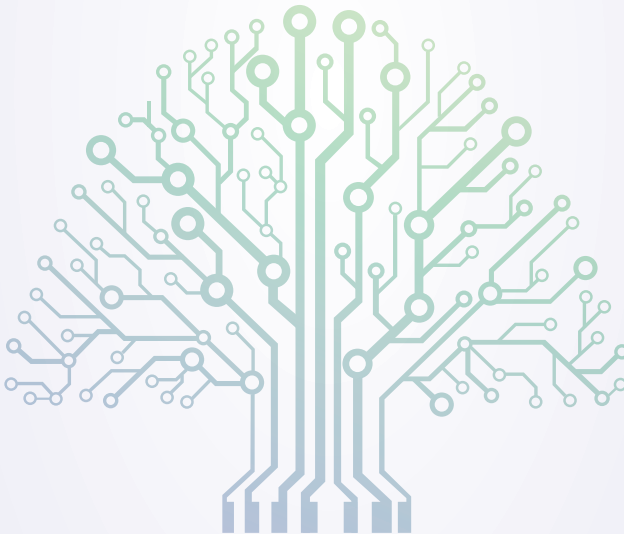


ENGE 2016

International Conference on **E**lectronic Materials
and **N**anotechnology for **G**reen **E**nvironment

Nov. 6 – 9, 2016 | Ramada Plaza Jeju Hotel, Jeju, South Korea



Hosted by



Organized by

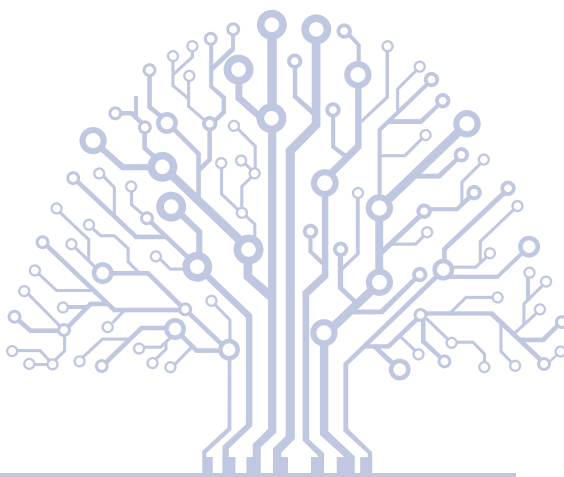


Supported by



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Welcome Message

Warmest Greetings! On behalf of the Committee of the 4th ENGE, it is my greatest pleasure and honor to welcome all of you to ENGE 2016, here in Jeju.

ENGE 2016 is taking place at the Ramada Plaza Hotel on Jeju Island from November 6 to 9, 2016. Over 1,100 abstracts have been submitted from more than 20 countries, and 930 papers will be presented during this conference. I'd like to express thanks to all committee members who have dedicated their time and effort for hosting this successful conference.

ENGE 2016 offers opportunities to share the most up-to-date scientific discoveries and innovative technologies. The ultimate objective is to advance the field of electronic materials and nanotechnology through networking among academia, industries, and all affiliated specialists and to establish a mutual understanding among those in the field worldwide. The target of conference is to provide tangible benefits and networking opportunities to current researchers; they will also provide an academic environment for young scientists and students to learn about future prospects and professional development opportunities.

I am confident that this year's conference will create a great synergy through the high level of expertise to be offered from internationally renowned experts and pioneers through their plenary and invited speeches.

We sincerely hope all of participants achieve true success in this conference and enjoy Korean hospitality.

We welcome you once again to the 4th ENGE.

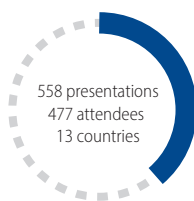
Prof. Jong-Lam Lee
Chairman, ENGE 2016



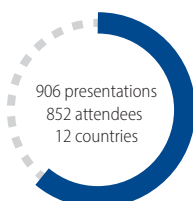
Overview

International Conference on Electronic Materials and Nanotechnology for Green Environment

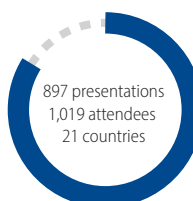
The ENGE (Electronic Materials and Nanotechnology for Green Environment) is a biannual conference for discussing new inventions and exchanging information and ideas among global researchers from energy, display, nano-process and semiconductors, and magnetic materials sectors.



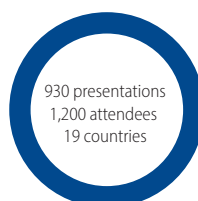
ENGE 2010



ENGE 2012



ENGE 2014



ENGE 2016

Committee

Steering Committee

Chairman	Jong-Lam Lee	POSTECH
Co-Chairman	Byung-ki Cheong	KIST
General Secretary	Moon-Ho Jo	IBS / POSTECH
Program	Young-Chang Joo	Seoul Nat'l Univ.
Publication	Sung Gyu Pyo	Chung Ang Univ.
	Soo Young Kim	Chung Ang Univ.
Global Cooperation	Sang Ouk Kim	KAIST
	Bae Ho Park	Konkuk Univ.
	Jwa-Min Nam	Seoul Nat'l Univ.
External Affairs	Byoung Hun Lee	GIST
	Cheolmin Park	Yonsei Univ.
Publicity	Jin Ho Ahn	Hanyang Univ.
Treasurer	Kyoung-Jin Choi	UNIST
Local	Jong Kyu Kim	POSTECH
	Ho Won Jang	Seoul Nat'l Univ.

Advisory Committee

Chairman	Jaegab Lee	Kookmin Univ.
	Ki-Bum Kim	Seoul Nat'l Univ.
	Young-Ho Kim	Hanyang Univ.
	Yong-Seog Kim	Hongik Univ.
	Jang-Joo Kim	Seoul Nat'l Univ.
	Byungwoo Park	Seoul Nat'l Univ.
	Sang-Hee Suh	KIST
	Dong Hyuk Shin	Hanyang Univ.
	Geun-Young Yeom	Sungkyunkwan Univ.
	Sang-Im Yoo	Seoul Nat'l Univ.
	Chan-gyu Lee	Changwon Nat'l Univ.
	Hee-Woong Lee	KERI
	Soon Hyung Hong	KAIST
	Kyung-Ho Shin	KIST

Program Committee

Chairman	Young-Chang Joo	Seoul Nat'l Univ.
	Byoung Hun Lee	GIST
	Unyong Jeong	POSTECH
	Tae-Woo Lee	Seoul Nat'l Univ.
	Jong-Hyun Ahn	Yonsei Univ.
	Woong Kim	Korea Univ.
	Won Il Park	Hanyang Univ.
	Hyun Suk Jung	Sungkyunkwan Univ.
	Kisuk Kang	Seoul Nat'l Univ.
	Keon Jae Lee	KAIST
	Jeong-Min Baik	UNIST
	Yoon Sung Nam	KAIST
	Seungwu Han	Seoul Nat'l Univ.
	Seung Min J. Han	KAIST

Program at a Glance

	Nov. 6 (Sun.)	Nov. 7 (Mon.)	Nov. 8 (Tue.)	Nov. 9 (Wed.)
09:00				
10:00		Oral Presentation 09:00-12:00	Oral Presentation 09:00-12:00	Oral Presentation 09:00-12:00
11:00				
12:00		Lunch 12:00-13:20	Lunch 12:00-13:20	Lunch 12:00-13:00
13:00		Plenary Speech 1 & 2 13:20-14:40		Plenary Speech 3 13:00-13:40
14:00			Oral Presentation 13:20-16:20	Oral Presentation 13:50-16:50
15:00	Tutorial Course 15:00-18:00	Oral Presentation 15:00-18:00		
16:00			Poster Presentation 16:20-18:00	Poster Presentation 16:30-17:30
17:00				
18:00	Welcome Reception 18:00-19:30	Poster Presentation 18:00-19:30	Banquet 18:00-20:00	
19:00				

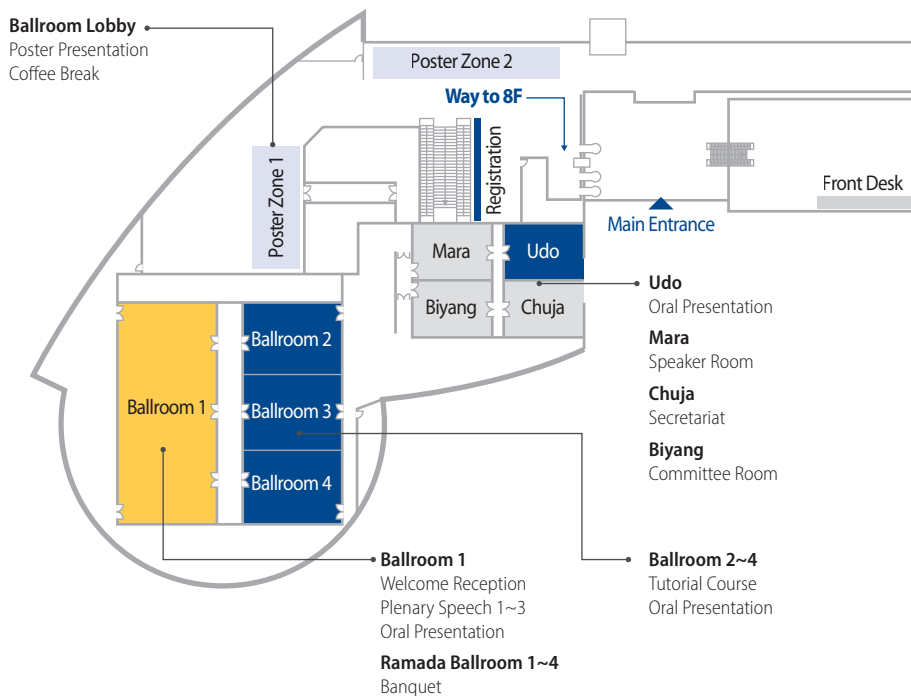
Events

- **Welcome Reception** Nov. 6 (Sun.) 18:00-19:30
- **Doughnut Time** Nov. 7-9 (Mon.-Wed.) 08:30-08:50
- **Beer Time** Nov. 7 (Mon.) 18:00-19:30
- **Banquet** Nov. 8 (Tue.) 18:00-20:00

Plenary Speakers

- **Plenary Speech 1** Karl Leo (IAPP, TU Dresden, Germany)
- **Plenary Speech 2** Chang-Beom Eom (Univ. of Wisconsin-Madison, USA)
- **Plenary Speech 3** Harry Atwater (California Institute of Tech., USA)

Venue Layout



2F

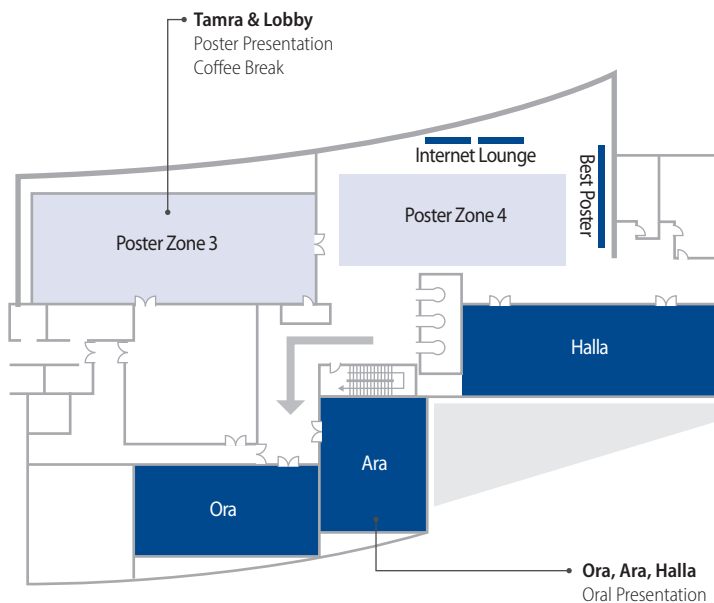
Poster Presentation Zone

Zone 1

Nov. 7 (Mon.) 10-2, 10-3, 11-1, 11-3
 Nov. 8 (Tue.) 10-1, 11-2, 11-4, 13-1
 Nov. 9 (Wed.) 12-1, 12-2, 13-3

Zone 2

Nov. 7 (Mon.) 3-1, 3-3, 5-1
 Nov. 8 (Tue.) 1-1, 2-1, 3-2, 5-3, 12-3
 Nov. 9 (Wed.) 1-2, 1-3, 2-2, 2-3, 3-4



8F

Poster Presentation Zone

Zone 3

Nov. 7 (Mon.) 6-1, 6-2, 8-1, 8-2
 Nov. 8 (Tue.) 6-3, 7-1, 8-3, 9-2, 13-4
 Nov. 9 (Wed.) 6-4, 7-2, 7-3, 13-2

Zone 4

Nov. 7 (Mon.) 9-1, 9-3
 Nov. 8 (Tue.) 4-3
 Nov. 9 (Wed.) 4-1, 4-2

Information

All about Registration

Registration Desk	Nov. 6 (Sun.)	14:00-18:00
Ramada Ballroom Lobby (2F)	Nov. 7-9 (Mon.-Wed.)	08:00-18:00

Registration Fees			Option (for student)		
Regular	USD 650	KRW 715,000	Banquet	USD 50	KRW 55,000
Student	USD 350	KRW 385,000			

Registration Fees Include	
Regular	Admission to All Sessions, eProceedings (Abstracts on APP), Welcome Reception, Banquet, Lunches
Student	Admission to All Sessions, eProceedings (Abstracts on APP), Welcome Reception, Lunches

Personal Envelope



Name Badge

Participants must wear their name badge at all times throughout the conference period. Please note that admission to all session rooms and social programs may be restricted without a name badge. If you have lost your badge or needed correction, please report to the registration desk.



Coupons

Beverage for Welcome Reception (Nov. 6), Lunches (Nov. 7-9), Beverage for Poster Session (Nov. 7), Banquet (Nov. 8)



Receipt & Certificate

You will be given a receipt for the registration fee and a certificate of attendance.



Program Book

Useful information of ENGE 2016 conference and every session



Coffee Break

Conference Room Lobby (2F & 8F)

Fresh coffee and tea will be served during the break times as below.

Nov. 7 (Mon.) 14:40-15:00

Nov. 8 (Tue.) 16:20-16:40

Nov. 9 (Wed.) 16:30-16:50



Lunch

Restaurant (1F)

Please bring your lunch coupons with your name badge.

Nov. 7-8 (Mon.-Tue.) 12:00-13:20

Nov. 9 (Wed.) 12:00-13:00



Doughnut Time

Conference Room Lobby (2F & 8F)

Doughnut & Coffee will be provided every morning.

Nov. 7-9 (Mon.-Wed.) 08:30-08:50



Beer Time

Conference Room Lobby (2F & 8F)

Beer & Snacks will be provided during poster session.

Nov. 7 (Mon.) 18:00-19:30



Message Board

Message board will be set up near the registration desk area so that participants can get useful information from the secretariat or other participants.



WiFi Access

Free WiFi is available in the ENGE 2016 venue as well as hotel room.

Network: RAMADA or RAMADA_PAD



Free Mobile Recharge

Mobile device charging is available at the registration desk (2F).



Electricity

In Korea, 220 volt outlets are most common. Most hotels provide 110 volt outlets for shavers. Please check the power supply before use.



ATM (Automated Teller Machines)

The nearest ATM from the Ramada Ballroom Lobby is located in the front side of CASINO (2F), Ramada Plaza Jeju Hotel.



Secretariat Office

Chuja (2F)

ENGE 2016 participants can use the secretariat office as Lost & Found and Cloakroom during the conference.

Nov. 6 (Sun.) 14:00-18:00

Nov. 7-9 (Mon.-Wed.) 08:00-18:00

Mobile App Service

Bring the entire ENGE meeting to your fingertips! ENGE 2016 Mobile App Service is ready to download to your iPhone, iPad or Android device. The app features full abstracts as well as the daily program schedule, floor plan of the venue and important daily notices allowing you to access real-time information on ENGE 2016.



Simply scan the QR code to download and install ENGE 2016 App onto your mobile device.



Android



iOS

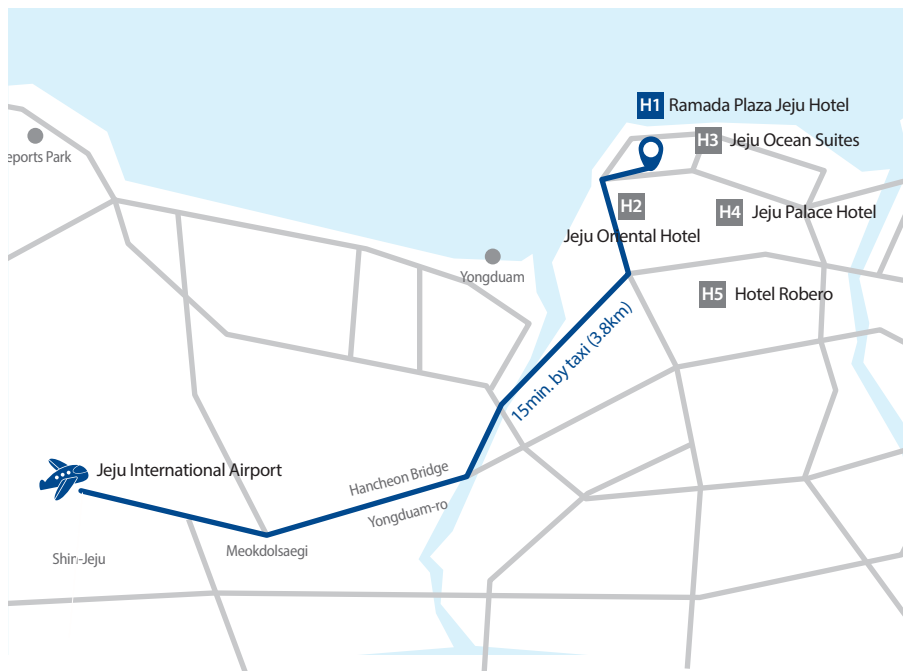
Hotel

Tour Desk | Conference Room Lobby (2F)

Nov. 6 (Sun.) 14:00-18:00

Nov. 7-9 (Mon.-Wed.) 09:00-18:00

The tour desk will be located near the registration desk. Please contact this desk for all tour related information. Participants can also buy a flight ticket and change the flight schedule at this desk.



Hotel	Grade	Address	Distance from Venue	Tel
H1 Ramada Plaza Jeju Hotel	★★★★★	66, Tapdong-ro	Conference Venue	+82-64-729-8100
H2 Jeju Oriental Hotel	★★★★★	47, Topdong-ro	5 min. on foot (0.3km)	+82-64-752-8222
H3 Jeju Ocean Suites	★★★★	74, Tapdonghaean-ro	10 min. on foot (0.7km)	+ 82-64-720-6000
H4 Jeju Palace Hotel	★★★	9, Tapdong-ro	10 min. on foot (0.7km)	+ 82-64-753-8811
H5 Hotel Robero	★★★	26, Gwandeok-ro	5 min. by taxi 20 min. on foot (1.1km)	+ 82-64-757-7111

Social Programs



Welcome Reception

Nov. 6 (Sun.) 18:00-19:30 | Ballroom 1

The welcome reception will be an excellent chance to get together with colleagues and make new friends while enjoying some delicious foods and refreshing beverage. Come and join this entertaining icebreaker to expand professional networks and form partnerships.



Banquet

Nov. 8 (Tue.) 18:00-20:00 | Ramada Ballroom

The banquet will be a great opportunity to meet and network with colleagues in pleasant surroundings. Enjoy the climax of ENGE 2016 with an excellent dinner.



Award

"ENGE 2016 Best Poster Awards" will be given to outstanding contribution to the field of electronic materials and nanotechnology for green environment among papers presented at the conference.

The Awardees will be announced during the conference. So please stay and find out who the winners are.

You may be one of the winners of the ENGE 2016 Best Poster Awards!

- During the coming ENGE 2016 conference, about 50 presenters will be awarded for the best and general poster presentations.
- In order to be considered for the awards, poster presenters stand by their designated numbered poster board in the poster display area during their session time.



Best Awards

KRW 300,000



General Awards

KRW 100,000

Technical Program

Conference Topic

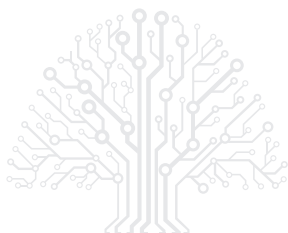
1. Materials for memory and logic devices		Byoung Hun Lee	GIST
1-1	Materials and devices for memory/logic applications	Sungjoo Lee	Sungkyunkwan Univ.
1-2	Materials and processes for interconnects and packaging	Young-Bae Park	Andong Nat'l Univ.
1-3	Materials, processes and devices for 3D integration	Rino Choi	Inha Univ.
2. Materials for flexible and wearable devices		Unyong Jeong	POSTECH
2-1	Materials and systems for tactile sensors	Min-Seok Kim	KRISS
2-2	Materials for wearable healthcare monitoring	Dae-Hyeong Kim	Seoul Nat'l Univ.
2-3	Materials for textile electronic devices	Do Hwan Kim	Soongsil Univ.
3. Materials for frontier displays and optoelectronics		Tae-Woo Lee	Seoul Nat'l Univ.
3-1	Organic LEDs and TFTs	Seunghyup Yoo	KAIST
3-2	Organic/inorganic hybrid LEDs and optoelectronics	Tae-Woo Lee	Seoul Nat'l Univ.
3-3	LED materials and devices	Jong Kyu Kim	POSTECH
3-4	Inorganic and hybrid thin film transistors	Jae-Kyeong Jeong	Hanyang Univ.
4. Two-dimensional materials		Jong-Hyun Ahn	Yonsei Univ.
4-1	Growth and integration of two-dimensional materials	Changgu Lee	Sungkyunkwan Univ.
4-2	Optical, electronic and phonon processes of two-dimensional materials	Hyunmin Kim	DGIST
4-3	Two-dimensional materials for novel functional device platforms	Jong-Hyun Ahn	Yonsei Univ.
5. Advanced nanomaterials & nanofabrications		Won Il Park Woong Kim	Hanyang Univ. Korea Univ.
5-1	Synthesis and applications of optical and electronic nanomaterials	Jong-Soo Lee	DGIST
5-2	Biological & bioelectronic applications of functional nanomaterials	Jae-Seung Lee	Korea Univ.
5-3	Large area synthesis, patterning, and organization of nanomaterials	Wooyoung Shim	Yonsei Univ.
6. Solar energy and environmental materials		Hyun Suk Jung	Sungkyunkwan Univ.
6-1	Perovskite photovoltaics	Jin Young Kim	Seoul Nat'l Univ.
6-2	Inorganic materials for photovoltaics	Woo Kyoung Kim	Yeungnam Univ.
6-3	Organic and hybrid materials for photovoltaics	Jung-Yong Lee	KAIST
6-4	Materials for solar fuels	In Sun Cho	Ajou Univ.

7. Electrochemical energy storage materials	Kisuk Kang	Seoul Nat'l Univ.
7-1 Materials for Li-air batteries	Yong Joon Park	Kyonggi Univ.
7-2 Electrode materials for lithium ion batteries	Yong-Mook Kang	Dongguk Univ.
7-3 All solid state Li/Na batteries	Young-Gi Lee	ETRI
8. Energy harvesting materials	Keon Jae Lee	KAIST
8-1 Nanogenerators	Sang-Woo Kim	Sungkyunkwan Univ.
8-2 Thermoelectric power generators	Sung Wng Kim	Sungkyunkwan Univ.
8-3 Piezoelectric and hybrid power generators	Miso Kim	KRISS
9. Smart sensor materials	Jeong-Min Baik	UNIST
9-1 Materials for chemical and gas sensors	Jeong-Min Baik	UNIST
9-2 Smart biosensors: materials and devices	Taesung Kim	UNIST
9-3 Mechanical/physical sensors and IOT	Changhyun Pang	Sungkyunkwan Univ.
10. Biomaterials	Yoon Sung Nam	KAIST
10-1 Bioelectronic materials and devices	Myung-Han Yoon	GIST
10-2 Biomaterials for organ-on-a-chip	Seung-Woo Cho	Yonsei Univ.
10-3 Biological materials for catalysis and sensing	Young-Pil Kim	Hanyang Univ.
11. Computational materials science	Seungwu Han	Seoul Nat'l Univ.
11-1 Material informatics & design	Seungwu Han	Seoul Nat'l Univ.
11-2 Surface nanoengineering: from nanocatalysis to corrosion science	Aloysius Soon	Yonsei Univ.
11-3 Computational approaches to materials for photonic devices	Ki-Ha Hong	Hanbat Nat'l Univ
11-4 Modeling of electrochemistry at material interfaces	Hyungjun Kim	KAIST
12. Nanomechanics and nanoscopy	Seung Min J. Han	KAIST
12-1 Nanomechanics and device reliability: experiment and modeling	Ju-Young Kim	UNIST
12-2 In-situ nanomechanical testing under microscope	Dongchan Jang	KAIST
12-3 Atomic-resolution analysis of surface, interface and defects	Sang Ho Oh	Sungkyunkwan Univ.
13. General program	Young-Chang Joo	Seoul Nat'l Univ.
13-1 Energy materials	Kyoung-Jin Choi	UNIST
13-2 Nano materials	Ho Won Jang	Seoul Nat'l Univ.
13-3 Electronic optical & magnetic materials	Sung Gyu Pyo	Chung Ang Univ.
13-4 Structural & composite materials	Insuk Choi	KIST

Session Timetable

Nov. 6 (Sun.)	
14:00-18:00	Registration
15:00-18:00	Tutorial Course (Ballroom 2~4)
18:00-19:30	Welcome Reception (Ballroom 1)

Nov. 7 (Mon.)								
	Ballroom 1 (2F)	Ballroom 2 (2F)	Ballroom 3 (2F)	Ballroom 4 (2F)	Udo (2F)	Halla (8F)	Ora (8F)	Ara (8F)
09:00-12:00	3-1 Seunghyup Yoo p.033	11-1 Seungwu Han p.099	5-1 Jong-Soo Lee p.053	10-3 Young-Pil Kim p.093		6-1 Jin Young Kim p.061	8-1 Sang-Woo Kim p.079	9-3 Changhyun Pang p.087
12:00-13:20	Lunch							
13:20-14:00	Plenary Speech 1 Karl Leo (Ballroom 1)							
14:00-14:40	Plenary Speech 2 Chang-Beom Eom (Ballroom 1)							
14:40-15:00	Coffee Break							
15:00-18:00	3-3 Jong Kyu Kim p.033	11-3 Ki-Ha Hong p.099	5-2 Jae-Seung Lee p.053	10-2 Seung-Woo Cho p.093		6-2 Woo Kyoung Kim p.062	8-2 Sung Wng Kim p.079	9-1 Jeong-Min Baik p.087
18:00-19:30	Poster Presentation							
	2F	3-1 p.036 11-3 p.103	3-3 p.038	5-1 p.055	10-2 p.095	10-3 p.096	11-1 p.102	
	8F	6-1 p.065	6-2 p.066	8-1 p.082	8-2 p.083	9-1 p.090	9-3 p.091	



Plenary



Materials for Highly Efficient Organic Devices

Karl Leo

IAPP, TU Dresden, Germany

13:20-14:00, Nov. 7 (Mon.)

Ballroom 1 (2F)

Oxide Nanoelectronics

Chang-Beom Eom

Univ. of Wisconsin-Madison, USA

14:00-14:40, Nov. 7 (Mon.)

Ballroom 1 (2F)



Fueling Human Progress with Sunlight

Harry Atwater

California Inst. of Tech., USA

13:00-13:40, Nov. 9 (Wed.)

Ballroom 1 (2F)

Tutorial

Computational Material Science: Perspective for Experimentalists

Seungwu Han

Seoul Nat'l Univ., Korea

15:00-18:00, Nov. 6 (Sun.)

Ballroom 2-4 (2F)



Keynote



High Efficiency Organic Light Emitting Diodes

Jang-Joo Kim

Seoul Nat'l Univ., Korea

09:00-09:30, Nov. 7 (Mon.)

Ballroom 1 (2F)

The Bulk Photovoltaic Effect in Polar Oxides for Robust and Efficient Solar Energy Harvesting

Andrew Marshall Rappe

Univ. of Pennsylvania, USA

15:00-15:30, Nov. 7 (Mon.)

Ballroom 2 (2F)



Concentrated Liquid Electrolytes

Atsuo Yamada

The Univ. of Tokyo, Japan

09:00-09:30, Nov. 8 (Tue.)

Halla (8F)



Innovating New Materials through Aberration-corrected Microscopy

Stephen John Pennycook

Nat'l Univ. of Singapore, Singapore

13:20-13:50, Nov. 8 (Tue.)

Ballroom 4 (2F)



Synthesis and Applications of Novel Two-Dimensional Nanomaterials

Hua Zhang

Nanyang Technological Univ., Singapore

13:20-13:50, Nov. 8 (Tue.)

Ora (8F)

Grain Boundary Atomic Structures, Vacancies and Segregated Dopants of Electronic Materials and the Properties

Yuichi Ikuhara

The Univ. of Tokyo, Japan

09:00-09:30, Nov. 9 (Wed.)

Ballroom 4 (2F)



Lithium Superionic Conductors and Their Application to All-solid-state Batteries

Ryoji Kanno

Tokyo Inst. of Tech., Japan

10:00-10:30, Nov. 9 (Wed.)

Ara (8F)



Presentation Guideline

Oral Presentation

Presentation Time

- Length of oral presentation material should be in accordance with your time assigned as follows;
 - + Keynote & Invited Presentation: 25 min. presentation + 5 min. Q&A
 - + Oral Presentation: 12 min. presentation + 3 min. Q&A
- Due time is strongly encouraged.

Presentation File & Speaker's Autobiography

- Presentation file should be prepared in MS-PowerPoint format in English.
- If you use fonts other than standard Windows Office 2010, please bring the font files along with the presentation file.
- Please bring your PowerPoint presentation file on USB flash drive and submit it to the staff of each presentation room at least 15 minutes before each session starts. The operator will load the presentation files to the laptop PC.
- Each presenter is also asked to submit his/her own short autobiography to the session chair at least 10 minutes before each session starts.

No Camera & No Record

Please note that photo taking and video recording are strictly prohibited in the presentation room.

Speaker Room

Speaker Room	Mara (2F)	Nov. 6 (Sun.)	14:00-18:00
		Nov. 7-9 (Mon.-Wed.)	08:00-18:00

- Please visit the speaker room to check your presentation file at least 3 hours before your session starts to ensure your presentation file appears properly.
- If your presentation file contains animations or movies, you are advised to check over the technical matters 6 hours prior to your session.
- If a presenter brings his/her own laptop, especially MAC, he/she should also let the staff know 6 hours prior to your session.

Poster Presentation

- Each poster will be assigned a panel, which has its own paper's number at the conference.
- We do not specify the poster format, but each poster should include the paper title, authors, affiliation, and paper number and must fit within a 0.9m x 1.2m space.
- The poster text including the paper title should be printed and enlarged, so that it can be read from distance of at least 2 meters.
- Poster presenters are required to prepare their own poster materials in advance and post their presentations 30 minutes prior to the beginning of the session.
- Please remove your poster within 1 hour after your session is ended. All remaining posters will be removed.
- The materials such as some scissors and tapes will be provided in poster presentation place.

Program

1. Materials for memory and logic devices	020
2. Materials for flexible and wearable devices	028
3. Materials for frontier displays and optoelectronics	033
4. Two-dimensional materials	045
5. Advanced nanomaterials & nanofabrications	053
6. Solar energy and environmental materials	061
7. Electrochemical energy storage materials	073
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10. Biomaterials	093
11. Computational materials science	099
12. Nanomechanics and nanoscopy	107
13. General program	112

1. Materials for memory and logic devices

1-1-1 Materials and devices for memory/logic applications

Chair Sungjoo Lee (Sungkyunkwan University, Korea)

Nov. 08 (Tue.) Udo (2F)

- 09:00-09:15** **Performance Enhancement of Non-Volatile Memory Devices via Block Copolymer Self-Assembly**
 1-1-0810 Byoung Kuk You, Keon Jae Lee
Korea Advanced Institute of Science and Technology, Korea
- 09:15-09:30** **Electrode Dependent Analog and Digital Resistive Switching of CeO₂ Layer**
 1-1-0840 Hyung Jun Kim, Paul Yang, Hong Zheng, Bong Soo Kim, Jong-Sung Park, Chi Jung Kang, Tae-Sik Yoon
Myongji University, Korea
- 09:30-09:45** **Physical and Electrical Characteristics of Ge_xSb_{1-x} for Phase Change Material**
 1-1-1384 Jeong Hoon Kim, Jeong Hee Park, Dae-Seop Byeon, Dae Hong Ko
Yonsei University, Korea
- 09:45-10:00** **Atomic Switching in Fully Solution Processed (Ag/TiOx/MIO) Memory Device**
 1-1-2052 Sujaya Kumar Vishwanath, Taekyu An, Jihoon Kim
Kongju National University, Korea
- 10:00-10:15** **A Study of Defect Generation in Nano-sized InP, GaAs Patterns on Si Substrate**
 1-1-2149 Ju Hee Lee¹, Youngdae Cho¹, In-Geun Lee¹, Chan-Soo Shin², Dae-hyun Kim³, Dae-Hong Ko¹
¹Yonsei University, Korea, ²Korea Advanced Nano Fab Center, Korea, ³Kyungpook National University, Korea
- 10:15-10:30** **A Study of Contact Resistivity Reduction Effect of Interfacial Dipole in Metal-Double Interlayers -Semiconductor Structure**
 1-1-2856 Sun-Woo Kim, Gwang-Sik Kim, Seung-Hwan Kim, Hyun-Yong Yu
Korea University, Korea
- 10:30-10:45** **CMOS Implementation of a Memristor Emulator**
 1-1-3224 Changju Yang, Yongjin Kim, Hyongsuk Kim
Chonbuk National University, Korea

1-1-2 Materials and devices for memory/logic applications

Chair Sungjoo Lee (Sungkyunkwan University, Korea)

Nov. 08 (Tue.) Ballroom 1 (2F)

- INVITED** **Trapping Mechanism of Charge Trap Capacitors with Various High-k Multilayers**
 13:20-13:50 Toshihide Nabatame
 1-1-0218 *National Institute for Materials Science, Japan*
- INVITED** **RRAM-based Cross-bar Arrays: Towards a Novel Data Processing Architectures**
 13:50-14:20 Jinfeng Kang, Peng Huang, Runze Han, Chen Liu, Yudi Zhao, Lifeng Liu, Xiaoyan Liu
 1-1-0331 *Peking University, China*
- INVITED** **Nonvolatile Memory Device and Logic-in-memory Architecture using Ferroelectric Materials**
 14:20-14:50 Sanghun Jeon
 1-1-0494 *Korea University, Korea*

- INVITED** **Scalable Growth of Mono- and Few-layers of 2D TMDCs for Future Electronics Applications**
 14:50-15:20 [Dongzhi Chi](#)
 1-1-0362 *Institute of Materials Research and Engineering, Agency for Science, Technology and Research, Singapore*
- INVITED** **Advanced Group-IV Materials and Devices for Next-Generation Integrated Systems**
 15:20-15:50 [Seongjae Cho](#)
 1-1-0588 *Gachon University, Korea*
- INVITED** **Defect Healing of Graphene for Conductive Flexible Electrodes by Wet & Dry Methods**
 15:50-16:20 [Han-Bo-Ram Lee](#)
 1-1-0401 *Incheon National University, Korea*

1-2 Materials and processes for interconnects and packaging

Chair Young-Bae Park (Andong National University, Korea) Nov. 09 (Wed.) Ballroom 2 (2F)

- INVITED** **Application of Forming Gas Plasma to Low-temperature Cu-Cu Direct Bonding**
 09:00-09:30 [Sungdong Kim](#), Sarah Eunkyung Kim, Youngju Nam
 1-2-0575 *Seoul National University of Science and Technology, Korea*
- INVITED** **Ultra Wafer Thinning Less than 10- μ m for 3D Multi-stack Wafer-On-Wafer (WOW) Application**
 09:30-10:00 [Young Suk Kim](#)
 1-2-0192 *Tokyo Institute of Technology, Japan*
- INVITED** **Application of Copper Nanoparticles Paste as High Thermal Conductivity Die Attach**
 10:00-10:30 [Chee Lip Gan](#)
 1-2-0560 *Nanyang Technological University, Singapore*
- INVITED** **A New Amorphous Alloy Having Liner/Barrier Function for Sub-10 nm Technology Node of LSI Interconnection**
 10:30-11:00 [Junichi Koike](#), Maryamsadat Hosseini, Hiroyuki Koide, Yuji Sutou
 1-2-0594 *Tohoku University, Japan*
- 11:00-11:15** **On the Potential of Tungsten as a Replacement of Copper for Next-generation Semiconductor Interconnects**
 1-2-0729 [Dooho Choi](#), Doseun Kim, Sunghoon Jung, Seung Hoon Lee, Byoung-Joon Kim
Korea Institute of Materials Science, Korea
- 11:15-11:30** **Circular Transmission Line Model Simulation of Contact Resistivity Accuracy in Highly Doped Silicon Substrate**
 1-2-2125 [Hyunsu Shin](#), Seran Park, Eunjung Ko, Jeongmin Choi, Mijin Jung, Daehong Ko
Yonsei University, Korea
- 11:30-11:45** **Influence of Zn Addition on the Microstructural Stability of Sn-0.7 wt% Cu Solder during Electromigration**
 1-2-1839 [Bernardo Ilha](#), Jae-Oh Bang, Jung-Soo Kim, Yongil Kim, Seung-Boo Jung
Sungkyunkwan University, Korea

1-3 Materials, processes and devices for 3D integration

Chair Rino Choi (Inha University, Korea)

Nov. 09 (Wed.) Ballroom 2 (2F)

INVITED

Overview of Technological Approaches to CMOS Integration

13:50-14:20

[Zvi Or-Bach](#)

1-3-0181

Monolithic 3D, USA

INVITED

Wafer Bonding Process for III-V MOSFET and Monolithic 3D Integration on Si Substrates

14:20-14:50

[Hyung-jun Kim](#), SangHyen Kim

1-3-0346

Korea Institute of Science & Technology, Korea

INVITED

3D Integration is Really in Terms of Cost and Energy Saving among Several 3D Technologies, Sequential (monolithic) 3D called CoolCubes™ Integration Offers the Opportunity to Fully Benefit from the 3rd Dimensions

14:50-15:20

1-3-0524

[Maud Vinet](#), Perrine Batude, Claire Fenouillet-Béranger, Laurent Brunet, Olivier Billoint, Sébastien Thuries, Fabien Clermidy, Jean-Michel Hartmann, Sébastien Kerdiles, Vincent Mazzocchi, Vincent Lu, Fabien Deprat, Mikael Cassé, Benoit Sklenard

The French Alternative Energies & Atomic Energy Commission (CEA), Leti, France

INVITED

Design and CAD Research for Monolithic 3D ICs

15:20-15:50

[Sung Kyu Lim](#)

1-3-2555

Georgia Institute of Technology, USA

INVITED

Low Temperature Unit Process Development for Low Power 3D IoT Device

15:50-16:20

1-3-0491

Hyun-Yong Yu¹, Hyoungsub Kim², Han-Youl Ryu³, [Changhwan Choi](#)⁴

¹Korea University, Korea, ²Sungkyunkwan University, Korea, ³Inha University, Korea, ⁴Hanyang University, Korea

16:20-16:35

1-3-2131

Ge Condensation Behaviors in the Selectively Grown Epitaxial SiGe Fin Structures by Dry Oxidation

[Hyunchul Jang](#), Byongju Kim, Sangmo Koo, Dae-hong Ko

Yonsei University, Korea

16:35-16:50

1-3-2284

Controlling the Morphologies of Inkjet Droplet using 1-Octanethiol Coated Copper Nano-ink

[Yeon Ho Son](#)¹, Min Kyu Kang¹, Caroline Sunyong Lee¹, Eric H Yoon², Yongil Kim³, Seung-Boo Jung³

¹Hanyang University, Korea, ²Daechang Co., Ltd, Korea, ³Sungkyunkwan University, Korea

1. Materials for memory and logic devices

1-1 Materials and devices for memory/logic applications

Chair Sungjoo Lee (Sungkyunkwan University, Korea)

16:20-18:00, Nov. 08 (Tue.) 2F

- 1-1-0996 **Schottky Barrier Characteristics of Ti Schottky Contacts on Strained Silicon-on-Insulator (sSOI) Based on Temperature Dependent I - V and C - V Measurements**
I Jyothi, Hoon-Ki Lee, V Janardhanam, Chel-Jong Choi
 Chonbuk National University, Korea
- 1-1-1052 **Threshold Voltage Control of Graphene Barristor**
So-Young Kim, Yun Ji Kim, Chang-Hoo Shim, Jinwoo Noh, Byoung Hun Lee
 Gwangju Institute of Science and Technology, Korea
- 1-1-1087 **Study on the Resistive-Switching Characteristics of Solution Processed Al-Zn-Sn-O Films using Microwave Annealing**
Il-Jin Baek, Tae-Wan Kim, Won-Ju Cho
 Kwangwoon University, Korea
- 1-1-1187 **High Pressure Hydrogen Annealing on Top Gate Graphene Field-effect Transistors**
Yun Ji Kim, Byoung Hun Lee
 Gwangju Institute of Science and Technology, Korea
- 1-1-1239 **Fabrication of Resistive Switching Memory based on Solution Processed PMMA – HfO_x Blended Thin Film**
Jae-Won Lee, Won-Ju Cho
 Kwangwoon University, Korea
- 1-1-1700 **Hindrance of the Ferroelectric Properties of PVDF-TrFE Depending on the Photoactive Crosslinker and Transition from Non-volatile Memory to Typical Transistor**
Sukjae Jang, Sukang Bae, Sang Hyun Lee, Tae-Wook Kim
 Korea Institute of Science and Technology, Korea
- 1-1-1750 **Effects of Fully Depleted SOI on Ultra-fast Swing Slope of 1 T-DRAM Memory**
Sehyun Kwon¹, Minho Choi¹, Yong Tae Kim², In-Sung Park¹, Jinho Ahn¹, Sorin Cristoloveanu³
¹Hanyang University, Korea, ²Korea Institute of Science and Technology, Korea, ³IMEP-LAHC, Grenoble INP Minatéc, France
- 1-1-1822 **Effect of IPL Treatment on the Electrical Characteristics of Transparent Metal/ZnO/ITO/PET Resistor**
Taehoon Lee, Yong Chan Jung, Sejong Seong, Bo Li, Hyun-Jun Hwang, Hak-Sung Kim, In-Sung Park, Jinho Ahn
 Hanyang University, Korea
- 1-1-1890 **Effects of Vacancy and Distortion in In₃SbTe₂ Phase-change Material by Bi Dopant**
Minho Choi¹, Heechae Choi², Yong Tae Kim³, Jinho Ahn¹
¹Hanyang University, Korea, ²Virtual Labortory, Korea, ³Korea Institute of Science and Technology, Korea

- 1-1-1939 **Suppression of Phosphorous Diffusion by Caron-doping in Ultra-Shallow Si Junctions**
Eunjung Ko, Minhyeong Lee, Jeongmin Choi, Seran Park, Hyunsu Shin, Hoonjung Oh, Dae-Hong Ko
Yonsei University, Korea
- 1-1-2059 **Memristive Behavior of Organic-inorganic Hybrid Perovskite Thin Films**
Jaeho Choi, Sunghak Park, Ho Won Jang, Ki Tae Nam
Seoul National University, Korea
- 1-1-2243 **The Effect of the Specific Contact Resistivity of Ti Silicide Formed on a SiGe Substrate with a Se Interlayer**
Mijin Jung, Jeongmin Choi, Eunjung Ko, Seran Park, Hyunsu Shin, Daehong Ko
Yonsei University, Korea
- 1-1-2427 **Study on Si_{1-x}Ge_x Surface Properties with NF₃/H₂O Dry Cleaning Process**
Seran Park¹, Chiyoung Choi², Gyoodong Kim², Sangmin Ryu³, Jongseok Lee³, Daehong Ko¹, Hoonjung Oh¹
¹Yonsei University, Korea, ²Advanced Cleaning Network, Korea, ³SK Hynix Inc., Korea
- 1-1-2643 **Effect of HfO₂ Crystal Phase on Memory Window in MAHOS Structure for 3D Flash Memory**
Heedo Na, Juyoung Jeong, Jimin Lee, Hyunchul Sohn
Yonsei University, Korea
- 1-1-2817 **Multilevel Non-volatile Memory Operation Device using Hysteresis of Networked Carbon Nanotubes**
Ihn Hwang, Cheolmin Park
Yonsei University, Korea
- 1-1-3108 **The Effect of the Electrode on the Characteristics of Ovonic Threshold Switch (OTS) Devices**
 Juhee Seo, Seong Won Cho, Hyung-Woo Ahn, Byung-ki Cheong, Suyoun Lee
Korea Institute of Science and Technology, Korea
- 1-1-3164 **A Study on the Characteristics of Mo Oxide Thin Films for Possible Application to Volatile Switching Device**
Ho Joon Ryu, Seong Won Cho, Minwoo Seo, Suyoun Lee, Byung-ki Cheong
Korea Institute of Science and Technology, Korea
- 1-1-3171 **The Enhancement of the Flash Memory Boosting Efficiency by Adding Deep N- Phosphorous Implantation**
Youngho Kwon^{1,2}, Byoung-deog Choi¹, IkHyung Joo²
¹Sungkyunkwan University, Korea, ²Samsung Electronics, Korea
- 1-1-3182 **Data Retention Issues by Degradation of IPD and Models of Sub-20nm NAND Flash Devices**
Sungjin Jang^{1,2}, Byoung Deog Choi¹
¹Sungkyunkwan University, Korea, ²Samsung Electronics Memory Division, Korea
- 1-1-3298 **Resistance Switching Properties of TaO_x/Ta₂O₅ Bilayer Structure for Nonvolatile Memory Devices**
Joonwoo Kim, Hyunseok Shim, Heeyeon Noh, Bunyod Allabergenov, Byeongdae Choi, Myoung-Jae Lee
Daegu Gyeongbuk Institute of Science and Technology, Korea

- 1-1-3395 **A Study of High Voltage Oxide Breakdown Induced by Etch Damage in NAND Flash Memory**
Sungjin Jang^{1,2}, Byoung Deog Choi¹
¹Sungkyunkwan University, Korea, ²Samsung Electronics Memory Division, Korea
- 1-1-3396 **The Optimization of Flash Memory Contact Resistance by Reducing Contact to Contact Interfacial Resistance**
Youngho Kwon^{1,2}, Byoungdeog Choi¹, Wookhyoung Lee², IkHyung Joo²
¹Sungkyunkwan University, Korea, ²Samsung Electronics, Korea

1-2 Materials and processes for interconnects and packaging

Chair Young-Bae Park (Andong National University, Korea) 16:30-17:30, Nov. 09 (Wed.) 2F

- 1-2-0453 **Study of Copper Thin Film Growth on Tungsten-based Diffusion Barriers by Electrodeposition for Microelectronic Applications**
Hongmin Youn¹, Kang O Kim¹, Soo-Hyun Kim², Sunjung Kim¹
¹University of Ulsan, Korea, ²Yeungnam University, Korea
- 1-2-0874 **Microstructure and Mechanical Behaviour of Low-melting Bi-Sn-In Solder Joints**
Van Luong Nguyen, Sang Hoon Kim, Jaecheol Yoon, Jae Won Jeong, Tae-Soo Lim, Dong-Yeol Yang, Ki Bong Kim, Young Ja Kim, Jun Hong Lee, Yong-Jin Kim, Sangsun Yang
 Korea Institute of Materials Science, Korea
- 1-2-0947 **Formation and Characterization of Metallic Joints Using Paste Containing Ag-Coated Cu Fillers**
Changhyun Lee, Jong-Hyun Lee
 Seoul National University of Science and Technology, Korea
- 1-2-0977 **Interfacial Adhesion Degradation Mechanism of Screen-Printed Ag / Polyimide in Temperature/Humidity Environment**
Young-Bae Park, Byung-Hyun Bae, Hyeonchul Lee, Kirak Son, Gahee Kim, Jina Lee
 Andong National University, Korea
- 1-2-1336 **The Environmental Friendly Patterning Method for Electronic Device, based on Surface Energy of Water**
Sung Min Lee, Seung Keun Song, Suk Tai Chang
 Chung-Ang University, Korea
- 1-2-1549 **Fabrication of Ag Paste and Die Attach of Power Devices using Ag Sintering**
Jong-Hoon Back¹, Byung-Suk Lee¹, So-Jeong Na¹, Seung-Boo Jung², Jeong-Won Yoon¹
¹Korea Institute of Industrial Technology, Korea, ²Sungkyunkwan University, Korea
- 1-2-1764 **Effect of Zn Addition on Interfacial Reactions and Mechanical Property of Sn-0.7Cu Solder Joints with Multiple Reflows**
Kyung-Yeol Kim, Woo-Ram Myung, Jae-oh Bang, Seung-Boo Jung
 Sungkyunkwan University, Korea
- 1-2-1782 **Electromigration Performance of Ag Metal Lines Printed by Electrohydrodynamic (EHD) Jet Printing**
Chaeri Yu, Jihoon Kim, Seok-Cheol Ko
 Kongju National University, Korea

- 1-2-1932 **Study on the Growth Behavior of W Films Deposited by Atmospheric Laser Chemical Vapor Deposition (LCVD) Depending on the Laser Energy**
 Kyunghoon Jeong¹, InJae Byun², Jiwon Lee¹, Son Singh¹, Pichen Gong¹, Jaegab Lee¹
¹Kookmin University, Korea, ²Charm Engineering Co., Korea
- 1-2-1956 **Physical Patterning Performance in the Modified Layer Extraction Rule with an Image Sensor Device**
 Keunwon Kang, Eunmi Choi, Soon Hyeong Kwon, Minwoo Nam, Sung Gyu Pyo
 Chung-Ang University, Korea
- 1-2-2030 **TEM Investigation on the Oxidation Behavior of Electroless Ni/immersion Au Surface Finish at 250 °C**
Min-Su Kim, Hiroshi Nishikawa
 Osaka University, Japan
- 1-2-2111 **Delamination Failure Detection Method of Power Semiconductor**
SungSoon Choi, Seongdae Noh, Wooyoung Lee, KwanHun Lee
 Korea Electronics Technology Institute, Korea
- 1-2-2238 **Intermetallic Compound Formation and Mechanical Property of Sn-Cu-xCr Lead-free Solder**
JungHwan Bang¹, Jun-Hyuk Son¹, Dong-Yurl Yu¹, Yong-Ho Ko¹, Hiroshi Nishikawa², Chang-Woo Lee¹
¹Korea Institute of Industrial Technology, Korea, ²Osaka University, Japan
- 1-2-2321 **TLP Bonding using Sn-Cu Solder and Cu Powder for Power Device Bonding**
Byung-Suk Lee¹, Soong-Keun Hyun², Jeong-Won Yoon¹
¹Korea Institute of Industrial Technology, Korea, ²Inha University, Korea
- 1-2-2470 **Direct Writing of Low Resistive Co Films on Various Substrates by Atmospheric Laser Chemical Vapor Deposition**
Jiwon Lee¹, Kyunghoon Jeong¹, InJae Byun², Jaegab Lee¹
¹Kookmin University, Korea, ²Charm Engineering Co., Korea
- 1-2-2684 **A Study on Etching Behavior of Cu and Invar for Uniform via Hole of CIC (Cu-Invar-Cu)**
Jong Chan Choi, Jae Ho Lee
 Hongik University, Korea
- 1-2-2988 **Effects of Pretreatments on the Adhesion between Copper/Substrate on Electroless Copper Plating in PCB**
Ju-Suk Kang¹, Jinuk Lee², Hyun-Woo Kwon², Jae-Ho Lee¹
¹Hongik University, Korea, ²Samsung Electro-Mechanics, Korea
- 1-2-3005 **In-situ Electrochemical Monitoring of Electroless Copper Bath to Enhance the Uniformity of Copper in PCB**
Young-Hwan Bae, Jae-Ho Lee
 Hongik University, Korea
- 1-2-3235 **Filler-Induced Reliability Degradation in Semiconductor Devices Assembled Utilizing a LOC Package Technique**
Seong-Min Lee
 Incheon National University, Korea

- 1-2-3380 **Thermo-mechanical Characteristics in Solder Joints of Flip Chip Package for Pillar Bump's Aspect Ratios and Pitch Lengths**
HeeSeon Bang, YongHyuk Kwon, HanSur Bang
 ChoSun University, Korea

1-3 Materials, processes and devices for 3D integration

- | Chair | Rino Choi (Inha University, Korea) | 16:30-17:30, Nov. 09 (Wed.) 2F |
|----------|--|--------------------------------|
| 1-3-1048 | Implementation of a Front-End Module by Embedding Active ICs and Capacitors in a Substrate
<u>Jong-In Ryu</u> , Junchul Kim, Jongchul Park
Korea Electronics Technology Institute, Korea | |
| 1-3-1817 | Monolithic 3D Integration of Graphene Field-effect Transistors
<u>Ho In Lee</u> , Sang Kyung Lee, Tae Jin Yoo, Abu Naser Rashid Reza, Byoung Hun Lee
Gwangju Institute of Science and Technology, Korea | |
| 1-3-1873 | Characterizations of Self-assembled Layer-by-Layer Layers for Reducing the Thermal Expansion Stress on through Silicon via
<u>Daekyun Jeong</u> , Jiwon Lee, Jaegab Lee
Kookmin University, Korea | |
| 1-3-1882 | 3D Printing based Single-build Process for Electronic Devices
<u>Hyun Woo Dang</u> ¹ , Young Su Kim ¹ , Young Jin Yang ¹ , Bon Jin Koo ² , Yong Suk Yang ² , In Kyu You ² ,
Chang Woo Lee ³ , Yang Hoi Doh ¹ , Kyung Hyun Choi ¹
¹ Jeju National University, Korea, ² Electronics and Telecommunications Research Institute, Korea,
³ Korea Institute of Machinery and Materials, Korea | |
| 1-3-2222 | Formation of a Polycrystalline Silicon Thin Film by a Blue Laser Diode Annealing
<u>Young-Hwan Choi</u> , Guen-Hwan Ryu, Han-Youl Ryu
Inha University, Korea | |
| 1-3-2837 | Solid Phase Crystallization of Amorphous Silicon using Amorphous SiGe as a Seed Layer
<u>Young Mo Kim</u> , Ji Woo Park, Hyun Chul Sohn
Yonsei University, Korea | |
| 1-3-2889 | Highly Vertical-sloped Dry Etching of InGaAs/InP in Cl₂/BCl₃/N₂ Inductively Coupled Plasmas for Tunneling Field Effect Transistors
<u>In-Geun Lee</u> ¹ , Young-Dae Cho ¹ , Dukyeon Yoo ² , Jae Won Choi ² , Hyun-Beom Shin ² , Kyung-Ho Park ² ,
Won-Kyu Park ² , Chan-Soo Shin ² , Jeongkeun Song ³ , Sung Ho Choi ³ , Do Sun Lee ⁴ , Dong Soo Lee ⁴ ,
Hyoungsub Kim ³ , Dae-Hyun Kim ⁵ , Dae-Hong Ko ¹
¹ Yonsei University, Korea, ² Korea Advanced Nano Fab Center, Korea, ³ Sungkyunkwan University, Korea,
⁴ Samsung Electronics Co., Ltd., Korea, ⁵ Kyungpook National University, Korea | |

2. Materials for flexible and wearable devices

2-1 Materials and systems for tactile sensors

Chair Min-Seok Kim (Korea Research Institute of Standards and Science, Korea)

Nov. 08 (Tue.) Ballroom 3 (2F)

INVITED Tactile Sensors: Piezoresistive Nanomembrane-based Approach

13:20-13:50

Min-Seok Kim

2-1-0248

Korea Research Institute of Standards and Science, Korea

INVITED Polymer-based Water Resistive Flexible Tactile Sensor

13:50-14:20

Ki-Uk Kyung

2-1-0547

Electronics and Telecommunications Research Institute, Korea

INVITED Simple Methods for Highly Sensitive Multimodal Tactile Systems in Soft Robotics

14:20-14:50

Lucia Beccai

2-1-0627

Istituto Italiano di Tecnologia, Italy

INVITED Adhesion of Thin Metal Films on the Polymeric Flexible Substrates

14:50-15:20

Jeong-Ki Kim, Haseob Seong, Young-Ho Kim

2-1-3400

Hanyang University, Korea

INVITED Electrospun Nanofibers for Stretchable Devices

15:20-15:50

Unyong Jeong

2-1-3282

Pohang University of Science and Technology, Korea

15:50-16:05 Conformal and Multifunctional 3D Sensor based on the Graphene for E-Skin

2-1-1716

Minhoon Park¹, Je-Jung Kim², Yon-Kyu Park¹, Jong-Hyun Ahn², Min-Seok Kim¹

¹Korea Research Institute of Standards and Science, Korea, ²Yonsei University, Korea

16:05-16:20 Integrated Active-Matrix Pressure Sensors Using Air-Dielectric Graphene Transistors with Wide Pressure Ranges

2-1-2638

Sungho Shin, Sangyoon Ji, Byeong Wan An, Jang-Ung Park

Ulsan National Institute of Science and Technology, Korea

16:20-16:35 Bending Insensitive Pressure Sensor using Nano Particel Embedded Nanofibers

2-1-2704

Sungwon Lee

Daegu Gyeongbuk Institute of Science and Technology, Korea

2-2 Materials for wearable healthcare monitoring

Chair Dae-Hyeong Kim (Seoul National University, Korea)

Nov. 09 (Wed.) Ballroom 3 (2F)

INVITED Sensors based on Nanomaterials for Wearable and Smart Electronics in Healthcare

09:00-09:30

Nae-Eung Lee

2-2-0416

Sungkyunkwan University, Korea

INVITED Implantable Bio-signal Monitoring System with Ultrasoft Electrodes

09:30-10:00

Tsuyoshi Sekitani

2-2-2547

Osaka University, Japan

- INVITED** **Photo-patternable Cellulose Substrates for Transparent and Stretchable Electronics**
 10:00-10:30 Jang-Ung Park
 2-2-0537 *Ulsan National Institute of Science and Technology, Korea*
- INVITED** **Self-Powered Flexible Inorganic Electronic Systems**
 10:30-11:00 Keon Jae Lee
 2-2-2346 *Korea Advanced Institute of Science and Technology, Korea*
- 11:00-11:15** **Direct Electron Transfer of Enzymes within a Layered Conductive Nanomesh of Single-Walled Carbon Nanotubes for the 3rd Generation Biosensor Platform**
 2-2-1069 Seung-Woo Lee, Ki-Young Lee, Yong-Won Song, Won Kook Choi, Joonyeon Chang, Hyunjung Yi
Korea Institute of Science and Technology, Korea
- 11:15-11:30** **A Graphene-based Electrochemical and Physiological Device with Thermoresponsive Microneedles for Diabetes Monitoring and Therapy**
 2-2-2813 Yongsik Lee, Tae Kyu Choi, Dae-Hyeong Kim
Seoul National University, Institute of Basic Science, Korea
- 11:30-11:45** **Octopus-Inspired Smart Adhesive Pads for Transfer Printing of Semiconducting Micro-/Nanomembranes**
 2-2-3185 Hochan Lee, Doo-Seung Um, Youngsu Lee, Seongdong Lim, Hyunhyub Ko
Ulsan National Institute of Science and Technology, Korea

2-3 Materials for textile electronic devices

Chair Do Hwan Kim (Soongsil University, Korea) Nov. 09 (Wed.) Ballroom 3 (2F)

- INVITED** **Hydrogel: A Platform for Nanostructured Conducting Polymer and Applications in Electronics**
 13:50-14:20 Lijia Pan
 2-3-0320 *Nanjing University, China*
- INVITED** **Stretchable Array of Polyaniline Nanofiber based Sensors**
 14:20-14:50 Jeong Sook Ha
 2-3-0173 *Korea University, Korea*
- INVITED** **Preparation of Porous Graphene/Nanoparticle Composite Scaffolds via Diffusion-driven Layer-by-layer Assembly**
 14:50-15:20 Franklin Kim
 2-3-0465 *Kyoto University, Japan*
- INVITED** **Silver Nanoflowers for Highly Conductive Stretchable Fibers Synthesized by Wet Spinning**
 15:20-15:50 Rujun Ma, Byeongguk Kang, Suik Cho, Minjun Choi, Seunghyun Baik
 2-3-0151 *Sungkyunkwan University, Korea*
- INVITED** **Electronic Skin in Robotics**
 15:50-16:20 Ravinder Dahiya
 2-3-0261 *University of Glasgow, UK*

16:20-16:35

2-3-2824

Stretchable, Transparent Electrodes Based on Metallic Glasses with Superior Mechanical Properties and Thermal Stability

Byeong Wan An, Eun-Ji Gwak, Kukjoo Kim, Young-Geun Park, Young-Cheon Kim, Jiuk Jang,
Ju-Young Kim, Jang-Ung Park

Ulsan National Institute of Science and Technology, Korea

2. Materials for flexible and wearable devices

2-1 Materials and systems for tactile sensors

Chair Min-Seok Kim (Korea Research Institute of Standards and Science, Korea)

16:20-18:00, Nov. 08 (Tue.) 2F

2-1-1139 **Microfluidic Techniques Based Novel Capacitive Sensors Using Ionic Liquids Electrodes and CNT/PDMS Composites**

Sun Geun Yoon, Suk Tai Chang
Chung-Ang University, Korea

2-1-2865 **Fingertip Skin-Inspired Multimodal Electronic Skins Discriminating Static/Dynamic Pressure and Temperature Stimuli**

Jonghwa Park, Youngoh Lee, Hyunhyub Ko
Ulsan National Institute of Science and Technology, Korea

2-1-3346 **Highly Sensitive Biomimetic Artificial Skin Using Ionic Mechanotransducer**

Eunsong Lee¹, Sangsik Park¹, Ming Linag Jin², Younghoon Lee³, Ji Hye Lee⁴, Junho Chung¹,
Joo Sung Kim¹, Jong-Seon Kim², Dae Woo Kim², Jae Woo Chung¹, Seung Geol Lee⁴, Dukhyun Choi³,
Hee-Tae Jung², Do Hwan Kim¹
¹Soongsil University, Korea, ²Korea Advanced Institute of Science and Technology, Korea,
³Kyung Hee University, Korea, ⁴Pusan National University, Korea

2-2 Materials for wearable healthcare monitoring

Chair Dae-Hyeong Kim (Seoul National University, Korea)

16:30-17:30, Nov. 09 (Wed.) 2F

2-2-0828 **Research on Exotic Carbon Materials for Multi-Functional Applications**

Seongwoo Ryu
Korea Advanced Institute of Science and Technology, Korea

2-2-1000 **Development of High Performance Flexible Material for the Wearable Electronics**

Se-hoon Park
Korea Electronics Technology Institute, Korea

2-2-1666 **Highly Stretchable Gold Nanosheet Electrodes Patterned by Stamping Process**

Jun Hyuk Song¹, Sungmin Moon², Unyong Jeong²
¹Yonsei University, Korea, ²Pohang University of Science and Technology, Korea

2-2-1675 **Rubber Clay Like Electrospun Fibrous Mat with Three-Dimensional Porous Structure**

Sunghwan Cho¹, Hyejin Hwang², Gyeongbae Park², Unyong Jeong²
¹Yonsei University, Korea, ²Pohang University of Science and Technology, Korea

2-2-2631 **Block Copolymer Based Stretchable Electrode Material**

Jun Hyuk Song¹, Sungmin Moon², Unyong Jeong²
¹Yonsei University, Korea, ²Pohang University of Science and Technology, Korea

- 2-2-2641 **Stretchable Electronic Skin for Apex Cardiogram Monitoring**
Gilwoon Lee, Insang You, Hyunwoo Kim, Unyong Jeong
Pohang University of Science and Technology, Korea
- 2-2-2648 **Smart Endoscope Systems using Soft Materials and Devices for Colon Cancer Treatment**
Youngsik Lee, Dae-Hyeong Kim
Seoul National University, Institute for Basic Science, Korea
- 2-2-2827 **Electromechanical Cardioplasty Using a Highly Conductive and Elastic Epicardial Mesh**
Suji Choi¹, Hye Jin Hwang², Dae-hyeong Kim¹
¹*Seoul National University, Institute for Basic Science, Korea,* ²*Harvard Medical School, USA*
- 2-2-2964 **PEDOT:PSS based Hybrid Organogels for the Soft Electronic Conductors**
Seung-Min Lim, Yoo-Yong Lee, Jung-Kwon Yang, Seok Hyeon Gwon, Gwang Mook Choi,
 Jeong-Yun Sun, Young-Chang Joo
Seoul National University, Korea

2-3 Materials for textile electronic devices

Chair Do Hwan Kim (Soongsil University, Korea)

16:30-17:30, Nov. 09 (Wed.) 2F

- 2-3-2796 **Highly Stable Electric Conductivity of Glass Bead / Carbon Nanotube Composite Electric Pathway for Bending Movements**
Chang Kee Lee, Eun Ae Shin, Sung Wook Hwang, Jin Kie Shim
Korea Institute of Industrial Technology, Korea
- 2-3-2840 **Capillary Printing of Aligned Silver Nanowire Transparent Electrode for High Efficiency Photovoltaic Devices**
Saewon Kang, Taehyo Kim, Seungse Cho, YoungOh Lee, Ayoung Choe, Seo-Jin Ko, Bright Walker,
 Jin Young Kim, Hyunhyub Ko
Ulsan National Institute of Science and Technology, Korea
- 2-3-2893 **Study on Mechanical Properties of Organic Field-effect Transistors and Circuits on Ultra-thin Flexible Substrate**
Eul-Yong Shin, Yong-Young Noh
Dongguk University, Korea
- 2-3-3341 **Stretchable and Multimodal Tactile Electronics Using Hierarchically Engineered Carbon Nanotube Microfabrics**
 So Young Kim, Sangsik Park, Do Hyung Park, Han Wool Park, Do Hwan Kim
Soongsil University, Korea

3. Materials for frontier displays and optoelectronics

3-1 Organic LEDs and TFTs

Chair Seunghyup Yoo (Korea Advanced Institute of Science and Technology, Korea)

Nov. 07 (Mon.) Ballroom 1 (2F)

KEYNOTE

High Efficiency Organic Light Emitting Diodes

09:00-09:30

Jang-Joo Kim

3-1-5001

Seoul National University, Korea

INVITED

Universal Ohmic Electron and Hole Contacts for Organic Electronics and Other Solution-processed Electronics

09:30-10:00

3-1-3401

Peter Ho, Rui-Qi Png, Lay-Lay Chua

National University of Singapore, Singapore

10:00-10:15

3-1-0477

Highly Efficient Phosphorescent Organic Light-Emitting Diodes with Horizontal Emitting Dipoles

Kwon-Hyeon Kim¹, Chang-Ki Moon¹, Yun-Hi Kim², Jang-Joo Kim¹

¹Seoul National University, Korea, ²Gyeongsang National University, Korea

10:15-10:30

3-1-1866

Charge Injection Improvement in Organic Field-effect Transistors by Surface Modification of Source and Drain Electrodes with Dipolar Interlayers

Hyeoun Kyu Sim¹, Philippe Lang², Gilles Horowitz³, Jin-Hyuk Bae⁴, Hyeok Kim¹

¹Korea Institute of Industrial Technology, Korea, ²CNRS, UMR 7086, France, ³Ecole Polytechnique, France,

⁴Kyungpook National University, Korea

INVITED

Strained Single-crystal Organic Transistors

10:30-11:00

3-1-1940

Jun Takeya

The University of Tokyo, Japan

INVITED

Development of Printed Ambipolar Polymer Complementary Integrated Circuits

11:00-11:30

3-1-0347

Yong Young Noh

Dongguk University, Korea

3-3 LED materials and devices

Chair Jong Kyu Kim (Pohang University of Science and Technology, Korea) *Nov. 07 (Mon.) Ballroom 1 (2F)*

INVITED

Group III Nitride Materials for Large Area Light Emitting Devices

15:00-15:30

3-3-0149

Hiroshi Fujioka, Atsushi Kobayashi, Jitsuo Ohta, Kohei Ueno

The University of Tokyo, Japan

INVITED

Polarized Light Emission from Nitride-based Light-emitting Diodes

15:30-16:00

3-3-0464

Jaehye Cho¹, E. Fred Schubert²

¹Chonbuk National University, Korea, ²Rensselaer Polytechnic Institute, USA

INVITED

Effects of Uniform Current Distribution on Wall-Plug Efficiency in AlGaN-based Deep-Ultraviolet Light-Emitting Diodes

16:00-16:30

3-3-0266

Guo-Dong Hao, Manabu Taniguchi, Shin-ichiro Inoue

National Institute of Information and Communications Technology, Japan

- INVITED** **Classical and Quantum Light Generation using Nitride Semiconductor Nano- and Micro-structures**
 16:30-17:00 Yong-Hoon Cho
 3-3-0500 *Korea Advanced Institute of Science and Technology, Korea*
- 17:00-17:15 **Flexible Display using Ink-Jet Printed QD-LED with Flexible Silver Nanowire/Graphene Electrode**
 3-3-1707 Sun-Kyo Kim, Yeong-Soo Choi, Seung-Yeol Yang, Yong-Seog Kim
Hongik University, Korea

3-2 Organic/inorganic hybrid LEDs and optoelectronics

Chair Tae-Woo Lee (Seoul National University, Korea) *Nov. 08 (Tue.) Ballroom 1 (2F)*

- INVITED** **Next Electroluminescence Platform: Organic-Inorganic Hybrid Perovskites**
 09:00-09:30 Himchan Cho¹, Su-Hun Jeong², Min-Ho Park², Young-Hoon Kim¹, Christoph Wolf², Chang-Lyoul Lee³,
 3-2-0224 Jin Hyuck Heo⁴, Aditya Sadhanala⁵, NoSung Myung³, Seunghyup Yoo⁶, Sang Hyuk Im⁴,
 Richard H. Friend⁷, Tae-Woo Lee¹
¹Seoul National University, Korea, ²Pohang University of Science and Technology, Korea, ³Gwangju Institute of Science & Technology, Korea, ⁴Kyung Hee University, Korea, ⁵University of Cambridge, India, ⁶Korea Advanced Institute of Science and Technology, Korea, ⁷University of Cambridge, UK
- INVITED** **The Photophysics of Halide Perovskites: From Low-dimensional Systems to Single Crystals**
 09:30-10:00 Tze-Chien Sum
 3-2-0256 *Nanyang Technological University, Singapore*
- INVITED** **Overcoming Electroluminescence Efficiency Limitation of All-inorganic Perovskite QLEDs**
 10:00-10:30 Haibo Zeng
 3-2-0540 *Nanjing University of Science and Technology, China*
- 10:30-10:45 **Self-supporting Ion Gels for Electrochemiluminescent Sticker-Type Display**
 3-2-0852 Kihyon Hong¹, Yeong Kwan Kwon², Hae Min Yang², Keun Hyung Lee²
¹Korea Institute of Materials Science, Korea, ²Inha University, Korea
- INVITED** **Improving the Performance of Perovskite Light-Emitting Diodes via Morphological Control of Perovskite Films**
 10:45-11:15 Myoung Hoon Song, Jaechoul Yu
 3-2-0202 *Ulsan National Institute of Science and Technology, Korea*

3-4 Inorganic and hybrid thin film transistors

Chair Jae-Kyeong Jeong (Hanyang University, Korea) *Nov. 09 (Wed.) Ballroom 1 (2F)*

- INVITED** **Development of New Amorphous Oxide Semiconductors: How to Understand and Control Their Defects?**
 09:00-09:30 Toshio Kamiya, Keisuke Ide, Hideya Kumomi, Hideo Hosono
 3-4-0321 *Tokyo Institute of Technology, Japan*
- INVITED** **P and n-type Materials and Devices based on Oxides and Chalcogenide Materials**
 09:30-10:00 Manuel Quevedo-Lopez
 3-4-0694 *The University of Texas at Dallas, USA*

INVITED

10:00-10:30

3-4-0169

High Performance In-Ga-Zn-O Thin-Film Transistors for Flexible Display ApplicationsHyun-Suk Kim*Chungnam National University, Korea*

10:30-10:45

3-4-2188

Fabrication of Dynamic Digital X-ray Detector based on a-IGZO Thin Film TransistorsJihwan Jung, Myeong-ho Kim, Junwon Park, Duckkyun Choi*Hanyang University, Korea*

10:45-11:00

3-4-2198

Self-aligned Coplanar Top Gate a-IGZO TFT with DUV IrradiationSung-ho Jeon¹, Myeong-ho Kim¹, So-yang Choi¹, Jun-hyung Lim², Duck-kyun Choi¹¹*Hanyang University, Korea*, ²*Samsung Display, Korea*

11:00-11:15

3-4-2454

Molybdenum Alloy based Source/Drain Electrode Material for High-mobility Oxide Thin-film Transistors and Its Copper Diffusion Barrier PropertyKwang-Heum Lee, Yunyong Nam, Geumbi Mun, Sang-Hee Ko Park*Korea Advanced Institute of Science and Technology, Korea*

11:15-11:30

3-4-2996

Thin Film Transistors based on Ge Doped Zn₂SnO₄ Transparent Oxide SemiconductorAbhishek Kumar Sharma¹, Rahim Abdur², Jaegab Lee², Sang-Im Yoo¹¹*Seoul National University, Korea*, ²*Kookmin University, Korea*

INVITED

11:30-12:00

3-4-0571

High Mobility Oxide TFT for Large Area AM DisplaySang-Hee Ko Park, Jaehan Ahn, Yujin Kim, Guk-Jin Jeon, Kwang-Heum Lee*Korea Advanced Institute of Science and Technology, Korea*

3. Materials for frontier displays and optoelectronics

3-1 Organic LEDs and TFTs

Chair Seunghyup Yoo (Korea Advanced Institute of Science and Technology, Korea)

18:00-19:30, Nov. 07 (Mon.) 2F

- 3-1-0429 **Carbazole/Indole-Substituted Bianthracene Derivatives for Blue Organic Light-Emitting Diodes**
Changmin Kim¹, Ho Won Lee², Young Kwan Kim², Seung Soo Yoon¹
¹Sungkyunkwan University, Korea, ²Hongik University, Korea
- 3-1-0625 **2- (9,9-Diethyl-2-vinyl-9H-fluoren-7-yl)-1,4-diphenyltriphenylene Derivatives Substituted with Arylamine for Blue Organic Light-Emitting Diodes**
Dong Young Kim¹, Jisu Kang¹, Song Eun Lee², Young Kwan Kim², Seung Soo Yoon¹
¹Sungkyunkwan University, Korea, ²Hongik University, Korea
- 3-1-0682 **Synthesis and Electro-Optical Properties of Adamantane-based Host and Hole-Transporting Material for Thermal Stable Blue Phosphorescent OLEDs**
Yoonho Eom, Min Hye Seo, Sungkoo Lee
 Korea Institute of Industrial Technology, Korea
- 3-1-0753 **Triangular Geometry Assisted Molecular Align on a Microscale Patterned Layer in Solution-processed Transistors**
Do-Kyung Kim, Hyeok Bin Kwon, Premkumar Vincent, Ji-Hoon Jung, Jin-Hyuk Bae
 Kyungpook National University, Korea
- 3-1-1224 **Photoresponsive Behavior of TIPS-Pentacene/TiO₂ Composite Thin-Film Transistors**
Hyunji Shin¹, Dongwook Kim¹, Dokyeong Kim¹, Jong Sun Choi¹, Xue Zhang², Hyunju Lee²,
 Youngjin Ham², Jaehoon Park²
¹Hongik University, Korea, ²Hallym University, Korea
- 3-1-1268 **The Effect of the Injection Barrier on the Mobility of an Organic Field-effect Transistor with a Semiconducting Organic Buffer Layer**
Gyujeong Lee¹, Min-Hoi Kim², Sin-Doo Lee¹
¹Seoul National University, Korea, ²Hanbat National University, Korea
- 3-1-1332 **Full-Color Thermally Activated Delayed Fluorescence Materials Based on 1-methyl-carbazole**
Geon Hyeong Lee, Young Sik Kim
 Hongik University, Korea
- 3-1-1600 **Synthesis and Photophysical Properties of Dithieno[3,2-b:2',3'-d]thiophene (DTT) Containing Conjugated Polymers**
Euichan Kim, Taek Ahn
 Kyungsung University, Korea
- 3-1-1622 **Synthesis and Characterization of Modified Poly (4-vinylphenol) with Thermally Curable 4-Trifluorovinyl Group for Gate Insulator in Thin Film Transistor**
Euichan Kim, Taek Ahn
 Kyungsung University, Korea

- 3-1-1642 **Chemical Exfoliation to Layered Transition Metal Oxide Monolayers and Their Hole Injection Layer Performance for OLED**
Kyoung Soon Choi¹, Min Joon Park², Yooseok Kim¹, Cheolho Jeon¹, Jonghan Won¹, Soo Young Kim², Hee Jung Park³, Jouhahn Lee¹
¹Korea Basic Science Institute, Korea, ²Chung-Ang University, Korea ³Daejeon University, Korea
- 3-1-1645 **Effect of Buffer Layer on the Electrical Performance of Ferroelectric Organic Memory Transistors**
Min-Hoi Kim, Amos Boampong, Ju-Ryong Kim, Yoonseuk Choi, Jae-Hyun Lee
 Hanbat National University, Korea
- 3-1-1955 **Thin Film Encapsulation with Al₂O₃/HfO₂/Alucone Hybrid Layers by Atomic Layer Deposition**
Minwoo Nam¹, Keunwon Kang¹, Aream Kim¹, Soon Hyeong Kwon¹, Eunmi Choi¹, Nak-Kwan Chung², Sung Gyu Pyo¹
¹Chung-Ang University, Korea, ²Korea Research Institute of Standards and Science, Korea
- 3-1-2075 **Highly Efficient Sky-Blue Fluorescence from Organic Light Emitting Diode Utilizing Mixed Cohost System**
Jinwon Sun, Jang-Joo Kim
 Seoul National University, Korea
- 3-1-2164 **Novel Laminated Top Electrode of OLEDs based on Chlorine-doped Multi-layered Graphene**
Sunghee Park¹, Jong Tae Lim², Kyongnam Kim³, Hyunkoo Lee², Seong Chu Lim⁴, Byung-Hwa Kwon², Nam Sung Cho², Geun Young Yeom⁴, Seunghyup Yoo¹, Jeong-Ik Lee²
¹Korea Advanced Institute of Science and Technology, Korea, ²Electronics and Telecommunications Research Institute, Korea, ³Daejeon University, Korea, ⁴Sungkyunkwan University, Korea
- 3-1-2442 **Mechanism of Peel-off of Extremely Flat Metal Thin Film for Flexible OLED Substrate : Effect of Surface Treatment on Delamination**
Sungjoo Kim, Jong-Lam Lee
 Pohang University of Science and Technology, Korea
- 3-1-2448 **Flexible Hazy Substrate with Embedded Scattering Voids for Enhancing Light out-coupling Efficiency**
Seungo Gim, Ilhwan Lee, Jae Yong Park, Jong-Lam Lee
 Pohang University of Science and Technology, Korea
- 3-1-2656 **Dependence of Photoresponse on Energy Barrier between Organic Semiconductor and Source/Drain Electrodes of Organic Phototransistor**
Hea-Lim Park, Sin-Hyung Lee, Sin-Doo Lee
 Seoul National University, Korea
- 3-1-2670 **High-Performance Electroluminescent Solution Blended with Robust Non-radiating Polymers**
Eui Hyuk Kim, Cheolmin Park, Seungwon Lee
 Yonsei University, Korea
- 3-1-2671 **A Field-induced Hole Generation Layer for High Performance Organic Light Emitting Device**
 Cheolmin Park, Eui Hyuk Kim, Seungwon Lee
 Yonsei University, Korea

- 3-1-2920 **High Efficiency, Simplified, Solution-Processed Thermally Activated Delayed-Fluorescence Organic Light-Emitting Diodes**
Young-Hoon Kim, Tae-Woo Lee
Seoul National University, Korea
- 3-1-2924 **Organic Alternating Current Driven Electroluminescence Programmable with Built-in Electric Field Induced by Ferroelectric P (VDF-TrFE) Layer**
Beomjin Jeong, Sung Hwan Cho, Eui Hyuk Kim, Cheolmin Park
Yonsei University, Korea
- 3-1-3008 **Charge Transfer and Separation Efficiencies of P-doped Organic Semiconductors**
 Akpeko Gasonoo, Min-Hoi Kim, Yoonseuk Choi, Jae-Hyun Lee
Hanbat National University, Korea
- 3-1-3033 **N-type Electrical Doping in Organic Semiconductors: Formation and Dissociation Efficiencies of Charge Transfer Complex**
Jae-Min Kim¹, Seung-Jun Yoo¹, Chang-Ki Moon¹, Bomi Sim¹, Jae-Hyun Lee², Heeseon Lim³, Jeong Won Kim⁴, Jang-Joo Kim¹
¹Seoul National University, Korea, ²Hanbat National University, Korea, ³Korea Advanced Institute of Science and Technology, Korea, ⁴Korea Research Institute of Standards and Science, Korea
- 3-1-3162 **Combined Inter-and Intra-molecular Charge Transfer Processes for Highly Efficient Fluorescent Organic Light-emitting Diodes with Reduced Triplet Exciton Quenching**
Chang-Ki Moon¹, Katsuaki Suzuki², Katsuyuki Shizu², Hironori Kaji², Jang-Joo Kim¹
¹Seoul National University, Korea, ²Kyoto University, Japan
- 3-1-3410 **Highly Efficient Blue Phosphorescent OLED with over 34% of EQE using a Low Refractive Index Charge Transporting Materials**
Hyun Shin, Jeong-Hwan Lee, Chang-Ki Moon, Bomi Sim, Jang-Joo Kim
Seoul National University, Korea

3-3 LED materials and devices

Chair Jong Kyu Kim (Pohang University of Science and Technology, Korea)

18:00-19:30, Nov. 07 (Mon.) 2F

- 3-3-0751 **Sn- ZnO/Ag/Sn-ZnO Multilayer for Transparent Contact Electrode in GaN LED Applications**
Nae-Man Park¹, Munsik Oh², Yun-Been Na³, Woo-Seok Cheong¹, Hyunsoo Kim²
¹Electronics and Telecommunications Research Institute, Korea, ²Chonbuk National University, Korea, ³University of Science and Technology, Korea
- 3-3-0774 **Optical Properties and Birefringence of M-Plane and R-Plane Sapphire Substrates in the Terahertz Frequency Range**
 Soohwan Jang¹, Jaehun Park², Seongheun Kim², Kwang Hyeon Baik³
¹Dankook University, Korea, ²Pohang Accelerator Laboratory, Korea, ³Hongik University, Korea
- 3-3-0844 **Optical Properties of Dy³⁺- and Eu³⁺-Codoped SrWO₄ Phosphors for White Light-emitting Diodes**
Jinhong Lee, Shinho Cho
Silla University, Korea

- 3-3-0921 **Design of LED Dimming Control Systems by Delta Sigma Modulation of Input Signals**
Keehong Um
Hansei University, Korea
- 3-3-1061 **Development of Highly Reliable Ag Alloy Wire for Light-Emitting Diodes**
Byungjin Ma¹, Kwan Hun Lee¹, Juho Lee¹, Sung Jae Hong², Young Il Heo², Seung Hyun Kim²,
 Chang Wan Kim³
¹Korea Electronics Technology Institute, Korea, ²MKE Electron Co. Ltd., Korea, ³Clean Technology Leader, Korea
- 3-3-1232 **Effect of Interface Layer between Coating Layer and Substrate on Thermal Properties for Composite Materials**
Dong-Yong Kim¹, Jong-Gu Kim¹, Byung-Dong Hahn², Young-Rae Cho¹
¹Pusan National University, Korea, ²Korea Institute Materials Science, Korea
- 3-3-1272 **Analytical Study on Junction Temperatures of GaInN/AlGaIn Deep-UV LEDs**
 C. Y. Ho¹, B. C. Chen², J. W. Yu¹, M. Y. Wen³
¹Hwa Hsia University of Technology, Taiwan, ²Buddhist Dalin Tzu Chi General Hospital, Taiwan, ³Cheng Shiu University, Taiwan
- 3-3-1412 **Investigations on Luminescence Properties of GaN-based Light-emitting Diodes with Defective Regions**
Jongseok Kim¹, HyungTae Kim¹, Seungtaek Kim¹, Hoon Jeong¹, Kyung Chan Jin¹, MinSoo Noh²,
 In-Sung Cho², Hyundon Jung², Wonjin Choi⁴
¹Korea Institute of Industrial Technology, Korea, ²Soft-Epi Inc., Korea, ³Etamax, Korea, ⁴Hanyang University, Korea
- 3-3-1467 **Effect of Sintering Condition on Crystallization of Zircon-Diopside Glass-ceramics Composites**
Dayoung Lee, Seunggu Kang
Kyonggi University, Korea
- 3-3-1544 **Carrier Transport of Silver Nanowire Contact to P-GaN**
Munsik Oh, Seonghoon Jeong, Minkyung Baek, Hyunsoo Kim
Chonbuk National University, Korea
- 3-3-1738 **Ultrathin Side Emitting LED for Ultrathin Back-light Unit**
In Yeol Hong, Seung Kyu Oh, Yu Jung Cha, Joon Seop Kwak
Sunchon National University, Korea
- 3-3-2129 **Effects of Hydrogen and Oxygen Plasma Treatment on Conducting Properties of RF Magnetron ITO Thin Films**
Jae-Kwan Kim, Ji-Myon Lee
Sunchon National University, Korea
- 3-3-2168 **Temperature Dependence of Efficiency Droop in InGaIn-based Blue Light-emitting Diodes**
Guen-Hwan Ryu, Young-Hwan Choi, Han-Youl Ryu
Inha University, Korea
- 3-3-2624 **Optical Characterization of Light-emitting Diodes Grown on the Various Substrate Patterning Dimensions**
Yoon Seok Kim, Sang Mook Kim
Korea Photonics Technology Institute, Korea

- 3-3-2758 **Macro and Nano-scopic Optical Property of 375nm Near-ultraviolet Light Emitting Diodes**
Yu Lim Lee¹, Joon Seop Kwak¹, Jong Hyeob Baek², Yoon Seok Kim²
¹Sunchon National University, Korea, ²Korea Photonics Technology Institute, Korea
- 3-3-3408 **A Novel Mn⁴⁺-Activated Red Phosphor for Use in Light Emitting Diodes, K₂SiF₇:Mn⁴⁺**
Minseuk Kim¹, Myoungho Pyo², Woon Bae Park¹, Changhae Kim³, Kee-Sun Sohn¹
¹Sejong University, Korea, ²Sunchon National University, Korea, ³Korea Research Institute of Chemical Technology, Korea
- 3-3-3456 **Fabrication of Al-based Metal PKG & PCB for High-power LED Module with Excellent Heat Dissipation Characteristics and Evaluation of Thermal Resistance of the LED Module**
Jung-Kab Park, Sun-Woo Kim, Seung-Bin Baek, Jong-Hwan Park, Young-Il Song, Yong-Soo Oh, Su-Jeong Suh
 Sungkyunkwan University, Korea
- 3-3-3468 **High Performance COB Type PCB for LED Lighting**
Kwang-Yeal Lee¹, Sung-Ki Kim², Min-Sang Lee³, Young-Ki Lee⁴
¹Chonbuk National University, Korea, ²Doart, Korea, ³Ecolumy, Korea, ⁴Uiduk University, Korea

3-2 Organic/inorganic hybrid LEDs and optoelectronics

Chair Tae-Woo Lee (Seoul National University, Korea)

16:20-18:00, Nov. 08 (Tue.) 2F

- 3-2-0878 **Effect of Bathocuproine as Electron Transfer Layer for Efficient Perovskite Light Emitting Diodes**
Changyun Moon, Sangouk Kim
 Korea Advanced Institute of Science and Technology, Korea
- 3-2-0912 **Use of MoS₂/GO Nanocomposite in Organic Light Emitting Diode as Hole Injection Layer**
Minjoon Park¹, Nguyen Thang Phan¹, Kyoung Soon Choi², Soo Young Kim¹
¹Chung-Ang University, Korea, ²Korea Basic Science Institute, Korea
- 3-2-1204 **All Solution-processed Quantum Dot Light Emitting Diode Prepared with EHD-jet Printing**
 Yunsoo Ka, Young-Jin Kwack, Namhun Baek, Byambaa Erdenedagva, Kyung-Hyung Lee, Woon-Seop Choi
 Hoseo University, Korea
- 3-2-1301 **Synergetic Approach to Improve Recombination Rate and Charge Balance in Highly Efficient Perovskite LEDs**
Min-Ho Park¹, Su-Hun Jeong¹, Christoph Wolf¹, Tae-Woo Lee²
¹Pohang University of Science and Technology, Korea, ²Seoul National University, Korea
- 3-2-1346 **Self-doped Conducting Polymer as Anode Interfacial Layer for Efficient Organic-Inorganic Hybrid Perovskite Light-Emitting Diodes**
S. Ahn¹, H. Cho², Y.-H. Kim², C. Wolf¹, Tae-Woo Lee²
¹Pohang University of Science and Technology, Korea, ²Seoul National University, Korea
- 3-2-1806 **Lead-free Inorganic - Perovskites for Light-emitting Diodes**
Jungmin Heo¹, Hobeom Kim², Tae-Woo Lee¹
¹Seoul National University, Korea, ²Pohang University of Science and Technology, Korea

- 3-2-1835 **Highly Efficient and Stable Perovskite Light-Emitting Diodes using Amino Acid Passivation**
Joo Sung Kim¹, Christoph Wolf², Himchan Cho¹, Tae-Woo Lee¹
¹Seoul National University, Korea, ²Pohang University of Science and Technology, Korea
- 3-2-2008 **Improving the Performance and Stability of Perovskite Light-Emitting Diodes by Annealing Treatment**
Jae Choul Yu, Dae Woo Kim, Da Bin Kim, Myoung Hoon Song
 Ulsan National Institute of Science and Technology, Korea
- 3-2-2012 **Enhanced Performance Perovskite LED using PEDOT: MoO₃ Composite Layers**
Da Bin Kim, Jae Chul Yu, Myoung Hoon Song
 Ulsan National Institute of Science and Technology, Korea
- 3-2-2343 **Inhibition of Ion Migration for Reliable Operation of Hybrid Perovskite-Based Metal/Semiconductor/Metal Broadband Photodetectors**
Kootak Hong¹, Ki Chang Kwon¹, Soo Young Kim², Ho Won Jang¹
¹Seoul National University, Korea, ²Chung-Ang University, Korea
- 3-2-2474 **Effect of Inorganic Buffer Layers on Solution-processed Inverted Quantum-Dot Light-Emitting-Diodes**
Namhun Baek, Kyung-Hyung Lee, Woon-Seop Choi
 Hoseo University, Korea
- 3-2-2478 **Perovskite Light-emitting Diodes with High Efficiency and Full-coverage Electroluminescence by Controlling Morphology**
 Myoung Hoon Song, Jae Choul Yu, Da Bin Kim, Dae Woo Kim
 Ulsan National Institute of Science and Technology, Korea
- 3-2-2925 **Bright Organic/Inorganic Hybrid Perovskite Light-Emitting Diodes**
Young-Hoon Kim, Tae-Woo Lee
 Seoul National University, Korea
- 3-2-3038 **Highly-Efficiency Perovskite Light-Emitting Diodes based on Mixed Cations**
Himchan Cho¹, Joo Sung Kim¹, Christoph Wolf², Hyung Joong Yun³, Jong Seong Bae³, Tae-Woo Lee¹
¹Seoul National University, Korea, ²Pohang University of Science and Technology, Korea, ³Korea Basic Science Institute, Korea

3-4 Inorganic and hybrid thin film transistors

- | Chair | Jae-Kyeong Jeong (Hanyang University, Korea) | 16:30-17:30, Nov. 09 (Wed.) 2F |
|----------|--|--------------------------------|
| 3-4-0762 | Effect of Hydroxyl Molecule Transferred Metal-oxide Film at Pre-annealing Step on Electrical Properties in a Solution-Processed Oxide Transistor
<u>Hyeok Bin Kwon</u> , Do-Kyung Kim, <u>Ji-Hoon Jung</u> , Premkumar Vincent, Eunji Choe, Jin-Hyuk Bae
Kyungpook National University, Korea | |
| 3-4-0931 | Investigation of Low-thermal Budget Microwave Irradiation Effect on Dopant Activation in Silicon-based Devices
<u>Cheol-Min Lim</u> , Won-Ju Cho
Kwangwoon University, Korea | |

- 3-4-0952 **Effects of SOG Passivation Layers Annealed in Various Ambient Conditions on the Stability of Amorphous InGaZnO Thin Film Transistors**
Jinsung Choi, Jin-Kuk Kim, Seong Min Shin, Byung Seong Bae, Eui-Jung Yun
 Hoseo University, Korea
- 3-4-0973 **High Mobility Thin Film Transistors Formed by Metal Catalytic Crystallization of Amorphous Zinc Tin Oxide Semiconductors**
SangTae Kim, Tae Jung Gim, Minhoe Cho, Ji Won Lee, Yeon Woo Shin, Jae Kyeong Jeong
 Hanyang University, Korea
- 3-4-0993 **Oxygen Ratio Effect of Positive Gate Bias Stability and Recovery in A-IGZO Thin Film Transistors**
Nuri On, Azida Azmi, Jiwon Lee, Yeonwoo Shin, Jaekyeong Jeong
 Hanyang University, Korea
- 3-4-1009 **Effect of UV Curing Process for High Quality Gate Insulator Formation of Thin Film Transistor**
Hyeonjoo Seul, Jiwon Lee, Yeonwoo Shin, Taejung Gim, Minhoe Cho, Jaekyeong Jeong
 Hanyang University, Korea
- 3-4-1287 **Schottky Contact with the Temperature Dependence in a Depletion Region of Indium-gallium-zinc-oxide Thin Film Transistor**
Teresa Oh
 Cheongju University, Korea
- 3-4-1563 **High Performance Ambipolar Thin-film Transistors based on Solution-processed Hybrid Bilayers of Carbon-nanotube/Indium-gallium-zinc-oxide Semiconductors**
Jun-young Jeon¹, Woobin Lee², Yong-Hoon Kim², Tae-Jun Ha¹
¹Kwangwoon University, Korea, ²Sungkyunkwan University, Korea
- 3-4-1670 **Solution Processed Zn-Doped SnO₂ for P-Type Channel Material**
An Hoang-Thuy Nguyen, Manh-Cuong Nguyen, Jaewon Choi, Sooyeon Han, Jungyeon Kim, Rino Choi
 Inha University, Korea
- 3-4-1906 **Electrical Characteristics of Organic Thin-Film Transistors with a Solution-Processed Zirconium Oxide Gate Dielectric**
Jin-Hyuk Kwon¹, Xue Zhang², Jin-Hyuk Bae¹, Jaehoon Park²
¹Kyungpook National University, Korea, ²Hallym University, Korea
- 3-4-2000 **A Study of Charge Injection Features through Homogeneous Interfacial Engineering in Solution-Processed Metal Oxide Thin-film Transistors**
 Eunji Choe¹, Hyeok Bin Kwon¹, Do-Kyung Kim¹, Young-Rae Kim¹, Jaehoon Park², Jin-Hyuk Bae¹,
Dong-Seok Song¹
¹Kyungpook National University, Korea, ²Hallym University, Korea
- 3-4-2070 **A P-type X-oxynitride Thin-film Transistor**
Ki June Lee, Tae Jung Gim, Min Hoe Cho, Jae Kyeong Jeong
 Hanyang University, Korea
- 3-4-2154 **Annealing Effect of Rapid Thermal Process (RTP) on the Electrical Characteristics of Back-Channel Etched Al-IZTO TFTs**
Yunyong Nam¹, Jong-Heon Yang², Sanghyun Ji³, Oh-Sang Kwon², Jae-Eun Pi², Chi-Sun Hwang²,
 Sung Haeng Cho², Jaehan Ahn¹, Pilseong Jeong³, Sang-Hee Ko Park¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Electronics and Telecommunications Research Institute, Korea, ³AP Systems, Korea

- 3-4-2192 **Enhancement of Stability of Bottom Gate a-IGZO TFTs under the Positive-bias-thermal-stress Condition by RTA Treatment**
Junwon Park, MyeongHo Kim, DuckKyun Choi
Hanyang University, Korea
- 3-4-2248 **Fabrication and Optimization of Hafnium Based Materials for Gate Dielectric Application**
NaYoung Lee, ByoungDeog Choi
Sungkyunkwan University, Korea
- 3-4-2299 **Impact of Thermal Annealing Temperature on Electrical Performances of ZnON TFTs**
Hwan Seok Jeong, Dae Hwan Kim, Hee Joong Kim, Chan Yong Jeong, Sang Hun Song, Hyuck In Kwon
Chung-Ang University, Korea
- 3-4-2304 **Impact of Oxygen Flow Rate on the Electrical Performances and Stabilities in ZnON TFTs**
Dae-Hwan Kim, Hwan-Seok Jeong, Hee-Joong Kim, Chan-Yong Jeong, Sang-Hun Song, Hyuck-In Kwon
Chung-Ang University, Korea
- 3-4-2335 **Analysis of Interface Traps in P-type Poly-Si TFT using Charge Pumping Method**
Sang Sub Kim, Byoung Deog Choi
Sungkyunkwan University, Korea
- 3-4-2341 **Electrical Properties of Solution-processed Nanolaminates of ZrO_2 and Al_2O_3 as Gate Insulator Materials for Thin-film Transistors**
Hyunwoo Kim, Byoung Deog Choi
Sungkyunkwan University, Korea
- 3-4-2362 **Flexible Indium-Tin-Zinc Oxide Thin-Film Transistors using Hybrid Buffer Layers on Polyimide Substrates**
Dae-Gyu Yang, Hyun-Suk Kim
Chungnam National University, Korea
- 3-4-2399 **Effects of IZTO:AlZr Layer Thickness on Stability IZTO/IZTO:AlZr TFT**
Yun-Been Na, Jeong-Jin Park, Chan-Hwa Hong, Chang-Ho Lee, Woo-Seok Cheong
Electronics and Telecommunications Research Institute, Korea
- 3-4-2502 **Development of NBIS-Stable Oxide Thin-Film Transistors using Ultra-Wide Bandgap Amorphous Oxide Semiconductors**
Jeong-Jin Park^{1,2}, Yun-Been Na¹, Chan-Hwa Hong¹, Chang-Ho Lee¹, Byeong-Kwon Ju², Woo-Seok Cheong¹
¹Electronics and Telecommunications Research Institute, Korea, ²Korea University, Korea
- 3-4-2723 **Effect of ZnO Nanowires on the Electrical Performance of InZnO Thin-film Transistor**
Seungil Choi, Yooseong Lim, Min Hyung Jang, Ji In Park, Nam Kyung Hwang, Moonsuk Yi
Pusan National University, Korea
- 3-4-2868 **Tuning the Electrical Properties of Amorphous Oxide Semiconductors through Structural Relaxation-Driven Electron Doping and Extrinsic Cu Doping**
Han-Wool Yeon, Seung-Min Lim, Ho-Young Kang, Young-Chang Joo
Seoul National University, Korea

- 3-4-3069 **Improved Stability of Dual-active Layer Amorphous Indium-gallium-zinc-oxide TFT under the NBIS Condition**
Soyang Choi, Myeong-ho Kim, Duckkyun Choi
Hanyang University, Korea
- 3-4-3250 **Defect Density Analysis of HfInZnO Thin Film Transistor**
Youngin Goh, Sanghun Jeon
Korea University, Korea
- 3-4-3278 **Understanding on the Defects and Charge Trapping Mechanism in Oxide-thin Film Transistors by Pulse I-V Method**
Taeho Kim, Kyungkwan Kim, Minhyun Jung, Sanghun Jeon
Korea University, Korea

4. Two-dimensional materials

4-3 Two-dimensional materials for novel functional device platforms

Chair Jong-Hyun Ahn (Yonsei University, Korea)

Nov. 08 (Tue.) Ora (8F)

KEYNOTE Synthesis and Applications of Novel Two-Dimensional Nanomaterials

13:20-13:50 [Hua Zhang](#)

4-3-5002 *Nanyang Technological University, Singapore*

INVITED Strong Light-matter Interactions at Graphene-heterostructures for Photonics and Photo-to-energy Conversions

13:50-14:20

4-3-3273 [Chun-Wei Chen](#)

National Taiwan University, Taiwan

INVITED Self-assembled Hetero-semiconducting Structure based on Two-dimensional Transition Metal Dichalcogenides

14:20-14:50

4-3-0319 [Kazuhiro Tsukagoshi](#), Mahito Yamamoto

National Institute for Materials Science, Japan

INVITED Triboelectric and Piezoelectric Properties of Two-Dimensional Materials for Self-Powered Electronics

14:50-15:20

4-3-0424 [Sang-Woo Kim](#)

Sungkyunkwan University, Korea

INVITED Optoelectronics based on Two-dimensional Semiconductor Heterostructures

15:20-15:50 [Chul-Ho Lee](#)

4-3-0351 *Korea University, Korea*

15:50-16:05 Synthesis of Aligned Transition Metal Dichalcogenide Wire using Evaporation-induced Self-assembly Method and Their Application

4-3-1512

[Seoung-Ki Lee](#)¹, Jae-Bok Lee², Kuldeep Rana², Jong-Hyun Ahn²

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

16:05-16:20 Fabrication of Flexible, Transparent, and Skin-attachable Field-effect Transistor (FET) Sensors based on Graphene-silver Nanowire

4-3-2634

Jang-Ung Park, [Joohee Kim](#)

Ulsan National Institute of Science and Technology, Korea

4-1 Growth and integration of two-dimensional materials

Chair Chul-Ho Lee (Korea University, Korea)

Nov. 09 (Wed.) Ora (8F)

INVITED Highly Efficient Photodetectors based on Heterostructures of 2D Materials

09:00-09:30 [Qiaoliang Bao](#), Yupeng Zhang

4-1-0210 *Monash University, Australia*

- INVITED**
09:30-10:00
4-1-0390
Growth of Graphene-based 3D Nanostructures for Energy Storage Materials and Electro-Mechanical Actuators
Ilkwon Oh
Korea Advanced Institute of Science and Technology, Korea
- INVITED**
10:00-10:30
4-1-0488
Synthesis, Application and Heterostructure of Monolayer Semiconductors
Yi-Hsien Lee
National Tsing Hua University, Taiwan
- INVITED**
10:30-11:00
4-1-0447
Large-area and Highly Crystalline CVD-grown 2D Nanosheet Device for Flexible Electronics
Sunkook Kim
Kyung Hee University, Korea
- 11:00-11:15**
4-1-0718
Lithography-free Plasma-induced Patterned Growth of MoS₂ and Its Heterojunction with Graphene
Xiang Chen, Jong-Hyun Ahn
Yonsei University, Korea
- 11:15-11:30**
4-1-2976
Transfer-free Growth of Polymer-Derived Graphene via Mobile Hot-Wire-Assisted CVD
Jinwook Baek, Myeongsoo Lee, Jinsup Lee, Jungmo Kim, Jaegil Choi, Seokwoo Jeon
Korea Advanced Institute of Science and Technology, Korea
- 11:30-11:45**
4-1-3063
Low Temperature Direct Growth of WS₂ Thin Films and Nano-sheets by Plasma-enhanced Atomic Layer Deposition
Seungmin Yeo¹, Jusang Pak¹, Hyungjun Kim¹, Soo-Hyun Kim²
¹*Yonsei University, Korea*, ²*Yeungnam University, Korea*

4-2 Optical, electronic and phonon processes of two-dimensional materials

Chair Hyunmin Kim (Daegu Gyeongbuk Institute of Science and Technology, Korea)

Nov. 09 (Wed.) Ora (8F)

- INVITED**
13:50-14:20
4-2-0334
Transports in Metal Contacts to Few-layer Black Phosphorous
Jaedong Lee
Daegu Gyeongbuk Institute of Science and Technology, Korea
- INVITED**
14:20-14:50
4-2-0462
Coherent Spectroscopy in the Single Molecule Limit
Eric Olaf Potma
University of California, Irvine, USA
- INVITED**
14:50-15:20
4-2-0487
Raman Spectroscopy for Surface Scientific Investigation of 2-Dimensional Crystals
Sunmin Ryu
Pohang University of Science and Technology, Korea
- INVITED**
15:20-15:50
4-2-2677
Optical Characterization of Next Generation Materials at the Nano-Scale
Stephan Stranick, Ryan Beams
National Institute of Standards and Technology, USA

INVITED

15:50-16:20

4-2-2543

Ultrafast Carrier Dynamics of MoS₂ Studied by Transient Differential Second Harmonic Generation MicroscopyHyunmin Kim*Daegu Gyeongbuk Institute of Science and Technology, Korea*

INVITED

16:20-16:50

4-2-3451

Probing Interlayer Interaction in van der Waals 2D CrystalsJonghwan Kim, Chenhao Jin, Feng Wang*University of California Berkeley and Lawrence Berkeley National Laboratory, USA*

16:50-17:05

4-2-2769

PEG-Functionalized Graphene Quantum Dots for Enhanced Exciton Dissociation in Organic Solar CellsTravis G. Novak¹, Jungmo Kim¹, Sung Ho Song¹, Gwang Hoon Jun¹, Hyojung Kim², Mun Seok Jeong², Seokwoo Jeon¹¹*Korea Advanced Institute of Science and Technology, Korea*, ²*Sungkyunkwan University, Korea*

4. Two-dimensional materials

4-3 Two-dimensional materials for novel functional device platforms

Chair Jong-Hyun Ahn (Yonsei University, Korea)

16:20-18:00, Nov. 08 (Tue.) 8F

- 4-3-0609 **Molecular Dynamics Simulations on Graphene NEMS Switch with Carbon Nanotube Electrode**
Eunae Lee¹, Ki-Sub Kim¹, Gyoo-Yeong Lee², Jeong Won Kang¹
¹Korea National University of Transportation, Korea, ²Kangwon National University, Korea
- 4-3-0792 **Direct Growth of Two-Dimensional Vanadium Oxide Nanostructures on Graphene Nanosheets by Thermal Evaporation**
Su-Ar Oh, Jong-Il Kim, Yea Eun Chae, Ji Hui Yoon, Ki-Chul Kim
 Mokwon University, Korea
- 4-3-0859 **Preparation of Layered-Controlled Two-Dimensional Black Phosphorus with Environment Stability**
Jingyuan Jia, Sung Kyu Jang, Shen Lai, Jiao Xu, Sungjoo Lee
 Sungkyunkwan University, Korea
- 4-3-0883 **Study of MXene Electrode for All 2D Integration of Electronic Devices**
Jiao Xu, Jaewoo Shim, Jin-Hong Park, Sungjoo Lee
 Sungkyunkwan University, Korea
- 4-3-1089 **Impacts of Series Resistance at Top-gate Graphene FET**
Sunwoo Heo, Sang Kyung Lee, Yun Ji Kim, Byoung Hun Lee
 Gwangju Institute of Science and Technology, Korea
- 4-3-1213 **Deposition of IZO Thin Film for the Improvement of AgNW Thermal Stability**
Sslimsearom You, Sangmo Kim, Kyung Hwan Kim
 Gachon University, Korea
- 4-3-1500 **Graphene Protected Ag Nanowires: Blocking of Surface Migration for Thermally Stable and Wide-range-wavelength Transparent Flexible Electrodes**
Jaeyeong Lee, Aram Lee, Hak Ki Yu
 Ajou University, Korea
- 4-3-1577 **Self-healing and Curing of Defective Graphene**
Eunji Ji, GwanHyoung Lee
 Yonsei University, Korea
- 4-3-1847 **Electrical, Optical and Photocatalytic Properties of Ag NWs Deposited ITO Thin Film**
Keon Yuep Shin, Sang Mo Kim, Kyung Hwan Kim, Sslimsearom You
 Gachon University, Korea
- 4-3-1907 **Two-dimensional Pn Injection Devices using Electrically Tunable Schottky Barrier at Heterointerfaces**
Junyoung Kwon, Gwan-Hyoung Lee
 Yonsei University, Korea

- 4-3-1961 **In Situ Analysis of Copper Electrochemical Deposition on Reduced Graphene Oxide Electrode**
Longshou Zheng, Eunmi Choi, Soon Hyeong Kwon, Areum Kim, Keunwon Kang, Minwoo Nam,
 Sung Gyu Pyo
Chung-Ang University, Korea
- 4-3-2014 **High-Performance Flexible Transparent Heater with a Uniform Metal Micromesh Film**
Yoonkap Kim, Sam-Soo Kim, Jae-Sung Park, DoYun Hwang, Sung-Eun Park
Gumi Electronics & Information Technology Research Institute, Korea
- 4-3-2177 **Highly Enhanced Electromechanical Stability of Large-area Graphene Transferred by Electrothermal-dry Transfer**
 Jangheon Kim¹, Gi Gyu Kim², Soohyun Kim¹, Wonsuk Jung²
¹Korea Advanced Institute of Science and Technology, Korea, ²Wonkwang University, Korea
- 4-3-2733 **MoS₂ Transistors Manufactured with the Solution Process**
Jihwan Moon, Sangyeon Lee, Donghyeun Sim, Hyungtak Seo
Ajou University, Korea
- 4-3-2800 **ITO Transparent Electrode Substrate for Strain Isolation Structure-based Stretchable Electronics**
Samsoo Kim¹, Jaesung Park¹, Doyun Hwang¹, Sungeun Park¹, Yoonkap Kim¹, Joon-Hyung Lee²,
 Seunghwan Cho², Sungjin Jo²
¹Gumi Electronics and Information Technology Research Institute, Korea, ²Kyungpook National University,
 Korea
- 4-3-2860 **Conformal, Graphene-based Triboelectric Nanogenerator for Self-powered Wearable Electronics**
Yong Jun Lee, Houk Jang, Hyenwoo Chu, Youngcheol Chae, Jong-Hyun Ahn
Yonsei University, Korea
- 4-3-2880 **Highly Sensitive, Conformal MoS₂-based Tactile Sensors on Fingertip for Electronic Skin Applications**
Yong Ju Park¹, Minhoon Park¹, Min-Seok Kim², Jong-Hyun Ahn¹
¹Yonsei University, Korea, ²Korea Research Institute of Standards and Science, Korea
- 4-3-2903 **Resonance Raman Spectroscopy of Thickness-Modulated Silicon Nanomembranes**
 Jong-Hyun Ahn, Seonwoo Lee
Yonsei University, Korea
- 4-3-2908 **Two-dimensional WSe₂ and ZnO Hybrid Heterojunction Diode**
Kyunam Park, Jeong-Gyu Song, Jusang Park, Hyungjun Kim
Yonsei University, Korea
- 4-3-3129 **Synthesis of WS₂ Nano-sheets by Low Temperature Sulfurization from WO₃ Colloids for Hydrogen Evolution Reaction**
Min Kyung Kim¹, Myeong-Je Jang¹, Mi-so Won¹, Young-bae Park², Sung Mook Choi¹, Kyu Hwan Lee¹
¹Korea Institute of Materials Science, Korea, ²Andong National University, Korea
- 4-3-3247 **All Graphene Multifunctional Sensors Matrix**
Donghae Ho¹, Qijun Sun², Soyoung Kim³, Joongtak Han⁴, Dohwan Kim³, Jeongho Cho¹
¹Sungkyunkwan University, Korea, ²Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy
 Sciences, China, ³Soongsil University, Korea, ⁴Korea Electrotechnology Research Institute, Korea

- 4-3-3302 **High Performance Wire Type Solid-State Symmetric Supercapacitors using Mechanically Delaminated Few Layered MOS₂ Nanosheets**
 Karthikeyan Krishnamoorthy, Parthiban Pazhamalai, Ganesh Kumar Veerasubramani, Sang Jae Kim
Jeju National University, Korea
- 4-3-3445 **Long-term Air Stability of Small Molecules Passivated-Graphene Field Effect Transistors**
Dong Heon Shin¹, Sukang Bae², Woo Jong Yu¹
¹*Sungkyunkwan University, Korea*, ²*Korea Institute of Science and Technology, Korea*

4-1 Growth and integration of two-dimensional materials

- | Chair | Chul-Ho Lee (Korea University, Korea) | 16:30-17:30, Nov. 09 (Wed.) 8F |
|----------|--|--------------------------------|
| 4-1-0405 | Effect of Process Variables on Electrical Properties of Al Doped Zinc Oxide Thin Film Grown by CVD
<u>Jung-Sam Kim</u> ^{1,2} , Keon-Woo Yang ^{1,2} , Yong Ho Jung ² , Sung-Ku Kwon ¹
¹ <i>Kunsan National University, Korea</i> , ² <i>National Fusion Research Institute, Korea</i> | |
| 4-1-0805 | Hexagonal Boron Nitride Gate Dielectric Films Prepared with Different Growth Modes by Chemical Vapor Deposition
<u>Sung Kyu Jang</u> , Sungjoo Lee
<i>Sungkyunkwan University, Korea</i> | |
| 4-1-0857 | Seeing Grain Boundaries in Chemical Vapor Deposited Graphene
<u>Jong-Young Lee</u> , Min Jung Kim, Gwan-Hyoung Lee
<i>Yonsei University, Korea</i> | |
| 4-1-0908 | Exploiting Transition Metal Ditellurides for Highly Conductive Transparent Electrodes
<u>Sung Hyuk Lee</u> , Jae Im Jeong, Jeon Taik Lim, Seok Yong Seo, Jeong Su Heo, Suk Jun Kim
<i>Korea University of Technology and Education, Korea</i> | |
| 4-1-1022 | Gas Phase Growth of Large Area Laterally Patterned Heterostructures of Monolayer TMDCs
<u>Gangtae Jin</u> ¹ , Hocheol Shin ¹ , Juho Kim ¹ , Hoseok Heo ¹ , Chang-Soo Lee ¹ , Jaehyun Park ¹ , Moon-Ho Jo ²
¹ <i>Pohang University of Science and Technology, Korea</i> , ² <i>Institute for Basic Science, Korea</i> | |
| 4-1-1034 | Annealing Dependent Surface Morphology of Polycrystalline Cu Foil and Its Effect on the Properties and Nature of CVD Synthesized Graphene
<u>Sandeepa Wimalananda</u> , Jae-Kwan Kim, Ji-Myon Lee
<i>Sunchon National University, Korea</i> | |
| 4-1-1158 | Large-scale Growth of Two-dimensional Semiconductor Materials using Proximity Sublimation of Metal Oxide Films
<u>Sojung Kang</u> , Seung Min Lee, Yong Soo Cho, Gwan-Hyoung Lee
<i>Yonsei University, Korea</i> | |
| 4-1-1274 | Hetero-epitaxial Growth of Two-dimensional Molybdenum Oxide Layers
<u>Jatis Kumar Dash</u> , Jae-Hwan Jeong, Gwan-Hyoung Lee
<i>Yonsei University, Korea</i> | |

- 4-1-1291 **Released Valence Electrons in Dense Metallic Cuboid of Layered Metal-rich Dichalcogenide, Hf_3Te_2**
Hosung Yu, Sungwng Kim
Sungkyunkwan University, Korea
- 4-1-1379 **Hexagonal Boron Nitride Passivated Coherent Growth of Al_2O_3 Dielectric Layer on Graphene for Triboelectric Nanogenerators**
Seung Choi, Sang-Woo Kim, Sang-A Han
Sungkyunkwan University, Korea
- 4-1-1506 **Aqueous Solution based Synthesis of Various Morphology Control of SnS Nanostructures**
Heeseung Yang¹, Hyun Woo Kim², Unyong Jeong²
¹*Yonsei University, Korea*, ²*Pohang University of Science and Technology, Korea*
- 4-1-1688 **Heteroepitaxial Integration of Atomically Thin Metal and Semiconductor Polymorph Crystals**
Saerom Si¹, Hoseok Heo¹, Ji Ho Sung¹, Yonghyun Kim¹, Seung-Young Seo¹, Chang-Soo Lee¹,
 Si-Young Choi², Junsung Kim¹, Moon-Ho Jo³
¹*Pohang University of Science and Technology, Korea*, ²*Korean Institute of Metals and Materials, Korea*,
³*Institute for Basic Science, Korea*
- 4-1-2103 **Electrodeposition of Au NPs on ITO Glass Modified with Graphene Oxide as High Performance SERS Substrate for Dopamine Detection**
Viet Duc Phung, Sang-Wha Lee
Gachon University, Korea
- 4-1-2699 **Liquid Exfoliated Two-Dimensional Tin Mono Oxide Nanosheets Ready for a Promising p-Semiconductor**
Gyuyeon Lee, Sangyeon Lee, Hyungtak Seo
Ajou University, Korea
- 4-1-2735 **Synthesis of Vertically Aligned MoS_2 Nanostructure on MoO_3 Nanofiber via Electrospinning**
Myeong Je Jang^{1,3}, Min Kyung Kim^{2,3}, Sung Mook Choi³, Nosang Myung⁴, Youngwoo Rheem⁴,
 Andreas Bund⁵, Kyu Hwan Lee³
¹*University of Science and Technology, Korea*, ²*Andong National University, Korea*, ³*Korea Institute of Materials Science, Korea*, ⁴*University of California, Riverside, USA*, ⁵*Technische Universität Ilmenau, Germany*
- 4-1-2805 **Demonstration of the Two-dimensional Metallic Channel in Aluminum Oxide and Indium Oxide Interfaces at Low Temperature**
Sangyeon Lee, Ayoung Park, Hyungtak Seo
Ajou University, Korea

4-2 Optical, electronic and phonon processes of two-dimensional materials

Chair Hyunmin Kim (Daegu Gyeongbuk Institute of Science and Technology, Korea)

16:30-17:30, Nov. 09 (Wed.) 8F

- 4-2-1117 **Characterization of AgNWs based-polymer-dispersed Liquid Crystal (PDLC) Smart Window Device**
DoYun Hwang, Jae-Sung Park, Sung-Eun Park, Yoonkap Kim, Sam-Soo Kim
Gumi Electronics & Information Technology Research Institute, Korea

- 4-2-1497 **Ferromagnetic Quasi-atomic Electrons in Two-dimensional Interlayer Space of Diyttrium Carbide Electride**
Jongho Park¹, Kimoon Lee², Hosung Yu¹, Chandani Nandadasa³, Sungho Kim¹, YoungHee Lee¹, Hideo Hosono⁴, Seong-Gon Kim³, SungWng Kim¹
¹Sungkyunkwan University, Korea, ²Kunsan National University, Korea, ³Mississippi State University, USA, ⁴Tokyo Institute of Technology, Japan
- 4-2-1502 **Low Resistive Metal-semiconductor Contact of MoTe₂ using Laser Thermal Decomposition**
SeungYoung Seo, Saerom Si, Jiho Sung, Moon-Ho Jo
 Pohang University of Science and Technology, Korea
- 4-2-1580 **Formation of Positive Trions in MoSe₂/h-BN/MoS₂ Heterostacked Multilayers**
Min Su Kim, Changwon Seo, Hyun Kim, Jubok Lee, Dinh Hoa Luong, Ji-Hoon Park, Gang Hee Han, Jeongyong Kim
 Institute for Basic Science, Sungkyunkwan University, Korea
- 4-2-1633 **2D Materials based Vertical Stacked P-N Diode for NIR Photo Sensors and Imager**
Hyo Sun Lee, Tae Won Lee, Young Tack Lee, Do Kyoung Hwang, Won Kook Choi
 Korea Institute of Science and Technology, Korea
- 4-2-1647 **Plasmon-induced Hot Electron Reponse by Au Nanostructures on Monolayer TMDCs**
Juho Kim¹, Soonyoung Cha², Ji Ho Sung¹, Hoseok Heo¹, Gangtae Jin¹, Moon-Ho Jo¹, Hyunyong Choi²
¹Pohang University of Science and Technology, Korea, ²Yonsei University, Korea
- 4-2-1696 **Emergence of Superconductivity in Te Deficient Layered Molybdenum Ditelluride, MoTe₂**
Se Hwang Kang, Suyeon Cho, Sung Wng Kim
 Sungkyunkwan University, Korea
- 4-2-2195 **Conductivity Control of a-IGZO Thin Film by Photochemical Hydrogen Doping using Deep UV Irradiation**
Myeong-Ho Kim¹, Sung-Ho Jeon¹, So-Yang Choi¹, Hyungtak Seo², Duck-kyun Choi¹
¹Hanyang University, Korea, ²Ajou University, Korea
- 4-2-2515 **Ultrafast Hot-carrier Photovoltaics of Type-I Monolayer Heterojunctions in the Broad Spectral Ranges**
Jiho Sung¹, Soonyoung Cha², Hoseok Heo¹, Hyunyong Choi², Moon-Ho Jo¹
¹Pohang University of Science and Technology, Korea, ²Yonsei University, Korea

5. Advanced nanomaterials & nanofabrications

5-1 Synthesis and applications of optical and electronic nanomaterials

Chair Jong-Soo Lee (Daegu Gyeongbuk Institute of Science and Technology, Korea)

Nov. 07 (Mon.) Ballroom 3 (2F)

INVITED Self-assembled Nanocrystal Superlattices and Their Derivatives

09:00-09:30 Angang Dong

5-1-0275 *Fudan University, China*

INVITED Fabrication of Highly Luminescent Cadmium Free QDs and Their WLED Application

09:30-10:00 Joongpil Park, Sang-Wook Kim

5-1-0969 *Ajou University, Korea*

INVITED Structurally Engineered Nanocrystal Quantum Dots for Optoelectronic Applications

10:00-10:30 Wan Ki Bae

5-1-0988 *Korea Institute of Science and Technology, Korea*

10:30-10:45 Fe₃O₄-ZnO Core-shell Nanoparticles Fabricated by Rotational Atomic Layer Deposition for Multifunctional Applications

5-1-1744

Sejong Seong, Yong Chan Jung, Taehoon Lee, Bo Li, In-Sung Park, Jinho Ahn
Hanyang University, Korea

10:45-11:00 Laser Induced Photothermal Oxidation of Metal-oxides

5-1-2778 Kyungmok Kwon, Jaeho Shim, Kyunghan Choi, Junghoon Park, Sinho Kim, Kyoungsik Yu

Korea Advanced Institute of Science and Technology, Korea

11:00-11:15 Effect of Nano NiO Particles Doping on Dielectric and Ferroelectric Properties of Bi_{0.5}(Na_{0.81}K_{0.19})_{0.5}TiO₃ Composites

5-1-3174

Chatchai Kruea-in¹, Suchittra Inthong²

¹*Chiang Mai Rajabhat University, Thailand,* ²*Chiang Mai University, Thailand*

5-2 Biological & bioelectronic applications of functional nanomaterials

Chair Jae-Seung Lee (Korea University, Korea)

Nov. 07 (Mon.) Ballroom 3 (2F)

INVITED Protein based Material Design for Brain Imaging and Biological Sensor

15:00-15:30 Yongho Kim

5-2-0370 *Sungkyunkwan University, Korea*

INVITED Controlled Nanoparticle Release from Stable Magnetic Micro Bubble Oscillations: A Paradigm Shift for Drug Delivery in Deep Tissue

15:30-16:00

5-2-0531 Chenjie Xu

Nanyang Technological University, Singapore

INVITED Plasmonic Nanostructures as Optical Sensors and Actuators

16:00-16:30 Ji Eun Song, Ju A La, Ji Hoon Park, Eun Chul Cho

5-2-0863 *Hanyang University, Korea*

INVITED Low-cost, Rapid Fabrication of Microfluidic Devices for Biomedical Applications16:30-17:00 Michinao Hashimoto5-2-0593 *Singapore University of Technology and Design, Singapore***17:00-17:15 Nanotube-on-Graphene Hybrid Biosensors for Electrophysiological Applications**5-2-1096 Sun Sang Kwon¹, Jae Hyeok Shin¹, SungWoo Nam², Won Il Park¹¹Hanyang University, Korea, ²University of Illinois at Urbana-Champaign, USA**5-3 Large area synthesis, patterning, and organization of nanomaterials**Chair Wooyoung Shim (Yonsei University, Korea)*Nov. 08 (Tue.) Ballroom 3 (2F)***INVITED Scalable Nanoarchitecturing Capitalizing Continuous Mechanical Machining and Hybrid Assembly Technologies towards Commercially-feasible Applications**

09:00-09:30

5-3-0140 Jong G. Ok*Seoul National University of Science and Technology, Korea***INVITED Semiconductor Nanowire Heterostructures for Artificial Photosynthesis**

09:30-10:00

5-3-0148 Min Kuang, Gengfeng Zheng*Fudan University, China***INVITED Dip-Pen Nanodisplacement Lithography: A Versatile Tool for Constructing Patterned 3D Polymer Surfaces**

10:00-10:30

5-3-0190 Zijian Zheng*The Hong Kong Polytechnic University, Hong Kong***INVITED Scaling Length-scales of Nanofabrication**

10:30-11:00

5-3-2016 Wooyoung Shim*Yonsei University, Korea***11:00-11:15 Three-dimensional Light-emitting Diodes based on ZnO/GaN Micro- and Nanostructure Arrays Grown by Polarity-selective Multistage Epitaxy**

5-3-1110

Won Woo Lee¹, Dong Won Yang¹, Dongha Yoo², Gyu-Chul Yi², Won Il Park¹¹Hanyang University, Korea, ²Seoul National University, Korea**11:15-11:30 Relation of Missing Hole with Side Lobe Intensity and Photon Shot Noise Effect in Extreme Ultraviolet Lithography**

5-3-1820

Jung Sik Kim, Seongchul Hong, Yong Ju Jang, Jinho Ahn*Hanyang University, Korea***11:30-11:45 Fabrication of the Boron Nano Particles Converter Thin Film by Sedimentation Process**

5-3-1861

Min Ho Park, Hwan Lee, Donghwan Ahn*Kookmin University, Korea***11:45-12:00 Simulation on Capacitive Type Single-layer Touch Sensor**

5-3-2309

Chan-Hwa Hong, Chang-Ho Lee, Yun-Been Na, Jeong-Jin Park, Woo-Seok Cheong*Electronics and Telecommunications Research Institute, Korea*

5. Advanced nanomaterials & nanofabrications

5-1 Synthesis and applications of optical and electronic nanomaterials

Chair Jong-Soo Lee (Daegu Gyeongbuk Institute of Science and Technology, Korea)

18:00-19:30, Nov. 07 (Mon.) 2F

- 5-1-0665 **Fabrication of Invisible Ag Nanowire Electrode Patterns for Transparent Devices**
Harim Oh, Jeeyoung Lee, Yoonseok Oh, Minseok Seo, Myeongkyu Lee
 Yonsei University, Korea
- 5-1-0671 **The Increased Stability of CsPbBr₃ Perovskite Materials using PbSe Shell**
Thang Phan Nguyen, Soo Young Kim
 Chung-Ang University, Korea
- 5-1-0674 **Control of the Crystal Shape of Methylamine Lead Halide Materials**
Quyet Van Le, Soo Young Kim
 Chung-Ang University, Korea
- 5-1-0871 **Laser-Controlled Current Switching in Two-Terminal Devices Based on Vanadium Dioxide Thin Films Using 965 nm Laser Diode**
Jihoon Kim, Songhyun Jo, Kyongsoo Park, Sung Wook Choi, Jun Hyeok Jeong, Seon Jae Jung, Nouaze Joseph Christian, Seul-Lee Lee, Yong Wook Lee
 Pukyong National University, Korea
- 5-1-1035 **Silica Nanoparticle Coating of the NaYF₄: (Yb³⁺, Er³⁺) Upconversion Phosphor**
 MaengJun Kim¹, SungHo Lee², SangHo Sohn³
¹Korea Atomic Energy Research Institute, Korea, ²Nano Convergence Practical Application Center, Daegu Technopark, Korea, ³KyungPook National University, Korea
- 5-1-1044 **NaF Removal Effect of the NaYF₄:Yb³⁺, Tm³⁺ Up Conversion Phosphor**
 MaengJun Kim¹, SungHo Lee², SangHo Sohn³
¹Korea Atomic Energy Research Institute, Korea, ²Nano Convergence Practical Application Center, Daegu Technopark, Korea, ³Kyungpook National University, Korea
- 5-1-1155 **The Ferroelectric Properties of the Ce-doped PZT/BFO Multilayer Thin Films Prepared Using Sol-gel Method**
Mi-Ri Park, Sung-Gap Lee, Dong-Jin Lee, Kyeong-Min Kim, Min-Su Kwon
 Gyeongsang National University, Korea
- 5-1-1169 **Improvements of Thermal Diffusivity of Ag-AgCNT Composites by Ball Mill**
YeoReum Lee^{1,2}, Hyo-soo Lee², Seung-Boo Jung¹, Taehoon Park², Jae-Ha Kim², Jeong Hwa Lee²
¹Sungkyunkwan University, Korea, ²Korea Institute of Industrial Technology, Korea
- 5-1-1389 **Synthesis and Characterization of Hybrid Composite Conductors based on Polyaniline and Inorganic Nanoparticles**
SungKyu Jang, Felix Sunjoo Kim
 Chung-Ang University, Korea

- 5-1-1515 **Fabrication of Nano-gap in Thin Metal (Ag, Au, Cu) Film using Water-soluble Inorganic Film for Surface-enhanced Raman Spectroscopy (SERS)**
Wook Jin Jeon, Kyungchan Min, Hak Ki Yu
Ajou University, Korea
- 5-1-1519 **CVD Synthesis of Size-Controlled Monolayer MoS₂ Nanoparticles for Floating Gate in Non-Volatile Memory Devices**
Jaeho Jeon¹, Jinhee Lee², Gwangwe Yoo¹, Jin-Hong Park¹, Yun Hee Jang², Sunjoo Lee¹
¹Sungkyunkwan University, Korea, ²Gwangju Institute of Science and Technology, Korea
- 5-1-1561 **Preparation and NIR Shielding Property of Cs_{0.33}WO₃ Nanowires by Electrospinning Process**
Dae-Hwan Jang¹, Chul-Han Song¹, Jae-Kyo Yang¹, Yong-Ho Choa²
¹Institute for Advanced Engineering, Korea, ²Hanyang University, Korea
- 5-1-1625 **Sintering Behavior of Ag Nanopowders with Different Particle Size: A Real-Time Synchrotron X-ray Scattering Study**
Joo Hyeon Jeong, Tae Sik Cho
Kyungpook National University, Korea
- 5-1-1648 **Crystallization of Amorphous TiO₂ Nanotubes : A Real-Time Synchrotron X-ray Scattering Study**
Joo Hyeon Jeong, Ki Young Lee, Tae Sik Cho
Kyungpook National University, Korea
- 5-1-1683 **Modelling of Dielectric Constant of P (VDF-TrFE)-Nanoring CNT Nanocomposite**
Sora Ham, Yun Jae Lee, Jung Hyuk Kim, Do Kyung Hwang, Won Kook Choi
Korea Institute of Science and Technology, Korea
- 5-1-1801 **Mechanical and Optical Characteristics of Graphene Composite for EUV Pellicle Application**
Yong Ju Jang, Jung Hwan Kim, Seongchul Hong, Jinho Ahn
Hanyang University, Korea
- 5-1-1844 **Hetero-epitaxy of Two-Dimensional Trigonal Selenium Crystal on Mica**
Hye In Hwang¹, Hoseok Heo¹, Seungwoo Song¹, DongHwi Kim¹, Seok-Hyun Hong¹, Moon-Ho Jo²
¹Pohang University of Science and Technology, Korea, ²Institute for Basic Science, Korea
- 5-1-1856 **Manufacturing Large-area SiNx EUV Pellicle using Waterbath Wet Etching Method**
Seonghoon Jeong, Jung Hwan Kim, Seong Chul Hong, Jinho Ahn
Hanyang University, Korea
- 5-1-1877 **Fabrication of Cu Nanoparticle Using PWE (Pulsed Wire Explosion) Method with Various PVP Contents and Molecular Weight**
Choong Jae Lee, Kwang-Ho Jung, Jae-oh Bang, Seung-Boo Jung
Sungkyunkwan University, Korea
- 5-1-2268 **Application of Hollow Silica Films to Enhance Optical Transmittance of Graphene-coated Polymer Substrates**
So Won Kim, Hee Chul Lee
Korea Polytechnic University, Korea

- 5-1-2407 **Simple and Scalable Method to Grow AgCl Nanorods by Plasma-assisted Strain Relaxation on Flexible Polymer Substrate**
Jae Yong Park, Jong-Lam Lee
Pohang University of Science and Technology, Korea
- 5-1-2506 **Optical Limiting of a Glass-ceramics Containing Nano-ferroelectric Phase**
Bonghoon Kang, Seongwoo Hong
Far East University, Korea
- 5-1-2513 **Fabrication of Magnesium Nanodisc Array by Nanoimprint Lithography and Its Plasmonic Properties**
Hyeong-seop Im¹, Tae-Yeon Seong², Gyu Weon Hwang¹, Inho Kim¹, Won Mok Kim¹, Wook Seong Lee¹, Kyeong-Seok Lee¹
¹Korea Institute of Science and Technology, Korea, ²Korea University, Korea
- 5-1-2540 **Synthesis and Optical Properties of TiO₂ Nanoparticles via Salt-Assisted Ultrasonic Spray Pyrolysis**
Young Hwangbo, Jae-Hyun Yoo, Young-In Lee
Seoul National University of Science and Technology, Korea
- 5-1-2599 **Enhanced Photocatalytic Activity of TiO₂ Nanomaterials**
Deuk Yong Lee¹, Siwon Son¹, Yo-seung Song²
¹Daelim University, Korea, ²Korea Aviation University, Korea
- 5-1-2636 **Evolution of Morphology of WO₃ Nanocrystals Synthesized by Hydrothermal Methods**
Soomin Park, Chunghee Nam
Hannam University, Korea
- 5-1-2693 **Electrically Switchable Structural Color of Soft-solid Self-assembled Block Copolymer**
 Cheolmin Park, Minjoo Kim
Yonsei University, Korea
- 5-1-2720 **Photochemically Hydrogen Doped Tin Oxide Thin Film Properties by Ultraviolet Irradiation**
Juyeong Kim, Sangyeon Lee, Hyungtak Seo
Ajou University, Korea
- 5-1-2823 **Synthesis and Photocatalytic Activities of Electrospun Bi₂O₃ Nanofibers with α - β Phase Heterojunction**
Jae Hyun Yoo, Min-Young Cho, Young-In Lee
Seoul National University of Science and Technology, Korea
- 5-1-2852 **Solar Transmittance Control of Thermochromic VO₂ Thin Films through Colloidal Lithography**
Jung-Hoon Yu, Sang-Hun Nam, Ki-Hwan Hwang, Hyeon Jin Seo, Ji Won Lee, Yulhee Lee, Hyun Ji Choi, Jin-Hyo Boo
Sungkyunkwan University, Korea
- 5-1-3097 **Self-powered UV Photodetector based on Stacked Layer of TiO₂/ZnO**
Hassan Algadi, Taeyoon Lee
Yonsei University, Korea

- 5-1-3104 **Fabrication of Metal Film Having Vertical Array of Size-Controlled Nanoholes with High Aspect Ratio**
Jihye Lee¹, Sohee Cheon¹, Won Woo Lee², Won Il Park², Tae-Eun Song³, Chi Won Ahn³, Jun-Ho Jeong¹
¹Korea Institute of Machinery and Materials, Korea, ²Hanyang University, Korea, ³National NanoFab Center, Korea
- 5-1-3151 **Thermally Stable Ta Nanodisc Array Fabricated by Photonic Nanojet Lithography and Its Plasmonic Properties in Mid-infrared Region**
Jung Suk Cha¹, Tae-Yeon Seong², Gyu Weon Hwang¹, Inho Kim¹, Won Mok Kim¹, Wook Seong Lee¹, Doo Seok Jeong¹, Kyeong-Seok Lee¹
¹Korea Institute of Science and Technology, Korea, ²Korea University, Korea
- 5-1-3195 **Fabrication of Plasmonic Nanodisc Array using Nanoimprint Lithography and Collimated Sputtering Method**
Yeon Jae Yoo¹, Heon Lee², Gyu Weon Hwang¹, Inho Kim¹, Won Mok Kim¹, Wook Seong Lee¹, Kyeong-Seok Lee¹
¹Korea Institute of Science and Technology, Korea, ²Korea University, Korea
- 5-1-3254 **Characteristics of Tungsten Doped Nanocrystalline Carbon Films Fabricated by Unbalanced Magnetron Sputtering for Electronic Devices**
Yong Seob Park¹, Su Chang Ahn², Jaehyeong Lee³
¹Chosun College of Science and Technology, Korea, ²Korea Photonics Technology Institute, Korea, ³Sungkyunkwan University, Korea
- 5-1-3325 **Tuning of Piezoelectric-Semiconducting Behavior of 1D- ZnO Nanorods by Cadmium Dopant for Self-Powered UV Sensor**
Yuvasree Purusothaman, Nagamalleswara Rao Alluri, Arunkumar Chandrasekhar, Sang Jae Kim
 Jeju National University, Korea
- 5-1-3465 **Effect of Alumina Powder Particle Size on the Light Transmittance of Transparent Alpha Alumina Films**
Jong-Hwan Park¹, Sun-Woo Kim¹, Dong-Soo Park², Chan Park³, Kyung-Sub Lee¹, Su-Jeong Suh¹
¹Sungkyunkwan University, Korea, ²Korea Institute of Materials Science, Korea, ³Pukyong National University, Korea
- 5-1-3466 **Quantum Dots Enhanced Panel (QDEP) for High CRI LED Lighting**
Min-Sang Lee¹, Kwang-Yeal Lee², Sung-Ki Kim³, Young-Ki Lee⁴
¹Ecolumy, Korea, ²Chonbuk National University, Korea, ³Doart, Korea, ⁴Uiduk University, Korea

5-3 Large area synthesis, patterning, and organization of nanomaterials

Chair Wooyoung Shim (Yonsei University, Korea) 16:20-18:00, Nov. 08 (Tue.) 2F

- 5-3-1028 **Properties of GBFS Mortar using Carbon Amino Silica Black**
Hongseok Jang¹, Yongtaek Lim¹, Juhee Kim¹, Junyeong Gwak¹, Hail Park², Uihyeon Jeon³, Seungyoung So¹
¹Chonbuk National University, Korea, ²Samsung C&T Corporation, Korea, ³Seo-Do Construction, Korea
- 5-3-1160 **Gate-tunable Graphene and Graphene Mesh on Si Schottky Junction Solar Cells with Optimal Performance**
 Won Il Park¹, Hong-Gyu Park², Suhan Kim¹, Jaehyung Lee¹, Wonjun Chang¹
¹Hanyang University, Korea, ²Korea University, Korea

- 5-3-1197 **Geometric Confinement Induced Highly Aligned Large Graphene Oxide Composites**
Sung Hwan Koo, Kyung Eun Lee, Sang Ouk Kim
Korea Advanced Institute of Science and Technology, Korea
- 5-3-1199 **Facile Polymer Grafting of Polyaniline via N-doped Sites of Carbon Nanotubes**
Ho Jin Lee, Joonwon Lim, Sang Ouk Kim
Korea Advanced Institute of Science and Technology, Korea
- 5-3-1446 **Oleophobic Behavior of Functional Surfaces Produced by Thermal Imprinting Process**
Kwang-Jin Bae, Eun-Wook Jeong, Young-Rae Cho
Pusan National University, Korea
- 5-3-1457 **Nano Pattern Fabrication and Simulation by Two beam Holographic Lithography**
Junhan Park, DanHee Yun, Sang-Mae Lee, Bo-Sung Shin, Chan-Ju Yoo, Gyeongju Je
Pusan National University, Korea
- 5-3-1540 **Laser Induced Polymeric Self-Assembly for Nanopatterning**
Jun Soo Kim, Hyeong Min Jin, Sang Ouk Kim
Korea Advanced Institute of Science and Technology, Korea
- 5-3-1692 **Basic Verification of Automated Design Method of Capacity-equalized Mold for Nanoimprint Lithography**
Sung-Won Youn, Kenta Suzuki, Hiroshi Hiroshima
National Institute of Advanced Industrial Science and Technology (AIST), Japan
- 5-3-1781 **Growth Mechanism of Water Soluble NaCl Thin Film on Si (100) for Large Area Nano Structure Transferring**
Dong Kyu Lee, Hak Ki Yu
Ajou University, Korea
- 5-3-1869 **A Molecular View of Block Copolymer Directed Assembly with Solvent Vapors**
Sang-kon Kim
Hongik University, Korea
- 5-3-1936 **Synthesis of 3D Graphene with Cu Powders**
Byung Sang Choi¹, Sae Rom Kwak¹, Terry Ring²
¹Chosun University, Korea, ²University of Utah, USA
- 5-3-2295 **Preparation of Au-Ag Alloy Film by Alternating Sputtering and Its Structural Evolution to Nanoporous Au Film during Dealloying Process**
Hwa Seub Lee¹, Tae-Yeon Seong², Gyu Weon Hwang¹, Won Mok Kim¹, Inho Kim¹, Taek Sung Lee¹, Wook Seong Lee¹, Doo Seok Jeong¹, Kyeong-Seok Lee¹
¹Korea Institute of Science and Technology, Korea, ²Korea University, Korea
- 5-3-2351 **Simulation on Window-unified Capacitive Touch Screen Panel for Stylus Pen Applications**
Chang-Ho Lee¹, Chan-Hwa Hong¹, Yun-Beon Na¹, Jeong-Jin Park¹, Hyuck-In Kwon², Woo-Seok Cheong¹
¹Electronics and Telecommunications Research Institute, Korea, ²Chung-Ang University, Korea
- 5-3-2546 **Nano-Cymatic Approach towards Nanomanipulation**
Hyeohn Kim¹, Wooyoung Shim¹, Taehoon Kim¹, Dohun Kim²
¹Yonsei University, Korea ²Seoul National University, Korea

5-3-2768

Sub-10 nm Graphene Patterns with a Novel Scanning Probe Lithography ApproachSungjun Cho, Wooyoung Shim*Yonsei University, Korea*

5-3-2916

Localized Surface Plasmon Resonance and Surface-enhanced Raman Scattering Studies on Flexible SubstratesJi-Eun Lee¹, ChooJin Park², Juwon Lim¹, Kyungwha Chung¹, Unyong Jeong³, Dong Ha Kim¹¹Ewha Womans University, Korea, ²Yonsei University, Korea, ³Pohang University of Science and Technology, Korea

5-3-3098

Molecular Printing for Patterning Solid State MaterialsKilsoo Lee, Wooyoung Shim*Yonsei University, Korea*

6. Solar energy and environmental materials

6-1 Perovskite photovoltaics

Chair Jin Young Kim (Seoul National University, Korea)

Nov. 07 (Mon.) Halla (8F)

INVITED A Controllable Deposition of High Performance Perovskite for Solar Cells and Photoluminescence

09:00-09:30 Yixin Zhao

6-1-0244 *Shanghai Jiao Tong University, China*

INVITED Intramolecular Exchanging Process for Formamidinium Lead Iodide Perovskite Solar Cells

09:30-10:00 Jun Hong Noh

6-1-0388 *Korea Research Institute of Chemical Technology, Korea*

INVITED Facet Effects of Oxide Scaffold in Perovskite Solar Cells

10:00-10:30 Masato Maitani¹, Yuji Wada², Hiroshi Segawa¹

6-1-0497 ¹*The University of Tokyo, Japan*, ²*Tokyo Institute of Technology, Japan*

INVITED Interface Engineering of Planar Heterojunction Perovskite Solar Cells

10:30-11:00 Jae Woong Jung

6-1-1478 *Kyung Hee University, Korea*

11:00-11:15 Investigation of Chlorine-Mediated Microstructural Evolution of CH₃NH₃PbI₃(Cl) for Enabling High Performance Solar Cell

6-1-0942

Taehyun Hwang, Duckhyung Cho, Jinhyun Kim, Jaewon Kim, Sangheon Lee, Byungho Lee, Kyung Hwan Kim, Seunghun Hong, Byungwoo Park
Seoul National University, Korea

11:15-11:30 Influence of Mixed Lead Halide Precursors on the Formation of Perovskite Films and Device Performance in Planar Perovskite Solar Cell

6-1-1025

Md. Abdul Kuddus Sheikh, Rahim Abdur, Daekyun Jeong, Bhabani Sankar Swain, Jaegab Lee
Kookmin University, Korea

11:30-11:45 Low-Temperature Solution-Processed Li-Doped Tin Oxide for Highly Efficient and Wearable Perovskite Solar Cells

6-1-1492

Minwoo Park
Sookmyung Women's University, Korea

11:45-12:00 Electrical Degradation of CH₃NH₃Sn(I_{1-x}Br_x)₃ Mesoporous Perovskite Thin Films Probed by Kelvin Probe Force Microscopy and Conductive Atomic Force Microscopy

6-1-3049

Bich Phuong Nguyen, Hye Ri Jung, Juran Kim, William Jo
Ewha Womans University, Korea

6-2 Inorganic materials for photovoltaics

Chair Woo Kyoung Kim (Yeungnam University, Korea)

Nov. 07 (Mon.) Halla (8F)

INVITED

Light-weight CdTe Thin-film Solar Cells with a High Conversion Efficiency

15:00-15:30

Jihyun Kim

6-2-0215

Korea University, Korea

INVITED

Rare Metal Free Chalcogenide Thin Film for Solar Cell Absorber

15:30-16:00

Jakapan Chantana, Takashi Minemoto

6-2-0503

Ritsumeikan University, Japan

INVITED

Amorphous Cu-In- (Ga)-S Nanoparticle based Non-vacuum Route for CuIn(Ga)Se₂ Thin Film Solar Cells

16:00-16:30

Sejin Ahn

6-2-0342

Korea Institute of Energy Research, Korea

INVITED

Solar Energy Harvesting Schemes Utilizing Low Dimensional Micro- and Nano-structures on Cu(In,Ga)Se₂ Thin Film Solar Cell

16:30-17:00

Yu-Lun Chueh

6-2-0512

National Tsing Hua University, Taiwan

17:00-17:15

6-2-0924

Integration of II-IV Nanorods in Sensitized Photovoltaics via Open-Structured Photoanode and Co-Sensitization Strategy

Sangheon Lee¹, Joseph C. Flanagan², Joonhyeon Kang¹, Jinhyun Kim¹, Moonsub Shim², Byungwoo Park¹

¹Seoul National University, Korea, ²University of Illinois at Urbana-Champaign, USA

17:15-17:30

6-2-1217

Largely Enhanced Photovoltaic Effect in Ferroelectric Bismuth Lanthanum Titanate through Bandgap Reduction

Hyunji An¹, Jun Young Han², Bongjae Kim³, Jaesun Song¹, Sang Yun Jeong¹, Cesare Franchini³,

Chung Wung Bark², Sanghan Lee¹

¹Gwangju Institute of Science and Technology, Korea, ²Gachon University, Korea, ³University of Vienna, Austria

17:30-17:45

6-2-2978

Front Band Gap Grading of Cu₂Zn(Sn,Ge)Se₄ Thin Films for Solar Cells Grown by Electron Beam Co-evaporation

Juran Kim, Gee Yeong Kim, William Jo

Ewha Womans University, Korea

6-3 Organic and hybrid materials for photovoltaics

Chair Jung-Yong Lee (Korea Advanced Institute of Science and Technology, Korea)

Nov. 08 (Tue.) Halla (8F)

INVITED

Interface Engineering for High Performance Polymer and Perovskite Solar Cells

13:20-13:50

Hin-Lap Yip

6-3-0289

South China University of Technology, China

- INVITED**
13:50-14:20
6-3-0387 **Molecular Engineering of Organic Photovoltaic Materials and Interfaces**
Biwu Ma
Florida State University, USA
- INVITED**
14:20-14:50
6-3-2504 **Design and Synthesis of Organic and Polymeric Conjugated Materials for Organic Photovoltaics**
Yen-Ju Cheng
National Chiao Tung University, Taiwan
- INVITED**
14:50-15:20
6-3-0309 **Effects of Contact-induced Doping on Organic Photovoltaic Device Performance**
Julia Hsu
University of Texas at Dallas, USA
- INVITED**
15:20-15:50
6-3-2608 **Realizing Perovskite Solar Cells with Dual Functionality: Semi-Transparency and Infrared Reflection**
Hoyeon Kim¹, Hui-Seon Kim², Jaewon Ha¹, Nam-Gyu Park², Seunghyup Yoo¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Sungkyunkwan University, Korea
- INVITED**
15:50-16:20
6-3-0246 **Graphene in Emerging Photovoltaic Energy Harvesting**
Hyesung Park
Ulsan National Institute of Science and Technology, Korea
- 16:20-16:35
6-3-1475 **Manipulating Photoactive/Metal Interface by Optimization of Conjugated Polymer-Metal Oxide Hybrid Film in Polymer Solar Cells**
Yu Jiang, Sai-Anand Gopalan, Sae-Wan Kim, Jae-Sung Lee, Shin-Won Kang
Kyungpook National University, Korea

6-4-1 Materials for solar fuels

Chair In Sun Cho (Ajou University, Korea)

Nov. 09 (Wed.) Halla (8F)

- INVITED**
09:00-09:30
6-4-0582 **Engineering Nanostructured Materials for High Performance Electrocatalysis**
Yanguang Li
Soochow University, China
- INVITED**
09:30-10:00
6-4-0380 **Highly Active Nanoclusters for Water Splitting**
Dong Wook Kim
Myongji University, Korea
- 10:00-10:15
6-4-1406 **Coordination Tuning of Cobalt Phosphates towards Efficient Water Oxidation Catalyst**
Hyunah Kim¹, Jimin Park², Ki Tae Nam¹, Kisuk Kang¹
¹Seoul National University, Korea, ²Korea Institute of Science & Technology, Korea
- 10:15-10:30
6-4-1472 **Tailoring Domain Structure of BiFeO₃ Thin Films for Highly Enhanced Ferroelectric Water Splitting**
Jaesun Song¹, Taemin Kim², Jaeseong Cha¹, Sang Yun Jeong¹, Hyunji An¹, Ho Won Jang², Sanghan Lee¹
¹Gwangju Institute of Science and Technology, Korea, ²Seoul National University, Korea
- 10:30-10:45
6-4-2801 **Armophous Cobalt Phyllosilicate with Layered Crystalline Clusters for Efficient Water Oxidation Catalyst**
Ju Seong Kim, Inchul Park, Ki Tae Nam, Kisuk Kang
Seoul National University, Korea

6-4-2 Materials for solar fuels

Chair In Sun Cho (Ajou University, Korea)

Nov. 09 (Wed.) Halla (8F)

INVITED

13:50-14:20

6-4-0586

Engineering of Molybdenum Disulphide for Hydrogen Generation

Hong Li

Nanyang Technological University, Singapore

INVITED

14:20-14:50

6-4-0685

Anisotropy Nanostructural WO_3 based Photoelectrode for Solar Energy Converting

Jinzhan Su, Tao Zhang

Xi'an Jiaotong University, China

14:50-15:05

6-4-2873

Path-specific Annealing to Achieve Pure Cu_2O Phase Nanofiber for Effective Photoelectrochemical CO_2 Reduction

Ho-Young Kang, Dae-Hyun Nam, Ki Dong Yang, Woo Je Chang, Ki Tae Nam, Young-Chang Joo
Seoul National University, Korea

15:05-15:20

6-4-3030

Tin Oxide Nanohelix Structures with Thin Iron Oxide Layer for Efficient Photoelectrochemical Water Splitting

Il Yong Choi, Tae Hwa Jeon, Wonyong Choi, Jong Kyu Kim
Pohang University of Science and Technology, Korea

15:20-15:35

6-4-3219

Highly Efficient Hydrogen-Doped Reduced TiO_{2-x} for Sunlight-Driven H_2 Generation

Apurba Sinhamahapatra, Jong-Pil Jeon, Jong-Sung Yu
Daegu Gyeongbuk Institute of Science and Technology, Korea

6. Solar energy and environmental materials

6-1 Perovskite photovoltaics

Chair Jin Young Kim (Seoul National University, Korea)

18:00-19:30, Nov. 07 (Mon.) 8F

- 6-1-0821 **Planar Heterojunction CsPbI₃ based Perovskite Solar Cell with Efficiency Exceeding 4.5%**
[Yu Geun Kim](#), Soo Young Kim
Chung-Ang University, Korea
- 6-1-1108 **Enhanced Growth of Organolead-halide Perovskite Solar Cells by using High Concentration Methylammonium Iodide as Additive**
[Hyo Jeong Jo](#), Yong Chan Choi, Jin-Kyu Kang, Dae-Hwan Kim
Daegu Gyeongbuk Institute of Science and Technology, Korea
- 6-1-1495 **Organometallic Perovskite Synthesis for Efficient and Stable Perovskite Solar Cells**
[Jinhyun Kim](#), Taehyun Hwang, Sangheon Lee, Byungho Lee, Jaewon Kim, Byungwoo Park
Seoul National University, Korea
- 6-1-1892 **Properties of Perovskite Solar Cells by the Sputtered Compact TiO₂ Layer**
[Seong Gwan Shin](#), Hyung Wook Choi
Gachon University, Korea
- 6-1-2288 **Characterization of TiO₂ Photoanodes with IrO₂ and Its Application to a Solar Water Splitting System using Perovskite Solar Cells**
[Kee-Tae Kim](#), Ji-Hun Park, Chan-Hyuk Ji, Se-Young Oh
Sogang University, Korea
- 6-1-2368 **Integration of the Inorganic Transport Layer for Deposition of Silver Nanowires Electrodes in Perovskite Solar Cells**
[Ji-Hye Choe](#), Choong-Heui Chung, Ki-Ha Hong
Hanbat National University, Korea
- 6-1-2798 **Efficiency Enhancement of Hole-conductor Free Perovskite Solar Cell**
[Kwan-Woo Ko](#)^{1,2}, Ji-Su Han¹, Sungjun Hong¹, Soon-Gil Yoon², Chi-Hwan Han¹
¹Korea Institute of Energy Research, Korea, ²Chungnam National University, Korea
- 6-1-2832 **Observation of Enhanced Hole Extraction in Br Concentration Gradient Perovskite Materials**
[Byeong Jo Kim](#)¹, Min-cheol Kim², Hyun Suk Jung¹, Mansoo Choi²
¹Sungkyunkwan University, Korea, ²Seoul National University, Korea
- 6-1-2894 **Organic-inorganic Hybrid Perovskite Solar Cells with Crater like TiO₂ Porous Layer Controlled by Combustion Sol-gel Reaction**
[Sunihl Ma](#), Hongseuk Lee, Eunsong Lee, Hyewon Hwang, Hyeok-Chan Kwon, Jooho Moon
Yonsei University, Korea
- 6-1-2932 **Influence of One Dimensional Nanostructured Absorber Layer on Charge Transport Dynamics in Organic-inorganic Hybrid Perovskite Solar Cells**
[Hyeok-Chan Kwon](#), Hongseuk Lee, Hyewon Hwang, Eunsong Lee, Sunihl Ma, Jooho Moon
Yonsei University, Korea

- 6-1-2933 **Ultra-low-cost Copper Nanowire Transparent Bottom Electrodes in Flexible Perovskite Solar Cells**
Hyewon Hwang, Eunsong Lee, Sunihl Ma, Hyeok-Chan Kwon, Hongseuk Lee, Kyungmi Kim, Jooho Moon
Yonsei University, Korea
- 6-1-2953 **Solution-processed Flexible High Efficient Perovskite Solar Cells on Silver Nanowire based Indium-free Transparent Composite Electrode**
Eunsong Lee, Sunihl Ma, Hyeok-Chan Kwon, Hyewon Hwang, Hongseuk Lee, Jooho Moon
Yonsei University, Korea
- 6-1-2958 **Ferroelectricity and Its Implications on Photo-conversion Efficiency of $\text{CH}_3\text{NH}_3\text{Pb}(\text{Br},\text{I})_3$ Perovskite Thin-films**
Hye Ri Jung, Bich Phuong Nguyen, Juran Kim, William Jo
Ewha Womans University, Korea
- 6-1-3157 **Improvement of Light Stability for MgO Ultrathin Layer to Prevent Decomposition of $\text{CH}_3\text{NH}_3\text{PbI}_3$**
Young Un Jin¹, Gill Sang Han², Hyun Suk Jung¹
¹Sungkyunkwan University, Korea, ²University of Pittsburgh, USA

6-2 Inorganic materials for photovoltaics

Chair Woo Kyoung Kim (Yeungnam University, Korea) 18:00-19:30, Nov. 07 (Mon.) 8F

- 6-2-0436 **Advanced Light Trapping Effect for Thin Film Solar Cells Fabricated on Periodic Double-Textured Substrate**
Shihyun Ahn¹, Jaehyun Cho¹, Anh Huy Tuan Le¹, Jinjoo Park¹, Youngkuk Kim¹, Chang-soon Han², Sungjae Bong², Junsin Yi¹
¹Sungkyunkwan University, Korea, ²Laser Advanced System Industrialization Center, Korea
- 6-2-0604 **Multi-junction Thin Film Silicon Solar Cell with High Efficiency**
Jinjoo Park, Sangho Kim, Pham Duy Phong, Sunbo Kim, Youn-Jung Lee, Shihyun Ahn, Junsin Yi
Sungkyunkwan University, Korea
- 6-2-0824 **Influence of Zinc Content on $\text{Cu}_2\text{ZnSnSe}_4$ Thin-Film Solar Cells Fabricated by Coevaporation**
Dong-Hwan Jeon¹, Byoung-Soo Ko¹, Dae-Kue Hwang¹, Jin-Kyu Kang¹, Dahyun Nam², Hyunsik Cheong²
¹Daegu Gyeongbuk Institute of Science and Technology, Korea, ²Sogang University, Korea
- 6-2-1050 **High Responsivity Graphene/Ge Schottky Junction Photodetector using ITO Top Gate Modulation**
Kyoung Eun Chang, Tae Jin Yoo, Ci Hyun Kim, Sang Kyung Lee, Yun Ji Kim, Byoung Hun Lee
Gwangju Institute of Science & Technology, Korea
- 6-2-1129 **Characterization of 4 Bus Bar Interconnection of Crystalline Silicon Solar Cells using Infrared Lamp and Hot Plate Temperature Control**
Sung Hyun Kim, Jung Jin Lee, Hyoung Jin Son
Korea Electronics Technology Institute, Korea

- 6-2-1229 **The Effect of Transparent Buffer Electrode Layer on the Properties of Impurity-doped ZnO Thin Films**
 Jin Soo Kim¹, Jeunghyun Jeong², Won Mok Kim²
¹LG Chem, Korea, ²Korea Institute of Science and Technology, Korea
- 6-2-1233 **FDTD Analysis of Optical Reflectance from c-Si Surface with Submicron Pyramidal Patterns**
 Seok-Joo Byun¹, Taek-Sung Lee², Inho Kim², Won Mok Kim²
¹INSIDEOPTICS Co., LTD, Korea, ²Korea Institute of Science and Technology, Korea
- 6-2-1250 **Effect of Pre-annealing Treatment of Metal Stack Precursors on Photovoltaic Properties of CuSbS₂ Thin Film Solar Cells**
Si-Nae Park, Sang-Ju Lee, Shi-Joon Sung, Dae-Hwan Kim, Kee-Jeong Yang, Jin-Kyu Kang
 Daegu Gyeongbuk Institute of Science and Technology, Korea
- 6-2-1328 **Influence of Particle Size on the Optical Band Gap of Fe-doped Bismuth Titanate**
Nguyen Thi Nguyen, Myung Geun Song, Chung Wung Bark
 Gachon University, Korea
- 6-2-1348 **Optimal Doping Level of Iron on the Bismuth Titanate for Oxide Optoelectronics**
Rui Tang, Jun Young Han, Chung Wung Bark
 Gachon University, Korea
- 6-2-1354 **Tin Oxide Thin Films Grown by Atomic Layer Deposition for Photoelectrode Application of Planar Bi₂S₃-Sensitized Solar Cells**
Sang-Ju Lee¹, Eun Kyung Gil¹, Yong Chan Choi¹, Shi-Joon Sung¹, Dae-Hwan Kim¹, Jin-Kyu Kang¹,
 Kuk Young Cho²
¹Daegu Gyeongbuk Institute of Science and Technology, Korea, ²Hanyang University, Korea
- 6-2-1358 **3-D Multi Structure using ICP-RIE Dry Etching for Developed Light Trapping Approaches n-i-p Thin-Film Silicon Solar Cells**
Sangho Kim, Duy Phong Pham, Jinjoo Park, Chonghoon Shin, Hyunsung Kim, Junsin Yi
 Sungkyunkwan University, Korea
- 6-2-1594 **Study on the Metal-ion Complexing Agents used for the Fabrication of Sb₂S₃ Thin Films by Spin-coating Process**
Eun Kyung Gil¹, Sang-Ju Lee¹, Yong Chan Choi¹, Shi-Joon Sung¹, Dae-Hwan Kim¹, Kuk Young Cho²
¹Daegu Gyeongbuk Institute of Science and Technology, Korea, ²Hanyang University, Korea
- 6-2-1842 **Effect of Current Density on Morphology Control of Silver Electrochemically Recovered from c-Si Solar Cell**
Jun-Kyu Lee, Jin-Seok Lee, Young-Soo Ahn, Gi-Hwan Kang
 Korea Institute of Energy Research, Korea
- 6-2-2089 **Fabrication of Thin Si Foils for c-Si PV Cell by using Electrodeposition Assisted Stripping (EAS) Process**
Jaeho Jeon, Changyol Yang, Subeen Park, Bongyoung Yoo, Donghyuk Shin
 Hanyang University, Korea

- 6-2-2203 **The Effect of Annealing in Se Atmosphere on the Properties of ITO Films**
Seongbin Choi¹, Jeunghyun Jeong¹, In-kyu Lee², Won Mok Kim¹
¹Korea Institute of Science and Technology, Korea, ²Korea Aerospace University, Korea
- 6-2-2256 **Fabrication of High Efficiency c-Si Solar Cells with a Combination of Boron Back Surface Field and a Transparent Conducting Oxide Spacer Layer**
Jihye Choi¹, Sung Bin Choi¹, Won Mok Kim¹, Taek Seong Lee¹, Kyeong-seok Lee¹, Wook Seong Lee¹,
 Doo Seok Jeong¹, Doo Jin Choi², Inho Kim¹
¹Korea Institute of Science and Technology, Korea, ²Yonsei University, Korea
- 6-2-2406 **A Study of Low-cost Conductive Paste for Silicon Solar Cell**
Byeong Tak Park, Myong Jae Yoo, Ji Sun Park, Hyoung Jin Son, Yee Ji Lyou, Sung Hyun Kim
 Korea Electronics Technology Institute, Korea
- 6-2-2417 **Kerfless Wafering by Proton Induced Exfoliation and Cell Processing for High Efficiency c-Si Solar Cells based on Ultrathin Si Wafers**
Hyeonseung Lee¹, Chanwool Kwon¹, Jaekwon Suk¹, Won Mok Kim¹, Jonghan Song¹, Joonkon Kim¹,
 Doo Seok Jeong¹, Wook Seong Lee¹, Kyeong-Seok Lee¹, Byeong-Kwon Ju², Inho Kim¹, Taek Sung Lee¹
¹Korea Institute of Science and Technology, Korea, ²Korea University, Korea
- 6-2-2464 **Optical Design and Fabrication of Parabolic Si Nanostructures for c-Si Solar Cells based on Ultra-thin Wafers**
See-Eun Cheon¹, Wook Seong Lee¹, Doo Seok Jeong¹, Taek Sung Lee¹, Won Mok Kim¹,
 Kyeong-Seok Lee¹, Heon Lee², Inho Kim¹
¹Korea Institute of Science Technology, Korea, ²Korea University, Korea
- 6-2-2688 **Photocatalytic Activity for Water-splitting and Degradation of Methylene Blue over Iodine Doped Titanium Dioxide Nanoparticles**
Jeongyeon Hwang, Hyungtak Seo
 Ajou University, Korea
- 6-2-2761 **Effect of Ga Content on Phase Behavior and Selenization Pathway of Cu-Ga-In Precursors**
Kyeongchan Moon¹, Sina Soltanmohammad², Ki Young Jung³, Seok Jin Lee³, William N. Shafarman²,
 Woo Kyoung Kim¹
¹Yeungnam University, Korea, ²University of Delaware, USA, ³Advanced Vacuum & Clean Equipment Optimizer, Korea
- 6-2-2835 **The Effect of Cu to (In, Ga) Ratio in the Metal Precursor on the Ga Gradient and Solar Cell Performances in Pure-sulfide Cu(In,Ga)S₂ Film**
Seok-Hwan Jeon¹, Jong-Heun Lee², Won Mok Kim¹, Jeunghyun Jeong¹, Jong-Keuk Park¹
¹Korea Institute of Science and Technology, Korea, ²Korea University, Korea
- 6-2-2943 **Porous WO₃ Photoanode with Extended Absorption for Efficient Renewable Energy Technology: Solar Water Splitting**
Shankara S Kalanur, Il-Han Yoo, Hyungtak Seo
 Ajou University, Korea
- 6-2-3015 **Studies on the Effect of Etching Solution on the Properites of Cu₂ZnSn(S,Se)₄ (CZTSSe) Thin Film Solar Cells**
Hongjae Shim, Jin Hyeok Kim, Jong-ha Moon, Myeong Gil Kang
 Chonnam National University, Korea

- 6-2-3020 **Investigation of Sulfurization Pressure on the Cu₂SnS₃ Thin Film Sulfurized by Cu-Sn Staked Metallic Precursors for Solar Cell Device**
Ming Rui He¹, In Young Kim², Mahesh Suryawanshi¹, Jin Hyeok Kim¹
¹Chonnam National University, Korea, ²Gwangju Institute of Science and Technology, Korea
- 6-2-3084 **Properties of Silicon Solar Cells with Local Back Surface Field Fabricated by Aluminum-silicon Eutectic Alloy Paste**
Jae-Wook Choi¹, Sungeun Park¹, Soohyun Bae¹, Seongtak Kim¹, Se Jin Park¹, Hyomin Park¹, Yoonmook Kang², Hae-Seok Lee², Donghwan Kim¹
¹Korea University, Korea, ²KU-KIST Green School, Graduate School of Energy and Environment, Korea University, Korea
- 6-2-3093 **The Effect of Ultraviolet on the Passivation Properties of Thermal Atomic Layer Deposited Al₂O₃**
Inseol Song¹, Jae Eun Kim², Ji Yeon Hyeon², Yoonmook Kang¹, Haeseok Lee², Donghwan Kim²
¹KU-KIST Green School, Graduate School of Energy and Environment, Korea University, Korea, ²Korea University, Korea
- 6-2-3105 **Opto-electric Properties of Tungsten Doped Indium Oxide Thin Films Prepared via Polymer Assisted Solution Process for Organic Solar Cell**
Taekyu An, Sujaya Kumar Vishwanath, Jihoon Kim
Kongju National University, Korea
- 6-2-3107 **High-quality Tin Monosulfide Thin Films by Post H₂ Annealing the Amorphous SnS_x Deposited by Atomic Layer Deposition as an Absorber Layer in Solar Cells**
Byeonghyeon Jang¹, Seungmin Yeo², Hyungjun Kim², Giuk Jeong³, Byungha Shin³, Soo-Hyun Kim¹
¹Yeungnam University, Korea, ²Yonsei University, Korea, ³Korea Advanced Institute of Science and Technology, Korea
- 6-2-3132 **Surface Texturing of Multicrystalline Silicon Wafer by Laser Process**
Heesoo Kim, Seung Hyun Ha, Gi Ryoung Maeng, Sang Joon Park
Gachon University, Korea
- 6-2-3327 **Effects of Synthesis Conditions on the Properties of CZTS Nanoparticles and Thin Films for Photovoltaic Applications**
Soohyun Hwang¹, Chaehwang Jeong², Minha Kim¹, Jin-Hong Park¹, Junsin Yi¹, Joong-Pyou Shim³, Woochang Song⁴, Jaehyeong Lee¹
¹Sungkyunkwan University, Korea, ²Korea Institute of Industrial Technology, Korea, ³Kunsan National University, Korea, ⁴Kangwon National University, Korea

6-3 Organic and hybrid materials for photovoltaics

Chair Jung-Yong Lee (Korea Advanced Institute of Science and Technology, Korea)

16:20-18:00, Nov. 08 (Tue.) 8F

- 6-3-0637 **Effect of Ag Nanowires/ZnO Core-shell Photoelectrodes in ALD-Sb₂S₃ based Hybrid Solar Cells**
Kang-Pil Kim
Daegu Gyeongbuk Institute of Science and Technology, Korea

- 6-3-0858 **Enhanced Performance of Dye-sensitized Solar Cells based on Electrospun TiO₂ Electrode**
Jeong-Hwa Kim, Kun-Ho Jang, Sungho Woo, Shi-Joon Sung, Dae-Kue Hwang
Daegu Gyeongbuk Institute of Science and Technology, Korea
- 6-3-0899 **Effect of Electrolyte Components on the Performance of Organic-Dye-Sensitized Solar Cells**
Jung Eun Nam, Hyo Jeong Jo, Jin-Kyu Kang, Dae-Kue Hwang
Daegu Gyeongbuk Institute of Science and Technology, Korea
- 6-3-1283 **The Critical Impact of Hole Transporting and Back Electrode Layer on the Stability of Flexible Organic Photovoltaic Modules**
Hyoung Jin Son, Sung Hyun Kim
Korea Electronic Technology Institute, Korea
- 6-3-1315 **Donor-free Dyes for Efficient Dye-Sensitized Solar Cells**
Geon Hyeong Lee, Young Sik Kim
Hongik University, Korea
- 6-3-1338 **Fabrication and Analysis of Dye-sensitized Solar Cells by using Li-treatment TiO₂ Photoelectrode**
Jeong Hun Ma, Hyung Wook Choi
Gachon University, Korea
- 6-3-1721 **Effects of Graphene Quantum Dots on the Optical Absorption Bandwidth of Dye-sensitized Solar Cells**
Seokju Yoo, Sehui Lee, Minjeong Park, Hyo-seon Kim, Sookhyun Hwang, Hyonkwang Choi, Sarah Kim, Minhyon Jeon
Inje University, Korea
- 6-3-1749 **Synthesis and Photovoltaic Performance of Simple and Novel Ullazine-based Organic Dyes for Dye-sensitized Solar Cells**
Chang Hee Son, Le Quoc Bao, Suresh Thogiti, Jae Hong Kim
Yeungnam University, Korea
- 6-3-1792 **Triphenylamine-based Organic Dyes for Dye Sensitized Solar Cells: Single Branched vs. Double Branched Dye Sensitizers**
Jung Min Cho, Yong Hui Lee, Kwang-soon Ahn, Jae Hong Kim
Yeungnam University, Korea
- 6-3-2412 **Dewetting of Ag Nanoparticle from 3-dimensional ITO Nanobranches: Plasmonic Light Trapping in Organic Solar Cells**
Wan Jae Dong, Jong-Lam Lee
Pohang University of Science and Technology, Korea
- 6-3-2649 **High-efficient Photovoltaic Performance based on PbS Colloidal Quantum Dots by Improvement of Surface Passivation and P-doping**
Jung Hoon Song¹, Yong-Hyun Kim¹, Sohee Jeong²
¹Korea Advanced Institute of Science and Technology, Korea, ²University of Science and Technology, Korea
- 6-3-3126 **Improved Oxidation Stability of Ag Nanowire based Transparent Conducting Electrode by TiO₂ Nanoshell**
Dong Geon Lee¹, Byeong Jo Kim¹, Sangwook Lee², Hyun Suk Jung¹
¹Sungkyunkwan University, Korea, ²Kyungpook National University, Korea

- 6-3-3138 **Lead Sulfide Quantum Dot Ink Solar Cells**
Hyekyoung Choi¹, Matthew C. Beard², Sohee Jeong¹
¹Korea Institute of Machinery & Materials, Korea, ²National Renewable Energy Laboratory, USA
- 6-3-3140 **Rough Surface Au@Ag Core-shell Nanoparticles for Efficient Plasmonic Light Scattering Effect in Organic Solar Cells**
Quang Nhat Tran, Ji Hyeon Kim, Sang Joon Park
 Gachon University, Korea
- 6-3-3146 **Near Infrared Organic Photodetector Utilizing a Double Electron Blocking Layer**
Shafidah Shafian, Heewon Hwang, Kyungkon Kim
 Ewha Womans University, Korea
- 6-3-3153 **Improving Stability of Small Molecule Organic Solar Cell by Ternary Blending with Conjugate Polymer**
Kyuwan Cho, Kyungkon Kim
 Ewha Womans University, Korea
- 6-3-3443 **Production of Porous Titania Film(TiO₂) & Study of Application to Photocatalyst, Photovoltaic Cell by using Cellulose Nanostructure Derivatives**
Yonghee Yoon, Wonhee Lee
 Sejong University, Korea
- 6-3-3446 **Improving Light Harvesting Efficiency in Dye-sensitized Solar Cells using Patterned TiO₂ Layer via PS Monolayer and PDMS Stamp**
 Hee-Su Yang¹, Dong In Kim¹, Jung-Hoon Yu¹, Ki-Hwan Hwang¹, Ji Won Lee¹, Sang-Hun Nam², Jin-Hyo Boo¹
¹Sungkyunkwan University, Korea, ²Institute of Basic Science, Sungkyunkwan University, Korea

6-4 Materials for solar fuels

Chair In Sun Cho (Ajou University, Korea)

16:30-17:30, Nov. 09 (Wed.) 8F

- 6-4-1305 **Improved Water Splitting Performance in Three-dimensionally Grown Bismuth Vanadate Thin Film**
Sang Yun Jeong¹, Kyoung Soon Choi², Hye-Min Shin¹, Taemin Kim³, Jaesun Song¹, Sejun Yoon¹, Ho Won Jang³, Myung-Han Yoon¹, Cheolho Jeon², Jouhahn Lee², Sanghan Lee¹
¹Gwangju Institute of Science and Technology, Korea, ²Korea Basic Science Institute, Korea, ³Seoul National University, Korea
- 6-4-1827 **Simple and Controllable Solution Reduction of TiO₂ Nanotubes for Improving Solar Water-Splitting Performance**
Jin Un Kim, Ju Young Cho, Sung Won Hwang, Gab Kyung Seo, Bit Na Kim, Da Yae Kim, In Sun Cho
 Ajou University, Korea
- 6-4-1884 **Sol-gel Preparation of p-type CuBi₂O₄ Photocathode with a Low Turn-on Potential for Solar Water-splitting**
Gab Kyung Seo, Bit Na Kim, Sung Won Hwang, Jin Un Kim, Ju Young Cho, Da Yae Kim, In Sun Cho
 Ajou University, Korea

6-4-2233 **Conformally Coated BiVO₄ Nanodots on Porosity-Controlled WO₃ Nanorods as Highly Efficient Type II Heterojunction Photoanodes for Water Oxidation**
Mi Gyoung Lee, Do Hong Kim, Woonbae Sohn, Cheon Woo Moon, Hoonkee Park, Ho Won Jang
Seoul National University, Korea

6-4-2267 **Wafer-scale Solution-processed Synthesis of NiO Nanorods for Efficient Si-based Water Splitting Photoanode**
Sol A Lee¹, Dinsefa Mensur Andoshe¹, Sun Yong Lee¹, Seungtaeg Oh², Jihun Oh², Ho Won Jang¹
¹*Seoul National University, Korea*, ²*Korea Advanced Institute of Science and Technology, Korea*

6-4-2431 **Three-Dimensional CuO Branched Nanowires for Efficient Photoelectrochemical Water Splitting**
Kwan Woo Lim, Hyung Won Cho, Wan Jae Dong, Jong-Lam Lee
Pohang University of Science and Technology, Korea

6-4-3218 **Cupric Oxide Nano-needles Array Photocathode with Enhanced Photoelectrochemical Water-splitting Performance**
Sung Won Hwang, Ju Young Cho, Gabkyung Seo, Bitna Kim, Jin Un Kim, In Sun Cho
Ajou University, Korea

7. Electrochemical energy storage materials

7-1 Materials for Li-air batteries

Chair Yong Joon Park (Kyonggi University, Korea)

Nov. 08 (Tue.) Halla (8F)

KEYNOTE Concentrated Liquid Electrolytes

09:00-09:30 Atsuo Yamada

7-1-5003 *The University of Tokyo, Japan*

09:30-09:45 Break Time

INVITED Rechargeable Room-temperature Na-CO₂ Batteries

09:45-10:15 Jun Chen

7-1-3245 *Nankai University, China*

INVITED Fundamental Design Principles of Cathode Catalysts for Rechargeable Li-O₂ Batteries

10:15-10:45 Yong-Mook Kang

7-1-0433 *Dongguk University, Korea*

INVITED Electrochemically Active and Stable Cathodes based on Metal Oxides for Lithium-Oxygen Batteries

10:45-11:15 Jong-Won Lee, Kyu-Nam Jung

7-1-0459 *Korea Institute of Energy Research, Korea*

11:15-11:30 Dissolution and Ionization of Sodium Superoxide (NaO₂) in Non-aqueous Sodium-oxygen Batteries

7-1-1135 Hyeokjun Park¹, Jinsoo Kim², Byungju Lee¹, Won Mo Seong¹, Hee-Dae Lim¹, Youngjoon Bae¹, Kisuk Kang¹

¹Seoul National University, Korea, ²Hyundai Motor Company, Korea

11:30-11:45 Tuning the Carbon Crystallinity for Highly Stable Li-O₂ Batteries

7-1-1208 Youngjoon Bae¹, Young Soo Yun², Hee-Dae Lim¹, Jinsoo Kim¹, Hyeokjun Park¹, Youngmin Ko¹, Sungho Lee³, Hyuk Jae Kwon⁴, Hyunjin Kim⁴, Dongmin Im⁴, Kisuk Kang¹

¹Seoul National University, Korea, ²Kangwon National University, Korea, ³Korea Institute of Science and Technology, Korea, ⁴Samsung Advanced Institute of Technology, Korea

7-3 All solid state Li/Na batteries

Chair Young-Gi Lee (Electronics and Telecommunications Research Institute, Korea)

Nov. 09 (Wed.) Ara (8F)

KEYNOTE Lithium Superionic Conductors and Their Application to All-solid-state Batteries

10:00-10:30 Ryoji Kanno

7-3-0566 *Tokyo Institute of Technology, Japan*

INVITED Toward Intimate Ionic Contacts for Bulk-Type All-Solid-State Lithium-Ion Batteries

10:30-11:00 Yoon Seok Jung

7-3-0196 *Ulsan National Institute of Science and Technology, Korea*

INVITED **Synthesis of High Li Ion Conducting $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$ (LLZO) Solid Electrolyte with Multi-Doping Strategy for All-Solid-State Batteries**
 11:00-11:30 Dong Ok Shin, Kwang Man Kim, Young-Gi Lee
 7-3-0668 *Electronics and Telecommunications Research Institute, Korea*

INVITED **Sodium Intercalation Chemistry in Graphite**
 11:30-12:00 Kisuk Kang
 7-3-0162 *Seoul National University, Korea*

7-2 Electrode materials for lithium ion batteries

Chair Yong-Mook Kang (Dongguk University, Korea) *Nov. 09 (Wed.) Ara (8F)*

INVITED **High Electrochemical Performance of High Voltage $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$ with Li Doping by Suppressing the Ni/Mn Disorder without Mn^{3+} Ions**
 13:50-14:20 Byoungwoo Kang
 7-2-0315 *Pohang University of Science and Technology, Korea*

INVITED **PLD Deposited Pt-Gd Alloy on Ni Foam as Cathode for Li-O₂ Batteries with High Efficiency, High Capacity, and Long Life**
 14:20-14:50 Shulei Chou
 7-2-0564 *University of Wollongong, Australia*

INVITED **High Capacity Cathode Materials for Li-ion Batteries: Failure Mechanism and Strategy**
 14:50-15:20 Kyu Tae Lee
 7-2-0490 *Seoul National University, Korea*

INVITED **Structural Recognition and Intercalation Chemistry of Some Layer-Structured Anode Materials for Na-ion Batteries**
 15:20-15:50 Xuefeng Wang, Yurui Gao, Zhaoxiang Wang, Liquan Chen
 7-2-0599 *Institute of Physics, Chinese Academy of Sciences, China*

15:50-16:05 **Web Based NanoMaterials Design Platform for Li Ion Battery**
 7-2-3262 Minho Lee¹, Sang Soo Han², Seungchul Kim², Kwang-Ryeol Lee²
¹Virtual Lab, Inc., Korea, ²Korea Institute of Science and Technology, Korea

7. Electrochemical energy storage materials

7-1 Materials for Li-air batteries

Chair Yong Joon Park (Kyonggi University, Korea)

16:20-18:00, Nov. 08 (Tue.) 8F

7-1-1178 **Synthesis and Properties of Polymer Electrolyte with Sulfonylurea Moiety for Lithium Batteries Applications**

Jiho Yoo, Kunyoung Choi, Hohyoun Jang, Sabuj Chandra Sutradhar, Jaeseong Ha, Sujin Yoon, Whangi Kim
Konkuk University, Korea

7-1-2885 **Mesoporous Carbonized Cobalt Oxide Inverse Opal Nanostructures as Cathode in Li-O₂ Battery**

Seol A Cho, Yu Jin Jang, Ji-Eun Lee, Rami Reddy Boppella, Dong Ha Kim
Ewha Womans University, Korea

7-2 Electrode materials for lithium ion batteries

Chair Yong-Mook Kang (Dongguk University, Korea)

16:30-17:30, Nov. 09 (Wed.) 8F

7-2-0450 **Electrochemical Synthesis of Metal Alloy Electrodes Using 3D Open-cell Polyurethane Template**

Geonheum Yeon, Sunjung Kim
University of Ulsan, Korea

7-2-1064 **Single-Layer Graphene-Wrapped Li₄Ti₅O₁₂ Anode with Superior Lithium Storage Capability**

Jaewon Kim¹, Kyung Eun Lee², Kyung Hwan Kim¹, Sungun Wi¹, Sangheon Lee¹, Seunghoon Nam³,
Chunjoong Kim⁴, Sang Ouk Kim², Byungwoo Park¹

¹Seoul National University, Korea, ²Korea Advanced Institute of Science and Technology, Korea,

³Korea Institute of Machinery & Materials, Korea, ⁴Chungnam National University, Korea

7-2-1258 **Surface Modified Ni-rich Cathode using PVDF as a New Coating Source**

Jun Won Lee, Yong Joon Park
Kyonggi University, Korea

7-2-1482 **The Effect of SiO₂ Passivation Thin Film Coating on Electrochemical Characteristic of Lithium Metal Electrode**

Ji Young Kim¹, A-Young Kim¹, Guicheng Liu¹, Min Kyu Kim¹, Hansung Kim², Joong Kee Lee¹

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

7-2-1592 **Preparation of Ti/TiO₂ Micron-cone Array Electrode as an Anode for Lithium Ion Battery**

Guicheng Liu, A-Young Kim, Ji Young Kim, Jae Young Woo, Joong Kee Lee
Korea Institute of Science and Technology, Korea

7-2-1596 **Preparation of Sn-C Molecular Level Composite Thin Film for the Anode of Lithium-Ion Batteries**

Ryanda Enggar Anugrah Ardhi¹, Martin Halim¹, Chairul Hudaya², Ji Young Kim¹, Joong Kee Lee¹

¹Korea Institute of Science and Technology, Korea, ²Universitas Indonesia, Indonesia

- 7-2-1621 **Surface Modification of Porous Silicon by Thermolytic Grafting for the Anode Materials of Lithium-ion Batteries**
Jae-Young Woo¹, Thuy-An Nguyen², Sang-Wha Lee², Yang-Kook Sun³, Joong Kee Lee¹
¹Korea Institute of Science and Technology, Korea, ²Gachon University, Korea, ³Hanyang University, Korea
- 7-2-1662 **Physical and Electrochemical Properties of CuO Coated on the Li[Ni_{0.8}Co_{0.1}Mn_{0.1}]O₂ Cathode Material for Lithium Ion Batteries at High Voltage and Elevated Temperature**
Suk Hyun Kang, Yong Nam Jo, Palanisamy Santhoshkumar, Chang Woo Lee
 Kyung Hee University, Korea
- 7-2-1711 **Time Efficient Synthesis of MnO₂ Coated α -Fe₂O₃ Ellipsoids for Application in Lithium Ion Batteries**
Santhoshkumar Palanisamy, K. Prasanna, Yong Nam Jo, I. Nirmal Sivagami, Tae Hong Kim, Suk Hyun Kang, Chang Woo Lee
 Kyung Hee University, Korea
- 7-2-1724 **Synthesis of Novel Lithium Metal Silicate and Its Application in Lithium Ion Batteries as a Potential Cathode Material**
Ilavazhakan Nirmal Sivagami, Yong Nam Jo, Su Jung Do, K. Prasanna, Suk Hyun Kang, Tae Hong Kim, Santhoshkumar Palanisamy, Ga Young Seo, Chang Woo Lee
 Kyung Hee University, Korea
- 7-2-1825 **The Effect of Al Doping on the Surface of Li[Ni_{0.8}Co_{0.1}Mn_{0.1}]O₂ for High Performance Lithium Ion Batteries**
Su Jung Do, Yong Nam Jo, Ga Young Seo, Suk Hyun Kang, K. Prasanna, Chang Woo Lee
 Kyung Hee University, Korea
- 7-2-1984 **Preparation of Ni-coated Si Anode Materials using Electroless Plating for High Performance Secondary Lithium-ion Batteries**
Seong-Ho Baek¹, Young-Min Jeong¹, Byeongman Ko², Injoon Son²
¹Daegu Gyeongbuk Institute of Science and Technology, Korea, ²Kyungpook National University, Korea
- 7-2-2263 **Electrochemical Analysis of LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ Cathode through EIS Method**
Jaeha Lee, Dongpyo Kim, Sukhyun Han, Eunhee Jeong
 Gangwon Technopark, Korea
- 7-2-2405 **Enhanced Electrochemical Performances of Lithium Sulfur Batteries with Dual Conductive Polymer Coated Sulfur**
Tae-Gyung Jeong¹, Yoon-Sung Lee¹, Yong Tae Kim², Byung Won Cho¹
¹Korea Institute of Science and Technology, Korea, ²Pusan National University, Korea
- 7-2-2512 **Synthesis of Layered Ni-rich Cathode Materials Coated with Li₂MnO₃ for Lithium Ion Batteries by Mechanochemical Process**
Jae-Kyo Noh^{1,2}, Juhyeon Ahn^{2,3}, Dongjin Byun¹, Byung-Won Cho²
¹Korea University, Korea, ²Korea Institute of Science and Technology, Korea, ³Yonsei University, Korea
- 7-2-2514 **Effect of Cation Doping on the Effective Mass of Li₄Ti₅O₁₂: First-principles Study**
Haneol Cho¹, Samuel Boateng¹, Heechae Choi², Kyu Hwan Lee¹
¹Korea Institute of Science and Technology, Korea, ²Virtual Lab Inc., Korea

- 7-2-2535 **Development of Heterogeneous Crystal Structure via Nanoscale Surface Doping**
Juhyeon Ahn^{1,2}, Jae-Kyo Noh^{2,3}, Jong Hak Kim¹, Byung Won Cho²
¹Yonsei University, Korea, ²Korea Institute for Science and Technology, Korea, ³Korea University, Korea
- 7-2-2592 **Preparation of Si/C Nanocomposite Anodes Combined with PVA Electrospinning for Lithium-ion Batteries**
Hui Cheol Jeong, Kwang Hui Jung, Seul Gi Yu, Yong Ha Kim, Yong Sun Won
 Pukyong National University, Korea
- 7-2-2814 **Metal Monoxides for Cathode Materials in Lithium Ion Batteries**
Sung-Kyun Jung¹, Hyunchul Kim², Min Gee Cho¹, Taeghwan Hyeon¹, Won-Sub Yoon², Kisuk Kang¹
¹Seoul National University, Korea, ²Sungkyunkwan University, Korea
- 7-2-2816 **Electrochemical Properties of LiFePO₄/Carbon-MnO₂ Nano-composites for Lithium Ion Batteries**
Sue Bin Lee^{1,2}, Kwan-Young Lee¹, Byung Won Cho²
¹Korea University, Korea, ²Korea Institute of Science and Technology, Korea
- 7-2-2870 **High-Throughput Method to Study the Electrochemical Performance of Ag-doped Olivine based Cathode for LIBs**
Hyunseok Lee¹, Kwang-Bum Kim², Ji-Won Choi³
¹Korea Institute of Science and Technology, Korea, ²Yonsei University, Korea, ³Korea University of Science and Technology, Korea
- 7-2-2949 **Substituents Effects on Redox Potential of Organic Electrode Materials: Electronic Effect vs. Cation-Substituents Interaction**
Sechan Lee¹, Ji Eon Kwon¹, Jihyun Hong², Soo Young Park¹, Kisuk Kang¹
¹Seoul National University, Korea, ²Stanford University, USA
- 7-2-2987 **Preparation of Thin Film Carbon Electrode and Its Application in Lithium Ion Battery**
Su Chan Lee^{1,2}, Ji-Hoon Lee¹, Seong Chan Jun², Kyung Yoon Chung¹
¹Korea Institute of Science and Technology, Korea, ²Yonsei University, Korea
- 7-2-3025 **Exploiting Li-ether Co-intercalation in Graphite for High-power Lithium Ion Batteries**
 Kisuk Kang¹, Kyungmi Lim¹, Haegyeom Kim²
¹Seoul National University, Korea, ²Lawrence Berkeley National Laboratory, USA
- 7-2-3188 **Failure Analysis of Commercial Electrode Materials for Li-ion Batteries**
Ji-Young Kim, Su Jin Kim, So Hyun Park, Hee Kyung Kang, Byung Won Cho, Kyung Yoon Chung, Hye Jung Chang
 Korea Institute of Science and Technology, Korea
- 7-2-3222 **Morphology-tuned Synthesis of NiCo₂O₄-Coated 3D Graphene Architectures as Binder-free Anode for Li Ion Battery**
 Chunfei Zhang, Hyeon Yeol Park, Jong-Sung Yu
 Daegu Gyeongbuk Institute of Science and Technology, Korea
- 7-2-3301 **Development of High Performance Aqueous Li-Ion Hybrid Capacitor**
Parthiban Pazhamalai, Karthikeyan Krishnamoorthy, Sang Jae Kim
 Jeju National University, Korea

7-3 All solid state Li/Na batteries

Chair Young-Gi Lee (Electronics and Telecommunications Research Institute, Korea)

16:30-17:30, Nov. 09 (Wed.) 8F

- 7-3-1375 **Fabrication of 3-dimensional Flexible Electrode for All-solid-state Li Microbatteries**
Haena Yim¹, Hyun Seok Lee¹, Yung-Eun Sung², Ji-Won Choi¹
¹Korea Institute of Science and Technology, Korea, ²Seoul National University, Korea
- 7-3-2273 **Preparation and Characterization of Ta-doped LLZO Garnet Solid Electrolyte by Sol-gel Processing for All-solid-state Lithium Ion Batteries**
SangA Yoon, NuRi Oh, HeeChul Lee
 Korea Polytechnic University, Korea
- 7-3-2774 **NaF-FeF₂ Nanocomposite: A New Type of Na-ion Battery Cathode Material**
 Kisuk Kang, Insang Hwang
 Seoul National University, Korea
- 7-3-3011 **Electrochemical Analysis of an All-solid-state Lithium Ion Batteries using NASICON Structured Electrolyte**
Jae-Ho Park^{1,2}, Yoon-Sung Lee², Hun-Gi Jung², Woo Young Yoon¹, Kyung Yoon Chung²
¹Korea University, Korea, ²Korea Institute of Science and Technology, Korea
- 7-3-3208 **All-Solid-State Na-Ion Batteries Using Na Superionic Conductor, Na₃SbS₄**
Kern Ho Park¹, Abhik Banerjee¹, Jongwook Heo², Young Jin Nam¹, Chang Ki Moon¹, Seung M. Oh³, Seung-Tae Hong², Yoon Seok Jung¹
¹Ulsan National Institute of Science and Technology, Korea, ²Daegu Gyeongbuk Institute of Science and Technology, Korea, ³Seoul National University, Korea

8. Energy harvesting materials

8-1 Nanogenerators

Chair Sang-Woo Kim (Sungkyunkwan University, Korea)

Nov. 07 (Mon.) Ora (8F)

INVITED Energy Harvesting Technology for Self-powered Systems

09:00-09:30 Youfan Hu

8-1-0166 *Peking University, China*

INVITED Triboelectric Nanogenerator for Self-powered Electronics

09:30-10:00 Jeong Min Baik

8-1-0679 *Ulsan National Institute of Science and Technology, Korea*

INVITED Wearable Self-charging Power Textile based on Flexible Nanogenerator and Battery

10:00-10:30 Pu Xiong¹, Weiguo Hu¹, Zhong Lin Wang²

8-1-1968 ¹*Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Science, China*, ²*Georgia Institute of Technology, USA*

INVITED A Novel Structured Triboelectric Energy Harvester

10:30-11:00 Yang-Kyu Choi, Seung-Bae Jeon

8-1-0507 *Korea Advanced Institute of Science and Technology, Korea*

11:00-11:15 Self-powered Wireless Sensor Node Enabled by an Aerosol-deposited PZT Flexible Energy Harvester

8-1-0938 Geon Tae Hwang

Korea Institute of Materials Science, Korea

11:15-11:30 Nanocomposite based Triboelectric Nanogenerators via Control of Ferroelectric Polarization and Dielectric Property

8-1-1372 Hongjoon Yoon, Wanchul Seung, Sang-Woo Kim

Sungkyunkwan University, Korea

8-2 Thermoelectric power generators

Chair Sung Wng Kim (Sungkyunkwan University, Korea)

Nov. 07 (Mon.) Ora (8F)

INVITED Unusually Large Thermopower of Nanostructured Oxides

15:00-15:30 Hiromichi Ohta¹, Woo Seok Choi²

8-2-0165 ¹*Hokkaido University, Japan*, ²*Sungkyunkwan University, Korea*

INVITED In-situ Nanostructuring Route for N-type Bi-Te-based Thermoelectric Materials

15:30-16:00 Kyu Hyoung Lee

8-2-0322 *Kangwon National University, Korea*

INVITED Hybrid Inorganic/Organic Superlattices for Flexible Thermoelectrics

16:00-16:30 Chunlei Wan¹, Kunihiro Koumoto²

8-2-0414 ¹*Tsinghua University, China*, ²*Toyota Physical and Chemical Research Institute, Japan*

- INVITED** **Band Structure Engineering for Thermoelectric Materials**
 16:30-17:00 Min-Wook Oh
 8-2-0338 *Hanbat National University, Korea*
- 17:00-17:15 **Observation of Anisotropy in Thermoelectric Properties of Individual Single-Crystalline Bismuth Nanowires**
 8-2-2291 Jeongmin Kim, Somi Yoo, Wooyoung Lee
Yonsei University, Korea
- 17:15-17:30 **Process Optimization of Screen-printed Thermoelectric Thick-films for Flexible Thermoelectric Devices**
 8-2-1221 Hyeonngo Choi¹, Sun Jin Kim¹, Yongjun Kim¹, Ju Hyung We¹, Ji Seon Shin², Kevin K. Yi², Byung Jin Cho¹
¹Korea Advanced Institute of Science and Technology, Korea, ²TEGway Co. Ltd., Korea
- 17:30-17:45 **Extremely Low Thermal Conductivity in Epitaxial Bi_{0.5}Sb_{1.5}Te₃ Thermoelectric Thin Films**
 8-2-1032 Jae-Yeol Hwang¹, Eun Sung Kim¹, Young-Min Kim², Sung Wng Kim²
¹Institute for Basic Science, Korea, ²Sungkyunkwan University, Korea
- 17:45-18:00 **Enhanced Thermoelectric Performance of Al and Bi Co-doped Mg₂Si**
 8-2-2213 Gwansik Kim¹, Hwijong Lee¹, In Woong Lyo², Byung-Wook Kim², Kyu Hyoung Lee³, Wooyoung Lee¹
¹Yonsei University, Korea, ²Hyundai Motor Company, Korea, ³Kangwon National University, Korea

8-3 Piezoelectric and hybrid power generators

Chair Miso Kim (Korea Research Institute of Standards and Science, Korea) **Nov. 08 (Tue.) Ora (8F)**

- INVITED** **Energy Harvesting from Vibration and Motion through Piezoelectric and Electromagnetic Generators**
 09:00-09:30 Wei-Hsin Liao
 8-3-0253 *The Chinese University of Hong Kong, Hong Kong*
- INVITED** **Wireless Sensor Network Driving by Magnetic Energy Harvester with Magnetolectric Multiferroic Composites**
 09:30-10:00 Jungho Ryu
 8-3-0284 *Korea Institute of Materials Science, Korea*
- INVITED** **Dual Phase Energy Harvesting – Materials, Characterization, and Applications**
 10:00-10:30 Shashank Priya
 8-3-3414 *Virginia Tech, USA*
- INVITED** **Advances in Energy Focusing, Localization and Harvesting**
 10:30-11:00 Byeng D. Youn¹, Yong Chang Shin¹, Soo-Ho Jo¹, Heonjun Yoon¹, Miso Kim², Choon-Su Park², Wonjae Choi²
 8-3-1485 ¹Seoul National University, Korea, ²Korea Research Institute of Standards and Science, Korea
- 11:00-11:15 **Phononic Crystal-based Energy Focusing and Harvesting: From Unitcell to Structure Design**
 8-3-2327 Yong Chang Shin¹, Heonjun Yoon¹, Soo-Ho Jo¹, Miso Kim², Choon-Su Park², Wonjae Choi², Guilian Yi¹, Byeng D. Youn¹
¹Seoul National University, Korea, ²Korea Research Institute of Standards and Science, Korea

11:15-11:30

Flexible Piezoceramic Film Generators

8-3-0782

Dae Yong Park, Chang Kyu Jeong

Korea Advanced Institute of Science and Technology, Korea

8. Energy harvesting materials

8-1 Nanogenerators

Chair Sang-Woo Kim (Sungkyunkwan University, Korea)

18:00-19:30, Nov. 07 (Mon.) 8F

- 8-1-0784 **Flexible Inorganic Piezoelectric Acoustic Nanosensors using Laser Lift-off Process**
Jae Hyun Han, Daniel Juhyung Joe, Keon Jae Lee
Korea Advanced Institute of Science and Technology, Korea
- 8-1-0976 **Triboelectric Nanogenerator based on Fully Enclosed Pocket-shaped Structure for Harvesting Wind Energy**
 Jeong Min Baik, Jin Pyo Lee, Jun Hyun Yang, Jinsung Chun
Ulsan National Institute of Science and Technology, Korea
- 8-1-1323 **Effects of Dopants on the Enhanced Piezoelectric Potential of ZnO Nanowires: Compensation of Free Charge-carrier Density by Neutralizing Donors**
Tae Yun Kim¹, Sang-Woo Kim¹, Seong Min Kim²
¹Sungkyunkwan University, Korea, ²Samsung Advanced Institute of Technology, Korea
- 8-1-1366 **Anomalous Large Power Output from a Single Droplet and Graphene on Tribo-electrified Substrate**
Sung Soo Kwak, Jeong Hwan Lee, Hanjun Ryu, Sang-Woo Kim
Sungkyunkwan University, Korea
- 8-1-1428 **Graphene based Transparent Flexible Triboelectric Nanogenerators**
Hyoung Taek Kim, Seongsu Kim, Sang-Woo Kim
Sungkyunkwan University, Korea
- 8-1-1434 **Investigation of Triboelectric Effect in the Ferroelectric Material**
Min Ki Kang, Sung Kyun Kim, Sang-Woo Kim
Sungkyunkwan University, Korea
- 8-1-1678 **Charge-Enhancing Mechanism with Light-Matter Interaction in Nano-phototronic Devices for Triboelectric Nanogenerator**
Byeong Uk Ye, Jeong Min Baik
Ulsan National Institute of Science and Technology, Korea
- 8-1-1776 **Cartridge Structured Replaceable Triboelectrification based Self-Powered Sensor for Detecting Human Movement on Shoes**
Kyeong Nam Kim, Jeong Min Baik
Ulsan National Institute of Science and Technology, Korea
- 8-1-1981 **Flexible Single Crystalline PMN-PT Thin Film Nanogenerator and Its Application for Self-powered Cardiac Pacemaker**
Jae Hyun Han, Keon Jae Lee
Korea Advanced Institute of Science and Technology, Korea

- 8-1-3304 **Piezoelectric-Triboelectric Hybrid Nanogenerator as a Self-Powered Air Pressure Sensor**
Nagamalleswara Rao Alluri, Arunkumar Chandrashekar, Sophia Selvarajan, Ji Hyun Jeong,
 Gae Myoung Lee, Sang Jae Kim
Jeju National University, Korea
- 8-1-3315 **Human Interactive Smart Mobile Pouch Triboelectric Nanogenerator and Its Self-Powered Applications**
Arunkumar Chandrasekhar, Nagamalleswara Rao Alluri, Sudhakaran M.S.P, Young Sun Mok, Sang Jae Kim
Jeju National University, Korea

8-2 Thermoelectric power generators

Chair Sung Wng Kim (Sungkyunkwan University, Korea) 18:00-19:30, Nov. 07 (Mon.) 8F

- 8-2-0917 **Developing a Device for Monitoring the Insulation Status of Cables in Power Generators at a Power Station**
Keehong Um¹, Bo-Kyeong Kim²
¹Hansei University, Korea, ²Osung Mega Power Co., Ltd., Korea
- 8-2-0979 **Flexible Thermoelectric Material based on CNT-polymer Composite**
Jeong-Hun Choi, Min-Sik Kim, Hyeok-ju Lee, Chul-Min Hyun, Tae-Hun Jwa, Kyoung Ryun Lee, Ji-Hoon Ahn
Korea Maritime & Ocean University, Korea
- 8-2-1068 **Graphene-assisted Epitaxial Growth of Thermoelectric Bi_{0.5}Sb_{1.5}Te₃ Thin Film on Amorphous SiO₂/Si Substrate by Pulsed Laser Deposition**
Eun Sung Kim, Jae-Yeol Hwang, Sung Wng Kim
Institute for Basic Science, Sungkyunkwan University, Korea
- 8-2-1074 **Additives to Control Thermoelectric Transport Properties of Spark-Plasma-Sintered Polycrystalline N-Type Bi₂Te_{2.7}Se_{0.3}**
 Kyu Hyoung Lee, Jin Heon Kim
Kangwon National University, Korea
- 8-2-1360 **High Thermoelectric Properties of Solution-processed Carbon Nanotube Composite Films**
Ban-Suk Park¹, Jaeyun Kim², Jeonghun Kwak², Tae-Jun Ha¹
¹Kwangwoon University, Korea, ²The University of Seoul, Korea
- 8-2-1464 **Thermoelectric Properties in Single- and Poly-crystalline Epitaxial SrRuO₃ Thin Films**
Sungmin Woo¹, Sang A Lee^{1,2}, Soohyun Shin¹, Yong-hoon Oh¹, Hyeona Mun¹, Morgane Lacotte³,
 Adrian David³, Wilfrid Prellier³, Sung Wng Kim¹, Tuson Park¹, W. N. Kang¹, Woo Seok Choi¹
¹Sungkyunkwan University, Korea, ²Institute of Basic Science, Korea, ³Normandie Universite, France
- 8-2-1587 **Waste Heat Recovery from an Exhaust Pipe using a Thermoelectric Generator**
 Seungwoo Han¹, Saerom Seo²
¹Korea Institute of Machinery and Materials, Korea, ²University of Science and Technology, Korea
- 8-2-1593 **Evaluation of Cooling Performance on Micro Thermoelectric Modules**
 Seungwoo Han, Si Jin Kim
Korea Institute of Machinery and Materials, Korea

- 8-2-1704 **Preparation and Structure of Bulk Nanostructured Bi₂Te₃ with Reduced Thermal Stability**
Dae-Hwan Jang, Chul-Han Song, Yun-Ho Jin, Jae-Kyo Yang, Man-Sik Kong
Institute for Advanced Engineering, Korea
- 8-2-1912 **Thermoelectric Power Generator using Flexible Substrates**
Seungwoo Han, Su Hyeon Lee, Chang-Soo Woo
Korea Institute of Machinery and Materials, Korea
- 8-2-1918 **Thermal Properties of SrRuO₃/SrTiO₃ Superlattice**
In-Ho Kim, Sungmin Woo, Hyeona Mun, Sung Wng Kim, Woo Seok Choi
Sungkyunkwan University, Korea
- 8-2-1920 **Life Test and Failure Analysis of Miniaturized Thermoelectric Module**
Hyoungseuk Choi¹, Soon-Mok Choi²
¹Korea Institute of Ceramic Engineering and Technology, Korea, ²Korea University of Technology and Education, Korea
- 8-2-1979 **Effects of Sn-deficiency on Thermoelectric Properties of Polycrystalline Sn_{1-x}Se Compounds**
Sang Tae Lee¹, Min Ji Kim¹, Gil-Geun Lee¹, Sung Gyoo Kim¹, Soonil Lee², Won-Seon Seo², Young Soo Lim¹
¹Pukyong National University, Korea, ²Korea Institute of Ceramic Engineering and Technology, Korea
- 8-2-1994 **Microstructure and Thermoelectric Properties of Cu_{2-x}Se Composites prepared by Rapid Solidification Process**
Jang-Yeul Tak^{1,2}, Sang Tae Lee³, Won-Seon Seo², Il-Ho Kim⁴, Hyung Koun Cho¹, Young Soo Lim³
¹Sungkyunkwan University, Korea, ²Korea Institute of Ceramic Engineering and Technology, Korea, ³Pukyong National University, Korea, ⁴Korea National University of Transportation, Korea
- 8-2-1995 **A Perspective on Patents on Thermoelectric Materials Developments**
Minwoo Lee¹, Ilkoo Huh², Jinil Kim³, Hoejun Kwon³, Taegryul Kwon³
¹Korea Intellectual Property Strategy Agency, Korea, ²Highest International Patent & Law Office, Korea, ³LivingCare Ltd., Korea
- 8-2-2173 **Thickness Effects on the Thermoelectric Properties of Bismuth Antimony Telluride Thin Films Prepared by RF Sputtering Deposition**
HanKi Cho, Seung Woo Han
Korea Institute of Machinery and Materials, Korea
- 8-2-2182 **Thermoelectric Properties of Bi₂Sb_{2-x}Te₃ Poly Crystal Alloy Fabricated by an Oxide-Reduction and Spark Plasma Sintering**
Gil-Geun Lee, Chaesun Lim, Young Soo Lim
Pukyong National University, Korea
- 8-2-2208 **Annealing Effect on Filled-Fe₃CoSb₁₂ Thermoelectric Materials**
Geonsik Son, Soonmok Choi, Byeong Geun Kim
Korea University of Technology and Education, Korea
- 8-2-2220 **Thermoelectric Transport Properties of Higher Manganese Silicide (HMS) via Rapid Solidification Process**
Hwijong Lee¹, Gwansik Kim¹, Byunghun Lee¹, Kyu Hyoung Lee², Wooyoung Lee¹
¹Yonsei University, Korea, ²Kangwon National University, Korea

- 8-2-2289 **Point Defect Controls for Cu Doped $\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3}$ Thermoelectric Materials**
KangHyun Seo¹, Soon-Mok Choi¹, Won Ho Shin², Soonil Lee², Il-Ho Kim³
¹Korea University of Technology and Education, Korea, ²Korea Institute of Ceramic Engineering and Technology, Korea, ³Korea National University of Transportation, Korea
- 8-2-2315 **Temperature-dependent Thermoelectric Properties of Two-Dimensional RuO_2 Nanosheets with Various Ru/O Ratio**
Somi Yoo¹, Jeongmin Kim¹, Jong Wook Roh², Wooyoung Lee¹
¹Yonsei University, Korea, ²Samsung Advanced Institute of Technology, Korea
- 8-2-2332 **Phase Transformation Characteristics of Bulk Metallic Glass (BMG) Electrodes for Use of High Temperature Thermoelectric Modules**
Yu Seong Lee¹, Soon Mok Choi¹, Soonil Lee², Won Ho Shin², Il-Ho Kim³
¹Korea University of Technology and Education, Korea, ²Korea Institute of Ceramic Engineering and Technology, Korea, ³Korea National University of Transportation, Korea
- 8-2-2364 **The Effect of the Cu Doping on the Thermoelectric Properties of Nanostructured Bi-Se-Te Materials**
Minsoo Park^{1,2}, Gook-Hyun Ha¹, Hye Young Koo¹
¹Korea Institute of Materials Science, Korea, ²Pusan National University, Korea
- 8-2-2558 **Charge Transport and Thermoelectric Properties of Partially-double-filled $(\text{Pr}_{1-z}\text{Yb}_z)_\text{Fe}_{4-x}\text{Co}_x\text{Sb}_{12}$ Skutterudites**
Dong-Kil Shin, Il-Ho Kim
Korea National University of Transportation, Korea
- 8-2-2560 **Thermoelectric Properties of N-Type $\text{Bi}_{2-x}\text{Sb}_x\text{Te}_{3-y}\text{Se}_y$ Prepared by Encapsulated Melting and Hot Pressing**
A Young Eum, Ji-Seon Seo, Il-Ho Kim
Korea National University of Transportation, Korea
- 8-2-2568 **Synthesis and Thermoelectric Properties of $\text{Ce}_{1-z}\text{Nd}_z\text{Fe}_{4-x}\text{Co}_x\text{Sb}_2$ Skutterudites**
Kwon Min Song, Dong Kil Shin, Il-Ho Kim
Korea National University of Transportation, Korea
- 8-2-2587 **Mechanical and Thermoelectric Properties of $\text{Bi}_{2-x}\text{Sb}_x\text{Te}_3$ Prepared by Mechanical Alloying and Hot Pressing**
Woo-Jin Jung, Hyeok-Jin Kim, Il-Ho Kim
Korea National University of Transportation, Korea
- 8-2-2789 **Effects of Cu Addition on Thermoelectric Properties in $\text{Cu}_x\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3}$ Composites**
Mahn Jeong¹, Soonil Lee¹, Won-Seon Seo¹, Young Soo Lim²
¹Korea Institute of Ceramic Engineering and Technology, Korea, ²Pukyong National University, Korea
- 8-2-3165 **Temperature Dependent Thermoelectric Properties of Graphene Incorporated Bi-Sb-Te Sintered by Spark Plasma Sintering**
Jeong Seop Yoon¹, Mahn Jeong¹, Won-Seon Seo¹, Young Soo Lim², Weon ho Shin¹
¹Korea Institute of Ceramic Engineering and Technology, Korea, ²Pukyong National University, Korea

8-2-3173

Influence of Electroless Ni-P and Pd-P Plating on the Bonding Strength of N-type Bi-Te ThermoelementSungsoon Kim¹, Injoon Son¹, KwanHo Park², Sanghum Cho², Kyungtae Kim³¹Kyungpook National University, Korea, ²DAE YANG Co., Ltd., Korea, ³Korea Institute of Materials Science, Korea

8-2-3369

Y₃Fe₅O₁₂ (YIG) Spin-Thermoelectric Module prepared by Sol-Gel MethodMin-Sun Jang¹, Seung-Hyub Baek², Ki-Suk Lee¹¹Ulsan National Institute of Science and Technology, Korea, ²Korea Institute of Science and Technology, Korea**8-3 Piezoelectric and hybrid power generators**

Chair

Miso Kim (Korea Research Institute of Standards and Science, Korea)

16:20-18:00, Nov. 08 (Tue.) 8F

8-3-1691

A Flexible Piezoelectric Nanogenerator for Wearable Human DevicesKyung Bum Kim¹, Su Kang Bae¹, Seoung-ki Lee¹, Sang Jin Kim¹, Tae Hyun Sung², San Nahm³, Sang Hyun Lee¹, Tae Wook Kim¹¹Korea Institute of Science and Technology, Korea, ²Hanyang University, Korea, ³Korea Univeristy, Korea

8-3-2082

Piezoelectric Energy Harvesting using Hexagonal Honeycomb Lattice StructureHeonjun Yoon, Byeng D. Yoon

Seoul National University, Korea

8-3-2119

Analysis of the Generating Efficiency according to the Shape of the Bar-type Piezoelectric GeneratorHolk Jun, SeongSu Jeong, SeongKyu Cheon, JungWhan Kim, TaeGone Park

Changwon National University, Korea

9. Smart sensor materials

9-3 Mechanical/physical sensors and IOT

Chair Changhyun Pang (Sungkyunkwan University, Korea)

Nov. 07 (Mon.) Ara (8F)

INVITED
09:00-09:30
9-3-0442 **Static and Dynamic Pressure Sensing using Stretchable Carbon Nanotube-based and Piezoelectric Polymer-based Capacitive Sensors and Their Application in Tactile and Sound Pressure Detection**

Steve Park¹, Elizabeth Olson², Ioannis Kyrmis³, Zhenan Bao⁴

¹Korea Advanced Institute of Science and Technology, Korea, ²Columbia University Medical Center, USA,

³Columbia University, USA, ⁴Stanford University, USA

INVITED
09:30-10:00
9-3-0155 **Bio-inspired Flexible Electronic Devices**

Xiaodong Chen

Nanyang Technological University, Singapore

INVITED
10:00-10:30
9-3-0201 **Ultrathin Gold Nanowires as New e-Skin Materials for Applications in Flexible Transparent Conductor and Stretchable Wearable Sensors**

Wenlong Cheng

Monash University, Australia

INVITED
10:30-11:00
9-3-0395 **Homeostatic and Ionic Mechanotransduction Sensor Inspired by Human Skin**

Do Hwan Kim

Soongsil University, Korea

11:00-11:15
9-3-3268 **Nanowire Embedded Electrode for Multifunctional Physical Sensor**

Yunsik Joo, Jaeyoung Yoon, Jewook Ha, Taehoon Kim, Byeongmoon Lee, Seunghwan Lee, Yongtaek Hong
Seoul National University, Korea

11:15-11:30
9-3-2166 **Flexible Active-matrix Sensor Arrays using a Dry Jet Printed Organic Semiconductor**

Hanul Moon, Hyukyun Kwon, Sungyeon Kim, Jaehyeok Park, Jungmin Choi, Mincheol Kim,
Seungwon Lee, Seunghyup Yoo

Korea Advanced Institute of Science and Technology, Korea

11:30-11:45
9-3-3080 **Micro-pore Embedded Pressure Sensor of High Sensitivity for Precise Pressure Perception**

Subin Kang, Jaehong Lee, Heetak Han, Sanggeun Lee, Byungwoo Choi, Taeyoon Lee

Yonsei University, Korea

9-1 Materials for chemical and gas sensors

Chair Jeong-Min Baik (Ulsan National Institute of Science and Technology, Korea)

Nov. 07 (Mon.) Ara (8F)

INVITED
15:00-15:30
9-1-0161 **Diode-type H₂ Sensors: Optimal Coating of the Pt-sensing Electrodes with Au for Improving the H₂-Sensing Properties**

Takeo Hyodo, Wataru Sakata, Kai Kamada, Taro Ueda, Yasuhiro Shimizu

Nagasaki University, Japan

- INVITED**
15:30-16:00
9-1-0468 **Highly Sensitive and Selective Chemiresistive Gas Sensors based on Nanocolumnar Metal Oxide Thin Films**
Soo Deok Han, Young Suk Shim, Hi Gyu Moon, [Chong-Yun Kang](#)
Korea Institute of Science and Technology, Korea
- INVITED**
16:00-16:30
9-1-0263 **High-performance Gas Sensors based on Hierarchical NiO Nanostructures**
[Geyu Lu](#), Chen Wang, Peng Sun
Jilin University, China
- INVITED**
16:30-17:00
9-1-0326 **Toward Highly Selective Oxide Semiconductor Gas Sensors: Challenges and Opportunities**
[Jong-Heun Lee](#)
Korea University, Korea
- 17:00-17:15
9-1-2499 **Al-Doped ZnO Nanoparticles based Sensors for the Detection of VOCs**
[Ran Yoo](#), Dongmei Li, Wooyoung Lee
Yonsei University, Korea
- 17:15-17:30
9-1-2886 **Insect Antenna Inspired Zero Power, Fast Optical Hydrogen Gas Sensor**
[Heetak Han](#)¹, Sangyul Baik², Jungmok Seo³, Sera Shin¹, Changhyun Pang², Taeyoon Lee¹
¹*Yonsei University, Korea*, ²*Sungkyunkwan University, Korea*, ³*Harvard Medical School, Massachusetts Institute of Technology, USA*
- 17:30-17:45
9-1-2438 **Effects of MoS₂ Sheet Morphology on NO₂ Response for Gas Sensor**
[Chang Min Lee](#), Servin Rathi, Seung Muk Lee, Geun Chul Park, Sang Hyeon Jeong, Sae Yang Seo, Jong Won Choi, Chae Hee Park, Gil-Ho Kim, Jun Hyung Lim, Jinho Joo
Sungkyunkwan University, Korea

9-2 Smart biosensors: materials and devices

Chair Taesung Kim (Ulsan National Institute of Science and Technology, Korea) *Nov. 08 (Tue.) Ara (8F)*

- INVITED**
09:00-09:30
9-2-0226 **CMOS Technologies for Analytical Bio-diagnosis**
Hsiao-Ting Hsueh, I-Shun Wang, Pei-Wen Yen, Shiang-Chi Lin, [Chih-Ting Lin](#)
National Taiwan University, Taiwan
- INVITED**
09:30-10:00
9-2-0299 **High-throughput Biosensing Aided by Smart Materials: The Study of Microfluidic Immunoassay and Cell Morphology**
[Sung-Jin Kim](#)
Konkuk University, Korea
- INVITED**
10:00-10:30
9-2-0365 **Rapid Electrical Immunoassay of the Cardiac Biomarker Troponin I through Dielectrophoretic Concentration**
Abhinav Sharma, Chang-Ho Han, [Jaesung Jang](#)
Ulsan National Institute of Science and Technology, Korea
- INVITED**
10:30-11:00
9-2-0535 **Cyborg Insect: Insect-computer Hybrid Robot for Remote Radio Control of Insect Flight and Walking**
[Hirotaka Sato](#)
Nanyang Technological University, Singapore

11:00-11:15
9-2-1787 **A Content Review for Critical Systems for Sensors Network and Security and Multimedia Enhancement**

Mairey Lee¹, Hongseok Jang¹, Jaeyoung Choi²

¹Chonbuk National University, Korea, ²Sungkyunkwan University, Korea

11:15-11:30
9-2-3237 **Metallic Nanowire Synthesis for Bio- and Chemical-sensor Applications using a Crack-photolithography-based Nanofluidic Channel Network**

Dong-Joo Kim, Dogyeong Ha, Taesung Kim

Ulsan National Institute of Science and Technology, Korea

9. Smart sensor materials

9-1 Materials for chemical and gas sensors

Chair Jeong-Min Baik (Ulsan National Institute of Science and Technology, Korea)

18:00-19:30, Nov. 07 (Mon.) 8F

- 9-1-0514 **CO Sensing Properties of CaO-ZnO Core-shell Nanorod Sensors**
[Hyejoon Kheel](#), Gun-Joo Sun, Jae Kyung Lee, Seungbok Choi, Chongmu Lee
Inha University, Korea
- 9-1-0517 **Ethanol Gas Sensing Properties of Co₃O₄ Nanoparticle-decorated SnO₂ Nanorod Sensors**
[Gun-Joo Sun](#)¹, Hyejoon Kheel¹, Jae Kyung Lee¹, Soong Keun Hyun¹, Hyoun Woo Kim², Chongmu Lee¹
¹*Inha University, Korea*, ²*Hanyang University, Korea*
- 9-1-0845 **Effects of Growth Temperature and Oxygen Flow Rate on Properties of MoO₃ Thin Films**
[Shinho Cho](#)¹, James Parry², Christian R. Beynis², Hao Zeng²
¹*Silla University, Korea*, ²*The State University of New York at Buffalo, USA*
- 9-1-0866 **Hydrogen Properties of Pd Film on SiO₂ Porous Template**
[Hoon-Sik Jang](#), Bong Ho Jeong
World Tech. Co. Ltd., Korea
- 9-1-0956 **Highly Sensitive Organic Ammonia Sensor with Fluorinated Polymers**
[Benjamin Nketia-Yawson](#), Gi-Seong Ryu, Grace Dansoa Tabi, Yong-Young Noh
Dongguk University, Korea
- 9-1-1830 **Hydrothermally Grown Nanowire Arrays for Selective Gas Detection**
[Jin Woong Kim](#), Young Min Kwon, Jeong Min Baik
Ulsan National Institute of Science and Technology, Korea
- 9-1-2225 **Highly Sensitive Hydrogen Sensors Based on P-type Si Nanowire Array**
[Jisun Baek](#), Byungjin Jang, Wooyoung Lee
Yonsei University, Korea
- 9-1-2276 **Preparation of Semiconductor Gas Sensors with Pd-doped SnO₂ Nanostructured Films by using Ink Dopping Method**
[Heesoo Yoon](#), JunHyung Kim, HeeChul Lee
Korea Polytechnic University, Korea
- 9-1-2279 **Effects of Heat and Plasma Treatment Conditions on the Sensitivity of Toxic Gas Sensors**
 Hee Chul Lee, [Hyeong Gwan Kim](#)
Korea Polytechnic University, Korea
- 9-1-2611 **Hybrid Metal Oxide Nanowire Semiconductor for Gas Sensor**
[Yeongmin Kwon](#), JeongMin Baik
Ulsan National Institute of Science and Technology, Korea
- 9-1-2729 **Fluidic Assembly of Nanoshell Microsphere Devices into Cross-Point Sensor Arrays**
[Jaekyun Kim](#)
Hanbat National University, Korea

- 9-1-2999 **Porous Si Nanowires for Highly Selective Room-temperature NO₂ Gas Sensing**
Yong Jung Kwon, Sung Yong Kang, Myung Sik Choi, Jae Hoon Bang, Ali Mirzaei, Hyoan Woo Kim
Hanyang University, Korea
- 9-1-3167 **Effect of Porous Palladium Films with Different Density on Hydrogen Sensing Property**
Hee-Jun Noh^{1,2}, Min Ah Han^{1,2}, JiHea Jeong¹, Hyun-Jong Kim¹, Seong Ho Son¹, Jin-Seong Park²,
Ho-Nyun Lee¹
¹*Korea Institute of Industrial Technology, Korea*, ²*Hanyang University, Korea*
- 9-1-3170 **Solar Absorption with Flexible Metal/Dielectric Multilayer Films for Thermoelectric and Wearable Applications**
Hye Jin Lee¹, Jeong Min Baik¹, Won Jun Choi²
¹*Ulsan National Institute of Science and Technology, Korea*, ²*Korea Institute of Science and Technology, Korea*
- 9-1-3228 **Effective Dielectrics of PVDF Graft Copolymer for Enhancing Triboelectric Nanogenerator**
Jae Won Lee, Hye Jin Cho, Changduk Yang, Jeong Min Baik
Ulsan National Institute of Science and Technology, Korea
- 9-1-3241 **Parallel Aligned Mesopore Array in Pramidal-Shaped Gallium Nitride and Their Photocatalytic Applications**
HeeJun Kim, Jeong Min Baik
Ulsan National Institute of Science and Technology, Korea
- 9-1-3272 **Synthesis of TNT Nanocomposite as Smart Materials**
Bora Ye^{1,2}, Jeong Min Baik², HongDae Kim¹
¹*Korea Institute of Industrial Technology, Korea*, ²*Ulsan National Institute of Science and Technology, Korea*

9-3 Mechanical/physical sensors and IOT

Chair	Changhyun Pang (Sungkyunkwan University, Korea)	18:00-19:30, Nov. 07 (Mon.) 8F
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- 9-3-0619 **Direct Formation of β -poly (vinylidene fluoride) Thin Films Coated by Electrostatic Spraying Deposition**
Min-Seok Kim¹, Jae-Won Choi¹, Young-Sun Jeon¹, Jong-Min Kang², Gyu-Tak Kim², Seung Hwangbo²,
Jin-Tae Kim³, Kyu-Seog Hwang¹
¹*Nambu University, Korea*, ²*Honam University, Korea*, ³*Chosun University, Korea*
- 9-3-1104 **A Highly Conformal and Stretchable Sensor on Curved Bio-surface using All-solution-processable Assembly of Graphene Nano-platelets**
Youngjin Park¹, Jongwon Shim², Sangyeol Beik¹, TaeHeon Yang³, Gi-Ra Yi¹, Changhyun Pang¹
¹*Sungkyunkwan University, Korea*, ²*AmorePacific R&D Center, Korea*, ³*Korea Research Institute of Standards and Science, Korea*
- 9-3-1157 **Structural and Electrical Properties of Zn-Mn-Cu-O System Ceramics for the Application of IR Detectors**
Kyeong-Min Kim¹, Sung-Gap Lee¹, Dong-Jin Lee¹, Mi-Ri Park¹, Myung-Soo Han²
¹*Gyeongsang National University, Korea*, ²*Korea Photonics Technology Institute, Korea*

- 9-3-1241 **Frog-inspired Programmable Nano-architectures for Skin Patches & Sensors**
Da Wan Kim, Youngjin Park, Sangyeol Baek, Suyeon Jung, Chanhun Pang
Sungkyunkwan University, Korea
- 9-3-1768 **Development of Highly Sensitive and Wide Dynamic Range Fiber-Optic Probe Type Temperature Sensor using Thermochromic Compound Containing Sensing Membrane**
Apurva Vinodrao Watekar, Md. Rajibur Rahman Khan, Alireza Khalilian, Shin-Won Kang
Kyungpook National University, Korea
- 9-3-3088 **Magnetically Controllable Anti-fouling Smart Surface**
Hyunchul Kim, Heetak Han, Taeyoon Lee
Yonsei University, Korea
- 9-3-3264 **Flexible High-sensitivity Dual Mode Sensor for E-skin**
Minhyun Jung¹, Kyungkwan Kim¹, Taeho Kim¹, Sanghun Jeon¹, Heedo Chae², Haena Cheong²,
 Oh-Sun Kwon², Kwanwoo Shin²
¹Korea University, Korea, ²Sogang University, Korea
- 9-3-3286 **Flexible Highly Sensitive Pressure Sensor with Double Electrode Layer for Application in Electronic Skin**
Kyungkwan Kim, Minhyun Jung, Taeho Kim, Sanghun Jeon
Korea University, Korea

9-2 Smart biosensors: materials and devices

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

16:20-18:00, Nov. 08 (Tue.) 8F

- 9-2-1578 **On-the-spot Smartphone Imaging-based Label-free Seesawed Fluorescent Detection of Estradiol on Fluorescent Enhanced Microarray with High Sensitivity and Accuracy**
Wonil Lee, Sajal Shrivastava, Nae-eung Lee
Sungkyunkwan University, Korea
- 9-2-2163 **Polyethyleneimine-grafted Graphene based Electrochemical Biosensor for Detection of Cardiac Biomarker Myoglobin**
Abhinav Sharma, Jaesung Jang
Ulsan National Institute of Science and Technology, Korea
- 9-2-2595 **Inkjet-printed Ag Micro-/Nanostructures on Cu Foil for In-situ Preconcentration and Surface Enhanced Raman Scattering**
Qitao Zhou, Ashishi Kumar Thockchom, Dongjoo Kim, Taesung Kim
Ulsan National Institute of Science and Technology, Korea
- 9-2-3135 **Detection of Melamine by using CdTe Quantum Dots – Apoferritin Arrays**
Thi Hoa Le, Ji Hyeon Lee, Hyung Wook Choi, Sang Joon Park
Gachon University, Korea
- 9-2-3309 **Biothiol Responsive Film based Self-powered Sensor for Non-invasive Analysis**
Sophia Selvarajan, Nagamalleswara Rao Alluri, Arun Kumar Chandrasekhar, Sang-Jae Kim
Jeju National University, Korea

10. Biomaterials

10-3 Biological materials for catalysis and sensing

Chair Young-Pil Kim (Hanyang University, Korea)

Nov. 07 (Mon.) Ballroom 4 (2F)

INVITED Intracellular Self-Assembly/Disassembly of Nanoparticles Confers "Off/On" Signal for Molecular Imaging

09:00-09:30

10-3-0420

Gaolin Liang

University of Science and Technology of China, China

INVITED Gold Nanoparticles-Dextran Gel Complex for Highly Efficient and Convenient Removal of Radioactive Iodine in Aqueous Solutions

09:30-10:00

10-3-0456

Jongho Jeon, Mi Hee Choi, Ha Eun Shim, Dae Seong Choi, Beom-Su Jang

Korea Atomic Energy Research Institute, Advanced Radiation Technology Institute, Korea

INVITED Multiplexed Micro-RNA Assays using Time-resolved FRET with Biospectral Correction

10:00-10:30

10-3-0383

Zongwen Jin¹, Daniel Geißler², Niko Hildebrandt³

¹Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China, ²Federal Institute for Materials Research and Testing, Germany, ³Université Paris-Saclay, Université Paris-Sud, CNRS, France

INVITED Enhancement of PCR Efficiency and Specificity using Nanocomposites

10:30-11:00

10-3-0709

Seung Hoon Baek, Tae Jung Park

Chung-Ang University, Korea

10-2 Biomaterials for organ-on-a-chip

Chair Seung-Woo Cho (Yonsei University, Korea)

Nov. 07 (Mon.) Ballroom 4 (2F)

INVITED 3D Reconstitution of Cancer Microenvironment

15:00-15:30

10-2-0527

Hyunho Kim, Dong Hee Choi, Jaehoon Kim, Kyuhwan Na, Hyejin Park, Yong-Hun Jung, Youngkyu Cho,

Hyo Eun Jeong, Hyun Jeong Oh, Seok (Sid) Chung

Korea University, Korea

INVITED Microfluidic Technologies for Constructing 3D Cell-laden Hydrogel Structures

15:30-16:00

10-2-0357

Hiroaki Onoe

Keio University, Japan

INVITED A BioSpleen Blood Cleansing Device for Sepsis Therapy

16:00-16:30

10-2-0277

Joo Hun Kang

Ulsan National Institute of Science and Technology, Korea

16:30-16:45 The Development of Single-stranded Microvessel using a Microfluidic Device with M13 Bacteriophage

10-2-1039

Eojin Lee¹, Chunga Kwon², Hyungseop Han¹, Yu-chan Kim¹, Hyun-Kwang Seok¹, Young Jun Kim²,

Hojeong Jeon¹

¹Korea Institute of Science and Technology, Korea, ²Korea Institute of Science and Technology in Europe, Germany

- 16:45-17:00 **Triboelectric Nanogenerator Accelerates Direct Neuronal Reprogramming In Vitro and In Vivo**
 10-2-1990 Yoonhee Jin, Jungmok Seo, Soohwan An, Taeyoon Lee, Seung-Woo Cho
Yonsei University, Korea

10-1 Bioelectronic materials and devices

Chair Myung-Han Yoon (Gwangju Institute of Science & Technology, Korea)

Nov. 08 (Tue.) Ballroom 4 (2F)

- INVITED** **Fluorescent Organic Dots based on AIEgens for Bioimaging**
 09:00-09:30 Zujin Zhao
 10-1-3403 *South China University of Technology, China*
- INVITED** **Harnessing Plasmonic Nanoparticles for Controlling Neural Activity on a Chip**
 09:30-10:00 Yoonkey Nam
 10-1-0616 *Korea Advanced Institute of Science and Technology, Korea*
- INVITED** **On-Chip Lipid Microfluidics: Controlled Self-Assembly to Form Biomembranes**
 10:00-10:30 Jae Hyeon Park, Nam-Joon Cho
 10-1-0177 *Nanyang Technological University, Singapore*
- INVITED** **Water-Stable Crystalline PEDOT:PSS-based Cardiac Interfaces**
 10:30-11:00 Myung-Han Yoon
 10-1-0632 *Gwangju Institute of Science and Technology, Korea*
- INVITED** **Fabrication of 3D-Engineered Tissues with Blood Capillaries and Their Biomedical Application**
 11:00-11:30 Michiya Matsusaki
 10-1-1815 *Osaka University, Japan*
- 11:30-11:45 **The Advancement of Flexible Inorganic Light-Emitting Diodes for Biomedical Applications**
 10-1-0965 Seung Hyun Lee, Han Eol Lee, Jung Ho Shin, Keon Jae Lee
Korea Advanced Institute of Science and Technology, Korea
- 11:45-12:00 **Aqueous Electrolyte-Gated Metal Oxide Thin Film Transistors for Direct Cellular Interfaces**
 10-1-2312 Sungjun Park, Dong-Hee Kang, Se-Yeong Lee, Chang-Hyun Kim, Won-June Lee, Sujin Sung,
 Jun-Gyu Choi, Yeongseok Kim, Seong-Min Kim, Myung-Han Yoon
Gwangju Institute Technology and Science, Korea
- 12:00-12:15 **Water-stable Transparent PEDOT:PSS-based Microelectrode Arrays**
 10-1-2393 Youngseok Kim, Seong-Min Kim, Myung-Han Yoon
Gwangju Institute of Science and Technology, Korea

10. Biomaterials

10-2 Biomaterials for organ-on-a-chip

Chair Seung-Woo Cho (Yonsei University, Korea)

18:00-19:30, Nov. 07 (Mon.) 2F

- 10-2-0648 **Hyaluronic Acid Cross-linked via Fe-catechol Complexation within Polylactide Scaffolds for 3D Culture of Cancer Cells**
Jaehwan Ahn, Yoon Sung Nam
Korea Advanced Institute of Science and Technology, Korea
- 10-2-0703 **DNA-mediated Assembly of Neuronal and Gustatory Cells for Biosensor Applications**
Junsu Yun¹, Daejeong Kim¹, Ann-Na Cho², Seung-Woo Cho², Yoonkey Nam¹, Yoon Sung Nam¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Yonsei University, Korea
- 10-2-2064 **3D Human Induced Pluripotent Stem Cell Culture in Microfluidic Device**
Jin Kim¹, Hyun-Ji Park¹, Eun Je Jeon¹, Jiho Jang², Dong-Wook Kim², Seung-Woo Cho¹
¹Yonsei University, Korea, ²Yonsei University School of Medicine, Korea
- 10-2-2114 **Brain Tissue-mimicking 3D Microfluidic Chip for Controlling Differentiation of Human Neural Stem Cells**
Jin Kim, Kisuk Yang, Jisoo Shin, Seung-Woo Cho
Yonsei University, Korea
- 10-2-2158 **Decellularization on a Chip**
Yoonmi Hong¹, Ilkyoo Koh¹, Kwideok Park², Pilnam Kim¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Korea Institute of Science and Technology, Korea
- 10-2-2218 **Microfluidic 3D Gastric Microtumor Model for Assessment of Chemoresistance**
Minjeong Jang¹, Jae-Ho Cheong², Pilnam Kim¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Yonsei University College of Medicine, Korea
- 10-2-2230 **Electroconductive Nanopatterned Substrates for Improving Functional Maturation of Human Neural Stem Cells**
 Kisuk Yang¹, Jong Seung Lee¹, Hak-Rae Lee², Seung Jung Yu², Gyeong-Eon Chang¹, Eunji Cheong¹, Sung Gap Im², Seung-Woo Cho¹
¹Yonsei University, Korea, ²Korea Advanced Institute of Science and Technology, Korea
- 10-2-2240 **Graphene Oxide Hierarchical Topography for the Induction of Functional Neuron-like Cells from Human Neural Stem Cells**
 Kisuk Yang, Jong Seung Lee, Jaehong Lee, Eunji Cheong, Taeyoon Lee, Seung-Woo Cho
Yonsei University, Korea
- 10-2-2449 **Effects of In Vitro Irradiation Treatment on 3D Micro-sized Blood Vessel Barrier (BVB)**
Kyuhwan Na¹, Jaehoon Kim¹, Hyunho Kim¹, Myung-Jin Park², Seok Chung¹
¹Korea University, Korea, ²Korea Institute of Radiological & Medical Sciences, Korea
- 10-2-2471 **3D Glomerular Endothelium on in Vitro Microfluidic Device**
Jaehoon Kim¹, Kyuhwan Na¹, Eun-Young Lee², Seok Chung¹
¹Korea University, Korea, ²Soonchunhyang University, Korea

- 10-2-2481 **Comparison between 2D Plate Culture and 3D Spheroid Regarding Effectiveness of L929 M-csf Protein Production**
Yong Hun Jung, Kyuhwan Na, Jaehoon Kim, Dong Hee Choi, Seok Chung
 Korea University, Korea
- 10-2-2488 **Effects of Irraditaion on 3 Dimensional In-vitro Micro Vascular System**
Dong-Hee Choi¹, Kyu-hwan Na¹, Hyunho Kim¹, Yong-Hun Jung¹, Myung-Jin Park², Seok Chung¹
¹Korea University, Korea, ²Korea Institute of Radiological & Medical Sciences, Korea
- 10-2-2496 **Study for 3D in Vitro Cancer Invasion Model with Pre-metastatic Niche Induced Monocyte**
Hyunho Kim¹, Hyewon Chung², Yoojin Shin³, Dong-Hee Choi¹, Seok Chung¹, Seung Hyeok Seok²
¹Korea University, Korea, ²Seoul National University, Korea, ³Massachusetts Institute of Technology, USA
- 10-2-2500 **Engineering Hydrogel Scaffold Component for in Vitro Skeletal Muscle Fiber Formation**
Jinchul Ahn, Hyo-Eun Jeong, Jaehoon Kim, Seok Chung
 Korea University, Korea

10-3 Biological materials for catalysis and sensing

Chair Young-Pil Kim (Hanyang University, Korea) 18:00-19:30, Nov. 07 (Mon.) 2F

- 10-3-0700 **Bio-templated Synthesis of Noble Metal Nanowires for Hydrogen Gas Sensing**
Insu Kim, Kyoung Nam Kang, Inkyu Park, Yoon Sung Nam
 Korea Advanced Institute of Science and Technology, Korea
- 10-3-0702 **Designing a Novel Linear Peptide for Selective Targeting of Fibrin**
Moon Young Yang, Jeong Heon Yu, Yoon Sung Nam
 Korea Advanced Institute of Science and Technology, Korea
- 10-3-0714 **Visualization of Matrix Metalloproteinase-2 Activity using Collagen-Bound FRET Sensors in 3D-Cultured Cancer Cells**
Hawon Lee, Young-Pil Kim
 Hanyang University, Korea
- 10-3-0720 **Nanotransfer Printed Au/TiO₂ Heterostructure for Plasmonic Water Splitting**
Joong Bum Lee, Kwang Min Baek, Yeon Sik Jung, Yoon Sung Nam
 Korea Advanced Institute of Science and Technology, Korea
- 10-3-0721 **Controlling Defects Chemistry in Non-stoichiometric Cu₃In₂S₂ Quantum Dots for Near-infrared Bio-imaging**
Jae Chul Park, Yoon Sung Nam
 Korea Advanced Institute of Science and Technology, Korea
- 10-3-0734 **Microfluidic Biopanning Platform for Identification of Streptavidin and Gold Binding Peptides**
Dong Jae Lee, Wonhee Lee, Yoon Sung Nam
 Korea Advanced Institute of Science and Technology, Korea
- 10-3-0738 **Gold Nanoparticle-based Plasmonic Photoanodes for Solar Water Oxidation**
Jeong A Kim, Ho Yeon Son, Yoon Sung Nam
 Korea Advanced Institute of Science and Technology, Korea

- 10-3-0743 **Self-assembly of DNA-functionalized Quantum Dots for FRET-based Biosensor Applications**
Se Yeon Choi, Jae Chul Park, Yoon Sung Nam
Korea Advanced Institute of Science and Technology, Korea
- 10-3-0834 **Visualization of Virus Particles using Color-coded Silica Particles Displaying Virus-targeting Peptides**
Jeong Heon Yu, Yoon Sung Nam
Korea Advanced Institute of Science and Technology, Korea
- 10-3-0870 **Rapid and Highly Selective Photocatalytic CO₂ Reduction by a Ruthenium Molecular Catalyst on Plasmonic Au/TiO₂ Heterostructures**
Hwiseok Jun, Shinyoung Choi, Moon Young Yang, Yoon Sung Nam
Korea Advanced Institute of Science and Technology, Korea
- 10-3-0935 **Au/TiO₂ Half-dome Heterostructures for Plasmonic Water Oxidation**
Shinyoung Choi, Yoon Sung Nam
Korea Advanced Institute of Science and Technology, Korea
- 10-3-0981 **Visible Light Active g-C₃N₄ Nanosheets for the Photoinduced Inhibition of Alzheimer's Beta-amyloid Aggregation and Toxicity**
You Jung Chung, Byung Il Lee, Jong Wan Ko, Chan Beum Park
Korea Advanced Institute of Science and Technology, Korea
- 10-3-0987 **NIR Mediated Inhibition of β -Amyloid Fibrillogenesis using Rattle Structured Upconversion Nanoparticles**
Sukeun Kuk, Byung Il Lee, Chan Beum Park
Korea Advanced Institute of Science and Technology, Korea
- 10-3-1016 **Functional DNzyme Sensors for the Dual Detection of Salinity and Glucose in Tear Drops**
Eun Hye Kim, Eun Song Lee, Dong Yun Lee, Young-Pil Kim
Hanyang University, Korea
- 10-3-1163 **Sensing Free Biothiols in Blood using DNzyme-Microbial Redox Protein Complex**
Jin Oh Lee, Yoon-Mo Yang, Jin-Won Lee, Young-Pil Kim
Hanyang University, Korea
- 10-3-1209 **Fluorescing Aptamer-Gold Nanoparticle Complex for the Sensitive Detection of Bisphenol A**
Eunsong Lee, Gae Baik Kim, Young Pil Kim
Hanyang University, Korea
- 10-3-1212 **Photoelectrochemical Redox Biocatalysis Fueled by Human Urine**
Woo Seok Choi, Sahng Ha Lee, Jong Wan Ko, Chan Beum Park
Korea Advanced Institute of Science and Technology, Korea
- 10-3-1342 **In Situ Photoelectrochemical Generation of H₂O₂ on Flavin Immobilized Single-walled Carbon Nanotube Electrodes for Peroxygenase Catalysis**
Da Som Choi, Chan Beum Park
Korea Advanced Institute of Science and Technology, Korea

10-3-2994

Enhanced Photodynamic Inactivation of Microbial Pathogens with Multifunctional ParticlesJun-Sik Nam¹, Sang-Yoon Lee¹, Kyong-Hoon Choi², Jin Seung Jung¹¹Gangneung-Wonju National University, Korea, ²Kwangwoon University, Korea**10-1 Bioelectronic materials and devices**

Chair

Myung-Han Yoon (Gwangju Institute of Science & Technology, Korea)

16:20-18:00, Nov. 08 (Tue.) 2F

10-1-1601

Development of PEDOT Deposited Microelectrode Arrays for Neuron based Taste Sensor ChipDaejeong Kim, Yoonkey Nam, Hongki Kang, Sunghoon Joo, Hyungsup Lee, Kiyoon Kim

Korea Advanced Institute of Science and Technology, Korea

10-1-1605

An Intelligent Healthcare Data Management SystemMalrey Lee¹, Hongseok Jang¹, Jae-young Choi²¹Chonbuk National University, Korea, ²Sungkyunkwan University, Korea

11. Computational materials science

11-1 Material informatics & design

Chair Seungwu Han (Seoul National University, Korea)

Nov. 07 (Mon.) Ballroom 2 (2F)

INVITED **Ab Initio Materials Design by an Inverse Method based on Conformational Space Annealing**
 09:00-09:30 Kee Joo Chang¹, Sunghyun Kim¹, Young Jun Oh², In-Ho Lee³, Jooyoung Lee⁴
 11-1-0186 ¹Korea Advanced Institute of Science and Technology, Korea, ²University of Texas at Dallas, USA, ³Korea Research Institute of Standards and Science, Korea, ⁴Korea Institute for Advanced Study, Korea

INVITED **Managing Computational Materials Science: The ADES Model and the AiiDA Infrastructure**
 09:30-10:00 Giovanni Pizzi
 11-1-0552 *Ecole Polytechnique Federale de Lausanne, Switzerland*

INVITED **Applications of Machine Learning Techniques to First-principles Data**
 10:00-10:30 Atsuto Seko
 11-1-0189 *Kyoto University, Japan*

INVITED **New Two Dimensional Compounds from Ab-initio Calculations**
 10:30-11:00 Sebastien Lebeque
 11-1-0280 *CNRS, Université de Lorraine, France*

INVITED **Reactive Force Field Simulation for Design of Energy-Related Materials**
 11:00-11:30 Sang Soo Han
 11-1-0577 *Korea Institute of Science and Technology, Korea*

INVITED **Atomic-scale Simulation for Discovery and Optimization of Organic Optoelectronic Materials: Virtual Screening, Biomimetic Evolution and Cloud Computing based Discovery**
 11:30-12:00 Mathew D. Halls¹, H. Shaun Kwak¹, Tsuguo Morisato², Jacob L. Gavartin³, Thomas J.L. Mustard¹
 11-1-0501 ¹Schrödinger Inc., USA, ²Schrödinger K.K., Japan, ³Schrödinger Inc., UK

12:00-12:15 **Evolutionary Structure Prediction for Two-Dimensional MB_x**
 11-1-2264 Junjie Wang¹, Tomofumi Tada¹, Naoto Umezawa², Hideo Hosono¹
¹Tokyo Institute of Technology, Japan, ²National Institute for Materials Sciences, Japan

11-3 Computational approaches to materials for photonic devices

Chair Ki-Ha Hong (Hanbat National Univ, Korea)

Nov. 07 (Mon.) Ballroom 2 (2F)

KEYNOTE **The Bulk Photovoltaic Effect in Polar Oxides for Robust and Efficient Solar Energy Harvesting**
 15:00-15:30 Andrew Marshall Rappe
 11-3-2518 *University of Pennsylvania, USA*

INVITED **Surface Termination and Ion Migration of Perovskite Materials for Carrier Transport and Aging**
 15:30-16:00 Yoshitaka Tateyama
 11-3-0511 *National Institute for Materials Science, Japan*

- INVITED**
16:00-16:30
11-3-0680
Real-time Time-dependent Density Functional Calculation of Fast Responses of Condensed Matters beyond Born-Oppenheimer Approximation
Noejung Park
Ulsan National Institute of Science and Technology, Korea
- INVITED**
16:30-17:00
11-3-0294
First-Principles-based Novel Materials Design for Pb-free Perovskite Solar Cell
Kyeongrok Shin, Seong-Hun Kim, Donghwa Lee
Chonnam National University, Korea
- 17:00-17:15
11-3-0849
Informatics-assisted Rapid Screening and Evaluation of Highly Efficient Organic Light-Emitting Materials
H. Shaun Kwak, David J. Giesen, Steve Dixon, Mathew D. Halls
Schrodinger, Inc., USA
- 17:15-17:30
11-3-1473
Effect of Vapor-deposition Condition on Molecular Orientation and Charge Carrier Transport in Organic Layers: Computational Study
Yong Youn, Dongsun Yoo, Hochul Song, Seungwu Han
Seoul National University, Korea

11-4 Modeling of electrochemistry at material interfaces

Chair Hyungjun Kim (Korea Advanced Institute of Science and Technology, Korea)

Nov. 08 (Tue.) Ballroom 2 (2F)

- INVITED**
09:00-09:30
11-4-0219
Simulating Electric Double Layers using Density Functional Theory based Molecular Dynamics
Jun Cheng
Xiamen University, China
- INVITED**
09:30-10:00
11-4-3339
Multiscale Modelling of Metal Oxide Interfaces and Nanoparticles
Kersti Hermansson
Uppsala University, Sweden
- INVITED**
10:00-10:30
11-4-0267
A Multicomponent Descriptor based Analysis of the Catalytic Activity of the Bimetallic Alloy Surfaces of Pt
Satadeep Bhattacharjee¹, Umesh V Waghmare², Seung-Cheol Lee¹
¹Korea Institute of Science and Technology, India, ²Jawaharlal Nehru Center for Advanced Scientific Research, India
- INVITED**
10:30-11:00
11-4-0354
Design of Non-precious Catalysts toward Oxygen Redox Reactions for Renewable Energy Devices
Byungchan Han
Yonsei University, Korea
- 11:00-11:15
11-4-2654
Mechanical Reaction Pathway of Dehydrogenation of CBN-like Liquid-phase Hydrogen Storage Materials; The Effect of Homogeneous Catalysts
Sung Jin Pai, Sang Soo Han
Korea Institute of Science and Technology, Korea
- 11:15-11:30
11-4-3329
Development of a ReaxFF Reactive Force Field for Li-F-Si System and Molecular Dynamics Simulations of Plated Lithium on LiF and SiO₂ Coated Si Electrodes
Sung-Yup Kim¹, Yue Qi²
¹Korea Institute of Science and Technology, Korea, ²Michigan State University, USA

- 11:30-11:45 **Mechanism Study of Electrochemical CO₂ Reduction in Ionic-liquid/Water Mixture**
 11-4-1439 Hyung-Kyu Lim, Hyungjun Kim
Korea Advanced Institute of Science and Technology, Korea
- 11:45-12:00 **Effect of Self-interaction Error in Band-edge for Interface Design of Two-dimensional Materials**
 11-4-3334 Debbichi Lamjed, Yong-Hoon Kim
Korea Advanced Institute of Science and Technology, Korea

11-2 Surface nanoengineering: from nanocatalysis to corrosion science

Chair Aloysius Soon (Yonsei University, Korea) Nov. 08 (Tue.) Ballroom 2 (2F)

- INVITED** **Interaction of Water with Fe₃O₄ (111) Surfaces: How Theory Meets Experiment**
 13:20-13:50 Xiaohe Li, Joachim Paier
 11-2-0172 *Humboldt University, Germany*
- INVITED** **Controlled Growth of Ceria Architectures on Anatase-titania Powder: A Bottom-up Theoretical Picture**
 13:50-14:20 Hyunyou Kim¹, Ping Liu², Mark Hybertsen²
 11-2-0235 ¹Chungnam National University, Korea, ²Brookhaven National Laboratory, USA
- INVITED** **Catalysts at Work: Unraveling Reaction Mechanisms through Hierarchical Multiscale Approaches**
 14:20-14:50 Matteo Maestri
 11-2-0300 *Politecnico di Milano, Italy*
- INVITED** **O₂ Adsorption Trends on Supported Pt-Ni Clusters: Towards an Efficient Nanocatalysts Design**
 14:50-15:20 Lauro Oliver Paz Borbón¹, Cono Di Paola², Francesca Baletto³
 11-2-0389 ¹National Autonomous University of Mexico, Mexico, ²University College London, UK, ³Kings College London, UK
- INVITED** **The Electronic Structure of the Oxygen Species Active in Ethylene Epoxidation on Ag**
 15:20-15:50 Simone Piccinin
 11-2-2039 *National Research Council - Institute of Materials, Italy*
- 15:50-16:05 **Tuning the Chemical Potential of Nonequilibrium Surface Systems: The O/Cu/Au Case**
 11-2-0643 Taehun Lee¹, Yonghyuk Lee¹, Simone Piccinin², Aloysius Soon¹
¹Yonsei University, Korea, ²National Research Council - Institute of Materials, Italy
- 16:05-16:20 **A First-Principles Study on the Phase Stability of ZnO (0001)-Zn Surfaces in an Electrochemical Environment**
 11-2-1121 Su-Hyun Yoo, Mira Todorova, Jörg Neugebauer
Max-Planck-Institut für Eisenforschung, Germany

11. Computational materials science

11-1 Material informatics & design

Chair Seungwu Han (Seoul National University, Korea)

18:00-19:30, Nov. 07 (Mon.) 2F

- 11-1-0966 **High-Performance and Relationships Study of Nanoporous Frameworks for Propylene/Propane Adsorptive Separation: High-Throughput Screening**
Byung Chul Yeo¹, Sang Soo Han²
¹Yonsei University, Korea, ²Korea Institute of Science and Technology, Korea
- 11-1-1011 **Simulating Li Diffusion in Amorphous Al₂O₃ using Neural Network Potential**
Kyuhyun Lee, Seungwu Han
 Seoul National University, Korea
- 11-1-1056 **First Principles Study of Hydrogen Evolution Reaction on Sulfur Vacancy of MoS₂**
Kye Yeop Kim, Seungwu Han
 Seoul National University, Korea
- 11-1-1079 **Use of Artificial Neural Network for the Analysis of Color Expression of GBFS Mortar using Carbon Amino Silica Black**
Hongseok Jang, Junhyeon Jo, Wiseok Park, Malrey Lee, Seungyoung So
 Chonbuk National University, Korea
- 11-1-1084 **Developing MD Interatomic Potential for Si Thermal Oxidation Simulation with Machine Learning Neural Network**
Wonseok Jeong, Kyuhyun Lee, Seungwu Han
 Seoul National University, Korea
- 11-1-1093 **Automatization of Doping Property Calculation for Doped-ZnO**
Kanghoon Yim¹, Joohee Lee¹, Kyeongpung Lee¹, Ho-Hyun Nahm², Seungwu Han¹
¹Seoul National University, Korea, ²Institute for Basic Science, Korea
- 11-1-1102 **Non-oxide High-k Materials Screened by High-throughput Ab Initio Calculation**
Miso Lee, Kanghoon Yim, Seungwu Han
 Seoul National University, Korea
- 11-1-1423 **First-principles Calculation on Charge Trap States in Amorphous Silicon Nitride**
Gijae Kang, Seungwu Han
 Seoul National University, Korea
- 11-1-1488 **Computational Screening of Transition Metal Dichalcogenides with Anion Vacancies for Hydrogen Evolution Reaction Catalyst**
Joohee Lee, Kye Yeop Kim, Sungwoo Kang, Seungwu Han
 Seoul National University, Korea
- 11-1-1532 **pH Effect on Reaction Mechanism in Oxygen Reduction Reaction at Fe-N₄ Catalyst**
Sungmin Kim, Hyungjun Kim
 Korea Advanced Institute of Science and Technology, Korea

- 11-1-1535 **First-principles Studies of the (10-12) Tension and (10-11) Compression Twinning Deformations of Magnesium: Effect of Yttrium and Lithium Addition**
Won June Kim, Kyeong Hwan Han, Hyungjun Kim, Eok Kyun Lee
Korea Advanced Institute of Science and Technology, Korea
- 11-1-1554 **Extended Cluster Expansion Studies in BCC to HCP Phase Transformation Pathway of Mg-Li System**
Myunghoon Han, Won June Kim, Hyungjun Kim, Eokkyun Lee
Korea Advanced Institute of Science and Technology, Korea
- 11-1-1770 **A Study of Modeling for Medical Information and Medical Hazards**
Malrey Lee¹, Hongseok Jang¹, Jaeyoung Choi²
¹Chonbuk National University, Korea, ²Sungkyunkwan University, Korea
- 11-1-2614 **Investigation of Layout and Optical Proximity Correction Effects to Control Trench Etching Process on 4H-SiC**
Sinsu Kyoung^{1,2}, Eun-Sik Jung³, Tai-young Kang², Man Young Sung¹
¹Korea University, Korea, ²Powercubesemi, Inc., Korea, ³Maplesemiconductor, Inc., Korea
- 11-1-2665 **Effect of Aluminum Doping to the Phase Transition from Anatase to Rutile in TiO₂ Nanomaterials**
Dai Q. Ho, Seungchul Kim
Korea Institute of Science and Technology, Korea University of Science and Technology, Korea

11-3 Computational approaches to materials for photonic devices

Chair Ki-Ha Hong (Hanbat National Univ, Korea) 18:00-19:30, Nov. 07 (Mon.) 2F

- 11-3-0612 **Molecular Dynamics Simulation Study on CdTe Nanowire Formation from CdTe Nanoparticles via Self-Assembly**
Eunae Lee¹, Gyoo-Yeong Lee², Jeong Won Kang¹, Ki-Sub Kim¹
¹Korea National University of Transportation, Korea, ²Kangwon National University, Korea
- 11-3-1191 **Enhanced Heat Dissipation and Reduced Weight of LED Headlamp for Vehicles by Using Thermally-Conductive Plastics**
Joon Seop Kwak¹, Dong Kyu Lee¹, Hyung Jung Park¹, Hyeong Jin Kim²
¹Sunchon National University, Korea, ²Seo Gwang, Korea
- 11-3-1371 **Screening of Lead-free Photoactive Materials using First-principles Calculations**
Kyeongrok Shin, Donghwa Lee
Chonnam National University, Korea
- 11-3-1585 **Small Bipolaron Induced by Substitutional Hydrogen in TiO₂ Polymorphs**
Dongheon Lee, Seungwu Han, Ho-Hyun Nahm
Seoul National University, Korea
- 11-3-2020 **Relationship between Defects and Device Characteristics of Perovskite Solar Cells: A Numerical Investigation**
Ji-Hye Choe, Choong-Heui Chung, Ki-Ha Hong
Hanbat National University, Korea

- 11-3-2165 **Relationship between Nanoparticle Size Dependent Scattering of ZnO Optical Spacer and the Efficiency of Organic-inorganic Hybrid Solar Cell**

Premkumar Vincent¹, Jin-Hyuk Bae¹, Hyeok Kim²

¹Kyungpook National University, Korea, ²Korea Institute of Industrial Technology, Korea

- 11-3-2434 **Ultrafast Non-collinear Spin-phonon Interaction of Spin-valley in Monolayer MoS₂**

Dongbin Shin, Noejung Park

Ulsan National Institute of Science and Technology, Korea

11-2 Surface nanoengineering: from nanocatalysis to corrosion science

Chair Aloysius Soon (Yonsei University, Korea)

16:20-18:00, Nov. 08 (Tue.) 2F

- 11-2-0767 **Structural Evolution of Pd-core@Au-shell Nanoparticle under CO Oxidation Condition**

Hyesung An, Hyun You Kim

Chungnam National University, Korea

- 11-2-1146 **Nanoscale Machining for Metal Films in an Ultrafast Process**

B. C. Chen¹, C. Y. Ho², M. Y. Wen³, Y. H. Tsai², J. W. Yu²

¹Buddhist Dalin Tzu Chi General Hospital, Taiwan, ²Hwa Hsia University of Technology, Taiwan, ³Cheng Shiu University, Taiwan

- 11-2-1300 **A Preparation and Characterization of Crack-free Chromium Coating by Direct and Pulse Reverse Electroplating of Hexavalent Chromium**

Dongwook Lim, Dongjo Seo, Yoonkyung Kim, Taesoon Park, Sang Eun Shim, Sung-Hyeon Baek

Inha University, Korea

- 11-2-1629 **Improvement of Corrosion Resistance of AZ31 Magnesium Alloys by Immersion in NaOH Solution Saturated with CO₂ Gas**

Dongwook Lim¹, Daehyeon Nam¹, Minho Mun¹, Sang-Deuk Kim¹, Seok Hoon Park², Sang Eun Shim¹, Sung-Hyeon Baek¹

¹Inha University, Korea, ²Anyang University, Korea

- 11-2-2325 **Enhancing the Potential of Graphene as a High Performance Gas Sensor by Specifying Favorable Sites for Gas Adsorption: A First-principles Study**

Taehyung Lee¹, Ho Won Jang¹, DongHwa Lee²

¹Seoul National University, Korea, ²Chonnam National University, Korea

- 11-2-2397 **Intercalation Behavior of Hydrogen at Graphene-Metal Interfaces**

Masood Yousaf^{1,2}, Mahmut Sait Okay², Noejung Park^{1,2}

¹Institute for Basic Science, Korea, ²Ulsan National Institute of Science and Technology, Korea

- 11-2-2845 **Chemisorption in Bimetallic NP/TiO₂ Catalyst: DFT Study and Machine Learning**

Kihoon Bang, Kihyun Shin, Soonho Kwon, Hyuck Mo Lee

Korea Advanced Institute of Science and Technology, Korea

- 11-2-2918 **Catalytic CO Oxidation by CeO₂-Supported Au Nanoclusters**

Hyesung An, Mi Yoo, Hyun You Kim

Chungnam National University, Korea

- 11-2-2930 **CO Adsorption induced Inverse Surface Segregation of Pd on Au/Pd Bimetallic Surfaces and Its Effect on CO Oxidation Pathway**
Hyesung An, Hyun You Kim
 Chungnam National University, Korea
- 11-2-3087 **Catalytic CO Oxidation by Computationally Designed Reactive Center: Pt-CeO₂-TiO₂ Catalyst**
Hyunwoo Ha, Hyesung An, Mi Yoo, Hyun You Kim
 Chungnam National University, Korea

11-4 Modeling of electrochemistry at material interfaces

Chair Hyungjun Kim (Korea Advanced Institute of Science and Technology, Korea)

16:20-18:00, Nov. 08 (Tue.) 2F

- 11-4-1114 **Realistic Multiscale Simulation of Interfaces between Graphene and Water Using QM/MM Method**
Suji Gim, Hyung-Kyu Lim, Hyungjun Kim
 Korea Advanced Institute of Science and Technology, Korea
- 11-4-1243 **QM/MM with Double Embedding Approach to Computational Electrochemistry of Redox Shuttles**
Jiwon Jeon, Hyungjun Kim
 Korea Advanced Institute of Science and Technology, Korea
- 11-4-1528 **Computational Studies on Catalytic Properties for CO₂ Reduction of Au Nanoparticles**
Taedaehyeong Eom, Hyungjun Kim
 Korea Advanced Institute of Science and Technology, Korea
- 11-4-1568 **A Modified Many-Body Dispersion Correction for Treating Universal Systems within Density Functional Theory**
Minho Kim¹, Won June Kim¹, Sébastien Lebègue², Hyungjun Kim¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Université de Lorraine, France
- 11-4-1902 **Energetic Study on Fe-doped LaCoO₃ from First-Principles Density Functional Theory Calculations**
Kiki Mulyadi, Donghwa Lee
 Chonnam National University, Korea
- 11-4-2603 **Understanding about Solid-Electrolyte Interphase Formation on Si/SiO₂ Anodes for Lithium-Ion Batteries: Reactive Molecular Dynamics**
Kangseop Yun¹, Byung-Chul Yeo¹, Kwang-Ryeol Lee¹, Sun-Jae Kim², Sangsoo Han¹
¹Korea Institute of Science and Technology, Korea, ²Sejong University, Korea
- 11-4-2788 **Surface Oxide Effect on the Lithiation Behavior in Different Oxide Thickness with Silicon Nano Wire: Molecular Dynamics Study**
 Sang Soo Han, Hyun Jung
 Korea Institute of Science and Technology, Korea
- 11-4-3124 **A DFT Study of Ammonia Decomposition and Nitrogen Diffusion on the Doped Fe (100) Surface**
Ku Kang, Soonho Kwon, Changsoo Lee, Hyuck Mo Lee
 Korea Advanced Institute of Science and Technology, Korea

- 11-4-3373 **Single Atom Catalyst for Carbon Reduction Reaction on Boron Nitride Nanosheet**
Juhyung Lim, Seoin Back, Yousung Jung
Korea Advanced Institute of Science and Technology, Korea
- 11-4-3374 **Bi-functional Interface of Au and Cu for Improved CO₂ Electroreduction**
Seoin Back¹, Yousung Jung¹, Jun-Hyuk Kim², Yongtae Kim²
¹*Korea Advanced Institute of Science and Technology, Korea*, ²*Pusan National University, Korea*

12. Nanomechanics and nanoscopy

12-3 Atomic-resolution analysis of surface, interface and defects

Chair Sang Ho Oh (Sungkyunkwan University, Korea)

Nov. 08 (Tue.) Ballroom 4 (2F)

KEYNOTE Innovating New Materials through Aberration-corrected Microscopy

13:20-13:50 [Stephen John Pennycook](#)
12-3-5004 *National University of Singapore, Singapore*

INVITED Surface/Interface Properties in Perovskite Transition Metal Oxides uncovered by Atomic-Resolution STEM/EELS

13:50-14:20 [Young-Min Kim](#)¹, Rohan Mishra², Albina Y. Borisevich³
12-3-0375 *¹Sungkyunkwan University, Korea, ²Washington University in St. Louis, USA, ³Oak Ridge National Laboratory, USA*

INVITED Electron Microscopic Analysis toward Ferroelectric/Ferromagnetic/Multiferroic Oxides

14:20-14:50 [Si-Young Choi](#)
12-3-0726 *Korea Institute of Materials Science, Korea*

14:50-15:05 High-resolution 2-D Strain Analysis of Si/SiGe Epitaxial Multilayer Systems

12-3-3076 [Bumsu Park](#)¹, Ja Kyung Lee², Kyung Song³, Woo Young Jung¹, Young-Min Kim⁴, Sang Ho Oh⁴
¹Pohang University of Science and Technology, Korea, ²Institute for Basic Science, Korea, ³Korea Institute of Materials Science, Korea, ⁴Sungkyunkwan University, Korea

15:05-15:20 Enhanced Electrical Properties of Electrospun Cu/C Core-Shell Nanofibers for Transparent Electrode via One-step Calcination

12-3-3100 Sekwon Na, [Jae Chan Lee](#), Dae-Hyun Nam, Young-Chang Joo
Seoul National University, Korea

15:20-15:35 The Influence of Ni Doping on Ti-Al Intermetallic Compounds Fabricated by the Infiltration

12-3-2130 [Sumin Kim](#)^{1,2}, Wonyoung Jeung², Gyeongho Kim², Wooyoung Lee¹
¹Yonsei University, Korea, ²Korea Institute of Science and Technology, Korea

12-1 Nanomechanics and device reliability: experiment and modeling

Chair Ju-Young Kim (Ulsan National Institute of Science and Technology, Korea)

Nov. 09 (Wed.) Ballroom 4 (2F)

KEYNOTE Grain Boundary Atomic Structures, Vacancies and Segregated Dopants of Electronic Materials and the Properties

09:00-09:30 [Yuichi Ikuhara](#)
12-1-5005 *The University of Tokyo, Japan*

INVITED Ultrahigh Tensile Strength of Metallic Nanowires by Controlling Ni/Ni-Au Multilayer Nanocrystalline Structures

09:30-10:00 Boo Hyun An¹, Young Keun Kim¹, Jae-Pyoung Ahn², [In-Suk Choi](#)²
12-1-2765 *¹Korea University, Korea, ²Korea Institute of Science and Technology, Korea*

- INVITED** **Enhanced Mechanical Properties of Bulk Graphene/Aluminum Composites with a Nanolaminated Structure**
 10:00-10:30 Qiang Guo, Di Zhang, Zan Li
 12-1-0239 *Shanghai Jiao Tong University, China*
- INVITED** **Benefit of Being Small for Structural Applications**
 10:30-11:00 Dongchan Jang
 12-1-3431 *Korea Advanced Institute of Science and Technology, Korea*
- INVITED** **Transient Electronics - A New Avenue of Lifetime Controlled Electronics**
 11:00-11:30 Seung-Kyun Kang, John A. Rogers
 12-1-0310 *University of Illinois at Urbana-Champaign, USA*
- 11:30-11:45** **Ultrasound Generation based on Electrically Heated Thermo-acoustic Ultrasound Transducer**
 12-1-0653 Choongman Moon¹, Kang Lyeol Ha², Duckjong Kim¹
¹Korea Institute of Machinery and Materials, Korea, ²Pukyong National University, Korea
- 11:45-12:00** **Fracture-Resistant Sn Micropillars as Anode for Lithium Ion Batteries**
 12-1-1395 Chung Su Hong, Nadeem Qaiser, Seung Min J. Han
Korea Advanced Institute of Science and Technology, Korea
- 12:00-12:15** **Evaluation of Thin-film Interfacial Properties using Single Nanoindentation Test**
 12-1-2791 Jinwoo Lee, Ju Yon Suh, Dongil Kwon
Seoul National University, Korea

12-2 In-situ nanomechanical testing under microscope

Chair Dongchan Jang (Korea Advanced Institute of Science and Technology, Korea)

Nov. 09 (Wed.) Ballroom 4 (2F)

- INVITED** **Origin of Enhanced Ductility of TiAl Alloys: A Hybrid Study using In-situ Transmission Electron Microscopy Experiments and Molecular Dynamics**
 13:50-14:20 Seong-Woong Kim^{1,2}, Jaemin Kim³, Seung-Hwa Ryu³, Young-Sang Na¹, Seung-Eon Kim¹, Jong-Taek Yeom¹, Andrew M. Minor²
¹Korea Institute of Materials Science, Korea, ²Lawrence Berkeley National Laboratory, USA, ³Korea Advanced Institute of Science and Technology, Korea
- INVITED** **Synthesis and In Situ Mechanical Characterization of Silicon Nanowires for Lithium-ion Batteries**
 14:20-14:50 Steven Boles
 12-2-0690 *The Hong Kong Polytechnic University, Hong Kong*
- INVITED** **Delocalized Plastic Flow in Proton-Irradiated Monolithic Metallic Glasses**
 14:50-15:20 Jaewon Heo, Sunghwan Kim, Seunghwa Ryu, Dongchan Jang
 12-2-0231 *Korea Advanced Institute of Science and Technology, Korea*

INVITED

Mechanical Behaviour of Glassy Materials at the Nanoscale for Novel, Lightweight Materials

15:20-15:50 Zachary Aitken¹, Shi (Eric) Luo², Stephanie Reynolds³, Christian Thaulow⁴, Julia Greer², Mehdi Zadeh¹,
12-2-0928 John Lewandowski⁵, Yong Wei Zhang¹

¹Institute of High Performance Computing, Singapore, ²California Institute of Technology, USA, ³Georgia Institute of Technology, USA, ⁴Norwegian University of Science and Technology, Norway, ⁵Case Western Reserve University, USA

Size Dependent Crack Stability and Fracture Behavior of Diamond like Carbon at the Nano-scale

15:50-16:05 Dahye Shin, Dongchan Jang

12-2-0660 Korea Advanced Institute of Science and Technology, Korea

In-Situ Scanning Electron Microscopy Nanomechanical Testing of Aluminide Bond Coating at High Temperatures

16:05-16:20 Yunje Oh, Sanjit Bhowmick, S.A. Syed Asif

12-2-0667 Hysitron Incorporated, USA

Strain Rate-dependent Deformation of Irradiated Zr-based Metallic Glasses

16:20-16:35 Jaewon Heo, Dongchan Jang

12-2-0891 Korea Advanced Institute of Science and Technology, Korea

Mechanical Properties of Copper-Graphene Multilayer with Large-Scale Fabrication

16:35-16:50 Sangmin Kim¹, Minsung Han¹, Wonsik Kim¹, Jaehyun Kim², Seung Min Han¹

12-2-1859 ¹Korea Advanced Institute of Science and Technology, Korea, ²Korea Institute of Machinery & Materials, Korea

Fabrication & Deformation of Large Area Squashable 3D Nano-structured Ceramics

16:50-17:05 Yeeun Na, Dahye Shin, Kisun Kim, Seokwoo Jeon, Dongchan Jang

12-2-1950 Korea Advanced Institute of Science and Technology, Korea

12. Nanomechanics and nanoscopy

12-3 Atomic-resolution analysis of surface, interface and defects

Chair Sang Ho Oh (Sungkyunkwan University, Korea)

16:20-18:00, Nov. 08 (Tue.) 2F

- 12-3-1811 **Improvement of Coherent Scattering Microscopy: from HIO to PIE**
Dong Gon Woo, Seongchul Hong, Hoon Jo, Whoi-Yul Kim, Jinho Ahn
Hanyang University, Korea
- 12-3-2028 **Investigation of Atomic and Electronic Structures of $\text{LaAlO}_3/\text{Sr}_x\text{Ca}_{1-x}\text{TiO}_3/\text{SrTiO}_3$ Interfaces using Cs-corrected STEM and EELS**
Woonbae Sohn, Taemin Kim, Sangmoon Yoon, Ho Won Jang, Miyoung Kim
Seoul National University, Korea
- 12-3-2829 **Dislocation Exhaustion and Forest Hardening Activated in Submicron Mg Pillars with Different Orientations as Evidenced by in Situ TEM**
Jiwon Jeong¹, Markus Alfreider², Daniel Kiener², Sang Ho Oh³
¹Institute for Basic Science, Korea, ²Montanuniversität Leoben, Austria, ³Sungkyunkwan University, Korea
- 12-3-2911 **Quantitative 2-D Strain Mapping of InGaN/GaN Quantum Wells in a Nanorod using Dark-field Inline Holography**
Ja Kyung Lee¹, Bumsu Park², Christoph T. Koch³, Martin Woelz⁴, Lutz Geelhaar⁴, Young-Min Kim⁵, Sang Ho Oh⁵
¹Institute for Basic Science Center for Integrated Nanostructure Physics, Korea, ²Pohang University of Science and Technology, Korea, ³Humboldt University of Berlin, Germany, ⁴Paul-Drude-Institut für Festkörperelektronik, Germany, ⁵Sungkyunkwan University, Korea
- 12-3-3230 **TEM Examinations of Silicon Wafers Subjected to Various Back-Lapping Processes**
Seong-Min Lee
Incheon National University, Korea

12-1 Nanomechanics and device reliability: experiment and modeling

Chair Ju-Young Kim (Ulsan National Institute of Science and Technology, Korea)

16:30-17:30, Nov. 09 (Wed.) 2F

- 12-1-2521 **Flexibility of Textured Ultra-thin Silicon Wafer for Flexible Solar Cell**
 Jeong-Hyun Woo¹, Si-Hoon Kim¹, See-Eun Cheon², Hyeonseung Lee², In-Ho Kim², Ju-Young Kim¹
¹Ulsan National Institute of Science and Technology, Korea, ²Korea Institute of Science and Technology, Korea
- 12-1-2661 **Evaluating the Adhesion Strength of Single Layered Thin Film deposited on the Metallic Substrate using Nano Indentation**
Ju Yon Suh, Jinwoo Lee, Jongho Won, Dongil Kwon
Seoul National University, Korea

12-2 In-situ nanomechanical testing under microscope

Chair Dongchan Jang (Korea Advanced Institute of Science and Technology, Korea)

16:30-17:30, Nov. 09 (Wed.) 2F

- 12-2-1174 **Effects of Irradiation on Mechanical Properties of Alumina Forming Stainless**
Heungrok Kwon, Dongchan Jang
Korea Advanced Institute of Science and Technology, Korea

13. General program

13-1 Energy materials

Chair Kyoung-Jin Choi (Ulsan National Institute of Science and Technology, Korea)

16:20-18:00, Nov. 08 (Tue.) 2F

- 13-1-0905 **Recycling of Al-Si Die Casting Scraps for Solar Si Feedstock**
Jeon Taik Lim, Sung Hyuk Lee, Jeong Su Heo, Jae Im Jeong, Seok Yong Seo, Suk Jun Kim, Ki Young Kim
Korea University of Technology and Education, Korea
- 13-1-0961 **Termite-Nest Mimicked Silicon with Excellent Rate Capability Feature for High Power Lithium Ion Capacitor**
Martin Halim, Joong Kee Lee
Korea Institute of Science and Technology, Korea
- 13-1-1182 **Synthesis and Characterization of Pendant Propane Sulfonic Acid on Poly (phenylene) Block Copolymer via Superacid-catalyzed Reaction**
Taewook Ryu, Hohyoun Jang, Nipa Banik, Faiz Ahmed, Kunyoung Choi, Minwoong Seo, Whangi Kim
Konkuk University, Korea
- 13-1-1244 **Fabrication and Evaluation of Shape-controlled Ag Nanocatalysts for Electrochemical CO₂ Reduction to CO**
Hyanjoo Park, Hoyoung Kim, Eunkyong Hwang, Sang Hyun Ahn, Soo-Kil Kim
Chung-Ang University, Korea
- 13-1-1247 **PdSn Catalysts for Electrochemical Conversion of Carbon Dioxide**
Eunkyong Hwang, Hoyoung Kim, Hyanjoo Park, Sang Hyun Ahn, Soo-Kil Kim
Chung-Ang University, Korea
- 13-1-1255 **An Insight into Redox Property of Onion-like Carbon**
Young-Jin Ko¹, Inho Kim¹, Doo Seok Jeong¹, Kyeong-Seok Lee¹, Jong-Keuk Park¹, Young-Joon Baik¹, Heon-Jin Choi², Wook-Seong Lee¹
¹Korea Institute of Science and Technology, Korea, ²Yonsei University, Korea
- 13-1-1271 **Effects of Carbon Content and Carbonization Time of carbon Coating on the Li₄Ti₅O₁₂ as Anode Material for Hybrid Capacitor**
Jong Kyu Lee, Jung Rag Yoon
Samwha Capacitor, Korea
- 13-1-1295 **Synthesis of Manganese Oxide for Supercapacitor: The Effect of Precursor on Electro-catalytic Performance**
Sang-Deuk Kim, Dongwook Lim, Young Il Choi, Dohyung Lee, Dongjo Seo, Sang Eun Shim, Sung-Hyeon Baek
Inha University, Korea
- 13-1-1411 **Performance of Flexible Solid-state Supercapacitors based on Ion Gel Electrolytes containing Different Doping Agents**
Jinok Yuk, Dong Chan Lim, Joo-Yul Lee, Kihyon Hong
Korea Institute of Materials Science, Korea

- 13-1-1420 **Fabrication and Characterization of Granular LiMn_2O_4 using Spray Dryer and Its Application for Pseudo Capacitors**
Byung-Gwan Lee¹, Hyo-Jin Ahn², Jung-Rag Yoon¹
¹Samwha Capacitor, Korea, ²Seoul National University of Science and Technology, Korea
- 13-1-1507 **Electrical Properties of 4H-SiC Schottky Diodes according to the Passivation Methods**
Ki-Hwan Kim¹, Jun-bo Park², Hyung-Seok Lee², Se-Woong Jung¹, Jae-Kyoung Mun², Sang-Choon Ko², Sang-Mo Koo¹
¹Kwangwoon University, Korea, ²Electronics and Telecommunication Research Institute, Korea
- 13-1-1617 **Mesoporous Manganese Oxide Electrodeposited using a Mixture of Surfactants for Supercapacitor Electrodes**
Taesoon Park, Dongwook Lim, Hyelee Park, Daehyeon Nam, Taewoo Kim, Sang Eun Shim, Sung-Hyeon Baek
 Inha University, Korea
- 13-1-1650 **Effect of Conductive Polymer Coated Zn on Self-discharge Behavior for the Zn-air Battery**
Yong Nam Jo¹, K. Prasanna¹, Suk Hyun Kang¹, Su Jung Do¹, Nirmal Sivagami Ilavazhakan¹, Seung Wook Eom², Chang Woo Lee¹
¹Kyung Hee University, Korea, ²Korea Electrotechnology Research Institute, Korea
- 13-1-1793 **Improvement of Carrier Concentration in Ga-doped Zinc Oxide Transparent Conducting Oxide Prepared by Polymer assisted Solution Processing**
Jiyeon Yang, Seok-cheol Ko, Jihoon Kim
 Kongju National University, Korea
- 13-1-1897 **Temperature Dependent Electrical Characteristics of SiC Nanoparticles - Incorporated ZTO/4H-SiC Heterojunction Diodes**
Se-Woong Jung, Sang-Mo Koo
 Kwangwoon University, Korea
- 13-1-1915 **Magnetic and Magnetocaloric Properties of Gd-based Alloys**
 Dong Sun Seo, Hyun Soo Park, Jin Kyu Lee
 Kongju National University, Korea
- 13-1-2002 **Numerical Study on the Growth Rate of SiC Single Crystals in a High Temperature Chemical Vapor Deposition System**
Seongkyung Kim¹, Jae Kyeong Jeong²
¹Seoul National University, Korea, ²Hanyang University, Korea
- 13-1-2388 **Thermoelectric Properties of the Bi_2Te_3 - Bi_2Se_3 Alloy by Hot Extrusion**
YongHo Kim¹, HyoSang Yoo¹, ChangGi Jung¹, JungHan Kim¹, HyeonTaek Son¹, JongHyeon Lee²
¹Korea Institute of Industrial Technology, Korea, ²Chungnam National University, Korea
- 13-1-2420 **Electrochromic Device with Hierarchical Three-dimensional Electrode: Extremely Localized Surface Plasmon Resonance by Spatially Separating Silver Nano-particles**
Ki Ryong Jeong, Jong Lam Lee
 Pohang University of Science and Technology, Korea
- 13-1-2422 **Nanostructured Copper for Efficient Electrochemical CO₂ Reduction**
Chul Jong Yoo, Seung O Gim, Kwan Woo Lee, Jong-Lam Lee
 Pohang University of Science and Technology, Korea

- 13-1-2486 **Microstructural Control Study of TiO₂ Layer on ITO-PEN Substrate with Varying Power of Laser Assisted Nano Particle Deposition System for the Application of Flexible Dye-sensitized Solar Cell**
Yunchan Park¹, Jungoh Choi², Dahyun Choi¹, Kwangmin Kim¹, Minji Lee¹, Sung-Hoon Ahn², Caroline Sunyong Lee¹
¹Hanyang University, Korea, ²Seoul National University, Korea
- 13-1-2493 **Cu Nanostructures using Electrochemical Anodization for CO₂ Reduction**
Young Jin Song, Jong-Lam Lee
 Pohang University of Science and Technology, Korea
- 13-1-2530 **Effect of Galvanic Corrosion on Magnesium in Hybrid Solution with Organic Solvent**
Jung Hoon Ha^{1,2}, Jong Hak Kim¹, Byung Won Cho², Si Hyoung Oh²
¹Yonsei University, Korea, ²Korea Institute of Science and Technology, Korea
- 13-1-2579 **Kinetics Changes of the HFC-134a Hydrate Formation in Seawater with the Addition of Edible Surfactants**
 Yong Sun Won, Hui Cheol Jeong, Hye Young An, Jun-Heok Lim
 Pukyong National University, Korea
- 13-1-2583 **Equilibrium Analysis on the Aging of BKNO₃ Igniter**
Ki Heon Eom, Hye Young An, Kyung Min Kim, Do Jin Im, Yong Sun Won
 Pukyong National University, Korea
- 13-1-2753 **Mathematical Modeling of ZrKClO₄ Nano Particle Energy Release**
Tae Yeon Kong, Yong Sun Won, Do Jin Im
 Pukyong National University, Korea
- 13-1-2808 **Study the Breakdown Voltage Characteristics for 4H-SiC SBD using a Floating Metal Ring Structure**
Taejin Nam¹, Sinsu Kyoung¹, Tai Young Kang¹, Ey Goo Kang²
¹Powercubesemi INC., Korea, ²Far East University, Korea
- 13-1-2944 **Hydrogen Evolution from Ammonia with Ruthenium Loaded Mesoporous Silicon Oxides in Microchannel Reactor**
Kshama Singh¹, Ji-Eun Lee¹, Mina Jeon², Hyo Young Kim^{2,3}, Chang Won Yoon^{3,4}, Dong Ha Kim¹
¹Ewha Womans University, Korea, ²Korea Institute of Science and Technology, Korea, ³Korea University, Korea, ⁴Kyunghee University, Korea
- 13-1-2983 **Investigating the Sodium Intercalation Mechanism into Olivine NaFePO₄ for Sodium-ion Batteries**
Ghulam Ali¹, Seong-Won Choi¹, Ji-Hoon Lee¹, Kyung-Wan Nam², Kyung Yoon Chung¹
¹Korea Institute of Science and Technology, Korea, ²Dongguk University, Korea
- 13-1-2991 **Effect of Nickel Substitution in the Electrochemical Performance of NaCo_{0.5}Fe_{0.5}O₂ as Cathode Materials for Na-ion Batteries**
Dieky Susanto^{1,2}, Ali Ghulam¹, Kyung Yoon Chung^{1,2}
¹Korea Institute of Science and Technology, Korea, ²Korea University of Science and Technology, Korea

- 13-1-2992 **Improved Electrochemical and Thermal Properties of Carbon/Mullite Double Coating on $\text{Na}_4\text{Co}_3(\text{PO}_4)_2\text{P}_2\text{O}_7$ Cathode Material for Sodium-ion Batteries**
Donghyun Kim^{1,2}, Won Young Chang¹, Byung Won Cho¹, Kwang-Bum Kim², Kyung Yoon Chung¹
¹Korea Institute of Science and Technology, Korea, ²Yonsei University, Korea
- 13-1-3070 **Dye-sensitized Solar Cells using 2D Graphene Sheet and 3D Crumpled Graphene**
Kimin Roh, Eun-Hee Jo, Hankwon Chang, Sungman Seo, Il-Mo Kang, Hee Dong Jang
 Korea Institute of Geoscience and Mineral Resources, Korea
- 13-1-3114 **Effect of Carbon Coating in Electrochemical Performance of Layered $\text{Na}_2\text{Ni}_2\text{TeO}_6$ Cathode Material for Na-ion Batteries**
Iqra Moez^{1,2}, Dieky Susanto¹, Ghulam Ali¹, Kyung Yoon Chung¹
¹Korea Institute of Science and Technology, Korea, ²University of Science and Technology, Korea
- 13-1-3290 **Realizing an Idle-to-Energy Material for Green Environment**
Ganesh Kumar Veerasubramani, Sang Jae Kim
 Jeju National University, Korea

13-4 Structural & composite materials

Chair Insuk Choi (Korea Institute of Science and Technology, Korea)

16:20-18:00, Nov. 08 (Tue.) 8F

- 13-4-0473 **Fabrication and Application of a Metal Hybrid Light-weight Composite with High Conductivity**
Ha-guk Jeong, Jong-bum Lee
 Korea Institute of Industrial Technology, Korea
- 13-4-0624 **Feasible Constitutive Model for Deformation Behavior of Bulk Metallic Glass Composite under Supercooled Liquid Region**
Hyun-Joon Jun¹, Hyoung Seop Kim²
¹Korea Atomic Energy Research Institute, Korea, ²Pohang University of Science and Technology, Korea
- 13-4-0771 **Crucible Reactions and Alpha-Case Analysis of TiAl Alloy by Investment Casting Methods**
 Jong Bum Park¹, Jung-Il Lee², Jeong Ho Ryu²
¹Chunji Corporation, Korea, ²Korea National University of Transportation, Korea
- 13-4-0772 **Effect of Heat Treatment on the Mechanical Properties of Co-Cr-Mo Alloys**
 Jong Bum Park¹, Hee Yoon Park¹, Hyun Jin Park¹, Jung-Il Lee², Jeong Ho Ryu²
¹Chunji Corporation, Korea, ²Korea National University of Transportation, Korea
- 13-4-0773 **Single Crystal Growing of Superalloys by Bridgman Process**
 Jong Bom Park¹, Tae Woong Kang¹, Jung-Il Lee², Jeong Ho Ryu²
¹Chunji Corporation, Korea, ²Korea National University of Transportation, Korea
- 13-4-0900 **The Effect of Cooling Rates on Atomic Structure of Metallic Glasses**
Jae Im Jeong, Sung Hyuk Lee, Seok Yong Seo, Jeon Taik Lim, Jeong Su Heo, Suk Jun Kim
 Korea University of Technology and Education, Korea
- 13-4-1005 **Variation of Thermal Diffusivity for Cu-based Composite Material using the Ag-CNT Flake**
Sangwoo Kim^{1,2}, Hyouk-Chon Kwon¹, Dohyung Lee², Hyo-Soo Lee¹
¹Korea Institute of Industrial Technology, Korea, ²Hanyang University, Korea

- 13-4-1166 **Manufacture of Polycarbonate-co-PMMA Block Copolymers via Interfacial Polymerization and ATRP Reactions for Applications**
Hohyoun Jang, Hyunho Joo, [Chaekyun Lee](#), Faiz Ahmed, Jaeseong Ha, Taewook Ryu, Sujin Yoon, Whangi Kim
Konkuk University, Korea
- 13-4-1167 **Bonding Strength of the Metal-AAO Composite for Heat Sink**
[Ji-Hee Kim](#)^{1,2}, Hyeong Won Shin¹, Hea-Jung Lee¹, Su-Jin Park¹, Jung-Hwa Lee¹, Hyo Soo Lee¹, Seung Boo Jung²
¹*Korea Institute of Industrial Technology, Korea*, ²*Sungkyunkwan University, Korea*
- 13-4-1168 **Preparation and Characterization of Anti-scratch Polycarbonate Containing Acrylate Group**
Hohyoun Jang, [Sabuj Chandra Sutradhar](#), Nipa Banik, Jiho Yoo, Chaekyun Lee, Minwoong Seo, Whangi Kim
Konkuk University, Korea
- 13-4-1235 **Fabrication and Characterization of Graphene-silver Nanowire Composite Electrodes for Flexible Actuators⁺**
[Minjeong Park](#)¹, Hyo-seon Kim¹, Sangwoo Kim¹, Yunkyeong Bae¹, Hyonkwang Choi¹, Seonpil Kim², Minhyon Jeon¹
¹*Inje University, Korea*, ²*Gyeongju University, Korea*
- 13-4-1285 **Improvement of Contact Interface between GO/Ag NWs Paper Electrode and Ionic Polymer to Enhance the Driving Characteristics of Electroactive Polymer Actuators⁺**
[Hyo-seon Kim](#)¹, Minjeong Park¹, Sangwoo Kim¹, Yunkyeong Bae¹, Hyonkwang Choi¹, Seonpil Kim², Minhyon Jeon¹
¹*Inje University, Korea*, ²*Gyeongju University, Korea*
- 13-4-1311 **Fabrication of Graphene/Platinum Hybrid Electrodes to Improve Stability and Durability of Ionic Polymer-metal Composite Actuators⁺**
[Sangwoo Kim](#)¹, Minjeong Park¹, Hyo-seon Kim¹, Yunkyeong Bae¹, Hyonkwang Choi¹, Seonpil Kim², Minhyon Jeon¹
¹*Inje University, Korea*, ²*Gyeongju University, Korea*
- 13-4-1393 **Mechanical Properties and Microstructural Evolution of Direct-extruded and Hydrostatic-extruded MWCNT-reinforced Al Matrix**
[Jongbeom Lee](#), Haguk Jeong
Korea Institute of Industrial Technology, Korea
- 13-4-1399 **Hardness Change and Texture Evolution of Mg-B Powder/Nb/Cu Clad Fabricated by Hydrostatic Extrusion with Area Reduction**
[Jongbeom Lee](#), Haguk Jeong, Sangyong Park
Korea Institute of Industrial Technology, Korea
- 13-4-1545 **Experimental Study on Additive Fabrication of 3D Metal Structure with CW Laser and Liquid Soluton**
[Bo-Seok Kang](#), Bo Sung Shin, SungMoo Hong, ChanJu Yoo, CheongYeol Gwak
Pusan National University, Korea
- 13-4-1597 **Precipitation of Oxide Particles in CaO/MgO mixed Surface Layer of Al-Mg Alloys with a Trace of Ca during Oxidation**
[Seong-Ho Ha](#)¹, Young-Ok Yoon¹, Bong-Hwan Kim¹, Taeg-Woo Lee², Sung-Hwan Lim², Shae K. Kim¹
¹*Korea Institute of Industrial Technology, Korea*, ²*Kangwon National University, Korea*

- 13-4-1610 **Solution Strengthening Behaviour of Cu-Mg Alloys with a Trace of Ca**
Seong-Ho Ha, Young-Ok Yoon, Hyun-Kyu Lim, Shae K. Kim
Korea Institute of Industrial Technology, Korea
- 13-4-1668 **Three-Dimensional Copper Nanowire-Graphene Composites to Enhance Electromagnetic Interference Shielding Effectiveness+**
Seulki Ahn, Sookhyun Hwang, Sukhun Jang, Minhyon Jeon
Inje University, Korea
- 13-4-1705 **Mesh Pattern Electrodes on Flexible Ionic Polymer Substrates to Improve Driving Characterization**
Yunkeyong Bae¹, Minjeong Park¹, Hyo-seon Kim¹, Sangwoo Kim¹, Hyonkwang Choi¹, Seonpil Kim², Minhyon Jeon¹
¹*Inje University, Korea*, ²*Gyeongju University, Korea*
- 13-4-1713 **Enhancement of Corrosion Resistance and Strength for Al-Si-Fe-Cu-Zn based Alloys by Mn Additions**
HyoSang Yoo¹, YongHo Kim¹, JungHan Kim¹, ChangGi Jung¹, SangChan Lee², HyeonTaek Son¹, SeongHee Lee²
¹*Korea Institute of Industrial Technology, Korea*, ²*Mokpo National University, Korea*
- 13-4-1759 **Correlation between Microstructure and Mechanical Properties of the Coatings Produced on Al7075 by Plasma Electrolytic Oxidation**
Tae Hwan Noh, SeongHun Shin, Zeeshan Ur Rehman, BonHeun Koo
Changwon National University, Korea
- 13-4-1797 **Effect of SiF₆²⁻ Ions Concentration on the PEO Coating Formed on AZ61 Alloy in the Electrolyte Containing SiO₃²⁻ as Major Anion Network**
Zeeshan Ur Rehman, Jang Woo Lee, Seong Hun Shin, Bon Heun Koo
Changwon National University, Korea
- 13-4-1855 **The Effect of UV Illumination and Ozone Exposure on the Electronic Properties of 4H-SiC Diodes**
Taeseop Lee, Sang-Mo Koo
Kwangwoon University, Korea
- 13-4-1874 **Impact of Al-Interlayer Processing on the Properties of 4H-SiC Schottky Diodes**
So-Mang Kim, Sang-Mo Koo
Kwangwoon University, Korea
- 13-4-2011 **Fabricating of Multi-layered Metal Membrane for Hydrogen Reforming**
Bonuk Gu^{1,2}, Minjeong Lee^{1,2}, Yujeong Yi^{1,2}, Jung-yeul Yun², Byoung-kee Kim¹
¹*University of Ulsan, Korea*, ²*Korea Institute of Materials Science, Korea*
- 13-4-2097 **Microstructure and Texture of AA1050/AA6061/AA5052 Multi-Layered Complex Aluminum Sheet Fabricated by Three-Layer Stack Accumulative-Roll Bonding**
Seong-Hee Lee¹, Jung-Han Kim², Hyo-Sang Yoo², Hyeon-Teak Son²
¹*Mokpo National University, Korea*, ²*Korea Institute of Industrial Technology, Korea*
- 13-4-2099 **Enhanced Thermal Conductivity in Metal Matrix Composites Reinforced with Carbide Forming Element-coated Diamond Particles**
Hwa-Jung Kim, Yong-Sik Ahn, Hee-Lack Choi
Pukyong National University, Korea

- 13-4-2144 **Effects of Post-Treatment of Al/Cu Clad Metals on Mechanical Properties and Microstructures**
Jae-Hoon Ju, Young-Rae Cho
Pusan National University, Korea
- 13-4-2171 **Thermal Conductivity of Multi-layered Metal Sheets**
Jong-Gu Kim, Dong-Yong Kim, Young-Rae Cho
Pusan National University, Korea
- 13-4-2226 **Design of Segregated and Double Percolated Structure of Hexagonal Boron Nitride/Poly (methylemethacrylate) Composite for Highly Thermal Conductive Polymer Composite**
Seung Han Ryu, Hong-Baek Cho, Yong-Ho Choa
Hanyang University, Korea
- 13-4-2250 **Measurement of Cast Shrinkage of 6061 Al Alloy for Tailored Step Casting Method**
Seok Yong Seo, Suk Jun Kim
Korea University of Technology and Education, Korea
- 13-4-2251 **Effects of Intermetallic Compound Formation in Al/Cu Clad Material Fabricated by Differential Speed Rolling**
 Yong Deok Im, Dae Jin Youn, Kuk Hyun Song
Korea Institute of Industrial Technology, Korea
- 13-4-2313 **Graphene Fiber-copper Composite with High Electrical Conductivity and Ampacity**
Sang Jin Kim, Dongheon Shin, Tae Wook Kim, Sang Hyun Lee, Sukang Bae
Korea Institute of Science and Technology, Korea
- 13-4-2376 **Preparation of Polystyrene Beads as a Pore Former Synthesized by Dispersion Polymerization Process**
Seong-Hyeon Baek^{1,2}, Dahee Park¹, Eun-mi Jeong¹, Je-pil Wang², Jung-Yeul Yun¹
¹Korea Institute of Materials Science, Korea, ²Pukyung University, Korea
- 13-4-3040 **Thermally Conductive Polymer Composite based on Hybrid Fillers**
Jaeyong Jung¹, Youngkuk Kim¹, Yangdo Kim²
¹Korea Institute of Materials Science, Korea, ²Pusan National University, Korea
- 13-4-3181 **Phase Formation and Electrical Characterization of Lead-free (1-x)Ba (Zr_{0.05}Ti_{0.95})O₃-xBa (Fe_{0.5}Ta_{0.5})O₃ Binary Solid-solutions**
Chatchai Kruea-in¹, Gobwute Rujijanagul²
¹Chiang Mai Rajabhat University, Thailand, ²Chiang Mai University, Thailand
- 13-4-3199 **Simulations on Powder Bed Formation in Metal 3D Printer**
Eun-A Kim, Hak-Sung Lee, Jihoon Yu
Korea Institute of Materials Science, Korea
- 13-4-3204 **Phase Stability and Oxidation Behaviors of Ti-Al-Mo-Nb System**
G. S. Choi¹, M. S. Kim¹, S Yi², Y. B. Song³, F. Zhang⁴, J. S. Park¹
¹Hanbat National University, Korea, ²Kyungpook National University, Korea, ³Agency for Defense System, Korea, ⁴ComputermLLC, USA

- 13-4-3207 **Surface Ablation Behaviors of Pack Cementation Coated Pure Mo and Mo-Si-B Alloys under High Temperature Flame Atmosphere**
M. S. Kim, Y. J. Kim, M. K. Kim, J. W. Lee, J. S. Park
Hanbat National University, Korea
- 13-4-3423 **Tial Alloys Fabricated by Centrifugal Casting for Turbo-Charger**
Jeong Ho Ryu, Jung-Il Lee
Korea National University of Transportation, Korea

13-2 Nano materials

Chair Ho Won Jang (Seoul National University, Korea)

16:30-17:30, Nov. 09 (Wed.) 8F

- 13-2-0868 **The Effect of Graphene and Thermal Annealing for Anticorrosive Stainless Steel**
Jeonghyeon Oh, Sooyoung Kim
Chung-Ang University, Korea
- 13-2-0970 **Removing Arsenic Ion in Water with N-doped Porous Carbon**
Keunsu Choi, Hiroshi Mizuseki
Korea Institute of Science and Technology, Korea
- 13-2-1455 **Synthesis of Circular Copper Nanowire for Isotropic Transparent Conductor**
Young-Soo Chae, Sun-Kyo Kim, Seung-Yeol Yang, Yong-Seog Kim
Hongik University, Korea
- 13-2-1638 **Quasi-Consolidated Titanium Dioxide (TiO₂)-Graphene Nanoparticles for Highly Enhancing Photoactivity under Visible Light**
Hong Hee Kim¹, Yeonju Lee¹, Cheolmin Park², Do Kyung Hwang¹, Won Kook Choi¹
¹Korea Institute of Science and Technology, Korea, ²Yonsei University, Korea
- 13-2-1740 **Effects of Interlayer Gap on Water Vapor Transmission Rate through Graphene Oxide Gas Barrier Film**
Seung-Yeol Yang, Sun-Kyo Kim, Do Yoon Lee, Yong-Seog Kim
Hongik University, Korea
- 13-2-1875 **Improvement of n-ZTO/p-SiC Heterojunction on Electrical Properties by Post Annealling Process**
Sung Joon Park, Young-Seok Jeong, Sang-Mo Koo
Kwangwoon University, Korea
- 13-2-1876 **Hydrothermal Growth of ZnO Nanowire with High Effective Surface Area by Substrate Energy Control for Gas Sensing Applications**
Ji-Sub Park, Imtiaz Mahmud, Jun-Chan Choi, Young-Chul Shin, Hak-Rin Kim
Kyungpook National University, Korea
- 13-2-1960 **EMI (ElectroMagnetic Interference) Shielding Effect of Electrospun Carbon Nanofiber Web containing Nanoparticles**
Keunwon Kang¹, Eunmi Choi¹, Areum Kim¹, Minwoo Nam¹, Longshou Zheng¹, Soon Hyeong Kwon¹, Huijin Kim², Hoon Huh², Sung Gyu Pyo¹
¹Chung-Ang University, Korea, ²Korea Institute of Industrial Technology, Korea

- 13-2-1964 **Microstructural Evolution of Silver Nano Thin Film Complex Structure with Functional Particle for Improving Conventional and Electrical Performance**
Soon Hyeong Kwon, Eunmi Choi, Hun Young Jung, In Young Choi, Areum Kim, Longshou Zheng, Ho Jae Shim, Minwoo Nam, Keunwon Kang, Jihyeon Kim, Seung Yeon Lee, Sung Gyu Pyo
Chung-Ang University, Korea
- 13-2-2041 **The Properties of Colored Mortar using Different Inorganic Pigment and Acrylic Polymer**
Hongseok Jang, Sujin Kang, Teamin Jin, Pilyong Youn, Jaegyeong Heo, Gyugwang Jo
Chonbuk National University, Korea
- 13-2-2093 **Synthesis of Metal Telluride Nanotubes via Combinational Method**
Kee-Ryung Park, Hong-Baek Cho, Yong-Ho Choa
Hanyang University, Korea
- 13-2-2108 **Localized Surface Plasmon Resonance Driven Near-Infrared Shielding of Copper Selenide Nanoparticles Synthesized in Aqueous Medium**
Gyu-Dam Lim, Ji-Ae Choen, Young-Tae Kwon, Yong-Ho Choa
Hanyang University, Korea
- 13-2-2138 **Synthesis and Characterization of In-doped Ga₂O₃ Thin Films on Sapphire (0001) Substrate Grown by RF Magnetron Sputtering with a Powder Target**
Su Yeon Cha, Hyon Chol Kang
Chosun University, Korea
- 13-2-2143 **Branched Beta-Ga₂O₃ Nanowires Synthesized by Post Annealing with Au Seeds**
Sojin Kim, Hyon Chol Kang
Chosun University, Korea
- 13-2-2277 **Effects of HF on Morphology Control of Anatase TiO₂ Mesocrystals: Size, Shape, and Facet Control of Subunits**
Seung Muk Lee, Tae Yang Seo, Geun Chul Park, Chang Min Lee, Sang Hyeon Jeong, Chaehee Park, Jong Won Choi, Jinho Joo
Sungkyunkwan University, Korea
- 13-2-2278 **Synthesis, Characterization, and Photocatalytic Application of Hydrothermally Grown ZnO Nanorods with Tubular Facet**
Geun Chul Park, Seung Muk Lee, Chang Min Lee, Sang Hyeon Jeong, Jong Won Choi, Tae Yang Seo, Chaehee Park, Jun Hyung Lim, Jinho Joo
Sungkyunkwan University, Korea
- 13-2-2357 **Size Control of ZnO Nanorods using Hydrothermal Method with Substrate Revolution Technique**
Wookbin Lee, Jae-Young Leem
Inje University, Korea
- 13-2-2458 **Higher Electron Transmission Technologies of Electron Beam with Carbon Nanotube Cathode for X-ray Tube Application**
Ji Hwan Hong, Jung Su Kang, Yibin Ihm, Kyu Chang Park
Kyung Hee University, Korea

- 13-2-2466 **Fabrication of Crystalline Doped Silicon Films with Carbon Nanotube Electron Beam Exposure Technique**
Ha Rim Lee, Jung Su Kang, Min Tae Chung, Hyeon Hee Yang, Kyu Chang Park
Kyung Hee University, Korea
- 13-2-2473 **Enhanced Efficiency of Field Emission Lamps with Carbon Nanotube Cold Cathode**
Sung Tae Yoo, Jung Su Kang, Kyu Chang Park
Kyung Hee University, Korea
- 13-2-2783 **Surface Plasmon-enhanced Electroluminescence due to the Incorporation of the Au-WO₃ Nanocomposite Layer in Organic Light-emitting Devices**
Yong Hun Lee, Dae Hun Kim, Tae Whan Kim
Hanyang University, Korea
- 13-2-2842 **Synthesis of Cu₂O@Ag Nanoparticles with Bumpy Structures and Evaluation of Their Photocatalytic Performance**
Changsoo Lee, Yung Jong Lee, Chanwon Jung, Hyuck Mo Lee
Korea Advanced Institute of Science and Technology, Korea
- 13-2-2848 **Fabrication of Transparent Electrodes using Cu-Ag Core-shell Nanowires**
Sulgi Jung, Changsoo Lee, Cho Rong Chu, Hyuck Mo Lee
Korea Advanced Institute of Science and Technology, Korea
- 13-2-2875 **Restrain the N₂O Formation by Niobium for NH₃-SCR at Low Temperature**
Hyun Choi^{1,2}, HeonPhil Ha¹, YoungEun Jeong¹, Anil Kumar Pullur¹, Jason Junho Kim¹, Dongwook Kwon¹, Kwan-young Lee²
¹Korea Institute Science Technology, Korea, ²Korea University, Korea
- 13-2-3149 **Synthesis of Au-Pt Alloy Nanoparticles using Apoferritin Cavity and Their Catalytic Activity**
Shasha Peng, Ji Hyeon Kim, Sang Joon Park
Gachon University, Korea
- 13-2-3166 **Enhanced Photocatalytic Activity of Multifunctional Nanoparticles**
Sang-Yoon Lee¹, Jun-Sik Nam¹, Kyong-Hoon Choi², Jin Seung Jung¹
¹Gangneung-Wonju National University, Korea, ²Kwangwoon University, Korea
- 13-2-3260 **Effect of Particle Velocity on Coating Deposition Characteristics in Cold Spraying Process**
HeeSeon Bang
ChoSun University, Korea
- 13-2-3349 **Formation Behavior of Nano Precipitates in Rolled Al-Si-Mg (-Fe) Alloys**
JaeHwang Kim, DaeHwan Kim
Korea Institute of Industrial Technology, Korea
- 13-2-3351 **Effects of Si Addition with Natural Aging Time on the Two-step and Multi-step Aging Behavior in Al-Mg-Si Alloys**
Jiwoo Im, JaeHwang Kim
Korea Institute of Industrial Technology, Korea

- 13-2-3353 **Effects of Constituent Particle Formation on Recrystallization Behavior in an Al-Mn Alloy**
Yongchul Lee¹, JaeHwang Kim²
¹Tokyo Institute of Technology, Japan, ²Korea Institute of Industrial Technology, Korea
- 13-2-3391 **Silver Recovery as Nanoparticles from LTCC By-products**
Dongyoon Shin, Nak-Kyoon Ahn, Soyeong Joo, Jin-Ho Yoon
 Institute for Advanced Engineering, Korea
- 13-2-3417 **Effects of Mg Addition and Pre-aging on the Age-hardening Behavior in Al-Mg-Si Alloys**
JaeHwang Kim, Jiwoo Im
 Korea Institute of Industrial Technology, Korea
- 13-2-3422 **Effects of Mg Addition on the Recrystallization Behavior in Al-Mn Alloys**
YongChul Lee¹, JaeHwang Kim²
¹Tokyo Institute of Technology, Japan, ²Korea Institute of Industrial Technology, Korea
- 13-2-3427 **Synthesis and Characterization of Iron Powder prepared by Plasma Arc Discharge**
Kiran Shinde¹, Mahipal Ranot¹, H.S. Kim², J.W. Kim¹, C.J. Choi¹, K.C. Chung¹
¹Korea Institute of Materials Science, Korea, ²Korea Electrotechnology Research Institute, Korea
- 13-2-3473 **Effect on the Sol-gel Coating after Plasma Electrolytic Oxidation (PEO) Process on Magnesium Alloys**
Seokhyun Nam
 KC Chemical. Co., Ltd, Korea

13-3 Electronic optical & magnetic materials

Chair Sung Gyu Pyo (Chung Ang University, Korea) 16:30-17:30, Nov. 09 (Wed.) 2F

- 13-3-0661 **Temperature Dependent DC Characteristics of AlInN:Mg/GaN High-Electron Mobility Transistors**
Seongjun Kim, Chel-Jong Choi, Hyunsoo Kim
 Chonbuk National University, Korea
- 13-3-0779 **Magnet Properties and Densification of Fe Powder Compacts with Heat-Treatment Conditions**
Hyeon-Taek Son, Yong-Ho Kim, Hyo-Sang Yu
 Korea Institute of Industrial Technology, Korea
- 13-3-0813 **An InSb-based Biosensor using Magnetoresistance**
Seongjong Kim^{1,2}, Seung-Woo Lee¹, Jin Dong Song¹, Young-Wan Kwon², Kyung-Jin Lee², Hyun Cheol Koo^{1,2}
¹Korea Institute of Science and Technology, Korea, ²KU-KIST Graduate School of Converging Science and Technology, Korea University, Korea
- 13-3-0835 **Effect of Substrate Temperature and Flow Rate of Atmosphere Gases on the Characteristics of Mo-doped ZnO (MZO) Thin Films**
YongHo Lee, YeongJin Lee, JiHoon Jeong, KyuMann Lee
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- 13-3-0886 **A Novel Filtering Structure Allowing Polarization-Sensitive Devices to Respond to Unpolarized Light**
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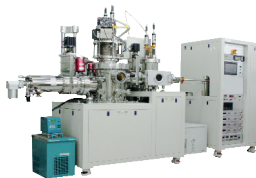


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- Etcher
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 2. RIE (Reactive Ion Etching)
 3. CAIBE
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- Atmospheric Plasma
- Vacuum Dryer



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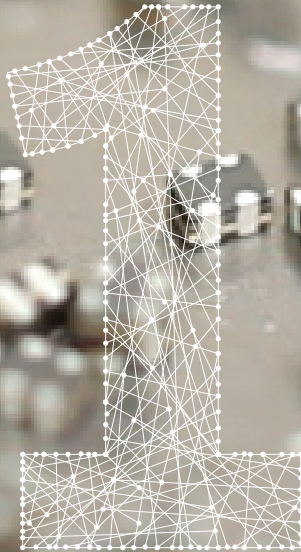
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