

ENGE 2022

The 7th International Conference on Electronic Materials
and Nanotechnology for Green Environment

PROGRAM BOOK

November 6 - 9, 2022

Ramada Plaza Jeju Hotel, Jeju, Korea



Hosted by



Sponsored by



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WELCOME MESSAGE

"ENGE 2022 offers more to see, learn, and experience than ever before.

We warmly welcome you to the 7th ENGE in 2022."

On behalf of the Committee for the 7th the International Conference on Electronic Materials and Nanotechnology for Green Environment, I sincerely welcome you all to the ENGE 2022 to be held in Jeju, Korea, from November 6 to 9, 2022.

As you are probably aware, the ENGE has experienced significant growth over the last 12 years. Now the ENGE Conference has become one of the top international conferences in the fields of electronic materials and nanotechnology, and its meetings have provided participants with great opportunities to share and disseminate the latest research outcomes and technological trends.

The Organizing Committee is committed to hosting the scientific 'must-attend' event of 2022 packed with a broad range of plenary, keynote, oral, and poster sessions. The ENGE 2022 promotes discussions on latest advances in the fundamental and applied science of electronic materials and nanotechnology, and many other relevant topics.

The excellence of this year's program is derived from the hard work of this year's authors and presenters, as well as members of the 2022 Steering and Program Committees, despite the unique challenges posed by the pandemic era. I would like to share my deep appreciation for all of them.

Please join the ENGE 2022 with your colleagues and friends.

We are confident that you will have a memorable and academically informative experience.

Moon-Ho Jo

Conference Chair of ENGE 2022

Institute for Basic Science

Pohang University of Science and Technology



OVERVIEW

ENGE 2010 NOV 21-24

558 presentations / 477 attendees 13 countries

ENGE 2012 SEP 16-19

906 presentations / 852 attendees 12 countries

ENGE 2014 NOV 16-19

897 presentations / 1,019 attendees 21 countries

ENGE 2016 NOV 6-9

931 presentations / 1,180 attendees 19 countries

ENGE 2018 NOV 11-14

1,056 presentations / 1,466 attendees 16 countries

ENGE 2020 NOV 1-4

1,002 presentations / 1,392 attendees 17 countries

THIS YEAR'S ENGE HAS ...

- **47** Session Topics under **14** Programs
- **5** Plenary, **21** Keynote, **2** Tutorial, **191** Invited, **299** Oral, **673** Poster Presentations from **22** Countries
- Best Oral & Poster Awards
- Interesting and Memorable Social Programs

TITLE	The 7th International Conference on Electronic Materials and Nanotechnology for Green Environment
DATE	November 6-9, 2022
VENUE	Ramada Plaza Jeju Hotel, Jeju, Korea
PROGRAM	Welcome Reception, Plenary & Keynote & Tutorial & Invited & Oral & Poster Sessions, Banquet
HOSTED BY	The Korean Institute of Metals and Materials
ORGANIZED BY	• IBS-Center for Van der Waals Quantum Solids • Research Center for Electric-Field-Controlled Materials • Korea University I BK21 FOUR R&E Center for Materials Science and Engineering • Sungkyunkwan University I BK21 FOUR Human Tech Materials-based Global Elite Cultivation Center of Student Success • POSTECH I BK21 FOUR Education and Research Center for Future Materials • Seoul National University I BK21 FOUR Materials Education/Research Division for Creative Global Leaders • Yonsei University I BK21 FOUR Education and Research Division for Futuristic Human-centric Materials • Changwon University I BK21 FOUR Human Resources and Research Platform Program for Leading Materials Innovation • Center for the Control of Material Properties 3D Nanostructure Design
SPONSORED BY	• Jeju Convention & Visitors Bureau • Korea Tourism Organization • Korean Federation of Science and Technology Societies

COMMITTEE

Steering Committee

Chairman	Moon-Ho Jo	<i>Institute for Basic Science / Pohang University of Science and Technology</i>
Co-Chairman	Young Keun Kim	<i>Korea University</i>
Vice Chairman	Cheolmin Park	<i>Yonsei University</i>
Program Chair	Seokwoo Jeon	<i>Korea Advanced Institute of Science and Technology</i>
Program Co-Chair	Jae-yong Song	<i>Pohang University of Science and Technology</i>
	Ki Suk Kang	<i>Seoul National University</i>
	Byungha Shin	<i>Korea Advanced Institute of Science and Technology</i>
	Su-Dong Park	<i>Korea Electrotechnology Research Institute</i>
	Jin-Woo Park	<i>Yonsei University</i>
	Hyung-jun Kim	<i>Korea Institute of Science and Technology</i>
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	In-Ho Jung	<i>Seoul National University</i>
	Heung Nam Han	<i>Seoul National University</i>
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	Feng Ding	<i>Ulsan National Institute of Science and Technology</i>
	Nam-Joon Cho	<i>Nanyang Technological University, Singapore</i>
	Aloysius Soon	<i>Yonsei University</i>
Publications	Chang Hyuck Choi	<i>Pohang University of Science and Technology</i>
Publicity	Chul-Ho Lee	<i>Korea University</i>
	Miso Kim	<i>Sungkyunkwan University</i>
Treasurer	Wooyoung Shim	<i>Yonsei University</i>
Local	Soo Young Kim	<i>Korea University</i>
	Byoungwoo Kang	<i>Pohang University of Science and Technology</i>

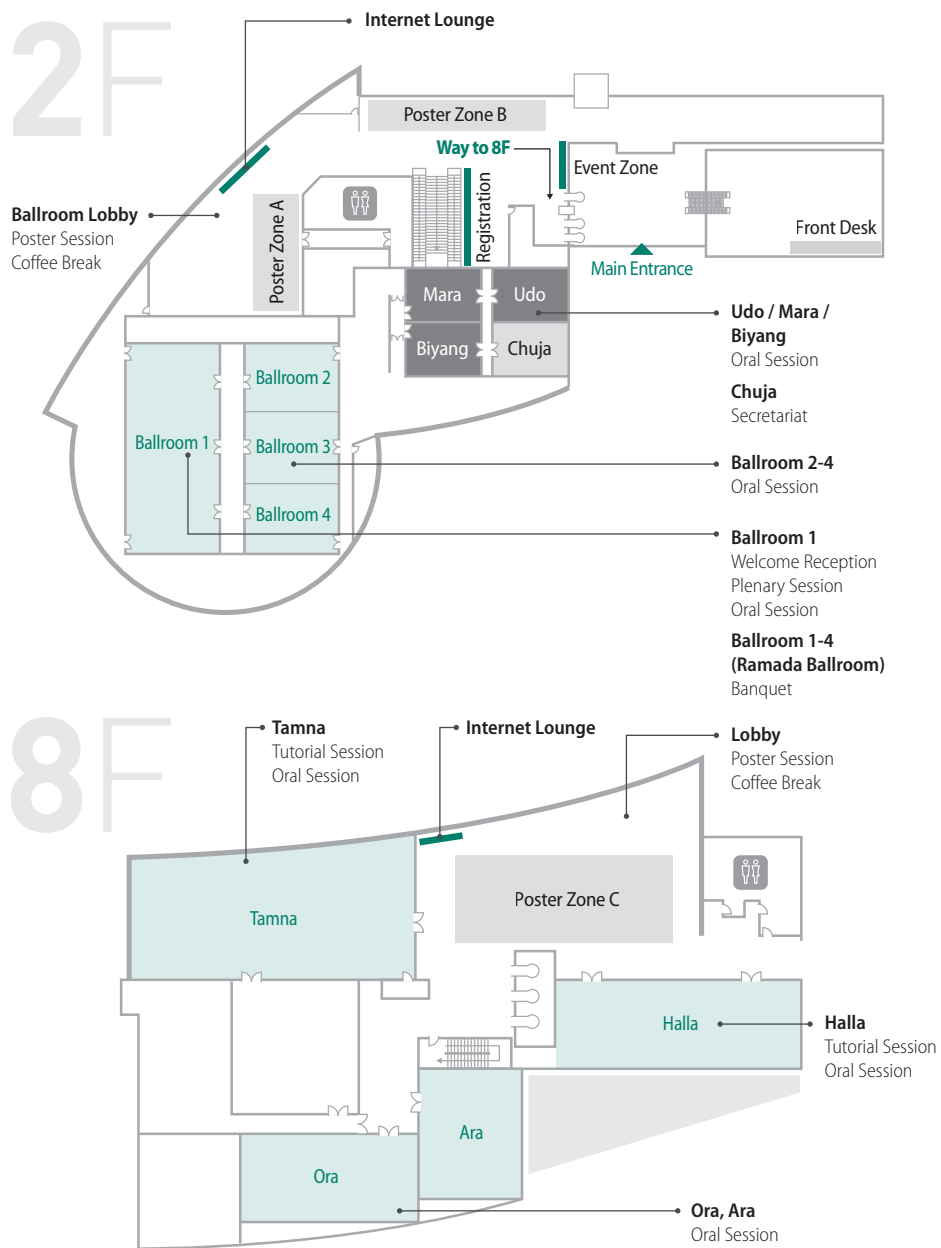
Advisory Committee

Chair	Byungwoo Park	<i>Seoul National University</i>
Member	Kyung-Ho Shin	<i>Korea Institute of Science and Technology</i>
	Joonyeon Chang	<i>Korea Institute of Science and Technology</i>
	Byung-ki Cheong	<i>Green Technology Center</i>
	Nak-Woong Eum	<i>Electronics and Telecommunications Research Institute</i>
	Young-Chang Joo	<i>Seoul National University</i>
	Young-Ho Kim	<i>Hanyang University</i>
	Young Keun Kim	<i>Korea University</i>
	Jong-Lam Lee	<i>Pohang University of Science and Technology</i>
	Hyuck Mo Lee	<i>Korea Advanced Institute of Science and Technology</i>
	Ji-Beom Yoo	<i>Sungkyunkwan University</i>
	Byungha Shin	<i>Korea Advanced Institute of Science and Technology</i>
	Euijoon Yoon	<i>Korea Institute of Energy Technology</i>

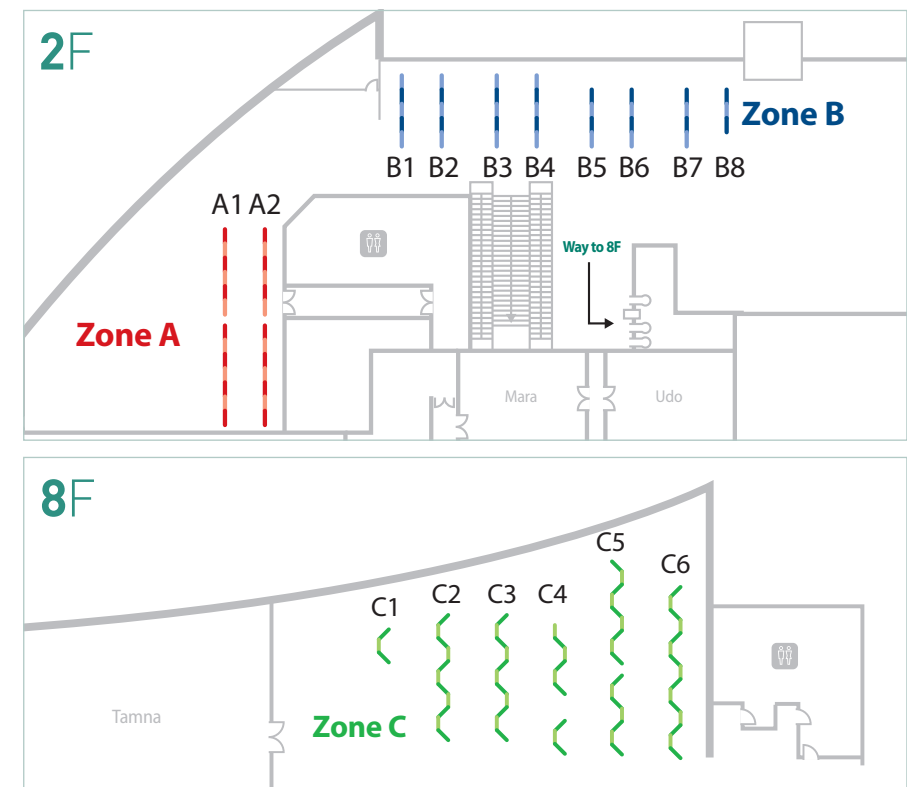
ENGE 2022

The 7th International Conference on Electronic Materials
and Nanotechnology for Green Environment

VENUE LAYOUT



POSTER SESSION LAYOUT



Program	November 7	November 8	November 9
Program 01	B1, B2, B3, B4, B5	B1, B2, B3	B8
Program 02	A1	B3	A1
Program 03	C1, C2	C2, C3, C4	C2, C3
Program 04	A1, A2	A1	A1, A2
Program 05		C5	C3, C4, C5
Program 06		A1, A2	A2, B1, B2
Program 07	C3	C5	
Program 08	C4		B3, B4, B5, B6
Program 09		B4, B5, B6	
Program 10	B5, B6	A2	
Program 11		C6	C5
Program 12			B6, B7, B8, C5, C6
Program 13	B7, B8	B6, B7	
Program 14	C4, C5, C6		

PROGRAM AT A GLANCE

SUN 11/6

14:00 Registration Desk Open
17:00-18:00 Welcome Reception
18:00-20:00 Tutorial Session

MON 11/7

08:00 Registration Desk Open
08:30-09:10 Plenary Session
09:10-09:20 Coffee Break
09:20-11:50 Oral Session
11:50-13:20 Lunch Break
13:20-15:40 Oral Session
14:00-17:00 Poster Put-up
15:40-16:00 Coffee Break
16:00-18:30 Oral Session
18:30-19:30 Poster Session

TUE 11/8

08:00 Registration Desk Open
08:30-09:50 Plenary Session
09:50-10:10 Coffee Break
10:10-12:40 Oral Session
12:40-14:00 Lunch Break
13:00-16:00 Poster Put-up
14:00-16:30 Oral Session
16:30-16:50 Coffee Break
16:50-18:20 Oral & Poster Session
18:20-20:00 Banquet

WED 11/9

08:00 Registration Desk Open
08:30-09:50 Plenary Session
09:00-12:00 Poster Put-up
09:50-10:10 Coffee Break
10:10-12:40 Oral Session
12:40-14:00 Lunch Break
14:00-15:00 Poster Session 1
14:00-16:30 Oral Session
16:30-16:50 Coffee Break
16:50-18:20 Oral Session
16:50-17:50 Poster Session 2

SOCIAL PROGRAMS

BANQUET

November 8 (Tuesday) 18:20-20:00 | Ramada Ballroom (2F)

The banquet is the place for conference attendees to mingle and enjoy featured entertainment while partaking in a delicious western course meal. Look forward to an unforgettable evening as one of highlight programs of ENGE 2022.

Sponsored by 

- Celebration Performance
- Congratulatory Address
- Dinner
- Greetings from the Conference Chair of ENGE 2024
- Welcome Address
- Statistics Report
- O/X Quiz 
- Group Photo

*Don't miss out on this opportunity, as there are plenty of gifts ready!
None of the dinner attendees will leave empty-handed.*



WELCOME RECEPTION

November 6 (Sunday) 17:00-18:00 Ballroom 1 (2F)

On the first day of the conference, please join an ice-breaking event to get to know each other! All participants who registered ENGE 2022 are invited to the welcome reception.



AWARDS

'The Best Oral & Poster Award' will be announced after the conference via the website. Best candidates will receive cash award of KRW 100,000 and a commemorative certificate each.



EVENT

Photo Exhibition & Video Clip

Winner Prize

KRW 200,000 / KRW 100,000

Voting Hour

SUN	NOV 6	14:00-18:00
MON-WED	NOV 7-9	09:00-18:00

- Selected photo & video clips will be displayed during the conference.
- Visit the event booth and vote for the final round.
- The winners will be announced after the conference via the website.

USEFUL INFORMATION

Registration Desk

Conference Room Lobby (2F)

SUN NOV 6 14:00-18:30

MON NOV 7 08:00-18:30

TUE NOV 8 08:00-18:30

WED NOV 9 08:00-18:00

On-site Registration Fee

Regular USD 700 | KRW 840,000

Student USD 350 | KRW 420,000

* On-site banquet tickets may be purchased at the registration desk subject to availability and will be provided on a first-come, first-served basis.

Fee Includes

Regular

Admission to all sessions, abstract e-Book, welcome reception, banquet, lunches (for 3 days) and coffee breaks

Student

Admission to all sessions, abstract e-Book, welcome reception, lunches (for 3 days) and coffee breaks

* Banquet (USD 50 | KRW 55,000)

Internet Lounge

Internet and printing service are available.

SUN NOV 6 14:00-18:30

MON NOV 7 08:00-18:30

TUE NOV 8 08:00-18:30

WED NOV 9 08:00-18:00

Conference Room Lobby (2F & 8F)

Wi-Fi Access

Wireless Network

RAMADA or RAMADA_PAD

Emergency Contact

Tel. +82-2-565-3571

E-mail enge2022korea@gmail.com

Message Board

Message board will be set up at the conference room lobby (2F & 8F) so that participants can get useful information.

Download Materials

✓ My Page: Attendance Certificate, Registration Payment Receipt

✓ Official Website: Abstract E-Book, Statistics Reports, Program Book

Secretariat

ENGE 2022 participants can use the secretariat office as lost & found and cloakroom during the conference.

SUN NOV 6 14:00-18:00

MON NOV 7 08:00-18:00

TUE NOV 8 08:00-18:00

WED NOV 9 08:00-18:00

Chuja (2F)

Beer Time

Beer & snacks will be provided during Monday's poster session.

MON NOV 7 18:30-19:30

Conference Room Lobby (2F & 8F)

Coffee Break

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

MON NOV 7 09:10-09:20

15:40-16:00

TUE NOV 8 09:50-10:10

16:30-16:50

WED NOV 9 09:50-10:10

16:30-16:50

Conference Room Lobby (2F & 8F)

Lunch Break

Bring your lunch coupon with your name badge.

MON NOV 7 11:30-13:30

TUE NOV 8 12:00-14:00

WED NOV 9 12:00-14:00

Restaurant (1F)

MON Bulgogi

TUE Bibimbap

WED Galbitang

** Vegetarian menu is prepared separately.

Doughnut Time

Doughnut & coffee will be provided every morning.

MON NOV 7 08:00-08:20

TUE NOV 8 08:00-08:20

WED NOV 9 08:00-08:20

Conference Room Lobby (2F)

SESSION TIMETABLE

NOVEMBER 6 (Sun)						
14:00	Registration					
17:00-18:00	Welcome Reception					
18:00-20:00	Tutorial Session Jaeyoung Kim & Donghun Kim					
NOVEMBER 7 (Mon)						
	Ballroom 1 (2F)	Ballroom 2 (2F)	Ballroom 3 (2F)	Ballroom 4 (2F)	Udo (2F)	Mara (2F)
08:30-09:10	Plenary Session 1 Hideo Ohno					
09:10-09:20	Coffee Break					
09:20-11:50	04 Synthesis and Integration of Low-dimensional Materials and 2D vdW Heterostructures 1 p. 095	01 Advanced Processes and Materials for Future Devices 1 p. 050	02 Brain-inspired Devices and Architecture 1 p. 064	10 Computational Design of Metallic/ Structural Materials 1 p. 157		13 Hard Magnets for Future Mobility Applications 1 p. 189
11:50-13:20	Lunch Break					
13:20-15:40	04 Synthesis and Integration of Low-dimensional Materials and 2D vdW Heterostructures 2 p. 096	01 - Advanced Processes and Materials for Future Devices 2 - Compound Semiconductors and Power Electronic Devices 1 p. 051	02 Brain-inspired Devices and Architecture 2 p. 065	10 Computational Modeling of Halide Perovskites for Optoelectronics 1 p. 158		13 - Hard Magnets for Future Mobility Applications 2 - Soft Magnets for Future Mobility Applications 1 p. 190
15:40-16:00	Coffee Break					
16:00-18:30	04 Fundamental Properties and Nano-characterization of Low-dimensional Materials and 2D vdW Heterostructures 1 p. 097	01 - Compound Semiconductors and Power Electronic Devices 2 - Quantum Devices and Computing p. 052	02 Computing-in-Memory p. 066	10 Computational Materials for Energy Conversion 1 p. 158		13 Soft Magnets for Future Mobility Applications 2 p. 191
18:30-19:30	Poster Session Lobby (2F)	01 Advanced Processes and Materials for Future Devices 02 Computing-in-Memory 02 Brain-inspired Devices and Architecture 04 Synthesis and Integration of Low-dimensional Materials and 2D vdW Heterostructures 10 Computational Design of Metallic/Structural Materials 13 Hard Magnets for Future Mobility Applications 13 Soft Magnets for Future Mobility Applications				p. 056 p. 070 p. 070 p. 101 p. 162 p. 194 p. 194

NOVEMBER 6 (Sun)							
Registration				Location 2F, Lobby			
				NOV 6 (Sun) 14:00-18:00			
				NOV 7-8 (Mon-Tue) 08:00-18:30			
				NOV 9 (Wed) 08:00-18:00			
Welcome Reception				Location 2F, Ballroom 1			
Tutorial Session				Location 8F, Tamna & Halla			
Jaeyoung Kim & Donghun Kim							
NOVEMBER 7 (Mon)							
Biyang (2F)	Ora (8F)	Ara (8F)	Halla (8F)	Tamna (8F)	Jeju Oriental Hotel		
Coffee Break				Location 2F & 8F, Lobby			
	14 Bioinspired and Biointegrated Materials p. 197	07 Halide Perovskite Solar Cells p. 129	08 Photoelectrochemical Hydrogen Production 1 p. 137	03 Piezoelectric, Triboelectric and Hybrid Energy Harvesting Materials and Systems 1 p. 075	12 Thermal Engineering Materials and Devices 1 Ilchul (2F), Jeju Oriental Hotel p. 177		
Lunch Break				Location 1F, Restaurant			
	14 Nano-medical Materials p. 198	07 Inorganic Thin Film Solar Cells p. 130	08 Photoelectrochemical Hydrogen Production 2 p. 138	03 Piezoelectric, Triboelectric and Hybrid Energy Harvesting Materials and Systems 2 p. 076	12 Thermal Engineering Materials and Devices 2 Ilchul (2F), Jeju Oriental Hotel p. 177		
Coffee Break				Location 2F & 8F, Lobby			
	14 Bionanomaterials for Biomedical Applications p. 198	07 Organic and Hybrid Solar Cells p. 130	08 Photoelectrochemical Hydrogen Production 3 p. 139	03 Piezoelectric, Triboelectric and Hybrid Energy Harvesting Materials and Systems 3 p. 077	12 Thermal Engineering Materials and Devices 3 Ilchul (2F), Jeju Oriental Hotel p. 178		
Poster Session Lobby (8F)						03 Piezoelectric, Triboelectric and Hybrid Energy Harvesting Materials and Systems	p. 083
						07 Inorganic Thin Film Solar Cells	p. 132
						08 Photoelectrochemical Hydrogen Production	p. 144
						14 Nano-medical Materials	p. 201
						14 Bioinspired and Biointegrated Materials	p. 201
						14 Bionanomaterials for Biomedical Applications	p. 203

NOVEMBER 8 (Tue)						
	Ballroom 1 (2F)	Ballroom 2 (2F)	Ballroom 3 (2F)	Ballroom 4 (2F)	Udo (2F)	Mara (2F)
08:30-09:10	Plenary Session 2 Taeghwan Hyeon					
09:10-09:50	Plenary Session 3 Teri W. Odom					
09:50-10:10	Coffee Break					
10:10-12:40	04 - Fundamental Properties and Nano-characterization ~ 2 - Advanced Applications ~ 1 p. 098	01 Applications for 2D and Carbon-based Materials 1 p. 053	02 Advanced Thin Film Processes for Future Memory 1 p. 066	10 Computational Design of Metallic/ Structural Materials 2 p. 159	09 Artificial Intelligence for Materials p. 149	13 Spintronic Materials and Devices 1 p. 191
12:40-14:00	Lunch Break					
14:00-16:30	04 Advanced Applications of Low-dimensional Materials and 2D vdW Heterostructures 2 p. 099	01 Applications for 2D and Carbon-based Materials 2 p. 054	02 Advanced Thin Film Processes for Future Memory 2 p. 067	09 AI for Structural Materials 1 p. 150	06 Overview of the Current State-of-the-art Lithium ion Batteries p. 120	13 Spintronic Materials and Devices 2 p. 192
16:30-16:50	Coffee Break					
16:50-18:20						10 - Computational Modeling of Halide Perovskites for Optoelectronics 2 - Computational Materials for Energy Conversion 2 p. 160
16:50-18:20	Poster Session Lobby (2F)	01 Compound Semiconductors and Power Electronic Devices 01 Applications for 2D and Carbon-based Materials 02 Advanced Thin Film Processes for Future Memory 04 Fundamental Properties and Nano-characterization of Low-dimensional Materials and 2D vdW Heterostructures 06 Overview of the Current State-of-the-art Lithium ion Batteries 09 AI for Structural Materials 09 AI for Smart/IT Materials 09 AI for Energy & Environmental Materials 10 Computational Modeling of Halide Perovskites for Optoelectronics 10 Computational Materials for Energy Conversion 13 Spintronic Materials and Devices p. 060 p. 062 p. 072 p. 104 p. 123 p. 154 p. 155 p. 155 p. 163 p. 164 p. 196				
18:20-20:00	Banquet					

NOVEMBER 8 (Tue)					
Biyang (2F)	Ora (8F)	Ara (8F)	Halla (8F)	Tamna (8F)	Jeju Oriental Hotel
					12 Workshop 1 Development and Demonstration of Thermoelectric Power Generation System Using Industrial Waste Heat Research Project Group's supported by MOTIE-KETEP (09:20-12:00) Ilchul (2F), Jeju Oriental Hotel
Coffee Break					
Location 2F & 8F, Lobby					
14 Advances in Bio-Nano Integrated Materials p. 199	05 Materials and Products for Metaverse Display p. 110	11 Origami, Kirigami and Auxetic Structures for Shape Programmable Structures 1 p. 166	08 Electrocatalysis for Hydrogen Generation 1 p. 140	03 Soft, Wearable, and Neuromorphic Electronics for Human Interfacing 1 p. 078	
Lunch Break					
Location 1F, Restaurant					
	05 Halide Perovskite Materials and Devices 1 p. 111	11 Origami, Kirigami and Auxetic Structures for Shape Programmable Structures 2 p. 167	08 Electrocatalysis for Hydrogen Generation 2 p. 141	03 Soft, Wearable, and Neuromorphic Electronics for Human Interfacing 2 p. 079	12 Thermal Engineering Materials and Devices 4 Ilchul (2F), Jeju Oriental Hotel p. 179
Coffee Break					
Location 2F & 8F, Lobby					
		11 Nano-architected Materials for Structural and Energy Applications 1 p. 168		03 Flexible/Stretchable Materials for Wearable Electronics 1 p. 080	12 Workshop 2 (16:30-19:00) Ilchul (2F), Jeju Oriental Hotel
Poster Session Lobby (8F)	03 Flexible/Stretchable Materials for Wearable Electronics p. 086				
	03 Soft, Wearable, and Neuromorphic Electronics for Human Interfacing p. 089				
	05 Quantum Dots for Advanced Display Technology p. 114				
	07 Halide Perovskite Solar Cells p. 134				
	07 Organic and Hybrid Solar Cells p. 135				
	11 Origami, Kirigami and Auxetic Structures for Shape Programmable Structures p. 172				
	11 Multi-scale Mechanical Testing in Materials Research and Development p. 173				
Banquet					
Location 2F, Ramada Ballroom					

NOVEMBER 9 (Wed)

	Ballroom 1 (2F)	Ballroom 2 (2F)	Ballroom 3 (2F)	Ballroom 4 (2F)	Udo (2F)	Mara (2F)
08:30-09:10	Plenary Session 4 John A. Rogers					
09:10-09:50	Plenary Session 5 Hongkun Park					
09:50-10:10	Coffee Break					
10:10-12:40	04 Advanced Applications of Low-dimensional Materials and 2D vdW Heterostructures 3 p. 100	01 3D Heterogeneous Integration for Advanced Packing p. 055	02 Ferroelectric Devices and Emerging Memory p. 068	09 AI for Smart/IT Materials p. 151	06 Probing the Inside of Batteries; Characterizations and Analysis p. 121	12 Thermal Engineering Materials and Devices 5 p. 179
12:40-14:00	Lunch Break					
14:00-16:30		Van der Waals Materials Science Forum p. 048		09 AI for Energy & Environmental Materials 1 p. 151	06 Emerging Safer Rechargeable Batteries p. 122	12 Thermal Engineering Materials and Devices 7 p. 181
16:30-16:50	Coffee Break					
16:50-18:20		Van der Waals Materials Science Forum p. 048		09 - AI for Structural Materials 2 - AI for Energy & Environmental Materials 2 p. 152		
14:00-15:00	Poster Session	Poster Session 1 (14:00-15:00)				
		01 3D Heterogeneous Integration for Advanced Packing 02 Ferroelectric Devices and Emerging Memory 04 Advanced Applications of Low-dimensional Materials and 2D vdW Heterostructures 12 Thermoelectric Physics 12 Thermoelectric Chemistry				
16:50-17:50	Lobby (2F)	Poster Session 2 (16:50-17:50)				
		06 Probing the Inside of Batteries; Characterizations and Analysis 06 Emerging Safer Rechargeable Batteries 08 Electrocatalysis for Hydrogen Generation				

NOVEMBER 9 (Wed)

Biyang (2F)		Ora (8F)		Ara (8F)		Halla (8F)		Tamna (8F)	
Coffee Break								Location 2F & 8F, Lobby	
12 Thermal Engineering Materials and Devices 6 p. 180		05 Quantum Dots for Advanced Display Technology p. 111		11 Nano-architected Materials for Structural and Energy Applications 2 p. 168		08 Electrocatalysis for Hydrogen Generation 3 p. 142		03 Wearable and Stretchable Devices for Mobile and Healthcare Applications p. 080	
Lunch Break								Location 1F, Restaurant	
12 Thermal Engineering Materials and Devices 8 p. 182		05 Halide Perovskite Materials and Devices 2 p. 112		11 Multi-scale Mechanical Testing in Materials Research and Development 1 p. 169		08 Thermochemical Hydrogen Production p. 142		03 Flexible/Stretchable Materials for Wearable Electronics 2 p. 081	
Coffee Break								Location 2F & 8F, Lobby	
12 Workshop 3 (16:30-19:00)				11 Multi-scale Mechanical Testing in Materials Research and Development 2 p. 170				03 Flexible/Stretchable Materials for Wearable Electronics 3 p. 082	
Poster Session Lobby (8F)		Poster Session 1 (14:00-15:00)							
		03 Wearable and Stretchable Devices for Mobile and Healthcare Applications p. 092							
		12 Thermoelectric Applications p. 186							
		12 Thermal-Assemble Materials and Applications with KSTP (The Korean Society of Thermalphysical Properties) p. 188							
		Poster Session 2 (16:50-17:50)							
		05 Halide Perovskite Materials and Devices p. 115							
		05 Materials and Products for Metaverse Display p. 117							
		11 Nano-architected Materials for Structural and Energy Applications p. 174							

TECHNICAL PROGRAMS

01

Advanced Logic Semiconductors & beyond CMOS Applications

Hyung-jun Kim

Korea Institute of Science and Technology

- 1-1 Advanced Processes and Materials for Future Devices
Kyung Rok Kim Ulsan National Institute of Science and Technology
- 1-2 3D Heterogeneous Integration for Advanced Packing
Hyun-Yong Yu Korea University
- 1-3 Quantum Devices and Computing
Yonuk Chong Sungkyunkwan University
- 1-4 Compound Semiconductors and Power Electronic Devices
Jae Kyoung Mun Electronics and Telecommunications Research Institute
- 1-5 Applications for 2D and Carbon-based Materials
Jin-Hong Park Sungkyunkwan University

02

Advanced Memory and Neuromorphic Materials & Device Applications

Changhwan Choi

Hanyang University

- 2-1 Ferroelectric Devices and Emerging Memory
Sanghun Jeon Korea Advanced Institute of Science and Technology
- 2-2 Advanced Thin Film Processes for Future Memory
Woongkyu Lee Soongsil University
- 2-3 Computing-in-Memory
Sangbum Kim Seoul National University
- 2-4 Brain-inspired Devices and Architecture
Doo Seok Jeong Hanyang University

03

Sensors and Energy Harvesting for Wearable Healthcare Devices

Miso Kim

Sungkyunkwan University

Jin-Woo Park

Yonsei University

- 3-1 Flexible/Stretchable Materials for Wearable Electronics
Hyunjung Yi Korea Institute of Science and Technology
- 3-2 Piezoelectric, Triboelectric and Hybrid Energy Harvesting Materials and Systems
Ju-Hyuck Lee Daegu Gyeongbuk Institute of Science and Technology
- 3-3 Soft, Wearable, and Neuromorphic Electronics for Human Interfacing
Hynhyub Ko Ulsan National Institute of Science and Technology
Do Hwan Kim Hanyang University
- 3-4 Wearable and Stretchable Devices for Mobile and Healthcare Applications
Dae-Hyung Kim Seoul National University

04

Low-dimensional Materials and 2D van der Waals Heterostructures

Gwan-Hyoung Lee

Seoul National University

Jangyup Son

Korea Institute of Science and Technology

- 4-1 Synthesis and Integration of Low-dimensional Materials and 2D vdW Heterostructures
Kibum Kang Korea Advanced Institute of Science and Technology
- 4-2 Fundamental Properties and Nano-characterization of Low-dimensional Materials and 2D vdW Heterostructures
Jangyup Son Korea Institute of Science and Technology
- 4-3 Advanced Applications of Low-dimensional Materials and 2D vdW Heterostructures
Chul-Ho Lee Korea University

05

Emerging Materials for Metaverse Display

Soo Young Kim

Korea University

- 5-1 Halide Perovskite Materials and Devices
Jongnam Park Ulsan National Institute of Science and Technology
- 5-2 Quantum Dots for Advanced Display Technology
Jiwan Kim Kyonggi University
- 5-3 Materials and Products for Metaverse Display
Soo Young Kim Korea University

06

Advanced Materials for Rechargeable World

Kisuk Kang

Seoul National University

Yun Sung Lee

Chonnam National University

- 6-1 Overview of the Current State-of-the-art Lithium ion Batteries
Yongmook Kang Korea University
- 6-2 Probing the Inside of Batteries; Characterizations and Analysis
Wonsub Yoon Sungkyunkwan University
- 6-3 Emerging Safer Rechargeable Batteries
Jangwook Choi Seoul National University

07

Advances in Photovoltaic Materials and Devices

Byungha Shin

Korea Advanced Institute of Science and Technology

- 7-1 Inorganic Thin Film Solar Cells
Jaeyeong Heo Chonnam National University
- 7-2 Halide Perovskite Solar Cells
Jun Hong Noh Korea University
- 7-3 Organic and Hybrid Solar Cells
Jung-Yong Lee Korea Advanced Institute of Science and Technology

08

Hydrogen Future and Its Economic and Environmental Consideration

Uk Sim

Korea Institute of Energy Technology

- 8-1 Photoelectrochemical Hydrogen Production
Sanghan Lee Gwangju Institute of Science and Technology
- 8-2 Electrocatalysis for Hydrogen Generation
Hyung-Suk Oh Korea Institute of Science and Technology
- 8-3 Thermochemical Hydrogen Production
Chang Won Yoon Pohang University of Science and Technology

09

Artificial Intelligence for Materials

Sang Soo Han

Korea Institute of Science and Technology

- 9-1 AI for Structural Materials
Dongwon Shin Oak Ridge National Laboratory
- 9-2 AI for Smart/IT Materials
Donghwa Lee Pohang University of Science and Technology
- 9-3 AI for Energy & Environmental Materials
Donghun Kim Korea Institute of Science and Technology

10

Advances in Computational Materials

Hyungjun Kim

Korea Advanced Institute of Science and Technology

- 10-1 Computational Design of Metallic/Structural Materials
Won-Seok Ko Inha University
- 10-2 Computational Modeling of Halide Perovskites for Optoelectronics
Jung-Hoon Lee Korea Institute of Science and Technology
- 10-3 Computational Materials for Energy Conversion
Hyungjun Kim Korea Advanced Institute of Science and Technology

11

Evolutionary Structural Materials

Dongchan Jang Korea Advanced Institute of Science and Technology
Eun-chaee Jeon University of Ulsan

- 11-1 **Origami, Kirigami and Auxetic Structures for Shape Programmable Structures**
In-Suk Choi Seoul National University
- 11-2 **Nano-architected Materials for Structural and Energy Applications**
Seung Min Han Korea Advanced Institute of Science and Technology
Dongchan Jang Korea Advanced Institute of Science and Technology
- 11-3 **Multi-scale Mechanical Testing in Materials Research and Development**
Ju-Young Kim Ulsan National Institute of Science and Technology

12

Thermal Engineering Materials and Devices

SuDong Park Korea Electrotechnology Research Institute
Il-Ho Kim Korea National University of Transportation
Dario Narducci University of Milano Bicocca
Kornelius Nielsch Leibniz Institute for Solid State and Materials Research Dresden

- 12-1 **Thermoelectric Physics**
Jong-Soo Rhyee Kyung Hee University
- 12-2 **Thermoelectric Chemistry**
Kyu Hyoung Lee Yonsei University
- 12-3 **Thermoelectric Applications**
Sang Hyun Park Korea Institute of Energy Research
- 12-4 **Thermal-Assemble Materials and Applications with KSTP(The Korean Society of Thermalphysical Properties)**
Woochul Kim Yonsei University
SuDong Park Korea Electrotechnology Research Institute

13

Magnetic Materials and Spintronics

Wooyoung Lee Yonsei University

- 13-1 **Hard Magnets for Future Mobility Applications**
Jung-Goo Lee Korea Institute of Materials Science
- 13-2 **Soft Magnets for Future Mobility Applications**
Haein Yim Sookmyung Women's University
- 13-3 **Spintronic Materials and Devices**
Byong-Guk Park Korea Advanced Institute of Science and Technology

14

Advances in Bio-Nano Integrated Materials

Jung Heon Lee Sungkyunkwan University

- 14-1 **Nano-medical Materials**
Heemin Kang Korea University
- 14-2 **Bioinspired and Biointegrated Materials**
Seung Soo Oh Pohang University of Science and Technology
- 14-3 **Bionanomaterials for Biomedical Applications**
Ju Hun Lee Hanyang University

PLENARY SPEAKERS

Spintronics for Green Society and Beyond

MONDAY, November 7
08:30-09:10, Ballroom 1 (2F)



Hideo Ohno

Tohoku University
Japan

Designed Synthesis and Assembly of Inorganic Nanomaterials for Energy and Soft-Electronics Applications

TUESDAY, November 8
08:30-09:10, Ballroom 1 (2F)



Taeghwan Hyeon

Seoul National University
and Institute for Basic
Science (IBS)
Korea

Designer Material Metasurfaces based on Surface Engineering

TUESDAY, November 8
09:10-09:50, Ballroom 1 (2F)



Teri W. Odom

Northwestern University
USA

Get Inspired by Our Featured Speakers!

Semiconductor Nanomaterials for Transient Electronics

WEDNESDAY, November 9
08:30-09:10, Ballroom 1 (2F)



John A. Rogers

Northwestern University
USA

Atomically Thin Canvas for Quantum Optoelectronics

WEDNESDAY, November 9
09:10-09:50, Ballroom 1 (2F)



Hongkun Park

Harvard University
USA

TUTORIAL SPEAKERS



Jaeyoung Kim

Institute for Basic Science, Korea

SUNDAY, November 6
18:00-20:00, Tamna (8F)

Advanced Analysis of Materials Using Synchrotron Radiation

Synchrotron radiation is a powerful X-ray source and its high brightness and other prominent features (polarization, fast timing, and coherence) give an in-depth characterization and unique information on the physical properties of materials. Now synchrotron radiation measurements are widely spread in physics and chemistry but, their application to materials science is highly restricted to a few specialists. In the first part, I would like to introduce the most fundamental approaches of synchrotron radiation, spectroscopy, scattering, and imaging. The second part will be assigned to the multi-modal characterization of materials combining the different approaches. Mostly I will avoid explaining the fundamental principles of the measurements but try to show you a lot of research examples giving you a chance to secure an appropriate tool in your research field.



Donghun Kim

Korea Institute of Science and Technology, Korea

SUNDAY, November 6
18:00-20:00, Halla (8F)

Understanding Machine Learning Tools for Materials Science Problems

For the last decade, machine learning (ML) has emerged as an important tool to accelerate the discovery of novel materials and to characterize them. The tutorial is composed of two parts (basic and advanced). The basic part covers the linear and logistic regression models, and the artificial neural network (ANN). The advanced part covers advanced models including graph neural network (GNN), generative adversarial network (GAN), which were recently the most used techniques for solving material science problems. In addition, due to the lack of database in materials science, unsupervised clustering methods are often necessary, and thus will be covered with specific examples. The main goal of this lecture is to provide the basic understanding of various types of existing ML techniques, and more importantly on how these methods are properly chosen to solve material science problems.

KEYNOTE SPEAKERS

Materials Science in EUV Lithography

Jinho Ahn

Hanyang University, Korea



01 Advanced Logic Semiconductors & beyond CMOS Applications

MONDAY, November 7

13:20-13:50, Ballroom 2 (2F)

Spin, Parity, Chirality and Topology in Quantum Matters

See-Hun Yang

IBM Research - Almaden, USA



01 Advanced Logic Semiconductors & beyond CMOS Applications

TUESDAY, November 8

14:00-14:30, Ballroom 2 (2F)

Advanced Heterogeneous Integration Enabled by Remote Epitaxy

Jeewan Kim

Massachusetts Institute of Technology, USA



02 Advanced Memory and Neuromorphic Materials & Device Applications

MONDAY, November 7

09:20-09:50, Ballroom 3 (2F)

Recent Progresses in Ternary Logic Devices and Architectures

Byoung Hun Lee

Pohang University of Science and Technology, Korea



02 Advanced Memory and Neuromorphic Materials & Device Applications

TUESDAY, November 8

10:10-10:40, Ballroom 3 (2F)

Flexible Energy Transducers for Wearable Applications

Pooi See Lee

Nanyang Technological University, Singapore



03 Sensors and Energy Harvesting for Wearable Healthcare Devices

MONDAY, November 7

09:20-09:50, Tamna (8F)

1D Novel Sensing Platform: Body Temperature, Environmental Gas Monitoring and Exhaled Breath Biomarker Analysis

Il-Doo Kim

Korea Advanced Institute of Science and Technology, Korea



03 Sensors and Energy Harvesting for Wearable Healthcare Devices

TUESDAY, November 8

14:00-14:30, Tamna (8F)

Epitaxy of Meter-scale Two-dimensional Single Crystals

Kaihui Liu

Peking University, China



04 Low-dimensional Materials and 2D van der Waals Heterostructures

MONDAY, November 7

09:20-09:50, Ballroom 1 (2F)

Extended van der Waals Materials and Artificial Quantum Solids

Xiangfeng Duan

University of California, Los Angeles, USA



04 Low-dimensional Materials and 2D van der Waals Heterostructures

MONDAY, November 7

16:00-16:30, Ballroom 1 (2F)

Perovskite Emitters for Down-conversion, Self-emissive, and Metaverse Displays

Tae-Woo Lee

Seoul National University, Korea



05 Emerging Materials for Metaverse Display

TUESDAY, November 8

14:00-14:30, Ora (8F)

Cation Disordered Rocksalt Electrode
Materials for Li-ion Battery
Applications

Naoaki Yabuuchi

Yokohama National University, Japan



06 Advanced Materials for Rechargeable World

TUESDAY, November 8

14:00-14:30, Udo (2F)

Electrochemo-mechanics of Metallic
Lithium Anodes

Mauro Pasta

University of Oxford, UK



06 Advanced Materials for Rechargeable World

WEDNESDAY, November 9

14:00-14:30, Udo (2F)

Understanding Nanoscale
Recombination and Instabilities in
Halide Perovskite Solar Cells

Sam Stranks

University of Cambridge, UK



07 Advances in Photovoltaic Materials and Devices

MONDAY, November 7

09:20-09:50, Ara (8F)

Insights into the Nature and Fate of
Excitons in Complex Materials from
First-principles

Jeffrey Neaton

University of California, Berkeley, USA



10 Advances in Computational Materials

MONDAY, November 7

13:20-13:50, Ballroom 4 (2F)

Kirigami Engineering for Energy
Efficiency and Energy Harvesting

Shu Yang

University of Pennsylvania, USA



11 Evolutionary Structural Materials

TUESDAY, November 8

10:10-10:40, Ara (8F)

Thermal Engineering Using Infrared
Photonic Structures: Probing Coherent
Thermal Emission in a Single
Nano-object

Sunmi Shin

National University of Singapore, Singapore



12 Thermal Engineering Materials and Devices

MONDAY, November 7

09:20-09:50, Ilchul (2F), Jeju Oriental Hotel

Silicon as a Key Material for Low-temperature Heat Harvesting and Thermal Management

Dario Narducci

Università di Milano Bicocca, Italy



12 Thermal Engineering Materials and Devices

MONDAY, November 7

09:50-10:20, Ilchul (2F), Jeju Oriental Hotel

Towards Tellurium-free Thermoelectric Modules for Power Generation from Low-grade Heat

Kornelius Nielsch

Leibniz Institute of Solid State and Materials Research (IFW-Dresden), Germany



12 Thermal Engineering Materials and Devices

MONDAY, November 7

10:20-10:50, Ilchul (2F), Jeju Oriental Hotel

Evolutions of MRAMs, from STT-writing to New Emerging Writings and from E-flash Replacement to Cache & Logic-gate Applications

Hiroaki Yoda

Spin-Orbitronics Technologies, Inc., Japan



13 Magnetic Materials and Spintronics

TUESDAY, November 8

10:10-10:40, Mara (2F)

Spin-orbitronic Materials and Devices for Future Electronics

Alexander Samardak

Far Eastern Federal University, Russia



13 Magnetic Materials and Spintronics

TUESDAY, November 8

14:00-14:30, Mara (2F)

Emerging Approaches to Fabricate Supported Lipid Bilayers: Moving Beyond Vesicles

Nam Joon Cho

Nanyang Technological University, Singapore



14 Advances in Bio-Nano Integrated Materials

MONDAY, November 7

09:00-09:30, Ora (8F)

Dielectrophoretic Single Bead-Droplet Reactor: An Approach Towards High-Fidelity Solid-Phase DNA Synthesis

Lambertus Hesselink

Stanford University, USA



14 Advances in Bio-Nano Integrated Materials

MONDAY, November 7

13:00-13:30, Ora (8F)

INVITED SPEAKERS

J. Joshua Yang

University of Southern California, USA

An Chen

International Business Machines Corporation, USA

Daewoong Kwon

Inha University, Korea

Joon Young Kwak

Korea Institute of Science and Technology, Korea

Sarah Kim

Seoul National University of Science and Technology, Korea

Hyuk-Jun Kwon

Daegu Gyeongbuk Institute of Science and Technology, Korea

Sanghyeon Kim

Korea Advanced Institute of Science and Technology, Korea

Sung Kyu Lim

Georgia Institute of Technology, USA

Dohun Kim

Seoul National University, Korea

Donghun Lee

Korea University, Korea

Oliver Slattery

National Institute of Standards and Technology, USA

Julien Buckley

University of Grenoble Alpes, France

Chel-Jong Choi

Jeonbuk National University, Korea

Andrej Kuznetsov

University of Oslo, Norway

Myungsoo Kim

Ulsan National Institute of Science and Technology, Korea

Byung Chul Jang

Kyungpook National University, Korea

Maksim Andreev

Sungkyunkwan University, Korea

Sang-Hoon Bae

Washington University in St. Louis, USA

Jongwook Jeon

Konkuk University, Korea

01

Advanced Logic Semiconductors & Beyond CMOS Applications

Seung Chul Chae

Seoul National University, Korea

Sanghun Jeon

Korea Advanced Institute of Science and Technology, Korea

Hocheon Yoo

Gachon University, Korea

Kyung Jean Yoon

Intel Corporation, USA

Min Hyuk Park

Seoul National University, Korea

Jinshi Zhao

Tianjin University of Technology, China

Yang Chai

The Hong Kong Polytechnic University, Hong Kong (SAR of China)

Yun Seog Lee

Seoul National University, Korea

Kyung Min Kim

Korea Advanced Institute of Science and Technology, Korea

Abu Sebastian

IBM Research - Zurich, Switzerland

Jung Ho Yoon

Korea Institute of Science and Technology, Korea

John Paul Strachan

Forschungszentrum Jülich GmbH / RWTH Aachen University, Germany

Mostafa Rahimi Azghadi

James Cook University, Australia

Hyungjin Kim

Inha University, Korea

02

Advanced Memory and Neuromorphic Materials & Device Applications

Jeong-Yun Sun

Seoul National University, Korea

Wenlong Cheng

Monash University, Australia

Donghee Son

Sungkyunkwan University, Korea

Benjamin Tee

National University of Singapore, Singapore

Sung Soo Kwak

Korea Institute of Science and Technology, Korea

Jun Chen

University of California, Los Angeles, USA

Dong-Myeong Shin

The University of Hong Kong, Hong Kong (SAR of China)

Jae Won Lee

Kangwon National University, Korea

Wen-Ya Lee

National Taipei University of Technology, Chinese Taipei

Gunuk Wang

Korea University, Korea

Jeong Ho Cho

Yonsei University, Korea

Nripan Mathews

Nanyang Technological University, Singapore

Tae-il Kim

Sungkyunkwan University, Korea

Unyong Jeong

Pohang University of Science and Technology, Korea

Tsuyoshi Sekitani

Osaka University, Japan

Xiaodong Chen

Nanyang Technological University, Singapore

03

Sensors and Energy Harvesting for Wearable Healthcare Devices

Deep Jariwala

University of Pennsylvania, USA

Jae-Hyun Lee

Ajou University, Korea

Shisheng Li

*International Center for Materials Nanoarchitectonics /
National Institute for Materials Science, Japan*

Himchan Cho

Korea Advanced Institute of Science and Technology, Korea

Xinran Wang

Nanjing University, China

Joonwon Lim

Kyung Hee University, Korea

Hyeonjun Baek

Sogang University, Korea

Arend Van der Zande

University of Illinois Urbana-Champaign, USA

Joohoon Kang

Sungkyunkwan University, Korea

Donguk Nam

Nanyang Technological University, Singapore

Jonghwan Kim

Pohang University of Science and Technology, Korea

Kyoung-Duck Park

Pohang University of Science and Technology, Korea

04

Low-dimensional Materials and 2D van der Waals Heterostructures

Wallace C.H. Choy

The University of Hong Kong, Hong Kong (SAR of China)

Gihwan Kim

Gyeongsang National University, Korea

Seungjin Lee

Korea Institute of Energy Technology, Korea

Haizheng Zhong

Beijing Institute of Technology, China

Younghoon Kim

Kookmin University, Korea

Yohan Kim

Fraunhofer Institute for Applied Polymer Research IAP, Germany

Soong Ju Oh

Korea University, Korea

Jaesang Lee

Seoul National University, Korea

Paloma Fernández Sánchez

Complutense University of Madrid, Spain

Hirotsugu Yamamoto

Utsunomiya University, Japan

Sung-Wook Min

Kyung Hee University, Korea

05

Emerging Materials for Metaverse Display

Seung-Ho Yu

Korea University, Korea

Minkyu Kim

Argonne National Laboratory, USA / Inha University, Korea

Seok Woo Lee

Nanyang Technological University, Singapore

Jongsoon Kim

Sungkyunkwan University, Korea

Yongming Sun

Huazhong University of Science and Technology, China

Jungwon Park

Seoul National University, Korea

Zhi Wei Seh

Agency for Science, Technology and Research, Singapore

Kyu Tae Lee

Seoul National University, Korea

Jie Sun

Tianjin University, China

06

Advanced Materials for Rechargeable World

Daniel Abou-Ras

Helmholtz-Zentrum Berlin, Germany

Jeung-hyun Jeong

Korea Institute of Science and Technology, Korea

Lydia Helena Wong

Nanyang Technological University, Singapore

Kihwan Kim

Korea Institute of Energy Research, Korea

Yi Hou

National University of Singapore, Singapore

Jin-Wook Lee

Sungkyunkwan University, Korea

Haipeng Lu

*The Hong Kong University of Science and Technology,
Hong Kong (SAR of China)*

Seong Sik Shin

Korea Research Institute of Chemical Technology, Korea

Jae Won Shim

Korea University, Korea

Jongmin Choi

Daegu Gyeongbuk Institute of Science and Technology, Korea

Clement Cabanetos

Centre National de la Recherche Scientifique, France

Gang Li

The Hong Kong Polytechnic University, Hong Kong (SAR of China)

07

Advances in Photovoltaic Materials and Devices

Kan Zhang

Nanjing University of Science and Technology, China

Wooseok Yang

Sungkyunkwan University, Korea

Segi Byun

Korea Institute of Energy Research, Korea

Ji-Hyun Jang

Ulsan National Institute of Science and Technology, Korea

Eric Han

Stanford University, USA

Heechae Choi

University of Cologne, Germany

Jung Kyu Kim

Sungkyunkwan University, Korea

Kyoungsuk Jin

Korea University, Korea

Kiho Bae

Korea Institute of Energy Technology, Korea

Zhenguo Huang

University of Technology Sydney, Australia

Hyungyu Jin

Pohang University of Science and Technology, Korea

08

Hydrogen Future and Its Economic and Environmental Consideration

Masahiko Demura

National Institute for Materials Science, Japan

Raymundo Arroyave

Texas A&M University, USA

Seungwu Han

Seoul National University, Korea

James Saal

Citrine Informatics, Inc., USA

Seunghwa Ryu

Korea Advanced Institute of Science and Technology, Korea

Isao Tanaka

Kyoto University, Japan

Tian Xie

Microsoft Research, UK

Alexander Urban

Columbia University, USA

T. Yong Han

Lawrence Livermore National Laboratory, USA

Hyun Woo Kim

Gwangju Institute of Science and Technology, Korea

Nongnuch Artrith

Utrecht University, The Netherlands

Shaun Kwak

Schrödinger, Inc., USA

Shyue Ping Ong

University of California, San Diego, USA

09

Artificial Intelligence for Materials

Su-Hyun Yoo

Max-Planck-Institut für Eisenforschung GmbH, Germany

Guanglong Xu

Nanjing Tech University, China

Kunok Chang

Kyung Hee University, Korea

Kyoungdoc Kim

Pohang University of Science and Technology, Korea

Hoon-Hwe Cho

Hanbat National University, Korea

Yuji Ikeda

University of Stuttgart, Germany

Ji-Sang Park

Kyungpook National University, Korea

Chang Woo Myung

Chungnam National University, Korea

Marina Filip

University of Oxford, UK

Aron Walsh

Imperial College London, UK

Mariachiara Pastore

*Centre National de la Recherche Scientifique /
Université de Lorraine, France*

Dong-Hwa Seo

Ulsan National Institute of Science and Technology, Korea

Hyun You Kim

Chungnam National University, Korea

Sang Uck Lee

Hanyang University, Korea

10

Advances in Computational Materials

Bongkyun Jang

Korea Institute of Machinery and Materials, Korea

Jiyun Kim

Ulsan National Institute of Science and Technology, Korea

Dae-Young Lee

Korea Advanced Institute of Science and Technology, Korea

Sung Hoon Kang

Johns Hopkins University, USA

In-Suk Choi

Seoul National University, Korea

Sangyeon Lee

Korea Advanced Institute of Science and Technology, Korea

Ill Ryu

The University of Texas at Dallas, USA

Hansohl Cho

Korea Advanced Institute of Science and Technology, Korea

Shoichi Nambu

The University of Tokyo, Japan

Motomichi Koyama

Tohoku University, Japan

So-Yeon Lee

Kumoh National Institute of Technology, Korea

Subin Lee

Karlsruhe Institute of Technology, Germany

Takahito Ohmura

National Institute for Materials Science, Japan

11

Evolutionary Structural Materials

Hyun-Sik Kim

University of Seoul, Korea

Tsunehiro Takeuchi

Toyota Technological Institute, Japan

Seungjun Chung

Korea Institute of Science and Technology, Korea

BoHung Kim

University of Ulsan, Korea

Hyejin Jang

Seoul National University, Korea

In Chung

Seoul National University, Korea

Woochul Kim

Yonsei University, Korea

Min-Wook Oh

Hanbat National University, Korea

Ji Hoon Shim

Pohang University of Science and Technology, Korea

Ikjin Lee

Korea Advanced Institute of Science and Technology, Korea

Sang-Kwon Lee

Chung-Ang University, Korea

Yong Jin Jeong

Korea National University of Transportation, Korea

Pawel Ziolkowski

German Aerospace Center - Institute of Materials Research, Germany

Taeyong Kim

Seoul National University, Korea

Kyung Tae Kim

Korea Institute of Materials Science, Korea

Jung Young Cho

Korea Institute of Ceramic Engineering and Technology, Korea

Gil-Ho Lee

Pohang University of Science and Technology, Korea

Myung-Ho Bae

Korea Research Institute of Standards and Science, Korea

Jae Sung Son

Ulsan National Institute of Science and Technology, Korea

Jungwon Kim

Korea Institute of Science and Technology, Korea

Dongsik Kim

Pohang University of Science and Technology, Korea

12

Thermal Engineering Materials and Devices

Tae-Hoon Kim

Chonnam National University, Korea

Tae-Hoon Kim

Korea Institute of Materials Science, Korea

Yusuke Hirayama

National Institute of Advanced Industrial Science and Technology, Japan

Jimin Lee

Georgia Institute of Technology, USA

Yang-Ki Hong

The University of Alabama, USA

Jongryoul Kim

Hanyang University, Korea

Seonghoon Yi

Kyungpook National University, Korea

Kyung-Jin Lee

Korea Advanced Institute of Science and Technology, Korea

Gyung-Min Choi

Sungkyunkwan University, Korea

Hyunsoo Yang

National University of Singapore, Singapore

Ken-ichi Uchida

National Institute for Materials Science, Japan

Jongill Hong

Yonsei University, Korea

13

Magnetic Materials and Spintronics

Junmin Lee

Pohang University of Science and Technology, Korea

Heemin Kang

Korea University, Korea

KiBum Lee

Rutgers University, USA

Yongju Kim

Korea University, Korea

Ju Young Lee

Korea Research Institute of Chemical Technology, Korea

Inchan Kwon

Gwangju Institute of Science and Technology, Korea

Hanyang Yu

Nanjing University, China

Matthew Shawkey

Ghent University, Belgium

Shinsuke Sando

The University of Tokyo, Japan

Hee Jeung Oh

Pennsylvania State University, USA

Ju-Hyuck Lee

Daegu Gyeongbuk Institute of Science and Technology, Korea

Jinhye Bae

University of California, San Diego, USA

Yongsung Hwang

Soonchunhyang University, Korea

Liliana D'Alba

Naturalis Biodiversity Center, The Netherlands

14

Advances in Bio-Nano Integrated Materials

PRESENTATION GUIDELINE

ORAL SESSION

• Presentation time

- Keynote & Invited Presentation
25 minutes Presentation + 5 minutes Live Q&A
- Oral Presentation
12 minutes Presentation + 3 minutes Live Q&A

- Make sure your presentation materials do not have compatibility issues beforehand.
- Please arrive in the session room at least 15 minutes before the session.
- Submit your file to the staff of each session room before session starts.

No Camera & No Record



Please note that photo taking, and video recording are strictly prohibited for legal reasons, such as copyright and portrait rights.

Preview Lounge

Conference Room Lobby (2F & 8F)

Internet and printing service are available.

SUN	NOV 6	14:00-18:30
MON	NOV 7	08:00-18:30
TUE	NOV 8	08:00-18:30
WED	NOV 9	08:00-18:00

Instructions on Covid-19

- Hand sanitizer and microphone cover are provided.
- All participants must wear a mask.

POSTER SESSION

- Poster authors should print, bring and post the posters at the designated spot.

📍 Lobby (2F) & (8F)

- Presenters make sure to stand by their posters during the presentation time.

Poster Session Timetable

Dates	Put-up	Presentation	Take-down
November 7 (Mon)	14:00-17:00	18:30-19:30	~ 20:30
November 8 (Tue)	13:00-16:00	16:50-18:20	~ 19:00
November 9 (Wed)	09:00-12:00	Session 1) 14:00-15:00 Session 2) 16:50-17:50	~ 18:30

Van der Waals Materials Science Forum

WEDNESDAY, November 9
Ballroom 2 (2F), Ramada Plaza Jeju Hotel, Jeju, Korea

TIME	TITLES	SPEAKERS
13:00 - 13:30	Epitaxial bi-crystals of van der Waals semiconductor monolayers	Moon-Ho Jo (IBS/POSTECH)
13:30 - 14:00	Grain boundary engineering at the atomic-scale in two-dimensional materials	Cheol-Joo Kim (POSTECH)
14:00 - 14:30	Atomistic exploration of metallic boundary in MoS ₂ bicrystal	Jewook Park (IBS)
14:30 - 15:00	Vapor-phase, low-temperature, wafer-scale production of van der Waals crystals for nano-electronics	Joonki Suh (UNIST)
15:00 - 15:30	Strategies for growing new 2D materials beyond 2D TMDCs	Kibum Kang (KAIST)
15:30 - 16:00	3D nano-domed atomically thin semiconductors for geometry-driven optical properties	Jong-Hoon Kang (POSTECH)
16:00 - 16:30	Unconventional epitaxy for fabricating free-form and multi-functionally integrated devices	Young Joon Hong (Sejong Univ.)
16:30 - 16:50	Break	
16:50 - 17:20	Atomically thin waveguides for 2D photonics	Myungjae Lee (SNU)
17:20 - 17:50	Next-generation optoelectronics based on two-dimensional semiconductors	Hyungjin Kim (Yonsei Univ.)
17:50 - 18:20	Probing deep-ultraviolet optoelectronic processes in hexagonal boron nitride	Jonghwan Kim (POSTECH)

PRESENTATION SCHEDULE

01. Advanced Logic Semiconductors & Beyond CMOS Applications	050
02. Advanced Memory and Neuromorphic Materials & Device Applications	064
03. Sensors and Energy Harvesting for Wearable Healthcare Devices	075
04. Low-dimensional Materials and 2D van der Waals Heterostructures	095
05. Emerging Materials for Metaverse Display	110
06. Advanced Materials for Rechargeable World	120
07. Advances in Photovoltaic Materials and Devices	129
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12. Thermal Engineering Materials and Devices	177
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01. Advanced Logic Semiconductors & Beyond CMOS Applications

Advanced Processes and Materials for Future Devices 1

NOV 07 (Mon) | Ballroom 2 (2F)

CHAIR	Kyung Rok Kim (Ulsan National Institute of Science and Technology, Korea)
1-2197	Emerging Synaptic Memory Devices for Neuromorphic Systems
09:20-09:50	Joon Young Kwak
INVITED	Korea Institute of Science and Technology, Korea
1-0421	Direct Verification of Quasi-Static Negative Capacitance (QSN-C)
09:50-10:20	Daewoong Kwon
INVITED	Inha University, Korea
1-0372	Exploring Novel Materials and Devices for Energy-Efficient Computing Systems
10:20-10:50	An Chen
INVITED	International Business Machines Corporation, USA
1-0238	Timing Selector: Using Transient Switching Dynamics to Solve the Sneak Path Issue of Crossbar Arrays
10:50-11:20	J. Joshua Yang
INVITED	University of Southern California, USA
1-3830	Impact of Residual Stress on Silicon Nitride Membrane During Substrates Etch Process Using Finite Element Method
11:20-11:35	Kihun Seong ^{1,2} , Junhyeok Jeon ^{1,2} , Sungho Yoon ^{1,2} , Seul-Gi Kim ¹ , Hyun-Mi Kim ¹ , Sung Kyu Jang ¹ , Jin Woo Cho ¹ , Hyeongkeun Kim ¹ , Jaeboong Choi ² , Sung-il Chu ³ , Ki-Bum Kim ⁴
	¹ Korea Electronics Technology Institute, Korea, ² Sungkyunkwan University, Korea, ³ Micro & Nano Technology, Korea, ⁴ Derkwoo Electronics, Korea
1-2970	Digital Light Process of Metasurface Structure and Its Application to Polarization Converter
11:35-11:50	Gyeongyeong Lee ¹ , Jihoon Kim ¹ , Yeonghoon Nob ² , Jonggwan Yook ² , Icpyo Hong ¹ , Jongyeong Kim ³
	¹ Kongju National University, Korea, ² Yonsei University, Korea, ³ Hanwha Systems, Korea
1-2535	Electromigration Failure in Electrohydrodynamic-Jet-Printed Ag Lines with Surface Passivation
11:50-12:05	Prabhakar Jepiti, Jihoon Kim
	Kongju National University, Korea

- Advanced Processes and Materials for Future Devices 2

- Compound Semiconductors and Power Electronic Devices 1

NOV 07 (Mon) | Ballroom 2 (2F)

CHAIRS	Kyung Rok Kim (Ulsan National Institute of Science and Technology, Korea) You Seung Rim (Sejong University, Korea)
1-4261	Materials Science in EUV Lithography
13:20-13:50	Jinho Ahn
KEYNOTE	Hanyang University, Korea
1-1023	Direct Patterning of Crystalline Semiconductor by Integration of Nanoimprint lithography and Metal-assisted Chemical Etching
13:50-14:05	Kyunghwan Kim, Haekyun Bong, Sunhae Choi, Jungwoo Oh
	Yonsei University, Korea
1-0857	The Ultrafast True Random Number Generator Based on a Heater Integrated Mott Memristor
14:05-14:20	Jae Hyun In, Kyung Min Kim, Gwangmin Kim
	Korea Advanced Institute of Science and Technology, Korea
1-0787	Ultra-Flexible Artificial All Solid-State 2D Channel/LiSiO _x Electrolyte Synapse Arrays via Laser-Lift Off Process for Neuromorphic Applications
14:20-14:35	Yonghun Kim
	Korea Institute of Materials Science, Korea
1-0533	Study on Electromigration of Ruthenium and Molybdenum for the Reliability Verification of Next-Generation Interconnect Material
14:35-14:50	Jungkyun Kim, Kyung Min Kim
	Korea Advanced Institute of Science and Technology, Korea
1-2171	Polymorph Engineering in Gallium Oxide: Physics and Potential Applications
14:50-15:20	Andrej Kuznetsov ^{1,2}
INVITED	¹ University of Oslo, Norway, ² Korea University, Korea
1-1465	Rapid-thermal-annealing-induced Microstructural Evolution of Au/Ni/ β -Ga ₂ O ₃ Schottky Diodes Correlated with Their Electrical Properties
15:20-15:50	Chel-Jong Choi
INVITED	Jeonbuk National University, Korea

- Compound Semiconductors and Power Electronic Devices 2
- Quantum Devices and Computing

NOV 07 (Mon) | Ballroom 2 (2F)

CHAIR Chel-Jong Choi (Jeonbuk National University, Korea)

- 1-0518** Gallium Nitride Power Devices for Power Conversion Applications
16:00-16:30 [Julien Buckley](#), René Escoffier, Blend Mohamad, Stéphane Bécu, Jérôme Biscarrat,
INVITED Florian Rigaud-Minet, Laura Vauche, Vishwajeet Maurya, Matthew Charles, Helge Haas,
Murielle Fayolle-Lecocq, Cyrille Le Royer, Romain Gwoziecki, Charlotte Gillot, Véronique Sousa
University of Grenoble Alpes, France
- 1-3760** Phase Engineering and High Crystalline Hetero-epitaxial Growth of α -Ga₂O₃ by Mist Chemical
16:30-16:45 Vapor Deposition
You Seung Rim, [Joon Hui Park](#)
Sejong University, Korea
- 1-1134** Crystalline BeO Film Grown by Atomic Layer Deposition for Wide Bandgap Semiconductor
16:45-17:00 Devices
[Dohwan Jung](#)¹, Yoonseo Jang¹, Prakash R. Sultane², Christopher W. Bielawski³, Jungwoo Oh¹
¹Yonsei University, Korea, ²Institute for Basic Science, Korea, ³Ulsan National Institute of Science and
Technology, Korea
- 1-3766** Quantum Communication and Networking Project – Silicon Carbide in Quantum
17:00-17:30 Communication
INVITED [Oliver Slattery](#)¹, Lijun Ma¹, Xiao Tang¹, Anouar Rahmouni¹, Qing Li², Michael Spencer³
¹National Institute of Standards and Technology, USA, ²Carnegie Mellon University, USA, ³Morgan State
University, USA
- 1-0874** Sensing and Imaging of Magnetic Field Based on Solid-state Spin Qubits in Diamond
17:30-18:00 [Donghun Lee](#)
INVITED *Korea University, Korea*
- 1-0142** Real-time Hamiltonian Parameter Estimation Techniques for High Fidelity Control of Quantum
18:00-18:30 Dot Spin Qubits
INVITED [Dohun Kim](#)
Seoul National University, Korea
- 1-2312** Measurement Error Mitigation on Fixed-frequency Superconducting Qubits
18:30-18:45 [Hwan-Seop Yeo](#)¹, Gayhun Choi², Sun Kyung Lee², Jiman Choi², Woon Song², Seungwook Woo¹,
Jeongwon Kim¹, Youngdu Kim¹, Beomgyu Choi¹, Yonuk Chong¹
¹Sungkyunkwan University, Korea, ²Korea Research Institute of Standards and Science, Korea

Applications for 2D and Carbon-based Materials 1

NOV 08 (Tue) | Ballroom 2 (2F)

CHAIR Keun Heo (Jeonbuk National University, Korea)

- 1-4151** A Study on the Application of Mono-Layer MoS₂ Channel Device Sub-3 nm Process Nodes
10:10-10:40 [Jihoon Park](#), Jaewon Lim, [Jongwook Jeon](#)
INVITED *Konkuk University, Korea*
- 1-2054** New Methodology of 2D Materials Production with Layer-controllability, Element-controllability,
10:40-11:10 and Crystallinity-controllability Towards 2D Materials-based Application at the Practical Level
INVITED [Sang-Hoon Bae](#)
Washington University in St. Louis, USA
- 1-0480** Van der Waals Materials for Beyond-binary Devices and Technologies
11:10-11:40 [Maksim Andreev](#)
INVITED *Sungkyunkwan University, Korea*
- 1-3734** Enhanced Flexibility and Stretchability of Highly Conductive Large-Area Graphene Grown
11:40-11:55 Directly at 100 °C
[Soon-Gil Yoon](#), Jang-Su Jung
Chungnam National University, Korea
- 1-3621** Confinement and Control of Excitons in Two-dimensional Semiconductors
11:55-12:10 [Hyowon Moon](#)
Korea Institute of Science and Technology, Korea
- 1-3214** Beam Trajectory Analysis of the Vertically Aligned Carbon Nanotube Emitter with a Focusing
12:10-12:25 Electrode in the Microchannel Plate
[Bishwa Chandra Adhikari](#), Kyu Chang Park
Kyung Hee University, Korea
- 1-3098** Large Scale Nanometer-thickness Molybdenum Carbide Membrane for Extreme Ultraviolet
12:25-12:40 Pellicle
[Yongkyung Kim](#)^{1,2}, Kihun Seong^{2,3}, Sung Kyu Jang², Hyun-Mi Kim², Jin Woo Cho², Hyeongkeun Kim²,
Seul-Gi Kim², Jinho Ahn¹
¹Hanyang University, Korea, ²Korea Electronics Technology Institute, Korea, ³Sungkyunkwan University, Korea

Applications for 2D and Carbon-based Materials 2

NOV 08 (Tue) | Ballroom 2 (2F)

CHAIR	Byung Chul Jang (Kyungpook National University, Korea)
1-4266	Spin, Parity, Chirality and Topology in Quantum Matters
14:00-14:30	See-Hun Yang
KEYNOTE	IBM Research-Almaden, USA
1-0380	MoS ₂ -based Nonvolatile Memory for High-density Flash Memory Application
14:30-15:00	Byung Chul Jang
INVITED	Kyungpook National University, Korea
1-0230	Towards Non-volatile 6G Switches Using Atomic-layers
15:00-15:30	Myungsoo Kim
INVITED	Ulsan National Institute of Science and Technology, Korea
1-3053	Fabrication of Extreme Ultraviolet Lithography Pellicle with Nanometer-thick Graphite by Ni Catalyzed Solid Phase Reaction
15:30-15:45	Hye-Young Kim ^{1,2} , Jun-Hyeok Jeon ^{1,2} , Seoul-Gi Kim ¹ , Hyun-Mi Kim ¹ , Jin Woo Cho ¹ , Hyeongkeun Kim ¹ , Ji-Beom Yoo ²
	¹ Korea Electronics Technology Institute, Korea, ² Sungkyunkwan University, Korea
1-1790	High Performance Organic-Inorganic Heterostructure Ambipolar Field-Effect Transistors and Circuits
15:45-16:00	Juhyung Seo , Jihyun Shin, Hocheon Yoo
	Gachon University, Korea
1-0826	Lithium Silicate Solid Electrolyte-Gated 2D-MoS ₂ Synaptic Transistor for High-Accuracy Analog Neuromorphic Computing
16:00-16:15	Byeongjin Park ^{1,2} , Je In Lee ² , Yonghun Kim ¹
	¹ Korea Institute of Materials Science, Korea, ² Pusan National University, Korea
1-0709	Neuromorphic Image Sensor Inspired by Human Synapse for In-sensor Preprocessing
16:15-16:30	Changsoo Choi
	Korea Institute of Science and Technology, Korea

3D Heterogeneous Integration for Advanced Packing

NOV 09 (Wed) | Ballroom 2 (2F)

CHAIR	Hyuk-Jun Kwon (Daegu Gyeongbuk Institute of Science and Technology, Korea)
1-4149	Glass Interposer Integration of Logic and Memory Chiplets: PPA and Power/Signal Integrity Benefits
10:10-10:40	Sung Kyu Lim
INVITED	Georgia Institute of Technology, USA
1-3764	Monolithic 3D III-V HEMT for Future Communication and Quantum Computing
10:40-11:10	Sanghyeon Kim
INVITED	Korea Advanced Institute of Science and Technology, Korea
1-0322	Area-selective and Shallow Surface Treatment for 3-dimensional Heterogeneous Integration
11:10-11:40	Hyuk-Jun Kwon
INVITED	Daegu Gyeongbuk Institute of Science and Technology, Korea
1-0137	Copper Nitride Passivation for Cu Bonding in 3D Packaging
11:40-12:10	Sarah Kim
INVITED	Seoul National University of Science and Technology, Korea
1-1499	Polymer/Cu Hybrid CMP Process for High-reliability of Cu Direct Bonding
12:10-12:25	Juseong Park , Sukkyung Kang, Sanha Kim, Kyung Min Kim
	Korea Advanced Institute of Science and Technology, Korea
1-1146	Robust Co Alloy Design for Co Interconnects using a Self-Forming Barrier Layer
12:25-12:40	Geosan Kang ¹ , Cheol Kim ² , Yoongu Lee ¹ , Young-Chang Joo ¹
	¹ Seoul National University, Korea, ² Samsung Electronics Co., Ltd., Korea

01. Advanced Logic Semiconductors & Beyond CMOS Applications

Advanced Processes and Materials for Future Devices

18:30-19:30, NOV 07 (Mon) | Lobby (2F)

CHAIR	Myungsoo Kim (Ulsan National Institute of Science and Technology, Korea)
1-0292	Characteristics of Thin-Body Indium Oxide Thin-Film Transistors with Diverse Channel Length Scaling Fabricated by Atomic Layer Deposition <u>JuHun Lee</u>^{1,2}, Seung-Youl Kang¹, Joung-Heon Yang¹, Chi-Sun Hwang¹, Jaehyun Moon^{1,2} ¹Electronics and Telecommunications Research Institute, Korea, ²Advanced Device Technology, ICT, University of Science and Technology, Korea
1-0609	Non-planar Substrate Contact Photolithography Using Nano-regime Soft Photomask <u>Dongchul Seo</u>, Gwangmook Kim, Wooyoung Shim Yonsei University, Korea
1-0667	Single-material Self-powered Sensing Display by Molecularly Architected Ferroelectric Electroluminescent Polymer <u>Seokyeong Lee</u>, Jihye Jang, Jin Woo Oh, Cheolmin Park Yonsei University, Korea
1-0807	Development of Fabrication Process for Flexible Film with Micro-scale High-curvature Structures Hwan-Jin Jeon, <u>Sang-Ah Oh</u> Tech University of Korea, Korea
1-0859	High-Performance Organic Thin-Film Phototransistors Based on Novel Chiroptical Narrow Bandgap π-Conjugated Polymers for Near-Infrared Circularly Polarized Light Detection <u>Hyemi Han</u>, Jung Ah Lim Korea Institute of Science and Technology, Korea
1-0999	Mimicking IR Visionary System via 0D-2D Heterojunction of InAs QD/WSe₂ Artificial Synapse <u>Hyeongtae Kim</u>¹, Dong Park Lee¹, Nuri Oh², Jun Hong Park¹ ¹Gyeongang National University, Korea, ²Hanyang University, Korea
1-1075	Application of Pulsed UV Light for Thin-Film Formation of Solution-Processed Indium Oxide Semiconductors <u>Bokyoung Kim</u>, Hyeonju Lee, Dongwook Kim, Jaehoon Park Hallym University, Korea

1-1099	Effects of UV-Ozone/Ozone Treatment of Solution-Processed Copper Oxide Thin-Film Transistors <u>Hyeonju Lee</u>, Bokyoung Kim, Dongwook Kim, Jaehoon Park Hallym University, Korea
1-1434	Sputtered Amorphous Carbon for Hard Mask Applications Varying Sputtering Condition and Doping Elements <u>Sungtae Kim</u>¹, Ung-gi Kim¹, Dokyun Kim¹, So-Yeon Lee², Young-Chang Joo¹ ¹Seoul National University, Korea, ²Kumoh National Institute of Technology, Korea
1-1526	Performance Enhancement of Electrospun ITO-nanofiber-based ISFETs by Microwave-assist-annealing and Post-calcination Argon Plasma Trimming <u>YeongUng Kim</u> WonJu Cho, Kwangwoon University, Korea
1-1639	Effect of Gd-doping on the Multiferroic Features of Nanoscale BiFeO₃ Ceramics <u>Jin Won Bak</u>¹, Yeong Shin Ham¹, So Young Shin², Kwon Jin Park³, Chun Yeol You³, Dae Yong Jung¹, Nam Hee Cho¹ ¹Inha University, Korea, ²Samsung Electronics Co., Ltd., Korea, ³Daegu Gyeongbuk Institute of Science and Technology, Korea
1-1713	The Effect of Underfill Filler Content on the Thermal Reliability of BGA Components Packaged with Underfill <u>Jang Baeg Kim</u>, Eun Ha, Kyung Yeol Kim, Seung Boo Jung Sungkyunkwan University, Korea
1-1800	Zinc-Tin Oxide Thin-Film Transistors Optimization and Applications to Organic and Metal Oxide Hybrid Complementary Inverter Circuits <u>Juhyung Seo</u>, Hocheon Yoo Gachon University, Korea
1-1808	GAAFET Fabrication by Single Exposure Process via Proximity-field Nanopatterning <u>Gunho Chang</u>¹, Myungwoo Choi¹, Junyoung Park², Seokwoo Jeon¹ ¹Korea Advanced Institute of Science and Technology, Korea, ²Kumoh National Institute of Technology, Korea
1-1821	A Study on the Effect of Ultrasonic Melt Treatment on the Deformation Behavior in Al-Mg Alloy <u>Sun Ki Kim</u>¹, Chang Hee Cho², Young Jig Kim³, Jin Kyu Lee¹ ¹NICELMS Co. Ltd., Korea, ²Korea Institute of Industrial Technology, Korea, ³Sungkyunkwan University, Korea
1-1858	Design of Phase Shifter Using Liquid Crystal in Limited Area <u>Deokjin Seo</u>, Yunsik Park, Jongin Ryu Korea Electronics Technology Institute, Korea
1-1983	Enhancement in Photoelectric Performance of Ga₂O₃ Solar-blind UV Photodetectors with Asymmetric Electrodes <u>Hsuan-Meng Tsai</u>¹, Yun-Chi Chen¹, Chien-Yie Tsay¹, Phongsaphak Sittimart², Tsuyoshi Yoshitake² ¹Feng Chia University, Chinese Taipei, ²Kyushu University, Japan

- 1-2178** Low-loss and Directivity-enhanced Coupled Line Coupler Using Polyimide Substrate
Yunsik Park, Jongin Ryu
Korea Electronics Technology Institute, Korea
- 1-2466** Electrodeposition Behavior of Cu Nanoscale Thin Film on Mo Diffusion Barrier Layer for Si-Based Microelectronic Device Fabrication
Yunhwa Jung, Jihoo Kim, Sunjung Kim
University of Ulsan, Korea
- 1-2658** Comparison of Board-level Drop Impact Property with Various Underfills
Taejoon Noh¹, Kyung-Yeol Kim¹, Dong-Gil Kang¹, Ji-Won Baek², Seung-Boo Jung¹
¹*Sungkyunkwan University, Korea*, ²*Wonchemical, Korea*
- 1-2737** Effects of Plasma Descum Conditions on the 15-um-pitch Pattern Formation in the FOWLP Substrates
Se Yong Park¹, Myung Ae Kim¹, Sung Yoon Lee¹, Sang A Yoon¹, Nam Son Park², Sung Yong Kim¹, Kyung Min Kim¹, Hee Chul Lee¹
¹*Tech University of Korea, Korea*, ²*Jesagi Hankook Ltd., Korea*
- 1-3092** The Study of Very Thin SrRuO₃ Films for Transparent Electrodes (TCO) Grown by RF Magnetron Sputtering
Hyo Jin Bang¹, Seung Woo Baek¹, Jong Hoon Lee², Hyung Soo Ahn¹, Nak Won Jang¹, Ji-Hoon Ahn³, Hong Seung Kim¹
¹*Korea Maritime and Ocean University, Korea*, ²*Ulsan National Institute of Science and Technology, Korea*, ³*Hanyang University, Korea*
- 1-3193** Ultraviolet Sensor Based on ScAlN Thin Film
Seungmin Myeong, Yeon Hwa Kwak, Sungmin Hong, Kwang Bum Park
Korea Electronics Technology Institute, Korea
- 1-3375** Quantitative Analysis Using Raman Spectroscopy for Concentration Monitoring of Hydrogen Peroxide in Slurry for Copper Chemical Mechanical Planarization (CMP) Process
Jin Hyun Choe, Jin Seok Kim, Da Won Ahn, Eun Su Jung, Sung Gyu Pyo
Chung-Ang University, Korea
- 1-3384** Plasma-Induced Damage Monitoring Using Multi-Array Laser Raman Spectroscopy
Da Won Ahn, Jin Seok Kim, Jin Hyun Choe, Eun Su Jung, Sung Gyu Pyo
Chung-Ang University, Korea
- 1-3507** Effect of SiO₂ Capping Layers on the Solid-phase Crystallization of Amorphous Ge Thin Films
Seungju Baik, Hoesup Soh, Donghwan Ahn, Woong Choi
Kookmin University, Korea
- 1-3517** High-Temperature Charge Transport in Spin-Coated PEDOT:PSS Top Contact Molecular Ensemble Junctions
Dong-Hyoup Seo, Hyunwook Song
Kyung Hee University, Korea

- 1-3531** Fabrication and Characterization of Molecular Tunnel Junctions with Single-Layer Graphene Electrodes
Seock-Hyeon Hong, Hyunwook Song
Kyung Hee University, Korea
- 1-3580** Analysis of Annealing Influence on Electrical Characteristics of Lithium Phosphate on Silicon Carbide
Hyung-Jin Lee, Soo-Young Moon, Hee-Jae Lee, Dong-Wook Byun, Seung-Woo Jung, Minkyung Kim, Sang-Mo Koo
Kwangwoon University, Korea
- 1-3639** Manufacturing and Printability of Photocurable Inks for Ceramic 3D Printing
Jihoon Kim, Munseong Kim
Kongju National University, Korea
- 1-3641** The Experiment for Preventing Blister Defect Induced by Extreme Ultraviolet Light
Juyoung Jung^{1,2}, Jin-hwan Hong¹, Yeonjin Jung³, Hyunsoon Park², Byungdeog Choi¹
¹*Sungkyunkwan University, Korea*, ²*Samsung Electronics Co., Ltd., Korea*, ³*Samsung Electronics Co., Ltd, Korea*
- 1-3695** Improvement of Energy Storage Performance of the Al-doped ZrO₂ with Anti-ferroelectricity for Electrostatic Capacitors
Seung Won Lee, Youkyoung Oh, Min Ji Jeong, Ji-Hoon Ahn
Hanyang University, Korea
- 1-3881** Fabrication of Photopatterns with Systematically Controlled Surface Chemical Functionalities
Seungjun Kim, Sol An, Myungwoong Kim
Inha University, Korea
- 1-3885** Continuous Flow Reaction to Produce Copolymers Applicable for Chemically Amplified Resists
Soeun Park, Jiyeong Yeo, Jihoon Woo, Seungyeon Choi, Kiyoun Kwon, Jin-Kyun Lee, Myungwoong Kim
Inha University, Korea
- 1-3903** High-Performance n-Type Organic Electrochemical Transistors Using High Capacitance Electrolyte Dielectrics
Su Jung Kim, Hong Myeong Yang, Keun Hyung Lee
Inha University, Korea
- 1-4003** Characterization of Y₂O₃ Prepared by Atomic Layer Deposition as a Plasma Resistance Material
Jun-Hyeok Jeon^{1,2}, Hye-Young Kim^{1,2}, Sung Kyu Jang^{1,2}, Kihun Seong^{1,2}, Hyun-Mi Kim^{1,2}, Jin Woo Cho^{1,2}, Hyeongkeun Kim^{1,2}, Jae-Boong Choi²
¹*Korea Electronics Technology Institute, Korea*, ²*Sungkyunkwan University, Korea*
- 1-4025** Experimental Demonstration for the Effect of EUV Pellicle Wrinkles on Mask 3D Effect and Mask Imaging Performance
Jin Hyuk Choi^{1,2}, Dong Gi Lee^{1,2}, Young Woong Kim^{1,2}, Seung Chan Moon^{1,2}, Seong Ju Wi^{1,2}, Jinho Ahn^{1,2}
¹*Hanyang University, Korea*, ²*EUV-IUCC, Korea*

- 1-4026** Evaluating Optical/Mechanical Properties of Single MoSi₂ EUV Pellicle
[Wonjin Kim](#)^{1,2}, Seongju Wi^{1,3}, Haneul Kim^{1,2}, Youngwoo Kang^{1,3}, Jungyeon Kim^{1,3}, Jinho Ahn^{1,3}
¹Hanyang University, Korea, ²Industry University Collaboration Center, Korea, ³EUV-IUCC, Korea
- 1-4035** EUV Mask Performance Enhancement Through Controlling Mask Bias for C/H Patterns
[Minsun Cho](#)^{1,2}, Dongmin Jeong^{1,2}, Yunsoo Kim^{1,2}, Jinho Ahn^{1,2}
¹Hanyang University, Korea, ²EUV-IUCC, Korea
- 1-4037** Impact of Thermo-Mechanical Properties of EUV Pellicle on Critical Dimension Uniformity
[Youngwoo Kang](#)^{1,2}, Junghwan Kim^{1,2}, Ha Neul Kim^{1,2}, Jinho Ahn^{1,2}
¹Hanyang University, Korea, ²EUV-IUCC, Korea
- 1-4213** An Integrated Apparatus for Decay Time Analyzer and Gamma-ray Detection
[Changhyun Roh](#), Su Jung Min, Bum Kyung Seo, Sang Bum Hong
Korea Atomic Energy Research Institute, Korea
- 1-4400** Enhancement of Photochromic Properties and Dispersibility Using Tungsten Oxide by Introducing Organic Materials
[Minsung Kim](#), Hyunkyu Lee, Junho Yoon, Dongjun Lee, Jaepil Kim
Seoul National University, Korea

Compound Semiconductors and Power Electronic Devices

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

- CHAIR** Jae Kyoung Mun (Electronics and Telecommunications Research Institute, Korea)
- 1-0258** High Quality GaN Epilayers Grown on Nanoporous-ordered GaN for High Performance LEDs
[Tae Hoon Seo](#), Jaewoong Kim, Changmin Pyo
Korea Institute of Industrial Technology, Korea
- 1-1613** Effects of Composition Ratio on Electrical Characteristics and Bias Stability of Solution-Processed Zn-Sn-O Thin-Film Transistors
[Ziyuan Wang](#), Jin-Hyuk Bae
Kyungpook National University, Korea
- 1-2019** The Role of Zn Concentration on the Improving the Physical Properties of CuI Thin Films and Performance of MSM Photodetectors
Yun-Chi Chen, [Hsuan-Meng Tsai](#), Chien-Yie Tsay
Feng Chia University, Chinese Taipei

- 1-3118** The Electrical Characteristics Analysis of 1,700V Split-Gate Field Stop IGBT According to Gate Experiments
[Hyeong Seong Jo](#), Ey Goo Kang, Chan Young Park, Heon Seok Chung
Far East University, Korea
- 1-3139** A Study on the Improvement of Electrical Characteristics of 1,700V SiC Power MOSFETs
[Yu Rim Kim](#), Ey Goo Kang, Hyeong seong Jo, Heon-Seok Cheong
Far East University, Korea
- 1-3150** A Study on Optimization of 4.5kV Trench MOSFETs in 4H-SiC
[Ji Yeon Ryou](#), Yu Rim Kim, Heon Seok Chung, Ey Goo Kang
Far East University, Korea
- 1-3276** Characterization of β -Ga₂O₃ Schottky Barrier Diodes Grown by Hydride Vapor Phase Epitaxy
[Chang Wan Ahn](#), Eun Kyu Kim
Hanyang University, Korea
- 1-3427** Fabrication of Bottom-Up Core-Shell Nanorod LED Using Thick Nano Mask
[Sohyeon Park](#), Jung-El Ryu, Ho Won Jang
Seoul National University, Korea
- 1-3633** Electrical Properties of Li-doped p-NiO_x Interlayers Embedded Ni/ β -Ga₂O₃ Schottky Barrier Diodes
[Ji Young Min](#), You Seung Rim
Sejong University, Korea
- 1-3778** Atomically Flat and Uniform Release of Target Epitaxial Layers in III-V Heterostructure via a Buffer-Free Mechanical Separation Technique
[Honghwi Park](#), Hongsik Park
Kyungpook National University, Korea
- 1-4017** Influence of High-k Gate Dielectrics on Static and Dynamic Characteristics of β -Ga₂O₃ MOSFETs
[Hui-Cheol Kim](#), Dong-Wook Byun, Seung-Woo Jung, Sang-Mo Koo
Kwangwoon University, Korea
- 1-4047** High-Performance AlGaIn/GaN-on-Si HEMTs with Reduced Trapping Effects by Periodically Carbon-Doped GaN Buffer and in-situ SiN Passivation
Youngjin Park, Honghwi Park, Seung-Hyun Kang, Hongsik Park, Jung-Hee Lee
Kyungpook National University, Korea

Applications for 2D and Carbon-based Materials

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

CHAIR	Jin-Hong Park (Sungkyunkwan University, Korea)
1-0631	Electrical Properties of Carbon Nano-tube and Oxide Semiconductor Composite Thin-film Transistors for Wearable Devices Hongjin Lee , Hokyun Ihm, Jonghoon Lee, Woon-Seop Choi <i>Hoseo University, Korea</i>
1-1406	Enhanced Performance of Top-emitting Vertical OLETs Based on Tunable Graphene Sources Ting Kang , Wangi Ren, Ho Jin Lee, Nahyun Kim, Chenjie Yao, Tae Geun Kim <i>Korea University, Korea</i>
1-1472	Stability and Reliability Analysis of 2D Tellurium-Based TFT Devices Under Various Stress Conditions Hwi Geun Kim , Ho Jin Lee, Seok Hee Hong, Tae Geun Kim <i>Korea University, Korea</i>
1-3209	Tuning ZnO by Applying Self-assembly Molecule Buffer Layer to Get High On/Off Ratio and Reducing Trap Density Taehyeon Kim , Woo Jong Yu <i>Sungkyunkwan University, Korea</i>
1-3223	A Novel Approach to Focus Electron Beam Trajectory Based on the Cathode – Gate Distance Ketan Bhotkar , Kyu Chang Park <i>Kyung Hee University, Korea</i>
1-3226	Micro-focused X-Ray Fabrication with Various Cold Cathode Electron Beam Array (C-Beam) Jaydip Sawant , Kyu Chang Park <i>Kyung Hee University, Korea</i>
1-3237	Fabrication of C-Beam for Nano-focused X-Ray Application Ravindra Patil , Kyu Chang Park <i>Kyung Hee University, Korea</i>
1-3335	High Performance Photodetector Using MoS ₂ /WSe ₂ van der Waals Heterostructure Seok Won Choi , Woo Jong Yu <i>Sungkyunkwan University, Korea</i>
1-3491	PN Photodetector Using Transition Metal Dichalcogenide WSe ₂ /MoS ₂ Heterostructure with Doping Controlled Sung Hyun Kim , Woo Jong Yu <i>Sungkyunkwan University, Korea</i>

1-3784	A Novel Electrical Characterization Method for Simultaneous Extraction of the Grain Size, Single-Crystalline Grain Sheet Resistance, and Grain Boundary Resistivity of Polycrystalline Monolayer Graphene Jiyeong Yun , Honghwi Park, Hongsik Park <i>Kyungpook National University, Korea</i>
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3D Heterogeneous Integration for Advanced Packing

14:00-15:00, NOV 09 (Wed) | Lobby (2F)

CHAIR	Hyun-Yong Yu (Korea University, Korea)
1-1187	Development of Next-generation CPI Bonding Materials and Processes Through Advanced NCFs System Myeongeun Kim , Juseong Park, Kyung Min Kim <i>Korea Advanced Institute of Science and Technology, Korea</i>
1-3010	Sinter-bonding Characteristics Using Paste Containing Surface-treated Submicron Ag-coated Cu Particles with Different Thickness of Ag Shell Yeong Jung Kim , Jong-Hyun Lee <i>Seoul National University of Science and Technology, Korea</i>
1-3198	High-Speed Transient Liquid Phase Bonding of a Sn-coated Cu Particle-Based Preform for Die Attachment of a Power Device Byeong Jo Han , Jong-Hyun Lee <i>Seoul National University of Science and Technology, Korea</i>

02.Advanced Memory and Neuromorphic Materials & Device Applications

Brain-inspired Devices and Architecture 1

NOV 07 (Mon) | Ballroom 3 (2F)

CHAIRS	Doo Seok Jeong (Hanyang University, Korea) Hyungjin Kim (Inha University, Korea)
2-4274	Advanced Heterogeneous Integration Enabled by Remote Epitaxy
09:20-09:50	Jeehwan Kim
KEYNOTE	Massachusetts Institute of Technology, USA
2-0525	Combining Brain-inspired Principles and Emerging Device Technologies to Build New Computing Systems
09:50-10:20	John Paul Strachan ^{1,2}
INVITED	¹ Forschungszentrum Jülich GmbH, Germany, ² RWTH Aachen University, Germany
2-1324	Analog and Digital Neuromorphic Learning in Spiking Neural Networks
10:20-10:50	Mostafa Rahimi Azghadi
INVITED	James Cook University, Australia
2-0848	Versatile Synaptic Transistors Learning from Electrical and Optical Stimuli
10:50-11:05	Jung Wook Lim ^{1,2}
	¹ Electronics and Telecommunications Research Institute, Korea, ² University of Science and Technology, Korea
2-3584	Pattern-recognizable Neuromorphic System with 12x14 Diffusion Memristor Array
11:05-11:20	Yu-Rim Jeon ¹ , Donguk Seo ² , Yoonmyung Lee ² , Changhwan Choi ¹
	¹ Hanyang University, Korea, ² Sungkyunkwan University, Korea
2-2058	Design of Memristive Crossbar Arrays in 1T1R Architecture for Spiking Neural Network Computing
11:20-11:35	Jae Gwang Lim ¹ , Keonhee Kim ¹ , Dae cheol Kang ¹ , Minseok Kim ¹ , Yeonjoo Jeong ¹ , Jaewook Kim ¹ , Suyoun Lee ¹ , Joon Young Kwak ¹ , Jongkil Park ¹ , Gyu Weon Hwang ¹ , Keong-Seok Lee ¹ , Seongsik Park ¹ , Byeong-Kwon Ju ² , Inho Kim ¹ , Jong Keuk Park ¹
	¹ Korea Institute of Science and Technology, Korea, ² Korea University, Korea
2-3748	High Linearity of Charge Trap Memory for Synaptic Transistor Through Trap Control
11:35-11:50	Eun Seo Jo , You Seung Rim
	Sejong University, Korea

Brain-inspired Devices and Architecture 2

NOV 07 (Mon) | Ballroom 3 (2F)

CHAIRS	John Paul Strachan (RWTH Aachen University, Germany) Doo Seok Jeong (Hanyang University, Korea)
2-1524	Emerging Memory Devices and Architectures for In-memory Computing
13:20-13:50	Hyungjin Kim
INVITED	Inha University, Korea
2-0224	Oxide Memristor Research for Bio-inspired Computing Applications
13:50-14:20	Jung Ho Yoon
INVITED	Korea Institute of Science and Technology, Korea
2-3453	Tailoring the Functionality between Threshold and Resistive Switching via Ag-incorporation in Organometallic Halide Perovskite for Memristive Crossbar Array
14:20-14:35	In-Hyuk Im , Hyeonji Lee, Ho Won Jang
	Seoul National University, Korea
2-3382	Investigating the Elemental Role in Chalcogenide-based Ovonic Threshold Switching Devices for Neuromorphic Application
14:35-14:50	Chaebin Park , Su-Bong Lee, Sang-Heon Park, Young-Min Kim, Si-Won Park, Deok-Jin Jeon, Jong-Souk Yeo
	Yonsei University, Korea
2-3072	Vertically Aligned Two-dimensional Halide Perovskites for Reliably Operable Artificial Synapses
14:50-15:05	Seung Ju Kim , Ho Won Jang
	Seoul National University, Korea
2-3005	A Flexible and Self-rectifying Synaptic 32 x 32 Crossbar Array for a Wearable Neuromorphic Application
15:05-15:20	Younghyun Lee , Geunyoung Kim, Kyung Min Kim
	Korea Advanced Institute of Science and Technology, Korea
2-2047	Cu/SiO _x Memristive Devices with Insertion of a-SiGe Buffer Layer for Reliable Analog Synapse Behavior
15:20-15:35	Keonhee Kim ^{1,2,3} , Dae Cheol Kang ¹ , Jae Gwang Lim ^{1,2} , Minseok Kim ^{1,3} , Yeonjoo Jeong ¹ , Jaewook Kim ¹ , Suyoun Lee ¹ , Joon Young Kwak ¹ , Jongkil Park ¹ , Weon Gyu Hwang ¹ , Kyeong-Seok Lee ¹ , Seongsik Park ¹ , Byeong-Kwon Ju ² , Inho Kim ¹ , Jong Keuk Park ¹
	¹ Korea Institute of Science and Technology, Korea, ² Korea University, Korea, ³ Korea University of Science and Technology, Korea

Computing-in-Memory

NOV 07 (Mon) | Ballroom 3 (2F)

CHAIR	Sangbum Kim (Seoul National University, Korea)
2-2079	PCM-based In-memory Computing for Deep Learning Acceleration
16:00-16:30	Abu Sebastian
INVITED	IBM Research - Zurich, Switzerland
2-0435	In-sensor Computing for Neuromorphic Machine Vision
16:30-17:00	Yang Chai
INVITED	The Hong Kong Polytechnic University, Hong Kong (SAR of China)
2-0498	Stateful Neural Networks for Edge Boolean Logic
17:00-17:30	Kyung Min Kim
INVITED	Korea Advanced Institute of Science and Technology, Korea
2-0464	Metal-oxide Electrochemical Memory for High-density Synaptic Array Based Neuromorphic Computing
17:30-18:00	Yun Seog Lee
INVITED	Seoul National University, Korea
2-1853	Role of Electrical and Chemical Stimuli on the Electrical Responses of Resistive RAM and Neuromorphic Computing Devices: A Phase Field Study
18:00-18:15	Arijit Roy , Pil-Ryung Cha
	Kookmin University, Korea

Advanced Thin Film Processes for Future Memory 1

NOV 08 (Tue) | Ballroom 3 (2F)

CHAIRS	Hocheon Yoo (Gachon University, Korea) Woongkyu Lee (Soongsil University, Korea)
2-4270	Recent Progresses in Ternary Logic Devices and Architectures
10:10-10:40	Byoung Hun Lee
KEYNOTE	Pohang University of Science and Technology, Korea
2-0390	Electrical Characterization of Resistive Switching Thin Films
10:40-11:10	Kyung Jean Yoon
INVITED	Intel Corporation, USA

2-0156	Wafer-scale Optical-guided Memory Array Implemented with Hybrid Organic-Inorganic Heterogeneous Materials
11:10-11:40	Hocheon Yoo
INVITED	Gachon University, Korea
2-3475	Fabrication of Single-crystalline SrRuO ₃ Freestanding Membranes by Sacrificial Infinite Cuprates
11:40-11:55	Muhammad Sheeraz¹ , Min-Hyoung Jung ² , Yoon Ki Kim ³ , Nyunjong Lee ¹ , Seyeop Jeong ¹ , Jin San Choi ¹ , Yong Jin Jo ¹ , Shinuk Cho ¹ , Ill Won Kim ¹ , Young-Min Kim ² , Sanghoon Kim ¹ , Chang Won Ahn ¹ , Sang Mo Yang ³ , Hu Young Jeong ¹ , Tae Heon Kim ¹
	¹ University of Ulsan, Korea, ² Sungkyunkwan University, Korea, ³ Sogang University, Korea
2-3472	Area Selective Atomic Layer Deposition of SnS ₂ Using Acetylacetone as an Inhibitor
11:55-12:10	Jae Gyun Yim^{1,2} , Hong Keun Chung ^{2,3} , Seong Keun Kim ^{1,2}
	¹ Korea University, Korea, ² Korea Institute of Science and Technology, Korea, ³ Hanyang University, Korea
2-1162	Light-Induced Synaptic Behaviors by Interface Trap Engineering and Photo-Gating Effects in C8-BTBT
12:10-12:25	Jihyun Shin¹ , Somi Kim ¹ , Byung Chul Jang ² , Hocheon Yoo ¹
	¹ Gachon University, Korea, ² Kyungpook National University, Korea
2-1307	A Study on Ferroelectric Properties of Furnace-annealed Hf _{0.5} Zr _{0.5} O ₂ Films
12:25-12:40	Jeong Gyu Yoo¹ , Yong Chan Jung ² , Jin-Hyun Kim ² , Jong Mook Kang ¹ , Min Kwan Cho ¹ , Taeho Gong ¹ , Hye Ryeon Park ¹ , Seongbin Park ¹ , Jiyoung Kim ² , Si Joon Kim ¹
	¹ Kangwon National University, Korea, ² The University of Texas at Dallas, USA

Advanced Thin Film Processes for Future Memory 2

NOV 08 (Tue) | Ballroom 3 (2F)

CHAIRS	Woongkyu Lee (Soongsil University, Korea) Min Hyuk Park (Seoul National University, Korea)
2-2124	Emerging Strategies for Improving Ferroelectricity in Hafnia-based Thin Films
14:00-14:30	Min Hyuk Park
INVITED	Seoul National University, Korea
2-2577	Advances in Memristor Devices Based on Polyelectrolytes Thin Film
14:30-15:00	Jinshi Zhao
INVITED	Tianjin University of Technology, China

- 2-3460** Growth and Characterization of Iridium Thin Films Grown by Atomic Layer Deposition with TlCP and Oxygen
15:00-15:15
[Hong Keun Chung](#)^{1,2}, Tae Joo Park², Seong Keun Kim^{1,3}
¹Korea Institute of Science and Technology, Korea, ²Hanyang University, Korea, ³Korea University, Korea
- 2-2837** Direct Imaging of Charge Distribution in High-κ Oxide Thin Film Capacitors under Electric Fields by In-situ STEM
15:15-15:30
[Keeyong Lee](#)¹, Yaolong Xing², Jinsol Seo³, Myoungcho Jeong⁴, Eunha Lee⁴, Jaewoo Lee⁴, Jeongil Bang⁴, Sang Ho Oh^{1,2}
¹Korea Institute of Energy Technology, Korea, ²Sungkyunkwan University, Korea, ³The Korean Institute of Energy Technology, Korea, ⁴Samsung Advanced Institute of Technology, Korea
- 2-1705** Flexible Room-Temperature-Deposited Trilayer Self-Rectifying Memristor for Wearable Electronics
15:30-15:45
[Alba Martinez](#), Younghyun Lee, Kyung Min Kim
Korea Advanced Institute of Science and Technology, Korea
- 2-1197** Reversible, Reconfigurable Multi-mode Synaptic Operation of HfAlOx-based Memristor for Neuromorphic Application
15:45-16:00
[Eun Young Kim](#), Hyung Seok Shin, Hanchan Song, Kyung Min Kim
Korea Advanced Institute of Science and Technology, Korea
- 2-1078** Photo-synaptic Properties of TiO₂-based Transistor Devices with Ultra-thin Gate Insulators
16:00-16:15
[Jieun Kim](#)^{1,2}, Jung Wook Lim^{1,2}
¹Electronics and Telecommunications Research Institute, Korea, ²University of Science and Technology, Korea

Ferroelectric Devices and Emerging Memory

NOV 09 (Wed) | Ballroom 3 (2F)

CHAIRS Sanghun Jeon (Korea Advanced Institute of Science and Technology, Korea)
Seung Chul Chae (Seoul National University, Korea)

- 2-0452** Stable Sub-Loop Behavior in Ferroelectric Si-Doped HfO₂
10:10-10:40
[Seung Chul Chae](#)
INVITED Seoul National University, Korea
- 2-3636** Dual-gated Flash Memory Device Characteristics with Ferroelectric Zr-doped HfO₂ Thin Film and IGZO Oxide Semiconductor
10:40-10:55
[Boncheol Ku](#), Ye Rim Shin, Se Jin Kim, Changhwan Choi
Hanyang University, Korea

- 2-3262** A Study on the Effect of the Thickness and Composition of Ferroelectric Hf_{1-x}Zr_xO₂ Thin Film Using Mo Electrodes
10:55-11:10
[Ju Yong Park](#), Se Hyun Kim, Dong Hyun Lee, Kun Yang, Geun Hyeong Park, Younghwan Lee, Min Hyuk Park
Seoul National University, Korea
- 2-1503** Phase Field Simulation of Ferroelectric Switching in Polycrystalline HZO Thin Film Using Effective Landau Coefficients Predicted by Genetic Algorithm
11:10-11:25
[Sandeep Sugathan](#)¹, Krishnamohan Thekkepat^{2,3}, Soumya Bandyopadhyay¹, Jiyoung Kim⁴, Pil-Ryung Cha¹
¹Kookmin University, Korea, ²Korea Institute of Science and Technology, Korea, ³Korea University of Science and Technology, Korea, ⁴The University of Texas at Dallas, USA
- 2-1176** Mo-based Low-power 1T1M Array Device for Homomorphic Encryption
11:25-11:40
[Woon Hyung Cheong](#), Jae Hyun In, Jae Bum Jeon, Moon Gu Choi, Kyung Min Kim
Korea Advanced Institute of Science and Technology, Korea
- 2-0903** Investigation of All-inorganic Metal Halide Perovskite CsPb₂Br₅ Nanosheets Based Resistive Switching Devices
11:40-11:55
[Uijin Jung](#), Jeongah Lim, JuYun Ha, Jinsub Park
Hanyang University, Korea
- 2-0610** Effects of the Operating Environment, Active Layer Thickness and Low-temperature Characteristics of Ti/SiO_xNy/Pt Bipolar RRAM
11:55-12:10
[Nayan Chandra Das](#)¹, Sung-Min Hong², Jae-Hyung Jang¹
¹Korea Institute of Energy Technology, Korea, ²Gwangju Institute of Science and Technology, Korea
- 2-0542** Ferroelectric Pure ZrO₂ on CMOS Compatible Electrode
12:10-12:25
[Myeongchan Ko](#), Kyung Min Kim
Korea Advanced Institute of Science and Technology, Korea
- 2-0489** Fluorite Ferroelectric Transistor for Logic-Memory Convergence Devices: Various Approaches
12:25-12:55
[Sanghun Jeon](#)
INVITED Korea Advanced Institute of Science and Technology, Korea

02.Advanced Memory and Neuromorphic Materials & Device Applications

Computing-in-Memory

18:30-19:30, NOV 07 (Mon) | Lobby (2F)

CHAIR	Doo Seok Jeong (Hanyang University, Korea)
2-1065	Engineering BP/WS2 Heterojunction Traps in 2D Transistors for Resistive Memory and Synaptic Functions Atul Chandrakant Khot , Tukaram Dattatray Dongale, Kiran Arun Nirmal, Tae Geun Kim <i>Korea University, Korea</i>

Brain-inspired Devices and Architecture

18:30-19:30, NOV 07 (Mon) | Lobby (2F)

CHAIR	Doo Seok Jeong (Hanyang University, Korea)
2-0858	Second-order Flexible Mott Neuron Gwangmin Kim , Jae Hyun In, Younghyun Lee, Kyung Min Kim <i>Korea Advanced Institute of Science and Technology, Korea</i>
2-0891	Au Nanoparticle Inserted Sandwich Structure Charge Trap Memristor for Low Power and High Speed Neuromorphic Synapse Application Geunyoung Kim , Kyung Min Kim <i>Korea Advanced Institute of Science and Technology, Korea</i>
2-0917	Heterogeneous-Filament Switching Responsible for Neuromorphic Computing in HfOx-Based Memristors Min Gu Jang , Kyung Min Kim <i>Korea Advanced Institute of Science and Technology, Korea</i>
2-0960	Amplified Current Oscillation in Au Nanodots Incorporated NbOx Threshold Switching Device Woojoon Park , Gwangmin Kim, Hakseung Rhee, Jaehyeon In, Hanchan Song, Kyung Min Kim <i>Korea Advanced Institute of Science and Technology, Korea</i>
2-1166	Implementation of Long-term Plasticity of Photo-synaptic Oxide Transistors Employing Dual Dielectrics Including High κ Materials Jaehee Lee ^{1,2} , Jung Wook Lim ^{1,2} ¹ <i>Electronics and Telecommunications Research Institute, Korea,</i> ² <i>University of Science and Technology, Korea</i>

2-1190	Artificially Intelligent Photonic Synapse with Structurally Controllable Perovskite Nanocones Gwanho Kim , Kyuho Lee, Cheolmin Park <i>Yonsei University, Korea</i>
2-1194	Gate-tunable Oxide Thin-film Transistor Using Three-terminal Charge Trap Memristive Devices for Heterosynaptic Plasticity Jae Bum Jeon , Seong-In Cho, Kyung Min Kim <i>Korea Advanced Institute of Science and Technology, Korea</i>
2-1275	Indium-Titanium-Oxide Based Artificial Synaptic Thin-Film Transistors Using Interface Trap Charges Chohyeon Park ^{1,2} , Jung Wook Lim ^{1,2} ¹ <i>Electronics and Telecommunications Research Institute, Korea,</i> ² <i>University of Science and Technology, Korea</i>
2-1653	Double-gated Casein Electrolyte-based Lateral Proton-coupling Synaptic Transistors on Paper Substrates Hwi-Su Kim , Won-Ju Cho <i>Kwangwoon University, Korea</i>
2-1768	Casein Bio-memristors Developed on Bovine Milk with Outstanding Synaptic Characteristics Jingi Min , Wonju Cho <i>Kwangwoon University, Korea</i>
2-1770	Time-dependent pH Sensitivity Based on Synaptic Transistors with Organic-Inorganic Hybrid Electric-double-layer Ki-Woong Park , Won-Ju Cho <i>Kwangwoon University, Korea</i>
2-1949	Implementation of Polyvinyl Alcohol Electrolyte-based CMOS-compatible Bio-friendly Synaptic Transistors Dong Hee Lee , Won Ju Cho <i>Kwangwoon University, Korea</i>
2-2252	Three-Terminal Ovonic Threshold Switch (3T-OTS) with Tunable Threshold Voltage for Versatile Artificial Sensory Neurons Sangheon Kim ^{1,2} , Suyoun Lee ¹ , Hyejin Lee ^{1,3} , Jaesang Lee ^{1,4} , Seongwon Cho ^{1,4} , Youngwoong Lee ^{1,5} , Jinwoo Jeong ¹ , Seunmin Oh ¹ , Soyeon Park ¹ ¹ <i>Korea Institute of Science and Technology, Korea,</i> ² <i>Korea University, Korea,</i> ³ <i>Yonsei University, Korea,</i> ⁴ <i>Seoul National University, Korea,</i> ⁵ <i>Konkuk University, Korea</i>
2-2293	MXene Encapsulated-Magnetic Liquid Metal For 3D Motion Adaptive Synapse HoYeon Kim , Cheolmin Park <i>Yonsei University, Korea</i>
2-2609	2D hBN-based RRAM for Artificial Neuron in Neuromorphic Applications Yooyeon Jo ¹ , Gichang Noh ¹ , Eunpyo Park ¹ , Min Jee Kim ¹ , Yong Woo Sung ¹ , Dong Yeon Woo ¹ , Dae Kyu Lee ¹ , Joon Young Kwak ^{1,2} ¹ <i>Korea Institute of Science and Technology, Korea,</i> ² <i>Korea University of Science and Technology, Korea</i>

- 2-2639

Emerging Potassium Ion Intercalated Layered Metal Oxide (2D K-MnO₂) for Artificial Synaptic Device
[Gichang Noh](#)^{1,2}, Jeongho Kim², Yooyeon Jo¹, Eunpyo Park¹, Min-kyung Jo², Dong Yeon Woo¹, Min Jee Kim¹, Kibum Kang², Joon Young Kwak¹
¹Korea Institute of Science and Technology, Korea, ²Korea Advanced Institute of Science and Technology, Korea
- 2-2706

Indium Gallium Zinc Oxide based Flash Memory for a Neuromorphic Synaptic Device
[Eunpyo Park](#)^{1,2}, Yooyeon Jo¹, Gichang Noh¹, Min Jee Kim¹, Yong Woo Sung¹, DongYeon Woo¹, Dae Kyu Lee¹, In Soo Kim¹, Sangbum Kim², Jiwon Chang³, Hyun-Cheol Song¹, Joon Young Kwak^{1,4}
¹Korea Institute of Science and Technology, Korea, ²Seoul National University, Korea, ³Yonsei University, Korea, ⁴University of Science and Technology, Korea
- 2-3049

Ambient Stable All Inorganic CsCu₂I₃ Artificial Synapses for Neurocomputing
[Ji Hyun Baek](#), Ho Won Jang
Seoul National University, Korea
- 2-3062

Fully Soft Organic Optoelectronic Synaptic Devices Enabled by Elastomeric Composite
[Myeonghyeon Na](#), Kyoseung Sim
Ulsan National Institute of Science and Technology, Korea
- 2-3755

Eco-friendly and Bio-resorbable Neuromorphic Devices for Hardware-secure Applications
Youseung Rim, [Hojung Jeon](#)
Sejong University, Korea

- 2-1610

Synapse Characteristics of IGZO TFT with Silk Fibroin Gate Insulator
[Hyunjoo Hwang](#), Wonwoo Kho, Gyuil Park, Jisoo Kim, Minjeong Kang, Jisu Byun, Yoomi Kang, Seung-Eon Ahn
Tech University of Korea, Korea
- 2-1699

Optically Programmable Organic Memory Transistors Exceeding a Program/Erase Current Ratio of 10⁷
[Seungme Kang](#), Seongjae Kim, Hocheon Yoo
Gachon University, Korea
- 2-2241

Resistive Switching Characteristics of Ta_xMn_yO_z-based ReRAM with Large Resistance Window
[Yunki Kim](#), Kyu-Jin Jo, Jin-Su Oh, Cheol-Woong Yang
Sungkyunkwan University, Korea
- 2-2389

P-type Organic Photo Memory Integrated with N-type Metal Oxide Transistors for Complementary Logic-in-memory Inverter Circuit
[Juhyung Seo](#), Seongjae Kim, Hocheon Yoo
Gachon University, Korea
- 2-2420

Fabrication of Ultra-thin AZO/Ag Co-sputtered Film and Its Functional Properties
[Younghwa Yoon](#), Sangbin Park, Taejun Park, Hyungmin Kim, Kyunghwan Kim, Jeongsoo Hong
Gachon University, Korea

Advanced Thin Film Processes for Future Memory

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

CHAIR	Woongkyu Lee (Soongsil University, Korea)
2-0871	Threshold Switching Behavior of HfO _x /GST-based Dual-layer Selector for PCRAM Applications Kyoung Joung Yoo , Min Ji Yu, Tae Hyeong Kim, Tae Ho Kim, Seung Woo Park, Tae Geun Kim Korea University, Korea
2-1302	Polarity Direction Observation of the Ferroelectric Thin Film(SrMnO ₃)by Micro X-ray Beam Based a Thermoelectric Coupling Device Rui He , Thi My Huyen Nguyen, Pham Hoang Huy Vo, Thi Muoi Vo, Chung Wung Bark Gachon University, Korea
2-1439	Atomistic Modeling on Atomic Layer Deposition of Titanium Nitride Using Kinetic Monte Carlo Simulation Hyungmin An , Sangtae Kim, Sangmin Oh, Seungwu Han Seoul National University, Korea

Ferroelectric Devices and Emerging Memory

14:00-15:00, NOV 09 (Wed) | Lobby (2F)

CHAIR	Sanghun Jeon (Korea Advanced Institute of Science and Technology, Korea)
2-0831	Effects of Annealing Temperature on Crystallite Size and Microstructure Evolution of Hydrothermally Synthesized Barium Titanate Powders Jongbeom Lee , Haguk Jeong Korea Institute of Industrial Technology, Korea
2-0843	Effects of Annealing Temperature on Phase Transition and Lattice Densification of Barium Titanate Nanoparticles Containing 0.1 mol% Mn Element Jongbeom Lee ¹ , Jinyoung Jeong ^{1,2} , Haguk Jeong ¹ ¹ Korea Institute of Industrial Technology, Korea, ² Inha University, Korea
2-1537	Identification of Unexplored Ternary Metal Oxide High-K Dielectrics Through a Large-scale Heuristic Approach Using Machine Learning Potentials Seungwoo Hwang , Sungwoo Kang, Jisu Jung, Changho Hong, Jaehoon Kim, Minseok Moon, Yutaek Park, Seungwu Han Seoul National University, Korea

- 2-1735** Prediction of SNN Learning Weight of Hafnia-based Ferroelectric Tunnel Junction Device for Neuromorphic Computing Application
Wonwoo Kho, Gyuil Park, Jisoo Kim, Hyunjoo Hwang, Yoomi Kang, Minjeong Kang, Jisu Byun, Seung-Eon Ahn
Tech University of Korea, Korea
- 2-1969** Charge Trapping Based CNTFET for Synaptic Device Application
Jisoo Kim, Wonwoo Kho, Hyunjoo Hwang, Gyuil Park, Yoomi Kang, Minjung Kang, Jisu Byun, Seungeon Ahn
Tech University of Korea, Korea
- 2-2025** Effect of Yttrium Doping on Ferroelectricity of As-grown $\text{Hf}_{1-x}\text{Zr}_x\text{O}_2$ Thin Films via Atomic Layer Deposition
Youkyoung Oh, Hyo-Bae Kim, Ji-Hoon Ahn
Hanyang University, Korea
- 2-2746** The Wake-up Mitigation of the Ferroelectric $\text{Hf}_{0.5}\text{Zr}_{0.5}\text{O}_2$ Thin Films by Surface Oxidized W(tungsten) Electrode
Kun Yang¹, Dong Hyun Lee¹, Se Hyun Kim¹, Geun Hyeong Park¹, Gi-Yeop Kim², Jin Joo Ryu³, Ju Yong Park¹, Gun Hwan Kim³, Si Young Choi², Min Hyuk Park¹.¹
¹Seoul National University, Korea, ²Pohang University of Science and Technology, Korea, ³Korea Research Institute of Chemical Technology, Korea
- 2-3435** Controlling Electrode Junction Area in the Ferroelectric Tunnel Junction Based on Hafnium Zirconium Oxide
Sunghyuk Park¹, Sung Hwan Cho¹, Ho Won Jang^{1,2}
¹Seoul National University, Korea, ²Advanced Institute of Convergence Technology, Korea
- 2-3601** RRAM with High Endurance Using All-inorganic Perovskite Quantum Dot
Daeun Lee, Ho Won Jang
Seoul National University, Korea
- 2-3672** Analysis on the Dielectric Properties of a BaTiO_3 -resin Capacitor Manufactured by Inkjet Printing Technology
Yujin Kim, Minju Lee, Jihoon Kim
Kongju National University, Korea

03. Sensors and Energy Harvesting for Wearable Healthcare Devices

Piezoelectric, Triboelectric and Hybrid Energy Harvesting Materials and Systems 1

NOV 07 (Mon) | Tamna (8F)

- CHAIRS** Miso Kim (Sungkyunkwan University, Korea)
Ju-Hyuck Lee (Daegu Gyeongbuk Institute of Science and Technology, Korea)
-
- 3-4281** Flexible Energy Transducers for Wearable Applications
09:20-09:50 Pooi See Lee
KEYNOTE *Nanyang Technological University, Singapore*
- 3-2111** Smart Textiles for Personalized Health Care
09:50-10:20 Jun Chen
INVITED *University of California, Los Angeles, USA*
- 3-3931** Mechanical Energy Scavenging Using Flexible Piezoelectric and Triboelectric Nanogenerators
10:20-10:50 Dong-Myeong Shin
INVITED *The University of Hong Kong, Hong Kong (SAR of China)*
- 3-3442** Self-Powered Piezoelectric Sensor Based on Fiber Morphology Control Induced by Ambient Humidity Driven Phase Separation
10:50-11:05 Dabin Kim¹, Sooun Lee², Sangryun Lee³, Yong-Il Kim², Sihyeon Kum¹, Sang-Woo Kim¹, Yunseok Kim¹, Seunghwa Ryu⁴, Miso Kim¹
¹Sungkyunkwan University, Korea, ²Korea Research Institute of Standards and Science, Korea, ³University of California, Berkeley, USA, ⁴Korea Advanced Institute of Science and Technology, Korea
- 3-3643** Solar Energy Harvesting by Photoacid Solution
11:05-11:20 Jaehyeong Bae, Haeseong Lim, Jaewan Ahn, Yoon Hwa Kim, Min Soo Kim, Il-Doo Kim
Korea Advanced Institute of Science and Technology, Korea
- 3-0511** Triboelectric Nanogenerator with an Asymmetric Electrode Design and Its Application to a Self-powered Pressure Sensor
11:20-11:35 Soyeon Lee, Jin-Woo Park
Yonsei University, Korea
- 3-2869** An Injectable, Flexible and Biodegradable Triboelectric Nanogenerator
11:35-11:50 Xiao Xiao, Xiangchun Meng, Dabin Kim, Sera Jeon, Sang-Woo Kim
Sungkyunkwan University, Korea

Piezoelectric, Triboelectric and Hybrid Energy Harvesting Materials and Systems 2

NOV 07 (Mon) | Tamna (8F)

CHAIR	Ju-Hyuck Lee (Daegu Gyeongbuk Institute of Science and Technology, Korea)
3-4401	Functionalized Dielectrics-based Triboelectric Nanogenerators for Output Power Enhancement
13:20-13:50	Jae Won Lee
INVITED	Kangwon National University, Korea
3-2016	Stable, High Performance, Efficient Triboelectric Nanogenerators for Self-Powered System
13:50-14:20	Sung Soo Kwak
INVITED	Korea Institute of Science and Technology, Korea
3-0278	Self-powered/Battery-less Biomedical Applications
14:20-14:35	Hanjun Ryu
	Chung-Ang University, Korea
3-3682	Direct Current Triboelectric Nanogenerator Based on Schottky Junction with Interlayer for Sustainable High Output
14:35-14:50	Sera Jeon , You-Sun Lee, Dabin Kim, Sang-Woo Kim
	Sungkyunkwan University, Korea
3-0561	Ion-Assisted Piezoelectric Tactile Sensor for a Self-Powered, Single-Mode Tactile Sensing System with Sensory Adaptation Behavior
14:50-15:05	Ey-In Lee , Jin-Woo Park
	Yonsei University, Korea
3-1530	Efficient Thermogalvanic Energy Harvesting upon Melting Phase Transformation
15:05-15:20	Kihoon Ryu , Sangtae Kim
	Hanyang University, Korea
3-2105	Triboelectric Nanogenerators Based on Immobilized Living Microalgae for Biomechanical Energy Harvesting
15:20-15:35	Sugato Hajra ¹ , Pichaya In-na ² , Chalampol Janpum ² , Swati Panda ¹ , Hoe Joon Kim ¹
	¹ Daegu Gyeongbuk Institute of Science and Technology, Korea, ² Chulalongkorn University, Thailand
3-3578	Conformal Bio-adhesive Triboelectric Nanogenerator for Emergency Rescue
15:35-15:50	Xiangchun Meng , Xiao Xiao, Sera Jeon, Dabin Kim, Sang-Woo Kim
	Sungkyunkwan University, Korea

Piezoelectric, Triboelectric and Hybrid Energy Harvesting Materials and Systems 3

NOV 07 (Mon) | Tamna (8F)

CHAIRS	Hanjun Ryu (Chung-Ang University, Korea)
	Sung Soo Kwak (Korea Institute of Science and Technology, Korea)
3-3354	Subcutaneous Antibacterial Activity by Ultrasound-driven Triboelectric Stimulation
16:00-16:15	Iman Mohammadi Imani , Bosung Kim, Sang-Woo Kim
	Sungkyunkwan University, Korea
3-2448	An Eco-friendly Stretchable High-power Hybrid Nanogenerator Based on Lead-free 2D-Layered Perovskite Nanorods
16:15-16:30	Venkatraju Jella , Swathi Ippili, Soon-Gil Yoon
	Chungnam National University, Korea
3-1564	Elucidating Piezoelectric Properties of Multi-Layered Ruddlesden-Popper Perovskite Semiconductors Composites for Highly Durable Nanogenerators
16:30-16:45	Lakshmi Praba Prabakar ^{1,2} , Jae Woong Jung ¹
	¹ Kyung Hee University, Korea, ² Integrated Education Institute for Frontier Science & Technology, Korea
3-2851	Ultrasound-mediated Triboelectric Nanogenerator as an Energy Solution of On-demand Transient Electronics
16:45-17:00	Dong-Min Lee , Sang-Woo Kim
	Sungkyunkwan University, Korea
3-1029	Imidazolium-based Ionic Polyurethanes for Self-healing Triboelectric Nanogenerator
17:00-17:15	Hyeonseo Joo , Ju-Hyuck Lee
	Daegu Gyeongbuk Institute of Science and Technology, Korea
3-1753	Utilization of TiO ₂ Anatase Electrodes for Efficient Thermogalvanic Studies
17:15-17:30	Eunho Choi ¹ , Dongwook Lee ² , Sangtae Kim ¹
	¹ Hanyang University, Korea, ² Hongik University, Korea
3-2279	Revealing a New Governing Formula for Static Electrification
17:30-17:45	Eui-Cheol Shin ¹ , Jae-Hyeon Ko ¹ , Ho-Ki Lyeo ² , Yong-Hyun Kim ¹
	¹ Korea Advanced Institute of Science and Technology, Korea, ² Korea Research Institute of Standards and Science, Korea
3-2788	Maximization of Non-bonding States with Local Dipoles for Highly Positive Triboelectric Materials
17:45-18:00	Donghyeon Kang , Jihye Kim, SeongMin Kim, Sang-Woo Kim
	Sungkyunkwan University, Korea

Soft, Wearable, and Neuromorphic Electronics for Human Interfacing 1

NOV 08 (Tue) | Tamna (8F)

CHAIR	Gunuk Wang (Korea University, Korea)
3-3573	Utilising the Ionic and Electronic Properties of Halide Perovskites for Neuromorphic Applications
10:10-10:40	Nripan Mathews
INVITED	<i>Nanyang Technological University, Singapore</i>
3-2988	Artificial Stimulus-response System Capable of Conscious Response
10:40-11:10	Jeong Ho Cho
INVITED	<i>Yonsei University, Korea</i>
3-3673	Artificial Synaptic Mechanoreceptor Based Organic Electrochemical Transistor for Touch Classification
11:10-11:25	M Junaid Sultan , Nae-Eung Lee
	<i>Sungkyunkwan University, Korea</i>
3-3153	Synapse Transistors with Lithium Ion-based Solid Electrolyte for Low Energy Process
11:25-11:40	Ji-Min Park , Hyun-Suk Kim
	<i>Chungnam National University, Korea</i>
3-2692	Excitatory and Inhibitory Synaptic Functions in a Flexible Chemo-receptive Ionogel Gated Organic Electrochemical Transistor as an Artificial Chemical Synapse
11:40-11:55	Hamna Haq Choudhry , Atanu Bag, Dong Hyun Lee, Nae-Eung Lee
	<i>Sungkyunkwan University, Korea</i>
3-2647	Bioadhesive Ionic Neural Interface for Non-Faradaic Neuromodulation
11:55-12:10	Joo Sung Kim ¹ , Junho Kim ² , Dong Jun Kim ¹ , Ji Hong Kim ¹ , Sung-Min Park ² , Do Hwan Kim ¹
	¹ Hanyang University, Korea, ² Pohang University of Science and Technology, Korea
3-3653	Soft Shear Sensor Array Based on the Ion Gel for Direct Monitoring of Quantitative Shear Distribution
12:10-12:25	Wonjeong Suh , Dongbeom Kim, Seunggoo Baek, Younghyun Lee, Unyong Jeong
	<i>Pohang University of Science and Technology, Korea</i>
3-3043	Stretchable Hydration Sensor for Touchless Human-machine Interface Based on PVA/LiCl Composite
12:25-12:40	Sangyun Na , Jeonghee Yeom, Yoojin Chang, Yong-Jin Park, Hyunhyub Ko
	<i>Ulsan National Institute of Science and Technology, Korea</i>

Soft, Wearable, and Neuromorphic Electronics for Human Interfacing 2

NOV 08 (Tue) | Tamna (8F)

CHAIRS	Jeong Ho Cho (Sungkyunkwan University, Korea) Nripan Mathews (Nanyang Technological University, Singapore)
3-4278	1D Novel Sensing Platform: Body Temperature, Environmental Gas Monitoring and Exhaled Breath Biomarker Analysis
14:00-14:30	Il-Doo Kim
KEYNOTE	<i>Korea Advanced Institute of Science and Technology, Korea</i>
3-0700	Ferroelectric Artificial Synapses and Neural Networks for Energy-efficient Neuromorphic Electronics
14:30-15:00	Gunuk Wang
INVITED	<i>Korea University, Korea</i>
3-0405	Stretchable Polymer-based Synaptic Transistors for Neuromorphic Electronics
15:00-15:30	Wen-Ya Lee , Chang-Jing Liu, Hsin-Chiao Tien
INVITED	<i>National Taipei University of Technology, Chinese Taipei</i>
3-2964	High Resolution, Ultrathin Light-emitting Diodes for Wearable Displays
15:30-15:45	Moon Kee Choi
	<i>Ulsan National Institute of Science and Technology, Korea</i>
3-2321	Anisotropic Nanowire Dielectric Composites for Self-healable Wearable Sensors with Multi-directional Tactile Sensitivity
15:45-16:00	Minsoo Kim , Young-Ryul Kim, Hyunhyub Ko
	<i>Ulsan National Institute of Science and Technology, Korea</i>
3-0130	Mechanosensitive and Highly Effective Air/Underwater Self-healable Iontronic Skin
16:00-16:15	Zhengyang Kong ¹ , Joo Sung Kim ¹ , Hanbin Choi ¹ , Dong Jun Kim ¹ , Wu Bin Ying ^{1, 2} , Do Hwan Kim ¹
	¹ Hanyang University, Korea, ² Chinese Academy of Sciences, China
3-3109	High-K Polymer Gate Dielectrics for Flexible Device Applications
16:15-16:30	SeongCheol Jang , Hyun-suk Kim
	<i>Chungnam National University, Korea</i>

Flexible/Stretchable Materials for Wearable Electronics 1

NOV 08 (Tue) | Tamna (8F)

CHAIR	Hyunjung Yi (Korea Institute of Science and Technology, Korea)
3-0206	Biomimetic Approaches with Stretchable Ionics
16:50-17:20	Jeong-Yun Sun
INVITED	Seoul National University, Korea
3-4072	Towards Sustainable and Autonomous Healing Soft Sensing Devices
17:20-17:50	Benjamin Tee
INVITED	National University of Singapore, Singapore
3-1161	Ionotronic Light-emitting Fibers Toward Robust Electronic Textile
17:50-18:05	Kihyon Hong ¹ , Seonjeong Lee ^{1,2} , Han Ju Lee ¹ , Keun Hyung Lee ³
	¹ Chungnam National University, Korea, ² Korea Research Institute of Chemical Technology, Korea, ³ Inha University, Korea
3-0549	Polymer Semiconductor/Elastomer Blends for Stretchable Light-emitting Diodes
18:05-18:20	Kun-Hoo Jeon , Jin-Woo Park
	Yonsei University, Korea

Wearable and Stretchable Devices for Mobile and Healthcare Applications

NOV 09 (Wed) | Tamna (8F)

CHAIR	Dae-Hyeong Kim (Seoul National University, Korea)
3-0329	Deformable Artificial Skins and Healthcare Sensors
10:10-10:35	Unyong Jeong , Taeyoung Kim, Joosung Oh
INVITED	Pohang University of Science and Technology, Korea
3-0965	Artificial Sense Technology
10:35-11:00	Xiaodong Chen
INVITED	Nanyang Technological University, Singapore
3-0171	Advanced Bandpass Filter for Signal-to-Noise Ratio Data in Wearable Electronics
11:00-11:25	Tae-il Kim
INVITED	Sungkyunkwan University, Korea

3-0427	Ultra-thin and Lightweight Organic Amplifier Enabling Bio-signal Monitoring with Reduced Noise Levels
11:25-11:50	Tsuayoshi Sekitani
INVITED	Osaka University, Japan
3-3250	Highly Stretchable Strain Sensor Prepared by EGaIn Liquid Metal Microchannels with EcoFlex Silicone Substrate
11:50-12:05	Soaram Kim ¹ , Byungseok Yoo ²
	¹ US Army Research Laboratory, USA, ² University of Maryland, USA
3-1509	Wearable Transcutaneous Oxygen Sensor for Early Diseases Diagnosis
12:05-12:20	Chang-Jin Lim ^{1,2} , Ross E. Triambulo ^{1,2} , Junwoo Jeon ² , Hyekeyong Pae ¹ , Youji Kim ¹ , Sejung Park ¹ , Jin-Woo Park ^{1,2}
	¹ Asen Company, Korea, ² Yonsei University, Korea
3-1531	Ion-gel Gated Organic Transistors for Next-Generation Affinity-based Biosensors
12:20-12:35	Dae-Gyo Seo ¹ , Jayoung Kim ^{2,3} , Zhenan Bao ² , Tae-Woo Lee ¹
	¹ Seoul National University, Korea, ² Stanford University, USA, ³ Yonsei University, Korea
3-2981	Laser-Processed Stretchable-Gradient Interface for Wearable Body Temperature Monitoring
12:35-12:50	Sunju Kang , Sunkook Kim
	Sungkyunkwan University, Korea
3-1054	Flexible, 3-dimensional Neural Recording Device for Simultaneous Measurement of Real-time Electrophysiological Signal at Both Surface and Intracortical Area of the Brain
12:50-13:05	Ju Young Lee , Sang Hoon Park, Young Uk Cho, Jeong eun Ju, Ki Jun Yu
	Yonsei University, Korea

Flexible/Stretchable Materials for Wearable Electronics 2

NOV 09 (Wed) | Tamna (8F)

CHAIR	Donghee Son (Sungkyunkwan University, Korea)
3-0735	Gold Nanowire-based Electronic Skins and Tattoos
14:30-15:00	Wenlong Cheng
INVITED	Monash University, Australia
3-2216	Thiochromenocarbazole Imide: A New Organic Dye with First Utility in Large Area, Flexible Electroluminescent Devices
15:00-15:15	Pierre Josse ¹ , José María Andrés Castán ¹ , Amruth C ² , Laura Abad Galán ³ , Pablo Simón Marqués ¹ , Magali Allain ¹ , Olivier Maury ³ , Tangui Le Bahers ³ , Philippe Blanchard ¹ , Cyrille Monnereau ³ , Gregory Welch ² , Clément Cabanetos ^{1,4}
	¹ University of Angers, France, ² University of Calgary, Canada, ³ Université Claude Bernard Lyon 1, France, ⁴ Yonsei University, Korea

- 3-1551** Self-powered Perovskite Solar Mini-Module System for Wearable Smart Fashion
15:15-15:30 [Son Singh](#)¹, Jae-Hun Kim¹, Sung Hyon Kim¹, Hyungseung Lee², Sung-Min Lee¹, Kyeong Sik Min¹, Jaegab Lee¹
¹Kookmin University, Korea, ²Incheon National University, Korea
- 3-2926** Fabrication of a Hand-Gesture Sensor for Sign Language Detection Using BaTiO₃-PDMS Composite
15:30-15:45 [Frances Danielle Fernandez](#), Laudimer Tye Tan, Jihoon Kim
Kongju National University, Korea
- 3-1002** Ultrahigh Sensitive Au-Doped Silicon Nanomembrane Based Wearable Sensor Arrays for Continuous Skin Temperature Monitoring with High Precision
15:45-16:00 [Mingyu Sang](#), Kyowon Kang, Ki Jun Yu
Yonsei University, Korea
- 3-3027** Interfacial Behavior of Liquid Metal and Its Solvent-Assisted Filling and Selective Dewetting for Layer-Structured 3D Interconnect and via for Stretchable Electronics
16:00-16:15 [Woojin Jung](#), Tae-il Kim
Sungkyunkwan University, Korea

Flexible/Stretchable Materials for Wearable Electronics 3

NOV 09 (Wed) | Tamna (8F)

- CHAIR** Hyunjung Yi (Korea Institute of Science and Technology, Korea)
- 3-2131** Soft Electronic Skin and Epineurium for Strain-Durable Bioelectronics
16:50-17:20 [Donghee Son](#)
INVITED Sungkyunkwan University, Korea
- 3-0556** Host, Dopant, and Additive Blending System for Intrinsically Stretchable Phosphorescence Organic Light-emitting Diode
17:20-17:35 [Je-Heon Oh](#), Jin-Woo Park
Yonsei University, Korea
- 3-2165** Electrospinning of Metal Oxide Nanofibers for Flexible Electronics
17:35-17:50 [Tan Tan Bui](#), Myung-Gil Kim
Sungkyunkwan University, Korea
- 3-0911** Transfer of TiO₂ Nanorod for Cs₂AgBiBr₆ Flexible Optoelectronic Device
17:50-18:05 [JuYun Ha](#), Dohyun Kim, Uijin Jung, Wenhu Shen, Jinsub Park
Hanyang University, Korea
- 3-1873** Surfactant-assisted Fabrication of N-type Hybrid Thermoelectric Fiber Using Wet-Spinning
18:05-18:20 [Da-hye Kim](#)¹, Seungik Shin¹, Seong-jae Jeon², Seungwoo Han²
¹University of Science and Technology, Korea, ²Korea Institute of Machinery and Materials, Korea

03. Sensors and Energy Harvesting for Wearable Healthcare Devices

Piezoelectric, Triboelectric and Hybrid Energy Harvesting Materials and Systems

18:30-19:30, NOV 07 (Mon) | Lobby (8F)

- CHAIR** Ju-Hyuck Lee (Daegu Gyeongbuk Institute of Science and Technology, Korea)
- 3-0538** Biowaste Derived Green Energy Hybrid System Using Rice Straw for Low Power Electronics
[Asokan Poorani Sathya Prasanna](#), A Monunith, Nagamalleswara Rao Alluri, Sang-Jae Kim
Jeju National University, Korea
- 3-0724** Electrical Characteristics of a Triboelectric Transistor Driven by a Rotating Wheel-Gate
[Hyunji Shin](#)¹, Xue Zhang², Dae Yu Kim¹
¹Inha University, Korea, ²Shandong University of Science and Technology, China
- 3-0738** Control Biodegradability of Diphenylalanine Nanotube by Using Porphyrin
[Yerin Kim](#), Hyojin Park, Yuseok Kim, Ju-Hyuck Lee
Daegu Gyeongbuk Institute of Science and Technology, Korea
- 3-0754** Introducing the Tuning of Triboelectric Property of PVDF from Negative to Positive by Grafting the Molecule Using ATRP Protocol
[Tapas Kamilya](#)¹, Jinhyoung Park¹, Somobrata Acharya²
¹Korea University of Technology and Education, Korea, ²Indian Association for the Cultivation of Science, India
- 3-0898** Enhanced Energy Storage and Electrical Performances of Nd₂O₃-modified Bi_{0.425}-xNd_xNa_{0.375}Sr_{0.175}TiO₃ Lead-free Ceramics
[Kamonporn Saenkam](#), Pharatree Jaita, Gobwute Rujijanagul
Chiang Mai University, Thailand
- 3-0954** Investigation of the Effects of Synthesis Route on Energy Storage Properties of Modified BNKT – BMN Lead-free Ceramics
[Lalita Tawee](#)¹, Narongdetch Boothrawong¹, Suwanan Thammarong², Pharatree Jaita¹, Gobwute Rujijanagul¹
¹Chiang Mai University, Thailand, ²Dalian University of Technology, China
- 3-1037** High Transparent Silk Fibroin-based Bio-triboelectric Nanogenerator Using Spin Coating Process
[Jongyun Choi](#), Taehun Kim, Jeong-Hyeon Kim, Kyungtaek Min, Sung-Nam Lee
Tech University of Korea, Korea

- 3-1128** Self-Powered and Flexible ZnO-based Ultraviolet Photodetector Utilizing Piezo-Phototronic Effect
Thi My Huyen Nguyen, Chung Wung Bark
Gachon University, Korea
- 3-1218** Reinforced Power Output from Triboelectric Nanogenerator with Auto-Switch Powered by Wind via Spark Charge
Hyunseo Park, Sungho Ji, Jaehee Shin, Jeongmin Lee, Jinhyoung Park
Korea University of Technology and Education, Korea
- 3-1339** Self-powered Finger Motion-Sensing Structural Color Display
Taebin Kim, Jae Won Lee, Cheolmin Park
Yonsei University, Korea
- 3-1454** High-sensitivity Piezoelectric Sensor Based on ZnO Nanorods-CNT Sheets Junction for Energy Harvesting Device Applications
Ji Min Lee, A Young Lee, Ye Ji Han, Hyun Jae Kim, Tae Wan Noh, Ho Seong Kim, Hui Jun Ahn, Dong Gyu Lee, Seung Won Lee, Jun Hyeok Choi, Yoomi Kang, Seung-Eon Ahn
Tech University of Korea, Korea
- 3-1508** Enhanced Performance of Triboelectric Nanogenerator and Tactile Sensor by Synthesizing High Dielectric
Jeongeun Kim, Hyosik Park, Ju-Hyuck Lee
Daegu Gyeongbuk Institute of Science and Technology, Korea
- 3-1767** Sustainable Hybrid Energy Film for the Piezo – tribo Hybrid System and Self-powered Sensors
Monunith Anithkumar, Prasanna Asokan Poorani Sathya, Nagamalleswara Rao Alluri, Sang-Jae Kim
Jeju National University, Korea
- 3-1788** A High-Performance Triboelectric Nanogenerator with Charge Trapping Layer for Self-Powered Sensor Applications
Kumar Shrestha, Sanghyun Lee, Jae Yeong Park
Kwangwoon University, Korea
- 3-1978** Zeolite Imidazole Framework for Triboelectric Energy Harvesting and Self-powered Robotics Applications
Sugato Hajra, Hoe Joon Kim
Daegu Gyeongbuk Institute of Science and Technology, Korea
- 3-2542** Implantable, Modulus-tunable HEMA-based Triboelectric Nanogenerator to Maximize Ultrasound Transmission
Bosung Kim, Hong-Joon Yoon, Sang-Woo Kim
Sungkyunkwan University, Korea
- 3-2694** Self-powered Cardiac Pacemaker System via Triboelectric Nanogenerators
Hyeon Yeong Lee¹, Hanjun Ryu², Hyun-moon Park³, Sang-Woo Kim¹
¹Sungkyunkwan University, Korea, ²Chung-Ang University, Korea, ³Energy-Mining Ltd., Korea

- 3-2847** Effect of Growth Temperature on the Piezoelectric Properties of ZnO Films Grown on Flexible Substrate Using Atomic Layer Deposition
Hye Jin Lee, Tae In Kim, Sung Jun Park, Yu Bin Kim, Hee Ju Jeon, Jongyun Choi, Sung-Nam Lee
Tech University of Korea, Korea
- 3-2849** Ultrahigh Performance from a Serrated-electrode Triboelectric Nanogenerator via Spark Discharge
Inah Hyun, Jihye Kim, Sang-Woo Kim
Sungkyunkwan University, Korea
- 3-3085** Self-powered Pathogen Control Systems by Triboelectric Energy Harvesting
Young-Jun Kim, Sang-Woo Kim
Sungkyunkwan University, Korea
- 3-3385** Conductive Coaxial Fibrous Mats for Hybrid Nanogenerator
Jin Seok Kim, Da Won Ahn, Jin Hyun Choe, Eun Su Jung, Sung Gyu Pyo
Chung-Ang University, Korea
- 3-3445** Mechanical and Piezoelectric Characterization of Electrospun P(VDF-TrFE) Fibers and Yarns Doped with Inorganic Ferroelectrics for Self-powered Sensing Applications
Ziyue Yang, Dabin Kim, Miso Kim
Sungkyunkwan University, Korea
- 3-3474** Underwater Acoustic Focusing with Gradient-index Lens
Seong-Jin Lee¹, Gunn Hwang², Miso Kim¹
¹Sungkyunkwan University, Korea, ²Electronics and Telecommunications Research Institute, Korea
- 3-3478** Effect of Dispersant on 3D Printed Lead-free Piezoelectric Ceramics for Energy Harvesting and Sensing Applications
Dongsu Lee, Hyungyong Kim, Seong-Jin Lee, Jongwoo Park, Jiyong Jung, Miso Kim
Sungkyunkwan University, Korea
- 3-4000** PZT Based Piezoelectric Micro-cantilever Sensor and Its Application on NO₂ Gas Detection by Resonance Frequency
Yeonje Lee, Su Jeong Suh, Jae Chul Ro
Sungkyunkwan University, Korea
- 3-4170** Wearable Sensors with the Multi Local Strain Using 3D Textile Structure for Detecting Human Body Signals
Yujinag Cho, Seongcheol Ahn, Il-Doo Kim
Korea Advanced Institute of Science and Technology, Korea
- 3-4175** MAPbI₃/PVDF-TrFE Composite Layer with Improved Surface Charge Density for Triboelectric Nanogenerators by Light
Minje Kim, Sol Lee, Chang Geun Kim, Viet Anh Cao, Junghyo Nah
Chungnam National University, Korea

3-4248 Deep Learning-based Flexible Piezoelectric Acoustic Sensors with Noise-robust Voice Coverage for Speech Processing
[Jae Hee Lee](#), Young Hoon Jung, Keon Jae Lee
 Korea Advanced Institute of Science and Technology, Korea

Flexible/Stretchable Materials for Wearable Electronics

16:50-18:20, NOV 08 (Tue) | Lobby (8F)

CHAIR Jin-Woo Park (Yonsei University, Korea)

3-0379 Local Visualization of the External Pressure by Integrating the Resistive Pressure Sensor and Thermochromic Panel
[Eohjin Kim](#), Gwangmook Kim, Wooyoung Shim
 Yonsei University, Korea

3-0563 Shape-Reconfigurable Aluminum-Air Batteries with High Energy Density
[Hong Choi](#), Gwangmook Kim, Jooho Moon, Wooyoung Shim
 Yonsei University, Korea

3-0603 Capacitive Pressure Sensors Using Paper to Control Surface Roughness
[Bokyeong Kim](#), Wooyoung Shim
 Yonsei University, Korea

3-0626 Transparent Capacitive Pressure Sensor with Nanoparticle Embedded Micro-surface
[YoungJun Cho](#), GwangMook Kim, TaeHoon Kim, WooYoung Shim
 Yonsei University, Korea

3-0634 Pressure Sensing Using Transparent Tunable Plasma Frequency Organic Electrodes
[Jihun Yeom](#)¹, Taehoon Kim¹, Gwangmook Kim¹, Wooyoung Shim^{1,2}
¹Yonsei University, Korea, ²Northwestern University, USA

3-0707 Effects of Bismuth Doping on the Properties of CuO_x Thin Films
[Sangwoo Lee](#), Minsoo Kang, Byung Seong Bae, Eui-Jung Yun
 Hoseo University, Korea

3-0747 Enhancement of the Bonding Characteristics of the PEI Interlayer for a Two-substrates OLED
 Cheol-Hee Moon¹, [Yeon-Wook You](#)¹, Chang-Min Yoon¹, Jun-Woo Jeong²
¹Hoseo University, Korea, ²Cinos engineering, Korea

3-0805 Fabrication of Self-healing Ion Gels and Their Application in Strain Sensors
[Minjun Kim](#), Yeonbae Lee, Sangwon Kim
 Inha University, Korea

3-0977 Development of a Film Fabrication Process Consisting of Semi-embedded Conductive Fibers for High-performance Flexible Transparent Electrodes
[Soie Yu](#), Hwan-Jin Jeon
 Tech University of Korea, Korea

3-1413 Electrical Impedance Tomography Based Intrinsically Stretchable Thin Film Tactile Sensor
[Kyubeen Kim](#), Jung-Hoon Hong, Ki Jun Yu
 Yonsei University, Korea

3-1622 Structural, Physical, Electrical Properties W Doped TiO2 Thin Films by Spray Coating Method for the Gas Sensor Application
[Yong Seob Park](#)
 Chosun College of Science and Technology, Korea

3-1846 Flexible Force Sensitive Resistor Based on Carbon Nanotubes
[Eun Ae Shin](#), Jeyoung Jung, Chang Kee Lee
 Korea Institute of Industrial Technology, Korea

3-1870 Fully Transparent and Ultra-sensitive Coplanar Gate Field-Effect Transistor Type Biosensor on Flexible Polyimide Substrates
[Tae-Hwan Hyun](#), Won-Ju Cho
 Kwangwoon University, Korea

3-1940 Pressure Sensor Insensitive to Stretching and Bending Force
[Wooseok Kim](#), Jihwan Kim, Sang Min Won
 Sungkyunkwan University, Korea

3-2154 Development of a Chemically Modified Flexible Membrane for an Electroosmotic Pump and Its Application in Wearable/Disposable Drug Delivery Systems
[JaeHong Kim](#), Mi Hyun Lee, Young Wook Jang, Chang Jung Kim
 EOFLOW Co., Ltd., Korea

3-2156 Study on the Application of Carbon Fabric-based Flexible Heater and Sensor by Staple Fiber Recycling
[Chil-Hyoung Lee](#), Eun Mi Kim, Taewon Ha, Dae Yun Lim, Gi Seok Heo, Young Baek Kim
 Korea Institute of Industrial Technology, Korea

3-2309 Influence of Deposition Temperature on Physical and Electrochemical Properties of Nanostructured Cobalt Oxide Electrodes
[Snehal Kadam](#)^{1,2}, Rahul Ingole³, Nidhi Tiwari², Eun Soo Park¹, Shrinivas Kulkarni²
¹Seoul National University, Korea, ²The Institute of Science, Mumbai, India, ³Punyashlok Ahilyadevi Holkar Solapur University, India

3-2359 High-performance Wearable Transparent Heaters Comprising a Planar Cu Layer
[Jaeun Lim](#), Doocho Choi
 Dong-Eui University, Korea

3-2387

A Study on Manufacturing and Multi-functional Characteristics of Nano-cellulose/graphene Flake Hybrid Nanofibers

[Chil-Hyoung Lee](#), Taewon Ha, Dae Yun Lim, Young Baek Kim, Eun Mi Kim
Korea Institute of Industrial Technology, Korea

3-2431

Antimicrobial and Hydrophobic ZnO–PTFE Composite Films for Display Coating and High-sensitivity Touch Sensor Applications

[Swathi Jppili](#), Venkatraju Jella, Soon-Gil Yoon
Chungnam National University, Korea

3-2730

Solution Processible UV Photodetector Using Complex of ZnO Nanoparticles Embedded in Polymer as an Active Layer

[Sanghoon Jung](#), Byoungho Kang, Jaesung Lee, Sehyuk Yeom, Wanghoon Lee
Gumi Electronics and Information Technology Research Institute, Korea

3-2787

Tailored Graphene Micropatterns by Wafer-Scale Direct Transfer for Flexible Chemical Sensor Platform

[Seungsoo Kim](#), Ho Won Jang
Seoul National University, Korea

3-3008

Wearable and Knittable Gas Sensors Employing MoS₂, rGO-covered CFs Embellished with Metal Catalysts for Improved Selectivity

[Hyuk Jin Kim](#), Chung Won Lee, Ho Won Jang
Seoul National University, Korea

3-3024

Suppression of Leakage Currents in Photo-Multiplication Photodetector Based Oxidation Controlled Metal Interfacial Layer

[Seong-Bin Lim](#)¹, Ji-Young Lee¹, Tae-Hun Lim¹, Gyu-Min Kim², Se-Young Oh¹
¹*Sogang University, Korea*, ²*Hankyong National University, Korea*

3-3045

Uniform Seed-Mediated Growth of Gold Nanocrystals on Carbon Nanofibers and for the Fabrication of a Flexible Substrate Toward SERS-based Multiplex Detection of Volatile Organic Compounds

[Jaewan Ahn](#), Il-Doo Kim
Korea Advanced Institute of Science and Technology, Korea

3-3051

A Study on the Characteristics of ZnCdO Thin Films Synthesized by Sol-gel Method

[Nayoung Wi](#), Hyo Jin Bang, Seung Woo Baek, Nak Won Jang, Hyung Soo Ahn, Hong Seung Kim
Korea Maritime and Ocean University, Korea

3-3058

Ion-Doped Gelatin Hydrogel-based Mechanical Stimuli-perceptible Sensor Using Switchable Ionic Polarization

[So-Hee Kim](#), Hong-Joon Yoon, Dong-Min Lee, Sang-Woo Kim
Sungkyunkwan University, Korea

3-3547

Skin-compatible Strain Sensor without an Adhesive Layer for Pulse Monitoring

Changhun Hong¹, [Minji Jeon](#)^{1,2}, Kunyun Kim¹
¹*Korea Electronics Technology Institute, Korea*, ²*Korea University, Korea*

3-3836

Printable Elastic Conductor with High Conductivity and Controllable Impedance for Textile Electronics

[Sun Hong Kim](#), Yei Hwan Jung
Hanyang University, Korea

3-3896

Ionically Conductive 3-Dimensional Polymer Electrolytes Based on Semi-crystalline Homopolymers for Stretchable Strain Sensors

[Minsu Kim](#)¹, Jeong-hui Kim², Keun Hyung Lee¹
¹*Inha University, Korea*, ²*Korea Institute of Science and Technology, Korea*

3-3900

Highly Flexible, Elastic, Electrically Stable, and 3D Printable Solid Polymer Electrolyte for Motion Monitoring Ionic Skins

[Chae Yoon Lee](#), Dong Hyeon Park, Min Su Kim, Keun Hyung Lee
Inha University, Korea

3-4132

Ultra Thin Glass Cover Window UV Coating Process Optimization and Performance Evaluation to UTG Impact Resistance

[Jae Soung Park](#), Doyun Hwang
Gumi Electronics and Information Technology Research Institute, Korea

3-4140

A Study for Flexible and Wearables Display Cover Windows UTG (Ultra Thin Glass) Manufacturing Characteristics

[Doyun Hwang](#), Jae Soung Park
Gumi Electronics and Information Technology Research Institute, Korea

3-4344

Ultrasensitive Capacitive Tactile Sensor with the Hetero-structured Dielectric and Electrode Layers for Signal Perception Application

[Hongsen Niu](#)¹, Shan Yang¹, Eun-Seong Kim^{1,2}, Nam-Young Kim¹
¹*Kwangwoon University, Korea*, ²*WAVEPIA Co., Ltd., Korea*

Soft, Wearable, and Neuromorphic Electronics for Human Interfacing

16:50-18:20, NOV 08 (Tue) | Lobby (8F)

CHAIR

Do Hwan Kim (Hanyang University, Korea)

3-0135

Direct Photo-patternable Elastic Polymer Network Electrolytes for Highly Integrated Ion-driven Electronics

[Ukjin Jeong](#)¹, Wanho Cho², Hyukmin Kweon¹, Seokran Choi¹, Borina Ha¹, Jiyeon Ha¹, Bongsoo Kim², Do Hwan Kim¹
¹*Hanyang University, Korea*, ²*Ulsan National Institute of Science and Technology, Korea*

- 3-0890** An Artificial Synaptic Pressure Sensor for In-Memory Tactition
Huynh Hung Quang, Tran Quang Trung, Lee Nae-Eung
Sungkyunkwan University, Korea
- 3-2063** Nanofiber Channel Organic Electrochemical Transistors for Low-Power Neuromorphic Computing and Wide-Bandwidth Sensing Platforms
SeungHyun Oh, SolKyu Lee, Youngchang Joo
Seoul National University, Korea
- 3-2349** Non von Neumann Multi-Input Spike Signal Processing Enabled by an Artificial Synaptic Multiplexer
Dong Gue Roe, Dong Hae Ho, Jeong Ho Cho
Yonsei University, Korea
- 3-2370** Risk-Perceptual and Feedback-Controlled Response System Based on NO₂-Detecting Artificial Sensory Synapse
Seonkwon Kim¹, Chuan Qian², Yongsuk Choi³, Jeong Ho Cho¹
¹Yonsei University, Korea, ²Hunan Normal University, China, ³California Institute of Technology, USA
- 3-2386** Low-Voltage Wearable Electroluminescent Devices for Sound-in-Display Electronics
Hyejin Lee, Dong-hee Kang, Hyunhyub Ko
Ulsan National Institute of Science and Technology, Korea
- 3-2413** Electrically Super Stable Liquid-Metal Based Kirigami Electrode (LMKE) for Stretchable Electronics
Hyesu Choi, Tae-il Kim
Sungkyunkwan University, Korea
- 3-2439** MXene Composites for Flexible Thermoacoustic and Piezoelectric Devices
Jinyoung Kim¹, Geonyoung Jeong¹, Moonjeong Jang², Ki-Seok An², Hyunhyub Ko¹
¹Ulsan National Institute of Science and Technology, Korea, ²Korea Research Institute of Chemical Technology, Korea
- 3-2452** Frequency-selective Acoustic and Haptic Smart Skin for Dual-mode Dynamic/Static Human–Machine Interface
Dong-hee Kang, Hyunhyub Ko, Jonghwa Park, Jinyoung Kim
Ulsan National Institute of Science and Technology, Korea
- 3-2453** Fabrication of Conductive Hydrogels by Reconstructing Conducting Polymer Using the Laser Process
Daeyeon Won, Seung Hwan Ko
Seoul National University, Korea
- 3-2513** Full Sign-language Translation Smart Glove by Auxetic-interlaced Yarn Sensor Array and Deep Learning
Ronghui Wu¹, Sangjin Seo¹, Liyun Ma², Juyeol Bae¹, Taesung Kim¹
¹Ulsan National Institute of Science and Technology, Korea, ²Donghua University, China

- 3-2533** Enhanced Performance of Wearable Thermoelectric Device in a Subaqueous Environment
Yeongju Jung, Seung Hwan Ko
Seoul National University, Korea
- 3-2537** Multi-Layered Triboelectric Nanogenerator with Multiple Spikes for an Artificial Synaptic Device
Yong-Jin Park, Yun Goo Ro, Sangyun Na, Yoojin Chang, Hyunhyub Ko
Ulsan National Institute of Science and Technology, Korea
- 3-2679** Deformable and Covalently Bonded Interpenetrating Polymer Networks Transistor for Foldable Electronics
Seokran Choi, Hyukmin Kweon, Ukjin Jeong, Borina Ha, Jiyeon Ha, Do Hwan Kim
Hanyang University, Korea
- 3-2725** Synaptic Tactile Memory Transistor Based on Mechano-modulated Ion Dynamics
Hyukmin Kweon¹, Joo Sung Kim¹, Seongchan Kim², Haisu Kang³, Dong Jun Kim¹, Hanbin Choi¹, Seung Geol Lee³, Jeong Ho Cho², Do Hwan Kim¹
¹Hanyang University, Korea, ²Yonsei University, Korea, ³Pusan National University, Korea
- 3-2872** Nitrogen Dioxide Detecting Artificial Chemo-Neural Synapse Based on Semiconducting Polymer Gel Networks
Dong Jun Kim, Do Hwan Kim, Hyukmin Kweon, Joon-Seok Lee, Seon-Jin Choi
Hanyang University, Korea
- 3-2996** Piezo-Driven Ion Dynamics in Tissue-Adaptive Bionogel for In-Vivo Mechanical Biosignal Acquisition System
Jihong Kim, Do Hwan Kim, Joo Sung Kim, Hanbin Choi, Dong Jun Kim, Bokyoung Kim
Hanyang University, Korea
- 3-3626** Response Polarity Tailored MOX-based p-n Heterojunction Gas Sensors for Enhancing Selectivity
Hyeonwoong Hwang, Jong Kyu Kim
Pohang University of Science and Technology, Korea
- 3-3980** Electrolyte-Gated Carbon Nanotube Transistors for Soft Electronics with Vertical Integration
Haksoo Jung, Jimin Kwon, Seongmin Heo, Yong-Young Noh
Pohang University of Science and Technology, Korea
- 3-4014** Solution-Processed 2D Indium Selenide by Electrochemical Exfoliation
Gwon Byeon, Haksoo Jung, Yong-Young Noh
Pohang University of Science and Technology, Korea
- 3-4340** A Virtual Reality-induced Digital Biomarker Between Healthy Elders, Mild Cognitive Impairment, and Alzheimer's Disease Patients Using Graph Theory Analysis with Electroencephalography
Shan Yang¹, Zhi Ji Wang^{1,2}, Hongsen Niu¹, Eun-Seong Kim^{1,3}, Nam-Young Kim¹
¹Kwangwoon University, Korea, ²Severance Children's Hospital, Korea, ³WAVEPIA Co., Ltd., Korea

Wearable and Stretchable Devices for Mobile and Healthcare Applications

14:00-15:00, NOV 09 (Wed) | Lobby (8F)

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

- 3-0499** Patch-Type Glucose Sensor Based on Self-Charging Supercapacitor
Hye-Jun Kil, Jin-Woo Park
Yonsei University, Korea
- 3-0514** Wearable Decubitus Ulcer Sensor for Early Detection
Seung-Rok Kim¹, Soyeon Lee¹, Jihee Kim², Eunbin Kim², Hye-Jun Kil¹, Ju-Hyun Yoo¹, Je-Heon Oh¹, Jiwan Jeon¹, Ey-In Lee¹, Jun-Woo Jeon¹, Kun-Hoo Jeon¹, Ju Hee Lee², Jin-Woo Park¹
¹Yonsei University, Korea, ²Severance Hospital, Korea
- 3-0530** Development of Stretchable Electrodes for Wearables Using Vacuum Thermal Pressure
Hyun Jin Nam^{1,2}, Se-Hoon Park¹
¹Korea Electronics Technology Institute, Korea, ²Seoul National University of Science and Technology, Korea
- 3-0568** Development of Ratiometric Wound pH Sensor Based on Dye-Encapsulated Silica Nanoparticles
Jun-Woo Jeon, Jin-Woo Park
Yonsei University, Korea
- 3-0576** Highly Conformable and Self-adhesive Polyurethane Skin Dry Electrode for Electrophysiological Sensing
Jiwan Jeon, Seung-Rok Kim, Jin-Woo Park
Yonsei University, Korea
- 3-0741** Printing Technology of the Cathode Electrode for All-solution-processed OLEDs
Cheol-Hee Moon, Dong-Heon Yoo, Jun-Yeong Lee
Hoseo University, Korea
- 3-0906** Momentary Ex-solution on Metal Oxide Using Intensive Light-derived Photothermal Effect
Euichul Shin, Il-Doo Kim
Korea Advanced Institute of Science and Technology, Korea
- 3-1001** Fully Implantable, Wireless Optoelectronic Devices for Photodynamic Therapy and Photodynamic Diagnosis
Kiho Kim, Insik Min, Ki Jun Yu
Yonsei University, Korea
- 3-1033** Soft, Fully-implantable Artificial Skin Electronics for Restoration of Nerve Function
Kyowon Kang, Ki Jun Yu
Yonsei University, Korea

- 3-1136** Solar Powered Flexible Electronic System for Wireless Optogenetic Neuromodulations
Jaejin Park, Kyubeen Kim, Tae Soo Kim, Chanwoo Lee, Ki Jun Yu
Yonsei University, Korea
- 3-1478** Inkjet Printing of Al₂O₃ Hybrid Film
Seong Guk Jeong, Dae Ho Yoon
Sungkyunkwan University, Korea
- 3-1497** Minimally Invasive and Biodegradable Fluorescence Based Microneedle for Continuous Glucose Monitoring
Se Lin Lim, Mingyu Sang, Myeongki Cho, Ki Jun Yu
Yonsei University, Korea
- 3-1646** Novel Silent Speech Recognition System Using Piezoresistive Sensors
Taemin Kim, Ki Jun Yu
Yonsei University, Korea
- 3-1987** A Flexible Lead Free Piezoelectric Nanogenerator Based on PDMS-SrTi₂O₅ Composites for Biomechanical Energy Harvesting
Swati Panda, Hoe Joon Kim
Daegu Gyeongbuk Institute of Science and Technology, Korea
- 3-1989** Exceptional NO₂ Sensing Performance with Two Way Photo-carrier Generation: Potential for Wearable Sensing Platform
Minhyun Kim, Seyeon Park, Jaewan Ahn, Il-Doo Kim
Korea Advanced Institute of Science and Technology, Korea
- 3-2012** MOF-Derived Co₃O₄/CoMoO₄ Heterostructure Nanosheets for Enhancing the Detection of Acetone
Lu Song, Il-Doo Kim
Korea Advanced Institute of Science and Technology, Korea
- 3-2189** Low-Voltage-Driven Durable Electroosmotic Pump with Carbon Cloth Supported PANI:PSS Electrodes and Its Application to Wearable Infusion Device
JaeHong Kim, Mi Hyun Lee, Young Wook Chang, Chang Jung Kim
EOFLOW Co., Ltd., Korea
- 3-2230** Electronic Skin with Localized Piezo-resistive Material for Omni-directional Pressure Profiling
Doowon Park, Ig Hyun Lim, Yoonsun Choi, Unyong Jeong, Chae-Eun Shim
Pohang University of Science and Technology, Korea
- 3-2444** Efficient Electroosmotic Actuator for Insulin Delivery System
Mihyun Lee, Jae Hong Kim, Young Wook Chang, Chang Jung Kim
EOFLOW Co., Ltd., Korea
- 3-2502** Development of the Vital Sign and Location Monitoring System
Sehyuk Yeom, Byoungcho Kang, Jaesung Lee, Sanghoon Jung, Wanghoon Lee
Gumi Electronics and Information Technology Research Institute, Korea

3-2612	A Facile Way to Simultaneously Improve Humidity-immunity and Gas Response in Semiconductor Metal Oxide Sensors Youngkyu Jeong <i>Korea Institute of Industrial Technology, Korea</i>
3-3002	Visible Light-activated NO ₂ Gas Sensor Based on 2-dimensional SnS ₂ Nanoflowers Gi Baek Nam , Tae Hoon Eom, Ho Won Jang <i>Seoul National University, Korea</i>
3-3321	Assembly of Microscale LEDs and Injectable Opto-probe Applications Ju Seung Lee , Tae-il Kim <i>Sungkyunkwan University, Korea</i>
3-3533	Flexible Silicon Nanomembrane Gas Sensor Integrated with Bluetooth System Jongwoon Shin , Kyubeen Kim, Insik Min, Ki Jun Yu <i>Yonsei University, Korea</i>
3-3718	Sensitive Taste Sensors Using Graphene Decorated with Metal or Nafion for High Selectivity to Glucose and Ph Chung Won Lee , Ho Won Jang <i>Seoul National University, Korea</i>
3-3750	Characterizations on Environmental-friendly and Multi-layered Flexible Substrates Using Room-temperature Pressing for Sensor Fabrications Min Seok Jeon ¹ , Jae-Hoon Lee ¹ , Jeong-Ryul Kim ² <i>¹Korea Testing Laboratory, Korea, ²ICH Co., Ltd., Korea</i>
3-3906	Highly Sensitive, Flexible, Solution Processable Organic Transistor Sensors Dong Hyeon Park , Chae Yoon Lee, Keun Hyung Lee <i>Inha University, Korea</i>
3-3916	Associating Polymer Network Ionogels Enabling Accurate Motion Monitoring Kyung Gook Cho , Sol An, Myungwoong Kim, Keun Hyung Lee <i>Inha University, Korea</i>
3-3963	Developments of a Non-Enzymatic Glucose Monitoring Microneedle System Hongsik Choi , Heung Seop Yim, Chul Soon Park, SungMin Lee, Yeonkyoung Lee, Joong Hyun Kim <i>KMEDl hub, Korea</i>
3-4227	Ethanol Sensor Based on Bi ₂ O ₃ /ZnO Heterojunction with Cauliflower Nanostructure Wanfeng Xie , Woochul Yang, Muhammad Hilal <i>Dongguk University, Korea</i>

04.Low-dimensional Materials and 2D van der Waals Heterostructures

Synthesis and Integration of Low-dimensional Materials and 2D vdW Heterostructures 1

NOV 07 (Mon) | Ballroom 1 (2F)

CHAIRS	Gwan-Hyoung Lee (Seoul National University, Korea) Chul-Ho Lee (Korea University, Korea)
4-4285 09:20-09:50 KEYNOTE	Epitaxy of Meter-scale Two-dimensional Single Crystals Kaihui Liu <i>Peking University, China</i>
4-0341 09:50-10:20 INVITED	2D Semiconductor Heterostructures for Strong Light-Matter Coupling and Low-Power Electronics Deep Jariwala <i>University of Pennsylvania, USA</i>
4-3743 10:20-10:50 INVITED	Single-Crystalline 2D Semiconductor Growth and Device Technology Xinran Wang <i>Nanjing University, China</i>
4-0506 10:50-11:20 INVITED	Direct Optical Patterning of Low-Dimensional Luminescent Nanomaterials and Devices Himchan Cho <i>Korea Advanced Institute of Science and Technology, Korea</i>
4-3645 11:20-11:35	Direct Conformal Growth of Hexagonal Boron Nitride on High-aspect Ratio Silicon-Based Nano-trenches Jiye Kim , Chang-Won Choi, Seokho Moon, Kyung Yeon Doh, Hokyeeong Jeong, Jaewon Kim, Inyong Hwang, Jaesub Song, Dong-hwa Lee, Si-Young Choi, Jong Kyu Kim <i>Pohang University of Science and Technology, Korea</i>
4-3585 11:35-11:50	Bulk Synthesis of Hyperbolic Metamaterials with Chemical Tunability Eunsil Lee , Muhyeok Jeong, Jong-Young Kim <i>Korea Institute of Ceramic Engineering & Technology, Korea</i>
4-2254 11:50-12:05	An Effective Way to Eliminate Residual Lithium Compounds by Coating a Lithium Ion and Electron Conducting Layer Taehyung Kim ¹ , Chang Woo Lee ¹ , Byung Yong Lee ² <i>¹Kyung Hee University, Korea, ²Soo Kyung Chemical Co., Ltd., Korea</i>

Synthesis and Integration of Low-dimensional Materials and 2D vdW Heterostructures 2

NOV 07 (Mon) | Ballroom 1 (2F)

CHAIRS	Janyup Son (Korea Institute of Science and Technology, Korea) Gwan-Hyoung Lee (Seoul National University, Korea)
4-0401 13:20-13:50 INVITED	Wafer-Scale Growth of Two-Dimensional Transition Metal Dichalcogenides Using Molten Salt Precursors Shisheng Li ^{1,2} <i>¹International Center for Materials Nanoarchitectonics, Japan, ²National Institute for Materials Science, Japan</i>
4-0392 13:50-14:20 INVITED	Toward Large-Scale Production of Single Crystal 2D Materials Jae-Hyun Lee , Ji-Yun Moon, Seung-IL Kim <i>Ajou University, Korea</i>
4-3494 14:20-14:35	In-plane Anisotropy of Graphene by Strong Interlayer Interaction with van der Waals Epitaxially-grown MoO ₃ Hangyel Kim ¹ , Jong-Hun Kim ¹ , Jungcheol Kim ² , Jejune Park ³ , Kwanghee Park ⁴ , Ji-Hwan Baek ¹ , June-Chul Shin ¹ , Sumnin Ryu ⁴ , Young-Woo Son ³ , Hyeonsik Cheong ² , Gwan-Hyoung Lee ¹ <i>¹Seoul National University, Korea, ²Sogang University, Korea, ³Korea Institute for Advanced Study, Korea, ⁴Pohang University of Science and Technology, Korea</i>
4-3359 14:35-14:50	Synthesis of Ferromagnetic VSe ₂ Thin Films on Si Substrates via a Hybrid Deposition Method Inhyeok Oh ¹ , Jung-Woo Lee ² , Wooyoung Lee ² , Sanghan Lee ¹ <i>¹Gwangju Institute of Science and Technology, Korea, ²Yonsei University, Korea</i>
4-2742 14:50-15:05	Light-Induced Capacitance Tunability of WSe ₂ Thin Films Donghyeon Lee , Sanghan Lee <i>Gwangju Institute of Science and Technology, Korea</i>
4-2487 15:05-15:20	The Effect of Sizing Composition in the Microstructural Architecture of Hierarchically Structured Graphene Nanoplatelets and Glass Fibre Reinforced Polypropylene Rafaela Aguiar , Nello Sansone, Meysam Salari, Patrick Lee <i>University of Toronto, Canada</i>
4-1647 15:20-15:35	Optical and Chemical Sensory Behavior of Catalytic Growth of WSe ₂ Dong Park Lee , ChangHwan Oh, Jung Hong Park <i>Gyeongsang National University, Korea</i>

Fundamental Properties and Nano-characterization of Low-dimensional Materials and 2D vdW Heterostructures 1

NOV 07 (Mon) | Ballroom 1 (2F)

CHAIRS	Chul-Ho Lee (Korea University, Korea) Janyup Son (Korea Institute of Science and Technology, Korea)
4-4290 16:00-16:30 KEYNOTE	Extended van der Waals Materials and Artificial Quantum Solids Xiangfeng Duan <i>University of California, Los Angeles, USA</i>
4-2089 16:30-17:00 INVITED	Straintronics in 2D Material Heterostructures Arend Van der Zande <i>University of Illinois Urbana-Champaign, USA</i>
4-3782 17:00-17:15	Van der Waals Heterostructure of Hexagonal Boron Nitride with an AlGaIn/GaN Epitaxial Wafer for High-Performance Radio-frequency Applications Seokho Moon ¹ , Sung-Jae Chang ² , Youngjae Kim ³ , Odongo Francis Ngome Okello ¹ , Jiye Kim ¹ , Jaewon Kim ¹ , Hyun-Wook Jung ² , Ho-Kyun Ahn ² , Dong-Seok Kim ⁴ , Si-Young Choi ¹ , JaeDong Lee ³ , Jong-Won Lim ² , Jong Kyu Kim ¹ <i>¹Pohang University of Science and Technology, Korea, ²Electronics and Telecommunications Research Institute, Korea, ³Daegu Gyeongbuk Institute of Science and Technology, Korea, ⁴Korea Atomic Energy Research Institute, Korea</i>
4-3019 17:15-17:30	Band Gap Engineering of Bilayer WSe ₂ by Self-assembled Monolayers Noki Lee , Jaichan Lee <i>Sungkyunkwan University, Korea</i>
4-2603 17:30-17:45	Gate-tunable Quantum Pathways of Massless Dirac Fermions in High Harmonic Generation Minjeong Kim , Jonghwan Kim <i>Pohang University of Science and Technology, Korea</i>
4-2476 17:45-18:00	AFM-based 0D, 2D Materials Research Sangmin An <i>Jeonbuk National University, Korea</i>
4-2150 18:00-18:15	Fatigue & Mechanical Reliability of 2D Materials Tobin Filleter <i>University of Toronto, Canada</i>
4-1914 18:15-18:30	Surface Passivation of Layered MoSe ₂ via van der Waals Stacking of Amorphous Hydrocarbon Dohyeon Lee , Junhong Park <i>Gyeongsang National University, Korea</i>

- Fundamental Properties and Nano-characterization of Low-dimensional Materials and 2D vdW Heterostructures 2

- Advanced Applications of Low-dimensional Materials and 2D vdW Heterostructures 1

NOV 08 (Tue) | Ballroom 1 (2F)

CHAIRS	Jonghwan Kim (Pohang University of Science and Technology, Korea) Gwan-Hyoung Lee (Seoul National University, Korea)
4-0928	Moiré Excitons and Correlated States in 2D Materials
10:10-10:40	Hyeonjun Baek
INVITED	<i>Sogang University, Korea</i>
4-0424	Unzipping of Carbon Nanotubes: A Promising Route towards Novel Edge Chemistry with Graphene
10:40-11:10	Joonwon Lim
INVITED	<i>Kyung Hee University, Korea</i>
4-1762	Aggregation-induced Emission of Matrix-free Graphene Quantum Dots via Selective Edge Functionalization
11:10-11:25	Sukki Lee , Jinho Lee, Seokwoo Jeon
	<i>Korea Advanced Institute of Science and Technology, Korea</i>
4-3221	Lattice Strain Induced Biosensing of SARS-CoV-2 Enabled by Quasi-Freestanding Epitaxial Graphene
11:25-11:40	Soaram Kim ¹ , Heeju Ryu ² , Sheldon Tai ³ , Michael Pedowitz ³ , John Robertson Rzasz ³ , Daniel J. Pennachio ⁴ , Jenifer R. Hajzus ⁴ , Donald K. Milton ³ , Rachael Myers-Ward ⁴ , Kevin M. Daniels ³
	¹ US Army Research Laboratory, USA, ² Fred Hutchinson Cancer Research Center, USA, ³ University of Maryland, USA, ⁴ US Naval Research Laboratory, USA
4-2958	High Sensitivity NO ₂ Gas Sensor Using Zig-zag TiO ₂ Nanorods (1D)-BiVO ₄ Nanosheet (2D) Heterojunction
11:40-11:55	Yeonji Yuk , Sanghan Lee
	<i>Gwangju Institute of Science and Technology, Korea</i>
4-2889	Gradient Interphase in Hierarchical Graphene Nanoplatelet and Glass Fiber Hybrid Composites
11:55-12:10	Nello D. Sansone ¹ , Jiyoung Jung ² , Peter Serles ¹ , Tobin Filletter ¹ , Seunghwa Ryu ² , Patrick C. Lee ¹
	¹ University of Toronto, Canada, ² Korea Advanced Institute of Science and Technology, Korea
4-2855	Two-Dimensional Tungsten Diselenide as High-Performance Electrode Material for Electrochemical Energy Storage Device
12:10-12:25	Parthiban Pazhamalai , Vimal Kumar Mariappan, Sang-Jae Kim
	<i>Jeju National University, Korea</i>

Advanced Applications of Low-dimensional Materials and 2D vdW Heterostructures 2

NOV 08 (Tue) | Ballroom 1 (2F)

CHAIRS	Joonwon Lim (Kyung Hee University, Korea) Chul-Ho Lee (Korea University, Korea)
4-1251	Probing Deep-ultraviolet Optoelectronic Processes in Hexagonal Boron Nitride
14:00-14:30	Jonghwan Kim ^{1,2}
INVITED	¹ Pohang University of Science and Technology, Korea, ² Institute for Basic Science, Korea
4-0226	Strained Graphene Optoelectronic Devices for Integrated Quantum Photonics
14:30-15:00	Donguk Nam
INVITED	<i>Nanyang Technological University, Singapore</i>
4-2810	Observation of Defect-driven Resistive Switching Properties in Sb ₂ Se ₃
15:00-15:15	Jiwoong Yang , Sanghan Lee
	<i>Gwangju Institute of Science and Technology, Korea</i>
4-2763	Synthesis of Hollow Nanostructure of TMDs for Gas Sensing
15:15-15:30	Jun-Cheol Park , Sanghan Lee
	<i>Gwangju Institute of Science and Technology, Korea</i>
4-2553	Fabrication of Pressure Conductive Socket Device by Using Disc-shaped Nickel Powders for High Performance Semiconductor Chip Test
15:30-15:45	Reddyprakash Maddipatla ¹ , Daseul Kim ¹ , Jihyeon Youn ¹ , Hyeonji Kang ¹ , Woojung Choi ² , Gyurim Hong ¹ , Chadrsekhar Loka ¹ , Kee-Sen Lee ¹
	¹ Kongju National University, Korea, ² TFE, Inc., Korea
4-2354	High-density Moisture Barrier Fabricated by Consecutive Plasma Oxidation of Partially Coated AL
15:45-16:00	Si Hyeon Joo , Dooho Choi
	<i>Dong-Eui University, Korea</i>

Advanced Applications of Low-dimensional Materials and 2D vdW Heterostructures 3

NOV 09 (Wed) | Ballroom 1 (2F)

CHAIRS	Kibum Kang (Korea Advanced Institute of Science and Technology, Korea) Janyup Son (Korea Institute of Science and Technology, Korea)
4-2213	Tip-Enhanced Cavity-Spectroscopy
10:10-10:40	<u>Kyoung-Duck Park</u>
INVITED	<i>Pohang University of Science and Technology, Korea</i>
4-0166	Solution-Processed Two-Dimensional Nanomaterials for Electronics
10:40-11:10	<u>Joohoon Kang</u>
INVITED	<i>Sungkyunkwan University, Korea</i>
4-2044	MXene-ALD Advanced Materials for Clean and Green Energy
11:10-11:25	<u>Debananda Mohapatra</u> , Yejin Park, Youn-Hye Kim, Soo-Hyun Kim
	<i>Yeungnam University, Korea</i>
4-1724	Van der Waals Schottky Gated MoS ₂ Metal-semiconductor Field-effect Transistor at the Schottky-Mott Limit
11:25-11:40	<u>Yeon Ho Kim</u> ¹ , Wei Jiang ² , Donghun Lee ¹ , Yeonsu Jeong ³ , Jong Chan Kim ⁴ , Woong Huh ¹ , Jae-Pil So ¹ , Jaeho Lee ¹ , Tae Soo Kim ³ , Kibum Kang ⁵ , Hong-Gyu Park ¹ , Hu Young Jeong ⁴ , Seongil Im ³ , Tony Low ² , Chul-Ho Lee ¹
	¹ Korea University, Korea, ² University of Minnesota, USA, ³ Yonsei University, Korea, ⁴ Ulsan National Institute of Science and Technology, Korea, ⁵ Korea Advanced Institute of Science and Technology, Korea
4-1316	High Quality Graphene Quantum Dots on Tin Oxide Nanodomes for Low-temperature Selective NO ₂ Gas Sensing with Ultra-low ppb Level Detection Limit
11:40-11:55	<u>Jinho Lee</u> ¹ , Minsu Park ² , Young Geun Song ³ , Donghwi Cho ⁴ , Young-Seok Shim ⁵ , Seokwoo Jeon ¹
	¹ Korea Advanced Institute of Science and Technology, Korea, ² Northwestern University, USA, ³ Korea Institute of Science and Technology, Korea, ⁴ Korea Research Institute of Chemical Technology, Korea, ⁵ Silla University, Korea
4-0883	Two Dimensional Layered Oxychalcogenides as Advanced Photothermal Materials for Efficient Interfacial Solar Desalination
11:55-12:10	<u>Tatachari Santhanagopalan Shridharan</u> ¹ , Min Je Kang ¹ , Arumugam Sivanantham ¹ , Sungkyu Kim ² , In Sun Cho ¹
	¹ Ajou University, Korea, ² Sejong University, Korea

04.Low-dimensional Materials and 2D van der Waals Heterostructures

Synthesis and Integration of Low-dimensional Materials and 2D vdW Heterostructures

18:30-19:30, NOV 07 (Mon) | Lobby (2F)

CHAIR	Janyup Son (Korea Institute of Science and Technology, Korea)
4-0516	Synthesis of FeAs van der Waals Crystal
	<u>Jongbum Won</u> , Wooyoung Shim
	<i>Yonsei University, Koreain</i>
4-0613	Effect of Two-step Nitrogen Doping on Graphene Oxide-based Materials
	<u>MDSL Wimalananda</u> ¹ , Jae-Kwan Kim ¹ , Ji-Myon Lee ²
	¹ Advanced IT-Convergence Materials Institute, Suncheon National University, Korea, ² Department of Advanced Components and Materials Engineering, Suncheon National University, Korea
4-0685	Influence of Sulfur Concentration and Catalyst Precursor Type in Carbon Nanotube Synthesis using Deep-Injection Floating-Catalyst Chemical Vapor Deposition
	<u>Ji Hong Park</u> ^{1,2} , Seokwoo Jeon ² , Seung Min Kim ¹
	¹ Korea Institute of Science and Technology, Korea, ² Korea Advanced Institute of Science and Technology, Korea
4-0748	A Facile Route on Hydrophilic Si ₃ N ₄ Substrate supported Wrinkle-Free Transfer of 2D-MoS ₂ Films and Its Transistor Device Application
	<u>Seungkwon Hwang</u> ^{1,2} , Se-Hun Kwon ² , Yonghun Kim ¹
	¹ Korea Institute of Materials Science, Korea, ² Pusan National University, Korea
4-0947	Low Temperature Growth of 2D MoS ₂ Thin Films by Plasma-enhanced Atomic Layer Deposition Using a Novel Precursor
	<u>Jeong-Hun Choi</u> , Min-Ji Ha, Dong Geun Kim, Ji-Min Lee, Ji-Hoon Ahn
	<i>Hanyang University, Korea</i>
4-1003	Improved Crystallinity of Graphene Grown on Cu/Ni (111) in Mobile Hot-Wire CVD System
	<u>Myungwoo Choi</u> ¹ , Huije Ryu ² , Hyejeong Lee ³ , Gwanhyoung Lee ² , Hosun Shin ³ , Seokwoo Jeon ¹
	¹ Korea Advanced Institute of Science and Technology, Korea, ² Seoul National University, Korea, ³ Korea Research Institute of Standards and Science, Korea
4-1080	Co@NG Catalyst Derived from Spent Lithium-Ion Batteries for Direct Methanol Fuel Cell
	<u>Keyru Serbara Bejigo</u> , Kousik Bhunia, Sang-Jae Kim
	<i>Jeju National University, Korea</i>

- 4-1249** All Solution-Processed van der Waals Thin-Film Electronics with High Performance and Low-Power Operation
Su-Yeon Joung¹, Haena Yim², Jaehyung Shim¹, Yeon Ho Kim¹, Yoon Seok Kim¹, Jin S. Kim¹, Ji-Won Choi², Chul-Ho Lee¹
¹Korea University, Korea, ²Korea Institute of Science and Technology, Korea
- 4-1425** Substitutional Oxygen Doping Induced Anomalous Optical Properties of CVD Grown MoSe₂
Seong Chul Hong, Yeonjoon Jung, Jaewoong Joo, Gwan-Hyoung Lee
 Seoul National University, Korea
- 4-1450** Low Temperature Synthesis of WSe₂ Assisted by LiCl
Jinwoo Kim, YeonJoon Jung, Gwan-Hyoung Lee
 Seoul National University, Korea
- 4-1477** Ultra-fast Reversible Hydrophobic-to-hydrophilic Transition in a Porous Graphene Foam by High-energy of Microwave-assisted Plasma
Soomin Cheon, Seungsoo Oh
 Pohang University of Science and Technology, Korea
- 4-1479** Van der Waals Epitaxial Growth of One-Dimensional Chalcogen Nanostructure on Two-Dimensional Material Templates
Jaewoong Joo, Yeonjoon Jung, Gwan-Hyoung Lee
 Seoul National University, Korea
- 4-1691** Artificial Nucleation Assisted by Nickel Pre-electrodeposition for High Uniformity and Controllable Fabrication of Copper Nano-objects on AAO (Anodic Aluminum Oxide) Template
Alfi Rodiansyah, Chang Hyun Do, Joonwon Lim
 Kyung Hee University, Korea
- 4-1721** Large-scale Heteroepitaxial Growth of 2D Tungsten Diselenide/Tungsten Disulfide
Suk-Ho Lee, Cheol-hee Han, Moon-Ho Jo
 Pohang University of Science and Technology, Korea
- 4-1744** Kinetics Control of WS₂ Growth on High Miscut Angle Substrate
Hyun Je Cho^{1,2}, Jong Yun Choi^{1,2}, Heonsu Ahn^{1,2}, Gunho Moon^{1,2}, Jaeyoung Kim², Hyunjin Jung², Moon-Ho Jo^{1,2}
¹Pohang University of Science and Technology, Korea, ²Institute for Basic Science, Korea
- 4-1758** Nucleation and Growth of Monolayer MoS₂ by Sulfurization of Faceted MoO₃ Crystals
Yeonjoon Jung, Huiju Ryu, Hangyel Kim, Jaewoong Joo, Seong Chul Hong, Gwan-Hyoung Lee
 Seoul National University, Korea
- 4-1825** Sulfurization of Graphene-Passivated Molybdenum Thin Film into High-Quality MoS₂ by Lateral Diffusion of Sulfur
Dong Hoon Moon, Gwan Hyoung Lee
 Seoul National University, Korea

- 4-1931** Wafer-scale Layer Controlled MoS₂ Synthesis Using Multi-step Metal Organic Chemical Vapor Deposition
Hyun-geun Oh, Donghoon Moon, Gwan-Hyoung Lee
 Seoul National University, Korea
- 4-1972** Synthesis and Characterization of 2D ReS₂
Heewon Park^{1,2}, Yeon-Jeong Jang^{1,2}, Moon-Ho Jo^{1,2}
¹Pohang University of Science and Technology, Korea, ²Institute for Basic Science, Korea
- 4-2028** Van der Waals Epitaxial Growth of Superconductive NbS₂
Jaehong Yoon¹, Heonsu Ahn^{1,2}, Je Wook Park¹, Moon-Ho Jo^{1,2}
¹Institute for Basic Science, Korea, ²Pohang University of Science and Technology, Korea
- 4-2145** Layer-engineered Atomic-scale Spalling of 2D van der Waals Crystals
Jiyun Moon, Seung-Il Kim, Jaehyun Lee
 Ajou University, Korea
- 4-2343** Dependence of Cu Layer Thickness of ZnO/Cu/ZnO Transparent Heaters
Doocho Choi
 Dong-Eui University, Korea
- 4-2653** Investigation of Physical and Chemical Properties of Layered Dirac/Wely Semimetal NiTe₂
Miji Kwon¹, Yeonjin Je¹, Hyeongtae Kim¹, Eunjeung Kim², Junhong Park¹
¹Gyeongsang National University, Korea, ²Lawrence Livermore National Laboratory, USA
- 4-2834** Engineering Schottky Barrier at Metal/Semiconductor Contact via Insertion of WSe₂ Monolayer Interfacial Layer
Suyeon Cho, Junhong Park
 Gyeongsang National University, Korea
- 4-3455** Morphology Engineering of Multilayer MoSe₂ FETs by Two-Step Functionalization
Soobin Shim, Chang Hwan Oh, Jun Hong Park
 Gyeongsang National University, Korea
- 4-3577** Single-crystalline van der Waals Monolayer Films by Uni-directional Vicinal Epitaxy
Heonsu Ahn^{1,2}, Chang-Soo Lee^{1,2}, Gunho Moon^{1,2}, Suk-Ho Lee^{1,2}, Hyun Je Cho^{1,2}, Jong Yun Choi^{1,2}, Dong-Hwan Yang^{1,2}, Jaeyoung Kim², Hyungju Ahn³, Hyunjin Jung^{1,2}, Taeho Kim^{1,2}, Jonghwan Kim^{1,2}, Feng Ding^{2,4}, Si-Young Choi^{1,2}, Moon-Ho Jo^{1,2}
¹Pohang University of Science and Technology, Korea, ²Institute for Basic Science, Korea, ³Pohang Accelerator Laboratory, Korea, ⁴Ulsan National Institute of Science and Technology, Korea
- 4-3593** Room-temperature Detection of Sub-ppm NO₂ with the Layered Structure of 2D Conductive MOF and Porous MOF
Chungseong Park, Il-Doo Kim
 Korea Advanced Institute of Science and Technology, Korea

4-3922 Electrocatalytic Performance for Oxygen Reduction Reaction According to the Production Order of N-doped Reduced Graphene Oxide/Fe₃O₄ Hybrid
Sangjoon Park, Yunseok Shin, Sungjin Park
Inha University, Korea

Fundamental Properties and Nano-characterization of Low-dimensional Materials and 2D vdW Heterostructures

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

CHAIR Jangyup Son (Korea Institute of Science and Technology, Korea)

4-0579 Quantum Transition Properties of Quasi Two Dimensional and Electron-phonon Interacting System in ZnO and CdS
Su-Ho Lee¹, Sang-Hyo Kim¹, He-Rie Park¹, Sek-Min Joo²
¹Dong-A University, Korea, ²Masan University, Korea

4-1074 The Pt-seed-induced Structural Effects to Local Tribological/Electrical/Thermoelectric properties of Two-dimensional PtSe₂
Jong Hun Kim¹, Sang Sub Han², Eunji Ji³, Gwan-Hyoung Lee¹, Yeonwoong Jung², Jeong Young Park⁴
¹Seoul National University, Korea, ²University of Central Florida, USA, ³Yonsei University, Korea, ⁴Korea Advanced Institute of Science and Technology, Korea

4-1216 The Study on the Mechanism of the Chemical Reaction Between XeF₂ and 2D Materials
Subin Shin^{1,2}, Yongjun Shin³, Seokhoon Ahn¹, Sukang Bae¹, Young Min Seo¹, Suklyun Hong⁴, Gwan-Hyoung Lee³, Joonwon Lim², Jangyup Son¹
¹Korea Institute of Science and Technology, Korea, ²Kyung Hee University, Korea, ³Seoul National University, Korea, ⁴Sejong University, Korea

4-1284 Optimization of the Distance Between TiO₂ and Graphene Quantum Dots toward Highly Efficient UV-Visible Photocatalyst
Juyoung An, Sukki Lee, Jinho Lee, Seokwoo Jeon
Korea Advanced Institute of Science and Technology, Korea

4-1347 Electrical Control of Interlayer Excitons in WSe₂/WS₂ Hetero-Bilayers
Taeho Kim, Gyuna Park, Habin Kang, Jonghwan Kim
Pohang University of Science and Technology, Korea

4-1411 Deep-ultraviolet Photoluminescence Excitation Spectroscopy of Hexagonal Boron-nitride Crystals
Sera Yang, Jonghwan Kim
Pohang University of Science and Technology, Korea

4-1602 Multidimensional Architecture of Ti₃C₂T_x MXene Nanosheets Based on Spontaneous Redox Reaction
Chang hyun Do¹, Taeyeong Yun², Gang San Lee³, Geon Gug Yang³, Jin Goo Kim³, Alfi Rodiansyah¹, Sangouk Kim³, Joonwon Lim¹
¹Kyung Hee University, Korea, ²Korea Electronics Technology Institute, Korea, ³Korea Advanced Institute of Science and Technology, Korea

4-1812 Quantum Transport Spectroscopy of van der Waals Semiconductors
Seok Young Min^{1,2}, Gunho Moon^{1,2}, Moon-ho Jo^{1,2}
¹Institute for Basic Science, Korea, ²Pohang University of Science and Technology, Korea

4-1824 Ultrafast Time-resolved Photocurrent Response of Interlayer Exciton in vdW Heterostructures
Ye Won Lee^{1,2}, Soonyoung Cha², Moon-Ho Jo^{1,2}
¹Pohang University of Science and Technology, Korea, ²Institute for Basic Science, Korea

4-1885 Functionalization of Graphene: Effect of Doping and Substrate
HyunJun Kim, HuiJe Ryu, GwanHyoung Lee
Seoul National University, Korea

4-2036 Effects of Stacking Order on Optoelectronic Properties in WSe₂/MoSe₂ Heterobilayers
Hyeong Seok Lee, Ji-Hwan Baek, Gwan-Hyoung Lee
Seoul National University, Korea

4-2217 Van der Waals Epitaxial Recrystallization of Gold Thin Film into Crystallographically Aligned Single Crystals by Encapsulation Annealing
Yunah Lee, Yuneong Chang, Huije Ryu, Miyoung Kim, Gwan Hyoung Lee
Seoul National University, Korea

4-2478 Large-area Graphene Oxide/Carbon Nanotube Composite Membrane for Self-powered Humidity Sensors
Mufarah Amjad^{1,2}, Ilhwan Yu¹, Subin Shin^{1,3}, Chngheon Kim^{1,4}, Joonwon Lim³, Gwan-Hyoung Lee⁴, Yongho Joo^{1,2}, Jangyup Son¹
¹Korea Institute of Science and Technology, Korea, ²University of Science and Technology, Korea, ³Kyung Hee University, Korea, ⁴Seoul National University, Korea

4-3433 Synthesis of Y-doped SnS₂/SnO₂ to Improve Humidity Performance of Gas Sensor
Tae Bin Ha, Jae Chul Ro, Su-Jeong Suh
Sungkyunkwan University, Korea

4-3606 Comparison of Memristors Based on Multi-layer InSe Properties with Different Electrodes
 Eunwoo Jang, Taejin Kim, Myungsoo Kim
Ulsan National Institute of Science and Technology, Korea

4-3928 Transmission Shift Using Symmetric Disorder in Deep-subwavelength Scale
Seunghwa Oh, Xianji Piao, Namkyoo Park
Seoul National University, Korea

Advanced Applications of Low-dimensional Materials and 2D vdW Heterostructures

14:00-15:00, NOV 09 (Wed) | Lobby (2F)

CHAIR	Kibum Kang (Korea Advanced Institute of Science and Technology, Korea)
4-0529	Antireflective Broadband Absorber with Impedance-graded Structure <u>Taehoon Kim</u> , Wooyoung Shim <i>Yonsei University, Korea</i>
4-0672	Halide Perovskite Nanocrystal-Enabled Stabilization of Transition Metal Dichalcogenide Nanosheets and their Image Sensor <u>Hyeokjung Lee</u> , Jin Woo Oh, Jihye Jang, Hayeon Jeong, Hyowon Han, Cheolmin Park <i>Yonsei University, Korea</i>
4-0697	Bandgap Analysis of Transition-Metal Dichalcogenide and Oxide via Machine Learning Approach <u>Upendra Kumar</u> ¹ , Km Arti Mishra ² , Ajay Kushwaha ³ , Sung Beom Cho ¹ ¹ <i>Korea Institute of Ceramic Engineering & Technology, Korea</i> , ² <i>Rama University, India</i> , ³ <i>Indian Institute of Technology Indore, India</i>
4-0798	Synthesis and Properties of P-doped Tellurium Nanoropes and Its Applications <u>Adila Rani</u> , Wanqi Ren, Ho Jin Lee, Min Ji Yu, Seok Hee Hong, Tae Geun Kim <i>Korea University, Korea</i>
4-0942	Control of Photocurrent of CNT-ZnO Nanocomposite-based Ultraviolet Photodetector <u>Jeong-Hyeon Kim</u> , Jongyun Choi, Sung-Nam Lee <i>Tech University of Korea, Korea</i>
4-1076	Multifunctional WSe₂/MoS₂ Heterojunction Devices with Graphene Floating Gates Inserted <u>Changheon Kim</u> ^{1,2} , Junechul Shin ² , Donghyun Kim ^{1,3} , Yunjo Jeong ¹ , Daeyoung Jeon ¹ , Dongsu Lee ¹ , Gwanhyoung Lee ² , Jangyup Son ¹ ¹ <i>Korea Institute of Science and Technology, Korea</i> , ² <i>Seoul National University, Korea</i> , ³ <i>Sungkyunkwan University, Korea</i>
4-1095	High Uniformity Carbon Nanotube-based Heater Using Spin Coating Process <u>Dae-Choul Choi</u> , Ji-Seon Hwang, Jeong-Hyeon Kim, Sung-Nam Lee <i>Tech University of Korea, Korea</i>
4-1117	Two-dimensional Field-Effect Transistors with a Reconfigurable Floating Gate for Logic-in-memory <u>June-Chul Shin</u> , Gwan-hyoung Lee <i>Seoul National University, Korea</i>

4-1121	Fluorinated Graphene Contacts and Passivation Layer for MoS₂ Field Effect Transistors <u>Dong-hyun Kim</u> ^{1,2} , Huije Ryu ³ , Junyoung Kwon ⁴ , Sang Kyu Park ¹ , Wanggon Lee ⁵ , Hyungtak Seo ⁵ , Kenji Watanabe ⁶ , Takashi Taniguchi ⁶ , SunPhil Kim ⁷ , Arend M. van der Zande ⁷ , Jangyup Son ¹ , Gwan-Hyoung Lee ³ ¹ <i>Korea Institute of Science and Technology, Korea</i> , ² <i>Sungkyunkwan University, Korea</i> , ³ <i>Seoul National University, Korea</i> , ⁴ <i>Yonsei University, Korea</i> , ⁵ <i>Ajou University, Korea</i> , ⁶ <i>National Institute for Materials Science, Japan</i> , ⁷ <i>University of Illinois Urbana-Champaign, USA</i>
4-1210	Deep-ultraviolet Electroluminescence in van der Waals Heterostructures of Hexagonal Boron Nitride <u>Yerin Han</u> ^{1,2} , Sangho Yoon ^{1,2} , Su-Beom Song ^{1,2} , So Young Kim ² , Sera Yang ^{1,2} , Seung-Young Seo ^{1,2} , Soonyoung Cha ^{1,2} , Kenji Watanabe ³ , Takashi Taniguchi ³ , Jun Sung Kim ² , Moon-Ho Jo ^{1,2} , Jonghwan Kim ^{1,2} ¹ <i>Institute for Basic Science, Korea</i> , ² <i>Pohang University of Science and Technology, Korea</i> , ³ <i>National Institute for Materials Science, Japan</i>
4-1278	Spatial Modulation of Electrically Generated Exciton Flux in van der Waals Heterostructures <u>Cheolhee Han</u> ^{1,2} , Moon-Ho Jo ^{1,2} ¹ <i>Pohang University of Science and Technology, Korea</i> , ² <i>Institute for Basic Science, Korea</i>
4-1371	Atomistic Synapse Networks on Atomically Thin van der Waals Photo-memtransistors <u>Gunho Moon</u> ^{1,2} , Seok Young Min ^{1,2} , Cheolhee Han ^{1,2} , Suk-Ho Lee ^{1,2} , Heonsu Ahn ^{1,2} , Seung-Young Seo ^{1,2} , Feng Ding ² , Seyoung Kim ¹ , Moon-Ho Jo ^{1,2} ¹ <i>Pohang University of Science and Technology, Korea</i> , ² <i>Institute for Basic Science, Korea</i>
4-1388	Deterministic and Stable Single-photon Emission in Phase-patterned In-plane WSe₂/WOX Quantum Wells <u>Yoon Seok Kim</u> , Jae-Pil So, Seunghoon Yang, Hong-Gyu Park, Chul-Ho Lee <i>Korea University, Korea</i>
4-1419	Tunable Nucleation Morphology of Gold Nanoparticles on Monolayer Fluorinated Graphene <u>Yunjo Jeong</u> ¹ , Sangmin An ² , Jangyup Son ¹ ¹ <i>Korea Institute of Science and Technology, Korea</i> , ² <i>Jeonbuk National University, Korea</i>
4-1549	Photoluminescence Modulation of Monolayer MoS₂ via Functionalization of Substrate <u>Kyungmin Yang</u> ¹ , Eunji Ji ² , Youngbum Kim ³ , June-Chul Shin ¹ , Jin-woo Park ² , Jeongyong Kim ³ , Gwan-Hyoung Lee ¹ ¹ <i>Seoul National University, Korea</i> , ² <i>Yonsei University, Korea</i> , ³ <i>Sungkyunkwan University, Korea</i>
4-1865	Switchable Bulk Photovoltaic Effect in Rhombohedral Transition Metal Dichalcogenides Homobilayers <u>Ji-Hwan Baek</u> , Seong Chul Hong, Yeonjoon Jung, Gwan-Hyoung Lee <i>Seoul National University, Korea</i>
4-1951	Programmable Two-dimensional Field-effect Transistors with Split Floating Gates <u>Hyun Young Choi</u> , June Chul Shin, Gwan Hyoung Lee <i>Seoul National University, Korea</i>

- 4-1965** A Highly Conductive Ultra-exfoliated MXene Composite Film for Flexible Electronics
[Byoung Wan Lee](#), Bongjun Choi, Young-Seok Kim
Korea Electronics Technology Institute, Korea
- 4-1966** MXene-based Transparent Conductive Electrodes for Light-emitting Diodes
[Bongjun Choi](#), Byoung Wan Lee, Young-Seok Kim
Korea Electronics Technology Institute, Korea
- 4-2064** Monolithic Interface Contact Engineering to Boost Optoelectronic Performances of 2D Semiconductor Photovoltaic Heterojunctions
 Seunghoon Yang¹, [Jinyong An](#)¹, Janghwan Cha², Jong Chan Kim³, Woong Huh¹, Donghun Lee¹, Yoon Seok Kim¹, Seong Won Lee¹, Hong-Gyu Park¹, Hu Young Jeong³, Suklyun Hong², Gwan-Hyoung Lee⁴, Chul-Ho Lee¹
¹Korea University, Korea, ²Sejong University, Korea, ³Ulsan National Institute of Science and Technology, Korea, ⁴Seoul National University, Korea
- 4-2195** NO₂ Gas Sensing of TeO₂ Nanowires Deposited with Amorphous Carbon by Flame Carbon Vapor Deposition
[Eun Bi Kim](#), Ka Yoon Shin, Wansik Oum, Dong Jae Yu, Suk Woo Kang, Hyeong Min Kim, Hyoun Woo Kim
Hanyang University, Korea
- 4-2383** Memristive Behavior of WSe₂ Field-effect Transistors on Fluorinated Graphene
[Won Seok Choi](#), June-Chul Shin, Gwan-Hyoung Lee
Seoul National University, Korea
- 4-2392** Addition Effects of Methacrylated Ti₃ C₂ MXene on Physical Properties of Ultraviolet-cured Resins
[SeokHun Shin](#)¹, Baekseo Choi¹, Younghwan Kwon², Yoon Soo Han¹
¹Daegu Catholic University, Korea, ²Daegu University, Korea
- 4-2492** Graphene Via Contact Architecture for Vertical Integration of vdW Heterostructure Devices
[Yongjun Shin](#)¹, Junyoung Kwon², Yeonsu Jeong², Kenji Watanabe³, Takashi Taniguchi³, Seongil Im², Gwan-Hyoung Lee¹
¹Seoul National University, Korea, ²Yonsei University, Korea, ³National Institute for Materials Science, Japan
- 4-2638** Deformable Carbon Atomic Film-based Etching Mask
[Jiwoo Kim](#), Dong Hoon Moon, Gwan-Hyoung Lee
Seoul National University, Korea
- 4-3319** High-performance of Transparent Electrode with a Hybrid Multilayer Structure Using Ag Nanowire and Metal Mesh
[Jin Wook Shin](#), Seung Taek Jo, Chan Woong Kim, In Pyo Lee, Hyesun Yoo, Jong Wook Roh
Kyungpook National University, Korea
- 4-3506** Suppression of Volume Expansion by Graphene Encapsulated Co₃O₄ Quantum Dots for Boosting Lithium Storage
[Young Jae Park](#)¹, Kyu Seung Lee², Jaeho Shim², Seongjun Kim¹, Min-Jae Kang¹, Myungjin Park¹, Hoon-Kyu Shin¹, Yeonho Kim³, Dong Ick Son²
¹Pohang University of Science and Technology, Korea, ²Korea Institute of Science and Technology, Korea, ³Incheon National University, Korea

- 4-3551** Phase Engineered WO₃/WS₂ Heterostructure Towards Supercapacitor Application
[Rajavarman Swaminathan](#), Kesavan Dhanasekar, Swapnil Nardekar, Noor Ul Haq, Sang-Jae Kim
Jeju National University, Korea
- 4-3911** Jacobsen Catalyst Immobilized on N-modified Graphenes as Efficient Electrocatalytic Active Species for Oxygen Reduction Reaction
[Seokhyeon Jeon](#), Dawoon Jang, Sungjin Park
Inha University, Korea
- 4-3924** Generation of Ni-O₄ Active Species on N-doped Graphenes as Electrocatalysts for Oxygen Reduction Reaction
[Juheon Han](#), Dawoon Jang, Sungjin Park
Inha University, Korea
- 4-3926** Production of P, N Co-doped Graphene-based Materials Using Solution Processes and Their Electrocatalytic Performance for Oxygen Reduction Reaction
[Eunyoung Shin](#), Dawoon Jang, Sungjin Park
Inha University, Korea
- 4-4022** Annealing Effect of Molybdenum Disulfide Thin Films Using RF-Sputtering and 355 nm UV Laser
[Yonghyeok Seo](#), Van Tuan Nguyen, Young Woo Kim, Sang Yeon Park, Daeho Lee, Yongmin Jeon, Sang Jik Kwon, Eou-Sik Cho
Gachon University, Korea
- 4-4360** Vacancy-engineered Perovskite Nanosheets for Artificial Synapse
[Haena Yim](#)¹, Chansoo Yoon², Bae Ho Park², Ji-Won Choi¹
¹Korea Institute of Science and Technology, Korea, ²Konkuk University, Korea

05. Emerging Materials for Metaverse Display

Materials and Products for Metaverse Display

NOV 08 (Tue) | Ora (8F)

CHAIRS	Soo Young Kim (Korea University, Korea) Younghoon Kim (Kookmin University, Korea)
5-3464	Geometric Phase Optical Components for Holographic AR System
10:10-10:40	Sung-Wook Min
INVITED	<i>Kyung Hee University, Korea</i>
5-0468	Aerial Display for the Interface in the New Normal
10:40-11:10	Hirotsugu Yamamoto , Kengo Fujii, Masaki Yasugi, Shiro Suyama
INVITED	<i>Utsunomiya University, Japan</i>
5-0282	The Challenges of Light-emitting Devices to Enable VR and AR Displays
11:10-11:40	Jaesang Lee
INVITED	<i>Seoul National University, Korea</i>
5-0445	Ordered Growth of Nano- and Microstructures of Metal Oxides Assisted by Ultrafast Laser
11:40-12:10	Paloma Fernández Sánchez
INVITED	<i>Complutense University of Madrid, Spain</i>
5-3696	Spatial Multiplexing Method for Achromatic Metalens
12:10-12:25	Sangwon Baek , Joohoon Kim, Yesul Kim, Junsuk Rho, Jong-Lam Lee
	<i>Pohang University of Science and Technology, Korea</i>
5-1414	Utilization of Aerial Display for Direct Shooting of Augmented Reality Scene in TV Drama
12:25-12:40	Kohei Kishinami ¹ , Kengo Fujii ¹ , Masaki Yasugi ¹ , Shiro Suyama ¹ , Shin Hara ¹ , Tatsuya Ikezawa ² , Hirotsugu Yamamoto ¹
	¹ Utsunomiya University, Japan, ² Telepack Co., Ltd., Japan
5-3207	Fabrication of High Efficiency Micro-LED Display by Using Sapphire Nano-Membrane
12:40-12:55	Jung-El Ryu , Jehong Oh, Sohyeon Park, Ho Won Jang
	<i>Seoul National University, Korea</i>

Halide Perovskite Materials and Devices 1

NOV 08 (Tue) | Ora (8F)

CHAIRS	Jongnam Park (Ulsan National Institute of Science and Technology, Korea) Jaesang Lee (Seoul National University, Korea)
5-4294	Perovskite Emitters for Down-conversion, Self-emissive, and Metaverse Displays
14:00-14:30	Tae-Woo Lee
KEYNOTE	<i>Seoul National University, Korea</i>
5-0483	In-situ Fabricated Perovskite Quantum Dots for Display Applications
14:30-15:00	Haizheng Zhong
INVITED	<i>Beijing Institute of Technology, China</i>
5-0221	Next-generation Display and Solar Cells Based on Perovskite Materials
15:00-15:30	Gihwan Kim
INVITED	<i>Gyeongsang National University, Korea</i>
5-0152	Balancing Carrier Confinement and Transfer for Efficient Two-dimensional Perovskite-based Light-emitting Diode
15:30-16:00	Wallace C.H. Choy
INVITED	<i>The University of Hong Kong, Hong Kong</i>
5-0335	Surface Engineering for Perovskite-based Optoelectronic Devices
16:00-16:30	Seungjin Lee
INVITED	<i>Korea Institute of Energy Technology, Korea</i>

Quantum Dots for Advanced Display Technology

NOV 09 (Wed) | Ora (8F)

CHAIRS	Jiwan Kim (Kyonggi University, Korea) Chang-Lyoul Lee (Gwangju Institute of Science and Technology, Korea)
5-0413	Development of Cd-free Quantum Dot Materials and Their Processing Technologies for Future Information Display Technology
10:10-10:40	Yohan Kim
INVITED	<i>Fraunhofer Institute for Applied Polymer Research IAP, Germany</i>
5-0359	All-Inorganic Perovskite Quantum Dots for Optoelectronic Applications
10:40-11:10	Younghoon Kim
INVITED	<i>Kookmin University, Korea</i>

5-0527 Nanocrystal Based Electronic and Optoelectronic Devices and Sensors
11:10-11:40 [Soong Ju Oh](#)
INVITED *Korea University, Korea*

5-3206 Ligand Engineering of Quantum Dots for Bright and Stable Light-Emitting Diodes
11:40-11:55 [Dong Ryeol Whang](#)
Hannam University, Korea

5-2898 Electronic Trap Analysis in InP QD Layers with Carboxylate Ligands
11:55-12:10 [Gyu Weon Hwang](#), Taehwan Park, Hyeri Yoo, Gyeong Won Seo
Korea Institute of Science and Technology, Korea

Halide Perovskite Materials and Devices 2

NOV 09 (Wed) | Ora (8F)

CHAIRS Soong Ju Oh (Korea University, Korea)
Jongnam Park (Ulsan National Institute of Science and Technology, Korea)

5-3430 Wide-Width Effects of Oxide TFTs
14:00-14:15 [Su Hyun Kim](#)¹, Kihwan Kim¹, Joon Seok Park², Jun Hyung Lim², Saeroonter Oh¹
¹Hanyang University, Korea, ²Samsung Display Co., Ltd., Korea

5-2517 Enhanced Near-infrared Detection of Zinc Oxynitride-based Hybrid Phototransistor by Suppressing Internal Charge Accumulation in an InAs QD Layer
14:15-14:30 [Jong-Ho Kim](#), Byung Ku Jung, Su-Kyung Kim, Kwang-Ro Yun, Min-Gyu Jeon, Tae-Ju Lee, Soong Ju Oh, Tae-Yeon Seong
Korea University, Korea

5-1320 Ambient Perovskite Crystallization for Highly Stable and Efficient Solar Cells via Compositional Engineering
14:30-14:45 [Jinhyun Kim](#), Jihyun Kim
The University of Suwon, Korea

5-0590 Large-scale One-Pot Single-step Synthesis of Inorganic Perovskite Nanoplatelets for Blue Light-Emitting Diodes
14:45-15:00 [Ju-Hyun Yoo](#), Jin-Woo Park
Yonsei University, Korea

5-4125 Realizing Highly Stable Perovskite Quantum Dots (QDs) for Light-Emitting Diode Applications
15:00-15:15 [Chang-Lyoul Lee](#)
Gwangju Institute of Science and Technology, Korea

5-1594 Lead-free Layered Double Perovskites for Blue Light Emission
15:15-15:30 [Tejas Dhanalaxmi Raju](#), Ho Jin Lee, Vignesh Murugadoss, Tae Geun Kim
Korea University, Korea

5-2294 Nondestructive Direct Photolithography for Patterning Quantum Dot Films by Atomic Layer Deposition of ZnO
15:30-15:45 [Joon Yup Lee](#), Eun A Kim, Seong-Yong Cho
Myongji University, Korea

5-4167 In-Situ Core/shell Perovskites for Ultra-Bright, Efficient and Stable Light-Emitting Diodes
15:45-16:00 [Joo Sung Kim](#)¹, Jung-Min Heo¹, Gyeong-Su Park¹, Seung-Je Woo¹, Changsoon Cho², Hyung Joong Yun³, Dong-Hyeok Kim¹, Jinwoo Park¹, Seung-Chul Lee¹, Sang-Hwan Park¹, Eojin Yoon¹, Neil C. Greenham², Tae-Woo Lee¹
¹Seoul National University, Korea, ²University of Cambridge, UK, ³Korea Basic Science Institute, Korea

05.Emerging Materials for Metaverse Display

Quantum Dots for Advanced Display Technology

16:50-18:20, NOV 08 (Tue) | Lobby (8F)

CHAIR	Yohan Kim (Fraunhofer Institute for Applied Polymer Research IAP, Germany)
5-0896	Long Operating Lifetime Blue Light Emitting Diode with Cadmium-Free ZnO and Polyaromatic Hydrocarbons (PAHs) Hybrid Quantum Dots (QDs) Hong Hee Kim , Won Kook Choi <i>Korea Institute of Science and Technology, Korea</i>
5-1077	The Effect of P3HT Concentration on the Performance of Hybrid P3HT: PbS QDs Based SWIR Photodiodes Kyeong-Ho Seo , Jin-Hyuk Bae <i>Kyungpook National University, Korea</i>
5-1088	Dichromatic Blue and Green InGaN-based Light Emitting Diodes Using CsPbBr ₃ Quantum Dots Jae-Hyeok Oh ¹ , Seung-Beom Cho ² , Il-Gyu Park ² , Sung-Nam Lee ¹ ¹ <i>Tech University of Korea, Korea</i> , ² <i>Seoul National University of Science and Technology, Korea</i>
5-1626	Near-Unity Quantum Yield Green InP/ZnSe/ZnS Quantum Dots Benefiting from Zn Halide in ZnSe Shell Growth Heesun Yang, Dae-Yeon Jo , Hyun-Min Kim, Seoyeon Park, Suk-Young Yoon, Ali Imran Channa, Yuri Kim, Hyo-Jin Yeo <i>Hongik University, Korea</i>
5-1636	Controlling Parameters in In-to-Ga Cation Exchange Reaction for InGaP Quantum Dots Heesun Yang ¹ , Seong Min Park ^{1,2} , Dae-Yeon Jo ¹ , Hyun-Min Kim ¹ , Yuri Kim ¹ , Yang-Hee Kim ¹ , Yu-Been Kong ¹ , Kyoungwon Park ² ¹ <i>Hongik University, Korea</i> , ² <i>Korea Electronics Technology Institute, Korea</i>
5-1643	High-Efficiency, High-Stability Blue ZnSeTe Quantum Dot-Light-Emitting Diodes: Effects of Surface Ligands and Heterostructural Dimensions Heesun Yang, Yang-Hee Kim , Sun-Hyoung Lee, Suk-Young Yoon, Young-Ju Lee, Ali Imran Channa, Hyungmin Yang, Seong Min Park <i>Hongik University, Korea</i>
5-2269	High Stable Gradient Quantum Dot Light-Emitting Diodes by Surface Engineering JaeSung Lee , ByoungHo Kang, SangHoon Jung, SeHyuk Yeom, WangHoon Lee <i>Gumi Electronics and Information Technology Research Institute, Korea</i>

5-2274	Influence of Surface Trap Controlled ZnO Nanoparticles as Electron Transport Layer on QLEDs ByoungHo Kang , Jaesung Lee, Sanghoon Jung, Sehyuk Yeom, Wanghoon Lee <i>Gumi Electronics and Information Technology Research Institute, Korea</i>
5-2615	Heteroatom-doped Carbon Dots with Solvatochromic Properties for Sensing Volatile Organic Solvents Gwajeong Jeong ¹ , Chan Ho Park ² , Hyunseung Yang ¹ ¹ <i>Korea Electronics Technology Institute, Korea</i> , ² <i>Gachon University, Korea</i>
5-2695	Optimized NiO/ZnS Nanoparticles as a Hole Injection Layer for Enhanced Quantum Dot Light-Emitting Diodes Jungho Kim , Kim Jiwan <i>Kyonggi University, Korea</i>
5-2698	Efficient Quantum Dots Light-emitting Diodes with a Zn _{0.85} Mg _{0.15} O Electron Transport Layer by RF Sputtering Bo Mi Kim ¹ , Min Suk Oh ² , Ji Wan Kim ¹ ¹ <i>Kyonggi University, Korea</i> , ² <i>Korea Electronics Technology Institute, Korea</i>
5-3397	A Continuous Synthesis of Ternary Semiconductor Nanocrystals with Narrow Emission Spectra Jung Min Lee ¹ , Jae Young Choi ¹ , Dong Yun Lee ² , Hee Jo Jang ³ , Jong Pal Hong ³ , Young Kuk Kim ¹ ¹ <i>Korea Institute of Materials Science, Korea</i> , ² <i>Pusan National University, Korea</i> , ³ <i>Laminar Inc., Korea</i>
5-3710	Lead-Free Perovskite-Inspired Thin Films for Self-Powered Flexible and Stable Photodetectors Hoang Vuong , Soon Gil Yoon <i>Chungnam National University, Korea</i>
5-3943	In Situ Observation of Colloidal Nanoparticle Macroscale Dynamics via Light Scattering Under a Non-Uniform Electric Field Wooseok Jeong ¹ , Yoonsu Park ¹ , Yun-Kun Hong ¹ , Ildoo Kim ² , Hyungbin Son ¹ , Don-Hyung Ha ¹ ¹ <i>Chung-Ang University, Korea</i> , ² <i>Konkuk University, Korea</i>
5-3944	Contact Enhancement in Nanoparticle Assemblies Through Electrophoretic Deposition Yoonsu Park , Don-Hyung Ha <i>Chung-Ang University, Korea</i>

Halide Perovskite Materials and Devices

16:50-17:50, NOV 09 (Wed) | Lobby (8F)

CHAIR	Jongnam Park (Ulsan National Institute of Science and Technology, Korea)
5-0677	Dual-Mode Image Sensing Display with Defect Passivated All-Inorganic Perovskite Film by Metal-Organic Framework-Assisted Metal-Ion Doping Process Jin Woo Oh , Hyowon Han, Hyeokjung Lee, Seokyeong Lee, Jihye Jang, Cheolmin Park <i>Yonsei University, Korea</i>

- 5-0705** Perovskite Nanopatterns with High Photoluminescence and Stability by Using Self-Assembled Block Copolymer Template
Hayeon Jeong, Hyowon Han, Hyeokjung Lee, Seonju Lee, Cheolmin Park
Yonsei University, Korea
- 5-0801** Colloidal Synthesis of Deep-blue Europium Halide Perovskite Crystals
Jaeyeong Ha, Himchan Cho
Korea Advanced Institute of Science and Technology, Korea
- 5-1357** Fabrication of Multi-Conversion Single Pellet Using Polyethylene Capsule Encapsulated Halide Perovskite
JungHyeon Yoo, SeokBin Kwon, HoChan Yoo, DaeHo Yoon
Sungkyunkwan University, Korea
- 5-1378** Fabrication of LuAG: Ce³⁺ Ceramic Phosphors Prepared with Nanophosphors Synthesized by Sol-gel-combustion Method
Ho Chan Yoo¹, Seok Bin Kwon¹, Jung Hyeon Yoo¹, Jin Woong Cha¹, Seung Hee Choi², Young Hyun Song², Woong Gi Lee³, Dae Ho Yoon¹
¹*Sungkyunkwan University, Korea*, ²*Korea Photonics Technology Institute, Korea*, ³*Woosukat, Korea*
- 5-2687** Lead-free Tin-based Perovskite for High Performance Photodetector with Additive Engineering
Tae-Yeon Seong, Kwang-Ro Yun, Se-Jin Kim, Su-Kyung Kim, Jong-Ho Kim
Korea University, Korea
- 5-2782** Green Synthesis of Ce Doped Cs₃MnBr₃ for Highly Stable Violet Light-emitting Diodes
Subhajit Dutta¹, Jung Hyeon Yoo¹, Seok Bin Kwon¹, Swagata Panchanan², Ho Chan Yoo¹, Dae Ho Yoon^{1,1}
¹*Sungkyunkwan University, Korea*, ²*Ulsan National Institute of Science and Technology, Korea*
- 5-2859** One-Step CVD Growth of Single Crystalline CsPbBr₃ Multiple Geometries with Self-Assembled Exciton-Polariton
Mamoon Ur Rashid, Yong Soo Kim, Zeeshan Tahir, Sungdo Kim
University of Ulsan, Korea
- 5-2936** Halide Perovskite-Amorphous TiO₂ Composites for the Natural Degradation of Organic Dyes
Tae Hyung Kim, Young-Hoon Kim
Hanyang University, Korea
- 5-3557** A Polymer/small-molecule Binary-blend Hole Transport Layer for Enhancing Charge Balance in Blue Perovskite Light Emitting Diodes
Woo Hyeon Jeong¹, Zhongkai Yu², Xinyu Shen², Seongbeom Lee², Gyeongun Seok², Hyosung Choi¹, Bo Ram Lee¹
¹*Hanyang University, Korea*, ²*Pukyong National University, Korea*
- 5-4067** Direct Optical Patterning of Metal Halide Perovskite Nanocrystals with Thiol Additives
SeongKyu Maeng, Sun Jae Park, Himchan Cho
Korea Advanced Institute of Science and Technology, Korea

- 5-4096** Low-Dimensional Lead-Free Perovskite for Efficient and Stable Red Light-Emitting Diodes via Spacer Cation Engineering
JuHyun Lee, Jung Jae Do, Jae Woong Jung
Kyung Hee University, Korea
- 5-4194** Chemical Origin of Ferroelectric and Piezoelectric Response in Germanium Halide Perovskites CsGeX₃ (X = Cl, Br, and I)
Jiwoo Lee¹, Aron Walsh², YoungKwang Jung¹
¹*Yonsei University, Korea*, ²*Imperial College London, UK*
- 5-4214** Perovskite-based Functional Plastic Scintillator for Radiological Measurement
Changhyun Roh, Su Jung Min, Bum Kyung Seo, Sang Bum Hong
Korea Atomic Energy Research Institute, Korea

Materials and Products for Metaverse Display

16:50-17:50, NOV 09 (Wed) | Lobby (8F)

- | CHAIR | Soo Young Kim (Korea University, Korea) |
|---------------|---|
| 5-0682 | Stand-alone Sensing Display Wireless Operated via Direct Capacitive Coupling
<u>Jihye Jang</u> , Seokyeong Lee, Hyeokjung Lee, Jin Woo Oh, Cheolmin Park
<i>Yonsei University, Korea</i> |
| 5-0776 | Naphtho-Acridine Substituted Anthracene Derivatives for Efficient Blue Organic Light-Emitting Diodes
<u>Jinyeong Heo</u> ¹ , Ki Ju Kim ² , Hakjun Lee ² , Young Kwan Kim ² , Seung Soo Yoon ¹
¹ <i>Sungkyunkwan University, Korea</i> , ² <i>Hongik University, Korea</i> |
| 5-0834 | Effect of Ozone Concentration on Moisture Barrier Properties of Al ₂ O ₃ Thin Film Prepared by Atomic Layer Deposition
<u>SeokYoon Shin</u> ¹ , Heesoo Kim ² , Joohwan Ha ¹ , Changwoo Byun ¹
¹ <i>Advanced Institute of Convergence Technology, Korea</i> , ² <i>L Bio Co., Ltd, Korea</i> |
| 5-1107 | Perfluorocyclobutane Containing Crosslinked Polyimide Gate Dielectric for Hysteresis Free Thin Film Transistor
Jae Kyung Lee, <u>Taek Ahn</u>
<i>Kyungsung University, Korea</i> |
| 5-1123 | High Performance and Photo-crosslinkable Polyimide Gate Dielectrics for Flexible Thin Film Transistors
<u>Taek Ahn</u>
<i>Kyungsung University, Korea</i> |

- 5-1200** **Organohydrogel Encapsulated Low-Power E-Switching Block Copolymer Structural Color Display**
SeonJu Lee, Seungsoo Mun, Hayeon Jeong, Cheolmin Park
 Yonsei University, Korea
- 5-1541** **Facile Post-synthesis of Blue Emissive Perovskite with High Photoluminescence Quantum Yield**
Jeong Woo Han, Soo Young Kim
 Korea University, Korea
- 5-1659** **Improved Properties of Perovskite Light-Emitting Diode by Formation of Quasi-2D Perovskite with Amine Ligand**
Myeong Jin Seol, Soo Young Kim
 Korea University, Korea
- 5-1898** **First-principles Analysis of Ga and N Vacancies on GaN m plane**
Purun-hanul Kim¹, Seungwu Han¹, Youngho Kang²
¹Seoul National University, Korea, ²Incheon National University, Korea
- 5-1995** **Enhancement of Structural Stability of SiO₂ Encapsulated Perovskites Through Ligand Attachment**
Seung Hwan Hwang, Soo Young Kim
 Korea University, Korea
- 5-2251** **Microstructure and Photoluminescence of Eu-doped Sr₃Al₂O₆ Phosphors Calcined with and without H₃BO₃ Flux**
Ji Ho Hong, Sangho Han, Deokyeon Lee, Dong Hun Kim
 Myongji University, Korea
- 5-2368** **Demonstration of Size-Dependent Efficiency Trend for the Peak Wavelengths of 380 nm and 450 nm Micro-LEDs**
Abu Bashar Mohammad Hamidul Islam¹, Tae Kyoung Kim¹, Yu-Jung Cha¹, Jae Won Seo¹, Jiun Oh¹, Jong-In Shim², Dong-Soo Shin², Joon Seop Kwak¹
¹Korea Institute of Energy Technology, Korea, ²Hanyang University, Korea
- 5-2395** **Chemical Resistance and Adhesion Strength of Ultraviolet-cured Resins Applicable to Fabrication of Ultrathin Glasses for Display Cover Window**
Minguk Son, Keong Ho Ryu, Baekseo Choi, Yoon Soo Han
 Daegu Catholic University, Korea
- 5-2399** **Effect of Surface Treatment of Cathode Materials on the Electrodeposition Behavior of Fe-Ni Alloy**
Na Young Kang, Jae-Ho Lee
 Hongik University, Korea
- 5-2460** **Enhancing Responsivity of Sb₂Se₃-based Photodetectors by Selenization and Crystalline Engineering**
Hee Kyoung You, Su Kyung Kim, Tae Yeon Seong
 Korea University, Korea

- 5-2562** **High-Speed, Real-Time Extraction of Traps in Oxide Thin Film Transistors**
Kihwan Kim¹, Taeho Lee¹, Kwang Hwan Ji², Ju Heyuck Baeck², Jiyong Noh², Kwon-Shik Park², Saeroonter Oh¹
¹Hanyang University, Korea, ²Samsung Display Co., Ltd., Korea
- 5-2680** **Silicone-Integrated Hole Transport Network for Highly Efficient OLED Microdisplay**
Borina Ha¹, Hyukmin Kweon¹, Seonkwon Kim², Ukjin Jeong¹, Seunghan Lee³, Moon Sung Kang³, Jeong Ho Cho², Do Hwan Kim¹
¹Hanyang University, Korea, ²Yonsei University, Korea, ³Sogang University, Korea
- 5-3373** **Effects of Additional Change on Nucleation Behavior of Alq₃ Crystal Grown in [C12mim][TFSI] Ionic Liquids**
Seo Jeong Na, Ga Bin Park, Dong Chan Shin
 Chosun University, Korea
- 5-3563** **The Effect of the Initial Alq₃ Crystal Phase on the Properties of Deposited Alq₃ Thin Film**
Ga Bin Park, Seo Jeong Na, Dong Chan Shin
 Chosun University, Korea
- 5-3872** **Photoimaging Fluorinated Copolymers for Photolithographic Fabrication of OLED Devices**
KyungHyun Eun¹, Myungwoong Kim¹, Changjae Lee¹, Doo Hong Kim², Jin-Kyun Lee¹, Byung Jun Jung²
¹Inha University, Korea, ²University of Seoul, Korea
- 5-3875** **Latent Thermal Initiators Utilizable for Epoxy Adhesives for Anisotropic Conductive Films**
Jinhyeong Kim, Myungwoong Kim, Seungjun Kim, Dongwan Son
 Inha University, Korea
- 5-3960** **Effect of Hydrogen Supply Layer on PEALD Processed InZnO TFTs**
Seong-In Cho, Namgyu Woo, Sang-Hee Ko Park
 Korea Advanced Institute of Science and Technology, Korea
- 5-3974** **Dual Gate Structured Oxide Semiconductor TFT for Next Generation Display**
Sehun Jeong, Jingyu Kim, Sang-Hee Ko Park
 Korea Advanced Institute of Science and Technology, Korea

06. Advanced Materials for Rechargeable World

Overview of the Current State-of-the-art Lithium ion Batteries

NOV 08 (Tue) | Udo (2F)

CHAIRS	Kisuk Kang (Seoul National University, Korea) Yongmook Kang (Korea University, Korea)
6-2096	Cation Disordered Rocksalt Electrode Materials for Li-ion Battery Applications
14:00-14:30	<u>Naoaki Yabuuchi</u>
KEYNOTE	<i>Yokohama National University, Japan</i>
6-2470	Temperature Dependence of Mechanical Behavior of Single Crystalline Si Pillar and Plate Upon Electrochemical Lithiation
14:30-15:00	<u>Seok Woo Lee</u>
INVITED	<i>Nanyang Technological University, Singapore</i>
6-0318	The Effect of Cross-talk on Performance of Li Ion Batteries and Exploiting It for Developing High Performance Si-based Batteries
15:00-15:30	<u>Minkyu Kim</u> ^{1,2} , Zhenzhen Yang ¹ , Ira Bloom ¹
INVITED	<i>¹Argonne National Laboratory, USA, ²Inha University, Korea</i>
6-0302	Understanding Electrochemical Reactions in Post Li-Ion Batteries via Operando Imaging
15:30-16:00	<u>Seung-Ho Yu</u>
INVITED	<i>Korea University, Korea</i>
6-3287	Multi-layer Graphene Mesh Membrane Decorated with ZnO Rods for Controlling Position-selective and Direction-selective Lithium Deposition in Lithium Metal Anodes
16:00-16:15	<u>Dae Yeop Jeong</u> , Won Jun Chang, Suhee Jang, Minjoo Kim, Ye Lim Kim, Beomju Kim, Won Il Park
	<i>Hanyang University, Korea</i>
6-1516	An Insulating Material in a Structured Host Enables Sustainable Formation of a Granular Li Metal for Highly Durable Li Metal Battery
16:15-16:30	<u>Yongho Shin</u> , Byoungwoo Kang
	<i>Pohang University of Science and Technology, Korea</i>
6-1398	Meso/nano Porous Hollow Nanostructures of Mn/ Co/ Ni-based Metal Oxides as Anode Electrodes for Li-ion Energy Storage Systems
16:30-16:45	<u>Venugopal Nulu</u> , Arunakumari Nulu, Keun Yong Sohn
	<i>Inje University, Korea</i>

Probing the Inside of Batteries; Characterizations and Analysis

NOV 09 (Wed) | Udo (2F)

CHAIRS	Wonsub Yoon (Sungkyunkwan University, Korea) Jongsoo Kim (Sungkyunkwan University, Korea)
6-4077	Anode Design for Fast-charging Lithium Batteries
10:10-10:40	<u>Yongming Sun</u>
INVITED	<i>Huazhong University of Science and Technology, China</i>
6-0279	Discovery of Outstanding Cathodes for Alkali-ion Batteries
10:40-11:10	<u>Jongsoo Kim</u>
INVITED	<i>Sungkyunkwan University, Korea</i>
6-3804	Influence of Process Parameters on Joint Characteristics in Friction Stir Welding of Al/Cu Dissimilar Materials for Lithium-ion Battery
11:10-11:25	<u>Bum-Su Go</u> , Dong-Min Park, Hee-Seon Bang
	<i>Chosun University, Korea</i>
6-2529	Nitrogen-Doped Carbon-Coated NCM811 Cathode for Enhanced Performance in Li-ion Batteries
11:25-11:40	<u>Pulia Venkatachalapathy Keerthivasan</u> , Chang Woo Lee
	<i>Kyung Hee University, Korea</i>
6-2301	Pushing the Limits of Cryo-atom Probe Tomography in Energy Materials
11:40-11:55	<u>Se-Ho Kim</u> , Ayman El-Zoka, Xuyang Zhou, Baptiste Gault
	<i>Max-Planck-Institut für Eisenforschung GmbH, Germany</i>
6-1579	Redesign of Biological Organic Materials for Greener Rechargeable Batteries
11:55-12:10	<u>Jihyeon Kim</u> , Kisuk Kang
	<i>Seoul National University, Korea</i>
6-1469	Oxygen Stacking Engineering-Induced Reversible Cation Migration in Lithium-Rich Layered Oxides
12:10-12:25	<u>Donggun Eum</u> , Kisuk Kang
	<i>Seoul National University, Korea</i>

Emerging Safer Rechargeable Batteries

NOV 09 (Wed) | Udo (2F)

CHAIR Jangwook Choi (Seoul National University, Korea)

6-4301 Electrochemo-mechanics of Metallic Lithium Anodes

14:00-14:30 [Mauro Pasta](#)

KEYNOTE *University of Oxford, UK*

6-0663 Designing Advanced Battery Materials Beyond Lithium-Ion Technologies

14:30-15:00 [Zhi Wei Seh](#)

INVITED *Agency for Science, Technology and Research, Singapore*

6-4004 The Fast-charging and Safe Phosphorus-based Anode for Lithium-ion Battery

15:00-15:30 [Jie Sun](#)

INVITED *Tianjin University, China*

6-2147 Strategies for Overcoming the Failure Mode of Mild-Acid Zn-MnO₂ Batteries

15:30-16:00 [Kyu Tae Lee](#)

INVITED *Seoul National University, Korea*

6-0472 Nanoscale Investigation of Electrochemical Interfaces by in Situ TEM

16:00-16:30 [Jungwon Park](#)

INVITED *Seoul National University, Korea*

6-1954 Superior Compatibility of the Oxide-based LISICON-type SE with High Ni-rich Materials and Li Metal Enables High Energy Density All-solid-state Batteries

[Seungjun Woo](#), Byoungwoo Kang

Pohang University of Science and Technology, Korea

6-1703 Zn-Al Layered Double Hydroxide Growth Via Electrodeposition for Stabilized Zinc Metal Anodes

16:45-17:00 [Seung Hyun Jeong](#), Su-Ho Cho, Il-Doo Kim

Korea Advanced Institute of Science and Technology, Korea

06. Advanced Materials for Rechargeable World

Overview of the Current State-of-the-art Lithium ion Batteries

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

CHAIR Yongmook Kang (Korea University, Korea)

6-0319 Enhancement of Electrochemical Performance of Lithium Ion Battery by Improving Separator Wettability

[Minjun Kim](#), Wooyoung Shim

Yonsei University, Korea

6-0788 Molten-salt Coated Solid Electrolytes for Li/FeS₂ Thermal Batteries

[Hae-Won Cheong](#), Minu Kim, Tae-Young Ahn, Chaehyeok Han, Seung-Ho Kang, Yusong Choi, Jang-Hyeon Cho

Agency for Defense Development, Korea

6-1109 Issues & Progress of Inorganic Solid-State Electrolytes: Oxides

[Hwa Jung Kim](#), Hyeokjun Park, Sun Hwa Park, Seungwook Baek

Korea Research Institute of Standards and Science, Korea

6-1113 Two-Dimensional Metal Sulfide Composite with High-Capacity and -Kinetics for Next-Generation Lithium-Ion Batteries by Electrochemical Method

[Uijin Chang](#)^{1,2}, Hosun Shin², KwangSup Eom¹

¹Gwangju Institute of Science and Technology, Korea, ²Korea Research Institute of Standards and Science, Korea

6-1215 Electrochemical Behavior of Organic-based Cathode for Rechargeable Li-ion Batteries

[Jihye Park](#)^{1,2}, Hosun Shin¹, Sun Hwa Park¹, Jung-Yong Lee², Jae Yong Song^{1,3}

¹Korea Research Institute of Standards and Science, Korea, ²Korea Advanced Institute of Science and Technology, Korea, ³University of Science and Technology, Korea

6-1366 Synthesis of Single Crystal Ni-rich Cathode via Microwave Calcination for Lithium-ion Batteries

[Seong-Ju Sim](#), Bong-Soo Jin, Hyun-Soo Kim

Korea Electrotechnology Research Institute, Korea

6-1443 Transition Metal-doped Si/graphite Composite as a Cost-effective Anode for Li-ion Batteries

[Arunakumari Nulu](#), Young Geun Hwang, Venugopal Nulu, Keun Yong Sohn

Inje University, Korea

- 6-3302** An Angstrom-level d-spacing Control of Graphite Oxide Using Organofillers for High-rate Lithium Storage
[Jiyoung Lee](#)¹, Chanhon Kim², Il-Doo Kim¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Korea Institute of Industrial Technology, Korea
- 6-3523** An Effective Modification Strategy to Enhance the Electrochemical Performance of Nickel-high LiNi_{0.8}Co_{0.1}Mn_{0.1}O₂ Cathodes for Lithium Ion Batteries
[Chea Yun Kang](#)¹, Do Young Hwang², Seung-Hwan Lee¹
¹Kangwon National University, Korea, ²Daejeon University, Korea
- 6-3713** Investigation Mechanical Process of Lithium Magnesium Foil Using all Solid States Battery
[Sangwoo Kim](#), DongEung Kim
Korea Institute of Industrial Technology, Korea
- 6-3996** Electrochemical Treatment to Recover NCM Cathode from Spent Lithium-ion Batteries
[Woojin Kwak](#), Jinsub Choi, Yong-Tae Kim
Inha University, Korea
- 6-4015** Study on the Treatment of Microplastics via Electrocoagulation and the Application of Plastic Waste as Carbon Coating Precursor
[Jinhee Lee](#), Jinsub Choi, Yong-Tae Kim
Inha University, Korea
- 6-4027** Functional Additives for High-loading Graphite Negative Electrode in Lithium-ion Batteries
[Min Seo Cho](#), Jun Haeng Huh, Jeong Min Kang, Ji Heon Ryu
Tech University of Korea, Korea
- 6-4028** Electrochemical Performance of Non-uniform NCM811-NCM523 Blend Positive Electrode
[Chang Hun Lim](#), Hyang Sun Jeon, Hee Jin Joo, Ji Heon Ryu
Tech University of Korea, Korea
- 6-4032** Electrochemical Characteristics of Graphite/LiNi_{0.6}Co_{0.2}Mn_{0.2}O₂ Cells During Overdischarge
[Bong Jin Kim](#), Geonwoo Yoon, Inje Song, Ji Heon Ryu
Tech University of Korea, Korea
- 6-4040** Novel Liquid Synthesis of Impurity Control for High Performance Li₆PS₄Cl Solid Electrolyte in Solid-state Batteries
[Young-Jun Huh](#), Chang-Min Cho, Hee-taek Park, Jun-Woo Park, Byung-Gon Kim, You-Jin Lee, Yoon-Cheol Ha, Jun-Ho Park
Korea Electrotechnology Research Institute, Korea
- 6-4231** Interface Modification of Cathode/Electrolyte by 2D Dielectric Nanosheets for High-power Micro-batteries
[Ji-Won Choi](#)
Korea Institute of Science and Technology, Korea

- 6-4358** Composition Dependence of Li₇La₃Zr₂O₁₂ Solid Electrolytes for All-Solid-State Thin Film Batteries
[Ahrom Ryu](#)¹, Ji-Won Choi^{1,2}
¹Korea Institute of Science and Technology, Korea, ²Korea University of Science and Technology, Korea

Probing the Inside of Batteries; Characterizations and Analysis

16:50-17:50, NOV 09 (Wed) | Lobby (2F)

- CHAIR** Kyu Tae Lee (Seoul National University, Korea)
- 6-0877** Study and Characterization of In-situ Gel Polymer Electrolyte with Epoxidized Soybean Oil and Lithiumbis(fluorosulfonyl)imide (LiFSI) by Lithium Ion Batteries
[Wansu Bae](#), Lei Jin, Wei Zhang, Hyunmin Lim, Whangi Kim, Hohyoun Jang
Konkuk University, Korea
- 6-1291** Synthesis of Lithium Salt Additive of Urethane Form for Liquid Electrolyte
[SungJun Park](#), Sujin Yun, Giseok Jang, Minhyuk Jeon, Hohyoun Jang, Whangi Kim
Konkuk University, Korea
- 6-2162** Effect of Sodium Addition on Lattice Structure and Oxygen Loss in Sodium Rich Na_xTm_{2-x}O₂ Type Cathode Materials (Tm=Mn and Cr; X=1.05–1.3) - A Study
[Bala Krishnan Ganesan](#)¹, Ui-Rim Son¹, Ranjith Thangavel², Yun-Sung Lee¹
¹Chonnam National University, Korea, ²Indian Institute of Technology Guwahati, India
- 6-2212** Ru-Ni Bimetallic 3D Porous Cathode Catalysts for Li-O₂ Batteries
[Joseph Harding](#), Seokwoo Jeon
Korea Advanced Institute of Science and Technology, Korea
- 6-2335** Electrochemical Performance of Biowaste-derived Hard Carbon as an Anode Material for Sodium-ion Batteries
Varun Karthik Muragesan, [Chang Woo Lee](#)
Kyung Hee University, Korea
- 6-2507** Geometrical Effect of Active Material on Electrode Tortuosity in all Solid State Lithium Battery
[So-Yeon Park](#), Jiung Jeong, Heon-Cheol Shin
Pusan National University, Korea
- 6-2547** SiO_x/Si-Graphite Nanocomposite Anode Materials Produced by High Energy Milling and Surface Oxidation for Li-Rechargeable Battery
[Da Seul Kim](#), Reddyprakash Maddipatla, Hyeonji Kang, Chadrasekhar Loka, Kee-Sun Lee
Kongju National University, Korea

6-2773	Green-friendly Material-derived N-doped Carbon Coating for Electrochemical Performance Improvement of $\text{Li}[\text{Ni}_{0.8}\text{Co}_{0.1}\text{Mn}_{0.1}]\text{O}_2$ Feng Jiang, Chang Woo Lee Kyung Hee University, Korea
6-2779	Preparation of Combined $\text{Li-Li}_3\text{Zr}_2\text{O}_{12}$ Solid Electrolyte with $\text{Li}(\text{Ni}_{0.8}\text{Co}_{0.1}\text{Mn}_{0.1})\text{O}_2$ Cathode Electrode for Lithium-ion Battery Soon Phil Jung, Lee Chang Woo Kyung Hee University, Korea
6-2909	Gel Electrode Design for High Performance of Li-ion Batteries Jae Yoon Sung, Chang Woo Lee Kyung Hee University, Korea
6-3497	Degradation Mechanism of Composite Cathode in Sulfide-based All-Solid-State Li-ion Batteries: Role of Binder Kyong-ryol Tag, Hyun-Jeong Lee, Eun Hyun Kim, Kyu-Jun Lee, Hae-Ryoung Kim, Hong-Kyu Kim, Jae-Pyoung Ahn Korea Institute of Science and Technology, Korea
6-3788	Analysis of Lithium-Ion Battery Anode Slurry Using Electrochemical Impedance Spectroscopy Soo Won Jung, EunJu Lim, Seoung Jai Bai, Young Seok Song Dankook University, Korea
6-3807	The Effect of Wobbling on the Welding Characteristics in Al/Cu Fiber Laser Welded Joints HyeSeul Yoon, SoonIl Kwon, HeeSeon Bang Chosun University, Korea
6-3934	Recovery of Cobalt Sulfate for Lithium Secondary Battery Cathode Material by Mechanochemical Process Hyo Jeong Jo¹, Seunghyun Kim², HyunJun Jo², Onyu Bae², Dae-Hwan Kim¹ ¹Daegu Gyeongbuk Institute of Science and Technology, Korea, ²YKS Interling, Korea
6-3953	Effect of Oxygen Vacancy on Li-ion Diffusion in the Perovskite-Type Solid Electrolyte Jaejin Hwang¹, Hyeon-Ah Ju², Eun-Byeol Park², Young-Hoon Kim², Jae Hyuck Jang³, Jae-Hyun Shim⁴, Young-Min Kim², Jaekwang Lee¹ ¹Pusan National University, Korea, ²Sungkyunkwan University, Korea, ³Korea Basic Science Institute, Korea, ⁴Dongshin University, Korea
6-3967	Computational Analysis on Dynamic Dendrite Growth on Lithium Metal Anode During Battery Charging Cycles Hae Gon Lee, Jeong-Hee Choi Korea Electrotechnology Research Institute, Korea
6-4150	A Study on the Mechanism of High Ion Conductivity Characteristics of Sulfide-Based Solid Electrolytes for All-Solid-State Batteries Youngin Lee, Young-Hoon Kim, Jae-Hyun An, Jae-Chul Lee Korea University, Korea

Emerging Safer Rechargeable Batteries

16:50-17:50, NOV 09 (Wed) | Lobby (2F)

CHAIR	Jangwook Choi (Seoul National University, Korea)
6-0614	Low Temperature Na-BASE Batteries via Utilizing Bi Islands Layer on a β''-alumina Jihong Bae, Dana Jin, Wooyoung Shim Yonsei University, Korea
6-0622	High Energy Density Aluminum-Air Batteries with Aluminum Anode-Spark Reduced Graphene Oxide Cathode Geonwoo Lim, Sangjin Choi, Wooyoung Shim Yonsei University, Korea
6-0628	Enhancement of Liquid Na/BASE Interface Through Sparked Reduced Graphene Oxide Sheet Incorporation Hansol Ra, Wooyoung Shim, Dana Jin, Hae Gon Lee, Sangjin Choi, Sungsoon Kim Yonsei University, Korea
6-1409	Stable Lithium Metal Batteries Employing Garnet-type Solid Electrolytes with Tailored Lithium Metal Compatibility Sewon Kim^{1,2}, Ju-Sik Kim¹, Dongmin Im¹, Kisuk Kang² ¹Samsung Advanced Institute of Technology, Korea, ²Seoul National University, Korea
6-1813	Simultaneously Improved Cubic Phase Stability and Li-Ion Conductivity in Garnet-Type Solid Electrolytes Enabled by Controlling the Al Occupation Sites Abin Kim¹, Joo-Hee Kang², Kyoung Song², Byoungwoo Kang¹ ¹Pohang University of Science and Technology, Korea, ²Korea Institute of Materials Science, Korea
6-2193	Building an Artificial Alloy Layer for Stabilizing the Sodium Metal Anodes Megala Moorthy, Bala krishnan Ganesan, Seo-Jun Lee, Ui-Rim Son, Yun-Sung Lee Chonnam National University, Korea
6-2623	An Improved Electrolyte Retention for Practical Use of Aqueous Zinc-Air Batteries Seowon Song¹, Ki Ro Yoon² ¹Advanced Institute of Industrial Technology, Korea, ²Korea Institute of Industrial Technology, Korea
6-3039	Concurrently Achieving High Density and Ionic Conductivity of $\text{Li}_{6.25}\text{Ga}_{0.25}\text{La}_3\text{Zr}_2\text{O}_{12}$ Solid Electrolyte via Lithium Proton Exchange Reaction Treatment Misael Ali Mita, Kanghyuk Lee, Kisuk Kang, Sang-Im Yoo Seoul National University, Korea
6-3847	Development of LIB Module Temperature Control Device Using Artificial Intelligence-Based MPC Control Sujin Lee, Juwon Lee, Sungwon Hwang Inha University, Korea

- 6-3935

Rechargeable Batteries Using Non-flammable Ionic Liquid Electrolytes
[Da Eun Kim](#), Jeong Mu Heo, Keun Hyung Lee
Inha University, Korea
- 6-3970

A Study on Flexible and Thin Li₆PS₄Cl-based Free-standing Membrane for All-solid-state Batteries
[UnGi Han](#), ByungGon Kim, JiHyeon Yoo, CheolHo Lee, JunHo Park, JeongHui Choi, Heetaek Park
Korea Electrotechnology Research Institute, Korea

07. Advances in Photovoltaic Materials and Devices

Halide Perovskite Solar Cells

NOV 07 (Mon) | Ara (8F)

CHAIR	Jun Hong Noh (Korea University, Korea)
7-4308	Understanding Nanoscale Recombination and Instabilities in Halide Perovskite Solar Cells
09:20-09:50	Sam Stranks
KEYNOTE	<i>Cambridge University, UK</i>
7-2081	Halide-assisted Proton Transfer Stabilisation at Alkylammonium in Halide Perovskites
09:50-10:20	Byung-wook Park
INVITED	<i>Ulsan National Institute of Science and Technology, Korea</i>
7-0248	Control of Chirality and Spin in Hybrid Perovskites for New Energy-efficient Technologies
10:20-10:50	Haipeng Lu
INVITED	<i>The Hong Kong University of Science and Technology, Hong Kong (SAR of China)</i>
7-0225	Surface Defect Engineering for Efficient and Stable Perovskite Solar Cells
10:50-11:20	Jin-Wook Lee
INVITED	<i>Sungkyunkwan University, Korea</i>
7-0193	Next Generation Photovoltaics: Perovskite-based Multijunction Solar Cells
11:20-11:50	Yi Hou ^{1,2}
INVITED	<i>¹National University of Singapore, Singapore, ²Solar Energy Research Institute of Singapore, Singapore</i>
7-1514	Inhomogeneous Defect Distributions in Mixed-Polytype Metal Halide Perovskites
11:50-12:05	Young Won Woo ¹ , Young-Kwang Jung ¹ , Zhenzhu Li ^{1,2} , Ji-Sang Park ³ , Aron Walsh ^{1,2}
	<i>¹Yonsei University, Korea, ²Imperial College London, UK, ³Kyungpook National University, Korea</i>
7-1180	Phase Stability of Cesium Lead Mixed-halides: Crystal Structure Prediction with a Neural Network Potential
12:05-12:20	Changho Hong ¹ , Yong Youn ² , Kanghoon Yim ² , Seungwu Han ¹
	<i>¹Seoul National University, Korea, ²Korea Institute of Energy Research, Korea</i>

Inorganic Thin Film Solar Cells

NOV 07 (Mon) | Ara (8F)

CHAIR	Jaeyeong Heo (Chonnam National University, Korea)
7-3890	Lightweight Flexible CIGS Solar Cells and Modules with High Specific Power
13:20-13:50	Kihwan Kim ¹ , Ji Hye Gwak ¹ , Jae Ho Yun ² , Jung-Jae Park ³
INVITED	¹ Korea Institute of Energy Research, Korea, ² Korea Institute of Energy Technology, Korea, ³ Korea Hydro & Nuclear Power Co., Ltd., Korea
7-2196	Emerging Chalcogenide Thin Films for Next Generation Solar Harvesting Devices
13:50-14:20	Lydia Helena Wong
INVITED	Nanyang Technological University, Singapore
7-0419	Cu(In,Ga)Se ₂ Thin-film Solar Cell Technology Combined with Laser Process for Advanced Functionalization
14:20-14:50	Jeung-hyun Jeong
INVITED	Korea Institute of Science and Technology, Korea
7-0317	Line and Planar Defects in Inorganic Thin-film Solar Cells
14:50-15:20	Daniel Abou-Ras
INVITED	Helmholtz-Zentrum Berlin, Germany
7-3658	High Performance, Flexible Ultraviolet Photodetectors Based on Facilely Synthesized Zn-Al: LDH Nanosheets
15:20-15:35	Alphi Maria Thomas , Soon-Gil Yoon
	Chungnam National University, Korea

Organic and Hybrid Solar Cells

NOV 07 (Mon) | Ara (8F)

CHAIR	Jung-Yong Lee (Korea Advanced Institute of Science and Technology, Korea)
7-3893	Multiple Ligands-Tailored SnO ₂ Quantum Dots Endow in Situ Dual-Interface Binding for High Efficiency and Low Energy Loss Perovskite Photovoltaics
16:00-16:30	Gang Li , Zhiwei Ren, Kuan Liu
INVITED	The Hong Kong Polytechnic University, Hong Kong (SAR of China)
7-0393	Synthesis of Active Materials for Solar Energy Conversion: “Make-it-simple !”
16:30-17:00	Clement Cabanetos
INVITED	Centre National de la Recherche Scientifique, France

7-0354	Material Engineering Strategies for Efficient and Stable Quantum Dots Photovoltaics
17:00-17:30	Jongmin Choi
INVITED	Daegu Gyeongbuk Institute of Science and Technology, Korea
7-0217	Indoor Organic Photovoltaics: Optimal Cell Design Principles with Synergistic Parasitic Resistance and Optical Modulation Effect
17:30-18:00	Jae Won Shim
INVITED	Korea University, Korea
7-3257	Fabrication of Efficient Semitransparent Organic Solar Cells via Bar-Coating in Air Using Green Solvent System
18:00-18:15	Shafket Rasool , Jin Young Kim
	Ulsan National Institute of Science and Technology, Korea
7-1837	Highly Efficient Flexible Organic Photovoltaic Modules for Sustainable Energy Harvesting Under Low-light Condition via Suppressing Voltage-drop by Metal-mediated Cross-linkable Polymer Interfacial Layer
18:15-18:30	Muhammad Jahandar , Soyeon Kim, Dong Chan Lim
	Korea Institute of Materials Science, Korea
7-1098	Multilayer Ti ₃ C ₂ MXene Based Electrodes for Transparent and Flexible Organic Solar Cell
18:30-18:45	Kiran Arun Nirmal , Wanqi Ren, Tukaram Dattatray Dongale, Atul Chandrakant Khot, Dae Yun Kang, Tae Geun Kim
	Korea University, Korea

07.Advances in Photovoltaic Materials and Devices

Inorganic Thin Film Solar Cells

18:30-19:30, NOV 07 (Mon) | Lobby (8F)

CHAIR	Jaeyeong Heo (Chonnam National University, Korea)
7-1104	A Study on Low Temperature Growth of ZnO-based Ultraviolet Photodetector Using Atomic Layer Deposition Hee-Jin Kim, Ga-Young Lim, Jeong-Hyeon Kim, Sung-Nam Lee <i>Tech University of Korea, Korea</i>
7-1620	Emergence of Localized Ferroelectric Polarization in Antiferroelectric Chalcogenide Perovskite BaZrS₃ Thin Film Juhi Pandey^{1,2}, Ajay Soni¹, Debjit Ghoshal³, Dibyendu Dey⁴, Tushar Gupta³, A. Taraphder⁵, Nikhil Koratker³ ¹Indian Institute of Technology Mandi, India, ²Korea Advanced Institute of Science and Technology, Korea, ³Rensselaer Polytechnic Institute, USA, ⁴Arizona State University, USA, ⁵Indian institute of Technology Kharagpur, India
7-1631	Structural, Optical, and Electrical Properties of Tungsten Doped Vanadium Oxide Thin Films Fabricated by Unbalanced Magnetron Sputtering for Smart Window Application Yong Seob Park <i>Chosun College of Science and Technology, Korea</i>
7-1732	Flexible PbS Colloidal Quantum Dot Solar Cells with Self-Assembled APTES Layer Irem Kozakci, Jung-Yong Lee <i>Korea Advanced Institute of Science and Technology, Korea</i>
7-2288	Super Hydrophilic Surface Sputtered-TiO₂ Thin Films Fabricated by Thermal and Ultraviolet Treatments Sangbin Park, Younghwa Yoon, Taejun Park, Hyungmin Kim, Kyunghwan Kim, Jeongsoo Hong <i>Gachon University, Korea</i>
7-2435	High Performance of Self-Powered Deep Ultraviolet Photodetector Based on Ag₂O/β-Ga₂O₃ Heterojunction Taejun Park, Sangbin Park, Younghwa Yoon, Hyungmin Kim, Kyunghwan Kim, Jeongsoo Hong <i>Gachon University, Korea</i>
7-2702	Importance of Fine Control of Se Flux for Improving Performances of Sb₂Se₃ Solar Cells Prepared by Vapor Transport Deposition Seunghwan Ji¹, Jiwoon Choi¹, Sung-Wook Nam², Byungha Shin¹ ¹Korea Advanced Institute of Science and Technology, Korea, ²Kyungpook National University, Korea

7-2781	Effects of Al₂O₃ Thickness in Silicon Heterojunction Solar Cells Doowon Lee, Myongsu Chae, Hee-Dong Kim <i>Sejong University, Korea</i>
7-2815	MgF₂/ITO Antireflection Coating for Silicon Heterojunction Solar Cells Doowon Lee, Hee-Dong Kim <i>Sejong University, Korea</i>
7-2820	NiO/β-Ga₂O₃ Hetero-junction for Photodetector Hyungmin Kim, Younghwa Yoon, Sangbin Park, Taejun Park, Jeongsoo Hong, Kyunghwan Kim <i>Gachon University, Korea</i>
7-2923	Effect of Substrate Temperature on the Characteristics of CIGS Solar Cells with a Rear Point Contact Passivation Layer Si-Nae Park¹, Jaebaek Lee², Shi-Joon Sung², Kee-Jeong Yang², Dae-Hwan Kim², Yun Seon Do¹, Jin-Kyu Kang² ¹Kyungpook National University, Korea, ²Daegu Gyeongbuk Institute of Science and Technology, Korea
7-2942	Rear Surface Passivation of Superstrated Sb₂Se₃ Solar Cells via Selenium Post-annealing Treatment and Hole-transport Layer Application Yazi Wang, Seunghwan Ji, Byungha Shin <i>Korea Advanced Institute of Science and Technology, Korea</i>
7-3325	ZnTiO Thin Films Grown by Atomic Layer Deposition for Window Layer Application of Cu(In,Ga)Se₂ Solar Cells Jaebaek Lee, Dong-Hwan Jeon, Dae-Kue Hwang, Shi-Joon Sung, Kee-Jeong Yang, Dae-Hwan Kim, Jin-Kyu Kang <i>Daegu Gyeongbuk Institute of Science and Technology, Korea</i>
7-3333	Micro-mesh Based Transparent Electrode Fabricated by Cracked Templates and Its Application to Solar Cell Seung Taek Jo, Jin Wook Shin, In Pyo Lee, Chan Woong Kim, Hyesun Yoo, Jong Wook Roh <i>Kyungpook National University, Korea</i>
7-3483	Investigation of Ultra-Thin Silicon Wafer Fabricated by Stress-induced Lift-off Method Cut via Nickel Plating Doowon Lee, Hee-Dong Kim <i>Sejong University, Korea</i>
7-3659	Fabrication of Flexible GaAs Nanorod Solar Cell Grown on Recycling GaAs Substrate Hyo Jin Kim, Gwang Yeol Park, Seong Min Kim <i>Korea Photonics Technology Institute, Korea</i>
7-3729	Efficiency Enhancement of InP Nanorod Solar Cell by Inserting Wavelength Conversion Layer Kwang-Cheol Lee, Gwang Yeol Park, Jeong Hwan Ahn, Hyo Jin Kim <i>Korea Photonics Technology Institute, Korea</i>

- 7-3907** Ga Distribution Control at Absorber Layer for Low-bandgap Cu(In,Ga)Se₂ Thin Film Solar Cells
[Dong-Hwan Jeon](#), Van Quy Hoang, Dae-Kue Hwang, Dae-Hwan Kim
 Daegu Gyeongbuk Institute of Science and Technology, Korea
- 7-3959** Ligand-free SnO₂ Nanoparticles for N-type Oxides as Electron Transport Layers of Perovskite Solar Cells
[Hee Jung Kim](#), Bonghyun Jo, Geon Woo Yoon, Young Ju Kim, Gill Sang Han, Hyun Suk Jung
 Sungkyunkwan University, Korea
- 7-3989** Enhanced Photovoltaic Properties in AgBiS₂ Nanocrystal Solar Cells with a Modified Electron Transport Layer
[Wook Hyun Kim](#)¹, Jungyoun Bae², Kang-Pil Kim¹, Sungho Woo¹
¹Daegu Gyeongbuk Institute of Science and Technology, Korea, ²Kyungpook National University, Korea

Halide Perovskite Solar Cells

16:50-18:20, NOV 08 (Tue) | Lobby (8F)

- CHAIR** Yi Hou (National University of Singapore, Singapore)
- 7-0795** Effect of Au/Ag Bilayer Electrode on Aging-Induced Recovery Process in Perovskite Solar Cells
[Junyeong Lee](#), Padmalatha Muthukrishnan Akshaiya, Hyoseon Kim, Abrar Md Karim, Sungjin Jo
 Kyungpook National University, Korea
- 7-0799** Low Temperature Processed SnO₂ Layer via Surface Modification with Oxygen Plasma for Planar Perovskite Solar Cells
[Padmalatha Muthukrishnan Akshaiya](#), Junyeong Lee, Hyoseon Kim, Abrar Md Karim, Sungjin Jo
 Kyungpook National University, Korea
- 7-1130** A Study of Mixed-cation Mixed-halide Perovskite UVC Photodetector Implemented by Simple Surface Engineering Technology
[Soo Beom Hong](#), Hyung Wook Choi, Chung Wung Bark
 Gachon University, Korea
- 7-1139** A Study on Fabrication of High Sensitivity Deep-Ultraviolet Photodetector with Mixed Cation-Halide Perovskite
[Ga In Choi](#), Il Tae Kim, Hyung Wook Choi
 Gachon University, Korea
- 7-1193** Enhancement of Perovskite Solar Cells Efficiency Using Cu₂O/ Reduced Graphene Oxide Nanocomposite as Hole Transport Material
[Thi Muoi Vo](#), Chung Wung Bark
 Gachon University, Korea

- 7-1329** Polymer-doped SnO₂ as an Electron Transport Layer for High-efficient and Stable Perovskite Solar Cells
[Vo Pham Hoang Huy](#), Nguyen Thi My Huyen, Rui He, Muoi Vo Thi, Chung Wung Bark
 Gachon University, Korea
- 7-1373** Band-Structure Engineering of Lead-free Double Perovskites for Optoelectronic Applications
[Ismail A. M. Ibrahim](#), Chan-Yeup Chung
 Korea Institute of Ceramic Engineering & Technology, Korea
- 7-3267** Physical Effects of 2PACz Layers as Hole Transport Material on the Performance of Perovskite Solar Cell
[Doo-Hwan Kim](#)¹, Seri Lee¹, Se-Young Oh¹, Gyu Min Kim²
¹Sogang University, Korea, ²Hankyong National University, Korea
- 7-3280** Improving Efficiency and Stability of Wide-bandgap Perovskite Solar Cells Through PEABF₄ Passivation Layer
[Sejin Kim](#), Jaehyuk Koh, Byungha Shin
 Korea Advanced Institute of Science and Technology, Korea
- 7-3355** In Situ Observation of Photo-Induced Halide Segregation in Mixed Halide Perovskite
 Hyunhwa Lee¹, Passarut Boonmongkolas², Byungha Shin², Jeong Young Park^{1,2}
¹Institute for Basic Science, Korea, ²Korea Advanced Institute of Science and Technology, Korea
- 7-3612** Universal Passivation Strategy for the Hole Transport Layer/Perovskite Interface via an Alkali Treatment for High Efficiency Perovskite Solar Cells
 Byungha Shin¹, [Sanghyuk Ryu](#)¹, Passarut Boonmongkolas¹, Syed Dildar Haider Naqvi², Daehan Kim¹, Seongryul Pae¹, SeJin Ahn², Minkyu Kim¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Korea Institute of Energy Research, Korea
- 7-4100** Mixed-Phase Methylammonium-Free Perovskite Solar Cells for High Performance Perovskite Solar Cells with Enhanced Thermal/Long-Term Stability
[Yeseo Lee](#), Jae Woong Jung
 Kyung Hee University, Korea

Organic and Hybrid Solar Cells

16:50-18:20, NOV 08 (Tue) | Lobby (8F)

- CHAIR** Jongmin Choi (Daegu Gyeongbuk Institute of Science and Technology, Korea)
- 7-0786** Thickness Effect of TiO₂ Active Layer on Photovoltaic Conversion Efficiency of Dye-sensitized Solar Cells
 Sang-Hun Nam, Dong-Woo Ju, [Jin-Hyo Boo](#)
 Sungkyunkwan University, Korea

- 7-1558** Synergistic Effect of Narrow Band-gap Organic Solar Cells and Wide Band-gap Perovskite Solar Cells for High-performance Hybrid Tandem Solar Cells
[Fella Maouche](#)^{1,2}, Jae Woong Jung^{1,1}
¹Kyung Hee University, Korea, ²Integrated Education Institute for Frontier Science & Technology, Korea
- 7-2947** Photovoltaic Properties of Organic-solvent-free Hybrid Solar Cells with Graphene/Ti₃C₂-mixed Layer as Counter Electrode
[Baekseo Choi](#), Ju Hee Gu, Dongho Park, Yoon Soo Han
 Daegu Catholic University, Korea
- 7-3856** Utilizing Heterogeneous Catalysis in Flow Reactor System for Conjugated Polymer Synthesis
[Seungjun Lee](#), Youngrok Kim, Chanseo Lee, Jinwoo Jeon, Yejin Hwang
 Inha University, Korea

08. Hydrogen Future and Its Economic and Environmental Consideration

Photoelectrochemical Hydrogen Production 1

NOV 07 (Mon) | Halla (8F)

- | | |
|--------------|--|
| CHAIR | Uk Sim (Korea Institute of Energy Technology, Korea) |
|--------------|--|
-
- 8-3799** Dual Textured Heterostructure for Enhanced Photoelectrochemical Water-splitting
 09:20-09:50 [Eric Han](#)
 INVITED [Stanford University, USA](#)
- 8-3254** Efficient Charge Transport Pathways of Ta₃N₅ Photoanode for Photoelectrochemical Water Splitting
 09:50-10:05 [Hee Ryeong Kwon](#), Ho Won Jang
[Seoul National University, Korea](#)
- 8-3218** Multifunctional Nano-Heterogeneous Ni(OH)₂/NiFe Catalysts on Silicon Photoanode toward Efficient Water and Urea Oxidation
 10:05-10:20 [Jin Wook Yang](#), Ho Won Jang
[Seoul National University, Korea](#)
- 8-1070** Flame Activation of Spinel Zinc Ferrite Photoanode with Enhanced Charge Collection Property for Photoelectrochemical Water Splitting
 10:20-10:35 [Runfa Tan](#), Yoo Jae Jeong, Li Qu, Minjae Kang, In Sun Cho
[Ajou University, Korea](#)
- 8-1864** Boosting Photoelectrochemical Water Oxidation by Introducing Homogeneous Metal Oxide Interlayer
 10:35-10:50 [Jaekyum Kim](#)¹, Byung-Hyun Kim², Jung Kyu Kim¹
¹Sungkyunkwan University, Korea, ²Korea Institute of Energy Research, Korea
- 8-1999** Enhancing Light Harvesting and Photoelectrochemical Catalytic Properties by Plasmonic Metal Nanoparticles@Graphene Quantum Dots Core-Shell Structures
 10:50-11:05 [Unbeom Baeck](#), Jung Kyu Kim
[Sungkyunkwan University, Korea](#)
- 8-2008** Enhancing Solar-assisted Water Splitting of BiVO₄ via Rapid Sol-Flame-based Transition Metal Doping
 11:05-11:20 [Eujin Kwak](#), Jung Kyu Kim
[Sungkyunkwan University, Korea](#)

8-1861 Stable Core-Shell Perovskite Quantum Dots Supported on WO₃ for Enhanced Photoelectrochemical Water Splitting
[Won Tae Hong](#), Jung Kyu Kim
Sungkyunkwan University, Korea

Photoelectrochemical Hydrogen Production 2

NOV 07 (Mon) | Halla (8F)

CHAIR	Uk Sim (Korea Institute of Energy Technology, Korea)
8-2075 13:20-13:50 INVITED	Doping of Hematite for Efficient Water Splitting Ji-Hyun Jang <i>Ulsan National Institute of Science and Technology, Korea</i>
8-0838 13:50-14:20 INVITED	A Novel Solution to the Reproducibility Problem in the Fabrication of Bismuth Vanadate Photoanodes for Efficient Photoelectrochemical Water Splitting Segi Byun ¹ , Gihun Jung ² , Byungha Shin ² ¹ Korea Institute of Energy Research, Korea, ² Korea Advanced Institute of Science and Technology, Korea
8-2985 14:20-14:35	Large-Scale Growth of Hematite Nanostructures for Photoelectrochemical Water Splitting on Foldable Aluminum Foil Jun Beom Hwang , Sanghan Lee <i>Gwangju Institute of Science and Technology, Korea</i>
8-2325 14:35-14:50	Efficient and Stable Unassisted Solar Water Splitting Using Organometal Halide Perovskite-based Dual Photoelectrodes Hojoong Choi ¹ , Sehun Seo ² , Chang Jae Yoon ¹ , Heejoo Kim ¹ , Sanghan Lee ¹ ¹ Gwangju Institute of Science and Technology, Korea, ² Lawrence Berkeley National Laboratory, USA
8-1060 14:50-15:05	Point-defect Engineering of Nanoporous CuBi ₂ O ₄ Photocathode via Rapid Thermal Processing for Enhanced Photoelectrochemical Activity Li Qu , Runfa Tan, Arumugam Sivanantham, Min Je Kang, Yoo Jae Jeong, Dong Hyun Seo, In Sun Cho <i>Ajou University, Korea</i>
8-2759 15:05-15:20	Photoelectrochemical Glycerol Oxidation to Glycolic Acid with Bi-MOF Decorated WO ₃ Photoanode Yoonsung Jung ¹ , Seungkyu Kim ² , Sanghan Lee ¹ ¹ Gwangju Institute of Science and Technology, Korea, ² Korea Institute of Energy Technology, Korea
8-3028 15:20-15:35	Tailored MoS ₂ Catalytic Layer for Photoelectrochemical Nitrogen Reduction to Ammonia Yejoon Kim , Sanghan Lee <i>Gwangju Institute of Science and Technology, Korea</i>

Photoelectrochemical Hydrogen Production 3

NOV 07 (Mon) | Halla (8F)

CHAIR	Jung Kyu Kim (Sungkyunkwan University, Korea)
8-0158 16:00-16:30 INVITED	Control of Charge Transfer at the Solid/Liquid Interface for Photoelectrochemical Water Oxidation Kan Zhang <i>Nanjing University of Science and Technology, China</i>
8-0326 16:30-17:00 INVITED	Emerging Photocathode Materials for Photoelectrochemical Water Splitting: From Synthesis to Advanced Device Characterizations Wooseok Yang <i>Sungkyunkwan University, Korea</i>
8-3676 17:00-17:15	3D Geometry-controlled Superaerophobic Ni Nanoarrays for Efficient Alkaline Hydrogen Evolution Reaction Jaerim Kim , Jong Kyu Kim <i>Pohang University of Science and Technology, Korea</i>
8-1985 17:15-17:30	Self-Assembled Nickel Nitride Stable Efficient Electrode for Hydrogen Evolution Shivraj Mahadik ¹ , Subramani Surendran ² , Tae-Hoon Kim ¹ , Uk Sim ² ¹ Chonnam National University, Korea, ² Korea Institute of Energy Technology, Korea
8-1219 17:30-17:45	Nitrogen and Sulfur Co-doped on MXene via Hydrothermal Method for Hydrogen Evolution Reaction Mahider Asmare Tekalgne ¹ , Sang Hyun Ahn ¹ , Soo Young Kim ² ¹ Chung-Ang University, Korea, ² Korea University, Korea
8-1115 17:45-18:00	Surface-Embedded Molybdenum Carbide/Carbon Nanofibers Electrochemical Catalyst by Thermodynamic and Kinetic Reaction Process Design Sang-Ho Oh ¹ , Geosan Kang ¹ , Ji-Yong Kim ¹ , Dae-Hyun Nam ² , Young-Chang Joo ¹ ¹ Seoul National University, Korea, ² Daegu Gyeongbuk Institute of Science and Technology, Korea
8-1090 18:00-18:15	Faceted CuMn ₂ O ₄ Nanoparticles Enabling the Active Sites for High Performance Electrocatalytic Water Splitting Balasubramanian Jansi Rani , Arumugam Sivanantham, Tatachari Santhanagopalan Shridharan, Runfa Tan, In Sun Cho <i>Ajou University, Korea</i>

Electrocatalysis for Hydrogen Generation 1

NOV 08 (Tue) | Halla (8F)

CHAIR	Jung Kyu Kim (Sungkyunkwan University, Korea)
8-0382 10:10-10:40 INVITED	Electrochemical Epoxidation Coupled with H ₂ Evolution Kyoungsuk Jin Korea University, Korea
8-1904 10:40-10:55	Electrochemical Catalytic Ammonia Synthesis from Nitrogen and Nitrogen Oxides via Bismuth Catalyst by DFT Calculation Dong-Kyu Lee ¹ , Jaehyoung Lim ¹ , Min-Cheol Kim ² , Uk Sim ¹ , Jung Kyu Kim ² ¹ Korea Institute of Energy Technology, Korea, ² Sungkyunkwan University, Korea
8-3331 10:55-11:10	Database-Aided Design of Metal Phosphide Electrocatalysts for Efficient and Selective Nitrogen Oxides Reduction Reaction Jaehyoung Lim ¹ , Dong-kyu Lee ¹ , Min-Cheol Kim ^{1,2} , Jung Kyu Kim ² , Uk Sim ^{1,3} ¹ Korea Institute of Energy Technology, Korea, ² Sungkyunkwan University, Korea, ³ NEEL Sciences Inc., Korea
8-3680 11:10-11:25	Electrocatalytic Nitrogen Reduction Reaction on Vanadium Based Hetero-interface Catalysts for Highly Boosted Ammonia Production Tae-Yong An ¹ , Joon Young Kim ¹ , SeJin Im ¹ , Dae Joon Moon ¹ , Uk Sim ^{1,2} ¹ Korea Institute of Energy Technology, Korea, ² NEEL Sciences. Inc., Korea
8-3032 11:25-11:40	A Facile Synthesis of Electrodeposited Cu/Co Bi-metallic Catalysts for Improving Electrocatalytic Nitrate to Ammonia Sejin Im ¹ , Jaehyoung Lim ¹ , Taeyong An ¹ , Dae Jun Moon ¹ , Uk Sim ^{1,2} ¹ Korea Institute of Energy Technology, Korea, ² NEEL Sciences Inc., Korea
8-1887 11:40-11:55	Investigation of Electrocatalytic Nitrogen Reduction Activities on Au@Cu ₂ Se Core@Shell Electrocatalyst in Aqueous and Non-aqueous Conditions Yujin Jeong ¹ , Dohun Kim ² , Mi-kyung Han ² , Uk Sim ¹ ¹ Korea Institute of Energy Technology, Korea, ² Chonnam National University, Korea
8-3421 11:55-12:10	Efficient Ammonia Oxidation and Eco-friendly Hydrogen Production of Ni ₂ P@NC Electrocatalysts Chanmin Jo ¹ , Subramani Surendran ¹ , Dae Jun Moon ¹ , Joon Young Kim ^{1,2} , Uk Sim ^{1,2} ¹ Korea Institute of Energy Technology, Korea, ² NEEL Sciences Inc., Korea
8-1784 12:10-12:25	Electrospun Ni ₂ P@CNF as an Anode Material for Nonaqueous Sodium-Ion Capacitor Jihyun Park ¹ , Song Yeul Lee ² , Joon Young Kim ¹ , Yong Il Park ² , Uk Sim ¹ ¹ Korea Institute of Energy Technology, Korea, ² Chonnam National University, Korea
8-1976 12:25-12:40	In-Situ Integration of Co-Active Sites in MnO@C Composite for Zinc-Air Battery-Driven Water Splitting Gnanaprakasam Janani ¹ , Subramani Surendran ¹ , Krishnan Veeramani ² , Uk Sim ¹ ¹ Korea Institute of Energy Technology, Korea, ² Chonnam National University, Korea

Electrocatalysis for Hydrogen Generation 2

NOV 08 (Tue) | Halla (8F)

CHAIR	Kyoungsuk Jin (Korea University, Korea)
8-0215 14:00-14:30 INVITED	Interfacial/Surficial Modulation of Energy Nanomaterials for Efficient Water Splitting Jung Kyu Kim Sungkyunkwan University, Korea
8-0125 14:30-15:00 INVITED	Computation-aided Developments of Photoanodes and Electrocatalysts for High Activity and Durability Heechae Choi University of Cologne, Germany
8-3077 15:00-15:15	Photovoltaic-driven CO ₂ Electrochemical Reduction to Formate with High Solar-to-fuel Efficiency Woo Seok Cheon , Ho Won Jang Seoul National University, Korea
8-3669 15:15-15:30	Introducing Secondary Metals to Control Selectivity of Cu ₂ O Nanoparticle for Carbon Dioxide Reduction Seung Ju Yu , Jong Lam Lee Pohang University of Science and Technology, Korea
8-3297 15:30-15:45	Porously Reduced 2-Dimensional Bi ₂ O ₂ CO ₃ Petals for Strain-Mediated Electrochemical CO ₂ Reduction to HCOOH Won Seok Cho ¹ , Dae Myung Hong ¹ , Wan Jae Dong ² , Tae Hyung Lee ³ , Chul Jong Yoo ¹ , Kisoo Kim ¹ , Donghwa Lee ¹ , Ho Won Jang ³ , Jong-Lam Lee ¹ ¹ Pohang University of Science and Technology, Korea, ² Michigan State University, USA, ³ Seoul National University, Korea
8-3199 15:45-16:00	Cu _x S Catalysts by Ag-Mediated Corrosion of Cu for Electrochemical Reduction of Sulfur-Containing CO ₂ Gas to HCOOH Jin Wook Lim , Wan Jae Dong, Won Seok Cho, Chul Jong Yoo, Kisoo Kim, Jong-Lam Lee Pohang University of Science and Technology, Korea
8-4130 16:00-16:15	MOF-derived ZnO@GC Nanoarchitecture as an Effective Hydrogen Gas Sensor with Improved Selectivity and Gas Response Bharat Sharma Karlsruhe Institute of Technology, Germany

Electrocatalysis for Hydrogen Generation 3

NOV 09 (Wed) | Halla (8F)

CHAIR	Uk Sim (Korea Institute of Energy Technology, Korea)
8-0523	Effective Temperature Reduction of Solid Oxide Electrochemical Cells with Thin-Film Protonic Ceramics
10:10-10:40	<i>INVITED</i> Kiho Bae Korea Institute of Energy Technology, Korea
8-2482	Hydrogen for a Climate-Neutral Europe - A Review of the Hydrogen Strategy of the European Union
10:40-10:55	<i>INVITED</i> Moritz Venschott IU International University of Applied Science, Germany
8-3956	Preliminary Assessment of Ru-doped LiNiO ₂ as a Dual-functioning Electrode for Solid Oxide Fuel Cells
10:55-11:10	<i>INVITED</i> Wan Nor Anasuhah Wan Yusoff ¹ , Nurul Akidah Baharuddin ¹ , Mahendra Rao Somalu ¹ , Nigel P. Brandon ² ¹ National University of Malaysia, Malaysia, ² Imperial College London, UK
8-0638	Synthesis of CoSe ₂ Nanoparticles Embedded on Nitrogen-Doped Carbon from Metal-Organic Frameworks for Hydrogen Evolution Reaction
11:10-11:25	<i>INVITED</i> Ha Hwu Do ¹ , Sang Hyun Ahn ¹ , Soo Young Kim ² ¹ Chung-Ang University, Korea, ² Korea University, Korea
8-0606	Control of the Morphologies of Molybdenum Disulfide for Hydrogen Evolution Reaction
11:25-11:40	<i>INVITED</i> Tuan Van Nguyen ¹ , Sang Hyun Ahn ¹ , Soo Young Kim ² ¹ Chung-Ang University, Korea, ² Korea University, Korea

Thermochemical Hydrogen Production

NOV 09 (Wed) | Halla (8F)

CHAIR	Kiho Bae (Korea Institute of Energy Technology, Korea)
8-0490	Lowering the Reduction Temperature of Two-step Thermochemical Water Splitting
14:00-14:30	<i>INVITED</i> Hyungyu Jin Pohang University of Science and Technology, Korea
8-0243	Hydrogen-rich B,N Containing Systems for Hydrogen Storage
14:30-15:00	<i>INVITED</i> Zhenguo Huang University of Technology Sydney, Australia

8-1740	The Effect of Support on the Two-step Thermochemical Water Splitting
15:00-15:15	<i>INVITED</i> Beomjun Kim , Dongkyu Lee, Taehyeong Kim, Hyungyu Jin Pohang University of Science and Technology, Korea
8-1522	A Systematic Study on Fe _x (MgNiCo) _{1-x} O _y on Enhancing Thermochemical Water Splitting Performance
15:15-15:30	<i>INVITED</i> Hyemin Kim ¹ , Dongkyu Lee ¹ , Taehyeong Kim ¹ , Byeong-Gyu Park ² , Hyungyu Jin ¹ ¹ Pohang University of Science and Technology, Korea, ² Pohang Accelerator Laboratory, Korea
8-1518	High-throughput Thermodynamic Screening of Fe-containing Catalysts for Two-step Thermochemical Hydrogen Production
15:30-15:45	<i>INVITED</i> Dongkyu Lee ¹ , Joonhyun Nam ² , Hyemin Kim ¹ , In-Ho Jung ² , Hyungyu Jin ¹ ¹ Pohang University of Science and Technology, Korea, ² Seoul National University, Korea
8-1006	Kinetic Analysis of Isothermal and Non-isothermal Water Splitting by Poly-cation Oxides
15:45-16:00	<i>INVITED</i> Taehyeong Kim , Yugon Kim, Hyungyu Jin Pohang University of Science and Technology, Korea
8-0864	Crystal Structure Degradation by Oxygen Ion Accumulation at the Solid Oxide Electrolysis Cell (SOEC) Interface
16:00-16:15	<i>INVITED</i> Haneul Choi ^{1,2} , Mi-Young Park ¹ , Kyung Joong Yoon ¹ , Jin-Woo Park ² , Hye Jung Chang ^{1,3} ¹ Korea Institute of Science and Technology, Korea, ² Yonsei University, Korea, ³ University of Science and Technology, Korea

08. Hydrogen Future and Its Economic and Environmental Consideration

Photoelectrochemical Hydrogen Production

18:30-19:30, NOV 07 (Mon) | Lobby (8F)

CHAIR	Sanghan Lee (Gwangju Institute of Science and Technology, Korea)
8-0869	Productive Solar-driven Electrochemical Reduction of Carbon Dioxide to Carbon Monoxide by Using Shingled Si Solar Cells <u>Jeon Ryang Lee</u>¹, Jeonghyeon Lee¹, Min-Joon Park¹, Chaehwan Jeong¹, Eun Mi Han², Tae-Won Kim¹ ¹Korea Institute of Industrial Technology, Korea, ²Chonnam National University, Korea
8-1205	Photoelectrochemical Water Splitting Based on LaFeO₃ Photocathode for Green Hydrogen Production <u>Hyunwoong Seo</u>¹, Kyu Mi Han¹, Min-Kyu Son² ¹Inje University, Korea, ²Korea Institute of Ceramic Engineering and Technology, Korea
8-1226	Surface Passivation Layers to Prevent Deterioration of Optical Properties of Cu₂O Photocathode Deposited in Low Vacuum for PEC Cell <u>Kyungmin Kwak</u>, Sangwoo Ryu Kyonggi University, Korea
8-1370	CeO₂ Quantum-dots Hole Extraction Layer for Enhanced Solar Water Splitting of BiVO₄ Photoanode <u>Tak Hyun You</u>, Dong Hyun Seo, Seo Yeong Hong, Arumugam Sivanantham, In Sun Cho Ajou University, Korea
8-1379	Synthesis of BiVO₄/SnO₂ Nanorods-Axial-Heterostructure with Improved Charge Collection Properties for Solar Water-splitting <u>Seo Yeong Hong</u>, Yoo Jae Jeong, In Sun Cho Ajou University, Korea
8-1400	Properties of Sulfur-doped CuBi₂O₄ Prepared by Sol-gel and Electrochemical Synthesis <u>Eunhwa Kim</u>, Sangwoo Ryu Kyonggi University, Korea
8-2953	Designation and Characterization of NiMoO₄/BiVO₄/WO₃ Double Heterojunction Photoanode to Enhance Photoelectrochemical Water Splitting Performance <u>Htoo Thiri Htet</u>, Sanghan Lee Gwangju Institute of Science and Technology, Korea

8-2999	Enhanced Photoelectrochemical Performance of BiVO₄ Photoanodes Through Borate-treated Impregnation <u>Myat Thwe Naing</u>, Sanghan Lee Gwangju Institute of Science and Technology, Korea
8-3107	Enhanced Photoelectrochemical Performance in BiVO₄ Photoanode by Inserting the BiFeO₃ Ferroelectric Thin Layer <u>Haejin Jang</u>, Sanghan Lee Gwangju Institute of Science and Technology, Korea
8-3255	Effect of MgO Miscut Substrates on CuBi₂O₄ Thin Films for Photoelectrochemical Water Splitting <u>Jinsol Jun</u>, Sanghan Lee Gwangju Institute of Science and Technology, Korea

Electrocatalysis for Hydrogen Generation

16:50-17:50, NOV 09 (Wed) | Lobby (2F)

CHAIR	Hyung-Suk Oh (Korea Institute of Science and Technology, Korea)
8-0633	Electronic structure modification and N-doped carbon shell design of Ni₃FeN@NC for overall water splitting performance evaluation <u>Dong In Jeong</u>, Hyung Wook Choi, Jiwon Kim, Ui Young Lee, Dae Ho Yoon Sungkyunkwan University, Korea
8-0658	Mesoporous Cobalt-Iron-Phosphide Nanocube Electrocatalyst for Efficient Oxygen Evolution Reaction <u>Ui Young Lee</u>, Dong In Jeong, Hyung Wook Choi, Jiwon Kim, Chauhan Neeshu, Man Gyu Hur, Jong Hee Kim, Dae Ho Yoon Sungkyunkwan University, Korea
8-0987	Characteristics of Ni-P Electrode for Oxygen Evolution Reaction in Alkaline Media <u>Byeong Chan Choi</u>^{1,2}, Byounguk Yu^{1,2}, Yong-Wook Choi¹, Byung Jun Kim¹, Hyoung Chan Kim¹ ¹Korea Institute of Industrial Technology, Korea, ²Pusan National University, Korea
8-1343	Nickel-Molybdenum Based Hydrogen Evolution Electrocatalysts <u>Yu Jin Kim</u>¹, Sang Eon Jun¹, Go eun Lee¹, Ki Chang Kwon¹, Seunghoon Nam², Sun Hwa Park¹ ¹Korea Research Institute of Standards and Science, Korea, ²Andong National University, Korea
8-1351	Co₄N Encapsulated by N-doped Carbon Nanobox Synthesized from PDA as an Electrocatalysts for Oxygen Evolution Reaction <u>Hyung Wook Choi</u>¹, Dong In Jeong¹, Jiwon Kim¹, Ui Young Lee¹, Bong Kyun Kang², Dae Ho Yoon¹ ¹Sungkyunkwan University, Korea, ²Soonchunhyang University, Korea

- 8-1353** Ni(CN)₂/Ni₂P Nanoplate Derived from 2D Hofmann-type Coordination Polymer as Oxygen Evolution Electrocatalysts
[Jiwon Kim](#)¹, Hyung Wook Choi¹, Dong In Jeong¹, Ui Young Lee¹, Bong Kyun Kang², Dae Ho Yoon¹
¹Sungkyunkwan University, Korea, ²Soonchunhyang University, Korea
- 8-1421** Potentiostatic Electrodeposition of Ni-Fe-S on Ni Foam for Efficient Oxygen Evolution Reaction
[DaeGeon Choi](#), Sangwoo Ryu
 Kyonggi University, Korea
- 8-1648** Transition Metal-based Single Atom Catalysts Anchored on 2-D Materials for Alkaline Hydrogen Evolution Reaction
[Sang Eon Jun](#)^{1,2}, Goeun Lee¹, Yu Jin Kim¹, Ki Chang Kwon¹, Ho Won Jang², Sun Hwa Park¹
¹Korea Research Institute of Standards and Science, Korea, ²Seoul National University, Korea
- 8-1672** Electrochemical Evaluation of Readily Two-step Modified Stainless Steel Anode
[Byounguk Yu](#)^{1,2}, Byeong Chan Choi¹, Jung Rae Kim², Hyoung Chan Kim¹, Yong-Wook Choi¹
¹Korea Institute of Industrial Technology, Korea, ²Pusan National University, Korea
- 8-1799** Self-supported Tin Selenide on Nickel Foam as an Efficient Electrocatalyst for Electrochemical Water Splitting
[Aparna Sajeed](#), Arunprasath Sathyaseelan, Sang-Jae Kim
 Jeju National University, Korea
- 8-2004** Nitrogen-Rich Functionalized Carbon Wrapped on CoP/Ag: A Dynamic Multifunctional Electrocatalyst for Zinc-Air Battery Driven Water Splitting System
[Subramani Surendran](#)¹, Gnanaprakasam Janani¹, Sebastian Cyril Jesudass², Uk Sim¹
¹Korea Institute of Energy Technology, Korea, ²Chonnam National University, Korea
- 8-2203** The Preparation of Pt/C Nanoparticles Using Carbon Blacks and Investigation of the Catalytic Activity of a MEA's
 Sooyoul Park, Jueun Lee, [Junghoon Lee](#)
 Korea Research Institute of Chemical Technology, Korea
- 8-2669** Ni & Fe-doped Carbon Nanotubes Prepared by Pulsed Laser Ablation in Liquid Media for Improved Oxygen Evolution Reaction in Water Splitting
[Sihyun Lee](#)¹, Minju Kim¹, Jong Cheol Kim², Sungwook Mhin¹
¹Kyonggi University, Korea, ²Daegu Mechatronics & Materials Institute, Korea
- 8-2672** Electrochemical Performance of the P-doped Ni₃S₂ Directly Grown on Nickel Foam in Seawater Splitting
[Younghee So](#), Seoah Kim, Sungwook Mhin
 Kyonggi University, Korea
- 8-2747** A Study on the MoSe₂ for Hydrogen Evolution Reaction Catalyst Using Hydrothermal Synthesis Method
[Yu Ri Jung](#), Jae Chul Ro, Su-Jeong Suh
 Sungkyunkwan University, Korea

- 8-2753** Characterization of Electrodeposited NiFe for Oxygen Evolution Reaction Catalysts
[Da Young Lee](#), Jae Chul Ro, Su-Jeong Suh
 Sungkyunkwan University, Korea
- 8-2790** Narrow Size-Distribution of Nanoscale Pores of Penetrated Graphene for High Ion Transport of Electrocatalysts
[Seungmin Lee](#), Sang Ouk Kim
 Korea Advanced Institute of Science and Technology, Korea
- 8-3160** 2D Ni-based Metal-organic Framework Electrocatalyst for Oxygen Evolution Reaction
[Jeewon Bu](#), Min Kyung Lee, Ho Won Jang
 Seoul National University, Korea
- 8-3182** Enhanced Stability for Ammonia Electrooxidation with Core-shell NiCu alloy
[Jiwoo Lee](#), Sol A Lee, Ho Won Jang
 Seoul National University, Korea
- 8-3418** Hierarchical Co, N-co-doped Hollow Porous Carbon Material Derived from PS@ZIF for Electrochemical Catalyst
[HeeJun Park](#), Il-Doo Kim
 Korea Advanced Institute of Science and Technology, Korea
- 8-3685** Tailoring Binding Abilities by Incorporating Oxophilic Transition Metals on 3D Nanostructured Ni Arrays for Accelerated Alkaline Hydrogen Evolution Reaction
[Jaerim Kim](#), Hyeonjung Jung, Sang-Mun Jung, Yong-Tae Kim, Jeong Woo Han, Jong Kyu Kim
 Pohang University of Science and Technology, Korea
- 8-3816** Self Sacrificial Hollow Fe Doped CoP with Phosphorus Vacancies Electrocatalyst for Overall Water Splitting
[Rin Na](#), Jaeseo Lee, Minjung Kim, Sung-Hyeon Baeck
 Inha University, Korea
- 8-3820** Flower Like Defect-rich Fe-doped Ni₂P with Phosphorus Vacancies as Electrocatalyst for Oxygen Evolution Reaction
[SoJeong Min](#), Hyejin Kim, Kyeongseok Min, Sung-Hyeon Baeck
 Inha University, Korea
- 8-3829** Boosting Electrocatalytic Activity Toward Overall Water Electrolysis via Constructing Core-Shell Structured NiCo@NiCoP Nanorod on Nickel Foam
[Minjung Kim](#), Sojeong Min, Hyejin Kim, Sung-Hyeon Baeck
 Inha University, Korea
- 8-3839** Techno-economic Analysis for Hydrogen Production and Its Transportation via Hydrogen Carrier
[Nomuunaa Tsogt](#), Taehyung Kang, Sungwon Hwang
 Inha University, Korea

- 8-3945** Corrosion-Engineered Transition Metal Sulfide as a Bi-functional Electrocatalyst for Overall Alkaline Water Splitting
[Chiho Kim](#), Jea-Yeop Jeong, Song Jin, Shin-woo Myeong, Ho-seok Lee, Sung Mook Choi
Korea Institute of Materials Science, Korea
- 8-3988** Electrocatalytic Properties of Co and Fe Doped SnS₂ on Ni Foam Catalyst for Improving OER
[Byeong Sun Cho](#), Jong Hwan Park, Su Jeong Suh
Sungkyunkwan University, Korea
- 8-4007** Lithiation-Induced Electrochemical Activation of Carbon-Doped Iron Oxide for Highly Efficient Hydrogen Evolution Reaction
[Jaeyun Ha](#), Moonsu Kim, Yong-Tae Kim, Jinsub Choi
Inha University, Korea
- 8-4105** Bimetallic Alloy Catalyst for Hydrogen Evolution Reaction in Proton Exchange Membrane Water Electrolyzer
[Kyeong-Rim Yeo](#), Kyung Ji Choi, Hong Seong Park, Soo-Kil Kim
Chung-Ang University, Korea
- 8-4108** Non-precious Alloy Catalysts for Hydrogen Oxidation for Anion Exchange Membrane Fuel Cell
[Hong Seong Park](#), Kyeong-Rim Yeo, Kyung Ji Choi, Soo-Kil Kim
Chung-Ang University, Korea

09. Artificial Intelligence for Materials

Artificial Intelligence for Materials

NOV 08 (Tue) | Udo (2F)

- CHAIR** Sang Soo Han (Korea Institute of Science and Technology, Korea)
- 9-1405** Structural Evolution of Pt₃Co Nanoparticles Described by Kinetic Monte Carlo Simulation Combined with Neural Network Potential
 10:10-10:25 [Jisu Jung](#)¹, Suyeon Ju¹, Purun-hanul Kim¹, Wonseok Jeong^{1,2}, Jinhee Lee³, Gijin Kim¹, Sungwoo Kang^{1,4}, Seungwu Han¹
¹Seoul National University, Korea, ²Lawrence Livermore National Laboratory, USA, ³Hyundai Motor Company, Korea, ⁴Samsung Advanced Institute of Technology, Korea
- 9-0992** Determining Parameters of Anisotropic Yield Criterion from Indentation Data through Neural Networks
 10:25-10:40 [Kyeongjae Jeong](#), Heung Nam Han
Seoul National University, Korea
- 9-3014** A Keyword-based Exploration Framework: Data Mining and Structuralizing the ReRAM Research Field
 10:40-10:55 [Hyeon Kim](#), Seong Hun Kim, Jaeseon Kim, Eun Ho Kim, Jun Hyeong Gu, Donghwa Lee
Pohang University of Science and Technology, Korea
- 9-2800** Boosting Crystal Graph Convolutional Neural Network for Predicting the Metal-insulator Transition Materials
 10:55-11:10 [Eun Ho Kim](#), Donghwa Lee
Pohang University of Science and Technology, Korea
- 9-3231** Ruddlesden-Popper Tolerance Factor: An Indicator Predicting Stability of 2D Ruddlesden-Popper Phases
 11:10-11:25 [Hyogyueong Shin](#), Eun Ho Kim, Jaeseon Kim, Seong Hun Kim, Donghwa Lee
Pohang University of Science and Technology, Korea
- 9-3416** Systematic Approach to the Novel Quinone-based Organic Cathode for Li-ion Batteries by High-throughput Screening Based on DFT and DFTB Calculation
 11:25-11:40 [Jun Hyeong Gu](#), Eun Ho Kim, Donghwa Lee
Pohang University of Science and Technology, Korea
- 9-3144** Screening Study for High-performance LOHC Materials Through Machine-learning Approach
 11:40-11:55 [Hyunwoo Yook](#), Joeng Woo Han
Pohang University of Science and Technology, Korea

- 9-2229** A Neural Network Model for High Entropy Alloy Design
11:55-12:10 [Jaemin Wang](#), Hyeonseok Kwon, Hyoung Seop Kim, Byeong-Joo Lee
Pohang University of Science and Technology, Korea
- 9-2405** Surface Segregation Prediction Machine-Learned with Inexpensive Numerical Fingerprint for Design of Alloy Catalysts
12:10-12:25 [Dongjae Shin](#), Jeong Woo Han
Pohang University of Science and Technology, Korea

AI for Structural Materials 1

NOV 08 (Tue) | Ballroom 4 (2F)

- CHAIRS** Sang Soo Han (Korea Institute of Science and Technology, Korea)
Dongwon Shin (Oak Ridge National Laboratory, USA)
- 9-0937** Bayesian Frameworks for Efficient Materials Discovery
14:00-14:30 [Raymundo Arroyave](#)
INVITED *Texas A&M University, USA*
- 9-2090** Machine Learning Potentials Enabling Realistic Material Simulation and Accelerated Material Discovery
14:30-15:00 [Seungwu Han](#)
INVITED *Seoul National University, Korea*
- 9-3740** Accelerating Development of Structural Materials with Artificial Intelligence
15:00-15:30 [James Saal](#)
INVITED *Citrine Informatics, Inc., USA*
- 9-0294** Data Driven Approaches in Materials Integration
15:30-16:00 [Masahiko Demura](#)
INVITED *National Institute for Materials Science, Japan*
- 9-2523** Physics-based Machine Learning for Creep Rupture Lives of Structural Materials
16:00-16:15 Changho Lee, Taejoo Lee, [Yoon Suk Choi](#)
Pusan National University, Korea
- 9-2462** Phase Prediction Model and Feature Selection Strategy of Complex-concentrated Alloys for High-temperature Application
16:15-16:30 [Jiwon Park](#), Chang-Seok Oh, Hyo-Sun Jang
Korea Institute of Materials Science, Korea

AI for Smart/IT Materials

NOV 09 (Wed) | Ballroom 4 (2F)

- CHAIR** Donghwa Lee (Pohang University of Science and Technology, Korea)
- 9-1490** Predicting Temperature-dependent Materials Properties with Machine-learning Augmented First-principles Calculations
10:10-10:40 [Alexander Urban](#)
INVITED *Columbia University, USA*
- 9-0232** Data Driven Discovery of New Inorganic Compounds
10:40-11:10 [Isao Tanaka](#)^{1,2}
INVITED *¹Kyoto University, Japan, ²Japan Fine Ceramics Center, Japan*
- 9-0286** Forward and Inverse Design of Solid Materials with Graph Neural Networks
11:10-11:40 [Tian Xie](#)
INVITED *Microsoft Research, UK*
- 9-0147** Machine Learning Based Design of Composite Structures
11:40-12:10 [Seunghwa Ryu](#)
INVITED *Korea Advanced Institute of Science and Technology, Korea*
- 9-3742** Searching for an Optimal Multi-Metallic Alloy Catalyst by Active Learning Combined with Experiments
12:10-12:25 [YongJoo Kim](#)
Kookmin University, Korea
- 9-0813** Accelerating the Construction of ANN Interatomic Potentials Using Surrogate Models
12:25-12:40 [In Won Yeu](#)¹, Annika Stuke¹, Lappawat Ngamwongwan², David R. Reichman¹, Richard A. Friesner¹, Alexander Urban¹, Nongnuch Artrith²
¹Columbia University, USA, ²Utrecht University, The Netherlands

AI for Energy & Environmental Materials 1

NOV 09 (Wed) | Ballroom 4 (2F)

- CHAIR** Donghun Kim (Korea Institute of Science and Technology, Korea)
- 9-0356** Things to Consider When Applying Machine Learning Techniques to Scientific Domains
14:00-14:30 [T. Yong Han](#)
INVITED *Lawrence Livermore National Laboratory, USA*

- 9-2318** Exploring the Matterverse with Graph Deep Learning
14:30-15:00 [Shyue Ping Ong](#), Chi Chen
INVITED *University of California, San Diego, USA*
- 9-1486** Modelling of Complex Energy Materials with Machine Learning
15:00-15:30 [Nongnuch Artrith](#)^{1,2}
INVITED *¹Utrecht University, The Netherlands, ²Debye Institute of Nanomaterials Science, The Netherlands*
- 9-0546** Applying Graph Neural Networks to Optimize Representations of Molecules and Materials
15:30-16:00 [Hyun Woo Kim](#)
INVITED *Gwangju Institute of Science and Technology, Korea*
- 9-2095** Smart Design of Molecular Materials by Digital Chemistry
16:00-16:30 [Shaun Kwak](#), Anand Chandrasekaran, Hadi Abroshan, Garvit Agarwal, Mathew Halls
INVITED *Schrödinger, Inc., USA*

- 9-1676** Interpretable Deep Learning Model for Analyzing the Relationship Between Electronic Structure and Chemisorption Property
18:05-18:20 [Doosun Hong](#)¹, Jaehoon Oh², Kihoon Bang¹, Soonho Kwon³, Se-Young Yun², Hyuck Mo Lee²
¹Korea Institute of Science and Technology, Korea, ²Korea Advanced Institute of Science and Technology, Korea, ³California Institute of Technology, USA

- AI for Structural Materials 2

- AI for Energy & Environmental Materials 2

NOV 09 (Wed) | Ballroom 4 (2F)

- CHAIR** Donghun Kim (Korea Institute of Science and Technology, Korea)
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- 9-4117** Data Mining of Microstructure and Texture Data of Aluminum Alloy Sheets for Machine Learning
16:50-17:05 [Shihoon Choi](#), Lalit Kaushik, Kiseong Park
Sunchon National University, Korea
- 9-2176** Exploration of High-ductility Ternary Refractory High-entropy Alloys Using First-Principle Calculations and Machine Learning
17:05-17:20 [Hyo-Sun Jang](#)¹, Jin-Woong Lee², Kee-Sun Sohn², Jiwon Park¹, Chang-Seok Oh¹
¹Korea Institute of Materials Science, Korea, ²Sejong University, Korea
- 9-3105** Machine-Learning (ML) Guided Reactivity Prediction in Energy Storage Devices
17:20-17:35 [Byungju Lee](#)¹, Jaekyun Yoo², Kisuk Kang²
¹Korea Institute of Science and Technology, Korea, ²Seoul National University, Korea
- 9-2172** Artificial-Intelligence-Driven Characterization of Crystallographic Interfaces in Energy Materials
17:35-17:50 [Byung Chul Yeo](#)
Pukyong National University, Korea
- 9-3171** Generation of Surface Pourbaix Diagram of Metal Nanoparticles Using Bond-type Embedded Machine Learning
17:50-18:05 [Kihoon Bang](#)¹, Donghun Kim¹, Sangsoo Han¹, Hyuck Mo Lee²
¹Korea Institute of Science and Technology, Korea, ²Korea Advanced Institute of Science and Technology, Korea

09. Artificial Intelligence for Materials

AI for Structural Materials

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

CHAIR	Dongwon Shin (Oak Ridge National Laboratory, USA)
9-3392	Deep Learning-based Analysis for X-ray Photoelectron Spectroscopy Spectra <u>Mina Lim</u> ^{1,2} , Sooyeon Lim ^{1,2} , Byeong-hyeon Lee ¹ , Hong-Kyu Kim ¹ , Soohyung Park ¹ ¹ Korea Institute of Science and Technology, Korea, ² Korea University, Korea
9-3402	Classification of Space Group from Electron Diffraction Powder Patterns via Deep Learning <u>Sooyeon Lim</u> ^{1,2} , Mina Lim ^{1,2} , Byeong-hyeon Lee ¹ , Soohyung Park ¹ , Hong-Kyu Kim ¹ ¹ Korea Institute of Science and Technology, Korea, ² Korea University, Korea
9-4365	Deep Learning-Based Optimization, 3D printing, and Testing of Adhesive Pillar Shape with Directionality <u>Jinwook Yeo</u> , Sukheon Kang, Minwoo Park, Seunghwa Ryu Korea Advanced Institute of Science and Technology, Korea
9-4369	Deep Learning Approach to Predict Correlation between Digital Composite and Strain Fields <u>Donggeun Park</u> , Junheui Jo, Seunghwa Ryu Korea Advanced Institute of Science and Technology, Korea
9-4373	Toughness Optimization of Grid Composite Using Genetic Algorithm and Active Learning. <u>Jaemin Lee</u> , Hyeonbin Moon, Seunghwa Ryu Korea Advanced Institute of Science and Technology, Korea
9-4376	Efficient Prediction of Effective Properties of Heterogeneous Materials Using Transfer Learning Scheme with Multi-fidelity Dataset <u>Hugon Lee</u> , Seunghwa Ryu Korea Advanced Institute of Science and Technology, Korea

AI for Smart/IT Materials

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

CHAIR	Donghwa Lee (Pohang University of Science and Technology, Korea)
9-2201	Metamaterial Design for 5G Basestation Array Antenna <u>Seunggoo Nam</u> , Sehwan Choi Korea Electronics Technology Institute, Korea
9-3486	Interpretable Machine Learning Method for Semiconductor Fabrication Data Analysis <u>Youjin Lee</u> , Yonghan Roh Sungkyunkwan University, Korea
9-3521	Prediction of Defect Behavior Based on Graph Neural Network Model <u>Seong Hun Kim</u> , Donghwa Lee Pohang University of Science and Technology, Korea
9-3939	Finding a Si ₂ Te ₃ Resistive Switching Mechanism and Si Dimer Patterns for Modulation of Si ₂ Te ₃ Resistive Switching Behavior via First-principles Calculations and Machine Learning <u>Jaeseon Kim</u> , June Ho Lee, Donghwa Lee Pohang University of Science and Technology, Korea

AI for Energy & Environmental Materials

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

CHAIR	Donghun Kim (Korea Institute of Science and Technology, Korea)
9-1590	AI-robotics Based Bespoke Synthesis Planning of Ag Nanoparticle, Automation vs Autonomy <u>Hyuk Jun Yoo</u> ^{1,2} , Na Yeon Kim ^{1,2} , Hee Seung Lee ¹ , Leslie Ching Ow Tiong ¹ , Kwan-Young Lee ² , Donghun Kim ¹ , Sang Soo Han ¹ ¹ Korea Institute of Science and Technology, Korea, ² Korea University, Korea
9-1761	Trend Analysis and Insight Extractions Using Named Entity Recognition of CO ₂ RR Literature <u>Jiwoo Choi</u> , Suji Jang, Kihoon Bang, Kwang-Ryeol Lee, Sang Soo Han, Donghun Kim Korea Institute of Science and Technology, Korea
9-2364	First Principles Study of Mechanochemical NH ₃ Synthesis on Fe Catalysts <u>Hong Woo Lee</u> , Ga-Un Jeong, Min-Cheol Kim, Donghun Kim, Sooyeon Kim, Sang Soo Han Korea Institute of Science and Technology, Korea

- 9-2633** Vial-Positioning Detection to Improve Safety in Autonomous Laboratory using Computer vision and Deep Learning Model
Leslie Ching Ow Tiong¹, Hyuk Jun Yoo^{1,2}, [Na Yeon Kim](#)^{1,2}, Kwan-Young Lee², Sang Soo Han¹, Donghun Kim¹
¹Korea Institute of Science and Technology, Korea, ²Korea University, Korea
- 9-2924** A Comparison Study on Phase Transition Characteristics of VO₂ Thin Films Deposited on TiO₂ Buffer Layer and TiO₂/VO₂/TiO₂ Multilayers by DC Magnetron Sputtering
[Bunyod Allabergenov](#), Sanghun Yun, Soo-Keun Lee, Byeongdae Choi
Daegu Gyeongbuk Institute of Science and Technology, Korea
- 9-2927** Computational Screening of Novel Active Bimetallic Catalysts for Liquid Organic Hydrogen Carriers
[Chen Hui Chan](#), Sang Soo Han
Korea Institute of Science and Technology, Korea
- 9-3080** First Principles Study of Oxygen Reduction for H₂O₂ Synthesis by Penta-nitrogen Coordinating Cobalt Single Atom Electrocatalyst Embedded on the Oxidized Carbon Support
[Sooyeon Kim](#), Wen Jun Zhang, Jae Won Choi, Jong Min Kim, Sang Soo Han
Korea Institute of Science and Technology, Korea
- 9-3165** Discovery of New Materials with Target DOS Using Deep Learning
Jeongrae Kim, [Kihoon Bang](#), Doosun Hong, Sangsoo Han
Korea Institute of Science and Technology, Korea
- 9-3364** Machine Learning Based Epoxy Resins Properties Prediction
[Huiwon Jang](#), Jihan Kim
Korea Advanced Institute of Science and Technology, Korea
- 9-3511** Mining Insights on Metal–Organic Framework Synthesis from Scientific Literature Texts
[Yeonghun Kang](#), Hyunsoo Park, Jihan Kim
Korea Advanced Institute of Science and Technology, Korea
- 9-3834** Software Platform for High Fidelity Neural Network Development for Process Parameter Prediction and Optimization in Chemical and Materials Engineering
[Dela Quarme Gbadago](#), Sungwon Hwang
Inha University, Korea
- 9-4350** Optimization of Injection Molding Process Based on MBO and CGIDN
[Jiyoung Jung](#), Kundo Park, Seunghwa Ryu
Korea Advanced Institute of Science and Technology, Korea

10. Advances in Computational Materials

Computational Design of Metallic/Structural Materials 1

NOV 07 (Mon) | Ballroom 4 (2F)

- CHAIR** Won-Seok Ko (Inha University, Korea)
- 10-2132** Application of Continuum Mechanics-based Simulation into Structural/Energy Materials
09:20-09:50 [Hoon-Hwe Cho](#)¹, Sam Yaw Anaman¹, Jaekook Kim², Jongsook Lee²
INVITED ¹Hanbat National University, Korea, ²Chonnam National University, Korea
- 10-0414** Quantitative Evaluation of Effect of Elasticity in Interfacial Energy Using Different Interpolation Schemes
09:50-10:20 [Kunok Chang](#), WooSeob Shin
INVITED [Kyung Hee University](#), Korea
- 10-0347** CALPHAD Informed Modeling of Martensitic Transformation Coupled with Edge Dislocation Evolution
10:20-10:50 [Guanglong Xu](#)
INVITED [Nanjing Tech University](#), China
- 10-2498** Computational Design of a Novel Medium-Entropy Alloy with Multi-strengthening Mechanisms
10:50-11:05 [Hyeon-Seok Do](#)¹, Tae Jin Jang², Ki Jeong Kim², Seok Su Sohn², Byeong-Joo Lee¹
¹Pohang University of Science and Technology, Korea, ²Korea University, Korea
- 10-1167** The Study of Li-doped BPhen in Charge-generation Layer of Organic Light-emitting Diodes via Density Functional Theory
11:05-11:20 [Suyeon Ju](#), Jisu Kim, Jaesun Kim, Jiho Lee, Yutack Park, Seungwu Han
[Seoul National University](#), Korea
- 10-2550** All-printed Flexible Electroadhesive Pad for Wall-climbing Robots
11:20-11:35 [Taekyu An](#), Jihoon Kim
[Kongju National University](#), Korea

Computational Modeling of Halide Perovskites for Optoelectronics 1

NOV 07 (Mon) | Ballroom 4 (2F)

CHAIR	Dong-Hwa Seo (Ulsan National Institute of Science and Technology, Korea)		
10-4312	Insights into the Nature and Fate of Excitons in Complex Materials from First-principles		
13:20-13:50	Jeffrey Neaton		
KEYNOTE	University of California, Berkeley, USA		
10-0429	Anharmonicity-Driven Rashba Cohelical Excitons Break Quantum Efficiency Limitation		
13:50-14:20	Chang Woo Myung		
INVITED	Chungnam National University, Korea		
10-1890	Excitons in Quasi-Two Dimensional Metal Halide Perovskites from First Principles Computational Modeling: The Impact of Dimensionality, and Chemical and Structural Heterogeneity		
14:20-14:50	Marina Filip		
INVITED	University of Oxford, UK		
10-0273	Density Functional Theory Calculation of Halide Perovskites: Grain Boundaries and High-throughput Screening		
14:50-15:20	Ji-Sang Park		
INVITED	Kyungpook National University, Korea		
10-2119	Models of Heterogeneity in Metal Halide Perovskites		
15:20-15:50	Aron Walsh		
INVITED	Imperial College London, UK		

Computational Materials for Energy Conversion 1

NOV 07 (Mon) | Ballroom 4 (2F)

CHAIR	Chang Woo Myung (Chungnam National University, Korea)		
10-0396	First Principles Modeling of Materials and Processes in Dye Functionalised-Metal Oxide Interfaces for Solar Energy Conversion		
16:00-16:30	Interfaces for Solar Energy Conversion		
INVITED	Mariachiara Pastore ^{1,2}		
	<i>¹Centre National de la Recherche Scientifique, France, ²Université de Lorraine, France</i>		
10-1212	Utilizing Confined Oxide Interfaces for Catalytic Enhancement of Pt Single-atoms		
16:30-17:00	Hyun You Kim		
INVITED	Chungnam National University, Korea		

10-0430	Computational Study on the Stabilization of Oxygen-redox Reaction for High-energy Li-rich Cathodes	
17:00-17:30	Dong-Hwa Seo	
INVITED	<i>Ulsan National Institute of Science and Technology, Korea</i>	
10-1484	Origin of High Ionic Conductivity of Argyrodite-based Electrolytes for All-Solid-State Li-Ion Batteries	
17:30-18:00	Sang Uck Lee	
INVITED	<i>Hanyang University, Korea</i>	
10-2115	Understanding Synergistic Metal-Oxide Interactions for Designing High-Performance Electrocatalysts	
18:00-18:15	Byung-Hyun Kim ¹ , Myeongjin Kim ²	
	<i>¹Korea Institute of Energy Research, Korea, ²Kyungpook National University, Korea</i>	
10-1902	Optical and Dynamical Properties of Self-assembled Perylene Diimides (PDI) Aggregates in Solution Through a Mixed Quantum-classical Approach	
18:15-18:30	Alekos Segalina ^{1,2} , Daniel Aranda ^{3,4} , James A. Green ⁴ , Giacomo Prampolini ⁴ , Mariachiara Pastore ² , Fabrizio Santoro ⁵	
	<i>¹Korea Advanced Institute of Science and Technology, Korea, ²University of Lorraine, France, ³University of Valencia, Spain, ⁴Consiglio Nazionale delle Ricerche, Italy, ⁵Istituto di Chimica dei Composti Organometallici, Italy</i>	

Computational Design of Metallic/Structural Materials 2

NOV 08 (Tue) | Ballroom 4 (2F)

CHAIR	Won-Seok Ko (Inha University, Korea)		
10-2469	Ab Initio Simulations for Mechanical and Hydrogen-Storage Properties of High-Entropy Alloys		
10:10-10:40	<u>Yuji Ikeda</u> ¹ , Fritz Körmann ² , Kaveh Edalati ³ , Blazej Grabowski ¹		
INVITED	¹ University of Stuttgart, Germany, ² Delft University of Technology, The Netherlands, ³ Kyushu University, Japan		
10-0313	Origins of the Hydrogen Signal in Atom Probe Tomography		
10:40-11:10	<u>Su-Hyun Yoo</u> , Se-Ho Kim, Eric Woods, Baptiste Gault, Mira Todorova, Joerg Neugebauer		
INVITED	Max-Planck-Institut für Eisenforschung GmbH, Germany		
10-0442	Integrated Computational Materials Engineering for High Temperature Aluminum Alloys		
11:10-11:40	<u>Kyoungdoc Kim</u>		
INVITED	Pohang University of Science and Technology, Korea		

- 10-0780** Study on the Deformation Behavior and Microstructural Properties of Nb Nanowire Embedded NiTi Shape Memory Alloy Composite via Molecular Dynamics Simulation
11:40-11:55 [Jung Soo Lee](#)¹, Won-Seok Ko¹, Blazej Grabowski²
¹Inha University, Korea, ²University of Stuttgart, Germany
- 10-2099** Atomistic Study for the Tantalum and Its Tungsten Alloy Displacement Energy Evaluation Under Local Strain
11:55-12:10 Muhammad Bany Salman¹, Minkyu Park², [Mosab Banisalman](#)²
¹Incheon National University, Korea, ²Virtual Lab Inc., Korea
- 10-1020** High-Throughput Screening of Corrosion-Resistant Alloy Elements in γ -Fe and Ni for Molten Salt Reactors
12:10-12:25 [Ho Lee](#), Sangtae Kim
Hanyang University, Korea

- 10-0726** Unraveling Unintuitive Enhancement in Hydrogen Conversion and Production Catalysts with Density Functional Theory: From Surface Magnetism to Charge Transfer Effects
17:50-18:05 [Min-Cheol Kim](#), Jung Kyu Kim
Sungkyunkwan University, Korea
- 10-0972** Atomic Details of the Electric Double Layer and Its Importance on the Electrocatalysis
18:05-18:20 [Seung-Jae Shin](#)¹, Dong Hyun Kim², Geunsu Bae², Stefan Ringe³, Hansol Choi⁴, Hyung-Kyu Lim⁵, Chang Hyuck Choi², Hyungjun Kim⁶
¹Yonsei University, Korea, ²Pohang University of Science and Technology, Korea, ³Korea University, Korea, ⁴Gwangju Institute of Science and Technology, Korea, ⁵Kangwon National University, Korea, ⁶Korea Advanced Institute of Science and Technology, Korea

- Computational Modeling of Halide Perovskites for Optoelectronics 2

- Computational Materials for Energy Conversion 2

NOV 08 (Tue) | Mara (2F)

- CHAIR** Kihyun Shin (Hanbat National University, Korea)
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- 10-2338** First-principles Study of Impact of Bi Doping on the Optoelectronic Properties of CsPbX₃ (X=Br or I)
16:50-17:05 [Youngho Kang](#)
Incheon National University, Korea
- 10-2581** Strong Oxidant as a Localized Electron Scavenger for Highly Efficient Halide Perovskites Solar Cells: A First-Principles Study
17:05-17:20 [Seulyoung Park](#)¹, Jun Zhu¹, Oh Yeong Gong¹, Chang Hwun Sohn¹, Zijia Li¹, Zhenru Zhang^{1,2}, Bonghyun Jo¹, Wooyul Kim², Gill Sang Han¹, Dong Hoe Kim³, Tae Kyu Ahn¹, Hyun Suk Jung¹, Jaichan Lee¹
¹Sungkyunkwan University, Korea, ²Sookmyung Women's University, Korea, ³Sejong University, Korea
- 10-3408** Four-penta-graphenes: Novel Two-Dimensional Fenestrane-Based Auxetic Nanocarbon Allotropes for Nanoelectronics and Optoelectronics
17:20-17:35 [Mehmet Emin Kilic](#), Kwang-Ryeol Lee
Korea Institute of Science and Technology, Korea
- 10-3213** Materials Design of Halide Solid Electrolytes for All-Solid-State Li- and Na-Ion Batteries
17:35-17:50 [Seungho Yu](#)
Korea Institute of Science and Technology, Korea

10. Advances in Computational Materials

Computational Design of Metallic/Structural Materials

18:30-19:30, NOV 07 (Mon) | Lobby (2F)

CHAIR	Won-Seok Ko (Inha University, Korea)
10-1237	Structural and Electronic Modulations of Imidazolium Covalent Organic Frameworks for Electrocatalytic Oxygen Redox Reactions in Rechargeable Zn-Air Batteries Sang Uck Lee, Hajin Lee Hanyang University, Korea
10-1257	A Performance Comparison of Waveguides Fabricated by Brazing Process and 3D Printing Jaewoong Jung , Yunsik Park, Jongin Ryu Korea Electronics Technology Institute, Korea
10-1279	Designing Descriptor for the Computational Screening of Argyrodite-based Solid-State Superionic Conductors: Uniformity of Ion-Cage Size Ji Hoon Kim , Ji Won Lee, Ji Sun Kim, SangUck Lee Hanyang University, Korea
10-1710	Accurate Assessment of Current Force Fields for Artificial Peptide Jihye Park ¹ , Hee-seung Lee ¹ , Hyungjun Kim ¹ , Jeong-Mo Choi ² ¹ Korea Advanced Institute of Science and Technology, Korea, ² Pusan National University, Korea
10-1826	Interface-Tailored Pt-Single-Atom Catalysts with Improved Catalytic Performance Toward CO Oxidation Eunji Kang ¹ , Hyuk Choi ¹ , Mi Yoo ² , Jieun Yun ¹ , Ju Hyeok Lee ¹ , David Shapiro ³ , Young-Sang Yu ⁴ , Chunjoong Kim ¹ , Hyun You Kim ¹ ¹ Chungnam National University, Korea, ² Virginia Tech, USA, ³ Lawrence Berkeley National Laboratory, USA, ⁴ Chungbuk National University, Korea
10-1833	Understanding How the Inherent Nature of the Supporting Oxide Affects the Catalytic Functionality of the Au-Oxide Interfaces Hyuk Choi , Ju Hyeok Lee, Eunji Kang, Jieun Yun, Jongseok Kim, YeJung Choi, Hyun You Kim Chungnam National University, Korea
10-1842	Understanding the Mechanism of CO-Driven Disintegration of Pt Nanoparticles into Single-Atoms Eunji Kang ¹ , Jieun Yun ¹ , Hyuk Choi ¹ , Mi Yoo ² , Ju Hyeok Lee ¹ , Hyun You Kim ¹ ¹ Chungnam National University, Korea, ² Virginia Tech, USA

10-1863	Conditional Activation of Multiple Pathways for Methane Oxidation Catalyzed by CeO ₂ -Supported Pt Nanoparticles Hyuk Choi ¹ , Ju Hyeok Lee ¹ , YeJung Choi ¹ , Jongseok Kim ¹ , Siwon Lee ^{2,3} , WooChul Jung ² , Hyun You Kim ¹ ¹ Chungnam National University, Korea, ² Korea Advanced Institute of Science and Technology, Korea, ³ Pennsylvania State University, USA
10-1883	Catalytic Preferential Oxidation of CO under the H ₂ -Rich Conditions by Pt Single-Atoms Ju Hyeok Lee ¹ , Hyuk Choi ¹ , Eunji Kang ¹ , Sangwoo Kim ² , Jieun Yun ¹ , Jongseok Kim ¹ , YeJung Choi ¹ , Hong Jin Park ¹ , WooChul Jung ² , Hyun You Kim ¹ ¹ Chungnam National University, Korea, ² Korea Advanced Institute of Science and Technology, Korea
10-1894	Interface Coordinated Pt-TiO ₂ Catalyst for Facile Catalytic CO Oxidation Jieun Yun ¹ , Mi Yoo ² , Eunji Kang ¹ , Hyuk Choi ¹ , YeJung Choi ¹ , Jongseok Kim ¹ , Jaeeun Joo ¹ , Hyun You Kim ¹ ¹ Chungnam National University, Korea, ² Virginia Tech, USA
10-2591	Correlation of Generalized Stacking Fault Energy with Charge Reduction in Fault Plane in FCC Metals Dohyun Kim ¹ , Young-Kyun Kwon ² , In-Suk Choi ¹ ¹ Seoul National University, Korea, ² Kyung Hee University, Korea
10-2975	Analysis and Enhancement of Magnetic Structure of SrFe ₁₂ O ₁₉ with Controlling Composition Taesu Park , Changhoon Lee, Ji Hoon Shim Pohang University of Science and Technology, Korea
10-3426	Development of Numerical Analysis Model for Magnesium Electrolysis Process Using COMSOL Mae Hyun Cho ¹ , Hyeong-Jun Jeoung ^{2,3} , Jungshin Kang ² , Kunok Chang ¹ ¹ Kyung Hee University, Korea, ² Korea Institute of Geoscience and Mineral Resources, Korea, ³ Seoul National University, Korea
10-3952	A Computational Screening Study to Develop Monomers for Ultra-High Performance Aramid Copolymer Hyeonsuk Yoo , Yongjin Lee Inha University, Korea

Computational Modeling of Halide Perovskites for Optoelectronics

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

CHAIR	Jung-Hoon Lee (Korea Institute of Science and Technology, Korea)
10-0752	Guanidinium-Pseudohalide Perovskite Interfaces Enable Surface Reconstruction of Colloidal Quantum Dots for Efficient and Stable Photovoltaics Seong Chan Cho , Sang Uck Lee Hanyang University, Korea

10-3352 Design of Promising Lead-Free Halide Compounds Through Graphical Neural Network Assisted by Machine-learned Lattice Optimization

Jong-Goo Park, [Sung In Hong](#), Sang Woo Park, Eun Ha Shin, Ki-Ha Hong
Hanbat National University, Korea

10-3377 Theoretical Analysis and Design of Low Bandgap Tin-based Mixed Halide Perovskites

[Sang-Woo Park](#), Jong-Goo Park, Ki-Ha Hong
Hanbat National University, Korea

Computational Materials for Energy Conversion

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

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

10-0184 The Study of Ammonia Decomposition on Ruthenium Nanoparticles for Hydrogen Production by Reactive Molecular Dynamics Simulations

[Mosab Banisalman](#)
Virtual Lab Inc., Korea

10-0586 Accelerated Computation of Lattice Thermal Conductivity Using Neural Network Interatomic Potentials

[Jeong Min Choi](#)¹, Kyeongpung Lee¹, Wonseok Jeong², Seungwu Han¹
¹Seoul National University, Korea, ²Lawrence Livermore National Laboratory, USA

10-1045 Exploring the Effects of Ir Doping in CaCu₃Ti₄O₁₂ for Enhanced OER Performance: A Density Functional Theory Study

[Kwangsoo Kim](#)^{1,2}, Byeong-Seon An¹, Hyun-Seok Cho¹, Jong Hyeok Park², Hyuksu Han³, Byung-Hyun Kim¹
¹Korea Institute of Energy Research, Korea, ²Yonsei University, Korea, ³Konkuk University, Korea

10-1147 Effect of Local Atomic Arrangement of CuZn Alloy on Ethylene and Ethanol Selectivity

[Deokgi Hong](#)¹, Yeji Baek², Hakhyeon Song², Sungwoo Lee¹, Young-Chang Joo¹, Jihun Oh², Gun-Do Lee¹
¹Seoul National University, Korea, ²Korea Advanced Institute of Science and Technology, Korea

10-1232 Theoretical Investigations into the Hydrogen Evolution Reaction of the Carbon Schwarzites: From Electronics to Structure-catalytic Activity Relationship

[Jun Ho Seok](#), Hung Ngo Manh, Sang Uck Lee
Hanyang University, Korea

10-1247 A Theoretical Investigation of Bifunctional Covalent Organic Framework Electrocatalysts with Modulated p-Band Centers

[Jae Hun Seol](#), Sang Uck Lee
Hanyang University, Korea

10-1729 Thermodynamics of π - π Interactions of Benzene and Phenol in Water

[Dooam Paik](#)¹, Hankyul Lee¹, Kim Hyungjun¹, Jeongmo Choi²
¹Korea Advanced Institute of Science and Technology, Korea, ²Pusan National University, Korea

10-1906 Universal Screening Strategy for the Accelerated Design of Superior Oxygen Evolution/Reduction Electrocatalysts

[Dong Yeon Kim](#)
Ulsan National Institute of Science and Technology, Korea

10-1952 Computation-Screened Electrocatalysts of Metal Single Atom in N-doped Graphene for Water Splitting

[Miran Ha](#), Dong Yeon Kim, Kwang S. Kim
Ulsan National Institute of Science and Technology, Korea

10-2875 Effect of Redox Additive on Synaptic Characteristics of Organic Electrochemical Transistors

[Sooyeon Narie Kay](#), Jiyoung Lee, Il-Doo Kim, Kyung Min Kim
Korea Advanced Institute of Science and Technology, Korea

10-3067 Investigation of Intercalated Ion in WSe₂ Interlayer Using ReaxFF Molecular Dynamics

[Seunghwan Kim](#), Sanghan Lee
Gwangju Institute of Science and Technology, Korea

10-3271 Optical Anomaly of 2D Materials in a Solution

[Se-Jun Kim](#)¹, Stefan Ringe², Hyungjun Kim¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Korea University, Korea

10-3932 MXene-Based Catalysts for the NH₃ Production Via Electrochemical Nitrogen Reduction Reaction: A Density Functional Theory (DFT) Study

Hochang Song, [HyunJu Lee](#), Hyungchul Ham
Inha University, Korea

10-4042 Effect of Electrolyte Poisoning on Catalytic Activity of MCEC : A DFT Study

[Gi Seong Song](#), Hwa Woong Cha, Hyung Chul Ham
Inha University, Korea

10-4116 Atomistic Study of Site-selective Doping Behavior in SnO₂

[Yeongrok Jin](#)¹, Woo-Sung Jang², Young-Hoon Kim², Hangil Lee³, Young-Min Kim², Jaekwang Lee¹
¹Pusan National University, Korea, ²Sungkyunkwan University, Korea, ³Sookmyung Women's University, Korea

11. Evolutionary Structural Materials

Origami, Kirigami and Auxetic Structures for Shape Programmable Structures 1

NOV 08 (Tue) | Ara (8F)

CHAIR	In-Suk Choi (Seoul National University, Korea)
11-0816	Kirigami Engineering for Energy Efficiency and Energy Harvesting
10:10-10:40	Shu Yang
KEYNOTE	University of Pennsylvania, USA
11-0310	Design and Fabrication of Stretchable Electronics Based on Origami and Kirigami Mechanical Metamaterials
10:40-11:10	Bongkyun Jang ^{1,2} , Sejeong Won ³ , Myoung-Ho Kim ^{1,4} , Hyeon-Don Kim ¹ , Jaehwa Lee ³ , Jaegu Kim ¹ , Minsub Oh ¹ , Seungmin Hyun ^{1,2} , Hak-Joo Lee ^{1,3} , Jae-Hyun Kim ^{1,2}
INVITED	¹ Korea Institute of Machinery and Materials, Korea, ² University of Science and Technology, Korea, ³ Center for Advanced Meta-Materials, Korea, ⁴ Sungkyunkwan University, Korea
11-2249	Computer Based Design of Shape Transformable Materials and Their Applications
11:10-11:40	In-Suk Choi
INVITED	Seoul National University, Korea
11-0344	Design of Transformable Machine with Origami
11:40-12:10	Dae-Young Lee
INVITED	Korea Advanced Institute of Science and Technology, Korea
11-2572	Programmable Symmetric Bistable Kirigami Surfaces
12:10-12:25	Hyeonho Cho , Do-Nyun Kim
	Seoul National University, Korea
11-1310	Highly Stretchable Anti-chiral Auxetic Structure Having Tunable Poisson's Ratio
12:25-12:40	Jaeyoung Choi , Yu-Ki Lee, In-Suk Choi
	Seoul National University, Korea
11-1322	Mechanical Metamaterial-based Electronic Skin for Long Term Monitoring and Skin Comfort
12:40-12:55	Juhee Kim ¹ , Wonseop Hwang ² , Hyunjung Yi ² , In-Suk Choi ¹
	¹ Seoul National University, Korea, ² Korea Institute of Science and Technology, Korea

Origami, Kirigami and Auxetic Structures for Shape Programmable Structures 2

NOV 08 (Tue) | Ara (8F)

CHAIR	In-Suk Choi (Seoul National University, Korea)
11-2071	Architected Liquid Crystal Elastomers with Synergistic Energy Absorption
14:00-14:30	Sung Hoon Kang
INVITED	Johns Hopkins University, USA
11-0336	Programmable Materials, Structures and Devices for Next Generation Intelligent Machine
14:30-15:00	Jiyun Kim
INVITED	Ulsan National Institute of Science and Technology, Korea
11-2170	Nanoarchitected Schwarzites and Tubulanes with Ultrahigh Energy Absorption and Resilience
15:00-15:15	Peter Series ¹ , Alianna Maguire ² , Jun Lou ² , Pulickel Ajayan ² , Tobin Filletter ¹
	¹ University of Toronto, Canada, ² Rice University, USA
11-0932	High Strength 3D Metal-ceramic Nano-architecture Fabricated via Proximity Field Nanopatterning
15:15-15:30	Dong Gyu Kang , Seung Min Han
	Korea Advanced Institute of Science and Technology, Korea
11-0760	Multifunctional Covalent Triazine Framework for CO ₂ Uptake and Solid-state Flexible Supercapacitor
15:30-15:45	Manmatha Mahato , Sanghee Nam, Il-Kwon Oh
	Korea Advanced Institute of Science and Technology, Korea
11-0324	Hard, Yet Flexible Nanocomposite Film Reinforced by Ceramic Thin-shell Nano-architected Materials Fabricated by Proximity-field Nanopatterning (Pnp)
15:45-16:00	Gwangmin Bae ¹ , Changui Ahn ² , Gwang-Mun Choi ³ , Sang-Min Kim ⁴ , Wonsik Kim ¹ , Youngjun Choi ¹ , Dawon Park ¹ , Dongchan Jang ¹ , Jung-Wuk Hong ¹ , Seung Min Han ¹ , Byeong-Soo Bae ¹ , Seokwoo Jeon ¹
	¹ Korea Advanced Institute of Science and Technology, Korea, ² Korea Institute of Ceramic Engineering and Technology, Korea, ³ Electronics and Telecommunications Research Institute, Korea, ⁴ Korea Institute of Machinery and Materials, Korea
11-1012	MXene Anchored Metal Organic Frameworks for Electroactive Artificial Muscles
16:00-16:15	Mousumi Garai , Manmatha Mahato, Il-Kwon Oh
	Korea Advanced Institute of Science and Technology, Korea

Nano-architected Materials for Structural and Energy Applications 1

NOV 08 (Tue) | Ara (8F)

CHAIR Seung Min Han (Korea Advanced Institute of Science and Technology, Korea)

11-0410 Defect-driven Plasticity in Nanostructural Metals

16:50-17:20 [Ill Ryu](#)
INVITED *The University of Texas at Dallas, USA*

11-0386 Strategies of the Electrode Design for the High Stretchable Organic Solar Cells

17:20-17:50 [Sangyeon Lee](#), Yeonjee Jeon, Seungseok Han, Jung-Yong Lee
INVITED *Korea Advanced Institute of Science and Technology, Korea*

11-2903 Development of Transition Metal Based High Entropy Silicide for Energy Storage Application

17:50-18:05 [Snehal Kadam](#), Kook Noh Yoon, Eun Soo Park
Seoul National University, Korea

11-1534 Ab Initio Gradient Interface Analysis in TiZrNb and Mo Based Multi-principal Element Alloy Heterostructures

18:05-18:20 [Aamir Malik](#), Ho Jin Ryu
Korea Advanced Institute of Science and Technology, Korea

Nano-architected Materials for Structural and Energy Applications 2

NOV 09 (Wed) | Ara (8F)

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

11-3859 Multi-scale Analysis of Microstructure and Mechanical Properties of Interface in Metallic Materials

10:10-10:40 [Shoichi Nambu](#)
INVITED *The University of Tokyo, Japan*

11-0462 Extreme Resilience and Dissipation in Interpenetrating Microstructures

10:40-11:10 [Hansohi Cho](#), Gisoo Lee, Jaehee Lee
INVITED *Korea Advanced Institute of Science and Technology, Korea*

11-3792 Post Synthetic Annealing of ZIF-67 MOF for High-Performance Hybrid Supercapacitors

11:10-11:25 [Amol Marotrao Kale](#), Rajavel Velayutham, Thondaiman Pugalenthayar, Antonysamy Dennyson Savariraj, Byung Chul Kim
Sunchon National University, Korea

11-3785 Enhance Active Sites with Structural 2D/3D Nanoengineering in NiCo LDH as a Battery-type Electrode for Supercapatteries

11:25-11:40 [Thondaiman Pugalenthayar](#), Antonysamy Dennyson Savariraj, Rajavel Velayutham, Amol Kale Marotrao, Byung Chul Kim
Sunchon National University, Korea

11-3770 Bifunctional Metal-Organic Framework (MOF) Templated Iron-Molybdenum Sulfide for Supercapacitor and Oxygen Evolution

11:40-11:55 [Velayutham Rajavel](#), Antonysamy Dennyson Savariraj, Pugalenthayar Thondaiman, Amol Marotrao Kale, Byung Chul Kim
Sunchon National University, Korea

11-1964 Transition Metal Ions Doping on ZIF-8 for Enhancing the Electrochemical CO₂ Reduction Reaction

11:55-12:10 [Jinhyuk Cho](#), Soo Young Kim
Korea University, Korea

11-1830 Design of a Stretch-dominated Open Structure Which is Close to Isotropic Based on Atomic-level Structural Configuration

12:10-12:25 [Sang Joon Lee](#), Seungjin Kim, SangHyuk Yoo, Sunil Moon, Keonwook Kang
Yonsei University, Korea

Multi-scale Mechanical Testing in Materials Research and Development 1

NOV 09 (Wed) | Ara (8F)

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

11-4145 Nano-mechanical Behavior Associated with Dislocation-boundary Interaction Characterized though Nanoindentation and TEM in-situ Straining

14:00-14:30 [Takahito Ohmura](#)
INVITED *National Institute for Materials Science, Japan*

11-0289 Multi-scale in Situ Characterization of Micro-deformation During Lüders Band Propagation in a Medium Mn Steel

14:30-15:00 [Motomichi Koyama](#)¹, Takayuki Yamashita², Satoshi Morooka³, Zhipeng Yang¹, Rama Srinivas Varanasi¹, Tomohiko Hojo¹, Takuro Kawasaki³, Stefanus Harjo³
INVITED ¹Tohoku University, Japan, ²Osaka University, Japan, ³Japan Atomic Energy Agency, Japan

11-0211 Modulus Mismatch in Interconnected Three-Dimensional Nanocomposites for High-Contrast Mechanochromisms

15:00-15:15 [Haomin Chen](#)¹, Donghwi Cho², Kwonhwan Ko¹, Jung-Wuk Hong¹, Jang-Kyo Kim³, Seokwoo Jeon¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Korea Research Institute of Chemical Technology, Korea, ³Hong Kong University of Science and Technology, Hong Kong (SAR of China)

- 11-1816** Bio-inspired Non-oxidized Graphene Flakes(NOGF) Based Aerogel for Enhanced Solar-Driven Water Generation
15:15-15:30 [Qiang Chen](#), Seokwoo Jeon
Korea Advanced Institute of Science and Technology, Korea
- 11-1779** Nanosized Dispersoid Formation and Coarsening Behavior in CoCrFeMnNi High-Entropy Alloy
15:30-15:45 [SeungHyeok Chung](#)¹, Ji Ho Shin², Ho Jin Ryu¹
¹*Korea Advanced Institute of Science and Technology, Korea*, ²*Korea Atomic Energy Research Institute, Korea*
- 11-1221** Unveiling Reconstruction Behavior of Copper Alloy Active Materials During Electrochemical Carbon Dioxide Reduction
15:45-16:00 [Intae Kim](#)¹, Gi-Baek Lee¹, Ji-Yong Kim¹, Yujin Lee², Dae-Hyun Nam², Young-Chang Joo¹
¹*Seoul National University, Korea*, ²*Daegu Gyeongbuk Institute of Science and Technology, Korea*

Multi-scale Mechanical Testing in Materials Research and Development 2

NOV 09 (Wed) | Ara (8F)

CHAIR Eun-chaee Jeon (University of Ulsan, Korea)

- 11-0436** Large Plastic Deformation in Nanocrystalline Metal
16:50-17:20 [So-Yeon Lee](#)
INVITED *Kumoh National Institute of Technology, Korea*
- 11-2137** Quantification of Twinning Stress of CoCrFeMnNi High Entropy Alloy
17:20-17:50 [Subin Lee](#), Camila Aguiar Teixeira, Christoph Kirchlechner
INVITED *Karlsruhe Institute of Technology, Germany*
- 11-0683** Mobility Mechanism of Hexagonal Dislocation Networks in bcc Iron
17:50-18:05 [Hadi Ghaffarian](#), Dongchan Jang
Korea Advanced Institute of Science and Technology, Korea
- 11-3800** Influence of Parameters for Resistance Element Welded Joint to CFRP/780DP Steel
18:05-18:20 [Jonghee Kim](#), Heeseon Bang
Chosun University, Korea
- 11-3175** Analysis of Factors Affecting the Cryogenic Toughness of 9% Ni-alloy Steel Depending on Heat Treatment Using the Indentation Size Effect of Nanoindentation
18:20-18:35 [Younghoon Kim](#)¹, Eunji Song¹, Minh Park², Hyunbo Shim², Ju-Young Kim¹
¹*Ulsan National Institute of Science and Technology, Korea*, ²*Hyundai Steel, Korea*

- 11-3003** Combinatorial Study of Thermal Stability and Mechanical Response in Segregation-engineered Nanocrystalline Al Alloys
18:35-18:50 [Jungho Shin](#)
Gangneung-Wonju National University, Korea
- 11-2818** Pile-up Dependent of Non-uniform Residual Stress and Mechanical Properties in H-beam under Instrumented Indentation Test
18:50-19:05 [Sohyeon Lee](#), Eunji Song, Gyeong-Seok Hwang, Ju-Young Kim
Ulsan National Institute of Science and Technology, Korea
- 11-2795** Highly Elastic Metal Nanolaminates with Nanocrystalline Cu and Metallic Glass Alternating Layers for Stretchable Electronics
19:05-19:20 [Gyeong-Seok Hwang](#), Sohyeon Lee, Ju-Young Kim
Isan National Institute of Science and Technology, Korea
- 11-1977** Microstructural Control and Processing Optimization for High Performance Cu-Cr Electrical Contact Materials
19:20-19:35 [Jin Uk Gwon](#), Hye Sung Kim
Pusan National University, Korea

11. Evolutionary Structural Materials

Origami, Kirigami and Auxetic Structures for Shape Programmable Structures

16:50-18:20, NOV 08 (Tue) | Lobby (8F)

CHAIR	In-Suk Choi (Seoul National University, Korea)
11-2509	Laser Patterning of Buckling Structure Electrode for Thermal Haptic Device <u>Junhyuk Bang</u> , Dongkwan Kim, Seung Hwan Ko <i>Seoul National University, Korea</i>
11-2663	Algorithmic Origami-based Zygote Structure: The Computational Design of the Pluripotent Evolving Structure <u>Doyun Kim</u> ¹ , Yu-Ki Lee ¹ , Jyh-Ming Lien ² , In-Suk Choi ¹ ¹ <i>Seoul National University, Korea</i> , ² <i>George Mason University, USA</i>
11-2813	A Pixelated Mechanical Metamaterial with Widely Tunable and Reprogrammable Mechanical Properties <u>Jun Kyu Choe</u> , Jiyeon Yi, Hajun Lee, Heejae Won, Yeonwoo Jang, Hyeonseo Song, Jiyun Kim <i>Ulsan National Institute of Science and Technology, Korea</i>
11-3238	Triboelectric Sensors with Programmable Lattice Structure <u>Hyeonseo Song</u> , Jin Pyo Lee, Yeonwoo Jang, Jiyun Kim <i>Ulsan National Institute of Science and Technology, Korea</i>
11-3410	Development of Copper-based Metal Assisted Chemical Etching for Micro and Nano-structuring of Silicon <u>Eunsol Lee</u> , In-suk Choi <i>Seoul National University, Korea</i>
11-3532	Design of Multimodal Soft Sensors Using Tensegrity Structures <u>Yeonwoo Jang</u> , Hajun Lee, Hyeonseo Song, Junghyo Kim, Jinpyo Lee, Jiyun Kim <i>Ulsan National Institute of Science and Technology, Korea</i>
11-3587	Origami Structured Magnetic Actuator with Integrated Capacitor Hajun Lee ¹ , <u>Junghyo Kim</u> ¹ , Yeonwoo Jang ¹ , Heejae Won ¹ , Kwon-Hyung Lee ¹ , Sang-Young Lee ² , Jiyun Kim ¹ ¹ <i>Ulsan National Institute of Science and Technology, Korea</i> , ² <i>Yonsei University, Korea</i>

Multi-scale Mechanical Testing in Materials Research and Development

16:50-18:20, NOV 08 (Tue) | Lobby (8F)

CHAIR	Ju-Young Kim (Ulsan National Institute of Science and Technology, Korea)
11-0571	Advanced Exothermic Reactivity of Al Particles Using Zn Coating <u>Jihun Lee</u> , Wonyoung Heo, Injoon Son <i>Kyungpook National University, Korea</i>
11-0620	High-Throughput Scanning Probe Microscopy Using Cantilever-Free Elastomeric Tip Array Wooyoung Shim, <u>Donghoon Oh</u> <i>Yonsei University, Korea</i>
11-1582	Experimental Study on the Improvement of Compressive Strength of Cement Composites Using Hydrogen Nanobubble Water <u>YiPei Chen</u> , JiYoon Kim, Jin Kim, Kyeong Jae Lee, JongYeong Lee, JungGeun Han <i>Chung-Ang University, Korea</i>
11-1707	Effects of PTFE on the Properties of Electroless Ni-P-PTFE Composite Plated Layer <u>Seung Hoon Oh</u> , Injoon Son <i>Kyungpook National University, Korea</i>
11-2805	Flexible Organic/Inorganic Multilayer Encapsulation for Transient Electronics <u>Hyeonji Yoo</u> , Gyeong-Seok Hwang, Ju-Young Kim <i>Ulsan National Institute of Science and Technology, Korea</i>
11-3011	Hybrid Bonding of Cu Bumps and Insulating Polymers in Semiconductor Devices <u>Youngju Sim</u> , Hangeul Kim, Gyeong-Seok Hwang, Ju-Young Kim <i>Ulsan National Institute of Science and Technology, Korea</i>
11-3094	Enhanced Flaw-tolerance of Nanoporous Gold with Optimum Grain Structure Eunji Song ¹ , Younghoon Kim ¹ , Gyeong-Seok Hwang ¹ , Myunghwan Byun ² , <u>Ju-Young Kim</u> ¹ ¹ <i>Ulsan National Institute of Science and Technology, Korea</i> , ² <i>Keimyung University, Korea</i>
11-3448	An Experimental Study on Applicability of Lightweight Aggregate Mortar with Natural Zeolite <u>Saruul Shinebayar</u> ¹ , Jung-Geun Han ¹ , Jung Mann Yun ² , Seung Kyoung You ³ , Jae Yoon Yoo ¹ ¹ <i>Chung-Ang University, Korea</i> , ² <i>Shin Ansan University, Korea</i> , ³ <i>Myongji College, Korea</i>
11-4236	Specific Strength Measurement Method Considering Thermal Expansion and Weight Loss in the High-temperature Region of Fine Ceramics <u>Myungwon Lee</u> ^{1,2} , Eunhye Seo ¹ , Kyeongsik Son ¹ , SunHong Lee ¹ , Myungchang Kang ² ¹ <i>Korea Institute of Ceramic Engineering & Technology, Korea</i> , ² <i>Pusan National University, Korea</i>

Nano-architected Materials for Structural and Energy Applications

16:50-17:50, NOV 09 (Wed) | Lobby (8F)

CHAIR Seung Min Han (Korea Advanced Institute of Science and Technology, Korea)

- 11-0370** Nano-cymatic Approach with Nanomanipulation
Minwoo Lee, Wooyoung Shim
Yonsei University, Korea
- 11-0594** 3D Ordered Porous Core-Shell Nanocomposites for High-Performance Li-Air Battery Cathodes Fabricated via Proximity-field nanoPatterning (PnP)
Seonggon Han¹, Seonyong Cho², Yongmook Kang², Seokwoo Jeon¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Korea University, Korea
- 11-0598** Power Generation from Salinity Gradient Energy Using Graphene Oxide Membrane
Sungsoo Kim, Wooyoung Shim
Yonsei University, Korea
- 11-0651** Photonic Crystal Palette of Binary Block Copolymer Blends for Full-Color Tunable Encryption
Seungsoo Mun, Seonju Lee, Cheolmin Park
Yonsei University, Korea
- 11-0692** Highly Luminescent and Ambient Stable Perovskites with Hierarchical Structure via Guided Self-Assembly of Block Copolymer
Hyowon Han, Jin Woo Oh, Hyeokjung Lee, Hayeon Jeong, Cheolmin Park
Yonsei University, Korea
- 11-0718** Facile Synthesis and Morphological Control of MnF₂ for High-capacity Anode of Li-ion Battery
Jeonghyeon Lee, Jeon Ryang Lee, Tae-Won Kim
Korea Institute of Industrial Technology, Korea
- 11-0774** Enhanced Mechanical Properties of Fluorinated Ethylene-propylene/Graphite/Silicon Carbide Composites for Fuel Cell Application
Jong Seok Woo¹, Kwang Sang Park¹, Moon Hee Lee¹, Byung Choon Kim¹, Soo-Young Park²
¹Morgan Advanced Materials, Korea, ²Kyungpook National University, Korea
- 11-0794** Ultra-Large-Scale, Uniform, and Controllable Nanostructures via Novel Chemical-Free Nanotransfer Printing
Sang-Ho Shin¹, Zhi-Jun Zhao², BongKwon Son³, Jun-Ho Jeong⁴, Byeong-Kwon Ju¹
¹Korea University, Korea, ²Southwest Jiaotong University, China, ³Nanyang Technological University, Singapore, ⁴Korea Institute of Machinery and Materials, Korea

- 11-1868** The Synthesis and Effect of Hierarchically Structured Nanoporous Carbon for Supercapacitors
Jisue Kang, Jong Gyeong Kim, Sunghoon Han, Chanho Pak
Gwangju Institute of Science and Technology, Korea
- 11-1922** Hierarchical Aerogel-decorated Carbon Foam as Flexible Freestanding Cathode for Rechargeable Zinc-Air Battery
Dogyeeon Jeon, Su-Ho Cho, Il-Doo Kim
Korea Advanced Institute of Science and Technology, Korea
- 11-2264** In-situ Growth of Nickel-Zinc MOFs on Carbon Cloth for Energy Storage Devices
Jie Zeng, S V Prabhakar Vattikuti, Jaesool Shim
Yeungnam University, Korea
- 11-2457** Synthesis of Nickel-copper Composite with Controllable Nanostructure Through Facile Solvent Control as Positive Electrode for High-performance Supercapacitors
Damin Lee¹, Roh Jong Wook¹, Jeongmin Kim², Dong Hwan Kim²
¹Kyungpook National University, Korea, ²Daegu Gyeongbuk Institute of Science and Technology, Korea
- 11-2621** Silicone-based Dispersant for Enhancing Dispersion Stability and Thermal Conductivity of Thermally Conductive Encapsulant
Gwajeong Jeong, Hyunseung Yang, Woo Sung Lee
Korea Electronics Technology Institute, Korea
- 11-2879** Controllable One-pot Wet Chemical Synthesis and Enhanced Photocatalytic Performance of TiO₂ Nanostructures Using Ammonium Hexafluorotitanate
Duk-Hee Lee, Chan-Gi Lee, Kyung-Soo Park
Institute for Advanced Engineering, Korea
- 11-2897** Synthesis and Design of Carbon-coated Sodium Titanate Nanostructures (Na₂Ti₃O₇, Na₂Ti₆O₁₃) with Enhanced Electrochemical Properties
Duk-Hee Lee, Chan-Gi Lee, Kyung-Soo Park
Institute for Advanced Engineering, Korea
- 11-2959** Observation of Faraday's Law of Induction in the Chiral Magnetic Nanocoils
Eunjin Jeong¹, Yoo Sang Jeon², Sang Won Im³, Gyu Won Kim¹, Min Jun Ko¹, Jun Hwan Moon¹, Ki Tae Nam³, Young Keun Kim¹
¹Korea University, Korea, ²Korea Institute of Science and Technology, Korea, ³Seoul National University, Korea
- 11-2972** Engineering Characteristics of Cement Mixture Applying Graphene Oxide and Hydrogen Nano Bubble Water
Jin Kim, JungGeun Han, JongYeoung Lee, JaeHyeon Jeon, YoungHo Kim
Chung-Ang University, Korea
- 11-3398** Mechanism of Enhanced Flowability/Spreadability in 3D Printed Ni Powder Alloy
Seunghan Kim¹, Chaemin Seol¹, Eunji Sim¹, Seongguk Jeong¹, Uk Sim², Tae-Hoon Kim¹
¹Chonnam National University, Korea, ²Korea Institute of Energy Technology, Korea

- 11-3767** Ceramic Catalyst Filter with Aligned Ultraviolet Light-emitting Diode Array
[Jeonghyeon Park](#)¹, Jaerim Kim¹, Min Seok Koo², Sang Min Ji², Hyun Chul Lee², Jong Kyu Kim¹
¹Pohang University of Science and Technology, Korea, ²Samsung Advanced Institute of Technology, Korea
- 11-3824** Silicon-based Material with Highly Controlled Yolk-shell Structure as a Stable Anode for Lithium Ion Battery
[Kyeongseok Min](#), Rin Na, Jaeseo Lee, Sung-Hyeon Baek
 Inha University, Korea
- 11-3826** Prussian Blue Analogue Derived NiCo Alloy Nanoparticle Encapsulated in N-doped CNT Arrays as Electrocatalyst for Oxygen Reduction Reaction
[Hyejin Kim](#), Kyeongseok Min, Rin Na, Sung-Hyeon Baek
 Inha University, Korea
- 11-3827** Hollow Structured N, S Doped Carbon Sphere with Abundant Fe-N_x Active Sites as an Efficient Electrocatalyst for Oxygen Reduction Reaction
[Jaeseo Lee](#), Minjung Kim, Sojeong Min, Sung-Hyeon Baek
 Inha University, Korea
- 11-4113** XPS Investigation of Oxide-metal Interface of Al-Mg Alloy Containing a Trace of Ca
[Seong-Ho Ha](#), Bong-Hwan Kim, Young-Ok Yoon, Hyun-Kyu Lim, Shae K. Kim
 Korea Institute of Industrial Technology, Korea
- 11-4180** Ultraflexible Electrosun PVDF Nanocomposite with Embedded Fe₃O₄ Nanoparticles Core and PEDOT Shell for EMI Shielding
[Sol Lee](#), Minje Kim, Chang Geun Kim, Junghyo Nah
 Chungnam National University, Korea

12. Thermal Engineering Materials and Devices

Thermal Engineering Materials and Devices 1

Nov 07 (Mon) | Ilchul (2F), Jeju Oriental Hotel

- CHAIR** Su-Dong Park (Korea Electrotechnology Research Institute, Korea)
- 12-4324** Thermal Engineering Using Infrared Photonic Structures: Probing Coherent Thermal Emission in a Single Nano-object
 09:20-09:50
KEYNOTE [Sunmi Shin](#)
 National University of Singapore, Singapore
- 12-4319** Silicon as a Key Material for Low-temperature Heat Harvesting and Thermal Management
 09:50-10:20
KEYNOTE [Dario Narducci](#)
 Università di Milano Bicocca, Italy
- 12-4318** Towards Tellurium-free Thermoelectric Modules for Power Generation from Low-grade Heat
 10:20-10:50
KEYNOTE [Kornelius Nielsch](#)
 Leibniz Institute of Solid State and Materials Research Dresden, Germany
- 12-4382** Scattering between Single Electrons and Phonons
 10:50-11:20
 INVITED [Min-Sik Kim](#)¹, [Bum-Kyu Kim](#)², [Wanki Park](#)³, [H.-S. Sim](#)³, [Ju-Jin Kim](#)¹, [Myung-Ho Bae](#)²
¹Jeonbuk National University, Korea, ²Korea Research Institute of Standards and Science, Korea, ³Korea Advanced Institute of Science and Technology, Korea
- 12-1399** Designing Defect Architecture in the Crystal Lattice for Enhancing Thermoelectric Performance
 11:20-11:50
 INVITED [In Chung](#)^{1,2}
¹Seoul National University, Korea, ²Institute for Basic Science, Korea

Thermal Engineering Materials and Devices 2

Nov 07 (Mon) | Ilchul (2F), Jeju Oriental Hotel

- CHAIR** Jong-Soo Rhyee (Kyung Hee University, Korea)
- 12-2042** Skin-deep Aspect of Thermopower in Bi₂Q₃, PbQ and BiCuQO (Q = Se, Te): Hidden One-dimensional Character of Their Band Edges Leading to High Thermopower
 13:20-13:50
 INVITED [Ji Hoon Shim](#)
 Pohang University of Science and Technology, Korea

12-0280	Thermoelectric Properties of (Ag,Cu) ₂ (S,Se,Te) and Their Potential for Thermoelectric Generators
13:50-14:20	Tsunehiro Takeuchi
INVITED	Toyota Technological Institute, Japan
12-0293	Compliant Thermoelectric Generators Toward Self-Powered Flexible Electronics
14:20-14:50	Seungjun Chung
INVITED	Korea Institute of Science and Technology, Korea
12-2040	Skutterudite-based Tubular Thermoelectric Generator
14:50-15:20	Min-Wook Oh
INVITED	Hanbat National University, Korea
12-2428	Analysis of Thermoelectric Generator (TEG) System Using Multi-fidelity Surrogate Modeling
15:20-15:50	Ikjin Lee
INVITED	Korea Advanced Institute of Science and Technology, Korea

Thermal Engineering Materials and Devices 3

Nov 07 (Mon) | Ilchul (2F), Jeju Oriental Hotel

CHAIR	Sang Hyun Park (Korea Institute of Energy Research, Korea)
12-4354	Thermoelectrics for Direct Conversion of Industrial Waste Heat into Useful Electrical Power
16:00-16:30	Jung Young Cho , Woo Hyun Nam
INVITED	Korea Institute of Ceramic Engineering and Technology, Korea
12-4251	Microscopic Origin of High Thermal Conductivity in Disentangled Ultra-high Molecular Weight Polyethylene Films: Ballistic Thermal Phonons within Extended Crystals
16:30-17:00	Taeyong Kim ¹ , Stavros X. Drakopoulos ² , Sara Ronca ² , Austin J. Minnich ³
INVITED	¹ Seoul National University, Korea, ² Loughborough University, UK, ³ California Institute of Technology, USA
12-4204	Application of Thermoelectric Energy Converters for Future Aviation Systems
17:00-17:30	Pawel Ziolkowski ¹ , Eckhard Müller ^{2,3}
INVITED	¹ German Aerospace Center - Institute of Materials Research, Germany, ² Institute of Materials Research, Germany, ³ Justus Liebig University Gießen, Germany
12-1448	Thermal Transport and Application in Thermoelectrics
17:30-18:00	Woochul Kim
INVITED	Yonsei University, Korea
12-0454	Nonequilibrium Heat Transport Probed by Ultrafast Magnetic Thermometry
18:00-18:30	Hyejin Jang
INVITED	Seoul National University, Korea

Thermal Engineering Materials and Devices 4

Nov 08 (Tue) | Ilchul (2F), Jeju Oriental Hotel

CHAIR	Woochul Kim (Yonsei University, Korea)
12-0448	Continuum Modeling Approach on the Boundary for the Nanoscale Transport Phenomena
14:00-14:30	BoHung Kim
INVITED	University of Ulsan, Korea
12-4393	Laser Processing of Nanomaterials to Enhance Thermal Conductivity
14:30-15:00	Dongsik Kim
INVITED	Pohang University of Science and Technology, Korea
12-4379	Engineering Graphene Josephson Junction for Sensitive Photon Detector
15:00-15:30	Gil-Ho Lee
INVITED	Pohang University of Science and Technology, Korea
12-3465	Abnormal Interface-induced Seebeck Effect in PtSe ₂ /PtSe ₂ van der Waals Homostructures
15:30-16:00	Sang-Kwon Lee
INVITED	Chung-Ang University, Korea

Thermal Engineering Materials and Devices 5

Nov 09 (Wed) | Mara (2F)

CHAIR	Kyu Hyoung Lee (Yonsei University, Korea)
12-4156	Functional Polymer-based Composite Films for Thermoelectric Application
10:10-10:40	Yong Jin Jeong
INVITED	Korea National University of Transportation, Korea
12-4389	Freely Shapable and Elastic Thermoelectric Power Generators
10:40-11:10	Jungwon Kim
INVITED	Korea Institute of Science and Technology, Korea
12-4384	Solution-processed Thermoelectric Thin Films for Power Generation
11:10-11:40	Jae Sung Son , Seung Hwae Heo, Hye In Hwang
INVITED	Ulsan National Institute of Science and Technology, Korea
12-4351	Point-Defects-Engineered Bismuth Telluride Alloys
11:40-12:10	Kyung Tae Kim
INVITED	Korea Institute of Materials Science, Korea

12-0236 Approach to Determine the Density-of-States Effective Mass with Carrier Concentration-Dependent Seebeck Coefficient
 12:10-12:40
 INVITED Kyu Hyoung Lee¹, Sang-il Kim², Jong-Chan Lim³, Jung Young Cho⁴, Heesun Yang³, [Hyun-Sik Kim](#)²
¹Yonsei University, Korea, ²University of Seoul, Korea, ³Hongik University, Korea, ⁴Korea Institute of Ceramic Engineering and Technology, Korea

Thermal Engineering Materials and Devices 6

Nov 09 (Wed) | Biyang (2F)

CHAIR Min-Wook Oh (Hanbat National University, Korea)

12-3201 Analysis of Fiber Alignment Depending on Deposition Flow Regime During 3D Printing Process
 10:10-10:25 [Hoang Minh Khoa Nguyen](#), Dong-Wook Oh
 Chosun University, Korea

12-2381 Interface Engineering between Polycrystalline Ag and Amorphous TiOx for Thermochromic Applications
 10:25-10:40 [Thi Bao Tran Vo](#), Dooho Choi
 Dong-Eui University, Korea

12-1264 Development of A Cross-plane Seebeck Measurement System for Sub-μm-thick Films
 10:40-10:55 [Sunho Lee](#)^{1,2}, Hosun Shin¹
¹Korea Research Institute of Standards and Science, Korea, ²University of Illinois Urbana-Champaign, USA

12-2344 Wettability Regulation for Ultrathin Ag Layer for High-Performance Transparent Electrodes
 10:55-11:10 [Taehyeong Lee](#), Dooho Choi
 Dong-Eui University, Korea

12-0918 Improvement of Heat Transfer Characteristics through Metal Oxide Structure in Polymer Based Thermal Interface Material
 11:10-11:25 [Jinuk Moon](#), Uijin Jung, Bomseumin Jung, Jinsub Park
 Hanyang University, Korea

12-1661 Enhancing Thermoelectric Performance Of PEDOT: PSS Through Nature-Abundant Substances
 11:25-11:40 [Jeong Han Song](#), Jeonghun Kwak
 Seoul National University, Korea

12-4398 Synthesis and Thermoelectric Characterization of Organic-Inorganic Composites
 11:40-11:55 [Hong Ju Ahn](#), Joo-yul Lee, Se-il Kim
 Korea Institute of Materials Science, Korea

12-3369 Exploring Ways of Enhancing Power Factor PF on Thermoelectric Materials : Theoretical Approach
 11:55-12:10 [Changhoon Lee](#)^{1, 2}, Ji Hoon Shim³
¹Max Planck POSTECH, Korea, ²Korea Research Initiative, Korea, ³Pohang University of Science and Technology, Korea

12-2593 Enhanced High-temperature Thermoelectric Properties by Suppressed Bipolar Conduction in Se-rich N-type Cu_{0.008}Bi₂(Te,Se)₃ Alloys
 12:10-12:25 [Seungki Jo](#)¹, Hyun-Sik Kim², Sang-il Kim², Kyu Hyoung Lee³
¹Korea Institute of Materials Science, Korea, ²University of Seoul, Korea, ³Yonsei University, Korea

12-0403 Recent Advances in Thermoelectric Properties of Bismuth Telluride Based Composites
 12:25-12:40 [Jong-Soo Rhyee](#)
 Kyung Hee University, Korea

Thermal Engineering Materials and Devices 7

Nov 09 (Wed) | Mara (2F)

CHAIR Su-Dong Park (Korea Electrotechnology Research Institute, Korea)

12-2601 Diffusion of Intrinsic and Extrinsic Defects in Mg₂X (X = Si, Sn): Hybrid Density Functional Study
 14:00-14:15 [Sungjin Park](#), Byungki Ryu, SuDong Park
 Korea Electrotechnology Research Institute, Korea

12-2066 Constant Seebeck-coefficient Approximation (CSA) and Average Thermoelectric Figure of Merit
 14:15-14:30 [Byungki Ryu](#), Jaywan Chung, Sungjin Park, SuDong Park
 Korea Electrotechnology Research Institute, Korea

12-2065 Thermoelectric Figure of Merit Under Constant Seebeck Coefficients
 14:30-14:45 [Jaywan Chung](#)¹, Byungki Ryu¹, Hyowon Seo²
¹Korea Electrotechnology Research Institute, Korea, ²Kunsan National University, Korea

12-3312 Improvement of Themoelectric Properties of p-type Bi_{0.4}Sb_{1.6}Te₃ by Introducing Magnetic Nanoparticles
 14:45-15:00 [SungWook Ye](#)¹, Jungmin Park¹, Sehoon Seo¹, Kyungmi Lee², Hyesun Yoo¹, Wooyoung Lee², JongWook Roh¹
¹Kyungpook National University, Korea, ²Yonsei University, Korea

12-3469 Selective Dissolution-Derived Nanoporous Design of Bulk Bi₂Te₃ Alloys for High Thermoelectric Performance
 15:00-15:15 [Seunghyeok Lee](#)^{1,2}, Sung-Jin Jung¹, Gwang Min Park^{1,3}, Min Young Na¹, Seung-Hyub Baek^{1,4}, Heesuk Kim¹, Jin-Sang Kim¹, Tae Joo Park², Seong Keun Kim^{1,3}
¹Korea Institute of Science and Technology, Korea, ²Hanyang University, Korea, ³Korea University, Korea, ⁴Yonsei University, Korea

12-2408 Surface Modified Liquid Metal Nanoparticle and Elastomer Composite for Thermal Transport Application in Soft and Deformable Electronics
15:15-15:30 [Hyunwoo Bark](#), Matthew Wei Ming Tan, Gurunathan Thangavel, Pooi See Lee
Nanyang Technological University, Singapore

12-2032 Assessment and Fabrication of Thermoelectric Chip Cooling System
15:30-15:45 [Seungik Shin](#)¹, Da-hye Kim¹, Seungwoo Han²
¹University of Science and Technology, Korea, ²Korea Institute of Machinery and Materials, Korea

12-1267 Effect of Dopant on the Thermoelectric Properties and Microstructure of In-doped GeTe-based Thermoelectric Materials
15:45-16:00 [Hyunji Kim](#), Ho Seong Lee
Kyungpook National University, Korea

12-3482 Thermal Transport Properties of Mechanically Exfoliated ZnPS₃ and Graphite Fluoride (GF) Flakes
16:00-16:15 [Wonsik Lee](#), Hyejin Jang
Seoul National University, Korea

Thermal Engineering Materials and Devices 8

Nov 09 (Wed) | Biyang (2F)

CHAIR Jong-Soo Rhyee (Kyung Hee University, Korea)

12-1544 The Effect of Spin-orbital Entropy on Anomalous Nernst Effect
14:00-14:15 [Min Young Kim](#), Hyungyu Jin
Pohang University of Science and Technology, Korea

12-1459 Coherent Phonon Scattering and Improved Charge Transport in Coated Grain Oxide Thermoelectric Material
14:15-14:30 [Somnath Acharya](#), Woochul Kim
Yonsei University, Korea

12-1144 Ultra-low Lattice Thermal Conductivity, Microstructure Evolution and Enhanced Mechanical Properties of Cu and Sb Co-doped SnTe
14:30-14:45 [Samuel Kimani Kihoi](#), Ho Seong Lee
Kyungpook National University, Korea

12-0956 Improving the Thermoelectric Performance of Ti-Doped NbFeSb by Substitutional Doping of the Sb Atoms with the Isoelectric Bi Atoms
14:45-15:00 [Joseph Nguigi Kahiu](#), Samuel Kimani Kihoi, Hyunji Kim, Ho Seong Lee
Kyungpook National University, Korea

12-0745 When Doping Increases the Lattice Thermal Conductivity
15:00-15:15 [Hanhwi Jang](#)¹, Michael Toriyama², Gerald Jeffrey Snyder², Yeon Sik Jung¹, Min-Wook Oh³
¹Korea Advanced Institute of Science and Technology, Korea, ²Northwestern University, USA
³Hanbat National University, Korea

12-1473 Thermoelectric Hotspot Cooling with Thermally Conductive Fillers
15:15-15:30 [Sang J. Park](#), Junyoung Park, Hyungyu Jin
Pohang University of Science and Technology, Korea

12-1429 Design Optimization of the Thermopile Thermoelectric Generator for Transverse Thermoelectric Performance Enhancement
15:30-15:45 [Ki Mun Bang](#), Hyungyu Jin
Pohang University of Science and Technology, Korea

12-3566 Numerical Study for Heat Transfer Performance of Heat Exchanger according to the Medium
15:45-16:00 [Myeong Jin Seo](#)¹, Jun Beom Park¹, Jae Gwan Kim², Ki Kon Kwak², Jae Ho Jeong¹
¹Gachon University, Korea, ²Samsung Heavy Industries, Korea

12-3558 Numerical Study for Heat Transfer Performance by Fin Geometric Parameter
16:00-16:15 [JunBeom Park](#), Jae-Ho Jeong
Gachon University, Korea

12-3553 EES Program Validation of Thermoelectric Generation with CFD
16:15-16:30 [Hyun-Jun An](#), Jae-Ho Jeong
Gachon University, Korea

12-2729 Removal of Soot Deposition on Hydrophobic Coated Copper Plate of Thermoelectric Generators
16:30-16:45 [Seongmin Han](#)¹, Kyungjun Lee¹, Jaegwan Kim², Kikon Kwak², Jaeho Jeong¹
¹Gachon University, Korea, ²Samsung Heavy Industries, Korea

12. Thermal Engineering Materials and Devices

Thermoelectric Physics

14:00-15:00, NOV 09 (Wed) | Lobby (2F)

CHAIR	Jong-Soo Rhyee (Kyung Hee University, Korea)
12-0199	Effects of Sn and In Double-Doping on the Thermoelectric Performance of $\text{Cu}_3\text{Sb}_{1-x}\text{Sn}_x\text{In}_y\text{S}_4$ Famatinites Sang Yun, Il-Ho Kim Korea National University of Transportation, Korea
12-0584	The Temperature Dependence Properties of Electron-piezoelectric Phonon Interacting Materials in Square Well Confinement Potential Su-Ho Lee ¹ , Nam-Ho Kim ² , Byoung-Il Sagong ² , Sun-Pyoung Go ¹ ¹ Dong-A University, Korea, ² Pukyong National University, Korea
12-0969	A Study on the Quantitative Calculation Method of Acceptor-like States of In-Zn-O Semiconductor Using Thermal Excitation Dongwook Kim , Hyeonju Lee, Bokyoung Kim, Jaehoon Park Hallym University, Korea
12-3236	A Consideration of Thermoelectric Device Design Optimization with Material Properties Tae-Young Yun , Ju-Young Baek, Jong Tae Kim, Hyunchul Kim, Seok-Hwan Chung, Dong Hwan Kim Daegu Gyeongbuk Institute of Science and Technology, Korea

Thermoelectric Chemistry

14:00-15:00, NOV 09 (Wed) | Lobby (2F)

CHAIR	Kyu Hyoung Lee (Yonsei University, Korea)
12-0196	Solid-State Synthesis and Thermoelectric Performance of $\text{Cu}_3\text{Sb}_{1-y}\text{B}^{\text{III}}_y\text{Se}_4$ ($\text{B}^{\text{III}} = \text{Al, In}$) Permingeatites Ho-Jeong Kim ^{1,2} , Il-Ho Kim ¹ ¹ Korea National University of Transportation, Korea, ² Yonsei University, Korea

12-0645	Magnetic and Electronic Properties of Layered Re_2C by Strong SOC from the Electron at Interlayer Space Jeongyun Hwang ¹ , Seungyong Lee ¹ , Chuloh Park ¹ , Kimoon Lee ² , Sungwng Kim ³ , Kyuhyoung Lee ¹ ¹ Yonsei University, Korea, ² Kunsan National University, Korea, ³ Sungkyunkwan University, Korea
12-1258	Simple Equations to Predict the Maximum zT and Corresponding Optimum nH Minsu Heo , Hyun-Sik Kim, Sang-il Kim University of Seoul, Korea
12-1334	TaFeSb-based Half-heuslers with the Highest Quality Factor Estimated by the SPB Model Hyunjin Park , Sang-il Kim, Hyun-sik Kim University of Seoul, Korea
12-1494	Estimation of the Weighted Mobility Ratio in Polycrystalline $(\text{Bi}_{1-x}\text{Sb}_x)_2\text{Te}_3$ Alloy with Grain Boundary Dislocations Jeong-Yeon Kim , Hyun-Sik Kim University of Seoul, Korea
12-2238	Emerging Functional Properties in Ternary Strongly Correlated Electron System of NiWO_4 by Doping Approach Junewon Suh , Seung Yong Lee, Jisu Kim, Haeun Choa, Kyu Hyoung Lee Yonsei University, Korea
12-2257	Design and Performance of Bi-Te-based Flexible Thermoelectric Power Generator Yong Hwan Kim , Gi Hyun Park, Si Hoon Jeong, Kyu Hyoung Lee Yonsei University, Korea
12-2302	Thermoelectric Properties of Ag Concentration Deposited on Sb_2Te_3 Thin Film Prepared by Using the Electroless Plating Method Ji Hee Pi , Min Young Kim, Ga Young Koo, Kyu Hyoung Lee Yonsei University, Korea
12-2423	Generation of Nanogap Defect in Porous ZnO Sheets and Enhanced Ultrafast Electron Transfer Seung Yong Lee , Min Young Kim, Kyu Hyoung Lee, Hyegi Min Yonsei University, Korea
12-2777	Thermal Growth of Copper Oxide Thin Films for Photoelectrochemical Water Splitting Yongseon Choi , JeongEun Yoo, Kiyoung Lee Inha University, Korea
12-3285	Synthesis and Thermoelectric Properties of N-type Mg_3Sb_2 -based Materials with Well-dispersed Bi-doped Silica Mesoporous Balls Ju-Young Baek , Jeongmin Kim, Tae-Young Yun, Jong Tae Kim, Hyunchul Kim, Seok-Hwan Chung, Dong Hwan Kim Daegu Gyeongbuk Institute of Science and Technology, Korea

12-3650 Understanding Electronic Transport Properties of the $\text{HfTe}_2\text{-HfSe}_2$ Solid Solutions in Terms of Band Parameters Estimated Using the Two-Band Model
Seungmee Hwang, Okmin Park, Hyun-Sik Kim, Sang-il Kim
University of Seoul, Korea

Thermoelectric Applications

14:00-15:00, NOV 09 (Wed) | Lobby (8F)

CHAIR Sang Hyun Park (Korea Institute of Energy Research, Korea)

12-0368 Thermochromic Displays Using Molecular Printing for Unprecedented Fast Color Switching
Taeyoung Kim, Wooyoung Shim
Yonsei University, Korea

12-0717 Discovery of Thermoelectric Biocatalysis for Recycling Low-grade Waste Heat
Jaeho Yoon¹, Hanhwi Jang¹, Min-Wook Oh², Thomas Hilberath³, Frank Hollmann³, Yeon Sik Jung¹, Chan Beum Park¹
¹Korea Advanced Institute of Science and Technology, Korea, ²Hanbat National University, Korea, ³Delft University of Technology, The Netherlands

12-0878 Aluminum/graphite Metal Matrix Composite for Application in Heat Sink
Jongtae Kim, Dong Hwan Kim, Hoyoung Kim, Seok-Hwan Chung
Daegu Gyeongbuk Institute of Science and Technology, Korea

12-1204 Experimental Validation for Optimization of Thermoelectric Cooling on EV Fast Charging
ChulHyun Hwang^{1,2}, Jaeyoung Jeong^{1,2}, Ikjin Lee¹, Sang Hyun Park²
¹Korea Advanced Institute of Science and Technology, Korea, ²Korea Institute of Energy Research, Korea

12-1877 3D Printing of NbCoSn Half-Heusler Thermoelectric Material with Ultra-Low Thermal Conductivity by Introducing Nano Powder and Nano-Pulse Laser
Hail Park, Seoung-Ho Lim, Kiyoon Yi, Pyuck-Pa Choi, Hoon Sohn
Korea Advanced Institute of Science and Technology, Korea

12-2153 Low-Temperature Sintering Characteristics by Adding $\text{Ba}_3\text{V}_4\text{O}_{13}$ Ceramic to $\text{BaTiO}_3\text{-Nb}_2\text{O}_5\text{-Co}_3\text{O}_4$ Ternary Composition
Changho Lee, Junrag Yoon
Samwha Capacitor Co., Ltd., Korea

12-2159 Composition-Dependent Structural and Thermoelectric Properties of Metal Chalcogenides Electrodeposits
Jiwon Kim, Jin-Ju Choi, Chan-Gi Lee
Institute for Advanced Engineering, Korea

12-2198 Development of Thermoelectric Power Module with Low Thermal Resistance for the Application of Ship Industry
Jongmin Lee¹, Yongsang Cho¹, Hyungeui Lee¹, Jaegwan Kim², Kikon Kwak², Kyungtae Yun²
¹LG Innotek, Korea, ²Samsung Heavy Industries, Korea

12-2265 Thermally Stable P-type Bi-Sb-Te Nano-structured Materials for Thermoelectric Generation
Yongmin Kang¹, Jaek Lee¹, Jinseok Lee¹, Tsuyoshi Toshio², Hyungeui Lee¹
¹LG Innotek, Korea, ²LG Innotek, Japan

12-3476 Interface-Induced In-plane Seebeck Effect in 2D van der Waals Homostructures
Yunho Kim, Sang-Kwon Lee, Nowon Park, Minsung Kang, Jaewon Choi, Minjeong Kim
Chung-Ang University, Korea

12-3481 Thickness Dependency of Thermoelectric Properties in 2D PtSe_2 Thin Films
Jung-Min Cho¹, Sang-Kwon Lee¹, Gil-Sung Kim¹, No-Won Park¹, Min-Sung Kang², Sihoo Kim¹, Chan-Ho Park¹
¹Chung-Ang University, Korea, ²Jeonbuk National University, Korea

12-3509 Modulation of Out-of-Plane Seebeck Coefficients with Phase and Composition Tuning for MoS_2 -Based Films
Jaewon Choi, Sang-Kwon Lee, Hyeok-Jun Kwon, Gil-Sung Kim
Chung-Ang University, Korea

12-3697 Light-Induced Carbon Nanotube/Copper Nanocomposites: Applications in Thermal Interface Materials
Tae Yoo Kim¹, Jang-Woo Han², Kwang-Seok Kim¹
¹Korea Institute of Industrial Technology, Korea, ²Kumoh National Institute of Technology, Korea

12-3738 Study on Full Copper Heat Sink Fabricated with New Novel Closed-diecasting for Thermoelectric Device
 Min Seok Jeon¹, Jae-Hoon Lee¹, Soo-Bin Heo¹, Gi-Won Hong²
¹Korea Testing Laboratory, Korea, ²Castman Co., Ltd., Korea

12-4241 Performance Optimization of a TEG System in Seafaring Vessels
Honggoo Kwon, Sungjin Park, Woochul Kim
Yonsei University, Korea

12-4245 Anodic WO_3 Nanostructures for Their Use in Energy Conversion
Eunoak Park, Kiyoun Lee
Inha University, Korea

Thermal-Assemble Materials and Applications with KSTP(The Korean Society of Thermalphysical Properties)

14:00-15:00, NOV 09 (Wed) | Lobby (8F)

CHAIR Woochul Kim (Yonsei University, Korea)

- 12-3307

Enhanced Thermoelectric Performance of SiO₂ Nanoparticle-embedded Bi₂Te_{2.7}Se_{0.3} Composites
[Jungmin Park](#), Jong Ryeol Kim, Sungwook Ye, Sehoon Seo, Hyesun Yoo, Dong Choon Hyun, Jongwook Roh
Kyungpook National University, Korea
- 12-3569

Design of Optical Thermometry for Materials with Low Thermal Conductivity and Nonconformal Surface
[Yoonseong Jung](#), Hyejin Jang
Seoul National University, Korea

13. Magnetic Materials and Spintronics

Hard Magnets for Future Mobility Applications 1

NOV 07 (Mon) | Mara (2F)

CHAIR Kwangjae Park (National Institute of Advanced Industrial Science and Technology, Japan)

- 13-4078

Recent Advances in Low-dimensional Rare-earth-based Magnet Manufacturing and its Application
09:20-09:50
INVITED [Jimin Lee](#)
Georgia Institute of Technology, USA
- 13-1288

Nanopowder Preparation for Permanent Magnet by Induction Thermal Plasma
09:50-10:20
INVITED [Yusuke Hirayama](#)
National Institute of Advanced Industrial Science and Technology, Japan
- 13-0504

Development of High-performance Nd-saving Nd-Fe-B Hot-deformed Magnets
10:20-10:50
INVITED [Tae-Hoon Kim](#)¹, [Ga-Yeoung Kim](#)^{1,2}, [Hee-Ryoung Cha](#)¹, [Jung-Goo Lee](#)¹
¹Korea Institute of Materials Science, Korea, ²Pusan National University, Korea
- 13-0494

In-situ Observation of Magnetic Skyrmion Crystal Formation: Kinetics
10:50-11:20
INVITED [Tae-Hoon Kim](#)
Chonnam National University, Korea
- 13-3543

Effect of Sodium Ions Addition on the Magnetic Properties and Microstructure of SrFe₁₂O₁₉
11:20-11:35
[Jae Young Choi](#)^{1,2}, [Jung Min Lee](#)², [Yang Do Kim](#)¹, [Youn Kyoung Baek](#)², [Jung Goo Lee](#)², [Young Kuk Kim](#)²
¹Pusan National University, Korea, ²Korea Institute of Materials Science, Korea
- 13-3261

Fine-grained Anisotropic Nd-Fe-B Magnets Fabricated by Hot-press of HDDR Powders Aligned Under Pulsed Magnetic Field
11:35-11:50
[Jae-Gyeong Yoo](#)¹, [Hee-Ryoung Cha](#)¹, [Tae-Hoon Kim](#)¹, [Yang-Do Kim](#)², [Jung-Goo Lee](#)¹
¹Korea Institute of Materials Science, Korea, ²Pusan National University, Korea

- Hard Magnets for Future Mobility Applications 2
- Soft Magnets for Future Mobility Applications 1

NOV 07 (Mon) | Mara (2F)

CHAIRS	Haein Choi-Yim (Sookmyung Women's University, Korea) Jae Won Jeong (Korea Institute of Materials Science, Korea)
13-2628 13:20-13:35	Anisotropic Sm-Co Alloy Nanoparticles and Nanocrystalline Sm-Co Permanent Magnets with Huge Coercivity <u>Kwangjae Park</u> ^{1,2} , Yusuke Hirayama ² , Jian Wang ² , Zheng Liu ² , Kenta Takagi ² , Makoto Kobashi ¹ ¹ Nagoya University, Japan, ² National Institute of Advanced Industrial Science and Technology, Japan
13-3146 13:35-13:50	Effects of Ti Addition on Magnetic and Microstructural Properties of Ce-substituted Nd-Fe-B Hot-deformed Magnets <u>Ga-Yeong Kim</u> ¹ , Hee-ryoung Cha ¹ , Tae-hoon Kim ¹ , Yang-Do Kim ² , Jung-goo Lee ¹ ¹ Korea Institute of Materials Science, Korea, ² Pusan National University, Korea
13:50-14:05	Break Time
13-0255 14:05-14:35 INVITED	Computational Materials Science: Nano-Crystalline and Amorphous Soft Magnetic Materials Design <u>Yang-Ki Hong</u> ¹ , Minyeong Choi ¹ , Hoyun Won ¹ , Jihoon Park ^{1,2} , Woncheol Lee ^{1,3} , Jaemin Lee ^{1,4} , Hyunsol Son ⁵ , Haein Choi-Yim ⁵ ¹ The University of Alabama, USA, ² Korea Institute of Materials Science, Korea, ³ Samsung Electro-Mechanics Co., Ltd., Korea, ⁴ Intel Corporation, USA, ⁵ Sookmyung Women's University, Korea
13-0476 14:35-15:05 INVITED	Alloy Design Strategies for Nanostructured Soft Magnetic Composites Prepared Using Fe-based Amorphous Precursors <u>Seonghoon Yi</u> Kyungpook National University, Korea
13-0375 15:05-15:35 INVITED	Manufacturing of High Efficiency Fe-based Magnetic Materials and Composite Cores <u>Jongryoul Kim</u> , Kwiyoung Lee Hanyang University, Korea
13-0250 15:35-15:50	Mossbauer Spectroscopic Characterization of the Intrinsic Properties of Magnetic Materials <u>Yang-Ki Hong</u> ¹ , Minyeong Choi ¹ , Hoyun Won ¹ , Woncheol Lee ^{1,2} , Jihoon Park ^{1,3} , Jaemin Lee ^{1,4} , Young Rang Uhm ⁵ ¹ The University of Alabama, USA, ² Samsung Electro-Mechanics Co., Ltd., Korea, ³ Korea Institute of Materials Science, Korea, ⁴ Intel Corporation, USA, ⁵ Korea Atomic Energy Research Institute, Korea

Soft Magnets for Future Mobility Applications 2

NOV 07 (Mon) | Mara (2F)

CHAIRS	Tae-Hoon Kim (Chonnam National University, Korea) Yusuke Hirayama (National Institute of Advanced Industrial Science and Technology, Japan)
13-3901 16:00-16:15	A Study on the Soft Magnetic Materials for Extreme Low Frequency Magnetic Field (ELF-MF) Shielding <u>Moosung Choi</u> , Jeong-Hyeon Jo, Taemoo Rho, Joon-Young Soh Korea Electric Power Research Institute, Korea
13-3186 16:15-16:30	Multilayered Electromagnetic Wave Interference Shielding Films at High-frequency Fabricated via Electroplating <u>HyunJun Kwon</u> , Jong-Hwan Park, Su-Jeong Suh Sungkyunkwan University, Korea
13-3151 16:30-16:45	Crystallization Behavior and Soft Magnetic Properties of High-ms Nanocrystalline Alloys for High-Frequency and High-Efficiency Electromagnetic Applications <u>Jae Won Jeong</u> , Hyun Aha Im, Su-Bong An, Yeong Gyun Nam, Hea-Ran Kim Korea Institute of Materials Science, Korea
13-3130 16:45-17:00	Effect of Shape-controlled FeCo Nanomaterials on Electromagnetic Wave Absorbing Properties <u>Young-Tae Kwon</u> , Mi Se Chang, Jae Won Jeong, Byeongjin Park, Sang-Sun Yang Korea Institute of Materials Science, Korea
13-2253 17:00-17:15	Thermal, Optical, and Magnetic Properties of Pure and Ni Incorporated PrCoO ₃ Compound Ateeq Ahmed, Byung-Sang Choi Chosun University, Korea

Spintronic Materials and Devices 1

NOV 08 (Tue) | Mara (2F)

CHAIRS	Gyung-Min Choi (Sungkyunkwan University, Korea) Soogil Lee (Korea Advanced Institute of Science and Technology, Korea)
13-4328 10:10-10:40 KEYNOTE	Evolutions of MRAMs, from STT-writing to New Emerging writings and from E-flash Replacement to Cache & Logic-gate Applications <u>Hiroaki Yoda</u> Spin-Orbitronics Technologies, Japan

- 13-3721

10:40-11:10

INVITED

Giant Orbital Anisotropy with Strong Spin-Orbit Coupling Established at the Pseudomorphic Interface of the Co/Pd Superlattice

Jongill Hong

Yonsei University, Korea
- 13-0374

11:10-11:40

INVITED

THz Charge, Spin, and Magnon Currents in Magnetic Heterostructures

Kyusup Lee, [Hyunsoo Yang](#)

National University of Singapore, Singapore
- 13-1359

11:40-11:55

Spintronic Physical Unclonable Functions in Perpendicular Exchange-biased Structures

[Jaimin Kang](#), Daekyu Koh, San Ko, Kab-Jin Kim, Soogil Lee, Byong-Guk Park

Korea Advanced Institute of Science and Technology, Korea
- 13-2377

11:55-12:10

Novel Field-Free, Shape-Assisted Ferromagnet Switching Using VCMA Effect

[Stanislav Sin](#), Saeroonter Oh

Hanyang University, Korea
- 13-0765

12:10-12:25

Reduced Spin-orbit Torque Switching Current by Voltage-controlled Magnetic Easy-cone States

[Jimin Jeong](#), Min-Gu Kang, Soogil Lee, Byong-Guk Park

Korea Advanced Institute of Science and Technology, Korea
- 13-1256

12:25-12:40

SOT Properties of W-Si/CoFeB Heterostructure

[Seok In Yoon](#)¹, Taehyun Kim¹, Quynh Anh T. Nguyen², Gyu Won Kim¹, Min Hyeok Lee¹, Sonny H. Rhim², Young Keun Kim¹

¹Korea University, Korea, ²University of Ulsan, Korea

- 13-0366

15:30-16:00

INVITED

Observation of the Orbital Hall Effect in a Light Metal Ti

Young-Gwan Choi¹, Daegeun Jo², Kyung-Hun Ko¹, Dongwook Go³, Kyung-Han Kim², Hee Gyum Park⁴, Changyoung Kim⁵, Byoung-Chul Min⁴, [Gyung-Min Choi](#)¹, Hyun-Woo Lee²

¹Sungkyunkwan University, Korea, ²Pohang University of Science and Technology, Korea, ³Johannes Gutenberg University Mainz, Germany, ⁴Korea Institute of Science and Technology, Korea, ⁵Seoul National University, Korea
- 13-3596

16:00-16:15

Efficient Conversion of Orbital Current to Spin Current Through Pt Insertion Layer for Spin-orbit Torque Switching

[Soogil Lee](#), Min-Gu Kang, Byong-Guk Park

Korea Advanced Institute of Science and Technology, Korea
- 13-1489

16:15-16:30

Hierarchically Engineered Manganite Thin Films with a Wide-Temperature-Range Colossal Magnetoresistance Response

[Shanshan Guo](#)¹, Baomin Wang², Daniel Wolf¹, Axel Lubk¹, Weixing Xia³, Junfeng Cui³, Run-Wei Li³, Ruben Hühne¹, Kornelius Nielsch¹

¹Leibniz Institute for Solid State and Materials Research, Germany, ²Ningbo University, China, ³Chinese Academy of Sciences, China

Spintronic Materials and Devices 2

NOV 08 (Tue) | Mara (2F)

CHAIRS Jongill Hong (Yonsei University, Korea)
Byong-Guk Park (Korea Advanced Institute of Science and Technology, Korea)

13-4326 Spin-orbitrtonic Materials and Devices for Future Electronics
14:00-14:30 [Alexander Samardak](#)
KEYNOTE Far Eastern Federal University, Russia

13-0327 Ferrimagnetic Spintronics
14:30-15:00 [Kyung-Jin Lee](#)
INVITED Korea Advanced Institute of Science and Technology, Korea

13-0551 Transverse Magneto-Thermoelectric Conversion
15:00-15:30 [Ken-ichi Uchida](#)^{1,2}
INVITED ¹National Institute for Materials Science, Japan, ²Tohoku University, Japan

13. Magnetic Materials and Spintronics

Hard Magnets for Future Mobility Applications

18:30-19:30, NOV 07 (Mon) | Lobby (2F)

CHAIR	Jung-Goo Lee (Korea Institute of Materials Science, Korea)
13-2409	Magnetic Performance and Microstructures of Hot-deformed Nd-Ce-Fe-B Magnets <i>Wonjin Kim</i> , Ye Ryeong Jang, Hyun-Sook Lee, Wooyoung Lee <i>Yonsei University, Korea</i>
13-2416	Magentic Properties in Nd Reduced Nd-Ce-Fe-B Hot-deformed Magnets <i>Ye Ryeong Jang</i> , Wonjin Kim, Hyun-Sook Lee, Wooyoung Lee <i>Yonsei University, Korea</i>
13-2709	Additive Effects of La-Ca-Co Substituted Sr M-type Hexaferrites on Magnetic Properties <i>Minkyung Seong</i> ¹ , Kang-Hyuk Lee ² , Sang-Im Yoo ² , Haein Choi-Yim ¹ ¹ <i>Sookmyung Women's University, Korea</i> , ² <i>Seoul National University, Korea</i>
13-3243	Fabrication of Anisotropic Ce-Fe-B Based Magnets by Hot-deformation Process <i>Ha-Rim Choi</i> ^{1,2} , Hee-Ryoung Cha ¹ , Jung-Goo Lee ¹ , Haein Choi-Yim ² ¹ <i>Korea Institute of Materials Science, Korea</i> , ² <i>Sookmyung women's University, Korea</i>

Soft Magnets for Future Mobility Applications

18:30-19:30, NOV 07 (Mon) | Lobby (2F)

CHAIR	Haein Choi-Yim (Sookmyung Women's University, Korea)
13-2334	Electromagnetic Properties of Flexible Microwave Absorbers for 5G Communication Employing SrW Hexaferrites <i>Seung Min Choi</i> , Sang Im Yoo <i>Seoul National University, Korea</i>
13-2561	Magnetic Properties of Nanocrystalline Fe-Co-B-P-Cu Alloy System <i>Jihye Park</i> , Haein Choi-yim <i>Sookmyung Women's University, Korea</i>

13-2586	Microwave Absorption Properties of Sr _{0.8} La _{0.2} Co _{0.2} Zn _{1.8-x} Ni _x Fe ₁₆ O ₂₇ W-type Hexaferrites and MXene (Ti ₃ C ₂) Composites in Ka Band (26.5-40 GHz) <i>Hyuk Jin Seo</i> , Sang Im Yoo <i>Seoul National University, Korea</i>
13-2929	Effect of Heat Treatment on Magnetic Properties in Fe-B-Si-P-Cu-Nb Alloy System <i>Hyunkyung Lee</i> , Haein Choi-Yim <i>Sookmyung Women's University, Korea</i>
13-3156	Effect of Nb/ Zr co-addition on Crystallization Behavior and the Soft Magnetic Properties of Fe _{77.5} Si _{11.5} B ₇ Nb _x Zr _{3-x} Cu ₁ Nanocrystalline Soft Magnetic Alloys <i>Hyun Ah Im</i> ¹ , Subong An ¹ , Yeong Gyun Nam ¹ , Sangsun Yang ¹ , Jung Woo Lee ² , Jae Won Jeong ¹ ¹ <i>Korea Institute of Materials Science, Korea</i> , ² <i>Pusan National University, Korea</i>
13-3166	The Effect of Si/B Ratio on the Glass Formation and Microstructure Evolution of Fe ₈₀ (B _a Si _b) ₁₅ C ₁ Cu ₁ Nb ₃ Nanocrystalline Soft Magnetic Alloys <i>Subong An</i> ^{1,2} , Hyun Ah Im ^{1,2} , Yeong Gyun Nam ^{1,2} , Sangsun Yang ¹ , Jung Woo Lee ² , Jae Won Jeong ¹ ¹ <i>Korea Institute of Materials Science, Korea</i> , ² <i>Pusan National University, Korea</i>
13-3387	Senary Fe73Si9—xB10P5C3Mox Alloy with Abnormal Glass-forming Ability for the Preparation of Gas-atomised Amorphous Soft Magnetic Powders <i>Yeong Gyun Nam</i> ¹ , Hearn Kim ¹ , Hyun Ah Im ¹ , Su Bong An ¹ , Jung Woo Lee ² , Sangsun Yang ¹ , Jae Won Jeong ¹ ¹ <i>Korea Institute of Materials Science, Korea</i> , ² <i>Pusan National University, Korea</i>
13-3437	Novel Double-layer-insulated Soft Magnetic Composite with Improved High-Temperature Heat Resistance <i>Jong-Min Park</i> ¹ , Jang Min-sun ² , Bounk Koo ² , Hea-Ran Kim ² , Young-Tae Kwon ² , Sang-sun Yang ² , Jung Woo Lee ² , Jae Won Jeong ² ¹ <i>Pusan National University, Korea</i> , ² <i>Korea Institute of Materials Science, Korea</i>
13-3991	Synthesis of Nanosized FeCo@MnO ₂ Core@shell Particles Using Two-step Method : Effect of MnO ₂ Layer Thickness on Electromagnetic Wave(EMW) Shielding <i>Yeong Jun Park</i> , Su Jeong Suh, Jong Hwan Park <i>Sungkyunkwan University, Korea</i>

Spintronic Materials and Devices

16:50-18:20, NOV 08 (Tue) | Lobby (2F)

CHAIR	Gyung-Min Choi (Sungkyunkwan University, Korea)
13-0656	Local Electronic Structure of MgO under 100 MeV O⁷⁺ Ion Irradiation Investigated using Angle Dependent NEXAFS Measurements Jitendra Pal Singh¹, <u>Weon Cheol Lim</u>², Manish Kumar¹, Sanjeev Gautam³, Kandasami Asokan⁴, Sangsul Lee¹, Keun Hwa Chae² ¹Pohang Accelerator Laboratory, Korea, ²Korea Institute of Science and Technology, Korea, ³Panjab University, India, ⁴Inter University Accelerator Centre, India
13-0990	Gradient-Induced Symmetry Breaking in Pt/Co Multilayer Structures <u>Han Seok Ko</u>¹, Alexander Samardak², Taehyun Kim¹, Young Keun Kim¹ ¹Korea University, Korea, ²Far Eastern Federal University, Russia
13-2000	Enhancement of Robustness Against Magnetic Tampering Using Write-back Operation on Spin-orbit Torque (SOT)-based Hardware Security Primitives <u>Daekyu Koh</u>, Jaimin Kang, Soogil Lee, Byong-Guk Park Korea Advanced Institute of Science and Technology, Korea
13-2020	Spintronic Hardware-based Security Primitive Through Field-free Spin-orbit Torque Switching <u>Soogil Lee</u>, Jaimin Kang, Byong-Guk Park Korea Advanced Institute of Science and Technology, Korea
13-2167	Self-Assembled Growth and Magnetic Anisotropy Modulation of Co-Sputtered Fe-SrTiO₃ Nanocomposite Thin Films <u>Ji Ho Kang</u>, Sangho Han, Dong Hun Kim Myongji University, Korea
13-2808	Modulation of Spin-Orbit Torque and Field-free Switching Polarity in Ferrimagnet/Non-magnet/Ferromagnet Trilayer Structures <u>Donghyeon Han</u>, Namhee Kim, Jeongmok Kim, Jaimin Kang, Jong-Guk Choi, Soogil Lee, Byong-Guk Park Korea Advanced Institute of Science and Technology, Korea
13-3339	Efficient Spin-orbit Torque in Magnetic Trilayers Using All Three Polarizations of a Spin Current <u>Jaimin Kang</u>, Jeongchun Ryu, Kyung-Jin Lee, Byong-Guk Park Korea Advanced Institute of Science and Technology, Korea
13-4225	Positive Exchange Bias in Y₃Fe₅O₁₂/CoFe₂O₄ Bulk Composite at Room Temperature <u>Junseok Kim</u>¹, Phuoc Cao Van², Sang J. Park¹, Jong-Ryul Jeong², Hyungyu Jin¹ ¹Pohang University of Science and Technology, Korea, ²Chungnam National University, Korea

14. Advances in Bio-Nano Integrated Materials

Bioinspired and Biointegrated Materials

NOV 07 (Mon) | Ora (8F)

CHAIRS	Seung Soo Oh (Pohang University of Science and Technology, Korea) Jung Heon Lee (Sungkyunkwan University, Korea)
14-4329	Emerging Approaches to Fabricate Supported Lipid Bilayers: Moving Beyond Vesicles 09:00-09:30 <u>Nam Joon Cho</u> KEYNOTE Nanyang Technological University, Singapore
14-4083	Synthetic Growth Factors for Controlling Cellular Behaviors and Fates 09:30-09:55 <u>Shinsuke Sando</u> INVITED The University of Tokyo, Japan
14-0267	Tailoring a Metabolite Trafficking Pathway for Membrane-Impermeable-Terpene Secretion 09:55-10:20 <u>Ju Young Lee</u> INVITED Korea Research Institute of Chemical Technology, Korea
14-0361	Functional Xenobiological Nucleic Acids for Biomedical Application 10:20-10:45 <u>Hanyang Yu</u> INVITED Nanjing University, China
14-0298	Albumin Affibody-Containing Injectable Gel Extended the Release of Urate Oxidase-Albumin Conjugates for Hyperuricemia Treatment 10:45-11:10 <u>Inchan Kwon</u> INVITED Gwangju Institute of Science and Technology, Korea
14-3869	Biomimetic Optical Nanostructures 11:10-11:35 <u>Matthew Shawkey</u> INVITED Ghent University, Belgium
14-2070	Bioinspired Materials with Self-adaptable Mechanical Properties and Damage Mitigation 11:35-11:55 <u>Sung Hoon Kang</u> Johns Hopkins University, USA

Nano-medical Materials

NOV 07 (Mon) | Ora (8F)

CHAIRS	Heemin Kang (Korea University, Korea) Jung Heon Lee (Sungkyunkwan University, Korea)
14-4333 13:00-13:30 KEYNOTE	Dielectrophoretic Single Bead-Droplet Reactor: An Approach Towards High Fidelity Solid-Phase DNA Synthesis Lambertus Hesselink <i>Stanford University, UK</i>
14-2306 13:30-13:55 INVITED	Combinatorial Nanomaterial and Therapeutic Approaches for Neuronal Reprogramming in CNS Repair KiBum Lee <i>Rutgers University, USA</i>
14-0161 13:55-14:20 INVITED	Smart Design of Nanomaterial-based Platforms for Biomedical Applications Junmin Lee <i>Pohang University of Science and Technology, Korea</i>
14-0281 14:20-14:45 INVITED	In Situ Control of Nano-Medical Materials Heemin Kang <i>Korea University, Korea</i>
14-3592 14:45-15:10 INVITED	Biomedical Supramolecular Materials Based on Synthetic Amphiphiles Yongju Kim <i>Korea University, Korea</i>

Bionanomaterials for Biomedical Applications

NOV 07 (Mon) | Ora (8F)

CHAIRS	Ju Hun Lee (Hanyang University, Korea) Jung Heon Lee (Sungkyunkwan University, Korea)
14-4121 16:00-16:25 INVITED	Reptile Eggshells as Model Multifunctional Membranes Liliana D'Alba ¹ , Karen De Clerck ² , Maarten Wynant ² , Gerben Debruyn ² , Matthew Shawkey ² <i>¹Naturalis Biodiversity Center, The Netherlands, ²Ghent University, Belgium</i>
14-0333 16:25-16:50 INVITED	3D Printed Polymer Adsorbers for Capturing Chemotherapy Drugs Before They Spread Through the Body Hee Jeung Oh <i>Pennsylvania State University, USA</i>

14-0408 16:50-17:15 INVITED	4D Microfabrication for Shape Morphing of Responsive Hydrogel Hybrids Jinhye Bae <i>University of California, San Diego, USA</i>
14-0352 17:15-17:40 INVITED	Biomolecular Self-Assembling Piezoelectric Materials Ju-Hyuck Lee <i>Daegu Gyeongbuk Institute of Science and Technology, Korea</i>
14-2141 17:40-18:05 INVITED	Cell Traction and Intracellular Force Microscopy-assisted Understanding of Chondrogenic Phenotypes of Stem Cells and Progenitors Yongsung Hwang <i>Soonchunhyang University, Korea</i>

Advances in Bio-Nano Integrated Materials

NOV 08 (Tue) | Biyang (2F)

CHAIRS	Junmin Lee (Pohang University of Science and Technology, Korea) Seung Soo Oh (Pohang University of Science and Technology, Korea)
14-3390 10:10-10:25 Engineering	Inorganic Molecular Nanowire-Based Extracellular Matrix-Mimicking Scaffolds for Tissue Cheol Hyun Park , Jina Bae, Jin Woong Lee, Sudong Chae, Seungbae Oh, Si Hyun Kim, Jae-Young Choi, Jung Heon Lee <i>Sungkyunkwan University, Korea</i>
14-1156 10:25-10:40	Magnetic-optical Nanoclusters for High Sensitivity Virus Detection Hong En Fu ¹ , Thomas Myeongseok Koo ¹ , Myeongsoo Kim ¹ , Min Jun Ko ¹ , Bum Chul Park ¹ , KyuHa Oh ² , Young Keun Kim ¹ <i>¹Korea University, Korea, ²PRIME4DIA Co., Ltd., Korea</i>
14-3111 10:40-10:55	Fabrication of Hydroxyapatite Scaffolds with Natural Bone-mimicking Nanopores with Controlled Pore Size by Low-temperature Sintering Process DaiHwan Kim , Jina Bae, Jun Hyuk Heo, Jung Heon Lee <i>Sungkyunkwan University, Korea</i>
14-0966 10:55-11:10	Rapid and Ultrasensitive Molecular Detection via Nanoparticle Surface Localized Nucleic Acid Amplification Jeong Ook Soh ¹ , Young Keun Kim ² , Ju Hun Lee ¹ <i>¹Hanyang University, Korea, ²Korea University, Korea</i>
14-2400 11:10-11:25	Wearable Immunosensor for Biomarker Detection Using Electrochemical Microfiber Device Based on Gold Nano-coral Structures Mottour Vinaygam Chinnamani , Nae-Eung Lee <i>Sungkyunkwan University, Korea</i>

- 14-1950** Aptamer-guided Site-specific Covalent Coupling of Nucleic Acids to an Intact Protein
11:25-11:40 [Hyesung Jo](#), Seung Soo Oh
Pohang University of Science and Technology, Korea
- 14-1116** Enhanced Phosphorescence and Waveguide of Bio-Organic Hybrid Crystal
11:40-11:55 [Seokho Kim](#)¹, Dong Hyuk Park², Dong June Ahn¹
¹*Korea University, Korea*, ²*Inha University, Korea*
- 14-2106** Tannic Acid Modified Antifreezing Gelatin Organohydrogel for Low Modulus, High Toughness, and Sensitive Flexible Strain Sensor
11:55-12:10 [Syed Farrukh Alam Zaidi](#)^{1,2}, Yun Ah Kim¹, Aiman Saeed¹, Nasir Sarwar², Dae Ho Yoon¹, Byungkwon Lim¹, Jung Heon Lee¹
¹*Sungkyunkwan University, Korea*, ²*University of Engineering and Technology, Pakistan*
- 14-3616** Where Material Science and Biological Science Meet: Expansion Microscopy and Protein-specific Biotemplating
12:10-12:25 [Jae-Byum Chang](#)
Korea Advanced Institute of Science and Technology, Korea

14. Advances in Bio-Nano Integrated Materials

Nano-medical Materials

18:30-19:30, NOV 07 (Mon) | Lobby (8F)

- CHAIR** Heemin Kang (Korea University, Korea)
- 14-0639** Lipid Nanoparticles for the Co-Delivery of Antigenic Protein and Adjuvant to Enhance Vaccine Immune Responses
[Dongjae Lee](#), Bon Il Koo, Yoon Sung Nam
Korea Advanced Institute of Science and Technology, Korea
- 14-3705** Cell Quantification Using Colorimetric Sensors Combined with Image Analysis
[Do Hyeon Jung](#), Yun Chul Kim, Byoung Sang Lee, Hui Hun Cho, Jun Hyuk Heo, Jung Heon Lee
Sungkyunkwan University, Korea
- 14-3892** Regulating Reversible Receptor-Ligand Binding via Magnetic Manipulation of Nanomaterials to Control Macrophage Polarization
[Yuri Kim](#), Sungkyu Lee, Gunhyu Bae, Heemin Kang
Korea University, Korea
- 14-4153** Tumor Microenvironment-activated Synergistic Fenton Reaction by Copper-Iron Peroxide Nanoparticles for Enhanced Chemodynamic Therapy
[Sagang Koo](#), Taeghwan Hyeon
Seoul National University, Korea

Bioinspired and Biointegrated Materials

18:30-19:30, NOV 07 (Mon) | Lobby (8F)

- CHAIR** Seung Soo Oh (Pohang University of Science and Technology, Korea)
- 14-0712** Development of a SiC Electrochemical Sensor for Environmental Application
[Sung-Woong Han](#), Dong-Eun Kim, Min-Jae Sung, Seongjun Kim, Young Jae Park, Min-Jae Kang, Dong-Hi Han, Min-Sik Kang, Hoon-Kyu Shin
Pohang University of Science and Technology, Korea

14-1230 Mesoporous Silica-Titania-Polyphenol Hybrids for Enhanced UV Screening with Photochemical Suppression
Saehan Choi, Jeonga Kim, Rafia Tasnim Rahman, Yoon Sung Nam
Korea Advanced Institute of Science and Technology, Korea

14-1801 Biocompatible Silk Film and Conductive Silk Polymer Composites for Piezoresistive and Capacitive Sensors
Jeong Woo Chae¹, Dong Geun Lee², Wi Hyeong Lee², Sang Min Won¹
¹*Sungkyunkwan University, Korea*, ²*Konkuk University, Korea*

14-2261 Direct Analyte Detection in Undiluted Serum Using a Semi-permeable Protocell
Jinmin Kim, Seung Soo Oh
Pohang University of Science and Technology, Korea

14-2285 Site-selective Protein Modification by Electrophile Ligand-tagged Aptamers
Jiyun Beon, Hyesung Jo, Seung Soo Oh
Pohang University of Science and Technology, Korea

14-2461 Natural Photosystems and Carbon Nitride Nanosheets Self-assembly Hybrid Structure for Green Power Generation
Nyeongbeen Jo, Yoon Sung Nam
Korea Advanced Institute of Science and Technology, Korea

14-2522 Spider Silk-like Fibroin Fiber Actuator via Microfluidic Spinning
Ronghui Wu, Juyeol Bae, Taesung Kim
Ulsan National Institute of Science and Technology, Korea

14-2713 Building Synthetic Gene Networks Using De Novo Designed Toehold Switches and Cyclic Peptides for Sequence Specific Sensing
Priyannth Ramasami Sundharbaabu¹, Swetha Nagarajan², Shrute Kannappan¹, Jung Heon Lee¹
¹*Sungkyunkwan University, Korea*, ²*Tata Institute of Fundamental Research, India*

14-2715 Eco-friendly Adenosine Triphosphate/Chitosan Coating on Polyurethane for Flame Retardancy and Smoke Suppression
Hyewon Song, Soyoung Yoon, Cheol Hyun Park, Sun Hwan Jeong, Jun Hyuk Heo, Jung Heon Lee
Sungkyunkwan University, Korea

14-2829 Multifunctional Nanocomposites Assembled along DNA-carbon Nanotube Complex by Binding Peptide Anchors
Junhyuck Chang¹, Priyannth Ramasami Sundharbaabu¹, Min Jeong Kim¹, Dohyeon Jung¹, Shrute Kannappan¹, Kyung-Il Kim¹, Kyubong Jo², Jung Heon Lee¹
¹*Sungkyunkwan University, Korea*, ²*Sogang University, Korea*

14-2866 Improved DNA-Wrapped CNT Sensor for Small-RNA Detection: Influence of Small Complementary Sequence
Shrute Kannappan, Junhyuck Chang, Jung Heon Lee
Sungkyunkwan University, Korea

14-2914 Block Copolymer Patterning on the Substrates with Low Surface Energy via Mussel-Inspired Surface Engineering
Minhyeok Kim¹, Bong Hoon Kim², Sang Ouk Kim¹
¹*Korea Advanced Institute of Science and Technology, Korea*, ²*Daegu Gyeongbuk Institute of Science and Technology, Korea*

14-3101 Effect of Strontium-doped Calcium Phosphate Coating to Improve the Corrosion Resistance and Biocompatibility of Magnesium
Jung-Eun Park, Seon-Mi Byeon, Jeong-Hui Ji, Seon-Hwa Jeong, Tae-Sung Bae, Min-Ho Lee
Jeonbuk National University, Korea

14-3140 Gelatin Cryogel Combined with Bio-inspired Polydopamine Nanospheres for Bone Regeneration
Ji-Bong Choi, Yu-Kyoung Kim, Hye-Jin Song, Tae-Sung Bae, Min-Ho Lee
Jeonbuk National University, Korea

14-4361 Designing Staggered Platelet Composite Structure with Gaussian Process Regression Based Bayesian Optimization
Kundo Park¹, Seunghwa Ryu¹, Youngsoo Kim², Minki Kim³, Chihyeon Song¹, Jinkyoo Park¹
¹*Korea Advanced Institute of Science and Technology, Korea*, ²*Korea Institute of Machinery and Materials, Korea*, ³*Korea Institute of Industrial Technology, Korea*

Bionanomaterials for Biomedical Applications

18:30-19:30, NOV 07 (Mon) | Lobby (8F)

CHAIR Yongsung Hwang (Soonchunhyang Institute of Medi-bio Science, Korea)

14-0721 Protein Coordinated Nanofibrous Piezoelectric Sensor for Monitoring Postoperative Restenosis
Ji Yeon Lee
Korea Advanced Institute of Science and Technology, Korea

14-0950 Ultra-low Cost, Facile Fabrication of Transparent Neural Electrode Array for Electrocorticography with Photoelectric Artifact-free Optogenetics
Young Uk Cho, Ki Jun Yu, Ju Young Lee
Yonsei University, Korea

14-0982 Impedance Spectroscopic Analysis of the Barrier Function of Reconstructed Epidermal Equivalents
Jaehwan Ahn, Yoonsung Nam
Korea Advanced Institute of Science and Technology, Korea

- 14-1171** Efficient Antigen Cross-presentation via Robust Multilamellar Protein-Lipid Hybrid Nanovesicles
Bon Il Koo, Dong Jae Lee, Yoon Sung Nam
Korea Advanced Institute of Science and Technology, Korea
- 14-1182** Surface-Enhanced Raman Spectroscopy (SERS) Ag Substrate for Peanut Allergen, Ara h1 Detection
Yoon Seo Huh, Sang Woo Ryu
Kyonggi University, Korea
- 14-1468** Capillary Assembly of Single Bacterial Cells and their Detection using Reflection-Enhanced Raman Spectroscopy
Joong Bum Lee¹, Minjoon Kim¹, Stefan A. Maier^{2,3}, Emiliano Cortés², Yeon Sik Jung¹, Yoon Sung Nam¹
¹*Korea Advanced Institute of Science and Technology, Korea*, ²*Ludwig Maximilian University of Munich, Germany*, ³*Monash University, Australia*
- 14-2148** A Novel Strategy for Creating an Antibacterial Surface Using a Highly Efficient Electrospray-Based Method
 Odelia Levana¹, Soonkook Hong², Se Hyun Kim¹, Ji Hoon Jeong¹, Sung Sik Hur¹, Kye-Si Kwon¹, Yongsung Hwang¹
¹*Soonchunhyang University, Korea*, ²*Korea Naval Academy, Korea*
- 14-2233** Shape Memory Characteristics and Mechanical Properties of Non-toxic Ti-Zr-Mo-Sn Biomaterials
Yeon-wook Kim
Keimyung University, Korea
- 14-2474** Intragap Distance Tunable Clustering of Nanoparticles by Organosilicasome regardless of Surface Polarity
Min Jeong Kim¹, Chae Yeon Lee¹, Jennifer Kezia Soegijopranto¹, Byoungsang Lee¹, Seokyoung Yoon², Jung Heon Lee¹
¹*Sungkyunkwan University, Korea*, ²*University of Pennsylvania, USA*
- 14-2558** Antibacterial Effect and Biosafety with the Concentration of Ginger Extract in Biodegradable Polymer Coating
Seo-Young Kim, Yong-Seok Jang, Yu-Kyoung Kim, Ji-Bong Choi, Chen Ma, Regina Guadalupe Arbizú-Trigueros, Hye-Jin Song, Min-Ho Lee
Jeonbuk National University, Korea
- 14-2644** Anti-biofouling Triboelectric Nanogenerators Inspired by Microstructure of the Shark-skin Riblet
Sang Min Han¹, Cheol Jae Lee², Ju Hun Lee¹, Ju Hyuck Lee²
¹*Hanyang University, Korea*, ²*Daegu Gyeongbuk Institute of Science and Technology, Korea*
- 14-2824** Eco-friendly Flame Retardant Based on Bio-derived Adenosine Triphosphate
Sunhwan Jeong, Jun Hyuk Heo, Jung Heon Lee
Sungkyunkwan University, Korea

- 14-2894** Titanium Carbo-nitride Coatings for Improving of Biocompatibility and Mechanical Properties of Dental Implant System via Ion Beam Assisted Deposition Method
Jae Un Kim^{1,2}, Young Shin Yun², Byung Woo Ahn², Gi Un Park², Han Cheol Choe¹
¹*Chosun University, Korea*, ²*J&L TECH Co., Ltd., Korea*
- 14-2906** Transient Electronics with Biodegradable MgZnCa Metallic Glass
 Joon Min Moon¹, Young Seo Kim¹, Jae-Young Bae¹, Eun-Ji Gwak², Hae Won Hwang³, Myoung-Ryul Ok³, Ju-Young Kim⁴, Seung-Kyun Kang¹
¹*Seoul National University, Korea*, ²*Korea Institute of Machinery and Materials, Korea*, ³*Korea Institute of Science and Technology, Korea*, ⁴*Ulsan National Institute of Science and Technology, Korea*
- 14-2941** Boosting DNA Hydrogel Self-assembly Formation via Single Base-pair Mismatch for Enzyme-free MicroRNA Detection
Hyebin Na, Jae Chul Park, Yoon Sung Nam
Korea Advanced Institute of Science and Technology, Korea
- 14-2948** Gold Nanoparticle-based Colorimetric Sensor Strip for Rapid On-Site Detection of Heavy Metal Ions in Drinking Water
Hui Hun Cho, Jun Hyuk Heo, Do Hyeon Jung, Jung Heon Lee
Sungkyunkwan University, Korea
- 14-3035** HA/Zr Composite Coatings on Plasma Electrolytic Oxidized Ti-40Nb-xTa Alloy via Magnetron Sputtering
Byeong-Seok Lim, Han-Cheol Choe
Chosun University, Korea
- 14-3065** Analysis of the Effect of Temperature on Phage Production via ATP Expenditure
Young Kyun Choi, Sang Min Lee, Sang Min Han, Ju Hun Lee
Hanyang University, Korea
- 14-3189** Electron Microscopy Image Analysis of Bio-Integrated Nanomaterials
Yunchul Kim¹, Byoungsang Lee¹, Junhyuck Chang¹, Priyannth Ramasami Sundharbaabu¹, Seokyoung Yoon², Jung Heon Lee¹
¹*Sungkyunkwan University, Korea*, ²*University of Pennsylvania, USA*
- 14-3114** Fabrication of Bioactive Antibacterial Composite Coatings on Ti-6Al-4V for Dental Implant Application
Arun S., Han-Cheol Choe, Sang-Gun Ahn
Chosun University, Korea
- 14-3314** Highly Stretchable and Fully Biodegradable Molybdenum/Polybutylene Adipate Terephthalate Composite for Electrical Applications
 Kyung-Sub Kim¹, Jun-Seok Shim¹, Jaeyoung Yoo², Jahyun Koo³, Seung-Kyun Kang¹
¹*Seoul National University, Korea*, ²*Korea Advanced Institute of Science and Technology, Korea*, ³*Korea University, Korea*

- 14-3538** Effect of Ion Concentration on Sensitivity in Surface Acoustic Wave Biosensors
[Minji Jeon](#)^{1,2}, Yeon Hwa Kwak¹, Junsob Kim¹, Seungmin Myeong¹, Kunnyun Kim¹, Byeong-Kwon Ju²
¹Korea Electronics Technology Institute, Korea, ²Korea University, Korea
- 14-3724** Osteoconductive Hybrid Nanocomposite Coating on Spinal Cage for Bone Healing
[Jungho Shin](#)¹, Sang-guk Cha², Dae-Chul Cho³
¹Daegu Mechatronics & Materials Institute, Korea, ²Kyungpook National University, Korea, ³Kyungpook National University Hospital, Korea
- 14-3880** Substrate Independent Organic Composite Coatings for Active Surface
[Yun Hee Ko](#), Myungwoong Kim, Seungyeon Choi, Hai Ha Tran Nguyen
 Inha University, Korea
- 14-3949** Visible Light Mediated Antibacterial Activity of Reduced Graphene Oxide (rGO) - Titania (TiO₂) Nanotubes Hybrid Surface
 Kyung-Sook Moon, Eun-Joo Choi, Ji-Myung Bae, [Seunghan Oh](#)
 Wonkwang University, Korea
- 14-4011** Flexible, Sticky, and Biodegradable Wireless Device for Drug Delivery to Brain Tumors
[Gi Doo Cha](#)¹, Dae-Hyeong Kim², Seung Hong Choi¹
¹Seoul National University Hospital, Korea, ²Seoul National University, Korea
- 14-4050** A Digital X-ray Tube Based on Nanomaterial for Biomedical Imaging
[Amar Prasad Gupta](#)¹, Jaekyu Jang², Jaeik Jung², Seung Jun Yeo², Jehwang Ryu¹
¹Kyung Hee University, Korea, ²CAT Beam Tech Co., Ltd., Korea
- 14-4054** Development of Compact Ceramic Vacuum Tube Based on Carbon Nanotube for Blood Irradiator
[Jinho Choi](#)¹, Hanna Lee¹, Amar Prasad Gupta¹, Jaekyu Jang², Moonkyoo Kong¹, Jehwang Ryu¹
¹Kyung Hee University, Korea, ²CAT Beam Tech Co., Ltd., Korea
- 14-4055** Operation of Compact 120 kV Ceramic X-ray Tube for Medical X-ray Imaging
[In Cheol Lee](#)¹, Amar Prasad Gupta¹, Jaekyu Jang¹, Seung Jun Yeo², Jaeik Jung², Kyung-Sik Yoon¹, Jehwang Ryu¹
¹Kyung Hee University, Korea, ²CAT Beam Tech Co., Ltd., Korea
- 14-4060** Loading Characteristic of a 70 kV Compact Ceramic X-ray Tube for Dental Application
[Junho Yu](#)¹, Amar Prasad Gupta¹, Jaekyu Jang², Won Jee Jang², Jaeik Jung², Kyung-Sik Yoon¹, Jehwang Ryu¹
¹Kyung Hee University, Korea, ²CAT Beam Tech Co., Ltd., Korea
- 14-4063** Development of Nanomaterial-based Microelectron Beam Cell Irradiation System for Biological Research
[Hanna Lee](#)¹, Jinho Choi¹, Amar Prasad Gupta¹, Jaeik Jung², Kyung-Sik Yoon¹, Jehwang Ryu¹
¹Kyung Hee University, Korea, ²CAT Beam Tech Co., Ltd., Korea

- 14-4181** Biocompatible Polycaprolactone-Hydroxyapatite Composites Filaments for the FFF 3D Printing of Bone Imitation Application
[Change Geun Kim](#), Sol Lee, Minge Kim, Viet Anh Cao, Junghyo Nah
 Chungnam National University, Korea
- 14-4208** Microneedle-based Delivery Method of Theranostic Nanoparticles and High-energy Photons to Teat Brain Tumors
[Taegyung Kang](#)^{1,2}, Young Min Song³, Seung Hong Choi^{2,4}, Dae-Hyeong Kim^{2,4}, Taeghwan Hyeon^{2,4}
¹Seoul National University, Korea, ²Institute for Basic Science, Korea, ³Gwangju Institute of Science and Technology, Korea, ⁴Seoul National University College of Medicine, Korea
- 14-4240** Preparation of Self-assembled Fe₃O₄@Au Nanoparticles via Amino-functionalization
[Su Young Kang](#), Ji Hun Jeong, Jong Hun Kim, Jee In Kim, Jae Uk Hur, Jae Rok Shin, Jin Soon Han, Gye Seok An
 Kyonggi University, Korea
- 14-4346** Ultrasensitive Probeless Capacitive Biosensor with Oligomeric Aβ (oAβ) Aptamer for Amyloid Beta Detection in Human Plasma Using Interdigitated Electrodes on Pt/Ti-featured SiO₂ Substrate
[Parshant Kumar Sharma](#), Eun-Seong Kim, Nam-Young Kim
 Kwangwoon University, Korea

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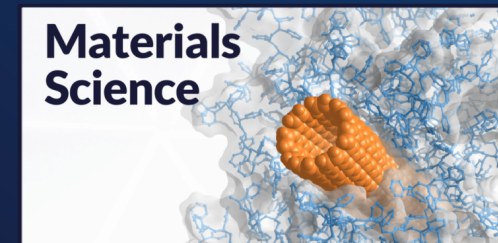
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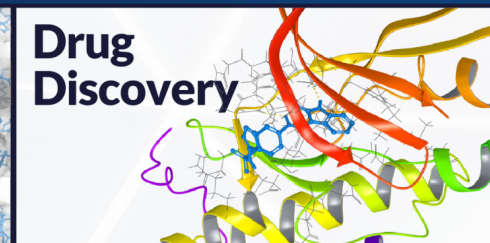
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제약을 포함한 생명과학 뿐만 아니라 재료과학 분야에 대한 글로벌 워크샵 및 원격 워크샵을 진행하고 있습니다.



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