



18TH CONFERENCE OF THE INTERNATIONAL
SOCIETY OF INDOOR AIR QUALITY & CLIMATE

INDOOR AIR 2024

July 7-11, 2024 🌸 Honolulu, Hawaii, USA

Conference Program



INDOOR AIR 2024 is the Flagship Conference of
the International Society for Indoor Air Quality
and Climate (ISIAQ)

Schedule Overview

	SUNDAY 07/07	MONDAY 07/08	TUESDAY 07/09	WEDNESDAY 07/10	THURSDAY 07/11
6:00 AM		ACTIVITY: DIAMOND HEAD HIKE (ON YOUR OWN)	ACTIVITY: SUNRISE RUN (ON YOUR OWN)		
7:00 AM					
7:30 AM					
8:30 AM		LIGHT BREAKFAST FOYER - 3RD FLOOR (7:30AM - 8:30AM)	LIGHT BREAKFAST FOYER - 3RD FLOOR (7:30AM - 8:30AM)	LIGHT BREAKFAST FOYER - 3RD FLOOR (7:30AM - 8:30AM)	LIGHT BREAKFAST FOYER - 3RD FLOOR (7:30AM - 8:30AM)
		PLENARY BALLROOM B 4TH FLOOR (8:30AM-10:00AM)	PLENARY BALLROOM B 4TH FLOOR (8:30AM-10:00AM)	PLENARY BALLROOM B 4TH FLOOR (8:30AM-10:00AM)	PLENARY BALLROOM B 4TH FLOOR (8:30AM-10:00AM)
10:00 AM	MASTER CLASS ROOM 311 (9:00AM-4:00PM)	COFFEE BREAK (FOYER - 3RD FLOOR)	COFFEE BREAK (FOYER - 3RD FLOOR)	COFFEE BREAK (FOYER - 3RD FLOOR)	COFFEE BREAK (FOYER - 3RD FLOOR)
10:30 AM	ISIAQ BOARD MEETING ALA MOANA (10:00AM-3:00PM)	SESSIONS 311, 312, 314, 315, 316 A/B/C, BALLROOMS A, B, & C (10:30AM - 12:00PM)	SESSIONS 311, 312, 314, 315, 316 A/B/C, BALLROOMS A, B, & C (10:30AM - 12:00PM)	SESSIONS 311, 312, 314, 315, 316 A/B/C, BALLROOMS A, B, & C (10:30AM - 12:00PM)	SESSIONS 311, 312, 314, 315, 316 A/B/C, BALLROOMS A, B, & C (10:30AM - 12:00PM)
12:00 PM	INDOOR ENVIRONMENTS EDITORIAL BOARD MEETING ROOM 328 (11:30AM-1:30PM)	LUNCH OPTIONAL SESSION: (BTC DISCUSSION) FOYER - 3RD FLOOR (12:00PM-1:30PM)	LUNCH OPTIONAL SESSION: (AGM) FOYER - 3RD FLOOR (12:00PM-1:30PM)	LUNCH OPTIONAL SESSION: (MENTORING) FOYER - 3RD FLOOR (12:00PM-1:30PM)	LUNCH OPTIONAL SESSION: (NETWORKING) FOYER - 3RD FLOOR (12:00PM-1:30PM)
1:30 PM	ISIAQ ACADEMY MEETING ROOM 314 (3:30PM-5:00PM)	POSTER SESSIONS 313 A/B/C (1:30pm - 3:00pm)	POSTER SESSIONS 313 A/B/C (1:30pm - 3:00pm)	SESSIONS 311, 312, 314, 315, 316 A/B/C BALLROOMS A, B, & C (1:30PM - 3:00PM)	SESSIONS 311, 312, 314, 315, 316 A/B/C BALLROOMS A, B, & C (1:30PM - 3:00PM)
3:00 PM		COFFEE BREAK (FOYER - 3RD FLOOR)	COFFEE BREAK (FOYER - 3RD FLOOR)		COFFEE BREAK (FOYER - 3RD FLOOR)
3:30 PM	REGISTRATION FOYER - 3RD FLOOR (3:00PM-7:00PM)	SESSIONS 311, 312, 314, 315, 316 A/B/C, BALLROOMS A, B, & C (3:30pm - 5:00pm)	SESSIONS 311, 312, 314, 315, 316 A/B/C, BALLROOMS A, B, & C (3:30pm - 5:00pm)		CLOSING CEREMONY BALLROOM B - 4TH FLOOR (3:15PM -4:00 PM)
4:00 PM					
4:30 PM					
5:00 PM					
5:30 PM		INNOVATION NETWORK MEETING 313 A/B/C (5:00PM-6:00PM)		INDOORERS GO OUT HILTON: GREAT LAWN AND LAGOON (4:30PM - 6:30PM)	
6:00 PM	OPENING CEREMONY AND KEYNOTE LECTURE BALLROOM B (5:30PM-7:00PM)	MIXERS HILTON: VILLAGE GREEN AND RAINBOW SUITE (6:30PM - 7:30PM)	LŪ'AU HILTON: GREAT LAWN (6:00PM-9:00PM) (TICKETED)		ALL EVENTS LOCATED AT HAWAI'I CONVENTION CENTER, UNLESS OTHERWISE NOTED.
6:30 PM					
7:00 PM					
7:30 PM	RECEPTION FOYER - 4TH FLOOR (7:00PM-9:00PM)			(OPTIONAL TICKETED EVENING CRUISE THROUGH EXTERNAL PROVIDER)	Registration Hours: • Sunday 3:00pm-7:00pm • Monday 7:30am-5:00pm • Tuesday 7:30am -5:00pm • Wednesday 7:30am-3:30pm • Thursday 7:30am-4:00pm
9:00 PM					

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Welcome from the Indoor Air 2024 Conference President



Aloha, Indoor Air 2024 Attendees!

Now more than ever is a critical time for us to gather together as the premier global community focused on research in the indoor environment. Worldwide, the importance of indoor environmental quality has recently been made even more clear in the wake of the COVID-19 pandemic and events related to climate change such as wildfires.

Indoor Air 2024 offers an important opportunity to share cutting-edge research related to improving human health, safety, and comfort in indoor spaces. We can never be certain what the future holds, but we can be certain that our work is critical to improving lives in our changing world.

The ISIAQ community is full of wonderful, intelligent, creative, and hard-working individuals with a shared mission: to improve quality in indoor spaces. And we're not afraid of a challenge. I am looking forward to connecting with those who are already friends and those who soon will be. It has truly been an honor to work with our amazing organizing committee, the ISIAQ board, other leaders, and of course student helpers to plan a conference for this group. We are thrilled to welcome a diverse global community both in-person and via the Remote Track. Whoever you are and wherever you are from, you are very welcome here. In fact, we all need to come together and share our best work to continue to improve indoor environmental quality. And in beautiful Honolulu, let's have a great time while we do so!

Karen Dannemiller
Indoor Air 2024 Conference President

Welcome from Incoming ISIAQ President

Welcome to Indoor Air Hawaii! As the incoming President for the International Society of Indoor Air Quality & Climate (ISIAQ), I am delighted that you are participating in Indoor Air 2024. This premier conference builds upon an amazing legacy of nearly 20 Indoor Air conferences held since 1978. Indeed, ISIAQ is at the leading edge of the indoor environment field and we are excited that Indoor Air 2024 continues to propel us forward. We have an exciting lineup of talks from international experts in the field as well as presentations from emerging leaders and early career investigators. Just as importantly, there are many opportunities to network with people actively working in this critical and ever evolving field. Whether you



are looking for the next big idea, collaborators interested in solving today's (and tomorrow's) indoor environment problems, or want to discuss how to transition research to practice (or practice to research), this conference provides it all. And, importantly, included in your registration is membership in ISIAQ with activities that continue all year round. Indeed, we are happy to announce the launch of our Innovation Network to address emerging indoor environment topics and spearhead research collaborations across ISIAQ. And, of course, please continue to look to ISIAQ for webinars on the latest topics, networking opportunities, and our new journal, Indoor Environments, published by Elsevier. We also want to hear from you! Please join us at this year's Annual General Meeting (over the lunch hour on Tuesday, July 9th) to share your ideas directly with us and to learn more about ISIAQ's activities. We are looking forward to another exciting year together.

Kerry Kinney
Incoming ISIAQ President

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Conference Organization

Primary Organizing Committee



Conference President
Karen Dannemiller
The Ohio State University



**Vice President,
Technical Planning**
Elliott Gall
Portland State University



**Vice President,
Conference Planning**
Richard Shaughnessy
University of Tulsa

Indoor Air Institute



Brett Singer
University of California,
Berkeley



Seema Bhargar
US Green Building
Council



Glenn Morrison
University of North Carolina

Remote Track Directors



Pawel Misztal
University of Texas at Austin



Irvan Luhung
Yale University



Lauren Lane
The Ohio State University

Marketing Intern

Event Planning Vendor: i3 Events



Managing Partner
Keith Johnston



Managing Partner
Neela Johnston



Associate
Carter Johnston

Conference Organization

Additional Primary Organizing Committee Personnel

Names

Student and staff from The Ohio State University, Portland State University, University of Colorado, and the University of California, Berkeley will be working diligently throughout the week to help make the conference run smoothly. Feel free to ask them any questions as needed. They will be running the speaker-ready room, addressing technical problems, helping with setting up posters, and more.

Mark Hernandez, PhD:

Master Class (Summer School)
Director

Jordan Zambrana, PhD:

Audio, Visual, and Technical Area
Lead

John Downey:

Industry Liason

Andrew Hoisington, PhD:

Early Career Event Director

Sarah Haig, PhD:

Mentoring and Networking Lunch
Director

Jonathan King

Student Helper

Zachary Golden

Student Helper

Rileigh L. Robertson

Student Helper

Yemi Toyinbo

Student Helper

John Van Dusen:

Student Helper

Chai Um:

Student Helper

Brett Stinson:

Student Helper

Ryan Bixler:

Student Helper

Nick Nastasi:

Student Helper

Neeraja Balasubrahmaniam:

Student Helper

Nataniel Ramirez:

Student Helper

Isaac Chavarria Esquivel:

Student Helper

Kristina Petrov:

Student Helper

Thuzar WinShwe

Student Helper

Conference Organization

Technical Track Leads

Conference submissions were categorized into 12 thematic areas, or Technical Tracks, each with a designated Technical Track to help the conference leadership team manage reviews of extended abstracts. We are grateful for the 25 Technical Track Leads and those who helped them, listed below.

Technical Track Name Affiliation

Health Outcomes: Gabriel Beko, Jim Zhang

Air Cleaning: Parham Azimi, Donghyun Rim

Ventilation and HVAC: Marwa Zaatari, Dusan Licina
--

Sensors and Monitoring: Jordan Clark, Alexandra Schieweck
--

Dampness, Mold, and the Indoor Microbiome: Bridget Hegarty, Sarah Haines, Naomichi Yamamoto
--

COVID-19 and Viral Transmission: Qian Hua, Shelly Miller

Thermal Comfort and Perception: Pawel Wargocki, Thomas Parkinson

Indoor Chemistry, Sources and Transformations: Yingjun Liu, Coralie Schoemaeker, Nicola Carslaw
--

Indoor Air, Policy, Regulation, and Standards: Paula Olsiewski, Tunga Salthammer

Building Simulation, Sustainability, and Energy: Adrian Chong, Parichehr Salimifard
--

Climate Change and Urbanization: Ellison Carter, Pawel Misztal

Aerosols/Particulate Matter: Anita Avery, Bin Zhao



Conference Organization

International Scientific Advisory Committee (ISAC)

We are grateful for those who contributed as part of the International Scientific Advisory Committee, conducting Full Paper reviews to help maintain a high quality and relevance of submissions, actively promoting the conference, and contributing to the work of various panels, workshops, and/or symposia.

Name		
Adrian Chong	Cheng Chen	Hai Guo
Aime Ruus	Cheryl Weyant	Hala Hassan
Alejandro Moreno-Rangel	Chia-Wei Lee	Heewon Shin
Aleksandra Lipczynska	Christian Pfrang	Heidi Salonen
Alessia Di Gilio	Christina Isaxon	Henna Maula
Alexandra Schieweck	Christopher Chao	Henry Oswin
Alice Caporale	Chun Chen	Hervé Plaisance
Alireza Afshari	Chungyoon Chun	Hongyuan Jia
Allen Haddrell	Clara M. A. Eichler	Howard Kipen
Alvin Lai	Coralie Schoemaeker	Iain Walker
Amanda Giang	Corinne Mandin	Iiris Pulkkinen
Amelia Staszowska	David Shaw	Ilpo Kulmala
Andrea Cattaneo	Delphine Farmer	Ioannis Sakellaris
Andrea Ferro	Derek Clements-Croome	Irvan Luhung
Andrea Spinazzè	Derek Shendell	James Bennett
Andrew Persily	Dikaia Saraga	James Lo
Aneta Wierzbicka	Dong Hwa KANG	James McGrath
Anita Avery	Donghyun Rim	Jan Kaczmarczyk
Anna Ławniczek-Wałczyk	Donhyun Rim	Janssen Xing ZHENG
Anna Neville	Douglas Collins	Jeffrey Siegel
Anna-Sara Claeson	Doyun Won	Jelena Srebric
Annina Salmela	Dusan Licina	Jelle Laverge
Arsen Melikov	Dustin Poppendieck	Jiahao Wang
Arttu Sivula	Elaine Cohen Hubal	Jianping Cao
Atsushi Mizukoshi	Elliott Gall	Jing Li
Benjamin Hanoune	Ellison Carter	Joana Madureira
Bert Blocken	Erica Hartmann	João Gomes
Bin CAO	Erik Uhde	John Van Dusen
Bin Zhao	Federico Tartarini	Jolanda Palmisani
Bogumila Szponar	Filipa Adzic	Jon Abbatt
Brandon Boor	Francesca Borghi	Jon King
Brent Stephens	Frederic Thevenet	Joo Hyun Moon
Brett Singer	Gabriel Beko	Joon-Ho Choi
Brett Stinson	Gaetano Settimo	Jordan Clark
Bridget Hegarty	Geo Clausen	Jørn Toftum
Bud Offermann	Georgios Martinopoulos	Josephine Lau
Carl Grimes	Gianluigi De Gennaro	Ju-Hyeong Park
Carla Viegas	Ginger Chew	Juan Maestre
Catherine Noakes	Giorgio Buonanno	Juha Pekkanen
Chandra Sekhar	Giorgos Panaras	Junfeng (Jim) Zhang
Chao-Hsin Lin	Glenn Morrison	Justin Berquist
Charles Weschler	Go Iwashita	Juyoun Lee
Chen Wang	Guofeng Shen	Kathleen Owen

Conference Organization

Name

Katrin Vorkamp	Mohammad Heidarinejad	Tami Bond
Kazukiyo Kumagai	Naomichi Yamamoto	Targo Kalamees
Kenichi Hasegawa	Neeraja Balasubrahmaniam	Teresa Vera
Klara Slezakova	Nicola Carslaw	Thomas Parkinson
Kyle Fortner	Nijing Wang	Tianyuan Li
Lance Wallace	Nora Zannoni	Tiina Reponen
Lei Fang	Nusrat Jung	Tomasz Cholewa
Li Lan	Olaf Wilke	Torben Sigsgaard
Liangzhu Wang	Oluyemi Toyinbo	Troye Sas-Wright
Lidia Morawska	Parham Azimi	Tunga Salthammer
Linchen He	Parichehr Salimifard	Twan Van Hooff
Linda Hägerhed	Paula Olsiewski	Valérie Desauziers
Lisa Ng	Paula Schenck	Vikki Grassian
Liselotte Tinel	Pawel Mistzal	Ville Silvonen
Liudmyla Yutskevych	Peder Wolkoff	Violeta Kauneliene
Lok Kwan So	Pedro Branco	Vishal Verma
Luca Stabile	Pertti Pasanen	Vito Ilacqua
Luca Zaniboni	Philip Hopfe	W. Stuart Dols
Lup Wai Chew	Pradeep Ramasubramanian	Wanyu Rengie Chan
Marcel Loomans	Prashant Anand	Wenhao Chen
Marie Coggins	Qian Hua	William Bahnfleth
Marina Almeida-Silva	Qihong Deng	William Nazaroff
Marina E. Vance	Rachel Hurley	Wolfgang Horn
Marion Hulin	Rachel O'Brien	Xiaojun Fan
Mariya Bivolarova	Rania Christoforou	Xin ZHOU
Mark Mendell	Richard Shaughnessy	Yan Lin
Marko Hyttinen	Ruth Onkangi	Yingjun Liu
Marta Gabriel	Ryan Bixler	Yong Yu
Martin Kriegel	Sandra Dedesko	Yu Qian Ang
Martin Ohlmeyer	Sarah Haines	Yuchun Zhang
Martin Täubel	Sarka Langer	Yuxia Sun
Martin Thalfeldt	Scott Weichenthal	Zachary Golden
Marwa Zaatari	Seema Bhangar	Zhenchun Yang
Marzenna Dudzinska	Seongjun Park	Zuoyu Xie
Masih Alavy	Shelly Miller	Zuraimi Sultan
Matthew Young	Shichao Liu	
Michael Breen	Shin-ichi Tanabe	
Michael Link	Shohei Miyata	
Michael Sohn	Sibel Mentese	
Michael Waring	Sicheng Zhan	
Michalis Michaelides	Steven Emmerich	
Miia Pitkäranta	SungChul Seo	
Miriam Byrne	Takamasa Hasama	

Conference Organization

Session Chairs

We are also grateful for all of those who volunteered as session chairs (listed below).

Session- Aerosols and Particulate Matter 1	Anita Avery	Andre Kohl
Session- Aerosols and Particulate Matter 2	James McGrath	Shelly Miller
Session- Aerosols and Particulate Matter 4	Dusan Licina	Parichehr Salimifard
Session- Aerosols and Particulate Matter 5	Jiayu Li	Tunga Salthammer
Session- Air Cleaning and Filtration 1	Michael Link	Richard Corsi
Session- Air Cleaning and Filtration 2	Kwok Wai Tham	Richard Shaughnessy
Session- Air Cleaning and Filtration 3	Jeffrey Siegel	Parham Azimi
Session- Air Cleaning and Filtration 4	Jelle Leverage	Jienan Li
Session- Air Cleaning and Filtration 5	Dustin Poppendieck	Brett Stinson
Session- Building Simulation, Sustainability, and Energy 1	Giorgio Buonanno	Adrian Chong
Session- Building Simulation, Sustainability, and Energy 2	Uttam Saha	Michael Sohn
Session- Building Simulation, Sustainability, and Energy 4	Doyun Won	Tham Kwok Wai
Session- Climate Change, Natural Disasters, and Urbanization 1	Ellison Carter	Zachary Golden
Session- Covid-19 and Viral Transmission 2	Yuguo Li	Richard Corsi
Session- Covid-19 and Viral Transmission 2	lidia morawska	Jeffrey Siegel
Session- Covid-19 and Viral Transmission 3	Delphine Farmer	Pawel Misztal
Session- Dampness, Mold, and Indoor Microbiome 1	Sarah Haig	Naomichi Yamamoto
Session- Dampness, Mold, and Indoor Microbiome 2	Irvan Luhung	J.P. Maestre
Session- Health Outcomes and Exposure Assessment 1	Charles Weschler	Linchen He
Session- Health Outcomes and Exposure Assessment 3	Howard Kipen	Jim Zhang
Session- Health Outcomes and Exposure Assessment 6	Pawel Misztal	Nick Nastasi
Session- Health Outcomes and Exposure Assessment 7	Bridget Hegarty	Jim Zhang
Session- Health Outcomes and Exposure Assessment 8	Pawel Wargocki	Gabriel Beko
Session- Indoor Chemistry, Sources, and Transformation 1	Glenn Morrison	Yingjun Liu
Session- Indoor Chemistry, Sources, and Transformation 2	Tianren Wu	Chen Wang
Session- Policy, Regulation, and Standards 1	Odessa Gomez	Paula Oslewski
Session- Sensors and Monitoring 1	Erik Uhde	Xiaoying Li
Session- Sensors and Monitoring 2	Jordan Clark	Bowen Du
Session- Sensors and Monitoring 4	Ryan Bixler	Geo Clausen
Session- Thermal Comfort and Perception 1	Alice Caporale	Asit Mishra
Session- Thermal Comfort and Perception 2	Federico Tartarini	Sandra Dedesko
Session- Thermal Comfort and Perception 3	Richard de Dear	Bud Offerman
Session- Thermal Comfort and Perception 4	Shin-ichi Tanabe	Jungsoo Kim
Session- Ventilation and HVAC 1	Marwa Zaatari	Alireza Afshari
Session- Ventilation and HVAC 2	Jelle Laverge	Atila Novoselac
Session- Ventilation and HVAC 3	Dusan Licina	Adrian Chong
Session- Ventilation and HVAC 4	Andrew Persily	Oluwatobi Oke
Session- Ventilation and HVAC 5	Brett Singer	Elena Austin

ISIAQ Information

Board of Directors

We are excited to introduce the newest members of the ISIAQ Board of Directors, elected by the membership in the 2024 election. All new members will begin their terms at the Annual General Meeting of the ISIAQ membership, which will be held on Tuesday, July 9, at the Indoor Air 2024 conference. Join us in welcoming and congratulating the new members of the ISIAQ leadership!

President-Elect: Nicola Carslaw, University of York

Treasurer-Elect: Dusan Licina, École polytechnique fédérale de Lausanne (EPFL)

Secretary: Jelle Laverge, Ghent University

Vice President, Policy: Karen Dannemiller, The Ohio State University

Vice President, Research: James Bennett, U.S. DHHS/Centers for Disease Control and Prevention (NIOSH)

Coordinator, Chapters: Chun Chen, The Chinese University of Hong Kong

Coordinator, Relations with Other Organizations: Wenjuan Wei, Scientific and Technical Centre for Building (CSTB)

Student Representative: Rachel Hurley, Worcester Polytechnic Institute

Trustee: Janice Green, ASSP

These new members will join **Kerry Kinney (President)**, **James McGrath (Treasurer)**, **Ying Xu (Past President)**, **Qihong Deng (Vice President, Practice)**, **Yuguo Li (Journal Editor)** and **Nadia Boschi (Trustee)** for the next term. We extend our sincere thanks and gratitude to the members of the Board who are rotating off and recognize their contributions to ISIAQ during their terms: **Corinne Mandin**, **Kati Huttunen**, **Benjamin Hanoune**, **Dustin Poppendieck**, **Weiwei Liu**, **Richard Shaughnessy**, **Lada Hensen Centnerová**, **Rita Lam**, **Martin Täubel**, and **Chungyoon Chun**.

ISIAQ Student Award Winners

In 2006, ISIAQ made a commitment to growing its base of student members, believing that today's students are not only the future of the Society, but also the future of this important field. In accordance with this belief, ISIAQ has generously provided 5 Student Conference Support Awards for INDOOR AIR 2024 to support lodging and attendance. Winners of the INDOOR AIR 2024 Student Awards include:

- Mahender Singh Rawat
- Ruiji Sun
- Saptarshi Ghosh
- Supreet Kaur
- Zidong Song

Conference Countdown Challenge Winners

We are thrilled to announce the winners of the Conference Countdown Challenge, a unique initiative designed to highlight and share the exciting research being conducted in the field of indoor environmental quality.

After public voting period, we are pleased to recognize the top 8 puzzles submitted by our talented participants. Each of these puzzles not only demonstrated creativity and innovation but also effectively conveyed valuable insights into indoor environmental quality res consid

Congratulations to our winners:

- Mahender Singh Rawat
- Clara Eichler
- Dr. Dustin Poppendieck
- Dr. Veerendra Sahu
- Benjamin Marshall
- Anna Neville
- Troye Sas-Wright
- Anna Segur



A Special Welcome to Our Remote Track Attendees!



At the peak of COVID-19 pandemic, the remote/virtual-track option, which allows researchers to present their work remotely, was the only feasible way we could celebrate our scientific advances in the form of international conferences. It was undoubtedly an integral part of the last two iterations of Indoor Air Conference in South Korea and Finland. As we now go back to the old-normal of meeting each other in-person, the organizing committee recognizes the values such virtual option can still bring, particularly in expanding the conference's outreach.

The remote-track returns in a big way in Indoor Air 2024! The remote-track sessions are organized before and after the in-person conference hours to accommodate participants from different parts of the world. All remote-track sessions are accessible by the in-person participants and the remote-track participants will also be able to live-stream the in-person plenaries and certain featured tracks. In-person attendees also benefit from having access to these materials and others from in-person attendees. To date, we are happy to report that the remote-track option has enabled us to maintain participation from > 95% of conference attendees who, at some point in the past few months, had to change their plans due to various reasons, e.g., visa approval or personal matters.

Indoor Air 2024 remote-track has two presentation types, the remote-track podium and remote-track poster presentations. Evaluations on which presentation type a speaker gets were held to the same standard as the in-person submissions. For remote-track podium presentations, we have decided to use pre-recorded videos to create a more streamlined experience for participants and to minimise risk of disruptions due to internet connectivity. The prepared presentation videos (slides with pre-recorded video/speech, up-to 10min) will be broadcast during the specific sessions and also available for viewing at later time. The speakers are still expected to be present/online during the session for the live Q&A session which will start right after a speaker's pre-recorded presentation video is finished playing. The Remote-track poster presentation, on the other hand, will be asynchronous. The poster and the accompanying video/audio (up-to 3min) will be accessible to all registered participants as soon as the conference starts. I

Thank you for your continued support and we look forward to meeting all of you, both in-person as well as virtually.

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Conference Information

Badges

Each registered participant will be provided with a name badge. Name badges should be worn at all times during conference events. Tickets for drinks and paid events can be found inside of badge.

Conference Event Locations

All conference sessions will be held in the Hawaii Convention Center in Honolulu. Refer to the Maps and Directions section of this document for more information on the location of each conference event. Some social events will be held at the Hilton Hawaiian Village.

Podium Sessions

Each podium session will consist of up to seven presentations. These podium sessions have a 12-minute time slot in the program, intended for a 10-minute talk plus up to 2-minutes for Q&A. Please do your best to arrive to podium sessions on time as they will start right on time. Presenters should refer to the Guide for Presenters section for more information on preparing for and giving your podium presentations. Each attendee is permitted to present a maximum of two podium presentations.

Speaker File Submission

Speakers will need to submit their presentations in advance of the conference to be quality checked and sorted to the appropriate location. Technology has changed and we are anticipating over 2000 files, so please submit your files as directed in conference emails.

If you have questions about your files, you can email indoorair2024@gmail.com. You may also come to the speaker ready table between 7:30-8:30 am each morning.

For technical issues, consult with your session chair who can contact our technical support team.

Errors and Omissions

If you notice any errors or omissions from the technical program, author lists, or paper lists, please contact us at indoorair2024@gmail.com

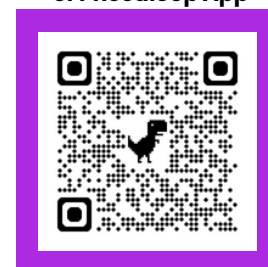
Pheedloop (Virtual Platform)

Pheedloop is our technical partner for bringing the conference to you digitally. During the conference, attendees are encouraged to download the Pheedloop app to build out their conference experience.

Through the app, you can explore exhibitor overviews, session details, sponsor information, and connect with fellow attendees.

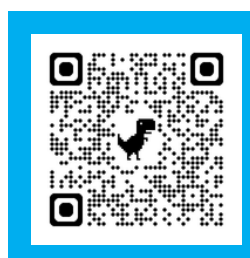
To get started, download the Pheedloop Inc. app in your app store, then log in using your attendee portal username and password.

QR Code for ios Download of Pheedloop App



Digital Conference Program

If you need assistance finding the schedule, visit <https://indoorair2024.org/conference-program/>. There, you will find a digital version of the technical program schedule, a broad overview schedule, and a detailed conference program book.



Digital conference schedule

Masking

We are a mask supportive community. Additionally, the convention center is open-air and all social events will be either open-air or outdoors.

Conference Information

Technical Agenda:

Tips for Viewing the Online Schedule Spreadsheet

- Visit the online detailed technical schedule
 - <https://indoorair2024.org/conference-program/>
- Peruse tabs to see content for each technical track. In total, we have 12 technical tracks.
- Use Ctrl+H to look for specific people or keywords. (E.g. "Dannemiller" or "HEPA filter")
- Make sure to check out workshops and symposia.
 - 12 symposia - series of talks aligned to a special topic
 - 13 workshops - interactive sessions aligned to special topic
- Consider attending remote content, even if in-person.
 - 6:30am - 8:00am and 19:00-20:30 PM Mon-Thurs
- Check out lunch sessions every day from 12-1:30 PM.
- Check out Innovation Network Meetings (Monday 5-6 PM)
- Make sure to plan out your social activities as well!

Accessibility: Live Captioning

Indoor Air 2024 will be offering live captioning for all sessions in Ballroom B. Those posting videos online have been encouraged to add captions to their presentation.

Due to the nature of live captioning, live captions are not completely verbatim, and errors cannot be corrected in real-time. The following link and QR code will allow you to see the captioning on your own device once the event begins.



<https://captionedtext.com/client/Event.aspx?EventID=12134>

Please notify the conference committee with any other accessibility needs.

Accessibility: ADA

The Hawai'i Convention Center (HCC) is an Americans with Disabilities Act (ADA) compliant facility. They work with meeting planners and event organizers to provide reasonable accommodations for all of our attendees.

To view a list of the accommodations, visit the following website.

<https://www.meethawaii.com/convention-center/about-hawaii-convention-center/ada-accessibility/>

First Aid

The First Aid office is located on the 3rd Floor, meeting-room level. Here, guests can receive treatment and wait for transport to a medical facility if needed.

Offerings:

- Emergency Response: First Aid will respond to emergency calls anywhere within HCC.
- Emergency Life-Support Measures: Including defibrillation, CPR, and airway management.
- Basic Wound Care: Providing services for minor injuries.
- First Aid Supplies: Offering basic First Aid supplies.
- Medication: Dispensing limited over-the-counter medication.

Emergency Numbers

While at the Convention Center, should any emergencies arise, dial 0 from any house phone to reach security. The Security base station will take the information and dispatch security and/or medical staff to assess the situation. Following your call...

- Security will generate an incident report form.
- Determination will be made if transport is needed.
- If transportation is needed, security will assist with Honolulu Fire reaching patient.

Conference Information

Dress Code

Technical sessions are business casual, social events can be smart casual or business casual (but remember that it will be hot!) Hawaiian shirts are welcome at the Luau and Indoors Go Out events!

Weather

The weather forecast predicts temperatures in the mid to upper 80s degrees Fahrenheit, which is approximately 29 to 32 degrees Celsius.

Mobile Phones

Please place your mobile phones in “silent” mode during all technical sessions and presentations throughout the conference out of respect for the speakers.

Local Customs

It is customary for customers dining at restaurants to tip wait staff (commonly 15-20%).

Power Outlets

Electric power is standardized at 110 Volts and 60 cycles in all states across the U.S. Standard plugs have two flat blades, while some also using a third grounding pin. If you bring any electrical appliance to the U.S. from other countries, you may need an adaptor to fit the US electrical receptacles.

Time Zone

Honolulu, Hawaii, is located in the Hawaii-Aleutian Standard Time (HST) zone, which is 10 hours behind Coordinated Universal Time (UTC-10:00). Honolulu is 3 hours behind Pacific Daylight Time (PDT), 6 hours behind Eastern Daylight Time (EDT), 11 hours behind the UK, and 18 hours behind Beijing.

Lost and Found

Hawai'i Convention Center lost and found process:

- Items brought to registration will be brought to security at end of day. Security will log into their system.
- Items brought directly to security can be logged.
- For anyone who has lost an item, there is a QR code that someone can scan, and it will show if security has a log of it. QR code to be provided and included in master book.

**Hawai'i Convention Center
Lost and Found
Claim Form**



Hilton Hawaiian Village lost and found process:

- The security team can also be reached on their 24 hour hotline at 808-952-5925

**Hilton Hawaiian Village
Lost and Found
Claim Form**



Nursing Pod

HCC offers the Mamava ADA lactation pod for a private, spacious, secure space to pump or nurse. This ADA compliant pod has a 60" turnaround space and grab bars for easy wheelchair access. It also includes a dual outlet and USB port, as well as a shelf, mirror and coat hook for convenience. Our Pod is located on the Lobby Level near Exhibit Hall 1. For more information and unlocking instructions, refer to the Nursing Pod link in our Event Planning Toolkit and Exhibitor Toolkit.

Conference Information

Wi-Fi Internet Access

The convention center features free wifi.

- Users will connect to the SSID: Hawaii Free Wi-Fi
- Each user will create an account and password
- You can then use this to access the wifi

Social Media

The official Twitter account for INDOOR AIR 2024 is @IndoorAir2024:
<https://twitter.com/IndoorAir2024>

The official hashtag for the conference is #IndoorAir2024.

Currency and Payments

The United States dollar (\$) or USD is the official currency of the United States. Most institutions accept credit or debit cards in addition to cash. Currency can be exchanged in the Daniel K. Inouye International Airport.

Inclusion

At Indoor Air, we believe that every person has the right to feel valued, respected, and included. We are committed to creating an environment where all attendees feel welcome regardless of their race, ethnicity, nationality, gender, sexual orientation, age, religion, and any other aspect of their identity. We strive to foster a culture of inclusion through our policies, practices, and behaviors to build a stronger and more innovative indoor air revolution.

Code of Conduct

Violation of the code of conduct agreed to during registration may result in disciplinary action, including but not limited to warnings, temporary or permanent suspension, or expulsion from the organization or community.

Carbon Offset Program

Indoor Air 2024 is proud to be a part of the Hawai'i Convention Center Carbon Offset Program.

How does it work?

- Each meeting's carbon footprint is automatically calculated based on the meeting space used and # of days (movein/out included), and an equivalent carbon offset program cost will automatically be calculated.
- Carbon offsets are generated through the planting of more than 500,000 endemic trees right here in the islands and are certified through the Swiss-based Gold Standard—the most rigorous standard on earth.
- The Center will then offset the meeting's carbon footprint through the planting of endemic Hawaiian trees here in Hawai'i.
- The Center partners with Hawai'i-based Legacy Carbon, which is dedicated to providing the highest quality certified carbon offsets in the world.

Acknowledgements

We acknowledge Hawai'i as an indigenous space whose original people are today identified as Native Hawaiians by the federal government. We recognize that in 1893, her majesty Queen Lili'uokalani yielded the Hawaiian Kingdom under duress in protest to the United States to avoid the bloodshed of her people. We further recognize the generations of Kānaka Maoli and the knowledge systems and lifeways that have shaped and continue to care for Pu'uuhonua o Hōnaunau to this very day. They do this so that we all can come together with humility in order to learn the history and appreciate this very special and sacred place. Mahalo.

Guide for Presenters

Below is helpful information for preparing and giving your podium and poster presentations.

In-Person Podium Presentations

Guidelines

Please arrive at your session 15 min in advance of the starting time of the whole session and check in with your session chair. Each podium presentation is given a 12-minute time slot in the program, intended for a 10-minute talk plus up to 2 minutes for a brief Q&A. Your presentation needs to be in 16:9 format. All presentations must be in English and free of commercialization. Presenters may not promote products for commercial gain. Each attendee is permitted to present a maximum of two podium presentations.

Preparing your presentation

Each presenter should prepare a 12-minute maximum PowerPoint or PDF slide presentation.

- Visual Aids: Slides are allowed and encouraged! Use clear and visually appealing graphics, minimal text (you want the audience to focus on you and your message, not the text on your slides), and consistent formatting.
 - File format must be .pptx or .pdf. Keynote files are NOT accepted; however, you may export to PDF. Here is a resource if you need help converting from Keynote: <https://www.adobe.com/acrobat/hub/how-to-convert-keynote-to-pdf.html>
 - For slides, use the widescreen (16:9) format
 - Keep animations to a minimum (only use when necessary)
 - Minimum font size: 24 pt
 - You will be able to view your speaker notes.
 - Your slides should not be dependent upon internet connectivity.
- You will have the option to post a recording of your presentation that you create on the conference platform for Remote Track attendees and other participants to view asynchronously. If you record voiceover slides, Microsoft Powerpoint standard is acceptable. If recording a Zoom video, please select the Full HD setting (1920 x 1080) in Zoom to ensure great video quality. The 1080x720 setting is also acceptable.
- We encourage individuals to add captions to their posted videos to promote accessibility for all of our participants. See information on how to add captions from PowerPoint (<https://support.microsoft.com/en-us/office/present-with-real-time-automatic-captions-or-subtitles-in-powerpoint-68d20e49-aec3-456a-939d-34a79e8ddd5f>) or Zoom (<https://ats.udel.edu/conferencing/zoom/live-transcriptions/>).
- Video file format: .mp4 is preferred, and .mov is acceptable

Giving your presentation

Please submit your file in advance of the conference as instructed via email.

Guide for Presenters

Below is helpful information for preparing and giving your podium and poster presentations.

In-Person Poster Presentations

Guidelines

Poster sessions are organized thematically so as to provide coherent content throughout the poster area. Please bring a physical copy of your poster to the conference and plan to put it up in the room before the start of the poster session. Please remove it after the poster session. Any posters left after the poster session will be discarded.

Preparing your poster

- Printing sizes: maximum 36 x 42 in OR 91.44 x 106.68 cm (landscape orientation)
- Printing Details: Poster setup is push pin and velcro compatible (pins provided by conference).
- Minimum font size for body text: 24 pt (recommended 32+)
- Printing Responsibility: Individuals are responsible for arranging and paying for printing their posters and bringing them to the conference. This includes any other media such as brochures, flyers, and any other items intended for distribution at the conference. We do have links to locations where you can arrange in advance to have your poster printed onsite, and this is the responsibility of the individual to arrange for printing and pick up the poster.
- Local Printing Locations: All of the following locations can only print a limited number of posters locally in a short period of time, so they are available on a first-come-first-served basis. If you would like to print onsite, please contact them sooner than later and confirm their availability before relying on it. You can also print your poster at your home location and bring it with you.
 - FEDEX Office Print & Ship Center: Located 2.5 blocks from Hawaii Convention Center [LINK](#)
 - Does not accept orders onsite (must be ordered online in advance)
 - May offer a discount if your organization has a printing account
 - May be able to print your order early and store it for you until the event so contact them early
 - Kapiolani Signs: 4 min. from Hawaii Convention Center by car [LINK](#)
 - Contact them early to confirm availability as capacity may be limited
 - Professional Image: 3 min. from Hawaii Convention Center by car [LINK](#)
 - Contact them early to confirm availability as capacity may be limited
 - More information and a detailed schedule will be communicated closer to the date of the conference.

All posters must be in English and free of commercialization. Presenters may not promote products for commercial gain. Please arrive to the room designated for your poster presentation at least 10 minutes prior to the beginning of the session.

Giving your poster presentation

Please plan to stand by your poster in the poster hall (313 A/B/C) for the duration of your assigned session. Discuss your finding as people stop to learn about your work.

Option to post your poster for asynchronous viewing:

- You will have the option to post your video file on the conference platform for Remote Track attendees and other participants to view asynchronously (there will not be live virtual poster viewing times due to varying waking times around the globe). You can post a 3 minute video (voice over slides) and your poster file.
- For your video: Slides are allowed and encouraged! Use clear and visually appealing graphics, minimal text (you want the audience to focus on you and your message, not the text on your slides), and consistent formatting.
 - File format must be .pptx or .pdf. Keynote files are NOT accepted; however, you may export to PDF. Here is a resource if you need help converting from Keynote: <https://www.adobe.com/acrobat/hub/how-to-convert-keynote-to-pdf.html>
 - For slides, use the widescreen (16:9) format
 - Keep animations to a minimum (only use when necessary)
 - Minimum font size: 24 pt
- If you record voiceover slides, Microsoft Powerpoint standard is acceptable. If recording a Zoom video, please select the Full HD setting (1920 x 1080) in Zoom to ensure great video quality. The 1080x720 setting is also acceptable.
- We encourage individuals to add captions to their posted videos to promote accessibility for all of our participants. See information on how to add captions from PowerPoint (<https://support.microsoft.com/en-us/office/present-with-real-time-automatic-captions-or-subtitles-in-powerpoint-68d20e49-aec3-456a-939d-34a79e8ddd5f>) or Zoom (<https://ats.udel.edu/conferencing/zoom/live-transcriptions/>).
- **Video file format:** .mp4 is preferred, and .mov is acceptable
- **Poster file format:** .pptx or .pdf
- Information will be coming soon about submission locations for your file. Please note that your file must be named (Last Name_Abstract #).
- Finalized files must be submitted no later than Friday, June 28, 2024.
- More information and a detailed schedule will be communicated closer to the date of the conference.

Information for Podium Speakers and Session Chairs

Below is the information sent to session chairs. The Key takeaways are below and please see the longer document for more detailed information.

[Your Session Chair is there to support you as a speaker!](#)

Key takeaways and summary:

- **Goal:** Session chairs will facilitate sessions, workshops, and symposia that are efficient and productive forums and allocate time to speakers according to conference format.
- **Timing:** Podiums in breakout sessions and symposia are allocated in 12-minute blocks with 1 minute for transition between speakers.
 - Speakers are instructed to talk for 10 minutes, with 2 minutes for Q+A
 - If speakers go beyond 11 minutes, it is the **role of the session chair to politely but firmly ensure the talk ends on-time.**
 - **Reason (to reiterate to speakers):** *We will run the sessions on-time so that everyone gets their promised 12 minutes of time. By exceeding 12 minutes, the speaker is taking someone else's time.*
 - Chairs will receive a set of colored cards to indicate to speakers when they have reached 8 minutes (hold up yellow card) and 10 minutes (hold up red card)
 - **We intend to support attendees to move between sessions if desired.**
 - In case of an open slot/absence, **do not** give more time to other speakers or move the schedule; take a break or Q+A/discussion to fill the time.
- **Logistics:**
 - Arrive 15 minutes prior to your scheduled session.
 - There is a computer at the front of the room - confirm presentations are present
 - Confirm speakers are on-site and seated near the front of the room
 - Confirm you have cards to indicate alerts at 8 and 10 minutes into talk.
 - Check to confirm room A/V tech works (microphone, slide advance, mic, etc.)
- **Other recommendations:**
 - Prior to session: meet speakers and inform re: timing and alerts during session
 - During transitions: chair 1 bring up slides, chair 2 briefly announces speaker

Air Quality Monitoring Program

Driving improvement with a data-centric approach



SEE IT
IAQ Monitors
and Installation



UNDERSTAND IT
Real-time
IAQ Data



IMPROVE IT
Delos Labs
Recommendation
Guide



Supporting Sponsor of Indoor Air 2024



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Monitor and Interpret
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Precision gas concentration analyzers for:

- Ammonia
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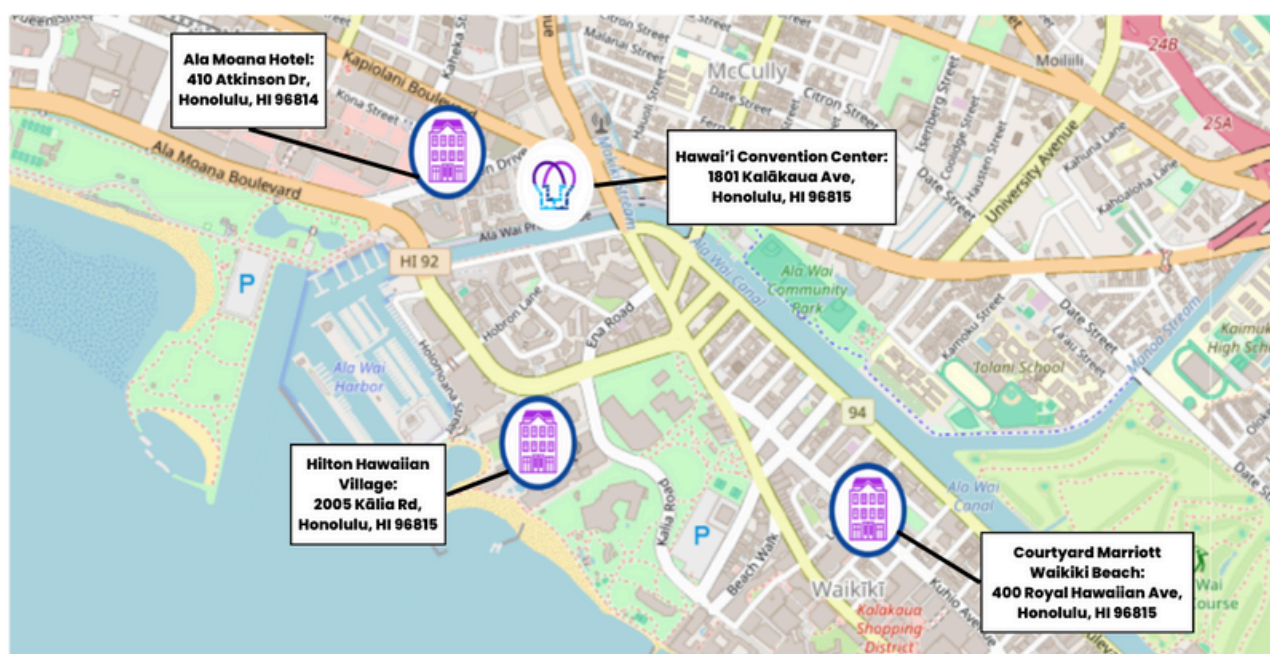
The AHAM Verifide® program makes the air cleaner purchase process a breeze for consumers. The AHAM Verifide seal on the air cleaner package indicates the unit's CADR and recommended room size. No longer do purchasers need to be concerned with variations in air cleaner technologies, filter types or fan sizes. The CADR measurement system, designed by AHAM, rates each air cleaner according to the amount of clean air the product will deliver per minute in cubic feet. Ratings appear in marketing and must be placed on the product package, for tobacco smoke, dust and pollen. Room air cleaners can remove smoke particles as small as one-tenth of a micron, and dust and pollen particles smaller than one micron. A micron is 39 millionths of an inch – far smaller than the period ending this sentence.

Maps and Directions

All Event Locations

The conference will be held Monday through Thursday at the Hawai'i Convention Center. Nearby areas include Waikiki Beach, Ala Moana Center, Magic Island, Honolulu Museum of Art, Iolani Palace, Kaka'ako, Diamond Head State Monument, and the Honolulu Zoo and Waikiki Aquarium.

Pre-conference activities, including the Master Class, affiliate meetings, and the opening ceremony and reception on Sunday evening, will be held at the Hawai'i Convention Center. Social events will be held each evening throughout the conference (Monday through Thursday). The map below shows all major event and hotel locations:

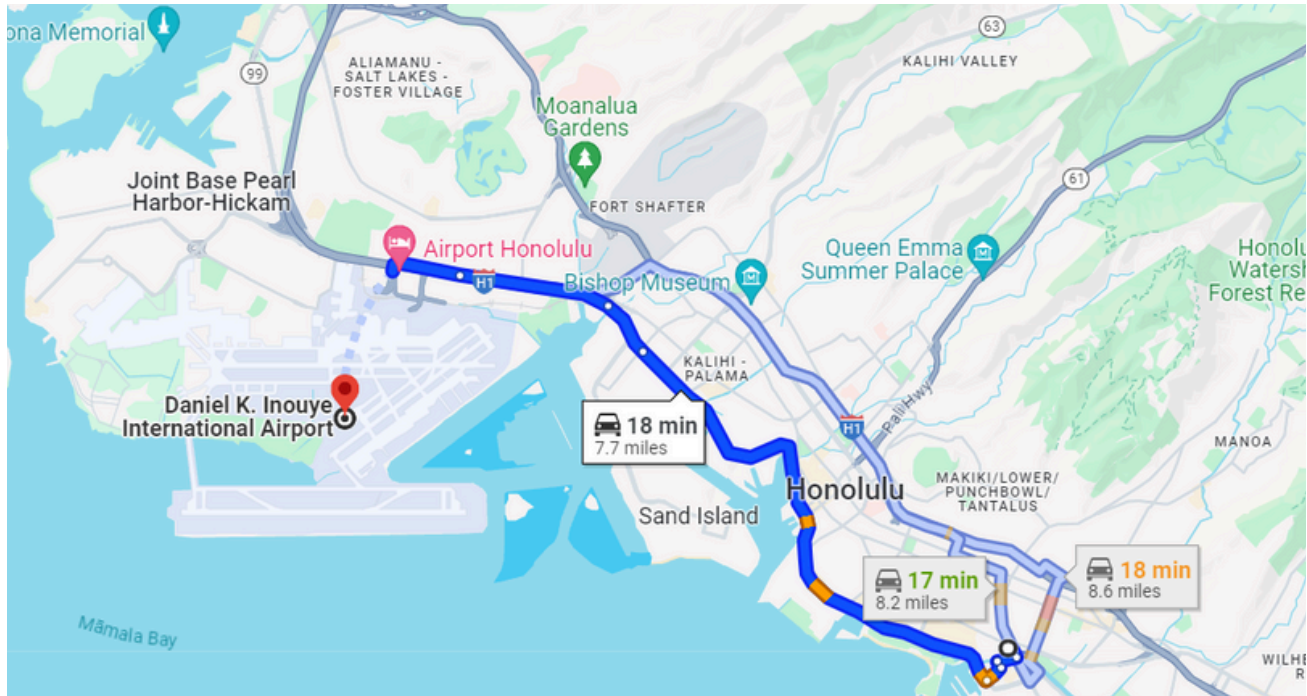


Transportation Times

	Walk	Drive
• Hilton Hawaiian Village to Hawai'i Convention Center:	13 min	6 min
• Courtyard Marriott to Hawai'i Convention Center:	21 min	6 min
• Ala Moana Hotel to Hawai'i Convention Center:	5 min	5 min

Maps and Directions

Convention Center: Directions from the airport



Airport: Daniel K. Inouye International Airport (HNL)

Taxis: The average taxi fare (without traffic) from HNL to Waikiki is \$40-\$45. Uber/Lyft rides average \$25.

Shuttle Services:

- Speedi Shuttle: <https://www.speedishuttle.com/reservations>
- Fly Shuttle & Tours: <https://flyshuttlehawaii.com/book-shuttle/>
- Roberts Hawaii: <https://www.robertshawaii.com/airport-shuttle/>

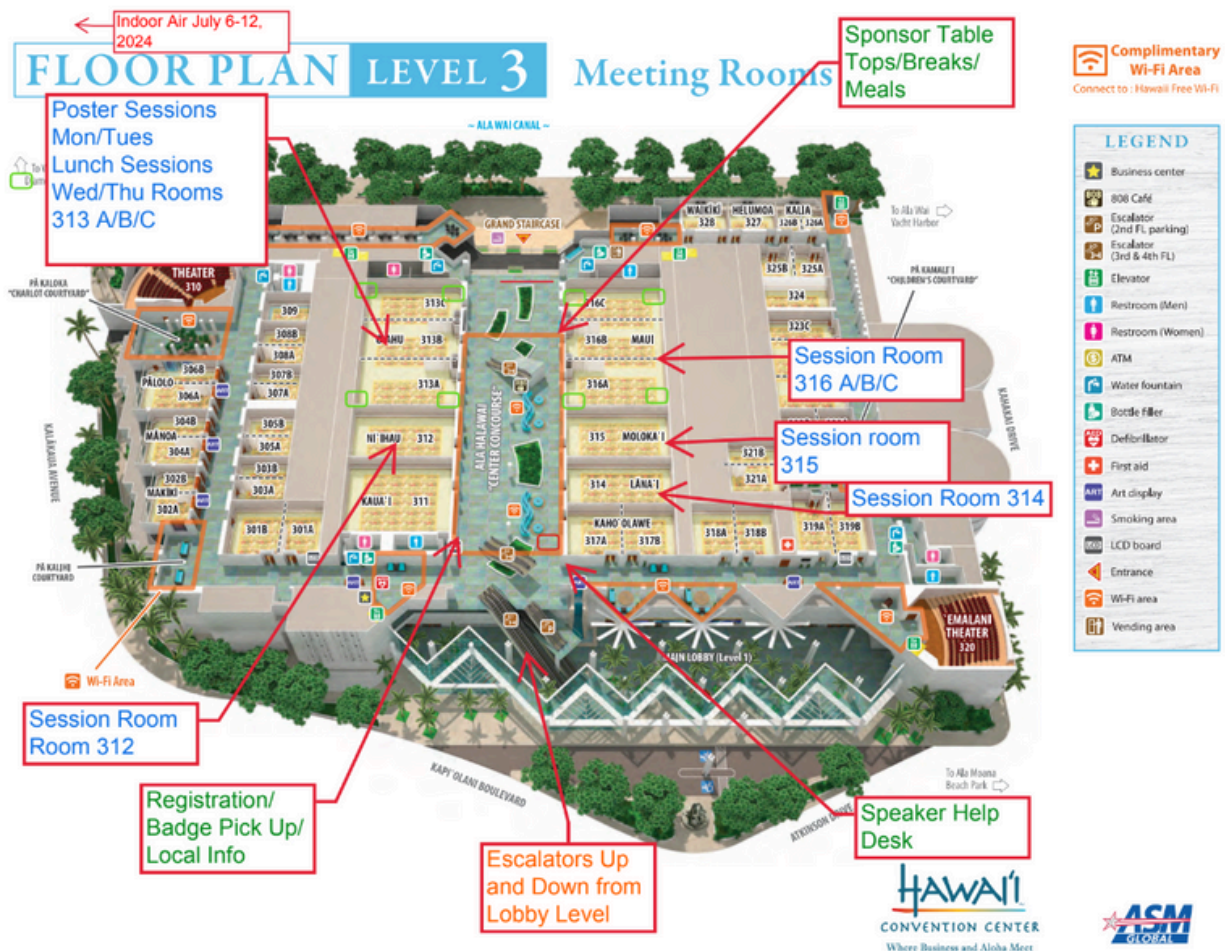
Maps and Directions

Convention Center: Location



Hawai'i Convention Center
1801 Kalākaua Avenue
Honolulu, HI 96815

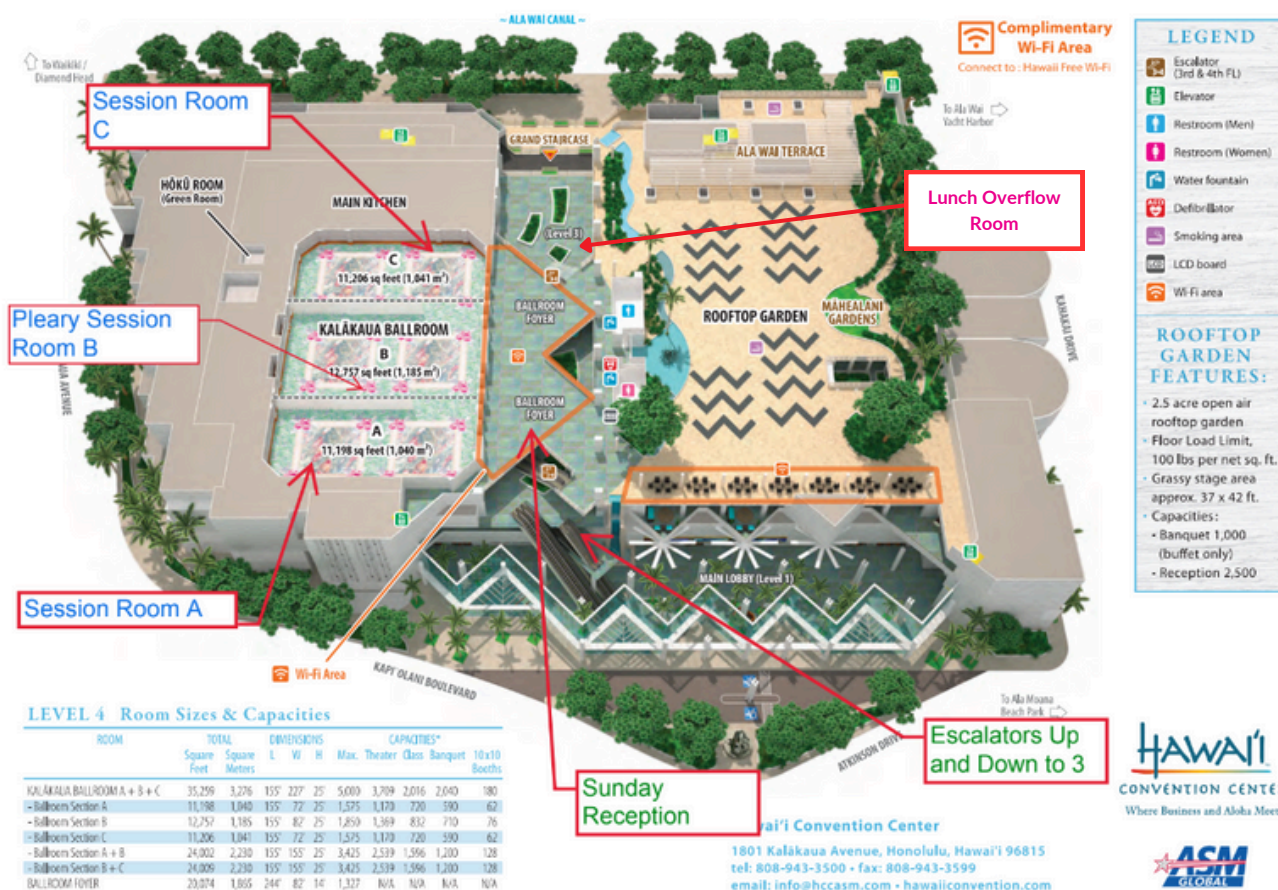
Convention Center: Session Rooms - 3rd Floor



Maps and Directions

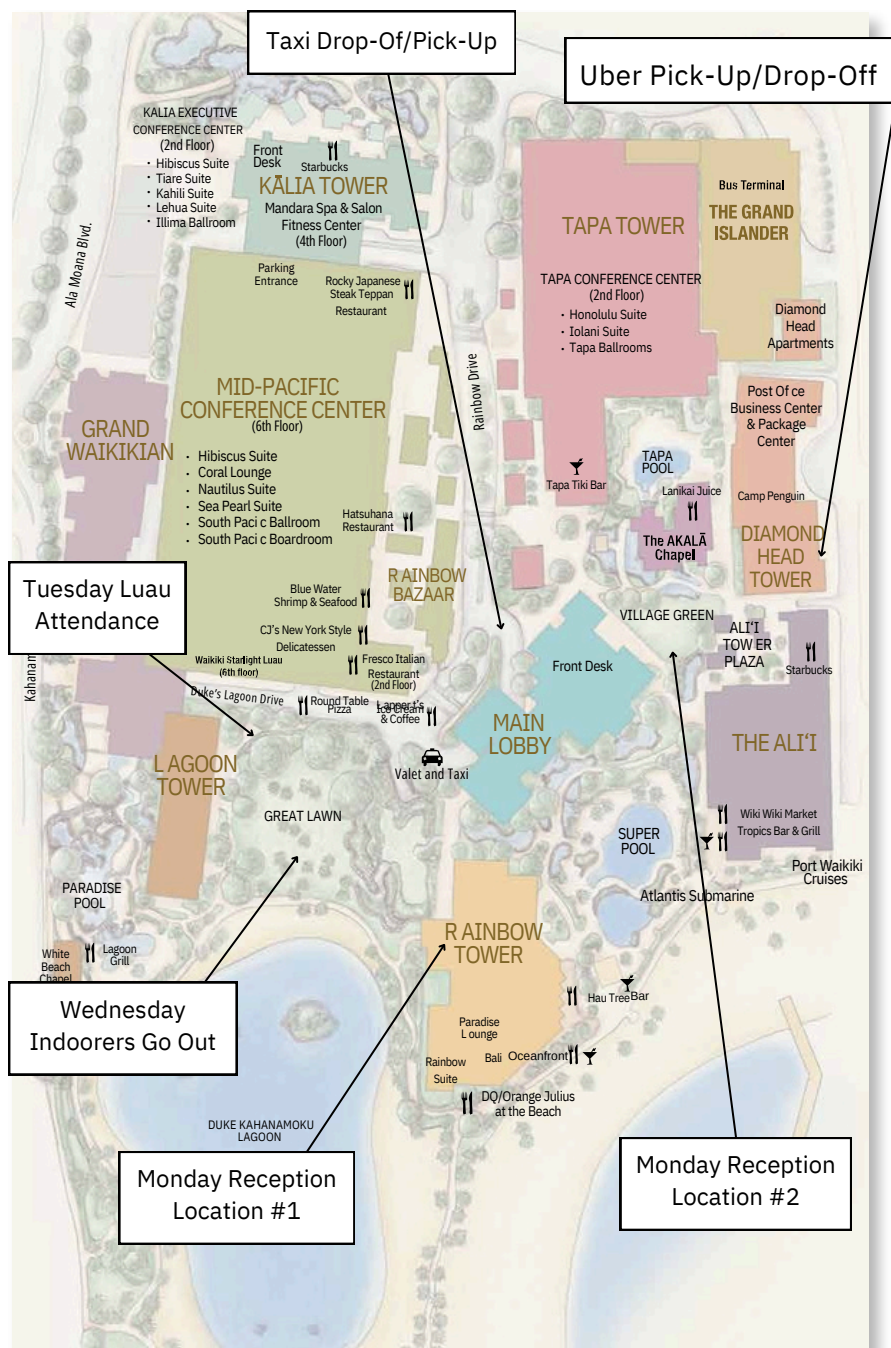
Convention Center: Ballroom - 4th Floor

FLOOR PLAN LEVEL 4 Ballroom and Rooftop Garden



Hilton Hawaiian Village Property Map

2005 Kālia Rd, Honolulu, HI 96815



Tapa Tower
Live entertainment nightly

- If you plan to enjoy a water activity (such as at Indoorers Go Out) and are not staying at the Hilton, please bring your own towel.
- Hilton guests can use their room key to obtain a towel.

Master Class

Next Generation Indoor Air Quality Monitoring

A new generation of air quality (AQ) monitors has emerged for characterizing occupied indoor environments. This Master Class will introduce the technology and resolution ranges of AQ monitors now available on commercial market along with their secure networking, archiving and algorithmic abilities. Contemporary deployment examples will be presented along with best practices for installation, operations, maintenance and field calibration(s).

This master class will be led by an industry-university cooperative instructional team with extensive experience in this sector: Professor Jeff Siegel, University of Toronto & Dr. Julien Stamatakis, Chief Technical Officer, Attune Corporation (formerly Senseware Inc.).

Afternoon session 1:00pm – 4:00pm and coffee break 2:00pm – 2:30pm.

Contemporary Germicidal Irradiation Applications

Recent changes to industrial hygiene guidelines have increased attention for engineering indoor applications of UV. This Master Class will introduce new perspectives on complimenting existing ventilation scenarios with conventional UV254 sources as well as adapting far UV222 source to occupied spaces. Managing potential air quality impacts associated with indoor UV supplements will be presented in the context of the latest professional society and government agency guidance.

This master class will be led by an agency-industry cooperative instructional team with extensive experience in this sector: Dr. Dustin Poppendieck, National Institutes for Standards and Technology (NIST) & Michael Clark, Chief Technical Officer, Far UV Technologies.

Morning session 9:00am -12:00pm with 10:00am – 10:30m coffee break.

Social Events

Student and Professional Mixer

Monday, July 8th, 2024 (6:30pm - 7:30pm)

Join us for an evening of networking and camaraderie as students and professionals from various disciplines and universities across the globe come together under one roof. Regardless of if you are a student or professional, you are welcome to join either mixer and move between the two locations.

- **Location:** Hilton Hawaiian Village: Village Green (students) AND Rainbow Patio Suite (Professionals)
- **Time:** 6:30 – 7:30 pm
- **What's Included:** Light snacks and cash bar
- **Other important items:** Must wear badge (guests traveling with you must have a paid ticket)



Sunrise Run

Tuesday, July 9th, 2024

Join us Tuesday morning to experience the magic of dawn against the backdrop of stunning tropical landscapes.

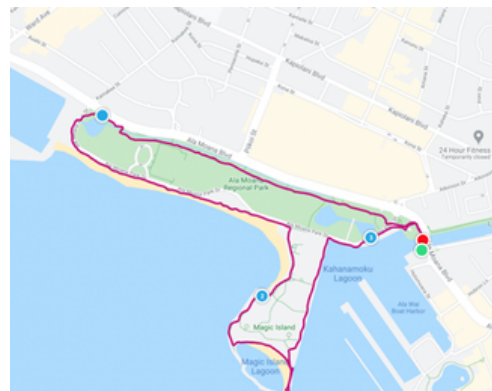
Intensity: Run, walk, jog; all are welcome to join!

Details:

- **Departure Time and Location:** Meet outside the Ala Moana Hotel at 6:00 am

Run Location:

- Ala Moana Regional Park: 1201 Ala Moana Blvd, Honolulu, HI 96814



Lū'au

Wednesday, July 10th, 2024 (6:00pm - 9:00pm)

Join us for an unforgettable lū'au experience to enhance your conference registration! Immerse yourself in the vibrant spirit of Hawaii as we host a tropical soir  e filled with lively entertainment, traditional Hawaiian delicacies, and an atmosphere perfect for networking in a relaxed setting.

- **Location:** Hilton Hawaiian Village, Great Lawn
- **Time:** 6:00- 9:00 pm
- **What's Included:** Heavy hors d'oeuvres/Light Buffet Stations and Cash Bar
- **Other important items:** Participants must wear a badge and have a paid ticket. This event is NOT included in your normal registration and must be purchased separately.



Social Events

Indoorers Go Out

Wednesday, July 10th, 2024 (4:30pm - 6:30pm)

Bring the indoorers out into the sunshine and shimmering waters of Waikiki Beach. This unique gathering is tailor-made for those looking to enjoy a day filled with sun, sand, and playful competition. Engage in a friendly game of beach volleyball, grab a paddle and kayak to explore the serene waters at your leisure, workout on giant water bikes, or just chill by the water with a few board games!

Please note that entrance into the lagoon area is limited to 200 people at any time for safety. Refreshments will also be served on a first come, first served basis. Let the games begin!



Location: Hilton Hawaiian Village, Duke's Lagoon

Time: 4:30 pm to 6:30 pm

What's included: Private area/access to games, beach volleyball, kayaks, frisbees, boogie boards, corn hole, Giant Jenga, Connect 4 etc.

- **Other important items:** Must wear badge (guests traveling with you must have a paid ticket); A wrist band will be provided at event check in; Waiver must be signed at entrance and wristband will be provided after showing badge.

Optional Events

Diamond Head Hike

Want to explore Diamond Head? Plan a self-guided hike up this dormant volcano! Purchase entry tickets and parking before you leave to ensure availability. There is no official meetup location or time for this event. Please reference the Hawaii State Park website beforehand to check for special hours or potential closures. (<https://gostateparks.hawaii.gov/diamondhead>)

Roberts Hawaii Hosted Events

Additionally, check out some optional activities in the link below. While not completely private, we have researched reputable vendors to offer first come first serve, pay on your own, options. So, if you are arriving early, check them out. These are not affiliated with Indoor Air 2024.

<https://www.robertshawaii.com/ia2024/>

Holokai Sunset Cocktail Cruise

Have some fun! You're going to be in Hawaii after all. Want to catch your own special cocktail cruise after Indoorers Go Out, the following are not private to us, and are optional activities on your own should you wish to check availability. Grab a friend or two!

- **Location:** Off Waikiki Beach, dependent on boat selected
- **Time:** Varying based on boat selected; All vessels are very strict with arrival times, so be sure to note departure times and addresses. For details and to book online go to <https://www.sailholokai.com/adventures-cruises/sunset-sail/> or call 808-922-2210
- Not affiliated with Indoor Air Conference. First come first served. The conference and its affiliates are not responsible for any injuries, damages, or losses resulting from participation in these events. Other individuals not affiliated with the conference may be on this cruise.



Aerosol Science and Technology

Publishing research at the
forefront of aerosol science

5.2 (2022) Impact Factor Q1
Impact Factor Best Quartile
7.2 (2022) CiteScore (Scopus)
29 days avg. submission to 1st
decision **43%** acceptance rate

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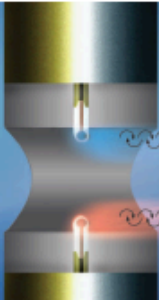
What are you doing to reduce your HVAC load to support decarbonization and electrification goals?



enVerid's award winning Sorbent Ventilation Technology® (SVT) reduces the cost and carbon emissions of heating, ventilating and air conditioning commercial buildings and increases their resilience to polluted air.

- Filters harmful gaseous contaminants from indoor air, so IAQ can be maintained with less energy-intensive outside air ventilation.
- Enables smaller, less expensive HVAC systems that use less energy.
- Approach supported by ASHRAE's updated IAQ Procedure and the International Mechanical Code. Earn LEED & WELL points.

Improving IAQ for Over 40 Years with Precision Airflow Measurements

Bead-in-Glass Thermistor Probe

Zero-Power Thermistor

Self-Heated Thermistor

Temperature Accuracy: 0.08 °C
Airflow Accuracy: ±2% of Reading

Power ΔT $\frac{Q}{(T_H - T_A)} \propto \rho v$ Mass Velocity

Discover why EBTRON's bead-in-glass thermistor sensors set the standard for accurate HVAC airflow and psychrometric measurement solutions. Our thermistors lead the industry in temperature and airflow measurement. Additionally, our patented velocity-weighted temperature, humidity, and enthalpy measurements provide better control of indoor environments and enable airside energy analysis.

Visit EBTRON exhibit space.



EBTRON
a measurable difference!

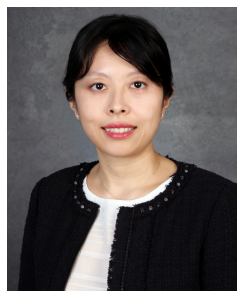
Speakers

Sunday, July 7th – Sunday Opening Ceremony

(5:30pm - 7:00pm Next to Registration Table in Foyer)

Conference Opening Talk on Behalf of ISIAQ

Ying Xu, Tsinghua University, China



The outgoing ISIAQ president, Dr. Ying Xu, will welcome everyone attending the conference, introduce ISIAQ and the Indoor Air conference, and declare the official opening of the conference. Following her introduction, the academy awards will be given out.

Monday, July 8th – Monday Plenaries – The Indoor Air Revolution

(8:30am – 10:00am Ballroom B)



Impacting Tomorrow's Indoor Environments Today: Equitable

Approaches to Future-Proofing Healthy IAQ in Community Buildings

Dr. Odessa Gomez, Colorado Department of Public Health and Environment

Community buildings, including schools, have been a center of focus for many of the indoor air quality challenges posed by public health events like disease outbreaks and severe wildfire smoke. Examples from IAQ programs at the Colorado Department of Public Health and Environment (CDPHE) underscore the importance of productive government-academic-community partnerships, advancing health equity, and strategically leveraging prior IAQ initiatives to ensure sustainable programming and equitable access to healthy air in our communities. These programs have focused on understanding and improving IAQ in schools, community spaces, and workplaces across Colorado, and emphasizing access to healthy indoor air for those most impacted. In 2023, Colorado schools received more than 45,000 free HEPA portable air cleaners and installed 2,400 IAQ monitors as a mitigation measure to reduce infectious aerosols and indoor air pollutants. CDPHE's IAQ/Ventilation Assessment Program collected critical building and IAQ data across the state to provide actionable guidance for healthy indoor workplace environments. Finally, a three-year initiative aims to increase wildfire smoke preparedness in community buildings and schools through education and training with community partners. By emphasizing the importance of partnerships, strategic planning, and health equity, this talk provides insights on successful initiatives and addresses some challenges faced by IAQ programs as we navigate this conversation on sustaining the indoor air revolution and assessment of buildings to simultaneously minimize energy consumption while enhancing indoor environmental quality. She has particular interests in thermal comfort and adaptation, occupant well-being, natural ventilation and mixed-mode buildings, and personalized environmental control.

Speakers

Monday, July 8th – Monday Plenaries – The Indoor Air Revolution (8:30am – 10:00am Ballroom B)



From Energy to Equity: Resident-Centric Retrofits for Social Housing

Dr. Marianne Touchie, University of Toronto

Housing around the world will need to be retrofit to achieve our decarbonization goals. Social (or public) housing is a particularly critical sector given that it often serves priority populations who have limited choice in how they are housed. At the same time, social housing in many jurisdictions suffers disproportionately from poor performance that impacts the resident experience including IAQ, thermal comfort and control issues, often due to underinvestment at the time of construction and through the building service life. Further, these performance issues will be exacerbated as our changing climate brings more extreme weather events, including heat waves and wildfires. This talk will explore some of the present and future pressures facing social housing and how we can use retrofit investments to go beyond decarbonization to improve equitable access to safe and healthy housing. Using examples from post-occupancy evaluations, we'll examine challenges with some current energy retrofit practices and then find inspiration in projects that take a resident-centric approach by considering resilience to future extreme events and resident wellbeing, including health and comfort.

Monday, July 8th – Morning Morning Announcement (8:30am – 10:00am Ballroom B)

Introducing Indoor Environments – the New ISIAQ-Owned Journal

Dr. Yuguo Li, The University of Hong Kong



ISIAQ launched the first society-owned journal with Elsevier – Indoor Environments in early 2024. This followed the unfortunate transfer of our early journal Indoor Air to Hindawi by Wiley in June 2022. I wrote then “this is not farewell, but a new beginning.” Indoor environments will continue to be a community-based, international, and multi-disciplinary journal and be dedicated to indoor environment sciences, with a broader scope, e.g. climate, sustainability, environmental impacts, and heat-resilient indoor environment. Being a new journal, Indoor Environments will be open to suggested new scope from the community – just write to the editors. I hope to share the passion, vision, and plan of the editorial board for the new journal and hear suggestions from the community.

Speakers

Tuesday, July 9th – Plenary – Indoor Environmental Quality: Impact on Health (8:30am – 10:00am Ballroom B)

Indoor Environmental Exposures in NYC and Disparities in Neighborhood Asthma Prevalence Dr. Matt Perzanowski, Columbia University



Within New York City, the prevalence of asthma and rates of hospitalizations for asthma vary dramatically among neighborhoods leading to great difference in asthma risk among children living just city blocks apart. Multiple indoor environmental exposures are thought to drive these differences, including those with sources from cockroaches and mice, fungi, combustion byproducts, pesticides and other manmade chemicals. Using NYC as a framework, the relevance of these exposures to the development of asthma and allergy and the exacerbation of asthma symptoms will be discussed. The possibility for individual, building level and city-wide interventions will also be examined.

Moving Heat Disparities Indoors

Dr. Patricia Fabian, Institute for Global Sustainability



Last year was the hottest on record on the planet, and with our changing climate, the public health threats of extreme heat continue to grow. Although cities across the world have invested in mitigating ambient heat disparities via urban cooling solutions, limited attention has been paid to indoor heat. In parallel, inequities in heat related morbidity and mortality are being driven by disparities in social, environmental, and building factors. In this talk Dr. Fabian will share lessons from a long-term project to build resilience to extreme heat in environmental justice neighborhoods. She will discuss how tools from the indoor air science community can be leveraged to inform city and community decisions, the value of transdisciplinary collaborations, and current opportunities to reduce indoor heat exposure disparities through climate adaptation and building decarbonization initiatives.

Speakers

Wednesday, July 10th – Plenary – Indoor Environmental Quality Policy
(8:30am – 10:00am Ballroom B)

People, Science and Policy: Strategies from Lead Poisoning Prevention to Inform the Indoor Air Revolution

Dr. Dave Jacobs, National Center for Healthy Housing & University of Illinois Chicago



In the 1970s there were hundreds of US childhood lead fatalities from lead paint annually. A reactive medical approach emerged between 1970-1990 that treated children, but only after their blood lead levels had already risen and the damage was done. Science had largely failed to uncover exposure pathways and early remediation often did more harm than good. The housing and environmental professions were largely missing in action. But by 1992 a new enlightened law was passed due to better science, an engaged citizenry, and more involvement from building and environmental professionals. There were nine key factors: research on new measurement, risk assessment, inspection, and remediation protocols & exposure limits; turning research into practical and valid guidelines; legislation to give the guidelines the force of law; public education; strategic plans; market forces; subsidies and enforcement where the private market fails; on-going evaluation; and above all, preventing exposure instead of merely reacting. It took courageous sacrifices to make all that happen and overcome opposition. The result: blood lead levels improved by more than 93% and disparities narrowed. A global healthy housing movement emerged, with WHO releasing housing and health guidelines. This talk will outline how the lessons from lead paint can be applied to other indoor contaminants. The lead paint experience reflected an insidious policy paralysis paradox that stalks the efforts to improve indoor air quality. Some argued the problem was too big and expensive to solve, while others said it didn't exist at all (like Covid-19, climate change and yes, other indoor air challenges). To succeed, the indoor air revolution must end this paralysis around the world. This talk discusses how that can and must happen.

Speakers

Wednesday, July 10th – Plenary – Indoor Environmental Quality Policy
(8:30am – 10:00am Ballroom B)

Enabling Infection Resilient Environments – From Science to Policy and Practice

Dr. Catherine Noakes, University of Leeds



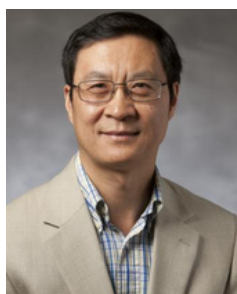
Over the course of the pandemic we became acutely aware of the role that the environment plays in transmission of diseases, and how our interactions in indoor spaces determine the risk of infection. At the same time, the focus on mitigations such as ventilation significantly accelerated the wider understanding of indoor air quality and health worldwide. Understanding the routes of transmission is challenging, but fluid dynamics modelling, assessment of indoor airflows, and development of technology solutions can play an important role in identifying mechanisms and determining mitigations. However, this evidence is only one part of a complex picture, and successful strategies to mitigate transmission are significantly influenced by human behavior, organizational strategy and policy choices. They also have to be considered alongside other challenges including thermal comfort, energy, security and climate mitigation and adaption. Tackling the pandemic urgently needed evidence to support national and international decisions, and the response pulled scientists worldwide into rapid research as well as supporting communication of evidence. In this talk I will give an insight into our learning around the complexities and uncertainties of disease transmission in indoor environments and how these play into implementing practical mitigations such as ventilation controls and air cleaning technologies. I will reflect on the challenges in providing balanced evidence and realistic advice to policy, practice and public and how this influences the research we do going forward.

Speakers

Thursday, July 11th – Plenary – Sustaining the Indoor Air Revolution: Future Directions (8:30am – 10:00 am Ballroom B)

Too Many Indoor Pollutants to Measure: Finding Exposure Surrogates Pertinent to Health Effects

Dr. Junfeng (Jim) Zhang, Duke University



Indoor chemical species are too numerous to measure all. Outdoor pollutants can enter an indoor environment. Historical and contemporary building materials can release toxic pollutants, some of which (e.g., PFAS) can accumulate indoors. The indoor environment is increasingly recognized as a dynamic “reactor” in which chemical species present in the air and on surfaces can be oxidized to form secondary organic aerosols, gaseous and semi-volatile species. Numerous studies have characterized various indoor chemical mixtures and contributed to the knowledge of human exposures occurring indoors. However, few studies have directly connected specific indoor chemical exposures to health outcomes, largely due to the challenge in accurately assessing toxic components of the mixture. More efforts should be made on finding exposure surrogates most pertinent to toxic effects. One approach is to measure chemical-specific or mixture-specific exposure biomarkers with a known pathophysiologic consequence (e.g., metabolites, hemoglobin adducts, oxidation products of essential biomolecules DNA or lipids). Another approach is to use a simple proxy to capture a mixture including short-lived reaction intermediates that are hard to measure. For example, recent studies showed that indoor O₃ loss (defined as outdoor ozone concentration minus indoor ozone concentration), as a surrogate of ozone reaction products, was associated with more indicators of cardiorespiratory pathophysiology than ozone exposure.

Thermal Comfort for the Next Generation

Dr. Shin-ichi Tanabe, Waseda University - Japan



In 2013, we published a review paper titled “Progress in thermal comfort research over the last twenty years” in *Indoor Air Journal*. In that paper, we covered various topics such as adaptive thermal comfort, thermal comfort and air movement inside buildings, thermal acceptability under personal comfort systems, thermal comfort in non-uniform and non-steady-state environments, multi-node models of human thermal physiology and comfort, thermal comfort in alternative HVAC designs, thermal comfort in mixed-mode buildings, thermal comfort and productivity, and so on and proposed a new framework for thermal comfort research. Since then, another ten years have passed, and the broader context of climate change and resilience in the post-COVID world has become more relevant. My talk will focus especially on Personal Comfort Systems (PCS), which are related to diversity in occupants, alliesthesia, sleeping environments and digital technology.

Speakers

Thursday, July 11th – Closing Remarks (3:15pm – 4:00pm Ballroom B)

Lessons Learned and the Future of Indoor Air Science

Dr. Richard L. Corsi, University of California - Davis



The COVID-19 pandemic has challenged a relatively unprepared humankind, caused immense morbidity and mortality, psychological impairments, damage to economies, deep political strains, public confusion and conflicts, scientific misinformation, politicalization of previously trusted authorities, and even tensions between scientific disciplines. It has also led to greater public awareness of the importance of indoor air quality, etched basic concepts of building and aerosol science into the public lexicon, and led to new standards and innovations. As a community of indoor air scientists, it is critical to reflect on what we have learned over the past four years, to celebrate our successes, and acknowledge where we could have done better and what we need to be able to do better in the future. This closing plenary presentation will focus on lessons learned over the past four years with a look toward leveraging these lessons to shape the future of indoor air science. Specific examples of major successes and lessons learned will be provided, along with recommendations for how these can positively shape our field over the next decade.

Incoming ISIAQ President Remarks

Dr. Kerry Kinney, University of Texas at Austin



Dr. Kerry Kinney is the Gilven Centennial Professor in the Department of Civil, Architectural and Environmental Engineering at the University of Texas at Austin as well as a Professor in the Department of Population Health at the Dell Medical School. Her cross-disciplinary research in environmental engineering centers on the investigation of human exposure to contaminants in the built environment. Her research team investigates microbial communities, pathogens, allergens and pollutants present in a range of settings including homes, schools, and commercial buildings. Her current research focuses on microbiome and pathogen studies, bioaerosols, contaminant exposure pathways as well identifying the relationships between indoor exposures and the physical and mental health of building occupants.



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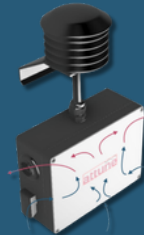
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Poster Presentations (Room 313 A/B/C)

MONDAY

Track	Title		Presenter	Full author List
A: Air Cleaning and Filtration	From the Laboratory to the Lavatory: Unintended Air Quality Impacts of Ultraviolet Light Disinfection in an Odiferous Bathroom Installation	M-AirClean-1	Michael Link	Raphaël Brun, Vincent Gaudion, Marie Verrielle, Manolis N. Romanias, Marion Chenal, Arnaud Soisson, Wolfram Maier, Frédéric Thevenet
A: Air Cleaning and Filtration	Realistic testing of air cleaners for virus removal or deactivation.	M-AirClean-2	Erik Uhde	Erik Uhde, Annette Clauß, Jochen Schulz
A: Air Cleaning and Filtration	Testing of Air Cleaning Technologies for Transport Applications	M-AirClean-3	Paul Hoertz	Petra Stavova, Paul Hoertz , Mike Lewis, Rohith Rohith, Kathleen Owen
A: Air Cleaning and Filtration	Identification of airborne pathogenic bacteria and their reduction in indoor spaces of multi-use facilities by air disinfection	M-AirClean-4	DONGRYEOL BAE	Dongryeoul Bae, Yu-Seung Kim, Chul-Kyu Lee, Jungwhan Chon
A: Air Cleaning and Filtration	Full-scale comparison between passive and active removal of indoor VOCs	M-AirClean-5	Frédéric Thevenet	Raphaël Brun, Vincent Gaudion, Marie Verrielle, Manolis N. Romanias, Marion Chenal, Arnaud Soisson, Wolfram Maier, Frédéric Thevenet
A: Air Cleaning and Filtration	Avenues to Improve Indoor Air Quality for COPD and Asthma Patients	M-AirClean-6	Christian Pfrang	Andrea Mazzeo, Zaheer Ahmad Nasir, Christian Pfrang
A: Air Cleaning and Filtration	A novel Dual Metal-Organic Frameworks-Derived Carbon Encapsulated CeO ₂ /C@Co/Co ₃ O ₄ /C Heterostructure for Catalytic Indoor Ozone Removal	M-AirClean-7	Abiyu Kerebo Berekute	Abiyu Kerebo Berekute, An-Yu Wang, Kuo-Pin Yu, Kun-Yi Andrew Lin
A: Air Cleaning and Filtration	Catalytic inactivation of airborne pathogens to prevent respiratory disease transmission	M-AirClean-8	Miguel Banares	A. Serrano-Lotina, A. Vazquez-Calvo, P. Llanos, A. Gomez-Lopez, M. Garcia-Castey, R. Martin, V. Alcolea-Rodriguez, A. Alcamiz, M.A. Bañares*
A: Air Cleaning and Filtration	Highly efficient technology for clean and safe air: photocatalytic advanced air purifiers to inactivate pathogens in aerosols	M-AirClean-9	Miguel Banares	G. Sánchez-Dominguez, G. Luna-López, A. Vázquez-Calvo, M. García-Castey, C. Jarne, A. Martínez-Arias, B. Bachiller, F. Fresno, M.A. Bañares, A. Alcamí, A. Iglesias-Juez
A: Air Cleaning and Filtration	Comparative and uncertainty analysis among different CO ₂ tracer gas methods for infiltration rate measurement	M-AirClean-10	Yibing Hu	Weihui Liang, Xiangnan Qiu
A: Air Cleaning and Filtration	Evaluation of Air Cleaning Technologies for ASHRAE 241 Compliance via Performance and Safety Testing	M-AirClean-11	John McKeon	Grainne Cunneiffe, John McKeon
A: Air Cleaning and Filtration	Effects of Growth Media in an Active Plant System on Indoor Thermal Environment and Air Quality	M-AirClean-12	Kaho Kodama	Kaho KODAMA, Soma SUGANO, Shin-ichi TANABE
A: Air Cleaning and Filtration	The efficacy of portable air cleaners to maintain acceptable indoor air quality in a high-occupancy office with occupant-induced ventilation	M-AirClean-13	Yiqun Li	Yiqun Li, Yujie Fan, Yuan Wei, Mingqi Liu, Bin Xu, Wei Ye
A: Air Cleaning and Filtration	Experimental Assessment of the Efficacy of Portable Air Cleaners in Mitigating Respiratory Droplet Nuclei Transmission	M-AirClean-14	Ihab Al-Rikabi	Ihab Jabbar Al-Rikabi, Hayder Alsaad, Svenja Carrigan, Conrad Voelker
A: Air Cleaning and Filtration	Airflow rate and captured particle distribution of a rectangular-spoke rotating disk	M-AirClean-15	Lianjie He	Lianjie He, Changsheng Cao, Chengquan Zhang, Jun Gao, Tao Wu
A: Air Cleaning and Filtration	Fast fabricating and low plate-plate distance two-stage ESP with dielectric coating for safe and efficient ultrafine PM removal	M-AirClean-16	Xihui Liu	Xihui Liu, Jinhan Mo
A: Air Cleaning and Filtration	Valuing benefits derived from controlling indoor air pollutants in China	M-AirClean-17	可亲 杨	Keqin Yang, Ningrui Liu, Yiming Wang, Jingya Wei, Yiping Zhang
A: Air Cleaning and Filtration	AHAM Test Methods	M-AirClean-18	Randy Cooper	Randy Cooper
A: Air Cleaning and Filtration	Effectiveness of Long-term HEPA filtration in Reducing PM _{2.5} Levels in Los Angeles Homes: Preliminary Data from a Randomized Crossover Trial	M-AirClean-19	Jim Zhang	Ruoxue Chen1 Yihui Ge, Zhenchun Yang, Jiawen Liao, Chenyu Qiu, Wu Chen, Yan Lin, Enrique Trigo, Sulema I S. Rodriguez, Vivien Le, Howard N. Hodis, Frank D. Gilliland, Michael H. Bergin, Marilyn Black, Zhanghua Chen, and Junfeng (Jim) Zhang
B: Building Simulation, Sustainability, and Energy	Deep-Learning-Based Approach for Automated Analysis of Indoor Thermal Environments	M-BldgSim-20	Jewon Oh	Jewon Oh, Daisuke Sumiyoshi, Takahiro Yamamoto, Takahiro Ueno, Tatsuto Kihara, Hyuntae Kim
B: Building Simulation, Sustainability, and Energy	Simplification of parameters of deep learning prediction depending on building size using explainable artificial intelligence	M-BldgSim-21	Dong Kyu Lee	Dong Kyu Lee, Woong June Chung
B: Building Simulation, Sustainability, and Energy	Analysis on heating/cooling load reduction of a building and integrated rooftop greenhouse depending on the operating schedule using energy simulation	M-BldgSim-22	Eunjung Choi	Eun Jung Choi, Doyun Lee, Jaehyun Kim, Sang Min Lee
B: Building Simulation, Sustainability, and Energy	A Simulation-Based Study on Classroom Air Temperature and Building Cooling Demand During Summer Heatwaves in Boston	M-BldgSim-23	Jianxiang Huang	Jianxiang Huang, Jinglei Li, Judith Rodriguez, Ernani Choma, Patricia Fabian, John D. Spengler
B: Building Simulation, Sustainability, and Energy	Smart Readiness Indicator (SRI) Applicability in the Perspective of Building Efficiency and Sustainability Enhancement	M-BldgSim-24	Cristiana Croitoru	Razvan Calota., Florin Bode., Miheea Sandu, Cristiana Croitoru ., Ilina Nastase,
B: Building Simulation, Sustainability, and Energy	Investigating Factors Influencing Radon Flux into Buildings: Enhancing Model Predictive Ability	M-BldgSim-25	James McGrath	Mohsen Pourkiaei, Patrick Murphy, Miriam A. Byrne, James A. McGrath
B: Building Simulation, Sustainability, and Energy	Heat transfer coefficient of block model for indoor temperature distribution	M-BldgSim-26	Lee Taecheol	Taecheol Lee, Rihiro Sato, Takashi Asawa, Seonghwan Yoon
B: Building Simulation, Sustainability, and Energy	Quantifying the cooling effect of cool materials on building surfaces and indoor temperature at the neighborhood scale	M-BldgSim-27	Fusuo Xu	Fusuo Xu, Zhi Gao Hanning Wang, Jianshun Jensen Zhang
B: Building Simulation, Sustainability, and Energy	Recycled Glass-Based Radiative Cooling Paint: A Feasible Approach for Space Cooling Applications	M-BldgSim-28	Can Xiao	Can Xiao, Chun Chen
B: Building Simulation, Sustainability, and Energy	Simple tool for informing shelter design on natural ventilation and indoor air quality: a preliminary study	M-BldgSim-29	Anna Conzatti	Anna Conzatti
B: Building Simulation, Sustainability, and Energy	Research on time-series power data analysis programme using DNN to save electricity without compromising environmental quality	M-BldgSim-30	Yuya Baba	Yuya Baba, Kim Jeong
B: Building Simulation, Sustainability, and Energy	Energy Saving Effects of Green Remodeling in Public Libraries according to Passive & Active Technology	M-BldgSim-31	Sung Jin Sim	Sung jin Sim, Jin chul Park
B: Building Simulation, Sustainability, and Energy	Analysis of airflow and indoor air quality characteristics by stack effect in high-rise Building	M-BldgSim-32	MINSEONG KIM	Minseong Kim, Joowook Kim
B: Building Simulation, Sustainability, and Energy	Research on Promoting Energy-Saving Behavior by Providing Information on Office Workers in Glass Buildings	M-BldgSim-33	諒 石川	Ryo Ishikawa, Jeongsoo Kim, Yumiko Kobayashi, Yuma Kouchi, Tokimi Kawase, Sijia Zou, Kensuke Watanabe, Taiga Amino
B: Building Simulation, Sustainability, and Energy	Modelling and optimization of PV and BT for a net zero energy renovated multi-residential building: A case study in Japan	M-BldgSim-34	Momoka Watanabe	Momoka WATANABE, Jungmin KIM, Minayo IMAI, Mizuho AKIMOTO, Seichi KASHIHARA, Yosuke CHIBA, Naoya WATANABE, Shin-ichi TANABE
B: Building Simulation, Sustainability, and Energy	A Study on Construction Digital Platform Technology Roadmap for Realization of Carbon-Neutral City based on Building Life Log Data	M-BldgSim-35	Hye-Sun Jin	Hye-Sun Jin
C: Sensors and Monitoring	Indoor air quality management based on target pathogenic microorganisms for each group of multi-use facilities	M-Sensors-36	Minkyong Kim	Minkyong Kim
C: Sensors and Monitoring	Assessing Indoor Environmental Quality in Varied Building Types with Long-term Measurement in South Korea	M-Sensors-37	Jong-Won Lee	Jong-Won Lee, Seung-Min Lee
C: Sensors and Monitoring	Ventilation in a world post pandemic: How do New Zealand buildings measure up?	M-Sensors-38	Julie Bennett	Julie Bennett, Kate Macnab Elinor Chisholm, and Caroline Halley
C: Sensors and Monitoring	Smokers' preference for cigarettes and heated tobacco: a relationship with the chemical constituents of environmental tobacco smoke	M-Sensors-39	Miyuki Noguchi	Miyuki NOGUCHI, Akihiro YAMASAKI, Yoshiharu SUZUKI
C: Sensors and Monitoring	Monitoring pollutants in the indoor air quality of new vehicles in Korea	M-Sensors-40	Young-Jun Byun	Yong-Jun Byun, Min-Kwang Kim, Eun-Ju Lim, Hyun-woo Lee, In-Ji Park

C: Sensors and Monitoring	Developing a small, battery-powered PMV measurement device.	M-Sensors-41	Eisuke Togashi	Eisuke Togashi
C: Sensors and Monitoring	A systematic review of low-cost sensors with the Internet of Things applica-tion: are they feasible for long-term indoor air quality monitoring in res	M-Sensors-42	Yong Yu	Yong Yu, Marco Gola, Gaetano Settimo, Stefano Capolongo
C: Sensors and Monitoring	Indoor Airborne Endotoxin Detection via On-site Biosensing System Using Carbon Nanotube Feld-Effect Transistors	M-Sensors-43	EUNUI KIM	EUNUI KIM
C: Sensors and Monitoring	Spatiotemporal Analysis of a Large U.S. Indoor Air Quality Dataset	M-Sensors-44	Brett Stinson	Brett Stinson, Jeff Mounts, Don Aultman, Elliott Gall
C: Sensors and Monitoring	Daycare Indoor Air Quality: Integrating Real-time Positioning for Health Insights	M-Sensors-45	Thuzar Win Shwe	Thuzar Win Shwe, Samy Clinchard , Pentti Kuurola, Ulla Haverinen-Shaughnessy
C: Sensors and Monitoring	Occupancy estimate based on Carbon-Dioxide and Differential Pressure Data	M-Sensors-46	Jehyun Kim	Jehyun Kim, Minki Sung
C: Sensors and Monitoring	Probing the health and thermal comfort of the occupants with respect to indoor environmental quality in a shared space	M-Sensors-47	Saeid Chahardoli	Saeid Chahardoli, Mina Lesan, Zhihong Pang, Amirhosein Jafari, Yimin Zhu, Arup Bhattacharya
C: Sensors and Monitoring	Driving Action on Indoor Air Monitoring in Commercial Buildings	M-Sensors-48	Seema Bhargar	Larissa Oaks, Tom Parkinson, Riwayat Katia, Dusan Licina, Seema Bhargar, Tobias Kramer
C: Sensors and Monitoring	Indoor Air Quality of public closed spaces: Beyond CO2 to Chemical and Microbial Pollutants	M-Sensors-49	Sarah Nauwelaerts	Sarah J.D. Nauwelaerts, Babette Muyshondt, Berdieke Goemaere, Lula Timmerman, Michel Degallier, Ann Packeu, Koen De Cremer
C: Sensors and Monitoring	Drone-mounted photoionization detector protocol for improved dispersion measurements	M-Sensors-50	Jordan Clark	Oluwatosin Onihale, Jordan Clark
D: Covid-19 and Viral Transmission	Propagation and Evaporation of Dental Droplets, Emission and Exposure in Surgery Environments: Preparing for Next "Disease X"	M-COVID-51	Xiujie Li	Xiujie Li, Cheuk Ming MAK, Zhengtao Ai, Kuen Wai MA, Hai Ming WONG
D: Covid-19 and Viral Transmission	SARS-CoV-2 on Portable Air Purifier Filters in Public Spaces without Confirmed Positive Occupants	M-COVID-52	Jing Li	Jing Li, Merel Bot, Xinlei Liu, Yuan Yao, Roel Ophoff, Yifang Zhu
D: Covid-19 and Viral Transmission	Transmission risk and its countermeasures in public transportation	M-COVID-53	Naohide Shinohara	Naohide Shinohara, Koichi Tatsu, Naoki Kagi, Hoon Kim, Jun Sakaguchi, Wataru Naito
D: Covid-19 and Viral Transmission	Particle concentration and indoor air quality in mechanically ventilated isolation patient rooms-A field study in a hospital building in Finland	M-COVID-54	Mohamed Elsayed	Mohamed Elsayed, Ville Silvonon, Henna Lintusaari, Anni Luoto, Natalia Lastovets, Topi Rönkkö, Pia Sormunen
D: Covid-19 and Viral Transmission	A Global Survey of the Impacts of Facemask Wear on Perceived Learning or Working Performance During the COVID-19 Pandemic	M-COVID-55	Rachel Hurley	Rachel Hurley, Oren Mangobi, Kai Zhang, Shichao Liu
D: Covid-19 and Viral Transmission	Influence of particle size distribution on airborne pathogen concentration in the breathing zone	M-COVID-56	Aleksandra Monka	Aleksandra Monka, Bruño Fraga
D: Covid-19 and Viral Transmission	A novel Pseudo-CO2 concept to monitor airborne infections in indoor settings	M-COVID-57	Wei Jia	Wei Jia, Yuguo Li
D: Covid-19 and Viral Transmission	Numerical modeling of airborne infectious disease transmission in a shared-office space under various ventilation strategies	M-COVID-58	Saeid Chahardoli	Saeid Chahardoli, Mina Lesan, Arup Bhattacharya
D: Covid-19 and Viral Transmission	Particle sizing and size-resolved survival of airborne phi6 under different environmental conditions	M-COVID-59	Lok Kwan So	Lok Kwan So, Chi Cheng Sou, Jingcui Xu, Cunteng Wang, Jiachi Chiou, Hai Guo
D: Covid-19 and Viral Transmission	Minimizing the infection risk on construction sites	M-COVID-60	Iiris Pulkkinen	Iiris Pulkkinen, Ulla Haverinen-Shaughnessy, Risto Salin
D: Covid-19 and Viral Transmission	A Head-mounted Air-supply Device for Protecting Healthcare Workers in an Isolation Ward	M-COVID-61	Manjiang Yu	Manjiang Yu, Xiaobin Wei, Jun Gao
D: Covid-19 and Viral Transmission	Quantifying the impact of Hydration Levels on the Formation of Respiratory Aerosols	M-COVID-62	Mahender Singh Rawat	Mahender Singh Rawat, Dinushani Senarathna, Byron D. Erath, Sumona Mondal, Andrea R. Ferro
E: Thermal Comfort and Perception Indoor Air	Thermal stress assessment in severe cold work environments: redesign of the IREQ index calculator according to age and gender	M-COVID-63	Alice Caporale	Alice Caporale, Francesca Anna Rita Inglese, Cristina Mora, Emilio Ferrari
E: Thermal Comfort and Perception Indoor Air	A Preliminary Examination of the Connection Between Thermal Comfort and Human Emotional States Through Surveys	M-COVID-64	Wannasa Setthapittayakul	Wannasa Setthapittayakul, Noresh Varman, Jin Wen, Simi Hoque, Sara Giarrotto, Teresa Wu, Victor Lubecke, Olga Boric-Lubecke
E: Thermal Comfort and Perception Indoor Air	Analysing the role of personal control on guest comfort: a text mining exploration in hotels	M-ThermalC-65	Giulia Lamberti	Giulia Lamberti, Fabio Fantozzi, Francesco Leccese, Giacomo Salvadori
E: Thermal Comfort and Perception Indoor Air	Natural Convective Coefficient for Individual Body Segments of a Thermal Manikin at Various Skin-to-Air Temperature Gradient	M-ThermalC-66	Xiaojing Zhang	Zizhou Wang, Xiaojing Zhang
E: Thermal Comfort and Perception Indoor Air	Mutual Evaluation Method of Office Design and Architectural Equipment Using Maslow's Hierarchy of Needs	M-ThermalC-67	Jo Wakui	Jo Wakui, Ichiro Maekawa, Masafumi Mikuriya, Ryouhei Ueyanagi, Tatsuo Nobe
E: Thermal Comfort and Perception Indoor Air	Assessment of the Impact of Wooden-Green Remodeling on the Indoor Environment of Childcare Facilities	M-ThermalC-68	Haedeun Park	Haedeun Park, Hyeonwoo Jeong, Seong Jin Chang
E: Thermal Comfort and Perception Indoor Air	Volatile organic compounds and odor emissions from building materials by headspace analysis	M-ThermalC-69	Yibing Hu	Weihui Liang, Yibing Hu
E: Thermal Comfort and Perception Indoor Air	Human Physiological Model for Predicting Thermal Comfort of a Heated and Ventilated Seat	M-ThermalC-70	Jun Seok Park	Kyoungmin Lim, Seungwoo Choi, Junseok Park, Sanghun Kim, Seokwon Seo
E: Thermal Comfort and Perception Indoor Air	Local Thermal Comfort Zone of Human Torso in Non-neutral Environment	M-ThermalC-71	Huan Yu Yue	Huan Yu Yue, Bin Cao
E: Thermal Comfort and Perception Indoor Air	Effect of low relative humidity on sleep quality	M-ThermalC-72	Mizuho Akimoto	Mizuho Akimoto, Shin-ichi Tanabe, Pawel Wargocki
E: Thermal Comfort and Perception Indoor Air	Is there a difference in how people improve their thermal comfort through local conditioning in different climates? A large-scale survey in China	M-ThermalC-73	Zhen Yang	Zhen Yang, Weirong Zhang
E: Thermal Comfort and Perception Indoor Air	Observation of thermal physiological and thermal sensation responses in an outdoor experimental study	M-ThermalC-74	Ying Jiang	Ying Jiang, Yongxin Xie, Jianlei Niu
E: Thermal Comfort and Perception Indoor Air	Features of outdoor thermal comfort with direct solar radiation	M-ThermalC-75	Sijing Liu	Sijing Liu, Bin Cao, Yingxin Zhu
E: Thermal Comfort and Perception Indoor Air	Pre-renovation Verification Aimed at Improving The Work Environment in Offices: Quantification of Work-efficiency Improvement Factors to Implement Act	M-ThermalC-76	Yoshika Tanaka	Yoshika Tanaka, Shintaro Ando, Tomomi Kano, Takeshi Kondo, Ryuta Tsurumi, Hideki Yuzawa, Naoki Hashimoto, Nobuaki Ishida, Tepei Nishi
E: Thermal Comfort and Perception Indoor Air	Ventilation and improvement of thermal environment using buoyancy-driven ventilation with a single opening	M-ThermalC-77	Akito Kono	Akito Kono, Takashi Kurabuchi, Takashi Kurabuchi, Jeongil Kim
E: Thermal Comfort and Perception Indoor Air	A cognitive performance evaluation model for low activitypersonnel in high temperature environments	M-ThermalC-89	Yingying Zhao	Yingying Zhao, Yuyan Chen, Weiwei Liu
E: Thermal Comfort and Perception Indoor Air	AI-Driven Advances in Human Thermal Sensation Detection and Control in Indoor Environments: A Review	M-ThermalC-90	Huan Yu Xu	Huan Yu Xu
F: Dampness, Mold, and Indoor Microbiome	Adoption of multiple phased anodes to dewater a porous insulation material by electro-osmosis	M-Microbiome-91	Tengfei Zhang	Zhiyi Zhang, Feng Wang, Tengfei (Tim) Zhang
F: Dampness, Mold, and Indoor Microbiome	Nano-metal Treatment of recycled building materials to improve the resistance of fungal growth	M-Microbiome-92	Chi-Chi Lin	Chi-Chi Lin, Pei-Chen Xiao
F: Dampness, Mold, and Indoor Microbiome	Estimation of inhaled microbial exposure in public-use facilities using genetic-based analysis	M-Microbiome-93	Bong Gu Lee	Bong Gu Lee, Min-Kyeong Yeo
F: Dampness, Mold, and Indoor Microbiome	Molded by the Storm: Assessing Fungal Exposure After Australian Floods	M-Microbiome-94	Heike Neumeister-Kemp	Heike Neumeister-Kemp

F: Dampness, Mold, and Indoor Microbiome	Indoor microbiomes in Korean homes: a synthesis of our past research	M-Microbiome-95	Naomichi Yamamoto	Naomichi Yamamoto, Cheolwoon Woo, Choa An, Mohammad Imtiaz Uddin Bhuiyan, Donghyun Kim, Priyanka Kumari, Seung-Kyung Lee, Ji Young Park, Ke Dong, Kiyoun Lee
F: Dampness, Mold, and Indoor Microbiome	Investigation of Far-UVC Disinfection of Bioaerosols Deposited on Surfaces	M-Microbiome-96	Kangqi Guo	Kangqi Guo, Chun Chen
F: Dampness, Mold, and Indoor Microbiome	Degradation of polyester polyurethane foams by Aureobasidium and Naganishia isolates	M-Microbiome-97	John Van Dusen	John Van Dusen, Amanda Stickney, Nancy Kelley-Loughnane, Blake Stamps, Vanessa Varaljay, Dominic Wagner, Karen C. Dannemiller
F: Dampness, Mold, and Indoor Microbiome	Fungal Flora on Floor Surfaces in 13 Newly Constructed Wooden Houses in Summer	M-Microbiome-98	Yoshiki Shinoda	Yoshiki Shinoda, U Yanagi, K. Azuma, N. Kagi, I. Bamba, T. Tachiki
G: Ventilation and HVAC	Development and Performance Evaluation Study of Window-Mounted Pressurized Ventilation Unit	M-VentHVAC-99	Sanghoon Park	Sanghoon Park, Chaemin Hong, Sehui Yun, Yuna Cho
G: Ventilation and HVAC	Experimental Study on Interworking Control of Energy Recovery Ventilation and Air Conditioner to Reduce Fine Dust in Residential Building	M-VentHVAC-100	Young Chull Ahn	Young Chull Ahn, Sang Moo Woo, Yul Ho Kang, Hae Eun Song, Jin Hyuk Shin, In Gyu Yang
G: Ventilation and HVAC	Comparing photocatalytic and outdoor-air-intake ventilation systems	M-VentHVAC-101	Yong Woo Song	Yong Woo Song
G: Ventilation and HVAC	Field Test of Thermal Performance of Alternating Current Heat Recovery System in Korean's apartment housing	M-VentHVAC-102	Beungyong Park	Beungyong Park, Jung Hwa Nam, Suhhyun Kwon, Sihwan Lee
G: Ventilation and HVAC	Research on building airtightness and planned ventilation in houses equipped with exhaust ventilation system	M-VentHVAC-103	Yoshihiro Toriumi	Yoshihiro Toriumi
G: Ventilation and HVAC	Energy-Saving Potential in Graphite Layer Enhanced Low Temperature Chilled Water Driven Ceiling Radiation Cooling Panel	M-VentHVAC-104	Sau Chung Fu	Yifan Wang, Sau Chung Fu, Ka Shuen Fung, Paul Y. C. Chan, M.K. Li, Oscar K.C. Chan, Horace K.W. Mui, Christopher Y. H. Chao
G: Ventilation and HVAC	Newer New Jersey Secondary School Teachers Assessment of School Building and Classroom Ventilation, Filtration, Trainings, and Awareness of Government	M-VentHVAC-105	Derek Shendell	Derek G. Shendell, Juhi Aggarwal, Maryanne Campbell, Midhat Rehman, Koshy Koshy
G: Ventilation and HVAC	Natural ventilation in homes and mould levels – exploration of occupant behaviours	M-VentHVAC-106	Caroline Halley	Caroline Halley, Elinor Chisholm, Michael Keall, Julie Bennett
G: Ventilation and HVAC	Thorough Evaluation of Building Energy Reduction and Enhanced Indoor Air Quality via Centralized Ventilation Systems Integrated with Air Cleaners	M-VentHVAC-107	Amirmohammad Behzadi	Amirmohammad Behzadi, Annika Gram, Sasan Sadrizadeh
G: Ventilation and HVAC	Study on Ventilation Efficiency Measurement Method of Air Purifier Using Artificial Droplets	M-VentHVAC-108	Jeongil Kim	Jeongil Kim, Takashi Kurabuchi, Sihwan Lee, Toshihiro Nonaka, Tatsuya Murai
G: Ventilation and HVAC	Effectiveness of ventilation and purification in VOCs control in Chinese home kitchens	M-VentHVAC-109	Jiaru Jiang	Jiaru Jiang, Junjie Liu
G: Ventilation and HVAC	Measurement of Age of Air in Air-Recirculating Systems using Dynamic Steady-State Concentration Theory	M-VentHVAC-110	Tatsuya Murai	Tatsuya Murai, Takashi Kurabuchi, Jin-ya Takeuchi, Hajime Yoshino, Yoshihiro Toriumi, Jeongil Kim, Toshihiro Nonaka, Hiko Ri
G: Ventilation and HVAC	Rational use of an over-track exhaust system has an enhanced effect on the smoke exhaust of fire on a metro platform	M-VentHVAC-111	Mingyao Ma	Mingyao Ma, Yumei Hou, Jun Gao
G: Ventilation and HVAC	Analyses of energy performance and thermal comfort through duty cycling control of HVAC systems	M-VentHVAC-112	Alya Penta Agharid	Alya Penta Agharid, Yaling Zhang, Indra Permana, Yihan Luo, Fugen Wang
G: Ventilation and HVAC	The effectiveness of simple technical methods in infection risk management, an experimental setup	M-VentHVAC-113	Iiris Pulkkinen	Iiris Pulkkinen, Ulla Haverinen-Shaughnessy
G: Ventilation and HVAC	Occupant response to ventilation reduction during simulated demand response events in a controlled environment	M-VentHVAC-112	Jordan Clark	Troye Sas-Wright, Jordan Clark
H: Aerosols and Particulate Matter	Inhalation exposure of Polystyrene microplastics causes pulmonary inflammation	M-Aerosols-113	Kyuhong Lee	Kyuhong Lee, Jong-Hwan Woo
H: Aerosols and Particulate Matter	An experimental investigation on vacuum cleaner head flow path for cleaner hygiene improvement	M-Aerosols-114	In-Gyu Yang	In-Gyu Yang, Kyoung Ho Ryoo, Ki Joong Kang, Jin Hyuk Shin, Young Chull Ahn
H: Aerosols and Particulate Matter	Spatial and temporal variations of airborne microplastic concentration, characteristic, and influencing factor in indoor air	M-Aerosols-115	Chien-Cheng Jung	Kuan-Ting Lin, I-An Chen, Kuan-Yuan Chen, Chien-Cheng Jung
H: Aerosols and Particulate Matter	Daily PM10 concentration profiles in some Parisian railway stations	M-Aerosols-116	Benjamin Hanoune	V. Rakotonirinahanary, S. Crumeyrolle, M. Bogdan, B. Hanoune
H: Aerosols and Particulate Matter	Association of Aerodynamic Size of Bioaerosols with Biodiversity and Antibiotic-resistance in kindergartens	M-Aerosols-117	Chane-Yu Lai	Tzu-Hsien Lin, Ying-Hsiang Chou, Tzu-Yu Hsu, Chun-Hui Hung, Chane-Yu Lai
H: Aerosols and Particulate Matter	Effects of Occupant Behaviour and Air Filtration on Indoor Air Quality in Social Housing	M-Aerosols-118	Arman Hashemi	Vishnupriya Valeriparambil Narayanan, Arman Hashemi, Heba Elsharkawy, Darryl Newport, Lucienne G. Basaly
H: Aerosols and Particulate Matter	Characteristics, Sources and Improvement Measures Regarding Fine Particulate Matter in Subway Station Staff Area	M-Aerosols-119	Chengzhi Luan	Chengzhi Luan, Xiaofeng Li, Chunwang Wang, Yulin Zhu
H: Aerosols and Particulate Matter	The Importance of Diverse Indoor Environmental Monitoring in Personal Exposure	M-Aerosols-120	Shinyoung Park	Shin Young Park, Heok Jang, Jeong In Jeon, Ji Yun Jung, Cheol Min Lee
H: Aerosols and Particulate Matter	Airborne Particulated Ergosterol Detection via On-site Biosensing System Using Carbon Nanotube Field-Effect Transistors	M-Aerosols-121	Beomsoo Park	Beomsoo Park, Eun-sook Choi, Soohyun Park, Eunui Kim, Hongki Kang, Eunjo Kim, Yoonhee Lee
H: Aerosols and Particulate Matter	Comparative analysis of indoor and outdoor air quality in Seoul: Source apportionment of PM2.5 using Positive Matrix Factorization (PMF)	M-Aerosols-122	Sujung Han	Sujung Han, Moonkyung Kim, Hyehin Shin, Ilhan Ryoo, Jaewook Hwang, Kwonho Jeon, Sunghwan Shim, Taeyeon Kim, Seung-Mul Yi
H: Aerosols and Particulate Matter	Development of stable concentration chamber and CFD analysis of particle mechanisms for in-vitro exposure experiment	M-Aerosols-123	Seoyeon Park	Seoyeon Park
H: Aerosols and Particulate Matter	Assessing Volatile Organic Compounds Emitted by 3D printers in Educational Environments	M-Aerosols-124	Gitaek Oh	Gitaek Oh, Boowook Kim, Taehong Kwon, MyoungHo Lee, Choongsik Yoon
H: Aerosols and Particulate Matter	A Pilot Study, Aerosol Formation in Medical Device Reprocessing	M-Aerosols-125	Rachel Tyli	Rachel Tyli, Remus Anders, Garry Bassi, Tony Mazzulli, James Scott
H: Aerosols and Particulate Matter	Performance Testing of Cordless Handheld Vacuum Cleaners	M-Aerosols-126	Jason Lin	Jason Lin, Sheng-Hsiu Huang, Yu-Mei Kuo, Chun-Wan Chen, Chih-Wei Lin, Chih-Chieh Chen
H: Aerosols and Particulate Matter	Assessment of Particle Distribution and Concentration in Consumer Spray Products (CSPs) Classified by Usage	M-Aerosols-127	Hyunbin Jo	Hyunbin Jo, Gitaek Oh, Taehong Kwon, Chungsik Yoon
H: Aerosols and Particulate Matter	The impact of altitude on dosage of indoor particulates to small airways	M-Aerosols-128	Yifan Li	Yifan Li, Kirstine M. Frandsen, Yiran Lu, Maltthe H. Hvelplund, Weiqi Guo, Baimu Suolang, Ziang Xi, Mengjie Duan, Li Liu
H: Aerosols and Particulate Matter	Disruption of phosphofructokinase activity and aerobic glycolysis in human bronchial epithelial cells by atmospheric ultrafine particulate matter	M-Aerosols-129	Su Hwan Park	Su Hwan Park, Gyuri Kim, Hye Jin Yun, Sun Hae Lim, Wan Seob Cho, Jong Ho Lee
H: Aerosols and Particulate Matter	Technological Advancements and Health: Innovations for Enhancing Classroom Air Quality	M-Aerosols-130	Ho Hyeon Jo	Ho Hyeon Jo, Won Duk Suh, Sumin Kim
H: Aerosols and Particulate Matter	Quantitative measurement and application of droplets on physical surfaces based on LIF technology	M-Aerosols-131	Shuaixiong Zhou	Shuaixiong Zhou, Fan Wu
H: Aerosols and Particulate Matter	Research on indoor droplet concentration prediction and analysis based on kernel function	M-Aerosols-132	Jiyu Yao	Jiyu Yao, Tiantian Wang
H: Aerosols and Particulate Matter	Evaluation of Indoor Ultrafine Particle Dynamic Behavior Considering Heating Status of Hotplate during Decay Period	M-Aerosols-133	Donghyun Rim	Su-Gwang Jeong, Lance Wallace, Donghyun Rim

H: Aerosols and Particulate Matter	A novel method for establishing typical profile of PM concentrations in underground railway stations	M-Aerosols-134	Valisoa Rakotonirinanahary	V. Rakotonirinanahary, S. Crumeyrolle, M. Bogdan, B. Hanoune
H: Aerosols and Particulate Matter	From Outdoors to Indoors: A Geo-AI Technique to Protect Children from the Invisible Threat of Indoor PM	M-Aerosols-135	Quang-Oai Lu	Quang-Oai Lu, Ching-Chang Lee
I: Indoor Chemistry, Sources, and Transformation	The emission rate of SVOC on the surface of furniture and home appliances	M-IndChem-136	Hyuntae Kim	Hyuntae Kim
I: Indoor Chemistry, Sources, and Transformation	Longer-wavelength upper-room germicidal UV produces less pollution than shorter-wavelength whole-room applications	M-IndChem-137	Zhe Peng	Zhe Peng, Ben Ma, Joost de Gouw, Jose-Luis Jimenez
I: Indoor Chemistry, Sources, and Transformation	Polycyclic Aromatic Hydrocarbons (PAHs) and Tetrahydrocannabinol (THC) in Secondhand Cannabis Smoke	M-IndChem-138	Xiaochen Tang	Xiaochen Tang, Abel S. Huang, Morgan BC Murphy, Marion Russell, Suzaynn Schick, Hugo Destailats
I: Indoor Chemistry, Sources, and Transformation	Characterizing air pollution emissions and mitigation strategies inside vehicles parked under extreme heat and sunlight	M-IndChem-139	Insung Kang	Insung Kang
I: Indoor Chemistry, Sources, and Transformation	Decaffeinated Coffee Can Emit Potentially Toxic VOCs that Increase Exponentially with Temperature	M-IndChem-140	Rileigh Robertson	Rileigh L. Robertson, Pawel K Misztal
I: Indoor Chemistry, Sources, and Transformation	Preliminary Investigation of the Volatile Organic Compounds and Odor Emitted from Flooring and Paint in the Environmental Chamber	M-IndChem-141	Yibing Hu	Yibing Hu, Weihui Liang
I: Indoor Chemistry, Sources, and Transformation	Quantitative analysis of Biogenic Volatile Organic Compound Emission from Syngonium plant: Potential Implications to Human Health	M-IndChem-142	Supreet Kaur	Supreet Kaur, Sumit K. Mishra, Vikas Goel, Mansi Gupta, Kartika Pandey, Marita Devi, Lokesh Sahu, Renu Singh, Manoj Shrivastava, Mayank Kumar
I: Indoor Chemistry, Sources, and Transformation	Assessing Secondhand Cannabis Exposure at a Cannabis Lounge	M-IndChem-143	Muchuan Niu	Muchuan Niu, Haoxuan Chen, Yuan Yao, Michael D. Roth, Yifang Zhu
I: Indoor Chemistry, Sources, and Transformation	A rapid and accurate two-parameter C-history method for measuring characteristic parameters of formaldehyde/VOC emission from building materials	M-IndChem-144	Haipeng Chen	Haipeng Chen, Ningrui Liu, Jian Guo, Luyang Wang, Yao Zhang, Jingya Wei, Yajun Cao, Yiping Zhang
I: Indoor Chemistry, Sources, and Transformation	Research on performance optimization of humidification system combining water heating and ultrasonic vibration	M-IndChem-145	Yongmin Kim	Yongmin Kim, Dongryul Park
I: Indoor Chemistry, Sources, and Transformation	Indoor Dust Analysis of PFAS: Unravelling Size Distribution Patterns for Source and Exposure Insights	M-IndChem-146	Mahender Singh Rawat	Mahender Singh Rawat, Clara M. A. Eichler, Naomi Yi-Ning Chang, Elizabeth Brown, Sujan Fernando, Barbara Turpin, Glenn Morrison, Thomas Holsten, Andrea R. Ferro
I: Indoor Chemistry, Sources, and Transformation	Determination of acrolein in environmental air	M-IndChem-147	Erik Uhde	Alexandra Schieweck, Erik Uhde, Tunga Salthammer
J: Policy, Regulation, and Standards	The 7-Year Journey to Develop a Radon-in-Water Proficiency Test to Bridge the Gap in this Field Across the Globe	M-Policy-148	Pamela Turner	Uttam Saha, David Parks, Derek Cooper, Michael Kitto, Pamela Turner
J: Policy, Regulation, and Standards	K-means clustering analysis to identify Sick Building Syndrome symptoms in office buildings	M-Policy-149	Evandro Eduardo Broday	Iasmin Lourenço Niza, Evandro Eduardo Broday
J: Policy, Regulation, and Standards	Towards a sustainable legislation for ventilation and healthy indoor air quality	M-Policy-150	Mikael Björling	Mikael Björling
J: Policy, Regulation, and Standards	Emission test method for products used close to humans	M-Policy-151	Martin Jönsson	Martin Jönsson, Anna Kozyrkova, Elisabeth Dragu, Maria Skogsberg, Per-Erik Gustavsson
J: Policy, Regulation, and Standards	MOVING FROM DATA LITERACY TO DATA FLUENCY: A PROPOSED FRAMEWORK FOR IMPROVING INDOOR AIR QUALITY IN MIXED-USE BUILDINGS	M-Policy-152	Maureen Johnson	Maureen Johnson-León
J: Policy, Regulation, and Standards	ISO 17772-1/2 a standard on indoor environmental parameters for design, operation, and assessment of IEQ in buildings.	M-Policy-153	Bjarne Wilkens Olesen	Bjarne Wilkens Olesen
J: Policy, Regulation, and Standards	Development of quad thermistor for wind direction measurement	M-Policy-154	Norise Tanabe	Norise Tanabe, Takashi Kurabuchi, Toshihiro Nonaka, Jeongil Kim
K: Climate Change, Wildfires, Natural Disasters, and Urbanization	Health Symptoms and Mitigation Behaviors Are Associated with Olfactory Perception of Indoor Wildfire Smoke	M-ClimateC-155	Rachel Hurley	Rachel Hurley, Professor Shichao, Oren Mangoubi
K: Climate Change, Wildfires, Natural Disasters, and Urbanization	Formation of gaseous nitrous acid (HONO) from reactions on indoor surfaces: the effects of biomass burning	M-ClimateC-156	Karla Rojas Garcia	Karla Rojas Garcia, Cholaphan Deeleepeojananan, Vicki H. Grassian
K: Climate Change, Wildfires, Natural Disasters, and Urbanization	Particle Infiltration During a Wildfire Event: Method Development	M-ClimateC-157	Zachary Golden	Zachary Golden, Elliott Gall
L: Health Outcomes and Exposure Assessment	Benzene Detection within Cleaning Agents: A Study on Real-time Volatile Organic Compounds Concentrations	M-HealthOut-158	Minjung Kim	Minjung Kim, Chungsik Yoon
L: Health Outcomes and Exposure Assessment	Household Socioeconomic Status Influences the Indoor Environments Affecting Chinese Children's Respiratory and Allergy Health	M-HealthOut-159	Linyan Li	Nuo Han, Linyan Li, Tingshao Zhu, Gary Adamkiewicz, John D. Spengler
L: Health Outcomes and Exposure Assessment	Investigation of Occupational Exposure to Particulate Matter among Stone Fabricators in Chicago	M-HealthOut-160	Yuan Shao	Alissa DeVaughn, Yuan Shao
L: Health Outcomes and Exposure Assessment	Household PM2.5 exposure in India at subnational scale: Recent changes and health implications	M-HealthOut-161	Sagnik Dey	S. Dey, A. Mukherjee, S. Ghosh
L: Health Outcomes and Exposure Assessment	Impact of use of silicone bakeware on the levels of cyclic volatile methylsiloxanes (cVMS) in surrounding indoor air	M-HealthOut-162	Jiping Zhu	Jiping Zhu, Jianjun Niu, Adam Wawrzyniczak
L: Health Outcomes and Exposure Assessment	Onset factors of environmental hypersensitivity from questionnaire survey	M-HealthOut-163	Atsushi Mizukoshi	Atsushi Mizukoshi, Sachiko Hojo, Chikako Nakama, Jiro Okumura, Kenichi Azuma
L: Health Outcomes and Exposure Assessment	Indoor environment in room offices vs. flexible activity-based office – employee experiences vs. measurement results during relocation	M-HealthOut-164	Arttu Sivula	Arttu Sivula, Jenni Radun, Henna Maula, Reijo Alakioivu, Johann Laukka, Valtteri Hongisto
L: Health Outcomes and Exposure Assessment	Characteristics of house dust mite allergens in Southeast and East Asia with the effect of hygienic practice	M-HealthOut-165	Kiyoung Lee	Kiyoung Lee, Ji Young Park
L: Health Outcomes and Exposure Assessment	Toxicity screening through measurement of reactive oxygen species emitted from indoor sources	M-HealthOut-166	Aneta Wierzbicka	Aneta Wierzbicka, Jonas Enarsson, Anne Thøstrup Saber, Bo Strandberg, Joakim Pagels, Nicklas Raun Jacobsen
L: Health Outcomes and Exposure Assessment	Assessing the Impacts of Indoor Air Quality on Dementia Care in Nursing Homes: A Mixed-Method Study	M-HealthOut-167	Hongwan Li	Mika Cheng, Julie Gordon, Shakil Shimul, Diana Sturdevant, Xiaobo Quan, Javeed Kittur, Hongwan Li
L: Health Outcomes and Exposure Assessment	Potential Occupational Exposures Associated with Indoor Marijuana Growing Facilities: A Pilot Study	M-HealthOut-168	Hongwan Li	Hongwan Li, Mika Cheng, Anni Yang, Changjie Cai
L: Health Outcomes and Exposure Assessment	Particulate Matter Pollution and Pediatric Renal Health: Insights from a Study on Chronic Kidney Disease in Children	M-HealthOut-169	Ching-Chang Lee	Ching-Chang Lee, Quang-Oai Lu, Nian-Wei Lee, Jyun-Yi Clou, Po-Cheng Chen, Tzu-Huai Wei, Yuan-Yow Chiou
L: Health Outcomes and Exposure Assessment	Identify indoor sources responsible for PM2.5 and PM1 exposure and associated health impacts in two Asian countries with low-cost sensors	M-HealthOut-170	Sc Candice Lung	Shih-Chun Candice Lung, Ming-Chien Mark Tsou, Chih-Hui Chloe Cheng, Wiewek Setyawati
L: Health Outcomes and Exposure Assessment	Health Implications of Microplastic Exposure: A Study on Face Masks	M-HealthOut-171	Jong Ryeul Sohn	Ji Hoon Seo, In Woo Choi, SungWoo Cho, Hyun Jung Kim, Jong Ryeul Sohn
L: Health Outcomes and Exposure Assessment	Examining Home Environments and Asthma Interventions in the Tennessee Valley	M-HealthOut-172	Laura Humphrey	Laura Humphrey, Bruce Tonn, Erin Rose, Allie Cardiel, Bruce Glanville
L: Health Outcomes and Exposure Assessment	How does wellness office influence workers' health and work capacity?	M-HealthOut-173	Kazuhiro Minami	Kazuhiro Minami, Futa Watanabe, Takayoshi Iida
L: Health Outcomes and Exposure Assessment	Eye dryness acceptability and blink frequency in 16 subjects when utilizing a wearable ventilation	M-HealthOut-174	Xiaobin Wei	Xiaobin Wei, Jun Gao
L: Health Outcomes and Exposure Assessment	Novel Method for Designing Outdoor Cool Spots using JOS-3 Thermoregulation Model	M-HealthOut-175	Kaho Higuchi	Kaho Higuchi, Kan Shindo, Ryota Matsumura, Kazuki Aono, Ryo Nakanishi, Kanari Hiram, Shin-ichi Tanabe

	L: Health Outcomes and Exposure Assessment	The effect of micro-movement of a computer-simulated person on the formation of breathing zones	M-HealthOut-176	Hyungyu Park	Hyungyu Park, Sung-Jun Yoo, Kazuki Kuga, Kazuhide Ito
	L: Health Outcomes and Exposure Assessment	Evaluation of High- and Low-efficiency Kitchen Hood Performance under Scripted Cooking Scenarios in Four Taiwanese Households	M-HealthOut-177	Hsin Chen	Hsin Chen, Pei-Yu Fan, Natasia Shanice Chanaka, Wan-Chen Lee
	L: Health Outcomes and Exposure Assessment	The Finnish Indoor Air and Health Programme 2018–2028 - towards a good indoor environment	M-HealthOut-178	Annina Salmela	Anniina Salmela, Kati Huttunen, Kaisa Jalkanen, Juha Pekkanen, Anne Hyvärinen
	L: Health Outcomes and Exposure Assessment	Analysis of Activity-Based Office Worker Selection Behaviour and Reasons for Working in an Office	M-HealthOut-179	Yuki Takeda	Yuki Takeda, Minami Seto, Shin-ichi Tanabe, Mikio Takahashi, Kazuki Wada, Tomoko Tokumura, Hiroki Takahashi, Naoki Shinohara
	L: Health Outcomes and Exposure Assessment	An optimal solution to microbial contamination of surfaces in commercial aircraft lavatory based on UVC method	M-HealthOut-180	Haofu Chen	Haofu Chen
	L: Health Outcomes and Exposure Assessment	Environmental Factors Affecting Sleep Quality in Accommodation and Training Facilities	M-HealthOut-181	Hayata Yokoyama	Hayata Yokoyama, Jengsoo Kim, Youhei Moriyama, Tatsuya Hayashi
	L: Health Outcomes and Exposure Assessment	Indoor Sulfur Dioxide and Carbon Monoxide Are Associated With Asthma and Reduced Lung Function in Schoolchildren in an Industrial City	M-HealthOut-182	Kuo-Ping Tseng	Guo Ping Tseng, Jia Lin Zhang, Pei-Shih Chen
	L: Health Outcomes and Exposure Assessment	Exposure of secondary organic aerosols in Beijing in 2017	M-HealthOut-183	Mingyao Yao	Mingyao Yao, Ao Zhang, Bin Zhao
	L: Health Outcomes and Exposure Assessment	Effects of Natural Scenery Projected onto Virtual Windows on the Quality of the Indoor Environment and Intellectual Productivity	M-HealthOut-184	Chiaki Shimoyama	Chiaki Shimoyama, Ryosuke Onoda, Yuta Fukawa, Shin-ichi Tanabe
	L: Health Outcomes and Exposure Assessment	Evaluation of Ambient Temperature Impacts on Domestic Kitchen Hoods Using Validated Computational Fluid Dynamics Models	M-HealthOut-185	Pei-Yu Fan	Pei-Yu Fan, Ying-Chieh Chan, Wan-Chen Lee

Poster Presentations (Room 313 A/B/C)

TUESDAY	Track	Title		Presenter	Full author list
	A: Air Cleaning and Filtration	Rethinking the significance of occupant's operation and maintenance practices for indoor radon	T-AirClean-1	Osama Mansour	Osama Mansour
	A: Air Cleaning and Filtration	Inactivation of Japanese cedar pollen, house dust mite, and their allergens using nano-sized electrostatic atomized water particles	T-AirClean-2	Masahiro Sakaguchi	Megumi Yoshida, Yasuhiro Komura, Yohei Ishigami, Sasa Iwamatsu, Masahiro Sakaguchi
	A: Air Cleaning and Filtration	Evaluation of indoor air quality and surface thin film formation during cooking in the kitchen environment applying PTR-TOF-MS technique	T-AirClean-3	Kacper Przykaza	Kacper Przykaza, Sara Bjerre Sørensen, Kasper Kristensen, Atila Novoselac, Kerry Kinney, Pawel Misztal
	A: Air Cleaning and Filtration	Optimization of a Do-It-Yourself Air Cleaner Design to Reduce Residential Air Pollution Exposure for a Community Experiencing Environmental Injustices	T-AirClean-4	Shelly Miller	Sumit Sankhyan, Nicholas Clements, Allison Heckman, Aumann, Cora Morency, Luke Leiden, Shelly L. Miller
	A: Air Cleaning and Filtration	Towards a better 0D-1D modelling approach for more accurate prediction of Indoor Air Quality (IAQ) in Buildings	T-AirClean-5	Nicolas Carnec	Nicolas Carnec, Thierry Duforestel, Bénédicte Wall-Ribot, Martin Ferrand, Marc Abadie, Karim Limam
	A: Air Cleaning and Filtration	Experimental study of the effect of the competitive gases in the performance evaluation of chemical filters	T-AirClean-6	Xin Feng	Shaoyang Zhou, Xin Feng, Bin Lu, Hui Zhang, Yanguo Zhang
	A: Air Cleaning and Filtration	Blossoming architecture in wood workshop for reducing dust contaminant	T-AirClean-7	prudsamon kmmasorn	Prudsamon Kammasorn
	A: Air Cleaning and Filtration	ESP integrated photocatalytic reactor for the removal of bioaerosols from the indoor air: A hybrid approach	T-AirClean-8	Saptarshi Ghosh	Saptarshi Ghosh, Chinmoy Mandal, Aiswarya Anilkumar, Manoranjan Nawale, Manoranjan Sahu
	A: Air Cleaning and Filtration	PHYTOREMEDIATION POTENTIAL OF EPIPHYTIC TILLANDSIA (BROMELIACEAE): EVALUATION OF REMOVAL EFFICIENCY OF FORMALDEHYDE	T-AirClean-9	Gianluigi de Gennaro	J. Palmisani, A. Di Gilio, S. Fortunato, P. Michieli, P. Follini, M.C. De Pinto, G. de Gennaro
	A: Air Cleaning and Filtration	Investigation on the dust holding performance of electret filter materials on hygroscopic aerosols under different relative humidity	T-AirClean-10	Xuetao Zhou	Xuetao Zhou, Zhongpin Lin
	A: Air Cleaning and Filtration	Optimization of VOC Recovery Performance of Temperature Swing Adsorption Assisted by Twin-Bed Tandem Adsorption	T-AirClean-11	Yunfei Xia	Yunfei Xia, Chengquan Zhang, Jun Gao
	A: Air Cleaning and Filtration	Evaluation of the effectiveness of filtration systems in Parisian underground railway stations	T-AirClean-12	Valisoa Rakotonirinanahary	V. Rakotonirinanahary, S. Crumeyrolle, M. Bogdan, B. Hanoune
	B: Building Simulation, Sustainability, and Energy	The impact of the microenvironment around a window on the temperatures of its inner surface.	T-BldgSim-13	Miloslav Bagona	Miloslav Bagona, Martin Lopusniak
	B: Building Simulation, Sustainability, and Energy	The impact of Venetian blinds on air temperatures in a double transparent façade cavity.	T-BldgSim-14	Martin Lopusniak	Miloslav Bagona, Martin Lopusniak
	B: Building Simulation, Sustainability, and Energy	Environmental parameters evaluation of a hospital burn center for infection control and energy efficiency: field measurement and simulation analysis	T-BldgSim-15	Indra Permana	Indra Permana, Fujen Wang, Zulvi Alfiqri Hidayatulloh, Alya Penta Agharid
	B: Building Simulation, Sustainability, and Energy	Adapting Building Operations: Navigating Energy, Occupancy, and Air Quality Challenges	T-BldgSim-16	Julien Stamatakis	Julien Stamatakis
	B: Building Simulation, Sustainability, and Energy	Analysis of Carbon Emission Reduction Effect through Green Remodeling of Public Daycare Centers	T-BldgSim-17	Se-Hyeon Lim	Se Hyeon Lim, Jin Chul Park
	B: Building Simulation, Sustainability, and Energy	Carbon Dots for Coloured Passive Radiative Cooling Design	T-BldgSim-18	Chi Yan Tso	Kaixin Lin, Chui Ting Kwok, Yihao Zhu, Chi Yan Tso
	B: Building Simulation, Sustainability, and Energy	building energy savings and efforts for optimal capacity of mechanical design	T-BldgSim-19	Goopyo Hong	Goopyo Hong, Chanhyung Shim
	B: Building Simulation, Sustainability, and Energy	Energy Efficiency Considerations for Early Stage of Office Building Design in South Korea	T-BldgSim-20	Seong-Hwan Yoon	Nam Juhee, Song Subin, Lee Taecheol, Yoon Seonghwan
	B: Building Simulation, Sustainability, and Energy	Seasonal Validity of Stack Pressures Driving Natural Infiltration	T-BldgSim-21	Dominic Bledsoe	Dominic T. Bledsoe, Will Claggett, Ellison Carter, Misa Soto, Paul W. Francisco, Tami C. Bond
	B: Building Simulation, Sustainability, and Energy	Enhanced Building Energy Efficiency by a Novel Dynamic Photovoltaic-integrated Shading Device (PVSD)	T-BldgSim-22	Wuwei Zou	Wuwei Zou, Jinhan Mo
	B: Building Simulation, Sustainability, and Energy	Efficient Energy Savings Through Adaptive Control Strategies in Photovoltaic Blinds	T-BldgSim-23	Jiaze Wei	Jiaze Wei, Jinhan Mo
	B: Building Simulation, Sustainability, and Energy	Research on online energy-saving control methods for chiller plant based on system models and calculations of the adjacent working conditions	T-BldgSim-24	Yujiang Wang	Yujiang Wang, Wanyi Zhang, Zhongping Lin
	B: Building Simulation, Sustainability, and Energy	Research on the development of evaluation for outdoor air pollutants entering a vehicle indoors in driving	T-BldgSim-25	Hohyeong Yang	Ho-Hyeong Yang, Hyun-Woo Lee, Cha-Ryung Kim, In-Ji Park, Myung-Soo Kim, Ho-Hyun Kim
	B: Building Simulation, Sustainability, and Energy	Characterization of cold storage energy consumption and control simulation – Addressing the challenge of climate data	T-BldgSim-26	Qiaobo Shi	Qiaobo Shi, Fulin Wang
	C: Sensors and Monitoring	PTR-MS as a tool for the determination of formaldehyde, ammonia and volatile organic sulfur compounds together with VOC	T-Sensors-27	Olaf Wilke	Olaf Wilke
	C: Sensors and Monitoring	Fragmentation and Water Clustering Complicate Interpretation of PTR-MS Measurements of Indoor Air	T-Sensors-28	Michael Link	Michael F. Link, Dustin Poppendieck
	C: Sensors and Monitoring	Poster: Field Evaluation of Indoor Air Quality in Residential Kitchens	T-Sensors-29	Frank Johnson	Frank Johnson
	C: Sensors and Monitoring	Naked-eye detection of pollutants through visible-light induced polymerization	T-Sensors-30	Jungkyyu Lee	Jungkyyu K. Lee
	C: Sensors and Monitoring	"If You Had a Sensor, You Would Know:" Unequal Exposures and Responses to Indoor Air Pollution	T-Sensors-31	Casey Mullen	Casey Mullen
	C: Sensors and Monitoring	The EASIER System: Alerting Elders and Trusted Social Networks Living in Environmental Justice Communities about Imminent Risks to Their Health	T-Sensors-32	Laura Humphrey	Bruce Tonn, Erin Rose, Allie Cardiel, Kristina Kitzinger, Bryce Bible
	C: Sensors and Monitoring	Verification of response time of CO2 Concentration Sensors for measuring Age of Air Distribution using Dynamic Steady-State Concentration	T-Sensors-33	Jinya Takeuchi	Jin-ya Takeuchi, Takashi Kurabuchi, Hajime Yoshino, Yoshihiro Toriumi, Kazuki Ko-dama
	C: Sensors and Monitoring	Mass transfer analysis of passive and semi-active sampler based on the series resistance model	T-Sensors-34	Akihiro Yamasaki	Akihiro Yamasaki, Miyuki Noguchi, Yoshihiro Suzuki
	C: Sensors and Monitoring	Total volatile organic compounds and formaldehyde in various indoor environments on a university campus	T-Sensors-35	Chi-Chi Lin	Chi-Chi Lin, Jheng Fong Tsai
	C: Sensors and Monitoring	Development of detection probes for fungi-derived ergosterol by molecularly-imprinted polymers	T-Sensors-36	Eunsook Choi	Eunsook Choi
	C: Sensors and Monitoring	Can low-cost sensor networks help indoor air quality?	T-Sensors-37	Mikko Poikimäki	Mikko Poikimäki, Matti Leikas, Nicolas P. Winkler, Patrick P. Neumann, Arto Säämänen, Anneli Kangas
	C: Sensors and Monitoring	Integrated Thermal, Light and Air Quality Monitoring for Health and Efficiency	T-Sensors-38	Yunyi Zeng	Yunyi Zeng, Juan Yu., Hao Tang, Jiayi Zhou, Borong Lin
	C: Sensors and Monitoring	Pressure differences over the building envelope during the cold season	T-Sensors-39	Pentti Kuurola	Pentti Kuurola, Filip Fredorik, Ulla Haverinen-Shaughnessy
	C: Sensors and Monitoring	Multi-algorithm calibration of low-cost air sensors to measure indoor air quality in households within vulnerable communities	T-Sensors-40	Elise Huglo	Elise Huglo

C: Sensors and Monitoring	Development of a Trigger Sampling System for Indoor and Workplace Exposure Assessment Using Low-Cost TVOC Sensors	T-Sensors-41	Mahender Singh Rawat	Alan Rossner, PhD, CIH, Mathew Skeels, PhD , Mahender Singh Rawat
C: Sensors and Monitoring	Anomaly Detection of Bathroom Usage Using CO2 Concentration and LSTM-Autoencoder in a Single-Person Household	T-Sensors-42	Jun-Sub Kim	Jun Sub Kim, Jeong Won Kim, Sun Ho Kim, Seol Hyun Noh, Hyeun Jun Moon
C: Sensors and Monitoring	Carbon Dioxide Monitoring and Artificial Intelligence Prediction for Respiratory Infection Control: A Pediatric Waiting Room Study	T-Sensors-43	Seunghoon Lee	Jin-young Baea, Seunghun Leea
C: Sensors and Monitoring	Preconcentrator design for sensing system toward indoor low-concentration VOC detection	T-Sensors-44	Yan Wang	Yan Wang, Jinhan Mo
C: Sensors and Monitoring	Indoor Environmental Quality in Airtight Energy-Efficient Dwellings: The Efficiency of Natural Ventilation	T-Sensors-45	Ibrahim Alhindawi	Ibrahim Alhindawi, Divyanshu Sood, James O'Donnell, James A. McGrath, Miriam A. Byrne
C: Sensors and Monitoring	Screening for a university library Indoor air quality (IAQ)	T-Sensors-46	Dadi Zhang	Dadi Zhang, Ling-tim Wong, Kwok-Wai Mui
C: Sensors and Monitoring	An innovative methodological sensor-based approach for health risk assessment in urban and industrialized areas: CALLIOPE project	T-Sensors-47	Gianluigi de Gennaro	A. Di Gilio, J. Palmisan, A. Marzocca, V. Pizzillo, M. Nisi, L. Pastore, G. de Gennaro
C: Sensors and Monitoring	"Sano aere in corpore sano": how can air quality sensors ensure the truth of this statement while practicing sports in fitness facilities?	T-Sensors-48	Marie Verriele-Duncanu	Nathalie Redon, Marie Verriele-Duncanu, Frédéric Thévenet, Sabine Crunaire, Sabine Vassaux, Anais Lostier, Marius Pascaud, Liselotte Tinel, Nadine Lococe
C: Sensors and Monitoring	Classification of Airborne Bioaerosol concentration in multi-use facilities using cluster analysis	T-Sensors-49	Sungchul Seo	Bo Yeon Kwon, Jihyeon Kim, Hanjong Ko, Donghyun Lee, Ju Hee Kim, Nalae Moon, Su Ji Heo, Yoon-Hyeong Choi, Sungchul Seo
D: Covid-19 and Viral Transmission	A Blueprint for the use of far-UVC to improve indoor air quality and prevent future pandemics	T-COVID-50	Richard Williamson	Richard Williamson, Peter Massschelin, Neal N. Oza , Jacob Swett,
D: Covid-19 and Viral Transmission	Correlations between indoor and outdoor environmental measures and in-fluenza incidence in New York, Pennsylvania, and California	T-COVID-51	Jin Pan	Jin Pan, Seema S. Lakdawala, Linsey C. Marr
D: Covid-19 and Viral Transmission	Should we use ceiling fans indoors to reduce the risk of transmission of infectious aerosols?	T-COVID-52	Jiayu Li	Jiayu Li, Sultan Zuraimi, Stefano Schiavon
D: Covid-19 and Viral Transmission	#covidisairborne: production and circulation of evidence on covid-19 transmission	T-COVID-53	Beatriz Klimeck	Beatriz Klimeck Gouvea Gama
D: Covid-19 and Viral Transmission	University closure plays a critical role for COVID-19 control	T-COVID-54	Nan Zhang	Doudou Miao, Peng Xue, Marco-Felipe King, Nan Zhang
D: Covid-19 and Viral Transmission	Impact of Mask-Wearing and Elevated CO2 in the Breathing Zone on Cognitive Performance in a Warm Environment	T-COVID-55	Rachel Hurley	Rachel Hurley
D: Covid-19 and Viral Transmission	A Case-Control Study of Behavioural and Built Environment Determinants of COVID-19 Transmission in a community space	T-COVID-56	Junjing Yang	Jiayu Li, Junjing Yang, Bindhu Unni, Rowena Yap, Jue Tao Lim, Mohammad Nazem, Joanna Shen, Lee Ching Ng, Shuzhen Sim
D: Covid-19 and Viral Transmission	Modeling the Climatic Influence on Measles Transmissibility in China	T-COVID-57	Peihua Wang	Peihua Wang, Jianjiu Chen, Wenyi Zhang, Wan Yang
D: Covid-19 and Viral Transmission	A Gasper Adjustment Strategy Based on Bayesian Optimization to Minimize the Infection Risks of Airborne Transmission in an Aircraft Cabin	T-COVID-58	Yiding Zhou	Yiding Zhou, Yunge Hou, Chun Chen, Ruoyu You
D: Covid-19 and Viral Transmission	Risk assessment of dynamic temporal asynchrony and mask mitigation in buses based on field monitoring: A case study of COVID-19	T-COVID-59	Yinshuai Feng	Yinshuai Feng, Xiaoyu Luo, Jianjian Wei, Yifan Fan, Jian Ge
D: Covid-19 and Viral Transmission	Evidence for Prevailing Positive Air Pressure in High-Rise Drainage System	T-COVID-60	Edwin Chung-Hin Dung	Edwin Chung-Hin Dung, Yuguo Li
D: Covid-19 and Viral Transmission	Human Close Contact Behavior in a Non-Homogenous Indoor Population	T-COVID-61	Ruth Onkangi	Ruth Onkangi , Kazuki Kuga , Pawel Wargocki, Kazuhide Ito
D: Covid-19 and Viral Transmission	A Direct Infection Risk Model for CFD Predictions and its Application to SARS-CoV-2 Aircraft Cabin Transmission	T-COVID-62	Florian Webner	Florian Webner, Andrei Shishkin, Daniel Schmeling, Claus Wagner
D: Covid-19 and Viral Transmission	Numerical Investigation of Human Movement Impact on Contaminant Transmission from an Infector in a High-Speed Train Compartment	T-COVID-63	Fan Zhiqiang	Fan Zhiqiang
E: Thermal Comfort and Perception Indoor Air	Impact of Thermal Insulation Renovation of Traditional Japanese Housing "Kyo-machiya" on Thermal Comfort and Energy	T-ThermalC-64	Jungmin Kim	Jungmin KIM, Tomitaro MORI, Kentaro SUGA
E: Thermal Comfort and Perception Indoor Air	Open Data Based Machine Learning Investigation on Indoor Thermal Comfort	T-ThermalC-65	Yanxiao Feng	Mohammad Saleh Nikoopayan Tak, Yanxiao Feng
E: Thermal Comfort and Perception Indoor Air	How does human thermal plume impact pollutant distribution indoors?	T-ThermalC-66	Marie Verriele	Alexandru Cernei, Matei Georgescu, Paul Danca, Nathalie Redon, Frédéric Thévenet, Ilinca Nastase, Marie Verriele
E: Thermal Comfort and Perception Indoor Air	Changes in facial expressions in response to air pollution exposure and correlation with self-reported symptoms	T-ThermalC-67	Bowen Du	Bowen Du., Gabriel Bekö, Dusan Licina
E: Thermal Comfort and Perception Indoor Air	An unique LTA@LDH adsorbent for indoor dehumidification and its improved adsorption performance	T-ThermalC-68	Weiman Li	Weiman Li, Chen Yunfa, Yan Ding, Hang Yin
E: Thermal Comfort and Perception Indoor Air	Improvement of Indoor Sleep Environment in Plateau Buildings by Thermal-Oxygen Combined Air Flow	T-ThermalC-69	Cong Song	Cong Song, Xiaohui Li, Longxiang Gao, Dongxue Zhao, Yanfeng Liu
E: Thermal Comfort and Perception Indoor Air	Effect of natural aging on the long-term cooling performance of radiative cooling coating: a field study	T-ThermalC-70	Yue He	Yue He, Biao Lu, Yue Lei, Yuhua Deng, Shan Gao, Chi Feng
E: Thermal Comfort and Perception Indoor Air	Students' Reading Comprehension Performance under Varied Light Color and Thermal Conditions	T-ThermalC-71	Xingtong Guo	Xingtong Guo
E: Thermal Comfort and Perception Indoor Air	Effect of Humidity Condition under Equivalent Thermal Environment on Physiological and Psychological Stress and Task Performance	T-ThermalC-72	Jin Ishii	Jin Ishii
E: Thermal Comfort and Perception Indoor Air	Impact of Climate Change on Indoor Thermal Environment and Energy Consumption for Air Conditioning	T-ThermalC-73	Jun-Ichiro Tsutsumi	Jun-ichiro Giorgos Tsutsumi, Ryo Nakamatsu, Rizky Uno Ananda, Fumio Kobayashi
E: Thermal Comfort and Perception Indoor Air	Improving Thermal Comfort in a Large Space with Hybrid-ventilation: A Case Study of a Buddha Hall	T-ThermalC-74	Yung-Chi Yang	Yung-Chi Yang , Shu-Hua Lin , Yaw-Shyan Tsay
E: Thermal Comfort and Perception Indoor Air	A Study of the Effects of Kitchen Worker Behavior and the Kitchen Environment on Kitchen Productivity	T-ThermalC-75	Yudai Kanemaki	Yudai Kanemaki, Asami Aikawa, Ryuichi Tominaga, Tatsuya Hayashi
E: Thermal Comfort and Perception Indoor Air	Wind comfort: a tactile comfort assessment considering the combined effect of supply air velocity and direction	T-ThermalC-76	Zuoyu Xie	Zuoyu Xie, Bin Cao, Yingxin Zhu
E: Thermal Comfort and Perception Indoor Air	Verification of the Effectiveness of the Room Environment for Improving Sleep Quality	T-ThermalC-77	Yuto Hazui	Yuto Hazui, Tatsuya Hayashi, Jeongsoo KIM, Yohei Moriyama
E: Thermal Comfort and Perception Indoor Air	The Change in Convective Heat Transfer Coefficient Distributions of Human Bodies in a Crowded Event	T-ThermalC-78	Islam Abouelhamd	Islam Abouelhamd, Junya Urashi, Kazuki Kuga, Kazuhide Ito
E: Thermal Comfort and Perception Indoor Air	A Methodology for Assessment of Cross-modal Impact of Indoor Environmental Quality (IEQ) on Occupant Comfort and Stress	T-ThermalC-79	Noresh Varman	Noresh Varman, Richard Kimball, Jin Wen, Simi Hoque, Sara Girotto, Amos Z
E: Thermal Comfort and Perception Indoor Air	Differences in thermal comfort between simulated and real walking	T-ThermalC-80	Jiahao Wang	Jiahao Wang, Xinyu Jia, Bin Cao, Yingxin Zhu
E: Thermal Comfort and Perception Indoor Air	Gender differences in thermal comfort of personal protective equipment (PPE) wearers	T-ThermalC-81	Haihua Jiang	Haihua Jiang, Bin Cao, Yingxin Zhu
E: Thermal Comfort and Perception Indoor Air	Air conditioning system using RFID tags	T-ThermalC-82	Kotaro Makino	Kotaro Makino, Tatsuo Nobe, Hiroki Watanabe, Katsuki Hidari, Yasutomo Matsuoka
E: Thermal Comfort and Perception Indoor Air	A review on thermal comfort field research in the cold zone of China	T-ThermalC-83	Yijia Wang	Yijia Wang, Bin Cao

E: Thermal Comfort and Perception Indoor Air	Revolutionizing ZEB Adoption in Public Buildings: A Flexible Operational Approach for Enhanced Efficiency and Comfort	T-ThermalC-84	Yui Morimoto	Yui Morimoto, Jun Maruyama, Anri Itoh, Yusuke Hashigaya, Tatsuya Hayashi
E: Thermal Comfort and Perception Indoor Air	Thermal comfort and heart rate variability under temperature and relative humidity in indoor environment	T-ThermalC-85	Yuchen 范宇宸	Yuchen Fan, Nan Zhang, Bin Cao
E: Thermal Comfort and Perception Indoor Air	Characteristics and improvement of dripping water noise generated from ultrasonic humidifier	T-ThermalC-86	Kim Yongmin	Yongmin Kim, Junghoon Lee, Dongryul Park, Kiwon Seo
E: Thermal Comfort and Perception Indoor Air	Study on the Development of Environmental Friendly Grading for Indoor Air Quality in Car	T-ThermalC-87	Jeong-In Jeon	Jeong-In Jeon, Yoon-Shin Kim, In-Ji Park, Hyun-Woo Lee, Cheol-Min Lee,
E: Thermal Comfort and Perception Indoor Air	Inspiration for indoor corridor air conditioning design considering walking wind speed disturbance	M-ThermalC-88	Yuchun Zhang	Yuchun Zhang, Zhang Lin
E: Thermal Comfort and Perception Indoor Air	Hearing voices of building occupants: Leveraging natural language processing into indoor environmental quality evaluation	T-ThermalC-89	Nan Ma	Shundong Li, Yalin Lu, Fabricio Murai, Nan Ma
E: Thermal Comfort and Perception Indoor Air	Predicting preferred temperature setpoints and characterizing occupant overall thermal preferences leveraging big data	T-ThermalC-90	Ali Ghahramani	Ali Ghahramani
F: Dampness, Mold, and Indoor Microbiome	Excellent Antibacterial Performance of ROS-mediated Cu-doped ZIF-8 and the Mechanism of ROS Generation	T-Microbiome-91	Jingkun Zhang	Yunfa Chen, Jingkun Zhang, Yan Ding, Hang Yin
F: Dampness, Mold, and Indoor Microbiome	Investigation into the Inactivation Mechanisms of Bacteria in Aerosol Droplets	T-Microbiome-92	Allen Haddrell	Allen Haddrell, Mara Otero Fernandez, Richard J. Thomas, Henry Oswin, Jannik Stemler, Julia Hurraß, and Jonathan P. Reid
F: Dampness, Mold, and Indoor Microbiome	Diagnostic algorithm for clarifying suspected indoor mould-related health problems	T-Microbiome-93	Gerhard A. Wiesmüller	Gerhard A. Wiesmüller, Dennis Nowak, Birger Heinow, Marcus Joest, Jannik Stemler, Julia Hurraß
F: Dampness, Mold, and Indoor Microbiome	Healthy Building database: Microbial growth and diversity in typical building materials in Finland	T-Microbiome-94	Vuokko Lappalainen	Vuokko Lappalainen, Vesa Koskinen, Milla Rantanen, Janita Törnroos, Timo Murto-niemi
F: Dampness, Mold, and Indoor Microbiome	Modeling the Public Transport Microbiome: Development of a Microbial Reference Community	T-Microbiome-95	Yen-Tran Ly	Yen-Tran Ly, Nina Wetzig, Julia Hotte, Stefan Leuko, Ralf Moeller
F: Dampness, Mold, and Indoor Microbiome	Towards a deeper understanding of mould growth mechanisms on construction materials	T-Microbiome-96	Hiba Ajib	Hiba Ajib, Ala Bouhanguel, Elisabeth Lys, Bénédicte Wall-Ribot, Marc Abadie, Karim Limam, Yves André, Thierry Duforeste!
F: Dampness, Mold, and Indoor Microbiome	Using the dust from vacuum cleaner bags to effectively detect hidden fungal growth indoors.	T-Microbiome-97	Evangelia Loukou	Evangelia Loukou, Nickolaj Feldt Jensen, Birgitte Andersen
F: Dampness, Mold, and Indoor Microbiome	Real-time indoor air biological pathogen analysis and prediction platform	T-Microbiome-98	Woojong Jeong	
G: Ventilation and HVAC	Analysis of Indoor Environment and Dehumidification Schemes for Hydroelectric Power Station	T-VentHVAC-99	Zixu Yang	Wang Guangming, Zixu Yang, Hongli Sun, Hanjie Zheng, Borong Lin, Wang Wenyuan
G: Ventilation and HVAC	HVAC energy saving through effective air distribution models based on occupancy patterns, exhaust positioning, and ceiling level in a large office	T-VentHVAC-100	Arup Bhattacharya	Mina Lesan, Saeid Chahardoli, Arup Bhattacharya, Ph. D.
G: Ventilation and HVAC	Swamp Coolers, Air Conditioners, and Infiltration of Ambient Particle and Gas-phase Pollutants into Homes in a Semi-arid Climate	T-VentHVAC-101	James Johnston	James Johnston, Hanyong Jung, Royce Harline, Tyler Peterson, Selah Willis, Taylor Christensen, Seth Van Roosendaal, Joseph West, and Darrell Sonntag
G: Ventilation and HVAC	Inclusive sleep environments: Personal exposure to PM2.5 and obstructive sleep apnea in children	T-VentHVAC-102	Nan Ma	Yalin Lu, Ignacio E. Tapia, Nan Ma
G: Ventilation and HVAC	Assessment of Indoor Air Quality Improvement Effects through the Operation of an Integrated IAQ Management System in an Underground Shopping Mall	T-VentHVAC-103	Jiwoong Kim	Jiwoong Kim, Kichul Kim, Jinhee Jeong, Yungyu Lee
G: Ventilation and HVAC	Detecting the Dispersion of Bioaerosols Generated in Negative-Pressure Isolation Rooms	T-VentHVAC-104	Chane-Yu Lai	Nao Yamagami, Kyogo Hayashi, Hisashi Hasebe, Akihiro Kawamura, Hiromasa Tsuzuki, Tatsuo Nobe
G: Ventilation and HVAC	Advanced Personalized Ventilation strategies in aircraft cabins for enhanced protection against airborne pathogens	T-VentHVAC-105	Ilinca Nastase	Paul Danca, Florin Bode, Matei Razvan Georgescu, Cristiana Croitoru, Mihnea Sandu, Ilinca Nastase
G: Ventilation and HVAC	Analysis of an occupancy-based estimation of cross ventilation rates and effective opening area	T-VentHVAC-106	Jihyun Yoo	Jihyun Yoo, Jaeyun Bae, Junseok Park
G: Ventilation and HVAC	A Control Process for Prioritizing Unused Energy for Simultaneous Heating and Cooling System with Solar Energy	T-VentHVAC-107	Seokhyun Lee	Seok Hyun Lee, Yu Jin Lee, Dae Uk Shin
G: Ventilation and HVAC	The Impact of Opening Positions on Naturally Ventilated Indoor Environments	T-VentHVAC-108	Zhen Liu	Zhen Liu, Bruño Fraga
G: Ventilation and HVAC	Operation and air stream analyzation of heat pump combined high-polymer desiccant wheel system for low humidity control	T-VentHVAC-109	Shaochen Tian	Shaochen Tian, Yixiang Huang, Yining Geng, Lei Huang, Shangao Li, Qinfao Wang, Xing Su
G: Ventilation and HVAC	Feedforward control of HVAC system based on load forecasting by grey box model	T-VentHVAC-110	Li Wang	Li Wang, Xiaofeng Li
G: Ventilation and HVAC	Effect of inlet turbulence characteristics on the contaminant dispersion and infection risks in train cabins using IDDES	T-VentHVAC-111	Yibin Lu	Yibin Lu, Zhang Lin, Tiantian Wang, Yaxin Zheng
G: Ventilation and HVAC	Components and operation of 100 °C sterilizing ultrasonic humidifier	T-VentHVAC-112	Yongmin Kim	Jeonghoon Lee, Dongryul Park, Yongmin Kim, Kiwon Seo
G: Ventilation and HVAC	VENTILATION STRATEGIES FOR INCREASING INDIVIDUAL THERMAL COMFORT IN OPEN-PLAN OFFICES – A COMPARATIVE STUDY	T-VentHVAC-113	Haider Latif	Haider Latif, Goran Hultmark, Alireza Afshari
H: Aerosols and Particulate Matter	Characterization of Airborne Particle Emissions and Volatile Organic Compounds from 3D Pen Printing	T-Aerosols-114	Chungsik Yoon	Chungsik Yoon, Geonho Do, Kyungduk Zoh, Seungsup Kim, Seungmuk Yi, Whajin Kim
H: Aerosols and Particulate Matter	Intervention Effectiveness Assessment of Report-back Results for In-home Air Quality and Household-level Mitigation Actions	T-Aerosols-115	Xiaoying Li	Xiaoying Li, Jessica Tryner, Mollie Phillips, Thomas Reilly, John Volckens, Ellison Carter
H: Aerosols and Particulate Matter	PM2.5 from cannabis consumption at dispensaries and cannabis festivals in California	T-Aerosols-116	Suzaynn Schick	Abel S. Huang, Bryanna G. Perez, Morgan B.C. Murphy, Suzaynn F. Schick
H: Aerosols and Particulate Matter	Chemical composition and toxicity of fine particles emitted from burning of pork and mackerel	T-Aerosols-117	Kihong Park	Yeonju Sim, Minhan Park, Kihong Park
H: Aerosols and Particulate Matter	Chemical composition and toxicity of fine particles emitted from burning of pork and mackerel	T-Aerosols-118	Kihong Park	Yeonju Sim, Minhan Park, Kihong Park
H: Aerosols and Particulate Matter	Measuring Indoor HCl at the parts-per-trillion level with novel Picarro CRDS Gas Concentration Analyzer	T-Aerosols-119	Juan Carlos Guerrero	Cora Young , Juan Carlos Guerrero
H: Aerosols and Particulate Matter	A Thorough Exploration of Cooking Oil Emission Characteristics: Unveiling Comprehensive Insights	T-Aerosols-120	Mehdi Amouei Torkmahalleh	Mostafa Salmani-mojaveri, Motahareh Naseri, Tomiris Madiyarova, Nadezhda Ushakova, Karina Yessengaziyeva, Gulnur Sultan, Enoch Adotey, Gulnaz
H: Aerosols and Particulate Matter	Aerosol behaviour and countermeasures for COVID-19 in public transportation	T-Aerosols-121	koichi tatsu	Koichi Tatsu, Naohide Shinohara, Hoon Kim, Naoki Kagi, Kento Takami, Wataru Naito
H: Aerosols and Particulate Matter	A Study of the Increase in Radon Decay Product (RDP) Levels in the Presence of PMs from Wildfire Smoke	T-Aerosols-122	Kimberley Waldron	Kimberley Waldron
H: Aerosols and Particulate Matter	Differences between indoor-outdoor-atmosphere PM2.5 and their sources in low and high PM2.5 seasons	T-Aerosols-123	Chien-Cheng Jung	Chien-Cheng Jung, Chia-Yu Huang, Hui-Tsung Hsu, Xin-Yi Lin, Liang-Ying Chen
H: Aerosols and Particulate Matter	Incense Burning as A Source of Indoor Phthalates	T-Aerosols-124	Xuan Zhang	Xuan Zhang
H: Aerosols and Particulate Matter	Research and Application of Indoor Air Purification and Nanocatalytic Antimicrobial Technology	T-Aerosols-125	Yu Huang	Yu Huang

H: Aerosols and Particulate Matter	Secondhand exposures to simulated cannabis vaping aerosols	T-Aerosols-126	Xiaochen Tang	Xiaochen Tang, Vi H. Rapp, Marion L. Russell, Hugo Destailats
H: Aerosols and Particulate Matter	Monitoring and Management of Particulate Matter based on Ambient Air Quality in Seoul using Positive Matrix Factorization (PMF)	T-Aerosols-127	Moonkyung Kim	Moonkyung Kim, Hyehin Shin, Ilhan Ryoo, Jaewook Hwang, Kwonho Jeon, Sujung Han, Sunghwan Shim, Taeyeon Kim, Seung-Muk Yi
H: Aerosols and Particulate Matter	The Study on the performance of magnetic filters with elliptical magnets	T-Aerosols-128	Yulin Zhu	Yulin Zhu, Xiaofeng Li, Zhenzhe Liu, Fan Yang, Chenzhi Luan, Chunwang Wang, Li Wang
H: Aerosols and Particulate Matter	Study on Particle Distribution and the Impact of Piston Wind on Particle Concentration in Metro: Based on Field Testing	T-Aerosols-129	Xinyu Sun	Xinyu Sun, Haibo Qu, Jianbin Zang, Yan Wu
H: Aerosols and Particulate Matter	Advancing Environmental Health Equity in Underserved Neighborhood: A Pilot Study on the Impact of Outdoor Air Pollutants on Indoor Air Quality	T-Aerosols-130	Peter Kim	Peter Kim, Hongwan Li, Mingze Zhu, Mika Cheng, Anvesh Vanga, Xiao-Ming Hu, Wenwen Cheng, Anni Yang, Changjie Cai
H: Aerosols and Particulate Matter	Characteristics of Particulate matter in Smart-Shelter according to Type and Operation of Mechanical Equipment	T-Aerosols-131	Hyejin Cho	Hye-Jin Cho, Chang-Ho Jeong
H: Aerosols and Particulate Matter	Evaluation of Airborne Fraction Based on Characteristics of Consumer Chemical Products.	T-Aerosols-132	Mincheol Kim	Mincheol Kim, Sungho Hwang, Hyunbin Jo, Chungsik Yoon
H: Aerosols and Particulate Matter	Beyond the Flames: Mapping the Impact of Indoor Fires Through Testing	T-Aerosols-133	Heike Neumeister-Kemp	Heike Neumeister-Kemp
H: Aerosols and Particulate Matter	Multi-virion droplets in the transmission of respiratory infection	T-Aerosols-134	Pan Cheng	Pan Cheng, Yuguo Li
H: Aerosols and Particulate Matter	A method to estimate indoor instantaneous PM2.5 thresholds for air cleaner in Chinese residences	T-Aerosols-135	Yiming Wang	Yiming Wang, Keqin Yang, Jingya Wei, Yiping Zhang
H: Aerosols and Particulate Matter	Emission factors of air pollutants from joss paper and incense combustion	T-Aerosols-136	YiChen Chen	Yi-Chen Chen, Abiyu Kerebo Berekute, Kuo-Pin Yu
H: Aerosols and Particulate Matter	Effects of Cloth Vibration Duration on Dust Resuspension	T-Aerosols-137	Jie Feng	J. Feng, S.C. Fu, K.C. Chan, Chun-Ho Liu, Christopher Y.H. Chao
H: Aerosols and Particulate Matter	Identification of Microplastics in Indoor Environment	T-Aerosols-138	Weijian Zhang	Weijian Zhang, Ying Xu
H: Aerosols and Particulate Matter	From Outdoors to Indoors: A Geo-AI Technique to Protect Children from the Invisible Threat of Indoor PM	T-Aerosols-139	QUANG OAI LU	Quang-Oai Lu, Ching-Chang Lee
I: Indoor Chemistry, Sources, and Transformation	Measurements and Prediction of the Partitioning of Volatile Organic Compounds Between Indoor Air and Cotton	T-IndChem-140	Chen Wang	Chen Wang, Bo Yang, Shu Tao
I: Indoor Chemistry, Sources, and Transformation	Indoor laundry drying: a full-scale characterization of water emission	T-IndChem-141	Frédéric Thevenet	Florent Caron, Vincent Gaudion, Marie Verrielle, Melanie Nicolas, Frédéric Thevenet
I: Indoor Chemistry, Sources, and Transformation	Tracking Formaldehyde (HCHO) Emissions and Exposure Risks in a Typical Single-Family Home of the United States	T-IndChem-142	Karsten Baumann	Karsten Baumann, Glenn Morrison, Jon Bent, Kai Skog, Chris Rella, Joel Avrunin
I: Indoor Chemistry, Sources, and Transformation	Survey and risk assessment of chemical substances from gaming equipment	T-IndChem-143	Nadja Lyng	Nadja L. Lyng, Poul Bo Larsen, Thomas Witterseh, Helene B. Klinke
I: Indoor Chemistry, Sources, and Transformation	Source apportionment of indoor airborne particles of different microenvironments of a technical university in India.	T-IndChem-144	Veerendra Sahu	Veerendra Sahu, and Bhola Ram Gurjar
I: Indoor Chemistry, Sources, and Transformation	Heterogeneous Interactions and Transformation of Dibasic Esters with Indoor Relevant Surfaces	T-IndChem-145	Cholaphan Deeleeppojananan	Cholaphan Deeleeppojananan, Jinxu Zhou, Vicki H. Grassian
I: Indoor Chemistry, Sources, and Transformation	Chemicals of Potential Concern in Water-based Paint Products	T-IndChem-146	Yujie Fan	Yujie Fan, Ying Xu
I: Indoor Chemistry, Sources, and Transformation	Changes in VOC concentrations from consumer spray products depending on purpose of use, type, and distance of the products	T-IndChem-147	Myoungcho Lee	Myoungcho Lee, Gitaek Oh, Taehong Kwon, Kiyoungh Lee, Kyung-Duk Zho, Chungsik Yoon
I: Indoor Chemistry, Sources, and Transformation	Kinetic modeling of indoor multiphase chemistry and integration with experiments: organic film formation and human skin ozonolysis	T-IndChem-148	Manabu Shiraiwa	Manabu Shiraiwa, Pascale S. J. Lakey
I: Indoor Chemistry, Sources, and Transformation	Comparison of the effects of water and chemical cleaning and different types of ventilation on indoor air quality	T-IndChem-149	Raimo Mikkola	Raimo Mikkola, Elli Anttila, Emmanuelle Castagnoli, Heidi Salonen
I: Indoor Chemistry, Sources, and Transformation	HIGH TEMPORAL AND SPATIAL RESOLUTION MONITORING APPROACH FOR INDOOR AIR QUALITY EVALUATION IN NATURALLY VENTILATED CHURCHES	T-IndChem-150	Gianluigi de Gennaro	A. Di Gilio, J. Palmisan, M. Nisi, L. Pastore, G. de Gennaro ¹
I: Indoor Chemistry, Sources, and Transformation	School cleaning and indoor air in Helsinki Metropolitan area	T-IndChem-151	Leila Kakko	Leila Kakko, Merja Korkkalainen, Miia Ronkainen, Emmanuelle Castagnoli, Martin Täubel Hanna Leppänen, Camilla Vornanen-Winqvist, Miina Juntunen, Tuomas Alapieti, Raimo Mikkola, Heidi Salonen
J: Policy, Regulation, and Standards	Indoor air quality research agenda development and implementation plan to improve health in Abu Dhabi Emirates	T-Policy-152	Grace Kilroy	Grace Kilroy, Jacqueline MacDonald Gibson
J: Policy, Regulation, and Standards	Utilization of CO2 as a Tracer Gas in Laboratory, Building Science, and Engineering Applications to Determine Air Infiltration in Buildings, Vehicle	T-Policy-153	Curt Freedman	Curt M. Freedman
J: Policy, Regulation, and Standards	Influences Affecting the Achievement of Acceptable Indoor Environments: Introduction to ASHRAE Guideline10-2023	T-Policy-154	Carl Grimes	Carl Grimes
J: Policy, Regulation, and Standards	Advancing Indoor Air Quality Equity in Underserved Communities: A Pilot Study	T-Policy-155	Hongwan Li	Hongwan Li
J: Policy, Regulation, and Standards	Making a newly constructed building ready for occupancy	T-Policy-156	Lawrence Schoen	Lawrence Schoen
J: Policy, Regulation, and Standards	Measurements of IEQ in University buildings using the TAIL rating scheme and newly developed work satisfaction occupant survey	T-Policy-157	Pawel Wargocki	Pawel Wargocki
J: Policy, Regulation, and Standards	Conceptual Processing of Natural, Complex Odours: Multisensory Effects on Behaviour and Time-Frequency EEG Data	T-Policy-158	Christine Huckle	Christine Ida Huckle, Viviane Gallus, Katja Butter, Martin Ohlmeyer, Christoph van Thriel
K: Climate Change, Wildfires, Natural Disasters, and Urbanization	Urban indoor air quality disparities amplified by wildfire smoke: Insights from the Mosquito Fire episode in Reno, Nevada	T-ClimateC-159	Lung-Wen Antony Chen	L.-W. Antony Chen, Alireza Rezaee, Olufunminire Onamuti
K: Climate Change, Wildfires, Natural Disasters, and Urbanization	The effect of climate change on the built heritage: the case study of Le Cor-busier's studio-apartment in Paris	T-ClimateC-160	Giulia Lamberti	Giulia Lamberti, Francesca Contrada, Andrea Kindinis, Arnaud Lapertot, Elisabeth Marie-Victoire, Myriam Bouichou, Bénédicte Gandini, Marie Monfort
K: Climate Change, Wildfires, Natural Disasters, and Urbanization	Sensitivity Analysis of Cooling Panel Temperature on the Thermal and Comfort Performance of Outdoor Radiant Cooling System	T-ClimateC-161	Dharmasastha Kumar	Dharmasastha Kumar, Shin-ichi Tanabe, Jianlei Niu
K: Climate Change, Wildfires, Natural Disasters, and Urbanization	Driver's identification for low-carbon buildings from a national perspective	T-ClimateC-162	Fan Yang	Fan Yang
L: Health Outcomes and Exposure Assessment	Miniaturization Options in VOC Emissions Assessments of Consumer Products: Comparison of Test Chambers and Dynamic Headspace Extraction Systems	T-HealthOut-163	Alexander Roloff	Luise Klein, Birte Poelke, Alexander Roloff
L: Health Outcomes and Exposure Assessment	Indoor Sport Facilities: Health and Environmental Assessment - User Experience, Material Emissions, and Indoor Air Quality	T-HealthOut-164	Marko Hyttinen	Marko Hyttinen, Isla Hahl, Linda Luostarinen, Pertti Pasanen
L: Health Outcomes and Exposure Assessment	Numerical Analysis Using CFD for Preventing Infectious Diseases through Sanitary Plumbing Network Isolation	T-HealthOut-165	Joo Hyun Moon	Joo Hyun Moon, Wonseok Oh, Jinkyun Cho
L: Health Outcomes and Exposure Assessment	Simultaneous method of volatile organic compounds' metabolites in human urine samples using a novel in-syringe based FaUMEx-UHPLC-MS/MS analysis	T-HealthOut-166	Po-Chin Huang	Po-Chin Huang, Vinoth Kumar Ponnusamy

L: Health Outcomes and Exposure Assessment	PM2.5 Exposure Modeling App for Mitigation Strategies during Wildfire Smoke Events	T-HealthOut-167	Michael Breen	Michael Breen, Vlad Isakov, Catherine Seppanen, Sarav Arunachalam
L: Health Outcomes and Exposure Assessment	Learning from COVID-19: Teaching Undergraduate Students Concepts in Indoor Air and Environmental Quality Related to Human Health	T-HealthOut-168	Derek Shendell	Derek Shendell
L: Health Outcomes and Exposure Assessment	Users' exposure to indoor air contaminants in European swimming pools	T-HealthOut-169	Heidi Salonen	Heidi Salonen, Tunga Salthammer, Camilla Vornanen, Emmanuelle Castagnoli, Raimo Mikkola, Lidia Morawska
L: Health Outcomes and Exposure Assessment	Nanoparticle Exposure and Immune Compromise: Insights from Natural Killer Cell Functionality	T-HealthOut-170	Juheon Lee	Juheon Lee, Seokho Kim
L: Health Outcomes and Exposure Assessment	The effects of dietary pattern may modify the kidney injury induced by exposure to indoor PM2.5	T-HealthOut-171	Hsiu-Ling Chen	Hsiu-Ling Chen, Wan-Ru Wang
L: Health Outcomes and Exposure Assessment	Health risk assessment of indoor air pollutants in modern large office buildings in Japan	T-HealthOut-172	Kenichi Azuma	Kenichi Azuma, Hoon Kim, Yohei Inaba, Shigehisa Uchiyama, Naoki Kagi, Kenichi Kobayashi
L: Health Outcomes and Exposure Assessment	Environmental Assessment of Indoor Air Using Apollo, a Novel Ambient Air Sampling Device	T-HealthOut-173	Stephanie Filep	Stephanie Filep, Maria Oliver, Rhys Meredith, Max Bermingham, Anna Kuklinska-Pijanka, Ross Yarham, Hayley Mills, Martin Chapman
L: Health Outcomes and Exposure Assessment	Exposure to phthalates from home dusts among infertile women and its influence on in vitro fertilization	T-HealthOut-174	Chia-Wei Lee	Pei-Hua Hsu, Chia-Wei Lee
L: Health Outcomes and Exposure Assessment	Antagonistic effect of copper ions on the toxicity of polystyrene nanoplastics by transformation into copper (II) oxide and copper (II) sulfate	T-HealthOut-175	Wan-Seob Cho	Muthuchamy Maruthupandy, Jun Hui Jeon, Sung Ik Yang, Wan-Seob Cho
L: Health Outcomes and Exposure Assessment	Exposure to indoor PM2.5 may induce kidney injury	T-HealthOut-176	Wan-Ru Wang	Wan-Ru Wang, Hsiu-Ling Chen, Huey-Jen Su
L: Health Outcomes and Exposure Assessment	How to evaluate the indoor air quality through users' perception and low-cost sensors: a methodology for defining how to match the qualitative and qua	T-HealthOut-177	Yong Yu	Alice Laghezza, Yong Yu, Gaetano Settimo, Stefano Capolongo, Marco Gola
L: Health Outcomes and Exposure Assessment	Prophylactic Cost-benefit of Hypertension and Overactive Bladder Symptoms by Improving Indoor Thermal Environment in Japan	T-HealthOut-178	Itsuki Tanaka	Itsuki Tanaka, Shintaro Ando, Wataru Umishio, Toshiharu Ikaga
L: Health Outcomes and Exposure Assessment	Climate Pollution Reduction Initiatives in a large U.S. Metropolitan Area: Novel Community Co-Planning Methods	T-HealthOut-179	Katie Kenney	Katie Kenney
L: Health Outcomes and Exposure Assessment	Paired Household Dust & Clinical Samples Indicate Relationship Between Benzalkonium Chloride Disinfectant Use & Biological & Environmental Persistence	T-HealthOut-180	Shelby Tillema	Shelby J. Tillema, Mary J. Akel, Leena B. Mithal, Estefania Espi-nosa, Frances Kincaid, Abigail Aron, Tonia N. Branche, Stephanie A. Fisher, Erica M. Hartmann
L: Health Outcomes and Exposure Assessment	Rapid Review of Radon Concentrations in Multi-family Buildings	T-HealthOut-181	Amanda Giang	Amanda Giang, Tianyuan Li
L: Health Outcomes and Exposure Assessment	Occupational inhalation exposure to welding fumes: distance, level and composition	T-HealthOut-182	Yiran Lu	Yiran Lu, Mengjie Duan, Daoyu Yang, Weiqi Guo, Shibao Su, Xudong Li, Li Liu
L: Health Outcomes and Exposure Assessment	Results from nationwide survey of healthcare professional's attitudes, beliefs, and practices around indoor air quality	T-HealthOut-183	Jill Heins Nesvold	Jill Heins Nesvold
L: Health Outcomes and Exposure Assessment	In silico 3D ocular model integrating tear evaporation and physiologically based pharmacokinetic modelling	T-HealthOut-184	Teruaki Hirayama	Teruaki Hirayama, Kazuki Kuga, Kazuhide Ito
L: Health Outcomes and Exposure Assessment	Improving pesticide exposure assessment in an indoor residential environment via model refinement	T-HealthOut-185	Noshin Anjum Kamal	Noshin Anjum Kamal, Raghavendhran Avanasai, Carrie Huffman, Allison Killius, Gabriel Sinclair, Raj Saran, Tharacad Ramanarayanan, Deborah H. Bennett, Hyeong-Moo Shin
L: Health Outcomes and Exposure Assessment	Impact of opening retrofit on the incidence of OAB and sleep disorders initial first year period.	T-HealthOut-186	Hayato Wakiyama	Hayato Wakiyama, Shintaro Ando, Wataru Umishio, Toshiharu Ikaga, Yoshihisa Fujino, Shuzo Murakami
L: Health Outcomes and Exposure Assessment	Sick Building Syndrome, Indoor Air Quality, and Related Health Effects: A Systematic Literature Review	T-HealthOut-187	Liudmyla Yutskevych	Liudmyla Yutskevych, Kaelan Moore
L: Health Outcomes and Exposure Assessment	Characterize and Intervene the Indoor Air Quality in Early Childhood Education Settings to Reduce the School Absenteeism Caused by Infectious Diseases	T-HealthOut-188	Mingze Zhu	Mingze Zhu, Peter Kim, Bukunmi Akanji, Diane Horn, Barbara Fuhrman, Balaji Sad-hasivam, Oliver Stroh, Geb Thomas, Thomas Peters, Changjie Cai
L: Health Outcomes and Exposure Assessment	Research on individual differences in sensitivity to environmental factors affecting sleep quality of nursing home dwelling older adults	T-HealthOut-189	Mio Kono	Mio Kono, Rei Nara, and Natsuko Nagasawa
L: Health Outcomes and Exposure Assessment	Modelling the transfer of Legionella pneumophila concentration in shower water to indoor air	T-HealthOut-190	Laura De Jonge	Laura De Jonge, Lien De Backer, Elisa Van Kenhove, Jelle Laverge
L: Health Outcomes and Exposure Assessment	Trace metals in secondhand and thirdhand tobacco smoke	T-HealthOut-191	Xiaochen Tang	Xiaochen Tang, Wenming Dong, Hugo Destailats
L: Health Outcomes and Exposure Assessment	Induced airflow and inhaling pollutant exposure to a standing adult after flushing a urinal	T-HealthOut-192	Tengfei (Tim) Zhang	Kuibo Wu, Tengfei (Tim) Zhang, Feng Wang
L: Health Outcomes and Exposure Assessment	Association of volatile organic compounds exposure with the risk of obstructive sleep apnea among middle-aged men	T-HealthOut-193	Changsoo Kim	Hyunji Park, Heeseon Jang, Hyunah Son, Changsoo Kim
M: Meet the Job Seeker posters	Job Candidate Poster - Mahender Singh Rawat	T-Jobs-194	Mahender Singh Rawat	
M: Meet the Job Seeker posters	Job Candidate Poster - Bowen Du	T-Jobs-195	Bowen Du	
M: Meet the Job Seeker posters	Job Candidate Poster - Ruiji Sun	T-Jobs-196	Ruiji Sun	
M: Meet the Job Seeker posters	Job Candidate Poster - Wing Lam Chan	T-Jobs-197	Wing Lam Chan	
M: Meet the Job Seeker posters	Job Candidate Poster - Peihua Wang	T-Jobs-198	Peihua Wang	
M: Meet the Job Seeker posters	Job Candidate Poster - Dr. Abiyu Kerebo Berekute	T-Jobs-199	Dr. Abiyu Kerebo Berekute	
M: Meet the Job Seeker posters	Job Candidate Poster - Darryl Angel	T-Jobs-200	Darryl Angel	
M: Meet the Job Seeker posters	Job Candidate Poster - Xiujie Li	T-Jobs-201	Xiujie Li	
M: Meet the Job Seeker posters	Job Candidate Poster - yifan li	T-Jobs-202	yifan li	
M: Meet the Job Seeker posters	Job Candidate Poster - Satya Patra	T-Jobs-203	Satya Patra	
M: Meet the Job Seeker posters	Job Candidate Poster - Supreet Kaur	T-Jobs-204	Supreet Kaur	
M: Meet the Job Seeker posters	Job Candidate Poster - Casey Mullen	T-Jobs-205	Casey Mullen	
M: Meet the Job Seeker posters	Job Candidate Poster - Sabrina Westgate	T-Jobs-206	Sabrina Westgate	
M: Meet the Job Seeker posters	Job Candidate Poster - Ciara A. Higham	T-Jobs-207	Ciara A. Higham	
M: Meet the Job Seeker posters	Job Candidate Poster - Jemima Ohwobete	T-Jobs-209	Jemima Ohwobete	
M: Meet the Job Seeker posters	Job Candidate Poster - Veerendra Sahu	T-Jobs-206	Veerendra Sahu	

Podium Presentations/Workshops/Symposia: Aerosols and Particulate Matter

MONDAY	AM		Session Chairs: Anita Avery and Shelly Miller	
	Session- Aerosols and Particulate Matter 1 (Room 314)		Presenter	Full author list
	Assessing Sustainable Filtration Solutions for Nano-plastic and Total Vol-atile Organic Compounds (TVOC) Mitigation in 3D Printer Emissions		Yuan Yu Zheng	Yuan Yu Zheng, Kuo-Pin Yu
	Evaluation of bioaerosol propagation through an air curtain		Andreas Kohl	Andreas Kohl, Yen-Tran Ly, Stefan Leuko, Daniel Schmeling, Claus Wagner, Ralf Moeller
	Aggressive or Passive Particle Measurement: An Evaluation of the Efficacy of Disturbing Settled Dust as Part of an Exposure Assessment		Ryan Allenbrand	Ryan N Allenbrand, Kevin Kennedy
	Assessment of Urban Coffee Shop Indoor Air Quality and Examination of Influencing Factors Using the Random Forests Model		Yu-Wen Lin	Yu-Wen Lin, Chin-Sheng Tang , Wei-Xiang Huang
	Effect of Exhaust Airflow Rate and Pressure Difference on the Particle Outflow from Airborne Infection Isolation Room		Gi-Hoon Kim	Gi-hoon Kim, Seong-min Jo, Minki Sung
	Development of a Full-Size-Range Respiratory Droplet Sampler		Yuchen Shi	Yuchen Shi, Yihan Wang, Jianjian Wei
	Personal exposure to PM2.5 Mass Concentrations using Consumer-Grade Personal Exposure and Outdoor Fixed Monitors in Denver, Colorado		Shelly Miller	Aniya Khalili Hollo, Dulce Gonzalez-Beltran, Allison Heckman, Sophie Castillo, Tim Herwig, Jonathan Aumann, Cora Morency, Sumit Sankhyan, Nicholas Clements, Shelly L. Miller
	PM		Session Chair: James McGrath and Andreas Kohl	
	Session- Aerosols and Particulate Matter 2 (Room 314)		Presenter	Full author list
	Effects on respiratory droplet generation and virus concentration of changes in oral opening geometry		Khoa Nguyen	Nguyen Dang Khoa, Kazuki Kuga, Kazuhide Ito
	Airborne influenza virus in daycare centers		Jia Lin Zhang	Jia Lin Zhang, Yi Lien Lee, Pei-Shih Chen
	Particulate Matter Infiltration in Colorado Workplaces		Benjamin Swanson	Ben Swanson, Will Claggett, Ashley Geraets, Jadelyn Lippman, Rachel Stevens, Gavin McMeeking, Nicholas Good, Kate Patterson, Kathy Boyers, Odessa Gomez, Kristen Good, Ellison Carter
	Development of a sampler utilizing a wet-impactor to collect pathogenic bioaerosols into liquid media		Subin Han	Subin Han, Jae Hong Park
	Between-unit indoor air quality variability due to resident behavior within a single Boston public housing complex		Madeleine Wallace	Madeleine Wallace, Lacey Satcher, Samantha Teixeira, Rebekah Levine Coley, Gary Adamkiewicz
	Investigating the Impact of Particle Morphology on the Resuspension of Aerosol Particles in Indoor Air		Jonathan Reid	Edward Neal, Lukesh Mahato, Richard Thomas, Maurice Walker, Jack Vincent, Simon Parker, Virginia Foot, Emily Kruger, Jonathan Reid
	Intervention Effectiveness Assessment of Report-back Results for In-home Air Quality and Household-level Mitigation Actions		Xiaoying Li	Xiaoying Li, Jessica Tryner, Mollie Phillips, Thomas Reilly, John Volckens, Ellison Carter
	AM		Session Chair: Dusan Licina	*FEATURE TRACK
	Symposium- Indoor Ultrafine Particles: Nano to Accumulation Modes (Room: Ballroom B)		Presenter	Full author list
WEDNESDAY	Symposium: Indoor Ultrafine Particle Dynamics Spanning the Nanocluster to Accumulation Modes		Dusan Licina	
	Nano aerosol formation initiated by oxidation of limonene during bleach cleaning: a comparison of oxidant chemistry		Anita Avery	Anita Avery, Mitchell Alton, Manjula Canagaratna, Andrew Lambe
	Influence of indoor air movement on formation and growth of 1-20 nm particles via ozone-human chemistry		Dusan Licina	Shen Yang, Tatjana Mueller, Nijing Wang, Gabriel Bekö, Meixia Zhang, Marouane Merizak, Pawel Wargocki, Jonathan Williams, Dusan Licina
	Particle number concentrations in office spaces around Europe		Ville Silvonon	Laura Salo, Ville Silvonon, Tuomas Raunima, Michal Vojtisek-Lom, Jakub Ondracek, Jan Topinka, Roel, P.F. Schins, Teemu Lepistö, Henna Lintusaari, Sanna Saarikoski, Luis M. F. Barreira, Jussi Hoivala, Lassi Markkula, Ilpo Kulmala, Juha Vinha, Panu Karjalainen, Topi Rönkkö

	Indoor Atmospheric Nanoparticle Growth Rates	Satya Sundar Patra	Satya S. Patra, Gerhard Steiner, Nusrat Jung, and Brandon E. Boor
	Improved Parametrization of Indoor Ultrafine Particle Coagulation	Satya Sundar Patra	Satya S. Patra, Gerhard Steiner, Nusrat Jung, and Brandon E. Boor
	Oxidation of cannabis smoke leads to ultrafine particle formation in indoor environments	Kristen Yeh	Kristen Yeh, Amirashkan Askari, Jenna C. Ditto, Jonathan P.D. Abbatt
	Development of a Korean 3D printed lung model for estimating respiratory deposition of aerosols	Jeongyeon Park	Jeongyeon Park, Minjung Kim, Chungsik Yoon
THURSDAY			
	AM	Session Chairs: Dusan Licina and Parichehr Salimifard	
	Session- Aerosols and Particulate Matter 3 (Room 316 A/B/C)	Presenter	Full author list
	Development and Application of a Computational Model to Predict Fugitive Emissions during Nebuliser Therapy	James McGrath	Ciarraí O'Toole, James A. McGrath, Marco-Felipe King, & Martín López-García, Miriam A. Byrne
	Toilet lids: Protectors preventing the spread of infectious bioaerosols generated during flushing bidet toilet	Yuanyuan Niu	Yuanyuan Niu, Hua Qian, Xiaohong Zheng, Jiayu Huang, Chenxue Song
	Training a Random-Forest Regression Model on Data from Low-Cost Sensors on a University Campus to Predict Indoor Air Quality	Sabrina Westgate	Sabrina Westgate, Nga Lee Ng
	Assessment of Comprehensive performance of Schools to resist PM2.5	Sihyeon Kim	Taeyeon Kim, Sihyeon Kim, Dongjun Park, Donghyun Kim, Bonghoon Jeong, Joosang Lee
			Judith Chui Ching Wong, Kalisvar Marimuthu, Sophie Octavia, Xiaowei Huan, Yi Kai Ng, JunJing Yang, Stephanie Sutjipto, Kyaw Zaw Linn, Yin Xiang Setoh, Jane Griffiths, Erica Sena Neves, Luqman Hakim, Shuzhen Sim, Merrill Lim, Mohammad Nazeem4, Shawn Vasoo, Kwok Wai Tham, Oon Tek Ng, Lee Ching Ng
	Detection of mpox virus in air and dust of a patient room	Yang Junjing	
	Collection and analysis of Indoor and outdoor aerosol using a dual AC/DC sampling system	Kunihiro Funasaka	K. Funasaka, Y. Furuichi and T. Hanada
	Influence of Human Activities and Occupancy on the Emission of Indoor Particles from Respiratory and Non-respiratory Sources	P. S. Ganesh Subramanian	P. S. Ganesh Subramanian, Joseph V. Puthussery, Yuqing Mao, Sudheer Salana, Thanh H. Nguyen, Ty Newell, Vishal Verma
	PM	Session Chairs: Jiayu Li and Tunga Salthammer	
	Session- Aerosols and Particulate Matter 4 (Room 316 A/B/C)	Presenter	Full author list
	Source Emissions from a Consumer Iron and Steamer	Rachel Tyli	Marie-Michele Dussault, Karen Kang, Annie Zhan, Rachel Tyli
	Ozonation of Thirdhand Smoke Embedded in Carpets and Mattresses	Xiaochen Tang	Xiaochen Tang, Nicolas Lopez-Galvez, Vi Rapp, Marion Russell, Samuel Padilla, Nathan Dodder, Penelope J. Quintana, Hugo Destailats
	Exploring dogs' influence on indoor air chemistry and microbiology	Shen Yang	Shen Yang, Nijing Wang, Tatjana Mueller, Gabriel Bekö, Meixia Zhang, Marouane Merizak, Pawel Wargocki, Jonathan Williams, Martin Taubel, Dusan Licina
	A Thorough Exploration of Cooking Oil Emission Characteristics: Unveiling Comprehensive Insights	Mehdi Amouei Torkmahalleh	Mostafa Salmanimojaveri, Motahareh Naseri, Tomiris Madiyarova, Nadezhda Ushakova, Karina Yessengaziyeva, Gulnur Sultan, Enoch Adotey, Gulnaz Zhemenev, Ali Darvishi Omrani, Farzaneh Jafarigol, Sumit Sankhyani, Shelly Miller, Lance Wallace, Dhawal Shah, Mehdi Amouei Torkmahalleh
	Effect of ultrasonic scaler tip on the aerosol generation in dental scaling	Gang Yang	G. Yang, S.C. Fu, K.C. Chan, K.W. Mui, Christopher Y.H. Chao
	A Lagrangian-based Markov Chain Model with Coarse Grids for Fast Prediction of Particle Transport in Complex Indoor Environments	Wenjie Huang	Wenjie Huang, Chun Chen
	The state of the art characterisation of particles from respiratory activities	Lidia Morawska	Lidia Morawska, Henry Oswin, Sadegh Niazi, Robert Groth, Zoran Ristovski

Podium Presentations/Workshops/Symposia: Air Cleaning and Filtration

TUESDAY

AM	Session Chairs: Michael Link and Richard Corsi	*FEATURE TRACK
Session- Air Cleaning and Filtration 1 (Room: Ballroom B)	Presenter	Full author list
Open-Source Air Cleaners: State of Knowledge and Experimental Evidence of Temporal and Size-Specific Performance	Theresa Pistochini	Theresa Pistochini, Graham Jaeger, Christopher Cappa, Richard Corsi,
Pilot Experiments Investigating if Non-Venting Range Hoods with Filtration Reduce Pollutants from Cooking with Gas or Induction Burners	Brett Singer	Brett Singer, Haoran Zhao, Marion Russell, William Delp, Alexandra Johnson, Xiaochen Tang, Iain Walker
Contradiction in Applying Carbon-Based Cocatalysts in Photocatalytic Air Purification	Myoung Won Chung	Myoung Won Chung, Ingyu Song, Seunghyun Weon
Lights On, Problems Gone? Probing the Influence of Germicidal UV (222 nm) Lamps on Ozone, Ultrafine Particles, and VOCs in Indoor Office Spaces	Sara Bjerre Sørensen	Sara Bjerre Sørensen, Frederik Rask Dalby, Søren Kristian Olsen, Kasper Kristensen
CFD modeling for reactive species air cleaner applications in a classroom	Youngbo Won	Youngbo Won, William Bahnfleth
Enhancing Ultrasonic Aerosol Agglomeration Pretreatment with Submicron Water Droplets: Impact on Air Filter Operating Pressure Drop	Xin Zhang	Xin Zhang, Pengzhan Liu, Guicai Liu, Shi Hao Lim, Man Pun Wan, Grzegorz Lisak, Bing Feng Ng
Enhancing the Filtration Performance of Nanofiber Filters via Spray-initiated Synthesis of Metal-Organic Frameworks	Zhuolun Niu	Zhuolun Niu, Ye Bian, Chun Chen
PM	Session Chairs: Kwok Wai Tham and Richard Shaughnessy	
Session- Air Cleaning and Filtration 2 (Room 311)	Presenter	Full author list
Comparative analysis of air cleaner performance with and without an air distribution system: An experimental study	Justin Berquist	Justin Berquist, Liang (Grace) Zhou, Ibrahim Reda
Numerical Assessments of Particle Protection Efficiency of Various Air Curtain Systems Installed at a Main Entrance of a Building	HyoBeom Jung	Hyo Beom Jung, Hee Won Shin, Dong Hwa Kang
Mitigation of Spray Polyurethane Foam with High Chemical Emission Rates	Bud Offermann	Francis J. Offermann
Multiroom Residence Air-circulation Effects on Ultrafine Particle Removal	Daniel Rush	Daniel Rush, Mengjia Tang, Sangyoung Hyun, Atila Novoselac
A Tracer Method to Characterize Within-Room Contaminant Transport with Implications for Assessing GUV Effectiveness	Michael Sohn	Michael Sohn, William Delp, Rowan Blacklock, Brett Singer
How effective are portable air cleaners at improving air quality during pollution events?	Jienan Li	Jienan Li, Kathryn Mayer, Andrew Martin, Han Huynh, Michael Link, Stephen Zimmerman, Dustin Poppendieck, Jonathan Abbott, Marina Vance, Delphine Farmer,
Prediction of the dynamic pressure drop of filter media loaded with water mists based on the deposited droplet mass and pore network model	Shuang Zhang	Shuang Zhang, Wanyi Zhang, Zhongping Lin

WEDNESDAY

AM	Session Chairs: Jeffrey Siegel and Parham Azimi	
Session- Air Cleaning and Filtration 3 (Room 311)	Presenter	Full author list
Experimental Assessment of the Efficacy of Portable Air Cleaners in Mitigating Respiratory Droplet Nuclei Transmission	Ihab Al-Rikabi	Ihab Jabbar Al-Rikabi, Hayder Alsaad, Svenja Carrigan, and Conrad Voelker
Comparing VOC Efficacies for Two Air Cleaners Using Proton Transfer Reactive Mass Spectrometry and Sorbent Tube Analysis	Paul Hoertz	Paul Hoertz
Evaluation of Air Cleaners Under Indoor Wildfire Smoke Conditions	Brett Stinson	Brett Stinson, Aurélie Laguerre, Elliott Gall
Integration of Filters into Ceiling Fans: Challenges and Opportunities	Atila Novoselac	Daniel Rush, Atila Novoselac
The improvement of indoor air in households through photocatalytic oxidation air purifier in an industrial city	Jia Lin Zhang	Jia Lin Zhang, Wan-Chen Li, Pei-Shih Chen
Valuing benefits derived from controlling indoor air pollutants in China	Keqin Yang 杨可亲	Keqin Yang, Ningrui Liu, Yiming Wang, Jingya Wei, Louise B. Weschler, Charles J. Weschler, Yinping Zhang
Collaborative Assessment of a Novel MOF Material for Efficient Removal of Indoor Formaldehyde	Doyun Won	Doyun Won, Be Be Fatima Sultani, Beverly Guo, Wenfeng Huang, Zhenlei Liu, Jianshun Zhang, Menghao Qin, Pierre Tignol, Nicolas Sadovnik, Farid Nouar, Vanessa Pimenta, Marco Daturi, Anne-Laurence Dupont, Bertrand Lavédrine, Christian Serre

	PM	Session Chairs: Bjarne Olesen and Pawel Wargocki	
	Symposia- Gas-Phase Air Cleaning (Room 312)	Presenter	Full author list
	Symposium: Supplementing Ventilation with Gas-phase Air Cleaning, Implementation and Energy Implications (60 min)		
	Impacts of Canadian Wildfire-Induced Smog on Outdoor and Indoor PM2.5 Levels in a Syracuse Office Environment	Xin Guo	Xin Guo, Sameeraa Soltanian-Zadeh, Shayan Mirzabeigi, Jianshun "Jensen" Zhang
	Calculating Clean Air Delivery Rate Based on Perceived Air Quality	Lei Fang	Kanta Amada, Yiming Xiang, Lei Fang, Shin-ichi Tanabe, Pawel Wargocki
	Performance Assessment of Gas-phase Portable Air Cleaners	Yiming Xiang	Yiming Xiang, K Amada, A K Mishra, Shin-ichi Tanabe, L Fang, P Wargocki
	ISO 17772-1/2 a standard on indoor environmental parameters for design, operation, and assessment of IEQ in buildings.	Bjarne W. Olesen	Bjarne Wilkens Olesen
THURSDAY	AM	Session Chairs: Jelle Leverage and Jienan Li	
	Session- Air Cleaning and Filtration 4 (Room 314)	Presenter	Full author list
	Variability in Performance and VOC Off-Gassing of DIY Air Cleaners	Amity Deters	Amity L. Deters, Elliott T. Gall, Brett W. Stinson
	Air Distribution using Open-air Ducts in Office Spaces	Kyosuke Hiyama	Kyosuke HIYAMA, Kaoru Tanaka, Norio Shoda
	Development of the New Generation Challenge Aerosol for General Ventilation Filter Evaluation	Xin Feng	Xin Feng, Bin Lu, Hui Zhang, R. Vijayakumar, Jing Bai, Louise B. Weschler, Yinping Zhang
	On-surface tailoring coarse polymer fibers for efficient air filtration: Interfacial morphologies and electrostatic enhancement	Yilun Gao	Yilun Gao, Jinhan Mo, Jing Wang
	Aerosol synthesized MgO nano-adsorbents for reducing CO2 concentrations in indoor air	Sukbyung Chae	Sukbyung Chae, Kyungil Cho, Yeryeong Kang, Jihye Park, Euntae Yang, Changhyuk Kim
	Evaluation of Control Strategies for Reducing Particle Filter System Runtime	Alexander Mendell	Alexander Mendell, Jeffrey Siegel, Seungjae Lee
	Enhancing Indoor Air Quality using Ag/TiO2-CS Nanocomposite Filter Efficacy against Viral Aerosols	Wonder Nathi Dlamini	Wonder Nathi Dlamini, Kuo-Pin Yu
	PM	Session Chairs: Dustin Poppendieck and Brett Stinson	
	Session- Air Cleaning and Filtration 5 (Room 314)	Presenter	Full author list
	Lessons Learned from Field Evaluations of 20 Germicidal Ultraviolet Installations	Belal Abboushi	Belal Abboushi, Eduardo Rodriguez-Feo Bermudez, Jason Tuenge, Gabe Arnold
	Enhancing Hospital Air Quality Through Advanced Purification Systems and Cloud-Enabled Monitoring: Strategies and Innovations	Wonder Nathi Dlamini	Wonder Nathi Dlamini, Mastewal Endeshaw Getnet, Muchsin Maulana, Rasham Sallah-Ud-Din, Kuo-Pin Yu
	Background Loss Rates and Portable Air Cleaner Performance	Alexander Mendell	Alexander Mendell, Seungjae Lee, Jeffrey Siegel
	A performance assessment of vehicle cabin air filter	Chenhua Wang	Chenhua Wang, Junjie Liu, Jing Xu
	Simulative investigation of the thermal inactivation of SARS-CoV-2 in the cabin air of a people mover	Henrik Alexander Grubbel	Henrik Grubbel, Werner Kraft, Frank Rinderknecht
	An experimental study on a low-energy combination strategy for improving indoor air quality	Tzu Han Huang	Tzu-Han Huang, Yi-Hsing Chang, Nai-Tzu Che, Jo-Ting Hsieh, Wen-Hua Lee, Pei-Chih Wu, Yu-Chun Wang, Shih-Chun Candice Lung, Huey-Jen Su, Yaw-Shyan Tsay
	CFD design of an innovative personal air cleaner to prevent airborne disease transmission in transport microenvironments	Giorgio Buonanno	Giorgio Grossi, Fausto Arpino, Elisa Caracci, Giorgio Buonanno, Gino Cortellessa, Luca Stabile

Podium Presentations/Workshops/Symposia: Building Simulation, Sustainability, and Energy

TUESDAY

PM		Session Chairs: Giorgio Buonanno and Adrian Chong	
Session- Building Simulation, Sustainability, and Energy 1 (Room 314)	Presenter	Full author list	
Upcycling Clothing Waste into Construction Materials: Improving Thermal Performance by Using Phase Change Materials	Dongchan Jin	Dongchan Jin, Young Uk Kim, Beom Yeol Yun, Sungeun Kim, Sumin Kim	
Power-Saving Menus in Preparation for Winter Power Shortages Considering Diversity of Housing Performance and Residents' Lifestyles	Hikari Harasaki	Hikari Harasaki, Kanari Hirama, Yuta Fukawa, Tishiki Shinno, Jun Nakagawa, Shin-ichi Tanabe	
Occupant-Centric Proactive Control Methodology for IEQ	Alexis Kyriacou	Christina Kakoulli, Alexis Kyriacou, Michalis Michaelides	
Improvement Design of Raised Floors in a Semiconductor Cleanroom using Computational Fluid Dynamics Simulation	Zulvi Alfiqri Hidayatulloh	Zulvi Alfiqri Hidayatulloh, Tin-Wen Chang, Indra Permana, Fujen Wang	
Improving the thermal boundary conditions during CFD modelling of residential kitchen	Shou-Wang Chen	Shou-Wang Chen, Chao-Yen Chang, Wan-Chen Lee, Ying-Chieh Chan	
Development of an adjustment method for the calculated building energy consumption based on the law at the design stage, considering the actual operat	Akane Shimizu	Akane Shimizu, Tatsuya Hayashi, Jeongsoo Kim	
Influence of leakage corrections on the cup test results	Xinyue Luo	Xinyue Luo, Pengbo Hu, Chi Feng	

WEDNESDAY

AM		Session Chairs: Uttam Saha and Michael Sohn	
Session- Building Simulation, Sustainability, and Energy 2 (Room 315)	Presenter	Full author list	
Coupling indoor air quality, thermal comfort and HVAC energy consumption using IDA ICE and OpenFOAM	Niko Siilin	Niko Siilin, Andrea Ferrantelli	
Uncertainty analysis of building energy consumption based on occupant behavior-based HVAC control with optimal thermal comfort	Dongsu Kim	Dongsu Kim, Eunho Kang, Jongho Yoon	
Power Consumption Characteristics and Prediction of Airport Terminal Based on Data Mining	Sun Yongxiang	Sun Yongxiang, Chen Chao, Guan Dongya, Kang Chunhua, Li Zhiyong, Qiao Peng	
Evolution of direction air supply induced by worker walking through dynamic simulation	Yukun Xu	Yukun Xu, Jun Gao	
Digital Twin for Buildings – The Way Towards Sustainable Buildings	Mihnea Sandu	Mihnea Sandu, Cristiana Croitoru, Alexandra Ene, Andra Tanase	
Evaluation of computational room flow simulations by means of experimental methods	Jonathan Griener	Jonathan Griener, Susanna Bordin, Arno Dentel	
Coupling Chemistry and Fluid Dynamics to Assess Indoor Air Quality	Bruño Fraga	Bruño Fraga, Zhen Liu	
PM		Session Chair: Michael Sohn	
Symposia- Understanding Indoor-Outdoor Transport (Room 314)	Presenter	Full author list	
Symposia- Urban Pollutant Transport: Understanding Indoor-Outdoor Transport (60 min)	Michael Sohn		
Evaluation of different categories of turbulence models for calculating air pollutant dispersion in real urban layout	Jue Wang	Jue Wang, Ruoyu You	
Reconstructing outdoor concentrations for use by indoor models	Michael Sohn	Michael D. Sohn, David M. Lorenzetti	
Impacts of night market on indoor air quality and children's lung function in nearby households	Kuo-Ping Tseng	Kuo Ping Tseng, Jia Lin Zhang, Pei-Shih Chen	
Tracer Gas Experiment of Urban Pollutant Transport: Urban Canyons and Indoor-Outdoor Transport	Michael Sohn	Michael D. Sohn, Marion L. Russell, William W. Delp, David M. Lorenzetti, Kyla Cook	

THURSDAY

PM		Session Chairs: Doyun Won and Tham Kwok Wai	
Session- Building Simulation, Sustainability, and Energy 3 (Room: Ballroom C)	Presenter	Full author list	
Predicting ventilation rates in public housing in the era of modular flat design in Hong Kong using deep neural network model	Ho Kam Dai	Ho Kam Dai, Yifu Shi, Chun Chen	
Optimization of coupled displacement-personalized ventilation using CRITIC-TOPSIS method based on Taguchi design	Ken Bryan Fernandez	Ken Bryan Fernandez, Sung-Jun Yoo, Kazuhide Ito	
Hygrothermal and energy performance evaluation of cross-laminated timber walls	Yujin Kang	Yujin Kang, Jihee Nam, Sumin Kim	

	The 7-Year Journey to Develop a Radon-in-Water Proficiency Test to Bridge the Gap in this Field Across the Globe	Uttam Saha	Uttam Saha, David Parks, Derek Cooper, Michael Kitto, Pamela Turner	
	BuilSysPro-QAI: A new Modelica library for macro-design and thermo-hygro-aerodynamic-IAQ simulations in residential and tertiary buildings	Hiba Ajib	Hasan Sayegh, Hugues Bosche, Thierry Duforestel, Hassan Bouia, Bénédicte Wall-Ribot, Sébastien Labbé, Denis Covalet	
	Measuring the performance of a pressurized corridor ventilation system in high-rise multi-unit residential building (MURBs)	Justin Berquist	Justin Berquist, Marianne Touchie, William O'Brien	
	Session chair led panel discussion and extended Q+A			

Podium Presentations/Workshops/Symposia: Climate Change, Wildfires, Natural Disasters, and Urbanization

THURSDAY	AM	Session Chairs: Ellison Carter and Zachary Golden	*FEATURE TRACK
	Session- Climate Change, Wildfires, Natural Disasters, and Urbanization 1 (Room: Ballroom B)	Presenter	Full author list
	Characterizing Smoke Emissions Under Varied Burn Conditions With a Quartz Tube Furnace	Ryan Bixler	Ryan Bixler, Elliott T. Gal
	Indoor heat stress impairs emotional and physical states during extreme heat	Xingtong Guo	Xingtong Guo, Angela C Incollingo Rodriguez, Shichao Liu
	Air Pollutant Enhancements in Indoor Environment by Acute Outdoor Emission Events	Chou-Hsien Lin	Chou-Hsien Lin, Evelyn Deveraux, Daniel Blomdahl, David Jarma, Daniel Sung, Liv Haselbach, Sidney Lin, Elena McDonald-Buller, Yosuke Kimura, Kerry Kinney, Pawel Misztal
	Levels of PM, VOCs, and PAHs in Residences Post-2023 Maui Wildfire: Exposure and Mitigation Assessment	Parham Azimi	Parham Azimi, Zahra Keshavarz, Rachel Steiner, Tomi Oyedeji-Olaniyan, Sayed Bateni, Joseph Allen
	The effect of climate change on the built heritage: the case study of Le Corbusier's studio-apartment in Paris	Giulia Lamberti	Giulia Lamberti, Francesca Contrada, Andrea Kindinis, Arnaud Lapertot, Elisabeth Marie-Victoire, Myriam Bouichou, Bénédicte Gandini, Marie Monfort
	Observing the impacts of wildfires on indoor air quality in Western Canada	Kristen Yeh	Kristen Yeh, Rowshon Afroz, Ran Zhao, Stephanie Schneider, Rebecca Mesburis, Jason Olfert, Jonathan P.D. Abbatt
	The Thermal Sensitivity of the Elderly in Public Outdoor Open Spaces in Hong Kong Public Housing Estate	Jiawei Wang	Jiawei Wang, Jianong Li, Jianlei Niu

Podium Presentations/Workshops/Symposia: Covid-19 and Viral Transmission

MONDAY

AM

Workshop- Indoor Chemistry of Far UV (Room: Ballroom C)

Presenter

Workshop: Indoor Chemistry of Far UV

Gigi Gronvall

The Covid-19 pandemic highlighted the need for air cleaning. Upper Room Ultraviolet Germicidal Irradiation at 254 nm (UVGI), when installed and maintained properly, is an effective tool for killing or inactivating airborne TB bacteria and SARS-CoV2 virus. However, this technology requires professionals for installation and maintenance to ensure safety and efficacy. More recently, it has been shown that Far-UV at 222nm (Far-UV) inactivates airborne coronaviruses, and this UV wavelength may not harm human tissues. One chamber study showed that Far UV inactivates a human pathogen. The Far UV fixtures are easier to deploy and operate than UVGI. However, this Far-UV light reacts with oxygen to produce ozone, a harmful pollutant that can oxidize volatile organic compounds to produce PM2.5, hydroxyl radical and other compounds. This workshop will address what is known about the efficacy of Far-UV and the indoor chemistry of Far-UV and explore thresholds and conditions where the benefits of Far-UV outweigh the risks. Moderators: Paula Olsiewski, Johns Hopkins

1. Overview of Far UV: Dustin Poppendieck, NIST
2. Promise and efficacy of Far UV: Cath Noakes, Leeds
3. Understanding Far UV Sources:- Holger Claus, Ushio
4. Formation of ozone, aerosols and volatile organic compounds induced by 222-nm lamps: Joost DeGouw, U of Colorado
5. Far UV and Hydroxyl radical production: Victoria Barber, UCLA
6. From the Laboratory to the Lavatory: Unintended Air Quality Impacts of Ultraviolet Light Disinfection in an Odiferous Bathroom Installation Michael Link, NIST
7. Benefits vs Risks: Gigi Gronvall, Johns Hopkins
8. Application Decisions: William Bahnfleth, Penn State

PM

Session Chairs:
Yuguo Li and
Richard Corsi

*FEATURE TRACK

Session- Covid-19 and Viral Transmission 1 (Room: Ballroom B)

Presenter

Full author list

What is the acceptable minimum ventilation rate for mitigating airborne infections in public places

Hua Qian

Hua Qian, Xiaohong Zheng, Danting Luo, Weiwei Huang

Close contact behaviors between medical staff and patients in dental clinics

Xiao Shenglan

Yingjie Luo, Fangli Zhao, Bing Cao, Zhiyang Dou, Nan Zhang, Shenglan Xiao

Effects of Speech Duration on the Respiratory Aerosol Particle Concentration

Tomoki Takano

Tomoki TAKANO¹, Yiming XIANG, Masayuki OGATA, Yoshihide YAMAMOTO, Satoshi HORI, Shin-ichi TANABE

Dust as a novel environmental media for monitoring of viral illness

Karen Dannemiller

Austin Shamblyn, John Van Dusen, Jenny Panescu, Michael G. Sovic, Kyle Bibby, Mikkel B. Quam, Matt Wascher, Joe Tien, Karen C. Dannemiller

Identifying the Safest Seat in Aircraft: Modelling SARS-CoV-2 Infection Risk by CFD for 70 Different Source Locations

Florian Webner

Florian Webner, Andrei Shishkin, Daniel Schmeling, Claus Wagner

Bipolar Ionization-Mediated Airborne Viral Inactivation and Deposition

Darryl Angel

Darryl Angel, Jordan Peccia

Effect of Portable Air Cleaner Placement on Airborne Infection Control in Learning Environments

Parham Azimi

Gen Pei, Parham Azimi, Donghyun Rim, Joseph G. Allen

TUESDAY

AM

Session Chairs:
Lidia morawska
and Jeffrey
Siegel

Session- Covid-19 and Viral Transmission 2 (Room: Ballroom A)

Presenter

Full author list

Scaling a Quantitative Microbial Risk Assessment with DNA-Tagged Aerosol Tracers to Inform Building Strategies to Control Infectious Aerosols

Nicholas Clements

Nicholas Clements, Phil Arnold

	A Global Survey of the Impacts of Facemask Wear on Perceived Learning or Working Performance During the COVID-19 Pandemic	Rachel Hurley	Rachel Hurley, Oren Mangobi, Kai Zhang, Shichao Liu
	Propagation and Evaporation of Dental Droplets, Emission and Exposure in Surgery Environments: Preparing for Next "Disease X"	Xiujie Li	Xiujie LI, Cheuk Ming MAK, Zhengtao AI, Kuen Wai MA, Hai Ming WONG
	Airborne Cross-infection Risk Under Different Body Orientations in an Air conditioned Room.	Heewon Shin	Hee Won Shin, Hyun Wook Park, Jae Hyun Park, Dong Hwa Kang
	SARS-CoV-2 on Portable Air Purifier Filters in Public Spaces without Confirmed Positive Occupants	Jing Li	Jing Li, Merel Bot, Xinlei Liu, Yuan Yao, Roel Ophoff, Yifang Zhu
	Initial size distribution of coughing particles for CFD simulation based on measurements and evaporation model	Yunchen Bu	Yunchen BU, Hideki KIKUMOTO, Wonseok OH, Chao LIN, Ryoza OOKA
	Comparison of Computational Fluid Dynamics Simulation Results according to Ceiling Fan Modeling Method	Yelim Jo	Yelim Jo, Minki Sung
	PM	Session Chairs: Delphine Farmer and Pawel Misztal	
	Session- Covid-19 and Viral Transmission 3 (Ballroom A)	Presenter	Full author list
	CORINA: A new aerosol chamber for the study of virus-containing aerosols and their inactivation.	Miguel Banares	A. Vázquez-Calvo, M. García-Castey, M.A. Bñares, A. Alcamí
	Comparison of non-infectious air delivery rate and energy consumption – Room air cleaners versus in-duct ultraviolet light inactivation	Ilpo Kulmala	Arto Säämänen, Inga Ehder-Gahm, Anni Luoto, Piia Sormunen, Ilpo Kulmala
	A generalized Wells-Riley equation for multi-virion aerosols	Ao Li	Ao Li, David Y H Pui, Yuguo Li
	Evaluation of the Effectiveness of Far Ultraviolet C Light on Bioaerosol Disinfection in Public Transportation Environments	Yue Pan	Yue Pan, Kangqi Guo, Wenjie Huang, Ho Kam Dai, Chun Chen
	Using virtual manikins to tackle particle transport and inhalation risk as-sessment under different advanced air distribution methods	Alicia Murga	Alicia Murga, Rahul Bale, Kazuhide Ito, Makoto Tsubokura
	A novel method for quantifying the airborne infection risk of indoor spaces	Henry Oswin	Henry P. Oswin, Ville Silvonen, Robert Groth, Raymond Tellier, Lidia Morawska
	Session chair led panel discussion and extended Q+A		
WEDNESDAY			
	AM	Session Chair: Charles Gerba	
	Symposium- Dyanmics of virus aerosolization and resuspension (Room 316 A/B/C)	Presenter	Full author list
	Symposium- Dynamics of virus aerosolizes and resuspension from surfaces	Charles Gerba	
	A novel Pseudo-CO2 concept to monitor airborne infections in indoor settings	Wei Jia	Wei Jia, Yuguo Li
	Impact of Lid Closure during Toilet Flushing and of Toilet Bowl Cleaning on Viral Aerosol contamination of Restroom Surfaces	Charles Gerba	Madison P. Goforth, Stephanie A. Boone, Justin Clark, Priscilla B. Valenzuela, Julie McKinney, M. Khalid Ijaz, Charles P. Gerba
	Exploring the Toilet Plume: A Quantitative Microbial Risk Assessment (QMRA) Framework Using Experimental Particle Measurements	Ciara Higham	Ciara A. Higham, Martín López-García, Catherine J. Noakes, Louise Fletcher
	Air Sanitizer Efficacy in Indoor Air: Aerovirological investigations using airborne phages as surrogate for viruses & SARS-CoV-2	M. Khalid Ijaz	M. Khalid Ijaz, Bahram Zargar, Raymond Nims, Julie Mckinney, and Syed A. Sattar
	Aerosol dispersal and fomite contamination of Virus from Floor Surfaces during Indoor Activities	Stephanie Boone	Stephanie A. Boone, Justin Clark, Julie McKinney, M. Khalid Ijaz, Charles P. Gerba
	Resuspension of Virus (MS2) from Soft Surfaces during Indoor Activities	Stephanie Boone	Stephanie A. Boone, Melanie Kridler, Justin Clark, Julie McKinney, M. Khalid Ijaz, Charles P. Gerba
	Session chair led panel discussion and extended Q+A		

	PM		Sessoins Chair: Tunga Salthammer	
	Workshop- Building Systems Against Airborne Infection (Room 315)		Presenter	
	Workshop- Advanced Building Systems Against Airborne Infection Transmission - 6o min		Tunga Salthammer	
	Prior to 2020, ventilation/air-conditioning systems were never designed to protect the public from infectious disease. To address the fundamental question of how to mitigate the risk of indoor airborne infection transmission, the “ARC Training Centre for Advanced Building Systems Against Airborne Infection Transmission (THRIVE)” was founded. The importance of this centre is ultimately in advancing the design of a “brain” behind the building system that supports its operation, and a network of “nerves” and “sensors”, providing information on the operation of the system and allowing control of the system to ensure clean indoor air with minimal energy consumption. While complex buildings normally have a building management or automation system that may use integrated sensors, these systems are not yet sufficiently advanced to support clean indoor air. The aim of the workshop is to communicate the findings from THRIVE to the indoor community. The design and development of building systems and air cleaning measures, whose elements work together to reduce indoor airborne infection transmission by improving indoor air quality (IAQ) and at the same time maintaining comfort and energy efficiency will be discussed. This goal will be achieved by bringing together a body of experts representing all elements of the building and connecting these elements to operate as an efficient and effective system. A particular concern is to convince different interest groups and stakeholders of the advantages of synergy. It is clear that the expertise of the industry is just as necessary as that of the academic scientists and the authorities. The field of indoor airborne infection transmission is complex and multi-faceted. Consequently, measures require a holistic strategy and multidisciplinary to approach research and training in this field.			
THURSDAY	AM		Session Chair: Henry Oswin	
	Symposium- Aerobiology in the Context of Indoor Air Quality (Room 312)		Presenter	Full author list
	Symposium- Aerobiology in the context of indoor air quality: How should we engineer our air?		Henry Oswin	
	Ambient Carbon Dioxide Concentration Correlates with SARS-CoV-2 Aerostability and Infection Risk		Allen Haddrell	Allen Haddrell , Henry Oswin, Mara Otero-Fernandez, Joshua F. Robinson , Tristan Cogan, Robert Alexander, Jamie F.S. Mann, Darryl Hill, Adam Finn, Andrew D. Davidson, and Jonathan P. Reid
	Respiratory Aerosol Emission Rates and Relationship to Exhaled Carbon Dioxide Flux for Assessing Pathogen Transmission Risk in Indoor Air		Jonathan Reid	Jonathan P. Reid,, Bryan R. Bzdek, Justice Archer, Joshua Harrison, Lauren P. McCarthy, Henry E. Symons, Alicja Szczepanska, William J. Browne, Natalie A. Watson, Christopher M. Orton,,, Benjamin Moseley, Keir E. J. Philip,, James D. Calder,, Pallav L. Shah,,, Declan Costello, Brian Saccente-Kennedy, Ruth Epstein
	Acidity of air as a tool to help understand airborne pathogen viability		Ville Silvonen	Ville Silvonen, Henry Oswin, Robert Groth, Allen Haddrell, Lidia Morawska, Zoran Ristovski, Topi Rönkkö
	Validation results of a reasonably practicable methodology using in-space CO2 concentration to assess ventilation to indoor spaces		Peter McGarry	Peter McGarry, Lidia Morawska, Henry Oswin
	A Dual-Action Approach for CO2 Adsorption and Water Vapor Impact on Activated Carbon Filters		Jongsoo Jurng	JONGSOO JURNG, H.J. HWANG, T.W. KIM , J. S. KIM AND E.S. PARK
	In-situ effectiveness of portable air cleaners		Jeffrey Siegel	Md Rafsan Nahian, Jeffrey Siegel
	HOW CAN WE REIMAGINE THE CONTROL OF AIRBORNE PATHOGENS THROUGH VENTILATION IN THE CONTEXT OF CLIMATE CHANGE?		Lidia Morawska	Wendy Miller, Lidia Morawska, Rob Adams, Daniel Lester, Jason Monty
	PM		Session Chair: Chih-Chieh Chen	
	Symposium- High-Efficiency Engineering Controls for COVID-19 (Room: Ballroom A)		Presenter	Full author list
	Symposium - High-Efficiency Engineering Controls for COVID-19		Chih-Chieh Chen	
	Development of a High-Efficiency Source-Control Device for COVID-19		Chih-Chieh Chen	Sheng-Hsiu Huang, Yu-Mei Kuo, Chun-Wan Chen, Chih-Wei Lin, Ching-Yi Chiu, Chieh-Ling Chen, Chih-Chieh Chen

	Miniature electrostatic precipitator for personal protection	Ilpo Kulmala	Kulmala Ilpo, Salo Satu, Tella Susanna, Koskinen Patrik
	Development of a Compact and Easy-Breathing Receptor Control Device for airborne contaminants	Sheng-Hsiu Huang	Sheng-Hsiu Huang, Hsing-Yu Yeh, Chun-Wan Chen, Po-Chen Hung, Chih-Wei Lin, Chih-Chieh Chen
	Study on Performance Test Methods of Air Cleaners	Chih-Wei Lin	Chih-Wei Lin, Sheng-Hsiu Huang, Yu-Mei Kuo, Chun-Wan Chen, Chun-Ming Chang, Chih-Chieh Chen
	Field demonstration of a tracer method to track simulated exhaled air trajectories and mixing in three connected rooms with upper-room GUV	Chai Yoon Um	Chai Yoon Um
	Health Benefits vs. Harms from Different Indoor Air Cleaner Technologies	Zhe Peng	Zhe Peng, Jose-Luis Jimenez, Daven Henze, Charles Weschler, Patrick Kinney, Shelly Miller, Joost de Gouw
	Experimental Study on Optimal CADR Filter Thickness of Air Purifiers	Cindy Lin	Cindy Lin, Pei-Yao Tsai, Sheng-Hsiu Huang, Yu-Mei Kuo, Chun-Wan Chen, Chih-Wei Lin, Chih-Chieh Chen

Podium Presentations/Workshops/Symposia: Dampness, Mold, and Indoor Microbiome

MONDAY

AM		
Workshop- Beyond Mold in the Indoor Environments (Room 312)		Presenter
Workshop: Beyond Mold in the Indoor Environments: Interactive Discussion on Current State of Knowledge and Future Research Directions (Sponsored by STC 13)		Andrew Hoisington
<p>Fungal constituents in the indoor environment continue to garner attention due to their connect to water damage and associated negative health outcomes. While sampling, analyzing, and understanding of indoor fungi have been an important endeavor, exposure to other biological constituents also needs to be better understood. Recently, Initial studies of mold exposure and health effects have broadened to investigations on indoor bacteria, pathogen transmission, virus removal, and antimicrobial surfaces to name a few topics. However, additional research is needed to fully understand the non-fungal microbiology in an area that humans spend more than 90% of their lives. The aim of this workshop is to bring forward a discussion on fundamental knowledge and future research direction of non-fungal agents in the indoor environments. To accomplish this aim, we propose four speakers with a broad assignment to introduce their recent research and summarize current literature and future direction for 15 minutes each after a brief introduction by the organizers. Those same speakers will lead four discussion groups with audience members selecting what groups they would like to join. The groups that will expand discussions outside of mold include: (1) sampling methods and advanced molecular techniques for sample analysis; (2) indoor bacteria: diversity and health; (3) anti-microbial products indoors; (4) virus transmission. We believe this workshop will bring renewed attention to the indoor microbiome beyond mold and could provide a catalyst for future research in this important field.</p>		

TUESDAY

AM		
Session Chairs: Sarah Haig and Naomichi Yamamoto		
Session- Dampness, Mold, and Indoor Microbiome 1 (Room 312)	Presenter	Full author list
Characterizing the Interactions between Plant and Indoor Air Microbiomes	Bridget Hegarty	Bridget Hegarty, Abigail Leslie, Muhtashim Rafiq Chowdhury
Impacts of Outdoor Vegetation on Indoor Residential Microbiomes	Juan Maestre	Juan P. Maestre, David Jarma, Evan Williams, Dennis Wylie, Sharon Horner, Kerry Kinney
From Harvest to House: Co-developing pathways to sustainable housing and healthy indoor environments in First Nations communities	Sarah Haines	Sarah Haines,, Helen Stopps
Indoor metabolites and chemicals as potentially better predictors on childhood asthma and rhinitis than indoor microbiome	Zhuohui Zhao	Yu Suna, Hao Tangb, Shuang Dub, Xi Fu, Zhuohui Zhao
Burdens of respiratory illnesses in school staff can be predicted with dampness and mold scores assessed with the NIOSH DMAT	Ju-Hyeong Park	Ju-Hyeong Park, Jerry Roseman, Jean Cox-Ganser
Comparing changes to indoor microbiome of dust collected from the International Space Station and homes on Earth upon exposure to excess moisture	Nicholas Nastasi	Nicholas Nastasi, Ashleigh Bope, Marit Meyer, John Horack, and Karen Dannemiller
Ventilation in Chinese elementary schools and its association with respiratory infections	Yuxia Sun	Yuxia Sun, Feihu Yang, and Jing Hou
PM		
Session Chairs: Irvan Luhung and J. P. Maestre		
Session- Dampness, Mold, and Indoor Microbiome 2 (Room 312)	Presenter	Full author list
Fungal function provides novel targets for indicators of mold growth in homes	Neeraja Balasubrahmaniam	Neeraja Balasubrahmaniam, Jonathan King, Ashleigh Bope, Bridget Hegarty, Karen C. Dannemiller
Impact of Building Operational Parameters on Mold Status Classification	Irvan Luhung	Irvan Luhung, Bridget Hegarty, Jordan Peccia
Hidden Hazards: Establishing the influence of controllable home environment factors on fungal density, diversity, and environmental relative moldiness	Jemima Ohwobete	Jemima-Ederwoma Ohwobete, Sarah Haig
Balancing Water Conservation and Health: Do water saving showerheads impact the microbes we breathe in during showering?	Sarah Haig	Sarah Pitell, Cheolwoon Woo, Evan Trump, and Sarah Haig
Associations between early-life fungal exposures in homes and atopic/gastrointestinal disease are modified by breastfeeding	Jon King	Jon C. King, Luis M. Acosta, Matthew Perzanowski, Anne Marie Reardon, Stephanie Lovinsky-Desir, Adnan Divjan, Ginger L. Chew, Karen C. Dannemiller

	From bacteria, fungi, and viruses to microbial communities: How does indoor daylight affect the built environment microbes?	Sepideh Pakpour	Man In Lam, Michael Zhao, Sophia Liao, Sam Yeo, Kinga Vojnits, Piers MacNaughton, Sepideh Pakpour
	Cooking-Associated Organic Compounds Drove the Bacterial Concentration, Diversity and Composition on Household Surfaces	Wing Lam Chan	Wing Lam Chan, Huiju Lin,, Yin Hau Lam, Theodora Nah, Patrick K.H. Lee,,

Podium Presentations/Workshops/Symposia: Health Outcomes and Exposure Assessment

MONDAY

AM		Session Chairs: Charles Weschler and Linchen He	*FEATURE TRACK
Session- Health Outcomes and Exposure Assessment 1 (Room: Ballroom B)		Presenter	Full author list
Human physiological responses to indoor CO2 concentrations and the re-sulting reduction in CO2 emission rates		Kazuki Kuga	Kazuki Kuga, Jiayi Zhu, Pawel Wargocki, Kazuhide Ito
Mechanism for CO2 Induced Cognitive Impairment		Howard Kipen	Frederic T. Lu, Disha Gupta, Nancy Fiedler, Usha Satish, Kathleen G. Black, Alicia Legard, Adriana De Resende, Changjiang Guo, Andrew J. Gow, and Howard M. Kipen
Prenatal Exposure to PM2.5 Associated with Glucose Metabolism and Adiposity in Young Children		Yunhui Zhang	Hang Wang, Liyi Zhang, Ying Tian, Yunhui Zhang
Oxidative potential of the particulate matter emitted from common household sources		P. S. Ganesh Subramanian	P. S. Ganesh Subramanian, Zhuying Dai, Brent Stephens, Mohammad Heidarinejad, Vishal Verma
Synergistic Effects of Ozone Reaction Products and Fine Particulate Matter on Pulmonary Physiology in Children with Asthma		Linchen He	Linchen He, Charles J. Weschler, Glenn Morrison, Marilyn Black, Michael H Bergin, and Junfeng (Jim) Zhang
The Effects of Indoor Air Filtration on Cardiometabolic Outcomes Among Individuals in Urban Los Angeles		Jim Zhang	Chenyu Qiu, Jiawen Liao, Wu Chen, Zhenchun Yang, Yan Lin, Ruoxue Chen, Yihui Ge, Enrique Trigo, Sulema I Saravia Rodriguez, Vivien Le, Michael H. Bergin, Marilyn Black, Howard N. Hodis, Frank D. Gilliland, Junfeng (Jim) Zhang, Zhanghua Chen
Characterization of Human Exposure Sources in Human Hair and Indoor Dust using a Thermal Desorption Vocus-PTR-TOF-MS (TD-Vocus).		Anna Neville	Anna C. Neville, David Jarma, Kerry A. Kinney, and Pawel K. Misztal
PM		Session Chairs: Heidi Salonen and Pertti Pasanen	
Symposium- Children Exposure + Health in Day-Care and Schools (Room 316 A/B/C)		Presenter	Full author list
Symposium- Exposure and adverse health effects of children in day-care centers, schools and other public indoor environments		Heidi Salonen	
Associations of allergic diseases with indoor and outdoor living environments in preschool children in the Taipei Metropolis		Hsing Jasmine Chao	Hsing Jasmine Chao, Ya-Wen Yang, Ssu-Yin Chen, Ming-Lun Zou, Yi Hua Chen, Ling-Chu Chien
Exposure to particles in schools – how to control it		Pertti Pasanen	Pertti Pasanen, Maija Leppänen, Hanna Koponen, Olli Sippula, Marko Hyttinen
Roles of various chemical personal care consumer products on IAQ in public secondary school classrooms and teaching hair/nail salon rooms		Derek Shendell	Derek G. Shendell, D.Env, MPH, Juhi Aggarwal, BA, MPH, Maryanne Campbell, BS, and Midhat Rehman, BS, MPH
The impacts of cleaning on the airborne and surface microbiota in Finnish primary school classrooms.		Anniina Salmela	Martin Täubel,, Emmanuelle Castagnoli, Hanna Leppänen, Camilla Vornanen-Winqvist , Miina Juntunen, Leila Kakko, Tuomas Alapieti, Anniina Salmela, Raimo Mikkola, Maria Valkonen, Heidi Salonen
District-wide bond program for school renovation and upgrading - implications on indoor environmental quality and health		Richard Shaughnessy	Ulla Haverinen-Shaughnessy, Richard Shaughnessy
Improving learning through classroom experience in East Africa; Prelimi-nary findings		Oluyemi Toyinbo	Oluyemi Toyinbo, Eunice Jengo, Xuzel Villavicencio Peralta, Björn Haßler
Occupants' exposure to indoor air contaminants in European sports halls		Heidi Salonen	Heidi Salonen, Camilla Vornanen, Emmanuelle Castagnoli, Raimo Mikkola, Martin Täubel, Tunga Salthammer, Lidia Morawska

TUESDAY			
	AM	Session Chairs: Howard Kipen and Jim Zhang	
	Session- Health Outcomes and Exposure Assessment 2 (Room 314)	Presenter	Full author list
	Determination of Permeation Parameters for Dermal exposure to Endocrine-Disrupting Compounds in consumer products	Zidong Song	Zidong Song, Ying Xu
	Using portable CO2 monitors to explore the air quality of indoor spaces	Henry Oswin	Henry Oswin, Lucien Glachant, Lidia Morawska
	Indoor air pollution in low-income countries – assessment and characteri-zation of particulate matter from cooking with solid biofuels	Christina Isaxon	Axel Eriksson, Asmamaw Abera, Ebba Malmqvist, Christina Isaxon
	Assessing toxicity of PM2.5 from indoor sources and during exposure in private homes	Aneta Wierzbicka	Aneta Wierzbicka, Jonas Enarsson, Anne Thoustrup Saber, Bo Strandberg, Joakim Pagels and Nicklas Raun Jacobsen
	Indoor exposure to carbonyls associated with biomarkers of oxygen-carrying capacity of blood among college students in Lhasa, Tibet	Ruohong Qiao	Ruohong Qiao, Qiaoyi Hua, Yingjun Liu, Jicheng Gong, Tong Zhu
	Towards Developing an Indoor Air Pollution Emission Inventory for the UK: Challenges and Future Directions	Christian Pfrang	Andrea Mazzeo, Zaheer Ahmad Nasir, and Christian Pfrang
	Leveraging Multimedia PFAS Exposure Data to Understand Important Residential Sources and Pathways	Elaine Cohen Hubal	Elaine Cohen Hubal, Nikki Deluca, Jason Boettger, Jeffrey Minucci, Dylan Wallis, Lisa Melnyk, James McCord, Kent Thomas
	AM	Session Chairs: Jinping Zhang and Sani Dimitroulopoulou,	
	Workshop- The Burden of Disease of Indoor Air Pollutants (Room 316 A/B/C)	Presenter	
	Workshop Estimating and Comparing the Burden of Disease of Indoor Air Pollutants (BD-IAPs) Globally	Yinping Zhang	
	<p>Abstract: Indoor air pollution has been neglected compared with ambient outdoor pollution. People spend over 80% of their time indoors – why doesn't indoor air pollution problem attract more attention? A key reason may be that insufficient burden of disease data have been obtained for indoor air pollution internationally. Quantification and comparison of the burden of disease is a useful tool for risk communication, can allow for economic evaluations, and support evidence-informed decision- and policy-making. Although much research has been done in Europe and USA, some work has been completed in China and very little has been conducted in India. In China and India whose population is nearly 3 billion, exposure indoors to pollution originating both indoors and outdoors is quite severe. Thus, for global estimates of burden of disease from indoor air pollution, data from the two largest Asian countries (China and India) is strongly required.</p> <p>To address this problem co-operatively, experienced European, American, and Asian researchers are invited to constitute a panel. Following their presentations, all attendees are invited to participate in a discussion.</p> <p>Speakers and titles of the presentations Hänninen Otto (Finland, otto.hanninen@thl.fi), burden of disease of indoor air pollution globally, a chapter in Handbook of Indoor Air Quality, 15 minutes (video presentation) Sani Dimitroulopoulou (UK, Sani.Dimitroulopoulou@ukhsa.gov.uk, BD-IAPs in UK 15 minutes. Yinping Zhang (China, zhangyp@tsinghua.edu.cn), BD-IAPs in urban China, 15 minutes. Vinod Kumar Sekar (India, vinodsekar@icloud.com), research request of BD-IAPs in India, 15 minutes.</p> <p>Discussion (Panel and participants), 30 minutes. The following experts will attend the workshop: China: Hua Qian Denmark: Pawel Wargocki. USA: Ningrui Liu, Louise Weschler, Charles Weschler,</p>		
	PM	Session Chairs: Andrea Ferro and Lupita Montoya	
	Workshop- Community Engaged Research for Improving IAQ (Room 316 A/B/C)	Presenter	
	Workshop - Community Engaged Research Framework for Improving Indoor Air Quality and Addressing Environmental Justice and Climate Change	Andrea Ferro	

Community Engaged Research (CER) is a research discipline that supports joint knowledge creation with communities. Interest in CER and funding for CER are growing with the recognition that equitable and ethical community partnerships and shared knowledge creation are necessary to address environmental justice. Rigorous CER approaches have been developed that can produce the desired research outcomes and reduce the inherent risk of harm to partner communities. The CER process, outputs, and outcomes, however, can differ from those of traditional research methodologies. Building on existing CER scholarship will enable the indoor air research community to properly conduct and assess CER. This workshop seeks to convene scholars actively engaged in CER as well as those interested in CER. The workshop will focus on understanding and promoting appropriate methodologies for participation and valuation of CER.

WEDNESDAY

AM		Session Chairs: Pawel Misztal and Nick Nastasi	
Session- Health Outcomes and Exposure Assessment 3 (Room 314)		Presenter	Full author list
Examining Environmental Contentment and Job Efficiency in Offices: An Assessment of Hot Desking's Impact on Post Occupancy Evaluation		Joon-Ho Choi	Shreya Satodia, Joon-Ho Choi, Saba Imani
TIME-DEPENDENCE AND INDIVIDUAL VARIATION IN SENSORY IRRITATION FROM MASKED EXPOSURE TO ACROLEIN		Anna-Sara Claeson	Anna-Sara Claeson, Eduardo Rosa and Steven Nordin
Dormitory PM2.5 exposure and its association with an acute inflammation biomarker: A panel study in Lhasa, Tibet		Yingjun Liu	Ruohong Qiao, Wu Chen, Tong Zhu, Jicheng Gong, Yingjun Liu
Health Footprint of Endocrine-Disrupting Chemicals in Consumer Products: A System-of-Systems Approach		Yili Wu	Yili Wu, Hongwan Li, Yujie Fan, Elaine A. Cohen Hubal, John C. Little, Clara M. A. Eichler, Chenyang Bi, Zidong Song, Ying Xu
High ambient air pollution undermines the effect of clean cooking fuels in preventing low birth weight		Sagnik Dey	Ritu Parchure, Ekta Chaudhary, Shrinivas Darak, Santu Ghosh, Alok Kumar, Sagnik Dey
IAQ national survey in French dwellings 2020-2023: protocols and quality measurements		Olivier Ramalho	Man In Lam, Michael Zhao, Sophia Liao, Sam Yeo, Kinga Vojnits, Piers MacNaughton, Sepideh Pakpour
Exposure Risk and Characteristics of Bisphenol A and Its Substitutes in the General Taiwanese		Po-Chin Huang	Po-Chin Huang, Yu-Jung Lin, Hsin-Chang Chen, Wan-Ting Chang, Jung-Wei Chang
PM		Session Chairs: Bridget Hegarty and Jim Zhang	
Session- Health Outcomes and Exposure Assessment 4 (Room 316 A/B/C)		Presenter	Full author list
Results from nationwide survey of healthcare professional's attitudes, beliefs, and practices around indoor air quality		Jill Heins-Nesvold	Jill Heins-Nesvold
Long term monitoring of indoor carbon monoxide levels in disproportionately impacted Neighborhoods in Denver		Shelly Miller	Sumit Sankhyani, Aniya K. Hollo, Dulce Gonzalez-Beltran, Nicholas Clements, Shelly L. Miller
Reducing Measured Levels of Household Chemicals Plus Educational Intervention Reduces Symptoms of Chemical Intolerance		Carl Grimes	Carl Grimes
The InChildHealth Walkthrough Survey – towards a standardized characterization of classrooms for Indoor Air Quality studies in Europe		Katrin Vorkamp	Katrin Vorkamp, Carla Viegas, Marta Almeida, Maria Antonia Aretaki, Rossana Bossi, Emmanuelle Castagnoli, Renata Cervantes, Judith Desmet, Evangelia Diapouli, Alan Domínguez, Claudia M. Fabian, Patrik Fauser, Robert M.W. Ferguson, Ulla Haverinen-Shaughnessy, Timo Hugg, Pentti Kuorola, Mihalis Lazaridis, Andreas Massling, Inês Paciência, Pedro Pena, Aino K. Rantala, Teresa Schaefer, Mar Viana, Camilla Vornanen-Winqvist, Linyan Zhu, Heidi Salonen

THURSDAY

AM		Session Chairs: Pawel Wargocki and Gabriel Beko	
Session- Health Outcomes and Exposure Assessment 5 (Room 311)		Presenter	Full author list

	Association between Paraben Exposure and Thyroid Indicators in Taiwanese Pregnancy women	Hsi Chen	Hsi Chen, Po-Chin Huang, Jung-Wei Chang, Yu-Lung Lin, Hsin-Chang Chen, Wan-Ting Chang
	Modelling the accumulation of phthalates in the respiratory tract during long-term inhalation	Haoyu Dang	Haoyu Dang, Pengfei Zhang, Runjie Li, Jiachen Zheng, Xinke Wang
	Newer New Jersey Public Secondary School Teachers and Potential Exposure to Chemicals in Cleaning, Disinfecting and Sanitization Product in their Work	Derek Shendell	Derek G. Shendell, D.Env, MPH, Juhi Aggarwal, BA, MPH, Maryanne Campbell, BS, Midhat Rehman, BS, MPH, and Koshy Koshy, PhD, MS,,
	Predicting Absence Rates Due to Indoor Environmental Quality in Pre-Retrofitted USA Schools: An Analytical Study on Classroom Parameters	Oluyemi Toyinbo	Oluyemi Toyinbo, Richard Shaughnessy, Ulla Haverinen-Shaughnessy
	Exposure Distribution and Profiles of Paraben in Taiwanese (2013-2016)	Jung-Wei Chang	Jung-Wei Chang, Yen-Hsuan Huang, Yu-Jung Lin, Hsin-Chang Chen, Wan-Ting Chang, Po-Chin Huang
	Exposure Profile and risk assessment of parabens in a representative Taiwanese population	Yen Hsuan Huang	Yen-Hsuan Huang, Po-Chin Huang, Jung-Wei Chang, Hsin-Chang Chen, Yu-Jung Lin, Wan-Ting Chang
	The Role of Offices in Workers’ Resilience	Nodoka Tagawa	Nodoka Tagawa, Masanari Ukai, Kosuke Iihara, Toshiki Shinno, Osamu Kiyota, Osamu Kunitomo, Hiromichi Nishida, Shin-ichi Tanabe
	PM	Session Chair: Pawel Misztal	
	Workshop- Novel Methods for Indoor Chem Exposure Measurements (Room 312)	Presenter	
	Workshop- Novel Methods for Indoor Chemical Exposure Measurements	Pawel Misztal	
	<p>Holistic understanding of human exposure indoors is challenged by the chemical complexity of indoor sources and the lack of sufficiently resolved measurements indoors and exogenous exposome markers in human bioeffluents. Following the Paracelsus quote, “It is not the compound but the dose that makes the poison”, the measured compounds concentration should be considered not only in terms of their abundance but also toxicity. Recent, time-resolved laboratory and building-scale observations, point to complex processes on indoor surfaces, indoor dust, the role of occupants, and factors such as relative humidity governing chemical and microbial activity on indoor surfaces. Measuring human exposure directly indoors is one approach while the analysis of biosamples including breath, hair, skin can be helpful to understand the link between human exposure and bioaccumulated exogenous chemicals emitted from the human volatilome. The progress in technological advances to measure time-resolved concentrations of hundreds of chemical markers at high time and chemical resolutions has been remarkably fast and the new methods have only been finetuned over the last several years. The overarching goal of this workshop is to inspire thinking about novel approaches to exposure measurements in the context of emissions of volatile organic compounds and the processes including indoor pollutant removal and/or chemical transformations. The workshop aims at more holistic rapid approaches for the analysis of exposure source emissions comprising the human indoor exposome. The workshop consists of introduction by workshop chairs and invited keynote presentations, followed by Q&A session. We will endeavor sending a Vocus PTR-TOF-MS for an in-workshop demonstration. Workshop summary report and a collaborative paper with interested workshop attendees are envisaged following this workshop.</p>		
	PM	Session Chair: Xiaojun Fan	
	Symposium- Bedroom Environment and Sleep Quality (Room 311)	Presenter	Full author list
Symposium- Bedroom environment and sleep quality: current knowledge, progress, future	Xiaojun Fan		
Impact of overheated bedroom conditions on occupant thermal comfort and sleep quality: An experimental study	Jaydeep Bhadra	Jaydeep Bhadra, Arash Beizaee, Iuliana Hartescu Kevin Lomas	
Effect of low set temperature of bedroom heating system on sleep thermal comfort	Xiaojing Zhang	Xiaojing Zhang, Tianyang Zhang, Jingchao Xie, Jinyue Zhou	
Effect of indoor thermal environment before bedtime on sleep in winter	Misaki Miyazaki	Misaki Miyazaki, Tomomi Kanou, Shintaro Ando, Toshiharu Ikaga	
A pilot study of Indoor PM2.5 Exposure and their correlation with the sleep behaviors of the Aging and Dementia Population in Pacific Northwest in USA	Wan-Tai Au-Yeung	Wan-Tai Au-Yeung, Josephine Lau, Chao-Yi Wu, Hiroko Dodge, Joel Steele, Zachary Beattie, Jeffrey Kaye	
A Case Study on the Effect of Mat Surface Temperature and Sleep Quality in Cooling Season	Jeongwon Kim	Jeong Won Kim, Hyeun Jun Moon	

	How much ventilation is necessary to avoid disturbance to sleep?	Pawel Wargocki	Pawel Wargocki, Mizuho Akimoto, Xiaojun Fan, Kazuya Matsuo, Chandra Sekhar, and Li Lan
	Effect of Ventilation and CO2 on Sleep Quality and Cognitive Performance	Xiaojun Fan	Kazuya Matsuo, Xiaojun Fan, Pawel Wargocki

Podium Presentations/Workshops/Symposia: Indoor Chemistry, Sources, and Transformation

MONDAY

AM		Session Chair: Clara Eichler and Barbara Turpin	
Symposium- Emerging indoors contaminants and measurement advances (Room 316 A/B/C)		Presenter	Full author list
Symposium- Fantastic chemicals and how to find them: Emerging indoors contaminants and measurement advances		Clara Eichler	
Ionic PFAS on Indoor Surfaces and PM2.5 Quartz Fiber Filters in North Carolina Homes: Findings from the Indoor PFAS Assessment (IPA) Campaign		Barbara Turpin	Naomi Y. Chang, Clara M.A. Eichler, Daniel E. Amparo, Jason D. Surratt, Glenn C. Morrison, Barbara J. Turpin
Measuring emission profiles of neutral PFAS in waterproof clothing materials using I-HR-ToF-CIMS		Clara Eichler	Clara Eichler, Michael Davern, Jason Surratt, Glenn Morrison, Barbara Turpin
Surface to particle partitioning of reactive oxygen species (ROS)		Glenn Morrison	Zhenduo Yao, Glenn Morrison
Multiphase oxidation of bisphenol A and alternatives: rapid processes indoors		Jie Yu	Jie Yu, Yufeng Gong, Hui Peng, Jonathan P. D. Abbatt, and John Liggio
Automated liquid calibration and aerosol sampling inlet for online measurements of airborne PFAS in indoor environments		Chenyang Bi	Chenyang Bi, Michael Davern, Clara Eichler, Mitchell Alton, Anita Avery, Barbara Turpin, Jason Surratt, John Jayne, Manjula Canagaratna,
Impacts of Ozone Surface Oxidation on Air Quality		Jillian Downey	Jillian Downey, Pascale Lakey, Manabu Shiraiwa, Jonathan P.D. Abbatt
Spectroscopy as a Probe of Indoor Surface Chemistry		Vicki Grassian	Vicki Grassian
PM		Session Chair: Vito Ilacqua	
Workshop- When Does Indoor Air Chemistry Matter? (Room: Ballroom C)		Presenter	
Workshop - When does indoor air chemistry matter? Translating research into guidance		Vito Ilacqua	
<p>Indoor chemistry, the interaction between chemicals in the air and on surfaces in indoor environments, plays an important role in shaping the quality of indoor air. Decades of research has improved our understanding of the chemistry of the indoor environment, yet further progress is needed in translating research findings into practical indoor air quality strategies and guidance. It is not always clear what actions people may or should take to protect their health from the potential harmful effects of chemical transformations indoors, or whether these potential actions differ from existing and effective indoor air quality strategies for controlling individual indoor pollutants. This session will convene scientific experts from academia and government to discuss the practical implications of indoor chemistry research, including what is known about the role of indoor chemistry in influencing human health. The session will focus on translating research findings to inform indoor air quality strategies. The session will begin with an overview of Why Indoor Chemistry Matters, a recent consensus study conducted by the National Academies of Sciences, Engineering and Medicine and sponsored by the U.S. EPA. Speakers will then discuss research findings regarding the quantitative impact of indoor chemistry, which have been explored through modeling studies, such as EPA's Simplified Indoor Air Chemistry Simulator (SIACS); and through experimental measurements in test homes, such as the Net-Zero Energy Residential Test Facility (NZERTF) at the U.S. National Institute of Standards. Finally, speakers will participate in a panel discussion regarding the practical implications of indoor chemistry research and recommendations for the public.</p> <p>Associated Submitted abstracts:</p> <p>1) Why Indoor Chemistry Matters – Insights from a National Academy of Sciences Report
David A. Butler, Delphine Farmer *, Dustin Poppendieck</p> <p>2) Relative Contributions of Indoor Chemistry to Indoor Air Concentrations Danny Malashock, Jordan Zambrana, Vito Ilacqua*</p> <p>3) Volatile Organic and Inorganic Compounds: Sources, impacts, and strategies to improve indoor
air from the HOMEChem and CASA studies Delphine K. Farmer*, Marina E. Vance</p> <p>4) Lessons learned from HOMEChem and CASA concerning indoor aerosols Marina E. Vance*, Delphine K. Farmer</p> <p>5) Byproduct Formation from Portable Air Cleaners under Standard Test Conditions Dustin Poppendieck*, Raleigh Robertson, Michael F. Link</p> <p>After the presentations, we plan to have a 30-min panel discussions with the presenters, based on the potential guidance items identified live during the presentations. Participants in the room, and if available, remotely will be able to vote on the different items and propose additional ideas for consideration.</p>			

TUESDAY	AM	Session Chairs: Glenn Morrison and Yingjun Liu	
	Session- Indoor Chemistry, Sources, and Transformation 1 (Room: Ballroom C)	Presenter	Full author list
	Chemical characteristics of indoor aerosol particles and surface films	Rachel OBrien	Rachel O'Brien, Cate Shirilla, Amy Hrdina, Emily Legaard, Kathryn Mayer, Marina Vance, Dustin Poppendieck, Delphine Farmer
	High-Resolution Mass Spectrometry Screening of Quaternary Ammonium Compounds (QACs) in Dust from Homes and Various Micro-environments in South China	Guomao Zheng	Yao Cheng, Chenglin Liu, Zhong Lv, Yuge Liang, Yichun Xie, Chen Wang, Sheng Wan, Xinrui Leng, Min Hu, and Guomao Zheng
	New home air quality study (NHAQS): preliminary results of formaldehyde emission rates from composite wood products measured over 1 year	Doyun Won	Doyun Won, Apoorv Shah, Andy Dinh, Maria Giulia Testa, Christie McMann, Corrine Stocco, Keith Van Ryswyk, and Morgan MacNeill
	Research on Microbial and Volatile Organic Compound Exposures in Household Environments with Pets	Junji Cao	Yulei Zhao, Long Cui, Junji Cao
	Effects of Applying "Natural Paints" to Wooden Surfaces on Indoor Air Quality	Naho Tomita	Naho Tomita, Kosuke Ikeuchi, Nami Akamatsu, Yuta Fukawa, Hyuntae Kim, Shin-ichi Tanabe
	Laboratory study on the adsorption and desorption processes of VOCs on simulated wallboards	Jixuan Wang	Jixuan Wang, Yingjun Liu
	Novel Detection of PFAS Vapor Emissions Using PTR-TOF-MS with NO ⁺ Ionization and its Applications	Benjamin Kienzle	Benjamin A. Kienzle, Leif G. Jahn, Lynn E. Katz, Pawel Misztal
WEDNESDAY	AM	Session Chair: John Watson	
	Symposium- Sampling, Chemical Analysis, Apportionment for IAQ (Room: Ballroom C)	Presenter	Full author list
	Symposium- Indoor Air Quality Sampling, Chemical Analysis, and Source Apportionment	John Watson	
	Receptor Model Applications for Indoor Environments	John Watson	John G. Watson, Judith C. Chow
	Chemical Analysis Options for Receptor Model Source Apportionment in Indoor Environments	Judith Chow	Judith C. Chow, John G. Watson
	Indoor versus outdoor contributions to schoolchildren's PM _{2.5} exposure: A case study using low-cost sensors	Antony Chen	L.-W. Antony Chen, John Olawepo, Felicia Bonanno, Aman Gebreselassie, Mi Zhang
	Relationship between building product emissions and indoor air quality	Erik Uhde	Alexandra Schieweck, Nicole Schulz, Jiangyue Zhao, Erik Uhde
	Measurement and Characterization of Particles Generated by Small Electric Motors	Gary Casuccio	Gary Casuccio
	SVOC Quantification in Indoor Dust Collected from Residential Homes in Beaumont/Port Arthur, TX using Thermal Desorption Vocus-PTR-TOF-MS	David Jarma	David Jarma, Sam Lin, Evelyn Deveraux, Anna Neville, Pawel Misztal, Kerry Kinney
THURSDAY	AM	Session Chair: Rachel O'Brien	
	Workshop- Expanding Perspectives for Indoor Chemistry (Room: Ballroom A)	Presenter	
	Workshop: Expanding our perspectives: measurement/modeling discussions of indoor chemistry		Rachel O'Brien
	The chemistry of indoor environments is important to understand because it impacts our health, wellbeing, and comfort. Indoor spaces have a wide variety of chemicals and potential reactions and these environments have become even more complex in the face of climate change as well as large emission sources like wildfires. Advancing our understanding of the impact indoor chemistry has on indoor air quality requires both experimental studies and improvements in model representations of the fundamental and		

Indoor air quality requires both experimental studies and improvements in model representations of the fundamental and larger scale processes. In this special session, we will provide an opportunity to share work and foster discussions about the intersections between experimental and modeling studies. By providing a venue to share novel research in both areas, we seek to promote new collaborations and spark ideas for new studies and funding opportunities. Two talks are included: Impacts of Aging and Relative Humidity on Biomass Burning Smoke in an Indoor Environment (Marina Vance) and Indoor VOC Persistence and Particle Production following Wildfire Smoke and Outdoor Air Pollution Events (Delphine Farmer)

PM		Session Chairs: Tianren Wu and Chen Wang	*FEATURE TRACK
Session- Indoor Chemistry, Sources, and Transformation 2 (Room: Ballroom B)		Presenter	Full author list
Surface reactive oxygen species (ROS) on growing indoor surface films and resulting airborne ROS concentrations	Glenn Morrison	Glenn Morrison, Azin Eftekhari, Pascale Lakey, Manabu Shiraiwa, Bryan Cummings, Michael Waring	
Ozonolysis of human skin oils on indoor surfaces	Charles Weschler	Sarka Langer, Ann Sjöblom, Wojciech Karol Wojnowski, Armin Wisthaler, Tomas Mikoviny, Gabriel Bekö, Charles J. Weschler	
VOC emissions from the human body: the influence of ozone and other factors	Yuekun Qu	Yuekun Qu, Ziwei Zou, Charles J. Weschler, Yingjun Liu, Xudong Yang,	
Investigating the influence of ozone on volatile organic compound emissions from air filters	Junjie Liu	Muhammad Azher Hassan, Junjie Liu	
Indoor Emission, Oxidation, and New Particle Formation of Personal Care Product Related Volatile Organic Compounds	Tianren Wu	Tianren Wu, Tatjana Müller, Nijing Wang, Joseph Byron, Sarka Langer, Jonathan Williams, Dusan Licina	
Why do floor-cleaners with no formaldehyde in their compositions are in-door sources of formaldehyde?	Frédéric Thevenet	Gabriel Rossignol, Vincent Gaudion, Marie Verrièle, Melanie Nicolas, Frédéric Thevenet	
Identification of volatile organic compounds from topical drugs and medical products: Effects on air quality and healthcare environments	Amber Yeoman	Amber Yeoman, Ally Lewis, Martyn Ward	

Podium Presentations/Workshops/Symposia: Policy, Regulation, and Standards

MONDAY	AM		Session Chair: Hannah Carter	
	Workshop- School IAQ Research Agenda that Fuels Action (Room 311)		Presenter	
	Workshop- Setting a School IAQ Research Agenda that Fuels Action		Hannah Carter	
	<p>The importance of indoor air in U.S. schools became more glaring than ever during the COVID pandemic, and school systems (particularly large systems) have increased their sophistication around monitoring and managing indoor air in their classrooms. To expand and build on this focused attention will require advocates and researchers to stay responsive to the needs of school facilities managers and environmental health staff as they attempt to implement best practices. This workshop will further an important dialogue between school staff and indoor air quality researchers about how to get actionable information into the hands of the people who need it. On October 20, 2023, the Center for Green Schools at the U.S. Green Building Council hosted a School IAQ Research Summit in partnership with the U.S. DOE's Building Technologies Office, ISIAQ, AASA, ASHRAE, and CHPS. The objectives of this summit were (1) to bring school systems and school IAQ researchers together to brainstorm a new generation of research questions and (2) to craft recommendations for partnerships between schools and researchers. The proposed 90-minute workshop will build on the results of this summit (and any intervening progress) to explore school data collection and analysis options and to deepen the research community's understanding of how to address the on-the-ground needs of school district staff. We will begin by presenting the summit's outcomes, will then lead the participants through a group exercise to prioritize elements of a research agenda for school IAQ, and will finally invite collaborators to host small group discussions around the prioritization exercise. Expert contributors and small-group facilitators: Gary Bignami (Hawaii Department of Education), Jeff Siegel (University of Toronto), Ulla Haverinen-Shaughnessy (The University of Tulsa), Derek Shendell (Rutgers School of Public Health), Sheryl Magzamen (Colorado State University), Andrew Persily (National Institute of Standards and Technology), Parham Azimi (Harvard University), Josephine Lau (University of Nebraska-Lincol), and Pawel Wargocki (Technical University of Denmark).</p>			
TUESDAY	AM		Session Chairs: Odessa Gomez and Paula Osliewski	
	Session- Policy, Regulation, and Standards 1 (Room 311)		Presenter	Full author list
	Worldwide Carbon Dioxide Guidelines for Indoor Air Quality: A Review	Mark Mendell	Mark J. Mendell, Wenhao Chen, Dilhara R Ranasinghe, Rosemary Castorina, Kazukiyo Kumagai	
	Indoor exposure to Δ9-tetrahydrocannabinol (THC) from the consumption of cannabis products	Tunga Salthammer	Tunga Salthammer	
	Finnish guidelines for treatment of symptoms associated with indoor air: well-rounded recommendations formulated through consensus process	Kati Huttunen	Kati Huttunen, Tuomas Sorto., Jorma Komulainen, Sirkku Pikkujämsä, Taneli Puuma-lainen	
	Evaluating Indoor Climate Interventions: Balancing Sustainability and Health Outcomes	Asit Kumar Mishra	AK Mishra, P Wargocki, EJ O'Reilly	
	The difference of creating comfortable indoor and outdoor thermal envi-ronment: the changing trend of standards and research directions	Yongxin Xie	Yongxin XIE, Jianlei Niu	
	Characterizing indoor environment quality and energy efficiency improvement opportunities in U.S. commercial kitchens	Jiayu Li	Jiayu Li, Wanyu R. Chan, Brett Singer, Stefano Schiavon, Todd Bell, Richard Young	
	The conversion of steady-state formaldehyde test chamber concentrations to different climatic conditions	Tunga Salthammer	Tunga Salthammer	
WEDNESDAY	AM		Session Chair: Ulla Haverinen-Shaughnessy	
	Workshop- IEQ Guidelines Worldwide - Recommendations (Room 312)		Presenter	
	Workshop- ISIAQ STC 34 IEQ Guidelines Worldwide - Recommendations		Ulla Haverinen-Shaughnessy	
<p>The workshop will discuss guidelines related to indoor environmental quality, focusing on the work of ISIAQ STC 34. The STC has established a publicly accessible database of IEQ guidelines from around the world (www.ieqguidelines.org). The workshop will explain how to use the database, share how the committee and others have used the database, and discuss future uses and recommendations.</p> <p>Workshop program: 1. Database updates and demonstration: Ian Cull, Henna Maula, Xiaoni Fan</p>				

1. Database updates and demonstration: Ian Cui, Neha Maule, Xiaojun Fan
2. Future directions and recommendations: Oluyemi Toyinbo, Sani Dimitroulopoulou
3. Guest speakers / commentaries: Lidia Morawska, Mark Mendell, and Bowen Du
4. Discussion: Ju-Hyeong Park, Ulla Haverinen-Shaughnessy

PM	Session Chair: Alex Zhu
Workshop- Introducing the Model Clean Indoor Air Act (Room: Ballroom A)	Presenter
Workshop-Introducing the Model Clean Indoor Air Act	Alex Zhu
<p>Unlike outdoor air, indoor air quality in the United States is not comprehensively regulated. The Model Clean Indoor Air Act (Model Act), developed in 2023 with the input of an expert national advisory group, provides a template for states to create legislation to monitor, regulate, and improve indoor air. In this workshop, the authors of the Model Act will discuss its public health and legal aspects, implementation challenges, and updates on its adoption. Indoor air within public buildings can be made safer for all through filtration, ventilation, and other measures. The Model Act provides state legislatures with a regulatory blueprint to:</p> <ul style="list-style-type: none"> • Develop their own precise regulatory language and establish their own protective airflow rates and allowable contaminant levels that are appropriate to local conditions. • Mandate IAQ testing in publicly accessible buildings and require public posting of IAQ test results so that building occupants know the quality of the air they are breathing. • Establish a system for people to file complaints about bad air quality and respond to those complaints, often with inspection by a state agency. • Incentivize building owners to assess their HVAC systems and voluntarily make repairs and upgrades when necessary to improve IAQ. • Establish procedures for IAQ inspections and penalties for noncompliance. • Authorize a state agency to collect data, conduct research, and develop an IAQ plan, including the production of educational content. 	
PM	Session Chair: Richard Shaughnessy
Workshop- Should surface cleanliness be an IEQ factor? (Room: Ballroom C)	Presenter
Workshop- Should surface cleanliness and hygiene be considered as an independent IEQ factor?	Richard Shaughnessy
<p>Indoor environmental quality (IEQ) has been defined as a perceived indoor experience about the building indoor environment that includes aspects of design, analysis, and operation of energy efficient, healthy, and comfortable buildings. Fields of specialization include architecture, HVAC design, thermal comfort, indoor air quality (IAQ), lighting, acoustics, and control systems (ASHRAE TC1.6). In many publications, including a review on the influence of indoor environmental quality on human health and productivity (Mujan et al. 2019), the emphasis has been given only to the factors that "can be measured and controlled actively: thermal comfort, indoor air quality and ventilation, visual comfort and acoustic comfort". Evaluation models for post-occupancy IEQ often do not seem to include surface cleanliness and/or hygiene, which could lead to it not being routinely assessed. Along with ventilation and filtration of air from harmful pollutants, cleaning is another major technique to physically remove harmful pollutants from buildings and their surfaces thereby reducing opportunities of re-aerosolization of pathogens gravitationally settled on surfaces post-aerosolization indoor. Those pollutants may be related to accumulation and deposition of particulate matter, including microbes such as bacteria and viruses, that remain potentially infectious for hours, days or even months. The aim of this workshop is to discuss whether a much broader inclusion of surface cleanliness and hygiene in the IEQ evaluation models and classification schemes is warranted.</p> <ol style="list-style-type: none"> 1. Bacterial and fungal microbiota in floor dust in schools (Dr. Ju-Hyeong Park, NIOSH and Respiratory Health Division, Morgantown, West Virginia) 2. Dynamics of virus aerosolization and resuspension from surfaces and impact on risk of infection (Dr. Charles Gerba, University of Arizona) 3. Introduction and the results from a school district follow-up cleaning intervention (Dr. Richard Shaughnessy, University of Tulsa) 4. Industry standards for cleaning effectiveness, current and further developments (Carey Vermeulen, Chairman Executive Board, Institute of Inspection, Cleaning, and Restoration Certification, IICRC) 	

Podium Presentations/Workshops/Symposia: Sensors and Monitoring

MONDAY

AM	Session Chairs: Erik Uhde and Xiaoying Li	
Session - Sensors and Monitoring 1 (Room: Ballroom A)	Presenter	Full author list
A Novel Microfluidics-based SAW Sensor for Ultrafine Particle Detection	Thilhara Tennakoon	Thilhara Tennakoon, Tsz-Wai Lai, Sau-Chung Fu, Ka-Chung Chan, Chili Wu, Christopher Yu-Hang Chao, Chun-Ho Liu
Comparison of low-cost sensors under real world conditions	Erik Uhde	Erik Uhde, Nicole Schulz
A field study on long-term operations of air purifiers in classrooms in elementary schools in Korea	Bangwoo Han	Bangwoo Han, Kee-Jung Hong, Gunhee Lee, Dae-Hoon Park, Hak-Joon Kim, Yong-Jin Kim
Ventilation concepts in classrooms: First insights of a long-term monitoring in schools as part of a randomized controlled trial	Susanna Bordin	Susanna Bordin, Sebastian Hummel, Jonathan Griener, Renate Weisboeck-Erdheim, Arno Dentel
Merging ventilation efficiency, air quality and thermal comfort measurements	John Saffell	John Saffell
Comparing Targeted and Measured Ventilation and Filtration Rates in Classrooms Using Low-Cost Sensors	Zoe Hoskin	Zoe Hoskin, Bowen Du, Alexander Mendell, Ahmad Al-Musa, Rafsan Nahian, Sarah Haines, Jeffrey Siegel
Comparison of spot measurement and continuous measurements of CO2 concentrations in Danish schools	Geo Clausen	Geo Clausen, Emilie Patricia Dam-Krogh and Jørn Toftum
PM	Session Chair: Jordan Clark	
Session - Sensors and Monitoring 2 (Room: Ballroom A)	Presenter	Full author list
IAQ national survey in French dwellings 2020-2023: formaldehyde, benzene and particulate matter levels	Virginie Desvignes	Virginie Desvignes, Olivier Ramalho, Claire Dassonville, Anthony Gregoire, Sutharsini Sivanantham, Emma Lafaurie, Maria-José Rueda Lopez, Driss Samri
Humans and Their Dogs' Pesticide Air Exposure Concentrations in Boulder Colorado Using Passive Wearable Monitors	Shelly Miller	Aniya Khalili Hollo , Emily Johnson, Elizabeth Z. Lin, Rella Abernathy, Krystal J. Godri Pollitt, Shelly L. Miller*
A Longitudinal Evaluation of Indoor Environmental Quality in Educational and Work Environments	Adam Collison	Adam K. Collison, Miriam A. Byrne, James A. McGrath
What Can We Learn About Classroom Air from Low-cost Sensors? A study on CO2 and Volatile Organic Compounds in Danish Schools	Sara Bjerre Sørensen	Sara Bjerre Sørensen, Kasper Kristensen
How to deploy sensors for IEQ monitoring in a large space? A case study of an airport terminal based on the quantitative optimization method	Mufeng Yuan	Mufeng Yuan, Yang Geng, Borong Lin
Development and Validation of a Wrist-based Personal Monitoring Device for Environmental Exposure and Physiological Parameters	Jianbang Xiang	Xinjie Dai, Chunliang Wang, Kai Su, Linmin Hu, Siqing Wu, Xixian Fang, Jianbang Xiang
Session chair led panel discussion and extended Q+A		

TUESDAY

PM	Session Chair: Patricia Fabian	
Symposium - Improving indoor environmental quality in K-12 schools (Room: Ballroom C)	Presenter	Full author list
Symposium: Improving indoor environmental quality in K-12 schools: innovations, challenges and consensus	Patricia Fabian	
Characterization and Control of Room Air Mixing Regimes and PM exposures in a Large Cohort of Public Elementary School Classrooms	Mark Hernandez	Mark Hernandez, Kristina Petrov, Isaac Chevarria, Anna Segur and Odessa Gomez
Leveraging K-Means clustering to reveal particulate patterns and assessing the impact of particle filtration in Midwestern elementary classrooms in US	Daud Nosham and Josephine Lau	Daud Nosham, Josephine Lau, James A. Bovaird
Studying the efficiency of air cleaners at removing various indoor air impurities in classrooms and the relation to pupils' perceived symptoms	Kati Huttunen	Hanna Leppänen, Miina Juntunen, Tarja Yli-Tuomi, Pekka Taimisto, Kaisa Jalkanen, Taina Siponen, Kati Huttunen, Anne Hyvärinen, Martin Täubel
CO2 concentrations in twenty-four primary schools in Switzerland	Bowen Du and Joan Rey	Bowen Du, Joan Rey, Matias Cesari, Claude-Alain Roulet, Joëlle Goyette Pernot, Dusan Licina
Healthy School; Healthy Air Project effectiveness reporting	Elena Austin	Elena Austin, Alicia Kusaka, Jeffry Shirai, Timothy Gould, Maria Tchong-French, Edmund Seto

	Indoor environmental quality (IEQ) monitoring in K-12 schools: decision & research support for operations, climate, and pandemic resilience	Patricia Fabian and Katherine Walsh	Patricia Fabian and Katherine Walsh
	U.S. EPA Tools for Schools, Research Gaps and Funding	Sheila Brown and Kelley Smith	Sheila Brown and Kelley Smith
WEDNESDAY		Session Chairs: Ryan Bixler and Geo Clausen	
	PM		
	Sensors and Monitoring 3 (Room 311)	Presenter	Full author list
	Economic inequity of measured indoor and outdoor exposure to PM2.5 using data from 14,000 low-cost particle monitors	Lance Wallace	Lance Wallace
	Simultaneous Measurements of Indoor and Outdoor Air Quality	Christian Pfrang	Ravi Sahu, Vipul Lal Chandani, Ruijie Tang, Mao Du, Joe Acton, Zaheer Nasar, Zongbo Shi and Christian Pfrang
	Assessing Airborne Microfibres and Microplastics in Indoor Environments: A Case Study on a Canadian University Campus	Sepideh Pakpour	Joud Jelassi, Javad Sadeghi, Kinga Vojnits, Sophia Liao, Rita Lam, Sepideh Pakpour
	Measuring spatial features in office building public areas: Integrating occupant movement and IEQ exposures	Xinting Gao	Xinting Gao, Jiazhi Ni, Weimin Zhuang

Podium Presentations/Workshops/Symposia: Thermal Comfort and Perception

MONDAY

PM		Session Chairs: Alice Caporale and Asit Mishra	
Session- Thermal Comfort and Perception Indoor Air 1 (Room 311)		Presenter	Full author list
Dynamic Thermal Pleasure in an Office with Personal Environment Comfort Systems		Yoriaki Nitta	Yoriaki Nitta, Masanari Ukai, Kazuki Aono, Shin-ichi Tanabe, Kentaro Kimura, Akihiro Shimizu, Naoki Aizawa, Daisuke Hatori, Yuka Mutoh, Atsushi Takamuku
Factors Associated with Heat Exposure Risk Perceptions Among Elderly Asian Immigrants in New York City, 2023		Inkyu Han	Inkyu Han, Jin Young Seo, Elynn Volkova, Heyreoun An Han
Thermal performance evaluation of four personal heating devices and occupant usage behaviour under three cold conditions		Sishi Li	Sishi Li, Chenwei Peng, Bin Cao, Yingxin Zhu
Association between indoor temperature and coldness: a cross-sectional analysis of the nationwide Smart Wellness Housing Survey in Japan		Wataru Umishio	Wataru Umishio, Toshiharu Ikaga, Yoshihisa Fujino, Shintaro Ando, Shuzo Murakami
The impact of thermal history on thermal sensation in cooling conditions		Jiyoung Kwak	Jiyoung Kwak, Chungyoon Chun
Comparison of Local Thermal Comfort of Young and Older People under Local Exposure		Yin Tang	Yin Tang, Yang Yu, Xianzhun Zhong
Session chair led panel discussion and extended Q+A			
PM		Session Chair: Ruiji Sun	
Symposium- Causal Thinking on IEQ (Room 312)		Presenter	Full author list
Symposium: Causal Thinking on IEQ		Ruiji Sun	
Why do we need causal thinking?		Ruiji Sun	Ruiji Sun, Stefano Schiavon, Gail Brager, Edward Arens, Hui Zhang, Thomas Parkinson, Chenlu Zhang
A Longitudinal Assessment of Indoor Temperature, Thermal Perceptions, and Cognitive Function Among Students in University Classrooms		Sandra Dedesko	Sandra Dedesko, Joseph G. Allen
Classification of Cooking Events in Residential Kitchens in Austin, Texas using PM 2.5 Time Series Data		Ansel Early	Ansel Early, Hagen Fritz, Zoltan Nagy, Atila Novoselac, Kerry Kinney
Probing input variable selection risks in data-driven building energy mod-els: An investigation based on causal analysis		Tong Xiao	Tong Xiao, Peng Xu
Thermal Comfort Prediction for the Passengers based on HVAC System Data from Electric Vehicles		Byeongkuk Oh	Byeongkuk Oh, Chungyoon Chun, , Sanghun Kim, Seokwon Seo
MOVING TO A SMALLER ACTIVITY-BASED OFFICE– EMPLOYEE EXPERIENCES VS. MEASUREMENT RESULTS		Arttu Sivula	Arttu Sivula, Jenni Radun, Henna Maula, Johann Laukka, Valtteri Hongisto
Advanced predictive model based on automatic re-learning to improve indoor air quality prediction reliability in infant facilities		Kichul Kim	Kichul Kim, Jiwoong Kim, Jinhee Jeong, Yungyu Lee

TUESDAY

PM		Session Chairs: Federico Tartarini and Sandra Dedesko	*FEATURE TRACK
Session- Thermal Comfort and Perception 2 (Room: Ballroom B)		Presenter	Full author list
Thermal comfort of people with Autism Spectrum Condition (ASC): preliminary results of a field study		Luca Zaniboni	Luca Zaniboni, Mathilde Elisabeth Bruun Nielsen, Ida Hvidtfelt Nielsen, Jørn Toftum
Mapping Thermal Personality for Occupant-centric Environment Control		Yoon Hee Lee	Yoonhee Lee, Hyojin Jeon, Chungyoon Chun
Effect of low relative humidity on sleep quality		Mizuho Akimoto	Mizuho Akimoto, Shin-ichi Tanabe, Pawel Wargocki
Combined Effect of Thermal and Visual Environments on Thermal Comfort in Semi-outdoor Spaces		Hikari Ryuzaki	Hikari Ryuzaki, Yutaro Ogawa, Yuyuko Watanabe, Yuta Fukawa, Shin-ichi Tanabe
Climate-based thermal sensation ranges from existing data: preliminary analysis of the ASHRAE Thermal Comfort Database II.		Wilmer Pasut	Alberto Saugo, Lorenza Pistore, Cristiano Varin, Wilmer Pasut

	Residential Heat Exposures in Lower Income Households: Data Collected in the UT Austin Whole Communities—Whole Health (WCWH) Study	Ansel Early	Ansel Early, Hagen Fritz, Zoltan Nagy, Attila Novoselac, Kerry Kinney
	Enhancing air mixing through air diffusers for ventilation in vehicles and enclosed spaces	Florin Bode	Florin Bode, Titus Joldos, Ilinca Nastase, Gabriel Mihai Sirbu, Paul Danca
WEDNESDAY	AM	Session Chairs: Richard de Dear and Bud Offerman	
	Session-Thermal Comfort and Perception 3 (Room: Ballroom A)	Presenter	Full author list
	Effects of pulsating flow on local convective heat transfer over the human body	Siqi Zhou	Siqi Zhou, Yichen Yu, Jianlei Niu
	jsthermalcomfort: a JavaScript package to calculate thermal comfort and thermal stress indices	Federico Tartarini	Federico Tartarini, Akihisa Nomoto, Jordan Ockoljic, Omar Jesus Acuache Briceno, Santiago Zaldivar De Alba, Ruoshui Chen, Jingyu Lu, Yuchen Mu, Stefano Schiavon, Ollie Jay
	Distribution pattern of human skin temperature during sleep	Nan Zhang	Nan Zhang, Zihan Wang, Bin Cao, Yingxin Zhu
	An experimental study investigating school-age children's thermal environment perception.	Alice Caporale	Alice Caporale, Luca Zaniboni, Cristina Mora, Pawel Wargocki
	Do psychological factors influence the thermal responses of building occupants?	Pawel Wargocki	Pawel Wargocki and Negin Stengaard Hansen
	Thermal comfort and satisfaction in hospital wards in Cote d'Ivoire	Andrea Gasparella	Anna Sbalchiero, Federica Morandi, Giovanni Pernigotto, Andrea Gasparella
	Overall thermal comfort evaluation method based on local skin temperature	Siyi Li	Siyi Li, Weiwei Liu
THURSDAY	AM	Session Chairs: Shin-ichi Tanabe and Jungsoo Kim	
	Session- Thermal Comfort and Perception 4 (Room: Ballroom C)	Presenter	Full author list
	Thermal Comfort and Self-reported Productivity at Home and Office: a longitudinal field study	Kuniaki Mihara	Kuniaki Mihara, Toby Cheung, Eikichi Ono, Federico Tartarini, Takamasa Hasama
	Validation of CIBSE residential overheating criteria using Australian field data	Jungsoo Kim	Jungsoo Kim, Jing Xiong, Thomas Parkinson, Richard de Dear, Dong Chen
	Applicability of Skin Temperature for Thermal Sensation Recognition with Varying Clothing	Jiaqi Zhao	Jiaqi Zhao, Bin Cao
	Individual factors, clothing, and thermal comfort in office work during heating and cooling seasons	Henna Maula	Henna Maula, Jenni Radun, Arttu Sivula, Valteri Hongisto
	Decarbonization of Existing Offices through Owner/Tenant Collaboration: Energy saving while increasing productivity through environmental variability	Ryohei Itsuaki	Ryohei Itsuaki, Susumu Horikawa, Tomoyuki Chikamoto, Toshio Yamanaka, Tomohiro Kobayashi, Haruna Yamasawa, James Scott Brew, Hiromasa Tanaka, Shingo Tanabe
	Comparison of thermal comfort of TABS with all-air systems under different temperatures: A living laboratory study	Xiaojun Fan	Xiaojun Fan, Alberto Silvestri, Esther Borkowski, Arno Schlueter
	Session chair led panel discussion and extended Q+A		

Podium Presentations/Workshops/Symposia: Ventilation and HVAC

MONDAY

AM	Session Chairs: Marwa Zaatari and Alireza Afshari	
Session- Ventilation and HVAC 1 (Room 315)	Presenter	Full author list
Design and Experimental Study of Novel Controllable Attenuator Systems for Constant Temperature Air-Conditioning	Weichen Guo	Guo Weichen, Hong Yusong, Wang Zeng, Zhu Xuejin, Zhu Zhe, Ye Wei
Assessment of Indoor Air Quality Improvement Effects through the Operation of an Integrated IAQ Management System in an Underground Shopping Mall	Jiwoong Kim	Jiwoong Kim, Kichul Kim, Jinhee Jeong, Yungyu Lee
An Adaptive Cooling Coil for Large Load Diversity and Resilience	Kwok Wai Tham	Kwok Wai Tham, Xiaosong Su., Toby Cheong, David Kok Wai Cheong, Claire Fan Yang, Kwan On Tai and Chandra Sekhar
Estimation of Air Exchange Rates in Small-sized Multi-use Facilities using Multiple-formulas Method	Jimin Kim	Ji Min Kim, Hee Won Shin, Dong Hwa Kang
Design and Application of Reinforced Exhaust Hoods for Rooms with Strong Buoyancy	Qiyang Chen	Bingqian Chen, Sumei Liu, Junjie Liu, Nan Jiang, Qingyan Chen
Indoor thermal environment improvement based on switchable radiation/convection-combined intermittent heating	Yifan Wu	Yifan Wu, Hongli Sun, Mengfan Duan, Borong Lin
A Field Intervention Study of Effects of Thermal Environment and Ventilation in the Bedroom on Sleep Quality	Jumpei Nakano	Jumpei Nakano
PM	Session Chairs: Jelle Laverge and Atila Novoselac	
Session- Ventilation and HVAC 2 (Room 315)	Presenter	Full author list
Investigating the protection effect of gaspers in an aircraft cabin with personalized displacement ventilation	Yunge Hou	Yunge Hou, Ruoyu You
Investigating Ventilation Strategies on Public Transport through the Long-Term Environmental Monitoring of Operational London Buses	Oliver Wild	Oliver Wild, Filipa Adzic, Liora Malki-Epshtein
Development an empirical model to predict the capture efficiency of exhaust hoods in a confined enclosure	Qiyang Chen	Chuanming Chen, Dayi Lai, Qingyan Chen
Predicting Human CO2 Emissions for IAQ Applications	Oluwatobi Oke	Oluwatobi Oke, Andrew Persily
Measured and perceived IEQ in schools in Sweden, Slovakia and the UAE	Gabriel Bekö	Gabriel Bekö, Taher S. Eldanaf, Pavol Stefanic, Rawya Dagher, Omnia Altemnah, Sarka Langer
VENTILATION STRATEGIES FOR INCREASING INDIVIDUAL THERMAL COMFORT IN OPEN-PLAN OFFICES – A COMPARATIVE STUDY	Alireza Afshari	Haider Latif, Goran Hultmark, Alireza Afshari
Impact of Partition on Airborne Cross-Exposure Risk in Stratified Micro-Environments	Xue Tian	Xue Tian, Zhang Lin

TUESDAY

AM	Session Chairs: Dusan Licina and Adrian Chong	
Session- Ventilation and HVAC 3 (Room 315)	Presenter	Full author list
Killed by DALY? primary and secondary effects of IAQ management from an environmental justice perspective.	Jelle Laverge	Jelle Laverge, Merel Decleyre, Klaas De Jonge
DALY engineering: and to dust shall you return	Jelle Laverge	Jelle Laverge, Merel Decleyre, Klaas De Jonge
Failure Analysis and Forensic Engineering in the Built Environment	Pradeep Ramasubramanian	Pradeep Ramasubramanian, Shannon Ramey
Impacts of HVAC Cleaning on Energy Consumption and Indoor Air Quality: A Multi-Climate Site Demonstration	Nasim Ildiri	Nasim Ildiri, Mark Hernandez
Generating Thermal Stratification in the Controlled Active Ventilation Environment Laboratory (CAVE)	Liora Malki-Epshtein	Liora Malki-Epshtein, Oliver Wild, Filipa Adzic, José L. Torero

	Effectiveness of reciprocating recirculating horizontal air curtain in reducing heat flux across horizontal temperature stratifications	Yanlei Yu	Yanlei Yu, Jun Gao	
	Optimization of window opening for ventilation of a bedroom using the adjoint based topology method	Tengfei Zhang	Qingwen Xue, Feng Wang, Tengfei (Tim) Zhang	
WEDNESDAY		Session Chairs: Andrew Persily and Oluwatobi Oke		
	PM		*FEATURE TRACK	
	Session- Ventilation and HVAC 4 (Room: Ballroom B)	Presenter	Full author list	
	An Innovative Smart HVAC System for Cold Climates: Achieving Sustainable Thermal Comfort	Amirmohammad Behzadi	Amirmohammad Behzadi, Annika Gram, Sasan Sadrizadeh	
	Point source Ventilation Effectiveness of mixing ventilation solutions used in non-residential Settings	Raimo Simson	Martin Kiil, Alo Mikola, Karl-Villem Võsa, Raimo Simson, Jarek Kurnitski	
	Assessment of Indoor Air Quality and Ventilation Rate in Residential Dorms After Net-Zero Retrofit	Zhipeng Deng	Zhipeng Deng, Pratik Pandey, and Bing Dong	
	Cost-effective Retrofit for Optimized Ventilation and Filtration System Controls: Field Results	Theresa Pistochini	Theresa Pistochini, Deborah Bennett, Matthew Ellis, Christopher Cappa	
THURSDAY		AM	Session Chair: Kwok Wai Tham	
		Workshop- Mixed Mode Ventilation in the Tropical Climate (Room 315)		Presenter
		Workshop- Mixed Mode Ventilation in the Tropical Climate		Tham Kwok Wai
		According to the International Energy Agency (IEA), energy-related CO2 emissions from buildings rose to the highest ever recorded in 2019, with the energy demand for space cooling tripling since 1990, making it the fastest-growing end-use in buildings. The increasing demand for space cooling is expected to continue in the future due to higher standards of living. Consequently, mixed-mode ventilation provides an exciting opportunity to significantly reduce energy consumption through the integrated use of air-conditioning (when necessary) and natural ventilation (whenever possible). Mixed mode ventilation also enhances resilience in an uncertain world, by adapting to challenges like haze and pandemic, taking advantage of operable windows and mechanical systems to mitigate health risks. Enhancing resilience for rational operational continuity has emerged as an important consideration to identify strategies for thermal comfort, ventilation, energy efficiency, wellbeing and pandemic-readiness. Although the concept of mixed-mode is not new, most studies focused on milder climates. Past studies have also shown that regions with a hot and humid climate all year round, like Singapore, have little to no potential for natural ventilation, indicating that mixed-mode ventilation is unlikely to work. This Session/Workshop/Symposia aims to explore the potential of mixed-mode ventilation in the tropical climate through hybrid systems, systems adaptability and integration, and occupant-centric controls. The Workshop will also delve into case studies showcasing its impact on energy efficiency, indoor air quality, pandemic-readiness and thermal comfort.		
			Session Chairs: Brett Singer and Elena Austin	
		PM		
		Session- Ventilation and HVAC 5 (Room 315)	Presenter	Full author list
		Session - Ventilation and HVAC 5		
		Application and validation of a wearable monitor for assessing personal and in-home exposures to particulate matter in the California Central Valley	Xiaoying Li	Xiaoying Li , Jessica Tryner, Bonnie N. Young, Luis Hernandez Ramirez, Mollie Phillips, Sherry WeMott, Grace Kuiper, Nayamin Martinez, Lorena Sanpedro, Sheryl Magzamen, John Volckens
		Particle Emission and Cooking Performance of Induction Cooking Stoves	Amanda Giang	Amanda Giang, Tianyuan Li
		Improving Air Quality using Smart Thermostats: Minimizing Indoor Exposure to Wildfire-Generated Fine Particulate Matter (PM2.5)	Federico Dallo	Federico Dallo, Thomas Parkinson, Carlos Duarte, Stefano Schiavon, Chai Yoon Um, Mark Modera, Paul Raftery, Carlo Barbante, Brett C. Singer
		Mechanical Ventilation and IAQ in Recently Constructed US Homes	Brett Singer	Haoran Zhao, W. Rengie Chan, Chrissi Antonopoulos, Eric Martin, Paul Francisco, Iain Walker, Brett Singer
	Comparing Bath vs Kitchen Continuous Exhaust Ventilation on Indoor Air Contaminants in Single-Family Detached Homes using Gas Cooking	Kiel Gilleade	Jonathan Wilson, Sherry L. Dixon, Paul Francisco, Kiel Gilleade, Jill Breysse, Yigang Sun, Zachary Merrin, David E. Jacobs	
	Inequity of Exposure to Wildfire Smoke PM2.5 in the United States	Jing Li	Jing Li, Xinlei Liu, Qiao Yu, and Yifang Zhu	

	Measured air pollutants in 276 European homes using gas or electric hobs	Brett Singer	Brett Singer, Piet Jacobs, Nicole Kearney, Sara Demartini, Michael Scholand, Lorien Perryfrost, Juana Maria Delgado-Saborit
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Agenda ID	Track and Session	Title	Presenter	Position	Day	Time
1	Aerosols and PM 1	Assessing Sustainable Filtration Solutions for Nano-plastic and Total Vol-atile Organic Compounds (TVOC) Mitigation in 3D Printer Emissions	Yuan Yu Zheng		1 Monday	AM
2	Aerosols and PM 1	Evaluation of bioaerosol propagation through an air curtain	Andreas Kohl		2 Monday	AM
3	Aerosols and PM 1	Aggressive or Passive Particle Measurement: An Evaluation of the Efficacy of Disturbing Settled Dust as Part of an Exposure Assessment	Ryan Allenbrand		3 Monday	AM
4	Aerosols and PM 1	Assessment of Urban Coffee Shop Indoor Air Quality and Examination of Influencing Factors Using the Random Forests Model	Yu-Wen Lin		4 Monday	AM
5	Aerosols and PM 1	Effect of Exhaust Airflow Rate and Pressure Difference on the Particle Outflow from Airborne Infection Isolation Room	Gi-Hoon Kim		5 Monday	AM
6	Aerosols and PM 1	Development of a Full-Size-Range Respiratory Droplet Sampler	Yuchen Shi		6 Monday	AM
7	Aerosols and PM 1	Personal exposure to PM2.5 Mass Concentrations using Consumer-Grade Personal Exposure and Outdoor Fixed Monitors in Denver, Colorado	Shelly Miller		7 Monday	AM
8	Aerosols and PM 2	Effects on respiratory droplet generation and virus concentration of changes in oral opening geometry	Khoa Nguyen		1 Monday	PM
9	Aerosols and PM 2	Airborne influenza virus in daycare centers	Jia Lin Zhang		2 Monday	PM
10	Aerosols and PM 2	Particulate Matter Infiltration in Colorado Workplaces	Benjamin Swanson		3 Monday	PM
11	Aerosols and PM 2	Development of a sampler utilizing a wet-impactor to collect pathogenic bioaerosols into liquid media	Subin Han		4 Monday	PM
12	Aerosols and PM 2	Between-unit indoor air quality variability due to resident behavior within a single Boston public housing complex	Madeleine Wallace		5 Monday	PM
13	Aerosols and PM 2	Investigating the Impact of Particle Morphology on the Resuspension of Aerosol Particles in Indoor Air	Jonathan Reid		6 Monday	PM
14	Aerosols and PM 2	Intervention Effectiveness Assessment of Report-back Results for In-home Air Quality and Household-level Mitigation Actions	Xiaoying Li		7 Monday	PM
15	Aerosols and PM: Symposium	Nano aerosol formation initiated by oxidation of limonene during bleach cleaning: a comparison of oxidant chemistry	Anita Avery		1 Wednesday	AM
16	Aerosols and PM: Symposium	Influence of indoor air movement on formation and growth of 1-20 nm particles via ozone-human chemistry	Dusan Licina		2 Wednesday	AM
17	Aerosols and PM: Symposium	Particle number concentrations in office spaces around Europe	Ville Silvonen		3 Wednesday	AM
18	Aerosols and PM: Symposium	Indoor Atmospheric Nanoparticle Growth Rates	Satya Sundar Patra		4 Wednesday	AM
19	Aerosols and PM: Symposium	Improved Parametrization of Indoor Ultrafine Particle Coagulation	Satya Sundar Patra		5 Wednesday	AM
20	Aerosols and PM: Symposium	Oxidation of cannabis smoke leads to ultrafine particle formation in indoor environments	Kristen Yeh		6 Wednesday	AM
21	Aerosols and PM: Symposium	Development of a Korean 3D printed lung model for estimating respiratory deposition of aerosols	Jeongyeon Park		7 Wednesday	AM
22	Aerosols and PM 3	Development and Application of a Computational Model to Predict Fugitive Emissions during Nebuliser Therapy	James McGrath		1 Thursday	AM
23	Aerosols and PM 3	Toilet lids: Protectors preventing the spread of infectious bioaerosols generated during flushing bidet toilet	Yuanyuan Niu		2 Thursday	AM
24	Aerosols and PM 3	Training a Random-Forest Regression Model on Data from Low-Cost Sensors on a University Campus to Predict Indoor Air Quality	Sabrina Westgate		3 Thursday	AM
25	Aerosols and PM 3	Assessment of Comprehensive performance of Schools to resist PM2.5	Sihyeon Kim		4 Thursday	AM
26	Aerosols and PM 3	Detection of mpox virus in air and dust of a patient room	Yang Junjing		5 Thursday	AM
27	Aerosols and PM 3	Collection and analysis of Indoor and outdoor aerosol using a dual AC/DC sampling system	Kunihiro Funasaka		6 Thursday	AM
28	Aerosols and PM 3	Influence of Human Activities and Occupancy on the Emission of Indoor Particles from Respiratory and Non-respiratory Sources	P. S. Ganesh Subramanian		7 Thursday	AM
29	Aerosols and PM 4	Source Emissions from a Consumer Iron and Steamer	Rachel Tyli		1 Thursday	PM
30	Aerosols and PM 4	Ozonation of Thirdhand Smoke Embedded in Carpets and Mattresses	Xiaochen Tang		2 Thursday	PM
31	Aerosols and PM 4	Exploring dogs' influence on indoor air chemistry and microbiology	Shen Yang		3 Thursday	PM
32	Aerosols and PM 4	A Thorough Exploration of Cooking Oil Emission Characteristics: Unveiling Comprehensive Insights	Mehdi Amouei Torkmahalleh		4 Thursday	PM
33	Aerosols and PM 4	Effect of ultrasonic scaler tip on the aerosol generation in dental scaling	Gang Yang		5 Thursday	PM
34	Aerosols and PM 4	A Lagrangian-based Markov Chain Model with Coarse Grids for Fast Pre-diction of Particle Transport in Complex Indoor Environments	Wenjie Huang		6 Thursday	PM
35	Aerosols and PM 4	The state of the art characterisation of particles from respiratory activities	Lidia Morawska		7 Thursday	PM

36	Air cleaning and filtration 1	Open-Source Air Cleaners: State of Knowledge and Experimental Evidence of Temporal and Size-Specific Performance	Theresa Pistoichini	1	Tuesday	AM
37	Air cleaning and filtration 1	Pilot Experiments Investigating if Non-Venting Range Hoods with Filtration Reduce Pollutants from Cooking with Gas or Induction Burners	Brett Singer	2	Tuesday	AM
38	Air cleaning and filtration 1	Contradiction in Applying Carbon-Based Cocatalysts in Photocatalytic Air Purification	Myoung Won Chung	3	Tuesday	AM
39	Air cleaning and filtration 1	Lights On, Problems Gone? Probing the Influence of Germicidal UV (222 nm) Lamps on Ozone, Ultrafine Particles, and VOCs in Indoor Office Spaces	Sara Bjerre Sørensen	4	Tuesday	AM
40	Air cleaning and filtration 1	CFD modeling for reactive species air cleaner applications in a classroom	Youngbo Won	5	Tuesday	AM
41	Air cleaning and filtration 1	Enhancing Ultrasonic Aerosol Agglomeration Pretreatment with Submicron Water Droplets: Impact on Air Filter Operating Pressure Drop	Xin Zhang	6	Tuesday	AM
42	Air cleaning and filtration 1	Enhancing the Filtration Performance of Nanofiber Filters via Spray-initiated Synthesis of Metal-Organic Frameworks	Zhuolun Niu	7	Tuesday	AM
43	Air cleaning and filtration 2	Comparative analysis of air cleaner performance with and without an air distribution system: An experimental study	Justin Berquist	1	Tuesday	PM
44	Air cleaning and filtration 2	Numerical Assessments of Particle Protection Efficiency of Various Air Curtain Systems Installed at a Main Entrance of a Building	HyoBeom Jung	2	Tuesday	PM
45	Air cleaning and filtration 2	Mitigation of Spray Polyurethane Foam with High Chemical Emission Rates	Bud Offermann	3	Tuesday	PM
46	Air cleaning and filtration 2	Multiroom Residence Air-circulation Effects on Ultrafine Particle Removal	Daniel Rush	4	Tuesday	PM
47	Air cleaning and filtration 2	A Tracer Method to Characterize Within-Room Contaminant Transport with Implications for Assessing GUV Effectiveness	Michael Sohn	5	Tuesday	PM
48	Air cleaning and filtration 2	How effective are portable air cleaners at improving air quality during pollution events?	Jienan Li	6	Tuesday	PM
49	Air cleaning and filtration 2	Prediction of the dynamic pressure drop of filter media loaded with water mists based on the deposited droplet mass and pore network model	Shuang Zhang	7	Tuesday	PM
50	Air cleaning and filtration 3	Experimental Assessment of the Efficacy of Portable Air Cleaners in Mitigating Respiratory Droplet Nuclei Transmission	Ihab Al-Rikabi	1	Wednesday	AM
51	Air cleaning and filtration 3	Comparing VOC Efficacies for Two Air Cleaners Using Proton Transfer Reactive Mass Spectrometry and Sorbent Tube Analysis	Paul Hoertz	2	Wednesday	AM
52	Air cleaning and filtration 3	Evaluation of Air Cleaners Under Indoor Wildfire Smoke Conditions	Brett Stinson	3	Wednesday	AM
53	Air cleaning and filtration 3	Integration of Filters into Ceiling Fans: Challenges and Opportunities	Atila Novoselac	4	Wednesday	AM
54	Air cleaning and filtration 3	The improvement of indoor air in households through photocatalytic oxi-dation air purifier in an industrial city	Jia Lin Zhang	5	Wednesday	AM
55	Air cleaning and filtration 3	Valuing benefits derived from controlling indoor air pollutants in China	Keqin Yang 杨可亲	6	Wednesday	AM
56	Air cleaning and filtration 3	Collaborative Assessment of a Novel MOF Material for Efficient Removal of Indoor Formaldehyde	Doyun Won	7	Wednesday	AM
57	Air cleaning and filtration: Symposium	Impacts of Canadian Wildfire-Induced Smog on Outdoor and Indoor PM _{2.5} Levels in a Syracuse Office Environment	Xin Guo	1	Wednesday	PM
58	Air cleaning and filtration: Symposium	Calculating Clean Air Delivery Rate Based on Perceived Air Quality	Lei Fang	2	Wednesday	PM
59	Air cleaning and filtration: Symposium	Performance Assessment of Gas-phase Portable Air Cleaners	Yiming Xiang	3	Wednesday	PM
60	Air cleaning and filtration: Symposium	ISO 17772-1/2 a standard on indoor environmental parameters for design, operation, and assessment of IEQ in buildings.	Bjarne W. Olesen	4	Wednesday	PM
61	Air cleaning and filtration 4	Variability in Performance and VOC Off-Gassing of DIY Air Cleaners	Amity Deters	1	Thursday	AM
62	Air cleaning and filtration 4	Air Distribution using Open-air Ducts in Office Spaces	Kyosuke Hiyama	2	Thursday	AM
63	Air cleaning and filtration 4	Development of the New Generation Challenge Aerosol for General Ventilation Filter Evaluation	Xin Feng	3	Thursday	AM
64	Air cleaning and filtration 4	On-surface tailoring coarse polymer fibers for efficient air filtration: Interfacial morphologies and electrostatic enhancement	Yilun Gao	4	Thursday	AM
65	Air cleaning and filtration 4	Aerosol synthesized MgO nano-adsorbents for reducing CO ₂ concentrations in indoor air	Sukbyung Chae	5	Thursday	AM
66	Air cleaning and filtration 4	Evaluation of Control Strategies for Reducing Particle Filter System Runtime	Alexander Mendell	6	Thursday	AM
67	Air cleaning and filtration 4	Enhancing Indoor Air Quality using Ag/TiO ₂ -CS Nanocomposite Filter Efficacy against Viral Aerosols	Wonder Nathi Dlamini	7	Thursday	AM
68	Air cleaning and filtration 5	Lessons Learned from Field Evaluations of 20 Germicidal Ultraviolet Installations	Belal Abboushi	1	Thursday	PM

69	Air cleaning and filtration 5	Enhancing Hospital Air Quality Through Advanced Purification Systems and Cloud-Enabled Monitoring: Strategies and Innovations	Wonder Nathi Dlamini	2	Thursday	PM
70	Air cleaning and filtration 5	Background Loss Rates and Portable Air Cleaner Performance	Alexander Mendell	3	Thursday	PM
71	Air cleaning and filtration 5	A performance assessment of vehicle cabin air filter	Chenhua Wang	4	Thursday	PM
72	Air cleaning and filtration 5	Simulative investigation of the thermal inactivation of SARS-CoV-2 in the cabin air of a people mover	Henrik Alexander Gröbber	5	Thursday	PM
73	Air cleaning and filtration 5	An experimental study on a low-energy combination strategy for improving indoor air quality	Tzu Han Huang	6	Thursday	PM
74	Air cleaning and filtration 5	CFD design of an innovative personal air cleaner to prevent airborne disease transmission in transport microenvironments	Giorgio Buonanno	7	Thursday	PM
75	Building SS&E 1	Upcycling Clothing Waste into Construction Materials: Improving Thermal Performance by Using Phase Change Materials	Dongchan Jin	1	Tuesday	PM
76	Building SS&E 1	Power-Saving Menus in Preparation for Winter Power Shortages Considering Diversity of Housing Performance and Residents' Lifestyles	Hikari Harasaki	2	Tuesday	PM
77	Building SS&E 1	Occupant-Centric Proactive Control Methodology for IEQ	Alexis Kyriacou	3	Tuesday	PM
78	Building SS&E 1	Improvement Design of Raised Floors in a Semiconductor Cleanroom using Computational Fluid Dynamics Simulation	Zulvi Alfiqui Hidayatulloh	4	Tuesday	PM
79	Building SS&E 1	Improving the thermal boundary conditions during CFD modelling of residential kitchen	Shou-Wang Chen	5	Tuesday	PM
80	Building SS&E 1	Development of an adjustment method for the calculated building energy consumption based on the law at the design stage, considering the actual operat	Akane Shimizu	6	Tuesday	PM
81	Building SS&E 1	Influence of leakage corrections on the cup test results	Xinyue Luo	7	Tuesday	PM
82	Building SS&E 2	Coupling indoor air quality, thermal comfort and HVAC energy consumption using IDA ICE and OpenFOAM	Niko Siilin	1	Wednesday	AM
83	Building SS&E 2	Uncertainty analysis of building energy consumption based on occupant behavior-based HVAC control with optimal thermal comfort	Dongsu Kim	2	Wednesday	AM
84	Building SS&E 2	Power Consumption Characteristics and Prediction of Airport Terminal Based on Data Mining	Sun Yongxiang	3	Wednesday	AM
85	Building SS&E 2	Evolution of direction air supply induced by worker walking through dynamic simulation	Yukun Xu	4	Wednesday	AM
86	Building SS&E 2	Digital Twin for Buildings – The Way Towards Sustainable Buildings	Mihnea Sandu	5	Wednesday	AM
87	Building SS&E 2	Evaluation of computational room flow simulations by means of experimental methods	Jonathan Griener	6	Wednesday	AM
88	Building SS&E 2	Coupling Chemistry and Fluid Dynamics to Assess Indoor Air Quality	Bruño Fraga	7	Wednesday	AM
89	Building SS&E Symposium: Outdoor-Indoor	Evaluation of different categories of turbulence models for calculating air pollutant dispersion in real urban layout	Jue Wang	1	Wednesday	PM
90	Building SS&E Symposium: Outdoor-Indoor	Reconstructing outdoor concentrations for use by indoor models	Michael Sohn	2	Wednesday	PM
91	Building SS&E Symposium: Outdoor-Indoor	Impacts of night market on indoor air quality and children's lung function in nearby households	Kuo-Ping Tseng	3	Wednesday	PM
92	Building SS&E Symposium: Outdoor-Indoor	Tracer Gas Experiment of Urban Pollutant Transport: Urban Canyons and Indoor-Outdoor Transport	Michael Sohn	4	Wednesday	PM
93	Building SS&E 3	Predicting ventilation rates in public housing in the era of modular flat design in Hong Kong using deep neural network model	Ho Kam Dai	1	Thursday	PM
94	Building SS&E 3	Optimization of coupled displacement-personalized ventilation using CRITIC-TOPSIS method based on Taguchi design	Ken Bryan Fernandez	2	Thursday	PM
95	Building SS&E 3	Hygrothermal and energy performance evaluation of cross-laminated timber walls	Yujin Kang	3	Thursday	PM
96	Building SS&E 3	The 7-Year Journey to Develop a Radon-in-Water Proficiency Test to Bridge the Gap in this Field Across the Globe	Uttam Saha	4	Thursday	PM
97	Building SS&E 3	BuilSysPro-QAI: A new Modelica library for macro-design and thermo-hygro-aerodynamic-IAQ simulations in residential and tertiary buildings	Hiba Ajib	5	Thursday	PM
98	Building SS&E 3	Measuring the performance of a pressurized corridor ventilation system in high-rise multi-unit residential building (MURBs)	Justin Berquist	6	Thursday	PM
99	Building SS&E 3	Session chair led panel discussion and extended Q+A		7	Thursday	PM
100	Climate Change, Wildfires, Urbanization	Characterizing Smoke Emissions Under Varied Burn Conditions With a Quartz Tube Furnace	Ryan Bixler	1	Thursday	AM
101	Climate Change, Wildfires, Urbanization	Indoor heat stress impairs emotional and physical states during extreme heat	Xingtong Guo	2	Thursday	AM
102	Climate Change, Wildfires, Urbanization	Air Pollutant Enhancements in Indoor Environment by Acute Outdoor Emission Events	Chou-Hsien Lin	3	Thursday	AM

103	Climate Change, Wildfires, Urbanization	Levels of PM, VOCs, and PAHs in Residences Post-2023 Maui Wildfire: Exposure and Mitigation Assessment	Parham Azimi	4	Thursday	AM
104	Climate Change, Wildfires, Urbanization	The effect of climate change on the built heritage: the case study of Le Corbusier's studio-apartment in Paris	Giulia Lamberti	5	Thursday	AM
105	Climate Change, Wildfires, Urbanization	Observing the impacts of wildfires on indoor air quality in Western Canada	Kristen Yeh	6	Thursday	AM
106	Climate Change, Wildfires, Urbanization	The Thermal Sensitivity of the Elderly in Public Outdoor Open Spaces in Hong Kong Public Housing Estate	Jiawei Wang	7	Thursday	AM
107	Covid 19 1	What is the acceptable minimum ventilation rate for mitigating airborne infections in public places	Hua Qian	1	Monday	PM
108	Covid 19 1	Close contact behaviors between medical staff and patients in dental clinics	Xiao Shenglan	2	Monday	PM
109	Covid 19 1	Effects of Speech Duration on the Respiratory Aerosol Particle Concentration	Tomoki Takano	3	Monday	PM
110	Covid 19 1	Dust as a novel environmental media for monitoring of viral illness	Karen Dannemiller	4	Monday	PM
111	Covid 19 1	Identifying the Safest Seat in Aircraft: Modelling SARS-CoV-2 Infection Risk by CFD for 70 Different Source Locations	Florian Webner	5	Monday	PM
112	Covid 19 1	Bipolar Ionization-Mediated Airborne Viral Inactivation and Deposition	Darryl Angel	6	Monday	PM
113	Covid 19 1	Effect of Portable Air Cleaner Placement on Airborne Infection Control in Learning Environments	Parham Azimi	7	Monday	PM
114	Covid 19 2	Scaling a Quantitative Microbial Risk Assessment with DNA-Tagged Aerosol Tracers to Inform Building Strategies to Control Infectious Aerosols	Nicholas Clements	1	Tuesday	AM
115	Covid 19 2	A Global Survey of the Impacts of Facemask Wear on Perceived Learning or Working Performance During the COVID-19 Pandemic	Rachel Hurley	2	Tuesday	AM
116	Covid 19 2	Propagation and Evaporation of Dental Droplets, Emission and Exposure in Surgery Environments: Preparing for Next "Disease X"	Xiujie Li	3	Tuesday	AM
117	Covid 19 2	Airborne Cross-infection Risk Under Different Body Orientations	Heewon Shin	4	Tuesday	AM
118	Covid 19 2	SARS-CoV-2 on Portable Air Purifier Filters in Public Spaces without Confirmed Positive Occupants	Jing Li	5	Tuesday	AM
119	Covid 19 2	Initial size distribution of coughing particles for CFD simulation based on measurements and evaporation model	Yunchen Bu	6	Tuesday	AM
120	Covid 19 2	Comparison of Computational Fluid Dynamics Simulation Results according to Ceiling Fan Modeling Method	Yelim Jo	7	Tuesday	AM
121	Covid 19 3	CORINA: A new aerosol chamber for the study of virus-containing aerosols and their inactivation.	Miguel Banares	1	Tuesday	PM
122	Covid 19 3	Comparison of non-infectious air delivery rate and energy consumption – Room air cleaners versus in-duct ultraviolet light inactivation	Ilpo Kulmala	2	Tuesday	PM
123	Covid 19 3	A generalized Wells-Riley equation for multi-virion aerosols	Ao Li	3	Tuesday	PM
124	Covid 19 3	Evaluation of the Effectiveness of Far Ultraviolet C Light on Bioaerosol Disinfection in Public Transportation Environments	Yue Pan	4	Tuesday	PM
125	Covid 19 3	Using virtual manikins to tackle particle transport and inhalation risk as-sessment under different advanced air distribution methods	Alicia Murga	5	Tuesday	PM
126	Covid 19 3	A novel method for quantifying the airborne infection risk of indoor spaces	Henry Oswin	6	Tuesday	PM
127	Covid 19 3	Session chair led panel discussion and extended Q+A		7	Tuesday	PM
128	Covid 19: symposium 1	A novel Pseudo-CO2 concept to monitor airborne infections in indoor settings	Wei Jia	1	Wednesday	AM
129	Covid 19: symposium 1	Impact of Lid Closure during Toilet Flushing and of Toilet Bowl Cleaning on Viral Aerosol contamination of Restroom Surfaces	Charles Gerba	2	Wednesday	AM
130	Covid 19: symposium 1	Exploring the Toilet Plume: A Quantitative Microbial Risk Assessment (QMRA) Framework Using Experimental Particle Measurements	Ciara Higham	3	Wednesday	AM
131	Covid 19: symposium 1	Air Sanitizer Efficacy in Indoor Air: Aerovirological investigations using airborne phages as surrogate for viruses & SARS-CoV-2	M. Khalid Ijaz	4	Wednesday	AM
132	Covid 19: symposium 1	Aerosol dispersal and fomite contamination of Virus from Floor Surfaces during Indoor Activities	Stephanie Boone	5	Wednesday	AM
133	Covid 19: symposium 1	Resuspension of Virus (MS2) from Soft Surfaces during Indoor Activities	Stephanie Boone	6	Wednesday	AM
134	Covid 19: symposium 1	Session chair led panel discussion and extended Q+A		7	Wednesday	AM
135	Covid 19: symposium 2	Ambient Carbon Dioxide Concentration Correlates with SARS-CoV-2 Aerostability and Infection Risk	Allen Haddrell	1	Thursday	AM
136	Covid 19: symposium 2	Respiratory Aerosol Emission Rates and Relationship to Exhaled Carbon Dioxide Flux for Assessing Pathogen Transmission Risk in Indoor Air	Jonathan Reid	2	Thursday	AM

137	Covid 19: symposium 2	Acidity of air as a tool to help understand airborne pathogen viability	Ville Silvonen	3	Thursday	AM
138	Covid 19: symposium 2	Validation results of a reasonably practicable methodology using in-space CO2 concentration to assess ventilation to indoor spaces	Peter McGarry	4	Thursday	AM
139	Covid 19: symposium 2	A Dual-Action Approach for CO2 Adsorption and Water Vapor Impact on Activated Carbon Filters	Jongsoo Jung	5	Thursday	AM
140	Covid 19: symposium 2	In-situ effectiveness of portable air cleaners	Jeffrey Siegel	6	Thursday	AM
141	Covid 19: symposium 2	HOW CAN WE REIMAGINE THE CONTROL OF AIRBORNE PATHOGENS THROUGH VENTILATION IN THE CONTEXT OF CLIMATE CHANGE?	Lidia Morawska	7	Thursday	AM
142	Covid 19: symposium 3	Development of a High-Efficiency Source-Control Device for COVID-19	Chih-Chieh Chen	1	Thursday	PM
143	Covid 19: symposium 3	Miniature electrostatic precipitator for personal protection	Ilpo Kulmala	2	Thursday	PM
144	Covid 19: symposium 3	Development of a Compact and Easy-Breathing Receptor Control Device for airborne contaminants	Sheng-Hsiu Huang	3	Thursday	PM
145	Covid 19: symposium 3	Study on Performance Test Methods of Air Cleaners	Chih-Wei Lin	4	Thursday	PM
146	Covid 19: symposium 3	Field demonstration of a tracer method to track simulated exhaled air trajectories and mixing in three connected rooms with upper-room GUV	Chai Yoon Um	5	Thursday	PM
147	Covid 19: symposium 3	Health Benefits vs. Harms from Different Indoor Air Cleaner Technologies	Zhe Peng	6	Thursday	PM
148	Covid 19: symposium 3	Experimental Study on Optimal CADR Filter Thickness of Air Purifiers	Cindy Lin	7	Thursday	PM
149	Dampness, Mold, Microbiome	Characterizing the Interactions between Plant and Indoor Air Microbiomes	Bridget Hegarty	1	Tuesday	AM
150	Dampness, Mold, Microbiome	Impacts of Outdoor Vegetation on Indoor Residential Microbiomes	Juan Maestre	2	Tuesday	AM
151	Dampness, Mold, Microbiome	From Harvest to House: Co-developing pathways to sustainable housing and healthy indoor environments in First Nations communities	Sarah Haines	3	Tuesday	AM
152	Dampness, Mold, Microbiome	Indoor metabolites and chemicals as potentially better predictors on childhood asthma and rhinitis than indoor microbiome	Zhuohui Zhao	4	Tuesday	AM
153	Dampness, Mold, Microbiome	Burdens of respiratory illnesses in school staff can be predicted with dampness and mold scores assessed with the NIOSH DMAT	Ju-Hyeong Park	5	Tuesday	AM
154	Dampness, Mold, Microbiome	Comparing changes to indoor microbiome of dust collected from the International Space Station and homes on Earth upon exposure to excess moisture	Nicholas Nastasi	6	Tuesday	AM
155	Dampness, Mold, Microbiome	Ventilation in Chinese elementary schools and its association with respiratory infections	Yuxia Sun	7	Tuesday	AM
156	Dampness, Mold, Microbiome	Fungal function provides novel targets for indicators of mold growth in homes	Neeraja Balasubrahmaniam	1	Tuesday	PM
157	Dampness, Mold, Microbiome	Impact of Building Operational Parameters on Mold Status Classification	Irvan Luhung	2	Tuesday	PM
158	Dampness, Mold, Microbiome	Hidden Hazards: Establishing the influence of controllable home environment factors on fungal density, diversity, and environmental relative moldiness	Jemima Ohwobete	3	Tuesday	PM
159	Dampness, Mold, Microbiome	Balancing Water Conservation and Health: Do water saving showerheads impact the microbes we breathe in during showering?	Sarah Haig	4	Tuesday	PM
160	Dampness, Mold, Microbiome	Associations between early-life fungal exposures in homes and atopic/gastrointestinal disease are modified by breastfeeding	Jon King	5	Tuesday	PM
161	Dampness, Mold, Microbiome	From bacteria, fungi, and viruses to microbial communities: How does indoor daylight affect the built environment microbes?	Sepideh Pakpour	6	Tuesday	PM
162	Dampness, Mold, Microbiome	Cooking-Associated Organic Compounds Drove the Bacterial Concentration, Diversity and Composition on Household Surfaces	Wing Lam Chan	7	Tuesday	PM
163	Health Outcomes 1	Human physiological responses to indoor CO2 concentrations and the resulting reduction in CO2 emission rates	Kazuki Kuga	1	Monday	AM
164	Health Outcomes 1	Mechanism for CO2 Induced Cognitive Impairment	Howard Kipen	2	Monday	AM
165	Health Outcomes 1	Prenatal Exposure to PM2.5 Associated with Glucose Metabolism and Adiposity in Young Children	Yunhui Zhang	3	Monday	AM
166	Health Outcomes 1	Oxidative potential of the particulate matter emitted from common household sources	P. S. Ganesh Subramanian	4	Monday	AM
167	Health Outcomes 1	Synergistic Effects of Ozone Reaction Products and Fine Particulate Matter on Pulmonary Physiology in Children with Asthma	Linchen He	5	Monday	AM
168	Health Outcomes 1	The Effects of Indoor Air Filtration on Cardiometabolic Outcomes Among Individuals in Urban Los Angeles	Jim Zhang	6	Monday	AM
169	Health Outcomes 1	Characterization of Human Exposure Sources in Human Hair and Indoor Dust using a Thermal Desorption Vocus-PTR-TOF-MS (TD-Vocus).	Anna Neville	7	Monday	AM
170	Health Outcomes: Symposium	Associations of allergic diseases with indoor and outdoor living environments in preschool children in the Taipei Metropolis	Hsing Jasmine Chao	1	Monday	PM

171	Health Outcomes: Symposium	Exposure to particles in schools – how to control it	Perti Pasanen	2	Monday	PM
172	Health Outcomes: Symposium	Roles of various chemical personal care consumer products on IAQ in public secondary school classrooms and teaching hair/nail salon rooms	Derek Shendell	3	Monday	PM
173	Health Outcomes: Symposium	The impacts of cleaning on the airborne and surface microbiota in Finnish primary school classrooms.	Anniina Salmela	4	Monday	PM
174	Health Outcomes: Symposium	District-wide bond program for school renovation and upgrading - implications on indoor environmental quality and health	Richard Shaughnessy	5	Monday	PM
175	Health Outcomes: Symposium	Improving learning through classroom experience in East Africa; Preliminary findings	Oluyemi Toyinbo	6	Monday	PM
176	Health Outcomes: Symposium	Occupants' exposure to indoor air contaminants in European sports halls	Heidi Salonen	7	Monday	PM
177	Health Outcomes 2	Determination of Permeation Parameters for Dermal exposure to Endocrine-Disrupting Compounds in consumer products	Zidong Song	1	Tuesday	AM
178	Health Outcomes 2	Using portable CO2 monitors to explore the air quality of indoor spaces	Henry Oswin	2	Tuesday	AM
179	Health Outcomes 2	Indoor air pollution in low-income countries – assessment and characterization of particulate matter from cooking with solid biofuels	Christina Isaxon	3	Tuesday	AM
180	Health Outcomes 2	Assessing toxicity of PM2.5 from indoor sources and during exposure in private homes	Aneta Wierzbicka	4	Tuesday	AM
181	Health Outcomes 2	Indoor exposure to carbonyls associated with biomarkers of oxygen-carrying capacity of blood among college students in Lhasa, Tibet	Ruohong Qiao	5	Tuesday	AM
182	Health Outcomes 2	Towards Developing an Indoor Air Pollution Emission Inventory for the UK: Challenges and Future Directions	Christian Pfrang	6	Tuesday	AM
183	Health Outcomes 2	Leveraging Multimedia PFAS Exposure Data to Understand Important Residential Sources and Pathways	Elaine Cohen Hubal	7	Tuesday	AM
184	Health Outcomes 3	Examining Environmental Contentment and Job Efficiency in Offices: An Assessment of Hot Desking's Impact on Post Occupancy Evaluation	Joon-Ho Choi	1	Wednesday	AM
185	Health Outcomes 3	TIME-DEPENDENCE AND INDIVIDUAL VARIATION IN SENSORY IRRITATION FROM MASKED EXPOSURE TO ACROLEIN	Anna-Sara Claeson	2	Wednesday	AM
186	Health Outcomes 3	Dormitory PM2.5 exposure and its association with an acute inflammation biomarker: A panel study in Lhasa, Tibet	Yingjun Liu	3	Wednesday	AM
187	Health Outcomes 3	Health Footprint of Endocrine-Disrupting Chemicals in Consumer Products: A System-of-Systems Approach	Yili Wu	4	Wednesday	AM
188	Health Outcomes 3	High ambient air pollution undermines the effect of clean cooking fuels in preventing low birth weight	Sagnik Dey	5	Wednesday	AM
189	Health Outcomes 3	IAQ national survey in French dwellings 2020-2023: protocols and quality measurements	Olivier Ramalho	6	Wednesday	AM
190	Health Outcomes 3	Exposure Risk and Characteristics of Bisphenol A and Its Substitutes in the General Taiwanese	Po-Chin Huang	7	Wednesday	AM
191	Health Outcomes 4	Results from nationwide survey of healthcare professional's attitudes, beliefs, and practices around indoor air quality	Jill Heins-Nesvold	1	Wednesday	PM
192	Health Outcomes 4	Long term monitoring of indoor carbon monoxide levels in disproportionately impacted Neighborhoods in Denver	Shelly Miller	2	Wednesday	PM
193	Health Outcomes 4	Reducing Measured Levels of Household Chemicals Plus Educational Intervention Reduces Symptoms of Chemical Intolerance	Carl Grimes	3	Wednesday	PM
194	Health Outcomes 4	The InChildHealth Walkthrough Survey – towards a standardized characterization of classrooms for Indoor Air Quality studies in Europe	Katrin Vorkamp	4	Wednesday	PM
195	Health Outcomes 5	Association between Paraben Exposure and Thyroid Indicators in Taiwanese Pregnancy women	Hsi Chen	1	Thursday	AM
196	Health Outcomes 5	Modelling the accumulation of phthalates in the respiratory tract during long-term inhalation	Haoyu Dang	2	Thursday	AM
197	Health Outcomes 5	Newer New Jersey Public Secondary School Teachers and Potential Exposure to Chemicals in Cleaning, Disinfecting and Sanitization Product in their Work	Derek Shendell	3	Thursday	AM
198	Health Outcomes 5	Predicting Absence Rates Due to Indoor Environmental Quality in Pre-Retrofitted USA Schools: An Analytical Study on Classroom Parameters	Oluyemi Toyinbo	4	Thursday	AM
199	Health Outcomes 5	Exposure Distribution and Profiles of Paraben in Taiwanese (2013-2016)	Jung-Wei Chang	5	Thursday	AM
200	Health Outcomes 5	Exposure Profile and risk assessment of parabens in a representative Taiwanese population	Yen Hsuan Huang	6	Thursday	AM
201	Health Outcomes 5	The Role of Offices in Workers' Resilience	Nodoka Tagawa	7	Thursday	AM
202	Health Outcomes: Symposium 2	Impact of overheated bedroom conditions on occupant thermal comfort and sleep quality: An experimental study	Jaydeep Bhadra	1	Thursday	PM

203	Health Outcomes: Symposium 2	Effect of low set temperature of bedroom heating system on sleep thermal comfort	Xiaojing Zhang	2	Thursday	PM
204	Health Outcomes: Symposium 2	Effect of indoor thermal environment before bedtime on sleep in winter	Misaki Miyazaki	3	Thursday	PM
205	Health Outcomes: Symposium 2	A pilot study of Indoor PM2.5 Exposure and their correlation with the sleep behaviors of the Aging and Dementia Population in Pacific Northwest in USA	Wan-Tai Au-Yeung	4	Thursday	PM
206	Health Outcomes: Symposium 2	A Case Study on the Effect of Mat Surface Temperature and Sleep Quality in Cooling Season	Jeongwon Kim	5	Thursday	PM
207	Health Outcomes: Symposium 2	How much ventilation is necessary to avoid disturbance to sleep?	Pawel Wargocki	6	Thursday	PM
208	Health Outcomes: Symposium 2	Effect of Ventilation and CO2 on Sleep Quality and Cognitive Performance	Xiaojun Fan	7	Thursday	PM
209	Indoor Chemistry: Symposium	Ionic PFAS on Indoor Surfaces and PM2.5 Quartz Fiber Filters in North Carolina Homes: Findings from the Indoor PFAS Assessment (IPA) Campaign	Barbara Turpin	1	Monday	AM
210	Indoor Chemistry: Symposium	Measuring emission profiles of neutral PFAS in waterproof clothing materials using I-HR-ToF-CIMS	Clara Eichler	2	Monday	AM
211	Indoor Chemistry: Symposium	Surface to particle partitioning of reactive oxygen species (ROS)	Glenn Morrison	3	Monday	AM
212	Indoor Chemistry: Symposium	Multiphase oxidation of bisphenol A and alternatives: rapid processes indoors	Jie Yu	4	Monday	AM
213	Indoor Chemistry: Symposium	Automated liquid calibration and aerosol sampling inlet for online measurements of airborne PFAS in indoor environments	Chenyang Bi	5	Monday	AM
214	Indoor Chemistry: Symposium	Impacts of Ozone Surface Oxidation on Air Quality	Jillian Downey	6	Monday	AM
215	Indoor Chemistry: Symposium	Spectroscopy as a Probe of Indoor Surface Chemistry	Vicki Grassian	7	Monday	AM
216	Indoor Chemistry 1	Chemical characteristics of indoor aerosol particles and surface films	Rachel OBrien	1	Tuesday	AM
217	Indoor Chemistry 1	High-Resolution Mass Spectrometry Screening of Quaternary Ammonium Compounds (QACs) in Dust from Homes and Various Micro-environments in South China	Guomao Zheng	2	Tuesday	AM
218	Indoor Chemistry 1	New home air quality study (NHAQS): preliminary results of formaldehyde emission rates from composite wood products measured over 1 year	Doyun Won	3	Tuesday	AM
219	Indoor Chemistry 1	Research on Microbial and Volatile Organic Compound Exposures in Household Environments with Pets	Junji Cao	4	Tuesday	AM
220	Indoor Chemistry 1	Effects of Applying "Natural Paints" to Wooden Surfaces on Indoor Air Quality	Naho Tomita	5	Tuesday	AM
221	Indoor Chemistry 1	Laboratory study on the adsorption and desorption processes of VOCs on simulated wallboards	Jixuan Wang	6	Tuesday	AM
222	Indoor Chemistry 1	Novel Detection of PFAS Vapor Emissions Using PTR-TOF-MS with NO+ Ionization and its Applications	Benjamin Kienzie	7	Tuesday	AM
223	Indoor Chemistry: Symposium 2	Receptor Model Applications for Indoor Environments	John Watson	1	Wednesday	AM
224	Indoor Chemistry: Symposium 2	Chemical Analysis Options for Receptor Model Source Apportionment in Indoor Environments	Judith Chow	2	Wednesday	AM
225	Indoor Chemistry: Symposium 2	Indoor versus outdoor contributions to schoolchildren's PM2.5 exposure: A case study using low-cost sensors	Antony Chen	3	Wednesday	AM
226	Indoor Chemistry: Symposium 2	Relationship between building product emissions and indoor air quality	Erik Uhde	4	Wednesday	AM
227	Indoor Chemistry: Symposium 2	Measurement and Characterization of Particles Generated by Small Electric Motors	Gary Casuccio	5	Wednesday	AM
228	Indoor Chemistry: Symposium 2	SVOC Quantification in Indoor Dust Collected from Residential Homes in Beaumont/Port Arthur, TX using Thermal Desorption Vocus-PTR-TOF-MS	David Jarma	6	Wednesday	AM
229	Indoor Chemistry: Symposium 2	Multi-scenario validation and assessment of a particulate matter sensor monitor optimized by machine learning methods	Zhuohui Zhao	7	Wednesday	AM
230	Indoor Chemistry 2	Surface reactive oxygen species (ROS) on growing indoor surface films and resulting airborne ROS concentrations	Glenn Morrison	1	Thursday	PM
231	Indoor Chemistry 2	Ozonolysis of human skin oils on indoor surfaces	Charles Weschler	2	Thursday	PM
232	Indoor Chemistry 2	VOC emissions from the human body: the influence of ozone and other factors	Yuekun Qu	3	Thursday	PM
233	Indoor Chemistry 2	Investigating the influence of ozone on volatile organic compound emissions from air filters	Junjie Liu	4	Thursday	PM
234	Indoor Chemistry 2	Indoor Emission, Oxidation, and New Particle Formation of Personal Care Product Related Volatile Organic Compounds	Tianren Wu	5	Thursday	PM
235	Indoor Chemistry 2	Why do floor-cleaners with no formaldehyde in their compositions are in-door sources of formaldehyde?	Frédéric Thevenet	6	Thursday	PM
236	Indoor Chemistry 2	Identification of volatile organic compounds from topical drugs and medical products: Effects on air quality and healthcare environments	Amber Yeoman	7	Thursday	PM

237	Policy, Reg, Standards 1	Worldwide Carbon Dioxide Guidelines for Indoor Air Quality: A Review	Mark Mendell	1	Tuesday	AM
238	Policy, Reg, Standards 1	Indoor exposure to Δ9-tetrahydrocannabinol (THC) from the consumption of cannabis products	Tunga Salthammer	2	Tuesday	AM
239	Policy, Reg, Standards 1	Finnish guidelines for treatment of symptoms associated with indoor air: well-rounded recommendations formulated through consensus process	Kati Huttunen	3	Tuesday	AM
240	Policy, Reg, Standards 1	Evaluating Indoor Climate Interventions: Balancing Sustainability and Health Outcomes	Asit Kumar Mishra	4	Tuesday	AM
241	Policy, Reg, Standards 1	The difference of creating comfortable indoor and outdoor thermal environment: the changing trend of standards and research directions	Yongxin Xie	5	Tuesday	AM
242	Policy, Reg, Standards 1	Characterizing indoor environment quality and energy efficiency improvement opportunities in U.S. commercial kitchens	Jiayu Li	6	Tuesday	AM
243	Policy, Reg, Standards 1	The conversion of steady-state formaldehyde test chamber concentrations to different climatic conditions	Tunga Salthammer	7	Tuesday	AM
244	Sensors and Monitoring 1	A Novel Microfluidics-based SAW Sensor for Ultrafine Particle Detection	Thilhara Tennakoon	1	Monday	AM
245	Sensors and Monitoring 1	Comparison of low-cost sensors under real world conditions	Erik Uhde	2	Monday	AM
246	Sensors and Monitoring 1	A field study on long-term operations of air purifiers in classrooms in elementary schools in Korea	Bangwoo Han	3	Monday	AM
247	Sensors and Monitoring 1	Ventilation concepts in classrooms: First insights of a long-term monitoring in schools as part of a randomized controlled trial	Susanna Bordin	4	Monday	AM
248	Sensors and Monitoring 1	Merging ventilation efficiency, air quality and thermal comfort measurements	John Saffell	5	Monday	AM
249	Sensors and Monitoring 1	Comparing Targeted and Measured Ventilation and Filtration Rates in Classrooms Using Low-Cost Sensors	Zoe Hoskin	6	Monday	AM
250	Sensors and Monitoring 1	Comparison of spot measurement and continuous measurements of CO2 concentrations in Danish schools	Geo Clausen	7	Monday	AM
251	Sensors and Monitoring 2	IAQ national survey in French dwellings 2020-2023: formaldehyde, benzene and particulate matter levels	Virginie Desvignes	1	Monday	PM
252	Sensors and Monitoring 2	Humans and Their Dogs' Pesticide Air Exposure Concentrations in Boulder Colorado Using Passive Wearable Monitors	Shelly Miller	2	Monday	PM
253	Sensors and Monitoring 2	A Longitudinal Evaluation of Indoor Environmental Quality in Educational and Work Environments	Adam Collison	3	Monday	PM
254	Sensors and Monitoring 2	What Can We Learn About Classroom Air from Low-cost Sensors? A study on CO2 and Volatile Organic Compounds in Danish Schools	Sara Bjerre Sørensen	4	Monday	PM
255	Sensors and Monitoring 2	How to deploy sensors for IEQ monitoring in a large space? A case study of an airport terminal based on the quantitative optimization method	Mufeng Yuan	5	Monday	PM
256	Sensors and Monitoring 2	Development and Validation of a Wrist-based Personal Monitoring Device for Environmental Exposure and Physiological Parameters	Jianbang Xiang	6	Monday	PM
257	Sensors and Monitoring 2	Session chair led panel discussion and extended Q+A		7	Monday	PM
258	Sensors and Monitoring: Symposium	Characterization and Control of Room Air Mixing Regimes and PM exposures in a Large Cohort of Public Elementary School Classrooms	Mark Hernandez	1	Tuesday	PM
259	Sensors and Monitoring: Symposium	Leveraging K-Means clustering to reveal particulate patterns and assessing the impact of particle filtration in Midwestern elementary classrooms in US	Daud Nosham and Josephine Lau	2	Tuesday	PM
260	Sensors and Monitoring: Symposium	Studying the efficiency of air cleaners at removing various indoor air impurities in classrooms and the relation to pupils' perceived symptoms	Kati Huttunen	3	Tuesday	PM
261	Sensors and Monitoring: Symposium	CO2 concentrations in twenty-four primary schools in Switzerland	Bowen Du and Joan Rey	4	Tuesday	PM
262	Sensors and Monitoring: Symposium	Healthy School; Healthy Air Project effectiveness reporting	Elena Austin	5	Tuesday	PM
263	Sensors and Monitoring: Symposium	Indoor environmental quality (IEQ) monitoring in K-12 schools: decision & research support for operations, climate, and pandemic resilience	Patricia Fabian and Katherine Walsh	6	Tuesday	PM
264	Sensors and Monitoring: Symposium	U.S. EPA Tools for Schools, Research Gaps and Funding	Sheila Brown and Kelley Smith	7	Tuesday	PM
265	Sensors and Monitoring 3	Economic inequity of measured indoor and outdoor exposure to PM2.5 using data from 14,000 low-cost particle monitors	Lance Wallace	1	Wednesday	PM
266	Sensors and Monitoring 3	Simultaneous Measurements of Indoor and Outdoor Air Quality	Christian Pfrang	2	Wednesday	PM
267	Sensors and Monitoring 3	Assessing Airborne Microfibres and Microplastics in Indoor Environments: A Case Study on a Canadian University Campus	Sepideh Pakpour	3	Wednesday	PM
268	Sensors and Monitoring 3	Measuring spatial features in office building public areas: Integrating occupant movement and IEQ exposures	Xinting Gao	4	Wednesday	PM
269	Thermal Comfort 1	Dynamic Thermal Pleasure in an Office with Personal Environment Comfort Systems	Yoriaki Nitta	1	Monday	PM

270	Thermal Comfort 1	Factors Associated with Heat Exposure Risk Perceptions Among Elderly Asian Immigrants in New York City, 2023	Inkyu Han	2	Monday	PM
271	Thermal Comfort 1	Thermal performance evaluation of four personal heating devices and occupant usage behaviour under three cold conditions	Sishi Li	3	Monday	PM
272	Thermal Comfort 1	Association between indoor temperature and coldness: a cross-sectional analysis of the nationwide Smart Wellness Housing Survey in Japan	Wataru Umishio	4	Monday	PM
273	Thermal Comfort 1	The impact of thermal history on thermal sensation in cooling conditions	Jiyoung Kwak	5	Monday	PM
274	Thermal Comfort 1	Comparison of Local Thermal Comfort of Young and Older People under Local Exposure	Yin Tang	6	Monday	PM
275	Thermal Comfort 1	Session chair led panel discussion and extended Q+A		7	Monday	PM
276	Thermal Comfort: Symposium	Why do we need causal thinking?	Ruiji Sun	1	Monday	PM
277	Thermal Comfort: Symposium	A Longitudinal Assessment of Indoor Temperature, Thermal Perceptions, and Cognitive Function Among Students in University Classrooms	Sandra Dedesko	2	Monday	PM
278	Thermal Comfort: Symposium	Classification of Cooking Events in Residential Kitchens in Austin, Texas using PM 2.5 Time Series Data	Ansel Early	3	Monday	PM
279	Thermal Comfort: Symposium	Probing input variable selection risks in data-driven building energy mod-els: An investigation based on causal analysis	Tong Xiao	4	Monday	PM
280	Thermal Comfort: Symposium	Thermal Comfort Prediction for the Passengers based on HVAC System Data from Electric Vehicles	Byeongkuk Oh	5	Monday	PM
281	Thermal Comfort: Symposium	MOVING TO A SMALLER ACTIVITY-BASED OFFICE—EMPLOYEE EXPERIENCES VS. MEASUREMENT RESULTS	Arttu Sivula	6	Monday	PM
282	Thermal Comfort: Symposium	Advanced predictive model based on automatic re-learning to improve indoor air quality prediction reliability in infant facilities	Kichul Kim	7	Monday	PM
283	Thermal Comfort 2	Thermal comfort of people with Autism Spectrum Condition (ASC): preliminary results of a field study	Luca Zaniboni	1	Tuesday	PM
284	Thermal Comfort 2	Mapping Thermal Personality for Occupant-centric Environment Control	Yoon Hee Lee	2	Tuesday	PM
285	Thermal Comfort 2	Effect of low relative humidity on sleep quality	Mizuho Akimoto	3	Tuesday	PM
286	Thermal Comfort 2	Combined Effect of Thermal and Visual Environments on Thermal Comfort in Semi-outdoor Spaces	Hikari Ryuzaki	4	Tuesday	PM
287	Thermal Comfort 2	Climate-based thermal sensation ranges from existing data: preliminary analysis of the ASHRAE Thermal Comfort Database II.	Wilmer Pasut	5	Tuesday	PM
288	Thermal Comfort 2	Residential Heat Exposures in Lower Income Households: Data Collected in the UT Austin Whole Communities—Whole Health (WCWH) Study	Ansel Early	6	Tuesday	PM
289	Thermal Comfort 2	Enhancing air mixing through air diffusers for ventilation in vehicles and enclosed spaces	Florin Bode	7	Tuesday	PM
290	Thermal Comfort 3	Effects of pulsating flow on local convective heat transfer over the human body	Siqi Zhou	1	Wednesday	AM
291	Thermal Comfort 3	jsthermalcomfort: a JavaScript package to calculate thermal comfort and thermal stress indices	Federico Tartarini	2	Wednesday	AM
292	Thermal Comfort 3	Distribution pattern of human skin temperature during sleep	Nan Zhang	3	Wednesday	AM
293	Thermal Comfort 3	An experimental study investigating school-age children's thermal environment perception.	Alice Caporale	4	Wednesday	AM
294	Thermal Comfort 3	Do psychological factors influence the thermal responses of building occupants?	Pawel Wargocki	5	Wednesday	AM
295	Thermal Comfort 3	Thermal comfort and satisfaction in hospital wards in Cote d' Ivoire	Andrea Gasparella	6	Wednesday	AM
296	Thermal Comfort 3	Overall thermal comfort evaluation method based on local skin temperature	Siyi Li	7	Wednesday	AM
297	Thermal Comfort 4	Thermal Comfort and Self-reported Productivity at Home and Office: a longitudinal field study	Kuniaki Mihara	1	Thursday	AM
298	Thermal Comfort 4	Validation of CIBSE residential overheating criteria using Australian field data	Jungsoo Kim	2	Thursday	AM
299	Thermal Comfort 4	Applicability of Skin Temperature for Thermal Sensation Recognition with Varying Clothing	Jiaqi Zhao	3	Thursday	AM
300	Thermal Comfort 4	Individual factors, clothing, and thermal comfort in office work during heating and cooling seasons	Henna Maula	4	Thursday	AM
301	Thermal Comfort 4	Decarbonization of Existing Offices through Owner/Tenant Collaboration: Energy saving while increasing productivity through environmental variability	Ryohei Itsuaki	5	Thursday	AM
302	Thermal Comfort 4	Comparison of thermal comfort of TABS with all-air systems under different temperatures: A living laboratory study	Xiaojun Fan	6	Thursday	AM
303	Thermal Comfort 4	Session chair led panel discussion and extended Q+A		7	Thursday	AM
304	Ventilation and HVAC 1	Design and Experimental Study of Novel Controllable Attenuator Systems for Constant Temperature Air-Conditioning	Weichen Guo	1	Monday	AM

305	Ventilation and HVAC 1	Assessment of Indoor Air Quality Improvement Effects through the Operation of an Integrated IAQ Management System in an Underground Shopping Mall	Jiwoong Kim	2	Monday	AM
306	Ventilation and HVAC 1	An Adaptive Cooling Coil for Large Load Diversity and Resilience	Kwok Wai Tham	3	Monday	AM
307	Ventilation and HVAC 1	Estimation of Air Exchange Rates in Small-sized Multi-use Facilities using Multiple-formulas Method	Jimin Kim	4	Monday	AM
308	Ventilation and HVAC 1	Design and Application of Reinforced Exhaust Hoods for Rooms with Strong Buoyancy	Qiyen Chen	5	Monday	AM
309	Ventilation and HVAC 1	Indoor thermal environment improvement based on switchable radiation/convection-combined intermittent heating	Yifan Wu	6	Monday	AM
310	Ventilation and HVAC 1	A Field Intervention Study of Effects of Thermal Environment and Ventilation in the Bedroom on Sleep Quality	Jumpei Nakano	7	Monday	AM
311	Ventilation and HVAC 2	Investigating the protection effect of gaspers in an aircraft cabin with personalized displacement ventilation	Yunge Hou	1	Monday	PM
312	Ventilation and HVAC 2	Investigating Ventilation Strategies on Public Transport through the Long-Term Environmental Monitoring of Operational London Buses	Oliver Wild	2	Monday	PM
313	Ventilation and HVAC 2	Development an empirical model to predict the capture efficiency of exhaust hoods in a confined enclosure	Qiyen Chen	3	Monday	PM
314	Ventilation and HVAC 2	Predicting Human CO2 Emissions for IAQ Applications	Oluwatobi Oke	4	Monday	PM
315	Ventilation and HVAC 2	Measured and perceived IEQ in schools in Sweden, Slovakia and the UAE	Gabriel Bekö	5	Monday	PM
316	Ventilation and HVAC 2	VENTILATION STRATEGIES FOR INCREASING INDIVIDUAL THERMAL COMFORT IN OPEN-PLAN OFFICES – A COMPARATIVE STUDY	Alireza Afshari	6	Monday	PM
317	Ventilation and HVAC 2	Impact of Partition on Airborne Cross-Exposure Risk in Stratified Micro-Environments	Xue Tian	7	Monday	PM
318	Ventilation and HVAC 3	Killed by DALY? primary and secondary effects of IAQ management from an environmental justice perspective.	Jelle Laverge	1	Tuesday	AM
319	Ventilation and HVAC 3	DALY engineering: and to dust shall you return	Jelle Laverge	2	Tuesday	AM
320	Ventilation and HVAC 3	Failure Analysis and Forensic Engineering in the Built Environment	Pradeep Ramasubramanian	3	Tuesday	AM
321	Ventilation and HVAC 3	Impacts of HVAC Cleaning on Energy Consumption and Indoor Air Quality: A Multi-Climate Site Demonstration	Nasim Ildiri	4	Tuesday	AM
322	Ventilation and HVAC 3	Generating Thermal Stratification in the Controlled Active Ventilation Environment Laboratory (CAVE)	Liora Malki-Epshtein	5	Tuesday	AM
323	Ventilation and HVAC 3	Effectiveness of reciprocating recirculating horizontal air curtain in reducing heat flux across horizontal temperature stratifications	Yanlei Yu	6	Tuesday	AM
324	Ventilation and HVAC 3	Optimization of window opening for ventilation of a bedroom using the adjoint based topology method	Tengfei Zhang	7	Tuesday	AM
325	Ventilation and HVAC	An Innovative Smart HVAC System for Cold Climates: Achieving Sustainable Thermal Comfort	Amirmohammad Behzadi	1	Wednesday	PM
326	Ventilation and HVAC	Point source Ventilation Effectiveness of mixing ventilation solutions used in non-residential Settings	Raimo Simson	2	Wednesday	PM
327	Ventilation and HVAC	Assessment of Indoor Air Quality and Ventilation Rate in Residential Dorms After Net-Zero Retrofit	Zhipeng Deng	3	Wednesday	PM
328	Ventilation and HVAC	Cost-effective Retrofit for Optimized Ventilation and Filtration System Controls: Field Results	Theresa Pistochini	4	Wednesday	PM
329	Ventilation and HVAC	Application and validation of a wearable monitor for assessing personal and in-home exposures to particulate matter in the California Central Valley	Xiaoying Li	1	Thursday	PM
330	Ventilation and HVAC	Particle Emission and Cooking Performance of Induction Cooking Stoves	Amanda Giang	2	Thursday	PM
331	Ventilation and HVAC	Improving Air Quality using Smart Thermostats: Minimizing Indoor Exposure to Wildfire-Generated Fine Particulate Matter (PM2.5)	Federico Dallo	3	Thursday	PM
332	Ventilation and HVAC	Mechanical Ventilation and IAQ in Recently Constructed US Homes	Brett Singer	4	Thursday	PM
333	Ventilation and HVAC	Comparing Bath vs Kitchen Continuous Exhaust Ventilation on Indoor Air Contaminants in Single-Family Detached Homes using Gas Cooking	Kiel Gilleade	5	Thursday	PM
334	Ventilation and HVAC	Inequity of Exposure to Wildfire Smoke PM2.5 in the United States	Jing Li	6	Thursday	PM
335	Ventilation and HVAC	Measured air pollutants in 276 European homes using gas or electric hobs	Brett Singer	7	Thursday	PM

Type	Theme	Duration	Abbreviated Title	Organizer	Date	Time	Affiliated speakers
Symposium		90 min	Leveraging Causal Inference for IAQ Research	Ruiji Sun	Monday	PM	see tab "Thermal comfort and perception"
Symposium	Health Outcomes	90 min	Children exposure + health in day-care and schools	Heidi Salonen	Monday	PM	see tab "Health outcomes"
Symposium	Indoor Chem	90 min	Emerging indoors contaminants and measurement advances	Clara Eichler	Monday	AM	see tab "Indoor ChemSour&Trans"
Symposium	Health Outcomes	90 min	Bedroom environment and sleep quality:	Xiaojun Fan	Thursday	PM	see tab "Health outcomes"
Symposium	Covid 19	90 min	Aerobiology in the context of indoor air quality	Henry Oswin	Thursday	AM	see tab "Covid-19 and Viral Transmission"
Symposium	Covid 19	90 min	High-Efficiency Engineering Controls for COVID-19	CC Chen	Thursday	PM	see tab "Covid-19 and Viral Transmission"
Symposium	Vent	90 min	Residential Building Decarbonization in California	Maninder Thind	Thursday	PM	see tab "Ventilation and HVAC"
Symposium		90 min	Improving indoor environmental quality in K-12 schools:	Patricia Fabian	Tuesday	PM	see tab "Sensors and Monitoring" for list
Symposium	Building Sim	60 min	Understanding Indoor-Outdoor Transport	Michael Sohn	Wednesday	PM	see tab "Building SS&E"
Symposium	Indoor Chem	90 min	Sampling, Chemical Analysis, Apportionment for IAQ	John Watson	Wednesday	AM	see tab "Indoor ChemSour&Trans"
Symposium	Covid 19	90 min	Dynamics of virus aerosolization and resuspension	Charles Gerba	Wednesday	AM	see tab "Covid-19 and Viral Transmission"
Symposium		90 min	Indoor Ultrafine Particles: Nano to accumulation modes	Dusan Licina	Wednesday	AM	see tab "Aerosols and PM"
Symposium	Air cleaning and filtration	60 min	Gas-phase air cleaning	Bjarne Oleson	Wednesday	PM	
Workshop	Indoor Chem	90 min	When does indoor air chemistry matter?	Vita Ilacqua	Monday	PM	1) Why Indoor Chemistry Matters – Insights from a National Academy of Sciences Report; David A. Butler *, Delphine Farmer, Dustin Poppendieck; 2) Relative Contributions of Indoor Chemistry to Indoor Air Concentrations Danny Malashock, Jordan Zambrana, Vito Ilacqua; 3) Volatile Organic and Inorganic Compounds: Sources, impacts, and strategies to improve indoor air from the HOMEChem and CASA studies Delphine K. Farmer*, Marina E. Vance; 4) Lessons learned from HOMEChem and CASA concerning indoor aerosols Marina E. Vance*, Delphine K. Farmer; 5) Byproduct Formation from Portable Air Cleaners under Standard Test Conditions Dustin Poppendieck*, Raleigh Robertson, Michael F. Link
Workshop	Covid-19	90 min	Indoor Chemistry of Far UV	Gigi Gronvall	Monday	AM	Moderators: Paula Olsiewski, Johns Hopkins 1. Overview of Far UV: Dustin Poppendieck, NIST 2. Promise and efficacy of Far UV: Cath Noakes, Leeds 3. Understanding Far UV Sources: - Holger Claus, Ushio 4. Formation of ozone, aerosols and volatile organic compounds induced by 222-nm lamps: Joost DeGouw, U of Colorado 5. Far UV and Hydroxyl radical production: Victoria Barber, UCLA 6. From the Laboratory to the Lavatory: Unintended Air Quality Impacts of Ultraviolet Light Disinfection in an Odiferous Bathroom Installation Michael Link, NIST 7. Benefits vs Risks: Gigi Gronvall, Johns Hopkins 8. Application Decisions: William Bahnfleth, Penn State
Workshop	Policy, Reg	90 min	School IAQ Research Agenda that Fuels Action	Hanna Carter	Monday	AM	Ulla Haverinen-Shaughnessy, The University of Tulsa (confirmed) - Derek Shendell, Rutgers School of Public Health (confirmed) - Sheryl Magzamen, Colorado State University – to be confirmed - Andrew Persily, National Institute of Standards and Technology (confirmed) - Parham Azimi, Harvard University (confirmed) - Gary Bignami, Hawaii Department of Education – to be confirmed - Josephine Lau, University of Nebraska-Lincoln (confirmed) - Pawel Wargocki, Technical University of Denmark (confirmed) - Jeff Siegel, University of Toronto (confirmed)
Workshop	Dampness	90 min	Beyond Mold in the Indoor Environments	Andrew Hoisington	Monday	AM	
Workshop	Vent	90 min	Mixed Mode Ventilation in the Tropical Climate	Kwok Wai Tham	Thursday	AM	
Workshop	Health Outcomes	90 min	Novel Methods for Indoor Chem Exposure Measurements	Pawel Mistzal	Thursday	PM	<i>Panelists: Pawel Misztal, Anita Avery, Yingjun Liu, Anna Neville, Michael Link, Kerry Kinney</i> 1) Exogenous pollutant measurements in human breath and bioeffluents; 2) Recent Instrumentation and Method Development; 3) Exposure and Worker Performance; 4) Hair and Dust; 5) Challenges and Solutions 6) Human Exposure Wrap-up Discussion and Q&A

Workshop	Indoor Chem	90 min	Expanding perspectives for indoor chemistry	Rachel O'Brien	Thursday	AM	Impacts of Aging and Relative Humidity on Biomass Burning Smoke in an Indoor Environment (Marina Vance) and Indoor VOC Persistence and Particle Production following Wildfire Smoke and Outdoor Air Pollution Events (Delphine Farmer)
Workshop		90 min	Community Engaged Research for Improving IAQ	Andrea Ferro	Tuesday	PM	
Workshop		90 min	The Burden of Disease of Indoor Air Pollutants	Yinping Zhang	Tuesday	AM	
Workshop	Covid 19o	60 min	Building Systems Against Airborne Infection	Tunga Salthammer	Wednesday	PM	
							1) Overview, Indoor air quality guidelines (Ulla Haverinen-Shaughnessy, Oluyemi Toyinbo, Samy Clinchard) 2) Outdoor air quality guidelines (Marzenna Dudzińska, Oluyemi Toyinbo, Sani Dimitroulopoulou, Raja Singh) 3) Ventilation guidelines (Xiaojun Fan, Steven Emmerich, Ju-Hyeong Park, Mizuho Akimoto, Piet Jacobs) 4) Thermal comfort guidelines (Rajan Rawal, Marcel Schweiker, Lars Gunnarsen) 5) Acoustics guidelines (Henna Maula, Ian Cull) 6) Lighting guidelines (Raja Singh, Linda Hägerhed, Amelia Staszowska, Padmanabhan Gopalakrishnan, Gurkirpal Singh) 7) In-vehicle air quality guidelines (Albert Donnay, Yangang Xing, Maneerat Ongwandee, Jocelyn Moore, Ju-Hyeong Park)
Workshop	Policy	90 min	IEQ Guidelines Worldwide - Recommendations	Ulla Haverinen-Shaughnessy	Wednesday	AM	
Workshop	Policy	60 min	Should surface cleanliness be an IEQ factor?	Richard Shaughnessy	Wednesday	PM	
Workshop	Policy	60 min	Introducing the Model Clean Indoor Air Act	Alex Zhu	Wednesday	PM	

	AM, Session Chair: Pawel Micalist	Submission Code	Presenter	Location	USA				Europe			Asia			Australia
	Virtual - Mini Plenary		Kerry A Kinney	United States	Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Kinetic analysis of Trichloroglycidylphosphate (TCGP) emission from fireproofed upholstered furniture under realistic indoor conditions	PROBQ0ELUK	Valérie DESAULDERES	France											
	Assessing the VOCs effectiveness of air purifiers in realistic rooms: bridging the gap with the measured efficiency of standardized methods.	PROBBA2V0XK	Charles-Florin Picard, Marc Abadie	France											
	Causal Inference Engineers Crosscut Center: Building Science	PROCB3KASPL	Jan Nien	Germany	06:30-08:00	09:30-11:00	11:30-13:00	12:30-14:00	17:30-19:00	18:30-20:00	22:00-23:30	01:30-03:00	00:30-02:00	02:30-04:00	
	Quantitative analysis of indoor air quality under future climate scenarios: Projection till 2100 for a Belgian case study	PROCLTAPWVS	Mohsen Pourkazemi	Ireland											
	Method development of experimental particle measurements and exposure risk in long term health care facilities	PRODFWBS1E1	Karin Kompatscher	Netherlands											
	Determining the local and overall thermal sensation and comfort of occupants under personalized constant jet ventilation- Experimental study	PRODTHM1E1D	Sayed Mohammad Housheiniand	Germany											
	Break														
	Live Streaming: Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
Monday July 8, 2024	Break														
	Live Streaming: Feature Track - AM : Health Outcomes and Exposure Assessment 1				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - PM : Covid-19 and Viral Transmission 1				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Re-broadcast : Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	PM, Session Chair: Ivan Luhung	Submission Code	Presenter	Location	USA				Europe			Asia			Australia
	Virtual - Mini Plenary: Microbiomes and Viromes in the Air and on Surfaces of Indoor Built Environments		Patrick K.H. Lee	Hong Kong	Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Next-Generation Indoor Air Quality Management: An IoT and deep learning integrated based approach for real-time monitoring and prediction	PRODPOVDCST	Jamal Yousef	South Korea											
	Characteristics and antibiotic resistance of Isosporobol between ambient atmosphere and semi-open night market	PROCB33N0P	Yu Hsiang Ting	Taiwan											
	Indoor plants regulate the respiratory bacteria of high-altitude migrants and improve their environmental adaptability	PROD70N757	Yi Deng	China	19:00 - 20:30	22:00-23:30	00:00-01:30	01:00-02:30	06:00-07:30	07:00-08:30	10:30-12:00	14:00-15:30	13:00-14:30	15:00-16:30	
	Indoor environmental quality in French schools: a comparison of the TAI index with occupants' perception	PROD3P708TE	Wenjuan Wei	France											
	Doing multiple localized cooling stimuli to elicit thermal pleasure	PRODSUW1E8	Xiaofeng Geng	Australia											
	Break														
	Live Streaming: Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - AM : Air Cleaning and Filtration 1				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - PM : Thermal Comfort and Perception Indoor Air 2				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
Tuesday July 9, 2024	Break														
	Re-broadcast : Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	PM, Session Chair: Pawel Micalist	Submission Code	Presenter	Location	USA				Europe			Asia			Australia
	Virtual - Mini Plenary : Air cleaners or air changers? Lessons learned from classroom and laboratory studies on the removal of VOCs by mobile air cleaners		Kasper Roldemann	Denmark	Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Proposal of implementation methods for advanced HVAC operation strategies using single-board microcontrollers	PRODV0X7YV	Kwanghwan Choi	South Korea											
	Inter-phase partition of semi-volatile organic compounds (SVOCs) under steady-state in indoor environment	PROCBVME313	Shunshan Shi	China	19:00 - 20:30	22:00-23:30	00:00-01:30	01:00-02:30	06:00-07:30	07:00-08:30	10:30-12:00	14:00-15:30	13:00-14:30	15:00-16:30	
	How CO2 Concentration in classrooms changed before / during COVID-19 at an elementary school in Tokyo based on the measurement between 2017 and 2023	PROD7VAT1YV	Go Naohito	Japan											
	Experimental Investigation of Particle Dispersion in an Operating Room under Positive and Negative Pressurization	PRODTW1770	Rissa Danelasharian	Canada											
	Numerical investigation of HVAC System Impacts on Airborne Infectious Disease Transmission in Operating Rooms	PRODJMV8UJ	Rissa Danelasharian	Canada											
	AM, Session Chair: Chew Hsien Lin	Submission Code	Presenter	Location	USA				Europe			Asia			Australia
	Virtual - Mini Plenary : Kinetic modeling of indoor multiphase chemistry and integration with experiments: organo-halide formation and human skin toxicology		Manabendu Shrivastava	United States	Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Predicting airborne infectious disease transmission risk to future room occupants in an outpatient healthcare setting using CFD	PROHQW2BF2	Kyle Fortner	United States											
	Comparative Assessment of Occupant Behavior models for early stage occupant-centric design decisions	PROD782L16	Sharon Velghe	Germany	06:30-08:00	09:30-11:00	11:30-13:00	12:30-14:00	17:30-19:00	18:30-20:00	22:00-23:30	01:30-03:00	00:30-02:00	02:30-04:00	
	Performance of a sensor-based passive ventilation control system in a semi-private dormitory	PROCBW4UFC1	Sara Mohamed	United Kingdom											
	Ventilation Assessment in GP Surgeries during the COVID-19 Era: A Monitoring Approach	PROA714U66	Maninder Dhill	United Kingdom											
	Supporting Healthy, Equitable Residential Energy Transition through Applied Research			United States											
	Open Rooms and Indoor Environments (OPEN): Characterizing indoor air quality in occupied and unoccupied office spaces	PROLSH4EYV	Nehal Agrawal	Canada											
	Break														
	Live Streaming: Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
Wednesday July 10, 2024	Break														
	Live Streaming: Feature Track - AM : Aerosols and PM: Indoor Ultrafine Particle Dynamics Spanning the Nanocluster to Accumulation Modes				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - PM : Ventilation and HVAC 4				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Re-broadcast : Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	AM, Session Chair: Anna Neville	Submission Code	Presenter	Location	USA				Europe			Asia			Australia
	Virtual - Mini Plenary		Brent Stephens	United States	Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	CFD modeling to characterize wind-driven natural ventilation in offices	PRODQ0T1X0	Marzieh Fathallagour	United Kingdom											
Pandemic lessons learned: How effective were measures used to control COVID transmission in buildings?	PROD7VW6UE	Ed Cape	United States	06:30-08:00	09:30-11:00	11:30-13:00	12:30-14:00	17:30-19:00	18:30-20:00	22:00-23:30	01:30-03:00	00:30-02:00	02:30-04:00		
Urbanization and its role on indoor air quality- preliminary schools' characterization of EDC/Minid2 study	PROD7M57L6P	Klara Steukova	Portugal												
Modeling indoor infection risk and energy impacts due to airborne pathogens	PROD84E1P02	Samuel Fernandes	United States												
MVOC expression of molds under light	PROD85SD0P4	Benjamin Marshall	United States												
Ventilation study in contemporary Scottish homes	PROD85SD0P4	Uisde Thiele	United Kingdom												
Thursday July 11, 2024	Break														
	Live Streaming: Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - AM : Climate Change, Wildfires, Natural Disasters, and Urbanization 1				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - PM : Indoor Chemistry, Sources, and Transformation 2				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Re-broadcast : Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	AM, Session Chair: Anna Neville	Submission Code	Presenter	Location	USA				Europe			Asia			Australia
Virtual - Mini Plenary		Brent Stephens	United States	Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney		
CFD modeling to characterize wind-driven natural ventilation in offices	PRODQ0T1X0	Marzieh Fathallagour	United Kingdom												
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	Break														
	Live Streaming: Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - AM : Climate Change, Wildfires, Natural Disasters, and Urbanization 1				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - PM : Indoor Chemistry, Sources, and Transformation 2				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Re-broadcast : Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	AM, Session Chair: Anna Neville	Submission Code	Presenter	Location	USA				Europe			Asia			Australia
Virtual - Mini Plenary		Brent Stephens	United States	Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney		
CFD modeling to characterize wind-driven natural ventilation in offices	PRODQ0T1X0	Marzieh Fathallagour	United Kingdom												
Pandemic lessons learned: How effective were measures used to control COVID transmission in buildings?	PROD7VW6UE	Ed Cape	United States	06:30-08:00	09:30-11:00	11:30-13:00	12:30-14:00	17:30-19:00	18:30-20:00	22:00-23:30	01:30-03:00	00:30-02:00	02:30-04:00		
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	Break														
	Live Streaming: Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - AM : Climate Change, Wildfires, Natural Disasters, and Urbanization 1				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - PM : Indoor Chemistry, Sources, and Transformation 2				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Re-broadcast : Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	AM, Session Chair: Anna Neville	Submission Code	Presenter	Location	USA				Europe			Asia			Australia
Virtual - Mini Plenary		Brent Stephens	United States	Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney		
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	Break														
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	Break														
	Live Streaming: Feature Track - PM : Indoor Chemistry, Sources, and Transformation 2				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
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	Break														
	Live Streaming: Plenary				Hawaii	Pacific	Chicago	Eastern	UK	West/Cnt	India	East Asia	Singapore	Sydney	
	Break														
	Live Streaming: Feature Track - AM : Climate Change, Wildfires, Natural Disasters, and Urban														

*Submissions highlighted in grey: please complete your conference registration as soon as possible.

Virtual Poster Presentations	
Title	Presenter
Characterization of indoor air quality in 10 French sports halls	Valérie DESAUZIERS
Using Logistic regression to analyze the impact of external environmental factors on indoor air quality at Postpartum home	Cheng Chen Chen
The Impact of Germicidal Ultraviolet Light at 222 and 254 nm on Indoor Air Chemistry	David R. Shaw, Toby Carter
Unveiling Inhalable Particle Resuspension from Clothing: Insights from a Controlled Chamber Study	Dusan Licina, Han-Yun Jhang
Indoor environmental conditions in Italian childcare buildings: results from a monitoring campaign	Elena Crespino
Targeted and non-targeted analysis of semi volatile organic compounds (SVOCs) in indoor dust from 10 French sports halls	Gaelle Raffy
Associations between respiratory infections and ventilation rate in classrooms of elementary schools in northeastern China	Jing Hou
The Effects of Energy Retrofits to Variations of Airborne Particulate Matter in Finnish and Lithuanian Multifamily Buildings	Judita Švaikauskaitė
Energy Efficiency Considerations for Early Stage of Office Building Design in South Korea	Juhee nam, Lee Taecheol, Yoon SeongHwan
Evaluation of SVOC exposure from indoor air using SVOC gas-particle partitioning model and airborne particle deposition model onto human body surface	Kosuke Kondo
Unravelling the dynamics of human movements on airflow and bioaerosol dispersion within an isolation room: A numerical study	Manoj Kumar Satheesan
Elucidating the role of microorganisms in the removal of VOCs from indoor air	María Sol Montaluisa Mantilla
Phytoremediation of VOCs using the plants Epipremnum aureum and Syngonium podophyllum	
Fed-stated in vitro bioaccessibility method for SVOCs in indoor dust	Marie Dufresne
Towards a better OD-1D modelling approach for more accurate prediction of Indoor Air Quality (IAQ) in Buildings	Nicolas Carnec
VOC-Ozone Converters Demonstrated to Improve Aircraft Cabin Odor Compared with Standard Ozone Converters	Richard Fox
Outside Supply Air Purification for Conditioning Air in Aircraft Cabins	
Fugacity model incorporating computational fluid dynamics to predict the behavior of insecticide sprayed in a room	Sayuri Tanaka
Modelling study of disinfection and contaminant formation associated with far-UVC light (222 nm)	Seongjun Park
Gender-related indoor fungal diversity: a case study of university dormitory in Chongqing, China	Ting Fu
Comparative Analysis of Indoor Air Research Hotspots at Home and Abroad Based on Citespace Visualization Map in Recent 20 Years	Xiu Han
Quality control of data pre-processing for improving prediction performance of ANN model based on CFD simulations: Effect of grid resolutions	Yeseul Eom
Impact of building airtightness on portable air cleaner performance in an elementary school classroom	
Effect of natural aging on the long-term cooling performance of radiative cooling coating: a field study	Yue He
Unveiling Spatial-Temporal Patterns of PM2.5 Pollution in Kampala City: A Novel Local Moran's I Autocorrelation Approach	Fidel Raja Wabinyai
Health risks of trace metals of quasi-PM2.5 and quasi-ultrafine particles in metro stations in the East China	Bin Lu
Indoor ultrafine particles in underground metro station: a field study	
Enhancing OT Infection Control: Real-time Evaluation of HVAC Systems through Computational Fluid Dynamics and Digital Twin Technology	Giovanna Gargiulo
Development of regression model for metacognition of building energy users	Semi Park
Study on the influence of plane space division on the natural ventilation performance of teaching buildings	Siyi Liu
Investigation of the air conditioning regulation behavior and sleep characteristics during sleeping in summer for Chinese	Xiaohui Tian
The Renewal Design of Dong Timber Dwelling Based on Tas Software: The Case Study of Gaobu	Xiaoyun Liu
Spatial-temporal Distribution Characteristics and Size Distribution of Par-ticles of Two Different Types of Underground Garages in Harbin	Yafan Zhao
Elderly's Thermo-physiological Responses to Transient Temperature of Shower in winter	Yingxian Zhai
Ventilation and air quality of double-decker buses with known occupancy	Filipa Adzic
In vivo respiratory toxicology of Fine Particulate Matter Air Pollution and High relative humidity exposure: Evidence, mechanisms and prevention	Ziyu Shu
A systematic review of low-cost sensors with the Internet of Things applica-tion: are they feasible for long-term indoor air quality monitoring in res	Yong Yu
How to evaluate the indoor air quality through users' perception and low-cost sensors: a methodology for defining how to match the qualitative and qua	
Maximizing Comfort: Comparative Analysis of Key Body Parts in Local Radiant Heating Systems	Seyed Mohammad Hooshmand
Factors associated with formaldehyde levels in the offices of the Academic Medical Institute	Vithawat Surawattanasakul, Watcharakorn Chuthong
Restoring IAQ after structural fires	Ed Light
Unravelling the Complexities of Window Behaviour in Open Offices: In-sights from Semi-Structured Interviews and Content Analysis	Pengju Zhang
A Comprehensive Investigation of the Indoor Environment Monitoring of an Art Storage Facility	Shayeeka Alam
Development of a CFD-GA coupled model for evaluating optimal ventila-tion strategies in general inpatient ward cubicles	Tsz Wun Tsang
Fatty acids metabolism in indoor ozone-induced pulmonary inflammatory injury: evidence, mechanism and prevention	Mengyuan Li
The Impact of Fabrics on the Transport, Behavior and Fate of Indoor Organic Compounds	Xiaojun Zhou
Drosophila melanogaster detection and colliding segmentation for studying the behavioural effects of pollutant exposure	Xiaoying Li
Development of Humidifier Products with Physical Sterilization Technology in concern of severe death of Humidifier disinfectant use	Sunyoung Moon
Validating the Use of CONTAM to Predict Indoor Air Quality in Tertiary Institutions starting with the SOE (School of Engineering) for the Indoor Air Pollutants Carbon Dioxide, PM2.5 and formaldehyde	Michael McGregor
Assessing the CO2 removal effectiveness of potted plants: an experimental approach	Xuan Tian
Assessing Indoor Air Quality Impacts of Tobacco Products: Differential Cytotoxic Effects of Conventional Cigarette and Heated Tobacco Product Aerosols	Gailė Pocevičiūtė