ABOUT US

Vision
Established in 2009, the School of Energy and Environment (SEE) at City University of Hong Kong aims to be a leading School in the Asia-Pacific region specializing in cutting-edge research in energy and environment and in the training of energy and environment professionals.

Mission
• Advancing research in targeted themes of benefit to societal needs in energy, environment, and sustainability;
• Educating engineers and professionals at undergraduate and graduate levels adopting holistic approaches which provide innovative solutions to local and regional problems in energy, environment, and sustainability;
• Maintaining a collaborative and supportive atmosphere for students, faculty, alumni and other stakeholders in advancing our interdisciplinary research and educational objectives.

Academic Programs

Undergraduate Programs

<table>
<thead>
<tr>
<th>Major Programs</th>
<th>Minor Programs</th>
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<tbody>
<tr>
<td>• Major in Energy Science and Engineering</td>
<td>• Minor in Atmospheric and Climate Science</td>
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<tr>
<td>• Major in Environmental Science and Engineering</td>
<td>• Minor in Energy Technology</td>
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<td>• Minor in Sustainability</td>
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</tbody>
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Postgraduate Programs

<table>
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<tr>
<th>Research Degree Programs</th>
<th>Taught Postgraduate Program</th>
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<tbody>
<tr>
<td>• Master of Philosophy (M.Phil.)</td>
<td>• Master of Science in Energy and</td>
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<td></td>
<td>Environment (M.Sc.)</td>
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<tr>
<td>• Doctor of Philosophy (Ph.D.)</td>
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Student Population*

| Undergraduate Students: 291 | M.Sc. Students: 86 | Ph.D. Students: 90 |

(* as of September 2019)

Faculty
The School has 25 full-time faculty members, including 2 Chair Professors, 2 Professors, 7 Associate Professors and 14 Assistant Professors, as well as a Visiting Professor.
Research Overview

Energy

- Energy Efficiency & Building
- Renewable Energy
- Power Management

Environment

- Climate Change
- Waste to Energy
- Environmental and Energy Policy & Economics
- Atmospheric Science & Air Quality
- Wastewater & Ecosystem
- Waste


- 275 approved research grants
- HK$173M approved funding
- 20+ industrial collaborators including but not limited to CLP, DuPont, Towngas, Sinopec
Dr. Alicia K. J. AN  
Assistant Professor  

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**Biography**

Dr. An received her Ph.D. in Civil and Environmental Engineering from the Hong Kong University of Science and Technology (HKUST). Her dissertation on sludge minimization mechanism in Oxic-Settling-Anaerobic membrane process in wastewater treatment system was well received and cited. Since 2009, Dr. An has extended her research and education career to include Sustainability concepts at the University of Tokyo (UT), Japan. Dr. Alicia An joined the City University of Hong Kong in August 2014 and her research emphasizes the development of emerging membrane technologies and innovative approaches to solve pressing water quality and quantity issues.

**Research Interests**

- Seawater desalination using membrane technology: Reverse osmosis (RO), membrane distillation (MD), forward osmosis (FO), and hybrid process
- Emerging technologies such as MD, FO, and Crystallizer for wastewater treatment and resource recovery
- Membrane fabrication and characterization
- Membrane-based technologies for removing emerging pollutants

**Research Achievements/Industrial Collaborations**

Dr. An is the PI of several competitive external grants such as GRF, ITF, TRS and Contract Research, as well as internal grant such as the ARG. In addition, within City University of Hong Kong, Dr. An is working with Department of Infectious Diseases and Public Health as a Co-I in a grant from the International Development Research Center of Canada. Recently, Dr. An (in Co-PI capacity) was a recipient under the Theme-based Research Scheme 2019/20 (TRS) Funding for Developing a Sustainable Environment. Her research has led to more than 40 papers in top-tier journals. Through her consultancy work, she is collaborating with the Drainage Services Department (DSD) and Water Supplies Department (WSD) of the HKSAR; international consulting firms (Black & Vetch, Mott MacDonald); HK based industries (L Industries, Prime World Limited) and China Everbright International Limited.

**Recent Journal Publications**

Prof. Peter BRIMBLECOMBE
Visiting Professor

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Biography

Professor Brimblecombe went to university in Auckland, New Zealand where he did a Ph.D. on the aqueous chemistry of sulphur dioxide in the atmosphere. He was until recently a Professor in Atmospheric Chemistry at the University of East Anglia, U.K. and has served as a senior editor of Atmospheric Environment in 1990. Professor Brimblecombe was convinced that environmental pollution is not merely a matter of environmental chemistry; the smells have to be smelt. Painting and poetry can be as informative as a scientific description when trying to understand the complexities of environmental problems. Professor Brimblecombe admires detective writers; no crap and their hearts are in the right place. The title of his book, The Big Smoke was meant remind us of Philip Marlowe in The Big Sleep, so he was pleased when this academic book was reviewed as “reading like a thriller”. Recently he has been thinking much about the representation air pollution in cinema in films such as Blade Runner. Professor Brimblecombe enjoys Hong Kong as it offers great potential to explore the way we are exposed to air pollutants and consider how such exposures might be reduced.

Research Interests

• Long-term changes in urban air pollution and its effects on health and materials
• The statistical structure of air pollution monitoring data and its implications to policy
• Impact of climate change on historic sites and their use
• Microplastics at the sea surface and in the air

Research Achievements/Industrial Collaborations

Current work with Asia Pacific Air Quality Group Pte Ltd in Singapore aims to develop courses on Managing Air Quality in Urban Micro-Environments as part of an Air Quality Academy to train administrators and planners in South East Asia to utilise research data in civic planning.

Recent Journal Publications


• Xing, Y. and Brimblecombe, P., 2019. Role of vegetation in deposition and dispersion of air pollution in urban parks. Atmospheric Environment, 201, pp.73-83.


Biography

Professor Chan obtained BSc in Chemical Engineering from the University of Texas at Austin in 1986 and Ph.D. in Chemical Engineering from the California Institute of Technology in 1992. He is currently Dean and Chair Professor in School of Energy and Environment at City University of Hong Kong. He joined the Hong Kong University of Science and Technology (HKUST) as Assistant Professor in 1992 and rose to the rank of Professor in 2006. In 2010, he was appointed Founding Head of Division of Environment. He joined City University of Hong Kong in 2015.

Professor Chan has over 30 years of research experience in air pollution and aerosol science. He specializes in aerosol water uptake and phase transformation, gas-aerosol interactions and the formation of secondary aerosols in the atmosphere, and laser spectroscopy of aerosols. He was Science Advisor to Secretary of Environment, during his sabbatical at the HKSAR Environment Bureau in 2014. He has been an Editor-in-Chief of *Atmospheric Environment* since 2008. He has published over 200 papers with total SCOPUS citations of over 11,000 to date.

Research Interests

- Aerosol Chemistry: aerosol hygroscopic growth and phase transformation, formation of secondary pollutants, gas-particle interactions and equilibria, heterogeneous reactions
- Air Pollution: source identification, PM2.5, aerosol size distribution, vehicular and cooking emissions
- Micro-droplet laser spectroscopy

Research Achievements/Industrial Collaborations

- Haagen Smit Award of *Atmospheric Environment* in 2015
- Second Prize of the State Natural Science Award in 2010
- First Prize of the Natural Science Award in 2007
- First winner of the Asian Young Aerosol Scientists Award in 2004

Recent Journal Publications

**Biography**

Professor Johnny Chan obtained his bachelor and master degrees in physics from the University of Hong Kong and his Ph.D. in atmospheric science from Colorado State University in the US. After being a US National Research Council Post-doctoral Research Associate and then an Adjunct Research Professor at the US Naval Postgraduate School, he returned to Hong Kong and joined the then Royal Observatory Hong Kong as a Scientific Officer. In 1989, he began his academic career as a Senior Lecturer at the then City Polytechnic of Hong Kong (now the City University of Hong Kong) where he is now Chair Professor of Atmospheric Science and Director of the Guy Carpenter Asia-Pacific Climate Impact Centre. He was also the Founding Dean of the School of Energy and Environment of City University of Hong Kong. Between 2002 and 2008, he served as the Director of the Shanghai Typhoon Institute of the China Meteorological Administration.

Professor Chan is internationally renowned in the research areas of typhoons and monsoons. Recently, he has also started to work on tidal energy converters in low-flow environments for off-grid applications. He has published over 210 international journal articles and given more than 250 invited talks and conference presentations.

**Research Interests**

- Tropical cyclone dynamics, modelling and climate
- Urbanization and climate change
- Climate risk and resilience
- Tidal energy conversion in low-flow environments

**Research Achievements/Industrial Collaborations**

- Honorary Fellow, Energy Institute, UK
- International Journal of Climatology Prize, awarded by the Royal Meteorological Society, UK
- Fellow, American Meteorological Society
- Senior Research Fellowship awarded by the Croucher Foundation.

**Recent Journal Publications**

Dr. Shauhrat S. CHOPRA
Assistant Professor

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Biography
Dr. Shauhrat S. Chopra obtained his Integrated Masters of Science in Systems Biology from the University of Hyderabad, India in 2011. He received his Ph.D. in Civil and Environmental Engineering from the Swanson School of Engineering at the University of Pittsburgh, USA, in 2015. His doctoral dissertation was focused on resilience of complex systems including economic systems, industrial symbiosis, and critical infrastructure systems at urban and national levels. Before joining the School of Energy and Environment, Shauhrat worked as a Postdoctoral Researcher at the Institute for Environmental Science and Policy, University of Illinois at Chicago, on the U.S. EPA funded LCnano project focused on sustainable design of future transformative nano-enabled products. His data-driven research is focused on designing indicators for sustainability and resilience of the built environment in support of environmental decision-making.

Research Interests
• Resilience Urban Transportation Infrastructure
• Industrial ecology and symbiosis
• Life cycle assessment (LCA) for emerging materials and technology
• Food production systems
• Ecosystem goods and services management

Research Achievements/Industrial Collaborations
• Sustainable Kitchens: A Certification Programme (9231356) funded under 2019 Global Consortium of Sustainability Outcomes (GCSO) Grant Program
  Principal Investigator: Dr. Chopra Shauhrat Singh (SEE)
  Co-Investigators: Prof. WHARTON Christopher (Arizona State University), Prof. CHAN Chak Keung (SEE), Ms. ALLEN Julie (King’s College, London), Ms. FAHY Samantha (Dublin City University)
• Network-Based Resilience Assessment of the Multi-Modal Public Transport System in Hong Kong (9048170) funded through 2019 UGC Early Career Scheme
  Principal Investigator: Dr. Chopra Shauhrat Singh (SEE)

Recent Journal Publications

School of Energy and Environment
Dr. Walid DAOUD
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Biography
Dr. Daoud is Associate Dean (Research and Graduate Studies) and Associate Professor in the School of Energy and Environment. He graduated from the University of Technology Graz, Austria, with a Dipl-ing degree (BS and MS) in Chemical Engineering and received his Ph.D. in bilayer photovoltaic cells from the University of Sheffield, UK. In 2002, he joined the Hong Kong Polytechnic University, where he played a substantial role in the establishment of a Nanotechnology Center in 2003 and took up a lectureship in 2005. In 2007, he moved to Monash University to take up a lecturer post and was promoted to senior lecturer in 2010. He joined City University of Hong Kong in the School of Energy and Environment in 2012.

Dr. Daoud’s current research is mainly focused on the areas of renewable energy conversion and storage and wearable energy technologies including device fabrication and efficiency characterization. His group is developing materials and devices for harvesting free or waste energy, such as light and kinetic energies. Being intermittent sources, it is equally important to find storage solutions for renewable energy. Therefore, the group is also interested in the modelling and fabrication of compatible energy storage flow batteries. He has received international renown and several awards for his pioneering work on solar self-cleaning and kinetic energy harvesting technologies. His research has featured in Nature (2004) and Science (2008) and the international press, such as Reuters (2014), BBC (2015) and SCMP (2017).

Research Interests
• Materials and devices for harvesting light and kinetic energies
• Hybrid nanogenerators for self-powered wearable electronics
• Flexible organic based photovoltaics
• Renewable energy compatible energy storage flow batteries
• Solar wearable self-cleaning nanotechnology

Research Achievements/Industrial Collaborations
• Development of a Power Management-Integrated Multifaceted Human Body Kinetic Energy Harvesting System (Sponsor: Shenzhen Science, Technology and Innovation Commission)
• Development of Visible Light Self-cleaning Cashmere Yarn and Sweater (Sponsor: Innovation Technology Commission, HKSAR)

Recent Journal Publications
• Wang L, Daoud WA (2019), Highly Flexible and Transparent Polyionic-Skin Triboelectric Nanogenerator for Biomechanical Motion Harvesting, Advanced Energy Materials, 9, 1803183.
Biography

Dr. Dong Liang obtained his B.E. in Environmental engineering from Tsinghua University, China, and Ph.D. in Urban Environmental Studies from Nagoya University, Japan. Before joining City University of Hong Kong, he worked in National Institute for Environmental Studies, Japan, and Institute of Environmental Sciences (CML), Leiden University, Netherlands, in the field of industrial ecology, circular economy and low-carbon & eco-city planning. He also actively engaged in providing broad academic services, like consulting to UN-ESCAP, Energy Foundation and many local stakeholders of Industrial and Urban planning, to forward circular, eco and low-carbon urban transition in EU, Asia-Pacific and globe.

Research Interests

- Urban sustainability and Sustainable Urban Planning
- Environmental management & Policies
- Industrial Ecology and Environmental system analysis
- Eco-industrial development (EID) and Eco-industrial parks (EIPs)
- Low-carbon city, Eco-city and Smart city

Research Achievements/Industrial Collaborations

- Novel and integrated planning and assessment model supporting eco and low-carbon city planning;
- Holistic urban metabolism and environmental system analytical tool, integrating EEIOA, LCA and process analysis;
- Applied in sustainable urban initiatives in Japan (eco and environmental future cities), China (low-carbon and circular cities), and Europe (smart cities);
- Sound collaborations with industrial managers, consulting companies and urban planners like CCID, EY and eco-industrial parks' managers.

Recent Journal Publications

Biography

Dr. Yuhe He obtained his Bachelor degree in Applied Biology and M.Phil. degree in Environmental Science at City University of Hong Kong. He moved to Canada and obtained his Ph.D. degree under supervision of Prof. John Giesy at University of Saskatchewan. His work focused on toxicological assessment on Oil Sands Process-affected Water (OSPW). After that, he worked with Prof. Greg Goss at University of Alberta on several aquatic contaminant assessment projects, including hydraulic fracturing flowback and produced water (HF-FPW), nanomaterial and nanopesticide, brominated flame retardants, and other emerging contaminants, using a variety of aquatic invertebrate and fish models. He joined City University of Hong Kong in 2019, and his current research focuses on the environmental fate and impact of emerging organic pollutants in marine ecosystems.

Research Interests

- Aquatic ecotoxicology
- Emerging organic contaminants
- Molecular and cellular toxicology
- Small fish models

Research Achievements/Industrial Collaborations

- Informing best practices for hydraulic fracturing in Alberta: Water sources and characterizing the toxicity of produced fracturing fluid – project funded by National Sciences and Engineering Research Council (NSERC) and Encana Corporation.
- Assessing the environmental safety and potential ecotoxicological effects of municipal wastewater effluent treated by Advanced Oxidation System - project funded by National Sciences and Engineering Research Council (NSERC) and BioLargo Inc.

Recent Journal Publications

Dr. Sam H. Y. HSU
Assistant Professor

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Biography
Dr. Sam H. Y. Hsu obtained his Ph.D. degree under supervision of Prof. Kirk S. Schanze at University of Florida with focusing on photophysical behaviors of functional metallopolymer materials for solar energy and optoelectronic applications. After that, he received the two-year postdoctoral and research associate’s appointments respectively with Prof. Allen J. Bard and Prof. Edward T. Yu in Center for Electrochemistry as well as Department of Electrical and Computer Engineering at University of Texas at Austin. During the period of his postdoc and research associate, he completed many outstanding multidisciplinary projects. The area of his expertise stretches from material design to new related disciplines involving material characterization and diverse applications, such as solar fuels, organic and inorganic photovoltaic cells, wastewater treatment and food waste management.

Research Interests
- Energy engineering (solar fuels, photovoltaics and optoelectronic devices)
- Environmental engineering (wastewater treatment, food waste treatment)
- Materials design (e.g. organometallics, alloy, bio-materials, nanomaterials, perovskites and metallopolymer)
- Photophysics, photochemistry, electrochemistry and photoelectrochemistry

Research Achievements/Industrial Collaborations
- Hybrid perovskite photovoltaic devices for electricity generation
- Photoelectrochemical solar fuel devices for energy production
- Bio-photoelectrochemical hybrid devices for wastewater treatment and hydrogen generation
- Microbial photoelectrochemical cell for food waste treatment

Recent Journal Publications
With interests in combating climate change and environmental pollution, Dr. Lam’s research aims to mitigate global dependence on fossil resources by promoting the production of sustainable energy and chemicals.

As a Postdoctoral Fellow at Yale University, he developed a protocol to convert crude glycerol, a biodiesel refinery waste product, into lactic acid, a building block for biodegradable plastics. For his doctoral work at Michigan State University, Dr. Lam examined electrochemical strategies to convert biomass into liquid fuels.

Outside of lab work, Dr. Lam is an educator and an environment enthusiast. He has mentored numerous undergraduate researchers at MSU and Yale, as well as high school students in the MSU High School Honours Science Program (HSHSP). Dr. Lam has also been invited to design and teach an online certificate program on the practice of green chemistry to a diverse body of professional students in the University of Washington’s Continuing Education Programs. Dr. Lam recently taught at Wesleyan University for a year before joining the School of Energy and Environment of City University of Hong Kong in 2019.

Research Interests

- Industrial Waste and Biomass Valorisation
- Electrocatalysis for Organic Transformation
- Green Chemistry
- Catalyst Design and Synthesis
- Sustainable and Renewable Energy Storage

Research Achievements/Industrial Collaborations

- Collaborated and developed an electrocatalytic upgrading strategy to improve the energy content and chemical stability of biomass fast-pyrolysis oil (Bio-oil)
- Developed a mild electrochemical method to convert biodiesel crude glycerol waste into lactic acid
- Published several top-tier peer-reviewed journals and obtained 2 patents

Recent Journal Publications

Dr. Patrick K. H. LEE  
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Associate Professor  
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Biography
Dr. Lee is interested in solving biologically-related energy and environmental problems. His academic background is in biochemical engineering, environmental engineering and microbiology. He often works at the interface of fundamental and applied sciences. While Dr. Lee is interested in understanding microbiology at the molecular and cellular levels, it is also his goal to apply the fundamental findings in engineering applications to solve real-world problems. His research involves using experimental and computational systems biology approaches to study complex microbial communities or microbiome. Dr. Lee also applies molecular and engineering techniques to engineer model and non-model bacteria to produce value-added products.

Research Interests
- Biotechnology and microbiology
- Environmental microbiome
- Production of value-added products

Research Achievements/Industrial Collaborations
- Special Recognition Award, World Cultural Council (WCC), 2018
- Achievement Award, Bioenergy Society of Singapore, 2018
- Outstanding Supervisor Award, City University of Hong Kong, 2018
- The President's Awards, City University of Hong Kong, 2016
- Natural Sciences and Engineering Research Council Post-doctoral Fellowship, Canada, 2009

Recent Journal Publications
Prof. Michael K. H. LEUNG
Professor
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Biography
Prof. Michael Leung is a Professor in SEE and also the Director of Ability R&D Energy Research Centre (AERC) at City University of Hong Kong. His primary research interests include photocatalysis, fuel cell and advanced refrigeration/air-conditioning. Prof. Leung has totally received HK$40M+ research funding as a PI. He has published 150+ refereed journal papers. He is listed as a highly cited scholar in energy science and engineering. Prof. Leung is also a Registered Professional Engineer, Chartered Engineer, Chairman of HKIE Education and Examinations Committee, Past Chairman of the Energy Institute (Hong Kong Branch) and Editor of Applied Energy and HKIE Transactions.

Research Interests
• Solar Photocatalysis
• Fuel-cell Electrochemistry
• Advanced Refrigeration and Air-Conditioning

Research Achievements/Industrial Collaborations
• Highly Cited Researchers 2018 by Clarivate Analytics that recognizes world-class researchers selected for their exceptional research performance.
• The Most Cited Researchers in Energy Science and Engineering for ShanghaiRanking’s Global Ranking of Academic Subjects by Elsevier.

Recent Journal Publications
• Yun He, Ronghua Yuan, Michael K.H. Leung, Highly efficient AgBr/BiVO4 photoanode for photocatalytic fuel cell, Materials Letters, 2019, 236:394-397.
Dr. Wanxin Li
Associate Professor

Biography
Dr. Wanxin Li has worked with the World Bank, OECD and Tsinghua University in the past. Her research focuses on policy experimentation and evaluation for advancing environmental governance and quality of life in China. In addition to the research community, Dr. Li’s work also speaks directly to policy-makers. Single authored the OECD 2009 report entitled “Eco-innovation policies in the People’s Republic of China”. Being invited to speak at forums such as the Policy Dialogue with the Ministry of Environmental Protection in Beijing, the OECD International Conference on Environmental Compliance Assurance in Paris, the Trade and Environment Session of the WTO 2011 Public Forum in Geneva, and others. Specialties include policy design; policy analysis and evaluation; governance; and research methods.

Research Interests
- Policy design / experimentation
- Environmental and social governance
- Information transparency
- Subjective well-being
- Science and technology in society

Research Achievements/Industrial Collaborations
- Analytical framework for assessing institutional capacity of government agencies and/or other organizations
- Analytical framework for assessing environmental management tools
- Big data analysis integrating content analysis of policy documents and social media data with statistical analysis of socio-economic data
- Training program for the World Bank Institute on Institutional Strategies for Sustainable Development
- Policy papers and training programs for the EU-China Environmental Governance Programme
- Policy experimentation and evaluation of individual behavioural changes for the Suzhou municipal government, Hong Kong Rugby Union, and City University of Hong Kong

Recent Journal Publications
Dr. Carol Lin
Associate Professor

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Biography
Dr. Carol Lin is currently an Associate Professor in the School of Energy and Environment at the City University of Hong Kong. She was a Visiting Assistant Professor at the Bioengineering Program in the Department of Chemical and Biomolecular Engineering at the HKUST from January 2010 to June 2011. Prior to this, she was a postdoctoral researcher in the research group of Professor Wim Soetaert at the Centre of Expertise – Industrial Biotechnology and Biocatalysis (InBio.be) at the Ghent University in Belgium. She worked in a project titled “Optimisation and scale up for succinate production using genetically modified Escherichia coli”. It was the last phase of a collaborative project titled the “Metabolic engineering and dynamic modelling of Escherichia coli for the production of chemicals from renewable resources” (MEMORE) project.

Carol graduated in Chemical and Materials Engineering from the University of Auckland, New Zealand with a 1st class honours degree. Her Ph.D. was carried out within the Satake Centre for Grain Process Engineering (SCGPE) in the School of Chemical Engineering and Analytical Science at the University of Manchester, England. In collaboration with the Green Chemistry Centre of Excellence at the University of York, her research focused on novel wheat-based biorefining strategies for the production of succinic acid.

Her recent work on ‘Starbucks Biorefinery’ strategy for sustainable production of succinic acid has been highlighted by the American Chemical Society (ACS) in the 244th meeting in Philadelphia, USA as well as in numerous high profile media venues such as Time Magazine (US Edition), BBC News, CNN and the South China Morning Post in Hong Kong.

Dr. Lin is also editorial board member of several biotechnology and energy related journals. She has published over 100 papers with several scientific manuscripts in top impact factor journals including Chemical Society Reviews, Energy and Environmental Sciences; editor of 2 books, co-authored 13 book chapters and published 3 patents. She gave around 100 oral presentations including 12 key-note and 5 plenary talk in the following countries: Australia, Belgium, China, Colombia, France, Germany, Greece, Hong Kong, India, Indonesia, The Netherlands, New Zealand, Portugal, Serbia, Singapore, South Korea, Spain, Switzerland, Taiwan, the UK and USA.

Research Interests
- Biorefinery
- Green and Sustainable Chemistry
- Food waste valorisation
- Nutrient recovery
- Waste and biomass valorisation

Research Achievements/Industrial Collaborations
- Gold Medal at the 46th International Exhibition of Inventions of Geneva (Textile Waste Recycling Using a Biological Method)
- Gold medal with jury’s commendation of the 44th International Exhibition of Inventions Geneva (Conversion of food waste into polylactic acid fibre (PLA))
- RITA Award 2016, The Hong Kong Research Institute of Textile and Apparel (HKRITA)
- PepisoCo Global R&D Research Forum Award

Recent Journal Publications
Dr. Chunhua LIU
Assistant Professor

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Biography
Dr. Chunhua Liu received his B.Eng. and M.Eng. degrees in Automatic Control, Beijing Institute of Technology, China; and Ph.D. degree in Electrical and Electronic Engineering, The University of Hong Kong, in 2002, 2005 and 2009 respectively. Currently, he serves as an Assistant Professor of the School of Energy and Environment, City University of Hong Kong.

Dr. Liu is a Senior Member of the IEEE. He serves as an Associate Editor of IEEE Transaction on Industrial Electronics, Editor of IEEE Transactions on Vehicular Technology, Editor of IEEE Transactions on Energy Conversion. Also, he is an Editor of Energies, Subject Editor of IET – Renewable Power Generation, Subject Editor of Cambridge University – Wireless Power Transfer, Associate Editor of IEEE Chinese Journal of Electrical Engineering, Editor of IEEE Internmag Conferences, respectively. In addition, he is the Founder & Chair of the Hong Kong Chapter, IEEE Vehicular Technology Society. Dr. Liu has published over 100 SCI journal papers and over 60 conference papers, with the Google Citation over 4300 by August 2019.

Research Interests
• Electric Motors & Drives, Electric Generators
• Electrified Transportation Technologies: Electric Vehicles, Aircrafts and Ships.
• Power Electronics & Wireless Power Transfer Technologies
• Renewable Energies and Microgrids.

Research Achievements/Industrial Collaborations
• Development of emerging electric machines and drives for electric propulsion systems of electric robotics, electric ship, electric aircrafts under the grant supports from RGC, ITC, ECF, NSFC, Shenzhen TIC, etc.
• Development of on-board chargers, V2G bidirectional chargers, integrated multifunctional converters, and bidirectional power converters for the industrial bodies and companies.
• Development of wireless power transfer systems, SiC-based integrated motor drives, GaN-based integrated motor drives for industry application.

Recent Journal Publications
Biography

Dr. Theodora Nah received her Hon. B.Sc. in Chemistry and Mathematics from the University of Toronto, and her Ph.D. in Chemistry from the University of California, Berkeley. Prior to joining City University of Hong Kong, she was a postdoctoral fellow at Georgia Institute of Technology, where she worked on the U.S. EPA funded project focused on understanding the effects of ammonia on air quality and climate. Her research program at City University of Hong Kong uses a combination of laboratory, field, and modelling studies to study the air and water pollutants in coastal cities.

Research Interests

- Environmental chemistry
- Aerosol chemistry
- Air and water pollution
- University-Industry-Government Collaboration
- Organic pollutant lifecycles
- Biogeochemical cycles

Research Achievements/Industrial Collaborations

- Source contributions to and effects of aerosol acidity on the composition of acidic aerosols funded through 2019 UGC Early Career Scheme
  Principal Investigator: Dr. Theodora Nah (SEE)
- Invited participant (only 25 selected biennially) in the Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS) XIII

Recent Journal Publications

Dr. Yun Hau NG
Associate Professor

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Biography
Dr. Yun Hau Ng received his Ph.D. from Osaka University in 2009. He spent a brief research stay at Prof. Prashant Kamat (EIC of ACS Energy Letters)’s group at Notre Dame. In 2014, Dr. Ng was appointed as a lecturer in the School of Chemical Engineering, University of New South Wales (UNSW Sydney) and was promoted to a tenured Senior Lecturer in 2016. He joined the City University of Hong Kong in 2018.

Dr. Ng has research interest in the development of novel photoactive semiconductors system for sunlight energy-to-chemicals conversion and storage. Focusing on these topics, he has secured more than HK$25 million research funding from various sources including the Hong Kong Research Grant Council (RGC) and Australian Research Council (ARC). He has published more than 130 peer-reviewed journal articles including well-recognised journals such as Chem. Rev., Chem. Soc. Rev., Energy Environ. Sci., J. Am. Chem. Soc., Angew. Chem. Int. Ed., Adv. Mater., and Adv. Energy Mater. He currently has 11 papers recognised as ESI Top 1% Highly Cited Paper. He has attracted >8000 times of total citation to date. Dr. Ng’s works have been selected as Journal Cover and Frontiespiece in reputable journals, including in Adv. Mater., Adv. Energy Mater., Small, and J. Mater. Chem. A. Dr. Ng has delivered >30 keynote and invited talks at international conferences. He is also serving as a grant reviewer Australian Research Council (ARC), European Research Council (ERC), European Science Foundation (ESF) and etc.

Dr. Ng has received a number of prestigious recognition from the international community. He was recently awarded the 2019 Asia-Pacific Economic Cooperation (APEC) Science Prize for Innovation, Research and Education (ASPIRE). He was also the recipient of The Distinguished Lectureship Award from the Chemical Society of Japan in 2018. In 2013, he was named the Honda-Fujishima Prize winner as the first non-Japanese recipient by the Electrochemical Society of Japan, in recognition of his work in the area of photo-driven water splitting. He is also an Emerging Investigator in Energy Materials selected by RSC J. Mater. Chem. A in 2016.

Research Interests
• Suspension-type nanoparticulate photocatalytic water splitting
• Photoelectrochemical water splitting
• Electrochemical carbon dioxide reduction or conversion assisted with light
• Other photocatalytic reactions for energy and environmental applications

Research Achievements/Industrial Collaborations
• 2019 Asia-Pacific Economic Cooperation (APEC) Science Prize for Innovation, Research and Education (ASPIRE)
• 2018 Distinguished Lectureship Award by the Chemical Society of Japan
• 2017 John A. Brodie Medal by ENGINEERS Australia
• 2016 Emerging Investigator by J. Mater. Chem. (Royal Society of Chemistry)
• 2015 Theo Murphy Frontiers of Science Award, by the Theo Murphy Fund, Royal Society of London
• 2013 Honda-Fujishima Prize, by the Electrochemical Society of Japan

Recent Journal Publications
Dr. Keith NGAN
Assistant Professor

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Biography
Dr. Keith Ngan obtained his B.Sc. in Physics and Chemistry from the University of British Columbia and his M.Sc. and Ph.D. in Physics from the University of Toronto. Subsequently he was a postdoctoral fellow at the University of Chicago and a research associate at McGill University. Before moving to Hong Kong, he worked as a senior scientist in the numerical weather prediction division of the UK Met Office.

His research is focused on the fluid dynamics of the urban environment. It involves building-resolving numerical simulations via computational fluid dynamics, high-resolution atmospheric models, and mathematical modelling. Underlying themes include urban-mesoscale interactions, implications for air quality, and the application of techniques from applied mathematics and large-scale atmospheric dynamics. Recent applied projects include urban ventilation diagnostics and particulate matter in elevated walkway microenvironments. Recent theoretical projects include multiscale modelling of urban flow and dispersion, vortex dynamics for urban canopies, and scalar mixing in urban areas.

Research Interests
- Computational fluid dynamics
- Environmental fluid mechanics
- Numerical weather prediction
- Turbulence
- Urban meteorology

Research Achievements/Industrial Collaborations
- MTR Corporation, Hong Kong Observatory

Recent Journal Publications
Dr. Jin SHANG  
Assistant Professor

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Biography

Dr. Jin Shang obtained his Bachelor (2007) and Master (2009) degrees both in Environmental Engineering at Northeastern University in China and Ph.D. (2013) in Chemical Engineering at the University of Melbourne. His Ph.D. thesis was on the separation of carbon dioxide from flue gas and natural gas streams using porous adsorbent materials. The study discovered a new separation mechanism (i.e., molecular trapdoor mechanism) which changed the conventional understanding of how these adsorbents discriminate between molecules in gases. After his Ph.D., he worked as a research fellow on an Australian Research Council Discovery Project focusing on developing advanced adsorbents at the University of Melbourne. Since 2015, as Co-chief Investigator of Australian Research Council Training Centre for Liquefied Natural Gas Futures, he has been actively participated in research along with major industry partners in oil and gas field. He then moved to Georgia Institute of Technology and worked as a postdoctoral fellow funded by ExxonMobil focusing on restricted gas diffusion in zeolites by advanced molecular simulation, prior to joining the City University of Hong Kong as Assistant Professor in the School of Energy and Environment in 2016.

Dr. Shang specializes in molecular adsorption, separation, and storage using porous materials such as zeolites and metal-organic frameworks. His research is focused on understanding the fundamental physical chemistry of molecular adsorption process via combined experimental and computational methods, in order to rationally develop high-performance adsorbents. The target applications include carbon capture and utilization, methane purification from nature gas/biogas/landfill gas, nitrogen oxides removal and abatement, volatile organic compounds removal, energy gas storage, etc. As of September 2019, Dr. Shang has published over 52 papers in journals such as Nature Communications, Journal of the American Chemical Society, Advanced Science, Advanced Materials, Advanced Functional Materials, Nano Letters, Chemical Communications, Chemical Engineering Journal, etc.

Research Interests

- CO₂ capture
- Nature gas/biogas/landfill gas purification
- Low temperature NOx removal
- VOCs (volatile organic compounds) removal
- NH₃ removal
- CO removal
- Paraffin/olefin separation
- Gas storage
- Chemical sensing

Research Achievements/Industrial Collaborations

- Finalist of 2015 Win-in-Suzhou Start-up Competition Oceania, Australia
- Finalist of UNSW Energy Future Collaborative Innovation Award 2014, Australia
- The Chancellor’s Prize for Excellence in the Ph.D. Thesis, The University of Melbourne, Australia, in 2013
- Collaboration with Chevron in developing zeolite molecular sieves as adsorbents for industrial gas separations.

Recent Journal Publications

Dr. Patrick Sit
Associate Professor

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Biography
Dr. Patrick Sit is an Associate Professor at the School of Energy and Environment at the City University of Hong Kong. He received his undergraduate degree in Physics from the University of Oxford and Ph.D in Physics from MIT. Prior to joining City University of Hong Kong, he was an associate research scholar in the Department of Chemistry at Princeton University and a post-doctoral associate in the Department of Chemistry at the University of Pennsylvania.

Research Interests
- Density functional theory and first-principles (ab initio) molecular dynamics study and design of catalysts for energy storage and conversion.
- Stability and surface reactions of hybrid inorganic-organic perovskite materials.
- Graphite intercalation compounds in dual-ion batteries.
- Catalysts for NOx abatement
- Redox chemistry of transition metal-containing compounds.
- Ab initio molecular dynamics study of structural and dynamical properties of liquid systems.
- Methodology Development

Research Achievements/Industrial Collaborations
- Addressed the critical stability issue of the state-of-the-art perovskite solar cells through systematic study of the atomic-scale details of the perovskite degradation processes.
- Study and development of an electrocatalyst called cobaloxime to replace platinum as the next-generation hydrogen-producing catalyst for energy storage.
- Investigated the roles of different components in a novel class of rechargeable batteries called dual-ion batteries.
- Developed Oxidation-State Constrained Density Functional Theory (OS-CDFT), a novel theoretical approach which allows accurate and efficient study of electron-transfer processes.

Recent Journal Publications
Dr. Edwin C. Y. TSO
Assistant Professor

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Biography
Dr. Tso received his Bachelor’s degree in Mechanical Engineering with 1st class honors, M.Phil degree in Environmental Engineering and Ph.D. degree in Mechanical Engineering from The Hong Kong University of Science and Technology in 2010, 2012 and 2015, respectively. From 2015 to 2016, he served as Research Associate at the Department of Mechanical and Aerospace Engineering (MAE), HKUST. From 2016 to 2018, he was a Research Assistant Professor at the MAE, HKUST and a Junior Fellow at the HKUST Jockey Club Institute for Advanced Study. Dr. Tso joined the City University of Hong Kong as Assistant Professor in the School of Energy and Environment in 2018.

Research Interests
• Thermofluid
• Energy and Built Environment
• Heat Transfer
• Energy Efficient Building Technology

Research Achievements/Industrial Collaborations
• A daytime passive radiative cooler inspired by the Saharan silver ants has been developed, reducing the ambient air temperature by about 6 °C in Hong Kong climate.
• An adsorption cooling system has been built with a specific cooling power of 400 W/kg.
• A thermochromic smart window has been fabricated, exhibiting an average luminous transmittance of 62.5% and a solar modulation ability up to 25.4%.

Recent Journal Publications
Dr. Xuan WANG
Assistant Professor

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Biography
Dr. Xuan Wang received his B.Eng. (Environmental Engineering) in 2009 from Nankai University and M.Sc. (Environmental Science and Engineering) in 2012 from Tsinghua University. He obtained his Ph.D. (Environmental Chemistry) from Massachusetts Institute of Technology in 2017. After completing his Ph.D., he worked as a postdoctoral researcher at Harvard University. He joins the City University of Hong Kong in 2019.

Research Interests
• Atmospheric chemistry and physics
• Mathematical modelling for Environmental and Earth Science
• Aerosol effects on global and regional climate
• Strategies for Mitigating Air Pollution

Research Achievements/Industrial Collaborations
• Chlorine chemistry mechanism for atmospheric chemical transport models
• Carbonaceous aerosols model scheme for climate models
• Estimation of direct warming effect of atmospheric soot, which is highlighted by Nature as important scientific evidence for climate policy making.

Recent Journal Publications
Dr. Wei Wu received his Bachelor’s degree from the Department of Building Environment and Energy Engineering at Huazhong University of Science and Technology in 2010. He obtained his Ph.D. degree from the Department of Building Science at Tsinghua University in 2016. He was formerly a visiting scholar of the Center for Environmental Energy Engineering at University of Maryland in 2013. Since 2016, he served as a guest researcher of the Energy and Environment Division at the National Institute of Standards and Technology. He joined the City University of Hong Kong as an Assistant Professor in the School of Energy and Environment in July 2018.

Dr. Wu’s research is focused on sustainable building energy technologies. Aiming to mitigate the energy use and environmental impact in building sector from widened and deepened perspectives, his research work has been conducted at multi-levels: (1) investigating merits and potentials of alternative working fluids for heat pumps; (2) proposing a cluster of technologies for performance improvement of heat pumps; (3) exploring design and optimization methods of HVAC systems in net-zero energy buildings. He has obtained 9 patents, and he is now preparing a book titled Absorption Heating Technologies: Efficient Heating, Heat Recovery and Renewable Energy for Springer.

Research Interests
- Novel absorption heating and cooling technologies
- Renewable/waste energy utilization and storage technologies
- Advanced heat pump technologies; Natural and low-GWP refrigerants
- Net-zero energy buildings (NZEBs); Building energy efficiency

Research Achievements/Industrial Collaborations
- Willis H. Carrier Young Researcher Awards, International Institute of Refrigeration, 2019 (8 young researcher every 4 years)
- Distinguished Associate Award, National Institute of Standards and Technology (NIST), 2019
- Excellent Young Scholar Award of Energy and Built Environment, 2019 (3 young researcher every 2 years)

Recent Journal Publications
Dr. Denis Y.W. YU  
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Biography
Dr. Denis Yu received his A.B. (Physics) in 1995 from Princeton University and Ph.D. in 2003 (Applied Physics) from Harvard University. After completing his Ph.D., he moved to Japan to work as an engineer at the Energy R&D Laboratory at SANYO Electric Co. Ltd., developing cathode and anode materials for Li-ion batteries. In mid 2011, he joined the Energy Research Institute at Nanyang Technological University, Singapore, leading the battery and energy storage effort, as well as serving as a co-PI at the TUM CREATE Centre for Electromobility. He joined the City University of Hong Kong in 2013 and was promoted to associate professor in 2018.

Research Interests
- Lithium-ion battery materials and characterizations
- Mechanical properties of battery electrodes
- Anionic reactions in sodium-ion cathodes
- Dual-ion batteries and anion intercalation
- Technologies on electrolyte and membranes
- Metal-metal batteries
- Battery safety and surface chemistry characterizations

Research Achievements/Industrial Collaborations
- High capacity Si anode for Li-ion batteries – stable capacity up to 2500 mAh/g with Si cluster
- Novel fast charging Sb anode for Li-ion batteries – polymer coating to suppress volume expansion; 10-mins charge-discharge cycles
- High-voltage high-power battery cathode based on PF₆⁻ intercalation into graphite – excellent capacity up to 10C rate
- 3-V metal-metal batteries with low cost stainless steel/lithium and copper/lithium
- 2 industrial collaborations on green energy storage (carbon and silicon)  
  - Evaluate materials for energy storage applications  
  - Optimize performance and feedback to collaborators  
  - Provide expert advices on research directions and market trends

Publications
Dr. Lin ZHANG
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Biography
Dr. Zhang studied in Peking University where he received a Bachelor in Mechanical Engineering and a Double Bachelor in Economics. He then moved to Switzerland where he earned his master degree in management and Ph.D. in economics from ETH Zurich. Before joining the faculty of City University of Hong Kong, he was a postdoctoral researcher in the Center of Economic Research at ETH Zurich. He was also a researcher associated with the Energy Science Center, Simulation Lab, and the Competence Center for Research in Energy, Society, and Transition in Switzerland. Besides his position at School of Energy and Environment, Dr. Zhang has a joint appointment in the Department of Public Policy, College of Liberal Arts and Social Sciences.

Dr. Zhang’s research aims to develop improved quantitative modelling approaches for the design, evaluation, and upgrade of sustainable energy policies at local, regional, and global levels. He has received research grants from Swiss Federal Office of Energy, Swiss National Science Foundation, Research Grants Council in Hong Kong, European Environmental Agency, among others. He serves as a reviewer for more than 20 SSCI listed journals and a committee member of international conferences.

Research Interests
• Energy and environmental economics
• Efficiency and productivity analysis
• Energy policy and sustainable development
• Computable general equilibrium modelling

Research Achievements/Industrial Collaborations
• Outstanding reviewers for international journals including Economic Modelling, Journal of Environmental Management
• Top 10% of authors on SSRN (the largest social science research network) by total new downloads
• External expert reviewer for the Competition Commission of Hong Kong
• Global Top 500 young economists for Lindau Nobel Laureate Meetings on Economic Sciences
• Industrial collaboration on energy efficiency with Towngas

Recent Journal Publications
Prof. Wen ZHOU
Professor

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Biography
Prof. Wen Zhou received a B.S. and M.S. degree in meteorology from Sun Yat-sen University and Ph.D. in atmospheric science from City University of Hong Kong. She was Alexander Von Humboldt Fellow and now serves as Scientific Advisor to Hong Kong Observatory and Professor of the School of Energy and Environment, City University of Hong Kong. Prof. Zhou’s research focuses on the tropical meteorology, monsoon climate, large-scale atmospheric and oceanic dynamics, air pollution meteorology.

Research Interests
• East Asia monsoon climate
• Tropical intraseasonal oscillation
• Different types of El Niño and their effects on climate
• Climate extreme and climate change

Research Achievements/Industrial Collaborations
• Reviewed and proposed scenarios for changes in design rainstorm and design sea level, and their combinations as a result of climate change, to carry out sensitivity analyses on risk level assessments (Design Rainfall and Sea Level), AECOM, May-July 2014
• Study of extreme weather conditions in Hong Kong, KONO Insurance LTD, 2016-2017
• Climate Change Impact Study on Sewerage Facilities in Hong Kong - Feasibility Study. Black & Veatch, 2016-2017
• Review of drainage master plan in Tai Po, Sha Tin, Sai Kung, and Northern Hong Kong Island. AECOM Asia Company Limited, 2015-2017
• Seasonal predictions and climate projections of heat waves and flooding occurrences in South China and Hong Kong. Hong Kong Federation of Insurers, 2016-2018
• Co-author, Hong Kong-Macao regional climate change report, the 4th National Climate Change Report

Recent Journal Publications