



# EKC2019

## EKC 2019

Europe-Korea Conference on Science and Technology 2019  
Science, Technology and Humanity: Advancement and Sustainability

### Conference Programme

## EKC 2019

15–18 July 2019

Vienna University of Economics and Business  
Vienna, Austria

<https://ekc2019.org>

## MAIN ORGANISER



## CO-ORGANISERS



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## Welcome Message



**Jong Mun Park**

President of Korean Scientists and Engineers Association in Austria

On behalf of the organizing committee members, I would like to welcome you to the Europe-Korea Conference on Science and Technology 2019 (EKC 2019), which will be held in Vienna, Austria from 15th to 19th July, 2019.

EKC 2019 is hosted by Korean Scientists and Engineers Association in Austria (KOSEAA) together with the Korean Federation of Science and Technology Societies (KOFST) and eight other Korean Scientists and Engineers Associations in Europe: Germany (VeKNI), the UK (KSEAUK), France (ASCoF), the Netherlands (KOSEANL), Switzerland (KSEAS), Finland (KOSES), Scandinavia (KSSEA), and Belgium (KOSEABe).

EKC is an annual conference where scientists, engineers, government officials, industry executives, and policy-makers from both Korea and Europe not only share their expertise and ideas but also build a strong foundation for networking and collaboration. EKC 2019 in Vienna will continue a tradition that started in Heidelberg (2008), followed by Reading (2009), Vienna (2010), Paris (2011), Berlin (2012), Brighton (2013), Vienna (2014), Strasbourg (2015), Berlin (2016), Stockholm (2017), and Glasgow (2018).

EKC has become the most important scientific and social event between Korea and Europe.

We, the organizing committee of EKC 2019, are delighted that the EKC 2019 will be held back in Vienna after EKC 2010 and EKC 2014.

The theme of EKC 2019 is "Science, Technology and Humanity: Advancement and Sustainability". Human civilization is confronting huge anthropogenic problems such as environmental destruction, climate change, and social crisis. To tackle those issues, EKC 2019 will be a meeting place of science, technology, and humanity to acquire sustainability while they can continue advancing.

Especially, humanities division is newly launched in EKC 2019 to discuss the role of social science in collaboration with science and technology.

The conference includes multilateral programs: i) science and technology discussions, ii) policy and business sessions, iii) industrial forums, and iv) networking programs. Participants from industry, government policy makers, as well as academic scholars and researchers will present and discuss related scientific issues.

EKC 2019 especially promotes participation of young students to foster the next generation scientists.

Vienna, the capital of Austria, is one of the most attractive cities in the world and an economic and political centre in the heart of Europe, where there is a gate to the East and the West. Alongside the great support from the City of Vienna for our event, the final banquet will be held at Rathaus, the City hall, which is one of the most splendid monuments amongst numerous beautiful others in Vienna.

Finally, I would like to express my great appreciation to all sponsors, organisations and their members for great contributions. I also would like to express my sincere thanks to all committee members and volunteers who spent time and energy in preparing the conference. I believe our devoted effort will certainly be a legacy in international scientific cooperation and in supporting scientific communities in Korea and Europe.

We look forward to your participation in EKC 2019 and to seeing you in Vienna later this year!

**Jong Mun Park, Ph.D.**

Chair of the EKC 2019

President of Korean Scientists and Engineers Association in Austria

## Welcome Message



**Myung Ja Kim**

President of the Korea Federation of Science and Technology Societies

Good morning, distinguished guests, ladies and gentlemen.

It gives me great pleasure to welcome all scientists and engineers from home and abroad to the 2019 Europe-Korea Conference on Science and Technology (EKC-2019). This year's EKC is hosted by the Korean Scientists and Engineers Association in Austria (KOSEAA) and jointly organized by nine Korean Scientists and Engineers Associations in Europe. Allow me, at the outset, to extend my wholehearted thanks to President Jong Mun Park and the dedicated members of the KOSEAA for devoted time and effort invested in preparation of this auspicious Conference.

This year marks the 12th meeting of the EKC since its inception back in 2008 in Heidelberg, Germany. Since then, EKC has well established itself as the principal venue for networking among Korean scientists and engineers residing in Europe, contributing to S&T cooperation and mutual advancement between Korea and Europe. We are gathered here in Austria which established diplomatic ties with Korea in 1892 and have a history of longstanding friendly relations over period of more than 120 years.

The two countries concluded the Bilateral Agreement for Scientific and Technological Cooperation in September 2007, followed by the signing of a memorandum of understanding (MOU) on Science and Technology Cooperation in the areas of S&T, ICT and e-government. I wish to take this opportunity to pay respect to scientists and engineers representing Korea and Austria who have been instrumental in advancing the frontiers of bilateral cooperation, both diplomacy and science wise.

I trust that today's EKC will set another new milestone for the bilateral relations.

The theme of this year's EKC is 'Science, Technology and Humanity - Advancement and Sustainability'. As the world faces enormous environmental challenges, sustainable future has been the crux of the matter for human civilization over the past two decades. Beyond doubt, a paradigm shift is indispensable to galvanize concerted action towards sustainable development. The role of science and technology innovation (STI) in achieving the Sustainable Development Goals can be the prime mover for delivering the substantive change.

Among the '2018 Top 10 Science and Technology News' unveiled by Korean Federation of Science and Technology Societies (KOFST) last year, 'combat on fine dust' has topped the ranking followed by 'plastic waste crisis' in terms of people's interest. The KOFST believes that this result is a reflection of the public's high expectation for the role science and engineering community plays in addressing these challenges. Accordingly, we launched the 'Fine Dust National Forum' and the 'Plastic Issue Forum' as this year's flagship program, and held six consecutive meetings respectively as of today. In this regards, I attach great value to the fact that this year's KC(Korea Conference)s take a deep dive into the issues of sustainable development and environment as the common agenda.

Climate crisis along with environment pollution pose indisputable threats to sustainable future we face in the 21st century. The stark truth is that global warming has been projected since the beginning of the 19th century and aggravated over the past centuries. Global warming deteriorates natural disasters including drought, flooding, heat waves, cold spells, forest fire, cyclones, and causes other devastating problems on

drought, flooding, heat waves, cold spells, forest fire, cyclones, and causes other devastating problems on human and ecosystem. Korea is no exception as we are on the cusp of multiple risks including air stagnation, precipitation reduction and worst-ever levels of fine dust caused by multiple variables such as air pollution and climate change.

The Global Risks Report published annually by the World Economic Forum (WEF) serves as a wake-up call for humanity. In its 2019 Report, extreme weather events were the risk most likely to happen (remained at the top for the third year in a row). Failure of climate change mitigation and adaptation came in second place (moved up from fifth place in 2018). We are now hitting potential tipping point that causes climate change out of control, becoming more conscious that climate change is everyone's problem and our own problem.

Meanwhile, the plastic issue that became high on the global agenda is also impeding the planet's sustainability. Plastics have been the symbol of a phoenix of mankind's recovery from the ruins of the World War II. However, a reckless use of plastics due to its convenient and inexpensive nature contributed to the throwaway society. From 1950 to 2015, 8.3 billion tons of plastic has been produced worldwide, while 6.3 billion tons ended up as waste. Only 9% of plastic waste is recycled. Today, microplastic (less than 5mm in diameter) pollution has emerged as a new threat to marine ecosystem and is now invading our food chain. Regulations are set to tighten up controls on plastic waste. The UN Environment Assembly, for instance, adopted the Ministerial Statement that calls for significant reduction of single-use plastics by 2030.

Distinguished Guests, Ladies and Gentlemen, Apart from the perceived risk that sustainable development may not be feasible unless environmental problems are surmounted, we are also at the dawn of the Fourth Industrial Revolution that heralds the arrival of new era. The convergence of technological evolution across industries thanks to advances in AI, IoT, cloud, big data, robotics, drones and VR is blurring the physical, digital and biological boundaries, leading to an unprecedented Cyber-Physical System.

The evolution of certain core technologies and industries are unfolding at an astonishing pace. In parallel with it, the international community is entrusted with an important task to address the current risks by harnessing these new technologies.

This is because we can carve out a future anchored on the 4th Industrial Revolution only when the present risks are alleviated. To this end, I believe that cross-border cooperation and support can be the key enabler for common prosperity of the human being in the 21st century.

At this stage, science and engineering community has an important role to play. The smart decision we make today will determine our tomorrow. As such, this platform convened by Korea-Europe scientists and engineers is worthwhile to define the role of science and technology innovation in achieving sustainable development, which would eventually enhance our capacity to address sustainability issues through cooperation and shared visions among countries.

With that, I sincerely hope that EKC will serve as an incubator for Korea and Europe to lay a basis for joint research and make headway in science and technology advancements. I am confident that Korean scientists and engineers residing in Europe will be at the forefront of the non-governmental diplomacy. Rest assured, the KOFST will always remain committed to your noble work. I wish you the best of luck for all your future endeavors. Thank you.

**Myung Ja Kim**  
President of the Korea Federation of Science and Technology Societies



## Welcome Message



**SHIN, Chae-hyun**

Ambassador

Embassy & Permanent Mission of the Republic of Korea in Austria

It is my great pleasure to welcome all participants in this year's 12th annual EU-Korea Conference on Science and Technology (EKC 2019). I am also pleased to note that Vienna has hosted this important meeting for the third time following 2010 and 2014.

First of all, I would like to express particular appreciation to Chairman PARK Jong-Mun, who is also the Chairman of the Korean Scientists and Engineers Association in Austria, and co-organizers of the EKC 2019.

Since 2008 when the EKC was inaugurated, it has been a useful platform which not only facilitates exchanges of ideas and information between governments, academia and private sectors of Europe and Korea at various levels and also consolidates human and intellectual networks. In this regard, I would like to commend the members of the EKC for their scientific and technological achievements and excellence and also their dedicated efforts to further develop the EKC itself. As a result, you have contributed to enhancing the images and perceptions of Korea in and out of Europe.

In particular, the theme of this year's conference, that is, **"Science, Technology and Humanity: Advancement and Sustainability"**, is very opportune and reflects our imminent and common task that we have to jointly tackle in the era of the 4th industrial revolution. I am sure that meaningful suggestions and proposals will be made to realize genuine humanity in the wake of revolutionary advancement of science and technology.

Although Korea and Europe are geographically far apart, there exist huge potentials for cooperation and complementarity. Needless to say, European countries, including Austria, have been traditionally strong in science and technology. Korea, on the other hand, boasts of globally acknowledged capabilities of industrialization and commercialization. If we combine these two comparative advantages in harmonious and effective ways, we could produce enormous synergy effects.

This new type of cooperation modality has been officially recognized and agreed by President Moon Jae-in of the Republic of Korea and his many European counterparts on numerous summit meetings since 2017. In result, we have a framework in place for our future cooperation. Now what we need is the expertise, wisdom, and efforts of you, who have played a pivotal and bridging role between Korean and Europe, to put the agreements by the heads of states into actions and realities.

That is the reason why your this year's conference as well as your continued endeavors are important.



I envisage a future when Korea's advanced ICT technology and Europe's advanced precision machinery technology together can produce unmanned mobile vehicles.

On the other hand, I hope the EKC 2019 will also provide you with a chance to enhance understanding Korean government's evolving R&D policy.

In response to the opportunities and challenges of the 4th industrial revolution era, the Korean government is promoting innovative growth of scientific and technological capabilities with a view to upgrading the quality of its citizens' lives under the policy of 『I-Korea 4.0』 . In addition, Korea launched the world's first 5G commercial service in April, as a result of coordinated efforts of the government and private sectors.

I, once again, hope that the conference will provide a venue to move ahead your research expertise, explore new research areas and modalities, and also further reinforce research networks between Korean and European scientists.

I wish the EKC 2019 would be a great success and yield fruitful outcomes.

**SHIN, Chae-hyun**

Ambassador

Embassy & Permanent Mission of the Republic of Korea in Austria

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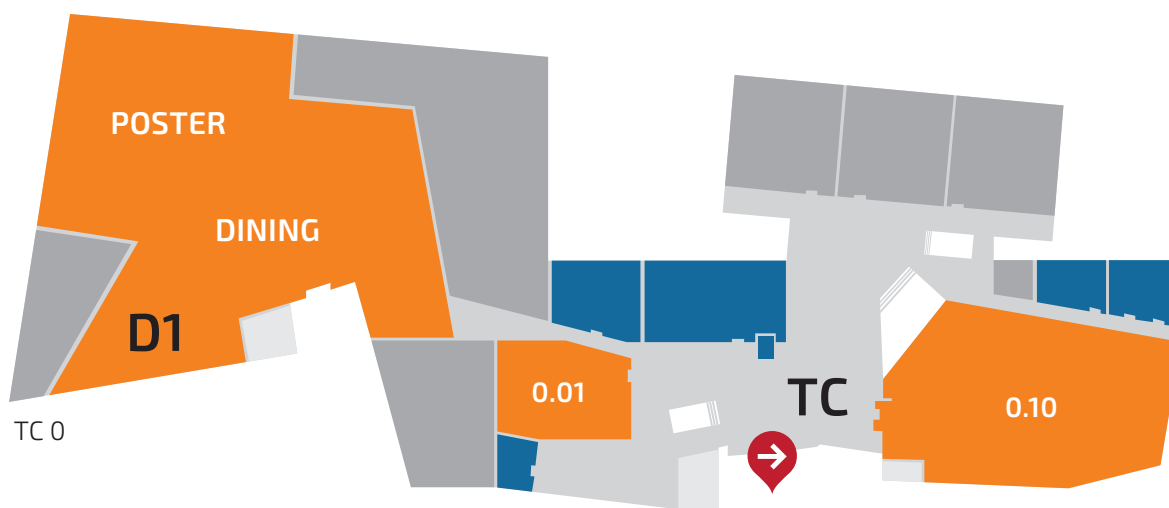
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KOSEAA	Korean Scientists and Engineers Association in Austria
KOFST	Korean Federation of Science & Technology Societies
VeKNI	The Korean Scientists and Engineers Association in Germany
KSEAUK	The Korean Scientists and Engineers Association in the UK
ASCoF	Korean Scientists and Engineers Association in France
KOSEANL	Korean Scientists & Engineers Association in the Netherlands
KSEAS	Korean Scientists and Engineers Association in Switzerland
KOSES	The Society of Korean Scientists and Engineers in Finland
KSSEA	Korean-Scandinavian Scientists and Engineers Association
KOSEAbel	Korean Scientists & Engineers Association in Belgium

## Floor Plan



## Conference Venue

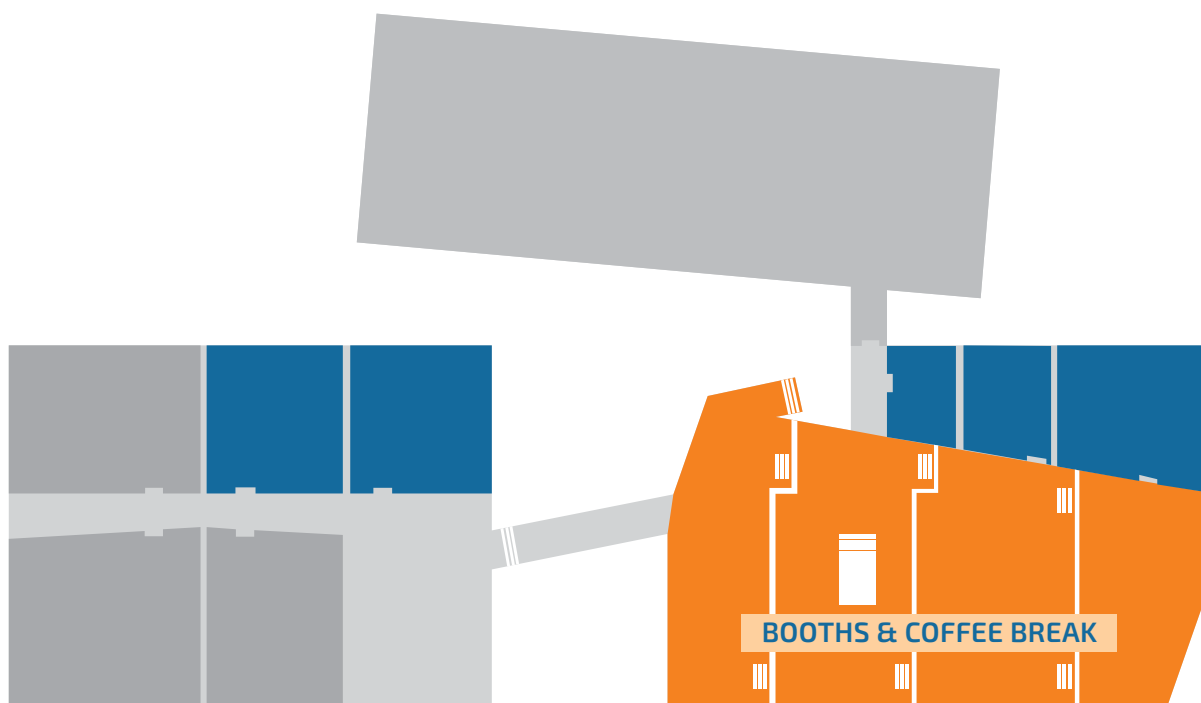


### WIFI

SSID: wu-conference Username: wu0018 PW: EurKorConf!9  
Access via Eduroam is also available.

WU (Vienna University of Economics and Business)  
Welthandelsplatz 1, 1020 Vienna, Austria  
wu.ac.at

## Floor Plan



TC 2



TC 5

## Daily Events Locator

<b>15 Jul (Mon)</b>		
<b>1000-1700</b>	Site Visit	
<b>16 Jul (Tue)</b>	<b>5F</b>	<b>0 F</b>
<b>0900-1230</b>	Global Industrial Technology Innovation Forum	
<b>1230-1400</b>	Lunch	
<b>1400-1520</b>	Thematic Presentation & B2B Consultation Meeting	Fellowship Opportunities in Europe
<b>1520-1540</b>		break
<b>1540-1700</b>		Grant Opportunities in Europe
<b>1700-1800</b>		S&T Committee Preview Meeting (c)
<b>1800-1900</b>	Move to Wien Heuriger	
<b>1900-2100</b>	Dinner at Wien Heuriger (Invitees and Industrial Forum Attendees)	
<b>17 Jul (Wed)</b>	<b>5F</b>	
<b>0900-1200</b>	Opening Ceremony (plenary, room 0.10)	
<b>1200-1300</b>	Lunch	
<b>1300-1415</b>	Science and Technology Programme I	
<b>1415-1530</b>	Science and Technology Programme II	
<b>1530-1600</b>	Coffee Break	
<b>1600-1715</b>	Science and Technology Programme III	
<b>1715-1730</b>	Break	
<b>1730-1900</b>	Next-Generation Science and Technology Leaders (plenary, room 0.01)	
<b>1900-2200</b>	Welcome Dinner / Poster Session	
<b>18 Jul (Thu)</b>	<b>5F</b>	
<b>0900-1015</b>	Science and Technology Programme IV	
<b>1015-1130</b>	Science and Technology Programme V	
<b>1130-1300</b>	Lunch	
<b>1300-1500</b>	Complementary Programme	
<b>1500-1530</b>	Break	
<b>1530-1645</b>	Science and Technology Programme VI	
<b>1645-1800</b>	Science and Technology Programme VII	
<b>1800-1915</b>	Move to Wien City Hall	
<b>1915-2300</b>	Closing Ceremony and Banquet	
<b>19 Jul (Fri)</b>	<b>5F</b>	
<b>1000-1300</b>	EKC 2019 Review Meeting (c)	Next Generation Forum Review Meeting (c)

Registration

Floor Plan <https://campus.wu.ac.at/en/#>

(c): closed session



# EKC 2019 Timetable

15 Jul Mon		1000-1700		Site Visit											
16 Jul Tue	Global Industrial Technology Innovation Forum														
	Lunch														
	Thematic Presentation & B2B Consultation Meeting Future Mobility (TC 5.13) Smart Production (TC 5.01) Life Science (TC 5.15)														
	Fellowship Opportunities in Europe (room 5.03)														
	Grant Opportunities in Europe (room 5.03)														
17 Jul Wed		Move to Wien Heuriger													
		Dinner at Wien Heuriger (Invitees and Industrial Forum Attendees)													
		Opening Ceremony (plenary, room 0.10)													
		Lunch													
		Room #	5.12	5.13	5.14	5.03	5.15	5.16	5.18	5.01	5.02	5.04	5.27		
		1300-1415	D1/D2_1	D2_2	D2_3	D3_1	Advisory Board Meeting (c)	D5_1	D1/D6_5	D7_Keynote (Room 5.01)	D7_1	D7_5	D1/D3_6		
		1415-1530			D2_4								D1/D3_7		
		1530-1600						Coffee Break							
		1600-1715	D1/D3_2	D2_Keynote (room 5.13)		D3_3	D4_2	D6_1	D7_2	D7_6			D8_2		
		1715-1730						Break							
		1730-1900	Next-Generation Science and Technology Leaders (plenary, room 0.01)												
		1900-2200	Welcome Dinner / Poster Session (D1)												
		0900-1015	D1_9	D2_5	D2_8	D3_5	D4_3	Presidential Roundtable (c)	D2_12	D7_4	D7_7	D7_10			
		1015-1130	D1_10		D2_9		D2/D4/D6_13						D8_3		
		1130-1300						Lunch							
18 Jul Thu	1300-1500	[KICT-Fraunhofer IAO] Collaborative workshop (c)	Multiscale Energy System Routtable (c)	Frontier EU Grant/Fellowship Opportunities	Urban Air Pollution & Particulate Matter	Innovative Urban Regeneration Paradigm	[NRF-KERC] Korean Researchers in Europe	[KEIT] Open Forum: Global Technology Planning	[NST-KIST Europe] Korea-Europe R&D Collaboration Platform				GSCT-AEC Future Collaborative Meeting (c)		
	1500-1530							Coffee Break							
	1530-1645	D1_4	D2_6	D2_10	Urban Heat Wave	D5_2	D6_2	AKCSE/KOSEAA Collaborative Forum							
	1645-1800		D2_7	D2_11	D4_5		D3/D6_8	CKC/EKC 2019 Collaborative Forum	D7_8	D7_11	D7_12		D8_4		
	1800-1915								Move to Vienna City Hall						
		1915-2300	Closing Ceremony and Banquet (Vienna City Hall)												
		EKC 2019 Review Meeting (c)													
		Next Generation Forum Review Meeting (c)													
		Floor Plan <a href="https://campus.wu.ac.at/en/#">https://campus.wu.ac.at/en/#</a>													
Science & Technology Divisions															
D1	Physics and Mathematics	AEC	Organizations Acronyms												
D2	Chemistry / Materials and Chemical Engineering	GSCT	Ais Electronica Center, Austria												
D3	Biology, Bioengineering, and Medical Science	KEIT	Graduate School of Cultural Technology, KAIST												
D4	Earth science and Environmental Engineering	KERC	Korea Evaluation Institute of Industrial Technology												
D5	Architecture / Civil and Ocean Engineering	KICT	Korea-EU Research Centre												
D6	Electrical, Electronic, and Informational Engineering	KIST	Korea Institute of Civil Engineering and Building Technology												
D7	Mechanical, Aerospace, Naval, and Nuclear Engineering	KRICT	Korea Institute of Science and Technology												
D8	Humanities	NRF	Korea Research Institute of Chemical Technology												
		NST	National Research Foundation of Korea												
			National Research Council of Science and Technology												

# EKC 2019 Science & Technology Programmes

<b>D1. Physics and Mathematics</b>	
D1/D2_1	Next generation X-ray sources and their applications
D1/D3_2	Neuroscience and Biomimetic Signaling-Engineering
D1_4	Discrete differential geometry and its applications
D1/D6_5	Information Science (and Machine learning with Neural Networks)
D1/D3_6	Mathematical modelling of infectious diseases
D1/D3_7	Emerging Infectious Disease Outbreaks
D1_9	General Discussions I: Physics and Mathematics
D1_10	General Discussions II: Physics and Mathematics
<b>D2. Chemistry / Materials and Chemical Engineering</b>	
D2_keynote	Keynote Lectures: D2
D1/D2_1	Next generation X-ray sources and their applications
D2_2	Solar Energy Harvesting & Conversion
D2_3	Wide Bandgap (SiC and GaN) Semiconductors and Sensors
D2_4	Flexible/Wearable Devices
D2_5	Perovskite solar cells and related materials
D2_6	Low temperature Solid Oxide Fuel Cells
D2_7	Multiscale Proton Exchange Membrane Fuel Cells
D2_8	Materials and Methods Towards Solar Fuels
D2_9	Composite Materials
D2_10	Organic Optoelectronic Materials and Devices
D2_11	Bioelectronics
D2_12	Secondary Batteries: From Advanced Lithium-Ion Systems to Post-Lithium Chemistries
D2/D4/D6_13	Particulate Matter Issue; From IoT Sensing Technologies to Data Collection & Monitoring
<b>D3. Biology, Bioengineering, and Medical Science</b>	
D3_1	Nano-, Bio-, and Medical- sensor
D1/D3_2	Neuroscience and Biomimetic Signaling-Engineering
D3_3	Advance in bio atomic force microscopy
D3_4	Cutting-Edge Advances in Medicine and Biomedical Engineering
D3_5	Biomedicine and Life Sciences Platform Technologies: Current State of the Art
D1/D3_6	Mathematical modelling of infectious diseases
D1/D3_7	Emerging Infectious Disease Outbreaks
D3/D6_8	Future RF and Microwave Technologies
<b>D4. Earth science and Environmental Engineering</b>	
D4_2	Plastic Waste Treatment and Management in Korea and the EU
D4_3	Response Technology & Strategy and Policy for Climate Change
D4_5	Green countermeasures as a strategic approach for the adaptation to climate change
D2/D4/D6_13	Particulate Matter Issue; From IoT Sensing Technologies to Data Collection & Monitoring
<b>D5. Architecture / Civil Engineering</b>	
D5_1	Sustainable built environment and urban design
D5_2	Towards A Sustainable Smart Society
<b>D6. Electrical, Electronic, and Informational Engineering</b>	
D6_1	ICT Technologies for Human Interface
D6_2	5G and Open Networks
D1/D6_5	Information Science (and Machine learning with Neural Networks)
D3/D6_8	Future RF and Microwave Technologies
D2/D4/D6_13	Particulate Matter Issue; From IoT Sensing Technologies to Data Collection & Monitoring
<b>D7. Mechanical, Aerospace, Marine, and Nuclear Engineering</b>	
D7_keynote	Keynote Lecture: D7
D7_1	Latest Advances in Numerical Simulations and Analytics
D7_2	Advances in Space Technology, Systems and Mission for the New Space Age
D7_4	Automotive technologies
D7_5	Maritime Safety & Environment
D7_6	Advanced Ship Technology and Future Ships
D7_7	Marine and Ocean (SNAK-EKMOA JOINT SESSION)
D7_8	Global Cooperation in Marine & Ocean Engineering on the Response of Climate Change
D7_10	Nuclear Energy
D7_11	Floating Offshore Wind in South Korea
D7_12	Offshore wind energy technology
<b>D8. Humanities</b>	
D8_1	Women in science and technology
D8_2	International business, marketing and management
D8_3	Improving the livelihood of small-scale farmers in developing countries
D8_4	Humanities and Science - The Future is Back

## Opening Ceremony and Plenary Lectures

(room 0.10, chair: PARK, Jaesoon / HWANG, Hyunhee)

0900-0905	<b>Opening Remarks</b>	<b>PARK, Jong Mun</b> (Conference Chair)
0905-0915	<b>Welcome Address</b>	<b>KIM, Myung Ja</b> (President, Korean Federation of Science and Technology Societies )
0915-0945	<b>Congratulatory Messages</b>	<b>SHIN, Chae-hyun</b> (Ambassador, Embassy & Permanent Mission of the Republic of Korea in Austria)  <b>SONG, Kyung Hee</b> (Director-General, Ministry of Science and ICT, Korea)  <b>CZERNOHORSZKY, Eva</b> (Vienna Business Agency, Austria)
0945-0950	<b>Introduction of EKC 2018 Distinguished Guests</b>	
0950-1000	<b>Korea Science and Technology Award Ceremony</b>	<b>SONG, Kyung Hee</b> (Director-General, Ministry of Science and ICT, Korea)
1000-1010	<b>Group Photo</b>	
1010-1030	<b>Coffee Break</b>	
1030-1100	<b>Opening Plenary Lecture</b>	Transformation from Information Society to Smart Society <b>KWON, Oh-Kyong</b> (President, National Academy of Engineering of Korea)
1100-1130	<b>Opening Plenary Lecture</b>	10 Years of IST Austria <b>HENZINGER, Thomas A.</b> (President of IST Austria)
1130-1200	<b>Opening Plenary Lecture</b>	Demography, Human Capital and Sustainable Development <b>LUTZ, Wolfgang</b> (Program Director, International Institute for Applied Systems Analysis)

## Plenary Session: Next Generation Science and Technology Leaders Forum

(room 0.01, chair: KIM, Hyong-Ha)

1730-1740	<b>Introductory Remarks</b>	Chair
1740-1800	<b>Plenary Lecture</b>	Industrial Revolution and Techno Humanism <b>KIM, Myung Ja</b> (President, Korean Federation of Science and Technology Societies )
1800-1820	<b>Plenary Lecture</b>	Demography, Human Capital and Sustainable Development <b>BOURGUIGNON, Jean-pierre</b> (President, European Research Council)
1820-1900	<b>Conversation with the Speakers</b>	Moderated by the Chair

**Prof. Oh-Kyong Kwon**

President  
National Academy of Engineering of Korea

## Biography

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Prof. Oh-Kyong Kwon received the B.S. degree in electronic engineering from Hanyang University, Seoul, Korea, in 1978, and the M.S. and Ph.D. degrees in electrical engineering from Stanford University, CA, USA, in 1986 and 1988, respectively.

From 1987 to 1992, he was with the Semiconductor Process and Design Center, Texas Instruments Inc., Dallas, TX USA, where he was engaged in the development of multichip module technologies, smart power integrated circuit technologies, display driver integrated circuit technologies, and silicon-on-insulator (SOI) technologies. In 1992, he joined Hanyang University, Seoul, Korea, as an assistant professor at the Department of Electronic Engineering, where he is now a distinguished professor. Dr. Kwon had served the position of the Department Chair of Electronic and Electrical Engineering from 2003 to 2005, the Dean of Engineering College from 2007 to 2011, and the Provost and Senior Executive Vice-President of Hanyang University from 2011 to 2013.

Dr. Kwon currently serves on the President of National Academy of Engineering of Korea (NAEK) and the President-elect of Council of Academies of Engineering and Technological Sciences (CAETS)

## Plenary Title: Transformation from Information Society to Smart Society

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Smart society is considered as a new model of a sustainable, socio-technological environment where people seek for a more informative, connected, and healthy living. Such a smart society will become a reality through transformation of an information society that we live in today, requiring further advances in automation, healthcare, security/safety, education, and environmental factors. These advances can be realized by utilizing various emerging ICT technologies such as 5G (and beyond) wireless communication, artificial intelligence, big data, internet-of-things, autonomous driving, and augmented & virtual realities, along with the sensor technology that can advance the efficient interfaces. This talk will cover the ICT and sensor technologies that are necessary for smart society; to see how both technologies are combined and connected together for better living and to explore what important roles they will play for our society in the near future.



**Prof. Thomas A.**  
Henzinger  
President of IST Austria

### Biography

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Tom Henzinger is president of IST Austria. He holds a Dipl.-Ing. degree in Computer Science from Kepler University in Linz, Austria, a Ph.D. degree in Computer Science from Stanford University, and a Dr.h.c. from Fourier University in Grenoble, France, and from Masaryk University in Brno, Czech Republic.

He was a professor of Electrical Engineering and Computer Sciences at the University of California, Berkeley, a director at the Max-Planck Institute for Computer Science in Saarbruecken, Germany, and a professor of Computer and Communication Sciences at EPFL in Lausanne, Switzerland.

His research focuses on modern systems theory, especially models, algorithms, and tools for the design and verification of reliable software, hardware, and embedded systems.

He is an ISI highly cited researcher, a member of Academia Europaea, a member of the German and Austrian Academies of Sciences, and a Fellow of the AAAS, ACM, and IEEE.

He has received the Milner Award of the Royal Society, the Wittgenstein Award of the Austrian Science Fund, and an ERC Advanced Investigator Grant.

### Plenary Title: 10 Years of IST Austria

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The Institute of Science and Technology (IST) Austria was conceived as a research institution offering doctoral education which attracts outstanding scientists of all age groups from all over the world to Austria. Its campus at the outskirts of Vienna, which opened its doors in 2009, is currently the home to about 50 research groups performing frontier science in biology and neuroscience, physics and chemistry, as well as mathematics and computer science. Expected to double in size over the next decade, IST Austria is poised to become a vibrant engine for scientific discovery, graduate training, and economic development in the center of Europe.



**Prof. Wolfgang Lutz**

Program Director  
International Institute for Applied Systems Analysis (IIASA)

### Biography

Wolfgang Lutz is Founding Director of the Wittgenstein Centre for Demography and Global Human Capital, a cooperation between IIASA (where he directs the World Population Program), the Austrian Academy of Sciences (where he is scientific director of the Vienna Institute of Demography), and the Vienna University of Economics and Business (where he is Professor of Applied Statistics). He holds a PhD in Demography from the University of Pennsylvania.

He has published widely on international population trends, with a special focus on population forecasting, population-development-environment interactions and introducing education as a standard demographic dimension in addition to age and sex. He has published over 250 scientific articles, including 11 in *Science* and *Nature*. His most recent book is entitled *Demographic and Human Capital Scenarios for the 21st Century: 2018 Assessment for 201 Countries*. He has won prestigious awards including the Wittgenstein Prize, two ERC Advanced Grants, the Mattei Dogan award of the IUSSP and the Mindel C. Sheps Award of PAA. He is a member of the Austrian Academy of Sciences, the Leopoldina, the World Academy of Sciences (TWAS), the Finnish Society for Sciences and Letters, and the US National Academy of Sciences (NAS).

Professor Lutz has been appointed by the UN Secretary-General to be one of the 15 members of the Independent Group of Scientists whose task is to produce the quadrennial Global Sustainable Development Report 2019.

### Plenary Title: Demography, Human Capital and Sustainable Development

Europe has been spearheading the global demographic transition toward expanding education and as a consequence higher life expectancy and lower fertility rates since the late 19th century. During the second half of the 20th century South Korea has been following this transition at a record speed. While very low birth rates together with expanding life spans pose challenges of population ageing and decline, the associated rapid increases in human capital open opportunities for better health, higher productivity and greater resilience to environmental change in the 21st century.

In this lecture we will show how multi-dimensional demographic models can help to analyze and forecast social and economic change through the replacement of generations with different characteristics and in particular different levels of education (demographic metabolism) and which challenges and opportunities this brings about. It will focus on examples from Europe and East Asia and will study the role of human capital (populations by age, health and level of education) in helping to achieve the Sustainable Development Goals. It will cover a 200 year perspective from 1900 to 2100 along different possible scenarios of socio-economic change.



**Prof. Jean-Pierre**  
Bourguignon  
President  
European Research Council

### Biography

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Professor Jean-Pierre Bourguignon is the President of the European Research Council since January 2014. Prior to that, he was the Director of the Institut des Hautes Etudes Scientifiques (IHES) from 1994 till 2013. This international research institute located near Paris, France, was built as the European counterpart of the Institute for Advanced Study in Princeton. He was also the first ERC Panel Chair in Mathematics, for Starting Grants. A mathematician by training, he spent his whole career as a fellow of the Centre National de la Recherche Scientifique (CNRS).

He held a Professor position at Ecole polytechnique from 1986 to 2012. From 1990 to 1992, he was President of the Societe Mathematique de France and President of the European Mathematical Society from 1995 to 1998. He is a former member of the Board of the EuroScience organisation (2002-2006) and served on EuroScience Open Forum (ESOF) committees since 2004. Professor Bourguignon received the Prix Paul Langevin in 1987 and the Prix du Rayonnement Francais in Mathematical Sciences and Physics from the Academie des Sciences de Paris in 1997.

He is a foreign member of the Royal Spanish Academy of Sciences. In 2005, he was elected honorary member of the London Mathematical Society and has been the secretary of the mathematics section of the Academia Europaea. In 2008, he was made Doctor Honoris Causa of Keio University, Japan, and, in 2011, Doctor Honoris Causa of Nankai University, China. In 2017, he was elected honorary member of the German Association of Mathematicians (DMV).

### Plenary Title:

**ERC, a success story of Emerging Researchers & Frontier Research open to the world**





**Dr. Kim, Myung Ja**

President

Korean Federation of Science and Technology Societies

### Biography

**Education :** 1967.9 ~ 1971.8 University of Virginia, Ph.D.

1962.3 ~ 1966.2 B.S. in Chemistry , Seoul National Univ.

#### Career :

1999 ~ 2003 Minister of Environment (Longest serving female minister in the constitutional history of Korea)

2004 ~ 2008 Member of the National Assembly (Chairperson of the Ethics Committee, Vice-chairperson of the Defense Committee)

2008 ~ 2017.2 Chairperson of the Green Korea 21 Forum

2016 ~ 2018.3 Chairperson of the Korea Business Council for Sustainable Development (KBCSD)

2017.3 ~ Present President of the Korean Federation of Science and Technology Societies

2018 ~ Present The International Advisory Panel (IAP) of the Asian Infrastructure Investment Bank (AIIB)

Board member or a special advisor to about forty private and public institutions, such as the Korean Academy of Science and Technology (KAST), the Korean Academy of Environment Science (KAES), the Sustainable Science Society, UN Sustainable Development Solutions Korea Network (SDSN Korea), Community Chest of Korea, Asan Social Welfare Foundation, Vice-president of the Alumni Association of Seoul National University, Visiting Distinguished Professor at KAIST and so forth.

Her numerous scientific publications include the Korean translation of ‘The Structure of Scientific Revolutions’ by Tomas S. Kuhn, and ‘Entropy’; and published ‘Science and Modern Society’, ‘The Oriental and Occidental Tradition of Science and Environmental Movement’ and many others.

#### Awards

-The Presidential High Decoration of ‘Changjo-jang’ in Science and Technology(2015.4)

-Seoul National University’s Proud Alumni Award(2015.10), Blue Stripes Order of Service Merit(2004.4)

-Presidential Award for Excellence in Government Administration Performance received by Ministry of the Environment under Kim’s leadership(2002, 2001)

-The Presidential Award for the Advancement of Science and Technology(1994)

#### Plenary Title:

**Industrial Revolution and Techno Humanism**

## KEYNOTE SPEAKER



**Prof. Helmut Mayer**

Albert-Ludwigs-University of Freiburg, Chair of Environmental Meteorology

### Biography

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Prof. Mayer is currently a retired professor at the Chair of Environmental Meteorology, Albert-Ludwigs-University of Freiburg (Germany), which emerged from the Meteorological Institute at this University in 2015. He studied meteorology at the Ludwig-Maximilians-University of Munich (Germany) and graduated with a diploma in 1971. He obtained his PhD degree at the Faculty of Physics, University (TH) of Karlsruhe (Germany), in 1974 and was habilitated in Forest Meteorology and Climatology at the Faculty of Forest Sciences, Ludwig-Maximilians-University of Munich (Germany), in 1985. He worked as a research fellow from 1971 to 1974 at the Meteorological Institute of the University (TH) of Karlsruhe and from 1974 to 1992 at the Chair for Bioclimatology and Applied Meteorology of the Ludwig-Maximilians-University of Munich. In 1992, he was appointed to the Chair of Meteorology and Climatology at the Albert-Ludwigs-University of Freiburg, which included the position of the director of the Meteorological Institute at this University. With respect to long-term research activities abroad, he carried out his research from August 1997 to March 1998 at the Department of Earth and Planetary Sciences, University of New Mexico, Albuquerque, NM, USA. He retired in autumn 2015, but he continues his research resulting in publications and presentations at different conferences.

His major research interests are in the fields of environmental meteorology, especially urban climatology, urban meteorology, urban air pollution and urban human-biometeorology, as well as in forest meteorology. Applied methods and results of his research are addressed in about 390 scientific publications in international peer-reviewed journals. Against the background of new challenges due to climate change, they reflect the increasing importance of "bringing science into practice". He was the field editor for urban climatology in the scientific journals *Climate Research* (2003 to 2013) and *International Journal of Biometeorology* (2007 to 2014). He is a member of several scientific societies such as International Association for Urban Climate or International Society of Biometeorology. For his fundamental work in environmental meteorology and forest meteorology as well as especially in urban human-biometeorology, he was awarded the "Reinhard-Süring-Badge" by the German Meteorological Society in March 2019.

### Keynote Title: Urban heat waves



**Prof. Niyazi Serdar Sariciftci**

Founding Director / Head Professor  
Linz Institute for Organic Solarcells (LIOS)  
Institute of Physical Chemistry Johannes Kepler University Linz

## Biography

Prof. Sariciftci is Ordinarius Professor for Physical Chemistry and the Founding Director (Vorstand) of the Linz Institute for Organic Solarcells (LIOS) at the Johannes Kepler University of Linz/Austria.

He studied at the University of Vienna (Austria) and graduated as PhD in physics in 1989. After two years postdoctoral study at the University of Stuttgart (Germany) he joined the Institute for Polymers and Organic Solids at the University of California, Santa Barbara, USA, by Prof. Alan J. HEEGER, Nobel laureate 2000 for Chemistry. His major contributions are in the fields of photoinduced optical, magnetic resonance and transport phenomena in semiconducting and metallic polymers. He is the inventor of conjugated polymer and fullerene based "bulk heterojunction" solar cells. Prof. Sariciftci published over 600 publications and with over 70000 citations he is one of the most cited scientists in material science (2011, Thompson Reuter ranking No: 14 of the world in material science). Google scholar ranks Sariciftci with an h-index of >110. Sariciftci has composed 8 books and educated several academic and industrial scientists. He also initiated seven spin off companies for organic optoelectronics. He is recipient of several prizes among them the National Science Prize of Turkey 2006 and the Austrian Scientists of the year Prize for Research 2008. He received the Medal for Humanity of the City of Linz 2009 and the Kardinal Prize for Science of the Archbishop in Vienna 2010. In 2012 he was awarded the prestigious Wittgenstein Prize of Austria. He is a Fellow of the Royal Society of Chemistry (FRSC), Fellow of SPIE, and member of several societies such as American Chemical Society, Materials Research Society, Austrian Chemical Society and Austrian Physical Society. He was selected as corresponding member of the Academy of Science in Austria (ÖAW). Sariciftci has been awarded honorary doctorate by the Abo Academy in Finland in 2011 and University of Bucharest in Romania in 2012. Recently, Sariciftci received the TÜBA Science Prize of the Turkish Academy of Sciences (2015) and selected as member of the Turkish Academy of Sciences in 2017.

## Keynote Title:

**Organic and bio-organic systems for solar energy conversion and CO<sub>2</sub> Recycling**

## KEYNOTE SPEAKER



**Prof. Sang Il Seok**

School of Energy and Chemical Engineering,  
Ulsan National Institute of Science and Technology (UNIST), Korea

### Biography

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Sang Il Seok is currently a Distinguished Professor at the School of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology (UNIST), Korea. He also holds a dual appointment as an adjunct professor at the Korea Research Institute of Chemical Technology (KRICT), Korea. He obtained his PhD degree at Department of Inorganic Materials Engineering of Seoul National University, Korea, in 1995. From 1996 to 1997, he experienced a post-doc to investigate defects and transport in Fe-Ti-O Spinel structure in Cornell University, USA, and visiting scholar in University of Surrey, UK, in 2003, and École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, in 2006 respectively.

His major research interests were functional inorganic-organic hybrid materials through solution process for optical amplifier, high dielectrics, corrosion-resistance coatings etc. Now, his research focus is based on inorganic-organic hybrid solar cells, in particular perovskite solar cells. He published around 200 peer-reviewed papers including Nature, Science etc. with several awards for his Excellency.

He is the recipient of "Korean Scientist Award from the Korean government in 2017.

### Keynote Title:

**Manipulating perovskite materials for highly efficient and stable perovskite solar cells**



**Dr. Marcel Langner**

Head of Unit, German Environment Agency

## Biography

Working at the German Environment Agency since 2013, Marcel Langner focused on assessment of measures to reduce ambient concentrations of air pollutants and on scenarios of future emission trends and their impacts on air quality in Germany. His work includes the evaluation of measurements of air pollutants and results from model outputs, both at the local and the regional scale. His expertise also covers requirements to test equipment for emission and ambient air monitoring of air pollutants. He has a special scientific interest in particle deposition on vegetation.

### Keynote Title:

**Particulate matter as a key air pollutant in Germany and the whole EU: Sources and abatement strategies**



**Prof. Veronique Riffault**

Professor, IMT Lille Douai

## Biography

Prof. Veronique Riffault is a Full Professor at the Department of Atmospheric Sciences and Environmental Engineering (SAGE) at IMT Lille Douai. She received her PhD from the University of Orleans in 2002. After a 2-year postdoctoral position at ESRL-NOAA/Univ. Colorado in Boulder (USA), she was recruited at IMT Lille Douai in 2006 and got her Habilitation diploma from the University of Lille in 2012. She is the current scientific coordinator of the 'Reactivity and air treatment' group and head of the Particulate Organic Matter lab at SAGE. Her research activities are focused on the characterization of fine aerosol composition and formation processes through lab and field experiments, which have led to more than 50 publications in peer-reviewed journals.

### Keynote Title:

**Current issues linked to particulate matter in North-Western Europe**

## KEYNOTE SPEAKER



**Prof. Horst Hörtner**

Senior Director, Ars Electronica Futurelab

### Biography

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Horst Hörtner is a media artist and researcher. He is expert in design of Human Computer Interaction and holds several patents in this field. He started to work in the field of media art in the 1980ies and co-founded the media art group x-space in Graz/Austria in 1990. Hörtner is founding member of the Ars Electronica Futurelab in 1996 and since then directing this atelier/laboratory.

Since 2013, Horst Hörtner also holds a position as conjoint Professor at the University of Newcastle/Australia. He is working in the nexus of art & science and giving lectures and talks at numerous international conferences and universities.

### Keynote Title:

**Art & Science about the transdisciplinary, the accessible and the tangible**



**Dr.-Ing. Matthias Brockmann**

Managing Director, Cluster of Excellence, RWTH Aachen University

### Biography

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Dr. Brockmann is managing director of the Cluster of Excellence „Internet of Production“ at RWTH Aachen University. Before this position, he was research group leader of “Product and Process Monitoring” group and Chief Engineer at the Chair of Manufacturing Technologies led by Prof. Fritz Klocke.

### Keynote Title:

**Internet of Production – Research Roadmap “Production Technology” at RWTH Aachen**

## Special session on: Urban Air Pollution and Particulate Matter / Urban Heat Wave

July 18 (Thursday) 13:00 – 16:45  
Room 5.15

### Part I: Urban Air Pollution and Particulate Matter

One of the most important environmental issues is the air pollution and its effects on health. Several studies have demonstrated consistent associations between concentrations of particulate matter (PM, air pollutant consisting of a mixture of solid and liquid particles suspended in the air) and adverse effects on human health (respiratory symptoms, morbidity and mortality) at concentrations commonly encountered in Europe and Asia. Consequences for public health may be considerable. In this session, we will discuss below aspects: Current issues and problems on particulate matter; Sources of particulate matter, transboundary problem, health impacts; PM monitoring/measurement and assessment of concentrations and trends; Key uncertainties, research needs and current policy implications; Policies and regulations to reduce particulate matter; other related issues

#### Schedule and Program

1) **Opening Remark:** Prof. Junbeum Kim, University of Technology of Troyes, France

#### 2) **Welcome Addresses:**

Dr. Myung-Ja Kim, President of the Korean Federation of Science and Technology Societies

H.E. LEE. Yongsoo, Deputy Ambassador, Embassy of the Republic of Korea

#### 4) **Keynote speech**

– Prof. Véronique Riffault, Atmospheric Science and Environmental Engineering (SAGE), Ecole nationale supérieure Mines-Télécom Lille Douai, France



Prof. Véronique Riffault is a full Professor in Atmospheric Chemistry at the Department of Atmospheric Sciences and Environmental Engineering (SAGE) of IMT Lille Douai. Prof. Riffault's research activities are focused on the characterization of fine aerosol composition and formation processes through lab and field experiments. She has been involved in several national and international projects (CORTEA, EMEP, ACTRIS1), a Laboratory of Excellence (CaPPAb, current scientific coordinator of the "Aerosol observations" working group) as well as European networking activities (COST Action COLOSSALc, French national representative and Short-Term Scientific Mission Coordinator).



Dr. Marcel Langner is the head of Unit II 4.1 – General Aspects of Air Quality Control, German Environment Agency. Working at the German Environment Agency since 2013, Marcel Langner focused on assessment of measures to reduce ambient concentrations of air pollutants and on scenarios of future emission trends and their impacts on air quality in Germany. His work includes the evaluation of measurements of air pollutants and results from model outputs, both at the local and the regional scale. His expertise also covers requirements to test equipment for emission and ambient air monitoring of air pollutants. He has a special scientific interest in particle deposition on vegetation.



### 5) Panel Discussion

- Moderator: Prof. Heegwan Lee, Incheon National University, South Korea

- Panels:

Dr. Gregor Kieseewetter, Research Scholar, IIASA Air Quality and Greenhouse Gas Program, Vienna, Austria

Prof. Véronique RIFFAULT, Atmospheric Science and Environmental Engineering (SAGE), Ecole Nationale Supérieure des Mines de Douai (Mines Douai), France

Dr. Marcel Langner, General Aspects of Air Quality Control, German Environment Agency, Germany

Prof. Rae Kwon Chung, Climate international cooperation department, Incheon National University, South Korea (Ambassador for Climate Change, 2008-2010)

## Part II: Urban Heat Wave

Heat waves cause devastating impacts on our societies, in particular human health, quality of life, and social infrastructure. Climate projections suggest more frequent and intense heat waves due to anthropogenic global warming, and ongoing urbanisation further aggravates the impact regionally. Climate actions and planning of cities, therefore, should consider ways of reducing heat waves and adaptation. In this session, we will discuss below aspects: current issues and problems on heat waves; global climate change and future extreme events; urbanisation and heat stress to human bodies; policies and regulations to reduce heat waves; other related issues

### Schedule and Program

1) **Opening Remark:** Dr. Hyunjung Lee, City of Stuttgart, Office for Environmental Protection, Germany

2) **Keynote Speech:** Prof. Dr. Helmut Mayer, Albert-Ludwigs-University of Freiburg, Chair of Environmental Meteorology, Germany



Prof. Mayer is currently a retired professor at the Chair of Environmental Meteorology, Albert-Ludwigs-University of Freiburg (Germany), which emerged from the Meteorological Institute at this University in 2015. His major research interests are in the fields of environmental meteorology, especially urban climatology, urban meteorology, urban air pollution and urban human-biometeorology, as well as in forest meteorology. Applied methods and results of his research are addressed in about 390 scientific publications in international peer-reviewed journals. For his fundamental work in environmental meteorology and forest meteorology as well as especially in urban human-biometeorology, he was awarded the "Reinhard-Süring-Badge" by the German Meteorological Society in March 2019.

### 3) Panel Discussion

- Moderator: Dr. Jihoon Min, International Institute for Applied Systems Analysis, Austria

- Panels:

Prof. Dr. Helmut Mayer, Albert-Ludwigs-University of Freiburg, Chair of Environmental Meteorology, Germany

Prof. Dr. Wilhelm Kuttler, University of Duisburg-Essen, Campus Essen, Applied Climatology, Germany

Prof. Dr. Harald Rieder, University of Natural Resources and Life Sciences, Institute of Meteorology, Vienna, Austria

Dr. Marc Olefs, Central Institute of Meteorology and Geodynamics, Department of Climate Research, Vienna, Austria

**SCIENCE  
AND  
TECHNOLOGY  
SESSION**

## Science and Technology (S&T) Session

### PROGRAMME CHAIR



**Prof. WHANG, Dong Ryeol**  
Johannes Kepler University Linz  
patrick.whang@jku.at

### Division: D1. Physics and Mathematics

Mathematics is developed from the beginning of human history and now is the base and fundamental tools for sciences and engineering including social and psychology, .... Pure mathematics including number theory, algebra, topology, geometry and analysis has their own prospect and applied mathematics including numerical analysis, probability and statistics support and gave fundamental methods for research and developments for sciences and engineering. Currently, developing important methods are artificial intelligent, machine learning and numerical simulation by using high performance computer. Physics, which was born to describe and understand nature, is one of the most fundamental subjects for humanity. The physics has affected to various other areas, e.g. electronics, mechanics, and chemistry, and had crucial networks with them. To keep up-to-date with the latest progress, look at the problems from different perspectives, and establish international networks., Physics and Mathematics Group plans to bring together Korean and European Scientists and Engineers by organizing following sessions at EKC 2019. In the Talk Sessions, experts and key persons in the selected research area (listed below) will introduce the field and discuss current main issues and new developments. - Session 1. Progress on the pure mathematics in Europe and Korea - Session 2. Machine learning and Artificial intelligent and its applications - Session 3. Numerical simulation on HPC for Plasma physics and Fusion energy In addition to these sessions, delegates are also encouraged to participate in the sessions of their own interests organized by other Science & Technology Divisions. Through these events, organizers of EKC 2019 wish to provide an unparalleled opportunity for Korean and European Scientists and Engineers to establish a valuable and prolonged network.

### PROGRAMME COMMITTEE



**DR. KANG, Kab Seok (강갑석)**  
Max Planck Institute for Plasma Physics  
ks.kang@ekc2019.org



**DR. KIM, Chan (김찬)**  
European XFEL  
c.kim@ekc2019.org

### [D1/D2\_1] Next generation X-ray sources and their applications

17 Jul (Wed) 13:00 - 15:35

Convener/Chair	DR. GIHM, Se Hoon (aweXome Ray Inc.)
Room: 5.12	DR. LEE, Hyun Hwi (Pohang Accelerator Lab, POSTECH Chief Researcher)

13:00 - 13:25	Extreme metrology for ultrafast electron dynamics in atomic scales
INVITED	<u>DONG EON KIM</u> POSTECH / MPK

13:25 – 13:50 INVITED	<b>Molecular Engineering of conjugated polymer to enhance the vertical electrical properties for photovoltaic devices</b> <u>Hyo Jung KIM<sup>1</sup>, Sangmin Chae<sup>1</sup>, Ahra Yi<sup>1</sup>, Hyun Hwi Lee<sup>2</sup>, Jiyeon Choi<sup>3</sup></u> <sup>1</sup> Pusan National University, <sup>2</sup> Pohang Accelerator Laboratory, <sup>3</sup> Korea Institute of Machinery and Materials
13:50 – 14:15 INVITED	<b>Investigation of Matter under Extreme Conditions with Ultrafast and Ultraintense Lights</b> <u>Byoung-ick Cho</u> GIST
14:15 – 14:35 INVITED	<b>Micro- and Nano-Imaging and Tomography at the Diamond Light Source (DLS) I13 Beamline</b> <u>Shashidhara Marathe<sup>1</sup>, Malte Storm<sup>1</sup>, Silvia Cipiccia<sup>1</sup>, Darren Batey<sup>1</sup>, Marie-Christine Zdora<sup>1,2</sup>, Andrew Bodey<sup>1</sup>, Xiaowen Shi<sup>1</sup>, Christoph Rau<sup>1</sup></u> <sup>1</sup> Diamond Light Source, Harwell Science and Innovation Campus, Didcot, OX11 0DE, UK, <sup>2</sup> Department of Physics & Astronomy, University College London, UK
14:35 – 14:55 INVITED	<b>The fabrication and the characterization of next generation X-ray tube based on aligned CNT fibers</b> <u>Se Hoon Gihm</u> aweXome Ray Inc.
14:55 – 15:15 INVITED	<b>Coherent x-ray scattering beamline at PLS-II: Techniques and Applications</b> <u>Su Yong Lee</u> Pohang Accelerator Laboratory
15:15 – 15:35 INVITED	<b>The Single Particles, Clusters and Biomolecules and Serial Femtosecond Crystallography (SPB/SFX) Instrument at European XFEL</b> <u>Yoonhee Kim</u> European XFEL GmbH

## [D1/D3\_2] Neuroscience and Biomimetic Signaling-Engineering

17 Jul (Wed) 16:00 – 17:15

Convener/Chair Room: 5.12	DR. KANG, Kyongok (Forschungszentrum Juelich, Juelich, Germany)
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16:00 – 16:25 INVITED	<b>Organic Neuroprosthetics</b> <u>Adam Williamson</u> Aix-Marseille University, France
16:25 – 16:40	<b>The role of gaze in bimanual reaching movement</b> <u>Sang-Hoon Yeo, David Sardar, David Punt</u> University of Birmingham
16:40 – 16:50	<b>Mapping response properties in lateral intraparietal area (LIP) of the rhesus macaque</b> <u>Hee Kyoung Ko, Kristine Krug</u> University of Oxford

16:50 – 16:58	<b>Neural ensemble dynamics during vocal learning</b> <u>Richard Hahnloser</u> , Juneseung Lee ETH Zurich
16:58 – 17:06	<b>Mirror feedback modulates temporal and spatial aspects of bimanual coordination.</b> <u>Jin Min Kim</u> , Sang-Hoon Yeo, T.David Punt University of Birmingham
17:06 – 17:15	<b>3D Flow Responses of Orientational Textures and Velocity Profiles of Charged DNA-virus Suspensions</b> <u>Kyongok Kang</u> Forschungszentrum Juelich

#### [D1\_4] Discrete differential geometry and its applications

18 Jul (Thu) 15:30 – 16:45

Convener/Chair Room: 5.12	DR. CHA, Ye Sle (Freie Universität Berlin)
15:30 – 15:55	<b>Geometric Inequalities for Axially Symmetric Initial Data Sets</b> <u>Ye Sle Cha</u> Freie Universität Berlin
15:55 – 16:20	<b>Topological Solitons in Chiral Magnets</b> <u>Changhoon Heo</u> Radboud University Nijmegen

#### [D1/D6\_5] Information Science (and Machine learning with Neural Networks) 17 Jul (Wed) 13:00 – 15:30

Convener/Chair Room: 5.18	DR. SEO, Hyewon(CNRS - Univ. Strasbourg). DR. KANG, Kab Seok(Max Planck Institute for Plasma Physics)
13:00 – 13:30 INVITED	<b>Con Espressione! AI, Machine Learning, and Music</b> <u>Gehard Widmer</u> Institute for Computational Perception Johannes Kepler University, Linz and LIT   AI Lab, Linz Institute of Technology and Austrian Research Institute for Artificial Intelligence (OFAI), Vienna
13:30 – 14:00	<b>Multi-Task Deep Learning based Non-Verbal Communication Method for Cognitive Human-Robot Interaction</b> <u>KwangEun Ko</u> , In Hoon Jang, Gi Hun Yang, HyeunSeog Choi, Bummo Ahn, Dong Wook Lee Korea Institute of Industrial Technology
14:00 – 14:30	<b>Developing QA algorithm using Machine Reading Comprehension</b> <u>Wootae Jeong</u> , Hyelim Do 42maru
14:30 – 15:00	<b>Millimeter-scale computers as the next generation computing class for Internet-of-Everything</b> <u>Taekwang Jang</u> ETH zUrich

15:00 – 15:30 **Deep Momentum Strategy**  
Chulwoo Han  
 Durham University

**[D1/D3\_6] Mathematical modelling of infectious diseases**

**17 Jul (Wed) 13:00 – 14:15**

**Convener/Chair** DR. CHOI, Yoon Hong(Public Health England).  
**Room: 5.04** PROF. LEE, Jeehyun(Yonsei University)

13:00 – 13:20 **Optimising pneumococcal vaccination strategies and the use of mathematical models**  
 INVITED

Stefan Flasche  
 London School of Hygiene & Tropical Medicine

13:20 – 13:40 **A hierarchical nonlinear mixed effects models for HIV infection**  
 INVITED

Jeehyun Lee<sup>1</sup>, Yunjeong Lee<sup>2</sup>, Yoon-gu Hwang<sup>2</sup>, Jun Yong Choi<sup>3</sup>, Heedae Kwon<sup>4</sup>  
<sup>1</sup>Department of Mathematics & Department of CSE, Yonsei University,  
<sup>2</sup>Department of Computational Science and Engineering, Yonsei University,  
<sup>3</sup>Department of Internal Medicine, Severance Hospital, Yonsei University College of Medicine, <sup>4</sup>Department of Mathematics, Inha University

13:40 – 14:00 **The impact of demographic changes on varicella and herpes zoster epidemiology in the era of universal varicella vaccination in South Korea**  
 INVITED

Sun Hee Park<sup>1</sup>, Jeehyun Lee<sup>2</sup>, Jiyeon Suh<sup>3</sup>, Taeyong Lee<sup>4</sup>, Jae-Ki Choi<sup>1</sup>  
<sup>1</sup>Division of Infectious Diseases, Department of Internal Medicine, College of Medicine, The Catholic University of Korea, <sup>2</sup>Department of Mathematics & CSE, Yonsei University, <sup>3</sup>Department of Computational Science & Engineering, Yonsei University, <sup>4</sup>Department of Mathematics, Yonsei University

14:00 – 14:10 **Microfluidic approach to Facilitate Novel Way to Biology and beyond**

Jung-uk Shim  
 University of Leeds

14:00 – 14:10 **Examples of Mathematical models informed the UK Vaccination Policies**

INVITED  
Yoon Hong Choi  
 Public Health England

**[D1/D3\_7] Emerging Infectious Disease Outbreaks**

**17 Jul (Wed) 14:15 – 15:30**

**Convener/Chair** DR. CHOI, Yoon Hong  
**Room: 5.04** (Public Health England)

14:15 – 14:35 **Responding to a Pandemic Influenza**

(invited)  
Andre Charlett  
 Public Health England

14:35 – 14:50 **Utilizing news article data to predict infectious disease outbreak and spread**

(invited)  
Juhyeon Kim, Insung Ahn  
<sup>1</sup>Korea Institute of Science and Technology Information

14:50 – 15:05	<b>Novel strategies to tackle antimicrobial resistance</b> <u>Seung Seo Lee</u> University of Southampton
15:05 – 15:15	<b>What determines adaptive evolutionary rates?</b> <u>Kiwoong Nam</u> INRA
15:15 – 15:25	<b>A multidisciplinary approach to defining the identity and dynamics of adult gastric isthmus stem cells</b> <u>Seungmin Han</u> <sup>1</sup> , Juergen Fink <sup>2</sup> , Jong Kyoung Kim <sup>3</sup> , Benjamin D. Simons <sup>2</sup> , Bon-Kyoung Koo <sup>4</sup> <sup>1</sup> Wellcome Trust–Medical Research Council Stem Cell Institute, University of Cambridge, <sup>2</sup> WT–MRC Cambridge Stem Cell Institute, <sup>3</sup> Department of New Biology, DGIST, <sup>4</sup> IMBA – Institute of Molecular Biotechnology
15:25 – 15:30	<b>Discussions</b> <u>Yoon Hong Choi</u> Public Health England

## [D1\_9] General Discussions I: Physics and Mathematics

18 Jul (Thu) 09:00 – 10:25

Convener/Chair Room: 5.12	DR. KIM, Chan (European XFEL GmbH) DR. KANG, Kab Seok (Max Planck Institute for Plasma Physics)
09:00 – 09:25	<b>Graphene nanomechanical resonator based ultra-sensitive mass change detection</b> <u>Sang Wook Lee</u> <sup>1</sup> , Dong Hoon Shin <sup>1</sup> , JunHee Choi <sup>2</sup> , Hakseong Kim <sup>3</sup> , Yu Gyeong Je <sup>1</sup> <sup>1</sup> Ewha Womans University, <sup>2</sup> Korea Institute of Materials Science, <sup>3</sup> Korea Advanced Institute of Science and Technology
09:25 – 09:45	<b>Observation of exceptional points in active non-Hermitian graphene metasurfaces</b> <u>Teun-Teun Kim</u> IBS, SKKU
09:45 – 10:05	<b>Light activated bactericidal activity of crystal violet and gold nanocluster treated silicone</b> <u>Gi Byoung Hwang</u> <sup>1</sup> , Gaowei Wu <sup>2</sup> , Asterios Gavrilidis <sup>2</sup> , Elaine Allan <sup>3</sup> , Ivan P Parkin <sup>1</sup> <sup>1</sup> Chemistry department, University College London, <sup>2</sup> Department of Chemistry Engineering, University College London, <sup>3</sup> Department of Microbial Diseases, University College London
10:05 – 10:25	<b>Floating gate effect on two-dimensional electronics by tunneling-triboelectric charge</b> <u>Tae Yun Kim</u> <sup>1</sup> , Seongsu Kim <sup>2</sup> , Christian Falconi <sup>3</sup> , Sang-Woo Kim <sup>4</sup> <sup>1</sup> University of Cambridge, Sungkyunkwan University, <sup>2</sup> Purdue University, <sup>3</sup> University of Rome Tor Vergata, <sup>4</sup> Sungkyunkwan University



Convener/Chair	DR. KIM, Chan (European XFEL GmbH)
Room: 5.12	DR. KANG, Kab Seok (Max Planck Institute for Plasma Physics)

10:25 – 10:50	<b>Liquid flow through paper</b> <u>Wonjung Kim, Sooyoung Chang</u> Sogang University
10:50 – 11:10	<b>Constraining the detectability of water ice in debris disks</b> <u>Minjae Kim</u> Institut für Theoretische Physik und Astrophysik
11:10 – 11:30	<b>The Mask of Venus – the thick sulfuric acid cloud layer on our neighbor planet</b> <u>Yeon Joo Lee</u> Technische Universität Berlin
11:30 – 11:50	<b>Helical transport in coupled resonator waveguides</b> <u>JungYun Han</u> PCS IBS, UST

## Division: D2. Chemistry / Materials and Chemical Engineering

Chemistry, Materials Science, and Chemical Engineering are fundamental and challenging fields to study and acquire the knowledge to be understood. The fields have inspired and contributed to the emergence of various chemistry-based materials, such as, nanomaterials, biomaterials, electronic/optical/magnetic materials, ceramics, polymers, metal alloys, smart materials, semiconductor materials, and composite materials associating with design of complicated structures through the innovation of technology by the advancements in the study of fundamental science. The knowledge acquired from the studies will greatly impact on our society and coming life. In the sessions of Chemistry, Material and Chemical Engineering at EKC 2019, the current scientific issues that are considered for environment and human being will be discussed with various up-to-date results from studies in the fields.

### PROGRAMME COMMITTEE



DR. YOON, Songhak (윤송학)  
Fraunhofer IWKS  
s.yoon@ekc2019.org



DR. KIM, Wonjae (김원재)  
VTT Technical Research  
Center of Finland  
w.kim@ekc2019.org

### [D2\_k] KEYNOTE LECTURES: D2

17 Jul (Wed) 16:00 – 17:15

Convener/Chair	DR. WHANG, Dong Ryeol (Johannes Kepler University / Assistant Professor)
Room: 5.13	DR. YOON, Songhak (Fraunhofer IWKS)

16:00 – 16:30 KEYNOTE	<b>Manipulating perovskite materials for highly efficient and stable perovskite solar cells</b> <u>Sang Il Seok</u> UNIST
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16:30 – 17:00 **Organic and bio-organic systems for solar energy conversion and CO<sub>2</sub> Recycling**  
 KEYNOTE Niyazi Serdar Sariciftci  
 Linz Institute of Organic Solar Cells (LIOS) / Institute of Physical Chemistry, JKU

**[D1/D2\_1] Next generation X-ray sources and their applications**

**17 Jul (Wed) 13:00 – 15:35**

<b>Convener/Chair</b>	<b>DR. GIHM, Se Hoon (aweXome Ray Inc.)</b>
<b>Room: 5.12</b>	<b>DR. LEE, Hyun Hwi (Pohang Accelerator Lab, POSTECH Chief Researcher)</b>

13:00 – 13:25 **Extreme metrology for ultrafast electron dynamics in atomic scales**  
 INVITED DONG EON KIM  
 POSTECH / MPK

13:25 – 13:50 **Molecular Engineering of conjugated polymer to enhance the vertical electrical properties for photovoltaic devices**  
 INVITED Hyo Jung KIM<sup>1</sup>, Sangmin Chae<sup>1</sup>, Ahra Yi<sup>1</sup>, Hyun Hwi Lee<sup>2</sup>, Jiyeon Choi<sup>3</sup>  
<sup>1</sup>Pusan National University, <sup>2</sup>Pohang Accelerator Laboratory, <sup>3</sup>Korea Institute of Machinery and Materials

13:50 – 14:15 **Investigation of Matter under Extreme Conditions with Ultrafast and Ultraintense Lights**  
 INVITED Byoung-ick Cho  
 Gwangju Institute of Science and Technology

14:15 – 14:35 **Micro- and Nano-Imaging and Tomography at the Diamond Light Source (DLS) I13 Beamline**  
 INVITED Shashidhara Marathe<sup>1</sup>, Malte Storm<sup>1</sup>, Silvia Cipiccia<sup>1</sup>, Darren Batey<sup>1</sup>, Marie-Christine Zdora<sup>1,2</sup>, Andrew Bodey<sup>1</sup>, Xiaowen Shi<sup>1</sup>, Christoph Rau<sup>1</sup>  
<sup>1</sup>Diamond Light Source, Harwell Science and Innovation Campus, Didcot, OX11 0DE, UK, <sup>2</sup>Department of Physics & Astronomy, University College London, UK

14:35 – 14:55 **The fabrication and the characterization of next generation X-ray tube based on aligned CNT fibers**  
 INVITED Se Hoon Gihm  
 aweXome Ray Inc.

14:55 – 15:15 **Coherent x-ray scattering beamline at PLS-II: Techniques and Applications**  
 INVITED Su Yong Lee  
 Pohang Accelerator Laboratory, Pohang 37673, South Korea

15:15 – 15:35 **The Single Particles, Clusters and Biomolecules and Serial Femtosecond Crystallography (SPB/SFX) Instrument at European XFEL**  
 INVITED Yoonhee Kim  
 European XFEL GmbH

Convener/Chair Room: 5.13	DR. KO, Seo-jin (KRICT) DR. SEO, Jangwon (KRICT)
13:00 – 13:10	<b>Welcome remarks</b> <u>Chang Gyoung Kim</u> KRICT
13:10 – 13:35 INVITED	<b>Towards Artificial Cells powered by Solar Energy: Photosensitization and Photocatalysis in Bioinorganic, Bio-organometallic and Biomimetic Systems</b> <u>Günther Knör</u> Institute of Inorganic Chemistry, JKU
13:35 – 14:00 INVITED	<b>Efficient and Stable Perovskite Solar Cells at KRICT</b> <u>Jangwon Seo</u> KRICT
14:00 – 14:25 INVITED	<b>Efficient and Stable Perovskite Solar Cells at KRICT</b> <u>Soo-Jin Moon</u> <sup>1</sup> , Brett A. Kamino <sup>1</sup> , Adriana Paracchino <sup>1</sup> , Arnaud Walter <sup>1</sup> , Christophe Ballif <sup>2</sup> , Sylvain Nicolay <sup>1</sup> <sup>1</sup> CSEM, PV-Center, <sup>2</sup> CSEM, PV-Center / EPFL, IMT Photovoltaics and Thin-Film Electronics Laboratory (PV-Lab)
14:25 – 14:40	Coffee Break
14:40 – 15:05 INVITED	<b>High potential organic solar cells light the way for semitransparent photovoltaics with high efficiency</b> <u>Seo-Jin Ko</u> KRICT
15:05 – 15:30 INVITED	<b>Are perovskites the better semiconductors for solar cells?</b> <u>Markus Scharber</u> Linz Institute of Organic Solar Cells, JKU

Convener/Chair Room: 5.14	DR. YOON, Songhak (Fraunhofer IWKS) DR. KIM, Sangcheol (Korea Electrotechnology Research Institute)
13:00 – 13:20	<b>Epitaxial graphene on SiC and its applications</b> <u>Rositsa Yakimova</u> Linköping University
13:20 – 13:40	<b>SiC manufacturing technology for sensors and lateral power transistors towards integrated circuits</b> <u>Tobias Erlbacher</u> Fraunhofer IISB

13:40 – 13:55	<b>Process and design optimization of SiC MOSFET for low on-state resistance</b> <u>Tomasz Sledziewski</u> , Tobias Erlbacher, Anton Bauer Fraunhofer IISB
13:55 – 14:15	<b>Research Activities of Silicon Carbide Power Semiconductor Devices in KERI (Korea Electrotechnology Research Institute)</b> <u>Sangcheol Kim</u> KERI

#### [D2\_4] Flexible/Wearable Devices

17 Jul (Wed) 14:15 – 15:30

Convener/Chair Room: 5.14	DR. KIM, Wonjae (VTT Technical Research Center of Finland)
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14:15 – 14:40 INVITED	<b>Stretchable Platform Technology for Attachable Patch Device Applications</b> <u>Yongtaek Hong</u> Electrical and Computer Engineering, SNU
14:40 – 15:05 INVITED	<b>Imperceptible sensor foils for soft electronics and machines</b> <u>Martin Kaltenbrunner</u> Department of Soft Matter Physics / LIT Soft Materials Laboratory, JKU
15:05 – 15:30	<b>Toward Implantable Active Electronic Devices using Flexible Device Fabrication Process</b> <u>Chan-mo Kang</u> <sup>1</sup> , Woo-Seup Youm <sup>1</sup> , Eunjin Hwang <sup>2</sup> , Jeehyun Choi <sup>3</sup> , O Eun Kwon <sup>1</sup> , Chan Woo Park <sup>1</sup> , Chun-Won Byun <sup>1</sup> , Jeong-Ik Lee <sup>1</sup> <sup>1</sup> ETRI, <sup>2</sup> Lablup Inc., <sup>3</sup> KIST

#### [D2\_5] Perovskite solar cells and related materials

18 Jul (Thu) 09:00 – 11:30

Convener/Chair Room: 5.13	DR. SEO, Jangwon (KRICT) PROF. NOH, Jun Hong (Korea University) DR. SEO, Jangwon (KRICT)
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09:00 – 9:20	<b>Overview on Global Frontier Center for Multiscale Energy Systems</b> <u>Man Soo Choi</u> SNU
09:20 – 09:50 INVITED	<b>High Performance Flexible Perovskite Solar Cells</b> Min Jae Ko, Young Kim, Wooyeon Kim, Donghwan Kim, SeongYeon Hwang, <u>Seong Yeon Ko</u> , SangHyun Jeong Department of Chemical Engineering, Hanyang University
09:50 – 10:20 INVITED	<b>Factors for Manufacturing Scalable &amp; Printable Perovskite Solar Cells</b> <u>Seulki Song</u> <sup>1</sup> , Young Yun Kim <sup>1</sup> , Tae-Youl Yang <sup>1</sup> , Rikka Suhonen <sup>2</sup> , Jangwon Seo <sup>1</sup> <sup>1</sup> Division of Advanced Materials, KRICT, <sup>2</sup> VTT Technical Research Centre of Finland Ltd, Oulu, Finland

10:20 – 11:00  
INVITED

**Materials and Devices Engineering for Low Voltage Deficit in Perovskite Solar Cells**  
Jun Hong Noh  
 School of Civil, Environmental and Architectural Engineering, Korea University

11:00 – 11:30  
INVITED

**Spin Coating Process for Highly Efficient 10cm × 10cm Perovskite Solar Modules Enabled by Self-Assembly of SnO<sub>2</sub> Nanocolloids**  
Gill Sang Han<sup>1</sup>, Jio Kim<sup>1</sup>, Seunghwan Bae<sup>2</sup>, Se-Hoon Han<sup>3</sup>, Yong Joo Kim<sup>4</sup>,  
 Oh Yeong Gong<sup>1</sup>, Phillip Lee<sup>5</sup>, Min Jea Ko<sup>6</sup>, Hyun Suk Jung<sup>1</sup>  
<sup>1</sup>School of Advanced Materials Science and Engineering, Sungkyunkwan University,  
<sup>2</sup>Intelligent Sustainable Materials R&D Group, KITECH, <sup>3</sup>School of Advanced  
 Materials Science and Engineering, Sungkyunkwan University,  
<sup>4</sup>Sharechem Co., Ltd., <sup>5</sup>Photo-Electronic Hybrids Research Center, KIST,  
<sup>6</sup>Department of Chemical Engineering, Hanyang University

**[D2\_6] Low temperature Solid Oxide Fuel Cells (LT-SOFC)**

**18 Jul (Thu) 15:30 – 16:45**

Convener/Chair  
Room: 5.13

DR. SEO, Jangwon (KRICT)  
DR. SON, Ji-won (KIST)

15:30 – 15:49  
INVITED

**Fuel reforming technology for enhancing fuel flexibility of thin film LT-SOFCs**  
Joongmyeon Bae  
 KAIST

15:49 – 16:08  
INVITED

**Multiscale-architected thin-film LT-SOFCs with redox stability and fuel flexibility**  
Ji-Won Son  
 KIST

16:08 – 16:27  
INVITED

**Computational Materials Design for Developing High Performance Solid Oxide Fuel Cell Electrodes**  
Jeong Woo Han<sup>1</sup>, Wonyoung Lee<sup>2</sup>, WooChul Jung<sup>3</sup>  
<sup>1</sup>POSTECH, <sup>2</sup>Sungkyunkwan University, <sup>3</sup>KAIST

16:27 – 16:45  
INVITED

**Enhancing catalytic activity and stability of LSCF oxygen electrodes induced by compositional modification for solid oxide fuel cell applications**  
Kang Taek Lee  
 DGIST

**[D2\_7] Multiscale Proton Exchange Membrane Fuel Cells**

**18 Jul (Thu) 16:45 – 18:00**

Convener/Chair  
Room: 5.13

DR. SEO, Jangwon (KRICT)  
PROF. NAM, Ki Tae (SNU)

16:45 – 17:10  
INVITED

**Current Challenge in Design for Water Oxidizing Electrocatalysts**  
Ki Tae Nam, Sunghak Park  
 Department of Materials Science and Engineering, SNU

17:10 – 17:35  
INVITED  
**Designs of Efficient Ion Conducting Polymers**  
Moon Jeong Park  
POSTECH

17:35 – 18:00  
INVITED  
**High-performance fuel cell in low relative humidity condition and its application to drone system**  
Sang Moon Kim<sup>1</sup>, Changwook Seol<sup>1</sup>, Segeun Jang<sup>2</sup>, Sung Jong Yoo<sup>3</sup>  
<sup>1</sup>Incheon National University, <sup>2</sup>Hanbat National University, <sup>3</sup>KIST

## [D2\_8] Materials and Methods Towards Solar Fuels

18 Jul (Thu) 09:00 – 10:15

Convener/Chair  
Room: 5.14  
DR, APAYDIN, Dogukan Hazar  
(Institute of Science and Technology Austria)

09:05 – 09:45  
INVITED  
**STATE-OF-THE-ART, CHALLENGES AND PROSPECTS OF HETEROGENEOUS PHOTOCATALYSIS**  
Alexey Cherevan  
Institute of Materials Chemistry, TU Wien

09:45 – 10:00  
**Application of differential electrochemical mass spectrometry in electrocatalysis**  
Niusha Shakibi Nia, Julia Kunze-Liebhäuser  
Institute of Physical Chemistry, University Innsbruck

10:00 – 10:15  
**Photocatalytic CO<sub>2</sub> Reduction by Cr-substituted Ba<sub>2</sub>In<sub>2</sub>O<sub>5</sub>·(H<sub>2</sub>O)<sub>δ</sub>**  
Songhak Yoon<sup>1</sup>, Marc Widenmeyer<sup>2</sup>, Anke Weidenkaff<sup>1</sup>  
<sup>1</sup>Fraunhofer-Einrichtung IWKS, <sup>2</sup>University of Stuttgart, Institute for Materials Science

## [D2\_9] Composite Materials

18 Jul (Thu) 10:15 – 11:30

Convener/Chair  
Room: 5.14  
DR. KIM, Se Jong  
(Lead Buyer)

10:15 – 14:45  
INVITED  
**Hybrid Fiber Reinforced Composites and its Processing for a System Efficient Lightweight Design**  
Tobias Joppich  
Fraunhofer ICT

10:45 – 11:10  
**Improvement of dynamic testing procedures for crashworthiness of composite transportation structures**  
Sang Hyun Yoo  
IGerman Aerospace Center (DLR)

11:00 – 11:30  
TBD

Convener/Chair Room: 5.14	DR. YUMUSAK, Cigdem (JKU)
15:30 – 15:50 INVITED	<b>Highly efficient, photostable and printable organic solar cells using novel non-fullerene acceptors</b> <u>Kwanghee Lee</u> 1Research Institute for Solar and Sustainable Energies, Heeger Center for Advanced Materials / School of Materials Science and Engineering, GIST
15:50 – 16:10 INVITED	<b>Alkyl substitutions a powerful tool for tailor-made properties of soluble and versatile organic semiconducting materials</b> <u>Jozef Krajcovic</u> <sup>1</sup> , Alexander Kovalenko <sup>1</sup> , Cigdem Yumusak <sup>2</sup> , Niyazi Serdar Sariciftci <sup>2</sup> <sup>1</sup> Brno University of Technology, Faculty of Chemistry, <sup>2</sup> Linz Institute for Organic Solar Cells (LIOS), JKU
16:10 – 16:30 INVITED	<b>Excited-State Electron Transfer of Molecules: Tale of Degradation in Electroluminescence Devices</b> <u>Youngmin You</u> Ewha Womans University
16:30 – 16:45	<b>2D Perovskite as a Hole Transporting Material for Stable and Efficient Perovskite Solar Cells</b> <u>Hobeom Kim</u> <sup>1</sup> , Mohammad K. Nazeeruddin <sup>1</sup> , Hoichang Yang <sup>2</sup> <sup>1</sup> EPFL, <sup>2</sup> Inha University
16:45 – 17:00	<b>Elucidating the long-range charge carrier mobility in metal halide perovskite thin films</b> <u>Jongchul Lim</u> Istituto Italiano di Tecnologia
17:00 – 17:15	<b>Improving Stability of Lead Halide Perovskite Solar Cells based on 3D/2D Multi-dimensional Perovskite</b> <u>Min Kim</u> Istituto Italiano di Tecnologia
17:15 – 17:30	Coffee Break

Convener/Chair Room: 5.14	DR. YUMUSAK, Cigdem (JKU)
17:30 – 17:50 INVITED	<b>Photoactive Neural Interfaces Using Quantum Dots</b> <u>Sedat Nizamoglu</u> Koc University

17:50 – 18:10 **One-dimensional mechanical sensing systems in biomedical engineering**  
 INVITED Jaehong Lee  
 ETH Zurich

**[D2\_12] Secondary Batteries: From Advanced Lithium-Ion Systems to Post-Lithium Chemistries**

**18 Jul (Thu) 09:00 – 11:30**

**Convener/Chair** DR. PORTENKIRCHNER, Engelbert  
**Room: 5.18** (University of Innsbruck)

09:00 – 09:30 **Materials and reaction mechanisms in beyond intercalation batteries**  
 INVITED Stefan Freunberger  
 Institute for Chemistry and Technology of Materials, Graz University of Technology

09:30 – 09:45 **Molecular Design Strategies to Achieve High Voltage and Energy Organic Electrode Materials for Secondary Batteries**  
Ji Eon Kwon, Soo Young Park  
 SNU

09:45 – 10:00 **Tailored surface modification on porous SiO as an anode material for Lithium ion rechargeable battery**  
Sang-Min Lee, Gumjae Park, Hae-Young Choi  
 Next Generation Battery Research Center, KERI

10:00 – 10:15 **Challenges and strategies for practical all-solid-state lithium batteries based on sulfide solid electrolytes**  
Yoon-Cheol Ha, Byung Gon Kim, You-Jin Lee, Jun-Woo Park, Sang-Min Lee  
 KERI

10:15 – 10:30 **High performance sodium-ion rechargeable battery with 3V-120 Wh/kg**  
Jeong-hee Choi, Min-Ho Lee, Hae-Young Choi, Sang-Min Lee  
 KERI

10:30 – 10:50 **Nanostructured Electrode Materials for Rechargeable Sodium Ion Batteries**  
 INVITED Engelbert Portenkichner<sup>1</sup>, Daniel Werner<sup>1</sup>, Sebastian Liebl<sup>1</sup>, Dogukan Apaydin<sup>2</sup>, Dominik Wielend<sup>3</sup>, Julia Kunze-Liebhäuser<sup>1</sup>  
<sup>1</sup>Institute of Physical Chemistry, University of Innsbruck, <sup>2</sup>Institute of Science and Technology Austria, <sup>3</sup>Linz Institute for Organic Solar Cells (LIOS), JKU

**[D2/D4/D6\_13] Particulate Matter Issue; From IoT Sensing Technologies to Data Collection & Monitoring**

**18 Jul (Thu) 10:15 – 11:30**

**Convener/Chair** PROF. LEE, Heekwan  
**Room: 5.15** (Incheon National University)

10:15 – 10:30 **A joint analysis of air pollution level and digital social media activity:**  
 (invited) **A case study of Paris and its area.**  
PEREZ Charles, SOKOLOVA KARINA, GUNCU HUSEYIN  
 Paris School of Business



10:30 – 10:45	<b>Contributions of Brake/Tire Wear Particles to Non-exhaust Traffic Related PM</b> <u>Seokhwan Lee</u> KIMM
10:45 – 11:00	<b>TBD</b> <u>Heekwan Lee</u> Incheon National University
11:00 – 11:15	<b>TBD</b>

## Division: D3. Biology, Bioengineering, and Medical Science

The Biology, Bioengineering and Medical Science group aims to bring together Korean and European scientists working in various fields of Life and Medical Sciences-related research, encourage communication, strengthen global networks, and develop joint research projects. To further maximize such opportunities, we have organized three sessions jointly with the Physics and Mathematics group, as we believe life science and health care data are one of the key applications in other allied fields. The sessions will be organized in different categories as listed below:

### PROGRAMME COMMITTEE



**PROF. MOK, K. Hun (목 헌)**  
Trinity College Dublin  
kh.mok@ekc2019.org



**DR. NAM, Kiwoong (남기웅)**  
Institut National de la  
Recherche Agronomique  
k.nam@ekc2019.org

### [D3\_1] Nano-, Bio-, and Medical- sensor

17 Jul (Wed) 13:00 – 15:30

Convener/Chair **DR. OH, Yoojin**  
Room: 5.03 (Elise-Richter Fellow, Institute of Biophysics, JKU)

13:00 – 13:25  
INVITED **Understanding cancer drug resistance based on tumor niche reconstituted by microfluidics and 3D bioprinting**  
Sungsu Park  
Sungkyunkwan University

13:25 – 13:45 **Vascularized Tumor Spheroids for Drug Screening**  
Noo Li JEON  
Department Of Mechanical And Aerospace Engineering, Seoul National University,  
Seoul 151-744, Republic Of Korea)

- 13:45 – 14:05 **Proteins and Cells on Chips: Microfluidic devices for biological applications**  
Hoon Suk Rho  
 Instructive Biomaterials Engineering, MERLN Institute for Technology-Inspired Regenerative Medicine
- 14:05 – 14:20 **Force Spectroscopy and Recognition Imaging: Quantifying Binding Strength and Affinity on the Single-Molecule Level**  
YOOJIN OH  
 Institute of Biophysics, JKU
- 14:20 – 14:40 **Paving the way to single-molecule protein sequencing**  
Chirlmin Joo  
 Kavli Institute of NanoScience and Department of BioNanoScience, Delft University of Technology
- 14:40 – 15:00 **A single-molecule approach to reveal the molecular mechanism behind bacterial membrane permeability**  
Sejeong Lee  
 University of Oxford
- 15:00 – 15:20 **Cryo-EM reveals the mechanisms of human membrane transporters**  
Yongchan Lee  
 Max Planck Institute of Biophysics
- 15:20 – 15:30 **Analysis of indirect calorimetry with wild-type mice and Tbc1d4-deficient mice by using TSE metabolic cages**  
Daebin Kim  
 Heinrich-Heine-University Duesseldorf

**[D1/D3\_2] Neuroscience and Biomimetic Signaling-Engineering**

**17 Jul (Wed) 16:00 – 17:15**

**Convener/Chair** DR. KANG, Kyongok  
**Room: 5.12** (Forschungszentrum Juelich, Juelich, Germany)

- 16:00 – 16:25 **Organic Neuroprosthetics**  
 INVITED Adam Williamson  
 Aix-Marseille University, France
- 16:25 – 16:40 **The role of gaze in bimanual reaching movement**  
Sang-Hoon Yeo, David Sardar, David Punt  
 University of Birmingham
- 16:40 – 16:50 **Mapping response properties in lateral intraparietal area (LIP) of the rhesus macaque**  
 INVITED Hee Kyoung Ko, Kristine Krug  
 University of Oxford
- 16:50 – 16:58 **Neural ensemble dynamics during vocal learning**  
Richard Hahnloser, Juneseung Lee  
 ETH Zurich

- 16:58 – 17:06 **Mirror feedback modulates temporal and spatial aspects of bimanual coordination.**  
Jin Min Kim, Sang-Hoon Yeo, T.David Punt  
 University of Birmingham
- 17:06 – 17:15 **3D Flow Responses of Orientational Textures and Velocity Profiles of Charged DNA-virus Suspensions**  
Kyongok Kang  
 Forschungszentrum Juelich

**[D3\_3] Advance in bio atomic force microscopy**

**17 Jul (Wed) 16:00 – 17:15**

**Convener/Chair** DR. RYU, Je-kyung (MSC Postdoctoral Fellow, Department of Bionanoscience, Kavli Institute of Nanoscience Delft, Delft University of Technology)  
**Room: 5.03**

- 16:00 – 16:25 **Antibody Walking on Membranes filmed with High-Speed AFM**  
 INVITED Peter Hinterdorfer  
 Institute for Biophysics, JKU
- 16:25 – 16:40 **AFM imaging of SMC-proteins mediated DNA loop extrusion**  
Je-Kyung Ryu  
 Department of Bionanoscience, Kavli Institute of Nanoscience Delft, Delft University of Technology
- 16:40 – 17:00 **Deciphering attachment of rotavirus to cell surface by AFM-combined confocal microscopy**  
Jinsung Yang<sup>1</sup>, Melanie Köhler<sup>2</sup>, Javier M. Rodriguez<sup>3</sup>, Daniel Luque<sup>3</sup>, David Alsteens<sup>1</sup>  
<sup>1</sup>Université Catholique de Louvain, Louvain Institute of Biomolecular Science and Technology, <sup>2</sup>Université Catholique de Louvain, Louvain Institute of Biomolecular Science and Technology, <sup>3</sup>Centro Nacional de Microbiologia/ISCIII, Majadahonda
- 17:00 – 17:15 **A Magnetic Actuation System for the Active Microrheology in Soft Biomaterials**  
Moon Kwang Jeong  
 Max Planck Institute for Intelligent Systems

**[D3\_5] Biomedicine and Life Sciences Platform Technologies:  
 Current State of the Art**

**18 Jul (Thu) 09:00 – 11:30**

**Convener/Chair** PROF. MOK, K. Hun (Trinity College Dublin)  
**Room: 5.03** DR. NAM, Kiwoong(INRA)

- 09:00 – 09:25 **Stem Cells and Their Dynamic Niche in Lung Repair and Regeneration**  
 INVITED Joo-Hyeon Lee  
 Wellcome Trust – MRC Stem Cell Institute, University of Cambridge
- 09:25 – 09:45 **Modelling Cryptosporidium infection in human small intestinal and lung organoids**  
 INVITED Inha Heo  
 Johnson & Johnson, Belgium

09:45 – 10:05	<b>Gene network reconstruction using single cell transcriptomic data reveals key factors for autophagic process</b> <u>Kyoung Jae Won</u> U of Copenhagen
10:15 – 10:40 INVITED	<b>Tracing Oncogene Rearrangements in the Mutational History of Lung Adenocarcinoma</b> <u>Young Seok Ju</u> KAIST
10:40 – 10:55	<b>Lipid Droplet: A one-stop shop for fragrance biosynthesis and transport</b> <u>Hansol Bae, Henrik Toft Simonsen</u> <sup>1</sup> Mosspiration Blotech
10:55 – 11:10	<b>Application of high-end sequencing technologies</b> <u>Kiwoong NAM</u> INRA
11:10 – 11:30	<b>Protein-Fatty Acid Complexes that Exhibit Tumoricidal Activity: From Basic Research to Clinical Trials</b> <u>K. Hun Mok</u> Trinity College Dublin

**[D3\_4] Cutting-Edge Advances in Medicine and Biomedical Engineering**    18 Jul (Thu) 15:30 – 18:00

<b>Convener/Chair</b> <b>Room: 5.03</b>	<b>PROF. MOK, K. Hun (Trinity College Dublin)</b> <b>DR. NAM, Kiwoong (INRA)</b>
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15:30 – 15:55 INVITED	<b>ArthroLube: Injectable lubricants for prosthetic joint implants</b> <u>Seunghwan Lee</u> Technical University of Denmark
15:55 – 16:10	<b>Natural compound library screening identifies new molecules for the treatment of cardiac fibrosis and diastolic dysfunction</b> <u>Mira Jung</u> <sup>1</sup> , <u>Katharina Schimmel</u> <sup>2</sup> , <u>Thomas Thum</u> <sup>1</sup> <sup>1</sup> IMTTs, IFB-Tx, Hannover Medical School, <sup>2</sup> Cardiovascular Institute, Stanford University School of Medicine
16:10 – 16:25	<b>5<math>\alpha</math>-reductase inhibitor classification model development based on machine learning and deep learning algorithms</b> <u>Hyun Kil Shin</u> <sup>1</sup> , <u>Yong Oh Lee</u> <sup>2</sup> , <u>Young Jun Kim</u> <sup>2</sup> <sup>1</sup> KITOX, <sup>2</sup> KIST Europe
16:25 – 16:40	<b>Utilization of a computational cardiac electromechanics for mechano-electric feedback</b> <u>Yongjae Lee</u> Institute of Structural Analysis, TU Dresden

- 16:50 – 17:05 **Pathogen mimetics activate MAP kinase signalling and induce inflammatory molecules in microglia**  
Jaedeok Kwon  
University of Glasgow
- 17:05 – 17:20 **Measuring notch signaling range during bristle patterning in drosophila**  
Jangmi Kim, François Schweisguth  
Institut Pasteur
- 17:20 – 17:35 **The effects of uncommonly used horticultural plant materials on the diversity of gut microbiota and lipid peroxidation in mice model**  
Yunjeong So  
Lund University
- 17:35 – 17:50 **Identification of genetic markers associated with intestinal Behçet's disease using genome-wide association and HLA analyses**  
Eun Suk Jung<sup>1</sup>, Stefan Schreiber<sup>2</sup>, Andre Franke<sup>2</sup>, Won Ho Kim<sup>3</sup>, David Ellinghaus<sup>2</sup>, Jae Hee Cheon<sup>3</sup>  
<sup>1</sup>Department of Internal Medicine and Institute of Gastroenterology, Yonsei University College of Medicine, Seoul, Korea | Institute of Clinical Molecular Biology, Kiel University, <sup>2</sup>Institute of Clinical Molecular Biology, Kiel University, <sup>3</sup>Department of Internal Medicine and Institute of Gastroenterology, Yonsei University College of Medicine
- 17:50 – 18:05 **Brewing Less- and Enhanced-caffeinated Coffee by Using Cold Brew MethodOxide Fuel Cell Electrodes**  
Seung-Hun Lee, Nikolai Kuhnert  
Jacobs University Bremen

#### [D1/D3\_6] Mathematical modelling of infectious diseases

17 Jul (Wed) 13:00 – 14:15

Convener/Chair DR. CHOI, Yoon Hong (Public Health England)  
Room: 5.04 PROF. LEE, Jeehyun (Yonsei University)

- 13:00 – 13:20 **Optimising pneumococcal vaccination strategies and the use of mathematical models**  
INVITED  
Stefan Flasche  
London School of Hygiene & Tropical Medicine
- 13:20 – 13:40 **A hierarchical nonlinear mixed effects models for HIV infection**  
INVITED  
Jeehyun Lee<sup>1</sup>, Yunjeong Lee<sup>2</sup>, Yoon-gu Hwang<sup>2</sup>, Jun Yong Choi<sup>3</sup>, Heedae Kwon<sup>4</sup>  
<sup>1</sup>Department of Mathematics & Department of CSE, Yonsei University,  
<sup>2</sup>Department of Computational Science and Engineering, Yonsei University,  
<sup>3</sup>Department of Internal Medicine, Severance Hospital, Yonsei University College of Medicine, <sup>4</sup>Department of Mathematics, Inha University

13:40 – 14:00 INVITED	<b>The impact of demographic changes on varicella and herpes zoster epidemiology in the era of universal varicella vaccination in South Korea</b> <u>Sun Hee Park<sup>1</sup>, Jeehyun Lee<sup>2</sup>, Jiyeon Suh<sup>3</sup>, Taeyong Lee<sup>4</sup>, Jae-Ki Choi<sup>1</sup></u> <sup>1</sup> Division of Infectious Diseases, Department of Internal Medicine, College of Medicine, The Catholic University of Korea, <sup>2</sup> Department of Mathematics & CSE, Yonsei University, <sup>3</sup> Department of Computational Science & Engineering, Yonsei University, <sup>4</sup> Department of Mathematics, Yonsei University
14:00 – 14:10	<b>Microfluidic approach to Facilitate Novel Way to Biology and beyond</b> <u>Jung-uk Shim</u> University of Leeds
14:10 – 14:15 INVITED	<b>Topological Solitons in Chiral Magnets</b> <u>Yoon Hong Choi</u> Public Health England

#### [D1/D3\_7] Emerging Infectious Disease Outbreaks

17 Jul (Wed) 14:15 – 15:30

Convener/Chair Room: 5.18	DR. CHOI, Yoon Hong (Public Health England)
14:15 – 14:35 INVITED	<b>Responding to a Pandemic Influenza</b> <u>Andre Charlett</u> Public Health England
14:35 – 14:50 INVITED	<b>Utilizing news article data to predict infectious disease outbreak and spread</b> <u>Juhyeon Kim, Insung Ahn</u> Korea Institute of Science and Technology Information
14:50 – 15:05	<b>Novel strategies to tackle antimicrobial resistance</b> <u>Seung Seo Lee</u> University of Southampton
15:05 – 15:15	<b>What determines adaptive evolutionary rates?</b> <u>Kiwoong NAM</u> INRA
15:15 – 15:25	<b>A multidisciplinary approach to defining the identity and dynamics of adult gastric isthmus stem cells</b> <u>Han Seungmin<sup>1</sup>, Juergen Fink<sup>2</sup>, Jong Kyoung Kim<sup>3</sup>, Benjamin D. Simons<sup>2</sup>, Bon-Kyoung Koo<sup>4</sup></u> <sup>1</sup> Wellcome Trust–Medical Research Council Stem Cell Institute, University of Cambridge, <sup>2</sup> WT-MRC Cambridge Stem Cell Institute, <sup>3</sup> Department of New Biology, DGIST, <sup>4</sup> IMBA - Institute of Molecular Biotechnology
15:25 – 15:30	<b>Discussions</b> <u>Yoon Hong Choi</u> Public Health England

Convener/Chair Room: 5.18	DR. CHOI, Heungjae (Ser Cymru Research Fellow, Cardiff University) DR. CHOI, Jung Han (IC-Design Project Manager, Fraunhofer Heinrich Hertz Institute HHI)
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|--------------------------|---|
| 16:45 – 17:05<br>INVITED | <b>Noise reduction techniques for human vital-signal radar sensors</b><br><u>Kawon Han</u> , Songcheol Hong<br>EE School, KAIST   |
| 17:05 – 17:20            | <b>Embedded Packaging Technologies for Microwave and mmWave Applications</b><br><u>Dongsu Kim</u> , Jong-Min Yook, Jun-Chul Kim<br>KETI   |
| 17:20 – 17:35            | <b>A Return Loss Equalizer Using Non-reciprocal Device for In-band Full-duplex RF Front-end</b><br><u>Junhyung Jeong</u> <sup>1</sup> , Girdhari Chaudhary <sup>1</sup> , Phanam Pech <sup>1</sup> , Dongshin Kim <sup>2</sup> , Yongchae Jeong <sup>1</sup><br><sup>1</sup> Chonbuk National University, <sup>2</sup> Korea Electronics Technology Institute |
| 17:35 – 17:45            | <b>Portable Microwave Power Excitation System Based on Substrate Integrated Waveguide Resonator for Rapid DNA Extraction</b><br><u>Heungjae CHOI</u><br>School of Engineering, Cardiff University   |
| 17:45 – 18:00            | <b>Ultra low-power high-speed IC and high-frequency packages for optical communication transceivers</b><br><u>Jung Han CHOI</u><br>Fraunhofer Heinrich-Hertz Institute  |

## Division: D4. Earth science and Environmental Engineering

Humanity is currently dealing with many environmental problems. They are exacerbated by the sprawl of cities, which is accompanied by the growth of urban population and an increase of elderly people, as well as land use changes. For example, these problems relate to (i) causes and consequences of climate change including global warming and embedded severe heat waves, (ii) urban sprawl, as well as (iii) air and water pollution. They affect organisms such as humans, plants and animals as well as materials and socio-economic sectors. Earth and environmental scientists and engineers are interested in methods and data, which enable impact-related comparative analyses of processes and resulting phenomena that are typical of past and future effects of human environmental activities. They aim at the development and implementation of solutions to a variety of current environmental issues.

In the "Earth Science & Environmental Engineering" sessions at EKC 2019, delegates from Europe and Korea will discuss the main issues, core trends and collaboration opportunities in the field of earth science and the environment with experts and key persons from diverse sectors including industry, governments, local authorities, research associations and organizations, as well as academia.

The following specific sessions are focused on "Earth Science & Environmental Engineering" at EKC 2019:

- 1) Adaptation to climate change in cities
- 2) Current issues of urban air quality
- 3) Current issues of urban water
- 4) Waste treatment and management
- 5) Circular economy and sustainability
- 6) Current environment-related topics on atmosphere, biosphere, hydrosphere and lithosphere
- 7) Poster presentation

Through these events, the "Earth Science & Environmental Engineering" group offers delegates a valuable opportunity to create a new network between Europe and Korea.

### PROGRAMME COMMITTEE



**PROF. KIM, Junbeum (김준범)**

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**DR. LEE, Hyunjung (이현정)**

Office for Environmental  
Protection

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### [D4\_2] Plastic Waste Treatment and Management in Korea and the EU 17 Jul (Wed) 16:00 – 17:15

<b>Convener/Chair</b> <b>Room: 5.15</b>	<b>PROF. RHEE, Seung-whee</b> (Kyonggi Univeristy, Chair, KSWM)
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16:00 – 16:15	<b>Circular Economy with Plastic: Plastic Waste, Recycling, and Biodegradable Plastic</b> <u>Seung Hye Lee</u> Leipzig University
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16:15 – 16:30	<b>Plastic waste management and flow analysis in South Korea</b> <u>Sora Yi</u> Korea Environment Institute
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16:30 – 16:45	<b>Current Status and Perspectives on Recycling of Waste Plastics in Korea</b> <u>Seung-Whee Rhee</u> <sup>1</sup> , Dal-Ki Min <sup>2</sup> <sup>1</sup> Kyonggi University, <sup>2</sup> Gachon University
16:45 – 17:00	<b>Plastic waste management in the EU</b> <u>Junbeum Kim</u> University of Technology of Troyes
17:00 – 17:15	<b>Group Discussion</b> <u>Sung-whee Rhee</u>

**[D4\_3] Response Technology & Strategy and Policy for Climate Change 18 Jul (Thu) 09:00 – 10:15**

<b>Convener/Chair</b> <b>Room: 5.15</b>	<b>MR. SONG, Jaeryoung</b> (Center for Climate Technology Cooperation, GREEN TECHNOLOGY CENTER) <b>DR. AHN, Ji-whan</b> (Korea Institute of Geoscience and Mineral Resources)
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09:00 – 09:15	<b>Numerical Study on Multi-Scale Diffusion of CO<sub>2</sub> Leaked from Seafloor of Southeastern Coast of Korea during Ocean Geological Storage</b> <u>Se-Min Jeong</u> <sup>1</sup> , Seokwon Ko <sup>1</sup> , Jong-Chun Park <sup>2</sup> , Henzeh Leeghim <sup>3</sup> , Chang-Yull Lee <sup>3</sup> <sup>1</sup> Department of Naval Architecture and Ocean Engineering, Chosun University, <sup>2</sup> Department of Naval Architecture and Ocean Engineering, Pusan National University, <sup>3</sup> Department of Aerospace Engineering, Chosun University
09:15 – 09:30	<b>An analysis of media coverage during the 2018 heat wave in South Korea</b> <u>Yi Hyun Kang</u> Technical University of Munich
09:30 – 09:45	<b>Importance of livestock manure storage: Reduction of odor/greenhouse gases emission and enhancement of subsequent biogas production</b> <u>Dong-Hoon Kim</u> , Seongwon Im Inha University
09:45 – 10:00	<b>The use of thermal treatment residues for H<sub>2</sub>S removal from biogas</b> <u>Valentine GASQUET</u> , Boram KIM, Hassen BENBELKACEM Univ Lyon, INSA Lyon, DEEP (Déchets Eaux Environnement Pollutions)
10:00 – 10:15	<b>Korea-EU R&amp;D Cooperation for Implementation of the Paris Agreement</b> <u>Jaeryoung SONG</u> Center For Climate Technology Cooperation, Green Technology Center

**[D4\_5] Green countermeasures as a strategic approach  
for the adaptation to climate change**

**18 Jul (Thu) 16:45 – 18:00**

Convener/Chair Room: 5.15	DR. LEE, Hyunjung (Office For Environmental Protection, City Of Stuttgart, Germany)
16:45 – 17:05 INVITED	<b>Maximum potential of green infrastructure to reduce human heat stress on urban conversion areas</b> <u>Helmut Mayer</u> Albert-Ludwigs-University of Freiburg, Chair of Environmental Meteorology
17:05 – 17:25	<b>Street trees mitigate severe local heat stress for pedestrians in summer</b> <u>Hyunjung Lee</u> Office for Environmental Protection, City of Stuttgart, Germany
17:25 – 17:45 INVITED	<b>Strategies for the evaluation of green infrastructure as a measure for climate change adapted urban planning and architecture</b> <u>Bernhard Scharf</u> <sup>1</sup> , <u>Florian Kraus</u> <sup>2</sup> <sup>1</sup> University of Natural Resources and Life Sciences Vienna – Institute of Soil Bioengineering and Landscape Construction, <sup>2</sup> GREENPASS GmbH, Vienna

**[D2/D4/D6\_13] Particulate Matter Issue; From IoT Sensing  
Technologies to Data Collection & Monitoring**

**18 Jul (Thu) 10:15 – 11:30**

Convener/Chair Room: 5.15	PROF. LEE, Heekwan (Incheon National University)
10:15 – 10:30 INVITED	<b>A joint analysis of air pollution level and digital social media activity: A case study of Paris and its area.</b> <u>PEREZ Charles</u> , SOKOLOVA KARINA, GUNCU HUSEYIN Paris School of Business
10:30 – 10:45	<b>Contributions of Brake/Tire Wear Particles to Non-exhaust Traffic Related PM</b> <u>Seokhwan Lee</u> KIMM
10:45 – 11:00	<b>TBD</b>
10:45 – 11:00	<b>TBD</b>

## Division: D5. Architecture / Civil Engineering

As there is greater pressure for sustainable development, the requirements from the built environment are becoming more demanding. There is broad agreement that densely populated urban areas should be more sustainable rural areas. However, whilst over half the planet's population lives in cities, they account for more than 75% of the consumption of non-renewable resources, causing climate change. Built Environment group will take a new perspective on sustainable built environment and strategical approaches responding to climate change. The sessions aim to bring together built environment professionals, climate and energy researchers, policy experts and government officials to discuss recent research and works. The sessions of the Built Environment will allow delegate to increase their knowledge and skills related to sustainable development, building design and the performance of buildings and materials.

### PROGRAMME COMMITTEE



PROF. LEE, Pyoung-jik (이평직)

University of Liverpool

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### [D5\_1] Sustainable built environment and urban design

17 Jul (Wed) 13:00 – 15:30

Convener/Chair Room: 5.16	DR. LEE, Pyoung Jik (Lecturer, University of Liverpool) DR. JEONG, Jeong Ho (Senior Researcher, FILK)
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13:00 – 13:30 INVITED	<b>Combined exposure to transportation sources, the built environment and health: a lifespan perspective.</b> <u>Peter Lercher</u> Graz University of Technology
13:30 – 13:50	<b>Visual information effect on the subjective evaluation of floor impact sound</b> <u>Jeong-Ho Jeong<sup>1</sup>, Sung-Chan Lee<sup>2</sup>, Jong-In Choi<sup>2</sup></u> <sup>1</sup> Fire Insurers Laboratories of Korea, <sup>2</sup> Yongsan University
13:50 – 14:10	<b>Acoustics and psychological well-being in built environments</b> <u>Pyoung Jik Lee</u> University of Liverpool
14:10 – 14:30	<b>Technology development to improve urban resilience in declining areas</b> <u>Minhee Je, Seunghyun Jung, Minju Kim</u> KICT
14:30 – 14:50	<b>Web/mobile-based information system for the Korean Building Regulation (e-KBC)</b> <u>Youngchan You, Sunwoo Park</u> KICT

Convener/Chair Room: 5.16	DR. LEE, Keonho (Research Fellow, KICT)
15:30 – 15:50 INVITED	<b>Planning and operation of multi-energy systems at district level</b> <u>Kristina Orehounig</u> , Bollinger Andrew Swiss Federal Laboratories for Materials Science and Technology (Empa)
15:50 – 16:10 INVITED	<b>The value of urban data</b> <u>Alanus Von Radecki</u> Fraunhofer IAO
16:10 – 16:30	<b>Smart city policies and strategies in Korea</b> <u>Seunghyun Jung</u> KICT
16:30 – 16:50 INVITED	<b>Urban mining and the circular economy at Empa NEST</b> <u>Reto Largo</u> Swiss Federal Laboratories for Materials Science and Technology (Empa)
16:50 – 17:10 INVITED	<b>Zero energy building Germany</b> <u>Olaf Boettcher</u> Federal Institute for Research on Building, Urban Affairs and Spatial Development
17:10 – 17:30	<b>Smart healthy home model for indoor air quality improvement using AI</b> <u>Hyeonjeong Yang</u> <sup>1</sup> , <u>Sooam Kim</u> <sup>2</sup> , <u>Eunkyoung Hwang</u> <sup>3</sup> , <u>Hyunsoo Lee</u> <sup>4</sup> <sup>1</sup> Research Specialist, KICT <sup>2</sup> Senior Research Fellow, <sup>3</sup> Research Fellow, <sup>4</sup> Professor

## Division: D6. Electrical, Electronic, and Informational Engineering

In recent years Information and Communication Technology (ICT) has drastically evolved in multifold directions at an accelerated pace. Advancements of semiconductors, communication technologies, front-end/back-end software engineering, and various engineering fields are intertwined together yielding emerging technologies, which even expedite development and collaboration. Various relevant R&BD topics attract multiple interdisciplinary societies, seeing vast amount of opportunities in research and business. Innovative companies and research organizations successfully show up their challenging ideas, which create new user experiences, thereby making digital personalization come true. Some keywords in these regards include artificial intelligence (AI), 5G, IoT, AR/VR, blockchain, etc. It goes without saying that high-speed networks and ultra-scale data centers in systems and associated components in subsystems play essential roles as enablers to realize such technologies. In the following sessions, we aim to cover recent R&D activities in EU and Korea on the state-of-the-art ICT while discussing technological hurdles and on-going evolutions in it. Topics mainly covered are AI, various sensors and their relevant technologies, 5G, wired and wireless communications, and high-frequency applications.

## PROGRAMME COMMITTEE



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**DR. CHOI, Jung Han (최정환)**  
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### [D6\_1] ICT Technologies for Human Interface

17 Jul (Wed) 16:00 – 17:15

**Convener/Chair** DR. AN, Jae-Sung (TU Delft)  
**Room: 5.18** DR. KIM, Taehoon (TU Delft)

16:00 – 16:30 INVITED	<b>Millimeter-scale computers as the next generation computing class for Internet-of-Everything</b> <u>Taekwang Jang</u> ETH Zurich
16:30 – 16:40	<b>Semiconductor Technologies for Biological Applications</b> <u>Seungkyu Ha</u> KU Leuven
16:40 – 16:55	<b>Validity of Real Time Gait Analysis Using a Single Head-Worn IMU</b> <u>Tong-Hun Hwang</u> <sup>1</sup> , <u>Julia Reh</u> <sup>2</sup> , <u>Alfred Effenberg</u> <sup>2</sup> , <u>Hoger Blume</u> <sup>3</sup> <sup>1</sup> Institute of Microelectronic systems, Leibniz University Hannover, <sup>2</sup> Institute of Sports Science, Leibniz University Hannover, <sup>3</sup> Institute of Microelectronic systems, Leibniz University Hannover
16:55 – 17:05	<b>High SNR and High Frame Rate Analog Front-End ICs with Active Stylus for Capacitive Touch Screen Panels</b> <u>Taekwang Jang</u> <u>Jae-Sung An</u> Delft University of Technology
17:05 – 17:15	<b>8-Channel Ultrasound Receiver with a Beamforming Embedded SAR ADC</b> <u>Taehoon Kim</u> Delft University of Technology

Convener/Chair Room: 5.18	KIM, Juhoon (Deutsche Telekom AG)
15:35 – 15:45	<b>PriMO-5G project: smart firefighting with immersive videos through 5G</b> <u>Ki Won Sung</u> KTH Royal Institute of Technology
15:45 – 15:55	<b>5G for Vertical Business; Use Cases, Current Status, Next Step</b> <u>Seil Jeon</u> Huawei Technologies, Stockholm Research Center
15:55 – 16:05	<b>Partition-based Task Mapping for Communication Energy Minimization in 3D Network-on-Chip</b> <u>Sanghoon Kwak</u> Intel Deutschland GmbH
16:05 – 16:15	<b>The killer service for the 5G network.</b> <u>Kwangil Jung</u> Miliwave - Korea 60G Wigi company
16:15 – 16:45	<b>Panel Discussion</b>

## [D1/D6\_5] Information Science(and Machine learning with Neural Networks) 17 Jul (Wed) 13:00–15:30

Convener/Chair Room: 5.18	DR. SEO, Hyewon (CNRS - Univ. Strasbourg). DR. KANG, Kab Seok (Max Planck Institute for Plasma Physics)
13:00 – 13:30 INVITED	<b>Con Espressione! AI, Machine Learning, and Music</b> <u>Gehard Widmer</u> Institute for Computational Perception Johannes Kepler University, Linz and LIT   AI Lab, Linz Institute of Technology and Austrian Research Institute for Artificial Intelligence (OFAI), Vienna
13:30 – 14:00	<b>Multi-Task Deep Learning based Non-Verbal Communication Method for Cognitive Human-Robot Interaction</b> <u>KwangEun Ko</u> , In Hoon Jang, Gi Hun Yang, HyeunSeog Choi, Bummo Ahn, Dong Wook Lee Korea Institute of Industrial Technology
14:00 – 14:30	<b>Developing QA algorithm using Machine Reading Comprehension</b> <u>Wootae Jeong</u> , Hyelim Do 42maru
14:30 – 15:00	<b>Millimeter-scale computers as the next generation computing class for Internet-of-Everything</b> <u>Taekwang Jang</u> ETH zUrich

15:00 – 15:30      **Deep Momentum Strategy**  
Chulwoo Han  
Durham University

**[D3/D6\_8] Future RF and Microwave Technologies**

**18 Jul (Thu) 16:45 – 18:00**

**Convener/Chair**      DR. CHOI, Heungjae (Ser Cymru Research Fellow, Cardiff University)  
**Room: 5.18**          DR. CHOI, Jung Han (IC-Design Project Manager, Fraunhofer Heinrich Hertz Institute HHI)

16:45 – 17:05      **Noise reduction techniques for human vital-signal radar sensors**  
INVITED            Kawon Han, Songcheol Hong  
EE School, KAIST

17:05 – 17:20      **Embedded Packaging Technologies for Microwave and mmWave Applications**  
Dongsu Kim, Jong-Min Yook, Jun-Chul Kim  
KETI

17:20 – 17:35      **A Return Loss Equalizer Using Non-reciprocal Device for In-band Full-duplex RF Front-end**  
Junhyung Jeong<sup>1</sup>, Girdhari Chaudhary<sup>1</sup>, Phanam Pech<sup>1</sup>, Dongshin Kim<sup>2</sup>,  
Yongchae Jeong<sup>1</sup>  
<sup>1</sup>Chonbuk National University, <sup>2</sup>Korea Electronics Technology Institute

17:35 – 17:45      **Portable Microwave Power Excitation System Based on Substrate Integrated Waveguide Resonator for Rapid DNA Extraction**  
Heungjae CHOI  
School of Engineering, Cardiff University

17:45 – 18:00      **Ultra low-power high-speed IC and high-frequency packages for optical communication transceivers**  
Jung Han CHOI  
Fraunhofer Heinrich-Hertz Institute

**[D2/D4/D6\_13] Particulate Matter Issue; From IoT Sensing Technologies to Data Collection & Monitoring**

**18 Jul (Thu) 10:15 – 11:30**

**Convener/Chair**      PROF. LEE, Heekwan  
**Room: 5.15**          (Incheon National University)

10:15 – 10:30      **A joint analysis of air pollution level and digital social media activity: A case study of Paris and its area.**  
INVITED            PEREZ Charles, SOKOLOVA KARINA, GUNCU HUSEYIN  
Paris School of Business

10:30 – 10:45      **Contributions of Brake/Tire Wear Particles to Non-exhaust Traffic Related PM**  
Seokhwan Lee  
KIMM

10:45 – 11:00      **TBD**  
Heekwan Lee  
Incheon National University

10:45 – 11:00      **TBD**

## Devision: D7. Mechanical, Aerospace, Marine, and Nuclear Engineering

Europe is leading the development of the industrial revolution, and continuing to be a leader in world industry. European industry covers several industrial sectors that contribute to high economic valued-added activities and generate mass employment. This session group especially aims to gather Korean and European experts for their exchange of opinions/viewpoints and potential collaboration on mechanical engineering fields such as Automotive, Aeronautics/Aerospace, Naval/Ocean, and Nuclear Engineering. Various topics will be discussed in details, but not limited to the following topics:

- Advanced technology in vehicle transportation such as automotive and aircrafts
- Innovation in space satellites & space transportation
- Naval architecture & Oceanographic applications
- Offshore engineering & hydrodynamics
- Nuclear materials, radiation protection, and measurements
- Nuclear medicine and medical physics
- Robotics & Sensor technologies
- Smart manufacturing, machines, and innovative product technology
- Advanced Design, Numerical Analysis, Simulation, and Test Methods
- Advanced control methods and multidisciplinary

### PROGRAMME COMMITTEE



**PROF. JEONG, Cheol-ho (정철호)**  
Denmark Technical University  
ch.jeong@ekc2019.org



**DR. HA, Kwangtae (하광태)**  
Fraunhofer IWES  
k.ha@ekc2019.org

### [D7\_k] KEYNOTE LECTURE

17 Jul (Wed) 13:00 – 14:15

Convener/Chair      HA, Kwangtae  
Room: 5.01          (Fraunhofer)

13:00 – 14:00      **Internet of Production - Research Roadmap**  
KEYNOTE          Matthias Brockmann  
RWTH Aachen University



Convener/Chair Room: 5.01	PARK, Daehyun (Siemens Industry Software)
14:15 – 14:30 INVITED	<b>Overview of Recent Research Activities at the Wind Energy Institute of the Technical University of Munich (TUM)</b> <u>Carlo L. Bottasso</u> Technische Universität München
14:30 – 14:50	<b>Creation of a local sound source using bandgap</b> <u>Jaesoon Jung</u> , Cheol-Ho Jeong, Jakob S. Jensen Technical University of Denmark
14:50 – 15:10	<b>Incompressible Smoothed Particle Hydrodynamics with Generalised Particle Distribution</b> <u>Georgios Fourtakas</u> , Dae-Young Park, Abouzied Nasar The University of Manchester
15:10 – 15:30	<b>QUICK AND EFFICIENT SUBJECT-SPECIFIC FINITE ELEMENT MODELING OF THE FOOT USING MESH MORPHING</b> <u>Woo-Suck HAN</u> , Nicolas KROUPA, Baptiste PIERRAT, Jérôme MOLIMARD EMSE

Convener/Chair Room: 5.01	DR. YOON, Zizung (Technische Universität Berlin) PROF. HAN, Woo-suck (Ecole Nationale Supérieure des Mines de Saint-Etienne (EMSE))
16:00 – 16:15	<b>X2MDIS-Driven Vertical/Horizontal Integration Method for Smart Manufacturing: Business Process Scenarios and Data Models</b> <u>Jongwon Kwon</u> , Seonyoung Park, Yeonjun Choo Korea Testing Laboratory
16:20 – 16:35	<b>Spaceborne IoT communication : challenges, technologies and mission</b> <u>Zizung Yoon</u> Technische Universität Berlin
16:40 – 16:55	<b>Virtual Spring-Damper Modeling of Spacecraft Formation Flight Methods</b> <u>Jiyeon Maeng</u> UST-KARI
17:00 – 17:15	<b>Suspension of A Point-Mass-Attached Fiber in Non-Uniform Flows: Ballooning Flight of Spiders</b> <u>Moonsung Cho</u> Technical University of Berlin

Convener/Chair Room: 5.01	PROF. YANG, Changho (Oxford Brookes University, UK)
15:30 – 16:00	<b>Advanced sensing combustion dynamics and combustion-generated acoustic noise</b> <u>Seong-Ho Jin</u> University of Lincoln
16:00 – 16:30	<b>Deep Learning Based Fault Diagnosis of Bearing in Mechanical Systems with Nested Scatter Plot using Stator Current Signals</b> <u>Chan Hee Park</u> <sup>1</sup> , <u>Yong Oh Lee</u> <sup>2</sup> , <u>Byeng Dong Youn</u> <sup>3</sup> <sup>1</sup> KIST Europe, SNU, <sup>2</sup> KIST Europe, <sup>3</sup> SNU, OnePredict Inc.
17:00 – 17:30	<b>Optimization methodology of Urea-SCR system to achieve higher NOx reduction performance</b> <u>JOONSOO HAN</u> Chalmers University of Technology
17:30 – 18:00	<b>The Effects of the Cooling System with Al<sub>2</sub>O<sub>3</sub> Nanofluids on the Thermal Performances Behaviors of the Diesel Engine</b> <u>Gee-Soo Lee</u> <sup>1</sup> , <u>Chan-Jung Kim</u> <sup>2</sup> , <u>Moo-Yeon Lee</u> <sup>3</sup> , <u>Ki-Hyun Kim</u> <sup>4</sup> <sup>1</sup> Yongsan University, <sup>2</sup> Pukyong National University, <sup>3</sup> Dong-A University, <sup>4</sup> Silla University

Convener/Chair Room: 5.02	NAM, Dong (Lloyd's Register, Lead specialist)
14:15 – 14:40 INVITED	<b>Biodiversity Beyond National Jurisdiction and Shipping</b> <u>Elizabeth Bouchard</u> International Registries (U.K.) Limited
14:40 – 15:05	<b>Regulatory compliance from Marine to Offshore</b> <u>Dong Nam</u> Lloyd's Register
15:05 – 15:30	<b>Hydroelasticity in Ship Design</b> <u>Yongwon Lee</u> Lloyd's Register Global Technology Centre

Convener/Chair Room: 5.02	MR. OH, Dohan (UNIVERSITY OF STRATHCLYDE) MR. KWON, Bae Jun (Principle approval engineer, Stability-Maritime, DNV GL AS) DR. OTERKUS, Selda (DEPARTMENT OF NAVAL ARCHITECTURE, OCEAN & MARINE ENGINEERING, UNIVERSITY OF STRATHCLYDE)
16:00 – 16:25 INVITED	<b>Structural Health Monitoring of Ship Structures</b> <u>Erkan Oterkus, Selda Oterkus</u> University of Strathclyde
16:25 – 16:45	<b>Development of Numerical Model of Heaving-Buoy-type Wave Energy Converters Using Numerical Wave Tank Technique</b> <u>Weoncheol Koo, Sung-Jae Kim</u> Inha University
16:45 – 17:00	<b>Burst pressure prediction method for thin-walled API 5L X grades pipelines with dent</b> <u>DOHAN OH</u> University of Strathclyde
17:00 – 17:15	<b>A numerical modelling of elastic fluid-structure interaction for aquaculture floater applications</b> <u>Sungsoo Lim, Tobias Martin, Hans Bihs</u> Norwegian University of Science and Technology

Convener/Chair Room: 5.02	DR. JEONG, Byongug (University of Strathclyde) PROF. KIM, Hyunsoo (Inha Technical College)
09:10 – 09:35 INVITED	<b>Marine engines simulation – In-house or commercial tools?</b> <u>Gerasimos Theotokatos</u> University of Strathclyde
09:35 – 10:00	<b>A Numerical Study on the Effect of an Air Lubrication System for the Frictional Resistance Reduction of a Ship</b> <u>Kwang-Jun Paik Paik, Dong-Young Kim</u> Inha University
10:00 – 10:25	<b>Pressure Estimation based on Velocity Profiles on under Deck due to Wave Impact</b> <u>Kwang Hyo Jung<sup>1</sup>, Tien Trung Duong<sup>1</sup>, Gang Nam Lee<sup>1</sup>, Jae Myung Lee<sup>1</sup>, Dae Seung Cho<sup>1</sup>, Hyun Soo Kim<sup>2</sup></u> <sup>1</sup> Pusan National University, <sup>2</sup> Inha Technical College
10:25 – 10:50	<b>R&amp;D Planning for the Technology of Maritime Autonomous Surface Ship in Korea</b> <u>Jin Kim</u> KRISO

10:50 – 11:10	<b>The latest design and monitoring practice for Offshore Wind Foundations</b> <u>Yunsup Shin</u> NGI.NO
11:10 – 11:30	<b>Problems and Improvement Devices of Air Pollutants Management Policies in Korean Ports</b> <u>Yong Sung Ahn</u> Marine Policy Research Department, Korean Maritime Institute, Busan, Korea

**[D7\_8] Response of Climate Change in Marine & Ocean Engineering  
(KRISO-EKMOA JOINT SESSION)**

**18 Jul (Thu) 15:30 – 18:00**

Convener/Chair Room: 5.02	DR. LEE, Yongwon (Lloyd's Register & EKMOA, United Kingdom) DR. JOUNG, Tae-hwan (KRISO, South Korea) DR. JANG, Jinho(KRISO, South Korea)
15:30 – 15:55	<b>Sea Ice Research for the Influence of Climate Change on the Design of Ships and Offshore Structures</b> <u>Robert BRIDGES</u> Total S.A.
15:55 – 16:20	<b>Introduction of a Korea national R&amp;D project related with floating-type offshore structure in the Arctic Ocean</b> <u>Kuk-Jin Kang</u> <sup>1</sup> , <u>Young-Shik Kim</u> <sup>1</sup> , <u>Jin-Ho Jang</u> <sup>1</sup> , <u>So-Lyoung Han</u> <sup>2</sup> , <u>Hong-Gu Lee</u> <sup>3</sup> , <u>Kwang-Hyo Jung</u> <sup>4</sup> , <u>Hyun-Soo Kim</u> <sup>5</sup> , <u>Seung-Jae Lee</u> <sup>6</sup> , <u>Jae-Young Lee</u> <sup>7</sup> <sup>1</sup> Korea Research Institute of Ships & Ocean Engineering, <sup>2</sup> Samsung heavy industries co. ltd., <sup>3</sup> Korea Register, <sup>4</sup> Pusan national university, <sup>5</sup> Inha technical college, <sup>6</sup> Korea maritime & ocean university, <sup>7</sup> Dong-eui university
16:20 – 16:40	<b>Introduction of Initial IMO Strategy on Reduction of GHG Emissions from Ships and its Follow-up Actions</b> <u>TaeHwan JounG</u> , <u>Seong-Gil Kang</u> , <u>Jongkap Lee</u> KRISO
16:40 – 17:00	<b>Introduction of the experimental mooring performance evaluation method for a turret moored Arctic offshore structure</b> <u>Young-Shik Kim</u> , <u>Hyung-Do Song</u> Offshore plant research division, KRISO
17:00 – 17:20	<b>FEQUENCY DOMAIN ANALYSIS FOR CYLINDRICAL FPSO IN BARENTS SEA</b> <u>Sooyoung Min</u> university of strathclyde
17:20 – 17:40	<b>Global R&amp;D Collaborative programs in Korea</b> <u>Cheonkyo PARK</u> KIAT Europe office
17:40 – 18:00	<b>Discussion</b>

Convener/Chair Room: 5.04	DR. KANG, Ki-sig (IAEA) DR. SHIN Yong-hoon (SCK•CEN)
09:00 – 9:10	<b>Opening remarks</b>
09:10 – 09:30	<b>Nuclear energy and climate change</b> <u>Bong YOO</u> SCK•CEN
09:30 – 09:50	<b>Overview of the Status and Forecast of Nuclear Power Industries in the World</b> <u>WOOHO KIM</u> KEPCO E&C
09:50 – 10:10	<b>Overview of Plant Life Management for Long Term Operation in Nuclear Power Plant</b> <u>Ki Sig KANG</u> IAEA
10:10 – 10:25	<b>Adjourn / Coffee break</b>
10:25 – 10:45	<b>Non-Baseload Operation of NPPs: Reasons, Challenges and Solutions</b> <u>KILIC A. Nesimi</u> IAEA
10:45 – 11:05	<b>An overview of computational methods in nuclear physics modelling</b> <u>David Sangcheol Lee</u> The Manufacturing Technology Centre
11:05 – 11:25	<b>Nuclear fusion material research: diagnostic mirrors and castellated tiles</b> <u>Sunwoo Moon</u> KTH
11:25 – 11:45	<b>KJRR, Medical Radioisotope Production Reactor</b> <u>Kye Hong Lee</u> KAERI
10:10 – 10:25	<b>Adjourn / Coffee break</b>

Convener/Chair Room: 5.04	DR. YOO, Martin S. D. (CRUSE Offshore GmbH) MR. KIM, Hyung-geun (ULSAN Metropolitan City)
13:00 – 13:04	<b>Welcome and Introduction</b> <u>Martin S.D. Yoo</u> CRUSE Offshore GmbH
13:05 – 13:25	<b>Situation and Task of Offshore Wind Power in South Korea</b> <u>Sanghoon Lee</u> Korea Energy Agency

13:25 – 13:45	<b>Equinor's ambitions and perspectives on offshore wind in South Korea</b> <u>Sebastian BRINGSVæRD</u> Equinor
13:45 – 14:05	<b>Development of offshore wind project in Korea</b> <u>Woo Jin Choi</u> Macquarie-Green Investment Group
14:05 – 14:25	<b>Investigation of the Self-aligning behaviour of the passively yawing floating wind turbine</b> <u>Moustafa Abdel Maksoud</u> Hamburg University of Technology
14:25 – 14:45	<b>Design of Floating Offshore Wind Turbine (FOWT) "SelfAligner"</b> <u>Jens Cruse</u> CRUSE Offshore GmbH
14:45 – 15:00	<b>Lightweight superconducting generators for the next generation of floating offshore wind turbines</b> <u>Markus Bauer</u> THEVA Dünnschichttechnik GmbH
15:30 – 15:50	<b>Full-scale demonstrators, a necessary step towards commercial-scale bankability</b> <u>Bruno G. Geschier</u> Ideol Offshore
15:50 – 16:10	<b>FOWT Integrated Load Analyses – Impact on Innovation Process, Financing Costs and O&amp;M strategy</b> <u>B. Chassé</u> PRINCIPIA
16:10 – 16:30	<b>Offshore Floating Lidar Wind Measurements for Finance Grade Wind Resource Assessments</b> <u>Detlef Stein</u> Multiversum GmbH
16:30 – 16:45	<b>Introduction of the Open Sea Test Site for Both Wave Energy Converters and Floating Wind Turbines in Korea</b> <u>Jong-Su Choi</u> , JeongKi Lee, Chang Hyuck Lim, Tae Kyeoung Ko, Ji Yong Park, Kilwon Kim, Jeong-Hwan Oh, Taehwan Joung KRISO

#### [D7\_12] Offshore wind energy technology

18 Jul (Thu) 16:45 – 18:00

Convener/Chair Room: 5.04	PROF. KIM, Taeseong (Loughborough University, Professor)
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16:45 – 17:10	<u>DR. CZICHON</u> , Steffen Fraunhofer Institute of Wind Energy Systems (IWES)
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- 17:10 – 17:25      **A Numerical Analysis on the Effect of Wind Turbine Blade Erosion on Change in Performance Curve and Energy Production**  
Im Heejeon, Kim Bumsuk  
 Faculty of Wind Energy Engineering, Graduate School, Jeju National University
- 17:25 – 17:40      **Design of Highly Loaded Slewing Bearings - The Collaborative Project HBDV**  
Jae-Il Hwang, Torben Terwey, Gerhard Poll  
 Institute of Machine Design and Tribology, Leibniz University Hannover
- 17:40 – 17:55      **Numerical validations of scaled DTU 10MW TLP floating wind turbine with experimental data**  
Taeseong Kim  
 Loughborough University

## Division: D8. Humanities

Today's sciences and technology request interdisciplinary and multidisciplinary approach. Especially, when it comes to the principle of "science for all", the impact of scientific research on the human society should be considered. In this context, EKC 2019 open a series of sessions on humanities. Various topics on women, life, economy and future will be presented through oral and poster sessions.

## PROGRAMME COMMITTEE



**DR. CHO, Hyong Sil (조형실)**

Speech into Language  
and Data

hyongsil@gmail.com

## [D8\_1] Women in Sciences and technology

17 Jul (Wed) 13:00 – 15:30

Convener/Chair	DR. CHO, Hyong Sil (Speech into Language and Data)
Room: 5.27	PROF. KIM, Mi-hye (Chungbuk National University)

- 13:00 – 13:20      **Opening speech**  
Myeong Hee YU  
 KOWFST
- Welcome speech**  
Mi-young SONG(JEUNG)  
 EKWSEA
- 13:20 – 13:50      **Presentation of research themes**  
MRS. , Young Korean Women Scientists In Eu  
 European associations of Korean Scientists and Engineers
- 13:50 – 14:10      **대한가정학회 소개**  
Young-eun LEE  
 Wonkwang University; Korean Home Economics Association

13:50 – 14:10	<b>충북여성과학기술인회 소개</b> <u>Jiyeoun LEE</u> Jungwon University
	<b>한국생활과학회 소개</b> <u>Yoonjung CHOI</u> Chungbuk National University; Korean Association of Human Ecology
	<b>한국식생활문화학회 소개</b> <u>Hae Young KIM</u> Yongin University; Korean Society of Food Culture
	<b>한국멀티미디어학회 여성위원회 소개</b> <u>Young-suk LEE</u> Dongguk University
14:10 – 15:25	<b>Networking and discussion</b> <u>Mi-hye KIM</u> Chungbuk National University

#### [D8\_2] International business, marketing and management

17 Jul (Wed) 16:00 – 17:15

Convener/Chair Room: 5.27	UM, Juneho (University of Essex)
16:00 – 16:20	<b>Global SC uncertainty and risk management strategies for supply chain resilience</b> <u>Juneho Um</u> University of Essex
16:20 – 16:40 INVITED	<b>Main Issues of Container Terminal Automation and Development Strategy in Korea</b> <u>Sung-Woo Cho</u> Kunsan National University
16:40 – 17:00	<b>Effective technology accelerator model based in UK collaborating with KR and EU institutions</b> <u>Jung Min Lim<sup>1</sup></u> , Jung Min 'Leonardo' Lim <sup>2</sup> <sup>1</sup> Judge Business School, University of Cambridge, <sup>2</sup> L-WEB Limited
17:00 – 17:20 KEYNOTE	<b>Does Culture affect Consumer Behaviour, when shopping On-Line?</b> <u>Adnane Alaoui</u> Liverpool John Moores University

#### [D8\_3] Improving the livelihood of small-scale farmers in developing countries

18 Jul (Thu) 10:15 – 11:30

Convener/Chair Room: 5.27	MR. OH, Hongkun (Agriconsulting GROW) DR. KANG, Myung Joo (GrAT (Center for Appropriate Technology) TU Wien)
10:15 – 10:35	<b>Application of bio-economical farm model 'FarmDESIGN' in improving the livelihood of the small scale farmers in the developing countries</b> <u>Hongkun Oh</u> Agriconsulting GROW



10:40 – 11:00      **Gender and Agricultural Innovations in Developing Countries: A Reality Check**  
DAUN CHEONG  
 Wageningen Research and University

**[D8\_4] Humanities and Science - The Future is Back**

**18 Jul (Thu) 15:30 – 18:00**

**Convener/Chair**      **PROF. PARK, Juyong**  
**Room: 5.27**          **(Graduate school of culture technology)**

15:00 – 15:30      **Art & Science about the transdisciplinary, the accessible and the tangible**  
 Keynote          Horst Hörtner  
                          Ars Electronica Futurelab, Austria

15:30 – 16:00      **Session plenary talk: Art-Science in the 21st Century**  
 INVITED          Juyong Park  
                          Graduate School of Culture Technology, KAIST

16:00 – 16:30      **The effects of identity and structure on EDM DJ's professional status**  
 Invited          Wonjae Lee  
                          Graduate School of Culture Technology, KAIST

16:30 – 17:00      **Bridging Two Cultures - A Leap into the Realms of Reality**  
 Invited          Michael Hitchman  
                          University of Strathclyde

17:00 – 18:00      **Variability in Human Visual Representation**  
 Invited          Jeongmi Lee  
                          Graduate School of Culture Technology, KAIST

## INDUSTRY FORUM

### Global Industrial Technology Innovation Forum

#### DATE

16 (TUE) JULY, 2019 9:00 am – 6:00 pm

#### VENUE

Learning Center Kleiner Festsaal, Vienna University of Economics and Management (WU Wien)

#### ORGANISED BY

Korean Scientists and Engineers Association in Austria (KOSEAA)  
Korea Evaluation Institute of Industrial Technology (KEIT)

#### SUPPORTED BY

Vienna Business Agency  
Austria Research Promotion Agency (FFG)

The Industry Forum 2019 in Vienna will be organized by the Korean Scientists and Engineers Association in Austria (KOSEAA) and the Korea Evaluation Institute of Industrial Technology (KEIT) in cooperation with the Vienna Business Agency and the Austria Research Promotion Agency (FFG).

The aim of the Industry Forum is to enhance the cooperation between Korea and Europe in the area of industrial technologies and to promote mutually beneficial opportunities of industrial technology collaboration in the future. The Industry Forum 2019 will be a platform to bring the related industries and research institutes together to know each other and to foster the future collaboration.

The topics of the forum are selected based on the possible common interests of Korea and Europe, especially Austria, such as:

- Future Mobility
- Life Science
- Smart Production and Information & Communication Technology (ICT)

#### REGISTRATION DESK

##### LOCATION

Info Desk, LC (Learning Center), WU Wien  
(Ground Floor)

##### OPENING HOUR

08:00 am - 12:00 pm

#### PROGRAMME AT A GLANCE

08:00 am – 09:00 am	Registration
09:00 am – 12:30 pm	Global Industrial Technology Innovation Forum
12:30 pm – 02:00 pm	Lunch Break
02:00 pm – 06:00 pm	Thematic Presentations & B2B Meeting
07:00 pm – 09:30 pm	Networking

## Global Industrial Technology Innovation Forum

09:00 am – 09:10 am	<p>Opening Ceremony</p> <p><b>Moderator:</b> Dr. Bohyun Lee</p> <p><b>Welcome Address &amp; Congratulatory Remarks</b></p> <ul style="list-style-type: none"> <li>• Dr. Jong Mun Park Conference Chair. President of Korean Scientists and Engineers Association in Austria (KOSEAA)</li> <li>• Yang Ho Chung, PhD. Chairman and President of Korea Evaluation Institute of Industrial Technology (KEIT)</li> <li>• Dr. Henrietta EGERTH Managing Director, Austrian Research Promotion Agency (FFG)</li> <li>• Jae Moon PARK, PhD. President, Telecommunications Technology Association (TTA)</li> </ul>
09:10 am – 09:40 am	<p><b>Key Note Speech I</b></p> <p>How to enhance the industrial cooperation Between Korea and EU for digital economy. Dr. Wonsok Yun Chairman, Institute for Global Industry Competitiveness, Professor, Sookmyung Woman's University.</p>
09:40 am -10:10 am	<p><b>Key Note Speech II</b></p> <p>Dr. Roland BRANDENBURG Coordinator International R&amp;D Cooperation, Austrian Research Promotion Agency (FFG)</p>
10:10 am – 10:30 am	Coffee Break and Networking
10:30 am - 11:00am	<p><b>Key Note Speech III</b></p> <p>EUREKA – A global network for industrial research, development and Innovation Dr. Peter CHISNALL Head of Operations, Eurostars Programmes</p>
11:00 am – 11:30 am	<p><b>Key Note Speech IV</b></p> <p>Industrial Technology R&amp;D Investment Strategy in South Korea Dongsun KIM, PhD. Program Director in field of Semiconductor, Korea Evaluation Institute of Industrial Technology (KEIT)</p>
11:30 am – 12:00 pm	<p><b>Key Note Speech V</b></p> <p>Smart Manufacturing Coping with the Industry 4.0 Sangmok LEE, PhD. Vice President, Korea Institute of Industrial Technology (KITECH)</p>
12:00 pm – 12:30 pm	<p><b>Key Note Speech VI (tbc)</b></p> <p>A.I. and Autonomous Driving by HYUNDAI NN, Hyundai Motor Europe Technical Center GmbH</p>
12:30 pm – 02:00 pm	Lunch Break

## Thematic Presentation & B2B Consultation Meeting

Venue: TC Building 5th Floor, WU Wien

Organised by: KOSEAA (Korean Scientists and Engineers Association in Austria), KEIT (Korea Evaluation Institute of Industrial Technology), Vienna Business Agency, Austrian Chamber of Commerce (tbc)

### To find the room

- An interactive plan of the campus is available <https://campus.wu.ac.at/en/> link or below
- Zoom the Building for example, TC
- Select the Floor 5

02:00 pm – 4:30 pm      Thematic Presentations

**Future Mobility (Room: TC 5.13)**

**Smart Production and Information & Communication Technology**

**Life Science (Room: TC 5.15)**

04:30 pm – 05:00 pm      Coffee break & Networking

05:00 pm – 06:00 pm      B2B Meeting

06:00 pm – 07:00 pm      Drive to Viennese Heuriger

07:00 pm – 10:00 pm      Dinner & Networking

## KEYNOTE SPEAKER



**Dr. Wonsok Yun**

Chairman, Institute of Global Industry Competitiveness

### Biography

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Dr. WonSok Yun is Coordinator Professor at Sookmyung Woman's University since August, 2018. Dr. YUN is a Chairman of IGIC(Institute of Global Industry Competitiveness) which is a Forum associated with MOTIE(Ministry of Trade, Industry and Energy). Dr. Yun had retired as a Board Member and Executive Vice President of KOTRA(Korea Trade Investment Promotion Agency) which is a non-profit national government agency to promote international trade and investment through its own 127 global offices. He had served almost 33 years with KOTRA and had a lot of important positions in Global Market Intelligence, Trade Negotiation, outbound Investment, M&A, Expo and trade show, ODA CSR etc. Dr. Yun was also appointed as Head of Presidential Economic Diplomacy Support Centre which implement organizing economic delegation and conducting business partnership events when President's Official Overseas Trips between 2015~2017. Dr. Yun successfully initiated and developed key international projects which contributed Korea's overall economy growth and globalization for Korean companies. Dr. Yun also served official overseas missions for totally 13 years through 4 times service in USA, Canada and Africa. Dr. Yun holds a Phd. in Business Administration from Sungkyunkwan University and MBA from Seoul National University. Dr. Yun was awarded the Order of Industrial Service Merit from President of Korea.

### Keynote Title:

**How to enhance economic cooperation between Korea and EU for the Digital Economy**

## KEYNOTE SPEAKER



**Dr. Peter Chisnall**

Head of Operations, EUREKA Association, Brussels

### Biography

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Peter is responsible for managing the Eurostars funding programmes under FP7 and Horizon 2020. He is an expert in the design and running of international funding programmes.

Prior to EUREKA, he gained experience at the European Commission and European Research Council. Industrial experience includes time at Wyeth Pharmaceuticals (now part of Pfizer) and with Reaxa, an R&D intensive SME within the speciality chemical sector.

Peter was educated at Aston University (UK) and holds a BSc in Applied Chemistry and a PhD in Organic Chemistry.

### Keynote Title:

**EUREKA – A global network for industrial research, development and Innovation**

# COMPLEMENTARY PROGRAMME



## FRONTIER RESEARCH OPPORTUNITIES THROUGH EU & INTERNATIONAL GRANTS & FELLOWSHIPS

### FRONTIER RESEARCH OPPORTUNITIES for FRONTIER RESEARCH

Date / Time	2019-07-16 / 14:00 - 15:20
Room	5.03
Convener	DR. KIM, Hyong- Ha (European Research Council NCP / HFSP National Coordinator/ KRISS Principal Research Scientist)

**Synopsis** This special session is organized by the European Research Council (ERC) National Contact Point of Korea, aiming to introduce various fellowship opportunities funded by the EU- (Marie Skłodowska Curie Action) and International Organization Human Frontier Science Program (HFSP) to Korean researchers based in Europe as well as Korea.

The speakers are former or current Korean fellowship holders, either based in Europe or Korea, and this session will mainly cover their testimonials. The speakers will share their efforts, trials, failure & success stories in obtaining fellowships, in addition to how the fellowships helped them establish their research career in Europe & Korea, in hopes of giving insight to fellow researchers. Also, they will be present to address questions from the audience.

This session may be helpful to graduate students/postdocs who are planning for postdoc positions in Europe as their next career move, as well as principal investigators who are mentors to these candidates.

This session will use Korean only without translation.

Part 1: International Organization Fellowship Opportunities  
- Human Frontier Science Program Fellowship Awardees' Testimonials

Part 2: EU-Funded Fellowship Opportunities  
- Introduction of Marie Skłodowska-Curie Action (MSCA) COFUND Fellowship  
- MSCA Individual Fellowship Fellows' Testimonials

Part 3: EMBO Fellowship Opportunities  
- EMBO Individual Fellowship Fellows' Testimonials

Part 4: Question & Answer Session with the Speakers

In addition to this session, there will be another session on July 18th 13:00~15:00, with high-level officials as speakers from the European Research Council, European Commission Directorate-General for Education, Youth, Sport, and Culture (Marie Skłodowska Curie Action), and Human Frontier Science Program Organization.

Also an information booth for these organizations will be present during the conference, with informative leaflets and booklets. A communication officer from ERC will be present at the booth.



16:30 – 16:40	<b>Human Frontier Science Program Research Grant</b> DR. LEE, Sang Wook (Ewha Woman's University, Dept. of Physics)
16:40 – 16:50	<b>Human Frontier Science Program Young Investigator Grant</b> DR. JU, Young Seok (Korea Advanced Institute of Science & Technology)
16:50 – 17:10	<b>Question &amp; Answer Session</b> DR. KIM, Hyong-ha (KRISS (Principal Research Scientist), ERC NCP & HFSP Adviser, Korea)

## FRONTIER RESEARCH OPPORTUNITIES through EU & Internal Grants & Fellowships

Date / Time	2019-07-18 / 13:00 – 15:10
Room	5.03
Convener	DR. KIM, Hyong-ha (Korea National Contact Point of ERC, HFSP National Coordinator & Principal Research Scientist, KRISS)
COChair	DR. KANG, Sungwon (Research Fellow, Korea Institute of Civil Engineering & Building Technology)

**Synopsis** This special session is organized by the European Research Council (ERC) National Contact Point of Korea, aiming to introduce grant opportunities funded by the EU- and International Organization Human Frontier Science Program (HFSP) to Korean researchers based in Europe as well as Korea.

The ERC President Prof. Jean-Pierre Bourguignon will be present to share insight with young researchers, as well as the ERC Head of Department of Scientific Management, Prof. Jose Labastida (ERC), Prof. Warwick Anderson, Secretary General of HFSP, and EC officials to introduce each organization's funding and address the audiences' questions.

Part 1: Introducing EU-funded Grant & Fellowship opportunities

- Horizon 2020 funding opportunities
- ERC grant opportunities
- MSCA grant & fellowship opportunities

Different funding schemes such as ERC grants, Marie Skłodowska-Curie actions (MSCA), and Horizon 2020 thematic projects will be presented by appropriate experts from the ERC, DGEAC (Directorate-General for Education, Youth, Sport and Culture, for MSCA), and DGRI (Directorate-General for Research & Innovation for Thematic projects of Horizon 2020).

Part 2: Introducing Funding Opportunities by International Organization HFSP

- HFSP grants & fellowship opportunities

HFSP has provided grants and fellowships to researchers all over the world for the past 30 years. These funding tracks, recent trends, along with data of Korean researchers' participation. will be introduced.

### Part 3: International S&T Cooperation Programs & Policies of Korea

- Korea-Europe International Cooperation Programs funded by MSIT
- Korea-Europe S&T International Cooperation Policies & Activities

### Part 4: Panel Discussion and Q&A

With the ERC President and other presenters as panel members, in-depth discussion will be held to share more information. Along with the speakers, Korean ERC grantees, MSCA fellows & HFSP awardees will be present to answer questions from the audience. During panel discussion, they may share their efforts, trials, failures & successes in getting grants, in addition to how the grants helped them establish their research career in Europe & Korea, in hopes of giving insight to fellow researchers.

Also an information booth for these organizations will be present during the conference, with informative leaflets and booklets. A communication officer from ERC will be present at the booth.

#### \* Organizing Committee

- Chair: Hyong-Ha KIM, Ph.D., ERC NCP for Republic of Korea, Principal Research Scientist, KRISS
- Sungwon Kang, Ph.D., Research Fellow, Korea Institute of Civil Engineering & Building Technology (National Liaison & Coordination)
- Teun-Teun Kim, Ph.D., Research Professor, IBS Young Scientist Fellow, Center for Integrated Nanostructure Physics, Institute for Basic Science, Sungkyunkwan University (International Coordination & Liaison with Organizers)
- Seunghwan Lee, , Ph.D., Associate Professor, Technical University of Denmark (Contents Coordination & Program Planning)

13:00 - 13:10	<b>Opening of the Session &amp; Introduction of Speakers</b> DR. KIM, Hyong-ha (KRISS (Principal Research Scientist), ERC NCP & HFSP Adviser, Korea)
13:10 - 13:30	<b>European Research Council Grant Opportunities</b> PROF. LABASTIDA, Jose (The European Research Council Executive Agency)
13:30 - 13:50	<b>Marie Skłodowska-Curie Action Grant Opportunities</b> MR. RICHTER, Bodo (European Commission, Directorate-General for Education, Youth, Sport & Culture)
13:50 - 14:10	<b>Human Frontier Science Program Fellowship &amp; Grant Opportunities</b> DR. ANDERSON, Warwick (Human Frontier Science Program Organization)
14:10 - 14:20	<b>Group photo session</b>
14:20 - 14:40	<b>International S&amp;T Cooperation Programs &amp; Policies of Korea</b> DR. KIM, Jong-deok (The National Research Foundation of Korea (NRF))

- 14:40 – 15:00      **Horizon 2020 Funding Opportunities**  
MR. ARENTOFT, Michael  
(European Commission, Directorate-General for Research & Innovation))
- 15:00 – 15:10      **Question & Answer Session / Panel Discussion**  
DR. KIM, Hyong-ha  
(KRISS (Principal Research Scientist), ERC NCP & HFSP Adviser, Korea)

## [NST & KIST EUROPE] KOREA-EUROPE R&D COLLABORATION PLATFORMS

### Encouraging Korea-Europe Collaboration through the Innovative R&D Platforms

Date / Time	2019-07-18 / 13:00 – 15:20
Room	5.02
Chair	DR. HAHN, Sun-hwa (Director General / Policy Office / NST)

**Synopsis**      Korean Government has supported Korea-EU R&D collaboration using many kinds of platforms, organizations and networks. This session introduces some platforms – such as KOSEN – as efficient mechanisms which foster innovation ecosystem in terms of R&D cooperation between Korea and European countries.

KOSEN (Korean Scientists and Engineers' Network), established in 2007 by KISTI, is a cyber human networking for Korean scientists working around the world. It not only connects people all over the world but also helps researchers find their research partners by matching R&D needs.

KIST Europe is located in Saarbrücken, Germany and has launched a Global Test-bed platform, which could be used as a test-bed to fulfill some feasibility test or research. This is open facility for every kind of research organization.

#### Objective

In this session NST and KISTI will organize some presentations to share collaboration experience and encourage their further effort with EU partner. One joint research case matched through KOSEN will be shared and several government-funded research institutes (GRIs) will explain their research cooperation needs with Europe.

In this session, Global Test-bed platform in KIST Europe would be introduced also. This session is open for all participants in EKC 2019.

#### Scope of the session

Then we could summarize the scope of this session as follow;

- To introduce exchange collaboration experience
- R&D needs match-making
- Platform for the exchange and transfer of collaboration needs

Scope of the session

Then we could summarize the scope of this session as follow;

- To introduce exchange collaboration experience
- R&D needs match-making
- Platform for the exchange and transfer of collaboration needs
- Issue discussion within the participants in the platform (in closed session)

13:00 - 13:05	<b>Introduction of 1st Session</b> DR. HAHN, Sun-wha (NST)
13:05 - 13:15	<b>KOSEN: Korea-Europe Scientists Network Platform</b> DR. YOON, Jung-sun (Principal Researcher / Convergence Service Center / KISTI)
13:15 - 13:25	<b>Global Test-Bed in KIST Europe : Support for Collaboration</b> DR. SEO, Jeongho (Head of Department / Global Cooperation Department / KIST Europe)
13:25 - 14:05	<b>Share the experiences : Korea-EU R&amp;D Machmaking</b> DR. DIFFERENT PRESENTER, (Differnet Organization)
14:05 - 14:10	<b>Wrap-Up and Discussion</b> MR. ,
14:10 - 14:20	Sessino Break and preparation of second half
14:20 - 14:50	<b>A global network for industrial research, development and Innovation</b> DR. CHISNALL, Peter (Eurostars Program)
14:50 - 15:00	Q&A and Discussion about EUREKA Program - How to facilitate the collaboration between Korea and EU

# [NRF-KERC] DIRECTIONS FOR KOREAN RESEARCHERS IN EUROPE TO UTILIZE NRF AND KERC

## [NRF-KERC] Directions for Korean Researchers in Europe to utilize NRF and KERC

Date / Time	2019-07-18 / 13:00 - 15:00
Room	5.18
Chair	DR. KIM, Myon Jung (Korea-EU Research Centre (KERC))

**Synopsis** This session aims to provide Korean researchers in Europe with practical information for participation in international cooperation programs under the NRF Grants and also for promotion of Korea-Europe R&D collaboration using cooperation platform, KERC scheme.

It consists of three parts as follows ;

1) 'The road to NRF vision 2030' shows diverse programs and activities of NRF. This part will enable Korean researchers in Europe to contact NRF and participate in the respective programs. Through comprehensive R&D programs, implemented by NRF, covering all academic fields for personal and group/institute-level project, Korean researchers may find multiple paths to build and foster individual capacity and also to bring in new cooperative activities to the organization where they belong.

2) 'Opportunities for Korean researchers in Europe' shows the effective way to international cooperation. In particular, it explains how to join Brain Pool or Korea Research Fellowship program through which Korean government attracts excellent researchers in overseas countries to stay and conduct collaborative research with their partners in Korea. With this part, Korean researchers will get tailored information and knowledge related to bilateral and multilateral cooperation programs between Korea and Europe. Also, there will be an introduction to a R&D platform, KERC, located in Brussels, which facilitates and enhances the R&D collaboration between both sides. Once connected to KERC, Korean researchers will get opportunities of partnering and match-making for international cooperation.

3) 'Q&A'

Accordingly, the audience can get abundant information and knowledge regarding how to find an effective path to join in the international projects between Korea & European countries and European programs(such as Horizon 2020) as well. This session deals with not only funding opportunities in a nutshell but also substantial and useful approach focusing on Korean researchers based in European countries. Additionally, there'll be a Q&A time to meet the researcher's individual need.

13:00 - 13:30	DR. KIM, Myon Jung (Korea-EU Research Centre (KERC))
13:30 - 14:00	DR. KANG, Dongseob (National Research Foundation)

# INNOVATIVE URBAN REGENERATION PARADIGM

## [Innovative Urban Regeneration Paradigm]

Date / Time	2019-07-18 / 13:00 - 15:00
Room	5.16
Convener	MR. YANG, Jin Seok (BaroArch Design Lab)

### Synopsis

A city consists of a number of 'Units', the most important of them is human being. We became a family. Family became a village. A village became a town. A town became a city. And we live in a city.

Every city has its own history, which encompasses evolution of the city from the beginning to now. A city has been formed on the basis of human needs. In other words, it can be dilapidated once it has no more to give us what we need.

Urban growth, which used to rely on society's activities, trades or the public's specific behaviours, has started to show a productivity pattern that would possibly result in urban gentrification due to lack of public's appreciation of long term view towards urban renewal and the need for massive financial resources. It has become apparent that it needs to be controlled by not only government or local authorities but also the one whom lives and will live in the city.

Urban regeneration came from an ideology that the most of cities in the world possesses greater amount of land which has been underused or left in a really poor condition even though it used to be so fertile and popular that it grew quickly to be able to accommodate so many residents and which we should look to bring back to what it should be. This session not only look at a regeneration process in terms of urban planning and sustainable measurements but also touch on energy and environment. Successful precedents in Denmark and other European countries would supplement the latter. In addition, it would be emphasized how important role the community-led planning process and study plays in urban regeneration development.

### Session Structure

#### Part 1

13:00 to 13:20 Jin Seok Yang's presentation on urban regeneration by re-purposing of retail concept and public realm

13:20 to 13:40 Panel Discussion. Panel consists of Professor Taesung Kim at Loughborough University, Lecturer Dr. Pyoung-Jik Lee at University of Liverpool and others to be confirmed soon

13:40 to 13:50 Q&A

#### Part 2

13:50 to 14:20 Soham De's presentation on Letchworth Garden City Design Competition winning concept

14:20 to 14:45 Panel Discussion. Panel consists of Professor Taesung Kim at Loughborough University, Lecturer Dr. Pyoung-Jik Lee at University of Liverpool and others to be confirmed soon

13:45 to 14:55 Q&A

14:55 to 15:00 Convenor's remark to wrap up the session

13:00 – 13:20	<b>Innovative urban regeneration paradigm</b> MR. YANG, Jin Seok (Planning, Baroarch Design Lab, Cambridge, UK)
13:20 – 14:20	<b>A systemic approach to healthy place-making – Re-imagining the Garden City</b> MR. DE, Soham (Ecoresponsive Environments)

## [KRICT] YOUNG SCIENTISTS IN CHEMISTRY

### [KEIT] Open Forum: Global Technology Planning

Date / Time	2019-07-16 / 18:00 – 20:00
Room	
Convener	DR. KIM, Chang Gyun (Korea Research Institute of Chemical Technology)
Chair	DR. SEO, Jangwon (Korea Research Institute of Chemical Technology) DR. BAEG, Jin-ook (Korea Research Institute of Chemical Technology) DR. YOON, Sung Cheol (Korea Research Institute of Chemical Technology)

Synopsis	This session is a dinner gathering of young scientists in the field of chemistry to meet with researchers at Korea Research Institute of Chemical Technology (KRICT). It is a combination of networking and mentoring program for young scientists in Europe. The participants will learn about KRICT –institutional overview, research areas, career opportunities, and etc. The participants will also share expertise in their respective backgrounds and find opportunities to expand their potential network both in Europe and Korea.
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# POSTER SESSION



### D1. Physics and Mathematics

- [D1\_P01] **Three-dimensional visualization of phase-order ring in an Fe-Al alloy by coherent x-ray Bragg ptychography**  
 Chan Kim(chan.kim@xfel.eu)<sup>1</sup>, Virginie Chamard<sup>2</sup>, Anders Madsen<sup>1</sup>  
<sup>1</sup>European X-Ray Free-Electron Laser Facility, <sup>2</sup>Aix-Marseille Univ, CNRS, Centrale Marseille, Institut Fresnel
- [D1\_P02] **Connectivity profiling and single-cell RNA sequencing to study homeostatic plasticity in hippocampal neuronal networks in vitro**  
 Taehoon Kim(takim@student.ethz.ch), Julian Bartram, Manuel Schröter, Andreas Hierlemann  
 ETH Zurich, Department of Biosystems Science and Engineering, Basel, Switzerland
- [D1\_P03] **A role of nucleus reuniens in goal-directed navigation**  
 Hye-A Kim(hye-a.kim@brain.mpg.de), Max Planck Institute for Brain Research
- [D1\_P04] **Investigating the link between bodily self-consciousness (BSC) and grid cells**  
 Hyuk-June Moon(dreamingseed@gmail.com / hyukjun.moon@epfl.ch)<sup>1</sup>, Baptiste Gauthier<sup>2</sup>, Hyeong-Dong Park<sup>2</sup>, Nathan Faivre<sup>3</sup>, Olaf Blanke<sup>4</sup>  
<sup>1</sup>Laboratory of Cognitive Neuroscience (LNCO), Center of Neuroprosthetics (CNP) and Brain Mind Institute (BMI), École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, Center for Bionics, Biomedical Research Institute, KIST, Seoul, South Korea, <sup>2</sup>Laboratory of Cognitive Neuroscience (LNCO), Center of Neuroprosthetics (CNP) and Brain Mind Institute (BMI), École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, <sup>3</sup>CNRS, LPNC UMR 5105, Université Grenoble Alpes, Grenoble, France, <sup>4</sup>Laboratory of Cognitive Neuroscience (LNCO), Center of Neuroprosthetics (CNP) and Brain Mind Institute (BMI), École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, Department of Neurology, University Hospital Geneva, Rue Micheli-du-Crest 24, 1205, Geneva Switzerland
- [D1\_P05] **Theory based rate constants for H-abstractions of silanes and the possibility of reactivity analogies and rate rules**  
 Hang Choi(hang.choi@rub.de)<sup>1</sup>, Holger Somnitz<sup>2</sup>, Sebastian Peukert<sup>2</sup>  
<sup>1</sup>Ruhr-Universität Bochum, <sup>2</sup>Universität Duisburg-Essen
- [D1\_P06] **Molecular absorption line study in obscured AGNs**  
 Dongjin Kim(dongjin@mpifr-bonn.mpg.de), Thomas Krichbaum  
 Max Planck Institute for Radioastronomy

### D2. Chemistry / Materials and Chemical Engineering

- [D2\_P01] **Light-induced electron transfer by Copper(II) complex**  
 Youngju RO(youngju.ro@u-psud.fr)<sup>1</sup>, Winfried LEIBL<sup>2</sup>, Ally Aukauloo<sup>1</sup>  
<sup>1</sup>University Paris-Sud, <sup>2</sup>CEA Saclay
- [D2\_P02] **Improving the Performance of Perovskite Solar Cells Using a Polyphosphazene Interlayer**  
 Bekele Hailegnaw(bekele.teklemariam@jku.at)<sup>1</sup>, Vanessa Poscher<sup>2</sup>, Christoph Ulbricht<sup>1</sup>, Hathaichanok Seelajaroen<sup>1</sup>, Ian Teasdale<sup>2</sup>, Yolanda Salinas<sup>2</sup>, Niyazi Serdar Sariciftci<sup>1</sup>, Markus Clark Scharber<sup>1</sup>  
<sup>1</sup>Linz Institute for Organic Solar Cells (LIOS), Institute of Physical Chemistry, Johannes Kepler University Linz  
<sup>2</sup>Institute of Polymer Chemistry (ICP) and Linz Institute of Technology (LIT), Johannes Kepler University Linz

- [D2\_P03] Improving thermal stability of cathode for low temperature thin film solid oxide fuel cells by vacuum thin film deposition methods**  
Suk Won Cha(swcha@snu.ac.kr)<sup>1</sup>, Sangbong Ryu<sup>1</sup>, Ikwhang Chang<sup>2</sup>, Yoon Ho Lee<sup>3</sup>  
<sup>1</sup>Seoul National University, <sup>2</sup>Wonkwang University, <sup>3</sup>University of California, San Diego
- [D2\_P04] Reversible electrochemical capture and release of CO<sub>2</sub> using anthraquinone**  
Dominik Wielend(dominik.wielend@jku.at)<sup>1</sup>, Dogukan Hazar Apaydin<sup>2</sup>, Dong Ryeol Whang<sup>1</sup>, Niyazi Serdar Sariciftci<sup>1</sup>  
<sup>1</sup>Linz Institute for Organic Solar Cells (LIOS), Institute of Physical Chemistry, Johannes Kepler University Linz, Altenbergerstrasse 69, 4040 Linz, Austria., <sup>2</sup>Linz Institute for Organic Solar Cells (LIOS), Institute of Physical Chemistry, Johannes Kepler University Linz, Altenbergerstrasse 69, 4040 Linz, Austria.; Current address: Institute of Science and Technology Austria (IST Austria) Am Campus 1, 3400 Klosterneuburg, Austria.
- [D2\_P05] Developing efficient Water Oxidation Catalyst**  
Hyunah Kim(hyunah6231@gmail.com), Kisuk Kang  
Department of Materials Science and Engineering, Seoul National University, Seoul 151-744, South Korea
- [D2\_P05] Equilibrium Theory Analysis of Adsorption and Thermal Regeneration of Water Vapour on Zeolite 13X**  
Hyungwoong Ahn(h.ahn@ed.ac.uk)  
University of Edinburgh
- [D2\_P07] Analysis of Correlation between Korea Traditional Chilbo Enamel and Metal Substrate**  
JAE YOUNG PARK(redolpin@kitech.re.kr), Hohyeong Kim, Min-su Lee, Tai Hong Yim  
Korea Institute of Industrial Technology
- [D2\_P08] Metallic Color Coating with Silica Layer Embedding Metal Nanoparticles on Textured Metal Surface**  
Hohyeong Kim(khh0524@kitech.re.kr), Minsu Lee, HeungYeol Lee  
Tai Hong Yim, Jae Young Park  
Korea Institute of Industrial Technology (KITECH)
- [D2\_P09] Plastic Deformation Characteristics of Liners for the Production of Cladding Tube in Sodium-cooled Fast Reactor**  
Minsu Lee(lms0120@kitech.re.kr)<sup>1</sup>, Jun Hwan Kim<sup>2</sup>, Jinho Ahn<sup>3</sup>, Tai Hong Yim<sup>1</sup>  
<sup>1</sup>Surface R&D Group, Korea Institute of Industrial Technology, <sup>2</sup>SFR Fuel Development Division, Korea Atomic Energy Research Institute, <sup>3</sup>Department of Materials Science and Engineering, Hanyang University
- [D2\_P10] Low Temperature Deactivation of Cu/SAPO-34 Catalysts Synthesized Using Different SDAs During NH<sub>3</sub>-SCR Reaction**  
Jungwon Woo(jungwon@chalmers.se)<sup>1</sup>, Diana Bermin<sup>1</sup>, Homayoun Ahari<sup>2</sup>, Mark Shost<sup>2</sup>, Michael Zammit<sup>2</sup>, Louise Olsson<sup>1</sup>  
<sup>1</sup>Chalmers University of Technology, <sup>2</sup>Fiat Chrysler Automobile US
- [D2\_P11] Conformality analysis of the archetype aluminium oxide ALD process in 3rd-generation silicon-based lateral high-aspect-ratio test structures**  
Puurunen Riikka Liisa(riikka.puurunen@aalto.fi)<sup>1</sup>, Ylivaara Oili<sup>2</sup>, Jihong Yim<sup>1</sup>, Markku Ylilammi<sup>3</sup>, Virpi Korpelainen<sup>2</sup>, Mikko Utriainen<sup>2</sup>  
<sup>1</sup>Aalto University, <sup>2</sup>VTT Technical Research Centre of Finland, Finland, <sup>3</sup>Espoo, Finland

- [[D2\_P12] Electron-hole recombination enhanced by lone-pairs in kesterite solar cells**  
Sunghyun Kim(sunghyun.kim@imperial.ac.uk), Ji-Sang Park, Samantha N. Hood, Aron Walsh  
Department of Materials, Imperial College London, UK
- [D2\_P13] Robust silver electrodes for high performance organic photovoltaics**  
Jaemin Lee(J.Lee.2@warwick.ac.uk), Ross A. Hatton  
University of Warwick
- [D2\_P14] Organic and Perovskite Photovoltaic device fabrication & characterization at LIOS**  
Patrick John-Denk(patrick.john-denk@jku.at), Niyazi Serdar Sariciftci, Markus Clark Scharber  
Linz Institute for Organic Solar Cells (LIOS), Institute of Physical Chemistry, Johannes Kepler University Linz, Altenberger Straße 69, 4040 Linz, Austria
- [D2\_P15] Investigation of Conductive Polymer-DNA Biocomposites for Bioelectronics**  
Serpil Tekoglu(serpil.tekoglu@jku.at), Dominik Wielend, Cigdem Yumusak, Serdar Niyazi Sariciftci  
Linz Institute for Organic Solar Cells (LIOS), Physical Chemistry, Johannes Kepler University Linz, Altenberger Str 69, A4040, Linz, Austria
- [D2\_P16] Product-Service System Design of Personalized Portable Air Purifier**  
Soohang Lee(soohaeng74@naver.com), Eok Kim  
Korea Polytechnic University
- [D2\_P17] Elemental composition of particulate matter collected from in-use Diesel engine passenger vehicles measured by Laser Induced Breakdown Spectroscopy**  
Richard Viskup(Richard.Viskup@jku.at), Christoph Wolf, Werner Baumgartner  
Institute of Biomedical Mechatronics, Johannes Kepler University Linz, Altenberger strße 69, Linz, Austria
- [D2\_P18] Machine Learning Approach on Steel Microstructure Classification**  
Abdullah Öztürk(mutlupark@gmail.com)<sup>1</sup>, Haon Park<sup>2</sup>  
<sup>1</sup>Department of Metallurgical and Materials Engineering, Middle East Technical University, 06800, Ankara, Turkey, <sup>2</sup>Oasis International School, 06830, Ankara, Turkey
- [D2\_P19] Colorimetric sensor for EtOH-sensing with one-dimensional photonic crystals based on metal-organic framework**  
JUN YONG KIM(yuns.do@knu.ac.kr), Yun Seon Do  
School of Electronics Engineering, Kyungpook National University, South Korea
- [D2\_P20] Experimental investigation of droplet breakage in the oil-in-water emulsion in a stirred tank**  
Seok Ki Moon(seokki.moon@ntnu.no)  
Norwegian University of Science and Technology (NTNU)
- [D2\_P21] new bioactive secondary metabolites from beetle**  
Soohyun Um(Tryptophan@me.com)  
Leibniz institute
- [D2\_P22] A Study on Controlling Thermal Conductivity of Metal Alloy by Using Hierarchical Structure**  
Tai Hong Yim(thyim@kitech.re.kr)<sup>1</sup>, HeungYeol Lee<sup>1</sup>, Jae Young Park<sup>1</sup>, Hyeonjin Eom<sup>2</sup>, Hohyeong Kim<sup>1</sup>, Minsu Lee<sup>1</sup>, Seong-Sik Han<sup>3</sup>, Heung-Kyu Kim<sup>3</sup>  
<sup>1</sup>Surface R&D Group, Korea Institute of Industrial Technology, <sup>2</sup>Thermochemical Energy System R&D Group, Korea Institute of Industrial Technology, <sup>3</sup>Department of Automotive Engineering, Kookmin University
- [D2\_P23] Preparation of g-C<sub>3</sub>N<sub>4</sub>/TiO<sub>2</sub> Heterojunction Photocatalysts for Photocatalytic Applications**  
Jongee Park(jongee.park@atilim.edu.tr)<sup>1</sup>, Pelin Gündoğmuş<sup>2</sup>, Abdullah Öztürk<sup>2</sup>  
<sup>1</sup>Atilim University, Department of Metallurgical and Materials Engineering, 06836, Ankara, Turkey, <sup>2</sup>Middle East Technical University, Department of Metallurgical and Materials Engineering, 06800, Ankara, Turkey
- [D2\_P24] Mesoporous silica nanoparticles containing polyphosphazenes for controlled delivery applications**  
Yolanda Salinas(yolanda.salinas@jku.at)<sup>1</sup>, Ian Teasdale<sup>1</sup>, Oliver Brüggemann<sup>2</sup>  
<sup>1</sup>Institute of Polymer Chemistry (ICP)/Linz Institute of Technology (LIT), Johannes Kepler University Linz, Altenberger Straße 69, 4040 Linz, Austria, <sup>2</sup>Institute of Polymer Chemistry (ICP), Johannes Kepler University Linz, Altenberger Straße 69, 4040 Linz, Austria

### D3. Biology, Bioengineering, and Medical Science

- [D3\_P01] **Translational Research for Construction of Microbial Cell Factory – Translational Core**  
Se Hyeuk Kim(figo7sh@gmail.com)  
Technical University of Denmark (DTU)
- [D3\_P02] **Cancer Biomarker Detection and Classification: Extracellular Vesicles, Raman Microscope and Convolutional Neural Network**  
Wooje Lee Herman L. Offerhaus(w.lee@utwente.nl)  
University of Twente
- [D3\_P03] **A comprehensive TE-Gene network to reveal the impact of transposable elements (TEs) on physiological and pathological states**  
Eunji Shin(eunji.l.shin@epfl.ch)  
School of Life Sciences, École Polytechnique Fédérale de Lausanne (EPFL), Laboratory of Virology and Genetics (LVG)
- [D3\_P04] **Effects of listening to music on the stress during the study - a study on students at the SRH University of Heidelberg**  
Jihang Han(jihang.han@gmail.com)  
Ludwig-Maximilians-Universität München/ Hochschule für Musik und Theater München
- [D3\_P05] **Anti-atherosclerotic polymeric nanobiocatalysts for the dissolution of cholesterol crystals in atherosclerosis**  
Jong Hyun Lee(jhle@dtu.dk)  
Denmark Technical University
- [D3\_P06] **New challenges of the medical device sector in the era of Regulation (EU) 2017/745**  
Ye-Lynne LEE(lee.yelynne@gmail.com)  
Universite Paris Sud
- [D3\_P07] **Ginseng Berry Suppresses Metabolic Syndrome Induced by High-Fructose Diet in Rats**  
Young-Eun Lee(yelee@wku.ac.kr), So-Yeon Ko  
Wonkwang University
- [D3\_P08] **Targeted delivery of doxorubicin through conjugation with cathepsin B-cleavable peptide**  
Suah Yang(haehwan@kist.re.kr)<sup>1</sup>, Man Kyu Shim<sup>2</sup>, Jooho Park<sup>2</sup>  
Hong Yeol Yoon<sup>2</sup>, Kwangmeyung Kim<sup>2</sup>  
1KU-KIST Graduate school, 2KIST
- [D3\_P09] **Discovery of heterocyclic 4-arylamido 5-methylisoxazole analogues as selective FLT3 inhibitors by Conformational restriction of type II FMS inhibitor**  
Jung-Mi Hah(jhah@hanyang.ac.kr), Daseul Im, Byeongha Choi, Youri Oh, Miyoung Jang, Jingwoong Kim, Hyungwoo Moon  
College of Pharmacy and Institute of Pharmaceutical Science and Technology, Hanyang University, Ansan, Korea
- [D3\_P10] **Umbilical Cord Blood Stem Cells - A Comparative Analysis of Differential Stromal Cell Lines Used to Support Natural Killer Cell Development**  
Yuri Na(yurisa@gmail.com)  
University of Science and Technology

- [D3\_P11] **Healthcare App Design with Infographics**  
 Jihee Gwon(gjh0522@gmail.com)  
 Muthesius University of Fine Arts and Design
- [D3\_P12] **Developing the simulation model for infectious disease spreading in Korea based on transportation and mobile phone data**  
 OKYU KWON(okyu.kwon@gmail.com)  
 NIMS

## **D4. Earth science and Environmental Engineering**

- [D4\_P01] **Assessment of the oxidative stress and reproductive effects of mono(2-ethylhexyl) phthalate on *Daphnia magna***  
 Yohan Seol(y.seol@kist-europe.de), Minjeong Baek, Dahye Kim  
 Changseon Ryu, Young Jun Kim  
 Environmental Safety Group, KIST Europe, Korea Institute of Science and Technology
- [D4\_P02] **Reconstruction of historical trends of and persistent organic pollutants during Anthropocene in the sediment core from Southern Ocean**  
 Jun-Tae Kim(j.kim@mpic.de)  
 Max Planck Institute for Chemistry
- [D4\_P03] **Removal of cesium in contaminated water using Prussian Blue**  
 Wontae Lee(wtlee@kumoh.ac.kr)  
 Kumoh National Institute of Technology
- [D4\_P04] **A REGIONALIZED DATA COLLECTION APPROACH FOR MATERIAL FLOW ANALYSIS AND APPLICATION IN RAILWAY INFRASTRUCTURES IN FRANCE**  
 Junbeum Kim(junbeum.kim@utt.fr), Imran Muhammad , Rahman S M Mizanur  
 University of Technology of Troyes (UTT), France
- [D4\_P05] **Electrochemical reduction of nitrate using TiO<sub>2</sub> nanotube arrays**  
 Daewon Pak(daewon@seoultech.ac.kr)  
 Seoul National University of Science and Technology
- [D4\_P06] **Prediction of the Radioactive pollution due to the Accident at a Nuclear Power Plant**  
 Sungwon Kang(kangsw93@kict.re.kr)  
 Korea Institute of Civil Engineering and Building Technology
- [D4\_P07] **Abnormal Structural Transition Induced by Cage-dependent Guest Exchange in CH<sub>4</sub> + C<sub>3</sub>H<sub>8</sub> Hydrates with CO<sub>2</sub> Injection for Energy Recovery and CO<sub>2</sub> Sequestration**  
 Yohan Lee(ylee@geomar.de)  
 GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel
- [D4\_P08] **Optimum geometry of geofoam for earth pressure reduction on Retaining Walls**  
 Yeonwook Jeong(jyw5757@snu.ac.kr)  
 Seoul National University

## D5. Architecture / Civil Engineering

- [D5\_P01] **Performance evaluation of fire resistance of complex penetration sealing systems**  
Hee-Won Seo(hwseo@kfpa.or.kr), Dong-Ho Choi, Dae-Hoi Kim  
Fire Insurers Laboratories of Korea
- [D5\_P02] **Activity-based traveler analyzer using mobile and socioeconomic bigdata**  
JIN KI EOM(jkom00@krri.re.kr)  
Korea Railroad Research Institute
- [D5\_P03] **A study on improvement of the quality management for fire doors**  
Dong-Ho Choi(cdh1118@hanmail.net), Hee-Won Seo, Dae-Hoi Kim  
Fire Insurers Laboratories of Korea
- [D5\_P04] **A standard study for improving thermal performance of the hot and cold water pipe insulation in buildings**  
Hyung-Kyou Ryu(ryuhk1972@krimfi.re.kr)  
KRIMFI(Korea Research institute of Mechanical Facilities Industry)
- [D5\_P05] **Suggestion on setting up categories and elements for green campus through field surveys about the advanced cases**  
Yoon Jung Choi(ychoi@cbnu.ac.kr)  
Chungbuk National University
- [D5\_P06] **Prediction of ground surface settlement during tunneling using artificial neural network**  
Dongku Kim(dkkim9013@korea.ac.kr)<sup>1</sup>, Hangseok Choi<sup>2</sup>  
<sup>1</sup>Ph.D. Candidate, Department of Civil Engineering, Korea University, <sup>2</sup>Professor, Department of Civil Engineering, Korea University
- [D5\_P07] **Energy network optimization for smart micro energy network based on cogeneration system among various building types**  
Jaejoon Choi(jjchoi@kier.re.kr), Yongjik Youn, Jaeyong Lee, Saebul Kang, Jeongseok Oh, Yonghoon Im  
Korea Institute of Energy Research
- [D5\_P08] **Development of management and operation model for smart city R&D Project**  
Seongsig Kim(sskim@kict.re.kr), Seunghyun Jung, Minhee Je  
KICT

## D6. Electrical, Electronic, and Informational Engineering

- [D6\_P01] **Anomaly Detection and Response Framework based on Network traffic and hardware Information of IoT Devices**  
Jaehyuk Lee(jaehyuk@kisa.or.kr), Sungtaek Oh, Mijoo Kim  
Woong Go, Soon-tai Park  
KISA(Korea Internet & Security Agency)
- [D6\_P02] **Deriving Key Performance Indicator of a Home Energy Management System project in Siheung smart city, Korea**  
Hyungtae Kim(laputaone@gmail.com), Se Hoon Baik  
Seoul National University

- [D6\_P03] **A Computable General Equilibrium Analysis on the Effect of Increasing Electric Vehicle Adoption Rate in Korea**  
Seong-joong Kim(gianthips@snu.ac.kr)  
Seoul National University
- [D6\_P04] **Introduction of national project related to the modular quality system of Smart Factory**  
Giyeon Gim(ggim@ktl.re.kr), Jongwon Kwon, Jin-Yong Kim, Tae-seung Song  
Korea Testing Laboratory
- [D6\_P05] **Condition Monitoring of Wind Farms using Neural Network**  
SUNG-HO HUR(hur.s.h@ieee.org)  
School of Electronics Engineering, Kyungpook National University
- [D6\_P06] **Recognition of surface plasmon scattering based on deep learning**  
Gwiyeong Moon(ansrnludud@yonsei.ac.kr), Taehwang Son, Hongki Lee, Donghyun Kim  
School of Electrical and Electronic Engineering, Yonsei University, Seoul, Republic of Korea
- [D6\_P07] **Figuring out Fast Journalism Trend via Text Mining Based on Deep Transfer Learning**  
Yunho Maeng(yunhomaeng@yonsei.ac.kr), Choong C. Lee, JaeYoung An  
Graduate School of Information, Yonsei University
- [D6\_P08] **MEMS-based lidar for autonomous driving**  
Han Woong Yoo(yoo@acin.tuwien.ac.at)<sup>1</sup>, Norbert Druml<sup>2</sup>, David Brunner<sup>1</sup>, Christian Schwarzl<sup>3</sup>,  
Thomas Thurner<sup>2</sup>, Marcus Hennecke<sup>2</sup>, Georg Schitter<sup>1</sup>  
<sup>1</sup>TU Wien, <sup>2</sup>Infineon Technologies Austria AG, <sup>3</sup>Virtual Vehicle Research Center
- [D6\_P09] **Physical Layer Security for Visible Light Communication Systems Subject to Eavesdropper Location Uncertainty**  
Sunghwan Cho(sunghwan.cho@eng.ox.ac.uk)  
Oxford University
- [D6\_P10] **A Comparative Study of Various Core Design for Multiple Charging Stations in Drone Wireless**  
CheolHee Jo(cjfgmlgk@nate.com)  
Pusan National University

## **D7. Mechanical, Aerospace, Marine, and Nuclear Engineering**

- [D7\_P01] **Numerical Investigation of the Effect of various High Speed Train Roof Configurations on Aerodynamic Noise**  
Hogun Kim(hk1g14@soton.ac.uk), Zhiwei Hu, David Thompson  
University of Southampton
- [D7\_P02] **Consumer preference and mechanical properties of Korean menu with cooked mineral water**  
HeeJung Park(hjpark@yuhan.ac.kr)<sup>1</sup>, HyeRan Lee<sup>2</sup>, YeongEun Kim<sup>3</sup>  
<sup>1</sup>Yuhan university, <sup>2</sup>Baewah women's university, <sup>3</sup>Orion Corp.
- [D7\_P03] **Numerical study of a Taylor bubble rising in stagnant water**  
Seungchul Shin(skyt1s5108@naver.com)  
University of Strathclyde and Pusan National University
- [D7\_P04] **A Numerical Study on the Variation of Internal Flow Field of the External Pintle Nozzle with Pintle Radius**  
Hansol Kim(whale7514@naver.com)<sup>1</sup>, Kihwan Lee<sup>2</sup>, Hwanil Huh<sup>1</sup>  
<sup>1</sup>Department of Aerospace Engineering, Chungnam National University, Daejeon, Republic of Korea, <sup>2</sup>Department of Aerospace Engineering, Graduate School of Chungnam National University, Daejeon, Republic of Korea



- [D7\_P05] **Fundamental Numerical Study for Performance of an Expansion-Deflection Nozzle according to the Base Nozzle Length**  
 Kihwan Lee(leeh1021@naver.com)<sup>1</sup>, Hansol Kim<sup>1</sup>, Hwanil Huh<sup>2</sup>  
<sup>1</sup> Department of Aerospace Engineering, Graduate School of Chungnam National University, Daejeon, Republic of Korea, <sup>2</sup>Department of Aerospace Engineering, Chungnam National University, Daejeon, Republic of Korea
- [D7\_P06] **A study on numerical simulation tool for GNSS signal design in Korea**  
 Heon Shin(newold0621@gmail.com)  
 Autonomous Navigation System lab, Electrical Engineering, Inha univ
- [D7\_P07] **Preliminary Blade Trailing Edge Flap System Development using Conceptual Flexible Torsion Bar and Worm Drive**  
 Kwangtae Ha(kwangtae.ha@iwes.fraunhofer.de)  
 Fraunhofer Institute of Wind Energy Systems
- [D7\_P08] **A Study on Analytical Simulation Method for KPS Signal Design**  
 Jong-Hoon Won(jh.won@inha.ac.kr), Kahee Han  
 INHA University
- [D7\_P09] **Fundamental Experiment on Actuators for Two-Axis Pintle Thrusters**  
 Jaecheong Lee(123wocjd@naver.com)<sup>1</sup>, Hwanil Huh<sup>2</sup>  
<sup>1</sup>Department of Aerospace Engineering, Graduate school of Chungnam National University, Daejeon, Republic of Korea, <sup>2</sup>Department of Aerospace Engineering, Chungnam National University, Daejeon, Republic of Korea
- [D7\_P10] **Charasteristic of Supersonic Diffuser with Constant Circular Cross Section**  
 Yuseok Lee(aimatgo@naver.com)<sup>1</sup>, Hwanil Huh<sup>2</sup>  
<sup>1</sup>Department of Aerospace Engineering, Graduate School of Chungnam National University, Daejeon, Republic of Korea, <sup>2</sup>Department of Aerospace Engineering, Chungnam National University, Daejeon, Republic of Korea
- [D7\_P11] **Conceptual Design on Main Components of the Electric-Pump Cycle Engine**  
 Wonkeun Ki(marine\_236@naver.com)<sup>1</sup>, Jaecheong Lee<sup>1</sup>, Hwanil Huh<sup>2</sup>  
<sup>1</sup>Department of Aerospace Engineering, Graduate School of Chungnam National University, Daejeon, Republic of Korea, <sup>2</sup>Department of Aerospace Engineering, Chungnam National University, Daejeon, Republic of Korea
- [D7\_P12] **Development of vibration testing method for bone-conduction device**  
 Chan-Jung Kim(cjkim@pknu.ac.kr)<sup>1</sup>, Gee-Soo Lee<sup>2</sup>, Ki-Hyun Kim<sup>3</sup>, Moo-Yeon Lee<sup>4</sup>  
<sup>1</sup>Pukyong National University, <sup>2</sup>Yongsan University, <sup>3</sup>Silla University, <sup>4</sup>Dong-A University
- [D7\_P13] **Visual seam quality in laser keyhole welding**  
 Won-Ik Cho(cho@bias.de), Villads Schultz, Peer Woizeschke  
 BIAS – Bremer Institut für angewandte Strahltechnik GmbH
- [D7\_P14] **Laser Welding and Joining Technology for Lightweight Carbody**  
 Su Jin LEE(leesj@kimm.re.kr), Kwang-Deok Choi, Insung Choi  
 Jeong Suh, Dongsig Shin  
 Korea Institute of Machinery and Materials
- [D7\_P15] **FPSO Structure Analysis regarding simplified Green Water -RETRACTED by the AUTHOR-**  
 Han Jo Kwon(dorigogogo@naver.com)  
 Strath Clyde and Busan Uni.

- [D7\_P16] **COOLING EFFECT INDUCED BY FLOW IN DELUGE PIPE EXPOSED TO JET FIRE**  
HyunPyo KIM(imcontroled@naver.com)  
University of Strathclyde, United Kingdom
- [D7\_P17] **Derivation of Ship Operational Efficiency Using AIS Data**  
HONGSEOK BAE(elvisfromkorea@gmail.com)<sup>1</sup>, Dominic A Hudson<sup>2</sup>  
<sup>1</sup>University of Strathclyde, <sup>2</sup>University of Southampton
- [D7\_P18] **A cost-effective analysis for DP3 cable routing of drillship through an LCA and LCCA**  
Muki Park(parkmuki@gmail.com)
- [D7\_P19] **Hydrostatic and dynamic analysis of semi-submersible according to different column configuration for design optimization**  
Jungmu Lee(longman00@naver.com)  
University of Strathclyde
- [D7\_P20] **Holistic environmental assessment for Marine Scrubber systems**  
Hayoung Jang(hayoung.jang.2017@uni.strath.ac.uk)  
University of Strathclyde
- [D7\_P21] **Safety Evaluation on LNG Bunkering: To Enhance Practical Establishment of Safety Exclusion**  
Byongug Jeong(byongug.jeong@strath.ac.uk)  
University of Strathclyde
- [D7\_P22] **An Experimental Study on the Fire Retardant Performance of Class 1E/Non-Class 1E cables in accordance with ambient temperature condition**  
Jihyun Kwark(kwark@kfpa.or.kr)<sup>1</sup>, Jueun Lee<sup>1</sup>, Young-Seob Moon<sup>2</sup>, Sang-Kyu Lee<sup>2</sup>  
<sup>1</sup>Fire Insurers Laboratories of Korea, <sup>2</sup>Korea Institute of Nuclear Safety
- [D7\_P23] **Data rich imaging approaches assessing fatigue crack growth mechanisms in a Ni base superalloy with varying γ' size**  
Donghyuk Kim(Dk2g17@soton.ac.uk)<sup>1</sup>, Rong Jiang<sup>2</sup>, Angelos Evangelou<sup>1</sup>, Philippa A.S Reed<sup>1</sup>  
<sup>1</sup>University of Southampton, UK, <sup>2</sup>Nanjing University of Aeronautics and Astronautics, China

## D8. Humanities

- [D8\_P01] **Dietary Education Dissemination through Case study of Dietary life Education Lesson**  
Juhyeon Kim(jhkim33@du.ac.kr)<sup>1</sup>, Nam-E Kang<sup>2</sup>, Misook Cho<sup>3</sup>, Hae Young Kim<sup>4</sup>  
<sup>1</sup>Department of Hotel, Food Service and Culinary Art, Dong Seoul University, <sup>2</sup>Department of Food and Nutrition, Eulji University, <sup>3</sup>Department of Food and Nutrition, Ewha Woman's University, <sup>4</sup>Department of Food Science and Nutrition, Yongin University
- [D8\_P02] **Study On Vitalization Awareness of Traditional Market - Focusing on the Participation in Management Activaion Education of Traditional Market Traders**  
Wan Soo Hong(wshong@smu.ac.kr), Yong Sook Kim  
Sangmyung University
- [D8\_P03] **A Study on the Analysis of the Urban Spacial Characteristics Using Mobile Data**  
SANGKEUN LEE(sangkeun@krri.re.kr)  
Korea Railroad Research Institute

- [D8\_P04] **What variables affect the practices levels on sustainable meal management at home from middle aged women ?**  
Hyeja Chang(hjc10@dankook.ac.kr)<sup>1</sup>, Wansoo Hong<sup>2</sup>  
<sup>1</sup>Dankook University, <sup>2</sup>Sangmyung University
- [D8\_P05] **Effects of Adding Green Grape Juice on Sensory Characteristics of Konjac Jelly**  
In-Seon Lee(inseon.lee@kunsan.ac.kr)<sup>1</sup>, Jae-Eun Jeon<sup>1</sup>, Hye-Min Ha<sup>1</sup>  
Young-Ho Kwon<sup>1</sup>, Ji-Hyun Park<sup>2</sup>  
<sup>1</sup>Department of Food and Nutrition, Kunsan National University, <sup>2</sup>Michel Food company
- [D8\_P06] **Analysis of Nutritional Composition and Food Safety of Developed Porridge Menu**  
Jihyun Park(nasly81@gmail.com)<sup>1</sup>, In-Seon Lee<sup>2</sup>  
<sup>1</sup>Michel Food company, <sup>2</sup>Dept. of Food and Nutrition, Kunsan National University
- [D8\_P07] **Exploring the relationship between food environment and dietary quality in marriage immigrant women in the metropolitan area of Seoul, South Korea**  
Ji-Yun Hwang(jiyunhk@smu.ac.kr), Sung-Min Yook  
Department of Foodservice Management and Nutrition, Sangmyung University, Seoul, Korea
- [D8\_P08] **Toward Integrated Roadmapping: Networked Foresight for Innovation Systems**  
Jae-Yun Ho(jaeyunho@gmail.com)  
University of Cambridge
- [D8\_P09] **Study on snack intake characteristics of Korea elementary school students**  
Ok Hwa Jhee(ohjhee@gjue.ac.kr)<sup>1</sup>, Jung Eun Lee<sup>2</sup>  
<sup>1</sup>Gongju National University of Education, Korea, <sup>2</sup>Cheongbo elementary school, Korea
- D8\_P10] **The memory of scar – Stolperstein of Günter Demnig**  
Nammyoung Hong(dangmu7722@gmail.com)  
TU Berlin
- [D8\_P11] **Semantic networks in the Korean mental lexicon**  
Yoolim Kim(yoolim.kim@wolfson.ox.ac.uk), Aditi Lahiri  
University of Oxford
- [D8\_P12] **Effect of consumer experience of food on sensory expectation**  
Hakyoun Song(reese.hy.song@gmail.com)  
Arts et Metiers ParisTech

# Introducing 2019 Brain Pool Program

Since 1994, a total of 1,909 mid-career researchers have been invited to research institutions in Korea and a total amount up to \$ 177,000(USD)/person/year are provided for personnel costs and invitation expenses for the invited scientists

- **Eligibility of Invited Scientists (Brain Pool candidates)** : Outstanding scientists in all fields of science and technology who have 'more than five years of experience in R&D outside of Korea after obtaining a Ph.D'.
- **Quota for the 2nd call of 2019** : Around 50 (Type 1 : 00, Type 2 : 00)
- **Type of BP Programs and Level of Funding**

Type	Program Period	Goals	Personnel Costs	Invitation Expenses
[Type 1] Short-Term Support	6~12 Months ※ For industries, possible to apply for 3~12 months. ※ Possible to reapply for maximum 3 years (evaluation for extension)	To enhance various joint research with overseas scientists and to establish a long term international cooperation network.	Relevant level of salary to the fellow's original affiliate (Support Max. <u>KRW 200 Million/ year</u> ) ※ Including host contributions such as four major insurances ※ Around an additional 5% of the personnel costs will be provided for invited scientists who have excellent research achievements such as theses or patents	Airfare, moving expenses, child education subsidies, domestic travel expenses, etc Max. KRW 17.6 Million ※ To be paid within the scope of each regional criteria from their original affiliate
[Type 2] Long-Term Support	3 years (2yrs+1yr) ※ Additional funding year will be decided after the evaluation for the first 2 years.	Stable support for long term settlement *Attracting Korean Scientists who wish to return to Korea		

- **Application submission period** : 06/05/2019 ~ 07/16/2019
- **Statistical Data from 1<sup>st</sup> Call**

# of Selected Proposals (# of proposals with Korean scientists)	Success Rate
51 projects (13 Korean applicants)	66.2% (81.3%)

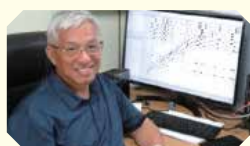
## - Messages from Brain Pool Fellow 2018 -

Dr. T-Raissi of Florida Solar Energy Center, USA (hosted in MetaVista INC.)



I have had my discussions with my colleague at the MetaVista Inc. over the years. These discussions revolved on the commercialization of GEN 3 chemochromic hydrogen detection sensors as well as other sustainable energy technologies. The Brain Pool Program opportunity has been brought to my attention by my colleagues at MetaVista Inc. Brain Pool Program has given me a unique and rewarding experience interacting with MetaVista Inc. and be able to contribute to hydrogen energy research And development in Korea. I am delighted that this opportunity for collaborative research, development, and commercialization existed and I am very excited about taking part in this Brain Pool program.

Prof. Jer-Ming Chiu of The University of Memphis, USA (hosted in Pusan Nat'l Univ.)



The Korean Brain Pool program has provided an excellent platform of steady financial and logistic supports for foreign scientists to establish a research cooperation with the host Korean scientists. 2019 is going to be the second year for my visit of Korea under the Brain Pool support. So far, we have enjoyed not only the research environment at the Pusan National University but also the splendid Korean culture and Korean Language, the beautiful nature of Korea.

Inquiries

- **NRF Homepage** : [www.nrf.re.kr](http://www.nrf.re.kr) / [www.bpkrf.or.kr](http://www.bpkrf.or.kr)(English)
- **TEL** : 82-(0)2-3460-5637/5624 • **E-mail** : [bpkrf@nrf.re.kr](mailto:bpkrf@nrf.re.kr)
- ※ If you have difficulties reaching by phone, please contact us via email.

# Introducing 2019 KRF Program

Started in 2015, a total of 182 overseas early career researchers have been invited to research institutions in Korea and got long-term growth support. Maximum amount up to \$62,000(USD)/person/year are provided for personnel costs, living expenses, and other expenses for the invited scientists

- **Eligibility of Overseas Ph.D. Researchers (KRF candidates)** : Overseas post-doc researchers or Korean national post-doc researchers currently residing overseas who have 'obtained their doctoral degree \*within the past five years \*starting from Aug. 31, 2019
- **Quota for the 2nd call of 2019** : Around 50 for Type 1
- **Level of Funding**

Type	Program Period	Personnel Costs	Living Expenses	Others	Subsidies for Host Institutions
[Type 1] Inviting researchers residing overseas (Overseas -> Korea)	3~5 years	Up to KRW 50 million	Up to KRW 12 million (for Rent including tax)	Up to KRW 5 million (Airfare, Moving Expense, Travel Expenses, etc.)	KRW 5 million (fixed amount) (for the Assigned Staff, Nuri Course Subsidies, etc.)
		Support up to KRW 70 million / year			

- **Application Submission Period** : 06/14/2019 ~ 07/31/2019
- **Statistical Data from 1<sup>st</sup> Call(Type1)**

# of Selected Proposals (# of proposals with Korean scientists)	Success Rate
47 projects (16 Korean applicants)	43.5% (88.9%)

## - Messages from KRF Fellows -

Dr. Serret of Ewha Womans University (KRF Fellow 2016 from France)



This fellowship has been for me and my PI a great opportunity to develop research projects linked to citizen science programs in ecology in Korea. This fellowship is interesting because it allows the development of long-term projects (up to 5 years). In our case, we really needed this long-term approach because we were starting a research project from scratch. We needed to create partnerships with local schools, to gather reliable data to conduct analysis, and to produce qualitative papers. This opportunity will give me the chance to pursue research, linked to biodiversity conservation in the future.

Dr. Murale of Korea Institute of Science and Technology (Former KRF Fellow 2015 from India)



I am very happy and fortunate to be part of KRF fellowship one of the reputed fellowships worldwide. My new job at KIST is full time faculty position called Research Scientist at the Molecular Recognition Research Center. My future plan is to work here at KIST and soon I wish to apply University of Science and Tech. (UST) as assistant prof. where most of the faculty members at KIST are affiliated. Without this fellowship it would not have been possible to get this current position. I am very satisfied with the KRF program and have recommended this to many of my friends. Thank you very much for giving me a chance to be a KRF fellow.

Inquiries

- **NRF Homepage** : [www.nrf.re.kr](http://www.nrf.re.kr) / [www.bpkrf.or.kr](http://www.bpkrf.or.kr)(English)
- **TEL** : +82-(0)2-3460-5647/5624 • **E-mail** : [bpkrf@nrf.re.kr](mailto:bpkrf@nrf.re.kr)
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## Who we are

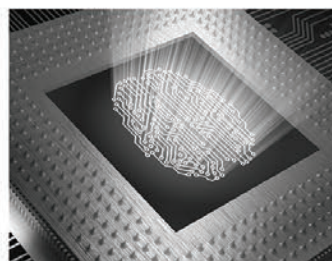
SAIT, Samsung Advanced Institute of Technology is Samsung's R&D hub. Established in 1987, it serves as the incubator for cutting-edge technologies under the founding philosophy of 'Boundless Research for Breakthroughs'

## What we research



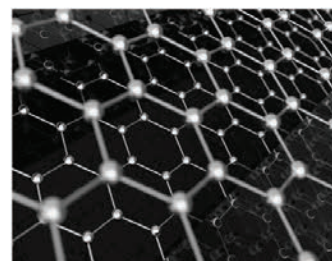
### Artificial Intelligence

- Machine Learning, Computer Vision, Speech Algorithms
- Augmented Reality
- Autonomous Material Development, Design Automation
- Neural, Neuromorphic Processors
- Energy Efficient Processors
- Security, Supercomputing



### Device & System

- Metaphotonics, Holographic Display
- Mobile Healthcare Sensor & Solution
- Nano Electronics Devices : Quantum Computing, GaN Power Device
- Nano Fabrication : Dielectric thin film, Nano Patterning



### Material

- OLED Materials
- Quantum Dot
- Graphene/2-Dimensional Materials
- Next-generation Batteries

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국내·외를 연결하는 지질자원 연구를 통해 대한민국의 지속 가능한 내일을 책임지고 있습니다.

## VISION | 비전

지속가능한 안전·풍요사회 실현의 지질자원기술 솔루션 리더

대한민국 유일의 지질자원 연구기관으로 한반도와 지구의 밝은 미래를 열어갑니다.



지구의 46억 년.

세월을 이해하고 자원의 한계를 극복하는 일

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<b>지오플랫폼연구본부</b> 지질자원 정보 대국민 서비스 제공 	<b>국토지질연구본부</b> 지질정보 구축 및 지진재해 대응 기술개발 	<b>광물자원연구본부</b> 광물자원 확보 및 활용 기술개발 
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## CLIMATE CHANGE | 기후변화대응

세계 최고 수준의 원천기술을 보유한 한국지질자원연구원은 「탄소광물 플러그십 사업」을 착수하여 우리나라 CO<sub>2</sub> 배출 저감 목표량 달성에 중추적인 역할을 수행하고 있습니다.





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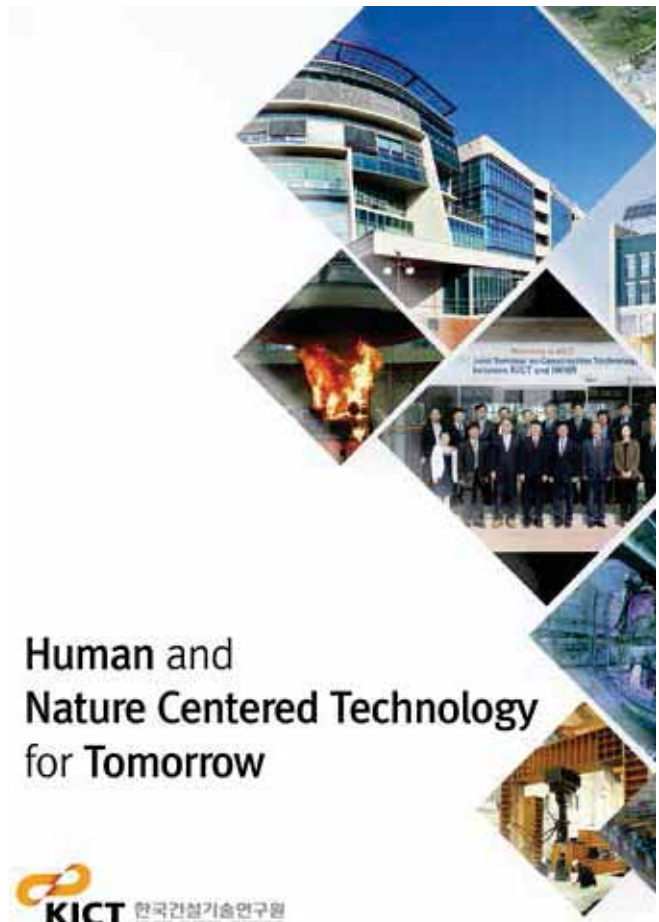

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