# Equitable, Sustainable and Climate Resilient Urban Development in China

## The 1st USS Winter School Handbook

**17-23 December 2023 XIAMEN, CHINA**

URBAN HEALTH AND WELLBEING
A SYSTEMS APPROACH

International Science Council

## 1. Sponsors and Organizers

***Sponsoring Organizations***

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International Science Commission (ISC), Urban Health and Well-being (UHWB) Program

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***Organizing Committee***

Lulu Song, Institute of Urban Environment, Chinese Academy of Sciences

Yupeng Liu, Institute of Urban Environment, Chinese Academy of Sciences/ISC-UHWB

Chuyue Zhong, Institute of Urban Environment, Chinese Academy of Sciences/ISC-UHWB

Tingting Guo, Institute of Urban Environment, Chinese Academy of Sciences

## 2. Dates, Schedule and Location

**Time:** Dec. 17-24, 2023 (Check in on Dec. 17)

**Location:** Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS)

**Address**: #1799 Jimei Road, Xiamen, Fujian Province, China

## 3. Program of the School

***Themes***

Urbanization is an irreversible trend across the world. As concentrators of people and activities cities are at the forefront of experiencing the effects of climate change. The principal challenge is how to minimize growing vulnerabilities while enabling far-reaching and equitable climate action for sustained and sustainable development. The pace and scale of urbanization in China over the past forty years have been unprecedented. The way China continues to urbanize will greatly affect the country's success in becoming a "moderately prosperous society", mitigating the adverse effects of climate change and responding to the effects. How can China continue to benefit from urbanization while avoiding some of the common negative effects of urbanization, minimizing environmental damage, promote urban residents' health and make Chinese cities reliant to the effects of climate change?

This intensive one-week school explores sustainable urban development sustainability from several many perspectives with particular focus on problems posed by the effects of climate change on cities. This inaugural winter school is aimed at graduate students and early-career scholars in China interested in *equitable, sustainable and climate resilient urban development* and the challenges and opportunities that it poses for Chinese society. Sustainable urban development and urban adaptation to climate change are relatively new research domains and research agendas are still being designed that integrate accumulated insights from the various disciplines which have studied cities and urbanization and advance new topics of inquiry. The School will introduce students to these emerging research areas.

The School's lectures and discussions will address how urbanization contributes to socioeconomic development, questions about urban sustainability (what is it? how is it studied? how is it measured?), how solutions intended to facilitate adaptation to the effects of climate

change on cities needs to be woven into urban development policies, the design of nature-based solutions as adaptation responses and the challenges posed by decarbonizing the supply of energy to cities.

***Learning Outcomes***

Students will be introduced to the emerging, multidisciplinary and global research effort on developing a science of urban sustainability and about the global discussion on how such a science can inform the design and implementation of solutions to mitigate and respond to the effects of climate change on cities. Students will learn about concepts, methods, and modeling frameworks which can be used to study urbanization in China and the ways in which ongoing urbanization in China can both be sustainable and resilient to the effects of climate change. Topics include the role of urbanization in socioeconomic development, the drivers of urbanization, the urban scaling framework to study urbanization, urban sustainability, decarbonizing the supply of energy to cities, the effects of climate change on cities. While the lectures cover insights learned from the study of urbanization worldwide and across eras, they will also focus on the experience of urbanization and economic growth in China from 1980 to 2020.

***Format and Student Work***

The school's program consists of lectures (in person, remote and recorded) and discussion sessions. The School is highly interdisciplinary and the lectures will draw on urban economics, economic geography, data science, complexity science, urban sustainability science and urban climate science. The lectures will be in the morning while afternoons are set aside for plenary discussions, small groups discussions, training sessions and working on students' projects. ***Students must be willing and ready to listen attentively, ask questions, advance hypotheses and engage in discussions.***[1] Readings will be assigned corresponding to the lectures and discussion topics, and students will be asked to write brief reports addressing specific questions for each of the readings. The readings will consist of published articles and reports.

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[1] Quietly listening to lectures and being quite during discussions is not an option. Student's mastery of the English language must be sufficient for them to feel comfortable asking discussion and participating in discussions.

Students will be organized into small working groups and asked to work on a data analysis project pertaining to urban sustainability in China. About 6~10 groups (5 students per group) will be formed in the winter school. Half of these groups will be asked to collect panel data for Chinese cities and analyze the tendency of urban sustainability in China. The other half of them will be asked to collect spatially explicit data for specific cities (e.g., Beijing, Shanghai, Guangzhou, Chengdu…) and understand the expansion of these cities and how urban form affect urban sustainability. Faculty will be available during the working groups session to answer questions, provide technical advice and facilitate students' work on projects.

***Preparatory Readings***

Students will be asked to read two papers and two reports in preparation participating in the school --- they can be downloaded for free. These readings introduce themes, findings, and research questions about urbanization (globally and in China), sustainable urban development and urban adaptation to climate change which will be referred to often during the Winter School.[2] Students should try to have read the papers and the reports before the first lecture of the School – and to make notes on what they agree and disagree with, find novel, and would like to discuss during the School.

https://www.nature.com/articles/509158a

https://www.nature.com/articles/s42949-023-00113-0

https://sdgs.un.org/sites/default/files/2023-09/UN%20Climate%20SDG%20Synergies%20Report-091223B.pdf

https://supforclimate.com/wp-content/uploads/2022/11/SUP-15Nov-CONSOLIDATED-Report.pdf

***Language***

Lectures will be in English. Discussions will be conducted in English and Chinese.

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[2] Urbanization tends to refer to the population shift from rural to urban areas, a perspective that presupposes a clear distinction between urban and rural. Here we use the term urbanization to refer to the agglomeration of population settlements of diverse types, scale and density. What is seen as essential in the urbanization process is the concentration of populations thereby increasing proximity and closeness in physical space which in turn facilitates interactions in social space.

## 4. Evaluation and Credit

All students will be evaluated based on the performance of class (40%), practice (40%) and final presentation (20%). Among them, the evaluation of class performance covers attendance (10%), question (10%), discussion (10%), and thinking (10%). The evaluation of practice includes both data quality (20%) and group organization (20%). Every certificated student will hold a certification for the winter school. Some of them will receive excellent student certification based on the personal performance on the class, practice, and final presentation. Parts of groups will receive best presentation award based on the final presentation. We will provide accommodation supports for the excellent students and best presentation groups.

## 5. Check-in

**Time:** Dec. 17, 14:00-22:00

**Location:** Room 107, 1st floor, Lobby of Main Building at IUE, CAS

**Process:** 1) Confirm personal information; 2) Collect conference material.

## 6. Overview

| Time | | Venue | Content |
|---|---|---|---|
| Dec. 17 | 14:00-22:00 | Room 107 in IUE, CAS | Registration & Check-in |
| Dec. 18-22 | 08:30-17:30 | Room 208 in IUE, CAS | Morning: Lecture & Discussion<br>Afternoon: Exercise or Field-trip |
| Dec. 23 | | Room 208 in IUE, CAS | Group Presentation & Award |
| Dec. 24 | | | Check-out & Departure |

## 7. Schedule[3]

| December 18 (Room 208) | | |
|---|---|---|
| **Time** | **Topic** | **Presenter/ Exercise Leader** |
| **Morning Session: Lectures** | | |
| 08:30-08:40 | Welcome Remarks | Wei-Qiang Chen |
| 08:40-09:25 | Lecture 1: From Growth to Health Urban Sustainability Challenges in China | Wei-Qiang Chen |
| 09:25-10:10 | Lecture 2: Emerging Pollutants in Urban Aquatic Environments: Microbes to the Rescue | Max Haggblom |
| 10:10-10:20 | Break and Group Photo | |
| 10:20-11:05 | Lecture 3: The Exposome: A Big Data, Whole Life Course Approach to Environmental Exposure Assessment | Clive Sabel |
| 11:05-11:50 | Lecture 4: The Economic Complexity of Global Clean Energy Supply Chain | Yang Li |
| 11:50-12:00 | Questions & Discussion | Yupeng Liu |
| **Lunch (1st floor of the Cafeteria)** | | |
| **Afternoon Session: Working Groups and Exercise** | | |
| 14:00-15:00 | How can urban sustainability be studied in China? - Panel and GIS Data | Lulu Song, Yupeng Liu |
| 15:00-17:00 | Ice-breaking | |
| 17:00-17:30 | Organizing into Working Groups | |
| 17:30-18:15 | Lecture 5: Modelling Geospatial Characteristics: Theory, Models and Software | Yongze Song |
| **Gala Dinner (2nd floor of the Cafeteria)** | | |

[3] The final School program is subject to change due to the availability of tentatively listed presenters and unforeseen circumstances.

| December 19 (Room 208) | | |
|---|---|---|
| **Time** | **Content** | **Presenter/ Exercise Leader** |
| **Morning Session: Lectures and Discussion** | | |
| 09:00-09:45 | Lecture 6: Urban Transportation and AI | Hua Cai |
| 09:45-10:30 | Lecture 7: LCA: Exploring Green Design | Matthew Eckelman |
| 10:30-10:00 | Break | |
| 11:00-11:45 | Lecture 8: Cities After The Future: Building More With Less | Shoshanna Saxe |
| 11:45-12:00 | Questions & Discussion | Lulu Song |
| **Lunch (1st floor of the Cafeteria)** | | |
| **Afternoon Session: Working Groups and Exercise** | | |
| 14:00-17:30 | Group Working | Group leader |
| **Dinner (1st floor of the Cafeteria)** | | |

| December 20 (Room 208) | | |
|---|---|---|
| **Time** | **Content** | **Presenter, Exercise Leader** |
| **Morning Session: Lecture and Discussion** | | |
| 08:30-09:15 | Lecture 9: Towards Sustainable Urbanization: Environmental Externalities, Income Inequality And Resources Governance In The Post-Carbon Era | Xiaoling Zhang (online) |
| 09:15-10:00 | Lecture 10: Multi-Scale Life Cycle Energy and GHG emissions Assessment of Residential Buildings | Stephanie Li |
| 10:00-10:15 | Break | |
| 10:15-11:00 | Lecture 11: Urban Metabolism For Resource-Efficient Cities | Jooyoung Park |
| 11:00-11:30 | Questions and Discussion | Yupeng Liu |
| **Lunch (1st floor of the Cafeteria)** | | |
| **Afternoon Session: Exercise** | | |
| 14:00-17:30 | Group Working | Group leader |
| **Dinner (1st floor of the Cafeteria)** | | |

| December 21 (Room 208) | | |
|---|---|---|
| **Time** | **Content** | **Presenter, Exercise Leader** |
| **Morning Session: Lectures and Discussion** | | |
| 09:00-09:45 | Lecture 12: Agglomeration Economies | José Lobo (online) |
| 09:45-09:55 | Break | |
| 09:55-10:40 | Lecture 13: Urban Scaling | José Lobo (online) |
| 10:40-10:50 | Break | |
| 10:50-11:35 | Lecture 14: Spatial Units of Analysis | José Lobo (online) |
| 11:35-12:00 | Questions & Discussion | José Lobo (online) |
| **Lunch (1st floor of the Cafeteria)** | | |
| **Afternoon Session: Field-trip** | | |
| 14:00-18:00 | Group Working | Group leader |
| **Dinner (1st floor of the Cafeteria)** | | |

| December 22 (Room 208) | | |
|---|---|---|
| **Time** | **Content** | **Presenter, Exercise Leader** |
| **Morning Session: Lecture and Discussion** | | |
| 08:30-09:15 | Lecture 15: Improving Climate Resilience via Nature-Based Solutions: lessons from the Chinese Sponge City Program (SCP) | Faith Chen (online) |
| 09:45-10:30 | Lecture 16: Urban Green nad Human Health | Tao Lin (online) |
| 10:30-10:45 | Break | |
| 10:45-11:30 | Lecture 17: Several Thoughts on Urban Ecology (城市生态学的几点思考) | Shenghui Cui |
| 11:30-12:00 | Questions and Discussion | Yupeng Liu |
| **Lunch (1st floor of the Cafeteria)** | | |
| **Afternoon Session: Exercise** | | |
| 14:00-18:00 | Field-trip: LUHAI Pro-environment (Urban Recyclable Solid Waste Integrated Operator) | |
| **Dinner (1st floor of the Cafeteria)** | | |

| December 23 (Room 208 in the morning) | |
|---|---|
| **Time** | **Content** |
| **Moring Session: Exercise** | |
| 09:00-12:00 | Group Working and Preparing |
| **Lunch (1st floor of the Cafeteria)** | |
| **Afternoon Session: Group Presentations (Moderator: Wei-Qiang Chen)** | |
| 14:00-16:00 | Working Groups Presentations (15 mins each) |
| 16:00-16:30 | Break |
| 16:30-17:00 | Summary & Awards |
| **Close ceremony (2nd floor of the Cafeteria)** | |
| **Departure** | |

## 8. Readings

(1) Seto, K.C., Sánchez-Rodríguez, R., Fragkias, M., 2010. The New Geography of Contemporary Urbanization and the Environment. Annual Review of Environment and Resources 35, 167-194.

(2) Glaeser, Edwards, Joshi-Gani, Abha (2013) Rethinking Cities: Toward Shared Prosperity. Economic premise no. 126. World Bank. https://documents1.worldbank.org/curated/en/552061468340145253/pdf/819270BRI0reth01260379848B00PUBLIC0.pdf

(3) Wu, J., 2014. Urban ecology and sustainability: The state-of-the-science and future directions. Landscape Urban Plan. 125, 209-221.

(4) Wu, J., Xiang, W., Zhao, J., 2014. Urban ecology in China: Historical developments and future directions. Landscape Urban Plan. 125, 222-233.

(5) Lobo, José et al. (2020) Settlement scaling theory: Bridging the study of ancient and contemporary urban systems. Urban Studies, 57:731-747.

(6) Revi, Aromar et al. (2022) The Summary for Urban Policymakers of the IPCC's Sixth Assessment Report. Indian Institute for Human Settlements. Volume 1. https://supforclimate.com/

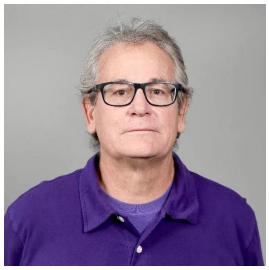
(7) Creutzig, F., Roy, J., Devine-Wright, P., Díaz-José, J., Geels, F.W., Grubler, A., Maïzi, N., Masanet, E., Mulugetta, Y., Onyige, C.D., Perkins, P.E., Sanches-Pereira, A., Weber, E.U., 2022. Demand, services and social aspects of mitigation. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.007.

## 9. Chairs

### *WEI-QIANG CHEN*

Dr. Wei-Qiang Chen is a professor of Sustainability Science in the Institute of Urban Environment, Chinese Academy of Sciences (CAS). Before joining CAS, he was working at the Center for Industrial Ecology, Yale School of Forestry & Environmental Studies for five years. He was the lead organizer of the "2015 Chinese Environmental Scholars Forum" held at Yale University. He is on the board of the Sustainable Urban Systems Section of the International Society for Industrial Ecology, was the president of the Chinese Society for Industrial Ecology, and is associate editor of Resources, Conservation, and Recycling. His research interests include industrial ecology and urban ecology, specifically on material/substance flow analysis, urban metabolism, urban mining, and global trade networks of materials. His studies have been published in PNAS, Environmental Science & Technology, and other first level journals.

### *JOSÉ LOBO*



Prof. José Lobo is the Senior Global Futures Scientist and Clinical Associate Professor in School of Sustainability, Arizona State University. He is interested in determinants of metropolitan economic performance and location-specific economic growth; the application of machine learning, data mining and spatial statistics methods to the study of socio-economic data; causes and consequences of urban size and scale; and how the characteristics of individuals, organizations, institutions and social networks interact to create "regions of innovation".

## 10. Lecturers *(Sort by the first letter of last name)*

***YUPENG LIU***

Dr. Yupeng Liu is an Associate Professor in the Industrial & Urban Ecology group at the Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS). Before joining CAS, he was working at the Center for Human-Environment System Sustainability (CHESS), State Key Laboratory of Earth Surface Processes and Resource Ecology (ESPRE), Faculty of Geographical Science, Beijing Normal University for three years as a postdoc. His studies are related to industrial ecology, urban ecology, and landscape ecology. He is familiar with and develops models, including remote sensing and GIS-based models (e.g. U-TAE), species distribution models (e.g. MaxEnt), biogeochemistry models (e.g. PnET-II), dynamic global vegetation models (e.g. LPJ-DGVM), and meteorological models (e.g. WRF). Now his research focuses on developing a bottom-up and spatially explicit model to estimate material stocks and flows in urban constructions.

***LULU SONG***

Dr. Lulu Song is an Associate Professor in the Industrial & Urban Ecology group at the Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS). Her research focuses on material/substance stocks and flows analysis at national or city scale. Before joining IUE, she was working as a post-doc for two years at the Institute of Geographic Sciences and Natural Resources Research (IGSNRR), CAS. She obtained her bachelor degree in forestry from Beijing Forestry University, master degree in ecology, and PhD degree in physical geography from IGSNRR.

***HUA CAI***

Dr. Cai is an Associate Professor of Environmental and Ecological Engineering and Industrial Engineering at Purdue University. Dr. Cai uses agent-based modeling, life cycle assessments, system dynamics, big data analytics, and GIS to study the environmental implications of emerging technologies from the systems perspective. Her research interests include energy-water nexus, emerging transportation systems, energy policy, and urban sustainability.

Dr. Cai received her Ph.D. from University of Michigan in Environmental Engineering and Natural Resources and Environment (jointly conferred). She received her M.S. from The Pennsylvania State University and B.E. from Tsinghua University, both in environmental engineering. Prior of Michigan, she was laboratory manager and environmental engineer at CDM Smith.

***FAITH CHAN***

Dr Faith Ka Shun Chan is an Associate Professor at University of Nottingham Ningbo China (UNNC). He holds a visiting research faculty/professorship at SUSTech, Shenzhen, and a senior research fellow position at Water@Leeds Research Institute and School of Geography, University of Leeds, UK. He specialised in sustainable flood risk management, climate adaptations and urban resilience on Asian coastal megacities. He is currently funded by the Chinese National Research Council (NSFC) as principal investigator on the microplastics and its impacts on urban rivers, he is also involved in two international research projects as a researcher in the Blue-Green Cities Consortium (funded by ESPRC and British Academy from the UK Research Council) and co-investigating in the flood risk and commercial properties (funded by the Royal Institute of Chartered Surveyors (RICS)) project. He is also a Principal Investigator on three municipal-funded projects to investigate the surface water quality, typhoon-enhanced flood risk, and the development of a “Sponge City” pilot study in Ningbo, the total funding he awarded has been over 1.5 million RMB. His

“Sponge City” paper in the Land Use Policy received the top cited notification in 2020. He currently has published 2 books and more than 50 publications in top tier international peer-reviewed journals (located at JCR Q1 and CAS Q1 and Q2).

***SHENGHUI CUI***

Prof. Shenghui Cui is a professor of environmental planning and management from the Institute of Urban Environment, Chinese Academy of Sciences. He is also the Director of Key Lab of Xiamen Urban Metabolism. He has host or participated in more than 40 projects at all levels, such as the key R&D projects of the Ministry of Science and Technology, National Natural Science Foundation of China, and Chinese Academy of Sciences. He has published more than 150 papers in PNAS, Nature Food, ES&T and other important journals, including 74 SCI papers. His research areas are urban climate change resilience, urban food systems and carbon, nitrogen and phosphorus nutrient management.

***MATTHEW ECKELMAN***

Matthew Eckelman is an Associate Professor and Associate Chair for research of Civil and Environmental Engineering at the Northeastern University, with affiliate appointments in Public Policy and the Social Science and Environmental Health Research Institute. He is also an adjunct Associate Professor at the Yale School of Public Health. His research focuses on modeling emissions from industrial supply chains, including those of the health sector, and linking these emissions to human health damages and loss of ecosystem function. Dr. Eckelman worked previously for the Massachusetts Executive Office of Environmental Affairs and in non-profit product engineering design and was a Peace Corps volunteer in Nepal. He received a PhD from Yale Engineering.

***MAX HAGGBLOM***

Dr. Max Häggblom is Distinguished Professor and Chair of the Department of Biochemistry and Microbiology at Rutgers University. He is an elected fellow of the American Academy of Microbiology and the American Association for the Advancement of Science and serves as Editor in Chief of FEMS Microbiology Ecology. His research interests are in microbial ecology and environmental biotechnology, with a focus in the bioexploration, cultivation and characterization of novel microbes including soils, sediments, marine sponges and animal intestinal tracts. The common theme is the “unusual appetites” of bacterial communities, such as the metabolism and detoxification of xenobiotic chemicals or natural products, respiration of rare metalloids, or life in the cold. Work in his laboratory aims to elucidate the physiology, ecology and phylogeny of these bacteria providing a foundation for applications that address the pollution problems facing impacted industrialized and urbanized environments.

***STEPHANIE LI***

Stephanie Li is a Lecturer and PhD supervisor at Curtin University. She received her PhD degree at the University of Melbourne. She was awarded a CSIRO Early Research Career fellowship and contributed to the "Towards Net Zero (TNZ)" project in Australia. Her research focuses on Sustainable Construction, Decarbonisation of the Built Environment, Building Energy Efficiency, Material Flow Analysis, and Life Cycle Assessment. She has published high-quality journal papers and peer-reviewed international conference papers and participated in research projects funded by various institutions, such as the National Social Science Fund of China, the Ministry of Education of Singapore, and the International Energy Agency. She has been a scientific committee member at international conferences and have been invited to present my research at international conferences. In addition, She is a member of Engineers Australia, the International Society for Industrial Ecology, and the American Society of Civil Engineers.

***JOOYOUNG PARK***

Jooyoung Park is an Associate Professor at the Department of Civil and Environmental Engineering, Seoul National University, South Korea. Before, she worked for the School of Management, Universidad de los Andes in Colombia as well as the Graduate School of Energy and Environment of Korea University. With an overarching interest in resource efficiency and sustainability, her research has particularly focused on: 1) valuation of waste and innovation of waste recovery technologies, 2) business collaborations and eco-industrial development, and 3) exploration of circular economy strategies, particularly for water, plastics, and buildings. She has a PhD in environmental studies from Yale University and Master and Bachelor of Science in Civil, Urban, and Geosystems Engineering from Seoul National University.

***CLIVE ERIC SABEL***

Prof. Clive Sabel, Professor of Department of Public Health - Institute of Environmental and Occupational Medicine at Aarhus University, is a spatial data scientist working in the nexus between spatial data informatics, health and the environment. His research focusses on the over-arching theme of individual level spatial data. This can mean working with point-pattern data (often residential location) to reveal epidemiological relationships to environmental exposures or patterns in road traffic accidents; building whole life-course exposures to social and environmental sources to, for example, understand wellbeing in urban areas; data mining 'Big Data' such as twitter feeds and sensors for spatial-temporal trends; working in the Future Cities agenda, sensing and tracking individuals through GPS and environmental and social sensors in smart-phones; or writing on the sensitive issues (and exciting possibilities) surrounding tracking individuals and their rights to privacy and confidentiality.

His research career is naturally evolving more into a leadership role. He has considerable center, programme and project management experience, from winning and running large EU consortium grants, to his other role as Director, BERTHA – Denmark's Big Data Centre for

Environment and Health, managing and coordinating some 30 researchers.

***SHOSHANNA SAXE***

Dr. Shoshanna Saxe is an Associate Professor in the University of Toronto's Department of Civil & Mineral Engineering, and Canada Research Chair (Tier II) in Sustainable Infrastructure. She investigates the relationship between the infrastructure we build and the society we create to identify opportunities – and pathways – to better align infrastructure provision with sustainability. Her research focuses around two main questions: 1) What should we build? and 2) how should we build it?

Saxe is a former Action Canada fellow, sits on Waterfront Toronto's Capital Peer Review Panel and Metrolinx Project Evaluation Advisory Panel. She was awarded the 2019 OPEA Engineering Medal – Young Engineer. Her research and commentary have been featured in media outlets such as The New York Times, The Toronto Star, The Financial Post, and Wired, including "What We Really Need Are Good 'Dumb' Cities" (New York Times, July 2019).

***YONGZE SONG***

Yongze Song is a Senior Lecturer in geospatial analysis and sustainable infrastructure. He is a Fellow of the Royal Geographical Society (RGS), UK, and a Committee Member of the International Association for Mathematical Geosciences (IAMG). He developed innovative theories and widely used new geospatial models for geographical factor analysis and spatial prediction. The developed new models and software demonstrate both academic and industrial impacts globally. He is a recipient of more than ten awards at international and national levels, such as the Global Top 10 Young Scientist Award and the Australian National Location Data First Prize. He is an Editorial Board Member of 7 reputable international peer-reviewed journals, including GIScience & Remote Sensing, iScience (Cell Press), Geo-spatial Information Science, Annals of GIS, Remote Sensing, etc. He serves as a Chair or Program Committee Member for international conferences held in over 10 countries, including Australia,

the United Kingdom, Egypt, Norway, China, France, the United States, Canada, Iran, Vanuatu, and Greece. He was invited to present more than 40 research seminars at universities (e.g., Harvard University, Australian National University, National University of Singapore, Peking University, etc.) and industries globally. Find out more at: https://yongzesong.com/about/.

***LIN TAO***

Dr. Lin is a Professor of institute of urban environment, CAS, and engages in sustainable urbanization, urban environment management and planning, and urban ecology research for a long time. His recent research interests focused on sustainable region system, smart urban environmental management, and urban ecological planning and management by using GIS, remote sensing and Big data. He makes systematic study on city and relative regions as a human and environmental coupled ecosystem: (1) at large scale, monitor and simulate the urban spatial expansion and its interaction with natural, social and economic factors; (2) at small scale, explore the evolution of urban form and its impact on human living environment; (3) develop system solutions for the sustainable urbanization and regional human and environment coupled system. He has published more than 130 peer-reviewed journal articles, and selected as leading author for the Global environment outlook 7th report of UNEP. He worked in Long Time Ecological Research in Central Arizona—Phoenix of USA as visiting scholar during 2010-2011 and set up China Chapter of Society for Urban Ecology as a standing director since 2016.

***LI YANG***

Yang LI joined the Center for International Development's Growth Lab as a Postdoctoral Fellow in 2019.

His research focuses on the patterns, processes, and sustainability of industrial development in cities. By integrating the view of economic complexity and industrial ecology, he aims to understand the diversification of industries in cities, measure the environmental impact of diversification

through changes of material and energy flows, and investigate the sustainable pathways of industrial development, especially for cities in developing countries.

He holds a Ph.D. in Environmental Science and Engineering (2019) and a Bachelor degree in Environmental Engineering (2012), both from Tsinghua University, China.

***XIAOLING ZHANG***

Professor Zhang is a tenured Full Professor with the Department of Real Estate and Construction, Faculty of Architecture and has a joint appointment with Institute for Climate and Carbon Neutrality (ICCN), at the University of Hong Kong (HKU). She received B.B.A in Business Administration, M.S. in Resource Management, and PhD. in Engineering Management and Economics (Hong Kong). In 2022, Prof. Zhang has been listed as Clarivate Highly Cited Researcher in Cross-Field. She has also been listed as Stanford's top 2% most highly cited scientists in Environmental Engineering Field since 2020.

Prof. Zhang's research is primarily centered around understanding the intricate relationship between humans and the built environment, with a focus on tackling significant challenges such as urban and industrial ecology, energy, pollution, and the achievement of sustainable development goals (SDGs). Initially, her research delved into areas such as green building, real estate, and enterprise-scale sustainability. And in recent years, her research interests have shifted towards exploring affordable yet effective 'net zero' technologies and systems, including renewable energy systems and clean energy technologies.

## 11. Meal Arrangements

| Meal | Time | Location | Notes |
|---|---|---|---|
| **December 18-23** | | | |
| **Lunch** | 12:00-14:00 | Cafeteria in the IUE | By coupon |
| **Dinner** | 17:30-18:30 | Cafeteria in the IUE | By coupon |
| **Local food recommendation** | | | |
| 沙茶面、海蛎煎、土笋冻、烧肉粽、肉燕、润饼、姜母鸭、炸醋肉、五香卷、满煎糕、莆田卤面、福鼎肉片、牛肉汤咸饭、锅边糊、面线糊、凤梨酥、四果汤、花生汤等 | | | |

## 12. Contact Information

| | | |
|---|---|---|
| ***Overall*** | Yupeng Liu (刘宇鹏) | ypliu@iue.ac.cn |
| ***Venue*** | Yizhuo Wen (闻一卓) | yzwen@iue.ac.cn |
| ***Materials*** | Chuyue Zhong (钟楚玥) | cyzhong@iue.ac.cn |
| ***Transportation*** | Nie Yu (聂宇) | nyu@iue.ac.cn |
| ***Meal*** | Shujun Li (李淑君) | abbylishujun6@gmail.com |

## 13. Transportation

***Route 1: Xiamen Gaoqi Airport (高崎机场) to IUE (中科院城环所)***

**Option 1:** By BRT (快速公交): 30-min ride and 10-min walk, ticket for 2 CNY

For Departures from T4: exit T4 from the arrival hall, then turn left; pass through the underground passage leading to the BRT station; take K1 (快 1 线) or K6 (快 6 线) that is directed towards Xiamen North Railway Station (厦门北站) and get off at IUE Stop (中科院站); see **Map 1** for the route from IUE Stop to IUE residence hall

For Departures from T3: take the shuttle bus at the exit of T3 to get to T4; then refer to the transportation route of T4 to IUE

**Option 2:** By taxi: around 30-min ride depending on traffic (17 kilometers), cost around 50 CNY

For departures from T3 & T4: line up at the taxi pick-up point outside the exit of arrival hall to take taxi

***Route 2: Xiamen Railway Station (厦门站) to IUE (中科院城环所)***

***Option 1*:** By BRT: 50-min ride and 10-min walk, ticket for 4 CNY

Take BRT at the exit of Xiamen Railway Station; take K1 (快 1 线) that is directed towards Xiamen North Railway Station (厦门北站) and get off at IUE Stop (中科院站); see **Map 1** for the route from IUE Stop to IUE residence hall

***Option 2*:** By taxi: around 40-min ride depending on traffic (25 kilometers), cost around 70 CNY

***Route 3: Xiamen North Railway Station (厦门北站) to IUE (中科院城环所)***

***Option 1*:** By BRT: 15-min ride and 10-min walk, ticket for 1 CNY

Take BRT at the exit of Xiamen Railway Station; take K1 (快 1 线) that is directed towards Xiamen North Railway Station (厦门北站) and get off at IUE Stop (中科院站); see **Map 1** for the route from IUE Stop to IUE residence hall

***Option 2*:** By taxi: 15-min ride depending on traffic (8 kilometers), cost around 20 CNY

**NOTICE: BRT is in service from 06:10 to 22:10.**


**Map 1. Top view of Institute of Urban Environment (IUE)**

***Dots in yellow*:** locations of main spots related to the conference

***Route in red*:** route from BRT IUE Stop to the residence hall

***Route in blue*:** route from the residence hall to the main building

***Route in green*:** common route for taxi/car

***NOTES:***

***NOTES:***

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