pyramid Apex

Yong-Ho Song, Hwan-Seop Yeo, Chan-Young Sung, Byung Su Kim, Seong-Hun Ahn, and Yong-Hoon Cho*
Korea Advanced Institute of Science and Technology, Korea

AS_O_1907

Comprehensive Analysis of Surface Changes by Localized Biasing of Te-based Ovonic Threshold Switch

Young-Min Kim, Subong Lee, Chaebin Park, Siwon Park, and Jong-Souk Yeo*
Yonsei University, Korea

Novel Functional Spintronics (NFS)

NFS_O_1296

Coexisting and Strongly Interacting Spin Torque Driven Free and Reference Layer Magnetic Droplet Solitons

S. Jiang[1,3], S. Chung[1,2*], M. Ahlberg[1], A. A. Awad[1], Q. Tuan Le[1,3], H. Mazraati[3], A. Gangwar[1], A. Houshang[1], O. Heinonen[4], and J. Åkerman[1,3]
[1]University of Gothenburg, Sweden, [2]Korea National University of Education, Korea, [3]KTH Royal Institute of Technology, Sweden, [4]Argonne National Laboratory, USA

NFS_O_1500

Enhanced Spin-to-Charge Conversion by Rashba Splitting States Combined with Topological Surface States in Co/Bi/$Bi_{1-x}Sb_x$

Seungwon Rho, Hanbum Park, Jonghoon Kim, and Mann-Ho Cho*
Yonsei University, Korea

NFS_O_1535

Spin-orbit Torque Properties of W-V Alloy Layers

Jeong Kyu Lee[1], Gyu Won Kim[1], Taehyun Kim[1], Min Hyeok Lee[1], In Ho Cha[1], Jiung Cho[2], and Young Keun Kim*
[1]Korea University, Korea, [2]Korea Basic Science Institute, Korea

NFS_O_1695

Co-existing Ferro and Anti-ferromagnetic Order in Ultrathin $CrPS_4$

Bheema Lingam Chittari[1,2], Xinbiao Wang[2], Dongkyu Lee[1], Jeil Jung[1]*, and Euyheon Hwang[2]*
[1]University of Seoul, Korea, [2]Sungkyunkwan University, Korea

NFS_O_1737

Stable Multi-level States in Graded GaMnAsP Ferromagnetic Semiconductor Films Induced by Spin-orbit Torque

Kyung Jae Lee[1], Sanghoon Lee[1]*, X. Liu[2], M. Dobrowolska[2], and J. K. Furdyna[2]
[1]Korea University, Korea, [2]University of Notre Dame, USA

NFS_O_1777

Current-induced Spin-Orbit Field Along <100> Crystallographic Direction in GaMnAs Single Layer

Kyoul Han[1], Kyung Jae Lee[1], Sanghoon Lee[1]*, X. Liu[2], M. Dobrowolska[2], and J. K. Furdyna[2]
[1]Korea University, Korea, [2]University of Notre Dame, USA

NFS_O_1808

Magnetic Property Transition of Layered Antiferromagnet $MnPS_3$ via Organic Ion Intercalation

Min-kyung Jo[1,2], Seorin Cho[2], Jun Woo Choi[3], Gichang Noh[2,3], Eoram Moon[2], Jeongtae Kim[1], Kibum Kang[2]*, and Seungwoo Song[1]*
[1]Korea Research Institute of Standards and Science, Korea, [2]Korea Advanced Institute of Science and Technology, Korea, [3]Korea Institute of Science and Technology, Korea

NFS_O_1878

Controlling Interlayer Magnetic Coupling in the Two-dimensional Magnet Fe_3GeTe_2

In kee Park*, Young Sin Park, and Geunsik Lee
Ulsan National Institute of Science and Technology, Korea

NFS_O_1902

Probing Nanoscale Magnetism in 2 Dimensional van der Waals Ferromagnet Fe_5GeTe_2 with Magneto-thermal Microscopy

E. Chung[1]*, H. Zhang[2], R. Chen[2,3], H. F. H. Cheung[1], Y. Xie[1], and G. D. Fuchs[1]
[1]Cornell University, USA, [2]University of California, USA, [3]Lawrence Berkeley National Laboratory, USA

Low Dimensional Semiconductors (LDS)

LDS_O_1083

Electrical Properties of TFSI-treated Molybdenum Disulfide

Byung-wook Ahn[1], Meeree Kim[1], Yoonsok Kim[2], Jaehun Ahn[1], Hyoyoung Lee[1], Eun Kyu Kim[2], and Seong Chu Lim[1]*
[1]Sungkyunkwan University, Korea, [2]Hanyang University, Korea

LDS_O_1124

Tailoring the Interfacial Band Offset by the Molecular Dipole Orientation for a Molecular Heterojunction Selector

Jung Sun Eo, Jaeho Shin, Seunghoon Yang, Takgyeong Jeon, Jaeho Lee, Sanghyeon Choi, Chul-Ho Lee, and Gunuk Wang*
Korea University, Korea

LDS_O_1182

Single Ru and Ru-Co Nanowire for Studying Electrical Properties and Microstructural Evolution to Alternate Interconnect Materials

Jun Hwan Moon[1], Seunghyun Kim[1], Taesoon Kim[1], Yoo Sang Jeon[1], Yanghee Kim[2], Jae-Pyoung Ahn[2], and Young Keun Kim[1]*
[1]Korea University, Korea, [2]Korea Institute of Science and Technology, Korea

LDS_O_1208

Band Structure Engineering of 2D Materials Using a 1D Superlattice

Pilkyung Moon[1,2,3]*, Yutao Li[4], Scott Dietrich[4], Carlos Forsythe[4], Takashi Taniguchi[5], Kenji Watanabe[5], and Cory R. Dean[4]
[1]New York University Shanghai, China, [2]New York University, USA, [3]East China Normal University, China, [4]Columbia University, USA, [5]National Institute for Materials Science, Japan

LDS_O_1427

Sound Tuned Non-classical Light Emission from Atomic-scale Defects in Hexagonal Boron Nitride

S. Lazić*, P. Ares, C. Gibaja, H. Santos, J. J. Palacios Burgos, H. P. van der Meulen, P. García-González, and F. Zamora
Universidad Autónoma de Madrid, Spain

LDS_O_1430

High-Performance Au-Nanopillar Electrodes for MoS_2-Based Optoelectronic Devices

Jung eun Song, Soyeong Kwon, Hyunjeong Jeong, Hyeji Choi, Anh Thi Nguyen, Ha Kyung Park, William Jo, Sang Wook Lee, and Dong-Wook Kim*
Ewha Womans University, Korea

LDS_O_1455

Hetero-Integration of Soft Silicon Electronics and 2D Materials for Bioabsorbable, Wireless Neurochemical Analyzers

Seung Min Yang[1], Jae Hyung Shim[1], Hyun-U Cho[2], Chul-Ho Lee[1]*, Dong Pyo Jang[2]*, and Suk-Won Hwang[1]*
[1]Korea University, Korea, [2]Hanyang University, Korea

LDS_O_1466

Plug-and-play Single Photon Source with Efficient Fiber-quantum Dot Interface

Woong Bae Jeon[1], Jong Sung Moon[1], Kyu-Young Kim[1], Young-Ho Ko[2], Christopher J. K. Richardson[3], Edo Waks[3,4] and Je-Hyung Kim[1]*
[1]Ulsan National Institute of Science and Technology, Korea, [2]Electronics and Telecommunications Research Institute, Korea, [3]University of Maryland, USA, [4]University of Maryland and the National Institute of Standards and Technology, USA

LDS_O_1494

Exciton-Polaritons in Exfoliated WS_2 Multilayer Flakes

Thi-Anh Nguyen, Soyeong Kwon, Jungeun Song, Eunseo Cho, Hyohyeon Kim, and Dong-Wook Kim*
Ewha Womans University, Korea

LDS_O_1498

Enabling Attomolar-Level Molecular Detection of 2D Semiconductor Platform by Single Atomic Doping

Jihyung Seo, Junghyun Lee, Eunbin Son, and Hyesung Park*
Ulsan National Institute of Science and Technology, Korea

LDS_O_1502

Highly Vanadium Substitutional Doping in 2D Semiconductor at Wafer-Scale Using Reaction Promoter

Eunbin Son, Jihyung Seo, Jiha Kim, and Hyesung Park*
Ulsan National Institute of Science and Technology, Korea

LDS_O_1516

Graphene Capping Effect on InAs/GaAs Quantum Dot Photoluminescence and its Carrier Transfer Mechanism

Q.N.D Lung[1,2], R. J. Chu[1,2], I. Lee[1], C. Choi[1], and D. Jung[1,2]*
[1]Korea Institute of Science and Technology, Korea, [2]University of Science and Technology, Korea

LDS_O_1547

Low Energy X-rays by Cold Cathode Electron Beam for Mammography

Ketan Bhotkar, Ravindra Patil, Sawant Jaydip, and Kyu Chang Park*
Kyung Hee University, Korea

LDS_O_1548

Electron Beam Trajectory Analysis of Vertically Aligned Carbon Nanotubes Array

Bishwa Chandra Adhikari and Kyu Chang Park*
Kyung Hee University, Korea

LDS_O_1552

Tunable Local Seebeck Coefficient Domain of MoS_2 Grain Boundary

Seungil Baek[1], Euicheol Shin[1], Jun Jung[1], Ho-Ki Lyeo[2], and Yong-Hyun Kim[1]*
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Korea Research Institute of Standards and Science, Korea

LDS_O_1557

Direct Patterning of 2D Semiconductors at Wafer-Scale Through Intergranular Diffusion-Assisted Liquid-Phase Chemical Vapor Deposition

Jiha Kim, Jihyung Seo, Junghyun Lee, Donghwan Koo, Gyujeong Jeong, Yunseong Choi, Eun Bin Son, and Hyesung Park*
Ulsan National Institute of Science and Technology, Korea

LDS_O_1571

Stability and Optical Properties of Low-dimensional Perovskite Cs_nPbX_{n+2} Semiconductors; First-principles Study

Ami Tomita* and Takashi Nakayama*
Chiba University, Japan

LDS_O_1642

Ultra-high Photoresponsivity of Photodiode Based on Integrated Freestanding Two-dimensional Transition Metal Dichalcogenide

Hyun Jeong[1], Mun Seok Jeong[1]*, Young Hee Lee[2], and Gilles Lérondel[3]*
[1]Hanyang University, Korea, [2]Sungkyunkwan University, Korea, [3]Université de Technologie de Troyes, France

LDS_O_1690

Direct Determination of Quantum Decoherence with High-harmonic Spectroscopy

Youngjae Kim[1], Min Jeong Kim[2,3], Soonyoung Cha[3], Shinyoung Choi[2,3], Cheol-Joo Kim[2,3], B. J. Kim[2,3], Moon-Ho Jo[2,3], Jonghwan Kim[2,3]*, and J.D. Lee[1]*
[1]DGIST, Korea, [2]POSTECH, Korea, [3]Institute for Basic Science, Korea

LDS_O_1700

High Performance IR Photodetector Based on n-MoS_2/graphene/p-Si Heterostructure

Woojin Park, Wondeok Seo, and Byungjin Cho*
Chungbuk National University, Korea

LDS_O_1704

Controllable Surface Oxidation and Doping Effect of Indium (II) Selenide (InSe) Using Polymer Passivation

H. J. Park, D. Y. Park, C. Kwon, J. Jo, and M. S. Jeong*
Hanyang University, Korea

LDS_O_1723

Hot Electron Relaxation in Transition Metal Dichalcogenide Field-effect Transistors

Qi Zhang, Jin Shu Li, and Euy Heon Hwang*
Sungkyunkwan University, Korea

LDS_O_1724

Avalanche Multiplication Regulation and Control in WSe_2

Jin Shu Li*, Qi Zhang, and Euy Heon Hwang*
Sungkyunkwan University, Korea

LDS_O_1729

Nanoscale Conductivity Mapping in 2D and 1D Materials Through Mid-IR and Terahertz Scattering-type Scanning Near-field Optical Microscopy

N. Hartmann* and A. J. Huber
Attocube Systems AG, Germany

LDS_O_1750

Large-Area MoS_2 via Colloidal Nanosheet Ink for Integrated Memtransistor

Dae Young Park[1], Duc Anh Nguyen[2], Ngoc Thanh Duong[3], Kang-Nyeoung Lee[4], Hyunsik Im[2], Heejun Yang[5], and Mun Seok Jeong[1]*
[1]Hanyang University, Korea, [2]Dongguk University, Korea, [3]Phenikaa University, Korea, [4]Sungkyunkwan University, Korea, [5]Korea Advanced Institute of Science and Technology, Korea

LDS_O_1778

Highly Sensitive and Selective Geosmin Detection Utilizing an Aptamer-immobilized Graphene Field-effect Transistor

S. E. Seo[1,2], and O. S. Kwon[1]*
[1]Korea Research Institute of Bioscience and Biotechnology, Korea, [2]Yonsei University, Korea

LDS_O_1849

Carrier Capture into Individual InP Quantum Dots

Frank Bertram[1]*, Gordon Schmidt[1], Peter Veit[1], Julie Kernchen[1], Jürgen Christen[1], Ana Ćutuk[2], Michael Jetter[2], and Peter Michler[2]
[1]Otto-von-Guericke-University Magdeburg, Germany, [2]University of Stuttgart, Germany

LDS_O_1856

Electron Beam Patterning of Oxidized p^+-WSe_2 for Seamless Junction Devices

Min Sup Choi*, Tien Dat Ngo, Myeongjin Lee, Fida Ali, and Won Jong Yoo
Sungkyunkwan University, Korea

LDS_O_1859

Van der Waals Schottky Gated Metal-semiconductor Field-effect Transistor at the Schottky-Mott Limit

Yeon Ho Kim[1], Wei Jiang[2], Donghun Lee[1], Jong Chan Kim[3], Woong Huh[1], Tae Soo Kim[4], Jae-Pil So[1], Hong-Gyu Park[1], Kibum Kang[4], Hu Young Jeong[3], Tony Low[2], and Chul-Ho Lee[1]*
[1]Korea University, Korea, [2]University of Minnesota, USA, [3]Ulsan National Institute of Science and Technology, Korea, [4]Korea Advanced Institute of Science and Technology, Korea

LDS_O_1873

Heterosynaptic MoS_2 Memtransistors Emulating Biological Neuromodulation for Energy-Efficient Neuromorphic Electronics

Woong Huh[1], Seonghoon Jang[1], Tae-Hyun Yoon[1], Jae-Pil So[1], Jong Chan Kim[2], Donghun Lee[1], Yeon Ho Kim[1], Hong-Gyu Park[1], Hu Young Jeong[2], Gunuk Wang[1], and Chul-Ho Lee[1]*
[1]Korea University, Korea, [2]Ulsan National Institute of Science and Technology, Korea

LDS_O_1891

Realization of Strong Light-matter Interaction in GaAs Microcavity Using Metalorganic Chemical Vapor Deposition

Daegwang Choi, Min Park, Chan-Young Sung, Hyoungsoon Choi, and Yong-Hoon Cho*
Korea Advanced Institute of Science and Technology, Korea

LDS_O_1951

Exciton Transfer at Heterointerfaces of MoS_2 Monolayers and Fluorescent Organic Molecules

Soyeong Kwon[1], Dong Yeun Jeong[1], Chengyun Hong[2,3], Saejin Oh[2,3], Jungeun Song[1], Soo Ho Choi[2], Ki Kang Kim[2,3], Seokhyun Yoon[1], Taeyoung Choi[1], Ki-Ju Yee[4], Ji-Hee Kim[2,3], Youngmin You[1], and Dong-Wook Kim[1]*
[1]Ewha Womans University, Korea, [2]Institute for Basic Science, Korea, [3]Sungkyunkwan University, Korea, [4]Chungnam National University, Korea

LDS_O_1984

Nanoscale Luminescence Quenching Method Using Focused-ion-beam for Improving Single-photon Purity of the Quantum Emitters

Minho Choi[1], Seongmoon Jun[1], Jin Dong Song[2], Young Ho Ko[3], and Yong-Hoon Cho[1]*
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Korea Institute of Science and Technology, Korea, [3]Electronics and Telecommunications Research Institute, Korea

Artificial Intelligence (AI) Materials and Devices

AI_O_1114

SiO_x Memristive Artificial Neuron and Synapse for Probabilistic Computing Application

Sanghyeon Choi, Jingon Jang, Jehyeon Yang, Haein Cho, and Gunuk Wang*
Korea University, Korea

AI_O_1465

Filament-Free Electrochemical RAM with CuO_x Gate Electrode for Analog Synaptic Devices

Heebum Kang, Hyun Wook Kim, Eun Ryeong Hong, Nayeon Kim, and Jiyong Woo*
Kyungpook National University, Korea

AI_O_1483

Ferroelectric Synapse TFT with Multi-Level of Conductance State for Neuromorphic Computing

Dongsu Kim and Jae Eun Jang*
Daegu Gyeongbuk Institute of Science and Technology, Korea

AI_O_1484

Roughness Induced Anomalous Resistive Switching Behavior of an a-$InGaZnO_4$ Based Memristor

Haripriya G. R., Hee-Yeon Noh, Chan-Kang Lee, Myoung-Jae Lee, and Hyeon-Jun Lee*
Daegu Gyeongbuk Institute of Science and Technology, Korea

AI_O_1731

Threshold Switching CeO_2-based Selector Device for Crossbar Memory Application

Dwipak Prasad Sahu, KiTae Park, Jimin Han, and Tae-Sik Yoon*
Ulsan National Institute of Science and Technology, Korea

AI_O_1746

Leaky Integrate and Fire Neuron Based on 2D-hBN Threshold Switching RRAM Device for Neuromorphic Applications

Yooyeon Jo[1], Gichang Noh[1], Eunpyo Park[1], Min Jee Kim[1], Yong Woo Sung[1], Dong Yeon Woo[1], Dae Kyu Lee[1], and Joon Young Kwak[1,2]*
[1]Korea Institute of Science and Technology, Korea, [2]Korea Institute of Science and Technology, Korea

AI_O_1748

Self-selecting Bipolar Artificial Synapses with n-ZnO/p-NiO/n-ZnO Structure for Selector-less Crossbar Array Architecture Application

Peter H. Chung, Sola Moon, and Tae-Sik Yoon*
Ulsan National Institute of Science and Technology, Korea

AI_O_1761

Synaptic Floating Gate Memory based on Palladium Diselenide ($PdSe_2$)

Eunpyo Park[1,2], Jae Eun Seo[3], Gichang Noh[1], Yooyeon Jo[1], In Soo Kim[1], Jongkil Park[1], Jaewook Kim[1], YeonJoo Jeong[1], Suyoun Lee[1], Inho Kim[1], Jong-Keuk Park[1], SangBum Kim[2], Jiwon Chang[3]*, and Joon Young Kwak[1,4]
[1]Korea Institute of Science and Technology, Korea, [2]Seoul National University, Korea, [3]Yonsei University, Korea, [4]Korea University of Science and Technology, Korea

AI_O_1768

MOCVD Growth of 2D Germanium Selenide for van der Waals Heterostructure with Large Memory Window

Gichang Noh[1,2], Hwayoung Song[2], Heenang Choi[3], Saeyoung Oh[4], Yooyeon Jo[1], Eunpyo Park[1], Eoram Moon[2], Jeong Hu Young[4], Jongsun Lim[3], Taek-Mo Chung[3], Kibum Kang[2]*, and Joon Young Kwak[1,5]*
[1]Korea Institute of Science and Technology, Korea, [2]Korea Advanced Institute of Science and Technology, Korea, [3]Korea Research Institute of Chemical Technology, Korea, [4]Ulsan National Institute of Science and Technology, Korea, [5]Korea University of Scienc

AI_O_1783

Digits Pattern Recognition Application Utilizing Back-propagation with All-optically and Spatially Modulated Indium Gallium Zinc Oxide Optoelectronic Artificial Synapse Array

Seungho Song[1,2], Jongtae Ahn[1], Jisu Jang[1], Byoungsoo Yu[1], Yong-hoon Kim[2], and Do Kyoung Hwang[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Sung Sungkyunkwan University, Korea

AI_O_1843

Development of Probabilistic Computing System for MST Problem Using NbO_X Mott Memristor

H. Rhee, G. Kim, H. Song, W. Park, J. H. In, and K. M. Kim*
Korea Advanced Institute of Science and Technology, Korea

AI_O_1861

Stochastic Stateful Logic Technology for Evolutionary Learning of a TaO_X-based Memristive Binary Neural Network

D. H. Kim, Y. S. Kim, W. H. Cheong, H. Song, H. Rhee, and K. M. Kim*
Korea Advanced Institute of Science and Technology, Korea

AI_O_1868

Atypical Memristive Neuromorphic Network Mimicking Brain Structural and Functional Characteristics

Hanchan Song, Do Hoon Kim, Hakseung Rhee, and Kyung Min Kim*
Korea Advanced Institute of Science and Technology, Korea

AI_O_1906

Enhanced Performance of Nitrogen Doped Si_xTe_{1-x} Ovonic Threshold Switch for Selector Devices

Su-Bong Lee, Yoon-Gu Lee, Sang-Heon Park, Chaebin Park, Young-Min Kim, and Jong-Souk Yeo*
Yonsei University, Korea

Quantum Information (QI)

QI_O_1097

Decoherence of Diamond NV Ensembles with Varying Nitrogen Spin Concentration: A Cluster Expansion Study

Huijin Park[1], Jung-Hyun Lee[2], Sangwook Han[2,3], Sangwon Oh[4]*, and Hosung Seo[1]*
[1]Ajou University, Korea, [2]KIST Center for Quantum Information, Korea, [3]Korea University of Science and Technology, Korea, [4]Korean Research Institute of Standards and Science, Korea

QI_O_1409

Theoretical Study of Spin Decoherence in Transition Metal Dichalcogenides

Taejoon Park, Huijin Park, Jaewook Lee, and Hosung Seo*
Ajou University, Korea

QI_O_1477

Temporal Modulation of Telecom Wavelength Single Photons from a Single Quantum Emitter

K. Y. Kim, C. J. K. Richardson, E. Waks, and J.-H. Kim*
University of Maryland, USA

QI_O_1478

Bright Zero-phonon Line Emission from Point Defect-stacking Fault Complexes in SiC Nanowires

Jin Hee Lee[1], Woong Bae Jeon[1], Jong Sung Moon[1], Junghyun Lee[2], Sang-Wook Han[2], Zoltán Bodrog[3], Adam Gali[3,4], Sang-Yun Lee[2,5], and Je-Hyung Kim[1]*
[1]Ulsan National Institute of Science and Technology, Korea, [2]Korea Institute of Science and Technology, Korea, [3]Wigner Research Centre for Physics, Hungary, [4]Budapest University of Technology and Economics, Hungary, [5]Gwangju Institute of Science and Techn

QI_O_1481

Microsphere-enhanced Optical Interface for Solid-state Qubit

Jong Sung Moon[1], Haneul Lee[1], Jin Hee Lee[1], Woong Bae Jeon[1], Dowon Lee[1], Junghyun Lee[2], Seoyoung Paik[2,4], Sang-Wook Han[2], Rolf Reuter[3], Andrej Denisenko[3], Jörg Wrachtrup[3], Sang-Yun Lee[2,4], and Je-Hyung Kim[1]*
[1]Ulsan National Institute of Science and Technology, Korea, [2]Korea Institute of Science and Technology, Korea, [3]University of Stuttgart, Germany, [4]Gwangju Institute of Science and Technology, Korea

QI_O_1809

Nuclear Spin Polarization by Forced Single Mode Electron Spin Precession in Self-Assembled InGaAs Quantum Dots

E. Evers[1]*, N. E. Kopteva[1], I. A. Yugova[2,3], D. R. Yakovlev[1,4], M. Bayer[1,4], and A. Greilich[1]
[1]TU Dortmund University, Germany, [2]Spin Optics Laboratory of St. Petersburg State University, Russia, [3]Physical Faculty of St. Petersburg State University, Russia, [4]Russian Academy of Sciences, Russia

QI_O_1892

Quasi-resonant Excitation on InGaN Single Quantum Dot for Improving Single-photon Purity and Linewidth

Seongmoon Jun[1], Minho Choi[1], Martina Morassi[2], Maria Tchernycheva[2], Noëlle Gogneau[2], and Yong-Hoon Cho[1]*
[1]Korea Advanced Institute of Science and Technology, Korea, [2]University Paris-Saclay, France

QI_O_1915

Portable, and Miniaturized Quantum Magnetometer Based on Diamond NV Center

Wookyoung Choi, Dongkwon Lee, Chanhu Park, and Donghun Lee*
Korea University, Korea

QI_O_1916

Suppressing the Spin Qubit–spin Bath Interaction by Doubly Dressing a Spin Qubit in the Solid-state System

Kihwan Kim, Yisoo Na, Jungbae Yoon, Dongkwon Lee, Hee Seong Kang, Chul-Ho Lee, and Donghun Lee*
Korea University, Korea

QI_O_1917

Identification of Nuclear-Nuclear Interaction through Supervised Contrastive Learning and Autoencoder Neural Network

K. Jung[1], J. Yun[1,2], and D. Kim[1],*
[1]Seoul National University, Korea, [2]Delft University of Technology, The Netherlands

QI_O_1923

Sequential Hamiltonian Parameter Estimation of GaAs Singlet-Triplet Spin Qubit

Hyeongyu Jang[1], Jehyun Kim[1], Jongin Yun[1], Wonjin Jang[1], Jinwoong Kim[1], Jaemin Park[1], Hanseo Sohn[1], Youngwook Song[1], Sangwoo Sim[1], Min-Kyun Cho[1], Hanrim Kang[1], Hwanchul Chung[2], Vladimir Umansky[3], and Dohun Kim[1]*
[1]Seoul National University, Korea, [2]Pusan National University, Korea, [3]Weizmann Institute of Science, Israel

Plasmonics and Optoelectronics (PO)

PO_O_1143

Dynamic Modulation of Trion-exciton Conversion in $MoSe_2$ with Plasmonic Nanostructure via Tip-enhanced Spectroscopy

Mingu Kang[1], Su-jin Kim[2], Yeonjeong Koo[1], Jinseong Choi[3], Hyun Seok Lee[2]*, and Kyoung-Duck Park[1]*
[1]Pohang University of Science and Technology, Korea, [2]Chungbuk National University, Korea, [3]Ulsan National Institute of Science and Technology, Korea

PO_O_1185

Role of h-BN Encapsulation in Excitonic Properties of 2D Semiconductors

Jin-Woo Jung, Hyeon-Seo Choi, Young-Jun Lee, Dohun Kim, Youngwook Kim, and Chang-Hee Cho*
Daegu Gyeongbuk Institute of Science and Technology, Korea

PO_O_1186

Indirect Bandgap Transition Lasing Action in an WS_2 Disk

J. Sung and S.-H. Gong*
Korea University

PO_O_1189

Exciton Complexes in Doped-transition Metal Dichalcogenides

Young-Jun Lee, Jin-Woo Jung, Ji-Yeon Kim, Youngwook Kim, and Chang-Hee Cho*
Daegu Gyeongbuk Institute of Science and Technology, Korea

PO_O_1193

Exciton Diffusion Properties in Single Crystalline Lead Halide Perovskites

Minjee Ko[1], Hyeon-Seo Choi[1], Taejin Lee[1], Jang-Won Kang[1], Jin-Woo Jung[1], Dongha Kim[1], Shinbuhm Lee[1], Jinhee Heo[2], and Chang-Hee Cho[1]*
[1]Daegu Gyeongbuk Institute of Science and Technology, Korea, [2]Korea Institute of Materials Science, Korea

PO_O_1196

Rabi Oscillations of Exciton-polariton in Phase-changing Lead Halide Perovskites

Hyeon-Seo Choi, Minjee Ko, Jin-Woo Jung, Young-Jun Lee, Taejin Lee, Dongha Kim, Shinbuhm Lee, and Chang-Hee Cho*
Daegu Gyeongbuk Institute of Science and Technology, Korea

PO_O_1340

Potential Gradient Control of Room-temperature Triangular-whispering Gallery Polariton Condensate

Hyun Gyu Song, Sunghan Choi, Chung Hyun Park, Su-Hyun Gong, Chul Won Lee, Min Sik Kwon, Dae Gwang Choi, Kie Young Woo, and Yong-Hoon Cho✳
Korea Advanced Institute of Science and Technology, Korea

PO_O_1402

Chirality Detection Using the Combined Nanoparticle and Chiral Molecules System

TaeHyung Kim and Q-Han Park*
Korea University, Korea

PO_O_1458

Dynamical Control of Interlayer Excitons and Trions in $WSe_2/Mo_{0.5}W_{0.5}Se_2$ Heterobilayer via Tunable Near-Field Cavity

Yeonjeong Koo[1], Hyeongwoo Lee[1], Tatiana Ivanova[2], Ali Kefayati[3], Vasili Perebeinos[3], Ekaterina Khestanova[2], Vasily Kravtsov[2]*, and Kyoung-Duck Park[1]*
[1]Pohang University of Science and Technology, Korea, [2]ITMO University, Russia, [3]University at Buffalo, USA

PO_O_1472

Observation of Light-matter Coupling in h-BN/WS_2/h-BN Waveguide Cavity

Jiyeon Kim, Young-Jun Lee, Hyeon-Seo Choi, Jin-Woo Jung, and Chang-Hee Cho*
Daegu Gyeongbuk Institute of Science and Technology, Korea

PO_O_1528

Identification and Modulation of Photocurrent in 2D Layered Materials

Thi Uyen Tran, Wonkil Sakong, and Seong Chu Lim*
Sungkyunkwan University, Korea

PO_O_1604

Tunable Gap-enhanced Raman Scattering via Flexible Plasmonic 1D Nano-gap

Taeyoung Moon[1], Bamadev Das[3], Dai Sik Kim[2]*, and Kyoung Duck Park[1]*
[1]Pohang University of Science and Technology, Korea, [2]Ulsan National Institute of Science and Technology, Korea, [3]Seoul National University, Korea

PO_O_1612

Fourier Transform Photoconductivity of Graphene-Enhanced Silicon Carbide Interdigital Sensors

J. Kunc*, B. Morzhuk, M. Shestopalov, and V. Dědič
Charles University, Czech Republic

PO_O_1727

Design of Metasurface-integrated Vertical Cavity for Circularly Polarized Bessel Beam and Beam Splitting

Jaewon Jang, Minsu Park, and Yeonsang Park*
Chungnam National University, Korea

PO_O_1789

Core-Sheath Composite Architecture of Plasmonic Nanowires for Chemical Sensing via Surface-enhanced Raman Spectroscopy

H. G. Park*, J. Lee, H. Kim, and J. Lee
Pohang University of Science and Technology, Korea

PO_O_1790

Metalens Integrated Micro Light Emitting Diodes for Near Eye Displays

Young-Bin Kim, and Sun-Kyung Kim*
Kyung Hee University, Korea

PO_O_1874

Structural Degradation of Perovskite QDs and Its Prevention by Introducing Gradient Halide Concentration

Hanleem Lee[1,2], Cuc Kim Trinh[1], Mo Geun So[1], and Chang-Lyoul Lee[1]*
[1]Gwangju Institute of Science and Technology, Korea, [2]Myongji University, Korea

PO_O_1893

High Numerical Aperture Metalens on a Crystalline Silicon-on-sapphire with a Micrometer Scan Range

Gi-Hyun Go and Yong-Hoon Cho*
Korea Advanced Institute of Science and Technology, Korea

Energy Materials and Devices (EMD)

EMD_O_1282

Defect Passivation of Low-Temperature Sputtered Tin Oxide Electron Transport Layer via Magnesium Doping

Shuai Lan, Wenting Zheng, Jin-Wook Lee, and Han-Ki Kim*
Sungkyunkwan University, Korea

EMD_O_1288

Development of the Highly Transparent and Low Resistive Flexible ITO/PEDOT:PSS Composite Electrodes via Low Temperature Plasma Annealing for Energy Conversion Devices

Vivekanandan Raman, Yong-Hwan Cho, and Han-Ki Kim*
Sungkyunkwan University, Korea

EMD_O_1352

Synthesis of Metal Selenides-based Electrodes for High-performance Energy Storage Devices

Ramulu Bhimanaboina, S. Chandra Sekhar, Shaik Junied Arbaz, and Jae Su Yu*
Kyung Hee University, Korea

EMD_O_1353

Electrospun Biocompatible Fibers as a Tribosensor for Human Body Motion

Sontyana Adonijah Graham and Jae Su Yu*
Kyung Hee University, Korea

EMD_O_1354

Synthesis of Flower-shaped Nanosheets Architectured Electrode Materials for High-performance Electrochemical Supercapacitors

B. N. Vamsi Krishna, Obula Reddy Ankinapalli, and Jae Su Yu*
Kyung Hee University, Korea

EMD_O_1398

A Metal-organic Framework (ZIF-67) Based Triboelectric Nanogenerator and Robotics Applications

Sugato Hajra, Swati Panda, and Hoe Joon Kim*
Daegu Gyeongbuk Institute of Science and Technology, Korea

EMD_O_1419

Self-powered Wastewater Purification System with Disk Triboelectric Nanogenerator and Electromagnetic Generator

Hyunwoo Cho and Daewon Kim*
Kyung Hee University, Korea

EMD_O_1420

Liquid- metal Embedded Sponge-typed Triboelectric Nanogenerator for Omnidirectionally Detectable Self-powered Motion Sensor

Jihyeon Park and Daewon Kim*
Kyung Hee University, Korea

EMD_O_1421

High Performance Supercapacitor Electrodes of Hybrid Porous Core-shell Structure of Hierarchical MnO_2 Nanoflakes and Mesoporous $NiTiO_3$ Nanorods

Narasimharao Kitchamsetti and Daewon Kim*
Kyung Hee University, Korea

EMD_O_1445

Highly Efficient Self-Encapsulated Flexible Semi-Transparent Perovskite Solar Cells via Bifacial Cation Exchange

Gyujeong Jeong, Donghwan Koo, and Hyesung Park*
Ulsan National Institute of Science and Technology, Korea

EMD_O_1456

Vacuum-Processed Vertically Oriented Two-dimensional Ruddlesden–Popper Phase Perovskite Passivation Layer for Efficient and Stable Inverted Perovskite Solar Cells

Yunseong Choi, Donghwan Koo, Gyujeong Jeong, Ungsoo Kim, Hyungmin Kim, and Hyesung Park*
Ulsan National Institute of Science and Technology, Korea

EMD_O_1482

Modulation of Oxygen Evolution Kinetics and Energetics via Incorporation of Low Oxidation State Transition Metal

Ungsoo Kim, Donghwan Koo, Jihyung Seo, and Hyesung Park*
Ulsan National Institute of Science and Technology, Korea

EMD_O_1485

Intimate Contact with Perovskite Layer via Mesoporous Structured MoS_2 Toward High-Performance Perovskite Solar Cells with Photostability

Donghwan Koo, Ungsoo Kim, Yunseong Choi, and Hyesung Park*
Ulsan National Institute of Science and Technology, Korea

EMD_O_1504

Investigation of Self-powered UV Photodetector Based on the Transparent *p*-CuI/n-SiZnSnO Heterojunction Diode

Jeong Hyuk Lee[1], Byeong Hyeon Lee[2], Sang Yeol Lee[3], and Kee Hoon Kim[1]*
[1]Seoul National University, Korea, [2]Korea University, Korea, [3]Gachon University, Korea

EMD_O_1510

Maximum Transfer of Wave for Energy Harvesting

Ku Im and Q-Han Park*
Korea University, Korea

EMD_O_1551

Fabrication of High Efficiency ACZTSSe Solar Cells by Inserting Ag-doped Thin Layers Through Aqueous Spray Approach

T. Enkhbat, MH. Sharif, E. Enkhbayar, MS. Mina, and JH. Kim*
Incheon National University, Korea

EMD_O_1558

Efficiency Improvement of Low Bandgap $CuInSe_2$ (CIS) Photovoltaic Devices via Alkali Incorporation

M. S. Mina, E. Enkhbayar, and J. H. Kim*
Incheon National University, Korea

EMD_O_1569

Surface Treatments of Potassium on SnO_2 Electron Transport Layers for Improvements of Perovskite Solar Cells

SeongYeon Kim[1,2,3], Fei Zhang[3], Jinhui Tong[3], Xihan Chen[3], Enkhjargal Enkhbayar[2], Kai Zhu[3], and JunHo Kim[2]*
[1]Daegu Gyeongbuk Institute of Science and Technology, Korea, [2]Incheon National University, Korea, [3]National Renewable Energy Laboratory, USA

EMD_O_1632

Heterostuructured Catalyst Close to Optimal Water Oxidation via Simultaneous in-situ Electronic Structure Engineering

Jihoo Cha, Ungsoo Kim, Jihyung Seo, and Hyesung Park*
Ulsan National Institute of Science and Technology, Korea

EMD_O_1640

Rationally Designed Ternary NiCuFe LDH/Phosphide Hierarchical Architecture for Efficient Overall Water Splitting

Yihan Zhang, Ungsoo Kim, Jihoo Cha, and Hyesung Park*
Ulsan National Institute of Science and Technology, Korea

EMD_O_1667

Utilizing Fluorescence Quenching Microscopy to Analyze Defects in Charge Transport Layers of Halide Perovskite-based Solar Cells

Hannah Kwon[1], Hyun Chul Kim[1], Hyejun Kim[1], Seok Joon Kwon[2], and In Soo Kim[1,2]*
[1]Korea Institute of Science and Technology, Korea, [2]Sungkyunkwan University, Korea

EMD_O_1702

A Study on the Long-term Stability of Perovskite Solar Cells by Cation Ratio

Dong-Hyeok Choi[1,2], Hae-Jun Seok[1], Su-Kyung Kim[1,2], and Han-Ki Kim[1]*
[1]Sungkyunkwan University, Korea, [2]Korea Electric Power Research Institute, Korea

EMD_O_1703

Effects of Deposition Process of NiO_x Thin Film as Hole Transport Layer to Performance of Perovskite Solar Cells

Su Kyung Kim[1,2], Hae Jun Seok[1], Dong Hyeok Choi[1,2], and Han Ki Kim[1]*
[1]Sungkyunkwan University, Korea, [2]Korea Electric Power Research Institute, Korea

EMD_O_1743

Photogating Mechanism of Graphene Field Effect Transistor

Byeoungju Lee[1], Kwangnam Yu[1], Jiho Kim[2], Jiwon Jeon[1], and E. J. Choi[1]*
[1]University of Seoul, Korea, [2]Pohang Accelerator Laboratory, Korea

EMD_O_1745

Decomposition Mechanism by Moisture of Quasi-2D halide Perovskite

Hyeon Jun Jeong[1], Jae-Hyun Sung[1], Gang Hyeok Seo[1], Hyeongchan Suh[1], Gon Namkoong[2]*, and Mun Seok Jeong[1]*
[1]Hanyang University, Korea, [2]Old Dominion University, USA

EMD_O_1845

Stability Studies of Ti_3C_2Tx MXene Under Different Conditions

Sunil Kumar*, Hyun Min Park, Van Huy Nguyen, Minwook Kim, Naila Nasir, Sohee Lee, Muhammad Suleman, and Yongho Seo
Sejong University, Korea

EMD_O_1850

ITO/SnO_2 Interface Effect in Perovskite Solar Cells

Sarah Su-O Youn[1,2], Jihyun Kim[1], Junhong Na[3], William Jo[1], and Gee Yeong Kim*[2]
[1]Ewha Womans University, Korea, [2]Korea Institute of Science and Technology, Korea, [3]Kyungnam University, Korea

EMD_O_1862

Two-dimensional Exfoliated Boron Nanosheets: An Efficient Bifunctional Electrocatalyst for Overall Water Splitting

Arunprasath Sathyaseelan, Dhanasekar Kesavan, Noor Ul Haq Liyakath Ali, and Sang-Jae Kim*
Jeju National University, Korea

EMD_O_1866

Photogenerated and Trap-assisted Carrier Transport Under Different Illuminations in Hybrid Perovskite Single Crystals

Hye Ri Jung[1,2], Yunae Cho[1], and William Jo[1]*
[1]Ewha Womans University, Korea, [2]Korea Institute of Science and Technology, Korea

EMD_O_1885

Fe-Co Mixing Enhanced Efficiency and Stability for Perovskite Oxygen Evolution Electrocatalyst

Yongchul Kim, Youngsin Park, and Geunsik Lee*
Ulsan National Institute of Science and Technology, Korea

EMD_O_1949

Two-dimensional Transition Metal Dichalcogenides as a Platform for Singlet Fission Solar Cells

J.-H. Kim[1,2]*
[1]Sungkyunkwan University, Korea, [2]Institute for Basic Science, Korea

Industrial Semiconductor Applications (ISA)

ISA_O_1426

A Transient, Bioresorbable, On-demand, Life-time Control System

Jeong-Woong Shin[1], Eunkyoung Park[2], and Suk-Won Hwang[1]*
[1]Korea University, Korea, [2]Soonchunhyang University, Korea

ISA_O_1428

Nanofab Process and Test Bed for Devices and Materials Development of Semiconductor

Jun-Mo Yang
National Nanofab Center, Korea

ISA_O_1462

Determination of the Internal Quantum Efficiency in InGaAsP Multiple Quantum Wells Emitting at 1.55 μm Using Rate Equation Analysis

Chibuzo Onwukaeme and Han-Youl Ryu*
Inha University, Korea

ISA_O_1545

VACNTs Employed Cold Cathode X-ray Generator for AXI Applications

Y. Y. Yu and K. C. Park*
Kyung Hee University, Korea

ISA_O_1554

Extreme Ultraviolet Generation Technology Using Carbon Nanotube Based Cold Cathode Electron Beam

Sung Tae Yoo and Kyu Chang Park*
Kyung Hee University, Korea

ISA_O_1578

Energy Level Modulation of MoS_2 Monolayers by Halide Doping for Enhanced Hydrogen Evolution Reaction

Jungmoon Lim[1], Taehun Kim[1], Seung je Kim[1], Junsung Byeon[1], Hong ju Park[1], Jung Min[1], Young Hoon Lim[1], Kyung-Ho Park[2], John Hong[3], Sangyeon Pak[4]*, and SeungNam Cha[1]*
[1]Sungkyunkwan University, Korea, [2]Nanodevices Laboratory Korea Advanced Nano Fab Center, Korea, [3]Kookmin University, Korea, [4]Hongik University, Korea

ISA_O_1588

Fully Implantable Bladder-integrated Wireless Electronic System with Interconnected Architectures for Real-time Monitoring and Regulating Bladder Function

Tae-Min Jang[1], Joong Hoon Lee[1], Eunkyoung Park[2], Kyu-Sung Lee[3], and Suk-Won Hwang[1]*
[1]Korea University, Korea, [2]Soonchunhyang University, Korea, [3]Sungkyunkwan University School of Medicine, Korea

ISA_O_1628

Control of Thermal and Electrical Conductivity of Metal-coated Carbon Fibers for Vacuum Sensor

Seungsu Kang, Dang Xuan Dang, Suar Oh, and Seong Chu Lim*
Sungkyunkwan University, Korea

ISA_O_1722

Room Temperature synthesis of Transition Metal Sulfide via a Simple Hydrogen Sulfide Corrosion Method

Taehun Kim[1], Jungmoon Lim[1], Junsung Byeon[1], Sangyeon Pak[2]*, and SeungNam Cha[1]*
[1]Sungkyunkwan University, Korea, [2]Hongik University, Korea

ISA_O_1883

Ternary Transistor Using p-$MoTe_2$/n-MoS_2 Heterostack Channel Toward Quaternary NAND Logic

S. Park, H. J. Lee, and S. Im*
Yonsei University, Korea

ISA_O_1904

Semiconductor Workforce Development and Research Through Immersive Simulations on NanoHUB.org

Gerhard Klimeck[1]*, Tanya Faltens[1], Daniel Mejia[1], Alejandro Strachan[1], Lynn Zentner[1], and Michael Zentner[2]
[1]*Purdue University, USA,* [2]*UC San Diego, USA*

Poster Session I

Lobby (2F), FJuly 18, 2022 (Mon.) / 17:00-18:30

Advanced Semiconductors (AS)

AS_P1_1168

Drain Current Dependency of Microwave-Noise Characteristics in AlGaN/GaN HEMTs on SiC

Hyung Sup Yoon*, Byoung-Gue Min, Jong Min Lee, Kyu Jun Cho, Zinsik Kim, Hong Gu Ji, Hyung Seok Lee, Yun Ho Choi, Woojin Chang, and Dong Min Kang
Electronics and Telecommunications Research Institute, Korea

AS_P1_1220

Photoreflectance and Photoluminescence Study for InGaAs/ InAsP(Sb) Different Barrier MQW Structure

Jaedu Ha[1], Taein Kang[1], Jong Su Kim[1]*, Suho Park[2], Yeongho Kim[2], and Sang Jun Lee[2]
[1]Yeungnam University, Korea, [22]Korea Research Institute of Standards and Science, Korea

AS_P1_1360

AlGaN/GaN High Electron Mobility Transistors with Hexagonal Boron Nitride

Gun Hee Lee[1], Geonnam Park[2], Seongmin Park[2], Eun Mi Kim[2], Eun-Kyung Suh[1], and Tae Hoon Seo[2]*
[1]Chonbuk National University, Korea, [2]Korea Institute of Industrial Technology, Korea

AS_P1_1361

Improved Light Output Power in UV-LEDs with Graphene Network Silver Nanowire as a Transparent Conductive Electrode

Tae Hoon Seo*
Korea Institute of Industrial Technology, Korea

AS_P1_1457

Fluorescent Surface Imaging with High Localization Accuracy Based on Optical Nanotopography

Inhong Kim and Kwangseuk Kyhm*
Pusan National University, Korea

AS_P1_1486

3D Fabrication of Quantum Dot Microwire by Using Micorpipette-combined QTF-AFM and in Situ Raman Spectroscopy

Taesun Yun[1], Yong Bin Kim[1], Taegeon Lee[1], Hee-suk Rho[1], Ayoung Choi[1], Hamizah Muhaiya[1], Hyeongwoo Lee[2], Kyoung-Duck Park[2], Hong Seok Lee[1]*, and Sangmin An[1]*
[1]Jeonbuk National University, Korea, [2]Pohang University of Science and Technology, Korea

AS_P1_1531

Formation of Nanoscale Si Layers for the Sake of Channel Stacked GAA-FET

Gayoung Kim, Sang-Hoon Kim, Jinha Kim, Seong Hyun Lee, Wangjoo Lee, Jeong-Woo Park, and Dongwoo Suh*
Electronics and Telecommunications Research Institute, Korea

AS_P1_1538

Energy Bands of InAs/GaSb Type II Superlattice Structure with Finite Difference Method Applied for Eight-Band k.p Model

S. B. Seyedein Ardebili[1], J. S. Kim[1]*, J. D. Ha[1], Y. Kim[2], and S. J. Lee[2]
[1]Yeungnam University, Korea, [2]Korea Research Institute of Standards and Science, Korea

AS_P1_1563

Bio-electronic Nose for High Sensitivity and Selectivity Imitated the Human Sense of Smell

Lina Kim and Oh seok Kwon*
Korea Research Institute of Bioscience and Biotechnology, Korea

AS_P1_1568

Enhanced the Physical and Electrical Properties of HfO_2 Deposited by Atomic Layer Deposition Using Novel Precursor with Improved Thermal Stability

Seung Won Lee, Min Ji Jeong, and Ji-Hoon Ahn*
Hanyang University, Korea

AS_P1_1574

Trap-density Dependent Performance Variations in V-NAND Structure

Jinwoo Kim and Ilgu Yun*
Yonsei University, Korea

AS_P1_1577

Highly Sensitive Stress Biomarker Detection by Polypyrrole Nanotube Coupled Field-Effect Transistor

Gyeong-Ji Kim and Oh Seok Kwon
Korea Research Institute of Bioscience and Biotechology, Korea

AS_P1_1732

Contact Engineering of a-IGZO Thin-film Transistors by Using Doped Interlayer

Taeyoung Kim, Yoonsok Kim, Juntae Ahn, and Eun Kyu Kim*
Hanyang University, Korea

AS_P1_1736

Structural Selectivity with Post-thermal Annealing and Resistive Switching Characteristics of Cobalt Oxide Films

Jun Tae Ahn, Taeyoung Kim, Yoonsok Kim, and Eun Kyu Kim*
Hanyang University, Korea

AS_P1_1751

Carrier Escaping Effect in InAs/InGaAs Sub-monolayer Quantum Dot-in-a-well Solar Cell Using by Photoreflectance

Gyoung Du Park[1], Hyun-Jun Jo[1], Jong Su Kim[1]*, Sang Jun Lee[2], and Im Sik Han[3]
[1]Yeungnam University, Korea, [2]Korea Research Institute of Standards and Science, Korea, [3]University of Sheffield, UK

AS_P1_1755

Investigation of Photoluminescence and Photoreflectance According to Rapid Thermal Annealing Temperature of InGaAlAs/InGaAlAs Multi-quantum Well

Jong Won Cha[1], Tae In Kang[1], Jae Du Ha[1], Gyoung Du Park[1], Jong Su Kim[1]*, Mee Yi Rue[2], and Jin Dong Song[3]
[1]Yeungnam University, Korea, [2]Kangwon University, Korea, [3]Korea Institute of Science and Technology, Korea

AS_P1_1767

First-principles Study of Localized Metal-induced Gap States at the Metal-insulator Interfaces

Dongchul Sung[1], Hyunsik Im[2], and Suklyun Hong[1]*
[1]Sejong University, Korea, [2]Dongguk University, Korea

AS_P1_1780

First-principles Study of Janus 2D Metal Monochalcogenides

Junghwan Kim, Yunjae Kim, and Suklyun Hong*
Sejong University, Korea

AS_P1_1782

Theoretical Investigations of Electronic Structure of Janus 2D vdW Heterostructures

Yunjae Kim, Junghwan Kim, Hyeong-Kyu Choi, and Suklyun Hong*
Sejong University, Korea

AS_P1_1784

Study of Thermal and Piezoelectric Properties of Janus 2D Materials Using First-principles Calculations

Wonseok Ryu, Yunjae Kim, and Suklyun Hong*
Sejong University, Korea

AS_P1_1786

Theoretical Investigations of Electronic and Thermal Properties of Ferromagnetic Insulator $Cr_2Ge_2Te_6$

Shinwon Son, Junghwan Kim, Chang-Gyu Choi, Hyeong-Kyu Choi, and Suklyun Hong*
Sejong University, Korea

AS_P1_1798

Photoluminescence and Photoreflectance Study for InAs/ GaSb Type-II MQW Structure

Yoogeun Kim[1], Taein Kang[1], Jaedu Ha[1], Jong Su Kim[1]*, Yeongho Kim[2], and Sang Jun Lee[2]
[1]Yeungnam University, Korea, [2]Korea Research Institute of Standards and Science, Korea

AS_P1_1825

Highly Sensitive, Flexible and Power-efficient Piezoelectric Tunneling Transistors

Hyerin Jo and Hongseok Oh*
Soongsil University, Korea

AS_P1_1847

Cu Diffusion Barrier Characteristics of Carbon Rich SiCN Films Deposited by PECVD Using the 1-(Trimethylsilyl)Pyrrolidine Precursor for Semiconductor Multilevel Metallization

Shinwon Kang, Namwuk Baek, Jihwan Cha, Taesoon Jang, Chanyong Seo, Gihoon Park, and Donggeun Jung*
Sungkyunkwan University, Korea

AS_P1_1857

Room Temperature Demonstration of 1-TR Reconfigurable Multivalue Logic Circuit Using a Si Ellipsoidal Quantum-Dot Transistor

Youngmin Lee, Jin Woo Lee, Dae Hyun Sim, Deuk Young Kim, and Sejoon Lee*
Dongguk University, Korea

AS_P1_1858

Fabrication and Characterization of Room-Temperature-operating Silicon Multi-quantum-dot Single-electron Transistors with Reduced Effective Electron Temperature

Youngmin Lee, So Hyun Lee, Hyo Seok Son, Deuk Young Kim, and Sejoon Lee*
Dongguk University, Korea

AS_P1_1860

Physically Unclonable Functions(PUFs) Based on Solution-Processable Organic Thin-Film Transistors with Microcrystalline Organic Semiconductor Fingerprints

Danbi Kim[1,2], Dongyoung Kim[1], Seong-il Im[1,2], Changsoon Choi[1], Jeong Ho Cho[2], Hyunsu Ju[1]*, and Jung Ah Lim[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Yonsei University, Korea

AS_P1_1864

DPP-organogelator/IGZO Hybrid Phototransistors for Circularly Polarized Light Detection

Hanna Lee[1,2], Changsoon Choi[1], Hyemi Han[1], Seung Ho Song[1], Do Kyung Hwang[1], Jeong Ho Cho[2], and Jung Ah Lim[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Yonsei University, Korea

AS_P1_1876

Ohmic-contact Multi-layered Tungsten Diselenide (WSe_2) Field-effect Transistor via V-doped WSe_2 Intermediated Layers

Xuan Phu Le, Tuan Dung Nguyen, Dinh Loc Duong*, and Young Hee Lee*
Sungkyunkwan University, Korea

AS_P1_1909

Ultrafast Carrier Dynamics of Partially Strained and Strain-relaxed Thick InGaN for Optoelectronic Applications

Kwangwook Park[1]*, Jung-Wook Min[2], Sang-Youp Yim[3], and Chul Kang[3]
[1]Jeonbuk National University, Korea, [2]King Abdullah University of Science and Technology, Saudi Arabia, [3]Gwangju Institute of Science and Technology, Korea

AS_P1_2000

Control of Device Characteristics Using Schottky Barrier Modulation

Taehoon Park and Shinhyun Choi*
Korea Advanced Institute of Science and Technology, Korea

Low Dimensional Semiconductors (LDS)

LDS_P1_1071

Investigation on Carrier Scatterings in Monolayer MoS_2 Using High Power THz Spectroscopy

Su-Ar Oh[1], Heejun Shin[2], and Seong Chu Lim[1]*
[1]Sungkyunkwan University, Korea, [2]Pohang Accelerator Laboratory, Korea

LDS_P1_1073

2D $MoTe_2/MoS_2$ Semi-vertical Heterojunction Photodiodes for Visible-Invisible Multiband Detection and Image Sensor

Jongtae Ahn[1,2], Hyun-Soo Ra[1], Jisu Jang[1], Tae Wook Kim[1,3], and Do Kyung Hwang[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Yonsei University, Korea, [3]Korea University, Korea

LDS_P1_1127

Drain Induced Fermi Energy Shift in ReS_2 Multilayers

Soo Yeon Kim[1], Dajeong Jeong[1], Hyebin Lee[2], Gyu-Tae Kim[2], and Min-Kyu Joo[1]*
[1]Sookmyung Women's University, Korea, [2]Korea University, Korea

LDS_P1_1147

Raman Study of 2H-$MoTe_2$/hBN Heterostucture

Hong Manh Nguyen, SooYeon Lim, and Hyeonsik Cheong*
Sogang University, Korea

LDS_P1_1160

Synthesis of 2D/2D $Bi_{12}O_{15}C_{l6}$/g-C_3N_4 Heterostructure with Enhanced Photocatalytic Performance for Degradation of Tetracycline Antibiotic

Syed Taj Ud Din, Woncheol Seo, Changchang Ma, and Woochul Yang*
Dongguk University, Korea

LDS_P1_1201

Effects of Ligand Concentration on Nucleation and Growth Kinetics of CdSe Quantum Dots

Sung Hun Kim and Hong Seok Lee*
Jeonbuk National University, Korea

LDS_P1_1213

Effects of Cation-Anion Ratio on Optical Properties of CdS Quantum Dots

Sung Hun Kim, Ju Seok Kim, and Hong Seok Lee*
Jeonbuk National University, Korea

LDS_P1_1245

Current Deep Level Transient Spectroscopic Investigation of Electron and Hole Trap States in Ambipolar $MoTe_2$ Nanosheets

Giheon Kim[1], Dang Xuan Dang[1], Eun Kyu Kim[2]*, and Seong Chu Lim[1]*
[1]Sungkyunkwan University, Korea, [2]Hanyang University, Korea

LDS_P1_1256

Improved Production Yield of MoS_2 Quantum Dots Synthesized by Ion-intercalation assisted Solvothermal Process

Luqman Ali and Clare Chisu Byeon*
Kyungpook National University, Korea

LDS_P1_1257

Synthesis and Characterization of $Rb_3Sb_2Br_9$ Perovskite Quantum Dots with No Lead Constituent

Luqman Ali and Clare Chisu Byeon*
Kyungpook National University, Korea

LDS_P1_1305

Distinct Optical and Electrical Properties of Disparate Defect Domains in CVD-grown h-WS_2 Monolayers

Seok-Ju Kang[1], Gwang Hwi An[2], Hyun Seok Lee[2], Jong Yun Kim[1], Oh Hun Gwon[1], Hye Ryung Byun[1], and Young-Jun Yu[1]*
[1]Chungnam National University, Korea, [2]Chungbuk National University, Korea

LDS_P1_1317

Cantilever-type NSOM Using a Single Laser for Topography Detection and Sample Excitation

Douglas Kagoiya Ng'ang'a, Yoong Joong Lee, and Clare Chisu Byeon*
Kyungpook National University, Korea

LDS_P1_1393

Random Telegraph Signal for Single Spin Tunneling in MoS_2

Hanul Kim[1], Hye Jung Kim[2], Christopher J. B. Ford[3], Aram Yoon[4,5], Zonghoon Lee[4,5], Chi-Te Liang[6], Dongmok Whang[1], and Gil-Ho Kim[1]*
[1]Sungkyunkwan University, Korea, [2]Pusan National University, Korea, [3]University of Cambridge, UK, [4]Ulsan National Institute of Science and Technology, Korea, [5]Institute for Basic Science, Korea, [6]National Taiwan University, Taiwan

LDS_P1_1407

X-ray Spectroscopy Studies of the Composition Changes of the Cu-doped In_2Se_3 Thin Films and Their Effect on the Optical Properties

Ahmed Yousef Mohamed and Deok-Yong Cho*
Jeonbuk National University, Korea

LDS_P1_1416

Fabrication of Liquid Phase Sensors Using ITO Nanoparticles

Sangsu An[1], Jaeha Noh[1], Changhan Lee[1], Yuna Heo[1], Jiho Chang[1]*, Sangtae Lee[1], Dongmin Seo[2], and Moonjin Lee[2]
[1]Korea Maritime & Ocean University, Korea, [2]Korea Research Institute of Ships & Ocean Engineering, Korea

LDS_P1_1418

Sensing Properties of Graphite Mixed Metal Oxide Nanoparticle Film Liquid Phase Sensor

Changhan Lee[1], Jaeha Noh[1], Sangsu An[1], Yuna Heo[1], Jiho Chang[1]*, Sangtae Lee[1], Dongmin Seo[2], and Moonjin Lee[2]
[1]Korea Maritime & Ocean University, Korea, [2]Korea Research Institute of Ships & Ocean Engineering, Korea

LDS_P1_1432

Electrical Property of Graphene Oxide-based Memristor Devices

Jong Yun Kim, Oh Hun Gwon, Seok-Ju Kang, Hye Ryung Byun, BeomKyu Shin, Seo Gune Jang, and Young-Jun Yu*
Chungnam National University, Korea

LDS_P1_1433

Ferroelectric Device Channel with R-stacked MoS_2

Yanggeun Joo and Heejun Yang*
Korea Advanced Institute of Science and Technology, Korea

LDS_P1_1434

Atomic and Electronic Manipulation of Robust Ferroelectric Polymorphs

Eunji Hwang[1], Yonas Assefa Eshete[2], and Heejun Yang[1]*
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Sungkyunkwan University, Korea

LDS_P1_1435

Laser-Driven Phase Design of Vanadium Ditellurides

W. Cho[1], D. Won[2], and H. Yang[1]*
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Sungkyunkwan University, Korea

LDS_P1_1436

Effect of the E-beam on the Optical Properties of WS_2

Hye Ryung Byun, Seo Gune Jang, BeomKyu Shin, Oh Hun Gwon, Jong Yun Kim, Seok-Ju Kang, and Young-Jun Yu*
Chungnam National University, Korea

LDS_P1_1441

Neuromorphic Devices Based on Molybdenum(VI) Oxide and Dopamine's Electrochemical Activity

Duc Minh Tran[1], Jong Wan Son[2], and Bae Ho Park[1]*
[1]Konkuk University, Korea, [2]Korea Research Institute of Standards and Science, Korea

LDS_P1_1447

Self-powered Semitransparent Photodetectors Employing Doped-graphene/WS_2 Vertical Heterostructures on Flexible Substrates

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

LDS_P1_1448

Deposition of Two-dimensional WS_xSe_{1-x} Thin Film by a Single CVD Process and Control of Their Band Gap Energy by Varying the Amount of Se

Jae Kuk Kim, Jun Ho So, Chan Wook Jang, Sung Kim, and Suk-Ho Choi*
Kyung Hee University, Korea

LDS_P1_1464

Ferroelastic-Ferroelectric Multiferroicity in Rhenium Disulfide

Jaehun Jeong, Hyeon-Sik Kim, Gi-Hyeon Kwon, and Mann-Ho Cho*
Yonsei University, Korea

LDS_P1_1474

Semitransparent Graphene/$LaVO_3$ Heterostructure Photodetectors

Gi Chen Park[1], Jeong Beom Choi[1], Jae Yeop Song[1], Jae Jun Lee[2], Hosun Lee[2], and Dong Hee Shin[1]*
[1]Andong National University, Korea, [2]Kyung Hee University, Korea

LDS_P1_1488

Synthesis of High-quality Violet Phosphorus Crystals

Jiwon Kim, Soo Ho Choi, Junseong Song, Ki Kang Kim, and Young Hee Lee*
Sungkyunkwan University, Korea

LDS_P1_1489

Growth of Multilayer Hexagonal Boron Nitride on Cobalt Foils

Yu Min Cha[1], Soo Ho Choi[1,2], Soo Min Kim[3], and Ki Kang Kim[1,2]*
[1]Sungkyunkwan University, Korea, [2]Institute for Basic Science, Korea, [3]Sookmyung Women's University, Korea

LDS_P1_1501

Patterned Lead-free $Cs_3Cu_2I_5$/Polymer Scintillator Film for High-Resolution X-ray Imaging

Sunjung Park, Sangeun Cho, Inah Han, Samkyu Noh, Hyungsang Kim, and Hyunsik Im*
Dongguk University, Korea

LDS_P1_1508

Plasmon-exciton Couplings in the MoS_2/AuNP Plasmonic Hybrid Structure

Hyuntae Kim[1], Jaeseung Im[1], Sung Jae Yoo[2], MohammadNavid Haddadnezhad[2], Kiin Nam[1], Jin Young Park[1], Woongkyu Park[3], Sungho Park[2], Gang Hee Han[1], Jae Sung Ahn[3], Doojae Park[4], Mun Seok Jeong[5], and Soobong Choi[1]*
[1]Incheon National University, Korea, [2]Sungkyunkwan University, Korea, [3]Korea Photonics Technology Institute, Korea, [4]Hallym University, Korea, [5]Hanyang University, Korea

LDS_P1_1518

Low-temperature Direct Growth of Wafer-scale Transition Metal Dichalcogenide Films via Remote Plasma-assisted Chemical Vapor Deposition

Jina Lee, Soo Ho Choi, Seok Joon Yun, Ki Kang Kim*, and Young Hee Lee*
Sungkyunkwan University, Korea

LDS_P1_1522

Sulfur Vacancy Effects on Monolayer MoS_2 Nanoflakes

Suejeong You, Heesang Kim, and Nammee Kim*
Soongsil University, Korea

LDS_P1_1525

Influence of Surface Defects on Optical Phonons in hBN/WS_2/Hbn

Kyoung-Yeon Lee[1], Taegeon Lee[1], Young-Jun Lee[2], Chang-Hee Cho[2], and Heesuk Rho[1]*
[1]Jeonbuk National University, Korea, [2]Daegu Gyeongbuk Institute of Science and Technology, Korea

LDS_P1_1537

Diverse Photocurrent Generation Mechanism of ReS_2-2D Te Heterostructure

Thi Uyen Tran[1], Jaeuk Bang[1], Xuan Dang Dang[1], Wonkil Sakong[1], Hai Phuong Duong[1], Mun Seok Jeong[2]*, and Seong Chu Lim[1]*
[1]Sungkyunkwan University, Korea, [2]Hanyang University, Korea

LDS_P1_1543

Band Gap Evaluation of $PtSe_2$ and $PdSe_2$ Using Density Functional Theory and GW Calculations

Janghwan Cha and Yong-Sung Kim*
Korea Research Institute of Standards and Science, Korea

LDS_P1_1553

Twisted-angle-dependent Optical Behaviors of Excitons and Interlayer Excitons in WS_2/MoS_2 Heterobilayer

Tae Jin Jeong, Chan Wook Jang, Jae Kuk Kim, Suk-Ho Choi, and Sung Kim*
Kyung Hee University, Korea

LDS_P1_1570

Laser-scribed Carbon Nanomaterials Directly Fabricated on Flexible Polyimide Films for Gas Sensor Application

Yong-il Ko[1], Min Jae Kim[1], A-Rang Jang[2], and Keun Soo Kim[1]*
[1]Sejong University, Korea, [2]Semyung University, Korea

LDS_P1_1573

Surface Reconstruction in Fe-doped $NiPS_3$ to Boost Oxygen Evolution Reactions

Yo Seob Won[1], Balakrishnan Kirubasankar[1,2], Soo Min Kim[2]*, and Ki Kang Kim[1]*
[1]*Sungkyunkwan University, Korea,* [2]*Sookmyung Women's University, Korea*

LDS_P1_1596

Investigation of Epitaxial WS_2 Monolayer on Zigzag Au Substrate Using Scanning Tunneling Microscopy

Jeong Won Jin[1], Bumsub Song[1,2], Soo Ho Choi[2], Ki Kang Kim[1,2], and Young Hee Lee[1,2]*
[1]*Sungkyunkwan University, Korea,* [2]*Institute for Basic Science, Korea*

LDS_P1_1598

Uncovered Surface Channel in Two-Dimensional Multilayers

Minji Chae, Sooyeon Kim, Youkyung Seo, Yeongseo Han, Yoojin Choi, Dahyun Choi, and Min-Kyu Joo*
Sookmyung Women's University, Korea

LDS_P1_1605

Property Engineering for Transition Metal Dichalcogenides Using Thermal Expansion of Supporting Layer

Seok Joon Yun[2], Byung Hoon Lee[1], Young Hee Lee[2], and Ki Kang Kim[1,2]*
[1]*Sungkyunkwan University, Korea,* [2]*Institute for Basic Science, Korea*

LDS_P1_1608

Synthesis of Janus Two-dimensional Materials via Chemical Vapor Deposition and its Characterization

Jungtae Nam[1], Gil Yong Lee[1], Yong-il Ko[1], Yoon Seok Noh[1], A-Rang Jang[2], and Keun Soo Kim[1]*
[1]*Sejong University, Korea,* [2]*Semyung University, Korea*

LDS_P1_1610

Effect of h-BN Encapsulation on Exciton-polariton in Transition Metal Dichalcogenides

Ho Seung Lee and Su-Hyun Gong*
Korea University, Korea

LDS_P1_1629

Spontaneous Self-Folding of Monolayer Graphene by Thermal Treatment

Yunjo Jeong[1], Ayoung Choi[2], Jangyup Son[1], and Sangmin An[2]*
[1]*Korea Institute of Science and Technology, Korea,* [2]*Jeonbuk National University, Korea*

LDS_P1_1662

Domain Selective Vanadium Doping in CVD-grown Hexagonal WS_2 Monolayers with Heterogeneous Defect Domains

Gwang Hwi An and Hyun Seok Lee*
Chungbuk National University, Korea

LDS_P1_1670

New Kinds of 2-dimensional Materials for Multi-functional Sensor Applications: Nb_3I_8, $Nb_4P_2S_{21}$, and 2D-Tellulium

Hak Ki Yu*
Ajou University, Korea

LDS_P1_1672

Growth Control of CVD-grown MoS_2 Monolayers via O_2 Plasma Pre-treatment of Liquid-precursor Coatings

Tae Yeon Kim, Gwang Hwi An, and Hyun Seok Lee*
Chungbuk National University, Korea

LDS_P1_1706

Gate-dependent Thermoelectric Power of P-type 2D Tellurene

Jaeuk Bahng[1], Giheon Kim[1], Thi Uyen Tran[1], Mun Seok Jeong[2], and Seong Chu Lim[1]*
[1]Sungkyunkwan University, Korea, [2]Hanyang University, Korea

LDS_P1_1711

Enhanced Physical Properties of Transition Metal Dichalcogenides by Passivating the Surface Defects of Substrate

Hyeong Chan Suh, Dae Young Park, Ju Chan Lee, Do Hyung Ko, Hwang June, and Mun Seok Jeong*
Hanyang University, Korea

LDS_P1_1719

Thermoelectric Properties of a Novel Semiconductor Single-layer $TlPt_2S_3$

Won Seok Yun[1]*, Hyeon-Jun Lee[1], June-Seo Kim[1], Myoung-Jae Lee[1], and Sang Wook Han[2]
[1]Daegu Gyeongbuk Institute of Science and Technology, Korea, [2]University of Ulsan, Korea

LDS_P1_1756

Field-Effect Phototransistor with an Asymmetric Split-gate Configuration to Overcome Large Exciton Binding Energy of 2D TMDCs Materials

Byoung-Soo Yu[1,2], Hyun-Soo Ra[3], Jongtae Ahn[1], Jisu Jang[1,2], and Do Kyung Hwang[1,2]*
[1]Korea Institute of Science and Technology, Korea, [2]University of Science and Technology, Korea, [3]The Barcelona Institute of Science and Technology, Spain

LDS_P1_1792

Synchrotron X-ray Radiation Induced Severe Carbon Accumulation on Black Phosphorous Flakes

Songwoung Hong[1,2], Sena Yang[1], Jeong Won Kim[1,2]*, and Ansoon Kim[1,2]*
[1]*University of Science and Technology, Korea,* [2]*University of Pittsburgh, USA*

LDS_P1_1801

Electrical Characteristics of 2D ReS_2 and WS_2 Monolayers

Jiseong Go, Taein Kang, Sagar M. Mane, Jaedu Ha, and Jong Su Kim*
Yeungnam University, Korea

LDS_P1_1816

Realization Ambipolar Transport of 2D Tellurene Using High-k Dielectric

Wonkil Sakong, and Seong Chu Lim*
[1]*Sungkyunkwan University, Korea*

LDS_P1_1827

Characteristics of Highly Carbonized Tungsten Trioxide Thin Film

Hak Dong Cho, Il Ho Ahn, Juwon Lee, and Deuk Young Kim*
Dongguk University, Korea

LDS_P1_1887

Wearable Respiration Sensor Based on Molybdenum Disulfide

Gwangsik Hong[1], Hyeon-Seung Kim[1], Hyun Sik Shin[1], Youngwon Kim[1], Ja-Yeon Kim[2], and Min-Ki Kwon[1]*
[1]*Chosun University, Korea,* [2]*Korea Photonics Technology Institute, Korea*

LDS_P1_1889

MoS_2 Based Piezoelectric Sensor

Gwang-Geun Oh[1], Hyeon-seung Kim[1], Hong Gwangsik[1], hyun sik Shin[1], Youngwon Kim[1], Ja-Yeon Kim[2], and Min-Ki Kwon[1]*
[1]*Chosun University, Korea,* [2]*Korea Photonics Technology Institute, Korea*

LDS_P1_1903

High-yield Transfer WS_2 Film Grown on Au Foil via Interfacial Graphene Layer

Jae Sik Bang, Soo Ho Choi, Ki Kang Kim*, and Young Hee Lee
Sungkyunkwan University, Korea

LDS_P1_2045

Multiple Magnetic Phases in Mn-SnS_2 Layered Semiconductor

Houcine Bouzid, Ramchandra Sahoo, Seokjoon Yun, and Young Hee Lee*
Sungkyunkwan University, Korea

Artificial Intelligence (AI) Materials and Devices

AI_P1_1123

Fiber Shaped Organic Artificial Multi-synapses Enabling Electronic-textile Neural Network for Wearable Neuromorphic Applications

Seonggil Ham[1], Minji Kang[2], Seonghoon Jang[1], Jingon Jang[1], Sanghyeon Choi[1], Tae-Wook Kim[3], and Gunuk Wang[1]*
[1]Korea University, Korea, [2]Korea Institute of Science and Technology, Korea, [3]Jeonbuk National University, Korea

AI_P1_1217

Analog and Digital Bipolar Resistive Switching Characteristics of NiO Based Devices

Young Ran Park and Gunuk Wang*
Korea University, Korea

AI_P1_1371

Application of Wearable Monitoring System for Diagnosis and Therapy of Obstructive Sleep Apnea

Won Ick Jang*
Electronics and Telecommunications Research Institute, Korea

AI_P1_1467

Understanding Switching Mechanism of Nonvolatile Analog Redox Transistor-based Synaptic Devices via Modeling

Nayeon Kim, Heebum Kang, Hyun Wook Kim, Eun Ryeong Hong, and Jiyong Woo*
Kyungpook National University, Korea

AI_P1_1541

Interface-type RRAM with TiN/PCMO for Analog Non-volatile Synaptic Device

Eun Ryeong Hong[1], Heebum Kang[1], Hyun Wook Kim[1], Nayeon Kim[1], Kibong Moon[2], and Jiyong Woo[1]*
[1]Kyungpook National University, Korea, [2]Pohang University of Science and Technology, Korea

AI_P1_1589

Electrical Characteristics of Memristive Devices Based on a Poly(methylmethacrylate) Matrix with Inserted Graphene Quantum Dots

Seong Yeon Ryu, Jun Seop An, Young Jin Kim, and Tae Whan Kim
Hanyang University, Korea

AI_P1_1674

Identification of Stacking Polymorphs of MoS_2 Based on Deep Learning Analysis of STEM Images

Jinsub Park[1], Kihyun Lee[1], Soyeon Choi[1], Yangjin Lee[1,2], Sol Lee[1,2], Joowon Jung[1], Farman Ullah[3], Zeeshan Tahir[3], Yong Soo Kim[3], and Kwanpyo Kim[1,2]*
[1]Yonsei University, Korea, [2]Institute for Basic Science, Korea, [3]Seoul National University, Korea

AI_P1_1680

STEM Image Analysis Based on Deep Learning: Identification of Vacancy Defects of MoS_2

Kihyun Lee, Jinsub Park, Soyeon Choi, Yangjin Lee, Sol Lee, Joowon Jung, and Kwanpyo Kim*
Yonsei University, Korea

AI_P1_1742

Nonvolatile Memory Characteristics in TFT with IZO Channel and HfO_{2-x} Gate Oxide Using the UV Ozone Interface Treatment

Jimin Han, Boyoung Jeong, and Tae-Sik Yoon*
Ulsan National Institute of Technology, Korea

AI_P1_1744

Machine Learning Aided Sensor for Words and Human Classifications

Younghwa Oh[1], Jinhyeok Park[2], Jong Hwan Ko[1]*, and Sang Min Won[1]*
[1]Sungkyunkwan University, Korea, [2]Pohang University of Science and Technology, Korea

AI_P1_1766

Electroforming-free Threshold Switching Characteristics of NbO_x Based Devices and its Application to Analog Synaptic Memristor in Pt/NbO_x/CeO_x/Pt Structure

Kitae Park, Jiyeon Ryu, and Tae-Sik Yoon*
Ulsan National Institute of Technology, Korea

AI_P1_1881

Controllable Photo-response in Zn(O,S)/Cu(In,Ga)Se_2 p-n Junction by Optical Pulses

Kwangsik Jeong[1]*, Woo-Jung Lee[2,3], Dae-Hyung Cho[2,3], Tae-Ha Hwang[2], Dongjoon Yi[1], and Yong-Duck Chung[2,3]*
[1]Dongguk University, Korea, [2]Electronics and Telecommunications Research Institute, Korea, [3]Korea University of Science and Technology, Korea

AI_P1_1896

Analog Synaptic Characteristic of Gd-doped Ceria/CeO_2 Bilayer Memristive Device

Sola Moon, Kitae Park, Peter Hayoung Chung, Dwipak Prasad Sahu, and Tae-Sik Yoon*
Ulsan National Institute of Science and Technology, Korea

AI_P1_1999

Optimizing Device Memory Characteristics from Short-term to Long-term Memory by Modulating Switching Layer Thickness

See-On Park, Seokho Seo, and Shinhyun Choi*
Korea Advanced Institute of Science and Technology, Korea

Plasmonics and Optoelectronics (PO)

PO_P1_1081

Luminance Performance of FA doped CsPbBr3 Quantum-Dot Light-emitting Diodes: Self-passivation Behaviors via Hydrogen-bonding between FA Insertion and Halide

Young Ran Park[1]* and Youngjong Kang[2]
[1]Korea University, Korea, [2]Hanyang University, Korea

PO_P1_1349

Higher-order Phonon Eigenmodes of Au Nanoparticles Revealed by Ultrashort Strain Pulses Generated from Superdiffusive Hot Electrons

Y. Shin[1], M. Vomir[2], and J.-W. Kim[1]*
[1]Kunsan National University, Korea, [2]Université de Strasbourg, France

PO_P1_1408

UV-Visible Photoresponse Enhancement at Self-power and Low Bias Mode by Plasmonic Nanoparticle Treatment on Quasi Freestanding Graphene/Vicinal SiC Devices

IB Khadka[1], MM Alsardia[1], NR Alluri[1], BU Haq[2], SJ Kim[1], and SH Kim[1]*
[1]Jeju National University, Korea, [2]King Khalid University, Saudi Arabia

PO_P1_1417

Broadband Absorber Utilizing Nonlocal Metamaterials

Won-Heum Han* and Q-Han Park*
Korea University, Korea

PO_P1_1423

FDTD Analysis of Local Electric Field Enhancement by Randomly Nanoscale Roughness of Varying Conditions

Ha Young Lee[1], Young Tea Chun[1], Hyung Soo Ahn[1], Geon-Tea Hwang[2], Dong Han Ha[3], and Sam Nyung Yi[1]*
[1]Korea Maritime & Ocean University, Korea, [2]Pukyong National University, Korea, [3]Korea Research Institute of Standards and Science, Korea

PO_P1_1440

Robustness of Topological Corner-state Lasers

Hae-Seok Jeong*, Ha-Reem Kim, Min-Soo Hwang, and Hong-Gyu Park
Korea University, Korea

PO_P1_1515

Ultrafast Carrier Dynamics in van der Waals Bi_2Se_3 and VSe_2/Bi_2Se_3 Heterostructure

Tae Gwan Park[1], Sunghun Lee[2]*, and Fabian Rotermund[1]
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Sejong University, Korea

PO_P1_1529

Study on the Optical Properties of Ce^{3+} Ion Doped $BaSO_4$ Prepared by Co-precipitation Method

Minjae Jeong[1]*, J. H. Choi[2], and Y. S. Lee[1]
[1]Soongsil University, Korea, [2]Korea Basic Science Institute, Korea

PO_P1_1533

Effect of Eu^{3+}, Bi^{3+}, and Li^{+} Ternary Doping on Photoluminescent, Structural Properties of $GdNbO_4$

S. W. Wi* and Y. S. Lee
Soongsil University, Korea

PO_P1_1567

Cycle-to-cycle Effect of PE-ALD Process Using OES for Uniformity Diagnosis

Dongyoun Kim, Seunggyu Na, Hyungjun Kim, and Ilgu Yun*
Yonsei University, Korea

PO_P1_1602

Optical Investigation of Graphitic Carbon Nitride / Transition Metal Dichalcogenide Heterostructures

Jolene W. P. Khor, Rebekah E. Kong, Wendy B. Mato, Anir S. Sharbirin, Jaspal Singh, and Jeongyong Kim*
Sungkyunkwan University, Korea

PO_P1_1652

Hybridization of Two-dimensional Transition Metal Dichalcogenides and MXene Quantum Dots

Rebekah E. Kong, Wendy B. Mato, Anir S. Sharbirin, Jolene W. P. Khor, and Jeongyong Kim*
Sungkyunkwan University, Korea

PO_P1_1712

Surface Plasmonic Resonance by Noble Metal Nanocomposites in Plasma-polymerized-fluorocarbon Matrix and Its Applications

Mac Kim, Aeran Song, Eunmi Cho, and Sang-Jin Lee*
Korea Research Institute of Chemical Technology, Korea

PO_P1_1714

Simple Patterning of Transparent Oxide-metal-oxide Multi-layer Thin Film by Chemical Etching for OLED Device

Seo Hyoung Park and Han-Ki Kim*
Sungkyunkwan University, Korea

PO_P1_1718

Highly Reflective ITO-Ag-ITO Multilayer Electrodes for Organic Light-emitting Diodes

Shaozheng Chen, Seo Hyoung Park, and Han-Ki Kim*
Sungkyunkwan University, Korea

PO_P1_1738

Vertical Structured, Hybrid Heterojunction Based Photodetector

Hyeyoon Ryu, Yongsu Choi, Hyungyu Yoo, A. Venkatesan, Wook Park, and Seunghyun Lee*
Kyung Hee University, Korea

PO_P1_1781

Interference Beam Pattern with Curved Trajectory

Hyeung Joo Lee and Jindong Song*
Korea Institute of Science and Technology, Korea

PO_P1_1872

Improved Efficiency of Near-UV Flip-chip LEDs by Surface Plasmon and Magnetic Field Effects from Reflector and Magnetic Layer

Sang-Hyun Hong[1], Jae-Joon Kim[1], Byeong-Hyeok Kim[2], Na-Yeong Kim[1], and Jang-Won Kang[3]*
[1]Gwangju Institute of Science and Technology, Korea, [2]Korea Atomic Energy Research Institute, Korea, [3]Mokpo National University, Korea

PO_P1_1888

Silver-Nanowire-Based Localized-Surface-Plasmon-Assisted Transparent Conducting Electrode for High-Efficiency Light-Emitting Diode

Ja-Yeon Kim[1], Hyeon-Seung Kim[2], Gwangsik Hong[2], and Min-Ki Kwon[2]*
[1]Korea Photonics Technology Institute, Korea, [2]Chosun University, Korea

PO_P1_1914

Optical Properties of InAsSb/InAs Epitaxial Layer for Mid-infrared LEDs

Hyo Jin Kim[1], Gwang Yeol Park[1], Jong Su Kim[2], and Seung-Woong Lee[3]*
[1]Korea Photonics Technology Institute, Korea, [2]Youngnam University, Korea, [3]Softwells Co., Ltd., Korea

PO_P1_1931

Ultra-sensitive Immunoassy of Cardiac Troponin I using Surface Plasmon Coupled Emission

V. T. Tran and H. Ju*
Gachon University, Korea

PO_P1_1933

Ultrafast Third-order Nonlinearity of Indigo Carmine Measured by a Z-scan Technique

Jinhyeok Hong[1], Jun-Ho Lee[2], and Heongkyu Ju[1]*
[1]Gachon University, Korea, [2]Korea Electronics Technology Institute, Korea

Energy Materials and Devices (EMD)

EMD_P1_1070

Magneto-optical Transitions of $MAPbI_3$ Organic-inorganic Perovskite Crystals

Y. H. Shin[1], Yongmin Kim[1]*, M. S. Jeong[2], H. Nojiri[3], and Y. Kohama[4]
[1]Dankook University, Korea, [2]Sungkyunkwan University, Korea, [3]Tohoku University, Japan, [4]University of Tokyo, Japan

EMD_P1_1089

Photo-excited Carrier Transport in $Cu_2ZnSn(S,Se)_4$ Thin Film Solar Cells Passivated by Sodium Treatment

H. K. Park[1], Y. Cho[1], J. Kim[1], G. Y. Kim[2], W. L. Jeong[3], K. P. Kim[3], D. S. Lee[3], and W. Jo[1]*
[1]Ewha Womans University, Korea, [2]Korea Institute of Science and Technology, Korea, [3]Gwangju Institute of Science and Technology, Korea

EMD_P1_1131

Effect of Thermal Annealing to the Photoelectric Properties of the Organic Solar Cells Based on P3HT:PCBM Thin Films

E. Zakhidov*, Sh. Nematov, V. Quvondikov, M. Imomov, I. Tajibaev, and A. Saparbaev
Institute of Ion-Plasma and Laser Technologies, Uzbekistan

EMD_P1_1153

Study of Structural Properties of $CsPbI_3$ Perovskite Film Based on MAAc Solution via Absorption Spectra

A. Saparbaev*, E. Zakhidov, Sh Nematov, V. Quvondikov, I. Tajibaev, L. Nurumbetova, and M. Imomov
Institute of Ion-Plasma and Laser Technologies, Uzbekistan

EMD_P1_1234

Vacuum Deposited Nickel Oxide P-type Semiconductor for Planar Structured Perovskite Solar Cells Application

Gisung Kim[1], Mijoung Kim[1], Moonhoe Kim[1], Woojong Kim[2], Mihyun Park[2], Daseul Hyeon[2], Jinpyo Hong[2]*, and JungYup Yang[1]*
[1]Kunsan National University, Korea, [2]Hanyang University, Korea

EMD_P1_1235

Vacuum Deposited Titanium Oxide/Zinc Oxide Electron Transport Double Layer for Perovskite Solar Cells

Mijoung Kim[1], Gisung Kim[1], Moonhoe Kim[1], Jaekwon Shin[1], Juyoung Oh[1], Geon Park[1], Jinpyo Hong[2]*, and JungYup Yang[1]*
[1]Kunsan National University, Korea, [2]Hanyang University, Korea

EMD_P1_1237

Investigation of Silver Iodide Formation in Organic-Inorganic Hybrid Perovskite Solar Cells with Silver Electrode

Jaegwan Sin[1], Gisung Kim[1], Mijoung Kim[1], Moonhoe Kim[1], Juyoung Oh[1], Geon Park[1], Jinpyo Hong[2]*, and JungYup Yang[1]*
[1]Kunsan National University, Korea, [2]Hanyang University, Korea

EMD_P1_1242

Characteristic of Methyl-ammonium Lead Bromide Perovskites Solar Cells Fabricated by One-step Spin Coating Process for the Application of Transparent Photovoltaics

Mijoung Kim[1], Moonhoe Kim[1], Gisung Kim[1], Jaegwan Sin[1], Juyoung Oh[1], Geon Park[1], Jinpyo Hong[2]*, and JungYup Yang[1]*
[1]Kunsan National University, Korea, [2]Hanyang University, Korea

EMD_P1_1243

Research on Back-end Process of Organic-inorganic Hybrid Perovskite Solar Cell Fabricated Using Various Absorber Layers

Moonhoe Kim, Mijoung Kim, Jaegwan Sin, Juyoung Oh, Gisung Kim, Geon Park, and JungYup Yang*
Kunsan National University, Korea

EMD_P1_1244

Investigation of Triple Cation Organo-metal Halide Perovskite Solar Cells

Gisung Kim[1], Mijoung Kim[1], Moonhoe Kim[1], Jaegwon Sin[1], Juyoung Oh[1], Geon Park[1], Jinpyo Hong[2]*, and JungYup Yang[1]*
[1]*Kunsan National University, Korea,* [2]*Hanyang University, Korea*

EMD_P1_1246

Research on Encapsulation Process for Perovskite Solar Cells

Moonhoe Kim[1], Juyoung Oh[1,2], Hyun-Jung Lee[2], GiSung Kim[1], MiJoung Kim[1], Jaekwon Shin[1], GiSung Kim[1], Geon Park[1], Donggeun Lee[2]*, and JungYup Yang[1]
[1]*Kunsan National University, Korea,* [2]*Hanyang Solar Energy, Korea*

EMD_P1_1251

Improved Charge Transport of NH_4Cl Modified SnO_2 for Efficient Hybrid Perovskite Planar Solar Cells

Jihyun Kim[1], Joonho Park[2], Bich Phuong Nguyen[1], Hyeonwoo Yeo[2], Yong-Hoon Kim[2], and William Jo[1]*
[1]*Ewha Womans University, Korea,* [2]*Korea Advanced Institute of Science and Technology, Korea*

EMD_P1_1261

MoS_2 Nanosheet with Pd/Pt Nanoparticles for High Efficient Hydrogen Evolution Reaction

Han-young Jung, Se-hee Shin, Jae-kyung Shin, Joo-mi Song, Min-ju Chae, Jong-hwan Park, Jae-chul Ro, and Su-jung Suh*
Sungkyunkwan University, Korea

EMD_P1_1343

Highly Efficient Double Junction GaInP/GaAs Thin-film Solar Cell on Flexible Substrate

Hyo Jin Kim*, Cheawon Kim, Gwang Cheol Lee, Seong Min Kim, and Wang Ki Kim
Korea Photonics Technology Institute, Korea

EMD_P1_1367

Enhanced Piezoelectricity of $BaTiO_3$ Perovskite-structured Nanomaterials and its Applications to Flexible Energy Harvesters

Yeon-gyu Kim[1], Dong Yeol Hyeon[1], Jae Hoon Lee[1], Chang Kyu Jeong[2], and Kwi-Il Park[1]*
[1]*Kyungpook National University, Korea,* [2]*Jeonbuk National University, Korea*

EMD_P1_1385

Hybrid Density Functional Theory Calculation of Cesium Lead Halide Perovskite Alloys

Youbin Song and Ji-Sang Park*
Kyungpook National University, Korea

EMD_P1_1387

Double Doping Effects of Ge and In on the Thermoelectric Properties of $Cu_3Sb_{1-x-y}Ge_xIn_ySe_4$ Permingeatites

Bong-Ki Hong and Il-Ho Kim*
Korea National University of Transportation, Korea

EMD_P1_1388

Thermoelectric Performance of $Cu_3Sb_{1-y}Fe_yS_3$-based Skinnerites Prepared by Mechanical Alloying and Hot Pressing

Sang Jun Park and Il-Ho Kim*
Korea National University of Transportation, Korea

EMD_P1_1389

Thermoelectric Properties of Off-stoichiometric Permingeatites $Cu_{3+m}SbSe_4$

DanAh Kim and Il-Ho Kim*
Korea National University of Transportation, Korea

EMD_P1_1390

Solid-State Synthesis of Thermoelectric Chalcostibite $CuSbS_2$

Dong Hwi Kim, Sang Yun, and Il-Ho Kim*
Korea National University of Transportation, Korea

EMD_P1_1391

Charge Transport and Thermoelectric Properties of $Cu_3Sb_{1-y}(Al/In)_yS_4$ Famatinites

Sang Yun and Il-Ho Kim*
Korea National University of Transportation, Korea

EMD_P1_1394

Optical and Structural Characteristics of Perovskite Films in Terms of the Application Time of Ethyl Acetate

Jaewon Oh, Hyunbok Lee, and Mee-Yi Ryu*
Kangwon National University, Korea

EMD_P1_1397

Piezoelectric Energy Harvesting Based on Flexible PVDF-barium Titanate Composite Films

Swati Panda, Sugato Hajra, and Hoe Joon Kim*
Daegu Gyeongbuk Institute of Science and Technology, Korea

EMD_P1_1399

Liquid Templated Synthesized Reduced Graphene Oxide 3D Foams for High-performance Energy and Oil Absorption Applications

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

EMD_P1_1473

High-performance and -stability $LaVO_3$/Si Heterojunction Solar Cells

Jeong Beom Choi[1], Gi Chen Park[1], Jae Yeop Song[1], Jae Jun Lee[2], Hosun Lee[2], and Dong Hee Shin[1]*
[1]Andong National University, Korea, [2]Kyung Hee University, Korea

EMD_P1_1479

Catalytic Activity of Silver Telluride Anchored on Semimetallic 2D Support

Ha Heun Lee and Suyeon Cho*
Ewha Womans University, Korea

EMD_P1_1480

Ethanolamine Assisted Hydrothermal Synthesis Co-free $LiNiO_2$ Cathode for Li-ion Batteries

Thuy Thi Bich Tran, Hae-In Kim, Eui-Jeong Park, Hyun-Ju Jang, and Jong-Tae Son*
Korea National University of Transportation, Korea

EMD_P1_1487

Structural Properties of Yttrium-substituted Erbium Iron Garnet

Yeon Woo Nahm, Yujin Cho, and Suyeon Cho*
Ewha Womans University, Korea

EMD_P1_1490

2D-C_3N_4-MoS_2 Hybrids for Efficient Photocatalytic Performance

Jaspal Singh, Sophia Akthar, Trang Thu Tran, and Jeongyong Kim*
Sungkyunkwan University, Korea

EMD_P1_1491

Synthesis and Characterization of Non-stoichiometric Ti-O System

M. Régnier and S. Cho*
Ewha Womans University, Koea

EMD_P1_1495

Two-step Single Crystal Growth of $Y_3Fe_5O_{12}$ Using Floating Zone Method

Yujin Cho and Suyeon Cho*
Ewha Womans University, Korea

EMD_P1_1496

Cupric Oxide Nanorods Photoelectrode Covered with Cuprous Oxide Thin Film for Photoelectrochemical Water Oxidation

Soyoung Kim and Hyojin Kim*
Chungnam National University, Korea

EMD_P1_1505

Active Hydrogen Evolution in Semimetallic $NiTe_2$

Jeong Hyo Kim and Suyeon Cho*
Ewha Womans University, Korea

EMD_P1_1507

Toward Non-gas-permeable hBN Film Growth on Smooth Fe Surface

Hayoung Ko[1], Soo Ho Choi[2], Jungmo Kim[3], Yong In Kim[1], Young-Hoon Kim[1], Laud Anim Adofo[1], Min-Hyoung Jung[1], Young-Min Kim[1,2], Mun Seok Jeong[5], Ki Kang Kim[1,2]*, and Soo Min Kim[4]*
[1]Sungkyunkwan University, Korea, [2]Institute for Basic Science, Korea, [3]Korea Electrotechnology Research Institute, Korea, [4]Sookmyung Women's University, Korea, [5]Hanyang University, Korea

EMD_P1_1511

Chromium and Iron co-doped CoP on Copper phosphide for efficient Hydrogen Evolution Reaction

Sohyeon Hong and Soo Min Kim*
Sookmyung Women's University, Korea

EMD_P1_1512

MoS_2-$MoSe_2$ Heterostructures for Efficient Hydrogen Evolution Reaction

Seungyeon Lee[1], Heejun Yang[2], and Suyeon Cho[1]*
[1]Ewha Womans University, Korea, [2]Korea Advanced Institute of Science and Technology, Korea

EMD_P1_1534

Gram-scale, Solid-state Synthesis of Blue Color Emission N, S Co-doped Carbon Dots and Their Applications

Dinh Khoi Dang[1,2], Chinh Tam Le[1], and Yong Soo Kim[1]*
[1]University of Ulsan, Korea, [2]Ho Chi Minh City University of Technology and Education, Vietnam

EMD_P1_1561

Three-Dimensional Mesostructured Epitaxial $ZnFe_2O_4$ Photoanode for Enhanced Photoelectrochemical Water Splitting

Minjeong Kim[1,2], and Jin Gu Kang[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Korea University, Korea

EMD_P1_1564

Fabrication and Characterization of Co-Doped Garnet $Li_7La_3Zr_2O_{12}$

E. Enkhbayar and J. H. Kim*
Incheon National University, Korea

EMD_P1_1607

Impact of the Polymer Matrix in GaN Nanowire-based Devices for Energy Harvesting and Force Sensor Applications

A. Chevillard*, T. Sodhi, E Lefeuvre, L. Couraud, X. Leroux, L. Travers, F. Julien, M. Tchernycheva, and N. Gogneau
Université Paris-Saclay, France

EMD_P1_1673

Boosting Photovoltaic Performance in Organic Solar Cells by Manipulating the Size of MoS_2 Quantum Dots as a Hole-Transport Material

Kwang Hyun Park and Sung Ho Song*
Kongju National University, Korea

EMD_P1_1682

Self-Powered Wristband-type Wireless Presenter Based on Body Heat Thermoelectric Generator

S. E. Moon*, J. H. Kim, and J. P. Im
Electronics and Telecommunications Research Institute, Korea

EMD_P1_1753

Plasmonic Silicon Nanowires for Efficient Interfacial Solar Steam Generation

Beom Soo Joo and Gumin Kang*
Korea Institute of Science and Technology, Korea

EMD_P1_1836

Reduced Interface Defects of NH_4Cl Passivated SnO_2 in for Highly Efficient Perovskite Solar Cell

Ahreum Lee, Jihyun Kim, and William Jo*
Ewha Womans University, Korea

EMD_P1_1867

Improving Interconnection between the Top and Bottom Electrodes in Perovskite Solar Module by Laser Processing

Hanseul Lee[1,2], Yujin Jeong[2], Seung Sik Ham[2], Won Mok Kim[2], Jeung-hyun Jeong[2], and Gee Yeong Kim[2]*
[1]Korea University, Korea, [2]Korea Institute of Science and Technology, Korea

EMD_P1_1869

Altering the Stability and Electrical Property of Perovskite Module Through Laser Processing

Yujin Jeong[1], Hanseul Lee[3], Seung Sik Ham[1], Won Mok Kim[2], Jeung-hyun Jeong[1], and Gee Yeong Kim[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Korea University, Korea

Industrial Semiconductor Applications (ISA)

ISA_P1_1096

Electrical Characteristics of 3D P-I-N Structured 1T DRAM

Yong Tae Kim*, Sehyun Kwon, and Jinho Ahn*
Hanyang University, Korea

ISA_P1_1187

The Electrical and Optical Effect of La Doping on $BaSnO_3$ as a Transparent Conducting Oxide (TCO)

Yoo Lim Cha[1], Su Hyeong Kim[1], Jeong Hye Jo[1], Ha Eun Kang[1], Sun Hee Kim[2]*, and Dong Joo Kim[3]*
[1]Gachon University, Korea, [2]Inchon National University, Korea, [3]Auburn University, USA

ISA_P1_1191

Electroless Silver Plating on $BaSnO_3$ as a Transparent Conductive Oxide (TCO)

Su Hyeong Kim, Jeong Hye Jo, and Young Soo Yoon*
Gachon University, Korea

ISA_P1_1249

Investigation of the Effective Resistivity for Metal Thin Films

Wonjoon Choi[1], Jinpyo Hong[1]*, and JungYup Yang[2]*
[1]Hanyang University, Korea, [2]Kunsan National University, Korea

ISA_P1_1536

Limitation on Chopping Frequency for Photo-reflectance Spectroscopy of p-n GaAs Junctions

Behnam Zeinalvand Farzin[1], DongKun Lee[1], Geun Hyeng Kim[2], Jaedu Ha[1], Jong Su Kim[1]*, Yeongho Kim[3], and Sang Jun Lee[3]
[1]Yeungnam University, Korea, [2]Kyungwoon University, Korea, [3]Korea Research Institute of Standards and Science, Korea

ISA_P1_1656

Preparation of Water-Soluble Silicon Quantum Dots and Their Applications

Jaeho Noh and Honglae Sohn*
Chosun University, Korea

ISA_P1_1676

All-Dry Transferred 2D Heterostructure for Room-Temperature NO_2 Sensing

A. Venkatesan, Hyeyoon Ryu, Anupom Devnath, Hyungyu Yoo, Sanghoek Kim, and Seunghyun Lee*
Kyung Hee University, Korea

ISA_P1_1707

Al_2O_3 Passivation Film Deposited by Atomic Layer Deposition for Flexible Device

Ju-Hyeon Lee and Han-Ki Kim*
Sungkyunkwan University, Korea

ISA_P1_1709

High-Quality Sn-doped In_2O_3 Film Deposited on Quartz Substrate

Seo-Yun Choi, Hae-Jun Seok, and Han-Ki Kim*
SungKyunKwan University, Korea

ISA_P1_1717

Conductive IZTO Source and Drain Contact on IZTO Channel Layer for Transparent TFTs

Jung-Min Park and Han-Ki Kim*
Sungkyunkwan University, Korea

ISA_P1_1720

Kirigami and Biomimetic Structure-inspired Patterning for Stretchable Electronics

C. Kang and H. K. Kim*
Sungkyunkwan University, Korea

ISA_P1_1721

Flexible Amorphous Oxide Electrode Deposited on Biocompatible Polymer Substrate for Glucose Sensing Bionic Application

Yu-Kyung Oh and Han-Ki Kim*
Sungkyunkwan University, Korea

ISA_P1_1725

Antireflection Effect of Oxide-based Multilayer for Top-emission OLEDs

Ye-Ju Lim, Su-Yeong Choe, and Han-Ki Kim*
Sungkyunkwan University, Korea

ISA_P1_1733

Highly Transparent, Flexible, and Hydrophobic Polytetrafluoroethylene Thin Film Passivation for MXene/AgNW(MA) EMI Shielding Electrodes

Seong-Won Kim and Han-Ki Kim*
Sungkyunkwan University, Korea

ISA_P1_1739

Transparent, Flexible, and Hydrophobic PTFE Passivation for Brush-painted Ag Nanowires/PEDOT:PSS Electrodes

Seong-Hyun Lim and Han-Ki Kim*
Sungkyunkwan University, Korea

ISA_P1_1815

Defect Engineering of MoS_2 by Sulfurization at Room Temperature

Junsung Byeon[1], Jungmoon Lim[1], Taehun Kim[1], Seungje Kim[1], Younghoon Lim[1], Hongju Park[1], Min Jung[1], Sangyeon Pak[2]*, and SeungNam Cha[1]*
[1]Sungkyunkwan University, Korea, [2]Hongik University, Korea

ISA_P1_1897

High-Contrast X-ray Live Image Generation Method Based on Mutual Information-based Non-local Total Variation Denoiser in CyberKnife System

Ho Lee*, Hojin Kim, Min Cheol Han, Chae-Seon Hong, Dong Wook Kim, Jin Sung Kim, and Ik Jae Lee
Yonsei University, Korea

ISA_P1_1925

PL and EPR Characteristics study of Blue Light-emitting Type Ⅱ ZnO@5-amino-2-naphthalene Sulfonic Acid (ZnO@ANSA) Hybrid Quantum Dots

H. H. Kim, S. Park, and W. K. Choi*
Korea Institute of Science and Technology

ISA_P1_1995

Highly Sensitive Breath-Biosensor with Carbon NanoWalls

Sang-Keun Sung and Hyung Jin Kim*
Gumi Electronics and Information Technology Research Institute, Korea

Poster Session II

Lobby (2F), July 19, 2022 (Tue.) / 17:00-18:30

Advanced Semiconductors (AS)

AS_P2_1178

Electrical and Optical Properties of Cu-doped $NiWO_4$ as a p-type Transparent Conductive Oxide Material

In Seo Kim[1], So Ra Yun[1], Seung Mee Hwang[2], and Kimoon Lee[1]*
[1]Kunsan National University, Korea, [2]University of Seoul, Korea

AS_P2_1308

One-Step Synthesis of Lead-free Perovskite with Two Different Structures for High-resolution X-ray Imaging

Seungun Yeon, Jonghoon Han, Sunjung Park, Giho Shin, Sangeun Cho, Hyunsang Kim, Samkyu Noh, and Hyunsik Im*
Dongguk University, Korea

AS_P2_1310

Enhanced Self-powered UVC Photodetector Using Two Different Lead-free Perovskites

Jonghoon Han, Sangeun Cho, Samkyu Noh, Hyunsang Kim, and Hyunsik Im*
Dongguk University, Korea

AS_P2_1337

Boron Doped 2D-gC_3N_4 Quantum Dots Sensitized Langasite Based Surface Acoustic Wave Sensor for the Augmented NO_2 Gas Detection with Faster Gas Kinetics Under UV Light Irradiation

Kedhareswara Sairam Pasupuleti[1], Na-Hyun Bak[1], Yun-Hee Shin[1], Devarajulu Gelija[1], Song-Gang Kim[2], and Moon-Deock Kim[1]*
[1]Chungnam National University, Korea, [2]Joongbu University, Korea

AS_P2_1351

Synthesis of Inorganic Intrinsic-emitting Materials for High-quality WLED Devices

Yongbin Hua and Jae Su Yu*
Kyung Hee University, Korea

AS_P2_1384

Cost-effective Calculation of Point Defects in Diamond Silicon Using Hybrid Density Functional Theory

Youbin Song, Seyeon Park, and Ji-Sang Park*
Kyungpook National University, Korea

AS_P2_1386

Transport Properties of Beta-InSe

Jaehun Ahn[1], Byungwook Ahn[1], Mun Seok Jeong[2]*, and Seong Chu Lim[1]*
[1]*Sungkyunkwan University, Korea,* [2]*Hanyang University, Korea*

AS_P2_1442

A Study of Neuromorphic Devices Based on Flash Memory Using Quantum Dots

Jisoo Choi, Yeeun Kim, JeongMok Yang, Dahyun Kang, Changyu Park, Soyeon Jung, Jaehun Jeong, and Moongyu Jang*
Hallym University, Korea

AS_P2_1444

Single Cell Capacitance Measurement of NIH 3T3 Cell Using Impedance Biosensor

Dahyun Kang, Gayoung Lee, Yeeun Kim, Jaehun Jeong, Jisoo Choi, Seokgyu Kim, and Moongyu Jang*
Hallym University, Korea

AS_P2_1461

Research on the Application of Photo-Energy to Process of Thin-Film Formation of Solution-Processed Zirconium Oxide Insulators

Bokyung Kim, Hyeonju Lee, and Jaehoon Park*
Hallym University

AS_P2_1513

Influence of Annealing Temperature on Electrical Properties of Solution-processed CuO Thin Film Transistors

Hyeonju Lee, Bokyung Kim, Dongwook Kim, and Jaehoon Park*
Hallym University, Korea

AS_P2_1519

Fabricating One-dimensional Semiconducting Polymer Nanowire Transistors for Logic Circuits

Chae Won Kim, Keon Joo Park, Seongbeom Kim, Sam Nyung Yi, Hyung Soo Ahn, Kyoung Hwa Kim, and Young Tea Chun*
Korea Maritime and Ocean University, Korea

AS_P2_1523

Highly Molecular Aligned Nanowire Polymer Field-Effect Transistors Based On Liquid Bridge Effect

Keon Joo Park, Chae Won Kim, Seongbeom Kim, Sam Nyung Yi, Hyung Soo Ahn, Kyoung Hwa Kim, and Young Tea Chun*
Korea Maritime and Ocean University, Korea

AS_P2_1527

AlN Thin Film Based Surface Acoustic Wave Device: Application to Gas Sensor with Two-dimentional MoS_2 Chemical Interface

Na-Hyun Bak[1], Kedhareswara Sairam Pasupuleti[1], Gelija Devarajulu[1], Yun-hee Shin[1], Song-Gang Kim[2], and Moon-Deock Kim[1]*
[1]Chungnam National University, Korea, [2]Joongbu University, Korea

AS_P2_1539

Fundamental Understanding of Friction Driven Static Electrification

Eui-Cheol Shin and Yong-Hyun Kim*
Korea Advanced Institute of Science and Technology, Korea

AS_P2_1546

Defect Analysis in Amorphous Indium Gallium Tin Zinc Oxide Thin Film Transistor During the Post Annealing Treatment

Nayoung Choi, Siyeon Choi, Hyunmin Hong, Minjung Kim, Kwangsik Jeong, and Kwun-Bum Chung
Dongguk University, Korea

AS_P2_1550

Device Characteristics and Defect Analysis of InZnSnO Thin Film Transistor as a Function of Annealing Ambient

Dongyeob Shin, Dongjoon Yi, Hyunmin Hong, Minjung Kim, Kwangsik Jeong, and Kwun-Bum Chung*
Dongguk University, Korea

AS_P2_1579

Shape Modulation of Micropatterns by Redesigning Single Photomask Lithography

Chan Jae Shin[1,2] and Oh Seok Kwon[1,2]*
[1]Korea Research Institute of Bioscience and Biotechnology, Korea, [2]University of Science & Technology, Korea

AS_P2_1582

A High-performance Portable Device for Fast and Sensitive Detection of Human H1N1 Influenza Virus via Graphene Field-effect Transistor

Sophia Nazir[1] and Oh Seok Kwon[2]*
[1]Korea Research Institute of Bioscience and Biotechnology, Korea, [2]University of Science & Technology, Korea

AS_P2_1595

Engineered Conducting Path in Organic-Inorganic Hybrid Perovskites for Neuromorphic Computing

Naeun Kim, Doyeon Kim, Jimyeoung Yu, Woori Jang, Seokgi Kim, and Sungkyu Kim*
Sejong University, Korea

AS_P2_1599

Ovonic Threshold Switching Characteristics of W/ZnTe/Pt Selector for 3D Stackable Crossbar Array Applications

Gabriel Jang, Daseul Hyeon, SunHwa Min, J. Choi, and JinPyo Hong*
Hanyang University, Korea

AS_P2_1600

Realization of Highly Stable Amorphous Carbon Oxide Memristors via Nitrogen Insertion Approach

SunHwa Min, Da seul Hyeon, Gabiel Jang, Jisoo Choi, and JinPyo Hong*
Hanyang University, Korea

AS_P2_1606

Exploring Transition of C-C Bonding Complexes for Advancing Bipolar Resistive Switching in Ultrathin Cu Layer Stacked Carbon Oxides

Da seul Hyeon, Gabriel Jang, SunHwa Min, Jisoo Chio, and JinPyo Hong*
Hanyang University, Korea

AS_P2_1613

Evolution on Device Characteristics of Phase-change Heterostructure According to Transition Metal Dichalcogenide Materials

Tae Hyeong Kim, Min Ji Yu, Kyoung Joung Yoo, Tae Ho Kim, and Tae Geun Kim*
Korea University, Korea

AS_P2_1614

Investigation of NiOx Interlayers for Thermal Stability in GeSb-based Phase Change Memory

Tae Ho Kim, Min Ji Yu, Seok Hee Hong, Tae Hyeong Kim, Kyoung Joung Yoo, Seong Woo Park, and Tae Geun Kim*
Korea University, Korea

AS_P2_1622

Electroluminescence from Ce^{3+}-doped $MSiO_3$ (M = Ca, Sr, Ba) Oxide Layer in Metal-oxide-semiconductor Structure

Hyunjee Jung, Chunghyun Lee, Busic Kang, Sanghyeon Lim, Gyeongdo Baek, Jingi Gim, Mohammad M. Afandi, Jehong Park, and Jongsu Kim*
Pukyong National University, Korea

AS_P2_1633

Classification of Surface Properties of Fluorinated Graphene via AFM

Namryeol Kim[1], Hyeonsu Kim[1], Munawwarah Khalid[1], Jangyup Son[2], and Sangmin An[1]*
[1]Jeonbuk National University, Korea, [2]Korea Institute of Science and Technology, Korea

AS_P2_1645

Physical and Structural Analyses of ZrO_2 Oxide Materials by Various Sputtering Parameters

Jisoo Choi, Gabriel Jang, Da seul Hyeon, SunHwa Min, and JinPyo Hong
Hanyang University, Korea

AS_P2_1693

Optical Characterization of InGaN/GaN MQWs on the Non-polar Sidewalls of GaN Nanorod Grown by MOCVD

Mandar A. Kulkarni, Hamza Thaalbi, Ameer Abdullah, Indrajit V. Bagal, Sang-Wan Ryu*
Chonnam National University, Korea

AS_P2_1699

Stable Synaptic Plasticity of IGZO Synaptic Transistor Implemented by TiO_2 Interlayer

Soohong Jeong and Byungjin Cho*
Chungbuk National University, Korea

AS_P2_1701

Suppression of Ion Migration Enhances the Stability of High-performance Quasi-2D Iodide Perovskite LEDs

A. Jana, V. G. Sree, and H. Im*
Dongguk University, Korea

AS_P2_1754

Mixed Halide Zero-dimensional Perovskites with Tunable Visible Emission Over a Broad Color Spectrum Synthesized via Mechanochemistry

Hyungbin Lim, Kyeong-Yoon Baek, Jae Il Kim, Jonghoon Lee, Woocheol Lee, Jaeyoung Kim, Heebeom Ahn, Junwoo Kim, Tae-Woo Lee, Keehoon Kang, and Takhee Lee*
Seoul National University, Korea

AS_P2_1757

Simple and Rapid Real-Time Monitoring for Cortisol Through Wearable Aptasensor

Jai Eun An and Oh Seok Kwon*
Korea Research Institute of Bioscience and Biotechnology, Korea

AS_P2_1805

Observation of Photoreflectance Spectra of $MAPbBr_3$ Single Crystal

Sung Yeop Kim[1], Tae In Kang[1], Jong Su Kim[1]*, Mee-Yi Ryu[2], Dae Young Park[3], Mun Seok Jeong[3], and Chang Lyoul Lee[4]
[1]Yeungnam University, Korea, [2]Kangwon National University, Korea, [3]Hanyang University, Korea, [4]Gwangju Institute of Science and Technology, Korea

AS_P2_1829

Controlling Magnetic Fluctuations in V-WSe_2

Lan-Anh T. Nguyen[1,2], Jinbao Jiang[3], Tuan Dung Nguyen[1,2], Philip Kim[4], Min-kyu Joo[5]*, Dinh Loc Duong[1,2]*, and Young Hee Lee[1,2]*
[1]Institute for Basic Science, Korea, [2]Sungkyunkwan University, Korea, [3]National University of Defense Technology, China, [4]Harvard University, USA, [5]Sookmyung Women's University, Korea

AS_P2_1838

Facet-selective Morphology Control of Remote Heteroepitaxial ZnO Microcrystals via Wet Chemical Synthesis

Joonghoon Choi and Young Joon Hong*
Sejong University, Korea

AS_P2_1839

All-solution Processed Quantum-dot Lighting Device with PEDOT:PSS:PMA p-type Layer

Guanning Shao and Young Joon Hong*
Sejong University, Korea

AS_P2_1840

Fully Solution-Processed White Quantum-Dot Light-Emitting Diodes with Hybrid Double-Stack Emitting Layer

Biswajit Roy and Young Joon Hong*
Sejong University, Korea

AS_P2_1863

Fibriform and Weavable Electrochemical Organic Diodes for Electrostatic Discharge Protection of Low-Voltage Operational E-Textile Wearable Devices

Kwang-Hun Choi[1,2], Soo jin Kim[1,2], Ho Won Jang[2], and Jung Ah Lim[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Seoul National University, Korea

AS_P2_1875

Optical and Electrical Characterization of Monolithically Grown $In_xGa_{1-x}As$ Photodetectors for Photon Absorption Extended Beyond the 3.0 μm

Minkyeong Kim[1,2], Suho Park[1,3], HS Kim[2], Yeongho Kim[1], and Sang Jun Lee[1]
[1]Korea Research Institute of Standards and Science, Korea, [2]Chonnam National University, Korea, [3]University of Science & Technology, Korea

AS_P2_1900

Strong Coupling of Exciton and Superscar Mode in Prism Structure

Chan-Young Seong, Hyun Gyu Song, Daegwang Choi, and Yong-Hoon Cho*
Korea Advanced Institute of Science and Technology, Korea

Novel Functional Spintronics (NFS)

NFS_P2_1149

In-plane Uniaxial Magnetic Anisotropy of Co Thin Film Deposited by Magnetron Sputter

Chan-Kang Lee[1], Jaehun Cho[1], KwangHyun Lee[1,2], Joonwoo Kim[1], June-Seo Kim[1]*, and Chun-Yeol You[1]*
[1]Daegu Gyeongbuk Institute of Science and Technology, Korea, [2]Keimyung University, Korea

NFS_P2_1230

Magnetic and Local Electronic Structure Study of MgO Single Crystals Implanted Using Fe^+ and Zn^+ Ions

Jitendra Pal Singh[1], Weon Cheol Lim[2], Sangsul Lee[1], and Keun Hwa Chae[2]*
[1]Pohang University of Science and Technology, Korea, [2]Korea Institute of Science and Technology, Korea

NFS_P2_1350

Surface Static Strain Governing Ultrafast Spin Dynamics: the Role of the Magneto-elastic Energy

Y. Shin[1], D.-H. Kim[2], P. C. Van[3], J.-R. Jeong[3], and J.-W. Kim[1]*
[1]Kunsan National University, Korea, [2]Chungbuk National University, Korea, [3]Chungnam National University, Korea

NFS_P2_1396

Field-free Spin-orbit Torque Induced Magnetization Switching Using the Chiral Spin Configuration by Locally Injected Spin Current

S. An, H.-J. Seo, E. Baek, S. Lee, and C.-Y You*
Daegu Gyeongbuk Institute of Science and Technology, Korea

NFS_P2_1404

Memristive Behavior of Domain Configuration by Non Uniform Spin Orbit Torque Current Density

Dongryul Kim, Eunchong Baek, Suhyeok An, Hyeong-Joo Seo, and Chun-Yeol You*
Daegu Gyeongbuk Institute of Science and Technology, Korea

NFS_P2_1410

Field-free Spin Orbit Torque Switching by Chiral Spin Configuration in Non-uniform Current Density System

H.-J. Seo, D. Kim, S. An, and C.-Y You*
Daegu Gyeongbuk Institute of Science and Technology, Korea

NFS_P2_1425

Interplay between Ferromagnet and Antiferromagnet Dynamics in Spin-orbit Torque Induced Exchange Bias Manipulation

Eunchong Baek, Suhyeok An, Dongryul Kim, Soobeom Lee, and Chun-Yeol You[1]*
Daegu Gyeongbuk Institute of Science and Technology, Korea

NFS_P2_1471

Role of the Insertion Layer in Spin Orbit Torque Efficiency of Topological Insulator

Jonghoon Kim, Seungwon Rho, Gihwan Nam, Youngmin Lee, Seokbo Hong, Dajung Kim, and Mannho Cho*
Yonsei University, Korea

NFS_P2_1514

Strong Exchange Field Effects in CrI_3/Graphene Heterostructure

Juyeong Jeong[1], Shoujun Zheng[2]*, and Heejun Yang[1]*
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Beijing Institute of Technology, China

NFS_P2_1603

Analyses of Spin Orbit Torque Efficiency for A15 Phase W_3Ta Material in Heavy Metal/Ferromagnetic Frame

Jeongwoo Seo, Jeonghun Shin, and Jinpyo Hong*
Hanyang University, Korea

NFS_P2_1611

Effect of Annealing Condition on the Sample Resistances and Spin-orbit Torque Efficiencies in Ta/Pt/Co/Ru Multilayers

W. Na, D. Kim, E. Baek, S. An, S. Lee, J. Kim, and C.-Y You*
Daegu Gyeongbuk Institute of Science and Technology, Korea

NFS_P2_1631

Perpendicular Magnetic Anisotropy of the Ferrimagnetic (001) $NiCo_2O_4$ Films Grown at Various Temperatures

Jungbae Kim and Joonghoe Dho*
Kyungpook National University, Korea

NFS_P2_1677

Measurement of Magnetic Phenomena via Magneto-Optical Kerr Effect Microscope

Jiyoung Lee, Jeong Kyu Lee, and Young Keun Kim*
Korea University, Korea

NFS_P2_1678

Pt Insertion Layer Dependent Interlayer Exchange Coupling on Pt/Co/Ru/Pt Co/Pt Structure Inserted at Co/Ru Interface

Seong Bok Kim, Woo Ri Ju, Da Hyeon Kim, Chan Kang Lee, Joon Woo Kim, Jaehun Cho, and June-Seo Kim*
Daegu Gyeongbuk Institute of Science and Technology, Korea

NFS_P2_1684

Asymmetric Motion of a Twisted Domain Wall by a Transverse Magnetic Field

Seongtae Kim and Soong-Geun Je*
Chonnam National University, Korea

NFS_P2_1817

Magnetostriction Effect on Ultrafast Spin Precession in Ni_xFe_{100-x} Alloy Films

Y. Shin[1], S. Yoon[2], J.-I. Hong[2], and J.-W. Kim[1]*
[1]Kunsan National University, Korea, [2]Daegu Gyeongbuk Institute of Science and Technology, Korea

NFS_P2_1835

Control of Skyrmion Hall Effect of Domain Wall Skyrmion

Seonuk Han and Soong-Geun Je*
Chonnam National University, Korea

Low Dimensional Semiconductors (LDS)

LDS_P2_1526

Synthesis and Characterization of Single Crystalline Layered Metal-Rich Chalcogenide of Ta_2Se

Jeongmin Lee and Kimoon Lee*
Kunsan National University, Korea

LDS_P2_1542

Tellurium Vacancy and Dissociative Vacancy-cluster of $ZrTe_5$

Sun-Kyung Cha[1,2], Seongil Im[1], and Yong-Sung Kim[2,3]*
[1]Yonsei University, Korea, [2]Korea Research Institute of Standards and Science, Korea, [3]University of Science and Technology, Korea

LDS_P2_1555

A New Strategy to Obtain Few-layered $MoTe_2$ Without Structure Changes and Applications

Soyoung Heo, Seulbi Kim, Jl Hun Park*, and Suyeon Cho*
Ewha Womans University, Korea

LDS_P2_1562

Study of Two-dimensional Materials Based Multi-level Floating Gate Memory Using Controlling hBN Thickness

Oh Hun Gwon, Jong Yun Kim, Seok-Ju Kang, Hye Ryung Byun, and Young-Jun Yu*
Chungnam National University, Korea

LDS_P2_1586

The Role of Si During the Chemical Reaction of XeF_2 with Graphene and Hbn

Subin Shin[1,2], Yongjun Shin[3], Yang Hui Kim[1,4], Seokhoon Ahn[1], Sukang Bae[1], Young min Seo[1], Suklyun Hong[5], Joonwon Lim[2], Gwan-Hyoung Lee[3], and Jangyup Son[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Kyung Hee University, Korea, [3]Seoul National University, Korea, [4]Jeonbuk National University, Korea, [5]Sejong University, Korea

LDS_P2_1597

Two-Dimensional Tin Sulfide Compounds Deposited by Atomic Layer Deposition Using a Novel Precursor

Dong Geun Kim, Jeong-Hun Choi, and Ji-Hoon Ahn*
Hanyang University, Korea

LDS_P2_1621

A Study on the Synthesis and Basic Properties of Large-area WS_2 Thin Film Using Chemical Vapor Deposition

Gil Yong Lee[1], Jungtae Nam[1], Yong-il Ko[1], June Hee Shin[1], A-Rang Jang[2], and Keun Soo Kim[1]*
[1]Sejong University, Korea, [2]Semyung University, Korea

LDS_P2_1634

Charge Trapping Memory Properties of $MoS_2/CrPS_4$ Heterostructure Devices

Minjeong Shin[1], Chansoo Yoon[1], Mijung Lee[1], Sungmin Lee[2], Je-Geun Park[2], and Bae Ho Park[1]*
[1]Konkuk University, Korea, [2]Seoul National University, Korea

LDS_P2_1635

Fluorinated Graphene Contacts and Passivation Layer for MoS_2 Field Effect Transistors

Dong-Hyun Kim[1,2], Huije Ryu[3], Junyoung Kwon[4], Sang Kyu Park[1], Wanggon Lee[5], Hyungtak Seo[5], Kenji Watanabe[6], Takashi Taniguchi[6], SunPhil Kim[7], Arend M. van der Zande[7], Jangyup Son[1]*, and Gwan-Hyoung Lee[3]*
[1]Korea Institute of Science and Technology, Koera, [2]Sungkyunkwan University, Korea, [3]Seoul National University, Korea, [4]Yonsei University, Korea, [5]Ajou University, Korea, [6]National Institute for Materials Science, Japan, [7]University of Illinois Urbana-Cha

LDS_P2_1657

Electrical and Thermoelectric Properties of Gamma-GeSe

Joonho Kim, Jeongsu Jang, Joong-Eon Jung, Jong Hyuk Kim, Sol Lee, Yangjin Lee, Heesun Bae, Chaewoon Lee, Seongil Im, Young Jai Choi, and Kwanpyo Kim*
Yonsei University, Korea

LDS_P2_1663

Comparative Study on Surface Effects between Alkali and Alkali-free Promoters in $MoSe_2$ Monolayers Grown by CVD Based on Liquid-solution Precursors

Su Jin Kim and Hyun Seok Lee*
Chungbuk National University, Korea

LDS_P2_1664

Effective Defect Healing Effects of $CsPbBr_3$ Nano-islands Decorated on MoS_2 Field Effect Transistors

Yaezy Kang and Hyun Seok Lee*
Chungbuk National University, Korea

LDS_P2_1669

Crystal Structure Identification and Application of Type-II Red Phosphorus

Dong-Gyu Kim[1], Jun-Yeong Yoon[1,2], Yangjin Lee[1,2], Dong Gun Oh[1], JinKyun Kim[3] Chae Un Kim[3], Young Jai Choi[1], Yanhang Ma[4], and Kwanpyo Kim[1,2]*
[1]Yonsei University, Korea, [2]Institute for Basic Science, Korea, [3]Ulsan National Institute of Science and technology, Korea, [4]ShanghaiTech University, China

LDS_P2_1671

Metal-silicon Contact Process Using Metallic Phase Transition of MoO_3 Thin Films via Chemical Vapor Deposition

Min Choi and Hyun Seok Lee*
Chungbuk National University, Korea

LDS_P2_1675

Oriented Assembly of AgCN Microwires on 2D Crystals

Myeongjin Jang[1,2], Minseol Kim[1], Yangjin Lee[1,2], Sol Lee[1,2], Hyeonhu Bae[3], Jahyun Koo[3], Woongki Na[4], Hyeonsik Cheong[4], Hoonkyung Lee[3], and Kwanpyo Kim[1,2]*
[1]Yonsei University, Korea, [2]Institute for Basic Science, Korea, [3]Konkuk University, Korea, [4]Sogang University, Korea

LDS_P2_1681

Commensurate C_{60} Thin Film on Black Phosphorus for Vertical Transistor Applications

Tae Keun Yun[1], Yangjin Lee[1,2], Min Je Kim[1], Jeongwoo Park[3], Donghee Kang[1], Seongchan Kim[1], Young Jin Choi[1], Yeonjin Yi[1], Bonggeun Shong[3], Jeong Ho Cho[1], and Kwanpyo Kim[1,2]*
[1]Yonsei University, Korea, [2]Institute for Basic Science, Korea, [3]Hongik University, Korea

LDS_P2_1694

Vibrational Property Investigation of Transition Metal Dichalcogenides Defect Sites via Tip-enhanced Raman Spectroscopy

Dong Hyeon Kim[1,2], Byeong Geun Jeong[1,2], Sung Hyuk Kim[1,2], Hyeong Chan Suh[2], Yo Seob Won[1], Tae Hoon Kim[2], Eui Kwan Koh[3], Ki Kang Kim[1], and Mun Seok Jeong[2]
[1]Sungkyunkwan University, Korea, [2]Hanyang University, Korea, [3]Korea Basic Science Institute, Korea

LDS_P2_1697

Large Area MXene (Ti_3C_2) Electrode for 2D Materials-based Devices

Jiseong Jang[1], Gang Hyeok Seo[2], Ga Hyun Cho[2], Junho Ryeom[2], Hyeon Jung Park[2], Gon Namkoong[3], and Mun Seok Jeong[2]*
[1]Sungkyunkwan University, Korea, [2]Hanyang University, Korea, [3]Old Dominion University, Korea

LDS_P2_1698

Outstanding Photoresponse of NbS_2/MoS_2/p-Si Photodiode Implemented by One-step CVD Process

Hyun Young Seo and Byungjin Cho*
Chungbuk National University, Korea

LDS_P2_1713

Modification of Optical and Electrical Properties of 2H-MoS_2 via Molecular Ion Intercalation

J. Kim[1,2], M. Jo[2,3], M. Choi[2,4], K. Kang[3], S. Song[2]*, and K. Hong[1]*
[1]Chungnam National University, Korea, [2]Korea Research Institute of Standards and Science, Korea, [3]Korea Advanced Institute of Science and Technology, Korea, [4]Hanyang University, Korea

LDS_P2_1716

Phonon Induced Pseudospin Rotation in Graphene

Jiwon Jeon, Youngjae Kim, and J. D. Lee*
Daegu Gyeongbuk Institute of Science and Technology, Korea

LDS_P2_1734

Interface Engineering with Organic Molecule and Polymer for Functionalized Low-dimensional Transition-metal Dichalcogenides

Phuong Huyen Nguyen[1], Duc Hieu Nguyen[1], Hyojung Kim[1], Hye Min Oh[2]*, Hyung Mo Jeong[1]*, and Mun Seok Jeong[3]*
[1]Sungkyunkwan University, Korea, [2]Kunsan National University, Korea, [3]Hanyang University, Korea

LDS_P2_1747

MOCVD Regrowth of InAs/GaAs Quantum Dots on Direct-bonded GaAs on SiO_2/Si Substrate

So Yeon Yoon[1,2], Ho Sung Kim[1]*, Min-Su Park[2], and Won Seok Han[1]
[1]Electronics and Telecommunications and Research Institute, Korea, [2]Dong-A University, Korea

LDS_P2_1749

Self-labeling of Interface Defects in MoS_2: Reasons for the Photoluminescence Reduction

Juchan Lee[1,2], Byeonggeun Jeong[1,2], Deogkyu Choi[1], and Mun Seok Jeong[1]*
[1]Hanyang University, Korea, [2]Sungkyunkwan University, Korea

LDS_P2_1760

Reconfigurable MoS_2 Field Effect Transistor Enabled by High-k Dielectrics

Ojun Kwon and Byungjin Cho*
Chungbuk National University, Korea

LDS_P2_1763

The Synthesis and Investigation of 2d P-type Semiconductor via Hydrothermal Method

In Cheol Choi[1,2], Dae Young Park[2], Kang-Nyeoung Lee[1], Chae Won Lee[2], Jea-Hyun Sung[2], Hyung Mo Jeong[1]*, and Mun Seok Jeong[2]*
[1]Sungkyunkwan University, Korea, [2]Hanyang University, Korea

LDS_P2_1793

Fourier Plane Imaging of Interlayer Transition of 2D Heterostructures

Eunji Lee[1], Changwon Seo[2], Teun-Teun Kim[2], and Jeongyong Kim[1]*
[1]Sungkyunkwan University, Korea, [2]University of Ulsan, Korea

LDS_P2_1802

NAND and NOR Logic Gate Applications on a Single MoS_2-FET with Longitudinally and Latitudinally Folded Split-Gate Electrodes

Chang Yong Park, Minjong Lee, Si Eun Yu, and Young Tack Lee*
Inha University, Korea

LDS_P2_1806

Multi-functional Sensor Application Methods Based on Suspended 2D van der Waals Materials

Si Eun Yu, Chang Yong Park, and Young Tack Lee*
Inha University, Korea

LDS_P2_1807

Molecular Remote Surface Charge-transfer Doping in MoS_2 Field-effect Transistors

Juntae Jang[1], Jae-Keun Kim[2], Jiwon Shin[1], Jaeyoung Kim[1], Kyeong-Yoon Baek[1], Jaehyoung Park[1], Keehoon Kang[1], Kyungjune Cho[3], and Takhee Lee[1]*
[1]Seoul National University, Korea, [2]Max-Planck Institute of Microstructure Physics, Germany, [3]Korea Institute of Science and Technology, Korea

LDS_P2_1814

Strategy to Differentiate Oxidized Channel of $MoTe_2$ Field-effect-transistor Using Operando-scanning Photoelectron Microscopy

Seungwook Choi[1,2], Guen Hyung Oh[3], Songwoung Hong[1,2], Taewan Kim[3], and Ansoon Kim[1,2]*
[1]Korea Research Institute of Standards and Science, Korea, [2]University of Science and Technology, Korea, [3]Jeonbuk National University, Korea

LDS_P2_1832

Incommensurate Antiferromagnetic Order in 2D Insulator $CrPSe_3$

Baithi Mallesh[1], Ngoc Toan Dang[2], Tuan Anh Tran[3], Krishna P. Dhakal[1], Anton Rutkauskas[4], Sergei Kichanov[4], Denis Kozlenko[4], Young Hee Lee[1], and Dinh Loc Duong[1]
[1]Sungkyunkwan University, Korea, [2]Duy Tan University, Vietnam, [3]Ho Chi Minh City University of Technology and Education, Vietnam, [4]Frank Laboratory of Neutron Physics, Russia

LDS_P2_1834

Controlled Number of Layers for Two-dimensional van der Waals Crystals

Do-Hoon Kim[1]*, Ji-Yun Moon[2]*, Jae-Hyun Lee[2], and Seok-Kyun Son[1]
[1]Mokpo National University, Korea, [2]Ajou University, Korea

LDS_P2_1844

Multifunctional WSe_2/MoS_2 Heterojunction Devices with Graphene Floating Gates Inserted

Changheon Kim[1,2], Junechul Shin[2], Donghyun Kim[1,3], Yunjo Jeong[1], Daeyoung Jeon[1], Dongsu Lee[1], Gwanhyoung Lee[2]*, and Jangyup Son[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Seoul National University, Korea, [3]Sungkyunkwan University, Korea

LDS_P2_1871

Effects of Top-hBN Passivation on Gate-induced Photocurrent Hysteresis in WSe_2 Field Effect Transistors

Seong-Yeon Lee and Ki-Ju Yee*
Chungnam National University, Korea

LDS_P2_1894

Long-wavelength Visible-light Emitting InGaN Triangular Pyramidal Quantum Dots Grown by Metal-organic Chemical Vapor Deposition

Baul Kim, Kwanjae Lee, and Yong-Hoon Cho*
Korea Advanced Institute of Science and Technology, Korea

LDS_P2_1898

Characteristics of InAlAs/$Al_{40}Ga_{60}As$ Single Quantum Dots Under Out-of-plane Magnetic Field

Byung Su Kim[1], Minho Choi[1], Jindong Song[2], Kie Young Woo[1], and Yong-Hoon Cho[1]*
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Korea Institute of Science and Technology, Korea

LDS_P2_1901

Characteristics of Two-dimensional MoS_2 Epilayer Grown on GaN and SiO_2 Substrates by Metal-organic Chemical Vapor Deposition

Seonghun Ahn, Tae Soo Kim, Yongho Song, Kibum Kang, and Yong-Hoon Cho*
Korea Advanced Institute of Science and Technology, Korea

LDS_P2_1918

Thickness- and Substrate-Dependent Colors of WS_2 Multilayers

Jungyoon Cho, Anh Thi Nguyen, Jungeun Song, Eunseo Cho, Soyeong Kwon, and Dong-Wook Kim*
Ewha Womans University, Korea

LDS_P2_1922

Reflectance Spectra of Metal/WS_2-Multilayer/Metal Structures

Eunseo Cho, Anh Thi Nguyen, Soyeong Kwon, Jungeun Song, and Dong-Wook Kim*
Ewha Womans University, Korea

LDS_P2_1935

Al_2O_3 Encapsulated 2D Te/ReS_2 p-n Junction Heterostructure for Tunable Optoelectronic Memtransistors

D. A. Nguyen[1], T. P. A. Bach[1], Y. Jo[1], T. U. Tran[2], M. S. Jeong[3], H. Kim[1], and H. Im[1]*
[1]Dongguk University, Korea, [2]Sungkyunkwan University, Korea, [3]Hanyang University, Korea

LDS_P2_1968

Identification of Thickness of WS_2 Multilayers Using Optical Microscopy

Hyohyeon Kim, Eunseo Cho, Jungyoon Cho, Anh Thi Nguyen, Seoyeong Im, Jungeun Song, Soyeong Kwon, and Dong-Wook Kim*
Ewha Womans University, Korea

LDS_P2_1972

Raman Scattering Spectroscopic Study of Low Dimensional $CoNb_2O_6$

Joohee Park[1], Songhee Lee[1], Sojeong Ko[1], Soungmin Bae[2], Myunghwa Kim[1], and Seokhyun Yoon[1]*
[1]Ewha Womans University, Korea, [2]Tokyo Institute of Technology, Japan

Quantum Information (QI)

QI_P2_1429

Ultrastrong Optomechanical Coupling of Micromechanical Resonators in a 3D Cavity Electromechanical System

Mingi Kim[1] and Junho Suh[2]*
[1]Kyung Hee University, Korea ,[2]Korea Research Institute of Standard and Science, Korea

QI_P2_1450

First-principles Investigation of Electron-phonon Interactions in Quantum Emitters in Hexagonal Boron Nitrides

Ujin Ko, Jaewook Lee, and Hosung Seo*
Ajou University, Korea

QI_P2_1451

First-principles Investigation of Paramagnetic Defects in Diamond as Qubit Decoherence Sources

Hyeonsu Kim, Huijin Park, and Hosung Seo*
Ajou University, Korea

QI_P2_1521

Detection and Manipulation of Majorana Zero Modes Using Nanomechanical Resonators

Junghyun Shin[1], Mingi Kim[2], Joon Sue Lee[3], Sang-june Choi[4], Younghun Ryu[5], Jinwoong Cha[1], Seung-Bo Shim[1], and Junho Suh[1]*
[1]Korea Research Institute of Standards and Science, Korea, [2]Kyung Hee University, Korea, [3]University of Tennessee, USA, [4]University of Wűrzburg, Germany, [5]Korea Advanced Institute of Science and Technology, Korea

QI_P2_1617

Superconducting Proximity Effect at High Temperature in $Bi_2Se_3/Tl_2Ba_2CaCu_2O_8$ Thin-film Heterojunctions

Tae-Ha Hwang[1], Dae-Hyung Cho[1,2], Yong-Duck Chung[1,2], Yong-Joo Doh[3], and Woo-Jung Lee[1,2]*
[1]Electronics and Telecommunications Research Institute, Korea, [2]Korea University of Science and Technology, Korea, [3]Gwangju Institute of Science and Technology, Korea

QI_P2_1679

Exploring Entanglement Resource in Si Quantum Dot Systems: Operational Quasiprobability Approach

Junghee Ryu, Ji-Hoon Kang, and Hoon Ryu*
Korea Institute of Science and Technology Information, Korea

QI_P2_1899

Waveguide-integrated Single Photon Emitter for Fiber-coupled Quantum Nanophotonic Interface

Hye-Min Kim[1,2], Mireu Lee[1], Yong-Hoon Cho[2], and Young-Ho Ko[1]*
[1]Electronics and Telecommunications Research Institute, Korea, [2]Korea Advanced Institute of Science and Technology, Korea

QI_P2_1912

Dynamic Nuclear Polarization with Electron Multiplet States in GaAs

Wonjin Jang[1], Jehyun Kim[1], Vladimir Umansky[2], and Dohun Kim[1]*
[1]Seoul National University, Korea, [2]Weizmann Institute of Science, Israel

QI_P2_1919

Overlaid Gate Device Fabrication with Optimized Design for Controlling and Measuring Silicon Quantum Dot Spin Qubit

Jaemin Park, Min-Kyun Cho, Youngwook Song, Byungwoo Kang, and Dohun Kim*
Seoul National University, Korea

QI_P2_1921

Probing Two-qubit Capacitive Interactions Beyond Bilinear Regime Using Dual Hamiltonian Parameter Estimation

Jonginn Yun[1], Jaemin Park[1], Hyeongyu Jang[1], Jehyun Kim[1], Wonjin Jang[1], Youngwook Song[1], Min-Kyun Cho[1], Hanseo Sohn[1], Hwanchul Jung[2], Vladimir Umansky[3], and Dohun Kim[1]*
[1]Seoul National University, Korea, [2]Pusan National University, Korea, [3]Weizmann Institute of Science, Israel

QI_P2_1932

Boundary Restoration Method of Quantum Edge Detection in Restricted Qubits in NISQ Era

Sungjoo Hwang*, Byungsoo Kang, and Minwoo Ahn
SEMCO, Korea

Plasmonics and Optoelectronics (PO)

PO_P2_1105

Complete Trion Conversion and Waveguiding in Atomically Thin Semiconductors

Hyeongwoo Lee[1], Shailabh Kumar[2], Yeonjeong Koo[1], Yunjo Jeong[3], Soo Ho Choi[4], Mingu Kang[1], Ki Kang Kim[4,5], Sangmin An[3], Hyuck Choo[2,6], and Kyoung-Duck Park[1]*
[1]Ulsan National Institute of Science and Technology, Korea, [2]California Institute of Technology, USA, [3]Jeonbuk National University, Korea, [4]Institute for Basic Science, Korea, [5]Sungkyunkwan University, Korea, [6]Samsung Advanced Institute of Technology, Kor

PO_P2_1258

Raman and Photoluminescence Studies of Monolayer MoS_2 Under the Influence of Insulating Materials

Taegeon Lee[1], Jeong-Hun Choi[2], Ji-Hoon Ahn[2], Young-Gui Yoon[3], and Heesuk Rho[1]*
[1]Jeonbuk National University, Korea, [2]Hanyang University, Korea, [3]Chung-Ang University, Korea

PO_P2_1403

Dynamical Aspect of Surface Polaritons in 2D Lateral Heterostructures

Wonjae Choi and Q-Han Park*
Korea University, Korea

PO_P2_1405

Perfect Photonic Waveguide Coupler Using Transformation Optics

Myeongjin Kim and Q-Han Park*
Korea University, Korea

PO_P2_1406

Effect of Electric Fields and Proximal Metal Plates on Quantum Yield and Exciton-exciton Annihilation of Monolayer WS_2

Trang Thu Tran[1], Yongjun Lee[1], Youngbum Kim[1], Shrawan Roy[1], Takashi Taniguchi[2], Kenji Watanabe[2], Joon I. Jang[3]*, and Jeongyong Kim[1]*
[1]Sungkyunkwan University, Korea, [2]National Institute for Materials Science, Japan, [3]Sogang University, Korea

PO_P2_1413

Origin of Visible Dark Excitons in $[CH_3(CH_2)_3NH_3]_2PbBr_4$

S. H. Shin, S. H. Ha, H. Ryu, J. S. Cho, H. K. So, M. H. Jung*, and J. I. Jang*
Sogang University, Korea

PO_P2_1449

Growth Optimization of Strain-compensated InGaAs/InAlAs/InP for Quantum Cascade Laser by MBE

Wonjun Lee[1,2], Wonbae Sohn[1], Joon Hyun Kang[1], Tae Geun Kim[2], and Il Ki Han[1]*
[1]Korea Institute of Science and Technology, Korea, [2]Korea University, Korea

PO_P2_1452

Subwavelength Imaging Utilizing Configurable Metasurfaces

Hyun Jun Ma, Jin Soo Kim, and Q-Han Park*
Korea University, Korea

PO_P2_1463

Impact of Quantum Confinements on the Biexciton Binding Energy in Quasi-2D perovskites $[CH_3(CH_2)_3NH_3]_2(CH_3NH_3)_{n-1}Pb_nBr_{3n+1}$ (n = 1-3)

Jun Sang Cho[1], Eugenia S. Vasileiadou[2], Mercouri G. Kanatzidis[2], and J. I. Jang[1]*
[1]*Sogang University, Korea,* [2]*Northwestern University, USA*

PO_P2_1468

Characterizations of MoS_2 Monolayers on Plasmonic Au Nanogratings

Seoyoung Lim, Soyeong Kwon, Jungeun Song, Anh Thi Nguyen, Jungyoon Cho, Eunseo Cho, and Dong-Wook Kim*
Ewha Womans University, Korea

PO_P2_1506

Size Estimation of Nanoparticle using Diffused Laser Scattering in Mie Regime

Jaeseung Im[1] and soobong Choi[1,2]*
[1]*Incheon National University, Korea,* [2]*Intelligent Sensor Convergence Research Center, Korea*

PO_P2_1509

2D Graphene Oxide-coated Thermometer Probe for Enhancing Optical Contrast

Kiin Nam, Hyuntae Kim, Jaeseung Im, and Jae Soobong Choi*
Incheon National University, Korea

PO_P2_1585

Large-area Selective Valley-polarization of 1L-MoS_2 on Gold Nanoparticle Substrate at Room Temperature

Y. Kim[1], K. P. Dhakal[1], S. Roy[1], T. T. Tran[1], S. Kim[2], H. S. Lee[2], and J. Kim[1]*
[1]*Sungkyunkwan University, Korea,* [2]*Chungbuk National University, Korea*

PO_P2_1594

Structure and Luminescent Properties of Rare Earth Ions-doped Perovskite Stannates ASnO3(A = Ca, Sr, and Ba)

Kwanchul Lee* and Y. S. Lee
Soongsil University, Korea

PO_P2_1615

TADF Top-emitting OLEDs Using Ni:SiO_2 Buffer Layers

Wanqi Ren, Kyung Rock Son, Hwi Geun Kim, Kang Ting, and Tae Geun Kim*
Korea University, Korea

PO_P2_1616

Flexible Organic Light-emitting Diodes Using Ni-doped IZO Mesh Electrodes

Nahyun Kim, Ho Jin Lee, Wanqi Ren, and Tae Geun Kim*
Korea University, Korea

PO_P2_1624

Deep-ultraviolet Thin-film Electroluminescence with $YPO_4:Pr^{3+}$ Emitting Layer

Gyeongdo Baek, Jingi Gim, Chunghyun Lee, Busic Kang, Sanghyeon Lim, Hyunjee Jung, Mohammad M. Afandi, Jehong Park, and Jongsu Kim*
Pukyong National University, Korea

PO_P2_1630

Photoluminescence Intensity Enhancement in Monolayer MoS_2 Through Laser Irradiation and UV-ozone Treatment

JinYoung Jeong*
Incheon National University, Korea

PO_P2_1650

Excitation Dependent Photoluminescence of Titanium Nitride (Ti_2N) MXene Quantum Dots

Anir S. Sharbirin and Jeongyong Kim*
Sungkyunkwan University, Korea

PO_P2_1653

Observation of Charge Transfer in Heterostructure of Monolayer WS_2 and Ti_2N MXene Quantum Dots

Wendy B. Mato, Rebekah E. Kong, Anir S. Sharbirin, Jolene W. P. Khor, and Jeongyong Kim*
Sungkyunkwan University, Korea

PO_P2_1661

Fabrication of Ti_2AlN MAX Phase by Step Sintering Method

Sophia Akhtar, Shrawan Roy, Trang Thu Tran, Jaspal Singh, Anir S. Sharbirin, and Jeongyong Kim*
Sungkyunkwan University, Korea

PO_P2_1741

Giant Two-photon Generation of Biexcitons in $BA_2(MA)_{n-1}PbnBr_{3n+1}$ (n = 1–3)

Jeong Bin Cho, Hyun Kyung So, Myung-Hwa Jung, and Joon Ik Jang*
Sogang University, Korea

PO_P2_1771

Low-attenuation-loss Metamaterial for Transparent Radar Heater

Jun-Young Kim, Young-Bin Kim, Eun-Joo Lee, and Sun-Kyung Kim*
Kyung Hee University, Korea

PO_P2_1841

Improving the Photoresponse Characteristics of ZnO/Quantum Dots Phototransistors via Solution Processed ZrO_2 Additional Layer

JunHyung Jeong, and Seong Jun Kang*
Kyung Hee University, Korea

PO_P2_1870

Enhanced Extinction Ratio from Bilayer One-dimensional Subwavelength Metal Gratings in the Short-wave Infrared

Youryang Seo[1,2], Jiyeon Jeon[1], Jong Su Kim[2], Yeongho Kim[1], and Sang Jun Lee[1]
[1]Korea Research Institute of Standards and Science, Korea, [2]Yeungnam University, Korea

PO_P2_1877

Spray Pyrolysis Method for Next-generation Optoelectronic Devices

Min Gye Kim, Jin Hyun Ma, Min Ho Park, and Seong Jun Kang*
Kyung Hee University, Korea

PO_P2_1929

Tunable SPR Frequency in a Wider NIR Region by Controlling Size and Ratio of ITO Nanoparticles Solution

Jeong-Yeon Lee, Ha Young Lee, Jae-Hoon Ryu, Sung-Hyun Kim, Jun-Hyeon Jang, Young Tea Chun, Hyung Soo Ahn, and Sam Nyung Yi*
Korea Maritime & Ocean University, Korea

PO_P2_1943

Viewing Angle-dependent Coloration via Multilayered Plasmonic Metasurfaces

Gyurin Kim, Hyun Min Kim, Jang- Hwan Han, Juhwan Kim, and Hyeon-Ho Jeong*
Gwangju Institute of Science and Technology, Korea

PO_P2_1944

Colorful Refractive Index Imaging with Plasmonic Metasurfaces

Doeun Kim, Hyun Min Kim, Juhwan Kim, Jang-Hwan Han, and Hyeon-Ho Jeong*
Gwangju Institute of Science and Technology, Korea

PO_P2_1946

Identifying Defect-Induced Trion in Monolayer WS_2

R. Sebait[1,2], C. Biswas[1]*, B. Song[1,2], C. Seo[1,2], and Y. H. Lee[1,2]*
[1]Institute for Basic Science, Korea, [2]Sungkyunkwan University, Korea

Energy Materials and Devices (EMD)

EMD_P2_1584

Morphology Engineering of Various Nanostructured Copper-sulfide Electrodes for Efficient Supercapacitor Applications by One Spot Approach

Sobi Cho[1], Woo Jong Kim[1], Min Kyeong Kim[2], John Hong[2], and Jin Pyo Hong[1]*
[1]Hanyang University, Korea, [2]Kookmin University, Korea

EMD_P2_1625

Electrical Characterization of PA-MBE Grown GaN Nanowires via Conductive Probe AFM - Effect of Load and Generator Resistances

T. Sodhi[1]*, P. Chrétien[2], L. Travers[1], F. Houzé[2], M. Tchernycheva[1], and N. Gogneau[1]
[1]Centre de Nanosciences et de Nanotechnologies, France, [2]Université Paris-Sorbonne, France

EMD_P2_1649

Boosting the Catalytic Properties of Nickel Oxide Film with Embedded "Nano-filament Arrays"

Giho Shin, Sangeun Cho, Hyungsang Kim, and Hyunsik Im*
Dongguk University, Korea

EMD_P2_1660

Flexible Triboelectric Nanogenerator Based on Mica-nylon6 Composites

Min Kyeong Kim[1], Woo Jong Kim[2], Dong Il Kim[1], Soo Hong Lee[1], Sobi Cho[2], Jin Pyo Hong[2], And John Hong[1]*
[1]Kookmin University, Korea, [2]Hanyang University

EMD_P2_1708

Oblique Angle Indium Gallium Tin Doped Oxide Films by Facing Target Sputtering

Jin-Won Yang, Hyeon Uk Ha, and Han-Ki Kim*
Sungkyunkwan University, Korea

EMD_P2_1710

Ga, Ti Co-doped In_2O_3 Top Cathode for Semi-transparent Perovskite Solar Cells Using a Linear Facing Target Sputtering

Hyeon Uk Ha[1], Hae-Jun Seok[1], Saemon Yoon[2], Dong-Won Kang[2], and Han-Ki Kim[1]*
[1]Sungkyunkwan University, Korea, [2]Chung-Ang University, Korea

EMD_P2_1759

Efficiency Enhancement of InGaP/GaAs Double-junction Thin Film Solar Cell Using TiO_2 Nanotextured Surface

Hyo Jin Kim*, Chae Won Kim, and Gwang Yeol Park*
Korea Photonics Technolgy Institute, Korea

EMD_P2_1774

Growth Characteristics of CNWs Synthesized on Various Metal Layer Coated Glass Substrate

Chulsoo Kim, Seokhun Kwon, Hyunil Kang, Chaehyun Ahn, Youngjin Sim, Young Park ,Kyuri Shin, Junghyun Kim, and Wonseok Choi*
Hanbat National University, Korea

EMD_P2_1775

Pholuminescence and Photochromisim of Ce^{3+} and Ce^{3+}/Eu^{3+} ions in Sr_2SnO_4

D. J. Lee and Y. S. Lee
Soongsil University, Korea

EMD_P2_1779

Emerging CoMn-NWs/Fe_2O_3/NF Nanocomposite Electrode for High-Performance Energy Production and Energy Storage Devices

A. Meena, A. Jana, and H. Im*
Dongguk University, Korea

EMD_P2_1785

Structure and Characteristics of Graphite Slurry Deposited Carbon Nanowall for Anode Active Material

Kangmin Kim, Seokhun Kwon, Chulsoo Kim, Chaehyun Ahn, Junghyun Kim, and Wonseok Choi*
Hanbat National University, Korea

EMD_P2_1787

1,3,7-trimethylxanthine as Additive for Highly Efficient Organic-inorganic Halide Perovskite Solar Cells

MiJoung Kim, Gisung Kim, and JungYup Yang*
Kunsan National University, Korea

EMD_P2_1788

Nickel Oxide of Inorganic Hole Transport Materials with Self-assembled Monolayer for Inverted Perovskite Solar Cells

Gisung Kim[1], Mijoung Kim[1], Sungho Kang[2]*, and JungYup Yang[1]*
[1]Kunsan National University, Korea, [2]Advanced Institute of Convergence Technology, Korea

EMD_P2_1791

Improving Phase Stability of $FAPbI_3$ by Mixed Dual Additive

Hyeonu Lee[1], Jaekwon Shin[1], Gisung Kim[1], Mijoung Kim[1], Moonhoe Kim[1], Juyoung Oh[1], Geon Park[1], Jinpyo Hong[2]*, and JungYup Yang[1]*
[1]Kunsan National University, Korea, [2]Hanyang University, Korea

EMD_P2_1794

Improved Thermoelectric Performance of Vertically Aligned Silicon Nanowires Through the Cold Spot Effect and Carrier Trapping Effect Due to Electroless-deposited Gold Nanoparticles

G. W. Jeon, J.-S. Jo, and J.-W. Jang*
Dongguk University, Korea

EMD_P2_1795

Improvement to Reduce the Thermal Degradation of Flexible III-V Solar Cells Bonded to Copper Foil by Au-Au Bonding

Gwangyeol Park and Hyojin Kim*
Korea Photonics Technology Institute, Korea

EMD_P2_1800

First-principles Study of the Rotation-induced Polar Structures in Perovskite $CaSnO_3$

Min Chul Choi and Se Young Park*
Soongsil University, Korea

EMD_P2_1803

Characteristics of V Doped TiO_2 Thin Films Coated by Spray Pyrolysis for Photovoltaic Application

Yong Seob Park[1]* and Jaehyeong Lee[2]
[1]Chosun College of Science and Technology, Korea, [2]Sungkyunkwan University, Korea

EMD_P2_1804

Characteristics of W Doped Vanadium Oxide Thin Films Fabricated by UBM Sputtering for the Sensor Application

Yong Seob Park*
Chosun College of Science and Technology, Korea

EMD_P2_1811

Large Area Perovskite Solar Cells Fabricated by Slot Die Coating System

Moonhoe Kim[1], Juyoung Oh[1,2], Mijoung Kim[1], Jaegwan Sin[1], Gisung Kim[1], Geon Park[1], Jaeho Kim[1], Hyeonu Lee[1], Dongguen Lee[2]*, and JungYup Yang[1]*
[1]Kunsan National University, Korea, [2]Hanyang Solar Energy, Korea

EMD_P2_1812

Improved Stability of $MAPbI_3$ Perovskite Solar Cells Using 2D Transition Metal Dichalcogenide Interlayers

Bora Kim[1], Moonhoe Kim[2], Hyojung Kim[2], JungYup Yang[2]*, Mun Seok Jeong[3]*, and Sohee Jeong[1]*
[1]Sungkyunkwan University, Korea, [2]Kunsan National University, Korea, [3]Hanyang University, Korea

EMD_P2_1818

Properties of TiO_2 Thin Film Deposited by Using RF Reactive Sputtering Method for Perovskite Solar Cells

Jeaho Kim[1], Mijoung Kim[1], Moonhoe Kim[1], GiSung Kim[1], Jaegwan Sin[1], Geon Park[1], Hyeonu Lee[1], Kyung A Jung[1], Hyojung Kim[2], and JungYup Yang[1]*
[1]Kunsan National University, Korea, [2]Sungkyunkwan University, Korea

EMD_P2_1819

Characterization of Si and SiC Coated Carbon Nanowalls Synthesized by Microwave PECVD

May Tran Thi, Chulsoo Kim, Seokhun Won, Junghyun Kim, and Wonseok Choi*
Hanbat National University

EMD_P2_1824

Suppressing Detrimental Inhibition of Side Reactions Against Electrolytes on $LiNi_{0.87}Co_{0.13}O_2$ Cathode for Li-ion Batteries of Sucrose Carbon Coating

Eui-Jeong Park, Hae-In Kim, Thuy Thi Bich Tran, Hyun-Ju Jang, and Jong-Tae Son*
Korea National University of Transportation, Korea

EMD_P2_1828

Wireless RF Energy Harvesting Through van der Waals Semiconductor Crystal Radio

Livia Janice Widiapradja, Sungjae Hong, Ki-Tae Kim, Heesun Bae, and Seongil Im*
Yonsei University, Korea

EMD_P2_1830

Heterometal Doped Molybdenum Phosphide as an Effective Electrocatalyst for Hydrogen Evolution Reaction in Alkaline Electrolytes

Jisu Kwon and Soo Min Kim
Sookmyung Women's University, Korea

EMD_P2_1842

The Optical Characteristics of Cu^+ Ions Implanted Cu_2ZnSnS_4 Thin Films

Sungwook Hong[1]* and Chan Kim[2]
[1]Daegu University, Korea, [2]Kyungpook National University, Korea

EMD_P2_1846

Tweaking the Surface Charge Density via Incorporation of Carbon Allotropes at PDMS Based Triboelectric Nanogenerator

Vigneshwaran Mohan, Karthikeyan Krishnamoorthy, Vimal Kumar Mariappan, Parthiban Pazhamalai, and Sang-Jae Kim*
Jeju National University, Korea

EMD_P2_1851

Recycling and Reusing of Value-Added Products from Spent Lithium-ion Batteries for Oxygen Reduction Reaction and Methanol Oxidation Reaction

Keyru Serbara Bejigo, Subramanian Natarajan, Kousik Bhunia, Vijayakumar Elumalai, and Sang-Jae Kim*
Jeju National University, Korea

EMD_P2_1852

Development of Large-Scale Colorimetric Sensors Based on Cellulose Nanostructures Synthesized by Vapor-Phase Self-assembly

In Woo Park[1], Kyung Won Kim[1], Byung Yang Lee[2], Woo-Jae Chung[3], and Kwang Heo[1]*
[1]Sejong University, Korea, [2]Korea University, Korea, [3]Sungkyunkwan University, Korea

EMD_P2_1880

Electrocatalytic Activity of Non-noble Ni-co-sn Alloy for Oxygen Reduction Reaction

Aparna Sajeev, Dhanasekar Kesavan, and Sang-Jae Kim*
Jeju National University, Korea

EMD_P2_1911

Theoretical Study of NH_4^+ Cation Passivation of SnO_2 for Hybrid Perovskite Solar Cells

Joonho Park[1], Jihyun Kim[2], William Jo[2], and Yong-Hoon Kim[1]*
[1]Advanced Institute of Science and Technology, Korea, [2]Ewha Womans University, Korea

EMD_P2_1920

High-quality Bottom Transparent Electrodes for High-efficiency and Stability Perovskite Solar Cells

Hae-Jun Seok and Han-Ki Kim*
Sungkyunkwan University, Korea

EMD_P2_1926

Piezoelectric Energy Harvester Using Enhanced Solar Radiation Pressure Through Surface Plasmons Generated in Visible to Near-infrared Regions

Jae-Hoon Ryu, Ha Young Lee, Sung-Hyun Kim, Jeong-Yeon Lee, Jun-Hyeon Jang, Han-Sol Kim, Young Tea Chun, Hyung Soo Ahn, and Sam Nyung Yi*
Korea Maritime & Ocean University, Korea

EMD_P2_1927

Improving Electrical Properties by Graphene Oxide Coupled with Ag Nano-roughness in Light Pressure Devices for Energy Harvesting

Sung-Hyun Kim, Ha Young Lee, Jae-Hoon Ryu, Jeong-Yeon Lee, Jun-Hyeon Jang, Han-Sol Kim, Young Tea Chun, Hyung Soo Ahn, and Sam Nyung Yi*
Korea Maritime & Ocean University, Korea

EMD_P2_1928

Fabrication of Energy Harvesting Device Using Increased Light Pressure by Coupling GaAs Crater Structure with AuNPs

Jun-Hyeon Jang, Ha Young Lee, Jae-Hoon Ryu, Jeong-Yeon Lee, Sung-Hyun Kim, Han-Sol Kim, Young Tea Chun, Hyung Soo Ahn, and Sam Nyung Yi*
Korea Maritime & Ocean University, Korea

EMD_P2_1969

Polarized-Raman Scattering Study of Methylammonium Ion Orientation in the Hybrid Perovskite $CH_3NH_3PbCl_3$ Single Crystals

Yejin Kim[1], Soungmin Bae[2], Joohee Park[1], Trang Thi Thu Nguyen[1,3], Hye Ri Jung[1], William Jo[1], Yong-Hoon Kim[4], Hannes Raebiger[2], and Seokhyun Yoon[1]*
[1]Ewha Womans University, Korea, [2]Yokohama National University, Japan, [3]Danang University of Science and Technology, Vietnam, [4]Korea Advanced Institute of Science and Technology, Korea

EMD_P2_1971

Temperature Dependent Raman Scattering Study of Structural Properties in $CH_3NH_3PbCl_3$ Single Crystals

Yejin Kim[1], Seoyeon Ko[1], Soungmin Bae[2,3], Yong-Hoon Kim[3], Hye Ri Jung[1], William Jo[1], and Seokhyun Yoon[1]*
[1]Ewha Womans University, Korea, [2]Yokohama National University, Japan, [3]Korea Advanced Institute of Science and Technology, Korea

EMD_P2_1987

Laser-driven Phase Transition in $Mo_{1-x}W_xTe_2$ Alloy

Ha Heun Lee[1], Eunji Lim[1], Seohui Kang[1], Yonas Assefa Eshete[2], Dongyeun Won[2], Yongjoon Lee[3], Ju-yeong Jeong[3], Heejun Yang[3]*, Ching-Yu Chiang[4]*, and Suyeon Cho[1]*
[1]Ewha Womans University, Korea, [2]Sungkyunkwan University, Korea, [3]Korea Advanced Institute of Science and Technology, Korea, [4]National Synchrotron Radiation Research Center, Taiwan

Industrial Semiconductor Applications (ISA)

ISA_P2_1459

Inhibitor-Free Area-Selective Atomic Layer Deposition of Device-Quality $Hf_{1-x}Zr_xO_2$ Thin Films

Hyo-Bae Kim, Jeong-Min Lee, Woo-Hee Kim, and Ji-Hoon Ahn*
Hanyang University, Korea

ISA_P2_1609

Home-made Single Wavelength Rotating Analyzer Ellipsometry for Thin Film Thickness and Optical Constant Measurement

Heewoo Lee and Soobong Choi*
Incheon National University, Korea

ISA_P2_1618

Surface Acoustic Wave-based UVC Sensor with Zinc Gallate Nanoparticles

Jingi Gim, Chunghyun Lee, Busic Kang, Sanghyeon Lim, Hyunjee Jung, Gyeongdo Baek, Mohammad M. Afandi, Jehong Park, and Jongsu Kim*
Pukyong National University, Korea

ISA_P2_1623

Full-color Eletroluminescence of Rare-earth Doped Beta-phase Zn_2SiO_4

Sanghyeon Lim, Hyunjee Jung, Jingi Gim, Gyeongdo Baek, Mohammad M. Afandi, Busic Kang, Chunghyun Lee, Jehong Park, and Jongsu Kim*
Pukyong National University, Korea

ISA_P2_1639

Luminescent Silicon Nanoparticles as a Dexamethasone Delivery in Contact Lenses

SeJeong Kim and Honglae Sohn*
Chosun University, Korea

ISA_P2_1770

Effects of an Interface Boundary on the Microwave Absorption Properties of Multi-phase TiO_x Nanocolumnar Films

I. H. Kim, H. J. Lee, and H. W. Seo*
Jeju National University, Korea

ISA_P2_1813

Work Function Engineering Using Different Thickness of Electrodes with a Single Type of Metal

Hongju Park[1], Taehun Kim[1], Jungmoon Lim[1], Seung je Kim[1], Junsung Byeon[1], Jung Min[1], Young Hoon Lim[1], Sangyeon Pak[2], and SeungNam Cha[1]*
[1]Sungkyunkwan University, Korea, [2]Hongik University, Korea

ISA_P2_1882

Nonvolatile Memory with IGZO Oxide Semiconductor and $LiCoO_x$ Charge Trap Layer with Large Memory Window

Boyoung Jeong, Jimin Han, and Tae-Sik Yoon*
Ulsan National Institute of Technology, Korea

ISA_P2_1895

Optical Measurements of Deep Level Defect States in Silicon Dioxide and Silicon Nitride

Hyun Don Kim, Minseon Gu, Moonsup Han, Young Jun Chang, and E. J. Choi*
University of Seoul, Korea

E-Poster Session

Online (Virtual Website)

Advanced Semiconductors (AS)

AS_P_1173

Generation and Validation of Density-functional-based Tight-binding Parameters for Indium Compound Semiconductors

Seung Mi Lee*
Korea Research Institute of Standards and Science, Korea

AS_P_1255

Effects of High Voltage Stress on Subthreshold Swing of the Gate in 900 V SiO_2/4H-SiC MOSFET

Ogyun Seok[1] and Min-Woo Ha[2]*
[1]*Myongji University, Korea,* [2]*Kumoh National Institute of Technology, Korea*

AS_P_1374

InAlGaN/GaN HEMTs with Over Cut-off Frequency of 160 GHz

Sung-Jae Chang[1]*, Hyun-Wook Jung[1], Il-Gyu Choi[1], Dohyun Kim[1,2], Ho-Kyun Ahn[1], and Jong-Won Lim[1]
[1]*Electronics and Telecommunications Research Institute, Korea,* [2]*Chungbuk National University, Korea*

AS_P_1439

Effect of T-gate Structure on RF Characteristic in AlGaN/GaN HEMTs

Hyun-Wook Jung[1]*, Dohyun Kim[1,2], Ho-Kyun Ahn[1], and Jong-Won Lim[1]
[1]*Electronics and Telecommunications Research Institute, Korea,* [2]*Chungbuk National University, Korea*

AS_P_1492

Burg/Andersen Maximum-entropy Analysis: a New Approach

Long V. Le[1], Tae Jung Kim[2], Young Dong Kim[2]*, and D. E. Aspnes[3]*
[1]*Vietnam Academy of Science and Technology, Vietnam,* [2]*Kyung Hee University, Korea,* [3]*North Carolina State University, USA*

AS_P_1524

Parameterization of SnS Dielectric Function on Ab-plane

Xuan Au Nguyen[1], Van Long Le[1,2], Hoang Tung Nguyen[1,2], Tae Jung Kim[1]*, and Young Dong Kim[1]*
[1]*Kyung Hee University, Korea,* [2]*Vietnam Academy of Science and Technology, Vietnam*

AS_P_1530

A Study on the Correlation and Mechanism between Hydrogen Introduction and Improvement of Electrical Properties in IGZO Thin Film Transistor

Hee Yeon Noh, Haripriya G. R., Chan-Kang Lee, Jung-Hwa Cha, Myoung-Jae Lee, Hyeon-Jun Lee*
Daegu Gyeongbuk Institute of Science and Technology, Korea

AS_P_1581

Study on Gelatin Biomaterial for Embryonic Stem Cell Culture by Measuring Young's Modulus via an Atomic Force Microscope

Sooyeon Ra[1], Yunjo Jeong[2], Hoon Jang[3]*, and Sangmin An[1]*
[1]Jeonbuk National University, Korea, [2]Korea Institute of Science and Technology, Korea, [3]Jeonbuk National University, Korea

AS_P_1590

Enhancement of Photoresponse in WSe_2 by Topological Insulator Electrodes

Dajung Kim[1], Seok-Bo Hong[1], Jonghoon Kim[1], Kwangsik Jeong[2], and Mann-Ho Cho[1]*
Yonsei University, Korea

AS_P_1626

Green Powder Electroluminescence from $Ga_2O_3:Tb^{3+}$ Phosphor

Chunghyun Lee, Busic Kang, Sanghyeon Lim, Hyunjee Jung, Gyeongdo Baek, Jingi Gim, Mohammad M. Afandi, Jehong Park, and Jongsu Kim*
Pukyong National University, Korea

AS_P_1638

HCl Etch Treatment for the Selective Epitaxial Growth of Silicon in 3D NAND Flash Memory

Woong Lee and Yonghan Roh*
Sungkyunkwan University, Korea

AS_P_1647

Impact of T-Gate Head Size on Frequency Properties in GaN-based HEMTs

Sung-Jae Chang[1]*, Hyun-Wook Jung[1], Il-Gyu Choi[1], Dohyun Kim[1,2], Haecheon Kim[1], Youn-Sub Noh[1], Sang-Heung Lee[1], Seong-Il Kim[1], Ho-Kyun Ahn[1], and Jong-Won Lim[1]
[1]Electronics and Telecommunications Research Institute, Korea, [2]Research Institute for Nanoscale Science and Technology, Korea

AS_P_1705

Switching of Tantalum Amorphous Oxide Using Self-Compliance Bipolar Resistive Switching

Jung-Hwa Cha, Hee Yeon Noh, and Myoung-Jae Lee*
Daegu Gyeongbuk Institute of Science and Technology, Korea

AS_P_1773

Controlling Substrate Temperature During Fabrication to Improve Carrier Properties of Organic Semiconductors

Seongjib Cho, Youngseok Song, and Eunju Lim*
Dankook University, Korea

Novel Functional Spintronics (NFS)

NFS_P_1593

Control of Spin Hall and Rashba Effects in a HM/FM Frame by Stacked HfO_x Gate Oxide Layer

Jeonghun Shin, Jeongwoo Seo, and Jinpyo Hong*
Hanyang University, Korea

Low Dimensional Semiconductors (LDS)

LDS_P_1051

Ellipsometric Study on Dielectric Function of Monolayer WS_2 from 41 to 300K

Hoang Tung Nguyen, Tae Jung Kim, Van Long Le, Xuan Au Nguyen, and Young Dong Kim*
Kyung Hee University, Korea

Artificial Intelligence (AI) Materials and Devices

AI_P_1666

Speech Recognition with Neck Mounted Voice Sensor

Sang Hoon Lee, Sang Uk Park, Hee Kyu Lee, and Sang Min Won*
SungKyunKwan University, Korea

AI_P_1945

Ferroelectric $Hf_{0.5}Zr_{0.5}O$ Synaptic Barrister for Energy-efficient Convolution Neural Network

Seonghoon Jang[1], Seonggil Ham[1], Jingon Jang[1], Sanghun Jeon[2], and Gunuk Wang[1]*
[1]Korea University, Korea, [2]Korea Advanced Institute of Science and Technology, Korea

Quantum Information (QI)

QI_P_1762

1550nm Wavelength Quantum Dots Grown with Migration Enhanced Epitaxy

Suk In Park and Jin Dong Song*
Korea Institute of Science and Technology, Korea
Plasmonics and Optoelectronics (PO)

PO_P_1231

Doping-Site Dependence of Upconversion Emission of Ho^{3+} Ion in $CaHfO_3$

Hyeontae Lim, Sojeong Lee, Soyeong Jang, and Y. S. Lee*
Soongsil University, Korea

PO_P_1499

Solar-blind Ultraviolet Photodetector based on Zinc Gallate Metal-oxide-semiconductor Structure via Solution-based Technique

Mohammad M. Afandi, Jehong Park, Yongseok Jeong, and Jongsu Kim*
Pukyong National University, Korea

PO_P_1517

Growth Temperature Optimization of InGaAs Single-layer for Quantum Cascade Lasers

Sooseok Kang[1], Jongmin Kim[1], Chan Wook Jang[2], Hyunchul Jang[1], Sang Tae Lee[1], Shinkeun Kim[1], Chan-Soo Shin[1], and Dong-Hwan Jun[1]*
[1]Korea Advanced Nano Fab Center, Korea, [2]Kyung Hee University, Korea

PO_P_1620

Optical and Degradation Properties of Patterned UVC-emitting Phosphor Film in Xenon Excimer Lamp

Busic Kang, Chunghyun Lee, Sanghyeon Lim, Hyunjee Jung, Gyeongdo Baek, Jingi Gim, Mohammad M. Afandi, Jehong Park, and Jongsu Kim*
Pukyong National University, Korea

Energy Materials and Devices (EMD)

EMD_P_1587

All Stretchable Fiber-based One-dimensional Triboelectric Nanogenerators via Carbon Nanotube-elastomer Composites

Woo Jong Kim[1], Sobi Cho[1], Minkyung Kim[2], John Hong[2], and Jin Pyo Hong[1]*
[1]Hanyang University, Korea, [2]Kookmin University, Korea

EMD_P_1644

First-principles Study of Shift Current Bulk Photovoltaic Effects in Strained γ-GeSe

Hong-Guk Min, Churlhi Lyi, and Youngkuk Kim*
Sungkyukwan University, Korea
Industrial Semiconductor Applications (ISA)

Industrial Semiconductor Applications (ISA)

ISA_P_1313

X-band Microstrip Isolator with NiCr Thin Film Resistor for Aircraft/Ship Radar Application

Ho-Kyun Ahn[1], Dong-Young Kim[1], Hyun-Wook Jung[1], Haecheon Kim[1], Sung-Il Kim[1], Jung-Gu Lim[2], Oh-Gon Chun[2], and Jong-Won Lim[1]
[1]Electronics and Telecommunications Research Institute, Korea, [2]ADMOTECH, Korea