

Date: 9/10/2022

**JSPS US AND CANADA ALUMNI ASSOCIATION SEMINAR PROGRAM
REPORT**

Organizer (Awardee)

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Position & Affiliation: Professor, University of Colorado at Boulder, US

1. TITLE OF SEMINAR International Workshop on Urban Environment and Energy (IWUEE)			
2. DATE(S) July 26-27, 2022			
3. VENUE & CITY, STATE Concordia University, Montreal, Canada			
4. TARGETED RESEARCH AREAS <table border="0"><tr><td>(1) Urban Air Environment (air, pollution, micro-climate, extreme weather, etc.)</td><td>(2) Urban Energy (energy demand and supply, renewable energy etc.)</td><td>(3) Interactions of Urban Micro-Climate and Energy</td></tr></table>	(1) Urban Air Environment (air, pollution, micro-climate, extreme weather, etc.)	(2) Urban Energy (energy demand and supply, renewable energy etc.)	(3) Interactions of Urban Micro-Climate and Energy
(1) Urban Air Environment (air, pollution, micro-climate, extreme weather, etc.)	(2) Urban Energy (energy demand and supply, renewable energy etc.)	(3) Interactions of Urban Micro-Climate and Energy	
5. NUMBERS OF PARTICIPANTS TOTAL: <u>151</u> persons including _____ US and Canada Alumni Association members -US: _____ persons -CANADA: _____ persons -FROM OTHER COUNTRIES: _____ person(s) including _____ person(s) from Japan			

NOTES FOR REPORT

Executive Summary

The rapid development of cities and the acceleration of urbanization bring large challenges to urban energy and environment, ranging from regional climate change, heat island effect, increasing natural disasters, to contamination of air, water and soil, traffic congestion and noise, and poor living environments. This 2-day JSPS workshop entitled “International Workshop on Urban Environment and Energy (IWUEE)”, organized by the University of Colorado at Boulder (US) and Concordia University (Canada), was held concurrently with the 5th International Conference on Building Energy and Environment (COBEE2022) on 25-29th July 2022 at Montreal, Canada. The workshop organized four 90-minute sessions including the JSPS information session, which attracted a total of 151 participants (107 in-person and 44 virtual). The workshop was the first in the field to bring together experts and researchers in both urban air environment and energy field, who often hold their own conversation/meeting groups. A follow-up workshop on the same topic will be organized in Tokyo, Japan on May 20-23, 2023, along with the 11th International Conference on Indoor Air Quality, Ventilation & Energy Conservation in Buildings.

Motivation

The rapid development of cities and the acceleration of urbanization are bringing significant challenges to energy and environment and opportunities for adjustment and optimization of existing energy structures and urban infrastructures. By 2030, the global urban population is expected to reach five billion or 60% of the total population (UNFPA, 2020). Urban areas account for 67–76% of global final energy consumption and 71–76% of fossil fuel-related CO₂ emissions. Globally, the energy use for heating and cooling by 2050 will be between 45 and 59 exajoules per year (corresponding to an increase of 7–40% since 2010) (www.pnas.org). Beyond energy use, urban form affects largely two other dimensions of sustainability: human well-being and economic productivity. Urban environment challenges range from regional climate changes, heat island effects, extraordinary weather conditions (e.g., heat/cold wave), and increasing natural disasters, to contamination of air, water and soil, traffic congestion and noise, and poor housing conditions exacerbated by unsustainable urban development and climate change.

The prediction of future urban energy and environment conditions, the balance of urban energy supply and demand, and the interactions between urban environment and energy, as well as the inherent links among regional weather, microclimate, and human behaviors, all require a comprehensive and systematic investigation. Archival data analysis, field test, computer modeling, and mock-up experiment are fundamental approach to addressing these questions, while many uncertainties remain in these fields.

Workshop Details

The 2-day JSPS workshop entitled “International Workshop on Urban Environment and Energy (IWUEE)” was initiated and organized by the University of Colorado at Boulder, and co-organized by Concordia University, Canada. The workshop was held concurrently with the 5th International Conference on

Building Energy and Environment (COBEE2022) on 25-29th July 2022 at Montreal, Canada (Figure 1), which attracted over 510 participants from the world in a hybrid format of in-person (over 350 people) and virtual (over 160) with more than 450 presentations across 77 parallel sessions (Figure 2).



Figure 1 Cover page of COBEE2022 conference program

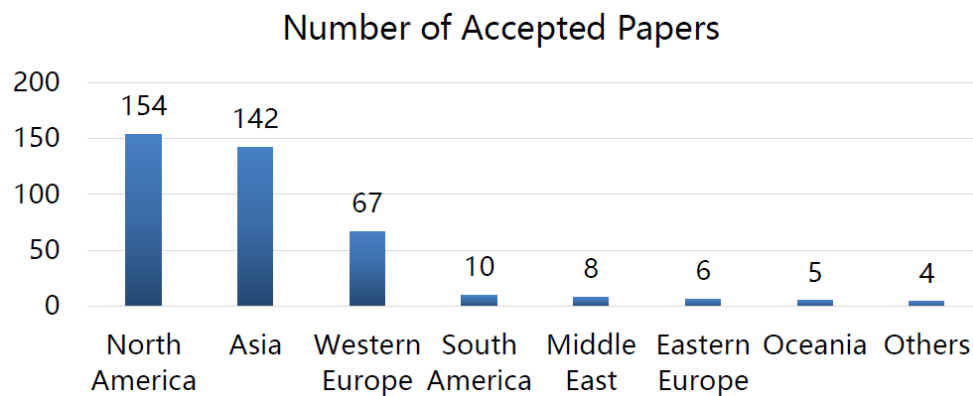


Figure 2 Region distribution of accepted papers to COBEE2022

The workshop was the first in the field to bring together experts and researchers in both urban air environment and energy field, who often hold their own conversation/meeting groups. The workshop provided

a platform for invited experimentalists, modelers, and theorists from all over the world to present their visions, research activities, and results for sustainable urban development. Four 90-minute sessions including the JSPS information session were organized presented with 14 invited speakers. The details of these sessions including the talk topics and speakers are shown in Figure 3. The numbers of the participants for these sessions are, respectively:

- 【July 26, 10:30 - 12:00】 : In-person 23, Online 20
- 【July 26, 13:00 - 14:30】 : In-person 36, Online 11
- 【July 26, 15:00 - 16:30】 : In-person 26, Online 1
- 【July 27, 15:00 - 16:30】 : In-person 22, Online 12

A group photo of the participants to one of the technical sessions is included in Figure 4.

This JSPS workshop received great attentions and the JSPS support was well recognized during the entire conference period, including the opening and closing ceremonies and the conference banquet as well as the conference program booklet (Figure 5) and the website (<https://www.cobee2022.org/support.html>).

JSPS WORKSHOP SCHEDULE

Time	Presentation Title	Presenters
Tuesday (7/26/2022)		
10:30-12:00	Workshop on Scientific and Technical Publishing - JSPS	Chair: Ted Stathopoulos
10:30-10:50	Wind Engineering & Industrial Aerodynamics	Ted Stathopoulos, Editor-in-Chief; Concordia University
10:50-11:10	Building and Environment	Qingyan Chen, Editor-in-Chief; The Hong Kong Polytechnic University
11:10-12:00	Q&A	
13:00-14:30	Invited Session: Workshop on Urban Environment and Energy - JSPS	Chair: John Zhai
13:00-13:25	Advances in Urban Environment Simulations	Yoshihide Tominaga, Niigata Institute of Technology
13:25-13:50	Modeling Building Stock in Cities	Tianzhen Hong, Lawrence Berkeley National Laboratory
13:50-14:15	Multiscale Modeling of Urban Environment Performance	Liangzhu (Leon) Wang, Concordia University
14:15-14:30	Q&A	
15:00-16:30	JSPS Info Session (with refreshments)	Chair: Yumi Sakai
15:00-15:20	Intro to JSPS and funding mechanisms	Arisu Wada
15:20-15:35	Experience in Japan	John Zhai
15:35-15:45	Collaboration in Japan: Niigata Institute of Technology	Yoshihide Tominaga
15:45-15:55	Collaboration in Japan: Tokyo Polytechnic University	Yingli Xuan

Time	Presentation Title	Presenters
15:55-16:30	Networking session with Q&A	
Wednesday (7/27/2022)		
15:00-16:30	Invited Session: Wind Engineering, Aerodynamics and Urban Physics	Chairs: Ted Stathopoulos and Bert Blocken
	An experimental and numerical study of football stadium ventilation to reduce aerosol concentrations and COVID-19 transmission	Bert Blocken, Eindhoven University of Technology and KU Leuven
	CFD analysis of airborne sea salt adhesion related to corrosion damage in a large sports stadium	Yoshihide Tominaga, Niigata Institute of Technology
	How climate changes require to design buildings differently	Umberto Berardi, Toronto Metropolitan University
	Dispersion of air pollution in urban environment due to wind-structure interaction	Kenny Kwok, The University of Sydney
	Characterization of wind in seaports and waterways through field measurements and CFD simulations	Alessio Ricci, KU Leuven

Figure 3 The JSPS workshop sessions



Figure 4 Group photo of one technical session

THANK YOU TO OUR SPONSORS!



Figure 5 Acknowledge of the JSPS support

Future Plan

This JSPS workshop successfully promoted opportunities to fusing new ideas and stimulating global collaborations. Focused workshop arranged in a major conference not only provides great opportunities to exchange ideas with researchers of diverse backgrounds but also ensures in-depth discussions with peers in the same fields. It is planned that another workshop on the same topics will be organized in Tokyo, Japan in May 20-23, 2023, along with the 11th International Conference on Indoor Air Quality, Ventilation & Energy Conservation in Buildings. In addition, a few global researchers and graduate students expressed their interests to participate in the JSPS Researcher Exchange Program to collaborate with the Japanese institutes and scholars.