PROGRAM

CKC 2021

Canada-Korea Conference on Science & Technology

1-4 September 2021

Online in Korea
In-person at Halifax Convention Center in Canada

CKC 2021

CANADA-KOREA CONFERENCE ON SCIENCE & TECHNOLOGY


KERI
The gateway to smart electric world
Electrical grid & new/renewable energy
Power Apparatus, Power semiconductor & superconductivity
EV
Robotics & motor control, Electric propulsion
Electrical Materials
Electro-Medical Devices
Testing & Certification
Femtosecond
KERI KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE

PLATFORM & DEVELOPMENT, KIAT

4차 산업혁명 시대 중소·중견기업의 글로벌 시장 진출을 위해
산업기술 정책수립, R&D 지원, 기술사업화, 글로벌 수출로 이어지는
전주기적 종합지원으로
기업에 실제 도움이 되는 비즈니스 모델을 창출하고
혁신적 산업기술 생태계를 구축합니다.

기술강국 대한민국, Platform & Development (P&D)
KIAT가 실현해 가겠습니다.

KIAT 한국산업기술진흥원

탄소중립 2050

한국에너지기술연구원

더 강한 경제를 만들어가는
더 맑은 지구와

- 에너지 전환 3020/4040 실현을 위한
  재생에너지 혁신기술 개발
- 수소경제사회 선도를 위한
  수소 공급 및 활용기술 개발
- 고효율 저탄소사회 구축을 위한
  스마트 에너지기술 개발
- 온실가스 감축과 맑은 공기를 위한
  탄소계에너지 청정 활용기술 개발

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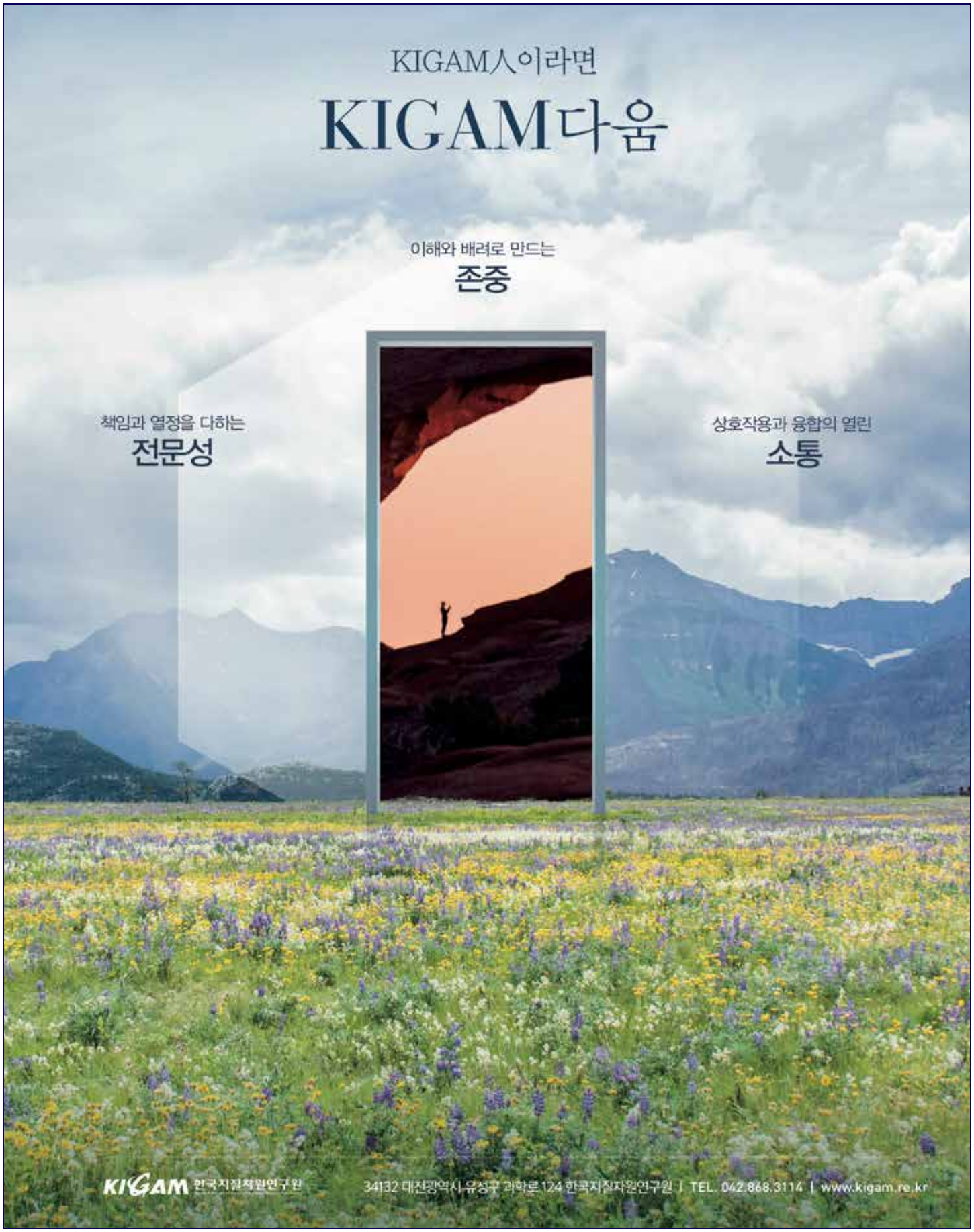
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KIGAM다움
이해와 배려로 만드는
존중
책임과 열정을 다하는
전문성
상호작용과 융합의 열린
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KIGAM 한국지질자원연구원
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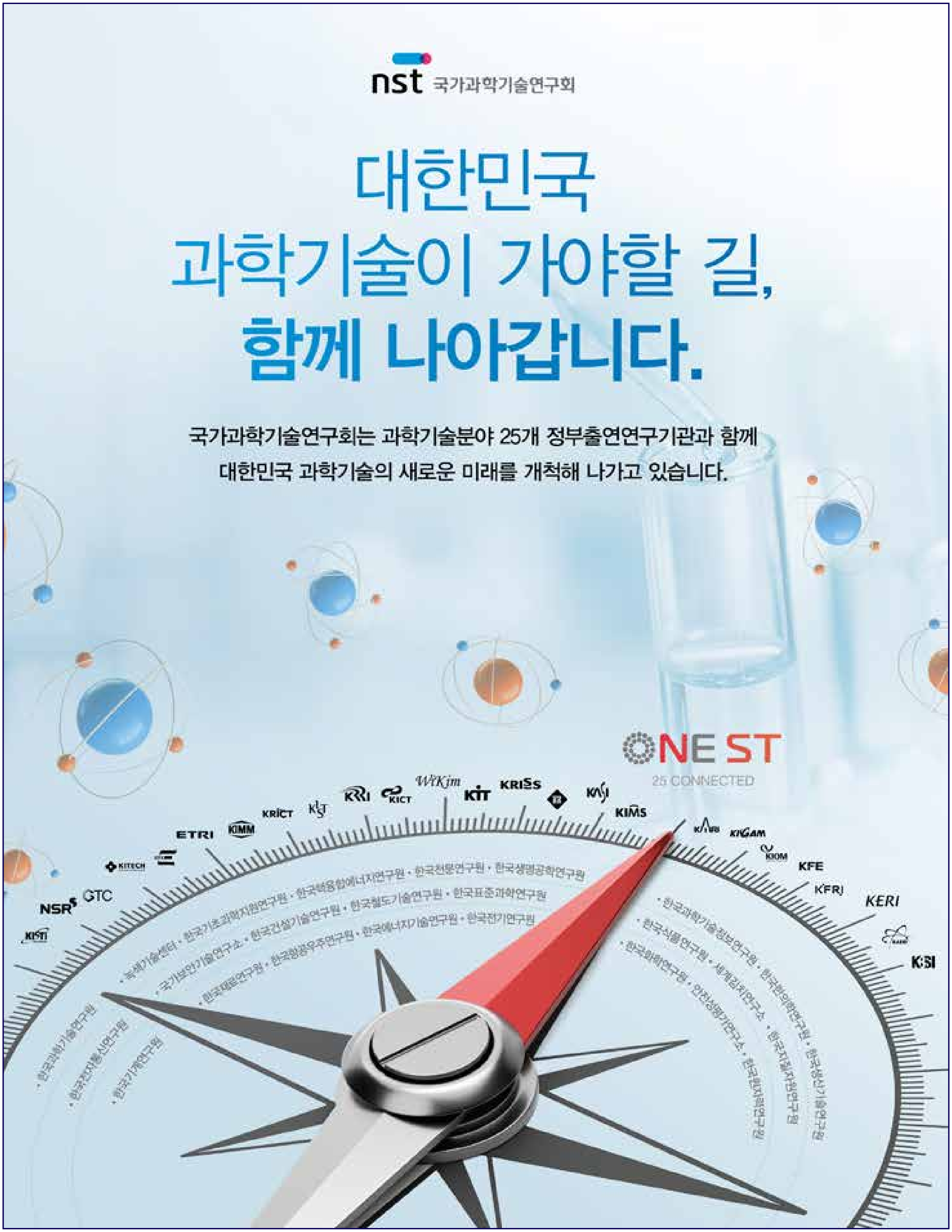
nst 국가과학기술연구회
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국가과학기술연구회는 과학기술분야 25개 정부출연연구기관과 함께
대한민국 과학기술의 새로운 미래를 개척해 나가고 있습니다.
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AKCSE 캐나다한인과학기술자협회
The Association of Korean-Canadian Scientists and Engineers

The Association of Korean-Canadian Scientists and Engineers (AKCSE) was established in 1986 as a non-profit professional organization and has grown to over 3,000 registered members with 11 Local Chapters, 16 School Chapters, 5 Young Professional Chapters, and 3 Professional Societies across Canada. The association is young with roughly half of its members in their 20s and growing today faster than ever. We have been active in promoting young Koreans to develop their professional career by holding annual competition in math and science from grade 4 to 11, sending young engineers and scientists to Young Generation Forum in Korea, awarding scholarship to undergraduate and graduate students, and supporting regional groups of young professionals. Our organization objectives are to:

- Promote the application of science and technology for the general welfare of society,
- Help Korean-Canadian scientists and engineers develop their full career potential in both Canada and Korea,
- Serve the Korean community by delivering scientific and technological information.

KOFST Korean Federation of Science & Technology Societies
한국과학기술단체총연합회

The increasing importance of science and technology calls upon the Korean Federation of Science and Technology Societies (KOFST), an organization of scientific and technological societies in various disciplines, to assume increased responsibilities for the advancement of our society. KOFST will double its efforts to foster and support scientific and technological societies, who are the key actors in knowledge creation and diffusion, and also to expand the participation of scientists and engineers in social developments. KOFST seeks “Represent the science and theology community sharing the future if science”. To fulfill our mission, KOFST has set the broad goals:

- Foster and support the science and technology societies
- Encourage scientists to engage with society
- Enhance the rights and interests of scientists
- Increase public understanding of scientific discoveries and theories
- Support the national growth by undertaking study, planning, research and advice on science and technology policy

과학기술정보통신부
Ministry of Science and ICT

Dear CKC 2021 Participants, Colleagues and the AKCSE Members:

On behalf of the Organizing Committee members, I am delighted to welcome all the delegates and participants to the 2021 Canada - Korea Conference on Science and Technology (CKC2021) organized by the Association of Korean-Canadian Scientists and Engineers (AKCSE) and the Korean Federation of Science and Technology Societies (KOFST). Despite the global disruption caused by COVID-19 in the spring of 2020, I am excited that CKC 2021 is held on September 1 – 4, 2021 in a hybrid mode (in-person and online), a new approach to meet the new social norm. Most Canadian participants are attending in-person in Halifax, Nova Scotia, while our Korean participants are mainly joining us online, synchronously.

The CKC is a multidisciplinary annual conference that aims to bring together experts and leaders from research institutes, industry, academia, and the governments of Canada and Korea to discuss emerging and future challenges in science, technology, and innovation (ST&I). We want to address these challenges working together. Since the first conference, CKCs have served as a major platform for innovation, cutting-edge technologies, scientific research, and multidisciplinary collaborations and professional networking between Canada and Korea.

This year's conference theme, "New Opportunities in the New Normal," highlights a goal shared by both Korea and Canada, and demonstrates new steps taken toward bilateral R&D collaboration between the two countries. In addition, the conference will also showcase and promote discussions and collaborations in artificial intelligence, next-generation energy storage systems, sustainable materials, advanced manufacturing, bio-medical research, nano technology and sensors, aerospace engineering, processing technologies, and clean technologies. For this we have prepared a rich and diverse conference program with Plenary Sessions, STI Forum, SDG AI forum, Research Showcase Session, Korean Government Research Institutes R&D programs, Young Generation & Young Professional Conference, WISE (Women in Science and Engineering), Program, a Government Funding Agency Briefing, Poster Presentation Sessions, as well as other events.

In 2011, the AKCSE hosted our first CKC in Vancouver, British Columbia with around 120 participants. In September 2020, we hosted the 10th CKC in Banff, Alberta, Halifax, Nova Scotia, and in Ottawa and Toronto, Ontario, respectively with nearly 600 participants, both online and in person despite the COVID-19 pandemic we were grateful. Without a doubt, the success of this conference ultimately depends on the participation of scientists and engineers, young minds, passionate organizers, and the partner research institutions and industry collaborators. As conference co-chair of the CKC 2021, I would like to thank all participating organizations for their generous support for the conference, and all members of the organizing committee, the local committee, the conference IT committee, and volunteers for their tireless dedication and efforts.

Building on last year's experience, our conference will be a combination of both in-person and online sessions for the second time. The Organizing Committee will learn from this year's experience and will further expand future online programs, thus allowing more scientists and engineers to participate in the conference. We will also be improving the quality and quantity of CKC programs. I am grateful to have all of you joining us at this conference, and I wish you all a pleasant and fruitful time at CKC2021 meeting friends and colleagues, as well as forging new collaborations.

Il Yong Kim

President, AKCSE
Conference Co-Chair, CKC2021
Professor, Queen's University

Distinguished guests, fellow scientists and engineers from home and abroad,

It is my great pleasure to welcome all participants to the 2021 Canada-Korea Conference on Science and Technology (CKC-2021). At the outset, my gratitude goes to His Excellency Chang Keung-Ryong, Ambassador of the Republic of Korea to Canada, for gracing the event with his distinguished presence. I am also grateful to President Kim Il Yong and the esteemed members of the Association of Korean-Canadian Scientists and Engineers (AKCSE) for successfully organizing today's gathering.

This year's CKC is held both in person and online in light of the COVID-19 pandemic. While face-to-face interactions hold their own worth, I am confident that virtual platform will achieve the same level of engagement by transcending the physical limitations set by space and time. In navigating the new normal of the post-COVID era, Korea and Canada have maintained close collaboration on the scientific front by harnessing non-contact technologies. I hope we will soon see this pandemic end, which will allow science and technology community to deepen their interaction across borders.

The theme of CKC-2021 is 'New Opportunities in the New Normal'. Since its emergence last year, the prolonged COVID-19 has unleashed extensive socio-economic crisis and transformation around the world. The rise of the contact-free economic activities and communication has become the norm, while unprecedented technological breakthroughs in AI, big data and robotics have advanced the frontier of the fourth industrial revolution.

As we channel our efforts to design a new normal in the post-pandemic world, international cooperation buttressed by science, technology and ICT shall remain at the forefront of global efforts. As such, I urge your collective knowledge and insights to leverage this year's conference as a vehicle to find global solutions to convert the risks of COVID-19 into opportunities and usher in a transformative era.

As this year marks the 11th anniversary of CKC since its inception, I sincerely hope that CKC will be uniquely positioned as an epicenter to facilitate communication among scientists residing in Korea and Canada. Please be assured that KOFST will always remain committed to your noble work. I have no doubt that CKC-2021 will be a great success and wish everyone the best of health and happiness. Thank you.

Woo Il Lee
President of the Korean Federation of Science and Technology Societies
Conference Co-Chair, CKC2021

Good morning and good afternoon,
Distinguished members of the science and technology community.
My name is Yong Hong Taek, I am the Vice Minister of Science and ICT Korea.
First of all, allow me to offer my heartfelt congratulations on the successful opening of the 11th Canada-Korea Conference on Science and Technology(CKC). Despite the difficulties caused by COVID-19, President Lee Woo Il of the Korean Federation of Science and Technology Societies (KOFST), President Kim Il Yong of the Association of Korean-Canadian Scientists and Engineers (AKCSE), and many others have worked hard to organize today's conference.
Although we cannot meet in person, I am pleased to address scientists and engineers of both Korea and Canada, who have joined us to share their knowledge. As the pandemic that began last year continues to linger, there is a pessimistic view that we may have to coexist with the coronavirus in the future. Amid such projections, we are fast approaching an era of the "New Normal," with contactless services increasingly becoming a way of life and digitalization accelerating in all economic sectors. Today, countries are focusing their efforts to not only recover from the COVID-induced economic crisis but also gain an upper hand in shaping a new economic paradigm in digital economy, bioeconomy, hydrogen economy, and more. In particular, enhanced efforts are being made to secure core technologies and foster talent in the field of advanced technology that is instrumental to industrial competitiveness and national security, such as semiconductor, artificial intelligence, quantum information science, and biotechnology.
As Korea ushers in the era of 100 trillion won R&D investments this year, we are making all-out efforts to achieve technology innovation in order to secure core technologies. In terms of R&D budget as a percentage of GDP, Korea ranks as one of the highest in the world. To promote a "human-centered"science and technology development, investment in researcher-oriented basic research has been doubled compared to that of 2017 to strengthen the fundamentals of science and technology. The ROK-U.S. Summit in May helped reaffirm the power of science diplomacy. It would not be an overstatement to say that advanced technology is now central to diplomacy and national security. In this context, it is timely that we discuss gearing up for the future with innovation in science and technology in this year's CKC, under the theme "New Opportunities in the New Normal."
I hope today's conference will be a valuable opportunity to explore ways to enrich our peoples' lives and solutions for a sustainable future. After entering into an Agreement for Science, Technology and Innovation Cooperation in 2016, Korea and Canada are working together to find more ways of cooperation in fields with new growth potential, including artificial intelligence, aerospace, and green technology. I trust scientists and engineers of Korea and Canada to serve as a bridge that connects our two countries, contributing to the bilateral cooperation on science and technology innovation and further strengthening the partnership. The Korean Government will stand by you as you take pride in your work and play a crucial role in the growth of both countries and bilateral cooperation. Once again, congratulations on the successful opening of the CKC, and I wish everyone here good health and happiness.
Thank you.

Yong Hong Taek
The 1st Vice Minister, Ministry of Science and ICT

Dear distinguished guests from Korea and Canada,

On behalf of the National Research Council of Science and Technology (NST) of Korea, I would like to extend my warmest welcome to all of you participating the 2021 Canada-Korea Conference on Science & Technology (CKC 2021).

There is no denying that the COVID-19 pandemic is the signature challenge of our era. Now, the world has a rare opportunity to come together and turn the costly lessons of this pandemic into a united movement to construct a more comprehensive, sustainable future for all. I would like to thank the Association of Korean-Canadian Scientists and Engineers (AKCSE) and the Korean Federation of Science & Technology Societies (KOFST) for organizing this conference during these very difficult times.

With the development of vaccines, hope for the end of the crisis and a return to normalcy is on the horizon. But a very long recovery awaits us.

Therefore, the ability to find new opportunities in the New Normal is of critical importance. We must challenge ourselves to build back better and be more innovative in how we work with international partners and face down unprecedented challenges.

In this regard, the AKCSE indeed provides an opportunity for promoting international research collaboration and for helping the world prepare for the New Normal.

We need to take advantage of this paradigm shift. I look forward to this Conference's continued leadership in catalyzing and channeling the collective wisdom of all participants in our common quest towards the New Normal.

Sincerely,

Dr. Bok Chul Kim
Chairperson
National Research Council of Science and Technology (NST)

PRIME MINISTER · PREMIER MINISTRE

September 1-4, 2021

Dear Friends:

I am pleased to extend my warmest greetings to everyone participating in the 2021 Canada-Korea Conference on Science and Technology.

Now in its 35th year, this annual gathering brings together a wide range of delegates from Canada and Korea to discuss the latest research and developments in science, technology and innovation. I am certain that the many discussions centered on this year's theme —New Opportunities in the New Normal— will stimulate a great deal of insightful and meaningful exchange and that participants will benefit from this opportunity to network, share information, and look to the future.

It continues to be a challenging time for planning and hosting events. That is why I would like to thank the Association of Korean-Canadian Scientists and Engineers and the Korean Federation of Science and Technology Societies for putting together an enlightening and rewarding program for everyone involved while respecting public health guidelines, and for their commitment to advancing knowledge and collaboration in the field.

Please accept my best wishes for a productive conference.

Sincerely,

The Rt. Hon. Justin P. J. Trudeau, P.C., M.P.
Prime Minister of Canada

SENATE
The Honourable Yonah Martin

SÉNAT
L'honorable Yonah Martin

CANADA

July 2021

GREETINGS FROM THE HONOURABLE YONAH MARTIN

I am honoured to extend my sincere greetings to all those participating in the 2021 Canada Korea Conference on Science and Technology. For over 35 years the Association of Korean-Canadian Scientists and Engineers (AKCSE) has contributed to the field of science and technology across Canada and Korea.

I would like to commend AKCSE and the Korean Federation of Science and Technology Societies for their dedication in supporting Korean Canadian scientists and engineers, and coordinating the annual Canada Korea Conference year after year.

I would also like to acknowledge and thank all of the presenters and mentors at this year's conference whose expertise and knowledge continues to enrich the fields of science and technology and inspire the next generation of innovative leaders.

On behalf of the Senate of Canada, best wishes for another successful conference and continued success in the years to come.

Sincerely,

The Honourable Yonah Martin
Deputy Leader of the Opposition in the Senate

Premier's Message

On behalf of the Province of Nova Scotia, it is my pleasure to welcome you to the Canada-Korea Conference on Science and Technology (CKC).

Our province is thrilled to host this year's Canada-Korea Conference. Nova Scotia is home to many Koreans, both as immigrants to our country and post-secondary students, which is a testament to our strong relationship with Korea. We have seen time and time again that diversity makes our province stronger, and we are proud to welcome perspectives from around the world to help advance industries like science and technology.

The theme of this year's conference, "New Opportunities in the New Normal", is fitting given the immense challenges our world has faced since the onset of the COVID-19 pandemic. I expect plenty of meaningful discussions and valued connections will come from this year's conference.

I would like to congratulate and thank the Association of Korean-Canadian Scientists and Engineers and the Korean Federation of Science and Technology Societies for bringing Canadians and Koreans together for this important event.

Together, we will share stories, learn from one another, and inspire the next generation of leaders in science and technology.

May you enjoy this year's conference.

Sincerely,

Honourable Iain Rankin, M.L.A.
Premier

Greetings from the Mayor

As Mayor of Halifax and on behalf of Regional Council, it is my distinct pleasure to extend warm greetings and a special virtual welcome to delegates of the Canada-Korea Conference on Science and Technology, CKC 2021, taking place here in Halifax.

Halifax is home to some of the brightest minds and best educational and research facilities specializing in an extensive range of science and technology disciplines. "*New Opportunities in the New Normal*" will strengthen the importance of fostering research and development collaboration, provide invaluable network opportunities for prominent scientists and engineers while promoting friendship between Korea and Canada. Your work advancing science technology that highlights current trends and advances is noted.

I want to acknowledge, with gratitude, the Association of Korean-Canadian Scientists and Engineers and the Korean Federation of Science and Technology Societies, for hosting the 35th Canada-Korea Conference on Science and Technology here on Canada's East Coast and our wonderful city.

I wish you much success and trust your visit will be a memorable experience. Enjoy CKC 2021!

Kindest regards,

Mike Savage

Mike Savage
Mayor

Dear President Il Yong Kim and all the members of AKCSE.

On behalf of Association des Scientifiques Coréens en France (ASCoF), let me offer my sincere congratulations on the opening of the 2021 Canada-Korea Conference on Science and Technology in Halifax, Canada. I wish to extend my deep appreciation to President Il Yong Kim and the Association of Korean-Canadian Scientists and Engineers (AKCSE) for their invaluable commitment in this successful conference.

Since ASCoF and AKCSE signed a MOU to promote scientific cooperation in May 2017, regularly we attend both conferences (France and Canada) to exchange ideas and discuss for future collaboration research. With current COVID 19 situation, we are attending the CKC 2021 with online access. Even though we are joining with online access, we will have a further discussion for future collaboration. I sincerely hope that this conference will produce valuable ideas and give us more opportunities to have joint research projects between France and Canada.
Once again, congratulations on running a great CKC 2021 conference event, and I wish everyone good health and much happiness.

Sincerely yours,

Junbeum Kim
President of the ASCoF

프랑스 한인 과학기술 협회
ASCOF
Association des Scientifiques Coréens en France (1976)

Dear President Il Yong Kim and Members of the Association of Korean-Canadian Scientists and Engineers (AKCSE)

On behalf of the Korean Scientists and Engineers Association in Austria (KOSEAA) I would like to congratulate the president Il Yong Kim, executives and members of AKCSE for hosting the Canada-Korea Conference on Science & Technology 2021 (CKC 2021).

Due to the corona virus there is still a lot of uncertainty, but the AKCSE members are working hard to prepare for the CKC 2021. As a host of the EKC events, I can fully understand the difficulties and efforts of organizing such a big event.

When I attended CKC events I was impressed by the passion of the organizers which always led to a successful CKC event.

Since 2008 KOSEAA and AKCSE have had a good relation. I hope that the exchanges between KOSEAA and AKCSE will become even more active in the future.

Once again, congratulations on hosting the CKC2021. Best wishes for a productive and memorable event.

Dr. Man Wook Han

President of the Korean Scientists and Engineers Association in Austria (KOSEAA)

Dear President Il Yong Kim and AKCSE members,

On behalf of The Korean Scientists and Engineers Association in the UK (KSEAUK), I wish to express my sincere congratulations to President Il Yong Kim and the members of The Association of Korean-Canadian Scientists and Engineers (AKCSE) on the opening of CKC 2021.

Despite the ongoing COVID-19 epidemic, I am delighted to see that AKCSE has been able to host CKC2021 well organised. It is my belief that CKC2021 will be as successful as CKC2020 with the right combination of online and offline sessions under the leadership of President Il Yong Kim and the accumulated know-how of hosting the past CKC events. This year, the Europe-Korea Conference on Science and Technology (EKC) will also be hosted in three locations in parallel – Essen, Germany, Cambridge in the United Kingdom, and Paris in France, with a hybrid method just like CKC2021. Thus, the AKCSE members are more than welcome to join the EKC2021 to establish collaborative networking opportunities.

Once again, my sincere congratulations on the successful hosting of the CKC2021, and I hope every delegate attending this event share a meaningful and tangible experience.

Yours Sincerely,

Dr Sungwoo Lim
President of The Korean Scientists and Engineers Association in the UK (KSEAUK)

Dear President Il Yong Kim and AKCSE members,

On behalf of The Korean Scientists and Engineers Association in the FRG (VeKNI), I sincerely congratulate to President Il Yong Kim and the members of the Association of Korean – Canadian Scientists and Engineers (AKCSE) and members for hosting CKC 2021.

Last year 2020, despite the corona pandemic, you and your members successfully organized the conference. I acknowledge you and your members very much for it. I am also very confident that, despite the pandemic, CKC 2021 will also be successful this year with the combination of online and offline events.
Due to the ongoing pandemic, the 13th Europe-Korea Conference on Science and Technology (EKC 2021) will be held on three different locations on different dates (10th October 2021, in Essen, Germany, on 24th October 2021, in Cambridge, UK, and on 31st October 2021, in Paris, France).
Role of Science, Technology and Innovation for Achieving Sustainability and Global Goals 2030.
Finally, I would like to once again congratulate you on the organization of the CKC2021 and wish you success.
In one month, EKC2021 will take place. I hope that you will share your experience with us.

Your Sincerely,

Dongwoon Bae
Chair of the Europe-Korea Conference on Science and Technology (EKC) in 2021 (1st day)
President of the Korean Scientists and Engineers Association in Germany

IN ALPHABETICAL ORDER OF FIRST NAME

Dr. Bok Chul Kim
Chairperson / National Research Council of Science and Technology (NST)

Dr. Bok Chul Kim is currently the Chairperson of the National Research Council of Science and Technology (NST). He has a B.Sc. in Geology and a M.Sc. in Sedimentary Petrology and Ph.D. in Sedimentology from Yonsei University, Korea. He also was a visiting professor at the University of Calgary, Canada (Sep. 2013~Aug. 2014). He built his academic career in KIGAM since 1988, and held various important positions at KIGAM and elsewhere. Dr. Kim was appointed as the Executive Director of the Geological Research Division at KIGAM and he was sent to serve as the Director General at the National Research Council of Science and Technology (NST) from 2015 to 2018. He holds leaders' positions for Korea Society of Economic and Environmental Geology and Korean Society of Petroleum and Sedimentary Geology as the President since 2017 as well. His life-time achievements were recognized with the prestige awards: The Order of Merit for Science and Technology of Korea, 'Jinbo' and Commendation of Merit from the Legislative Judiciary Committee of the National Assembly in 2016 after followed by the Minister's Awards in 2008 and 2012.

Dr. Byung Suk Kim, P.E.
President / Korea Institute of Civil Engineering and Building Technology (KICT)

Dr. Byung-Suk Kim is currently the president of the Korea Institute of Civil Engineering and Building Technology (KICT). He has a B.Sc. in Civil Engineering, a M.Sc. of Science in Civil Engineering, and a Ph.D. in Civil Engineering from Seoul National University, Korea.

Dr. Kim was a member of the Advisory Committee on the Board of Audit and Inspection of Korea in 2002 to 2003, and since then, he has been a part of the Advisory Committee in the National Assembly Research Service from 2015 to 2017. From 2013, he has also been a Committee Member in Working Group, National Standard Commission. He was also the Vice President of the Korean Society of Civil Engineering (KSCE) from 2016 to 2017.

Dr. Heesun Chung
President / The Korean Federation of Women's Science and Technology Associations (KOFWST)

Dr. Heesun Chung is a distinguished professor at the department of Forensic Science in SungKyunKwan University. She obtained her Ph.D. in Pharmacy from Sookmyung Women's University, Korea in 1987, and was awarded the Foreign Commonwealth Office Scholarship from the UK government to do further postdoctoral study in King's College, London.

Dr. Chung was the Director General of the National Forensic Service, Korea from 2008 to 2012. She was the 22nd president of the International Association of Forensic Sciences (IAFS) from 2011 to 2014, served as the 13th president of the International Association of Forensic Toxicologists (TIAFT) from 2014 to 2017, and has been an executive Board member since 2002 to present. She is also on the Editorial board for Forensic Toxicologists and Forensic Science International, a fellow of American Academy of Forensic Science, and the president of Korean Association of Forensic Science and the deputy president of the Pharmaceutical Society of Korea. From 2019, she has been a member of the International Panel of Forensic Experts of United Nations Office on Drugs and Crime (UNODC) and the National Bioethics Committee.

IN ALPHABETICAL ORDER OF FIRST NAME

Dr. Hyo-Suk Lim
President / The Association of Korean Woman Scientists and Engineers (KWSE)

Dr. Hyo-Suk Lim is currently serving as the President of the Association of Korean Woman Scientists and Engineers (KWSE).
Founded in 1993, KWSE aims to empower the scientific capacity as well as to uplift the status of women in academia, research institutes, and industry, as the first association of women scientists and engineers in Korea.
Dr. Hyo-Suk Lim received B.Sc. and M.Sc. degrees from Seoul National University, Korea, in 1985 and 1987. She got a Ph.D. degree in Meteorology from Texas A&M University, USA, in 1993 and worked as a Post Doc. at NASA/GSFC from February 1994 to February 1996. In March 1996, she joined the Korea Aerospace Research Institute (KARI) in Korea, where she is currently a principal researcher of National Satellite Operation & Application Center. Dr. Lim mainly has focused on satellite data application in earth science, calibration/validation of satellite data, and international collaboration of remote sensing. Until now, she has served as reviewer of several journals and organizing committee of international conferences. She is the board member of International Charter on Space and Major Disasters. The Charter is composed of space agencies and space system operators from around the world who work together to provide satellite data to disaster management. She also served as a member of Presidential Advisory Council on Science and Technology (PACST) from March 2020 to March of 2021.

Dr. Jong-Nam Kim
President / Korea Institute of Energy Research (KIER)

Dr. Jong-Nam Kim is currently the President of the Korea Institute of Energy Research (KIER), and Chairman of the Korea Carbon Neutral Technology Innovation Strategy established by Ministry of Science & ICT. He is also a member of Presidential Committee on Carbon Neutrality 2050 and Hydrogen Council of Korea. Dr. Jong-Nam Kim has contributed to climate change mitigation by conducting R&D activities as a researcher of the Korea Institute of Energy Research (KIER) since 1985. He received his Ph.D. in Chemical Engineering from the Korea Advanced Institute of Science and Technology (KAIST) in 1994. He has participated as principal investigator in chemical separation process R&D projects, and flourished KIER under his leadership as Chief of Separation Process Research Team, Chief of Chemical Process Research Center, and Director of Climate Change Research Division. He has published a total of 74 papers and a total of 3 books during the research period.

Dr. Kwang-Eun Kim
Vice President / Korea Institute of Geoscience and Mineral Resources (KIGAM)

Dr. Kwang-Eun Kim is currently the Vice President of the Korea Institute of Geoscience and Mineral Resources (KIGAM). He has a B.Sc. of Eng. in Mining Engineering, M.Sc. of Eng. in Exploration Geophysics, and Ph.D. in Remote Sensing from Seoul National Univeristy, Korea.
He built his academic career at KIGAM since 1998, and he held various important positions at KIGAM and elsewhere. Dr. Kim was appointed as the Executive Director of Policy Research Division, Geoscience and Technology Dissemination Division, and Mineral Resources Research Division starting from 2006 to 2018. He has been a key member of Korea Society of Remote Sensing since 1992. He has served as a President of Korea Society of Remote Sensing in 2015 and 2016, and he is now an Honorary President of the Korean Society of Remote Sensing. He is also a member of Korea Society of Mineral and Energy Resources Engineers, IEEE GRSS, and Korea Society for Geospatial Information System.

IN ALPHABETICAL ORDER OF FIRST NAME

Dr. Nak-Kyu Lee
President / Korean Institute of Industrial Technology (KITECH)

Dr. Nak-Kyu Lee is currently the President of the Korean Institute of Industrial Technology (KITECH). He has a B.Sc. in Mechanical Engineering and a M.Sc. in Production Engineering and Ph.D. in Precision Engineering from Korea Advanced Institute of Science and Technology, Korea. He also was a visiting researcher at the Ohio State University, USA in 2006.
In 2018, he became the Director of KITECH Convergence Research Center, and in 2020 the President of the Korean Society of Manufacturing Technology Engineers. Currently, along with being the President of KITECH, he is part of the Ministry of Science and ICT as a machinery-manufacturing field technology level evaluation member.

Dr. Sang Jin Park
President / Korea Institute of Machinery and Materials (KIMM)

Dr. Sang Jin Park is the President of the Korea Institute of Machinery and Materials (KIMM). He earned his bachelor's, master's, and doctoral degrees in Mechanical Engineering from Seoul National University. He has worked as a senior/principal researcher at KIMM since 1996. His main field of interest is desalination plant design and operation. Before he became the President, as the Director of Division of Research Planning and Coordination, he has been responsible for the entire cycle management from planning to commercialization of R&D. He also served as a Program Director for Plant Engineering under the Ministry of Knowledge Economy from 2011 to 2013.
He received a Prime Minister's Citation in 2016, as well as a Chairperson's Merit Award from the National Assembly in 2014.
Currently, he is the Advisor at the Plant Division, Korean Society of Mechanical Engineers, which is the oldest academic society in Korea with its foundation in 1945.

Dr. Seok-jin Yoon
President / Korea Institute of Science and Technology (KIST)

Dr. Yoon is currently president of the Korea Institute of Science and Technology (KIST). He graduated with a BA from Yonsei University in 1983, and with a Ph.D. in electrical and electronic engineering in 1992. Since joining KIST in 1988, he has devoted himself to researching sensors, actuators, and piezoelectricity within the electronic ceramics field. His previous positions include serving as president of the Korean Institute of Electrical and Electronic Material Engineers (KIEEME) and president of the Korean Sensors Society (KSS). E-mail: sjyoon@kist.re.kr

IN ALPHABETICAL ORDER OF FIRST NAME

Dr. Sung-Ho Myung
President / Korea Electrotechnology Research Institute (KERI)

Dr. Sung-Ho Myung was born in Gwangju, Korea. He received his B.S., M.S., and Ph.D. degrees from Seoul National University, Seoul, Korea, in 1981, 1983, and 1996, respectively. Since 1985, he has been with Korea Electrotechnology Research Institute(KERI), Changwon, Korea, where he is currently President of KERI since 2021 August. From 1997 to 2010, he was Group Leader of Electrical Environment Transmission Research Group, KERI. From 2010 to 2013, he was Executive Director of Advanced Power Grid Research Division, KERI. In 2014, he was Director of Future Strategy Division, KERI. From 2014 to 2016, he served as Vice President (Research), and from 2016 to 2018, Vice President (Testing and Certification Services), and in 2018 Vice President (Research) of KERI. From 2019 to 2021, he played a role as a Distinguished Researcher, KERI.

Dr. Yang Ho Chung
President, Korea Evaluation Institute of Industrial Technology (KEIT)

Dr. Yang Ho Chung received the B.S. and M.S. degree both in Economics from Seoul National University in 1985 and 1987, and Ph. D degree in Economics from Southern Illinois University in 1996 respectively. Dr. Jung passed Public Administration Examination in 1984, worked as a deputy director/secretary of the Ministry of Commerce and Industry from 1985 to 2000. After working for Ministry of Commerce Industry and Energy from 2007 to 2008 as a Leader of General Affair Team, he worked for Ministry of Knowledge Economy from 2011 to 2012 as a Director General of Industrial Technology Policy and from 2012 to 2013 as a Director General of Energy Resource Development. After Dr. Jung worked for Ministry of Trade, Industry and Energy (MOTIE) from 2014 to 2016 as a Deputy Minister of Energy Resources, he worked as a Commissioner of Public Procurement Service from 2016 to 2017. Currently Dr. Jung is working as a President of Korea Evaluation Institute of Industrial Technology (KEIT).

Dr. Yeong Cheol Seok
President / Korea Institute for Advancement of Technology (KIAT)

Dr. Yeong Cheol Seok received a B.S. degree in History from Seoul National University in 1981 and a Ph. D degree in Economics from Ohio State University in 1989.
Dr. Seok worked for the Korea Economic Research Institute (KERI) from 1983 to 1984 as a research economist. He worked at the University of Cincinnati as an assistant professor from 1990 to 1994. Then he moved to ITEP and worked as a senior research fellow/director from 1994 and 2001. Dr. Seok worked for KOTEF as a director from 2001 to 2009 and worked for KIAT as a vice president/executive director from 2009 to 2014. Along with these many positions, he worked as an executive director at the Office of Strategic R&D Planning (OSP) Ministry of Trade, Industry from 2014 to 2016, and as a professor at Inha University from 2017 to 2019. Now, Dr. Seok is working as the President of the Korea Institute for Advancement of Technology(KIAT).

Canada Time (Atlantic Daylight Time)

	Day 1: Wednesday, Sep. 1, 2021			
Room Layout (Max)	Ballroom (B1,B2) 150, 40	Ballroom (B3) 110	501-502 14	506-507 16
09:00 - 09:30 09:30 - 10:00	**Registration** (10:00 - 17:00) Ballroom Pre-function Area			
10:00 - 10:30 10:30 - 11:00		**Track 2** (Mentoring with AKCSE Executive) (10:00-11:00) B3		
11:00 - 11:30 11:30 - 12:00				
12:00 - 12:30 12:30 - 13:00	**Lunch** (12:00 - 13:00) B1			
13:00 - 13:30 13:30 - 14:00		**Volunteer Orientation** (13:00 - 14:30) B3		
14:00 - 14:30 14:30 - 15:00				
15:00 - 15:30 15:30 - 16:00			**Reserved** (14:30 - 17:00)	
16:00 - 16:30 16:30 - 17:00				
17:00 - 17:30 17:30 - 18:00	**Local Chapter President** (17:00 - 18:00) B2	**YGP Icebreaker** (17:00-18:00) B3		
18:00 - 18:30	**Networking & Welcome Reception** (18:00 - 18:30) B1			
18:30 - 19:00 19:00 - 19:30	**Dinner** (18:30 - 19:45) B1			
19:30 - 20:00		**YGF/YPF Alum Open** (19:30 - 19:50) B2		
20:00 - 20:30 20:30 - 21:00	**Opening Ceremony (20:00 - 20:50) B3**			
21:00 - 21:30 21:30 - 22:00	**Plenary Speech I (21:00 - 21:50) B3**			
22:00 - 22:30 22:30 - 23:00	**STI Forum (22:00 - 22:50) B3**			
23:00 - 23:30		**Carbon Neutrality Part 1 (23:00 - 23:50) B3**		
23:30 - 24:00 00:00 - 00:30 (+Day) 00:30 - 01:00 (+Day)	**KEIT (B2)**	**Carbon Neutrality Part 2 (00:00 - 00:50) B3**		

Session with Korea (Online, real-time)	Session with Korea (Online, real-time) Closed (Inviation Only)	Technical Session	Track 2 Program
Networking	Lunch / Dinner	Admin Meeting	YGF/YPF Alumni Network
YGP Meeting	Photo Time	Local Chapter President Meeting	

IN: In-person only
HC: Hybrid Centreal Podium Presentation
HZ: Hybrid Zoom Presentation

Canada Time (Atlantic Daylight Time)

	Day 2: Thursday, Sep. 2, 2021			
Room Layout (Max)	Ballroom (B1,B2) 150, 40	Ballroom (B3) 110	501-502 14	506-507 16
09:00 - 09:30 09:30 - 10:00	**Registration** (10:00 - 17:00) Ballroom Pre-function Area			
10:00 - 10:30 10:30 - 11:00 11:00 - 11:30 11:30 - 12:00	**AKCSE Board Meeting** (10:00 - 12:00) B2	**TEDxYGP (with Track 2)** (10:00-12:00) B3		
12:00 - 12:30 12:30 - 13:00	**Lunch** (12:00 - 13:00) B1	**YGF/YPF Alum "Meet my mentor"** (12:00 - 13:00) B1 (separate table)		
13:00 - 13:30 13:30 - 14:00 14:00 - 14:30 14:30 - 15:00	**YGP Research Comp 1** (13:00 - 14:45) B2	**K-TAG Forum** (13:00 - 14:45) B3	**YGP Research Comp 2** (13:00 - 14:45) 501-502	**YGP Research Comp 3** (13:00 - 14:45) 506-507
15:00 - 15:30 15:30 - 16:00 16:00 - 16:30 16:30 - 17:00 17:00 - 17:30 17:30 - 18:00		**Technical Sessions** (15:00 - 18:00) B3		
18:00 - 18:30	**Photo Time** (18:00 - 18:30)			
18:30 - 19:00 19:00 - 19:30 19:30 - 20:00	**Dinner** (18:30 - 19:45) B1			
20:00 - 20:30 20:30 - 21:00	**Plenary Speech II (SDG-AI Forum) (20:00 - 20:50) B3**			
21:00 - 21:30 21:30 - 22:00	**Research Showcase I (21:00 - 22:00) B3**			**YGP President Workshop** (21:00 - 23:00) 506-507
22:00 - 22:30 22:30 - 23:00 23:00 - 23:30	**KIMM** (B2)	**KIAT** (B3)	**KIER** 501-502	
23:30 - 24:00 00:00 - 00:30 (+Day) 00:30 - 01:00 (+Day)	**KERI** (B2)	**GEI** (B3)	**KITECH** 501-502	

Session with Korea (Online, real-time)	Session with Korea (Online, real-time) Closed (Inviation Only)	Technical Session	Track 2 Program
Networking	Lunch / Dinner	Admin Meeting	YGF/YPF Alumni Network
YGP Meeting	Photo Time	Local Chapter President Meeting	

IN: In-person only
HC: Hybrid Centreal Podium Presentation
HZ: Hybrid Zoom Presentation

Canada Time (Atlantic Daylight Time)

	Day 3: Friday, Sep. 3, 2021			
Room	**Ballroom (B1,B2)**	**Ballroom (B3)**	**501-502**	**506-507**
Layout (Max)	150, 40	110	14	16
09:00 - 09:30	**Registration** (10:00 - 17:00) Ballroom Pre-function Area	**Track 2** (Canadian Research Inst) (09:00-10:00) B3		
09:30 - 10:00				
10:00 - 10:30	**YGP AGM** (10:00 - 12:00) B2	**AKCSE Ambassador** (10:00 - 11:00) B3		
10:30 - 11:00				
11:00 - 11:30			**AI Roundtable** (11:00 - 12:00) 501-502	
11:30 - 12:00				
12:00 - 12:30	**Lunch** (12:00 - 13:00) B1			
12:30 - 13:00				
13:00 - 13:30		**AKCSE AGM** (13:00 - 14:45) B3		
13:30 - 14:00				
14:00 - 14:30				
14:30 - 15:00				
15:00 - 15:30	**R&D Funding Information** (15:00 - 16:15) B2	**YGP: Meeting with Ambassador of Korea** (15:00 - 16:15) B3		
15:30 - 16:00				
16:00 - 16:30				
16:30 - 17:00	**Human Bingo! (Poster Presentation)** (16:30 - 17:45) B3			
17:00 - 17:30				
17:30 - 18:00				
18:00 - 18:30				
18:30 - 19:00	**Farewell Dinner & Award Ceremony** (18:30 - 19:45) B1			
19:00 - 19:30				
19:30 - 20:00				
20:00 - 20:30	**KOFWST (20:30 - 22:20) B3**			
20:30 - 21:00				
21:00 - 21:30				
21:30 - 22:00				
22:00 - 22:30				
22:30 - 23:00	**KWSE (22:30 - 00:20) B3**			
23:00 - 23:30				
23:30 - 24:00				
00:00 - 00:30 (+Day)				
00:30 - 01:00 (+Day)				

Session with Korea (Online, real-time)	Session with Korea (Online, real-time) Closed (Inviation Only)	Technical Session	Track 2 Program
Networking	Lunch / Dinner	Admin Meeting	YGF/YPF Alumni Network
YGP Meeting	Photo Time	Local Chapter President Meeting	

IN: In-person only
HC: Hybrid Centreal Podium Presentation
HZ: Hybrid Zoom Presentation

Canada Time (Atlantic Daylight Time)

<table>
<tr><th></th><th colspan="4">Day 4: Saturday, Sep. 4, 2021</th></tr>
<tr><th>Room
Layout (Max)</th><th>Ballroom (B1,B2)
150, 40</th><th>Ballroom (B3)
110</th><th>501-502
14</th><th>506-507
16</th></tr>
<tr><td>09:00 - 09:30</td><td colspan="2" rowspan="2"></td><td colspan="2" rowspan="20">Off-site Technical Program
(09:00 - 18:00)</td></tr>
<tr><td>09:30 - 10:00</td></tr>
<tr><td>10:00 - 10:30</td><td rowspan="4">Brunch with AKCSE
(10:00 - 12:00) B1</td><td>Track 2 (Canadian Academia)
(10:00-11:00) B3</td></tr>
<tr><td>10:30 - 11:00</td></tr>
<tr><td>11:00 - 11:30</td><td>Track 2 (End & Survey)
(11:00-11:45) B3</td></tr>
<tr><td>11:30 - 12:00</td></tr>
<tr><td>12:00 - 12:30</td><td colspan="2" rowspan="5">Networking &
Conference Feedback
(12:00 - 14:30) B3</td></tr>
<tr><td>12:30 - 13:00</td></tr>
<tr><td>13:00 - 13:30</td></tr>
<tr><td>13:30 - 14:00</td></tr>
<tr><td>14:00 - 14:30</td></tr>
<tr><td>14:30 - 15:00</td><td colspan="2">END OF CKC2021</td></tr>
<tr><td>15:00 - 15:30</td></tr>
<tr><td>15:30 - 16:00</td></tr>
<tr><td>16:00 - 16:30</td></tr>
<tr><td>16:30 - 17:00</td></tr>
<tr><td>17:00 - 17:30</td></tr>
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<tr><td>22:00 - 22:30</td></tr>
<tr><td>22:30 - 23:00</td></tr>
<tr><td>23:00 - 23:30</td></tr>
<tr><td>23:30 - 24:00</td></tr>
<tr><td>00:00 - 00:30 (+Day)</td></tr>
<tr><td>00:30 - 01:00 (+Day)</td></tr>
</table>

Session with Korea (Online, real-time)	Session with Korea (Online, real-time) Closed (Inviation Only)	Technical Session	Track 2 Program
Networking	Lunch / Dinner	Admin Meeting	YGF/YPF Alumni Network
YGP Meeting	Photo Time	Local Chapter President Meeting	

IN: In-person only
HC: Hybrid Centreal Podium Presentation
HZ: Hybrid Zoom Presentation

Korean Time (KST)

	Day 0: 2021년 9월 1일, 수요일			
Room Layout (Max)		Ballroom (B3) 110		
00:00 - 00:30				
00:30 - 01:00				
01:00 - 01:30				
01:30 - 02:00				
02:00 - 02:30				
02:30 - 03:00				
03:00 - 03:30				
03:30 - 04:00				
04:00 - 04:30				
04:30 - 05:00				
05:00 - 05:30				
05:30 - 06:00				
06:00 - 06:30				
06:30 - 07:00				
07:00 - 07:30				
07:30 - 08:00				
08:00 - 08:30				
08:30 - 09:00				
09:00 - 09:30	**Track 2** (Entrepreneurship Seminar) (09:00-10:15)			
09:30 - 10:00				
10:00 - 10:30				
10:30 - 11:00				
11:00 - 11:30				
11:30 - 12:00				
12:00 - 12:30				
12:30 - 13:00				
21:00 - 21:30				
21:30 - 22:00				
22:00 - 22:30	**Track 2 (Mentoring with AKCSE Executive)** (22:00-23:00) B3			
22:30 - 23:00				
23:00 - 23:30				
23:30 - 24:00				

Session with Korea (Online, real-time)	Session with Korea (Online, real-time) Closed (Inviation Only)	Technical Session	Track 2 Program
Networking	Lunch / Dinner	Admin Meeting	YGF/YPF Alumni Network
YGP Meeting	Photo Time	Local Chapter President Meeting	

IN: In-person only
HC: Hybrid Centreal Podium Presentation
HZ: Hybrid Zoom Presentation

Korean Time (KST)

	Day 1: 2021년 9월 2일, 목요일			
Room Layout (Max)	Ballroom (B1,B2) 150, 40	Ballroom (B3) 110	501-502 14	506-507 16
00:00 - 00:30 00:30 - 01:00	Lunch (00:00 - 01:00) B1			
01:00 - 01:30 01:30 - 02:00 02:00 - 02:30		Volunteer Orientation (01:00 - 02:30) B3		
02:30 - 03:00 03:00 - 03:30 03:30 - 04:00 04:00 - 04:30 04:30 - 05:00			Reserved (02:30 - 05:00)	
05:00 - 05:30 05:30 - 06:00	Local Chapter President (05:00 - 06:00) B2	YGP Icebreaker (05:00-06:00) B3		
06:00 - 06:30	Networking & Welcome Reception (06:00 - 06:30) B1			
06:30 - 07:00 07:00 - 07:30	Dinner (06:30 - 07:45) B1			
07:30 - 08:00		YGF/YPF Alum Open (07:30 - 07:50) B2		
08:00 - 08:30 08:30 - 09:00	Opening Ceremony (08:00 - 08:50) B3			
09:00 - 09:30 09:30 - 10:00	Plenary Speech I (09:00 - 09:50) B3			
10:00 - 10:30 10:30 - 11:00	STI Forum (10:00 - 10:50) B3			
11:00 - 11:30		Carbon Neutrality Part 1 (11:00 - 11:50) B3		
11:30 - 12:00 12:00 - 12:30 12:30 - 13:00	KEIT (B2)	Carbon Neutrality Part 2 (12:00 - 12:50) B3		
21:00 - 21:30 21:30 - 22:00				
22:00 - 22:30 22:30 - 23:00 23:00 - 23:30 23:30 - 24:00	AKCSE Board Meeting (22:00 - 24:00) B2	TEDxYGP (with Track 2) (22:00-24:00) B3		

Session with Korea (Online, real-time)	Session with Korea (Online, real-time) Closed (Inviation Only)	Technical Session	Track 2 Program
Networking	Lunch / Dinner	Admin Meeting	YGF/YPF Alumni Network
YGP Meeting	Photo Time	Local Chapter President Meeting	

IN: In-person only
HC: Hybrid Centreal Podium Presentation
HZ: Hybrid Zoom Presentation

Korean Time (KST)

	Day 2: 2021, 9월 3일, 금요일			
Room	**Ballroom (B1,B2)**	**Ballroom (B3)**	**501-502**	**506-507**
Layout (Max)	150, 40	110	14	16
00:00 - 00:30	**Lunch** (00:00 - 01:00) B1	**YGF/YPF Alum "Meet my mentor"** (00:00 - 01:00) B1 (separate table)		
00:30 - 01:00				
01:00 - 01:30	**YGP Research Comp 1** (01:00 - 02:45) B2	**K-TAG Forum** (01:00 - 02:45) B3	**YGP Research Comp 2** (01:00 - 02:45) 501-502	**YGP Research Comp 3** (01:00 - 02:45) 506-507
01:30 - 02:00				
02:00 - 02:30				
02:30 - 03:00				
03:00 - 03:30		**Technical Sessions** (03:00 - 06:00) B3		
03:30 - 04:00				
04:00 - 04:30				
04:30 - 05:00				
05:00 - 05:30				
05:30 - 06:00				
06:00 - 06:30	**Photo Time** (06:00 - 06:30)			
06:30 - 07:00	**Dinner** (06:30 - 07:45) B1			
07:00 - 07:30				
07:30 - 08:00				
08:00 - 08:30	**Plenary Speech II (SDG-AI Forum) (08:00 - 08:50) B3**			
08:30 - 09:00				
09:00 - 09:30	**Research Showcase I (09:00 - 10:00) B3**			**YGP President Workshop** (09:00 - 11:00) 506-507
09:30 - 10:00				
10:00 - 10:30	**KIMM (B2)**	**KIAT (B3)**	**KIER** 501-502	
10:30 - 11:00				
11:00 - 11:30				
11:30 - 12:00	**KERI (B2)**	**GEI (B3)**	**KITECH** 501-502	
12:00 - 12:30				
12:30 - 13:00				
21:00 - 21:30		**Track 2** (Canadian Research Inst) (21:00-22:00) B3		
21:30 - 22:00				
22:00 - 22:30	**YGP AGM** (22:00 - 24:00) B2	**AKCSE Ambassador** (22:00 - 23:00) B3		
22:30 - 23:00				
23:00 - 23:30			**AI Roundtable** (23:00 - 24:00) 501-502	
23:30 - 24:00				

Session with Korea (Online, real-time)	Session with Korea (Online, real-time) Closed (Inviation Only)	Technical Session	Track 2 Program
Networking	Lunch / Dinner	Admin Meeting	YGF/YPF Alumni Network
YGP Meeting	Photo Time	Local Chapter President Meeting	

IN: In-person only
HC: Hybrid Centreal Podium Presentation
HZ: Hybrid Zoom Presentation

Korean Time (KST)

	Day 3: 2021, 9월 4일, 토요일			
Room Layout (Max)	Ballroom (B1,B2) 150, 40	Ballroom (B3) 110	501-502 14	506-507 16
00:00 - 00:30 00:30 - 01:00	**Lunch** (00:00 - 01:00) B1			
01:00 - 01:30 01:30 - 02:00 02:00 - 02:30 02:30 - 03:00		**AKCSE AGM** (01:00 - 02:45) B2		
03:00 - 03:30 03:30 - 04:00 04:00 - 04:30	**R&D Funding Information** (03:00 - 04:15) B2	**YGP: Meeting with Ambassador of Korea** (03:00 - 04:15) B3		
04:30 - 05:00 05:00 - 05:30 05:30 - 06:00	**Human Bingo! (Poster Presentation)** (04:30 - 05:45) B3			
06:00 - 06:30				
06:30 - 07:00 07:00 - 07:30 07:30 - 08:00	**Farewell Dinner & Award Ceremony** (06:30 - 07:45) B1			
08:00 - 08:30 **08:30 - 09:00** **09:00 - 09:30** **09:30 - 10:00** **10:00 - 10:30** **10:30 - 11:00** **11:00 - 11:30** **11:30 - 12:00** **12:00 - 12:30** **12:30 - 13:00**		**KOFWST** **(08:30 - 10:20) B3** **KWSE** **(10:30 - 12:20) B3**		
21:00 - 21:30 21:30 - 22:00			**Off-site Technical Program** (21:00 - 24:00)	
22:00 - 22:30 22:30 - 23:00 23:00 - 23:30 23:30 - 24:00	**Brunch with AKCSE** (22:00 - 24:00) B1	**Track 2** (Canadian Academia) (22:00-23:00) B3 **Track 2** (End & Survey) (23:00-23:45) B3		

Session with Korea (Online, real-time)	Session with Korea (Online, real-time) Closed (Inviation Only)	Technical Session	Track 2 Program
Networking	Lunch / Dinner	Admin Meeting	YGF/YPF Alumni Network
YGP Meeting	Photo Time	Local Chapter President Meeting	

IN: In-person only
HC: Hybrid Centreal Podium Presentation
HZ: Hybrid Zoom Presentation

Korean Time (KST)

	Day 4: 2021, 9월 5일, 일요일		
Room	Ballroom (B3)	501-502	506-507
Layout (Max)	110	14	16
00:00 - 00:30	Networking & Conference Feedback (00:00 - 02:30) B3	Off-site Technical Program (00:00 - 06:00)	
00:30 - 01:00			
01:00 - 01:30			
01:30 - 02:00			
02:00 - 02:30			
02:30 - 03:00	END OF CKC2021		
03:00 - 03:30			
03:30 - 04:00			
04:00 - 04:30			
04:30 - 05:00			
05:00 - 05:30			
05:30 - 06:00			
06:00 - 06:30			
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21:00 - 21:30			
21:30 - 22:00			
22:00 - 22:30			
22:30 - 23:00			
23:00 - 23:30			
23:30 - 24:00			

Session with Korea (Online, real-time)

Session with Korea (Online, real-time) Closed (Inviation Only)

Technical Session

Track 2 Program

Networking

Lunch / Dinner

Admin Meeting

YGF/YPF Alumni Network

YGP Meeting

Photo Time

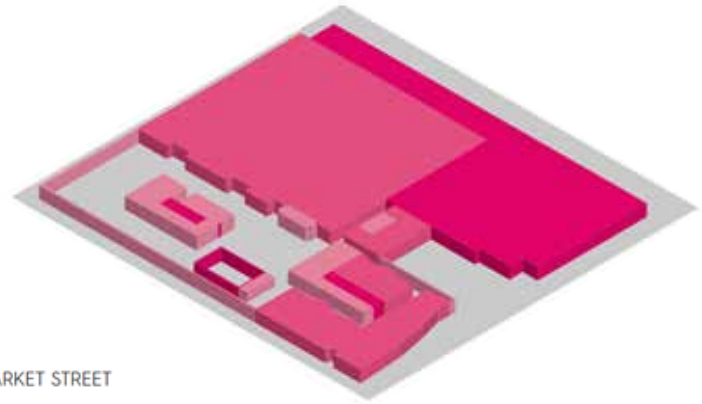
Local Chapter President Meeting

IN: In-person only
HC: Hybrid Centreal Podium Presentation
HZ: Hybrid Zoom Presentation

Floor Plan & Capacities

BALLROOM LEVEL

HALIFAX CONVENTION CENTRE




Halifax Convention Centre &
Sutton Place Hotel
Argyle St.
Prince St.
Sackville St.
Market St.
Halifax Citadel
Google Earth

21:00 - 21:50, September 1 (Wednesday) ADT
Ballroom B3

Speaker: Dr. Jeff Dahn

Dr. Jeff Dahn was born in Bridgeport, Conn. in 1957 and emigrated with his family to Nova Scotia, Canada in 1970. He obtained his B.Sc. in Physics from Dalhousie University (1978) and his Ph.D. from the University of British Columbia in 1982. Dahn then worked at the National Research Council of Canada (82-85) and at Moli Energy Limited (85-90) before taking up a faculty position in the Physics Department at Simon Fraser University in 1990. He returned to Dalhousie University in 1996.

During his years at Simon Fraser University (90-96) he collaborated strongly with the R+D team at NEC/Moli Energy Canada (Now E-One/Moli Energy Canada). Dahn then became the NSERC/3M Canada Industrial Research Chair in Materials for Advanced Batteries at Dalhousie University in 1996. In 2016, Dahn began a 5-year partnership with Tesla which will be extended till 2026. Dahn is the co-author of over 730 refereed journal papers and 73 inventions with patents issued or filed.

Dahn has received National and International awards including: Battery Division Research Award (The Electrochemical Society - 1996); Fellow of the Royal Society of Canada (2001); the "Technology Award" from the ECS Battery Division in 2011, the Governor General's Innovation Award (2016) and the Gerhard Herzberg Gold Medal in Science and Engineering (Canada's top science award) in 2017. He was named an Officer of the Order of Canada in 2020.

Modern Li-ion cells: More than 1 Million Miles and a Possibly a Century of Life

Abstract:
Modern lithium-ion cells can easily provide more than 1 million miles of tota driving range for electric vehicles and can last for many decades. These far exceed the requirements for vehicles, so why do Li-ion cells need to be so good?. In this talk I will spend time discussing how such incredible Li-ion cells can be made and then I will discuss why society needs vehicles equipped with such batteries.

20:00 - 20:50, September 2 (Thursday) ADT
Ballroom B3

Speaker: Dr. James Elder

Professor/Tier 1 York Research Chair in Human and Computer Vision

Dr. Elder is jointly appointed to the Department of Psychology and the Department of Electrical Engineering & Computer Science at York University. His research program seeks to improve machine vision systems through a better understanding of visual processing in biological systems. He has spearheaded numerous collaborative research projects with funding totalling more than $13M. He currently leads the $4M ORF-RE project Intelligent Systems for Sustainable Urban Mobility and the $1.65M NSERC CREATE Training Program in Data Analytics & Visualization. He has published over 80 peer-reviewed papers and these have been cited more than 7,000 times. He holds two patents on attentive vision technologies and is the co-founder of the AI start-up AttentiveVision. His research has won a number of awards and honours, including the Premier's Research Excellence Award. He is appointed to the Editorial Boards of the Journal of Vision and the ACM Transactions on Applied Perception. E-mail jelder@yorku.ca

Biomimetic Computer Vision: Science to Applications

James H. Elder[1]*

1Centre for Vision Research, York University

The human brain picks up information through five senses, of which vision is perhaps the most vital. Equipping machines with human-like intelligence will thus require computer vision systems that rival human vision. While in the last ten years we have seen a rapid improvement in the performance of computer vision algorithms based on convolutional neural networks (CNNs), there remain significant challenges to achieving human-like artificial visual intelligence. While humans learn quickly and often from few labelled examples, typical computer vision algorithms require large corpuses of hand-labelled training data that are difficult and expensive to obtain. While the human visual system quickly adapts to changes in lighting and perspective, once trained, most computer vision systems cannot adapt to changing conditions. While humans perceive a visual scene as a rich organization of textures, surfaces and objects at many scales, computer vision algorithms are typically trained to deliver a comparatively impoverished visual judgement (e.g., 'this is a cat'). I will argue that to address these challenges we should look deeper into the human visual system and use what we learn to engineer more comprehensive biomimetic artificial vision systems that have strong inductive biases but can also learn and adapt quickly to changing conditions. I will illustrate my argument with examples from diverse application domains, including autonomous driving, architecture, and sports videography. *Corresponding author; E-mail jelder@yorku.ca

STI - Canada-Korea STI Cooperation Forum

Time: 10:00 - 11:00, 2 September (Thursday) Korea Time
22:00 - 23:00, 1 September (Wednesday) Canada ADT

Place: Online
In-person at Ballroom B3 in the Halifax Convention Center, NS, Canada

Sponsor: National Research Council of Science and Technology (NST)

Organizer: AKCSE and NST

Contact: Dr. Gap Soo Chang, University of Saskatchewan (gapsoo.chang@usask.ca)

Description: The STI forum will focus on the theme of “Climate action strategies toward carbon neutrality in Canada and Korea” and provide participants with an active venue for discussion on the role of science and technology on “Net-Zero Emissions by 2050” in Canada and Korea, strategic direction of national research institutes, and priority areas for international cooperation between two nations.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
22:00-22:04	Online & Ballroom B3 Halifax Convention Center	Introduction		
22:04-22:07		Welcome Remark	Dr. Il Yong Kim	AKCSE President
22:07-22:10		Congratulatory Remark	Dr. Bok Chul Kim	NST Chairperson
22:10-22:15		TBA	TBA	MEI Quebec*
22:15-22:25		Canada Net-Zero Strategy	Dr. Philippe Tanguy	Polytechnic Montreal
22:25-22:40		Carbon neutrality strategy in Korea	Dr. In Hwan Lee	NST Director General Policy
22:40-23:00		Panel Discussion and General Q&A		

*MEI Quebec: Ministry of Economy & Innovation of Quebec

List of Participants:

Canada

Affiliation	Name	Position	In-person/ Online
National Research Council of Science & Technology	Dr. Bok Chul Kim	Chairperson	Online
Korea Institute of Science and Technology	Dr. Seok-Jin Yoon	President	Online
Korea Institute of Energy Research	Dr. Jong-nam Kim	President	Online
Korea Electrotechnology Research Institute	Dr. Sung-Ho, Myung	President	Online
Korea Research Institute of Chemical Technology	Dr. Mihye Yi	President	Online

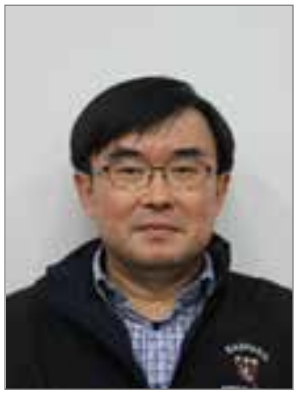
STI - Canada-Korea STI Cooperation Forum Biography

Chair: Dr. Gap Soo Chang

Professor at University of Saskatchewan

Dr. Gap Soo Chang is a Professor in the Department of Physics and Engineering Physics at the University of Saskatchewan. He received his B. Sc., M.Sc., and Ph.D. degrees in Experimental Condensed Matter Physics from Yonsei University, Seoul, Korea. He held postdoctoral researcher positions at Atomic-scale Surface Science Center, Korea and the University of Tennessee at Knoxville/Lawrence Berkeley National Laboratory prior to joining the faculty at the University of Saskatchewan. His research interests encompass materials design and characterization of carbon-based semiconductor, magnetic semiconductors/ nanostructures using synchrotron-radiation X-ray spectroscopy for electronics and renewable energy technology (photovoltaics and battery technology), and the first-principle theory for bioactivity assessment of xenobiotics. He has served as 21st President of AKCSE, a board member of Canadian Association of Physicists (CAP) and Hydrographic Society of Korea, and a chair of International Activities Committee of Council, University of Saskatchewan. E-mail: gapsoo.chang@usask.ca

STI - Canada-Korea STI Cooperation Forum Biography



Chair: Dr. Chaejun Song

Head of International Cooperation Team at National Research Council of Science & Technology

Dr. Chaejun Song is the head of international cooperation team at National Research Council of Science & Technology. He received Ph.D. in hadron physics from Seoul National University. He was a MOEHRD-KRF Professor at physics department in Pusan National University before he served as a research fellow for research policy at Korea Research Foundation, a research funding agency for academic scholars. He moved to Korea Research Council of Fundamental Science and Technology, which was merged into National Research Council of Science & Technology, and previously served as the strategy division director and an expert advisor for research policy. E-mail: chaejun@nst.re.kr

STI - Canada-Korea STI Cooperation Forum Biography

Keynote Speaker: Dr. Philippe Tanguy

President of Polytechnique Montreal Technological University

Dr. Philippe Tanguy is the President of Polytechnique Montreal technological university, one of the leading research institutions in Canada, since 2018. As an expert in hydrogen and economy decarbonization, he has also been working with government shaping the energy transition and electrification strategy.

Prior to joining Polytechnique, Dr. Tanguy served as a top R&D executive for the integrated energy company Total in Paris and Berlin, focusing on international R&D strategy, and deploying globally the corporate science and open innovation policy, in relation with the energy transition, the hydrogen economy, the energy-water-environment nexus. He previously pursued an academic career in several universities in Canada, including 15 years as an industrial research chairholder at Polytechnique Montreal.

Dr. Tanguy is presently the Chairman of the World Council of Chemical Engineering, a fellow of the Canadian Academy of Engineering, a fellow and founding member of the Hassan II Academy of Sciences and Technologies of Morocco, and an honorary fellow of the Institute of Chemical Engineers (UK). His education background includes an undergraduate education in mathematics and physics, a doctorate degree in physics (Paris), a Ph.D. in chemical engineering (Laval), an industrial post-doctoral fellowship with General Electric, and an executive management training at the MIT's Sloan School of Management. E-mail: philippe.tanguy@polymtl.ca

STI - Canada-Korea STI Cooperation Forum Biography

Keynote Speaker: Dr. In Hwan Lee

Director General Office of Policy at National Research Council of Science & Technology

Dr. In Hwan Lee is the director-general of Policy Office at National Research Council of Science & Technology, which is the headquarter organization for 25 Korean government-funded research institutes (GRIs). His office is responsible for developing R&D and HR strategy for GRIs, evaluating of GRIs' performance and external relations.

He got his Ph. D. in electronic electrical computer from Hanyang University. Since 1993, he has served as a researcher in Electronics and Telecommunication Research Institute (ETRI), which is the largest GRI and a most important engine to establish Korean IT industry. He applied ICT to solve societal problems. He led UGS (UnderGround Safety) Convergence Center, one of the first two Convergence Research Centers selected by National Research Council of Science and Technology in 2014. He developed IoT-based urban underground utility management system. He also previously developed ICT systems for city traffic. E-mail: ihlee@nst.re.kr

NST - AKCSE Carbon Neutrality Part 1 & 2

Time: 11:00 - 13:00, 2 September (Thursday) Korea Time
23:00 - 01:00, 1 September (Wednesday) Canada ADT

Place: Online
In-person in Ballroom B3 Halifax Convention Center, NS, Canada

Sponsor: NST (National Research Council of Science and Technology) and
AKCSE (Association of Korean-Canadian Scientists and Engineers)

Organizer: NST and AKCSE

Contact: Dr. Keekyoung Kim (keekyoung.kim@ucalgary.ca; University of Calgary) and
Dr. Hyo-Jick Choi (hyojick@ualberta.ca; University of Alberta)

Description: With the greenhouse effect being a major global challenge in recent days, carbon neutrality represents one of the world's most urgent missions as defined by United Nations (UN). While beneficial practice guidelines for greenhouse-gas emission management have been in place, guidelines and techniques for dealing with the root causes of the issue have often been overlooked and not fully addressed. The elevating historical levels of carbon dioxide in the atmosphere (418.94 ppm in 2021) have been a prevailing concern to governments as air pollution may lead to serious effects on both human health and global climate change, as evidenced by the apparent rise in global surface temperature, frequent severe weathers, loss of biodiversity, etc. While effective at coping with such catastrophic phenomena, transition to low-carbon or zero-carbon is expected to bring tangible economic benefits to industries at large.
It is noteworthy that the enhanced transparency framework (ETF) starts in 2024 to assess the long-term goals of the Paris agreement, raising awareness worldwide. To meet the milestone, the development of knowledge and innovative technical solution is extremely vital for ensuring the successful reduction in greenhouse gas emissions and facilitating movement to zero emissions. One of the most important lessons humanity has learned from the COVID-19 pandemic is that concerted efforts across the world have become increasingly essential for scientific innovation; and thus we have good reason to strive for multinational collaboration for achieving a net-zero emission of greenhouse gases by 2050. Keeping challenges mentioned above in mind, AKCSE and NST (National Research Council of Science & Technology) are hosting a special session featuring carbon neutralization as the central topic during CKC 2021. Experts from Canada and South Korea will speak about the current status of the research in the fields of carbon capture (CCC), carbon storage (CCS), and carbon utilization (CCU), presenting an agenda for future directions regarding carbon neutrality.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
23:00-23:02	Online & Ballroom B3 Halifax Convention Center	Opening	Dr. Keekyoung Kim	Univ. of Calgary
23:02-23:04		Welcome message	Dr. Il Yong Kim	AKCSE President
23:04-23:18		Keynote speech	Dr. Young Cheol Park	KIER
23:18-23:32		Keynote Speech	Dr. Insun Song	KIGAM

23:32-23:46	Online & Ballroom B3 Halifax Convention Center	Keynote Speech	Dr. Hyung-Suk Oh	KIST
23:46-00:00		Keynote Speech	Dr. Dae Hoon Lee	KIMM
00:00-00:20		Keynote Speech	Dr. Simon Park	Univ. of Calgary
00:20-00:30		Keynote Speech	Ms. Yoonhee Ko	Natural Resources Canada
00:30-00:50		Keynote Speech	Dr. Hyung-Sool Lee	Univ. of Waterloo
00:50-01:00		Keynote Speech	Dr. Hyo-Jick Choi	Univ. of Alberta
		Closing	Dr. Hyo-Jick Choi	Univ. of Alberta

List of Participants:

Korea

Affiliation	Name	Position	In-person/Online
NST	Dr. Chaejun Song	Head, International Cooperation Team	Online
KIER	Dr. Young Cheol Park	Principal Researcher, Greenhouse Gas Research Department	Online
KIGAM	Dr. Insun Song	Principal Investigator, Center for CO2 Geological Storage	Online
KIST	Dr. Hyung-Suk Oh	Principal Research Scientist, Clean Energy Research Center	Online
KIMM	Dr. Dae Hoon Lee	Principal Investigator, Dept. Plasma Engineering	Online
KIER	Dr. Sangjin Choi	Chief, Global R&D Strategy Team/ Energy Policy Research Team	Online

Canada

Affiliation	Name	Position	In-person/Online
Univ. of Calgary	Dr. Keekyoung Kim	Professor	In-person
Univ. of Alberta	Dr. Hyo-Jick Choi	Professor	In-person
Univ. of Calgary	Dr. Simon Park	Professor	In-person
Natural Resources Canada	Ms. Yoonhee Ko	Geoscientist	In-person
Univ. of Waterloo	Dr. Hyung-Sool Lee	Professor	Online

Carbon Neutrality Biography

Chair: Dr. Keekyoung Kim

Associate Professor at the University of Calgary

Dr. Keekyoung Kim is an associate professor in the Department of Mechanical and Manufacturing Engineering and Biomedical Engineering at the University of Calgary. Previously, he was at the University of British Columbia's Okanagan Campus from 2013 to 2019. Dr. Kim obtained a Ph.D. degree in Mechanical Engineering from the University of Toronto, specializing in MEMS devices for microscale biomaterial characterization. During his Ph.D., he was supported by an NSERC PGS D scholarship. He was a Postdoctoral Fellow at Stanford University in Mechanical Engineering and Pediatric Cardiology. Funded by NSERC Postdoctoral Fellowship, he joined Brigham and Women's Hospital at Harvard Medical School and the Wyss Institute of Biologically Inspired Engineering at Harvard University. Currently, Dr. Kim's research focuses on developing advanced biomanufacturing platforms to fabricate artificial tissues and organs for regenerative medicine and drug discovery applications, using a variety of cutting-edge technologies, including 3D printing and micro/nanotechnology. E-mail keekyoung.kim@ucalgary.ca

Carbon Neutrality Biography

Chair: Dr. Hyo-Jick Choi

Associate Professor at the University of Alberta

Dr. Hyo-Jick Choi is an associate professor in the Department of Chemical & Materials Engineering at the University of Alberta, and runs a sustainable engineering and drug delivery design (SE∃D) lab. Dr. Choi received his PhD in Biomedical Engineering from Univ. of Cincinnati (Sept. 2006-June. 2007)/ UCLA (Sept. 2002-Aug. 2006), followed by his postdoctoral fellowship at Georgia institute of Technology. Dr. Choi has made influential scientific contributions in Global health and Biotechnology by developing, 1) universal antimicrobial face masks/ rspirators, 2) cold chain-free, long-term stable solid oral vaccines, 3) antimicrobial technologies against food-borne, water-borne, and hospital-borne diseases, and 4) living/non-living hybrid system using artificial organells for application in environmental issues. His capability in integrative fusion technologies and their commercialization enabled him to establish three start-up companies based on his research findings. Dr. Choi is an Editorial Board Member of Scientific Reports and Pharmaceutics. He was chosen as the Researcher of the Month for June 2017 by the Canadians for Health Research for his efforts in the development of virus deactivation system against pandemic/epidemic diseases and solid oral vaccines. E-mail hyojick@ualberta.ca

Carbon Neutrality Biography

Welcome Message: Dr. Il Yong Kim

President, AKCSE

Professor, Mechanical and Materials Engineering, Queen's University, Canada

Dr. Il Yong Kim is a Professor in the Department of Mechanical and Materials Engineering at Queen's University, Kingston, Canada. His research interest is design optimization with applications in automotive and aerospace systems. KIM received his B.S. degree in mechanical engineering from Korea University and his M.S. and Ph.D. degrees in mechanical engineering from the Korea Advanced Institute of Science and Technology (KAIST). He worked as an instructor and postdoctoral researcher in the Department of Aeronautics and Astronautics at M.I.T., where he taught undergraduate design course. KIM received a number of awards, including the Early Researcher Award in Canada, the recognition of the Experienced Humboldt Fellow in Germany, the Research Excellence Award at Queen's, and many paper awards at major scientific conferences. KIM is actively collaborating with global, multi-national companies in the automotive and aerospace industries, including General Motors, Magna, Bombardier Aerospace, Pratt & Whitney, Safran Landing Systems, and General Dynamics.

Carbon Neutrality Biography

Speaker: Dr. Young Cheol Park

Principal Researcher, Greenhouse Gas Research Department, Korea Institute of Energy Research (KIER)

Dr. Park received his B.S. in chemical engineering, Sogang University in Korea, M.S and Ph.D. in chemical engineering, Korea Advanced Institute of Science and Technology (KAIST). Dr. Park started his career in Korea Institute of Energy Research (KIER) since 2007 and has focused on developing dry-sorbent CO2 capture technology. KIER has developed dry-sorbent CO2 capture technology (KIERDRY) since 2002, and has recently produced 50 ton/day liquefied CO2 via 10 MWe-scale demo plant integrated with coal-fired power plant in Southern Power Company. He published more than seventy papers in journals and registered about hundred fifty patents nationally and internationally. E-mail: youngchp@kier.re.kr

CO2 Capture Technologies in KIER

Young Cheol Park
Greenhouse Gas Research Department, Korea Institute of Energy Research, Daejeon, South Korea

CO2 capture technologies can be divided into three categories such as post combustion, pre combustion, and oxyfuel. Korea Institute of Energy Research (KIER) has developed diverse CO2 capture technologies since late 1990. For post combustion, KIER has developed several kinds of chemical absorption technologies using aqueous amine, aqueous ammonia, aqueous K2CO3 and dry sorbents. KIERSOL, which was an aqueous K2CO3 and amine solvent, was developed since 2006 and applied to cement industry on 10 tonCO2/day scale and coal-fired power plant on 1 tonCO2/day scale. Recently, technology transfer of KIERSOL to SK Materials was contracted on 2700 million Korean Won. MAB, which was an amine-based water lean solvent, was developed since 2011 and applied to coal-fired power plant on 10 tonCO2/day scale. Currently, Front-End Engineering Design (FEED) study for 150 MWe scale CO2 capture process based on chemical absorption has been in progress. Both technologies showed world best low reboiler heat duty of below 2.2 GJ/tCO2. Dry-sorbent CO2 capture technology was developed since 2002, where KIER developed CO2 capture process and KEPRI developed K-based dry sorbents. 10 MWe-scale demonstration plant was installed in 2014 and currently operated and 50 ton/day of liquefied CO2 was produced. For oxyfuel, KIER has developed oxyfuel circulating fluidized bed combustion (CFBC) technology and chemical looping combustion (CLC). KIER developed 0.1 MWth scale oxy-CFBC test-bed unit and 10 MWth oxy-CFBC demonstration plant and proved above 90 vol.% of concentrated CO2 was produced without CO2 capture process. 0.5 MWth scale CLC process was operated at 5 bar of high pressure condition for the first time in the world and recovered above 98 vol.% of high concentrated CO2 without CO2 capture process. Currently, development of 3 MWth scale, which is world largest demonstration, NG fueled CLC technology has been in progress.

Carbon Neutrality Biography

Speaker: Dr. Insun Song

Principal Investigator, Center for CO2 Geological Storage, Korea Institute of Geoscience and Mineral Resources (KIGAM)

Dr. Insun Song received his B.S. in Geology and M.S. in Geophysics at Chungnam National University in Korea, and Ph.D. in Geological Engineering at the University of Wisconsin-Madison in USA. After earning his Ph.D. degree, he had participated in various research projects at several rock mechanics/physics laboratories in Europe and the United States. During his Post Doc career, his major contribution had been the laboratory characterization of the mechanical and hydraulic properties of various rock/soil types, the micro-mechanical and micro-structural analyses of reservoir rocks, and the experimental simulations of a sediment basin in critical state. Since joining KIGAM in 2010, he has challenged some of the most serious problems in our society, such as the safe underground storage of CO2 and the hazardous earthquake mechanics. He contributed on understanding the mechanism of great earthquakes at shallow depth such as the Sumatra-Andaman earthquake in 2004. His main research interests are the physical property changes in multi-phase fluid flow in rock formations, the solid-fluid mechanical coupling, in situ stress measurements, and the safe operation of CO2 geological storage.
E-mail: isong@kigam.re.kr

Carbon Neutrality Biography

The Status of CO2 Geological Storage R&D in Korea on the Road to the 2050 Carbon Neutrality

Insun Song
Center for CO2 Geological Storage, Korea Institute of Geoscience and Mineral Resources, Daejeon, South Korea

The Presidential Committee on Carbon Neutrality 2050 announced the 'Draft 2050 Carbon Neutral Scenario' last August. According to the three scenarios for reduction pathway basis, CCUS technology should process 57.9 ~ 95 MtCO2eq, and CCS technology alone should store 42.5 ~ 60 MtCO2eq. Even though CCS is globally regarded as the most effective reduction option at the present stage, such reduction targets are still burdensome at the current national CCS technology level. Therefore, it is time to accelerate R&D for scale-up and commercialization of CCS technologies to cope with this challenge. The current CCS R&D roadmap primarily aims to achieve 2030 NDC of dealing with 4 MtCO2eq/year, where the core axis is summarized as (1) a medium-scale demonstration using the East Sea gas field, (2) an integrated 1 MtCO2eq/year-scale demonstration targeting domestic continental shelf salt aquifers, and (3) its extension up to 4 MtCO2eq/year by 2030. Securing large storage is a prerequisite for achieving the 2030 NDC of CCS and contributing to 2050 carbon-neutral scenarios. Therefore, various researches have been carried out to evaluate basin-scale storage potential for continental shelves in Korea. As of April 2021, a joint-ministerial CCUS project, for the purpose of establishing the basis of CCS integration demonstration and CCUS commercialization, has been launched, and researches for site characterization and storage capacity evaluation for the Gunsan Basin in the West Sea are proceeding. Even when large-scale geologic storage is secured, the improvement of technical efficiency and safety of CCS technologies is urgent in order to secure economic feasibility and public acceptance. Therefore, the researches for the site safety evaluation and effective monitoring technologies and technologies for enhancement of injectivity and storage performance has been attempted and is still being actively proceeded. These technologies can be classified in various stages according to their technology readiness level. However, considering the basis of a large-scale integrated demonstration must be secured by '23, it is urgent to raise their technological readiness level to the stage to be adopted to the large-scale demonstration. To this end, it is time to actively engage in not only multi-disciplinary and public-private collaborations but also an international collaboration with counties that have more technological maturity and experiences.

Carbon Neutrality Biography

Speaker: Dr. Hyung-Suk Oh

Principal Research Scientist, Clean Energy Research Center, Korea Institute of Science and Technology (KIST)

Dr. Hyung-Suk Oh received his B.S. (2006), M.S. (2008) and Ph.D. (2012) degrees in Chemical Engineering from Yonsei University, Korea. From 2013 to 2017, he was a postdoctoral fellow at the Technical University of Berlin (TUB), Germany. He studied electrochemical water splitting and polymer electrolyte membrane fuel cells (PEMFCs) using precious metals. Since 2017, he joined Korea Institute of Science and Technology (KIST) and his research focuses on the electrocatalyst and device developments for CO2 electrolysis, water splitting and novel electrocatalytic reactions. He is currently a principal researcher of KIST and a recipient of KIST Young Fellowship, and is an adjunct professor in KHU-KIST department of conversing science and technology at Kyung Hee University. He has published more than 60 papers in respectable journals, such as Nature Catalysis, Nature Communications, Journal of the American Chemical Society, etc., and has registered about 20 patents domestically and internationally. E-mail: hyung-suk.oh@kist.re.kr

Carbon Capture and Utilization (CCU) Research in KIST

Hyung-Suk Oh

Clean Energy Research Center, Korea Institute of Science and Technology (KIST), Seoul, South Korea

Global temperature has continuously risen since the mid-twentieth century owing to the greenhouse effect caused by various gases, including carbon dioxide. The reverse water–gas shift reaction is one of the methods for removing CO2 and producing CO. However, this is an endothermic reaction that requires temperatures above 400 □. In this regard, electrochemical carbon dioxide reduction reaction (CO2RR) which can be carried out at room temperature is an attractive method for converting carbon dioxide into useful chemicals, such as carbon monoxide (CO), methane, ethylene, acetaldehyde, and alcohols. Among these reaction products, CO is a key material used in the production of chemicals in large-scale processes such as the Fischer–Tropsch process. In this talk, we would like to introduce electrochemical CCU research in progress at KIST and the thermochemical, polymer, and bio-based CCU technology that the ‘Carbon to X Research Center’ is conducting.

Carbon Neutrality Biography

Speaker: Dr. Dae Hoon Lee

Principal Investigator, Head, Dept. Plasma Engineering, Korea Institute of Machinery and Materials (KIMM)

Dr. Dae Hoon Lee received his B.S, M.S and Doctoral degree in Aerospace Engineering, KAIST, 1997, 1999, 2003 respectively. And joined Dept. of Plasma Engineering, Korea Institute of Machinery and Materials in 2004 where he is serving as a head of the department. He also serves as a Professor in Dept. Environment & Energy Mechanical Engineering of University of Science and Technology. His research interest covers plasma driven thermal process including refinery process, reforming and combustion and electrification of diverse chemical processes. He is engaged in projects related to the reduction of fine dust, greenhouse gas, recycling of hydrocarbon wastes, electrification of diverse refinery process and so on. He is author of about 70 international journal papers and registered 232 domestic and foreign patents. Most of his works are dedicated in commercialization of the technology. He has been signed and contributed in more than 32 technology transfer contract. He is now under collaboration with more than 20 domestic and foreign companies to provide solutions for energy and environmental issues. E-mail: dhlee@kimm.re.kr

Introduction to Plasma Technology for Carbon Utilization

Dae Hoon Lee
Dept. Plasma Engineering, Korea Institute of Machinery and Materials (KIMM), Daejeon, South Korea

As climate change accelerates, countries are developing various countermeasures for carbon neutrality. Korea is also actively exploring carbon reduction measures through the Carbon Neutral 2050 Declaration. Under this background, among various technologies related to the capture, storage and utilization of carbon dioxide, some of the technologies for utilizing the carbon dioxide captured or emitted using plasma are to be introduced. Since carbon dioxide is a very stable material, high energy must be supplied for its decomposition or activation. Plasma is advantageous for decomposition and activation of carbon dioxide because it can form high-temperature conditions of thousands of K or more or provide high-energy electrons of about 1 to 10 eV depending on the generation method. In addition, since plasma is based on 100% electric energy, it is attracting attention because it is possible to realize a process that does not emit CO2 through electrification based on renewable energy. Representative examples include research on reforming bio-gas using plasma or performing methanation of CO2. Recently, many studies have been introduced to obtain synergy through plasma-catalysis, which combines plasma with a catalyst. In this presentation, some examples of these studies will be introduced and discuss the development direction of plasma technology in the utilization of CO2.

Carbon Neutrality Biography

Speaker: Dr. Simon Park

Professor, Mechanical Engineering, University of Calgary/ Co-Founder of Direct-C, Espark Energy and MakeSens Inc.

Dr. Park is a professor at the Schulich School of Engineering, Dept. of Mechanical and Manufacturing Engineering, University of Calgary, Canada. He was an AITF iCORE Chair in sensing and monitoring. He is a professional engineer in Alberta and is an associate member of CIRP (Int. Academy of Production Engineers) from Canada. Dr. Park received bachelor and master's degrees from the University of Toronto, Canada. He then continued his PhD at the University of British Columbia, Canada. He has worked in several companies including IBM manufacturing where he was a procurement engineer for printed circuit boards and Mass Prototyping Inc. dealing with rapid prototyping systems. His research interests include hydrogen pipeline engineering, monitoring of CCS, nanocomposites, petroleum processing printed electronics, sensors, IoTs, batteries and advanced manufacturing. He has also founded three start-up companies in sensing, batteries, advanced manufacturing and partial upgrading of bitumen. He has received several awards including Young Innovator's Award, Schulich School of Engineering Teaching Award, Schulich School Research Excellence Award, CFI New Faculty Grant, Alberta Innovates New Faculty award, NSERC scholarships, etc. He is also serving as associate editors of several journals. Currently, he is directly supervising over 30 students and scholars at Multifunctional Engineering, Dynamics and Automation Lab (MEDAL, www.ucalgary.ca/medal).

Towards Net-Zero Energy Transition: Hydrogen to CCUS in Canada

Simon Park

Department of Mechanical and Manufacturing Engineering, Schulich School of Engineering, University of Calgary, Calgary, Alberta, Canada

There are very strong motivations towards adopting a hydrogen economy. The main advantage of using hydrogen is that this would reduce greenhouse gas emissions. Globally, 78% of emissions come from the production and consumption of energy; there is potential to reduce our carbon footprint in those areas through hydrogen economy. Hydrogen is a versatile energy and a zero-emission fuel that supports, alongside electricity, the transition to a sustainable future. The production, transportation, storage, and utilization of energy in the form of hydrogen presents efficiency advantages over electricity. Hydrogen is a more efficient fuel than electricity in important applications such as industrial heating and heavy-duty long-haul transportation. While the hydrogen economy offers a great opportunity to meet climate change targets and to achieve a leap forward in economic sustainability, implementing this vision has critical challenges. One of the biggest challenges associated with hydrogen is the cost-effective production of blue hydrogen and Carbon capture, utilization and storage (CCUS). In this talk, I discuss general trends and activities in Canada related to blue hydrogen productions, carbon dioxide capture, transportation and storage. Also, the utilization of carbon dioxide will be discussed.

Carbon Neutrality Biography

Speaker: Vivien Yoonhee Ko

Geoscientist at Subsurface Environment Group, Clean Fossil Fuel Group, CANMET Energy Ottawa (CE-O), Innovation and Energy Technology Sector, Natural Resources Canada (NRCAN)

Vivien Yoonhee Ko received her B. Eng. in Environmental Engineering and M. Eng. in Energy Engineering in AJou University in Korea. Ms. Ko has started her career at NRCAN since 2000 as a research engineer. Her research projects encompassed fluidized bed combustion, investigation of clean fossil fuel, development of fuel analysis methods and characterization. Currently, as a geoscientist in Subsurface Environment Group, she is working on natural gas storage and biochar utilization, CO2 enhanced oil recovery and CO2 geological sequestration. NRCAN is supporting her part time PhD study in the department of chemical engineering and biology in University of Ottawa. E-mail: vivien.ko@nrcan-rncan.gc.caE-mail: dhlee@kimm.re.kr

Towards Net-Zero Energy Transition: Hydrogen to CCUS in Canada

Vivien Yoonhee Ko
Subsurface Environment Group, Clean Fossil Fuel Group, CANMET Energy Ottawa(CE-O), Innovation and Energy Technology Sector, Natural Resources Canada (NRCAN)

Vivien presents an overview of selected CCUS activities in CANMET Energy Ottawa (CE-O), NRCAN: CE-O has built up extensive expertise and unique test facilities for CO2 capture and conversion systems for CO2 emissions reduction and CCUS processes that can be applied to Canadian oil & gas, industry, power generation, and bio-energy sectors. CE-O is focussing on advanced and cost-effective CO2 capture processes for minimum negative environmental impacts and safe storage of CO2 in geological formations. CE-O continues to succeed in CO2 conversion technologies at bench/pilot-scale to produce fuels and chemicals to provide carbon neutral energy system and innovative CO2 utilization technologies that will lead to value-added products with future market potential. CE-O will provide technology options for Canadian fossil fuel intensive industries to reduce their emissions, while offering a potential revenue stream for CO2 emitters that can improve the overall economics currently impeding the implementation of CCU.plasma technology in the utilization of CO2.

Carbon Neutrality Biography

Speaker: Dr. Hyung-Sool Lee

Associate Professor, Founder and Director for Food Waste Consortium, University of Waterloo

Dr. Lee is currently Associate Professor at Civil and Environmental Engineering, University of Waterloo. He earned a Ph.D. degree in 2009 at Biodesign Institute at Arizona State University. Dr. Lee published research articles over 100 in top journals of environmental science and engineering with h-index 40. He has organized sessions or chaired international conferences (American Chemical Society, International Conference of Resource Recovery, Industrial Biotechnology, etc.) and served guest editors and associate editor to leading journals (Water Research and Bioresource Technology). His main research area includes water and energy nexus, climate change management and adaptation, circular economy, sustainable water and wastewater management, food waste valorization, and renewable energy and chemicals. Dr. Lee has pioneered new research areas (the recovery of value-added products from organic wastes and wastewaters) and facilitate the transfer of innovative skills and knowledge to industries or municipalities through large scale experiments (pilot and demonstration scale) in supports of industry partners and government agencies. Email: hyungsool@uwaterloo.ca

Carbon-neutral circular bioeconomy: energy and chemicals

Hyung-Sool Lee
Department of Civil & Environmental Engineering, University of Waterloo, ON, Canada

Our world is currently confronting some of the biggest challenges we have ever faced. Climate change, energy and water scarcity, and ever-growing volumes of waste urgently need new, disruptive solutions. Addressing these issues not only necessitates new ideas and technical innovations, but it also requires solutions which are environmentally, socially, and economically sustainable. One of the best ways of meeting these challenges is to develop a low-carbon circular economy. A circular economy is regenerative and sustainable, facilitating the net-zero carbon emissions. It is estimated that the transition to a circular economy can unlock $4.5 trillion of GDP growth worldwide by 2030 while supporting the life of 8.5 billion people.

Today's talk summarizes my innovative research, which can help establish the carbon-neutral circular bioeconomy by advanced scientific knowledge and disruptive technology, and catalyze development of policies based on science and technology in environment, energy and climate change nexus. More specifically, I will focus on innovative biotechnologies that are able to recover value-added products (energy, materials and water) from waste biomass simultaneously with treatment, which can help establish a green cycle and circular bioeconomy at the intersection of environment, energy, and climate change.

Carbon Neutrality Biography

Speaker: Dr. Hyo-Jick Choi

Associate Professor, University of Alberta

Dr. Hyo-Jick Choi is an associate professor in the Department of Chemical & Materials Engineering at the University of Alberta, and runs a sustainable engineering and drug delivery design (SE∃D) lab. Dr. Choi received his PhD in Biomedical Engineering from Univ. of Cincinnati (Sept. 2006-June. 2007)/ UCLA (Sept. 2002-Aug. 2006), followed by his postdoctoral fellowship at Georgia institute of Technology. Dr. Choi has made influential scientific contributions in Global health and Biotechnology by developing, 1) universal antimicrobial face masks/rspirators, 2) cold chain-free, long-term stable solid oral vaccines, 3) antimicrobial technologies against food-borne, water-borne, and hospital-borne diseases, and 4) living/non-living hybrid system using artificial organells for application in environmental issues. His capability in integrative fusion technologies and their commercialization enabled him to establish three start-up companies based on his research findings. Dr. Choi is an Editorial Board Member of Scientific Reports and Pharmaceutics. He was chosen as the Researcher of the Month for June 2017 by the Canadians for Health Research for his efforts in the development of virus deactivation system against pandemic/epidemic diseases and solid oral vaccines. E-mail hyojick@ualberta.ca

Reconstruction of Calvin cycle in vitro for application in carbon sequestration, specialty chemical products, and biofuel production

Hyo-Jick Choi

Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Alberta, Canada

Carbon sequestration and utilization are well known as the most direct methods to reduce carbon dioxide levels in the atmosphere. Due to their promising importance, there have been growing international competitions and R&D investment to develop breakthrough carbon capture and utilization (CCU) technologies with reliable and proven performance. In meeting the multiple demands of CCU, we have proposed an idea of replicating photosynthesis by which plant cells fix carbon dioxide to produce carbohydrates through the Calvin cycle, experimentally demonstrating its potential. Reconstructing the Calvin cycle in vitro strongly depends on the ATP production of artificial organelles (light-dependent reaction) and the selection/regulation of highly active enzymes for achieving high photosynthetic efficiency (light-independent reaction). The key components in this approach include 1) optimally functioning ATP-producing artificial organelles with life-like performance, 2) foam-based bioreactors with high environmental, biochemical, and physical stabilities, and 3) engineering metabolic pathways to produce highly valuable chemicals. Artificial organelle-embedded foam architectures can be used to replicate cellular metabolism in an in vitro environment, enabling cell-free metabolic reactions. Ultimately, this talk aims to review previous research efforts for reconstructing cellular photosynthetic processes along with their applications to carbon sequestration and production of valued carbon products, examining current knowledge/key technical parameters and identifying technical challenges ahead.

KEIT Global Technology Strategy Forum

Time: 11:30 - 13:00, 2 September (Thursday) Korea Time
23:30 - 01:00, 1 September (Wednesday) Canada ADT

Place: Online
In-person in Ballroom B2 in the Halifax Convention Center, NS, Canada

Sponsor: Korea Evaluation Institute of Industrial Technology (KEIT)

Organizer: KEIT and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Seonghwan Kim, University of Calgary (sskim@ucalgary.ca)

Description: This forum is to promote participation of Korean-Canadian scientists and engineers in the planning of Korea Government R&D projects for improving productivity and global cooperation.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
23:30-23:35	Online & Ballroom B2 Halifax Convention Center	Opening remarks (Video)	Dr. Yang Ho Chung	KEIT
23:35-23:40		Greeting (Live)	Dr. Il Yong Kim	AKCSE President
23:40-23:55		Introduction to Global R&D support center, KEIT International Cooperation Direction	Mr. Byoung-Jai Kim	KEIT
23:55-24:10		Carbon Neutrality Strategy from MOTIE, Korea	Dr. Jung Woo Han	KEIT
24:10-24:30		International Collaboration Success Case Presentation	Dr. Dae-Kyun Ro	Univ. of Calgary
24:30-24:50		Global Technology Forum Section Reports	Dr. Soo Jeon Dr. Jihyun Lee	Univ. of Waterloo Univ. of Calgary
24:50-24:55		Q&A	All	
24:55-01:00		Photo time and Concluding Remarks	Mr. Sunghwan Park	KEIT

KEIT Global Technology Strategy Forum Biography

Chair: Dr. Seonghwan (Sam) Kim

Associate Professor/Canada Research Chair in Nano Sensing Systems at the University of Calgary

Dr. Kim is an Associate Professor and Canada Research Chair in Nano Sensing Systems, in the Department of Mechanical and Manufacturing Engineering at the University of Calgary. He received his B.Sc. (1998) and M.Sc. (2000) degrees in Aerospace Engineering from Seoul National University, Seoul, South Korea and Ph.D. (2008) in Mechanical, Aerospace and Biomedical Engineering from the University of Tennessee, Knoxville, USA. He was a Postdoctoral Research Associate at Oak Ridge National Laboratory, USA and an Acting Research Associate at the University of Alberta, Canada prior to his current position. Dr. Kim has founded the Nano/Micro-Sensors and Sensing Systems Laboratory (NMSSS, www.ucalgary.ca/sskim) at the University of Calgary in 2013 to develop 1) ultrasensitive chemical/biological sensors and sensing systems based on micro/nanotechnology; 2) novel micro/nano-metrologies to characterize nanomaterials and polymeric nanocomposites for energy, environmental, biological applications. E-mail: sskim@ucalgary.ca

KEIT Global Technology Strategy Forum Biography

Speaker: Dr. Yang Ho Chung

President, Korea Evaluation Institute of Industrial Technology (KEIT)

Dr. Yang Ho Chung received the B.S. and M.S. degree both in Economics from Seoul National University in 1985 and 1987, and Ph. D degree in Economics from Southern Illinois University in 1996 respectively.

Dr. Jung passed Public Administration Examination in 1984, worked as a deputy director/secretary of the Ministry of Commerce and Industry from 1985 to 2000. After working for Ministry of Commerce Industry and Energy from 2007 to 2008 as a Leader of General Affair Team, he worked for Ministry of Knowledge Economy from 2011 to 2012 as a Director General of Industrial Technology Policy and from 2012 to 2013 as a Director General of Energy Resource Development. After Dr. Jung worked for Ministry of Trade, Industry and Energy (MOTIE) from 2014 to 2016 as a Deputy Minister of Energy Resources, he worked as a Commissioner of Public Procurement Service from 2016 to 2017. Currently Dr. Jung is working as a President of Korea Evaluation Institute of Industrial Technology (KEIT).

KEIT Global Technology Strategy Forum Biography

Speaker: Dr. Il Yong Kim

Professor at Queen's University

Dr. Il Yong Kim is a Professor in the Department of Mechanical and Materials Engineering at Queen's University, Kingston, Canada. His research interest is design optimization with applications in automotive and aerospace systems. KIM received his M.S. and Ph.D. degrees in mechanical engineering from the Korea Advanced Institute of Science and Technology (KAIST). He worked as an instructor and postdoctoral researcher in the Department of Aeronautics and Astronautics at M.I.T., where he taught undergraduate design course. KIM received a number of awards, including the Early Researcher Award in Canada, the recognition of the Experienced Humboldt Fellow in Germany, the Research Excellence Award at Queen's, and many paper awards at major scientific conferences. KIM is actively collaborating with global, multi-national companies in the automotive and aerospace industries, including General Motors, Magna, Bombardier Aerospace, Pratt & Whitney, Safran Landing Systems, and General Dynamics.

KEIT Global Technology Strategy Forum Biography

Speaker: Mr. Byoung-Jai Kim

Team Leader of Global R&D Cooperation, Korea Evaluation Institute of Industrial Technology (KEIT)

Mr. Kim is the team leader of Global R&D cooperation, KEIT. He earned master's degree from Seoul National University in Electrical and Computer Science Engineering. He joined KEIT in 2005 and worked in several fields of R&D including with a representative of KEIT USA from 2018 to 2021.

KEIT Global Technology Strategy Forum Biography

Speaker: Dr. Jung Woo Han

Program Director, Korea Evaluation Institute of Industrial Technology (KEIT)

Dr. Jung Woo Han received the B.S., M.S., and PhD degrees in Chemical Engineering from Yonsei University in Seoul, Korea in 1984, 1986 and 1992 respectively. Dr. Han worked in Hanwha Chemical Research Center from 1992 to 2013. After 2 more years in Hanwha Chemical as an Advisor, he went to Han-Nam University in 2013. From 2015 till now, he joined KEIT and has been working as the Chemical Engineering PD (Program Director).

KEIT Global Technology Strategy Forum Biography

Speaker: Dr. Daekyun Ro

Professor at the University of Calgary

Dr. Dae-Kyun Ro is a Professor in the Department of Biological Sciences at University of Calgary, Canada. Dr. Ro acquired his bachelor's degree from Korea University in Republic of Korea in 1995. He received his PhD degree from the University of British Columbia, Canada (2002), and was a Postdoctoral Fellow at University of British Columbia (2002 - 2004) and University of California, Berkeley (2004 - 2006). He held a Canada Research Chair tier 2 position from 2006 to 2016 at University of Calgary. Dr. Ro's research team uses integrative approaches involving traditional biochemistry, diverse Omics, metabolic engineering, and synthetic biology to address fundamental questions in plant and microbial metabolisms.

KEIT Global Technology Strategy Forum Biography

Speaker: Dr. Soo Jeon

Associate Professor at the University of Waterloo

Dr. Soo Jeon is an associate professor in Department of Mechanical & Mechatronics Engineering at University of Waterloo. He received his BS and MS degrees from Mechanical & Aerospace Engineering at Seoul National University, Korea in 1998 and 2001 respectively, and his PhD from Mechanical Engineering at University of California, Berkeley in 2007. After graduation, he worked as a mechanical engineer in Applied Materials Inc. until he moved to Waterloo in 2009. His research interests include dynamic systems and control, mechatronic system design, and machine intelligence. Applications of his research cover robotics, industry automation, medical ultrasound, and transportation systems. He received Rudolf Kalman Best Paper Award from ASME Dynamic Systems and Control Division in 2010, and Discovery Accelerator Supplement Award from NSERC (Natural Sciences and Engineering Research Council) of Canada in 2015. He is a member of ASME, IEEE, CSME (Canadian Society for Mechanical Engineering) and PEO (Professional Engineers Ontario). He has been an associate editor for ASME Journal of Dynamic Systems, Measurement and Control, IEEE Transactions on Automation Science

KEIT Global Technology Strategy Forum Biography

Speaker: Dr. Jihyun Lee

Assistant Professor at the University of Calgary

Dr. Jihyun Lee received her BSc in Mechanical Engineering from Yonsei University, Seoul, South Korea, and her MSc and Ph.D. in Mechanical Engineering from the University of Michigan-Ann Arbor, USA. Prior to joining the University of Calgary, she worked for 2.5 years as a senior researcher in the department of Ultra-precision Machines and Systems at Korea Institute of Machinery & Materials (KIMM), South Korea. She has worked as an assistant professor at the University of Calgary since February 2019. Projects she mainly fulfilled at the KIMM were 'Vibration Reduction of Machines using Multiple TMD system'(.1 million granted by Doosan Machine Tools), 'Virtual Machining Mechatronics Platform', 'Industrial Robot Manipulator Machining on Mobile Platform' and 'Laser Tracker Network Development'. Current research topic she focuses on at the UCalgary is robotic metal hybrid additive and subtractive manufacturing. Dr. Lee conducts her research at the intelligent automation research laboratory (iAR Lab). E-mail jihyun.lee@ucalgary.ca

KEIT Global Technology Strategy Forum Biography

Speaker: Mr. Sunghwan Park

Representative of KEIT US Office, Korea Evaluation Institute of Industrial Technology (KEIT)

Mr. Park is a representative of Korea Evaluation of Institute of Industrial Technology (KEIT) at US Office. He earned master's degree from Korea University in International Development and Cooperation. He joined KEIT in 2013 and currently is serving as representative of KEIT USA since January 2021.

KIAT Korea-Technology Advisory Group (K-TAG) Forum and General Meeting

Time: 01:00 - 02:45, 3 September (Friday) Korea Time
13:00 - 14:45, 2 September (Thursday) Canada ADT

Place: Online
In-person at Ballroom B3 at the Halifax Convetion Center, NS, Canada

Sponsor: Korea Institute for Advancement of Technology (KIAT)

Organizer: KIAT and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Jong Sung Kim, Dalhousie University (jskim@dal.ca)

Description: The Korea Institute for Advancement of Technology (KIAT) is a comprehensive technology support organization committed to promoting industrial technology growth in Korea. Korea-Technology Advisory Group (K-TAG) Canada launched by KIAT and AKCSE in July 2016, consists of Korean Science and engineering experts in Canada. Main activities of K-TAG are 1) to assist Korean Small and Medium-sized Enterprises (SMEs) in finding Canadian Innovative partners, 2) to provide advice as well as information related to Korea-Canada R&D cooperation and 3) to develop and participate in Korea-Canada joint R&D projects. In CKC 2021, the members of K-TAG Canada in various technical areas will get together to 1) seek research collaborations, 2) present/propose innovative research projects and 3) discuss R&D projects planning with delegates of KIAT in this forum.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
13:00-13:05	Online & Ballroom B3 Halifax Convention Center	Opening – Welcome Message	Jung-wook Kim	Executive Director, KIAT
13:05-13:25		KIAT Global R&D Cooperation Programs	Eunjung Kim	Chief Representative, KIAT
13:25-13:45		Korea- Technology Advisory Group (K-TAG) Canada	Dr. Jong Sung Kim Eunjung Kim	KIAT Ambassador (Dalhousie Univ.)
13:45-13:55		K-TAG Consulting Success Story	Dr. Simon Park	Univ. of Calgary
13:55-14:25		Discussion – Towards the Future	K-TAG members	
14:25-14:30		Closing		

KIAT Korea-Technology Advisory Group (K-TAG) Forum and General Meeting Biography

Chair: Dr. Jong Sung Kim

Associate Professor, Faculty of Medicine at Dalhousie University/ Director of Health and Environments Research Centre (HERC)

Dr. Jong Sung Kim is a tenured Associate Professor and Director of Health and Environments Research Centre (HERC) in the Faculty of Medicine at Dalhousie University in Canada. Nanotoxicology and human health risk assessment have been his primary academic and research interests since the completion of his MSc degree in Environmental Toxicology at the University of Nebraska Center for Health and Environmental Toxicology. Following this, he commenced his PhD in Human Toxicology, where he was enrolled in the Interdisciplinary Graduate Program at the University of Iowa (US National Institutes of Health Fellowship). In recognition of his contributions to nanotoxicology research, he has served on the Technical Committee for the International Organization for Standardization (ISO) Working Group on Nanotechnology, and he received numerous international awards such as Best Paper Award of Delta Omega Honorary Society in Public Health from the American Public Health Association and the MB Research Award from the Society of Toxicology. The primary objective of his research program is to better understand how emerging hazards and exposures lead to adverse health outcomes at various levels of biological organization (from cellular and molecular levels to populations) and how human body modify these responses to maintain homeostasis (host-defense).

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KIAT Korea-Technology Advisory Group (K-TAG) Forum and General Meeting Biography

Welcome Message: Mr. James (Jung-wook) Kim

Executive Director of Department of Innovation Promotion,
Korea Institute for Advancement of Technology (KIAT)

Mr. Jung-wook Kim is an Executive Director of Department of Innovation Promotion in KIAT. Since Mr. Kim joined KIAT in 2002, he has contributed to the various areas supporting middle market enterprises, building high-tech R&D strategies for Korean government, and managing the international collaboration projects.
Before joining KIAT, Mr. Kim has working experiences in Samsung SDI, Korea, responsible for HR management and strategy department for 5 years. He received the Global Management MBA degree from Helsinki School of Economics and BS degree in Electronic Engineering at Sogang University in 1997.

KIAT Korea-Technology Advisory Group (K-TAG) Forum and General Meeting Biography

Speaker: Ms. Eunjung Kim

Chief Representative, Korea Institute for Advancement of Technology (KIAT)

Ms. Eunjung Kim is the chief representative of the Korea Institute for Advancement of Technology (KIAT) US office. The KIAT, as a non-profit government funding agency, is entrusted with the implementation of the state R&D budget for industrial technology. It supports the overarching R&D of industry through planning, project support, building R&D infrastructure, nurturing human resources, and performance management. She has been involved in international R&D activities, and in particular, bilateral and multilateral industrial technology cooperation programs supporting Korean companies work with overseas partners, since 2010.

She received her B.Sc. degrees in Physics and Electronics Engineering from Ewha Womans University, Seoul, Korea in 1999 and the M.Sc. degree in Electronics Engineering from the Korea Advanced Institute of Science and Technology (KAIST), Daejon, Korea in 2001. She started her professional career in LG Information and Communications Co., Ltd. and Samsung Electronics Co., Ltd. as a global standardization engineer for next generation mobile communication making technical contributions towards 3GPP HSDPA and MBMS specifications. From 2005 until 2009, she worked as a senior researcher at the Institute for Information Technology Advancement (IITA) and oversaw Strategic Technology Roadmap and R&D projects planning for ICT technology, value-based information technology assessment and launching WiBro service.

KIAT Korea-Technology Advisory Group (K-TAG) Forum and General Meeting Biography

Speaker: Dr. Simon Park

Professor, Department of Mechanical and Manufacturing Engineering, University of Calgary, AB, Canada

Dr. Park is a professor at the Schulich School of Engineering, Dept. of Mechanical and Manufacturing Engineering, University of Calgary, Canada. He is an AITF iCORE Chair in sensing and monitoring. He is a professional engineer in Alberta, and is an associate member of CIRP (Int. Academy of Production Engineers) from Canada. Dr. Park received bachelor and master's degrees from the University of Toronto, Canada. He then continued his PhD at the University of British Columbia, Canada. He has worked in several companies including IBM manufacturing where he was a procurement engineer for printed circuit boards and Mass Prototyping Inc. dealing with rapid prototyping systems. His research interests include pipeline engineering, nanocomposites, directional drilling, enhanced oil recovery, and manufacturing. He has also founded several start-up companies in sensing and partial upgrading of bitumen. He has received several awards including Young Innovator's Award, Schulich School of Engineering Teaching Award, Schulich School Research Excellence Award, CFI New Faculty Grant, Alberta Innovates New Faculty award, NSERC scholarships. Currently, he is directly supervising over 20 students and scholars.

Technical Sessions

Time: 03:00 - 06:00, 3 September (Friday) Korea Time
15:00 - 18:00, 2 September (Thursday) Canada ADT

Place: Online
In-person at Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: AKCSE

Organizer: AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Seonghwan Kim, University of Calgary (sskim@ucalgary.ca)

Description: To promote research discussions and collaborations in the areas of (1) Biological Sciences and Health (BSH), (2) Information & Communication Technology (ICT), Technology, (3) Materials, Physics, Chemistry and Nano (MNT), and (4) Mechanical, Civil & Aerospace Engineering (MAE).

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
15:00-15:15	Online & Ballroom B3 Halifax Convention Center	Machine learning with almost no data	Dr. Chi-Guhn Lee	Univ. of Toronto
15:15-15:30		Intelligent Transportation System (ITS) Planning and Management using Deep Learning and Geostatistics – Case Studies	Dr. Tae J. Kwon	Univ. of Alberta
15:30-15:45		Analysis of Epidemic-style Autonomous Vehicle Malware	Dr. Yong Hoon Kim	Univ. of Windsor
15:45-16:00		Development of AI-Based Assembly System for Car Steering Shaft	Dr. Hyock Ju Kwon	Univ. Waterloo
16:00-16:15		Star Tracker Design for Space-based Space Surveillance (SBSS)	Dr. Regina Lee	York Univ.
16:15-16:30		Break		
16:30-16:45		A High-throughput 3D Microgel Array Platform for Cyclic Cell Mechanical Sitmulation	Dr. Keekyoung Kim	Univ. of Calgary
16:45-17:00		Microfabricated Probiotic Formulation	Dr. Hyo-Jick Choi	Univ. of Alberta
17:00-17:15		Assessing Toxicity of Commercial Zinc Oxide Nanoparticles	Dr. Jong Sung Kim	Dalhousie Univ.
17:15-17:30		Durability and Microstructures of Electron Beam Physical Vapor Deposition Processed Thermal Barrier Coatings under High Velocity Burner Rig	Dr. Dongyi Seo	NRC Ottawa
17:30-17:45		Mechanics of hyperelastic composites reinforced with nonlinear elastic fibrous materials in finite plane elastostatics	Dr. Chun Il Kim	Univ. of Alberta
17:45-18:00		Structurally Re-engineered Hybrid Aerogel	Dr. Chul Bum Park	Univ. of Toronto

Technical Sessions Biography

Chair: Dr. Seonghwan (Sam) Kim

Associate Professor/Canada Research Chair in Nano Sensing Systems at the University of Calgary

Dr. Kim is an Associate Professor and Canada Research Chair in Nano Sensing Systems, in the Department of Mechanical and Manufacturing Engineering at the University of Calgary. He received his B.Sc. (1998) and M.Sc. (2000) degrees in Aerospace Engineering from Seoul National University, Seoul, South Korea and Ph.D. (2008) in Mechanical, Aerospace and Biomedical Engineering from the University of Tennessee, Knoxville, USA. He was a Postdoctoral Research Associate at Oak Ridge National Laboratory, USA and an Acting Research Associate at the University of Alberta, Canada prior to his current position. Dr. Kim has founded the Nano/Micro-Sensors and Sensing Systems Laboratory (NMSSS, www.ucalgary.ca/sskim) at the University of Calgary in 2013 to develop 1) ultrasensitive chemical/biological sensors and sensing systems based on micro/nanotechnology; 2) novel micro/nano-metrologies to characterize nanomaterials and polymeric nanocomposites for energy, environmental, biological applications. E-mail: sskim@ucalgary.ca

Technical Sessions Biography

Speaker: Dr. Chi-Guhn Lee

Professor

Dr. Chi-Guhn Lee is a Professor of Industrial Engineering and the Director of the Centre for Maintenance Optimization and Reliability Engineering (C-MORE) at the University of Toronto. Dr. Lee received a Ph.D. in Industrial and Operations Engineering at the University of Michigan, Ann Arbor, USA in 2001 and has been active in the areas such as dynamic optimization, Markov decision processes, reinforcement learning, machine learning, maintenance optimization, and supply chain management. He has been working with private firms including LG, Nestle, IBM, General Motors, Magna International, State Grid Corp of China to name a few. He has played various roles in the academic community as well.

Technical Sessions Biography

Speaker: Dr. Tae J. Kwon

Assistant Professor of Transportation Engineering

Dr. Tae J. Kwon joined the Department of Civil and Environmental Engineering at the University of Alberta as an Assistant Professor in 2016 after receiving his Ph.D. degree from the University of Waterloo with the Doctoral Dissertation Award. Dr. Kwon's current research focuses on winter transportation engineering, sustainable winter road maintenance, location optimization of intelligent transportation system facilities, winter road conditions monitoring and estimations using advanced geomatics, geostatistics and machine learning techniques. Since 2016, Dr. Kwon has published more than 50 papers including peer-reviewed journal and conference papers and attracted more than $1 million in funding. Dr. Kwon received the 2019 Great Supervisor Award for excellent supervisory contribution and was awarded the 2020 Faculty of Engineering Early-Career Research Award in recognition of excellence in research. Dr. Kwon's research has been supported by many organizations including NSERC, Iowa Department of Transportation, City of Edmonton, Alberta Transportation, CIMA+, and others. E
-mail tjkwon@ualberta.ca

Technical Sessions Biography

Speaker: Dr. Yong Hoon Kim

Assistant Professor

Dr. Yong Hoon Kim is an Assistant Professor of Civil and Environmental Engineering at the University of Windsor. Dr. Kim has received the B.S. and M.S. degrees in transportation from the University of Seoul, Seoul, Korea, in 2003 and 2006, respectively, and Ph.D. degree in Civil Engineering from Purdue University, West Lafayette, IN, USA, in 2017. He worked for two and a half years at the Seoul Institute in Korea as a research engineer. He also worked a Research Associate with the NEXTRANS Center, Purdue University. His research interests include Intelligent Transportation System, connected and autonomous vehicle technology, data analytics for connected transportation system, artificial intelligence for connected and autonomous vehicle applications, and traffic safety.

Technical Sessions Biography

Speaker: Dr. Hyock Ju Kwon

Associate Professor, Mechanical and Mechatronics Engineering, University of Waterloo

Dr. Kwon is an Associate Professor in the Department of Mechanical and Mechatronics Engineering at the University of Waterloo. He received his B.Sc. (1985) in Mechanical and Design Engineering from Seoul National University, M.Sc. (1988) in Production Engineering from KAIST in South Korea. and Ph.D. (2007) in Mechanical Engineering from the University of Alberta, Edmonton, Canada. Prior to joining University of Waterloo, he held a NSERC Postdoctoral Fellowship at Caltech in Pasadena, USA. Dr. Kwon also has over 10 years industry experience at Samsung Electronics, Korea and Texas Instruments, USA before his academic career. He is a Professional Engineer in Alberta and Ontario in Canada, and also in Korea. Dr. Kwon has expertise in AI for manufacturing, AI-based nondestructive testing (NDT), Smart Factory and High Intensity Focused Ultrasound (HIFU). His group at Waterloo is also developing hardware-based AI technology, an universal NDT platform and Intelligent HIFU Table.

E-mail: hjkwon@uwaterloo.ca

Technical Sessions Biography

Speaker: Dr. Regina Lee

Professor at York University

Dr. Regina Lee, PhD, PEng, is a Professor at the Department of Earth and Space Science and Engineering, York University, Toronto, Canada. Dr. Lee received her Ph.D. from the University of Toronto in 2000. From 2000 to 2007 she worked at Dynacon Inc. as a (NSERC) industry post-doctoral fellow, and later as a Research Scientist. Dr. Lee's research interests center on nanosatellite technology development. It has been a focus of Dr. Lee's research to develop a series of space technologies that will lead to scientific nanosatellite missions. Currently, she's investigating several areas including MEMS based attitude sensors and actuators to incorporate their low-grade characteristics; and optical payloads including a star tracker for Resident Space Object (RSO) detection, identification and characterization with light curve analysis.

E-mail reginal@yorku.ca

Technical Sessions Biography

Speaker: Dr. Keekyoung Kim

Associate Professor at the University of Calgary

Dr. Keekyoung Kim is an associate professor in the Department of Mechanical and Manufacturing Engineering and Biomedical Engineering at the University of Calgary. Previously, he was at the University of British Columbia's Okanagan Campus from 2013 to 2019. Dr. Kim obtained a Ph.D. degree in Mechanical Engineering from the University of Toronto, specializing in MEMS devices for microscale biomaterial characterization. During his Ph.D., he was supported by an NSERC PGS D scholarship. He was a Postdoctoral Fellow at Stanford University in Mechanical Engineering and Pediatric Cardiology. Funded by NSERC Postdoctoral Fellowship, he joined Brigham and Women's Hospital at Harvard Medical School and the Wyss Institute of Biologically Inspired Engineering at Harvard University. Currently, Dr. Kim's research focuses on developing advanced biomanufacturing platforms to fabricate artificial tissues and organs for regenerative medicine and drug discovery applications, using a variety of cutting-edge technologies, including 3D printing and micro/nanotechnology.

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Technical Sessions Biography

Speaker: Dr. Hyo-Jick Choi

Associate Professor, Department of Chemical & Materials Engineering at the University of Alberta

Dr. Hyo-Jick Choi is an associate professor in the Department of Chemical & Materials Engineering at the University of Alberta, and runs a sustainable engineering and drug delivery design (SE∃D) lab. Dr. Choi has made influential scientific contributions in global health by developing, 1) universal and reusable antimicrobial personal protective measures against pandemic/epidemic diseases, 2) cold-chain free solid oral vaccine technologies, 3) microfabricated drug delivery systems, and 4) innovative antimicrobial technolgies against foodborne, waterborne, and hospital-acquired infectious diseases. His capability in integrative fusion technologies and their commercialization enabled him to establish two start-up companies based on his research findings. Dr. Choi is an Editorial Board Member of Scientific Reports. He was chosen as the Researcher of the Month for June 2017 by the Canadians for Health Research and received global attention for his efforts in the development of virus deactivation system against pandemic/epidemic diseases and solid oral vaccines.

E-mail: hyojick@ualberta.ca

Technical Sessions Biography

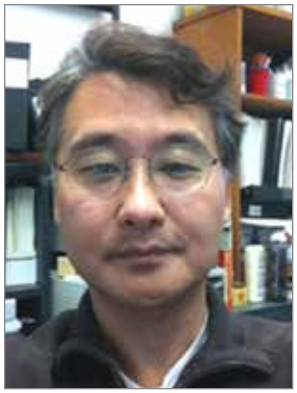
Speaker: Dr. Jong Sung Kim

Associate Professor, Faculty of Medicine at Dalhousie University/ Director of Health and Environments Research Centre (HERC)

Dr. Jong Sung Kim is a tenured Associate Professor and Director of Health and Environments Research Centre (HERC) in the Faculty of Medicine at Dalhousie University in Canada. Nanotoxicology and human health risk assessment have been his primary academic and research interests since the completion of his MSc degree in Environmental Toxicology at the University of Nebraska Center for Health and Environmental Toxicology. Following this, he commenced his PhD in Human Toxicology, where he was enrolled in the Interdisciplinary Graduate Program at the University of Iowa (US National Institutes of Health Fellowship). In recognition of his contributions to nanotoxicology research, he has served on the Technical Committee for the International Organization for Standardization (ISO) Working Group on Nanotechnology, and he received numerous international awards such as Best Paper Award of Delta Omega Honorary Society in Public Health from the American Public Health Association and the MB Research Award from the Society of Toxicology. The primary objective of his research program is to better understand how emerging hazards and exposures lead to adverse health outcomes at various levels of biological organization (from cellular and molecular levels to populations) and how human body modify these responses to maintain homeostasis (host-defense).

E-mail: jskim@dal.ca

Technical Sessions Biography



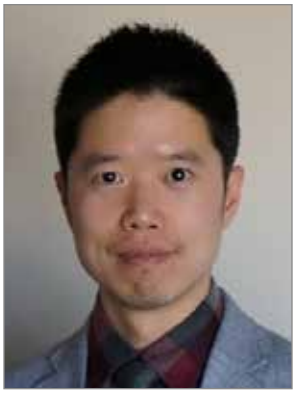
Speaker: Dr. Dongyi Seo

Senior Research Officer

Dr. Dongyi Seo is a senior research officer at the high temperature materials group, Structures and Materials Performance Lab at Aerospace Research Centre of National Research Council Canada. He received his Ph.D. degree in Materials Science from Michigan State University in 1998. He manages several significant projects on characterization and assessment of high-temperature materials and coatings and repair technology of single crystal Ni-base super alloys and lightweight metallic materials with the gas turbine OEMs and international research organizations. As an Adjunct Professor at Carleton University, he has been working and supervising students on the development of joining technology and evaluation of mechanical and environmental properties of various metallic materials as collaborative projects between NRC, and international research organizations such as Korea Institute of Materials Science (KIMS)-South Korea, Australia's Nuclear Science and Technology Organization (ANSTO)-Australia, IHI/ Tohoku University-Japan, and Los Alamos National Lab., Michigan State University, University of Tennessee and UES-USA. He has authored and co-authored 71 peer-reviewed journals, 37 conference proceedings, 48 internal technical reports, and 97 technical presentations at international and national conferences including 17 invited papers and plenary talks.

E-mail: dongyi.seo@nrc-cnrc.gc.ca

Technical Sessions Biography



Speaker: Dr. Chun Il Kim

Associate Professor

Dr. Kim obtained his undergraduate from the Department of Mechanical Engineering at Dong-A University. He subsequently extended his education by pursuing M.Sc. (2007) and Ph.D. (2012) degrees in the Department of Mechanical Engineering at the University of Alberta. His Ph.D. thesis was on the effect of surface elasticity on the deformations of a cracked elastic solid at the nano and micro-scales. During his graduate studies, he held an Alberta Ingenuity award in Nanotechnology and several internal FGSR awards. Following his Ph.D. he joined the research group of Dr. David J. Steigmann at the Mechanical Engineering Department of University of California at Berkeley (UCB) as a NSERC postdoctoral fellow. Dr. Kim has joined the Mechanical Engineering Department of the University of Alberta as an Assistant Professor on July 2014. His current research interest involves constitutive modeling and analysis of macro and/or micro scaled structures such as lipid membranes and fiber reinforced composite materials.

E-mail: cikim@ualberta.ca

Technical Sessions Biography

Speaker: Dr. Chul Bum Park

Distinguished Professor of Microcellular Engineered Plastics

Prof. Chul Bum Park received his PhD from MIT in 1993. He is Distinguished Professor of Microcellular Engineered Plastics at University of Toronto. He is also the NSERC Senior Industrial Research Chair in Multi-Functional Graphene-Based Polymer Nanocomposites and Foams. He has an international recognition in polymer foam area. He has published more than 1400 papers, including 420 journal papers and four books with 75 Scopus H-index. Prof Park serves as Editor-in-Chief for Journal of Cellular Plastics and serves as an Advisory Editorial Board member for over 10 journals. He has been inducted to be an Academician Fellow into 5 academies such as the Academy of Science of the Royal Society of Canada and the Korean Academy of Science and Technology. He is also a Fellow of 5 other professional societies including Society of Plastics Engineers.

Research Showcase I

Time: 09:00 - 10:00, 3 September (Friday) Korea Time
21:00 - 22:00, 2 September (Thursday) Canada ADT

Place: Online
In-person in Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: AKCSE

Organizer: AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Seonghwan Kim, University of Calgary (sskim@ucalgary.ca)

Description: This session serves as a venue to promote research activities of AKCSE members, to share ideas among different disciplines, and to foster new collaborations between Canada and Korea.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
21:00-21:10	Online & Ballroom B3 Halifax Convention Center	Real-Time Deep Learning-based Edge System for HAZMAT Recognition	Dr. Seok-Bum Ko	Univ. of Saskatchewan
21:10-21:20		Universal Antimicrobial Face Mask Technologies against Pandemics & Self-sanitizing Antimicrobial Surfaces for Applications in Food, Agriculture, and Healthcare Settings	Dr. Hyo-Jick Choi	Univ. of Alberta
21:20-21:30		Application Brain Computer Interface to Augmented Reality & The Development of the Automated Ergonomic posture assessment based on Computer Vision and Machine Learning	Dr. Eunsik Kim	Univ. of Windsor
21:30-21:40		Materials research for All-Solid-State Li-ion battery	Mr. Chae-Ho Yim	NRC Ottawa
21:40-21:50		3D bioprinted liver-on-a-chip devices for high-throughput drug-induced liver toxicity assessment	Dr. Keekyoung Kim	Univ. of Calgary
21:50-22:00		Multi-element Solid Solution Nanoparticles for Clean Energy Technologies	Dr. Keun Su Kim	NRC Ottawa

Research Showcase I Biography

Chair: Dr. Seonghwan (Sam) Kim

Associate Professor/Canada Research Chair in Nano Sensing Systems at the University of Calgary

Dr. Kim is an Associate Professor and Canada Research Chair in Nano Sensing Systems, in the Department of Mechanical and Manufacturing Engineering at the University of Calgary. He received his B.Sc. (1998) and M.Sc. (2000) degrees in Aerospace Engineering from Seoul National University, Seoul, South Korea and Ph.D. (2008) in Mechanical, Aerospace and Biomedical Engineering from the University of Tennessee, Knoxville, USA. He was a Postdoctoral Research Associate at Oak Ridge National Laboratory, USA and an Acting Research Associate at the University of Alberta, Canada prior to his current position. Dr. Kim has founded the Nano/Micro-Sensors and Sensing Systems Laboratory (NMSSS, www.ucalgary.ca/sskim) at the University of Calgary in 2013 to develop 1) ultrasensitive chemical/biological sensors and sensing systems based on micro/nanotechnology; 2) novel micro/nano-metrologies to characterize nanomaterials and polymeric nanocomposites for energy, environmental, biological applications. E-mail: sskim@ucalgary.ca

Research Showcase I Biography

Speaker: Dr. Seok-Bum Ko

Professor in Electrical and Computer Engineering at the University of Saskatchewan

Dr. Seok-Bum Ko received his Ph.D. in Electrical and Computer Engineering at the University of Rhode Island, Kingston, Rhode Island, USA in 2002. He is currently Professor in the Department of Electrical and Computer Engineering at the University of Saskatchewan, Saskatoon, Canada. He worked as a member of technical staff for Korea Telecom Research and Development Group, Korea from 1993 to 1998. His research interests include computer arithmetic, computer architecture, and biomedical engineering. Dr. Ko is a senior member of IEEE Circuits and Systems Society and an Associate Editor of IEEE Access and IEEE Transactions on Circuits and Systems I.

E-mail seokbum.ko@usask.ca

Research Showcase I Biography

Speaker: Dr. Hyo-Jick Choi

Associate Professor, Department of Chemical & Materials Engineering at the University of Alberta

Dr. Hyo-Jick Choi is an associate professor in the Department of Chemical & Materials Engineering at the University of Alberta, and runs a sustainable engineering and drug delivery design (SE∃D) lab. Dr. Choi has made influential scientific contributions in global health by developing, 1) universal and reusable antimicrobial personal protective measures against pandemic/epidemic diseases, 2) cold-chain free solid oral vaccine technologies, 3) microfabricated drug delivery systems, and 4) innovative antimicrobial technolgies against foodborne, waterborne, and hospital-acquired infectious diseases. His capability in integrative fusion technologies and their commercialization enabled him to establish two start-up companies based on his research findings. Dr. Choi is an Editorial Board Member of Scientific Reports. He was chosen as the Researcher of the Month for June 2017 by the Canadians for Health Research and received global attention for his efforts in the development of virus deactivation system against pandemic/epidemic diseases and solid oral vaccines.

E-mail: hyojick@ualberta.ca

Research Showcase I Biography

Speaker: Dr. Eunsik Kim

Assistant Professor in Mechanical, Automotive & Materials Engineering at the University of Windsor

Dr. Kim received his Ph.D. from Penn State University in 2018. He is an Assistant Professor in Mechanical, Automotive & Materials Engineering at the University of Windsor. His research areas include human factors and ergonomics and the development of effective gamification through user-centered design. His current research focuses on developing an emotion assessment algorithm through such psychological and psychophysiological measurements as eye tracking, GSR, HRV, fEMG and EEG using machine-learning techniques as part of an NSERC Discovery Grant. He received the Graduate Scholarship for Excellence and the C. Norwood Wherry Memorial Graduate Fellowship in Engineering from Pennsylvania State University. Dr. Kim was also awarded the Best Paper Award by the Ergonomics Society of Korea. He has served as a consultant of ergonomic services for over 10 small-, medium-, and large-sized companies, using physical and physiological sensors to identify, analyze and control workplace risk factors and prevent work-related musculoskeletal disorders.

Research Showcase I Biography

Speaker: Mr. Chae-Ho Yim

Research Officer in National Research Council of Canada, Ottawa

Chae-Ho Yim is a Research Council Officer at the National Research Council of Canada. He received his M.A.Sc. in chemical engineering in 2011, B.Sc. in Chemical engineering and BSc in Biochemistry in 2008 from the University of Ottawa. Since 2011 his research has focused on Li-ion battery materials including cathode, anode, and electrolytes. His recent focus and projects are mainly on the materials for the All-Solid-State Li-ion battery.

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Research Showcase I Biography

Speaker: Dr. Keekyoung Kim

Associate Professor at the University of Calgary

Dr. Keekyoung Kim is an associate professor in the Department of Mechanical and Manufacturing Engineering and Biomedical Engineering at the University of Calgary. Previously, he was at the University of British Columbia's Okanagan Campus from 2013 to 2019. Dr. Kim obtained a Ph.D. degree in Mechanical Engineering from the University of Toronto, specializing in MEMS devices for microscale biomaterial characterization. During his Ph.D., he was supported by an NSERC PGS D scholarship. He was a Postdoctoral Fellow at Stanford University in Mechanical Engineering and Pediatric Cardiology. Funded by NSERC Postdoctoral Fellowship, he joined Brigham and Women's Hospital at Harvard Medical School and the Wyss Institute of Biologically Inspired Engineering at Harvard University. Currently, Dr. Kim's research focuses on developing advanced biomanufacturing platforms to fabricate artificial tissues and organs for regenerative medicine and drug discovery applications, using a variety of cutting-edge technologies, including 3D printing and micro/nanotechnology.

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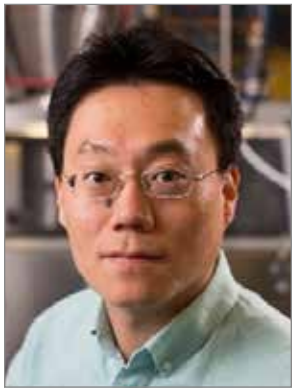
Research Showcase I Biography



Speaker: Dr. Keun Su Kim

Senior Research Officer, Security and Disruptive Technologies Research Centre

Dr. Kim is a Senior Research Officer at National Research Council Canada and an Adjunct Professor at the Department of Mechanical and Industrial Engineering, University of Toronto. He received his B.S., M.S., and Ph.D. degrees in Nuclear Engineering from Seoul National University in 1998, 2000, and 2005, respectively. With growing interest in energy, materials, and the environment, his research interest has focused on the development of new plasma technologies for renewable energy production and advanced nanomaterial synthesis. In 2009, he joined in NRC and is working on the synthesis of low-dimensional nanomaterials including carbon nanotubes, graphene and boron nitride nanotubes (BNNTs). By leading the research at NRC, Dr. Kim made a seminal breakthrough in synthesis of BNNTs in bulk and demonstrated world's first pilot-scale production, which helped place NRC as a world-leader in BNNT science and technology. In recognition of his excellence in science and technology, Dr. Kim is a recipient of Public Service Award of Excellence 2015 in scientific contribution from the Government Canada, and named as the Engineer of the Year by the Korean Federation of Science & Technology Societies (2016). Dr. Kim has published over 40 journal papers with 2 invited review papers and delivered over 25 invited/oral talks in international conferences.

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KIAT-AKCSE Global Cooperation Forum-R&D Partnership Development with NCC

Time: 10:00 - 11:30, 3 September (Friday) Korea Time
22:00 - 23:30, 2 September (Thursday) Canada ADT

Place: Online
In-person at Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: Korea Institute of for Advancement of Technology (KIAT)

Organizer: KIAT and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Jong Sung Kim, Dalhousie Univeristy (jskim@dal.ca)

Description: This Forum is intended to associate National Cooperation Centers(NCC) and AKCSE members. National Cooperation Centers(NCC) consists of an interconnected network of Korean National Research Institutes.
The Program is designed to be an innovative research-business partnership for supporting SMEs to find out their R&D cooperation demands, to match partners in other countries, and to plan collaborative R&D projects. As of August 2021, there were six established centers.
This session includes presentations from each NCC center and discussions about future collaboration opportunities between Korea and Canada.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
22:00-22:05	Online & Ballroom B3 Halifax Convention Center	Opening – Welcome Message	Cheon Kyo Park	Director General, KIAT
22:05-22:10		Congratulatory Remarks	Dr. Il Yong Kim	AKCSE President, Queen's Univ.
22:10-22:25		Introduction of NCC (National Cooperation Centers) Program	Eunjung Kim	Chief Representative, KIAT
22:25-23:00		Presentation from 6 NCC centers - Plans and Proposals for Cooperation	Daekyeong Nam Ilsue Roh Dr. Jae Yong Park Hoseop Park Dr. Sanghoon Ahn JooHee Jung	KETI ETRI KITECH KITECH KIMM KRICT
23:00-23:25		Discussion - Korea-Canada R&D Partnership Development with NCC	All	
23:25-23:30		Closing	Eunjung Kim	Chief Representative, KIAT

KIAT-AKCSE Global Cooperation Forum-R&D Partnership Development with NCC Biography

Chair: Dr. Jong Sung Kim

Associate Professor, Faculty of Medicine at Dalhousie University/ Director of Health and Environments Research Centre (HERC)

Dr. Jong Sung Kim is a tenured Associate Professor and Director of Health and Environments Research Centre (HERC) in the Faculty of Medicine at Dalhousie University in Canada. Nanotoxicology and human health risk assessment have been his primary academic and research interests since the completion of his MSc degree in Environmental Toxicology at the University of Nebraska Center for Health and Environmental Toxicology. Following this, he commenced his PhD in Human Toxicology, where he was enrolled in the Interdisciplinary Graduate Program at the University of Iowa (US National Institutes of Health Fellowship). In recognition of his contributions to nanotoxicology research, he has served on the Technical Committee for the International Organization for Standardization (ISO) Working Group on Nanotechnology, and he received numerous international awards such as Best Paper Award of Delta Omega Honorary Society in Public Health from the American Public Health Association and the MB Research Award from the Society of Toxicology. The primary objective of his research program is to better understand how emerging hazards and exposures lead to adverse health outcomes at various levels of biological organization (from cellular and molecular levels to populations) and how human body modify these responses to maintain homeostasis (host-defense).

E-mail: jskim@dal.ca

KIAT-AKCSE Global Cooperation Forum-R&D Partnership Development with NCC Biography

Speaker: Ms. Eunjung Kim

Chief Representative, Korea Institute for Advancement of Technology (KIAT)

Ms. Eunjung Kim is the chief representative of the Korea Institute for Advancement of Technology (KIAT) US office. The KIAT, as a non-profit government funding agency, is entrusted with the implementation of the state R&D budget for industrial technology. It supports the overarching R&D of industry through planning, project support, building R&D infrastructure, nurturing human resources, and performance management. She has been involved in international R&D activities, and in particular, bilateral and multilateral industrial technology cooperation programs supporting Korean companies work with overseas partners, since 2010.

She received her B.Sc. degrees in Physics and Electronics Engineering from Ewha Womans University, Seoul, Korea in 1999 and the M.Sc. degree in Electronics Engineering from the Korea Advanced Institute of Science and Technology (KAIST), Daejon, Korea in 2001. She started her professional career in LG Information and Communications Co., Ltd. and Samsung Electronics Co., Ltd. as a global standardization engineer for next generation mobile communication making technical contributions towards 3GPP HSDPA and MBMS specifications. From 2005 until 2009, she worked as a senior researcher at the Institute for Information Technology Advancement (IITA) and oversaw Strategic Technology Roadmap and R&D projects planning for ICT technology, value-based information technology assessment and launching WiBro service.

KIAT-AKCSE Global Cooperation Forum-R&D Partnership Development with NCC Biography

Speaker: Mr. Daekyeong Nam

General Manager, Global Cooperation Dept, Korea Electronics Technology Institute

Mr. Daekyeong Nam currently serves as General Manager of Global Cooperation Department from KETI(Korea Electronics Technology Institute).

For education, Working on Ph.D in technology & innovation management after obtaining BA in electronic engineering, and IMMS(Master of Science in Information Management).

For professional experience, 10+ years of experience in technology commercialization, planning and implementation of international R&D cooperation projects, and ultimately promoting business cooperation activities in KETI since 2008, after working in ETRI(Electronics and Telecommunications Research Institute).

For awards & credentials, 2016 recognized as person of distinguished service to SMEs technology support by Ministry of Science, ICT and Future Planning(renamed to Ministry of Science and ICT(MSIT)) 2017 won Korea Institute for Advancement of Technology(KIAT) Award for contribution to technology commercialization, 2019 recognized as person of distinguished service to international cooperation in industrial technology by MOTIE(Ministry of Trade, Industry and Energy), 2016-2018 served as Co-director of IEIE(Institute of Electronics and Information Engineers)

E-mail dknam@keti.re.kr

KIAT-AKCSE Global Cooperation Forum-R&D Partnership Development with NCC Biography

Speaker: Mr. Ilsue Roh

Director, International Cooperation Section, Electronics and Telecommunications Research Institute

Mr. Ilsue Roh is the Director of the International Cooperation Section, which facilitates cooperation with major foreign countries and partners to expand the utilization of ETRI(Electronics and Telecommunications Research Institute)'s technology abroad.

Prior to this position, he was appointed as Director General of ETRI US Research and Development Center (Silicon Valley) and was the Project Manager of ETRI US Research and Development Center's Operation (2015–2018).

He was also a Principal Researcher of ETRI's Future Technology and Strategy Research Laboratory (2000–2015).

Previously, he has advised countries in designing and developing national ICT strategies, as Project Manager for the development of ICT Master Plans for Indonesia, Kazakhstan, and Myanmar.

He was also a key project member for the development of the ICT Master Plans of Cambodia and Colombia, and the ICT Cooperation framework for United Arab Emirates.

He holds a Ph.D. in Economics from Hanyang University, and a Master's degree in Economics from New York University, USA.

E-mail isroh@etri.re.kr

KIAT-AKCSE Global Cooperation Forum-R&D Partnership Development with NCC Biography

Speaker: Dr. Jae Yong Park

Director, External cooperation Dept, Korea Automotive Technology Research Institute

Dr. Jae Yong Park is a director of external cooperation department at Korea Automotive Technology Research Institute(KATECH) in Korea.
Dr. Park holds a Ph.D degree in Mechanical engineering from University of Wisconsin, Madison and is an expert in international R&D cooperation with a focus on new technology development and growth in automotive components.
Recently, he completed the project that was to develope AEB system based on mono camera sensor with Spain (IDIADA).
KATECH has been designated as a global technology collaboration center for EVs & autonomous vehicle by Ministry of trade, industry & Energy(MOTIE).
E-mail jypark@katech.re.kr

KIAT-AKCSE Global Cooperation Forum-R&D Partnership Development with NCC Biography

Speaker: Mr. Hoseop Park

Director, Head of International Cooperation Office, Korea Institute of Industrial Technology

Mr. Hoseop Park received the MSc degree in Management of Science, Technology and Innovation (2009) from the Manchester Business School at the University of Manchester, and BSc degree in Manufacturing System and Design Engineering (2007) from Northumbria University, UK.

He worked as a researcher for HRST(Human Resources in Science and Technology) Policy Office in KISTEP(Korea Institute of S&T Evaluation and Planning) (2009-2010).

He joined KITECH in August 2010 and is currently working as a head of International Cooperation Office.

E-mail richard2@kitech.re.kr

KIAT-AKCSE Global Cooperation Forum-R&D Partnership Development with NCC Biography

Speaker: Dr. Sanghoon Ahn

Principal Researcher, Laser & E-beam Technology Dept, Korea Institute of Machinery and Materials

Dr. Sanghoon Ahn received his Bachelor's degree (2006) and Master's degree (2008) from Seoul National University, South Korea both in Mechanical Engineering. He obtained a Ph.D. degree (2013) from University of California at Berkeley in Mechanical Engineering. After working for developing next generation display at Samsung display as a senior engineer from 2013 to 2015, he joined the Laser & Electron beam application Department at Korea Institute of Machinery and materials as a senior researcher.

He experienced several international cooperating researches, which include Eurostars2 and Korea-Czech bilateral research program. His main research interest is related with Ultra short pulsed laser process and optical system for semiconductor and display industry.

He has 13 patents, 23 SCI journal papers, 4 S/W programs and 40 conference talks in optics and laser field. As acknowledging his dedication, he won the Ministerial Citation award from Ministry of Science and ICT for international cooperation as well as Chairman's Commendation award from National Research Council of Science and Technology.

E-mail shahn@kimm.re.kr

KIAT-AKCSE Global Cooperation Forum-R&D Partnership Development with NCC Biography

Speaker: Ms. JooHee Jung

Senior Administrator, Office of Global Cooperation, Korea Research Institute of Chemical Technology

Ms. JooHee Jung is Senior Administrator of the Office of Global Cooperation at the Korea Research Institute of Chemical Technology (KRICT).
She started her career at Korea Welfare Foundation (currently ChildFund Korea) since 2006 for 3 years working on overseas programs. While she was pursuing her master's degree in International Cooperation and Development, she experienced her internship at Organisation for Economic Co-operation and Development (OECD) and continued her consultancy position at United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) from 2010 until 2012. During her experience at the OECD and UNESCAP, she participated in projects on climate change and invloved in publishing relevant policy reports. She joined Seoul Metropolitan Government in July 2012 as Manager of International Relations Division working on urban diplomacy until she joined KRICT in July 2014.
Ms. Jung is currently in charge of the international cooperation program of KRICT to expand and consolidate the global R&D network with overseas institutions

KIMM NCC - AKCSE International Joint Research Workshop

Time: 10:00 - 11:30, 3 September (Friday) Korea Time
22:00 - 23:30, 2 September (Thursday) Canada ADT

Place: Online
In-person in Ballroom B2 at the Halifax Convention Center, NS, Canada

Sponsor: Korea Institute of Machinery & Materials (KIMM)

Organizer: KIMM and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Jihyun Lee, University of Calgary (jihyun.lee@ucalgary.ca)

Description: This session is to discuss the potential joint research between KIMM (Korea Institute of Machinery & Materials) and AKSCE members.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
22:00 - 22:10	Online & Ballroom B2 Halifax Convention Center	Opening	N/A	KIMM & AKCSE
22:10 - 22:25		Introduction of National technology Cooperation Center (NCC)	Dr. Seung-Kook Ro	KIMM
22:25 - 22:55		Smart design and manufacturing using virtual machine tools	Dr. Chang-Ju Kim	KIMM
		Robotics in machining: Challenges and Approaches	Dr. Jihyun Lee	AKCSE (Univ. of Calgary)
22:55 – 23:25		Metal additive manufacturing technology at KIMM	Dr. Tae-Ho Ha	KIMM
		Metal additive manufacturing: Current and Future in industries	Dr. Il Yong Kim	AKCSE (Queen's Univ.)
23:25 - 23:30		Q&A / Closing	N/A	KIMM & AKCSE

List of Participants:

Canada

Affiliation	Name	Position	In-person/ Online
Korea Institute of Machinery & Materials	Dr. Sang Jin Park	President	Online
	Dr. Junyeob Song	Vice President	Online
	Dr. Changwoo Lee	General Manager of Advanced Manufacturing Systems Research Division	Online
	Dr. Jeong Seok Oh	Department Manager of Ultra-Precision Machines and Systems	Online

Korea Institute of Machinery & Materials	Dr. Seung-Kook Ro	Principal Researcher	Online
	Dr. Changju Kim	Principal Researcher	Online
	Dr. Sungcheul Lee	Principal Researcher	Online
	Dr. Sunmin Kang	Senior Researcher	Online
	Dr. Jongyoup Shim	Principal Researcher	Online
	Dr. Chan-Young Lee	Senior Researcher	Online
	Dr. Seongheum Han	Senior Researcher	Online
	Dr. Byung-Sub Kim	Principal Researcher	Online
	Dr. Seung Guk Baek	Senior Researcher	Online
	Dr. Yongjin Kim	Senior Researcher	Online
	Dr. Jiyeon Choi	Department Manager of Laster & Electron Beam Technologies	Online
	Dr. Sanghoon Ahn	Principal Researcher	Online
	Dr. Taeho Ha	Department Manager of 3D Printing	Online
	Dr. Segon Heo	Principal Researcher	Online
	Dr. Pil-Ho Lee	Senior Researcher	Online
	Dr. Joon-Phil Choi	Senior Researcher	Online
	Dr. Yeo-Ul Song	Senior Researcher	Online
	Dr. Min-Kyo Jung	Researcher	Online
	Gyusik Hong	Intern	Online
	Dr. Hyungcheoul Shim	Senior Researcher	Online
	Ji Hyeon Seo	Department Manager of External Relations	Online
	Jeongyeon Oh	Senior Administrator	Online
	Minjung Kim	Senior Administrator	Online
	Sangho Bae	Administrator	Online
	Wooram Kim	Administrator	Online
	Dong-uk Chung	Administrator	Online

KIMM NCC - AKCSE International Joint Research Workshop Biography

Chair & Speaker: Dr. Jihyun Lee

Assistant Professor at the University of Calgary

Dr. Jihyun Lee received her BSc in Mechanical Engineering from Yonsei University, Seoul, South Korea, and her MSc and Ph.D. in Mechanical Engineering from the University of Michigan-Ann Arbor, USA. Prior to joining the University of Calgary, she worked for 2.5 years as a senior researcher in the department of Ultra-precision Machines and Systems at Korea Institute of Machinery & Materials (KIMM), South Korea. She has worked as an assistant professor at the University of Calgary since February 2019. Projects she mainly fulfilled at the KIMM were 'Vibration Reduction of Machines using Multiple TMD system'(.1 million granted by Doosan Machine Tools), 'Virtual Machining Mechatronics Platform', 'Industrial Robot Manipulator Machining on Mobile Platform' and 'Laser Tracker Network Development'. Current research topic she focuses on at the UCalglary is robotic metal hybrid additive and subtractive manufacturing. Dr. Lee conducts her research at the intelligent automation research laboratory (iAR Lab).

E-mail jihyun.lee@ucalgary.ca

KIMM NCC - AKCSE International Joint Research Workshop Biography

Speaker: Dr. Il Yong Kim

Professor at Queen's University

Dr. Il Yong Kim is a Professor in the Department of Mechanical and Materials Engineering at Queen's University, Kingston, Canada. His research interest is design optimization with applications in automotive and aerospace systems. KIM received his M.S. and Ph.D. degrees in mechanical engineering from the Korea Advanced Institute of Science and Technology (KAIST). He worked as an instructor and postdoctoral researcher in the Department of Aeronautics and Astronautics at M.I.T., where he taught undergraduate design course. KIM received a number of awards, including the Early Researcher Award in Canada, the recognition of the Experienced Humboldt Fellow in Germany, the Research Excellence Award at Queen's, and many paper awards at major scientific conferences. KIM is actively collaborating with global, multi-national companies in the automotive and aerospace industries, including General Motors, Magna, Bombardier Aerospace, Pratt & Whitney, Safran Landing Systems, and General Dynamics.

KIER - NRC Battery Forum

Time: 10:00 - 11:30, 3 September (Friday) Korea Time
22:00 - 23:30, 2 September (Thursday) Canada ADT

Place: Online
In-person in room 501-502 at the Halifax Convention Center, NS, Canada

Sponsor: KIER (Korea Institute of Energy Research)
NRC (National Research Council Canada)
AKCSE (Association of Korean-Canadian Scientists and Engineers)

Organizer: KIER, NRC, AKCSE

Moderator: Dr. Sangjin Choi, Korea Institute of Energy Research (sjinchoi@kier.re.kr)

Contact: Dr. Boyun Jang (byjang@kier.re.kr)
Mr. Chae-Ho Yim (Chae-Ho.Yim@nrc-cnrc.gc.ca)

Description: It provides an opportunity for discussion to develop into international joint research topics related to various battery technologies by expanding exchanges between KIER and NRC's experts built through CKC. Speakers from KIER and NRC will introduce current R&D activities of each institutions and suggest possible collaborative research idea between Korea and Canada.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
22:00-22:20	Online & room 501-502 Halifax Convention Center	Lithium-ion battery material characterization in harsh environments	Dr. Mike Fleischauer	NRC
22:20-22:40		Next Generation Materials for Solid-State Batteries	Dr. Yaser Abu-Lebdeh	NRC
22:40-23:00		Present and future of KIER material technologies for secondary battery	Dr. Boyun Jang	KIER
23:20-23:30		Q&A or discussion	Participants	

List of Participants:

Korea

Affiliation	Name	Position	In-person/ Online
KIER	Dr. Sangjin Choi	Chief, Global Strategy Team	Online
KIER	Dr. Woonho Baek	Coordinator, Global Strategy Team	Online
KIER	Dr. Boyun Jang	Principal Researcher, Energy Conversion & Storage Materials Lab.	Online
KIER	Dr. Joonsoo Kim	Principal Researcher, Energy Conversion & Storage Materials Lab.	Online
KIER	Dr. Daeil Kim	Senior Researcher, Energy Conversion & Storage Materials Lab.	Online

Canada

Affiliation	Name	Position	In-person/ Online
NRC	Dr. Yaser Abu-Lebdeh	Senior Research Officer	Online
NRC	Dr. Michael Fleischauer	Research Officer	Online
NRC	Mr. Chae-Ho Yim	Research Officer	Online

KIER - NRC Battery Forum Biography

Moderator: Dr. Sangjin Choi

Principal Researcher and Team lead, Korea Institute of Energy Research – Global Strategy Team

Dr. Choi earned his PhD from the Dept. of Industrial Engineering at Pusan National University (2000). Before he joined Korea Institute of Energy Research in 2002, he had his postdoctoral course in the Dept. of Manufacturing Engineering at University of Calgary. His research interests are Energy System Modeling and Analysis, R&D Quality Assurance, and Global R&D Strategy. As a chief of R&D Strategy Team for the last 4 years, he has developed global R&D strategic process and enhanced the competitiveness of energy technology through the collaboration. E-mail: sjinchoi@kier.re.kr

KIER - NRC Battery Forum Biography

Speaker: Dr. Mike Fleischauer

Senior Research Officer, National Research Council Canada – Nanotechnology Research Centre, and Adjunct. Professor, Department of Physics, University of Alberta

Dr. Mike Fleischauer received his B.Sc. (Physics) from the University of Guelph and his M.Sc. (Physics) and Ph.D. from Dalhousie University. He was a Postdoctoral Fellow at the University of Alberta prior to joining the National Research Council in 2007. He became an Adjunct Professor of Physics and a Professional Engineer in 2015. Mike's research and development contributions span a wide range of energy conversion and storage technologies including nanostructured thin films (and bulk foils) for organic photovoltaics, fuel cell catalysts, and rechargeable and primary batteries, with a focus on new, automated, and robust ex-situ, in-situ, and operando electrochemical, structural , and mechanical measurements. Early examples include contributions to combinatorial thin film battery material characterization, and high fidelity photovoltaic testing (leading to the creation of nationally recognized start-up company G2V Optics, Inc.). His current research and development is based on harnessing challenging environmental conditions (e.g. high temperature, variable pressure) to improve the field's understanding of energy storage materials and device performance in real-world conditions. E-mail: michael.fleischauer@nrc.ca

Lithium-ion battery material characterization in harsh environments

Mike Fleischauer

National Research Council – Nanotechnology Research Centre and Department of Physics, University of Alberta, Canada

Lithium-ion batteries need to be stored and operated in 'Goldilocks' conditions – not too hot, and not too cold. Non-ideal conditions lead to rapid deterioration of either cell performance (at low temperatures) or cell components (at high temperatures, high pressures, or both). We use harsh environments as experimental variables to help understand the dynamic behavior of lithium-rich materials. This talk will describe how we use materials challenges to drive (ex-situ, in-situ, and operando) characterization capability development, and use our enabling hardware to drive materials physics and chemistry. Specific examples of metastable phase formation, accelerated electrolyte breakdown, and creep deformation from the lithium, lithium-aluminum, and lithium-silver systems will be provided.

KIER - NRC Battery Forum Biography

Speaker: Dr. Yaser Abu-Lebdeh

Senior Research Officer and Team lead, National Research Council Canada – Energy, Mining and Environment Research Centre

Dr. Abu-Lebdeh is a Senior Research Officer and a Team Lead at the National Research Council of Canada in Ottawa. He is currently Leading the Battery Materials Innovation Team. His research focuses on energy storage and conversion materials and devices with a focus on lithium ion and metal batteries. Dr. Abu-Lebdeh earned his PhD in Electrochemistry from the University of Southampton (UK) in 2001, his Master's degree in Material Science from the University of Manchester (UK) in 1997 and his bachelor's degree in Industrial Chemistry from Jordan University of Science and Technology in 1995. He joined the NRC in 2005 as an NSERC Postdoctoral Fellow and before that he was a Postdoctoral Research fellow at the University of Montreal's International Laboratory on Electro-active Materials.

Next Generation Materials for Solid-State Batteries

Yaser Abu-Lebdeh

National Research Council – Energy, Mining and Environment Research Centre

Dr Abu-Lebdeh will give an overview of the research activities at the NRC related to solid state batteries (SSBs) with emphasis on an OERD-funded project on next generation materials for SSBs. Also, the presentation will cover the state of innovation and technological advancements made to date on the development of this exciting battery technology.

KIER - NRC Battery Forum Biography

Speaker: Dr. Boyun Jang

Principal Researcher, Korea Institute of Energy Research – Energy Conversion and Storage Material Laboratory, and Joint Professor, Choongnam National University, Energy technology Graduate School

Dr. Boyun Jang has received his Bachelor, Master and Doctor's degree of Material science and engineering at Korea University and had post-doctorial position at Virginia tech. for 1 year at 2012. He has worked at Hyndae Electronics for 2 years from 2000 and joined Korea institute of energy research since 2006. He researches various nano-materials for secondary battery, solar cell, optical devices and bio-applications. Since 2008, He has also developed various new process applicable for synthesis of nanomaterials using plasma such as inductive coupled plasma, microwave plasma, and arc plasma. He has been working on specific analysis methods such as internal quantum efficiency of nanomaterials, quantification of core-shell ratio of nanoparticles by Raman and XPS, etc. He has transferred his nano material technologies to more than 3 companies, who still on nanoparticle business. He has been joint professor in Chungnam national university since 2011. A number of students received Master's degree and doctor's degree in his laboratory. He received technical innovation award twice from techconnect held in USA. He received commendation form Korean president at 2018. E-mail: byjang@kier.re.kr

Present and future of KIER material technologies for secondary battery

Boyun Jang

Principal Researcher, Korea Institute of Energy Research – Energy Conversion and Storage Material Laboratory

Rechargeable battery is one of potential candidates to solve global climate problems, and material is key to realize the battery's mission. KIER has researched various innovative material based on nanotechnologies applicable for Li-ion battery. Anode materials using nanoparticle and nanosheet for Li-ion battery were investigated. Especially, not only electrode materials but also solid electrolyte materials have been researched to fabricate all solid-state battery. At the same time, 3D printing process is applied for capacitor for IoT application. Finally, flow battery with new redox coupling has been researched foe ESS applications. At the forum, brief of each technology will be introduced in order to find excellent collaboration topics with Canadian researchers.

KIER - NRC Battery Forum Biography

Speaker: Mr. Chae-Ho Yim

Research Officer in National Research Council of Canada, Ottawa

Mr. Chae-Ho Yim is a Research Council Officer at the National Research Council of Canada. He received his M.A.Sc. in chemical engineering in 2011, B.Sc. in Chemical engineering and BSc in Biochemistry in 2008 from the University of Ottawa. Since 2011 his research has focused on Li-ion battery materials including cathode, anode, and electrolytes. His recent focus and projects are mainly on the materials for the All-Solid-State Li-ion battery.

E-mail Chae-Ho.Yim@nrc-cnrc.gc.ca

GEI- AKCSE International Joint Research Proposal Presentation

Time: 11:30 - 13:00, 3 September (Friday) Korea Time
23:30 - 01:00, 2 September (Thursday) Canada ADT

Place: Online
In-person at Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: Green Energy Institute (GEI)

Organizer: GEI and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Homin Shin, National Research Council Canada (Homin.Shin@nrc-cnrc.gc.ca)

Description: This session to discuss potential opportunity of joint research between GEI (Green Energy Institute) and AKSCE members.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
23:30-23:35	Online & Ballroom B3 Halifax Convention Center	Opening	Dr. Seungheon Song	GEI
23:30-23:40		Turbo Blower of highly energy efficient and used in various industries	Mr. Yohan Park	NAMWON TURBOONE Inc.
23:40-23:50		Smart Grid Networking and Solution Provider	Mr. Jun Seon, Beck	NuriFlex Co., Ltd.
23:50-00:00		The Development of improving Photovoltaic power generation efficiency	Mr. Kwang woo Park	WP Co., Ltd.
00:00-00:10		The Essentials of the aviation industry “Aviation Obstruction Light”	Mr. Bum Seok Park	Korea Aviation Light Co., Ltd.
00:10-00:20		Photovoltaics and Wind Power in Canada	Dr. Gap Soo Chang	Univ. of Saskatchewan
00:20-00:30		Machine Learning Approach to Health Monitoring and Prediction with Limited Data	Dr. Chi-Guhn Lee	Univ. of Toronto
00:30-00:40		Thermal Plasma Technologies for Hydrogen Production	Dr. Keun Su Kim	NRC
00:40-00:50		Solar panel damage detection and autonomous UAVs for farm monitoring	Dr. Young-Jin Cha	Univ. of Manitoba
00:50-01:00		Closing		

List of Participants:

Korea

Affiliation	Name	Position	In-person/Online
Green Energy Institute (GEI)	Dr. Seungheon Song	General Manager of Business Cultivation Dept.	Online
	Yangsuk Shin	Team Leader of Business Cultivation Dept.	Online
	Yoon Ilgwon	Team Leader of Business Cultivation	Online
	Baek Seulgi	Senior Researcher of Business Cultivation	Online
	Seungo Yoo	Senior Researcher of Business Cultivation	Online
	Suchang Sung	Senior Researcher of Business Cultivation	Online
	Hyeongyeol Lee	Manager of Business Cultivation	Online
	Suhui Kim	Manager of Business Cultivation	Online
	Hyeyeon Jung	Researcher of Business Cultivation	Online
	Yangsu Park	Assistant Manager of Business Cultivation	Online
	Jihye Yoo	Assistant Manager of Business Cultivation	Online
	Yujeong Park	Assistant Manager of Business Cultivation	Online
	Minguk Kim	Assistant Manager of Business Cultivation	Online
	Yongjae Cho	Assistant Manager of Business Cultivation	Online
	Juseong Ham	Assistant Manager of Business Cultivation	Online
	Seyeong Lee	Assistant Manager of Business Cultivation	Online

GEI- AKCSE International Joint Research Proposal Presentation Biography

Chair: Dr. Homin Shin

Research Officer, National Research Council Canada

Dr. Shin is a Research Officer at National Research Council Canada. She obtained her B.S. and M.S. in physics from Ewha Womans University and her Ph.D. in physics from Syracuse University. Her graduate work was followed by postdoctoral research associate positions at the University of Massachusetts Amherst and at the University of Illinois Urbana-Champaign, where she explored a wide range of problems arising in soft condensed matter such as colloids, polymers, liquid crystals, structured vesicles and filamentous bio/nano materials, using a combination of analytic theory and computer simulations. She joined at National Research Council Canada in 2014 and has been continuing research in materials theory and computation with focus on nanotube-related materials and revealing the design principle of novel materials.

E-mail Homin.Shin@nrc-cnrc.gc.ca

GEI- AKCSE International Joint Research Proposal Presentation Biography

Co-Chair: Dr. Seungheon Song

General Manager, Green Energy Institute

Dr. Song is a General Manager at the Department of Business Cultivation at Green Energy Institute(GEI). He received his M.S. and Ph.D. degrees in computer science from the Sunchon National University, Korea and AbD in Education in Business Administration from the University of Caroline University, USA. He has over 20 years energy and ICT industry experience and considerable expertise in demonstration research projects for energy welfare Support and infrastructure. He also actively participated in a central, directive role in energy policy for Jeollanam-do province and enterprise support service. E-mail fsaa@gei.re.kr

GEI- AKCSE International Joint Research Proposal Presentation Biography

Speaker: Mr. Yohan Park

Manager/Namwon Turbo One Inc.

Mr. Yohan Park received his BE in Electric Engineering at Chosun University, Gwangju, South Korea. He worked for 2.5 years as an officer in Republic of Korea army. Since 2019 he has been working at Namwon Turbo One. He is a Manager in the Department of sales and service at Namwon Turbo One, Naju, South Korea. He has performed commissioning and maintenance of turbo blowers on more than 100 occasions in South Korea and abroad.

E-mail: overseassales@nwturbo.com

GEI- AKCSE International Joint Research Proposal Presentation Biography

Speaker: Mr. Jun Seon, Beck

Director/Nuriflex, co, Ltd.

Mr. Jun Seon, Beck received his bachelor's degree in electrical engineering from Gachon University in South Korea, and a master's degree in electrical and electronic engineering from the same University.

From 2001 to the present, he has been responsible for the Smart Energy Division of Nuriflex, and doing various new energy businesses such as microgrid, smart city, energy efficiency, and energy management system are in progress.

He is interested in developing new usinesses through the combination of 4th industrial revolution technology and energy industry.

E-mail: beck100@nuriflex.co.kr

GEI- AKCSE International Joint Research Proposal Presentation Biography

Speaker: Mr. Kwang woo Park

Senior Researcher / WP., Co Technical Research Center

Mr. Kwang woo Park received BSc in Food Engineering from Suncheon University, South Korea, MSc in Electrical and Semiconductor Engineering from Chonnam National University, South Korea. he has worked as a Senior Researcher at the WP., Co Technical Research Center since July 2017. Projects he mainly fulfilled at the WP., Co Technical Research Center were 'Development and Demonstration of Renewable Energy Mixed-Use System for the Livestock Industry', 'Development of 430W Negative Buck Type Solator with MPPT in Shaded Area' and 'Development of fault identification and monitoring techniques to increase microgrid generation efficiency'. Current research topic his focuses is on New Information Technology and Industrial and System Application of Renewable Energy. E-mail pkw9872@naver.com

GEI- AKCSE International Joint Research Proposal Presentation Biography

Speaker: Mr. Bum Seok Park

Project Manager/ Korea Aviation Light Co., Ltd.

Mr. Bum-Seok Park is currently a project manager in the Department of Overseas Business at Korea Aviation Light Co., Ltd. He is in-charging of 60k pcs solar module for street light to export Indonesia project, Taba&Hurgada new airport construction project in Egypt with Badry Group and Ecopro's oxygen cold box construction project for deliver to Fortune China.

He received his Bachelor's degree (2015) in international commerce from Shanghai Jiao Tong University in China.

Prior to joining Korea Aviation Light, he handled agricultural and frozen meat trade between India and China. Mr. Park also has over 4years international trade industry experience abroad before he came back to Korea.

And, Korea Aviation Light is Obtaining ICAO(International Civil Aviation Organization) Certification each Aviation light products for Oversea Market.

E-mail sales@kalkorea.com

GEI- AKCSE International Joint Research Proposal Presentation Biography

Speaker: Dr. Gap Soo Chang

Professor at University of Saskatchewan

Dr. Gap Soo Chang is a Professor in the Department of Physics and Engineering Physics at the University of Saskatchewan. He received his B. Sc., M.Sc., and Ph.D. degrees in Experimental Condensed Matter Physics from Yonsei University, Seoul, Korea. He held postdoctoral researcher positions at Atomic-scale Surface Science Center, Korea and the University of Tennessee at Knoxville/Lawrence Berkeley National Laboratory prior to joining the faculty at the University of Saskatchewan. His research interests encompass materials design and characterization of carbon-based semiconductor, magnetic semiconductors/ nanostructures using synchrotron-radiation X-ray spectroscopy for electronics and renewable energy technology (photovoltaics and battery technology), and the first-principle theory for bioactivity assessment of xenobiotics. He has served as 21st President of AKCSE, a board member of Canadian Association of Physicists (CAP) and Hydrographic Society of Korea, and a chair of International Activities Committee of Council, University of Saskatchewan. E-mail: gapsoo.chang@usask.ca

GEI- AKCSE International Joint Research Proposal Presentation Biography

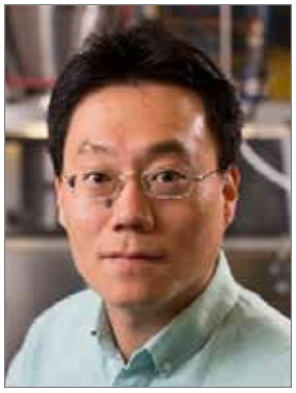
Speaker: Dr. Chi-Guhn Lee

Professor of Industrial Engineering at the University of Toronto

Dr. Chi-Guhn Lee is a Professor of Industrial Engineering and the Director of the Centre for Maintenance Optimization and Reliability Engineering (C-MORE) at the University of Toronto. His research interest includes reinforcement learning, Markov decision process, deep learning, supply chain optimization and physical asset management. Recent and on-going projects cover topics such as transfer learning, domain adaptation and Bayesian learning with applications from supply chain, equipment diagnosis. He has focused on both applications and theory, and published in machine learning conferences such as NeurIPS, ICLR, UAI as well journals such as Operations Research, IEEE Transactions on Industrial Electronics, Mechanical Systems and Signal Processing. He has also worked closely with private firms including Nestle, LG, IBM, General Motors, Magna International, Fujitsu, State Grid Corp of China to name a few.

E-mail cglee@mie.utoronto.ca

GEI- AKCSE International Joint Research Proposal Presentation Biography



Speaker: Dr. Keun Su Kim

Senior Research Officer, Security and Disruptive Technologies Research Centre

Dr. Kim is a Senior Research Officer at National Research Council Canada and an Adjunct Professor at the Department of Mechanical and Industrial Engineering, University of Toronto. He received his B.S., M.S., and Ph.D. degrees in Nuclear Engineering from Seoul National University in 1998, 2000, and 2005, respectively. With growing interest in energy, materials, and the environment, his research interest has focused on the development of new plasma technologies for renewable energy production and advanced nanomaterial synthesis. In 2009, he joined in NRC and is working on the synthesis of low-dimensional nanomaterials including carbon nanotubes, graphene and boron nitride nanotubes (BNNTs). By leading the research at NRC, Dr. Kim made a seminal breakthrough in synthesis of BNNTs in bulk and demonstrated world's first pilot-scale production, which helped place NRC as a world-leader in BNNT science and technology. In recognition of his excellence in science and technology, Dr. Kim is a recipient of Public Service Award of Excellence 2015 in scientific contribution from the Government Canada, and named as the Engineer of the Year by the Korean Federation of Science & Technology Societies (2016). Dr. Kim has published over 40 journal papers with 2 invited review papers and delivered over 25 invited/oral talks in international conferences.

Email KeunSu.Kim@nrc-cnrc.gc.ca

GEI- AKCSE International Joint Research Proposal Presentation Biography

Speaker: Dr. Young-Jin Cha

Associate Professor at the University of Manitoba

Dr. Young-Jin Cha received his Ph.D. (2008) from Texas A&M University's Department of Civil and Environmental Engineering, M.S. (2004) from Yonsei University, and B. E. (2002), from Kumoh National Institute of Technology. He started as a post-doctoral fellow (2009) in the City College of New York by collaborating with Professor Anil Agrawal who is Editor in Chief of the Journal of Bridge Engineering, ASCE, then he became post-doctoral associate at the Massachusetts Institute of Technology (MIT) (2012) by collaborating with MIT Computer Science and Artificial Intelligence Laboratory. He then joined the Department of Civil Engineering at the University of Manitoba in 2014. His areas of investigation include 1) advanced deep learning methods with big data, computer vision analysis, robotics and autonomous navigation of unmanned aerial vehicles (UAVs) for structural health monitoring, holistic three-dimensional (3-D) damage maps with autonomous UAVs, digitization and automation of manufacturing systems and infrastructures, intelligent transportation monitoring system, plant & industrial product quality inspection, and disease detection problems within medical images. He was reported as top 0.65% cited scientist for single year impact in the world within Civil Engineering field in 2020.

Email: young.cha@umantioba.ca, www.youngjincha.com

KERI-AKCSE International Joint Research Program Session

Invitees Only

Time: 11:30 - 13:00, 3 September (Friday) Korea KST
23:30 – 01:00, 2 September (Thursday) Canada ADT

Place: Online
In-person in Ballroom B2 at the Halifax Convention Center, NS, Canada

Sponsor: Korea Electrotechnology Research Institute (KERI)

Organizer: KERI and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Jihyun Lee, University of Calgary (jihyun.lee@ucalgary.ca)

Description: This session is to discuss the current status of the KERI AI project

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
23:30-23:35	Online & Ballroom B2 Halifax Convention Center	Opening Remarks	Moderator	
23:35-23:40		Welcome Remarks by KERI	Dr. Jong Uk Kim	KERI
23:40-23:45		Welcome Remarks by AKCSE	Dr. Il Yong Kim	AKCSE President
23:45-24:05		Project Overview and Future Visions	Dr. Taihyun Kim	KERI
24:05-24:30		Project Current Progress Update	Dr. Jihyun Lee	Univ. of Calgary
24:30-24:55		Discussion and Q&A	All	
24:55-1:00		Closing	Moderator	

List of Participants:

Affiliation	Name	Position	In-person/ Online
Korea Electrotechnology Research Institute (KERI)	Dr. Sung-Ho Myung	President	Online
	Dr. Nam-Kyun Kim	Vice President (Research)	Online
	Dr. Sung-Ho Son	Senior Researcher	Online
	Dr. Hongsoo Ha	Principal Researcher	Online
	Dr. Jong-Moon Kim	Director of Artificial Intelligence Research Center	Online
	Dr. Seung Hyun Sohn	Researcher	Online
	Dr. Hyuk Jin Lee	Senior Researcher	Online
	Dr. Jungmo Kim	Senior Researcher	Online
	Dr. Dong-Wook Yoo	Principal Researcher	Online
	Dr. Youngju Park	Senior Researcher	Online

Affiliation	Name	Position	In-person/ Online
Korea Electrotechnology Research Institute (KERI)	Dr. Jung-Hyo Bae	Principal Researcher	Online
	Dr. Ga-Eun Jung	Researcher	Online
	Dr. Young-Jin Park	Director of Electro-Medical Device Research Center	Online
	Dr. Jong-Uk Kim	Executive Director of Strategy & Policy Division	Online
	Dr. Taihyun Kim	Director of Future Strategy Department	Online
	Dr. Im-sook Ha	Principal Researcher	Online
	Dr. Seong Joon Lee	Research Associate	Online
	Dr. Young-Ho Kim	Senior Researcher	Online
	Dr. Yeong-su Kim	Researcher	Online
	Dr. Shinyoung Kim	Post-Doc	Online
	Dr. Sungjoo Koh	Director of Cooperation & PR Department	Online
	Jae Hoon Seo	Senior Staff	Online
	Jeongyi Seok	Senior Staff	Online
	Ji Hyun Choi	Staff	Online
	Su Ho Lee	Staff	Online
	Minju Kim	Administrative Technician (Secretary)	Online
	Jin Myung	Administrative Technician (Secretary)	Online

KERI-AKCSE International Joint Research Program Session Biography

Chair & Speaker: Dr. Jihyun Lee

Assistant Professor at the University of Calgary

Dr. Jihyun Lee received her BSc in Mechanical Engineering from Yonsei University, Seoul, South Korea, and her MSc and Ph.D. in Mechanical Engineering from the University of Michigan-Ann Arbor, USA. Prior to joining the University of Calgary, she worked for 2.5 years as a senior researcher in the department of Ultra-precision Machines and Systems at Korea Institute of Machinery & Materials (KIMM), South Korea. She has worked as an assistant professor at the University of Calgary since February 2019. Projects she mainly fulfilled at the KIMM were 'Vibration Reduction of Machines using Multiple TMD system'(.1 million granted by Doosan Machine Tools), 'Virtual Machining Mechatronics Platform', 'Industrial Robot Manipulator Machining on Mobile Platform' and 'Laser Tracker Network Development'. Current research topic she focuses on at the UCalglary is robotic metal hybrid additive and subtractive manufacturing. Dr. Lee conducts her research at the intelligent automation research laboratory (iAR Lab).

E-mail jihyun.lee@ucalgary.ca

KITECH - AKCSE International Joint Research Proposal Presentation

Open to all

Time: 11:30 - 13:00, 3 September (Friday) Korea Time
23:30 - 01:00, 2 September (Thursday) Canada ADT

Place: Online
In-person in room 501-502 at the Halifax Convention Center, NS, Canada

Sponsor: Korea Institute of Industrial Technology (KITECH)

Organizer: KITECH and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Simon Park, University of Calgary (simon.park@ucalgary.ca)
Dr. Seonghwan Sam Kim, University of Calgary (sskim@ucalgary.ca)

Description: This session is to discuss the proposal of joint research between KITECH and AKSCE members.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
23:30-23:40	Online & Room 501-502 Halifax Convention Center	Opening (KITECH and AKCSE)	Dr. Ik Hyun Oh Dr. Simon Park	KITECH Univ. of Calgary
23:40-23:50		AI use cases in manufacturing	Dr. Jeongsu Lee	KITECH
23:50-24:00		Functionalized Metal-Organic Framework (MOF) based high-performance sensor development for remote monitoring of toxic materials	Dr. Seonghwan Kim	Univ. of Calgary
00:00-00:10		An Explainable AI System for Automated Health Assessment and Recommendation	Dr. Mi-Young Kim	Univ. of Alberta
00:10-00:20		Intelligent machine tools based on intelligent HMI platform	Dr. Dong Yoon Lee	KITECH
00:20-00:30		Dynamic modelling of industrial robots for digital twins.	Dr. Jihyun Lee	Univ. of Calgary
00:30-00:40		Measurement and Utilization of Agricultural Workload Data for Development of Electric Tractor	Dr. Sangdae Lee	KITECH
00:40-00:50		Development of self-sanitizing fabrics	Dr. Hyo-Jick Choi	Univ. of Alberta
00:50-01:00		Q&A and Closing	Dr. Seonghwan Kim	Univ. of Calgary

KITECH - AKCSE International Joint Research Biography

Chair: Dr. Simon Park

Professor, Department of Mechanical and Manufacturing Engineering, University of Calgary, AB, Canada

Dr. Park is a professor at the Schulich School of Engineering, Dept. of Mechanical and Manufacturing Engineering, University of Calgary, Canada. He is an AITF iCORE Chair in sensing and monitoring. He is a professional engineer in Alberta, and is an associate member of CIRP (Int. Academy of Production Engineers) from Canada. Dr. Park received bachelor and master's degrees from the University of Toronto, Canada. He then continued his PhD at the University of British Columbia, Canada. He has worked in several companies including IBM manufacturing where he was a procurement engineer for printed circuit boards and Mass Prototyping Inc. dealing with rapid prototyping systems. His research interests include pipeline engineering, nanocomposites, directional drilling, enhanced oil recovery, and manufacturing. He has also founded several start-up companies in sensing and partial upgrading of bitumen. He has received several awards including Young Innovator's Award, Schulich School of Engineering Teaching Award, Schulich School Research Excellence Award, CFI New Faculty Grant, Alberta Innovates New Faculty award, NSERC scholarships. Currently, he is directly supervising over 20 students and scholars.

KITECH - AKCSE International Joint Research Biography

Chair: Dr. Seonghwan (Sam) Kim

Associate Professor/Canada Research Chair in Nano Sensing Systems at the University of Calgary

Dr. Kim is an Associate Professor and Canada Research Chair in Nano Sensing Systems, in the Department of Mechanical and Manufacturing Engineering at the University of Calgary. He received his B.Sc. (1998) and M.Sc. (2000) degrees in Aerospace Engineering from Seoul National University, Seoul, South Korea and Ph.D. (2008) in Mechanical, Aerospace and Biomedical Engineering from the University of Tennessee, Knoxville, USA. He was a Postdoctoral Research Associate at Oak Ridge National Laboratory, USA and an Acting Research Associate at the University of Alberta, Canada prior to his current position. Dr. Kim has founded the Nano/Micro-Sensors and Sensing Systems Laboratory (NMSSS, www.ucalgary.ca/sskim) at the University of Calgary in 2013 to develop 1) ultrasensitive chemical/biological sensors and sensing systems based on micro/nanotechnology; 2) novel micro/nano-metrologies to characterize nanomaterials and polymeric nanocomposites for energy, environmental, biological applications.
E-mail: sskim@ucalgary.ca

KITECH - AKCSE International Joint Research Biography

Speaker: Dr. Jeongsu Lee

Senior Researcher, Korea Institute of Industrial Technology (KITECH)

Jeongsu Lee (M'20) received the B.S. and Ph.D. degrees in mechanical and aerospace engineering from Seoul National University, Seoul, Korea, in 2009 and 2016, respectively. He was a Senior Engineer at Samsung Electronics, Suwon, Korea, from 2016-2019. He is currently a Senior Researcher of Intelligent Manufacturing R&D Department, Korea Institute of Industrial Technology (KITECH). His research interests include industrial artificial intelligence and smart factory.

E-mail sabaham@kitech.re.kr

KITECH - AKCSE International Joint Research Biography

Speaker: Dr. Mi-Young Kim

Assistant Professor in Computing Science, Augustana Faculty, University of Alberta, and Researcher in Alberta Machine Intelligence Institute (Amii)

Dr. Kim is currently an Assistant Professor in Computing Science, Augustana Faculty, University of Alberta and Researcher in Alberta Machine Intelligence Institute (Amii). She received her B.Sc. and Ph.D. from Pohang University of Science and Technology (POSTECH). Her research interests are in Natural Language Processing, Artificial Intelligence, and Machine Learning. Currently, she is researching information extraction from two specific domains: medical and legal domains. Since 2014, she has been serving as a co-organizer of the International Competition on Legal Information Extraction and Entailment (COLIEE). In the annual international competition of the legal bar exam question answering, her team's legal AI assistant had been ranked No.1 from 2014 to 2019. She is also interested in Explainable AI, and currently developing an AI system that can perform automated health assessment for a patient, and provide rationale (explanation) on the prediction. In addition, she is analyzing Alberta's Covid-19 Contact Tracing data to early predict high-risk regions of the virus spread in Alberta.

E-mail: miyoung2@ualberta.ca

KITECH - AKCSE International Joint Research Biography

Speaker: Dr. Dong Yoon Lee

Principal Researcher, Korea Institute of Industrial Technology (KITECH)

Dr. Dong Yoon Lee received a B.S. degree in Mechanical Design and Production Engineering from Yonsei University in 1997. He received his M.S. and Ph.D. degrees in Mechanical Engineering from KAIST in 1999 and 2005.

Dr. Lee began to work as a manager for Design & Engineering Group in Samsung Corning Precision Glass (now, Corning Precision Materials) in 2004. Dr. Lee joined KITECH as a Senior Researcher in 2006 and he is working as a Principal Researcher. Currently, Dr. Lee is the IT Converged Process Group leader of the Digital Transformation R&D Department.

E-mail dylee@kitech.re.kr

KITECH - AKCSE International Joint Research Biography

Speaker: Dr. Jihyun Lee

Assistant Professor at the University of Calgary

Dr. Jihyun Lee received her BSc in Mechanical Engineering from Yonsei University, Seoul, South Korea, and her MSc and Ph.D. in Mechanical Engineering from the University of Michigan-Ann Arbor, USA. Prior to joining the University of Calgary, she worked for 2.5 years as a senior researcher in the department of Ultra-precision Machines and Systems at Korea Institute of Machinery & Materials (KIMM), South Korea. She has worked as an assistant professor at the University of Calgary since February 2019. Projects she mainly fulfilled at the KIMM were 'Vibration Reduction of Machines using Multiple TMD system'(.1 million granted by Doosan Machine Tools), 'Virtual Machining Mechatronics Platform', 'Industrial Robot Manipulator Machining on Mobile Platform' and 'Laser Tracker Network Development'. Current research topic she focuses on at the UCalglary is robotic metal hybrid additive and subtractive manufacturing. Dr. Lee conducts her research at the intelligent automation research laboratory (iAR Lab). E-mail jihyun.lee@ucalgary.ca

KITECH - AKCSE International Joint Research Biography

Speaker: Dr. Sangdae Lee

Principal Researcher, Korea Institute of Industrial Technology (KITECH)

Dr. Sangdae Lee received the B.S., M.S. and Ph.D. degrees in Agricultural Machinery Engineering from Chungnam National University in Korea in 2003, 2005 and 2009 respectively.

After Dr. Lee worked as a postdoctoral researcher for U.S. Department of Agriculture-Agricultural Research Service(USDA-ARS) in 2010, he worked for Rural Development Administration in Korea form 2011 to 2013 as a postdoctoral researcher. Since 2014, Dr. Lee has been working for Korea Institute of Industrial Technology(KITECH) as a Leader of Smart Agricultural Machinery R&D group.

E-mail sdlee96@kitech.re.kr

KITECH - AKCSE International Joint Research Biography

Speaker: Dr. Hyo-Jick Choi

Associate Professor, University of Alberta

Dr. Hyo-Jick Choi is an associate professor in the Department of Chemical & Materials Engineering at the University of Alberta, and runs a sustainable engineering and drug delivery design (SE∃D) lab. Dr. Choi received his PhD in Biomedical Engineering from Univ. of Cincinnati (Sept. 2006-June. 2007)/ UCLA (Sept. 2002-Aug. 2006), followed by his postdoctoral fellowship at Georgia institute of Technology. Dr. Choi has made influential scientific contributions in Global health and Biotechnology by developing, 1) universal antimicrobial face masks/rspirators, 2) cold chain-free, long-term stable solid oral vaccines, 3) antimicrobial technologies against food-borne, water-borne, and hospital-borne diseases, and 4) living/non-living hybrid system using artificial organells for application in environmental issues. His capability in integrative fusion technologies and their commercialization enabled him to establish three start-up companies based on his research findings. Dr. Choi is an Editorial Board Member of Scientific Reports and Pharmaceutics. He was chosen as the Researcher of the Month for June 2017 by the Canadians for Health Research for his efforts in the development of virus deactivation system against pandemic/epidemic diseases and solid oral vaccines. E-mail hyojick@ualberta.ca

NST ST&I Ambassador Conference

Invitees Only

Date: 22:00 - 23:00, 3 September (Friday) Korea Time
10:00 - 11:00, 3 September (Friday) Canada ADT

Place: Online
In-person at Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: National Research Council of Science and Technology, Korea (NST)

Organizer: NST and AKCSE (Association of Korean-Canadian Scientists and Engineers)

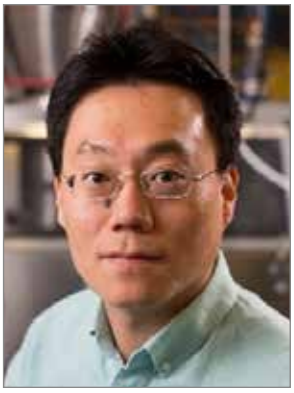
Contact: Dr. Keun Su Kim, National Research Council Canada (NRC) (KeunSu.Kim@nrc-cnrc.gc.ca)

Description: This session is intended to associate Korea Government Research Institutes (KGRIs) and corresponding AKCSE ambassadors. It also aims to encourage and support the ambassadors to closely work with KGRIs to relate AKCSE members with KGRIs for collaborative research.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
10:00-10:20	Online & Ballroom B3 Halifax Convention Center	Activity Briefing	Dr. Hyo-Jick Choi	Univ. of Alberta
10:20-10:30		2021-2022 Ambassador announcement	Dr. Keun Su Kim	NRC
10:30-11:00		Group Discussion - How to enhance the collaboration between KGRIs and AKCSE?	All	

NST ST&I Ambassador Conference Biography



Moderator: Dr. Keun Su Kim

Senior Research Officer, Security and Disruptive Technologies Research Centre

Dr. Kim is a Senior Research Officer at National Research Council Canada and an Adjunct Professor at the Department of Mechanical and Industrial Engineering, University of Toronto. He received his B.S., M.S., and Ph.D. degrees in Nuclear Engineering from Seoul National University in 1998, 2000, and 2005, respectively. With growing interest in energy, materials, and the environment, his research interest has focused on the development of new plasma technologies for renewable energy production and advanced nanomaterial synthesis. In 2009, he joined in NRC and is working on the synthesis of low-dimensional nanomaterials including carbon nanotubes, graphene and boron nitride nanotubes (BNNTs). By leading the research at NRC, Dr. Kim made a seminal breakthrough in synthesis of BNNTs in bulk and demonstrated world's first pilot-scale production, which helped place NRC as a world-leader in BNNT science and technology. In recognition of his excellence in science and technology, Dr. Kim is a recipient of Public Service Award of Excellence 2015 in scientific contribution from the Government Canada, and named as the Engineer of the Year by the Korean Federation of Science & Technology Societies (2016). Dr. Kim has published over 40 journal papers with 2 invited review papers and delivered over 25 invited/oral talks in international conferences.

Email KeunSu.Kim@nrc-cnrc.gc.ca

NST ST&I Ambassador Conference Biography

Speaker: Dr. Hyo-Jick Choi

Associate Professor, Department of Chemical & Materials Engineering at the University of Alberta

Dr. Hyo-Jick Choi is an associate professor in the Department of Chemical & Materials Engineering at the University of Alberta, and runs a sustainable engineering and drug delivery design (SE∃D) lab. Dr. Choi has made influential scientific contributions in global health by developing, 1) universal and reusable antimicrobial personal protective measures against pandemic/epidemic diseases, 2) cold-chain free solid oral vaccine technologies, 3) microfabricated drug delivery systems, and 4) innovative antimicrobial technolgies against foodborne, waterborne, and hospital-acquired infectious diseases. His capability in integrative fusion technologies and their commercialization enabled him to establish two start-up companies based on his research findings. Dr. Choi is an Editorial Board Member of Scientific Reports. He was chosen as the Researcher of the Month for June 2017 by the Canadians for Health Research and received global attention for his efforts in the development of virus deactivation system against pandemic/epidemic diseases and solid oral vaccines.

E-mail: hyojick@ualberta.ca

AI Roundtable

Invitees Only

Date: 22:00 - 23:00, 3 September (Friday) Korea Time
11:00 - 12:00, 3 September (Friday) Canada ADT

Place: Online
In-person in room 501-502 at the Halifax Convention Center, NS, Canada

Sponsor: AKCSE

Organizer: Korean Embassy to Canada and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Moderator: Dr. Hyock Ju Kwon, University of Waterloo (hjkwon@uwaterloo.ca)

Panels: Dr. Keung Ryong Chang (Ambassador of the Republic of Korea to Canada)
Dr. Simon Park (University of Calgary)
Dr. Youngjin Cha (University of Manitoba)
Dr. Jihyun Lee (University of Calgary)
Dr. Mi-Young Kim (University of Alberta)

Description: This session is to discuss how to promote the AI collaboration between Korea and Canadian researchers.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
11:00-11:05	Online & Room 501-502 Halifax Convention Center	Opening & introduction	Dr. Hyock Ju Kwon	Univ. Waterloo
11:05-11:10		Opening remark	Dr. Keung Ryong Chang	Ambassador
11:10-11:30		Panel Discussion I: Current	Dr. Simon Park Dr. Young-Jin Cha Dr. Jihyun Lee Dr. Mi-Young Kim	Univ. Calgary Univ. Manitoba Univ. Calgary Univ. Alberta
11:30-11:35		Intermediate remark	Dr. Hyock Ju Kwon	Univ. Waterloo
11:35-11:50		Panel Discussion II: Future	Dr. Simon Park Dr. Young-Jin Cha Dr. Jihyun Lee Dr. Mi-Young Kim	Univ. Calgary Univ. Manitoba Univ. Calgary Univ. Alberta
11:50-12:00		Closing remark	Dr. Keung Ryong Chang	Ambassador

AI Roundtable Biopgraphy

Moderator: Dr. Hyock Ju (HJ) Kwon

Associate Professor, Mechanical and Mechatronics Engineering, University of Waterloo

Dr. Kwon is an Associate Professor in the Department of Mechanical and Mechatronics Engineering at the University of Waterloo. He received his B.Sc. (1985) in Mechanical and Design Engineering from Seoul National University, M.Sc. (1988) in Production Engineering from KAIST in South Korea. and Ph.D. (2007) in Mechanical Engineering from the University of Alberta, Edmonton, Canada. Prior to joining University of Waterloo, he held a NSERC Postdoctoral Fellowship at Caltech in Pasadena, USA. Dr. Kwon also has over 10 years industry experience at Samsung Electronics, Korea and Texas Instruments, USA before he came to Canada. He is a Professional Engineer in Alberta and Ontario in Canada, and in Korea.

Dr. Kwon has expertise in AI for manufacturing, AI-based nondestructive testing (NDT), Smart Factory and Automation. His group at Waterloo is also developing hardware-based AI technology, an universal NDT platform and non-invasive surgery using focused ultrasound (FUS).

E-mail hjkwon@uwaterloo.ca

AI Roundtable Biopgraphy

Panel: Dr. Simon Park

Professor, Department of Mechanical and Manufacturing Engineering, University of Calgary, AB, Canada

Dr. Park is a professor at the Schulich School of Engineering, Dept. of Mechanical and Manufacturing Engineering, University of Calgary, Canada. He is an AITF iCORE Chair in sensing and monitoring. He is a professional engineer in Alberta, and is an associate member of CIRP (Int. Academy of Production Engineers) from Canada. Dr. Park received bachelor and master's degrees from the University of Toronto, Canada. He then continued his PhD at the University of British Columbia, Canada. He has worked in several companies including IBM manufacturing where he was a procurement engineer for printed circuit boards and Mass Prototyping Inc. dealing with rapid prototyping systems. His research interests include pipeline engineering, nanocomposites, directional drilling, enhanced oil recovery, and manufacturing. He has also founded several start-up companies in sensing and partial upgrading of bitumen. He has received several awards including Young Innovator's Award, Schulich School of Engineering Teaching Award, Schulich School Research Excellence Award, CFI New Faculty Grant, Alberta Innovates New Faculty award, NSERC scholarships. Currently, he is directly supervising over 20 students and scholars.

AI Roundtable Biopgraphy

Panel: Dr. Young-Jin Cha

Associate Professor at the University of Manitoba

Dr. Young-Jin Cha received his Ph.D. (2008) from Texas A&M University's Department of Civil and Environmental Engineering, M.S. (2004) from Yonsei University, and B. E. (2002), from Kumoh National Institute of Technology. He started as a post-doctoral fellow (2009) in the City College of New York by collaborating with Professor Anil Agrawal who is Editor in Chief of the Journal of Bridge Engineering, ASCE, then he became post-doctoral associate at the Massachusetts Institute of Technology (MIT) (2012) by collaborating with MIT Computer Science and Artificial Intelligence Laboratory. He then joined the Department of Civil Engineering at the University of Manitoba in 2014. His areas of investigation include 1) advanced deep learning methods with big data, computer vision analysis, robotics and autonomous navigation of unmanned aerial vehicles (UAVs) for structural health monitoring, holistic three-dimensional (3-D) damage maps with autonomous UAVs, digitization and automation of manufacturing systems and infrastructures, intelligent transportation monitoring system, plant & industrial product quality inspection, and disease detection problems within medical images. He was reported as top 0.65% cited scientist for single year impact in the world within Civil Engineering field in 2020.

Email: young.cha@umantioba.ca, www.youngjincha.com

AI Roundtable Biopgraphy

Panel: Dr. Jihyun Lee

Assistant Professor at the University of Calgary

Dr. Jihyun Lee received her BSc in Mechanical Engineering from Yonsei University, Seoul, South Korea, and her MSc and Ph.D. in Mechanical Engineering from the University of Michigan-Ann Arbor, USA. Prior to joining the University of Calgary, she worked for 2.5 years as a senior researcher in the department of Ultra-precision Machines and Systems at Korea Institute of Machinery & Materials (KIMM), South Korea. She has worked as an assistant professor at the University of Calgary since February 2019. Projects she mainly fulfilled at the KIMM were 'Vibration Reduction of Machines using Multiple TMD system'(.1 million granted by Doosan Machine Tools), 'Virtual Machining Mechatronics Platform', 'Industrial Robot Manipulator Machining on Mobile Platform' and 'Laser Tracker Network Development'. Current research topic she focuses on at the UCalglary is robotic metal hybrid additive and subtractive manufacturing. Dr. Lee conducts her research at the intelligent automation research laboratory (iAR Lab). E-mail jihyun.lee@ucalgary.ca

AI Roundtable Biopgraphy

Panel: Dr. Mi-Young Kim

Assistant Professor in Computing Science, Augustana Faculty, University of Alberta, and Researcher in Alberta Machine Intelligence Institute (Amii)

Dr. Kim is currently an Assistant Professor in Computing Science, Augustana Faculty, University of Alberta and Researcher in Alberta Machine Intelligence Institute (Amii). She received her B.Sc. and Ph.D. from Pohang University of Science and Technology (POSTECH). Her research interests are in Natural Language Processing, Artificial Intelligence, and Machine Learning. Currently, she is researching information extraction from two specific domains: medical and legal domains. Since 2014, she has been serving as a co-organizer of the International Competition on Legal Information Extraction and Entailment (COLIEE). In the annual international competition of the legal bar exam question answering, her team's legal AI assistant had been ranked No.1 from 2014 to 2019. She is also interested in Explainable AI, and currently developing an AI system that can perform automated health assessment for a patient, and provide rationale (explanation) on the prediction. In addition, she is analyzing Alberta's Covid-19 Contact Tracing data to early predict high-risk regions of the virus spread in Alberta.

E-mail: miyoung2@ualberta.ca

R&D Funding Information

AKCSE members Only

Date: 03:00 - 04:15, 4 September (Saturday) Korea Time
15:00 - 16:15, 3 September (Friday) Canada ADT

Place: Online
In-person in Ballroom B2 at the Halifax Convention Center, NS, Canada

Sponsor: AKCSE

Organizer: Dr. Hyo-Jick Choi (Univ. of Alberta), Dr. Il Yong Kim (Queen's Univ.)

Contact: Dr. Hyo-Jick Choi, Univ. of Alberta (hyojick@ualberta.ca)

Description: We cordially invite you to participate at the R&D Funding Information session. This session (in-person, online) is going to be organized on Sept 3, 2021 (ADT-Halifax) by AKCSE. Specific topics discussed will include 1) creation of a strategic AKCSE-Hanyang University ERICA partnership, 2) three funding success stories from our AKCSE members (IITP, KEIT, Alliance), and 3) information on Mitacs funding opportunities. In this session, you will learn tips on how to apply and how to develop a strong and successful application, primarily on the basis of the speaker's personal experience.

(Canada) Time	Place	Topic	Speaker	Affiliation
15:00-15:02	Online & Ballroom B2 Halifax Convention Center	Opening	Dr. Hyo-Jick Choi	Univ. of Alberta
15:02-15:05		Welcome Message by AKCSE President	Dr. Il Yong Kim	Queen's Univ.
15:05-15:15		Report on signing of MOU with Hanyang University ERICA & cooperation plan	Dr. Hyo-Jick Choi	Univ. of Alberta
15:15-15:25		IITP funding info & success story	Dr. Jihyun Lee	Univ. of Calgary
15:25-15:35		KEIT (Technology Demand Survey for Strategic Industrial Technology R&D Program) funding info & success story	Dr. Keun Su Kim	NRC
15:35-15:45		NSERC Alliance funding info & success story	Dr. Simon Park	Univ. of Calgary
15:45-15:55		Mitacs funding information	Ms. Hyelim Kim	Mitacs
15:55-16:15		Q&A (all AKCSE members)		

List of Participants:

Canada

Affiliation	Name	Position	In-person/Online
Queen's Univ.	Dr. Il Yong Kim	AKCSE president, Professor	In-person
Univ. of Alberta	Dr. Hyo-Jick Choi	Professor	In-person
Univ. of Calgary	Dr. Jihyun Lee	Professor	In-person
NRC	Dr. Keun Su Kim	Senior Research Officer	In-person
Univ. of Calgary	Dr. Simon Park	Professor	In-person
Mitacs	Ms. Hyelim Kim	Director, Business Development	In-person

KOFWST Session: How to Manage Covid-19 Burnout

Date: 08:30 - 10:20, 4 September (Saturday) Korea Time
20:30 - 22:20, 3 September (Friday) Canada ADT

Place: Online
In-person at Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: The Korean Federation of Women's Science and Technology Associations (KOFWST)

Organizer: KOFWST and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Homin Shin, National Research Council Canada (Homin.Shin@nrc-cnrc.gc.ca)
Dr. Regina Lee, York University (reginal@yorku.ca)

Description: Burnout is a syndrome caused by work-related stress and has been prevailing in various workplaces including academia and research institutes. Recent Covid-19 situation resulted in a lack of social interaction within the workplace and has been shown to amplify psychological distress. Such changes in workplace has made things worse for those who are already vulnerable, especially young generation and women. Their mental health during the pandemic has already become of a significant concern to the society.
This program will support a better understanding of the impact of the current pandemic on mental distress in Canada and Korea, especially among women scientists and engineers in the various stages of their careers. We would like to provide an opportunity for them to share their experiences on how they have been struggling and/or managing burnout during the pandemic period.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
20:30-21:30	Online & In-person (Pre-recorded videos)	COVID-19 Burnout: Impacts on Early Careers	Dr. Nana Lee Ms. Nia Kang Ms. Dianne Lee Ms. Jisoo Kang	Univ. of Toronto Univ. of Ottawa Queen's Univ. TC Energy
		Sharing the Burnout Experiences of Women Scientists and Engineers by Generation and How to Overcome Them	Dr. Kyungran Kang Dr. Mi-hwa Song Dr. Soyoung Kim	Ajou Univ. Semyung Univ. Univ. of Florida
21:30-22:20		Expert Panel Discussion and Q&A	Dr. Regina Lee Dr. Il Yong Kim Dr. Eunjeong Kwon Dr. Yun-Kyeung Choi	York Univ. Queen's Univ. St. Mary's Univ. Keimyung Univ.

KOFWST Session: How to Manage Covid-19 Burnout Biography

Chair: Dr. Homin Shin

Research Officer, National Research Council Canada

Dr. Shin is a Research Officer at National Research Council Canada. She obtained her B.S. and M.S. in physics from Ewha Womans University and her Ph.D. in physics from Syracuse University. Her graduate work was followed by postdoctoral research associate positions at the University of Massachusetts Amherst and at the University of Illinois Urbana-Champaign, where she explored a wide range of problems arising in soft condensed matter such as colloids, polymers, liquid crystals, structured vesicles and filamentous bio/nano materials, using a combination of analytic theory and computer simulations. She joined at National Research Council Canada in 2014 and has been continuing research in materials theory and computation with focus on nanotube-related materials and revealing the design principle of novel materials.

E-mail Homin.Shin@nrc-cnrc.gc.ca

KOFWST Session: How to Manage Covid-19 Burnout Biography

Co-Chair: Dr. Mi-Hye Kim

Professor at Chungbuk National University

Dr. Mi-Hye Kim is a Professor in the Department of Computer Engineering, Chungbuk National University, Korea. Her research interest is Fuzzy theory / Algorithm. Dr. Kim received her M.S. and Ph.D. degrees in Analysis from Chungbuk National University. She served as an expert member of the National Education Committee under the direct control of the President, the National Balanced Development Committee, and a member of the Korea Copyright Commission. Currently, he is serving as the head of the Computer Information Center at Chungbuk National University, a private member of the R&D Special Zone Committee of the Ministry of Science and ICT, and a member of the operating committee of the Ministry of Education for Foreign Education Institutions.

She is also president of Korea Associatoin of Science Communicator (KASC) and has long served as chairman of the International Cooperation Committee at KOFWST. She was appointed as the Director of Cultural Convergence Center, National Research Foundation of Korea in August 2021, and will serve for two years.

E-mail mhkim@cbnu.ac.kr

KOFWST Session: How to Manage Covid-19 Burnout Biography

Welcome Message: Dr. Heesun Chung

President of KOFWST (The Korean Federation of Women's Science and Technology Associations)

Dr. Heesun Chung is a distinguished professor at the department of Forensic Science in SungKyunKwan University. She obtained her PhD in Pharmacy from Sookmyung Women's University, Korea in 1987, and was awarded Foreign Commonwealth Office Scholarship from the UK government to do further postdoctoral study in King's College, London. Dr. Chung was the Director General of the National Forensic Service, Korea from 2008 to 2012. She was the 22nd president of the International Association of Forensic Sciences (IAFS) from 2011 to 2014, served as the 13th president of the International Association of Forensic Toxicologists (TIAFT) from 2014 to 2017, and has been an executive Board member since 2002 to present. She is also on the Editorial board for Forensic Toxicologists and Forensic Science International, a fellow of American Academy of Forensic Science, and the president of Korean Association of Forensic Science and the deputy president of the Pharmaceutical Society of Korea. From 2019, she has been a member of the International Panel of Forensic Experts of United Nations Office on Drugs and Crime (UNODC) and the National Bioethics Committee. E-mail hschung1024@gmail.com

KOFWST Session: How to Manage Covid-19 Burnout Biography

Welcome Message: Dr. Il Yong Kim

President, AKCSE

Professor, Mechanical and Materials Engineering, Queen's University, Canada

Dr. Il Yong Kim is a Professor in the Department of Mechanical and Materials Engineering at Queen's University, Kingston, Canada. His research interest is design optimization with applications in automotive and aerospace systems. KIM received his B.S. degree in mechanical engineering from Korea University and his M.S. and Ph.D. degrees in mechanical engineering from the Korea Advanced Institute of Science and Technology (KAIST). He worked as an instructor and postdoctoral researcher in the Department of Aeronautics and Astronautics at M.I.T., where he taught undergraduate design course. KIM received a number of awards, including the Early Researcher Award in Canada, the recognition of the Experienced Humboldt Fellow in Germany, the Research Excellence Award at Queen's, and many paper awards at major scientific conferences. KIM is actively collaborating with global, multi-national companies in the automotive and aerospace industries, including General Motors, Magna, Bombardier Aerospace, Pratt & Whitney, Safran Landing Systems, and General Dynamics.

KOFWST Session: How to Manage Covid-19 Burnout Biography

Speaker: Dr. Nana (Hyung-Ran) Lee

Director of Graduate Professional Development/Assistant Professor at University of Toronto

Dr. Nana Lee holds a PhD in Biochemistry from the University of Toronto, a Postdoctoral Fellowship at the University of Michigan and was a Visiting Scholar at Whitehead (Broad) Insititute, MIT. Her roles in the biotechnology industry include Senior Research Scientist for Ellipsis Biotherapeutics and Director of Application Science for DNA Software Inc. She is currently Director and Assistant Professor, Teaching Stream of Graduate Professional Development (GPD) & Mentorship for Departments of Biochemistry and Immunology, and Office of Graduate & Life Sciences Education (GLSE), Temerty Faculty of Medicine and the Lead for Faculty-wide Equity, Diversity and Inclusion (EDI) Committees. She teaches curriculum-embedded GPD, Introduction to Graduate Studies, Design Thinking for Scientists, Advanced Seminar Topics in Biochemistry, Teaching In Higher Education, and spearheads the PhD Leaders Program. She has presented to over 3000 learners about leadership, creating career pathways, and EDI throughout the USA, Canada and Asia. She is also a learner at Berklee Online School of Music.

Email: nana.lee@utoronto.ca

KOFWST Session: How to Manage Covid-19 Burnout Biography

Speaker: Ms. Nia Kang

Master's Student/University of Ottawa Faculty of Education

Nia received her Honours Bachelor of Health Sciences from the University of Ottawa. She is now pursuing her master's degree in Health Professions Education at the University of Ottawa Faculty of Education. Her research interests include the career progression of non-clinician medical education researchers in academic settings in Canada and the application of educational paradigms such as the Montessori method in managing symptoms of dementia in older adults.

Since 2017, Nia has contributed to the AKCSE Young Generation and Professional (YGP) group as President of the University of Ottawa YG Chapter, Young Generation National Chair, and President of the newly established Québec YP Chapter. She has been an active member of the CKC YGP organizing committee for the past four years and is serving as part of the YGP National Executive Team since the establishment of the collective YGP group in 2020.

E-mail: nia.kang@gmail.com

KOFWST Session: How to Manage Covid-19 Burnout Biography

Speaker: Ms. Dianne Seohyun Lee

Ph.D Student/ Department of Chemistry at Queen's University

Dianne received her BSc with honours in chemistry at Dalhousie University in 2017 and her MSc in chemistry at Queen's University in 2020. Currently, she is a 3rd year Ph.D. student at Queen's University under Dr. Cathleen Crudden. Her research focuses on investigating the use of carbon-based molecules as ligands for self-assembled monolayers on surface for pathogen detection with electroanalytical and surface characterization techniques. Outside of research, she is currently the president of Queen's Graduate Chemistry Society (QGCS). Since 2016, Dianne has been heavily involved with AKCSE YG/YP chapters and served as a VP of the young professional national (YPN) for 2 years. Dianne has served as a CKC YGP organizer from 2017-2020 and has extended her leadership skills internationally by serving as a co-chair at Ygnite, US based conference under KSEA for young professionals.

E-mail: dianne.lee@queensu.ca

KOFWST Session: How to Manage Covid-19 Burnout Biography

Speaker: Ms. Jisoo Kang

Engineer-In-Training / TC Energy

Jisoo received her Honours Bachelor of Science in Chemical Engineering from the University of Calgary. She currently works as an EIT for a Compressor Station project in Montréal, QC with a previous role on the Corrosion Prevention team under Pipe Integrity at TC Energy. Prior to her current project, Jisoo worked at Schlumberger to develop solutions for oilfield production challenges and provided field technical support to the upstream energy industry.

Since 2014, Jisoo has contributed to the AKCSE Young Generation and Professional (YGP) group as President of the University of Calgary YG Chapter, President of the Southern Alberta YP Chapter, and is currently the YGP National Vice President while serving as part of the CKC YGP Organizing Committee.

E-mail: jisookang95@gmail.com

KOFWST Session: How to Manage Covid-19 Burnout Biography

Speaker: Dr. Kyungran Kang

Professor at Ajou University

Dr. Kyungran Kang is a Professor in the Department of software and computer engineering at Ajou University, Korea. She is the chairperson of Women's committee of Korea Institute of Information Science. She received a B.S. degree in Statistics and Computer Science from Seoul National University, Korea in 1992, and an M.S. degree and Ph.D. degree in Computer Science from KAIST, Korea in 1994 and 1999, respectively. Since 2004, she has been a professor at Ajou University, where she has served as Director of Center for Education Innovation between 2019-2020 and been serving as a Vice Director of Leaders in Industry-University Cooperation since 2018. She has been a member of Internet Address Policy Deliberation Committee, a government-affiliated committee, since 2016.

E-mail korykang@ajou.ac.kr

KOFWST Session: How to Manage Covid-19 Burnout Biography

Speaker: Dr. Mi-hwa Song

Assistant Professor at Semyung University

Dr. Mi-hwa Song received the B.S. degree from the Department of Computer Science, EWHA Womans University, M.S. degree from the Department of Computer Science and Engineering, Seoul National University, and Ph.D. degree from the Department of Computer Science, Suwon University, South Korea, in 2002, 2005, and 2010, respectively. She worked on proposal for building fault-tolerant medical information systems for DoD, U.S. as a Visiting Fellow at the Department of Radiology, Imaging Science and Information Systems (ISIS) Center at Georgetown University, USA. She also worked as an instructor and senior researcher in the u-Healthcare Institute at Gachon University, South Korea. Since 2013, she has been working in School of Information and Communication Science at the Semyung University, South Korea. Her research interests include: computational intelligence, big data analysis, and intelligent healthcare system.

E-mail mhsong@semyung.ac.kr

KOFWST Session: How to Manage Covid-19 Burnout Biography

Speaker: Dr. Soyoung Kim

Postdoctoral fellowship at University of Florida

Dr. Soyoung Kim is a Postdoc associate in Department of Pharmaceutics at University of Florida, U.S. She received her Ph.D in Mathematics from Konkuk University, Seoul, South Korea. Prior to joining the University of Florida, she worked for 1.5 years as a postdoc researcher in Konkuk University. Her researches focused on mathematical modeling of infectious disease transmission dynamics. Current research topic is developing a population pharmacokinetic/pharmacodynamic (PK/PD) model for infectious disease.

E-mail soykim211@gmail.com

KOFWST Session: How to Manage Covid-19 Burnout Biography

Speaker: Dr. Regina Lee

Professor at York University

Dr. Regina Lee, PhD, PEng, is a Professor at the Department of Earth and Space Science and Engineering, York University, Toronto, Canada. Dr. Lee received her Ph.D. from the University of Toronto in 2000. From 2000 to 2007 she worked at Dynacon Inc. as a (NSERC) industry post-doctoral fellow, and later as a Research Scientist. Dr. Lee's research interests center on nanosatellite technology development. It has been a focus of Dr. Lee's research to develop a series of space technologies that will lead to scientific nanosatellite missions. Currently, she's investigating several areas including MEMS based attitude sensors and actuators to incorporate their low-grade characteristics; and optical payloads including a star tracker for Resident Space Object (RSO) detection, identification and characterization with light curve analysis.

E-mail reginal@yorku.ca

KOFWST Session: How to Manage Covid-19 Burnout Biography

Speaker: Dr. Eugena (Eunjeong) Kwon

Assistant Professor/ Saint Mary's University, Halifax, Canada

Dr. Eugena Kwon an Assistant Professor in the Department of Sociology at Saint Mary's University (SMU). She holds a Collaborative Ph.D. in Sociology & Migration and Ethnic Relations (MER) from Western University. Dr. Kwon specializes in the following four inter-related research areas: (1) international migration (e.g., post-migration integration and settlement experiences of immigrants and international students); (2) sociology of work and occupations; (3) gender and professions; and (4) population health and well-being. She is the principal investigator of NSIS project (https://www.nsisproject.ca), and is also involved in several other COVID-19 related projects with the support from external funding agencies (e.g., SSHRC, NSERC, and CLARI). Her projects involve close collaboration with community partners. Her work has been published in Gender Issues, AIDS Care, Sleep Health, Canadian Ethnic Studies, Journal of Immigrant and Minority Health and more. Please visit Dr. Kwon's website for more information about her work (https://www.eugenakwonsociology.com/).

KOFWST Session: How to Manage Covid-19 Burnout Biography

Speaker: Dr. Yun-Kyeung Choi Ph.D., Clinical Psychologist

Professor at Keimyung University

Dr. Yun-Kyeung Choi is a clinical psychologist and a professor in the Department of Psychology, Keimyung University, Korea. She received her Ph.D. degree in Clinical Psychology from Korea University. Dr. Choi received a number of paper awards, including the Paper of the Year Award from the Korean Society for Clinical Psychology in 2019 and the Best Paper Award from the Korean Health Psychological Association in 2017. She is also working as an auditor of the Trauma Psychotherapy Research Group at the Korean Clinical Psychological Association.
E-mail ykchoi@kmu.ac.kr

KWSE Korea - AKCSE Canada Consilience Technical Workshop

Date: 10:30 - 12:20, 4 September (Saturday) Korea Time
22:30 - 00:20, 3 September (Friday) Canada ADT

Place: Online
In-person in Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: The Association of Korean Woman Scientists & Engineers (KWSE)

Organizer: KWSE and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: Dr. Homin Shin, National Research Council Canada (Homin.Shin@nrc-cnrc.gc.ca)
Dr. Regina Lee, York University (reginal@yorku.ca)

Description: This session is a joint workshop between KWSE and AKCSE members to promote networking among Korean and Canadian women in science and technology, to disseminate their research works and to discover future international research collaboration projects. We will discuss the development of core technologies in the era of the 4th industrial revolution, such as convergence technology using artificial intelligence and emerging researches in the environment/energy/quantum fields.

Program:

(Canada) Time	Place	Topic	Speaker	Affiliation
22:30-22:40	Online & Ballroom B3 Halifax Convention Center	Opening remark	Dr. Hyo-Suk Lim	KWSE
22:40-24:00		c-Si solar cell R&D	Dr. Hee-eun Song	Korea Institute of Energy Research
		Explainable Artificial Intelligence Applications in Natural Language Processing	Dr. Mi-Young Kim	Univ. of Alberta
		Satellite-based Disaster Monitoring using Machine Learning Approaches	Dr. Seonyoung Park	Seoul National University of Science and Technology
		Ghost Particles and Topological Quantum Computer	Dr. Hae-Young Kee	Univ. of Toronto
24:00-24:20		Discussion, Q&A	All	

KWSE Korea - AKCSE Canada Consilience Technical Workshop Biography

Chair: Dr. Homin Shin

Research Officer, National Research Council Canada

Dr. Shin is a Research Officer at National Research Council Canada. She obtained her B.S. and M.S. in physics from Ewha Womans University and her Ph.D. in physics from Syracuse University. Her graduate work was followed by postdoctoral research associate positions at the University of Massachusetts Amherst and at the University of Illinois Urbana-Champaign, where she explored a wide range of problems arising in soft condensed matter such as colloids, polymers, liquid crystals, structured vesicles and filamentous bio/nano materials, using a combination of analytic theory and computer simulations. She joined at National Research Council Canada in 2014 and has been continuing research in materials theory and computation with focus on nanotube-related materials and revealing the design principle of novel materials.

E-mail Homin.Shin@nrc-cnrc.gc.ca

KWSE Korea - AKCSE Canada Consilience Technical Workshop Biography

Welcome Message: Dr. Hyo-Suk Lim

President of KWSE (The Association of Korean Woman Scientists and Engineers)

Dr. Hyo-Suk Lim serves as President of the Association of Korean Woman Scientists and Engineers (KWSE) from January 2020 to December 2021.
Founded in 1993, KWSE aims to empower the scientific capacity as well as to uplift the status of women in academia, research institutes, and industry, as the first association of women scientists and engineers in Korea.
Dr. Hyo-Suk Lim received BS and MS degrees from Seoul National University, Korea, in 1985 and 1987. She got a PhD degree in meteorology from Texas A&M University, USA, in 1993 and worked as a Post Doc. at NASA/GSFC from February 1994 to February 1996. In March 1996, she joined the Korea Aerospace Research Institute (KARI) in Korea, where she is currently a principal researcher of National Satellite Operation & Application Center. Dr. Lim mainly has focused on satellite data application in earth science, calibration/validation of satellite data, and international collaboration of remote sensing. Until now, she has served as reviewer of several journals and organizing committee of international conferences. She is

KWSE Korea - AKCSE Canada Consilience Technical Workshop Biography

Speaker: Dr. Hee-eun Song

Principal Researcher/Korea Institute of Energy Research

Dr. Song received her Ph.D. from Washington University in 2009 and worked in Yale University as a postdoctoral researcher. She is a Principal Researcher in Korea Institute of Energy Research. She is the author or co-author of over 100 journal papers. She received numerous honors and awards in her career including GPVC Young Scientist Award and has been the PI of national R&D projects. She has serving as the conference chair, the technical program committee member for various conferences including GPVC and ICEA.

E-mail hsong@kier.re.kr

KWSE Korea - AKCSE Canada Consilience Technical Workshop Biography

Speaker: Dr. Mi-Young Kim

Assistant Professor in Computing Science, Augustana Faculty, University of Alberta, and Researcher in Alberta Machine Intelligence Institute (Amii)

Dr. Kim is currently an Assistant Professor in Computing Science, Augustana Faculty, University of Alberta and Researcher in Alberta Machine Intelligence Institute (Amii). She received her B.Sc. and Ph.D. from Pohang University of Science and Technology (POSTECH). Her research interests are in Natural Language Processing, Artificial Intelligence, and Machine Learning. Currently, she is researching information extraction from two specific domains: medical and legal domains. Since 2014, she has been serving as a co-organizer of the International Competition on Legal Information Extraction and Entailment (COLIEE). In the annual international competition of the legal bar exam question answering, her team's legal AI assistant had been ranked No.1 from 2014 to 2019. She is also interested in Explainable AI, and currently developing an AI system that can perform automated health assessment for a patient, and provide rationale (explanation) on the prediction. In addition, she is analyzing Alberta's Covid-19 Contact Tracing data to early predict high-risk regions of the virus spread in Alberta.

E-mail: miyoung2@ualberta.ca

KWSE Korea - AKCSE Canada Consilience Technical Workshop Biography

Speaker: Dr. Seonyoung Park

Assistant Professor

Dr. Park received her Ph.D. from UNIST in 2018. She worked as a senior researcher at Korea Aerospace Research Institute (KARI) from 2018 to 2020. She currently works as a Professor in the Department of Applied Artificial Intelligence, Seoul National University of Science and Technology since September 2020. She have studied remote sensing theories, and applications and state-of-art modeling techniques such as artificial intelligence. Her research themes lie in remote sensing-based monitoring and forecasting of extreme weather events, characterization of Earth's surface processes, and water and energy cycles in terms of agriculture and hydrology. She have used various machine learning approaches such as random forest, support vector machines, artificial neural networks, and deep learning to solve various non-linear environmental problems.

E-mail sypark@seoultech.ac.kr

KWSE Korea - AKCSE Canada Consilience Technical Workshop Biography

Speaker: Hae-Young Kee

Professor of Physics at the University of Toronto

Hae-Young Kee is a professor of Physics at the University of Toronto, a Canada Research Chair in Theory of Quantum Materials, a fellow of the Canadian Institute for Advanced Research in Quantum Materials, and a distinguished fellow of Asia Pacific Center for Theoretical Physics. Kee is a theoretical physicist who specializes in condensed-matter physics of complex quantum materials including quantum spin liquids, topological phases, high temperature superconductors, and frustrated magnets.

YGP Icebreaker

YGP Participants

Date: 17:00 – 18:00, 1 Sep (Wednesday) Canada, ADT

Place: In-Person in Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: AKCSE

Organizer: AKCSE YGPN (Association of Korean Canadian Scientists and Engineers, Young Generation & Professionals National)

Contact: AKCSE YGPN, akcse.ygp@gmail.com

Description: This session is to quickly welcome all the YGP participants and provide them with a chance to meet with their group that they will be attending the CKC Programs with. There will be opportunities for participants to not only interact within their groups but also outside of the groups as part of the general YGP Group. A short 15 minute presentation will also be given at this event to relay information and provide general guidelines for CKC 2021.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
17:00-17:10	Online & Ballroom B3 Halifax Convention Center	Opening/Greetings to CKC 2021	Dr. Il Yong Kim Kanghee Ryu	AKCSE, AKCSE YGPN
17:10 – 17:25		General Information/Guideline for CKC delivery.	YGPN Executives	
17:25 - 17:35		Group Icebreaker – Personality Quiz (Choose Group Leaders)	Johnny Lee	
17:35 - 18:00		General YGP Icebreaker – Kahoot Trivia (CKC 2021 Themed)	Johnny Lee	

List of Participants:

All YGP Participants

YGP - TEDxYGP

Invitees Only

Date: 10:00 - 12:00, 2 Sep (Thursday) Canada ADT

Place: In-person in Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: AKCSE

Organizer: AKCSE & AKCSE YGPN (Association of Korean Canadian Scientists and Engineers, Young Generation & Professional National)

Contact: Yoona Park, ya.yoona.park@gmail.com

Description: TEDxYGP is a new YGP program proposed for the CKC 2021 to attract participants from diverse backgrounds, including but not limited to industry professionals, undergraduate and graduate students. The event is inspired by TED Talks, which has an objective of “ideas worth spreading”. Each presenter will be given 10-minutes to freely share their ideas/initiatives, career development, personal experiences, and lessons learned that have significantly contributed to their life decision.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
10:00-10:10	Ballroom B3 Halifax Convention Center	Opening	Facilitator: Yoona Park	AKCSE YGPN
10:10-10:50		First half of presentations (2 speakers)	Presenters: Nathan Byun Munghoon Choi	AKCSE YGPN
10:50-11:00		Intermission		
11:00-11:40		Second half of presentations	Presenter: Yoonjung Lee	AKCSE YGPN
11:40-11:50		Evaluation & Closing Remark	Facilitator: Yoona Park	AKCSE YGPN
11:50-12:00		Networking & Dismissal		AKCSE YGPN

List of Participants:

All YGP Participants

TEDxYGP Abstract List

Nathan Byun

Throughout my career, I achieved a few unusual accomplishments:
1. All three of my corporate affiliations were big conglomerates from different countries - Korea, India, USA.
2. I also attempted to build my own startup in between.
3. I was able to pivot my career from hardware-based car manufacturing to software-based robotics R&D.
4. I earned more accumulated passive income from my side job as a stock trader than salary from all of my employment combined so far.
It looks like a great resume, but the most bizarre part is they are the byproducts of my failed plans. None of these was what I had in my mind. In this presentation, I'd like to talk about my career story, how I came down this path, and what would be my next steps.

Munghoon Choi

In the new normal, many people have suffered from diseases, being separated from their loved ones, losing jobs and opportunities. As an undergraduate, it was really difficult to build new career-related experience. Thus, we had to find a way to develop our skills and experiences in a limited environment. In order to start a new project in a virtual environment with people around the world, software development was the best option we had. So, we were looking for colleagues who are also interested in this project. Surprisingly, there have been many interests from many students in different faculties (STEM). Through meetings, we decided to start two projects - Mobile App development and web application development with brain-mapping functionality. There has been lots of active involvement from our teammates and they enjoyed working on the projects. Although Covid-19 crisis has hugely affected our lives, we showed ourselves that we can turn crisis into opportunity.

Yoonjung Lee

The lives of people in their 20s are a series of challenges that can be nourished in life, and as times have changed, opportunities to choose their own lives are increasing. I would like to talk about ‘Drama club’ and ‘Travel’, which were the biggest experience and challenges and changed my life a lot.
I was an engineering student majoring in mechanical engineering, but I wanted to join the club unrelated to studying. I saw the welcoming play for freshmen and was fascinated by the happy laughter of the members at the curtain call and decided to apply to the drama club. I started working as a prop and costume manager, and more than 20 members gathered every day for two months to practice for two hours. On the day of the performance, my passion for the drama club was increased when I saw props and costumes that I prepared were used on the stage and the audience enjoyed the play. Afterward, I challenged the role of an actor which was a completely new experience in my life. I was afraid to start the drama with extreme tension before going on stage, but when I saw the audience laughing and crying in front of my eyes, I felt confident that I had practiced every day for two months, the tension disappeared and only passion and joy remained. After experiencing staff and actors, I wanted to be a director and completed the performance for freshmen successfully. I gained the challenging spirit and confidence to achieve something with lots of people who can run toward one dream with the same passion. Also, joining the drama club was an opportunity to think about the position of a leader and how to become a good leader. I have learned about the power of organization, and it is not difficult for me to work with many people.
Another experience that makes me a person who can challenge myself and helps me get to know myself too well is traveling. At the age of 23, I had a dream of traveling to South America, and I chose to take one year off school. It was a dream that I wanted to achieve with my own money, and I saved nearly $8,000 with three part-time jobs for six months. It was the first solo trip to Brazil

and Mexico, nine countries in total, with a 23-kilogram backpack. To save as much money as possible, I slept in an inexpensive hostel, took a night bus, and walked a long distance if possible. It was tired sometimes, but I experienced various worlds and met many people. Through a solo trip, I finally knew that I'm a cautious, scared but curious person who likes to experience new things. Also, I was the person who sleeps well on a bus for a long time but was choosy about the washroom, was friendly enough to hang out with new people in every city, learns a new language for two weeks to talk with the locals, and sometimes cancels all plans with the precious connection. After this trip, I gained confidence that I could achieve everything that I want if I tried and challenged, and I wanted to experience more cultures around the world. I decided to go to Turkey as an exchange student and traveled to neighboring countries. Especially, I spent a month in Egypt to get scuba diving and free diving licenses and made money by making homemade wine. Because of these trips, I felt that the world was full of things to learn and experience. Also, through the meeting and talking to people of various occupations and lifestyles, I wanted to deeply root the way I live because there is no fixed answer in life. I think drama club and travel have slowly accumulated the way of life I live now. Those experiences are something anyone could think of, but I'm so proud of myself for having the courage to do them.

James SeongJun Han

“Follow your passion,” a frequently given advice by many, can be a very challenging concept to implement in reality. At one point in our early career, many of us battle between our innate callings, versus our desire for respect, prestige or stability. In many cases, we make conscious or subconscious efforts to override our internal compass with a sense of reality. Growing up as an academically ambitious individual seeking “success” and fearful of failure, I was no exception and sought for a successful/comfortable career with a defined path. In this talk, I hope to share my 10-year journey of self-discovery, pursuit of my own internal compass and the lessons learned by making unconventional and challenging decisions. The objective of the talk is to share specific insights for those who are currently in the process of making important decisions in early career.

YGP – Research Competition

YGP Participants

Date: 13:00 – 15:00, 2 Sep (Thursday) Canada, ADT

Place: In-person in Ballroom B2, Room 501-502, and Room 506-507 at the Halifax Convention Center, NS, Canada

Sponsor: AKCSE

Organizer: AKCSE & AKCSE YGPN (Association of Korean Canadian Scientists and Engineers, Young Generation & Professional National)

Contact: AKCSE YGPN, akcse.ygp@gmail.com

Description: The Research Competition aims to provide YGP members an opportunity to share their research initiatives and experiences through 10-minute oral presentations. The presentations will be given to a general audience who are not expected to have background knowledge on the presenter's topic. Evaluation will be done by judging panels of professors using predetermined evaluation rubrics.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
13:00 - 13:05	Comp 1 - Ballroom B2 Comp 2 - Room 501-502 Comp 3 - Room 506-507 Halifax Convention Center	Greetings & Introductions	Johnny Lee Yoona Park	AKCSE YGPN
13:05 – 13:20		Presentation: MITACS	Ms. Julianna Kim	MITACS
13:20 – 13:35		Presentation: Graduate Student Experience	Dr. Nana Lee	Univ. Toronto
13:35 – 13:40		Split into different rooms for Research Competition		AKCSE YGPN
13:40 – 14:10		First Half of Presentations (3 Presentations)	Facilitators: Johnny Lee Nia Kang Yoona Park	AKCSE YGPN
14:10 – 14:15		Short Intermission		
14:15 – 14:55		Second Half of Presentations (3 or 4 Presentations)	Facilitators: Johnny Lee Nia Kang Yoona Park	AKCSE YGPN
14:55 – 15:00		Closing/Wrap-Up		

List of Participants:

All YGP Participants (Excluding Industry Professionals who are partaking in Industry Professionals Networking Workshop)

Judges:

MITACS	Ms. Hyelim Juliana Kim	In-person
KESC	Mr. Colin (Weantae) Ham	In-person
Univ. of Alberta	Dr. Tae J. Kwon	In-person
Univ. of Manitoba	Dr. Miyoung Suh	In-person
Univ. of Toronto	Dr. Nana (Hyung-Ran) Lee	In-person
KONA	Ms. Youngran Woo	In-person
Mitacs	Ms. Hyelim Kim	In-person

YGP Research Competition Abstract List

No.	Name	Affiliation	Title
1	Chan Woo Jeong	University of Calgary	Increased Sanitization Potency of Hydrogen Peroxide with Synergistic O3 and Intense Pulsed Light for Non-Woven Polypropylene
2	Jaemyung Shin	University of Calgary	Effective Antimicrobial Coatings Technology in response to COVID-19
3	Doowon Kim	University of Calgary	A low-cost, effective Differential Multi-Ventilation System for use against COVID- 19
4	Yoon Jung Lee	University of Calgary	High-throughput portable device to detect infectious diseases
5	Jaehyun Yang	University of Calgary	Leak Detection with Volume Estimation in Liquid Pipeline through Analysis of Flow Induced Vibration
6	Kihwan Keum	York University	Development of Hardware for Attitude Determination and Control System of the Iris CubeSat
7	Dongho Kang	University of Manitoba	Semantic Transformer Representation Network for Crack Segmentation
8	Minyoung Yoo	Simon Fraser University	Understanding Everyday Experiences of Reminiscence for People with Blindness: Practices, Tensions and Probing New Design Possibilities
9	Catherine Ko	University of Calgary	Fabrication of Lignin-Based Carbon Fibers
9	Yejong Yoo	McGill University	Content development of the child community health inclusion index: An evaluation tool for measuring inclusion of children with disabilities in the community
10	Yoonsik Park	University of Manitoba	Cyclolinopeptides Compounds as Chemotherapy Agents
11	Juri Kim	University of British Columbia	Adverse Psychological Impact During the COVID-19 in Canada
12	Kate Kyuri Kim	McMaster University	Potential Effects of Masks on Infants' Face Recognition Capacity
13	Haesung Ahn	University of Windsor	Development of demand-side management for public transportation in the era of the pandemic
14	Kayoung Heo	University of British Columbia	The Use of Innovative Technology in Surgical Training in Low-Resource Settings
15	Freddie Seo	McMaster University	Increased daily walking, but not twice daily milk consumption, enhances integrated rates of muscle protein synthesis in healthy elderly women
16	Minjun Kim	McGill University	BRAFV600E Transduction of SV40-immortalized Normal Human Thyroid Cell Line Induces Dedifferentiated Thyroid Carcinogenesis in a Mouse Xenograft Model
17	Goeun Lee	University of Toronto	HPV molecular testing as the primary screening tool for cervical cancer: comparison with Pap smear

No.	Name	Affiliation	Title
18	Dianne Lee	Queen's University	Self-assembled Monolyaer of N-heterocyclic Carbenes Applied to Pathogen Biosensing
19	Chulhun Park	University of Alberta	Design and evaluation of the cannabinoids-loaded microemulsifying system for an improvement in transdermal delivery and stability
20	Hyunjin Park	University of Alberta	Temperature sensitivity of microbial respiration of soils amended with leaf litters of oak and pine grown under elevated CO2

YGP Committee - YGP Research Competition Abstract

Increased Sanitization Potency of Hydrogen Peroxide with Synergistic O3 and Intense Pulsed Light for Non-Woven Polypropylene

Robin Jeong[1], Hitendra Kumar[1,2], Steven Jones[3], Allen Sandwell[1], Keekyoung Kim[1], Simon S. Park[1]*

1Department of Mechanical and Manufacturing Engineering, University of Calgary, Calgary, Alberta T2N 1N4, Canada, 2School of Engineering, The University of British Columbia, Kelowna, BC V1V 1V7, Canada, 3Zymetrix Biomaterials & Tissue Engineering Technology Development Centre, Calgary, Alberta T2N 1N4, Canada

High consumption of respiratory masks has recently become a concern due to the onset of the SARS-CoV-2 pandemic. Sanitization and reuse of masks can ease production stress and minimize potentially contaminated wastes. In the present work, improved sanitization potency of vaporous hydrogen peroxide (VHP) treatment of resilient bacterial spores while retaining polymeric filter performance was explored. A batch process of fumigating a chamber with hydrogen peroxide (H2O2) vapor and Ozone (O3) is featured, followed by a series of intense pulsed light (IPL) flash treatments. A resilient bacterial indicator, Geobacillus stearothermophilus (G. stearothermophilus), was utilized to observe the efficacy of sanitization agent combinations and H2O2 concentrations. The synergistic sanitization effect of H2O2, O3, and IPL has been characterized. It was found that exposure to 30 minutes of 4.01 L/min 0.03% H2O2 aqueous vapor and 3g/hr O3 followed by 10 IPL flashes per side could completely inactivate G. stearothermophilus. Due to the synergistic effects, H2O2 was able to sanitize at a diluted concentration of 0.03% H2O2. The physical properties, such as surface potential, tensile strength, hydrophobicity, and filtration efficiency of >300 nm saline water aerosol of fibrous polypropylene (PP) sheets, were maintained. In addition, no residue of sanitizers was detected, thus confirming the biosafety and integration of this method to disposable masks. Performance was benchmarked and compared with commercially available processes. The synergistic regime was found to achieve sterilization of G. stearothermophilus at drastically reduced H2O2 concentrations at reduced time and in ambient conditions relative to commercial methods. *Corresponding author; E-mail simon.park@ucalgary.ca

YGP Committee - YGP Research Competition Abstract

Effective Antimicrobial Coatings Technology in response to COVID-19

Jaemyung Shin[1], Keekyoung Kim[2]*, Simon Park[2]

1Department of Mechanical and Manufacturing Engineering, University of Calgary, Calgary, Alberta T2N 1N4, Canada, 2School of Engineering, The University of British Columbia, Kelowna, BC V1V 1V7, Canada, 3Zymetrix Biomaterials & Tissue Engineering Technology Development Centre, Calgary, Alberta T2N 1N4, Canada

High consumption of respiratory masks has recently become a concern due to the onset of the SARS-CoV-2 pandemic. Sanitization and reuse of masks can ease production stress and minimize potentially contaminated wastes. In the present work, improved sanitization potency of vaporous hydrogen peroxide (VHP) treatment of resilient bacterial spores while retaining polymeric filter performance was explored. A batch process of fumigating a chamber with hydrogen peroxide (H2O2) vapor and Ozone (O3) is featured, followed by a series of intense pulsed light (IPL) flash treatments. A resilient bacterial indicator, Geobacillus stearothermophilus (G. stearothermophilus), was utilized to observe the efficacy of sanitization agent combinations and H2O2 concentrations. The synergistic sanitization effect of H2O2, O3, and IPL has been characterized. It was found that exposure to 30 minutes of 4.01 L/min 0.03% H2O2 aqueous vapor and 3g/hr O3 followed by 10 IPL flashes per side could completely inactivate G. stearothermophilus. Due to the synergistic effects, H2O2 was able to sanitize at a diluted concentration of 0.03% H2O2. The physical properties, such as surface potential, tensile strength, hydrophobicity, and filtration efficiency of >300 nm saline water aerosol of fibrous polypropylene (PP) sheets, were maintained. In addition, no residue of sanitizers was detected, thus confirming the biosafety and integration of this method to disposable masks. Performance was benchmarked and compared with commercially available processes. The synergistic regime was found to achieve sterilization of G. stearothermophilus at drastically reduced H2O2 concentrations at reduced time and in ambient conditions relative to commercial methods. *Corresponding author; E-mail simon.park@ucalgary.ca

YGP Committee - YGP Research Competition Abstract

A low-cost, effective Differential Multi-Ventilation System for use against COVID-19

Jihyun Lee[1], Doowon Kim[1], Mitchell Weber[1]

1Department of Mechanical and Manufacturing Engineering, University of Calgary, Calgary, Canada

A respiratory virus like COVID-19 involves several injured people requiring intubation with a ventilator, causing a rapid demand. Presently, the number of patients who need mechanical ventilation to survive far outweighs the current supply of these medical devices. Fortunately, one way to mitigate this situation would be to get more use out of a single ventilator via ventilator splitting. Ventilator splitting has been done before in more rudimentary forms. The simplest way conceived is to use a tube splitter and have multiple patients connected. However, such a simple system has severe limitations in monitoring and adjusting an individual's airway pressure and flow independently. Moreover, safety concerns arise due to the lack of one-way valves and the incorrect assumption that all lungs require equal ventilation. On the other hand, a novel ventilatory system called the Differential Multi-Ventilation (DMV) consists of novel inline PEEP valves and a bypass circuit between the inlet and outlet. The inline PEEP valves allow for each patient to have their circuit individually adjusted with regards to PIP and PEEP, based on their lung compliance and resistance. The bypass circuit providing a direct connection from the inlet to the outlet enables equal pressure levels applied on the inlet and the outlet, adhering to ventilator requirements. These characteristics of the DMV system indicate that the development of a successful DMV system could provide a permanent solution to the serious dilemma of extreme imbalance in the supply and demand of ventilators during times of health crisis. *Corresponding author; E-mail jihyun.lee@ucalgary.ca

YGP Committee - YGP Research Competition Abstract

High-throughput portable device to detect infectious diseases

Yoonjung Lee[1], Keekyoung Kim[1,2]

1Department of Mechanical and Manufacturing Engineering, University of Calgary, AB, Canada, 2Biomedical Engineering Graduate Program, University of Calgary, AB, Canada

The onset of COVID-19 has brought forward the limitations in detection and understanding of infectious diseases. To overcome the shortcomings of conventional reverse transcription polymerase chain reaction (RT-PCR) based and reverse transcription loop mediated isothermal amplification (RT-LAMP) based methods to detect COVID-19 with nasopharyngeal samples, we developed a low-cost, portable, and high-throughput device, Biobox, to perform the saliva-based detection (Saliva-Dry LAMP). Biobox combines the three essential steps in the sequence Saliva-Dry LAMP assay: heating block for the isothermal incubation, excitation LEDs for visual fluorescent examination, and centrifuge for RNA extraction. Biobox is a portable lab-in-a-box solution powered by a common DC supply and the components are controlled by a low-cost microprocessor. For performing the COVID-19 detection assay, the saliva samples were mixed with lysis buffer and MS2 bacteriophage and incubated at 61°C for 5 minutes. RNA extraction was performed by four short centrifuge steps with lysate and elution buffers. Lyophilized pellets of Saliva-Dry LAMP assay were added to the enriched RNA sample and incubated for 45 min at 61°C. Under the excitation with blue LEDs (470 nm), the results were visually interpreted assigning orange color for negative and green color for positive readouts. Biobox achieved a limit of detection comparable to commercially available assays (4/4 positive reaction with 1 copy/μL, 3/4 with 0.5 copies/μL, and 2/4 with 0.25 copies/μL of sample concentrations). Overall, Biobox can provide rapid and accurate detection various infectious diseases in resource limited regions and can play a crucial role in limiting the spread of diseases.

YGP Committee - YGP Research Competition Abstract

Leak Detection with Volume Estimation in Liquid Pipeline through Analysis of Flow Induced Vibration

Jaehyun Yang[1], Simon Park[1]*

1Department of Mechanical Engineering, University of Calgary, AB, Canada

Pipeline monitoring provides operators with invaluable information regarding the potential risks that may pose threats to the integrity of the entire line. Pipeline leakage results in serious environmental and financial costs while it can be avoided through leak detection systems. This study introduces a comprehensive leak monitoring system that allows leak detection, localization, and volume estimation, simultaneously. To minimize the leak interpretation errors, an artificial intelligence (AI)-based leak detection algorithm is developed. Pressure sensors are utilized to capture real-time variations of fluid pressure and to localize pipeline leakage through the application of pressure gradient intersection method. Vibrations of the pipeline is also acquired in real-time through accelerometers and the acceleration signals are then used to estimate the leak forces through inverse dynamics of the pipeline between the leak location and the accelerometers. The leak forces are then used to estimate the fluid release and to provide the operators with proper warnings regarding the integrity issues. The dynamics of the model is obtained through a finite element (FE) vibration model based on Timoshenko beam theory and the inverse dynamics of the model is applied to the measured acceleration signals using a Kalman filter. A lab-scale experimental setup is then manufactured to verify the dynamic flow induced vibration (FIV) model and to test the proposed methodology. *Corresponding author; E-mail sipark@ucalgary.ca

YGP Committee - YGP Research Competition Abstract

Development of Hardware for Attitude Determination and Control System of the Iris CubeSat

Ki Hwan Keum[1]*, Ryan Clark[1], Nick Zonta[1], Fuat Diriker[1], Naeimeh Najafizadeh[2], Regina S. K. Lee[1], Phillip Ferguson[2]

1Department of Earth and Space Science, York University, Toronto, Canada, 2Price Faculty of Engineering, University of Manitoba, Manitoba, Canada

CubeSats have reduced time and development costs over conventional satellites and through its standardized size and commercial-off-the-shelf components. The Canadian CubeSat Project looks to take advantage of this to fund space development in various universities throughout Canada, and the Iris CubeSat from University of Manitoba is part of the project. The goal of the Iris CubeSat is to investigate the effects of space weathering on various material by monitoring changes in their spectral properties throughout the lifetime of the mission. At York University, we are supporting the design and characterisation of the attitude determination and control system to orient the satellite such that the material in the CubeSat is properly exposed to the sun and allowing the solar panels to get full exposure. In particular, we are providing (1) a custom-designed digital sun sensor and support electronics, as well as a (2) custom-design magnetorquer for magnetic actuation. All individual components involved in the sun sensor and control system are commercial-off-the-shelf components, carefully selected to meet the mission requirements. The digital sun sensor is a novel low-cost design making use of sub-pixel interpolation to improve its accuracy over conventional digital sun sensors, with a mean error of 0.002 degrees. The control electronics have redundant components to reduce the mitigate the risk of failure. The magnetorquer has been designed per the mission requirements and is manufactured in-house. Each component will be calibrated and tested before installation into the CubeSat in late 2021. In this presentation, we outline the design overview of the sun sensor and magnetorquers, as well as their calibration process. *Corresponding author; E-mail pkeum@yorku.ca

YGP Committee - YGP Research Competition Abstract

Semantic Transformer Representation Network for Crack Segmentation

Dongho Kang[1], Young-jin Cha[1]*

1University of Manitoba the Department of Civil Engineering, Winnipeg, MB, R3T 6B3, Canada

This research was motivated by the need to automate concrete crack detection for the eventual safety evaluation of structures. Existing approaches are limited by their small datasets and small input size of images, their application to simple monotonous background scenes, the use of wrong evaluation matrices, and their heavy networks, which are not possible for real-time processing. This paper proposes a new and efficient deep learning model to automate the segmentation of concrete cracks at the pixel level in a real-time manner in complex scenes, which are the actual realistic conditions of the problem. To achieve this, we designed an semantic transformer representation network (STRNet). STRNet are composed of STR module with an attention operator and attention decoder to improve the accuracy and processing speed of crack segmentation. Also, we suggest the use of the data augmentation technique to increase the train dataset from the original dataset using the artificial image creation technique and propose the technique for evaluating the complexity of dataset. To examine the performance of the network, we train and test the five other recently developed algorithms (Attention U-net, CrackSegNet, Deeplab V3+, FPHBN, and Unet++) with the same dataset (1203 train images, 543 test image). Among the six algorithms, our STRNet achieves the best performance as 92.6 % in terms of the mean intersection of union (mIoU), as well as the fastest speed (49 frame per seconds). E-mail: young.cha@umanitoba.ca

YGP Committee - YGP Research Competition Abstract

Understanding Everyday Experiences of Reminiscence for People with Blindness: Practices, Tensions and Probing New Design Possibilities

MinYoung Yoo[1]*, William Odom1, Arne Berger[2]

1 School of Interactive Arts and Technology, Simon Fraser University, Surrey, Canada
2 Computer Science and Languages, Anhalt University of Applied Sciences, Koethen, Germany

There is growing attention in the Human-Computer Interaction (HCI) community on how technology could be designed to support experiences of reminiscence on past life experiences. Yet, this research has largely overlooked people with blindness. We have engaged closely with a group of diverse – including but not limited to gender, age, socio-economic status and race – people living with blindness. In total, nine blind participants are interviewed through a field study that explores their personal routines, wishes and desires, and challenges and tensions regarding the experience of individual and social reminisce. Findings are interpreted to discuss new possibilities that offer starting points for future design initiatives and openings for collaboration. As a result, three possible opportunity areas are surfaced to better support the practices of capturing, sharing, and reflecting on significant memories of the past: audio, photograph and mixed media, and tactile/fabrication.

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YGP Committee - YGP Research Competition Abstract

Content development of the child community health inclusion index: An evaluation tool for measuring inclusion of children with disabilities in the community.

Paul Yejong Yoo[a,b,e], Annette Majnemer[a,b,e], Laury-Anne Bolduca, Karen Chena, Erin Lamba, Tanisha Panjwania, Robert Wilton[c,d], Sara Ahmed[a,b], Keiko Shikako-Thomas[a,b,e]

a School of Physical and Occupational Therapy, McGill University, Montreal, QC, Canada H3G 1Y5
b Faculty of Medicine and Health Sciences, McGill University, Montreal, QC, Canada H3G 2M1
c School of Geography & Earth Sciences, McMaster University, Hamilton, ON, Canada L8S 4L8
d Faculty of Social Sciences, McMaster University, Hamilton, ON, Canada L8S 4L8
e McGill University Health Centre Research Institute, Montreal, QC, Canada, H4A 3J1

The environment where children with disabilities live plays an important role in influencing their participation, which is vital for children's health and sense of competency, identity, and self-sufficiency. Addressing barriers in the environment can facilitate the participation and inclusion of children with disabilities. The Community Health Inclusion Index (CHII) is a measurement tool developed in the USA to identify environmental barriers and facilitators to community health and inclusion. The CHII adopts an adult viewpoint, therefore aspects that are most crucial for children may have been omitted. This study aimed to compile a comprehensive list of items that are most relevant for the community inclusion of children with disabilities in the Canadian context; and build consensus on this list with a panel of experts representing diverse areas related to the inclusion of children with disabilities. Total of 12 instruments, best practice guidelines and international and national best practice recommendations were gathered. Content generation resulted in 189 items, and expert consensus contributed to a relevant and comprehensive list of items. Suggestions made by the experts were taken into consideration to further refine and reduce the item list. This study highlights the importance of a child version of a community inclusion tool, as the needs of children with disabilities differ from those of adults. It will assist in the development of interventions, health strategies, and policies to improve community inclusion of children with disabilities in Canada; and can be used as a foundation for building a similar tool for the Korean context.

*Corresponding Author: Paul Yejong Yoo, paul.yoo@mail.mcgill.ca

YGP Committee - YGP Research Competition Abstract

Clinical Literature Entity-Relation Extraction using Pre-trained Language Models

Yoonsik Park[1], Serena Jeblee[2], Dr. Noah Crampton[3]

1University of Manitoba., 2University of Toronto, 3 University of Toronto, Canada

Literature review and meta-analysis of clinical articles is an important task that helps improve the understanding and awareness of knowledge in the healthcare field. The well-defined and structured format of a systematic review and meta-analysis suggests that tasks such as the extraction of risk estimates and study variables can be automated. In this study, we tested the performance of pre-trained Language Models (LM) when extracting risk ratios, odds ratios, and hazard ratios along with their respective outcome, explanatory, and baseline variables from PubMed abstracts. We fine-tuned three pre-trained RoBERTa (a transformer-based model) variations using two methods: the first method trains two separate single-task models on Named Entity Recognition (NER) and Relation Extraction (RE) respectively, while the second method trains a dual-task model simultaneously on both tasks. The RoBERTa-Large dual-task model performed the best on all tasks, achieving 0.81 F1 score on NER, 0.94 MCC on RE, and 0.44 Jaccard Similarity on pipelined Entity-Relation Extraction. With this experiment, we have successfully demonstrated the ability to automate tasks in clinical literature review and meta-analysis, opening up avenues for further improvement and extension.

YGP Committee - YGP Research Competition Abstract

Adverse Psychological Impact During the COVID-19 in Canada

Juri Kim[1]*

1School of Community and Regional Planning, University of British Columbia, BC, Canada

The present COVID-19 pandemic induces a considerable degree of adverse psychological impact for Canadians. This study attempts to evaluate the relative importance of determinants of psychological impact during the COVID-19. The study estimates the impacts of health-related behaviours, information source and accuracy, and socio-demographic characteristics on having adverse psychological impact. Logistics regression models find that the odds of having adverse psychological impact are significantly lower for those who exercise outdoors than those who don't, which aligns with the previous findings. Interestingly, it was how often people are exposed to misleading, false, or inaccurate information about COVID-19 that was significantly associated with higher odds of having adverse psychological impact even when controlled for health-related behaviours, source of information, and socio-demographic characteristics. Another important finding with regard to socioeconomic characteristics was that the odds of having adverse psychological impact were different across the age groups with the younger generation showing higher odds of having adverse psychological impact than the older generation.

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YGP Committee - YGP Research Competition Abstract

Potential Effects of Masks on Infants' Face Recognition Capacity

Kate Kyuri Kim[1], Wei Fang[1], Xiaomei Xhou[1], Naiqi G. Xiao[1]

1. Psychology, Neuroscience, & Behaviour, McMaster University, 1280 Main St. W, Hamilton Ontario, Canada

The safety regulation against coronavirus disease (COVID-19) has been substantially restricting interpersonal interactions in various ways. Although these restrictions (e.g., wearing masks and keeping social distance) effectively slowed the spread of COVID-19, the breadth of the impact is largely unexamined. Thus, this study focused on how the use of masks may affect infants' cognitive capacities.

Interpersonal experiences play a crucial role in shaping their early cognitive development. For example, the characteristics of commonly seen faces (e.g., gender and race) give rise to a specialized face recognition capacity during infancy. Masks cover the majority part of faces, making important facial information inaccessible to others. Because the early development of face recognition relies on the access of facial information, wearing masks might delay, alter, or even impair this crucial capacity in infancy. To access this potential impact, this study aimed to discover the possible effects of masks on infants' ability to recognize faces.

The study was completed virtually through the online platform. The familiarization and visual pair comparison paradigm were used to probe infants' face recognition performance. The session was recorded and used to analyze their looking behaviour in MATLAB. The results of the study suggested that masks may not only simply block facial information but further disturb infants face recognition capacity. Overall, the findings of this study will contribute to uncovering the potential impacts of the COVID-19 pandemic on early cognitive development, setting the stage for future investigations on COVID-19's lasting effects.

YGP Committee - YGP Research Competition Abstract

Development of demand-side management for public transportation in the era of the pandemic

Haesung Ahn[1]*, Yong Hoon Kim[1]

1Civil and Environmental Engineering, University of Windsor, Ontario, Canada

For individuals who rely on public transit, health and safety are their key concerns during the current public health crisis. To ensure physical distancing on the transit, there are some ways to manage the supply-side aimed at reducing the in-vehicle density. However, it may be difficult to provide enough transit services, due to the capacity limitation and cost increase. In response to growing public anxiety, this study proposes demand-side management for public transit in the era of the pandemic. An optimization model is formulated to find an optimal solution that balances the disutility of crowdedness by the in-vehicle density level and users' departure time change. It consists of a simulation-based transit-assignment and heuristic Genetic algorithm to solve the problem. Seoul subway ridership data and network are used to demonstrate the performance of the proposed strategies. The results will show that demand-side management strategies can lead to a significant density reduction while minimizing the departure time changes. This research could offer Canadian transit operators and policymakers the opportunity to prepare for the operation in the next pandemic era. *Corresponding author; E-mail ahn112@uwindsor.ca

YGP Committee - YGP Research Competition Abstract

The Use of Innovative Technology in Surgical Training in Low-Resource Settings

Kayoung Heo[1]*, Samuel Cheng[1], Alreem Al Hinai[2], Shahrzad Joharifard[2]

1Department of Medicine, University of British Columbia, Vancouver, British Columbia, Canada, 2 Department of Surgery, University of British Columbia, Vancouver, Canada

Significant disparities exist in global surgical care, due to the lack of medical equipment, geographic constraints, infrastructural challenges, affordability, and a shortage of skilled surgeons. Despite the rapid growth of interest in global surgical care, this has not translated into an equal exchange of surgical information between high-income countries (HICs) and low-income countries (LMICs). In recent years, a greater emphasis has been placed on training local medical personnel in order to increase surgical capacity locally without relying on external resources. To maximize training opportunities in low-resource settings, online curricular models, simulations, and immersive technologies have been developed and implemented. This study aims to assess and summarize innovative technologies used for surgical training in low-resource settings. We conducted a scoping study including any literature published on surgical education technologies from 2000 to 2021. Searches were performed on Medline and Embase as well as on Google, iOS and Android app stores. The platforms were identified and categorized according to the following types: web-based platforms, app-based platforms, virtual and augmented reality, and simulation. The platforms were analyzed based on the content, effectiveness, cost, accessibility, and barriers. Virtual learning platforms are useful in surgical training as they are easily accessible, not limited by geography, continuously updated, and evaluated for effectiveness. It is essential that more open-access, free surgical training programs be developed to provide access to educational resources for surgical trainees all around the world, particularly in low-resource settings, in order to ensure sustainable development in global surgical care.

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YGP Committee - YGP Research Competition Abstract

Increased daily walking, but not twice daily milk consumption, enhances integrated rates of muscle protein synthesis in healthy elderly women

Tanner Stokes[1], Michelle Mei[1], Freddie Seo[1], James McKendry[1], Chris McGlory[2], Stuart M. Phillips[1]

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With aging, skeletal muscle mass declines partly due to a reduced sensitivity to dietary protein. While dairy has been suggested to be among the highest quality whole food sources of protein based on its amino acid composition, researchers have largely used fat-free or processed dairy in this regard. We conducted a randomized controlled trial to compare the differential effects of whole-fat and fat-free milk on muscle protein synthesis (MPS) in women aged 60-75. Twenty-four women consumed a standardized diet providing 0.8g/kg body mass of protein per day. Diets were supplemented with two, 250 mL servings of either whole milk, skim milk, or almond beverage daily. MPS was measured during three distinct phases lasting three days each: habitual physical activity without intervention beverage, habitual activity with intervention beverage, and increased activity with intervention beverage. To increase physical activity, participants increased their daily step count by ~150%. MPS was quantified as fractional synthetic rate (%/day) using the deuterated water tracer method and was analyzed using a linear mixed model. Twenty-two participants completed the study. There was no significant interaction effect nor a main effect of beverage on MPS. However, pooled sample analysis of all three beverages revealed a main effect of study phase such that MPS increased progressively with each subsequent phase. Findings reveal that increasing daily walking is sufficient to stimulate MPS in older women. Furthermore, we suggest that in comparison to almond beverage, the addition of 2 daily servings of milk does not further augment MPS, irrespective of fat coingestion.

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YGP Committee - YGP Research Competition Abstract

BRAF^{V600E} Transduction of SV40-immortalized Normal Human Thyroid Cell Line Induces Dedifferentiated Thyroid Carcinogenesis in a Mouse Xenograft Model

Minjun Kim[1]*, Su-jin Kim[1, 2, 5]*, Zhen Xu[1, 6], Seong Yun Ha[1], Jae Hwan Byeon[7], Eun Ji Kang[1], Seung-Hyun Shin, Seong-Keun Yoo[8], Hyeon-Gun Jee[9], Sang Gab Yoon[11], Jin Wook Yi[12], Jeong Mo Bae[3]#, Hyeong Won Yu[10], Young Jun Chai[13], Sun Wook Cho[4], June Young Choi[10], Kyu Eun Lee[1, 2, 5]#, and Wonshik Han[1, 2]

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**These authors contributed equally*

Despite active studies of the clinical importance of BRAFV600E, a suitable research model to investigate the role of this mutation in the etiopathogenesis of human thyroid cancers has not been established. Thus, we xenografted Nthy/BRAFWT (Nthy/WT) and Nthy/BRAFV600E (Nthy/V600E), which are Nthy-ori 3-1 (Nthy) cell lines transduced with lentiviral vectors expressing either BRAFWT or BRAFV600E, into mice to evaluate the carcinogenic role of BRAFV600E and establish a new in vivo research model for human thyroid cancer with BRAFV600E. Each cell line was subcutaneously injected into NOD.Cg-Prkdcscid Il2rgtm1Wjl/SzJ mice, and a pathological analysis was performed. The effects of the mutation were further verified using a BRAFV600E-selective inhibitor (PLX-4032, vemurafenib). The transcriptome was analyzed by RNA-sequencing and compared to data from The Cancer Cell Line Encyclopedia and Gene Expression Omnibus. While Nthy/WT was not tumorigenic in vivo, Nthy/V600E formed tumors reaching 2784.3 mm3 in 4 weeks, on average. A pathological analysis indicated that Nthy/V600E tumors were dedifferentiated thyroid cancer. We found metastases in the lung, liver, and relevant lymph nodes. A transcriptomic analysis revealed 5512 differentially expressed genes (DEG) between the mutant and wild-type cell lines, and more DEGs were shared with anaplastic thyroid cancer than with papillary thyroid cancer. BRAFV600E activated the cell cycle mainly by regulating G1/S phases. PLX-4032 treatment significantly inhibited tumor growth and metastasis. Our data show that BRAFV600E plays a pivotal role in carcinogenesis of normal human thyroid cell line. This xenograft model is expected to contribute to studies of the etiopathogenesis and treatment of highly malignant thyroid cancers.

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YGP Committee - YGP Research Competition Abstract

HPV molecular testing as the primary screening tool for cervical cancer: comparison with Pap smear

Go Eun Lee[1], Daniel Kim[2], Seung Hee Han[3]*

1Department of Molecular Genetics and Microbiology, Univ. of Toronto, ON, Canada, 2Department of Kinesiology, Univ. of Toronto, ON, Canada, 3Division of Biophotonics, Princess Margaret Hospital, University Health Network, Toronto, ON, Canada.

Infection with high-risk human papillomavirus (HPV) is the causative agent of cervical cancer, which is the leading cause of cancer-related death in women worldwide. Since precancerous changes in the cervix occur many years before cancer develops and the survival rate goes up to nearly 100% with early detection, routine screening plays an essential role in reducing the burden of cervical cancer. Recently, HPV molecular testing has been recognized for its higher sensitivity compared to regular cytology-based Pap smear and started to replace it in the screening process. Although some countries have implemented primary HPV testing, only HPV 16 and HPV 18, the two most carcinogenic high-risk HPV types are genotyped and other high-risk subtypes are excluded. Moreover, Ontario Ministry of Health guidelines do not recommend primary HPV testing yet. To evaluate the efficacy of HPV testing over Pap smear and the adequacy of the genotypic range of current HPV testing methods, we conducted HPV testing and Pap smear co-testing to 300 women in Toronto. Our study showed that HPV testing had higher sensitivity and lower specificity compared to Pap smear. Also, HPV 16 and 18 account for only 7% of all positive cases which suggests the possibility of missing a significant number of non-16/18-positive cases according to the current guidelines. Based on our findings, there is a need to consider incorporating primary HPV testing and broadening the HPV genotyping range in cervical cancer screening guidelines in Ontario.

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YGP Committee - YGP Research Competition Abstract

Self-assembled Monolyaer of N-heterocyclic Carbenes Applied to Pathogen Biosensing

Ishwar Singh[a], Dianne S. Lee[a], Shuaishuai Huang[a], Hridaynath Bhattacharjee[a], Wei Xu[a], Jennifer F. McLeod[a, b], Cathleen M. Crudden[a,c], and Zhe She[a,b]*

aDepartment of Chemistry, Queen's University, Chernoff Hall, Kingston, Ontario, Canada, K7L 3N6. bBeaty Water Research Centre, Queen's University, Mitchell Hall, Kingston, ON, K7L 3N6
cInstitute of Transformative Bio-Molecules (WPI-ITbM), Nagoya University, Furo, Chikusa, Nagoya 464-8602, Japan.

Self-assembled monolayers (SAMs) have served as an inexpensive surface technology for uses in surface protection, nanoscience, and biosensing. The use of N-heterocyclic carbenes (NHCs) in place of commonly used thiols were shown to generate SAMs with excellent stability to temperature and pH extremes, and external oxidants. The stability imparted by NHCs allows for the potential use of SAMs in surface technology and commercial applications. Recently, our group has been investigating new NHC synthetic route and surface modification specifically for biosensing applications. In this presentation, I will be discussing our recent investigations of the NHC-based biosensor and its response towards pathogens.
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YGP Committee - YGP Research Competition Abstract

Design and evaluation of the cannabinoids-loaded microemulsifying system for an improvement in transdermal delivery and stability

Chulhun Park[1, 3], Beom-Jin Lee[2, 3], Raimar Löbenberg[1] *

1Faculty of Pharmacy & Pharmaceutical Sciences, University of Alberta, Edmonton, AB T6G 2E1, Canada
2College of Pharmacy, Ajou University, Suwon, 16499, South Korea
3College of Pharmacy and Institute of Pharmaceutical Science and Technology, Ajou University, Suwon 16499, Republic of Korea

The objective of this study was to develop a novel microemulsifying system of cannabinoid acids (tetrahydrocannabinolic acid (THCA) and cannabidiolic acid (CBDA)) for improved transdermal delivery and stability. The aqueous solubility of cannabinoid acids was screened by mixing with the different types of vehicles. Additionally, the emulsifying ability of each vehicle was evaluated by considering the stability of the emulsifying system and cannabinoid acids-excipient compatibility. The pseudo-ternary phase diagrams of the cannabinoids-loaded emulsifying system were constructed to identify the region of the stable microemulsifying system. The cannabinoid acid-loaded microemulsifying system was optimized by the mean droplet size, electrical conductivity, zeta-potential, pH, morphology, and loading content. Specifically, the influence of ratio oil to Smix (Surfactant/cosurfactant) on the microemulsifying system was investigated by the mean droplet size. The optimized system comprised cannabinoid acids, Capryol® 90, Smix (2:1, Procetyl® AWS, and Ethanol), and an aqueous phase with organic acid buffer. A significant improvement in transmembrane flux (Jss), permeability coefficient (Kp), and enhancement ratio (ER) was observed in cannabinoid acid-loaded optimized system compared to other crude extracts of cannabinoids. After storing the optimized cannabinoid acid-loaded emulsifying system for 6 months at 4°C and 25°C, the content of the cannabinoid acid was maintained over 95%, and there were no changes in physicochemical properties. In conclusion, these stable microemulsifying systems provide a promising approach to improve the transdermal delivery and stability of cannabinoid acids which can have the therapeutical potential for anti-cancer, anti-inflammatory, and analgesic effects.

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YGP Committee - YGP Research Competition Abstract

Temperature sensitivity of microbial respiration of soils amended with leaf litters of oak and pine grown under elevated CO_2

Hyun-Jin Park[1,2]*, Woo-Jung Choi[2], Scott X. Change[1]

1Department of Renewable Resources, University of Alberta, Edmonton, AB, Canada, 2Department of Rural & Biosystems Engineering, Chonnam National University, Gwangju, Korea

Temperature sensitivity (Q_{10}) of soil microbial respiration (Rs) is critical in predicting terrestrial C dynamics under climate change. Variations in Q_{10} of soils amended with plant litters of different species (inter-species), which have contrasting litter chemistry, are well understood. However, the effect of changed litter chemistry of a species (intra-species) grown under the different environments such as [CO_2] on Q_{10} has not been explored. In this study, Q_{10} of soils amended with leaf litters of oak (Quercus variabilis) and pine (Pinus densiflora) that were produced under ambient (A) and elevated (E) [CO_2] was investigated in incubation experiments at three temperature levels. As pine litters had a higher lignin (more recalcitrant) but lower nonstructural carbohydrates (NSC, less recalcitrant), calcium (Ca), and manganese (Mn) concentrations regardless of [CO_2] comparing between species, Q_{10} of Rs of soils amended with pine litters produced under A[CO_2] was greater than that with oak litter, in agreement with the "substrate quality-temperature" theory. However, there was no difference in Q_{10} between species when litter produced under E[CO_2] was added probably due to decreased nutrient concentration including nitrogen (N). Although E[CO_2] increased the rations of lignin to N (lignin/N) and carbon to N (C/N) of litters through decreased N concentration for both species, the legacy effects of E[CO_2] on Q_{10} of soils amended with the litters also differed with species. For oak, increased lignin/N and C/N resulted in a higher Q_{10} for soils amended with E[CO_2]-litters, which is consistent again with the "substrate quality-temperature" theory. However, for pine litters, an opposite pattern was found, suggesting that the lower NSC, Ca, and Mn concentrations of pine litters limited the response of Rs to warming. Our results indicate that Q_{10} of forest soils amended with E[CO_2]-litters may differ with tree species.

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YGP – Industry Professionals Networking Workshop

YGP Invite Only

Date: 13:00 - 14:45, 2 Sep (Thursday) Canada ADT

Place: In-person in room 501-502 at the Halifax Convention Center

Sponsor: AKCSE

Organizer: YGPN and AKCSE (Association of Korean-Canadian Scientists and Engineers)

Contact: YGPN (akcse.ygp@gmail.com)

Description: This workshop is to connect young working professionals and discuss key topics around early career development, work culture, and navigating through the pandemic around diverse industries. Members will discuss specific ideas to help shape AKCSE and YGP to be inclusive of more industry members going forward and find better balance for ratios between academia/research and industry.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
13:00-13:15	Room 501-502, Halifax Convention Center	Opening and Introductions	Jisoo Kang	TCE, YGPN
13:15-13:30		Industry Outlook: Trends and Challenges		
13:30-13:45		Company Culture		
13:45-14:00		Navigating the Pandemic: Work from Home		
14:00-14:15		Work-Life Balance and Integration		
14:15-14:30		Career Growth		
14:30-14:45		AKCSE Development		

YGP Industry Professionals Networking Workshop Biography

Jisoo Kang

Engineer-In-Training / TC Energy

Jisoo received her Honours Bachelor of Science in Chemical Engineering from the University of Calgary. She currently works as an EIT for a Compressor Station project in Montréal, QC with a previous role on the Corrosion Prevention team under Pipe Integrity at TC Energy. Prior to her current project, Jisoo worked at Schlumberger to develop solutions for oilfield production challenges and provided field technical support to the upstream energy industry.

Since 2014, Jisoo has contributed to the AKCSE Young Generation and Professional (YGP) group as President of the University of Calgary YG Chapter, President of the Southern Alberta YP Chapter, and is currently the YGP National Vice President while serving as part of the CKC YGP Organizing Committee.

E-mail: jisookang95@gmail.com

YGP Industry Professionals Networking Workshop Biography

Edward Hong

Hardware Engineer / ByteDance

Edward Hong is currently working as a hardware engineer at ByteDance designing solutions to accelerate their infrastructure. Previous to ByteDance he was working at Apple as a semiconductor design engineer for their system on chips in their mobile devices. Edward received his BASc in Engineering Science at the University of Toronto.

YGP Industry Professionals Networking Workshop Biography

Woojoo Lee

Mechanical EIT / McCuaig & Associates Engineering

Woojoo is a graduate from the University of Manitoba with a Bachelor of Science in Mechanical Engineering. During his time as an undergraduate student, he had the privilege of working for an aerospace company in the military sector. Upon graduation in 2017, he decided to explore the world of consulting and has been enjoying it since. He is currently specializing in building construction (HVAC, plumbing) and expected to receive his professional engineer designation later this year.

YGP Industry Professionals Networking Workshop Biography

Jimmy Lee

Community Pharmacist / Sobeys Inc

Jimmy Lee is currently working as a community pharmacist for Sobeys in rural Northern New Brunswick. He received his Bachelor of Science in Pharmacy from Dalhousie University in 2020. Prior to his pharmacy degree, Jimmy completed first year at Dalhousie University in Bachelor of Sciences in Medical Science before transferring to pharmacy school. He is working full time as a pharmacist serving the rural population of New Brunswick, along with several long-term care facilities, as well as providing COVID-19 vaccines to the community. When he is not working at the pharmacy, Jimmy continues to conduct research on the risk factors and their relationships in causing medication incidents.

YGP Industry Professionals Networking Workshop Biography

Julie Hong

Data Scientist / Neobi

Julie has received her BSc in Biochemistry from The University of British Columbia. Prior to joining Neobi as a data scientist, she worked at BC Cancer Research Centre for 1.5 years as a research assistant studying the role of the central nervous system and somatic mutations in endometriosis. After realizing that she did not want to continue wet-lab work for her future career, she dove into data science and statistics. She currently focuses on harvesting public and private data into a unified architecture for customer use. She hopes to continue her career path as a data scientist, and hope to later land a role as a data scientist in the healthcare field.

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YGP Industry Professionals Networking Workshop Biography

Nathan Byun

Sr. Advanced Robotics SQA/Test Engineer at Honeywell
Founder/Chair of BYN Foundation & FELIX

Nathan has 10 years of combined experience with diverse domain in automotive, logistics, robotics industry and startup. He also has a passive side job as a stock trader since 2009, with a track record of outperforming legendary professional investors.

- B.S. in Industrial and Systems Engineering at Georgia Institute of Technology (Minor in Economics)
- Quality Improvement Specialist at Hyundai Motor (HMMA)
- Founder at Fluxity (V2X Startup, Self-employed)
- Sr. Robotics Software Test Engineer at Tech Mahindra Americas (Contract)
- Sr. Advanced Robotics Test Engineer at Honeywell (SPS-IGS)
- Founder/Chair of BYN Foundation (Non-profit) & FELIX (Investment club/Activity group)

Join FELIX if you're interested in investment, startups, company culture, new tech, etc. (Meetings in Korean) FELIX sign-up: https://forms.gle/pV2ECVWVA11i7zUGA
E-mail: felix.ksea@gmail.com

YG/YP Presidents' Workshop

YGP Participants

Date: 21:00-23:20, 2 Sep (Thursday) Canada ADT

Place: In-person in Room 506-507 at the Halifax Convention Center, NS, Canada, virtual on Zoom

Sponsor: N/A

Organizer: AKCSE YGP (Young Generation and Professionals of AKCSE)

Contact: akcse.ygp@gmail.com

Description: The presidents' workshop aims to build professional and social bonds within and across YG-YP AKCSE presidents. Presidents will have an opportunity to share their leadership experiences, such as success and failure stories while running the chapter during the pandemic. The workshop will be designed to ask reflective and prospective questions in a series of small group discussions, guided by senior AKCSE members who have experience in running chapters and organizations. These questions help presidents to create their own chapter's identity within the AKCSE community. Presidents will also have a chance to develop strategies to flourish their chapters, including internal team-building activities and future collaborative events with other presidents who are geographically close. They are encouraged to execute strategies discussed and planned during the workshop in the following year, which will then be followed-up in CKC 2022.

We will also discuss requirements for the creation of YG/YP chapter by-laws and provide updates on the template and/or by-law merge option with local chapters.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
21:00-21:10	Online & Room 506-507, Halifax Convention Center	• Introductions • The significance of AKCSE and the YGP group	Kanghee Ryu	YGPN
21:10-21:40		Section 1 • Activity: Identifying core leadership values • Discussion: Personal motivations in spearheading an AKCSE YG/YP chapter	Nia Kang, Minyoung Yoo	
21:40-22:10		Section 2: • Activity: Reflections on positive and effective leadership • Discussion: Chapter identity • Discussion: Growing an AKCSE YG/YP chapter		
22:10-22:20		Leadership talk	Kanghee Ryu	

22:20-22:50	Online & Room 506-507, Halifax Convention Center	Section 3: • Activity: Entertainment and AKCSE YG/YP chapters • Discussion: Struggles and tensions	Nia Kang, Minyoung Yoo	YGPN
22:50-23:20		Section 4: • Activity: Core values and feedback • Discussion: YG/YP connection • Discussion: Looking ahead: Transitioning your chapter and beyond	Nia Kang, Minyoung Yoo	
23:20-23:30		• Moving forward: Key takeaways	Kanghee Ryu	

YGP Annual General Meeting (YGP AGM)

ALL YGP Members

Date: 10:00-12:00, 3 Sep (Friday) Canada ADT

Place: In-person in in Ballroom B2 at the Halifax Convention Center, NS, Canada
Virtual on Zoom

Sponsor: N/A

Organizer: AKCSE YGP (Young Generation and Professionals of AKCSE)

Contact: akcse.ygp@gmail.com

Description: The YGP AGM is an opportunity for all YGP members to discuss important matters pertaining to the operation of the AKCSE YGP group. Important decisions pertaining to the operation of the AKCSE YGP group are made by majority vote each year at CKC during the YGP AGM.

The agenda for the CKC 2021 YGP AGM is as follows:
1. Important updates from the YGPN Executive Team
2. YGP By-Law
3. 2021 YGP Presidential Election

(Canada) Time	Place	Topic	Facilitator	Affiliation
10:00-10:10	Online & Ballroom B2 Halifax Convention Center	Introduction	Kanghee Ryu	YGPN
10:15-10:45		YGP updates	YGPN Executives	
10:45-10:50		Break		
10:50-11:10		By-Law	Kanghee Ryu	
11:10-11:50		2021 YGP Presidential Election	Kanghee Ryu	
11:50-12:00		Final words	Kanghee Ryu	

Human Bingo!

YGP and Regular Members

Date: 16:30-17:45, 3 Sep (Friday) Canada ADT

Place: In-person in Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: N/A

Organizer: AKCSE YGP (Young Generation and Professionals of AKCSE)

Contact: Nia Kang, nia.kang@gmail.com

Description: This session is to facilitate a casual networking/mentorship session between YGP and regular AKCSE members. This is a new initiative to dedicate a session of the YGP program for YGP and regular members to meet and become form real, lasting relationships, considering that this has yet to be an official program at CKC. We invite everyone to come join us for a game of Bingo!

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
16:30-16:40	Online & Ballroom B3 Halifax Convention Center	Greetings, instructions	Nia Kang	YGPN
16:40-17:15		Rounds of 15–20-minute Bingo rounds (i.e., learn a general characteristic of a YGP or regular member)		
17:15-17:30		Casual networking		
17:30-17:45		Wrap-up, call out winners (winners will receive extra drink tickets for the Farewell Dinner)		

YGF/YPF Alumni Networking Forum

YGF/YPF Alumni Only

Date: 19:30, 1 Sep (Wednesday) - 18:00, 4 Sep (Saturday) Canada ADT
07:30, 2 Sep (Thursday) - 06:00 5 Sep (Sunday) Korean Time

Place: Online
In-person in Ballroom B2 at the Halifax Convention Center, NS, Canada

Sponsor: KOFST & AKCSE

Organizer: Dr. Hyo-Jick Choi (Univ. of Alberta) & Dr. Jong Sung Kim (Dalhousie Univ.)

Contact: Dr. Hyo-Jick Choi, Univ. of Alberta (hyojick@ualberta.ca) & Dr. Jong Sung Kim, Dalhousie Univ. (jskim@dal.ca)

Description: YGF/YPF Alumni Networking forum, taking place annually in different places across Canada, plays a critical role in reconnecting and establishing personal and professional relationships among alumni. The primary objectives of the forum lie in strengthening the ties among alumni and providing a link to establish relationships between alumni and professionals. Through this event, alumni will have an opportunity to participate in 1) brainstorming meeting to foster stronger YGF/YPF alumni, 2) “meet my mentor” program (i.e., mentees and mentors consultation session), 3) YGP research competition, 4) meeting with Ambassador of Korea, 5) YGP Industry Professionals' networking session, etc.

Program:

Case-1 (“A”): if you are a member of YGP and attending in-person,

Case-2 (“B”): if you are a member of YGP and attending online,

Case-3 (“C”): if you are not a member of YGP,

* Unless otherwise specified, all participants can attend open sessions (i.e., opening ceremony, plenary speech I&II, STI forum, carbon neutrality, research showcase, etc) and sessions for YGF/YPF Alumni only (listed below).

Day 1: Wednesday, Sep. 1, 2021

(Canada) Time	Place	Topic	Facilitator	Affiliation
19:30-19:50	Online & Ballroom B2 Halifax Convention Center	Opening (A,B,C) Welcome Message by AKCSE President (A,B,C) Ice-breaking (A,B,C)	Dr. Hyo-Jick Choi Dr. Il Yong Kim	Univ. of Alberta Queen’s Univ.

Day 2: Thursday, Sep. 2, 2021

(Canada) Time	Place	Topic	Facilitator	Affiliation
Online & Ballroom B1	Online & Halifax	TEDxYGP (A,B,C)		
Halifax Convention Center		YGF/YPF Alum “Meet my mentor" (A,B,C)	Dr. Hyo-Jick Choi Dr. Jong Sung Kim Dr. Keun Su Kim Dr. Chun-Il Kim Dr. Simon Park Dr. Yong Hoon Kim	Univ. of Alberta Dalhousie Univ. NRC Univ. of Alberta Univ. of Calgary Univ. of Windsor
13:00-14:45		Option-1 (only for students): YGP Research Competition (A,B,C) Option-2 (only for industry professionals): YGP Industry Professionals' networking session (A)		

Day 3: Friday, Sep. 3, 2021

(Canada) Time	Place	Topic	Facilitator	Affiliation
15:00-16:15	Online & Ballroom B3 Halifax Convention Center	YGP: Meeting with Ambassador of Korea (A,B,C)		
16:30-17:45		Human Bingo (A)		

Day 4: Saturday, Sep. 4, 2021

(Canada) Time	Place	Topic	Facilitator	Affiliation
09:00 - 18:00	Online & Halifax	Off-site Technical Program (A)		

List of Participants:

Canada

Affiliation	Name	Position	In-person/ Online
Queen’s Univ.	Dr. Il Yong Kim	AKCSE president, Professor	In-person
Univ. of Alberta	Dr. Hyo-Jick Choi	Professor	In-person
Dalhousie Univ.	Dr. Jong Sung Kim	Professor	In-person
NRC	Dr. Keun Su Kim	Senior Research Officer	In-person
Univ. of Calgary	Dr. Simon Park	Professor	In-person
Univ. of Alberta	Dr. Chun Il Kim	Professor	In-person
Univ. of Windsor	Dr. Yong Hoon Kim	Professor	In-person

KOFST Young Generation Leader Program
Track 2: Program Orientation

Korean Participants

Date: 21:00-22:10, 30 Aug (Monday) Canada ADT

Place: Virtual on Zoom

Sponsor: N/A

Organizer: AKCSE YGP (Young Generation and Professionals of AKCSE)

Contact: akcse.ygp@gmail.com

Description: This session will introduce the Association of Korean-Canadian Scientists and Engineers (AKCSE) and the AKCSE Young Generation & Professional National (YGPN) team to the Korean participants and provide details on the Track 2 sessions taking place alongside CKC 2021.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
21:00-21:10	Virtual on Zoom	Introduction	Kanghee Ryu	YGPN
21:10-21:20		Opening Remarks by AKCSE President	Kanghee Ryu	
21:20-21:30		Introduction of AKCSE YGP Committee and YGPN Members	YGPN Executives	
21:30-21:40		Introduction of AKCSE YGP	Kanghee Ryu	
21:40-22:00		Track 2 Programs' Introductions	Kanghee Ryu	
22:00-22:10		Q/A	Kanghee Ryu	

KOFST Young Generation Leader Program
Track 2: Program Orientation Biography

Welcome Message: Dr. Il Yong Kim

AKCSE President

Dr. Il Yong Kim is a Professor in the Department of Mechanical and Materials Engineering at Queen's University, Kingston, Canada. His research interest is design optimization with applications in automotive and aerospace systems. KIM received his M.S. and Ph.D. degrees in mechanical engineering from the Korea Advanced Institute of Science and Technology (KAIST). He worked as an instructor and postdoctoral researcher in the Department of Aeronautics and Astronautics at M.I.T., where he taught undergraduate design course. KIM received a number of awards, including the Early Researcher Award in Canada, the recognition of the Experienced Humboldt Fellow in Germany, the Research Excellence Award at Queen's, and many paper awards at major scientific conferences. KIM is actively collaborating with global, multi-national companies in the automotive and aerospace industries, including General Motors, Magna, Bombardier Aerospace, Pratt & Whitney, Safran Landing Systems, and General Dynamics.

KOFST Young Generation Leader Program
Track 2: Program Orientation Biography

Speaker: Dr. Simon Park

Professor, Department of Mechanical and Manufacturing Engineering, University of Calgary, AB, Canada

Dr. Park is a professor at the Schulich School of Engineering, Dept. of Mechanical and Manufacturing Engineering, University of Calgary, Canada. He is an AITF iCORE Chair in sensing and monitoring. He is a professional engineer in Alberta, and is an associate member of CIRP (Int. Academy of Production Engineers) from Canada. Dr. Park received bachelor and master's degrees from the University of Toronto, Canada. He then continued his PhD at the University of British Columbia, Canada. He has worked in several companies including IBM manufacturing where he was a procurement engineer for printed circuit boards and Mass Prototyping Inc. dealing with rapid prototyping systems. His research interests include pipeline engineering, nanocomposites, directional drilling, enhanced oil recovery, and manufacturing. He has also founded several start-up companies in sensing and partial upgrading of bitumen. He has received several awards including Young Innovator's Award, Schulich School of Engineering Teaching Award, Schulich School Research Excellence Award, CFI New Faculty Grant, Alberta Innovates New Faculty award, NSERC scholarships. Currently, he is directly supervising over 20 students and scholars.

KOFST Young Generation Leader Program
Track 2: Program Orientation Biography

Speaker: Dr. Regina Lee

Professor at York University

Dr. Regina Lee, PhD, PEng is a Professor at the Department of Earth and Space Science and Engineering, York University, Toronto, Canada. Dr. Lee received her Ph.D. from the University of Toronto in 2000. From 2000 to 2007 she worked at Dynacon Inc. as a (NSERC) industry post-doctoral fellow, and later as a Research Scientist. Dr. Lee's research interests center on nanosatellite technology development. It has been a focus of Dr. Lee's research to develop a series of space technologies that will lead to scientific nanosatellite missions. Currently, she's investigating several areas including MEMS based attitude sensors and actuators to incorporate their low-grade characteristics; and optical payloads including a star tracker for Resident Space Object (RSO) detection, identification and characterization with light curve analysis.

E-mail reginal@yorku.ca

KOFST Young Generation Leader Program
Track 2: Program Orientation Biography

Speaker: Dr. Hyun-Joong Chung

Associate Professor, Faculty of Engineering - Chemical and Materials Engineering Dept

Dr. Hyun-Joong Chung is an Associate Professor of Chemical and Materials Engineering at the University of Alberta. He received B.S. from KAIST and Ph.D. from the University of Pennsylvania. After graduation, he worked at Samsung Display in Korea as a senior engineer, where he contributed in developing prototype large-area OLED TVs, followed by a postdoctoral training on stretchable electronics at the University of Illinois at Urbana-Champaign. His current research interests are on soft materials - specifically on hydrogels and elastomeric polymers and their composites with textiles and/or 3D printed structures, as well as their applications in energy devices, medical devices, and wearable bioelectronics. He is the recipient of Hanwha Non-Tenured Faculty Award in 2015 for his contributions in polymer nanocomposites.

KOFST Young Generation Leader Program
Track 2: Program Orientation Biography

Speaker: Kanghee Ryu

Ph.D. Student / the School of Public Health at the University of Alberta

Kanghee Ryu is currently a Ph.D. student at the School of Public Health. He has been researching the phenotypic and genotypic traits of foodborne and waterborne pathogens via bioinformatics tools.

Since 2018, he has affirmatively contributed to promoting the young professional (YP) members of AKCSE by serving as the president of YP of the Central Alberta Chapter from 2018 to 2019 and as the YP National president from 2019 to 2020. He is currently the Young General/Professional National (YGPN) President.

E-mail: kanghee@ualberta.ca

KOFST Young Generation Leader Program
Track 2: Program Orientation Biography

Speaker: Jisoo Kang

Engineer-In-Training / TC Energy

Jisoo received her Honours Bachelor of Science in Chemical Engineering from the University of Calgary. She currently works as an EIT for a Compressor Station project in Montréal, QC with a previous role on the Corrosion Prevention team under Pipe Integrity at TC Energy. Prior to her current project, Jisoo worked at Schlumberger to develop solutions for oilfield production challenges and provided field technical support to the upstream energy industry.

Since 2014, Jisoo has contributed to the AKCSE Young Generation and Professional (YGP) group as President of the University of Calgary YG Chapter, President of the Southern Alberta YP Chapter, and is currently the YGP National Vice President while serving as part of the CKC YGP Organizing Committee.

E-mail: jisookang95@gmail.com

KOFST Young Generation Leader Program
Track 2: Program Orientation Biography

Speaker: Ms. Nia Kang

Master's Student/University of Ottawa Faculty of Education

Nia received her Honours Bachelor of Health Sciences from the University of Ottawa. She is now pursuing her master's degree in Health Professions Education at the University of Ottawa Faculty of Education. Her research interests include the career progression of non-clinician medical education researchers in academic settings in Canada and the application of educational paradigms such as the Montessori method in managing symptoms of dementia in older adults.

Since 2017, Nia has contributed to the AKCSE Young Generation and Professional (YGP) group as President of the University of Ottawa YG Chapter, Young Generation National Chair, and President of the newly established Québec YP Chapter. She has been an active member of the CKC YGP organizing committee for the past four years and is serving as part of the YGP National Executive Team since the establishment of the collective YGP group in 2020.

E-mail: nia.kang@gmail.com

KOFST Young Generation Leader Program
Track 2: Program Orientation Biography

Speaker: Johnny Lee

Undergraduate Student/ University of Alberta Faculty of Engineering

Johnny is currently an undergraduate student in his 3rd year of Mechanical Engineering Co-op at the University of Alberta, scheduled to graduate in 2023.

Since 2020, Johnny has contributed to the AKCSE Young Generation and Professional (YGP) group as Vice-President of the University of Alberta YG Chapter, and is now serving as a part of the YGP National Executive Team while serving as part of the CKC YGP organizing committee.

E-mail: jslee@ualberta.ca

KOFST Young Generation Leader Program
Track 2: Program Orientation Biography

Speaker: Yoona Park

Master's student / University of Toronto Department of Computer Science, Vector Institute of Artificial Intelligence

Yoona received her Honour Bachelor of Science in Computer Science specialized in Artificial intelligence from the University of Toronto. She is currently pursuing a thesis-based Master of Science in the department of Computer Science at the University of Toronto and at the Vector Institute of Artificial Intelligence. Her research specialty includes Natural Language Processing and Deep Learning. She is enthusiastic in building fair and ethical AI applications for real world usage. Since 2021, Yoona has contributed to the AKCSE Young Generation and Professional (YGP) group as a part of the YGP National Executive Team and the CKC YGP organizing committees.

E-mail: ya.yoona.park@gmail.com

KOFST Young Generation Leader Program
Track 2: Canadian Universities Virtual Tour

Korean Participants

Date: 10:00-12:00, 31 Aug (Tuesday) Canada ADT

Place: Virtual on Zoom

Sponsor: N/A

Organizer: AKCSE YGP (Young Generation and Professionals of AKCSE)

Contact: akcse.ygp@gmail.com

Description: The purpose of the Track 2: Canadian Universities Virtual Tour is to introduce Canadian universities to the Korean Track 2 participants through Vlog-style videos created by YG/YP chapters across Canada. These virtual tours will provide insight into Canadian university life.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
10:00-10:10	Virtual on Zoom	Introduction	YGPN	YGPN
10:10-11:50		Virtual Tours of Canadian Universities	YG/YP Presidents	
11:50-12:00		Closing	YGPN	

KOFST Young Generation Leader Program
Track 2: Entrepreneurship Seminar

Korean Participants

Date: 21:00-22:30, 31 Aug (Tuesday) Canada ADT

Place: Virtual on Zoom

Sponsor: N/A

Organizer: AKCSE YGP (Young Generation and Professionals of AKCSE)

Contact: akcse.ygp@gmail.com

Description: In this session, keynote speakers who are successful entrepreneurs in Canada will share their valuable experiences in launching a start-up and discuss the inspirations and lessons learnt throughout their entrepreneurship journey. The keynote presentations will be followed by a Q&A session, in which Korean participants will have a chance to engage with the Canadian entrepreneurs.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
21:00-21:10	Virtual on Zoom	Introduction	Yoona Park Nia Kang	YGPN
21:10-21:40		Presentation by Dr. Chaneel Park Q&A	Dr. Chaneel Park	
21:40-22:10		Presentation by Dr. Jiho Cho Q&A	Dr. Jiho Cho	
22:10-22:30		Discussion and Closing	Yoona Park Nia Kang	

KOFST Young Generation Leader Program
Track 2: Entrepreneurship Seminar Biography

Speaker: Dr. Chaneel Park

Dr. Chaneel Park is a co-founder of MakeSens Inc. and CEO of the company. He has served as a He has graduated from University of Calgary for the Bachelor's (BSc. Mechanical Engineering), Master (MSc. Mechanical and Manufacturing Engineering), and the Ph.D. (Ph.D. of Mechanical and Manufacturing Engineering). In his graduate studies, Dr. Chaneel Park has studied in the micro and nano scale manufacturing, with focus on smart materials and their manufacturing.

Education

- Doctor of Philosophy in Mechanical Engineering (2018)
  University of Calgary, Calgary, Canada (Advisor: Prof. S. Park)
- Master of Science in Mechanical Engineering (2013)
  University of Calgary, Canada (Advisor: Prof. S. Park)

Professional Career

- Founder, MakeSens Inc., Calgary, Canada (2017-Presence)
- Postdoctoral Research Assistant, ROSEN IPS Canada, Calgary, Canada (2018 - 2020)

Awards

- MITACS Elevate Postdoctoral Fellowship 2018 - 2020
- AITF Graduate Student Scholarship 2013 - 2017
- Queen Elizabeth II Graduate Scholarship 2011

KOFST Young Generation Leader Program
Track 2: Entrepreneurship Seminar Biography

Speaker: Dr. Ji Ho Cho

Dr. Ji Ho Cho is a computer vision and machine learning scientist with more than 15 years of experience in designing and implementing software algorithm with a focus on depth sensing and processing. He is a co-founder of Airy3D and has been building and leading a research organization of the company at Airy3D.

• Strong information technology professional with a Doctor of Philosophy (Ph.D.) focused on depth sensing solutions
• Experience in both academia and industry around the world in fields of computer vision and machine learning area
• Published 20+ high-impact scientific papers and 5+ patents, co-investigator for several research grants
• Highly skilled in computer vision, machine learning and various programming languages

KOFST Young Generation Leader Program
Track 2: Mentoring Session with AKCSE Executives

Date: 10:00-11:00, 1 Sep (Wednesday) Canada ADT

Place: Virtual on Zoom

Sponsor: N/A

Organizer: AKCSE YGP (Young Generation and Professionals of AKCSE)

Contact: akcse.ygp@gmail.com

Description: This session aims to provide Korean participants with an opportunity to develop knowledge and understanding about their specific fields. During the session, AKCSE executives will be providing field specific mentorship to the Korean participants. Mentees will share their career goals and struggles, and then the mentors will leverage their experience to share insights on career- or life-related topics.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
10:00-10:05	Virtual on Zoom	Introduction	Kanghee Ryu	YGPN
10:05-10:20		AKCSE Executives' Introduction	Kanghee Ryu	
10:20-10:50		Group Mentoring via Breakout Rooms on Zoom	AKCSE Executives	
10:50-11:00		Closing	Kanghee Ryu	

KOFST Young Generation Leader Program
Track 2: Mentoring Session with AKCSE Executives Biography

Speaker: Dr. Simon Park

Professor, Department of Mechanical and Manufacturing Engineering, University of Calgary, AB, Canada

Dr. Park is a professor at the Schulich School of Engineering, Dept. of Mechanical and Manufacturing Engineering, University of Calgary, Canada. He is an AITF iCORE Chair in sensing and monitoring. He is a professional engineer in Alberta, and is an associate member of CIRP (Int. Academy of Production Engineers) from Canada. Dr. Park received bachelor and master's degrees from the University of Toronto, Canada. He then continued his PhD at the University of British Columbia, Canada. He has worked in several companies including IBM manufacturing where he was a procurement engineer for printed circuit boards and Mass Prototyping Inc. dealing with rapid prototyping systems. His research interests include pipeline engineering, nanocomposites, directional drilling, enhanced oil recovery, and manufacturing. He has also founded several start-up companies in sensing and partial upgrading of bitumen. He has received several awards including Young Innovator's Award, Schulich School of Engineering Teaching Award, Schulich School Research Excellence Award, CFI New Faculty Grant, Alberta Innovates New Faculty award, NSERC scholarships. Currently, he is directly supervising over 20 students and scholars.

KOFST Young Generation Leader Program
Track 2: Mentoring Session with AKCSE Executives Biography

Speaker: Dr. Regina Lee

Professor at York University

Dr. Regina Lee, PhD, PEng is a Professor at the Department of Earth and Space Science and Engineering, York University, Toronto, Canada. Dr. Lee received her Ph.D. from the University of Toronto in 2000. From 2000 to 2007 she worked at Dynacon Inc. as a (NSERC) industry post-doctoral fellow, and later as a Research Scientist. Dr. Lee's research interests center on nanosatellite technology development. It has been a focus of Dr. Lee's research to develop a series of space technologies that will lead to scientific nanosatellite missions. Currently, she's investigating several areas including MEMS based attitude sensors and actuators to incorporate their low-grade characteristics; and optical payloads including a star tracker for Resident Space Object (RSO) detection, identification and characterization with light curve analysis.

E-mail reginal@yorku.ca

KOFST Young Generation Leader Program
Track 2: Mentoring Session with AKCSE Executives Biography

Speaker: Dr. Seonghwan (Sam) Kim

Associate Professor/Canada Research Chair in Nano Sensing Systems at the University of Calgary

Dr. Kim is an Associate Professor and Canada Research Chair in Nano Sensing Systems, in the Department of Mechanical and Manufacturing Engineering at the University of Calgary. He received his B.Sc. (1998) and M.Sc. (2000) degrees in Aerospace Engineering from Seoul National University, Seoul, South Korea and Ph.D. (2008) in Mechanical, Aerospace and Biomedical Engineering from the University of Tennessee, Knoxville, USA. He was a Postdoctoral Research Associate at Oak Ridge National Laboratory, USA and an Acting Research Associate at the University of Alberta, Canada prior to his current position. Dr. Kim has founded the Nano/Micro-Sensors and Sensing Systems Laboratory (NMSSS, www.ucalgary.ca/sskim) at the University of Calgary in 2013 to develop 1) ultrasensitive chemical/biological sensors and sensing systems based on micro/nanotechnology; 2) novel micro/nano-metrologies to characterize nanomaterials and polymeric nanocomposites for energy, environmental, biological applications.
E-mail: sskim@ucalgary.ca

KOFST Young Generation Leader Program
Track 2: Mentoring Session with AKCSE Executives Biography

Speaker: Dr. Jong Sung Kim

Associate Professor, Faculty of Medicine at Dalhousie University/ Director of Health and Environments Research Centre (HERC)

Dr. Jong Sung Kim is a tenured Associate Professor and Director of Health and Environments Research Centre (HERC) in the Faculty of Medicine at Dalhousie University in Canada. Nanotoxicology and human health risk assessment have been his primary academic and research interests since the completion of his MSc degree in Environmental Toxicology at the University of Nebraska Center for Health and Environmental Toxicology. Following this, he commenced his PhD in Human Toxicology, where he was enrolled in the Interdisciplinary Graduate Program at the University of Iowa (US National Institutes of Health Fellowship). In recognition of his contributions to nanotoxicology research, he has served on the Technical Committee for the International Organization for Standardization (ISO) Working Group on Nanotechnology, and he received numerous international awards such as Best Paper Award of Delta Omega Honorary Society in Public Health from the American Public Health Association and the MB Research Award from the Society of Toxicology. The primary objective of his research program is to better understand how emerging hazards and exposures lead to adverse health outcomes at various levels of biological organization (from cellular and molecular levels to populations) and how human body modify these responses to maintain homeostasis (host-defense).

E-mail: jskim@dal.ca

KOFST Young Generation Leader Program
Track 2: Introduction to Canadian Research Institutions

Korean Participants

Date: 9:00-10:00, 3 Sep (Friday) Canada ADT

Place: Virtual on Zoom

Sponsor: N/A

Organizer: AKCSE YGP (Young Generation and Professionals of AKCSE)

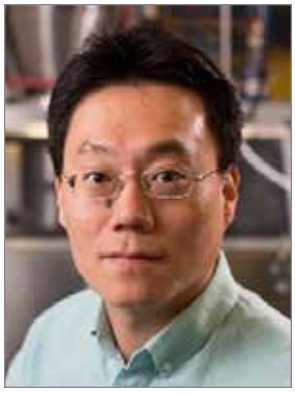
Contact: akcse.ygp@gmail.com

Description: This session aims to introduce Canadian research institutions to the Korean Track 2 participants. A panel consisting of three research scientists working at National Research Council Canada, Dr. Keun Su Kim, Dr. Homin Shin, Dr. Woosung Lee, will share their work experience on the Canadian work environment.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
9:00-9:05	Virtual on Zoom	Introduction	Kanghee Ryu	YGPN
9:05-9:20		Sharing Experience by Dr. Keun Su Kim Q&A	Dr. Keun Su Kim	
9:20-9:35		Sharing Experience by Dr. Homin Shin Q&A	Dr. Homin Shin	
9:35-9:50		Sharing Experience by Dr. Woosung Lee Q&A	Dr. Woosung Lee	
9:50-10:00		Closing	Kanghee Ryu	

KOFST Young Generation Leader Program
Track 2: Introduction to Canadian Research Institutions Biography



Speaker: Dr. Keun Su Kim

Senior Research Officer, Security and Disruptive Technologies Research Centre

Dr. Kim is a Senior Research Officer at National Research Council Canada and an Adjunct Professor at the Department of Mechanical and Industrial Engineering, University of Toronto. He received his B.S., M.S., and Ph.D. degrees in Nuclear Engineering from Seoul National University in 1998, 2000, and 2005, respectively. With growing interest in energy, materials, and the environment, his research interest has focused on the development of new plasma technologies for renewable energy production and advanced nanomaterial synthesis. In 2009, he joined in NRC and is working on the synthesis of low-dimensional nanomaterials including carbon nanotubes, graphene and boron nitride nanotubes (BNNTs). By leading the research at NRC, Dr. Kim made a seminal breakthrough in synthesis of BNNTs in bulk and demonstrated world's first pilot-scale production, which helped place NRC as a world-leader in BNNT science and technology. In recognition of his excellence in science and technology, Dr. Kim is a recipient of Public Service Award of Excellence 2015 in scientific contribution from the Government Canada, and named as the Engineer of the Year by the Korean Federation of Science & Technology Societies (2016). Dr. Kim has published over 40 journal papers with 2 invited review papers and delivered over 25 invited/oral talks in international conferences.

Email: KeunSu.Kim@nrc-cnrc.gc.ca

KOFST Young Generation Leader Program
Track 2: Introduction to Canadian Research Institutions Biography

Speaker: Dr. Homin Shin

Research Officer, National Research Council Canada

Dr. Shin is a Research Officer at National Research Council Canada. She obtained her B.S. and M.S. in physics from Ewha Womans University and her Ph.D. in physics from Syracuse University. Her graduate work was followed by postdoctoral research associate positions at the University of Massachusetts Amherst and at the University of Illinois Urbana-Champaign, where she explored a wide range of problems arising in soft condensed matter such as colloids, polymers, liquid crystals, structured vesicles and filamentous bio/nano materials, using a combination of analytic theory and computer simulations. She joined at National Research Council Canada in 2014 and has been continuing research in materials theory and computation with focus on nanotube-related materials and revealing the design principle of novel materials.

E-mail Homin.Shin@nrc-cnrc.gc.ca

KOFST Young Generation Leader Program
Track 2: Introduction to Canadian Research Institutions Biography

Speaker: Dr. Woosung Lee

Seasonal Prediction Specialist at CCCma(Canadian Centre for Climate Modelling and Analysis)

Dr. Woosung Lee received her B.S., M.S. and Ph.D. in Atmospheric Sciences from Yonsei University in Seoul, South Korea. Before joining CCCma in 2007, she worked as a research scientist in the Climate Research Laboratory and APCC(APEC Climate Center) at the Korea Meteorological Administration.
Her main research topic is the development and implementation of seasonal forecast models. E-mail woosung.lee@canada.ca

KOFST Young Generation Leader Program
Track 2: Academia in Canada

Date: 10:00-11:00, 4 Sep (Saturday) Canada ADT

Place: Virtual on Zoom
In-person in Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: N/A

Organizer: AKCSE YGP (Young Generation and Professionals of AKCSE)

Contact: akcse.ygp@gmail.com

Description: This session aims to provide a better understanding of academia in Canada. Korean Track 2 participants are invited to a panel discussion with Korean-Canadian professors, who will discuss various topics ranging from post-secondary institutions to research in Canada.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
10:00-10:05	Virtual on Zoom & Ballroom B3 Halifax Convention Center	Introduction	AKCSE Executives	AKCSE
10:05-10:20		Presentation by Prof. Seonghwan Kim Q/A	AKCSE Executives	
10:20-10:35		Presentation by Prof. Keekyoung Kim Q/A	AKCSE Executives	
10:35-10:50		Presentation by Prof. Jihyun Lee Q/A	AKCSE Executives	
10:50-11:00		Closing	AKCSE Executives	

KOFST Young Generation Leader Program
Track 2: Academia in Canada Biography

Speaker: Dr. Seonghwan (Sam) Kim

Associate Professor/Canada Research Chair in Nano Sensing Systems at the University of Calgary

Dr. Kim is an Associate Professor and Canada Research Chair in Nano Sensing Systems, in the Department of Mechanical and Manufacturing Engineering at the University of Calgary. He received his B.Sc. (1998) and M.Sc. (2000) degrees in Aerospace Engineering from Seoul National University, Seoul, South Korea and Ph.D. (2008) in Mechanical, Aerospace and Biomedical Engineering from the University of Tennessee, Knoxville, USA. He was a Postdoctoral Research Associate at Oak Ridge National Laboratory, USA and an Acting Research Associate at the University of Alberta, Canada prior to his current position. Dr. Kim has founded the Nano/Micro-Sensors and Sensing Systems Laboratory (NMSSS, www.ucalgary.ca/sskim) at the University of Calgary in 2013 to develop 1) ultrasensitive chemical/biological sensors and sensing systems based on micro/nanotechnology; 2) novel micro/nano-metrologies to characterize nanomaterials and polymeric nanocomposites for energy, environmental, biological applications. E-mail: sskim@ucalgary.ca

KOFST Young Generation Leader Program
Track 2: Academia in Canada Biography

Speaker: Dr. Keekyoung Kim

Associate Professor at the University of Calgary

Dr. Keekyoung Kim is an associate professor in the Department of Mechanical and Manufacturing Engineering and Biomedical Engineering at the University of Calgary. Previously, he was at the University of British Columbia's Okanagan Campus from 2013 to 2019. Dr. Kim obtained a Ph.D. degree in Mechanical Engineering from the University of Toronto, specializing in MEMS devices for microscale biomaterial characterization. During his Ph.D., he was supported by an NSERC PGS D scholarship. He was a Postdoctoral Fellow at Stanford University in Mechanical Engineering and Pediatric Cardiology. Funded by NSERC Postdoctoral Fellowship, he joined Brigham and Women's Hospital at Harvard Medical School and the Wyss Institute of Biologically Inspired Engineering at Harvard University. Currently, Dr. Kim's research focuses on developing advanced biomanufacturing platforms to fabricate artificial tissues and organs for regenerative medicine and drug discovery applications, using a variety of cutting-edge technologies, including 3D printing and micro/nanotechnology.

E-mail keekyoung.kim@ucalgary.ca

KOFST Young Generation Leader Program
Track 2: Academia in Canada Biography

Speaker: Dr. Jihyun Lee

Assistant Professor at the University of Calgary

Dr. Jihyun Lee received her BSc in Mechanical Engineering from Yonsei University, Seoul, South Korea, and her MSc and Ph.D. in Mechanical Engineering from the University of Michigan-Ann Arbor, USA. Prior to joining the University of Calgary, she worked for 2.5 years as a senior researcher in the department of Ultra-precision Machines and Systems at Korea Institute of Machinery & Materials (KIMM), South Korea. She has worked as an assistant professor at the University of Calgary since February 2019. Projects she mainly fulfilled at the KIMM were 'Vibration Reduction of Machines using Multiple TMD system'(.1 million granted by Doosan Machine Tools), 'Virtual Machining Mechatronics Platform', 'Industrial Robot Manipulator Machining on Mobile Platform' and 'Laser Tracker Network Development'. Current research topic she focuses on at the UCalglary is robotic metal hybrid additive and subtractive manufacturing. Dr. Lee conducts her research at the intelligent automation research laboratory (iAR Lab). E-mail jihyun.lee@ucalgary.ca

KOFST Young Generation Leader Program
Track 2: Closing and Feedback Survey

Korean Participants

Date: 11:00-11:45, 4 Sep (Saturday) Canada ADT

Place: Virtual on Zoom
In-person in Ballroom B3 at the Halifax Convention Center, NS, Canada

Sponsor: N/A

Organizer: AKCSE YGP (Young Generation and Professionals of AKCSE)

Contact: akcse.ygp@gmail.com

Description: Closing remarks and distribution of the feedback survey for all Korean Track 2 participants.

Program:

(Canada) Time	Place	Topic	Facilitator	Affiliation
11:00-11:15	Virtual on Zoom & Ballroom B3 Halifax Convention Center	Closing Remarks	AKCSE Executives	AKCSE
11:15-11:45		Feedback Survey	AKCSE Executives	

2021 AKCSE YGP Organizing Committee Biography

Kanghee Ryu

Ph.D. Student / the School of Public Health at the University of Alberta

Kanghee Ryu is currently a Ph.D. student at the School of Public Health. He has been researching the phenotypic and genotypic traits of foodborne and waterborne pathogens via bioinformatics tools.

Since 2018, he has affirmatively contributed to promoting the young professional (YP) members of AKCSE by serving as the president of YP of the Central Alberta Chapter from 2018 to 2019 and as the YP National president from 2019 to 2020. He is currently the Young General/Professional National (YGPN) President.
E-mail: kanghee@ualberta.ca

2021 AKCSE YGP Organizing Committee

Jisoo Kang

Engineer-In-Training / TC Energy

Jisoo received her Honours Bachelor of Science in Chemical Engineering from the University of Calgary. She currently works as an EIT for a Compressor Station project in Montréal, QC with a previous role on the Corrosion Prevention team under Pipe Integrity at TC Energy. Prior to her current project, Jisoo worked at Schlumberger to develop solutions for oilfield production challenges and provided field technical support to the upstream energy industry.

Since 2014, Jisoo has contributed to the AKCSE Young Generation and Professional (YGP) group as President of the University of Calgary YG Chapter, President of the Southern Alberta YP Chapter, and is currently the YGP National Vice President while serving as part of the CKC YGP Organizing Committee.

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2021 AKCSE YGP Organizing Committee

Nia Kang

Master's Student/University of Ottawa Faculty of Education

Nia received her Honours Bachelor of Health Sciences from the University of Ottawa. She is now pursuing her master's degree in Health Professions Education at the University of Ottawa Faculty of Education. Her research interests include the career progression of non-clinician medical education researchers in academic settings in Canada and the application of educational paradigms such as the Montessori method in managing symptoms of dementia in older adults.

Since 2017, Nia has contributed to the AKCSE Young Generation and Professional (YGP) group as President of the University of Ottawa YG Chapter, Young Generation National Chair, and President of the newly established Québec YP Chapter. She has been an active member of the CKC YGP organizing committee for the past four years and is serving as part of the YGP National Executive Team since the establishment of the collective YGP group in 2020.

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2021 AKCSE YGP Organizing Committee

Johnny Lee

Undergraduate Student/ University of Alberta Faculty of Engineering

Johnny is currently an undergraduate student in his 3rd year of Mechanical Engineering Co-op at the University of Alberta, scheduled to graduate in 2023.

Since 2020, Johnny has contributed to the AKCSE Young Generation and Professional (YGP) group as Vice-President of the University of Alberta YG Chapter, and is now serving as a part of the YGP National Executive Team while serving as part of the CKC YGP organizing committee.

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2021 AKCSE YGP Organizing Committee

Yoona Park

Master's student / University of Toronto Department of Computer Science, Vector Institute of Artificial Intelligence

Yoona received her Honour Bachelor of Science in Computer Science specialized in Artificial intelligence from the University of Toronto. She is currently pursuing a thesis-based Master of Science in the department of Computer Science at the University of Toronto and at the Vector Institute of Artificial Intelligence. Her research specialty includes Natural Language Processing and Deep Learning. She is enthusiastic in building fair and ethical AI applications for real world usage. Since 2021, Yoona has contributed to the AKCSE Young Generation and Professional (YGP) group as a part of the YGP National Executive Team and the CKC YGP organizing committees.

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2021 AKCSE YGP Organizing Committee

MinYoung Yoo

Ph.D. student / School of Interactive Arts and Technology, Simon Fraser University

MinYoung Yoo is a Ph.D. student at Simon Fraser University. He received his Bachelor's degree in Computer Science from the University of Waterloo in 2017, and his Master of Science at Simon Fraser University in 2020. Currently, MinYoung is studying and researching interactive technology that enriches people's everyday life experiences in the field of Human-Computer Interaction (HCI). His research interests are Research through Design, People with Disabilities, Interaction Design, Participatory Design and Slow Technology.

Since 2015, MinYoung has contributed to the AKCSE Young Generation and Professional (YGP) group as President of the University of Waterloo YG Chapter and President of the Mainland British Columbia YP Chapter. MinYoung has been actively contributing to CKC for the past five years as part of the organizing team and also as a presenter/speaker.

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CKC 2021 Award List

•Commendation from the Minister of Science and ICT (MSIT), Korea
• KOFST Scientist of the Year Award
• KOFST Engineer of the Year Award
• AKCSE Best Service Award
• AKCSE Early Achievement Award
• AKCSE WiSE Award
• 2020-2021 AKCSE Best Young Professional Member Award
• 2020-2021 AKCSE Best Student Member Award
• 2020-2021 AKCSE Best Chapter Award
• AKCSE Best CKC Volunteer Award

CKC 2021 Scholarship List

• SK Scholarship in Life Sciences
• Goryeo Medical Foundation Scholarship in Life Sciences
• Green Cross Scholarship
• CS WIND Scholarship
• KOGAS Canada Scholarship
• Min Dong Yun Scholarship
• KONA Scholarship
• KCSSF Scholarship

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Ultimate

Green Energy Institute

Keit
한국산업기술평가관리원
Korea Evaluation Institute of Industrial Technology

KERI
KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE

beyond leading technology
KIAT

KIER 한국에너지기술연구원
KOREA INSTITUTE OF ENERGY RESEARCH

KIGAM 한국지질자원연구원
Korea Institute of Geoscience and Mineral Resources

KIMM 한국기계연구원
KOREA INSTITUTE OF MACHINERY & MATERIALS

Ultimate

KITECH 한국생산기술연구원

nst 국가과학기술연구회
National Research Council of Science & Technology

Advanced

KOFWST Since 2003 한국여성과학기술단체총연합회
Korea Federation of Women's Science & Technology Associations

KWSE 대한여성과학기술인회
The Association of Korean Woman Scientists & Engineers

Basic

KICT 한국건설기술연구원

KIST Korea Institute of Science and Technology

www.kwse.or.kr

대한여성과학기술인회

KWSE

The Association of Korean Woman Scientists and Engineers

KWSE, founded in 1993, is the first association of woman scientists and engineers in Korea with a goal to contribute to national development of science & technology and to protect the rights of women in STEM.

Major Activities

- Participating in national policy development for science and technology
- Providing opportunities to exchange academic outcomes and research information for enhanced interdisciplinary capacity and leadership
- Supporting science education to foster science-friendly culture
- Expanding opportunities to build global networks for international cooperation by women scientists and engineers

대한여성과학기술인회
THE ASSOCIATION OF KOREAN WOMAN SCIENTISTS AND ENGINEERS

"국토 미래가치 창출로 국민의 행복한 삶을 실현합니다."

한국건설기술연구원은 1983년 첫 발을 내디딘 이래
대한민국 유일의 건설 및 국토관리분야 정부출연 종합연구기관으로서
세계적 수준의 인프라 원천기술 개발과 성과확산을 통해
건설산업 발전과 국민 삶의 질 향상에 노력하고 있습니다.

도로교통/포장/지반/구조교량/ICT/건축/수자원/환경플랜트/화재안전과,
건설분야 중소기업의 창업/사업화/해외진출 지원까지,
인프라 기술가치를 선도하는 세계 일류 연구기관이 되겠습니다.

비전

건설산업 혁신성장을 선도하는 국민중심 전문연구기관

주요 업무

연구개발	정책수립 및 기술지원	품질 인증 및 시험업무
• 국가기반시설 성능 고도화 기술 • 국토재해 대응 기술 • 친환경 국토조성 기술 • 건설기반 융·복합 기술 • 고성능 건설자재 기술	• 국가 건설 국토 기술 정책 수립 • 표준·기술개발 기술사업화 및 중소·중견기업 기술지원	• 건설공사 및 건설기자재의 품질인증, 인정, 지정, 검사, 시험, 평가, 인증

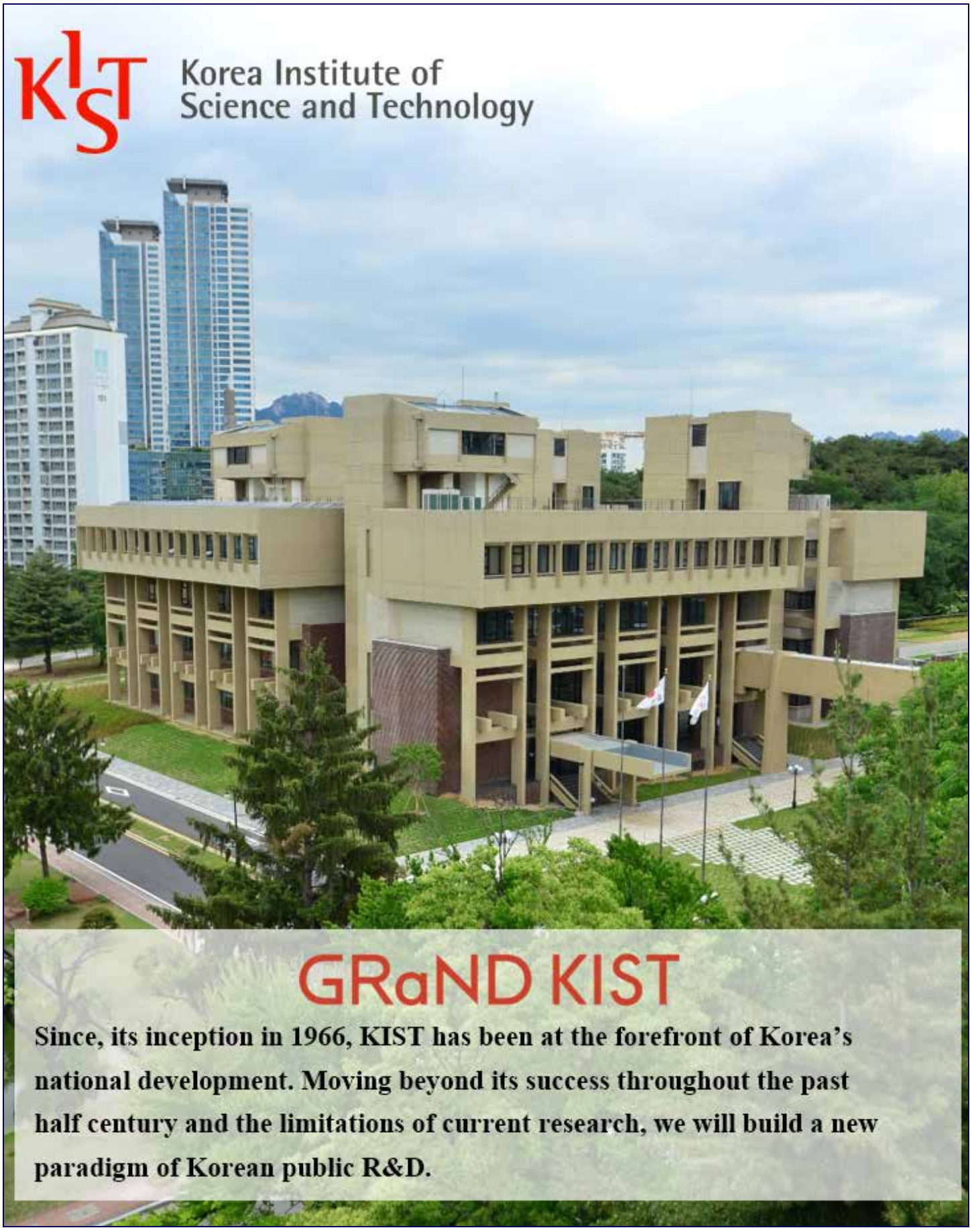
역할과 책임(R&R)

- 안전· 안심 국토교통기술로 국가 · 사회 문제 해결 · 국토재해 대응 기술
- 새로운 건설 패러다임 선도를 통한 건설산업 혁신 성장 기여
- 국토균형발전으로 한반도 공동번영 추구
- 글로벌 인프라 개발협력으로 지구촌 문제 해결

KICT 한국건설기술연구원

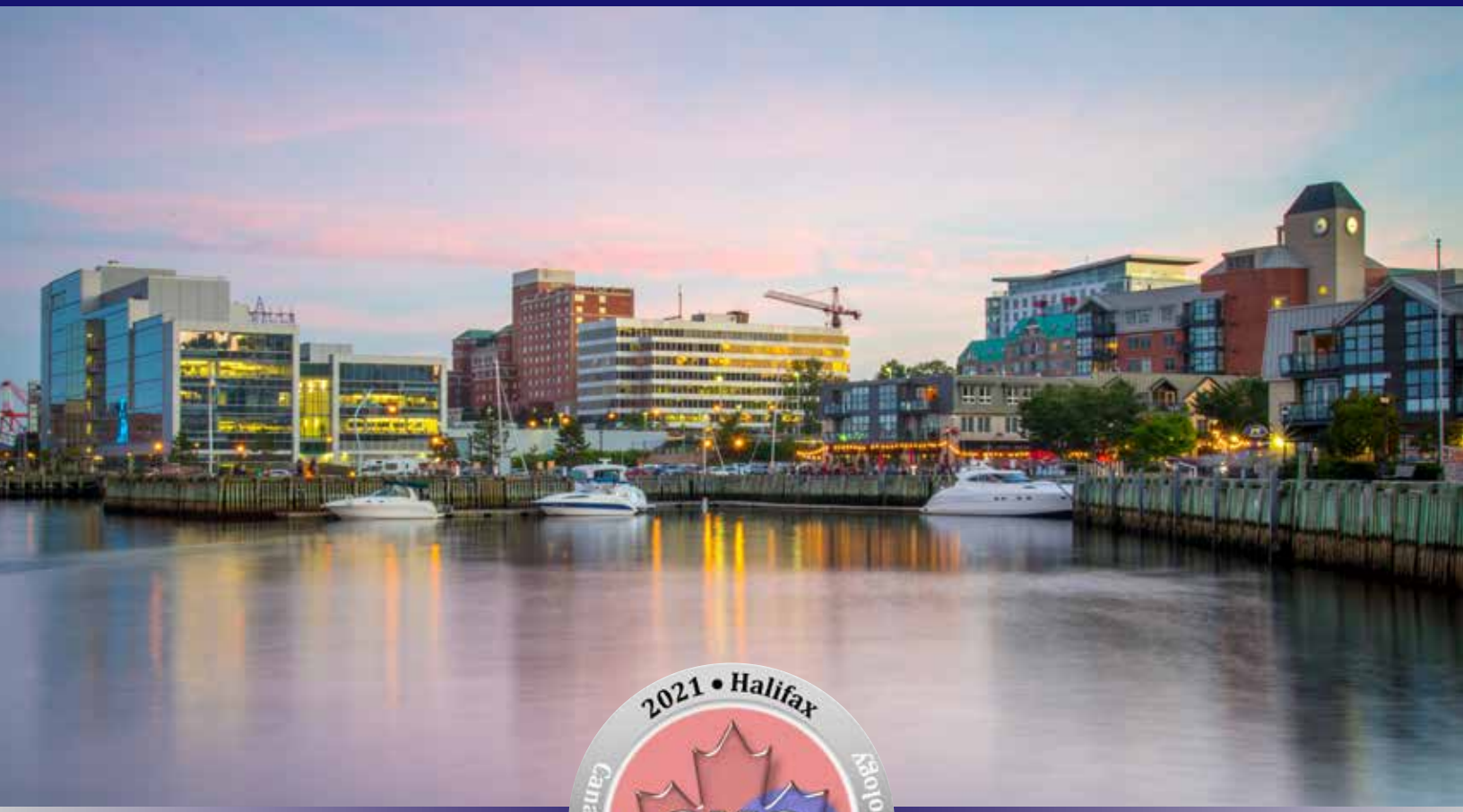
http://www.kict.re.kr

주소 : 경기도 고양시 일산서구 고양대로 283 (대화동 2311) TEL : (031)9100-114


KIST
Korea Institute of
Science and Technology
GRaND KIST
Since, its inception in 1966, KIST has been at the forefront of Korea's national development. Moving beyond its success throughout the past half century and the limitations of current research, we will build a new paradigm of Korean public R&D.

CKC 2021

CANADA-KOREA CONFERENCE ON SCIENCE & TECHNOLOGY



CKC 2021 PROGRAM

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