

## COBEE 2022 DETAILED PROGRAM SCHEDULE (Ver. 1.4)

FP = Full Paper, EA = Extended Abstract, IS = Invited Seminar, TS = Topical Session (Draft - Subject to Change)

Time	TUESDAY, JULY 26		
8:30 – 10:00	OPENING CEREMONY		
	<p><b>Dr. Leon Wang</b> (General President of COBEE 2022 / Président général COBEE 2022)</p> <p><b>Dr. Graham Carr</b> (President of Concordia University / Président de l'université Concordia)</p> <p><b>Mme Kaila Munro</b> (City of Montréal/ Ville de Montréal)</p> <p><b>Dr. Andreas Athienitis</b> (Director of CZEBS / Directeur de CZEBS Concordia)</p>		
	<p>Plenary Session</p> <p>Keynote Speaker: <b>Santamouris, Mat</b></p>		
10:00 – 10:30	COFFEE BREAK		
Start at 10:30	<b>PARALLEL SESSIONS</b>	TYPE	AUTHORS
<b>Health and Indoor Air Quality, Ventilation 1</b>			<b>Session Chair: Tariku, Fitsum</b>
Aerosol Transport in a Wide-Body Aircraft Cabin with Side Supply Air Outlets		FP	<b>Mahmoud, Seif</b> ; Bennett, James; Hosni, Mohammad; Jones, Byron
Effects of Perforation Pattern on the COVID-19 Exposure Time at Office Rooms Using Perforated Duct Diffusers		FP	Raphe, Peyman; <b>Fellouah, Hachimi</b> ; Poncet, Sébastien; Ameer, Mohamed
Indoor air quality and its health effects in offices and school buildings in Yangtze River Delta, China		FP	Chen, Jingyu; Huang, Xin; Li, Jingguang; Huang, Chen; <b>Sun, Chanjuan</b>
Numerical investigation of air indoor quality using two ventilations systems in fitting room		EA	Abdul Hameed Khan, mohammed ; Bennia, Abderazak; Lateb, Mohamed; <b>Fellouah, Hachimi</b>
Field measurement on bedroom environment and sleep quality of the elderly in winter		EA	<b>Yan, Yan</b> ; Lan, Li; Zhang, Haodong; Sun, Yuxiang
Validation of Fitbit Alta HR compared with Polysomnography in monitoring sleep of young adults		EA	Zhang, Haodong; <b>Yan, Yan</b> ; Kang, Mengyuan; Fan, Xiaojun; Wargocki, Pawel; Lan, Li

	Effects of temperature on indoor air quality of university classroom: an intervention study in Beijing	EA	<b>Zhao, Caixia</b> ; Zhang, Xiaojing; Wang, Mei; Xie, Jingchao
	Optimization on COVID-19 prevention and energy conservation during the stable period of pandemic	EA	Yin, Kaili; Zhang, Xiaojing; Xie, Jingchao; Hao, Ziyang; Ge, Shibo; Liu, <b>Jiaping Hu, Tingrui</b> ; Zhang, Nan
	<b>Building Physics, Building Envelope and Materials 1</b>		<b>Session Chair: Larsson, P Lennart</b>
	Fire risks of renewable energy technologies in buildings: Analysis of fire effluents for smoke and toxicant detection	FP	Ko, Yoon; Okunrounmu, Oluwamuyiwa; <b>Aram, Monireh</b> ; Qi, Dahai
	Evaluating Experimental Methods for Measuring the Specific Heat Capacity of Building Materials	FP	<b>Ward, Colin</b> ; Baldwin, Christopher; Treichel, Calene; Cruickshank, Cynthia A.
	The effect of thermally massive layer placement on the transient performance of wall assemblies	FP	<b>Ghobadi, Mehdi</b> ; Salehpour, Benyamin; Moore, Travis; Ge, Hua
	Impact of saturation water content and liquid diffusivity of wood-based materials on hygrothermal response of wood-frame wall components subjected to water penetration	FP	<b>Wang, Lin</b> ; Ge, Hua; Lacasse, Michael; Wang, Jieying; Holcroft, Neal
	Hygrothermal criteria for design of cross-laminated timber external walls	EA	<b>Kukk, Villu</b> ; Kers, Jaan; Kalamees, Targo; Lin, Wang; Ge, Hua
	Thermal stability of phase change material (PCM): Evaluation of indoor thermal stability and building energy for apartment building	EA	<b>Yun, Beom Yeol</b> ; Choi, Ji Yong; Yuk, Hyeonseong; Jo, Ho Hyeon; Wi, Seunghwan; Kim, Sumin
	Evaluation of thermal properties and building energy consumption of artificial stone finishing materials containing biochar and PCM	EA	<b>Kim, Young Uk</b> ; Yun, Beom Yeol; Choi, Ji Yong; Yuk, Hyeonseong; Wi, Seunghwan; Kim, Sumin
	Thermal performance analysis of phase change material/biochar composite for CLT application	EA	Chang, Seong Jin; <b>Park, Jinyoung</b> ; Yeo, Su-Hwan; Park, Haedeun
	<b>Building Renewables, Solar Buildings &amp; Smart Grid 1</b>		<b>Session Chair: Jandaghian, Zahra</b>
	Greenhouse Gas Analysis of Solar Adsorption and Typical Residential HVAC Systems for Major Cities Across Canada	FP	<b>McNally, Jordan</b> ; Baldwin, Chris; Cruickshank, Cynthia
	Thermal assessment of the Varennes Library building-integrated photovoltaic rooftop system	FP	<b>Roy, Benjamin</b> ; Delisle, Véronique; Gagné, Alexandre
	Application of novel methods to compare the flexibility of residential space heating systems	FP	<b>Gaucher-Loksts, Erin</b> ; Delisle, Véronique; Roy, Benjamin; Tamasauskas, Justin; Kim, JinHee; Yu, Jisuk; Kim, Jun-Tae
	Assessment of plant-based oils as low carbon phase change materials for building applications	FP	<b>Nichol, Alia R</b> ; Treichel, Calene; Cruickshank, Cynthia A; Baldwin, Christopher
	Preliminary Design of Greenhouse Coverage Systems with Dynamic Solar Heat Gain Features for Operational Energy Savings	EA	Zhang, Enhe; Wang, Julian; <b>Wang, Nan</b>
	Research on the calculation of summer sol-air temperature in low latitude island of China	EA	<b>Yin, Kaili</b> ; Zhang, Xiaojing; Xie, Jingchao; Hao, Ziyang; Ge, Shibo; Liu, Jiaping

	Energy Performance of Solar Thermal Collectors Coupled with Building Energy Systems Under Climate Change for Cold Climate	EA	<b>Sokhansefat, Tahmineh</b> ; Bonyadi, Nima; Lee, Bruno
	<b>Advanced Modeling and Building Simulations, CFD 1</b>		<b>Session Chair: Zinzi, Michele</b>
	A High-efficiency and Low-cost Ground Source Heat Pump System Design for Cold-climate Application	FP	<b>Hu, Xiaouu</b> ; Yu, Yao; Miao, Rui; Megri, Ahmed
	Investigation of the Thermal Cooling Load of a Multifamily Residential Building by Different Algorithms of Heat Transfer	FP	Silva, Wesley Cecilio; <b>Duarte, Matheus de Andrade</b> ; Oliveira, Raquel Diniz; Lima, Frederico Romagnoli Silveira
	Evaluating Design Options for Healthy Lighting in Apartment Housing Units Considering LEED, WELL, and Toronto Green Standard	FP	Peters, Terri; <b>Nareshkumar, Abi</b>
	Numerical Assessment of Cockpit Thermal Environment and Air Quality using Computational Fluid Dynamics	FP	<b>Li, Xueren</b> ; Yan, Yihuan; Fang, Xiang; Tu, Jiyuan
	Evaluating the thermal performance of a hydronic radiant wall/panel by using tap water as the cooling medium	FP	<b>Rezvanpour, Mohammad</b> ; Zamani, Vahid; Cruz-Noguez, Carlos; Chen, Yuxiang
	Research on the Dynamic Simulation Method of Air-layer Integrated Ceiling Radiant Cooling Panel	FP	<b>Zhang, Nan</b> ; Huang, Gongsheng
	<b>Urban Microclimate and Energy 1</b>		<b>Session Chair: Carmeliet, Jan</b>
	A Universal Method for Meeting a Wide-Scale Heat Demand via District Heating Networks	FP	<b>Strzalka, Aneta</b> ; Böhnisch, Helmut
	Developing and Calibrating a Cost-Effective Method to Determine the Window-to-Wall Ratio and Air-Conditioning Status of Existing Buildings	FP	<b>Philip, Abraham</b> ; Pathak, Bhavya Swapneel; Gandhi, Shaily; Rawal, Rajan
	Weather Normalization of Building Cooling Energy Consumption using Specific Enthalpy	FP	<b>Tam, Claire</b> ; Liao, Zaiyi
	Performance Analysis and Operation Optimization of Energy Bus System for Residential Community in the Downstream of Yangtze River	FP	<b>Zhou, Yibing</b> ; Fan, Rui; Sun, Kexin; Bu, Ting; Zheng, Bin
	Outdoor overheating evaluation in Montreal using a reference year method among future time periods	EA	<b>Zou, Jiwei</b> ; Gaur, Abhishek; Wang, Liangzhu
	Research on Maintaining and Managing Historic Residential dwellings based on Digital Twin Technology	EA	<b>Qian, Yuchong</b> ; LENG, Jiawei
	Testing an Outdoor Thermal Comfort Workflow for Evaluating Urban Infill Design Options	EA	Peters, Terri; <b>Weiss, Ariel</b>
	A Method for Generating Typical Meteorological Year with Simplified Types of Meteorological Parameters	EA	<b>Gai, Shibo</b> ; Zhang, Xiaojing; Xie, Jingchao; Yin, Kaili
	<b>IS: Big data analytics to inform building operations, resilience, policy and human mobility</b>		<b>Session Chair: Hong, Tianzhen</b>
	Extract Typical air-conditioning behavior pattern based on large-scale online VRF system operating data	IS	Yan, Da
	Understand Human Mobility Patterns in Arizona through Big Data Analysis	IS	Dong, Bing
	Applications of big data on residential properties to provide decision-support for building energy policies	IS	Qiu, Lucy
	Ecobee smart thermostat dataset to inform safe rotating power outage	IS	Hong, Tianzhen
	<b>Workshop on Scientific and Technical Publishing (JSPS)</b>		<b>Session Chair: Stathopoulos, Ted</b>
	Wind Engineering & Industrial Aerodynamics		Stathopoulos, Ted
	Building and Environment		Chen, Qingyan

End at 12:00

	Q & A		
	<b>Workshop on Respiratory Disease Transmission in Buildings</b>		<b>Session Chair: Berquist, Justin</b>
	Development and Testing of an In-Room UVGI Air Purification Device		Eric Blomster
	Optimization of Indoor Air Quality and Energy Consumption using Indoor Climate and Energy Software – IDA ICE		Sven Moosberger
	Calculation and Control of the Infection Risk in Buildings Using BMS-Data		Mani Zargari
	Research Institute of Sweden: Effects of Ventilation on Airborne Transmission – Test Method Development and Performance Evaluation		Huijuan Chen
	Advances and Innovations of In-Duct UVGI		Uday Krishan
	National Research Council of Canada: Transmission of Respiratory Pathogens, Ventilation, and Building Regulations		Liang (Grace) Zhou
<b>12:00 – 13:00</b>	LUNCH		
<b>Start at 13:00</b>	<b>PARALLEL SESSIONS</b>	<b>TYPE</b>	<b>AUTHORS</b>
	<b>Health and Indoor Air Quality, Ventilation 2</b>		<b>Session Chair: Wang, Lin</b>
	A deep learning based zero-equation turbulence model for indoor airflow simulation	FP	<b>Calzolari, Giovanni;</b> Liu, Wei
	Exploring CO <sub>2</sub> sensor grid configurations and the implications for demand-controlled ventilation	FP	<b>Hobson, Brodie W.;</b> Gunay, H. Burak; Shillinglaw, Scott
	A predictive control strategy to maximize energy savings while maintaining indoor air quality in commercial buildings	FP	<b>Wang, Xuezheng;</b> Dong, Bing; Zhang, Jianshun
	Optimization of a Powerful Double-Intake and Rotor Squirrel Cage Fan	EA	<b>Benchikh Le Hocine, Alla Eddine;</b> Poncet, Sébastien; Fellouah, Hachimi
	Experimental study of particle filtration efficiency of a non-woven activated carbon fabric to improve indoor air quality	EA	<b>Bouhanguel, Ala;</b> Joubert, Aurélie; Subrenat, Albert; Andres, Yves
	Assessment of non-uniform flow influence on an air handling unit filters efficiency and life cycle	EA	<b>Bouhanguel, Ala;</b> Pavard, Gaetan; Joubert, Aurélie; Lecann, Pierre;
	<b>Building Physics, Building Envelope and Materials 2</b>		<b>Session Chair: Zhou, Liang (Grace)</b>
	Towards embedded controls for advanced double skin facades	FP	<b>Gennaro, Giovanni;</b> Favoino, Fabio; De Michele, Giuseppe; Goia, Francesco; Perino, Marco
	Numerically Modelling the Hygrothermal Response to Air Movements in Wall to wall Junctions	FP	<b>Delgadillo Buenrostro, Leonardo;</b> Gosselin, Louis; Blanchet, Pierre
	Optimizing prefabrication of plumbing systems for residential buildings from remote high north communities by considering all three facets of sustainable development	FP	<b>Suárez, Jose Luis;</b> Gosselin, Louis; Lehoux, Nadia
	Image Processing for Future Machine Learning Algorithm Applications on Infrared Thermography of Building Envelope Systems	FP	<b>Gertsvolf, David;</b> Horvat, Miljana; Khademi, April; Aslam, Danesh; Berardi, Umberto

	The influence of plug-holing phenomenon on the effect of lateral mechanical smoke exhaust in tunnel fire	EA	<b>Ji, Jie</b> ; Zhong, Wei; Wang, Zhiyong; Zhou, Yang; Zhou, Fan
	In-situ Thermal Behavior of Curtain Wall Systems in the Canadian Climate	EA	<b>Coriveau-Peev, Paméla</b> ; Rouleau, Jean; Gosselin, Louis
	Practical Correlation for Vacuum Insulation Panel Edge Loss and Panel R-value	EA	<b>Saber, Hamed</b> ; Yarbrough, David
	Effect of Different Window Types on Energy Rating Based on the Survey Data in China	EA	<b>Xu, Xin</b> ; Xie, Jingchao; Hang, Zhou; Liu, Jiaping
	<b>Building Renewables, Solar Buildings &amp; Smart Grid 2</b>		<b>Session Chair: Zuo, Wangda</b>
	Climate Zone-Based Energy Retrofits – Residential Buildings in Canada	FP	<b>McLeod, Rachel Maeve</b> ; Moradi, Mohsen; Aliabadi, Amir
	Preliminary Analysis of the Electricity Consumption of Residential Units in Nunavik (Quebec, Canada)	FP	Dumas, David; Gosselin, Louis
	Application of Machine Learning for Cie Standard Sky Classification	FP	<b>Aghimien, Emmanuel Imuetinyan</b> ; Li, Danny Hin Wa; Tsang, Ernest Kin-Wai; Agbajor, Favour David
	Analysis of Thermal Response to Power Outages in Residential Sector Using a Multi-Zone Data-Driven Archetype Energy Model	FP	<b>Abtahi, Matin</b> ; Athienitis, Andreas; Delcroix, Benoit
	Modeling of a retrofitted photovoltaic/thermal–energy storage system to enhance building energy flexibility	FP	<b>Pelletier-De Koninck, Jean-Christophe</b> ; Athienitis, Andreas; Nouanegue, Hervé Frank; Moreau, Alain
	Building-integrated photovoltaic performance modelling: evaluation of the System Advisor Model (SAM) based on experimental data from a grid-connected rainscreen system	FP	<b>Jazouli, Soukaina</b> ; Eisenlohr, Johannes; Wilson, Helen Rose; Kapsis, Costa
	<b>Advanced Modeling and Building Simulations, CFD 2</b>		<b>Session Chair: Poncet, Sébastien</b>
	Feasibility study of using artificial intelligence methods to reduce building energy demand and improve thermal comfort in early stages of design	FP	Forouzandeh, Nima; Zomorodian, Zahra-Sadat; Tahsildoost, Mohamad; <b>Shaghaghian, Zohreh</b>
	Assessment of fast fluid dynamics with different turbulence models for simulating airflow and pollutant dispersion around buildings	FP	Dai, Ting; Liu, Sumei; Liu, Junjie; Jiang, Nan; Liu, Wei; <b>Chen, Qingyan</b>
	Influence of building configuration on outdoor thermal comfort in a hot and humid climate	FP	<b>Chen, Lan</b> ; Mak, Cheuk Ming
	Experiments with a Street Canyon Wind Tunnel Model using PIV: Preliminary Results and Future Directions	FP	Cottingham, Kristofer; <b>Bowden, Robert</b> ; Yang, Sun-Kyu
	A CFD approach to investigate the effect of the flow field on thermal and moisture transport enhancement of a small-scale MOF dehumidifier	FP	Zu, Kan; <b>Qin, Menghao</b>
	<b>Urban Microclimate and Energy 2</b>		<b>Session Chair: Fedel, Michele</b>
	Understanding Nature Based Solutions (NBS) on Buildings to Mitigate Urban Heat Islanding (UHI)	FP	<b>Jandaghian, Zahra</b> ; Hayes, Alexander; Gaur, Abhishek; Lu, Henry; Laouadi, Abdelaziz; Lacasse, Michael
	Comparison of Outdoor Thermal Environment Optimization Strategies in Different Residential Districts of Xi'an, China in Summer	FP	<b>Zhang, Xuefeng</b> ; Wang, Yupeng; Zhou, Dian
	Effects of urban morphology and anthropogenic heat on Microclimates in Xi'an, China	FP	<b>Chen, Yuan</b> ; Wang, Yupeng; Zhou, Dian

	The Impacts from Vertical Climate Distribution on Energy Consumption of High-rise Urban blocks – the Case from Xi'an, China	FP	<b>Ge, Juejun;</b> Wang, Yupeng
	Simulation of Electricity Demand in Non-Residential Buildings Based on CityGML Data Models	FP	<b>Köhler, Sally;</b> Hötzel, Sarina; Schröter, Bastian
	<b>Workshop on Urban Environment and Energy (JSPS)</b>		<b>Session Chair: John Zhai</b>
	Advances in Urban Wind Environment Simulations		Tominaga, Yoshihide
	Modeling Building Stock in Cities		Hong, Tianzhen
	Multiscale Modeling of Urban Environment Performance		Wang, Leon
	Q & A		
	<b>Smart Buildings and Smart Cities (ML, AI, IoT) 1</b>		<b>Session Chair: Chao, Yuan</b>
	Developing a Window Control Algorithm Based on Reinforcement Learning for Indoor PM2.5 Mitigation	FP	<b>An, Yuting;</b> Xia, Tongling; You, Ruoyu; Lai, Dayi; Liu, Junjie; Chen, Chun
	Model-Free Reinforcement Learning Based Control for Radiant Floor Heating Systems	FP	<b>Han, Xu;</b> Malkawi, Ali
	Quantifying energy usage and savings in IoT control retrofitted Canadian small commercial buildings	FP	<b>Huchuk, Brent;</b> Bahiraei, Farid; Goodman, Jared; Avadaiappan, Rajendran
	Data-driven Smart Building Applications and Relevant Privacy Considerations: A Review	FP	<b>Zay, Subhan-Ullah;</b> Ouf, Mohamed; Nik-Bakht, Mazdak; Duguay, Stefanie
	Impact of Zoning Definition on Electrical Heating Systems Flexibility Potential in Residential Buildings: A Quebec Case Study	FP	<b>Hosseini, Sayed Saeed;</b> Vallianos, Charalampos; Agbossou, Kodjo; Athienitis, Andreas; Delcroix, Benoit; Henao, Nilson; Rao, Jiwu; Kelouwani, Souso
<b>End at 14:30</b>	Data-driven predictive control (DDPC) with deep neural networks for building energy savings	FP	<b>Fontenot, Hannah;</b> Dong, Bing; Zhou, Zhi
<b>14:30 – 15:00</b>	COFFEE BREAK		
<b>Start at 15:00</b>	<b>PARALLEL SESSIONS</b>	<b>TYPE</b>	<b>AUTHORS</b>
	<b>COVID-19, Pandemic and Epidemic 1</b>		<b>Session Chair: Nabi, Saleh</b>
	Energy and occupancy analytics to improve understanding and efficiency of building operations - A case study of an office building in Northern California	FP	<b>Luo, Na;</b> Hong, Tianzhen
	The aftermath of COVID-19 on educational building: An energy performance aspect	FP	Run, Keovathana
	Numerical studies on impact of ventilation condition on the COVID-19 transmission in indoor environment	FP	<b>Fang, Xiang;</b> Yan, Yihuan; Li, Xueren; Tu, Jiyuan
	Energy performance assessment of COVID-19 building recommendations in Singapore	FP	Sultan, Zuraimi; Jia, Hongyuan; Schiavon, Stefano
	New insights on teleworkers' work-related preferences and energy-related behaviors for working remotely during the COVID-19 pandemic: An interview-based qualitative analysis	FP	<b>Kharvari, Farzam;</b> O'Brien, William; Arpan, Laura
	A practical-oriented approach for preventing COVID-19 transmission in naturally ventilated room	FP	<b>Ren, Chen; Cao, Shi-Jie</b>
	<b>Building Physics, Building Envelope and Materials 3</b>		<b>Session Chair: Rossi, Stefano</b>

	Two-dimensional Numerical Simulation of Balcony Thermal Bridge	FP	<b>Hou, Yifan</b> ; Chen, Guojie; Zhou, Xi; Zhang, Bin
	Hygrothermal Properties of Cladding Materials at Different Temperatures	FP	<b>Yousefi, Youness</b> ; Tariku, Fitsum
	Experimental study on the effects of carbon nanotubes on fire risks of PMMA	FP	Zhang, Ying; Wang, Shasha; Yang, Menglin; Yuan, Bihe; Tang, Kaixuan; <b>Li, Changwei</b>
	Pre-And Post-Retrofit Performance Evaluation Of A Low-Rise Block Of Flats In The UK	FP	<b>Gupta, Rajat</b> ; Howard, Alastaira
	Fire smoke control and ventilative cooling of atrium in high-rise buildings	FP	<b>Sha, Haohan</b> ; Zhang, Xin; Liang, Xiguan; Qi, Dahai
	Assessing building envelope air leakage and estimating their energy consequences in Egypt's new residential buildings	FP	<b>Goubran, Sherif</b> ; Tarabieh, Khaled; Kamel, Basil
	<b>Building Renewables, Solar Buildings &amp; Smart Grid 3</b>		<b>Session Chair: Horvat, Miljana</b>
	Solar Buildings and Structural Wind Resistance in Wind Codes and Standards	FP	<b>Alrawashdeh, Hatem</b> ; Stathopoulos, Ted
	Feasibility of using solar PV and solar thermal energy in high-rise commercial buildings	FP	<b>Shirinbaksh, Mehrdad</b> ; Harvey, L.D. Danny
	Decarbonizing the North: Carbon & Economic Analysis of Space Heating Combined Carbon Capture & Storage & storage	FP	<b>Gagnon, William</b> ; Adetona, Adekunbi; Gillespie, Elaine; Goldstein, Benjamin
	Collective intelligence function in extreme weather conditions: High-resolution impact assessment of energy flexibility on building energy performance	FP	<b>Hosseini, S. Mohammad</b> ; Moazzami, Amin; Nik, Vahid M.
	Getting from Net Zero to Zero Carbon One Step at a Time	FP	Gilbride, Theresa Lee; <b>Louie, Edward</b> ; Aucremanne, Connor
	Green insulation panels development from industrial lignocellulosic materials reinforced cementitious composites	FP	<b>Hasan, K M Faridul</b> ; Horváth, Péter György; Bak, Miklós; Alpár, Tibor
	<b>Advanced Modeling and Building Simulations, CFD 3</b>		<b>Session Chair: Dong, Bing</b>
	Prediction of ventilation performance in urban area with CFD simulation and generative adversarial networks	FP	<b>Zhuang, Xinwei</b>
	Flow-Based Stress-Blended Eddy Simulation (Fb-SBES): a new hybrid framework for urban flow CFD simulations	FP	<b>Cotteleer, Léo</b> ; Longo, Riccardo; Parente, Alessandro
	Tracing the Dependency of Water and Energy in Smart and Connected Communities through a Multi-Domain Modeling Framework	FP	<b>Anbarasu, Saranya</b> ; Hinkelman, Kathryn; Zuo, Wangda
	Impacts of urban buildings configurations on outdoor thermal comfort during summer heatwave by CityFFD/CityBEM	FP	<b>Yang, Senwen</b> ; Mortezaadeh, Mohammad; Zou, Jiwei; Katal, Ali; Leroyer, Sylvie; Stathopoulos, Ted; Wang, Liangzhu (Leon)
	Validation of cross-ventilation flow in a realistic building geometry	EA	<b>Sudirman, Mutmainnah</b> ; Hooff, T. van; Gillmeier, S.; Blocken, B.
	A multi-GPU based LES urban wind flow solver for real-time simulation	EA	<b>Yang, Mingyu</b> ; Oh, Geunwoo; Choi, Jung-Il
<b>End at 16:30</b>	<b>TS: Urban climate at neighborhood scale: Part A</b>		<b>Session Chair: Derome, Dominique</b>

	Urban Physics, a new field and new responsibilities for engineers	EA	<b>Derome, Dominique;</b> Kubilay, Aytaç; Carmeliet, Jan
	Mitigating intensity of urban heat island by better understanding on urban morphology and anthropogenic heat dispersion	FP	<b>Yuan, Chao;</b> Mei, Shuo Jun; He, Wenhui; Adelia, Ayu Sukma
	Comfort assessment in cities densified with high-rise buildings	EA	Kubilay, Aytaç; Rubin, Andreas; Derome, Dominique; <b>Carmeliet, Jan</b>
	Numerical investigation of the impact of morphological parameters on urban ventilation in compact cities	EA	<b>Palusci, Olga;</b> Monti, Paolo; Cecere, Carlo; Montazeri, Hamid; Blocken, Bert
	Spatial Microclimatic Characterization of an OASIS Schoolyard	FP	Karam, Ghid; Chanial, Maïlys; Hendel, Martin; Royon, Laurent; <b>(Parison, Sophie)</b>
	Thermal and Microclimatic Behaviour of Innovative Pavements for the Life Cool & Low Noise Asphalt Project	FP	<b>Chanial, Maïlys;</b> Parison, Sophie; Hendel, Martin; Royon, Laurent
	<b>JSPS Info Session (with refreshments)</b>		<b>Session Chair: Sakai, Yumi</b>
	Intro to JSPS and funding mechanisms		Wada, Arisu
	Experience in Japan		Zhai, John
	Collaboration in Japan: Niigata Institute of Technology		Tominaga, Yoshihide
Collaboration in Japan: Tokyo Polytechnic University		Xuan, Yingli	
Networking session with Q&A			

**Starts at 17:00**

**CZEBS SOLAR SIMULATOR & WIND TUNNEL TOUR**

**WEDNESDAY, JULY 27**

**8:30 – 10:00**

Plenary Session

**Moderator: John Zhai**

Clarke, Colleen Mercer

Persily, Andrew

**10:00 – 10:30**

COFFEE BREAK

**Start at 10:30**

**PARALLEL SESSIONS**

**TYPE**

**AUTHORS**

**Health and Indoor Air Quality, Ventilation 3**

**Session Chair: Gunay, Burak**

A Stand-Alone Markov Chain Solver for Predicting Indoor Contaminant Transport Based on Measured Airflow Field

FP

**Zhou, Yiding;** An, Yuting; Chen, Chun

Parametric study on vertical void configurations for improving natural ventilation in double-loaded apartments

FP

**Kumar, Nikhil;** Bardhan, Ronita; Kubota, Tetsu; Tominaga, Yoshihide; Shirzadi, Mohammadreza

Electrospun nanofiber filters with minimized pressure drop for indoor air quality control: a design and fabrication approach

FP

**Niu, Zhuolun;** Bian, Ye; Xia, Tongling; Zhang, Li; Chen, Chun

	Modifying the turbulence diffusion of Markov chain model for predicting particle transport	FP	<b>Huang, Wenjie</b> ; Chen, Chun
	Reducing aerosol particle concentration in indoor spaces with mechanical ventilation and aircleaning: Evidences and challenges	EA	<b>Xia, Lili</b> ; Ricci, Alessio; Qin, Peng; Blocken, Bert
	Comparing Regional Deposition Characteristics of Fibrous Particles and Spherical particles in Human Upper Airways – an in silico case study	EA	<b>Khoa, Nguyen Dang</b> ; Ito, Kazuhide
	Similarity Assessment of Substituting Air-Helium for Real Fire in BIPV Façade Fire-induced Smoke Spread	EA	<b>Aram, Monireh</b> ; Zhang, Xin; Qi, Dahai; Ko, Yoon
	An emissions barrier stops spread of harmful emissions from a building into the indoor air	EA	<b>Larsson, Lennart</b> ; Mattsson, Johan
	<b>IS: Modeling Airborne Transmission during COVID-19</b>		<b>Session Chair: Wang, Liangzhu (Leon)</b>
	AMCA COVID Guidance for UNDUCTED Fans – Modeling Airborne Virus Transmissions in Large Warehouses with Large Diameter Ceiling Fans	IS	Yang, Senwen; <b>Wang, Liangzhu (Leon)</b> ; Raftery, Paul; Ivanovich, Michael; Taber, Christian; Bahnfleth, William P.; Wargoeki, Pawel; Pantelic, Jovan; Zou, Jiwei; Mortezaadeh, Mohammad; Shu, Chang; Wang, Runzhong; Arnold, Scott
	Cross infection risk between two people in different temperature surroundings studied by aerosol dynamics	FP	<b>Nielsen, Peter Vilhelm</b> ; Zhang, Chen; Frandsen, Kirstine Meyer; Jensen, Rasmus Lund; Popalzai, Najim; Hundevad, Patrick; Madsen, Simon; Luckenwald, Tonje; Li, Yuguo; Qian, Hua; Xu, Chunwen; Li, Liu
	Measurement of Inhaled Respiratory Particles When People Wear Face Masks with Various Social Distancing	FP	Deng, Zhipeng; <b>Chen, Qingyan</b>
	CFD Simulation and Experimental Validation of Respiratory Airflow and Particle Dispersion When Wearing Face Masks	FP	Deng, Zhipeng; <b>Chen, Qingyan</b>
	<b>Building Renewables, Solar Buildings &amp; Smart Grid 4</b>		<b>Session Chair: Zuo, Wangda</b>
	Investigation of Controllable Multi-Inlet Semi-Transparent PV/T in Modular System with Applications to Buildings and Infrastructures	FP	<b>Valinejadshoubi, Masoud</b> ; Athienitis, Andreas; Bagchi, Ashutosh
	Modelling the temporal carbon footprint of electricity in Quebec: application to the evaluation of dual-energy heating systems.	FP	<b>Ott, Maxime</b> ; Lefebvre, Annie; Monfet, Danielle
	Preliminary Modelling and Analysis of an Urban-Scale Ambient-Temperature District Energy System with Solar-Thermal Integration	FP	<b>Brunt, Nicholas</b> ; Duquette, Jean; O'Brien, William
	On-site data-driven dynamic solar gain estimation: an artificial occupancy case	FP	<b>Zhang, Xiang</b> ; Saelens, Dirk; Roels, Staf
	RoofKIT - Circular Construction and Solar Energy Use in Practice at the Solar Decathlon Europe 21/22	FP	<b>Wagner, Andreas</b> ; Carbonare, Nicolas; Hebel, Dirk E.
	Techno-environmental assessment of a green and efficient concept based on smart thermal storage interacted with low-temperature heating and high-temperature cooling system	FP	Behzadi, Amirmohammad; Nourozi, Behrouz; <b>Sadrizadeh, Sasan</b>
	<b>Advanced Modeling and Building Simulations, CFD 4</b>		<b>Session Chair: Ricci, Alessio</b>
	A Weight Clustering-based Pattern Recognition Method for Improving Building's Cooling Load Prediction Reliability	FP	<b>Chen, Sihao</b> ; Wang, Liangzhu {Leon}; Li, Jing; Zhou, Guang; Zhou, Xiaoqing

	Study on thermal comfort and energy saving potential of decoupled ceiling radiant cooling panels	FP	<b>Liang, Yuying</b> ; Huang, Gongsheng
	EFFICIENT ARRANGEMENT OF CONDENSER UNIT TO MINIMIZE THE HEAT COLUMN GENERATION EFFECT IN HIGH-RISE RESIDENTIAL BUILDINGS	FP	<b>Harithkhan, Vatharkhan Mohamed</b> ; Nissanka, Indrajith D.; Manthilake, Inoka
	Impact of Microclimate Landscape Design Updates on Thermal Comfort in a Community Park	FP	<b>Xiao, Jing</b> ; Yuizonono, Takaya
	Analysis of the distribution characteristics and influencing factors of the temperature field in typical office buildings	FP	Jin, Xu; <b>He, Yue</b> ; Liu, Zhong Yan; Liu, Pei
	<b>Urban Microclimate and Energy 3</b>		<b>Session Chair: Berardi, Umberto</b>
	An Investigation on the Influence of Neighbourhood Morphology on Outdoor Thermal Comfort in Toronto's Public Spaces	FP	<b>Hasan, Javeriya</b> ; Horvat, Miljana
	Integrated Statistical–Simulation Approach to Improve Heat-Related Health, Environmental, and Urban Energy Responses	FP	Dardir, Mohamed; <b>Berardi, Umberto</b> ; Wilson, Jeffrey
	High Resolution Urban Climate Map Generator: The Vertical City Weather Generator (VCWG v2.1.0)	FP	Moradi, Mohsen; <b>Aliabadi, Amir A.</b>
	Application of Low-carbon Multi-energy Complementary System in the Field of District Cooling and Heating	FP	<b>Wang, Ruolin</b> ; Song, Chen; Dong, Lulu; Ma, Xusheng; Wang, Haobin; Liu, Yu; Li, Yuanchen; Wang, Qi; Wang, Yue
	Modular Multifamily Construction: A Field Study of Energy Code Compliance and Performance Through Offsite Prefabrication	EA	<b>Grosskopf, Kevin</b>
	YIn <sub>0.9</sub> M (Mn, Cu, Fe) O <sub>3</sub> -ZnO smart nano-pigments for cool-roof application: structure/performance correlations	EA	<b>Fedel, Michele</b> ; Rosati, Andrea; Rossi, Stefano
	Study of cool roof paints with the comparison of different artificial illuminants with natural exposure	EA	<b>Rossi, Stefano</b> ; Rosati, Andrea; Fedel, Michele; Benedetti, Luca
	<b>TS: Building Energy Codes – Opportunities, and Challenges</b>		<b>Session Chair: Stylianou, Meli</b>
	Initial Models of Existing Canadian Buildings for Building Energy Code Analysis	FP	<b>Kirney, Chris</b>
	Intensity-Based versus Reference Building Approach in a Code Compliance Process	FP	<b>Gilani, Sara</b>
	Upgrading Building Codes towards Zero Carbon Buildings and Communities in China	IS	<b>Yang, Xinyan</b>
	Building Energy Codes Compliance: Practices Around the World	EA	Evans, Meredydd; <b>Delgado, Alison</b> ; Mott, Andrea
	<b>Resilience and Climate Change 1</b>		<b>Session Chair: Candenado, Jose</b>
	The effect of climate change on indoor overheating in heritage apartments in Beijing and Shanghai	FP	<b>Lei, Muxi</b> ; van Hooff, Twan; Blocken, Bert; Pereira Roders, Ana
	Intervention proposals in open spaces as contribution to urban resilience in Aracaju	FP	<b>Barbosa Teixeira, Carla Fernanda</b>
	A Study on Natural Disasters Predictive Model Using Periodic Natural Phenomenon Based on Non-homogenous Poisson Process	FP	<b>Ju, Wenhui</b> ; Su, Guofeng; Oforiwa, Priscilla Obeng
	Towards resilient interconnected urban infrastructures: the nexus between energy system, urban morphology, and transportation network	FP	<b>Javanroodi, Kavan</b> ; Perera, Amarasinghage T.D.; M. Nik, Vahid; Scartezini, Jean-Louis
	Climate Emergency: Engineering Curriculum Overhaul	FP	<b>Gagnon, William</b> ; Liu, Michelle Charlotte; Bhargava, Sehjal; Kennington, Allie; Kang, Mary; Howard, Courtney

End at 12:00

	The implementation of digital tools for climate adaptation planning	FP	<b>Shayesteh, Homeira</b> ; Keibach, Evelina
	<b>IS: Indoor Air Quality and Ventilation in the Age of COVID</b>		<b>Session Chair: Fariborz Haghighat</b>
	Experimental and Numerical Study of Exhaled Airflow Velocity through Human Coughs	IS	<b>Ooka, Ryozo</b>
	Filtration in the Age of COVID-19	IS	<b>Siegel, Jeffrey</b>
	Mitigating Strategies of COVID-19 Infection Transmission in Indoor Environment: Ventilation and Disinfection	IS	<b>Cao; Shijie</b>
	Portable Air Cleaner: Roles in Pandemic	IS	<b>Zhai, John</b>
	CFD Modeling of Airborne pathogen transmission of COVID19 in confined spaces under Different Ventilation Strategies	IS	<b>Mirzaei Ahranjani, Parham</b>
<b>12:00 – 13:00</b>	LUNCH		
<b>Start at 13:00</b>	<b>PARALLEL SESSIONS</b>	<b>TYPE</b>	<b>AUTHORS</b>
	<b>Health and Indoor Air Quality, Ventilation 4</b>		<b>Session Chair: Barbosa, Bruno Perazzo Pedroso</b>
	Experimental Investigation of Indoor Air Ventilation in a small-scale aircraft cabin model	FP	Herzberg, Martin; <b>Otto, Henning</b> ; Resagk, Christian; Cierpka, Christian
	Impact of elevated CO2 exposure due to a face mask on thermal comfort and cognitive performance in a warm environment	FP	<b>Hurley, Rachel Frances</b>
	Reduced-Scale Particle Image Velocimetry Measurements and Validation of Steady RANS for Air-Curtain Flows in Buildings	FP	<b>Alanis Ruiz, Claudio</b> ; van Hooff, Twan; Blocken, Bert; van Heijst, GertJan
	Formation of Acetone concentration distribution around breathing zone and transport efficiency to olfactory epithelium cells	FP	<b>Hoshiyama, Sara</b> ; Kuga, Kazuki; Ito, Kazuhide
	Reducing the transmission of airborne infectious diseases in multiple-bed hospital wards: a numerical study	EA	Hu, Nan; Sadeghian, Parastoo; <b>Sadrizadeh, Sasan</b>
	Pollutant emission characteristics and long-term hazard evaluation of organic insulation materials	EA	<b>Wi, Seunghwan</b> ; Yang, Sungwoong; Kang, Yujin; Kim, Sumin
	Data mining approach to characterize the operating conditions of AHU for different building archetypes and climate zones	EA	<b>Sokhansefat, Tahmineh</b> ; Bonyadi, Nima; Lee, Bruno
	Integrated Modeling of CO2 Transport from Indoor to Alveolar Region for Elucidating Human CO2 Emission Mechanism	EA	<b>Kuga, Kazuki</b> ; Ito, Kazuhide
	<b>Building Physics, Building Envelope and Materials 4</b>		<b>Session Chair: Vinha, Juha Olavi</b>
	A survey of the impact of acoustic environment on occupants' satisfaction in open-plan offices	FP	<b>Kang, Shengxian</b> ; Mak, Cheuk Ming; Ou, Dayi
	Thermal performance of green and cool roofs: a field experiment combining night ventilation	FP	<b>Ran, Jiandong</b> ; Feng, Ya; Tang, Mingfang; Jiang, Lin; Zhong, Huizhi
	The greening of foam insulation materials considering their life cycle and effective thermal insulating properties	FP	<b>Berardi, Umberto</b>

	Interior daylight environment of a university library in Beijing	FP	<b>Tian, Chunyuan;</b> Yang, Hui; Tong, Yurou; Guo, Baoxia
	Metal-Organic Frameworks (MOFs) Based Super Hygroscopic Nanofiber Membrane for Indoor Dehumidification	FP	Ding, Dong; <b>Qin, Menghao</b>
	Concept of Storm-Water Detention on Commercial Roofs to Mitigate Urban Flooding	FP	<b>Jandaghian, Zahra;</b> Saragosa, James; Chavez, Mauricio
	<b>TS: Data-driven Building operations</b>		<b>Session Chair: Gunay, Burak</b>
	Data-Driven Smart Buildings: A New Era	IS	Candenado, Jose
	Disaggregating building-level occupancy into zone-level occupant counts using sensor fusion	FP	Hobson, Brodie
	Effect of submeter density and configuration on disaggregation accuracy in commercial buildings	IS	Zaeri, Narges
	Application of a hybrid machine learning model for the detection and diagnosis of multiple dependent faults	FP	<b>Bezyan, Behrad;</b> Zmuraneau, Radu
	<b>Advanced Modeling and Building Simulations, CFD 5</b>		<b>Session Chair: Bode, Florin</b>
	Assessing RBFMOpt and HypE's performance based on the number of fitness functions	FP	<b>Da Silva, Mario Alves;</b> Garcia, Rafael de Paula; Carlo, Joyce Correna
	Numerical Analysis of Two Air Conditioning Systems for Thermal Comfort in School Classrooms in Oman: Stratum vs DX Split Systems	FP	<b>Murad Khan, Hayder;</b> Al-Saadi, Saleh; Al-Hashim, Alya; Al-Khatiri, Hanan
	Parameter Uncertainty and performance gap in energy simulation of transparent building envelopes	FP	<b>Kim, Young-Sub;</b> Park, Cheol-Soo
	Testing Processes for Building Envelope Innovation: the Building Future Lab	FP	<b>Trombetta, Corrado;</b> Cavanna, Giovanni; Grillo, Evelyn; Mandaglio, Mariateresa; Musarella, Caterina Claudia; Sansotta, Sara; Milardi, Martino
	Development and testing of a data schema for exchanging information between urban building energy models and urban microclimate models	FP	Luo, Xuan; Mortezaadeh, Mohammad; Luo, Na; Albettar, Maher; Zhang, Wannu; <b>Hong, Tianzhen;</b> Wang, Liangzhu
	<b>COVID-19, Pandemic and Epidemic 2</b>		<b>Session Chair: Gaur, Abhishek</b>
	Energy consumption patterns in a Canadian social housing building under COVID-19 lockdowns – A preview of the future?	FP	<b>Rouleau, Jean;</b> Gosselin, Louis
	Investigating the benefits of unsolicited building maintenance requests and the impact of teleworking	FP	<b>Campbell-Templeman, Kayle;</b> Nojedehi, Pedram; O'Brien, Liam
	Quantitative assessment of teleworking: a pilot study on holistic energy usage and greenhouse gas emission in Canada	FP	Simon, Sharane; <b>O'Brien, William</b>
	Numerical Analysis of Effects of Ventilation Conditions on an In-duct UVGI System for Infection Control	FP	<b>Luo, Hao;</b> Zhong, Lexuan
	SARS-CoV-2 infection dynamics integrated with mucociliary transport in human upper airway	EA	<b>Li, Hanyu;</b> Kuga, Kazuki; Ito, Kazuhide
	Regional deposition of inhaled nano-to-microscale particle in realistic upper respiratory tract under steady and transient breathing conditions	EA	<b>Kizuka, Ryusei;</b> Kuga, Kazuki; Ito, Kazuhide

	Mitigating aerosol transmission risks of SARS-CoV-2 in commercial buildings	EA	<b>Yan, Shujie</b> ; Wang, Liangzhu (Leon); J. Birnkrant, Michael; Zhai, John; Miller, Shelly L.
	Numerical investigation of cough droplets dispersion dynamics in indoor environment: Effect of oral cavity shape	EA	<b>Nishihara, Takumi</b> ; Kuga, Kazuki; Ito, Kazuhide
	<b>Urban Microclimate and Energy 4</b>		<b>Session Chair: Fedel, Michele</b>
	Experimental characterization and outdoor testing of thermochromic coatings for building envelope	FP	Autretto, Giorgia; <b>Badino, Elena</b> ; Fantucci, Stefano; Serra, Valentina; Zinzi, Michele
	Evaluation of the Equivalent Purging Flow Rate for Single-side Ventilated Model with Tracer Gas Measurements	FP	<b>Lin, Yuanyuan</b> ; Sandberg, Mats; Cehlin, Mathias; Claesson, Leif; Wigö, Hans
	Using Wind Tunnel Measurements to Validate External Flow Simulations for Pedestrian Wind Comfort	FP	<b>Pedro, Goncalo</b>
	Residential Neighbourhood Assessment in the City of Abu Dhabi and the impact on Climate Change (Heat Island Effect analysis)	FP	<b>Bande, Lindita</b> ; Ahmad, Anwar; Mohamed Howaishel Alsereidi, Kholoud
	Air Quality Impact at Urban Scale: Bucharest Case Study	FP	<b>Croitoru, Cristiana</b> ; Nastase, Ilinca; Bode, Florin; Sandu, Mihnea; Georgescu, Matei; Popescu, Razvan
	<b>Thermal Storage</b>		<b>Session Chair: Delcroix, Benoit</b>
	Investigation of Thermal Energy Storage Properties of Halloysite Nanotubes-based Solid-Solid Phase Change Materials	FP	<b>Zhang, Tiantian</b> ; Chen, Zhenqian
	A systematic dynamic pinch approach for thermal energy storage and solar assisted ground source heat pump integration in buildings	FP	<b>Hosseinnia, Seyed.Mojtaba</b> ; Sorin, Mikhail
	Economic Assessment of Bidirectional Low-Temperature District Energy Systems with Seasonal Energy Storage and Photovoltaic Thermal Hybrid Solar System	FP	<b>Qin, Qiwei</b> ; Gosselin, Louis
	Application of Low-carbon Multi-energy Complimentary System in the Field of District Cooling and Heating	FP	<b>Wang, Ruolin</b> ; Song, Chen; Dong, Lulu; Ma, Xusheng; Wang, Haobin; Liu, Yu; Li, Yuanchen; Wang, Qi; Wang, Yue
	Development and evaluation of high efficiency heat exchange ventilation system applied with thermal storage material.	FP	Yang, Sungwoong; Nam, Jihee; Yun, Beom Yeol; <b>Kim, Yong Uk</b> ; Kim, Sumin
<b>End at 14:30</b>			
<b>14:30 – 15:00</b>	COFFEE BREAK		
<b>Start at 15:00</b>	<b>PARALLEL SESSIONS</b>	<b>TYPE</b>	<b>AUTHORS</b>
	<b>Health and Indoor Air Quality, Ventilation 5</b>		<b>Session Chair: Hayati, Abolfazl</b>
	Performance evaluation of green-rated housing developments in the warm humid and composite climates of India	FP	<b>Gupta, Rajat</b> ; Gregg, Matt
	A quantitative framework for numerically estimating the COVID19 infection risk in a crowded indoor environment	FP	<b>Li, ChungGang</b> ; Bale, Rahul; Fukudome, Hajime; Tsubokura, Makoto
	The impact of oxygen content in the primary air on CO and PM2.5 emission performances in a forced-draft biomass stove	FP	<b>Deng, Mengsi</b> ; Nie, Yazhou; Yuan, Yanping; Ma, Rongjiang; Shan, Ming; Yang, Xudong

	Inverse identification of pollutant source in coupled indoor and outdoor environment	FP	<b>Zhang, FuYao</b> ; Dai, Yuwei
	Optimization of the ultraviolet sterilization field for upper-room UVGI	EA	Jiachen, Li; Chen, Deshi; Miao, Wenda; Zhao, Jianye; <b>Su, Chunxiao</b>
	<b>Building Physics, Building Envelope and Materials 5</b>		<b>Session Chair: Vinha, Juha Olavi</b>
	Experimental Investigation of a Thick Supply-Air Window with PCM Cavity-Frame	FP	<b>Huang, Yujian</b> ; El Mankibi, Mohamed; Cantin, Richard
	Overview of a research project of novel and rapid in-situ U-value measurements	FP	<b>Huttunen, Petteri</b> ; Vinha, Juha
	A novel active-passive system for overheating reduction of lightweight buildings	FP	<b>Zavrl, Eva</b> ; El Mankibi, Mohamed; Dovjak, Mateja; Stritih, Uroš
	Comparison of different methods to identify the critical orientation of wood-frame walls in assessing moisture risks	FP	<b>Aggarwal, Chetan</b> ; Ge, Hua; Defo, Maurice; Lacasse, Michael A.
	Determination of the Effective Thermal Conductivity of Aerogel-based Coating Mortars Using Numerical Simulations- Random Packing	FP	<b>Karim, Ali Naman</b> ; Hagentoft, Carl-Eric
	Mathematical Expressions for Prediction of the Effective Thermal Conductivity of Perfectly Packed Two-phase Mixtures	FP	Hagentoft, Carl-Eric; <b>Karim, Ali Naman</b>
	<b>TS: Urban climate at neighborhood scale: Part B</b>		<b>Session Chair: Derome, Dominique</b>
	Vegetation and urban night ventilation as mitigation measures for heat waves in densified cities	EA	<b>Kubilay, Aytaç</b> ; Strebel, Dominik; Rubin, Andreas; Carmeliet, Jan
	Modelling of a large canopy to assess thermal comfort in an urban park	EA	<b>Giroux-Gauthier, Léopold</b> ; Kubilay, Aytaç; Strebel, Dominik; Herlem, Alicia; Wood, Sylvia; Carmeliet, Jan; Derome, Dominique
	Insights from novel, multiscale modelling of urban heat reduction strategies: street trees and cool materials	EA	<b>Krayenhoff, E. Scott</b> ; Jiang, Tim; Lachapelle, Jacob; Ken, Eric; Beaudry, Anika
	A Mobile Traverse Method to Measure Neighbourhood-Scale Microclimate	FP	Stastny, Austine; <b>Voogt, James A.</b> ; Lao, Jiahao
	Simulating contemporary and projected urban thermal climate with the urbanized WRF regional climate model	FP	<b>Jiang, Timothy</b> ; Krayenhoff, E. Scott
	Mitigation urban heat island phenomenon with innovative pavement coating and watering	FP	<b>Maxime, Frere</b> ; Martin, Hendel; Simon, Pouget; Julien, van Rompu; Laurent, Royon
	A thermal comfort modelling framework for urban neighbourhoods: tempo-spatial coupling of building energy and CFD models	FP	Aghamolaei, Reihaneh; Fallahpour, Marzieh; Zhang, Ruijun; <b>A.Mirzaei, Parham</b>
	<b>Advanced Modeling and Building Simulations, CFD 6</b>		<b>Session Chair: Bode, Florin</b>
	Wind tunnel measurements and CFD simulations of wind pressure distribution on the facades of a large educational building: validation of RANS and SAS	FP	<b>van Hooff, Twan</b> ; Gillmeier, Stefanie; Verbruggen, Marlies
	Developing a coupled spectral-dependent radiative cooling and building energy model	FP	<b>Yu, Xinxian</b> ; Chen, Chun

	CFD simulations of pollutant dispersion in a street canyon: Impact of ideal versus realistic source emissions	FP	<b>Qin, Peng</b> ; Ricci, Alessio; Blocken, Bert
	Energy-saving potential of thermochromic glazing in a cold climate	FP	<b>Khaled, Khaled</b> ; Berardi, Umberto; Liao, Zaiyi
	Fast Fluid Dynamics Simulation of the Tree Canopy Drag Effect with OpenFOAM	FP	<b>Li, Ruibin</b> ; Liu, Zhanpeng; Feng, Lu; Gao, Naiping
	Office Design Decisions and Indoor Environmental Quality: A Parametric Design and Simulation-Based Workflow	FP	<b>Fathi, Arefeh Sadat</b> ; O'Brien, Liam
	<b>IS: Building-integrated Renewables, Solar Buildings and Smart Grid Interaction</b>		<b>Session Chair: Athienitis, Andreas</b>
	Global and Regional climate change: impact on energy consumption. The potential of mitigation and adaptation technologies	IS	Santamouris, Mat
	A new model for typical building electricity use profile generation to support renewable energy system design and smart grid integration	IS	Yan, Da
	A building energy flexibility model to facilitate integration of building-integrated solar systems with smart grids	IS	Athienitis, Andreas
	Two-phase collaborative optimization and operation strategy for a new distributed energy system that combines multi-energy storage for a nearly zero energy community	IS	Wu, Di
	<b>Building Renewables, Solar Buildings &amp; Smart Grid 5</b>		<b>Session Chair: Nouanegue, Hervé Frank</b>
	Heating Performance of a Novel Centralized Solar Heating System Coupled with a Water-water Heat Pump in Lhasa, China	FP	<b>Zhang, Ruichao</b> ; Wang, Dengjia; Zhou, Heng; Qu, Lei; Mo, Zhelong
	Energy generation versus decrease energy consumption in buildings: cost-benefit ratio	FP	<b>Domingos, Renata Mansuelo Alves</b> ; Pereira, Fernando Oscar Ruttkay
	Modelling and Energy Management Control Study for a Net-Zero Energy Home	FP	<b>Caputo, Diego H</b> ; Fung, Alan S; Brookson, Aidan
	Sensitivity Analysis using a Simplified Transient Heat Transfer Model to Examine How Soils with Extreme Properties Affect Single and Double Borehole Heat Exchanger Designs	FP	<b>Kostevski, Michael John</b> ; Fung, Alan; Leong, Wey; Kerme, Esa
	Study of Energy Saving Potential of Solar Shading Devices in Various Climates	FP	Turner, Lewis; <b>Yang, Siliang</b> ; White, Mike
	Numerical Assessment of the Energy Impacts of the BIPV/T Façade Coupled with Heat Pump Technology for Domestic Hot Water Heating	FP	<b>Nghana, Barilelo</b> ; Tariku, Fitsum; Bitsuamlak, Girma
	<b>IS: Wind Engineering, Aerodynamics and Urban Physics (JSPS)</b>		<b>Session Chairs: Ted Stathopoulos and Bert Blocken</b>
	An experimental and numerical study of football stadium ventilation to reduce aerosol concentrations and COVID-19 transmission	IS	Bert Blocken
	CFD analysis of airborne sea salt adhesion related to corrosion damage in a large sports stadium	EA	Yoshihide Tominaga
	How climate changes require to design buildings differently	IS	Umberto Berardi
	Dispersion of air pollution in urban environment due to wind-structure interaction	FP	Kenny Kwok
	Characterization of wind in seaports and waterways through field measurements and CFD simulations	IS	Alessio Ricci

End at 16:30

Start at 18:00	BANQUET / AWARDS CEREMONY / NEW CONFERENCE ANNOUNCEMENT		
THURSDAY, JULY 28			
8:30 – 10:00	Plenary Session		
	<b>Moderator: Hua Ge</b>		
	Li, Yuguo		
Hong, Tianzhen			
10:00 – 10:30	COFFEE BREAK		
Start at 10:30	<b>PARALLEL SESSIONS</b>	TYPE	AUTHORS
<b>Health and Indoor Air Quality, Ventilation 6</b>			
Steps in designing an indicator for assessing window's effect on indoor thermal comfort		FP	<b>Session Chair: Fellouah, Hachimi</b> <b>Wang, Nan;</b> Ghaeili, Neda; Wang, Julian
Experimental evaluation of a CO2-based demand-controlled dual core energy recovery system		FP	<b>Ouazia, Boualem;</b> Arsenault, Chantal; Brhane, Sador; Nong, Gang; Mancini, Sandra; Lefebvre, Daniel
Extended monitoring of a dual core energy recovery system in the Arctic for proven performance and resiliency		FP	<b>Ouazia, Boualem;</b> Arsenault, Chantal; Brhane, Sador; Nong, Gang; Mancini, Sandra; Lefebvre, Daniel
<b>Building Physics, Building Envelope and Materials 6</b>			
Impacts of Building Energy Facilities In our Environment		FP	<b>Session Chair: Kapsis, Costa</b> <b>Osunsanmi, Morounfade Emmanuel</b>
Development and field performance evaluation of a novel passive dehumidification system		FP	<b>Chen, Yulu;</b> Ozaki, Akihito; Lee, Haksung
Investigation of phase change materials on Australian residential building energy efficiency		FP	Ma, Yunlong; Masouleh, Keivan Bamdad; <b>Omrani, Sara;</b> Drogemuller, Robin
Assessment of CO2 reduction effect according to the different window frames at the city-scale		FP	<b>Choi, Younhee;</b> Akihito, Ozaki (2); Lee, Haksung; Iqbal, Muhammad
Identifying the pathways toward zero embodied and operational carbon emissions for the housing stock in Jordan		FP	<b>Alasmar, Reham;</b> Schwartz, Yair; Burman, Esfandiar
Automated RC Model Generation for MPC Applications to Energy Flexibility Studies in Quebec Houses		FP	<b>Vallianos, Charalampos;</b> Hoseini, Sayed Saeed; Athienitis, Andreas; Agbossou, Kodjo; Delcroix, Benoit; Rao, Jiwu; Henao, Nilson
<b>Resilience and Climate Change 2</b>			
How will mechanical night ventilation affect the electricity use and the electrical peak power demand in 30 years? – A case study of a historic office building in Sweden		FP	<b>Session Chair: Leroyer, Sylvie</b> <b>Bakhtiari, Hossein;</b> Sayadi, Sana; Akander, Jan; Hayati, Abolfazl; Cehlin, Mathias

	Assessing the Thermal Resilience of Multiple Outage Events using a Multi-Objective Optimization Analysis	FP	<b>Bucking, Scott</b> ; Rostami, Milad
	What is the Difference Between Reliability, Resilience, Robustness, and Vulnerability in High-performance Buildings' Thermal Performance?	FP	<b>Rostami, Milad</b> ; Bucking, Scott
	Ecosystem-Level Biomimicry for the Built Environment: Adopting Systems Ecology Principles for the Control of Heterogeneous Energy Systems	FP	<b>Hinkelman, Kathryn</b> ; Zuo, Wangda; Wang, Jing; Huang, Sen; Wetter, Michael
	<b>Building Fire Safety</b>		<b>Session Chair: Nabi, Saleh</b>
	Research on Very Early Warning Aspirating Smoke Detector deployed in massive Guan style buildings from Ming and Qing dynasties in the Palace Museum	FP	<b>Li, Yue</b> ; Du, Haijiang; Wang, Bo; Liu, Yufeng; Liu, Jinzhou
	Experimental study on the maximum excess ceiling gas temperature of cable tray fires in utility tunnels	FP	<b>Huang, Ping</b> ; Ye, Shenglin; Qin, Liang; Yu, Longxing
	Burning rates and thermal feedback of pool fires in a tunnel under wind effect and sidewall restriction	FP	<b>Guo, Fangyi</b> ; Ding, Long; Ji, Jie; Gao, Zihe; Yu, Longxing
	Smoke Spreading Simulation of a High-rise Office building based on Evacuation Analysis	FP	<b>Shu, Chang</b> ; Wang, Liangzhu (Leon)
	Feasibility Analysis of Suppressing the Stack Effect by Installing Fireproof Curtains on Interior Stairs of Existing Elderly Care Institutions	FP	<b>Shih, ChiaYuan</b> ; Wang, ShiuanCheng; Chien, ShenWen; Su, ChungHwei; Dong, AnJie; Lin, GuanWei
	Indoor Fabric as an Adsorptive Reservoir for Volatile Organic Compounds in Wildfire Smoke: a Preliminary Study	FP	<b>Wang, Chao</b> ; Liang, Yirui; Bergendahl, John; Liu, Shichao
	<b>Occupant-Centric Building Design and Controls 1</b>		<b>Session Chair: Horvat, Miljana</b>
	Evaluate the Energy Saving from Window Opening Behavior through Coupling a Deep Learning Model with EnergyPlus	FP	<b>Pandey, Pratik Raj</b> ; Dong, Bing; Sharifi, Nina; Malsegna, Mason Kenneth
	Developing thermostat user mental models to inform better energy-saving design	FP	<b>Tamas, Ruth</b> ; O'Brien, Liam; Santana Quintero, Mario
	An Implementation Method of Collaborative Simulation for Integrated Optimization of Lighting and Interior Design	FP	<b>Chen, Tianyi</b> ; Wang, Lixiong; Wu, Yuting; Kong, Guangyan; Hao, Qingli; Yin, Yujun; Chen, Peng; Yu, Juan
	Generation and Analysis of Typical meteorological years for future weather data and the detection of heatwave in Copenhagen	FP	<b>Qian, Bin</b> ; Zhang, Chen; Kvols Heiselberg, Per; Lei, Bo; Yu, Tao; Trangbæk Jønsson, Kim
	Development and implementation of a novel occupant data collection method for assessing thermal comfort in multi-occupant spaces.	FP	<b>Athienitis, Emilios</b> ; Ouf, Mohammed
	<b>IS: Accelerating projects for smart, sustainable, low carbon buildings and neighborhoods</b>		<b>Session Chair: Ursula Eicker</b>
	The challenge of zero emission buildings		Eicker, Ursula
	Real estate solutions and roadmap for zero emission buildings		Voland, Natalie
	Financing solutions for building retrofits and new built		Demers, Rene
	Investing into innovative green building and neighborhoods		Westeinde, Jonathan
	Climate action and roadmap of the City of Montreal		laFramboise, Amelie
	The role of energy efficiency and retrofit solutions		Sammoun, Samira

	Outlook on the electricity grid infrastructure for zero emission cities		Otis, Linda
<b>End at 12:00</b>	<b>Building Renewables, Solar Buildings &amp; Smart Grid 6</b>		<b>Session Chair: Hachem-Vermette, Caroline</b>
	Energy-driven Urban Configuration Optimization based on Modified Deep Reinforcement Learning	FP	<b>Huang, Chenyu</b> ; Zhuang, Zhi; Zhang, Yongming; Yao, Jiawei
	A simulation tool for renewable energy supported buildings	FP	Kuru, Mustafa; Gökçül, Furkan; Ölmez, Burak Behlül; <b>Eicker, Ursula</b> ; Baker, Derek; Güğül, Gül Nihal; Geçer, Kenan; Güleç, Seda
	Energy and exergy analyses of a centralized heating system combined solar energy and biogas	FP	Guo, Mengmeng; <b>Chen, Yaowen</b> ; Liu, Yanfeng; Quan, Mengchen
	Small scale integrated solar-ORC system for power and heating	FP	<b>Xu, Xin</b> ; Zhang, Lian
	Review and Case Studies of Thermal Energy Harvesting Opportunities in Buildings	FP	<b>DePinto, Michael</b>
<b>12:00 – 13:00</b>	LUNCH BREAK		
<b>Start at 13:00</b>	<b>PARALLEL SESSIONS</b>	<b>TYPE</b>	<b>AUTHORS</b>
	<b>Health and Indoor Air Quality, Ventilation 7</b>		<b>Session Chair: Ghobadi, Mehdi</b>
	Building Integrated Photovoltaic/Thermal Collector for Arctic Residential Applications	FP	<b>Baril, Daniel J</b> ; Ge, Hua; Athienitis, Andreas K
	Mitigating the Effects of Urban Heat Island on Outdoor Thermal Comfort by Urban Geometry Reshaping: A Case Study of Mashhad's Vaez Tabasi Street	FP	<b>Hedayatnia, Hamed</b> ; Mirhaidartouran, Sara; Van Den Bossche, Nathan
	Application of a coupled CFD-multizone code on ventilation and filtration analysis for Covid-19 airborne infection control in a small office	FP	<b>Barbosa, Bruno Perazzo Pedroso</b>
	Study on the Actual Condition of Fungal Flora in Car Air Conditioners and its Effects on the Cabin Environment	FP	<b>Watanabe, Kensuke</b> ; Yanagi, U; Ishida, Yoshiki
	A comprehensive review on contaminant transfer in membrane energy recovery ventilators	FP	<b>Mathews, Ashwin Joseph</b> ; Annadurai, Gurubalan; Krishnan, Easwaran N.; Simonson, Carey J.
	Heating of cold wall with confluent jets in large space enclosures: Application in greenhouse premises	FP	<b>Choonya, Gasper</b> ; Larsson, Ulf; Moshfegh, Bahram
	<b>Low/Zero Carbon Emission Buildings and Communities 1</b>		<b>Session Chair: Holzer, Peter</b>
	Quantifying Building Energy Performance Gap Using a Multi-indicator Framework	FP	<b>Bai, Yefei</b> ; Yu, Cong; Pan, Wei
	Agent-based energy consumption behavior model for community multi-node building occupants	FP	<b>Yu, Zuoxiang</b> ; Song, Cong; Liu, Yangfeng; Wang, Dengjia; Hu, Xiaoxue; Tang, Huanglong
	Measurement of Power Consumption Savings Provided by a Residential Air Conditioner that Operates Continuously under Low-Load	FP	<b>Ito, Shinichi</b> ; Yamamoto, Kazuhide; Kuwasawa, Yasuo
	Embodied Carbon Assessment of Walling Technologies using Life Cycle Analysis for Housing Sector in India	FP	<b>Nathani, Sakshi</b> ; Rawal, Rajan; Shukla, Yash; Pathak, Bhavya

	Domestic Heating, Cooking and Baseload Emissions and Life Cycle Cost Analysis of Technological Solutions	FP	<b>Ryland, Michael;</b> He, Wei
	The potential assessment of carbon reduction by sharing activity rooms in Chinese Northern rural aging communities	FP	<b>Li, Na;</b> Luo, Xi; Luo, Fuzhou; Sun, Yongkai
	<b>Thermal Comfort 1</b>		<b>Session Chair: Shu, Chang</b>
	Roots and mechanisms of thermal comfort expectations: from individuals' own background to adaptation and change	FP	<b>Pistore, Lorenza;</b> Pasut, Wilmer
	The prediction accuracy of ISO and ASHRAE Predicted Mean Vote (PMV)	FP	<b>Tartarini, Federico;</b> Cheung, Toby; Schiavon, Stefano; Arens, Edward
	Thermal comfort with contact heating system for energy savings in electric vehicles	FP	<b>Kwak, Jiyoung;</b> Lee, Jeongseo; Eom, Sohyeon; Chun, Chungyoon; Kim, Sanghun; Seo, Seokwon
	Comparing Multiple Overheating Assessment Metrics Using Measured Data	FP	<b>Shu, Chang;</b> Xie, Zihan; Ji, Lili; Baril, Daniel; Wang, Lin; Bai, Xuechen; Yang, Senwen; Ge, Hua; Zmeureanu, Radu; Lacasse, Michael; Laouadi, Abdelaziz; Gaur, Abhishek; Wang, Liangzhu (Leon)
	Research on Skin Temperature and Thermal Comfort of Electric Vehicle Passengers under Contact Cooling System	FP	<b>You, Jiwon;</b> Kwun, Sohyun; Han, Jieun; Chun, Chungyoon; Park, Junseok
	Thermal comfort improvement with local contact cooling on the back of the neck	FP	<b>Han, Jieun;</b> Jeon, Hyojin; Noh, Changhyun; Kim, Jiwoo; Chun, Chungyoon
	<b>Occupant-Centric Building Design and Controls 2</b>		<b>Session Chair: Aliabadi, Amir A.</b>
	A data-driven frequency domain system identification approach to define house archetypes and flexibility	FP	<b>Maturo, Anthony;</b> Athienitis, Andreas; Delcroix, Benoit
	Deep Learning Models for Future Occupancy Prediction in Residential Buildings	FP	<b>Esrafilian-Najafabadi, Mohammad;</b> Babahaji, Mina; Haghigat, Fariborz
	Exploring the Feasibility of An Integrated HVAC System in U.S.	FP	<b>Li, Yuewei;</b> Dong, Bing; Deng, Zhipeng; Zhang, Jianshun; Wang, Xuezheng; Zhang, Rui
	A low-energy wearable cooling strategy for thermal comfort and cognition	FP	<b>Belyamani, Mohamed Amine;</b> Hurley, Rachel; Liu, Shichao
	Developing Urban-Scale Markovian Occupancy Profiles for Residential Buildings Using Smart Thermostat Data	FP	<b>Doma, Aya;</b> Ouf, Mohamed
	<b>Resilience and Climate Change 3</b>		<b>Session Chair: Larsson, P Lennart</b>
	Optimizing Mechanical Ventilation Systems for Wildfire Smoke Resilience in British Columbia	FP	Dsoza, Aaron; <b>Zhong, Lexuan</b>
	An activity-based spatial-temporal urban electricity vulnerability assessment	FP	<b>Xia, Chen;</b> Hu, Yuqing; Chen, Jianli
	Resilience and Climate Change: How a large-scale innovation district in Northern Italy is leading climate risk mitigation	FP	<b>Boschi, Nadia</b>

	Quantification of building thermal resilience against heatwaves	FP	<b>Ji, Lili</b> ; Shu, Chang; Laouadi, Abdelaziz; Ge, Hua; Zmeureanu, Radu; Lacasse, Michael; Wang, Liangzhu (Leon)
	<b>TS: Indoor Bioaerosols</b>		<b>Session Chair: Duchaine, Caroline</b>
	Why should air filters have antiviral properties? Detachment of bioaerosols from air filters and a silver ion antiviral air filter with rapid inactivation of SARS-CoV-2	FP	<b>Law, Chun Kit</b> ; Sze-To, G.N.; Lai, Joseph H.K.
	Infection risk in a restaurant environment due to airborne diseases	EA	<b>Bale, Rahul</b> ; Li, Chungang; Fukudome, Hajime; Yumino, Saori; Iida, Akiyoshi; Tsubokura, Makoto
	A practical-oriented approach for preventing infection disease transmission in naturally ventilated room	IS	<b>Ren, Chen</b> ; Cao, Shi-Jie
	Carbon Dioxide at TWA-TLV limits Alters Immune Responses to Influenza A	EA	<b>Schneberger, David</b> ; Kirychuk, Shelley; Thompson, Brooke; Zhou, Yan; Aulakh, Gurpreet; Simonson, Carey
	Bioaerosols: progresses and challenges in the study of the invisible entities that changed our world	EA	<b>Duchaine, Caroline</b>
<b>End at 14:30</b>	<b>TS: IEA Annex 79</b>		<b>Session Chair: Wagner, Andreas</b>
	Welcome and short introduction into Annex 79		Wagner, Andreas; O'Brien, Liam
	Occupants in the building design decision-making process		De Souza, Clarice Bleil
	Evaluation and re-development of occupant-centric design of an office building in Toronto		Abuimara, Tareq; O'Brien, Liam
	Occupant-centric energy modeling of a social housing building in Quebec City		Rouleau, Jean; Gosselin, Louis
	Short presentation of the book "Occupant-centric simulation-aided building design: theory, application, and case studies"		O'Brien, Liam
<b>14:30 – 15:00</b>	COFFEE BREAK		
<b>Start at 15:00</b>	<b>PARALLEL SESSIONS</b>	<b>TYPE</b>	<b>AUTHORS</b>
	<b>TS: IEA Annex 80</b>		<b>Session Chairs: Attia, Shady and Afshari, Afshin</b>
	An Original Urban Canopy Model to Support Urban Design/Retrofit Optimization	FP	<b>Afshari, Afshin</b>
	Exploiting passive cooling in office with advanced automated glazing systems	FP	Botticelli, Martina; Agnoli, Stefano; Romano, Sabrina; <b>Zinzi, Michele</b>
	Analysing future cooling demand for a new preschool building in central Sweden	FP	<b>Sayadi, Sana</b> ; Akander, Jan; Hayati, Abolfazl; Cehlin, Mathias
	The Impact of Building Retrofitting on Thermal Resilience against Power Failure: A Case of Air-conditioned House	FP	<b>Mirzabeigi, Shayan</b> ; Homaei, Shabnam; Razkenari, Mohamad; Hamdy, Mohamed
	Evaluating and mapping indoor thermal risk on older people in long-term care buildings under urban microclimate impacts	FP	<b>Ji, Lili</b> ; Shu, Chang; Laouadi, Abdelaziz; Ge, Hua; Zmeureanu, Radu; Gaur, Abhishek; Lacasse, Michael; Wang, Liangzhu (Leon)

	Assessing the potential of energy savings in residential buildings by city-scale cool materials application	FP	<b>Zinzi, Michele</b> ; Falasca, Serena; Ding, Lan; Augello, Andrea; Santamouris, Mattheos
	<b>Thermal Comfort 2</b>		<b>Session Chair: Jandaghian, Zahra</b>
	Oxygen comfort evaluation method and the oxygen adaptation level for sojourners at high altitude	FP	Cao, Ruixuan; <b>Song, Cong</b> ; Liu, Yanfeng; Wang, Dengjia
	Experimental Research on Circadian Rhythm on Thermal Comfort of Human in Awakening	FP	<b>Cheng, Xiang</b> ; Yang, Lei; Cao, Jian; Song, Gaoju
	Enhancing energy flexibility of a school building using local setpoint adjustment in classrooms	FP	<b>Morovat, Navid</b> ; Athienitis, Andreas K; Candanedo, José Agustín
	Green glass space based design for the driven of energy efficiency and thermal comfort: case study in Xiong'an, China	FP	<b>Xi, Chang</b> ; Cao, Shi-Jie
	Study on the control effect of fan coils considering both room temperature and humidity	FP	<b>Ding, Xiaoxiao</b> ; Wang, Chuang; Zhang, Weirong; An, Jingjing
	<b>COVID-19, Pandemic and Epidemic 3</b>		<b>Session Chair: Gaur , Abhishek</b>
	Effect of Airflow on Distribution of Floating Aerosol in Rooms with Air Conditioners under Natural and Mechanical Ventilation	FP	<b>Kato, Harumi</b> ; Ito, Shinichi; Kikuta, Koki; Hayashi, Motoya
	Airflow optimization to prevent transmission of COVID-19	FP	<b>Nabi, Saleh</b>
	Towards an accurate CFD prediction of respiratory flow and dispersion through face mask	FP	<b>Jia, Zhongjian</b> ; Ai, Zhengtao; Mak, Cheuk Ming
	Mapping of conflicts experienced in the environment built in front of pandemic Covid-19	FP	Silva, Heloisa Nunes e; Marcon, Lucileia; <b>Domingos, Renata Mansuelo Alves</b> ; Sartor, Beatriz
	Transmission of COVID-19 inside a classroom space due to natural ventilation and air leakage	FP	Kotb Ali, Hassan; <b>Goubran, Sherif</b>
	The airborne lifetime and spatial-temporal distribution of emitted particles in dental procedures	FP	<b>Li, Xiujie</b> ; MAK, Cheuk Ming; Ai, Zhengtao; Ma, Kuen Wai; Wong, Hai Ming
	<b>TS: Environmental Impacts of Telework</b>		<b>Session Chair: O'Brien, Liam</b>
	Causal relationships in the built environment from telework	IS	Kharvari, Farzam
	Long-term field measurement of the energy impacts of telework	IS	Simon, Sharane
	Social housing energy impact of telework	IS	Rouleau, Jean
	Office building operations adaptability to partial occupancy during COVID-19	IS	Hobson, Brodie
	Extensive energy monitoring of an office building before and after COVID-19	IS	Luo, Na
	<b>Smart Buildings and Smart Cities (ML, AI, IoT) 2</b>		<b>Session Chair: Berardi, Umberto</b>
	Agent-based Decentralized Energy Management with Distributed Intelligence for HVAC Control	FP	<b>Hussain, Syed Asad</b> ; Jayasena, Amindha; Wang, Lan; Lee, Eric Wai Ming; Kwok Kit Yuen, Richard; Sadiq, Rehan; Hewage, Kasun
	Socio-technical challenges to operational energy management in buildings: Semi-structured interviews with two facility management companies	FP	<b>Brackley, Connor</b> ; Nojedehi, Pedram; Darwazeh, Darwish; O'Brien, William; Ouf, Mohamed M.

	A model-based predictive control method for thermal environment in low-energy buildings	FP	Chen, Yibo; <b>Berardi, Umberto</b> ; Liang, Er; Cui, Guoyou; Jiang, Xin
	Time-Resolved Neural Network Surrogate Models as Digital Twins	FP	<b>Kotha, Rajeev</b> ; Lédée, François; Shamsi, Mohammad Haris; Evins, Ralph
	Sustainable Policy Design - How Policy impacts Household Waste Management: A Case-study from Shanghai	FP	<b>Du, Wenhong</b> ; Yang, Jiami; Chen, Tianyu; Yao, Jinli; Yan, Jun; Ge, Hua; Bhuiyan, Nadia; Zhou, Fayi; Liu, Xiao; Zeng, Yong
	Fairness-aware Regression Models for Building Energy Prediction to Achieve Uniform Performance	FP	<b>Sun, Ying</b> ; Haghighat, Fariborz; Fung, Benjamin C. M.
	<b>Health and Indoor Air Quality, Ventilation 8</b>		<b>Session Chair: Holzer, Peter</b>
	Role of Ag modification on oxidation of acetone in air over CeO2 photocatalysts under VUV illumination	FP	Payan, Amir; <b>Soltan, Jafar</b>
	Integrated Method for Assessing Indoor Air Quality, Moisture Performance and Thermal Comfort Measures	FP	<b>Heibati, Seyedmohammadreza</b> ; Maref, Wahid; Saber, Hamed H.
	Numerical Investigation of Wind-Driven Cross-Ventilation on a Low-Rise Residential Building	FP	<b>Vandewiel, Matthew R.</b> ; Younis, Muna; Kahsay, Meseret T.; Capretz, Miriam A.M.; Bitsuamlak, Girma T.
	Can local ventilation reduce fine particles dispersion caused by a coughing patient in a hospital environment?	FP	<b>Murga Aquino, Alicia Maria</b> ; Li, Chung-Gang; Bale, Rahul; Fukudome, Hajime; Yumino, Saori; Yokono, Ryotaro; Tsubokura, Makoto
	Predicting the Removal of Ozone through Carbon-based Filters for Indoor Air Quality Applications	EA	<b>Ghamangiz Khararoodi, Mohamad</b> ; Haghighat, Fariborz; Lee, Chang-Seo
	An Analysis of Natural Ventilation Rates in relation to Occupants' Window Opening Behavior in Residential Building	EA	<b>Yoo, Jihyun</b> ; Park, Junseok
	Indoor radon at a university campus in Shanghai, China - a field study	EA	Ni, Haoquan; Pan, Minyi; Yin, Yanmei; Yan, Yujie; <b>Su, Chunxiao</b>

End at 16:30

Start at 17:00

FUTURE BUILDING LAB (FBL) TOUR

Time FRIDAY, JULY 29

8:30 – 10:00

Plenary Session  
Moderator: **Ursula Eicker**

Lacasse, Michael

Beausoleil-Morrison, Ian

10:00 – 10:30

COFFEE BREAK

Start at 10:30	PARALLEL SESSIONS	TYPE	AUTHORS
	<b>Building Mechanical System and Controls</b>		<b>Session Chair: Aliabadi, Amir A.</b>
	Economic and Environmental Evaluation of a Ground-Source Transcritical CO2 Heat pump for Space Heating and Domestic Hot Water Production	FP	<b>Zendeboudi, Alireza</b> ; Ye, Zuliang; Carbonell, Daniel; Hafner, Armin
	Study on Development and Implementation of Cross-Laminated-Timber	FP	<b>Ren, Honghao</b> ; Bahrami, Alireza; Cehlin, Mathias; Wallhagen, Marita
	Research on the air conditioning terminal unit performance of novel heat and humidity treatment	FP	<b>Wang, Lincheng</b> ; Quan, Zhenhua; Zhang, Nan; Huang, Rui; Zhao, Yaohua; Hao, Limin; Liu, Yiyang; Hao, Yunfei
	Improving the operating condition of a thermoelectric system for achieving high temperature difference in indoor heating	FP	Koohi, Nimra; Nasirifar, Sherwin; <b>Behzad, Masoud</b>
	Condensation and frost onset of air-to-air heat exchangers – A detailed heat transfer analysis	FP	Nourozi, Behrouz; <b>Sadrizadeh, Sasan</b> ; Ploskic, Adnan
	<b>Wind Engineering, Aerodynamics and Urban Physics 2</b>		<b>Session Chair: Wang, Lin</b>
	Validity of Near-ground Wind Profile Assumptions Tested Using Mean Wind Velocity Time Series from Field Measurements	FP	<b>Zhong, Jiading</b> ; Liu, Jianlin; Liang, Guoming
	Interaction between the Urban Heat Island effect and the occurrence of Heatwaves: Comparison of Days with and without Heatwaves	FP	<b>Shu, Chang</b> ; Gaur, Abhishek; Lacasse, Michael; Wang, Liangzhu (Leon)
	Investigation methods and issues of urban microclimate in the last decade: A Review	FP	<b>Yang, Senwen</b> ; Stathopoulos, Ted; Wang, Liangzhu (Leon)
	Data-Driven Reduced-Order Model for Urban Airflow Prediction	FP	<b>Masoumi-Verki, Shahin</b> ; Haghighat, Fariborz; Eicker, Ursula
	A full-scale fire experiment of retail shops in large-scale transportation buildings	FP	<b>Yang, Longlong</b> ; Liu, Songtao; Liu, Wenli; Wei, Wenbin; Ou, Chen; Liu, Shiyao
	<b>Thermal Comfort 3</b>		<b>Session Chair: Bleil De Souza, Clarice</b>
	Thermal sensitivity maps of the human body for vehicle PCS design	FP	<b>Nastase, Ilinca</b> ; Danca, Paul; Bode, Florin; Fechete, Lucian; Croitoru, Cristina; Sandu, Mihnea
	Thermoregulation model for dynamic thermal responses in floor-cooling/heating radiation environments	FP	<b>Liu, Yunliang</b> ; Zhou, Xiang; Luo, Maohui; Ren, Yan
	Study on the Effect of Positions and Surface Temperature of Radiant Panel on Human Thermal Comfort with Ray Tracing Method	FP	<b>Deng, Yan</b> ; Ji, Lili; Wang, Liangzhu; Ding, Yunfei
	Field study on indoor thermal comfort of a 'ZEB ready' office building using radiant ceiling panel coupled with open-loop ground source heat pump	FP	<b>Ye, Minzhi</b> ; Serageldin, Ahmed A.; Sato, Hideki; Nagano, Katsunori
	Determination of the optimal temperature set-point and ventilation rate for balancing energy consumption and learning performance in primary schools in Taiwan	EA	<b>Liao, Wen-Jye</b> ; Chen, Wei-An; Hwang, Ruey-Lung
	Extension on acceptable range of temperature with stable mechanical airflow under hot-humid climate	EA	Zhou, Jinyue; Zhang, Xiaojing; Xie, Jingchao; Liu, Jiaping ( <b>Zhao, Caixia</b> )

	Analysis of the thermal comfort and space usability in hot-humid climate zone considering the impact of solar radiation and regional weather features	EA	<b>Chen, Wei-An;</b> Hwang, Ruey-Lung
	<b>Occupant-Centric Building Design and Controls 3</b>		<b>Session Chair: Kapsis, Costa</b>
	Operation Optimization of Air Source Heat Pump coupled Electric Boiler Heating System based on TRNSYS	FP	Jin, Xu; <b>Liu, Pei;</b> Liu, Zhongyan; He, Yue
	Baseline estimation of heating consumption for different house archetypes through a data-driven clustering methodology	FP	<b>Petrucci, Andrea;</b> Athienitis, Andreas; Kloutse, Follivi Ayevide
	Deep Reinforcement Learning-based Smart Water Heater Control for Reducing Electricity Consumption and CO2 Emissions	FP	<b>Amasyali, Kadir;</b> Munk, Jeffrey; Kurte, Kuldeep; Zandi, Helia
	Study of human moving velocity to temperature waves in displacement ventilated room	FP	<b>Feng, Lu;</b> Liu, Min; Li, Ruibin; Gao, Naiping
	The impact of window-opening behaviors on indoor air quality and human exposure during wildfires	FP	<b>Guo, Xingtong;</b> Yan, Shujie; Wang, Chao; Liu, Shichao; Wang, Liangzhu
	<b>Health and Indoor Air Quality, Ventilation 9</b>		<b>Session Chair: Ouazia, Boualem</b>
	Application of Knowledge Representation and Reasoning Frameworks to Indoor Air Quality	FP	<b>Delgoshaei, Parastoo;</b> Heidarinejad, Mohammad; Persily, Andrew
	Analysis of NO2 removal efficiency in bus stop applying an air purification system using CFD	FP	<b>Yoo, Yup;</b> Lim, Jonghun; An, Nahyeon; Kwon, Hyukwon; Cho, Hyungtae; Kim, Junghwan
	Research Characteristics and Trends of Indoor Environmental Comfort and Occupant Behavior Based on Bibliometrics	FP	<b>Liang, Shuxian;</b> Lu, Yao; Lin, Youran; Xiao, Yiqiang
	U.S Commercial Building Stock Analysis of COVID-19 Mitigation Strategies	FP	<b>CaraDonna, Christopher;</b> Trenbath, Kim
	Lumped model vs. data-driven model for model-predictive control of indoor air quality for two school buildings	FP	<b>Ra, Seon-Jung;</b> Jeong, Hoon; Heo, Taewook; Park, Cheol-Soo
	<b>Building Physics, Building Envelope and Materials 7</b>		<b>Session Chair: Barbosa, Bruno Perazzo Pedroso</b>
	Thermal and Optical Performance of Advanced Polycarbonate Systems with Granular Aerogel and Hollow Silica Powder	FP	Merli, Francesca; <b>Zinzi, Michele;</b> Buratti, Cinzia; Augello, Andrea; Takeshi, Lhara
	Expanded Polypropylene as Structural and Thermal Component of Panelized Wall Systems	FP	Tam, Claire; Liao, Zaiyi; Calder, David; Dernovsek, Robert; <b>Miller, Benjamin</b>
	Bias correction methods for generating climate data as input to hygrothermal simulations	FP	<b>Lu, Henry;</b> Gaur, Abhishek; Ge, Hua; Lacasse, Michael
	Dynamic and Spectral Transmission Changes in a Glass System Coupled with Photovoltaic and Phase Change Materials Subjected to Solar Simulator Tests	FP	<b>Čurpek, Jakub;</b> Čekon, Miroslav; Kuruc, Michal; Slávik, Richard; Junaid, Muhammad Faisal
	Effect of Adding Interior Thermal Insulation and Brick Properties on Frost Damage of Masonry Walls	FP	<b>Aldabibi, Mohamed;</b> Nokken, Michelle; Ge, Hua
	Exterior Retrofitting Systems for Energy Conservation and Efficiency in Cold Climates: A Systematic Review	FP	<b>Mirzabeigi, Shayan;</b> Zhang, Jianshun; Razkenari, Mohamad
<b>End at 12:00</b>	<b>IS: Building Mechanical Systems and Controls</b>		<b>Session Chair: Zmuraneau, Radu</b>

	Building energy rejection in district heating system as a potential for decarbonation and reduction of heat island	EA	<b>Charneux, Roland</b>
	Solar-Assisted Air Source Heat Pumps: A Review with a Focus on Cold-Climate Applications	FP	<b>Brands, Monica</b> ; Fung, Alan
<b>12:00 – 13:00</b>	LUNCH BREAK		
<b>Start at 13:00</b>	<b>PARALLEL SESSIONS</b>	<b>TYPE</b>	<b>AUTHORS</b>
	<b>Building Physics, Building Envelope and Materials 8</b>		<b>Session Chair: Shu, Chang</b>
	Characterization of the Thermal Transmittance in Buildings Using Low-cost Temperature Sensors	FP	<b>Mobaraki, Behnam</b> ; Castilla Pascual, Francisco Javier; Lozano-Galant, Fidel; Porras Soriano, Rocío; Lozano-Galant, Jose Antonio
	The environmental impact of retrofitting heritage buildings in New Zealand	FP	<b>Paschoalin, Rachel</b> ; Isaacs, Nigel; Chicca, Fabricio
	Thermal performance of a new ventilated concrete envelope	FP	Zhuang, Zhi; <b>Zhao, Tian</b> ; Xiao, Yucheng
	Heat loss and economic insulation optimization method of solar thermal storage tank in the Tibetan plateau, China	FP	<b>Liu, Hui</b> ; Wang, Dengjia; Liu, Yanfeng; Yin, Tingqiang; Chen, Yaowen
	<b>Health and Indoor Air Quality, Ventilation 10</b>		<b>Session Chair: Ouazia, Boualem</b>
	Air Quality Evaluation and Reconstruction Strategy of old Residential Public Areas with Direct Discharge of Cooking Smoke into Corridor	FP	Zhuang, Zhi; <b>Chen, Qiquan</b> ; Gu, Wen; Wang, Zheng; Shu, Chang
	Improved Pressure and Airflow Control in Pressure Controlled Spaces with low leakage Ceiling Panels.	FP	Sirdeshpande, Gourish
	Effects of wood sawdust and peanut shell mixing proportions on CO and NOx emissions in co-combustion experiments	FP	<b>Nie, Yazhou</b> ; Deng, Mengsi; Shan, Ming; Yang, Xudong
	Microbial volatile organic compound emissions from mould growth on building materials	FP	<b>Yang, Wenping</b> ; So, Stephanie; Nong, Gang; Schebywolok, Tomi; Shah, Apoorv; Ganapathy, Gnanamurugan; Defo, Maurice
	Quantifying convective heat transfer coefficients during natural ventilation in a full-scale operational building	FP	Chew, Lup Wai; Chen, Chen; <b>Yuan, Chao</b> ; Gorlé, Catherine
	<b>Building Renewables, Solar Buildings &amp; Smart Grid 7</b>		<b>Session Chair: Hachem-Vermette, Caroline</b>
	Impacts of Collective Communication on the Energy Flexibility and Climate Resilience of Buildings in Urban Areas	FP	<b>Nik, Vahid M.</b>
	Grasshopper Optimization Algorithm vis-a-vis Genetic Algorithm for Energy Optimization in Conditioned Buildings with Varying Hours of Occupancy in Composite Climate of Delhi	FP	<b>Ali, Sana Fatima</b> ; Bhattacharjee, Bishwajit; Rakshit, Dibakar
	Identification of Passive Solar Design Determinants in an Ancient Vernacular Structure located in the Composite Climate of New Delhi and its Performance Assessment based on Energy Matrices and Enviro-economics	FP	<b>Ali, Heena Fatima</b> ; Tiwari, G. N.

	Methodology for Predictive Control of Zones with STPV Windows, Motorized Shades, and Hydronic Floor Heating for High Performance Buildings	FP	<b>Hill, John;</b> Athienitis, Andreas
	Modelling and predictive control of air-based BIPV/T systems for optimal HVAC integration	FP	Sigounis, Anna-Maria; <b>Vallianos, Charalampos;</b> Athienitis, Andreas
	Hygrothermal Modeling of Building Integrated Photovoltaics in Low-Rise Wood-Frame Construction	FP	<b>Ye, Kai;</b> Ge, Hua; Athienitis, Andreas
	<b>Advanced Modeling and Building Simulations, CFD 7</b>		<b>Session Chair: Poncet, Sébastien</b>
	CFD investigation of Thermal Energy Storage encapsulation	FP	Charles, Berville; <b>Bode, Florin;</b> Cristiana, Croitoru; Nastase, Ilinca
	Wind-Driven Rain (WDR) Distribution on Buildings: Influential Parameters	FP	<b>Gholamalipour, Payam;</b> Ge, Hua; Stathopoulos, Ted
	Froude Modelling for Solar Roof Fire-Induced Smoke Movement	FP	<b>Zhang, Xin;</b> Aram, Monireh; Qi, Dahai; Wang, Liangzhu
	Case study on inter-building occupancy using GIS-based movement data on campus	FP	Zhu, Mingya; <b>Pan, Yiqun;</b> Zeng, Fei; Wu, Zejun; Huang, Zhizhong; Kosonen, Risto
	Thermal Resilience of a Zero Carbon Community Hub	EA	<b>Good, Joel;</b> Ozkan, Aylin
	Study of solar roof fire-induced smoke spread using helium smoke	EA	<b>Zhang, Xin;</b> Aram, Monireh; Qi, Dahai; Wang, Liangzhu (Leon)
	Mapping the intervention level index of historical residence from occupant's perspective by a data-driven evaluation scheme	EA	<b>Qian, Yuchong;</b> LENG, Jiawei
	<b>Low/Zero Carbon Emission Buildings and Communities 2</b>		<b>Session Chair: Ghobadi, Mehdi</b>
	Exploring decarbonization and clean energy pathways for disadvantaged communities in California	FP	<b>Sun, Kaiyu;</b> Kusumah, Patricia; Zhang, Wannu; Wei, Max; Hong, Tianzhen
	Development of low-carbon affordable apartments in the hot and humid climate of Indonesia: Construction of a full-scale experimental house	FP	<b>Alfata, Muhammad Nur Fajri;</b> Trihamdhani, Andhang Rakhmat; Kubota, Tetsu; Asawa, Takashi
	A system dynamics model for a deep decarbonization of social housing building stock	FP	<b>Ouyang, Tianrui;</b> Cantin, Richard; El Mankibi, Mohamed; Michel, Pierre
	MIND' decarbonisation strategy in support of the European policy priorities. Strategic aspects for establishing the development's carbon roadmap to achieve absolute zero	FP	<b>Boschi, Nadia</b>
	Current Progress in District Cooling Infrastructures and their Evolution to Integrated Vapor Absorption-Compression Refrigeration Systems	FP	<b>Hassan, Ibrahim Galal;</b> I. Papadopoulos, Athanasios; Panos, Panos; Azizur Rahman, Mohammad; T Kadam, Sambhaji; Kyriakides, Alexios
	A New Approach of Energy and Carbon Management for a University Campus	FP	<b>Yang, Lijun;</b> Couture, Marc; Saporta, Ron
	<b>Building Codes and Standards</b>		<b>Session Chair: Leroyer, Sylvie</b>
	Influence of energy units in building certification system, Miljöbyggnad – A case study of a School Building in Sweden	FP	<b>Hayati, Abolfazl;</b> Akander, Jan
	Energy impact assessment of occupant-related assumptions of the National Building Code of Canada	FP	Abdeen, Ahmed; <b>O'Brien, William;</b> Gunay, Burak

End at 14:30

Building Climate Resilient Homes: Do Energy Efficiency and Disaster Resistance Conflict or Complement?

FP

**Louie, Edward**; Gilbride, Theresa;  
Antonopoulos, Chrissi

CLOSING