APRU Sustainable Waste Management

KOREA UNIVERSITY

Stanford University

NANYANG TECHNOLOGICAL UNIVERSITY

Association of Pacific Rim Universities (APRU)
Sustainable Waste Management

APRU SWM Global Lecture Series

APRU SWM Virtual Winter School

3rd Sustainable Waste Management Conference

Nature Conference

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Program Leaders

Yong Sik Ok	Chair	Korea University
William Mitch	Co-chair	Stanford University
David Wardle	Co-chair	Nanyang Technological University
Ali Abbas	The University of Sydney	
Ong Hwai Chyuan	University of Malaya	
Cheng Gu	Nanjing University	
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Longbin Huang	University of Queensland	
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Xiaonan Wang	National University of Singapore	
Shicheng Zhang	Fudan University	
Christina Schönleber	APRU International Secretariat	

Global Lecture Series

Speakers

- March 2021

Massachusetts Institute of Technology

Prof. Jessika Trancit
Massachusetts Institute of Technology, USA
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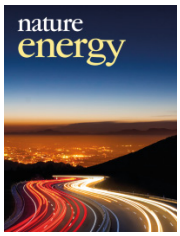
Jessika Trancik is a Professor in the Institute for Data, Systems, and Society at the Massachusetts Institute of Technology. Her research examines the dynamic costs, performance, and environmental impacts of energy systems to inform climate policy and accelerate beneficial and equitable technology innovation. Her projects focus on all energy services including electricity, transportation, heating, and industrial processes. This work spans solar energy, wind energy, energy storage, low-carbon fuels, electric vehicles, and nuclear fission among other technologies. Prof. Trancik received her B.S. from Cornell University and her Ph.D. from the University of Oxford as a Rhodes Scholar. She is currently an external professor at the Santa Fe Institute, and was formerly at Columbia University's Earth Institute, and at WSP International/UNOPS (now Interpeace) in Geneva.



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Trancik, J.E., 2015. Clean energy enters virtuous cycle. *Nature* 528, 333-333.

| Global Lecture Series

• April 2021

Prof. Ah-Hyung (Alissa) Park
Director, Lenfest Center for Sustainable Energy
Chair, Department of Earth and Environmental Engineering
Columbia University in the City of New York, USA
Email address: ap2622@columbia.edu
Website: https://www.cheme.columbia.edu/faculty/ah-hyung-alissa-park

Professor Park is the Lenfest Chair in Applied Climate Science at Columbia University and is also the Director of the Lenfest Center for Sustainable Energy, where she researches issues in energy, environmental engineering and particle technology. Park has received numerous honors and distinctions throughout her career as a researcher. Recently she has been appointed as a member of the International Committee at the American Institute of Chemical Engineers, where she has also been elected as the Vice-Chair (2009-2011) and Chair (2011-2013) of the Fluidization and Fluid-Particle Systems Group and Treasurer (2010-present) of the Particle Technology Forum. She has also recently received the James Lee Young Investigator Award, the NSF Career Award, and a nomination for the Packard Fellowship. In 2011, she was the distinguished speaker at the Womensphere Emerging Leaders Global Summit. A more complete list of her many accomplishments can be found on her website.
A graduate of the University of British Columbia, Professor Park received a Bachelor of Applied Science with distinction and a Masters of Applied Science, both in Chemical and Biological Engineering. She received a PhD degree in Chemical and Biomolecular Engineering from the Ohio State University.

Hsu, E., Barmak, K., West, A.C., Park, A.-H.A., 2019. Advancements in the treatment and processing of electronic waste with sustainability: a review of metal extraction and recovery technologies. *Green Chemistry* 21, 919-936.
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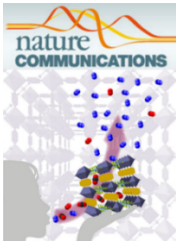
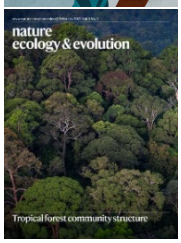


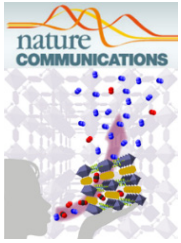
| Global Lecture Series

• May 2021

Prof. David Wardle
Full Professor and Smithsonian Chair
Nanyang Technological University, Singapore
Email address: david.wardle@ntu.edu.sg
Website: https://dr.ntu.edu.sg/cris/rp/rp00090

David Wardle works as the Smithsonian Professor of Forest Ecology at NTU. He has published around 350 peer-reviewed journal articles of which around 30 have appeared in Science and Nature, as well as two books on aboveground-belowground linkages (published by Princeton University Press in 2002 and Oxford University Press in 2010). He serves or has served on over ten editorial boards, including for Science, Ecology, Journal of Ecology and Ecology Letters. He has also been recognized as a highly cited scientist in every highly cited list from 2006 onwards and is among the world's 10 most cited scientists in ecology and environmental sciences. Further, he has supervised a very diverse assortment of >50 postdoctoral researchers and PhD students, most of which have actively published in major journals under his supervision (including in Nature and Science), and nearly all of which hold university faculty positions, or environmental research, policy and management positions, in 16 separate countries and 5 continents. He has also been the recipient of several scientific awards, recent examples including the 2016 Rosén´s Linnaeus Prize in Botany, the 2018 Eminent Ecologist award from the Journal of Ecology, and the 2020 Whittaker Distinguished Ecologist award from the Ecological Society of America.





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• May 2021

Dr. Carlos Antonio Guerra
Co-leader, Global Soil Biodiversity Observation Network
German Center for Integrative Biodiversity Research (iDiv), Germany
Institute of Biology/Geobotany and Botanical Garden, Martin Luther University Halle-Wittenberg, Germany
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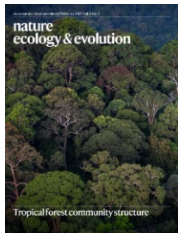

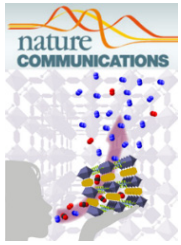

• June 2021

Prof. Johannes Lehmann
Cornell Atkinson Center for Sustainability, USA
School of Integrative Plant Science, Cornell University, USA
Institute for Advanced Study, Technical University of Munich, Germany
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Prof. Johannes Lehmann, professor of soil biogeochemistry and soil fertility management at Cornell University, received his graduate degrees in Soil Science at the University of Bayreuth, Germany. During the past 20 years, he has focused on nano-scale investigations of soil organic matter, the biogeochemistry of pyrogenic carbon and sequestration in soil, sustainable land management practices in tropical agriculture, and biochar-bioenergy systems. Dr. Lehmann is a member of the steering group of the International Soil Carbon Network, has testified in the US congress, briefed the President's council of advisors, was part of Workgroup 2 on Monitoring and Assessment of Sustainable Land Management of UNCCD, and serves on the Technical Management Advisory Committee of USAID's legume program. Dr. Lehmann has authored more than 200 journal publications, was named Highly-Cited Researcher by Thomson Reuter in 2014-2016, and is the editor-in-chief of the journal Nutrient Cycling in Agroecosystems. He co-founded the International Biochar Initiative in 2007 and served as Chair of its Board of Directors with interruption from 2007 to 2016.

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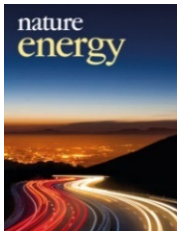
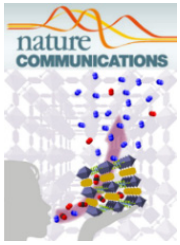
• July 2021

Prof. Jinyue Yan
Royal Institute of Technology (KTH), Sweden
Editor-in-Chief of Applied Energy (IF: 8.848, CiteScore: 16.4, 4.5+ million downloads per year)
Email address: jinyue.yan@mdh.se
Website: https://www.kth.se/profile/jinyue

Dr. Yan is professor of Energy Engineering, Royal Institute of Technology (KTH) and Mälardalen University, Sweden; Director of Future Energy Profile; Editor-in-Chief of Applied Energy; Editor-in-Chief of Handbook of Clean Energy Systems (Wiley). He is an active member of European Academy of Sciences and Arts. Prof. Yan received his PhD at KTH in 1991. During 2001 to 2005, Dr. Yan was chair professor and head of Energy Engineering at Luleå University of Technology, Sweden. Prof. Yan's research interests include simulation and optimization of advanced energy systems incl. advanced power generation; renewable energy (bioenergy and solar); carbon capture and storage; clean development mechanism (CDM); and fundamental engineering thermodynamics. Prof. Yan published about 400 papers including the paper in Science, Nature Climate Change and special feature article in ASME Mechanical Engineering.





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Global Lecture Series

UNIVERSITY OF CAMBRIDGE

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NANYANG TECHNOLOGICAL UNIVERSITY

APRU SWM Virtual Winter School
January to February 2021

January 12th (Tuesday, KST) / 11th (Monday, California time)

Session Wastewater Treatment and Recycling

APRU SWM Plenary Speakers		**Chair: Prof. Yong Sik Ok, Korea University, Korea**
4:00 PM ~ 4:50 PM (California time)	Prof. William Mitch Stanford University, USA	RO and FO/RO for Centralized and Decentralized Potable Reuse Applications
APRU SWM Student Presentations		**Chair: Prof. William Mitch, Stanford University, USA**
4:50 PM ~ 5:05 PM	Jessica MacDonald Stanford University, USA	Linking Mainstream Anaerobic Secondary Treatment to Wastewater Reuse Trains
5:05 PM ~ 5:20 PM	Kumuduni Niroshika Plansooriya Korea University, Korea	Occurrence of Contaminants in Drinking Water Sources and the Potential of Biochar for Water Quality Improvement
5:20 PM ~ 5:35 PM	Jack King Stanford University, USA	GAC-Based Cathodes for The Capture and Degradation of Halogenated Contaminants in RO Concentrate or Stormwater
5:40 PM ~ 6:00 PM	**Live Q & A and Panel Discussion** Session Chair: Prof. Yong Sik Ok, Korea University, Korea Prof. William Mitch, Stanford University, USA Panelist: Prof. Chia-Hung Hou, National Taiwan University, Taiwan Prof. Ali Abbas, The University of Sydney, Australia	

This Session is available on APRU YouTube channel: https://youtu.be/_TwgzRzr1xQ

January 26th (Tuesday) (KST)

Session APRU SWM's 2nd Forum on Plastics and Sustainability

Time	Presenter	Topic
APRU SWM Plenary Speakers		Chair: Prof. Yong Sik Ok, Korea University, Korea
2:00 PM ~ 2:20 PM	Prof. Cheng Gu Nanjing University, China	Aging of Microplastics and the Effects on the Environmental Behaviors of Contaminants in Aquatic Environments
2:20 PM ~ 2:40 PM	Prof. Defu He East China Normal University, China	Microplastics in Terrestrial Environments
2:40 PM ~ 3:00 PM	Prof. Sutha Khaodhir Chulalongkorn University, Thailand	Materials Flow Analysis to Promote Circular Economy Development: A Case Study on Post-Industrial Plastic Waste in Thailand
APRU SWM Student Presentations		Chair: Prof. Cheng Gu, Nanjing University, China
3:00 PM ~ 3:15 PM	Yoora Cho Korea University, Korea	Microplastics as Emerging Contaminants in the Environment
3:15 PM ~ 3:30 PM	Chao Wang Nanjing University, China	Enhanced Alteration of Poly(vinyl chloride) Microplastics by Hydrated Electrons Derived from Indole-3-acetic acid Assisted by a Common Cationic Surfactant
3:30 PM ~ 3:45 PM	Virin Kittithammavong, Chulalongkorn University, Thailand	Overview of Municipal Waste Characterization and Analysis in Thailand
3:45 PM ~ 4:00 PM	**Live Q & A and Panel Discussion** Session Chair: Prof. Yong Sik Ok, Korea University, Korea Panelists: Prof. Cheng Gu, Nanjing University, China Prof. Defu He, East China Normal University, China Prof. Sutha Khaodhir, Chulalongkorn University, Thailand Prof. Xiaonan Wang, National University of Singapore, Singapore	

This session is available on APRU YouTube channel:
https://www.youtube.com/watch?v=nBOIS6n7MhI&feature=youtu.be

February 23rd (Tuesday) (KST)

Session Biochar for Sustainable Development

APRU SWM Plenary Speakers		**Chair: Prof. Yong Sik Ok, Korea University, Korea**
2:00 PM ~ 2:20 PM	Prof. Xiaonan Wang National University of Singapore, Singapore	AI And Machine Learning Methods in Sustainable Environment and Waste Management
2:20 PM ~ 2:40 PM	Prof. Hwai Chyuan Ong University of Technology Sydney, Australia	Bioformulation of Biochar as a Potential Inoculant Carrier for Sustainable Agriculture
APRU SWM Student Presentations **Chair: Prof. Xiaonan Wang, National University of Singapore, Singapore**		
2:40 PM ~ 2:55 PM	Shuang Song E2S2-CREATE program, National University of Singapore, Singapore	Biochar for Urban Agriculture: Impacts on Soil Chemical Characteristics and on Vegetable Growth, Nutrient Content and Metabolism Over Multiple Growth Cycles
2:55 PM ~ 3:10 PM	Manu Suvarna National University of Singapore, Singapore	Machine Learning Framework for Biochar Design with Pre-Determined CO2 Adsorption
3:10 PM ~ 3:25 PM	Li Lanyu National University of Singapore, Singapore	Optimal Design of Negative Emission Hybrid Renewable Energy Systems with Biochar Production
3:25 PM ~ 4:00 PM	**Live Q & A and Panel Discussion** Session Chair: Prof. Yong Sik Ok, Korea University, Korea Prof. Xiaonan Wang, National University of Singapore, Singapore Panelists: Prof. Hwai Chyuan Ong, University of Technology Sydney, Australia	

3rd Sustainable Waste Management Conference

Date: May 18-21, 2021

This conference will offer a timely opportunity for knowledge exchange among professionals all over the world to support the formulation of an efficient sustainable waste management agenda.

This year's conference encompasses a diverse range of topics including:

- Waste to Energy
- Circular Economy
- Food Waste
- System Modeling
- Low Carbon Technology
- Biochar
- Plastics and Sustainability
- Wastewater Treatment and Recycling

Link: https://www.aiche.org/ifs/conferences/sustainable-waste-management-conference/2021

Nature Conference: Waste Management and Valorisation for a Sustainable Future

Date: October 26-28, 2021

nature conferences

Home Registration Agenda Speakers Abstracts Travel Organizers

The development of sustainable waste management strategies has become a major concern throughout the world. Thus, this program focuses on “recycling” and “recovery” of waste material while paving the way towards circular economy, land reclamation, and water and wastewater treatments. This program will offer a timely opportunity for knowledge exchange among professionals from all over the world to assist the formulation of an efficient sustainable management agenda for biological waste and remediation of soil, water and air in the local context, which satisfies the environmental compatibility, financial feasibility and social needs. It will deliberate on state-of-the-art treatment technologies, advanced management strategies, and political issues pertaining to recycling and recovery of organic waste. Moreover, local and overseas experts from different sectors including academic researchers, industrial practitioners, green groups, and government departments will be gathered in this program to solicit scientific and technical inputs as well as political feedback, facilitating the development of integrated solutions. Experienced industrial practitioners, professional organizations, green groups, as well as government officers are invited to the conference.

This conference aims to provide a forum to present research in regards to:

- Sustainable Waste Management
- Micro(nano)plastics in the Environments
- Electronic Waste and Circular Economy
- Reducing, Recycling and Recovery of Agricultural and Food Waste
- Biomass Valorization: Waste to Resources
- Governmental Policy on Waste Management and Valorization

Website: https://conferences.nature.com/WasteManagement

APRU Sustainable Waste Management

Introduction and overview of APRU Sustainable Waste Management Program

Waste such as food waste, yard waste, agricultural waste, sewage sludge, industrial waste, and e-waste imposes critical burdens on the environment, consuming precious land resources, and aggravating global warming. Currently, waste management has become a major challenge for most countries throughout the world. Deposition of waste in residential areas, uncontrolled landfills, illegal dumping of waste to waterways, and marine environment results in severe land, water, and air pollution causing tremendous negative impacts not only for humans but also for floral and faunal diversity in ecosystems. Hence, the development of sustainable waste management strategies has become a major concern throughout the world. Thus, this program focuses on “recycling” and “recovery” of waste material while paving the way towards soil remediation, land remediation, and groundwater remediation with water and wastewater treatments.

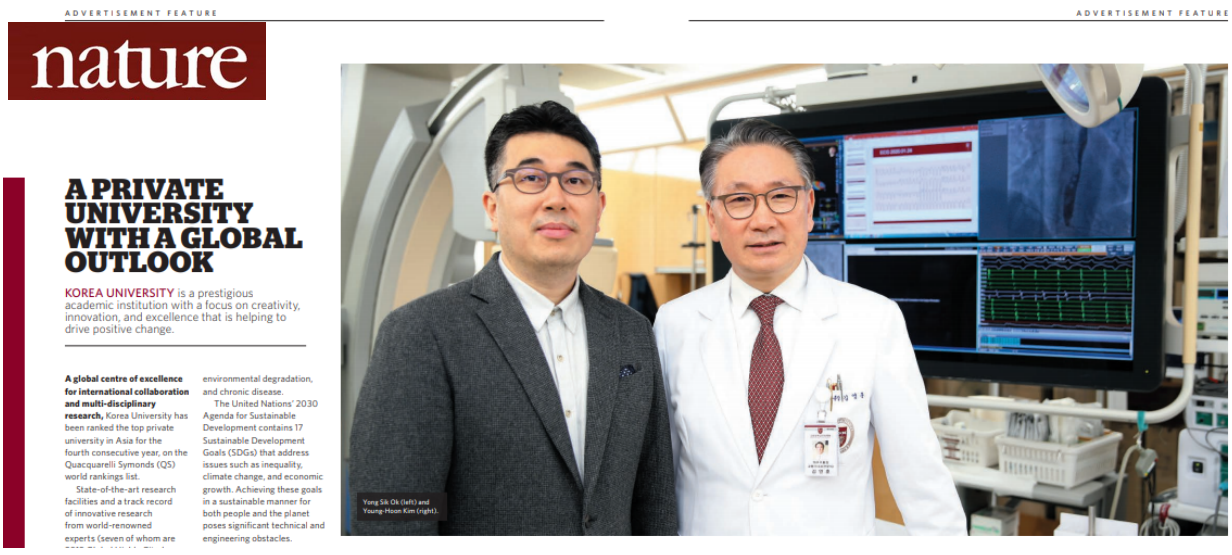
This program will offer a timely opportunity for knowledge exchange among professionals all over the world to assist the formulation of an efficient sustainable management agenda for organic waste and remediation of soil, land, and groundwater in the local context, which satisfies the environmental compatibility, financial feasibility, and social needs. It will deliberate the state-of-the-art treatment technologies, advanced management strategies, and political issues pertaining to recycling and recovery of organic waste.

Moreover, local and overseas experts from different sectors including academic researchers, industrial practitioners, green groups, and government departments will be gathered in this program to solicit scientific and technical inputs as well as political feedback, facilitating the development of integrated solutions. Experienced industrial practitioners, professional organizations, green groups, as well as government officers are invited to the conference.

The program is hosted by the Korea University (Seoul, Korea) together with APRU and supported by APRU member universities as well as non-APRU universities including Stanford University in USA, Nanyang Technological University in Singapore, National University of Singapore in Singapore, University of Queensland in Australia, Chulalongkorn University in Thailand, Fudan University in China, Nanjing University in China, University of Technology Sydney in Australia, The University of Sydney in Australia, and National Taiwan University in Taiwan.

Website: https://apru.org/our-work/pacific-rim-challenges/sustainable-waste-management/

APRU's SWM Program Highlighted in Nature's May Issue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nature

A PRIVATE UNIVERSITY WITH A GLOBAL OUTLOOK

KOREA UNIVERSITY is a prestigious academic institution with a focus on creativity, innovation, and excellence that is helping to drive positive change.

A global centre of excellence for international collaboration and multi-disciplinary research, Korea University has been ranked the top private university in Asia for the fourth consecutive year, on the Quacquarelli Symonds (QS) world rankings list.

State-of-the-art research facilities and a track record of innovative research from world-renowned experts (seven of whom are

environmental degradation, and chronic disease.

The United Nations' 2030 Agenda for Sustainable Development contains 17 Sustainable Development Goals (SDGs) that address issues such as inequality, climate change, and economic growth. Achieving these goals in a sustainable manner for both people and the planet poses significant technical and engineering obstacles.

Yong Sik Ok (left) and Young-Hoon Kim (right).

ADVERTISEMENT FEATURE

We are proud to note that Nature, the world's leading multidisciplinary science journal, in its latest issue highlighted key experts from Korea University, including Korea University's Global Research Director Yong Sik Ok for his role as the leader of the APRU Sustainable Waste Management Program. Read the full post on Nature, today.

The program, inaugurated at Korea University in December 2019, focuses on the technical challenges for the recycling and recovering of waste materials while paving the way towards a circular economy, land reclamation, and water and wastewater treatments. It will feed into the Nature Conference on Waste Management and Valorization for a Sustainable Future, to be hosted by Ok in Seoul in October 2021.

"Waste management on the land and the seas has become a major national, regional, and global challenge," Nature quoted Ok as saying.

"We need to develop better strategies for more effectively managing our waste, which not only seek to reduce waste but also seek to derive value from the waste we generate through, for example, the conversion of waste to energy and value-added products such as biochar," Ok added.

Nature went on to highlight Korea University's success in creating the next generation of solar cells and helping the world transition to more efficient and cleaner renewable energy technologies. Research by Korea University's Associate Professor in Architectural and Social Engineering Jun Hong Noh has been focused on developing solar cells made from perovskite, a mineral with a hybrid organic-inorganic structure. Perovskite solar cells are not only more efficient, lighter, cheaper, and easier to produce than conventional silicon-based cells, they can also be made into flexible devices.

Nature also featured Korea University's research on atrial fibrillation; the pioneering work of Young-Hoon Kim, Vice President, Professor and Executive Director of the Cardiovascular Center at Korea University Anam Hospital, has led to improved diagnoses and treatments.

Nature furthermore highlighted Korea University's prowess in developing state-of-the-art imaging techniques, such as coherent multidimensional spectroscopy, which has allowed scientists to capture real-time images of the high-speed chemical reactions that occur at the molecular level.

APRU Sustainable Waste Management Program leader Ok was the first Korean to be selected as a Highly Cited Researcher (HCR) in the field of Environment and Ecology by the Web of Science's HCR index with 60 Highly Cited Papers and Hot Papers.

Korea University has been ranked the top private university in Asia — for the fourth consecutive year — on the Quacquarelli Symonds (QS) world rankings list.

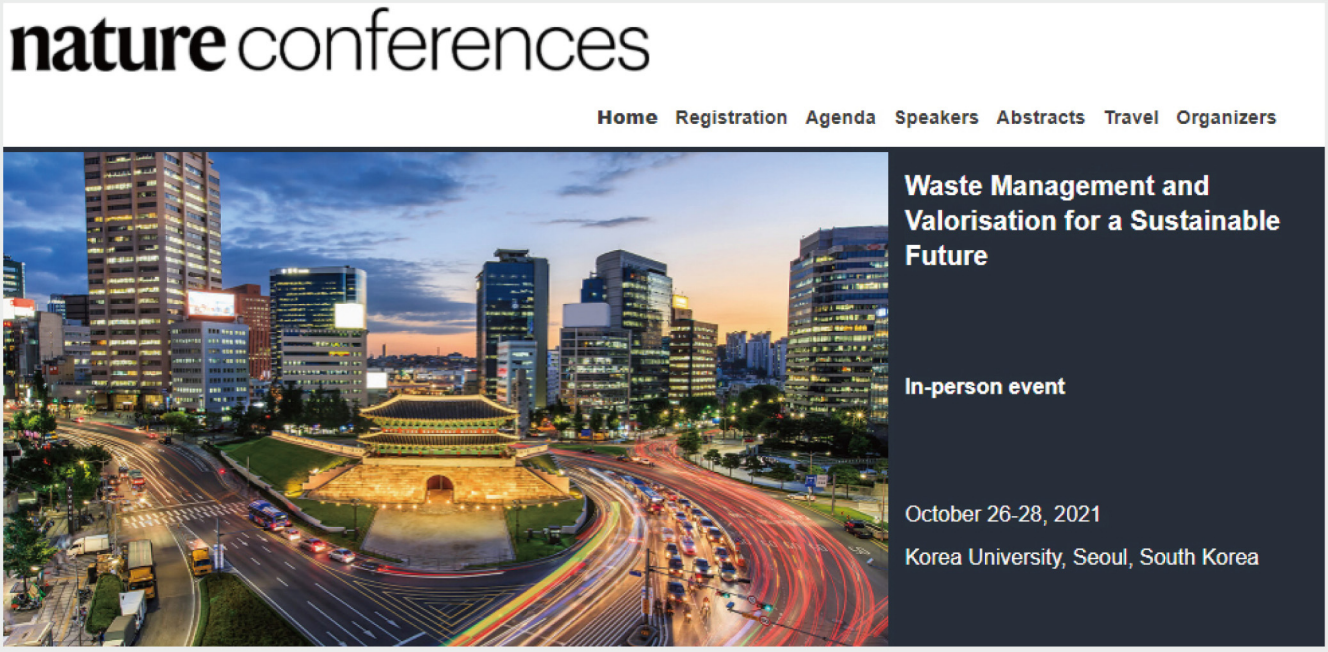
URL: https://www.nature.com/articles/d42473-020-00128-6

APRU Sustainable Waste Management

KOREA UNIVERSITY

Stanford University

NANYANG TECHNOLOGICAL UNIVERSITY



Association of Pacific Rim Universities (APRU) Sustainable Waste Management

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