

HEALTHY BUILDINGS EUROPE 2017

JULY 2-5 2017, LUBLIN (POLAND), [WWW.HB2017-EUROPE.ORG](http://WWW.HB2017-EUROPE.ORG)



Scientific PROGRAMME

DRAFT

version June 9,2017

	Sunday, 2 <sup>nd</sup> July	
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**Accompanying events:**

13.00 – 16.00 BOD Meeting

16.00 – 17.00 Academy Meeting / STC 1.3 Meeting

15.00 – 18.30 - **Registration**

18.30 – 21.00

**Opening ceremony:**

Welcoming addresses

**Plenary lecture:**

The Good, the Bad and the Ventilation

***Pawel Wargocki***

Concert

Welcoming Reception

8.30-10.00

Plenary session II

10.00 – 10.30 Break: coffee/tea

10.30 – 12.00 Parallel sessions/ workshops

Room 1	Room 2	Room 3	Room 4	Room 5
Nearly zero, zero and plus energy buildings	RADON, natural radioactive gas, as a factor influencing indoor air quality	New Materials/ Solutions – New Challenges - Part I	Hospitals and Elderly People - Part I	Release and Partitioning of Chemicals Indoors

12.00 – 13.30 Lunch

13.30 – 14.30 Coffee/poster viewing

14.30 – 16.00 Parallel sessions/workshops

Room 1	Room 2	Room 3	Room 4	Room 5
Energy Efficient Retrofit of Existing Buildings	Indoor Environmental Quality - Policies and Tools	Chemical Pollutants Impact of Health and Wellbeing - Part I	Hospitals and Elderly People - Part II	Indoor air purification

16.00 – 16.30 Break: coffee/tea

16.30 – 18.00 Parallel sessions/workshops

Room 1	Room 2	Room 3	Room 4	Room 5
New Materials/ Solutions – New Challenges - Part II	Indoor environmental Quality - Regional Problems	Chemical Pollutants Impact of Health and Wellbeing - Part II	Indoor Environment and Mental Health: Bridging Collaborative Efforts Across Disciplines	Interdisciplinary human-related field research - how to make the right choice?

18.00 – 19.30 REHVA meeting

18.00 – 19.30 Chapters Meeting

19.00 – 21.00 Student Event

Session	Monday, 3 <sup>rd</sup> July	8:30 – 10:00
Plenary Session II	M	
Chair:		

Urban Overheating, Health and Mitigation Potential

***Mattheos Santamouris***

Indoor Radon: Risks and Preventive Strategies

***James Mc Laughlin***

<b>Session</b>		<b>Monday, 3<sup>rd</sup> July</b>	<b>10:30 – 12:00</b>
<b>Session XX</b>	<b>Room 1</b>	<b>Nearly zero, zero and plus energy buildings</b>	
Chairs:			

- 0036** KODNZEB – retrofit buildings. Architect’s approach  
Elżbieta Ryńska, Urszula Koźmińska
- 0124** Optimization of passive building window's size  
Dawid Tąta, Henryk Foit
- 0205** Zero Energy Building - What is happening in Japan?  
Shin-Ichi Tanabe
- 0307** Concept of improving of indoor environment in a public building during planned modernization to nZEB  
Maciej Mijakowski, Urszula Koźmińska, Jerzy Kwiatkowski, Joanna Rucińska, Jerzy Sowa
- P0011** Feasibility Study of Zero Energy Building for different configurations of existing office buildings  
Yuka Maruyama, Kei Utsumi, Akihiro Takimoto, Shuhei Takahashi, Moe Matsuda, Shin-ichi Tanabe
- P0179** Putting up cloth to clean the air: A passive control perspective  
Mattia Pierpaoli, Gabriele Fava, Maria Letizia Ruello
- P0305** Indoor air parameters in higher education building before planned modernization to nZEB standard  
Jerzy Sowa, Justyna Noga-Zygmunt, Joanna Ugorowska

Session		Monday, 3 <sup>rd</sup> July	10:30 – 12:00
<b>Session XX</b>	<b>Room 2</b>	RADON, natural radioactive gas, as a factor influencing indoor air quality	
<b>Chairs:</b> Jadwiga Mazur (Institute of Nuclear Physics PAN, Krakow, Poland) Jose Luis Gutierrez Villanueva (University of Cantabria, Santander, Spain)			

- 0170** A computational evaluation assessing changes in building guidelines on indoor radon concentrations  
James A. McGrath, Miriam Byrne
- 0015** Design of radon-proof insulations – proposal for efficient and uniform procedure  
Martin Jiraneck
- 0178** Different approaches on radon policies at national and European level: a controversy  
Jose-Luis Gutierrez-Villanueva, Ismael Fuente Merino, Santiago Celaya, Alicia Fernandez, Jorge Quindos Lopez, Luis Quindos Lopez, Enrique Fernandez, Daniel Rabago, Luis Santiago Quindos Poncela
- 0283** Application of different foil materials as barriers against radon entry into buildings  
Szymon Guguła, Dominik Grządziel, Krzysztof Kozak, Jadwiga Mazur, Mariusz Mroczek
- 0285** Air conditioning settings vs. indoor radon dynamics  
Dominik Grządziel, Krzysztof Kozak, Jadwiga Mazur, Bernard Poędnik, Marzenna Dudzińska
- 0301** The potential sources of radon in buildings in Lublin Region in Poland  
Lucjan Gazda, Bernard Poędnik, Jacek Czerwiński, Krzysztof Kozak, Jadwiga Mazur, Dominik Grządziel, Marzenna Dudzińska

<b>Session</b>		<b>Monday, 3<sup>rd</sup> July</b>	<b>10:30 – 12:00</b>
<b>Session XX</b>	<b>Room 3</b>	<b>New Materials/ Solutions – New Challenges - Part I</b>	
<b>Chair:</b>			

- 0256** Study on exterior insulation and Finish system with vapor permeable air space  
Yoshinori Homma
- 0123** Effectiveness of nanofiber window screens in reducing indoor exposure to outdoor PM2.5 in Beijing  
Shanshan Shi, Ye Bian, Li Zhang, Chun Chen
- 0069** Acoustic benefits of vegetation screens in open-plan study environments  
Ella Braat-Eggen, Emile Quanjel
- 0066** Using indoor living wall systems as a climate control method in hot humid climates  
Tatiana Armijos Moya, Andy van den Dobbelen, Marc Ottele, Philomena M. Bluysen
- 0073** The reliability of the Finnish M1 voluntary classification of material emissions has been excellent  
Esko Kukkonen
- P0186** Sorptive gypsum board for formaldehyde removal: partitioning coefficients & clean-up performances  
Olivier Debono, Malak Rizk, Vincent Gaudion, Marie Verrielle, Nadine Locoge, Frédéric Thevenet

<b>Session</b>		<b>Monday, 3<sup>rd</sup> July</b>	<b>10:30 – 12:00</b>
<b>Session XX</b>	<b>Room 4</b>	<b>Hospitals and Elderly People - Part I</b>	
Chairs:			

- 0212** Relationship between indoor air chemical, microbiological contamination and activities in hospitals  
Estelle Baures, Jean-Pierre Gangneux, Guillaume Barbe, Olivier Blanchard, Fabien Mercier, Sorya Belaz, Pierre Yves Donnio, Monique Guillaso, Alexane Rivier, Pierre Le Cann, Arnaud Florentin
- 0075** Experimental investigation of airborne particle distribution in operating theatres under realistic load configuration: A – Developing an operating personnel dummy with realistic posture and particle emission  
Benjamin Zielke, Valeria Hofer, Hansjörg Rotheudt, Samuel Rischmüller, Gerrid Brockmann, Martin Kriegel
- 0226** Experimental investigation of airborne particle in operating theatres under realistic load configuration: B – effect of load configuration in a non-standard LAF system  
Valeria Hofer, Hansjörg Rotheudt, Benjamin Zielke, Samuel Rischmüller, Gerrid Brockmann, Martin Kriegel
- 0111** Experimental study of the effect of operation lamps on the local air quality of an operating theatre at St. Olavs Hospital in Norway  
Guangyu Cao, Amar Aganovic, Liv-Inger Stenstad, Jan Gunnar Skogås, Hans Martin Mathisen
- 0081** Effectiveness of an integrated air flow unit for an instrument table in an operating theatre  
Frank Behnke, Seyed Hossein Sagheby, Birgit Müller
- P0214** Survey on airborne chemicals and endotoxin in facilities for the elderly in Japan  
Hoon Kim, Motoya Hayashi, Haruki Osawa, Noriko Kaihara, Michiko Bando, Koki Kikuta, Hirofumi Hayama, Yoshinori Honma, U Yanagi
- P0016** Numerical simulation on airflow penetration through hinged and sliding doors of an operating room  
Sasan Saidrizadeh, Ramin Imani, Guangyu Cao



<b>Session</b>		<b>Monday, 3<sup>rd</sup> July</b>	<b>10:30 –12:00</b>
<b>SLOAN Session</b>	<b>Room 5</b>	<b>Release and Partitioning of Chemicals Indoors</b>	

**Moderators:** Cora Young, Memorial University

Release and Partitioning of Chemicals Indoors” will focus on questions relating to indoor sources of reactive compounds, including human emissions. Partitioning of these chemicals between gas, aerosol, surfaces, consumer products, and other indoor surfaces will also be explored. The session will feature invited talks by leaders in the study of chemicals indoors, as well as atmospheric chemists focused on the outdoor environment on topics relevant to indoor chemistry.

Session	Monday, 3 <sup>rd</sup> July	13:30 – 14:30
Poster session I	Poster Viewing Area	

<b>Session</b>		<b>Monday, 3<sup>rd</sup> July</b>	<b>14:30 – 16:00</b>
<b>Session XX</b>	<b>Room 1</b>	<b>Energy Efficient Retrofit of Existing Buildings</b>	
Chairs:			

- 0023** Utilizability study of existing building retrofit strategies  
Junjing Yang, Adrian Chong, Mat Santamouris, Denia Kolokotsa, Lee Siew Eang, Kwok Wai Tham, Chandra Sekhar, David Cheong
- 0030** Improved perceived indoor environment in renovated and energy-retrofitted social housing  
*Henrik N. Knudsen*
- 0086** Building energy retrofits using Ant Colony Optimisation  
*Keivan Bamdad, Michael E. Cholette, Lisa Guan, John Bell*
- 0089** Thermal retrofit of a residential building in Romania to reach low-consumption energy targets  
*Andrei Damian, Norana Petre, Aurelia Axente-Stan, Szabolcs Varga, Vlad Petean, Andreea Vartires*
- 0166** Affordable and replicable renovation of social housing fulfilling indoor climate and energy targets  
Nicolas Galiotto, Peter Foldbjerg, Jens Christoffersen, Thorbjørn Færing Asmussen, Sabine Pauquay
- P0105** Solving housing shortages by transforming buildings in comfortable homes  
*Marjolein Overtoom, Mieke Oostra, Marja Elsinga, Philomena Bluysen*
- P0006** Effects of foliage plants upon thermal sense in office environments  
*Yoshihito Kurazumi, Emi Kondo, Kenta Fukagawa, Reiko Hashimoto, Tomonori Sakoi, Tadahiro Tsuchikawa*

Session		Monday, 3 <sup>rd</sup> July	14:30 – 16:00
<b>Session XX</b>	<b>Room 2</b>	<b>Indoor Environmental Quality - Policies and Tools</b>	
Chair:			

- 0119** ISO 16890: a new worldwide standard for testing of general ventilation filters  
Alain Ginestet
- 0013** Proposal of environmental assessment index for office buildings considering the wellness of workers  
Junta Fujisawa, Sayana Tsushima, Anri Itoh, Shuhei Takahashi, Ryutaro Kubo, Shin-ichi Tanabe
- 0190** Indoor Environmental Quality (IEQ). Who cares?  
Leo van Cappellen, Joao Dias Carrilho, Manuel Gameiro da Silva, John van Putten, Bart Smid
- 0144** The impact of national standards for building energy efficiency on indoor formaldehyde concentrations  
Shaodan Huang, Dewen Gao, Yiping Zhang, Wenjuan Wei, Louise B. Weschler, Tunga Salthammer, Haidong Kan
- 0291** Healthy buildings: IEQ objectivation by real time monitoring  
Leo Van Cappellen, João Dias Carrilho, Manuel Gameiro da Silva, John van Putten, Bart Smid
- 0090** EU-LCI harmonisation framework for the health-based evaluation of VOC emissions to indoor air  
Ana Maria Scutaru, Derrick Crump
- 0135** Towards design tools for holistic assessment of indoor environmental quality  
Arnav Pathak, Matthias Mitterhofer, Kristin Lengsfeld, Sebastian Stratbuecker

<b>Session</b>		<b>Monday, 3<sup>rd</sup> July</b>	<b>14:30 – 16:00</b>
<b>Session XX</b>	<b>Room 3</b>	<b>Chemical Pollutants Impact of Health and Wellbeing - Part I</b>	
Chair:			

- 0272** Removal of PCB from indoor air and surface materials by introduction of additional sorbing materials  
Lars Gunnarsen, Nadja Lyng, Barbara Kolarik, Helle Vibeke Andersen
- 0288** Survey and risk assessment of chemical substances in rugs for children  
Helene Bendstrup Klinke, Sie Woldum Torup, Thomas Witterseh, Johnny Rodam, Nils Nilsson, Poul Bo Larsen
- 0125** Indoor aqueous chemistry as a potential mechanism to alter indoor air chemical makeup and exposures  
Sara Duncan, Kenneth Sexton, Barbara Turpin
- 0064** Organic films on indoor surfaces  
Charles Weschler, William Nazaroff
- 0229** Dermal uptake of benzophenone-3 from clothing  
Glenn Morrison, Gabriel Bekó, Charles Weschler, Tobias Schripp, Tunga Salthammer, Jørn Toftum, Geo Clausen, Hanne Frederiksen
- P0034** Exposure to toluene and other neurotoxic substances in Danish children's bedrooms  
Barbara Kolarik, Poul Bo Larsen, Lars Gunnarsen
- P0241** New parameter of retention properties of volatile organic compounds in respiratory system – preliminary study  
Grażyna Gałęzowska, Joanna Sychowska, Lidia Wolska
- P0164** The effect of wooden building materials on measured and perceived indoor environment quality: a review  
Tuomas Alapieti, Camilla Vornanen-Winqvist, Raimo Mikkola, Leena Aalto, Antti Peltokorpi, Heidi Salonen

<b>Session</b>		<b>Monday, 3<sup>rd</sup> July</b>	<b>14:30 – 16:00</b>
<b>Session XX</b>	<b>Room 4</b>	<b>Hospitals and Elderly People - Part II</b>	
Chairs:			

- 0118** Lighting conditions in hospital medication rooms and nurses appraisal  
Marielle Aarts, Helianthe Kort
- 0259** Speech privacy in multiple-bed patient rooms  
Jikke Reinten, Ella Braat-Eggen, Ronald Zuydervliet, Marten Valk, Quirijn de Mast
- 0142** Evaluation of hand hygiene and cleaning efficacy with contact-behavior in a medical examination room  
Masayuki Ogata, Hitomi Tsutsumi, Satoshi Hori, Shin-ichi Tanabe
- 0160** Contradictory thermal comfort requirements in neonatal intensive care units: exploring middle grounds  
Simone Teuwen, Asit Mishra, Marcel Loomans, Christa de Vaan, Helianthe Kort
- 0237** Evaluation of the thermal microenvironment, generated in a hospital bed with localized ventilation system  
Nushka Kehayova, Zhecho Bolashikov, Arsen Melikov
- 0235** Exhaled air removal effectiveness of a novel ventilation method for reduction of airborne cross-contamination in hospitals  
Nushka Kehayova, Zhecho Bolashikov, Arsen Melikov
- 0296** Thermal environment conditions in Polish patient rooms  
Piotr Uścińowicz, Anna Bogdan
- P0095** Verification of gymnasium designed by high thermal insulation considering elderly people in disaster  
Koki Kikuta, Hiroshi Kikuchi, Shiho Aoyagi, Hirofumi Hayama
- P0139** Indoor environment in patient rooms – the results of the survey  
Anna Bogdan, Patrycja Kociszewska, Piotr Uścińowicz

Session		Monday, 3 <sup>rd</sup> July	14:30 – 16:00
Session XX	Room 5	Indoor air purification	

Convenors: Lennart Larsson<sup>1</sup> and Alireza Afshari<sup>2</sup>  
<sup>1</sup>Dept of Laboratory Medicine, Lund University, Lund, Sweden  
<sup>2</sup>Danish Building Research Institute, Aalborg University, Denmark

Introduction and welcome: Lennart Larsson, Lund University, Sweden.

- 0033** Local control of IEQ in classrooms: what do we know?  
Dadi Zhang, Stanley Kurvers, David Keyson, Philomena Bluysen
- 0035** Improving the indoor air quality in damp buildings by using  
a surface emissions trap  
Lennart Larsson, Johan Mattsson
- 0053** Development of fan-filter unit to enhance IEQ in NV buildings during haze  
episode  
David Kok Wai Cheong, Kwok Wai Tham, Chandra Sekhar, Parshetti Ganesh
- 0180** SiO<sub>2</sub>/TiO<sub>2</sub> composites for real scale application: adsorptive and de-polluting  
properties  
Mattia Pierpaoli, Xu Zheng, Vladimir Bondarenko, Ruzhu Wang, Gabriele Fava,  
Maria Letizia Ruello
- 0187** Comparison of gypsum boards regarding toluene uptake under typical indoor air  
conditions  
Olivier Debono, Malak Rizk, Vincent Gaudion, Marie Verrielle, Nadine Locoge,  
Frederic Thevenet
- 0278** Applications of gas-phase ultraviolet photocatalytic oxidation technology in  
indoor environments  
Ular Palmiste, Henik Voll, Walter Z. Tang
- Summing Up Alireza Afshari

<b>Session</b>		<b>Monday, 3<sup>rd</sup> July</b>	<b>16:30 – 18:00</b>
<b>Session XX</b>	<b>Room 1</b>	<b>New Materials/ Solutions – New Challenges - Part II</b>	
Chair:			

- 0046** By-products from portable photocatalytic air cleaners  
Tunga Salthammer, Doreen Markewitz, Jan Gunschera
- 0093** Real scale assessment of photocatalytic air purifier impact on IAQ in a modelled wood based building  
Pamela Harb, Frédéric Thevenet, Nadine Locoge
- 0094** Real scale assessment of photocatalytic air purifier impact on IAQ during a typical household action  
Pamela Harb, Frédéric Thevenet, Nadine Locoge
- 0107** CFD analysis to assess performance of multi-lamp in-duct UVGI air disinfection systems  
Azael Capetillo, Catherine Noakes, Andrew Sleigh
- 0110** Impact of structured monolith on catalytic performance of a filtration article comprised a base metal oxide catalyst for indoor formaldehyde removal  
Chenggang Zhuang, Benedict Johnson, Edward Zhmayev, Amit Halder, Weimin Hou, Qing Zhou, Behan Francis
- P0315** Application of photocatalytic air purifier to improve indoor air quality in library environment  
Amelia Staszowska



<b>Session</b>		<b>Monday, 3<sup>rd</sup> July</b>	<b>16:30 – 18:00</b>
<b>Session XX</b>	<b>Room 2</b>	<b>Indoor Environment Quality - Regional Problems</b>	
Chair:			

- 0223** Investigating the indoor air quality of common library study spaces in an Australian university  
Joey YS Loh, Mary Myla Andamon, James PC Wong
- 0197** Assessment of indoor environmental quality in Australian healthcare facilities: a review of standards and guidelines  
Prachi Garnawat, Mary Myla Andamon, James PC Wong, Jin Woo
- 0018** A preliminary discussion on determining ventilation requirements for public buildings by compiling an indoor air pollutant database in China  
Wei Ye, Xu Zhang
- 0037** Healthy home barometer – A survey among European citizens  
Susanna Beranova, Loner Feifer, Marie Wickmann Elkjær, Ulrich Bang, Michael K. Rasmussen, Jens Christoffersen
- 0313 The Healthy Homes Barometer. Opportunities and Challenges for Poland and Europe  
Włodzimierz Piątkowski, Anna Sadowska
- 0079** Indoor air quality in a residential building before and after its refurbishment  
Imrich Sánka, Veronika Földváry, Dušan Petráš
- P0251** Natural elements in building design: the Italian polices  
Ilaria Oberti, Francesca Plantamura
- P0217** Measurement survey on thermal and acoustic environment in natural ventilating office building  
Hiroshi Muramatsu, Gaku Tateyama, Masamari Ukai, Tatsuo Nobe
- P0265** Analysis of thermal bridge in Korean residential building  
Hee Gang Kim, Chang Ho Jeong, Myoung Souk Yeo, Kwang Woo Kim

<b>Session</b>		<b>Monday, 3<sup>rd</sup> July</b>	<b>16:30 – 18:00</b>
<b>Session XX</b>	<b>Room 3</b>	<b>Chemical Pollutants Impact of Health and Wellbeing - Part II</b>	
Chair:			

- 0022** A review of the effects of exposure to carbon dioxide on human health in indoor environment  
Kenichi Azuma, U Yanagi, Naoki Kagi, Haruki Osawa
- 0242** Carbon dioxide generation rates from building occupants  
Andres Persily, Lilian de Jonge
- 0065** Indoor air quality and its effects on humans suffering from environmental intolerance  
Marko Hyttinen, Anni Varis, Anne Palonen, Pertti Pasanen
- 0087** The SWESIAQ Model – A systematic method for indoor environment investigations  
Anders Lundin, Lars Ekberg, Gunnel Emenius, Jörgen Grantén, Lasse Iisakka, Jan Kristensson, Berndt Stenberg, Aneta Wierzbicka
- 0168** Comparing cohort perception and satisfaction moving from non-Green Mark certified to certified buildings  
Tham Kwok Wai, Lee Jang Young, Lim Shu Ling Cherlyn
- P0104** Effect of high CO<sub>2</sub> concentrations on the molds' growth and morphology present in the indoor air  
Dorota Koruba, Jerzy Zbigniew Piotrowski
- P0196** An approach to make a healthy indoor environment in order to prevent adverse effects on human  
Hiroko Nakaoka, Norimichi Suzuki, Emiko Todaka, Chisato Mori, Akifumi Eguchi
- P0158** Risk assessment of inhalation exposure to VOCs in dwellings in Chongqing, China  
Zhu Cheng, Baizhan Li, Wei Yu, Han Wang, Tujingwa Zhang, Zhongming Bu

Session		Monday, 3 <sup>rd</sup> July	16:30 –18:00
Special Session	Room 4	Indoor Environment and Mental Health: Bridging Collaborative Efforts Across Disciplines	

**Moderators:** Dr. Kerry Kinney (Professor, University of Texas at Austin), Dr. Lisa Brenner (Director, Veteran Affairs Rocky Mountain Mental Illness Research Education and Clinical Center & Professor, University of Colorado, Anschutz School of Medicine )

- 0308** Integration of social science into built environment research: lessons learned and ways forward  
 Lisa A. Brenner, Andrew J. Hoisington, Kelly A. Stearns-Yoder, Christopher A. Lowry
- 0309** Centralized Accommodations for Displaced Persons  
 Kasey M. Faust, Jessica Kaminsky, Julie Faure, Miriam Hacker
- 0310** The human microbiome and mental health: potential implications for built environment microbiome research  
 Jack A. Gilbert
- 0311** The Microbiome and Mental Health: Results from Longitudinal Study of Cadets at the United States Air Force Academy  
 Andrew Hoisington, Kelly Stearns-Yoder, Katherine Bates, Christopher Lowry, Kerry Kinney, Jack Gilbert, Lisa Brenner
- 0312** Lighting in Permanent and Portable Classrooms, Factor Potentially Affecting Performance  
 Yan Zhang, Atila Novoselac

Session		Monday, 3rd July	16:30 –18:00
<b>Workshop</b>	<b>Room 5</b>	<b>Interdisciplinary human-related field research - how to make the right choice?</b>	

Moderators/presenters:

Helianthe Kort,

Mariëlle Aarts,

J. Reinten

Juliëtte van Duijnhoven

Christel de Bakker

Multiple studies have shown the influence of the built environment on our health and well-being on the level of public health. Unfortunately, little is known about the influence of the built environment on individual level. Furthermore, studying the influence of the built environment on people in a realistic setting is challenging. The aim of this workshop is to gain insight in the opportunities and strategies for performing interdisciplinary human-related research in buildings by discussing the various challenges that are encountered in this field of study.

## REHVA Meeting

### Chapters Meeting

**Sweden's national chapter of ISIAQ, SWESIAQ**, invite researchers and professionals to a Workshop at the Healthy Building Conference 2017 in Lublin, Poland about increased collaboration between Chapters of ISIAQ. The purpose of the Workshop is to discuss possibilities of cooperation and to share experience between the national chapters. Another central purpose is to increase interest for initiating new national chapters.

Right now we are five national chapters; FISIAQ (Finland), ISIAQ.nl (Netherlands), SWESIAQ (Sweden), ISIAQ.is in Iceland and NIO in Norway.

Welcome!

Maria Nordberg, President of SWESIAQ

Linda Hägerhed, Vice President of SWESIAQ, Board member of ISIAQ

8.30-10.00

Plenary session III

10.00 – 10.30 Break: coffee/tea

10.30 – 12.00 Parallel sessions/ workshops

Room 1	Room 2	Room 3	Room 4	Room 5
IEQ & Microbiological Problems	Chemical Pollutants Sources & Fates – Part I	Particles and Health Effects	Ventilation strategies - Part I	Healthy housing as a key determinant of sustainable development

12.00 – 13.30 Lunch / **ISIAQ Annual Meeting**

13.30 – 14.30 Coffee/poster viewing

14.30 – 16.00 Parallel sessions/workshops

Room 1	Room 2	Room 3	Room 4	Room 5
Biological Pollutants Impact of Health and Wellbeing	Thermal Comfort Model and Analysis	School Indoor Environment	Indoor/ Outdoor Aerosols	Towards Healthy net Zero Energy Buildings (HEAnZEBs)

16.00 – 16.30 Break: coffee/tea

16.30 – 18.00 Parallel sessions/workshops

Room 1	Room 2	Room 3	Room 4	Room 5
Moulds in Indoor Environment	Chemical Pollutants Sources & Fates – Part II	Indoor Thermal Comfort	Ventilation strategies - Part II	Microbes Indoors: Moving from DNA to Function

Session	Tuesday, 4 <sup>th</sup> July	8:30 – 10:00
<b>Plenary Session II</b>	<b>M</b>	
Chair:		

Is the microbiology of your building making you ill?

***Jimmy Walker***

Housing and healthy urban environments – a game changer for public health

***Maria Neira***

<b>Session</b>		<b>Tuesday, 4<sup>th</sup> July</b>	<b>10:30 – 12:00</b>
<b>Session XX</b>	<b>Room 1</b>	<b>IEQ &amp; Microbiological Problems</b>	
Chair:			

- 0271** Microbial growth on different types of building materials – survey of indicator microbes  
Teija Meklin, Helena Rintala, Marja Hänninen, Teemu Rintala
- 0103** Fungal and bacterial microbiota of severely moisture damaged homes and impact of interventions  
Balamuralikrishna Jayaprakash, Rachel I. Adams, Asko Vepsäläinen, Maria Valkonen, Anne Hyvärinen, Martin Täubel
- 0049** Validation of the bio-contamination model in closed habitat                      Anniina Salmela, Ilpo Kulmala, Aku Karvinen, Virginie Taillebot, Peter Weiss, Audrey Berthier, Vincenzo Guarnieri, Stephanie Raffestin, Pertti Pasanen
- 0038** Experimental investigation of airborne particle distribution in operating theatres under realistic load configuration:  
C – comparison of LAF and mixing ventilation  
Hansjörg Rotheudt, Benjamin Zielke, Valeria Hofer, Samuel Rischmüller, Gerrid Brockmann, Martin Kriegel
- 0244** Contamination of mattresses under investigation in Brussels habitats  
Billie Heene, Sandrine Bladt, Priscilla Declerck, Camille Chasseur, Maryse Wanlin
- 0243** Microbial indoor pollution and young children in the Brussels capital region: an analysis over the last 15 years  
Billie Heene, Priscilla Declerck, Sandrine Bladt, Camille Chasseur, Maryse Wanlin
- P0250** On the need for reference values for culturable bioaerosols:  
4 examples of fungal surveys  
Camille Chasseur, Sandrine Bladt, Maryse Wanlin
- P0084** Phthalates uptake by settled dust on polyvinyl chloride flooring and the influence of temperature  
Chenyang Bi, Ying Xu
- P0134** Spatial distribution of particulate matter concentration  
in classrooms  
Piet Jacobs



<b>Session</b>		<b>Tuesday, 4<sup>th</sup> July</b>	<b>10:30 – 12:00</b>
<b>Session XX</b>	<b>Room 2</b>	<b>Chemical Pollutants – Sources and Fates I</b>	
Chair:			

- 0052** Indoor air quality in a positive energy facility: Focus on the room dynamics and submicron particles  
Evdokia Stratigou, Sébastien Dusanter, Véronique Riffault
- 0083** Semi-volatile organic compounds in indoor settled and HVAC filter dust: Association with seasons, childhood asthma and building characteristics  
Chenyang Bi, Juan Maestre, Kerry Kinney, Jeffrey Siegel, Sharon Horner, Ying Xu
- 0096** Risk assessment of novel brominated and phosphorus flame retardants in indoor dust  
Masahiro Tokumura, Yuichi Miyake, Qi Wang, Yoko Kai, Takashi Amagai, Sayaka Ogo, Kazunari Kume, Takeshi Kobayashi, Shinji Takasu, Kumiko Ogawa, Masahiro Tokumura
- 0060** Secondary pollutant formation following cleaning activities indoors  
Magdalena Kruza, Joel Harrison, John Raymond Wells, Alastair C. Lewis, Nicola Carslaw
- 0099** Tracking the sources of volatile organic compounds in an occupied home  
Pawel Misztal, Yingjun Liu, Jianyin Xiong, Caleb Arata, Yilin Tian, William Nazaroff, Allen Goldstein
- P0140** Spatially and temporally resolved measurements of volatile organic compounds in a residence  
Yingjun Liu, Pawel Misztal, Jianyin Xiong, Yilin Tian, Caleb Arata, William Nazaroff, Allen Goldstein
- P0281** An analytical method for unidentified flame retardant in curtain  
Yuichi Miyake, Qi Wang, Masahiro Tokumura, Takashi Amagai
- P0131** PulseTest: a new method to locate sources of indoor volatile organic compounds and particulate matter  
Emmanuelle Castagnoli, Daniel Tairarol, Raimo Mikkola, Johanna Salo, Jarek Kurnistski, Heidi Salonen
- P0269** Use of silicone rubber for passive sampling of semivolatile organic contaminants in indoor air  
Lenka Sedlackova, Foppe Smedes, Lisa Melymuk, Roman Prokes, Michaela Belhacova, Branislav Vrana
- P0188** Dispersion of pollutants released at floor level under three types of heating systems: A CFD study  
Laura Stasiulienė, Andrius Jurelionis

- P0176** Emissions of formaldehyde from acoustic tiles  
Janine Richter, Olaf Wilke, Oliver Jann
- P0082** Indoor air quality in Finnish swimming pools  
Joonas Ruokolainen, Marko Hyttinen, Timo Laaja, Pertti Pasanen
- P0172** Reproducibly emitting reference material for QA/QC of emission test chamber measurements  
Wolfgang Horn, Olaf Wilke, Birte Mull, Matthias Richter, Doris Brödner, Nils Mölders, Manfred Renner

Session		Tuesday, 4 <sup>th</sup> July	10:30 – 12:00
Session XX	Room 3	Particles and Health Effects	
Chair:			

- 0114** Experimental investigation of inhalation intake fraction from localized indoor particle sources  
Dusan Licina, Yilin Tian, William Nazaroff
- 0028** Effect of a free-standing air cleaner on children's aerosol exposure and respiratory health  
Tiina Reponen, Jennie Cox, Christine James, Kelechi Isiugo, Chris Wolfe, Reshmi Indugula, Sergey A. Grinshpun, Michael Yermakov, Steve Vesper, Steve Chillrud, James Ross, Patrick Ryan
- 0163** Impact of air cleaners on particulate matter and microbial levels in classrooms and symptoms reports of pupils  
Hanna Leppänen, Arto Pennanen, Martin Täubel, Anni-Mari Pulkkinen, Maria Valkonen, Asko Vepsäläinen, Hanna Hovi, Anne Hyvärinen, Raimo Salonen
- 0231** Exposure to human body bio-effluents: impact of airflow interaction at the breathing zone  
Mariya Bivolarova, Kierat Wojciech, Eva Zavrl, Zbigniew Popiolek, Arsen Melikov
- 0211** Exposure to particles emitted from biomass burning systems in indoors  
Luca Stabile, Giorgio Buonanno, Pasquale Avino, Maurizio Manigrasso, Mauro Scungio
- 0102** Cleaning worker's eye and airway exposure from cleaning sprays  
Karin Lovén, Christina Isaxon, Jörn Nielsen, Eva Assarsson, Pia Tallving, Monica Kåredal, Aneta Wierzbicka, Anders Gudmundsson
- P0209** Inhalable particles as indoor air pollution indicator in schools in Latvia  
Aneka Klavina, Alina Berzina, Arvis Kokins, Inese Martinsons
- P0257** Monitoring of particulate matters in university library – case study  
Eva Kridlova Burdova, Silvia Vilcekova, Adriana Estokova, Ludmila Meciariova, Zoran Ilija Apostoloski
- P0193** The effect of particle size and type on di-2-ethylhexyl phthalate (DEHP) gas-particle partitioning  
Kimberly Drennon, Kristen Valseth, Yaoxing Wu, Jennifer Benning
- P0148** Characteristics of airflow and particle concentration underneath urban railway by operation mode  
Jong Bum Kim, Sang Hee Woo, Hong-Ryang Jang, Moon Se Hwang, Hwa Hyeon Yoon, Hyung-Koo Park, Gwi-Nam Bae

<b>Session</b>		<b>Tuesday, 4<sup>th</sup> July</b>	<b>10:30 – 12:00</b>
<b>Session XX</b>	<b>Room 4</b>	<b>Ventilation strategies - Part I</b>	
Chair:			

- 0213** Influences on flow separation at the wall in rooms with vertical unidirectional ventilation systems  
Hansjoerg Rotheudt, Valeria Hofer, Benjamin Zielke, Daniel Schulze, Gerrid Brockmann, Martin Kriegel
- 0201** The effect on ventilation ground on anti-condensation in rural residence of Chongqing in China  
Huibo Qian, Mingfang Tang
- 0219** Study on adaptive thermal comfort model based on the solar terms  
Chen Yu, Chen Bin, Fan Xinying, Zeng Chen, Song Xiaoming
- 0055** Assessment of time-periodic mixing ventilation using a sine function and a step function  
Twan Van Hooff, Bert Blocken
- 0138** Thermal comfort and self-reported productivity in an office with ceiling fans in the tropics  
Aleksandra Lipczynska, Stefano Schiavon, Lindsay Graham
- 0121** Efficiency of recirculation hoods with regard to PM2.5 and NO<sub>x</sub>  
Piet Jacobs, Eric Cornelissen
- 0247** Studying the effect of the wind direction on cross-ventilation turbulent flows  
Christos H. Halios, Hannah L. Gough, Janet F. Barlow, Marco-Felipe King, Catherine J. Noakes, Roger Hoxey, Adam Robertson, Andrew Quinn
- P0252** The effect of spray cooling in long and narrow space for two jet sources with intensive turbulence at 700K  
Yuliang Xie, Xu Zhang, Wei Ye
- P0290** Thermal comfort investigation of air-conditioning system with variable airflow in office  
Takuya Wakao, Masanari Ukai, Tatsuo Nobe
- P0314** Mini longitudinal flow spiral recuperator  
Mariusz Adamski
- P0208** Study on factors influencing performance of ventilation tower used for natural ventilation  
Maika Miyajima, Takashi Kurabuchi
- P0298** Reflectometric estimation of masonry moisture due to improper performance of natural ventilation  
Zbigniew Suchorab

<b>Session</b>		<b>Tuesday, 3<sup>rd</sup> July</b>	<b>10:30 –12:00</b>
<b>WHO Special Session</b>	<b>Room 5</b>	<b>Healthy housing as a key determinant of sustainable development</b>	

**Chairs:** Maria Neira, Director,

WHO Department of Public Health, Environmental and Social Determinants of Health

Chisato Mori,

Centre for Preventive Medical Sciences, Chiba University, Japan

**Invited Speakers:**

Nathalie Roebbel, Technical Officer, WHO Department of Public Health, Environmental and Social Determinants of Health

*WHO's new "Housing and Health Guidelines"*

Matti Jantunen, Research Professor Emeritus, National Institute for Health and Welfare, Environmental Health, Kuopio, Finland

*Environmental burden of disease associated with inadequate indoor air quality in the European Union*

Lidia Morawska, Professor and Director, International laboratory for Air Quality and Health, Australia

*"Housing characteristics and their impact on the exposure to airborne particulate matter"*

Emiko Todaka, Professor, Centre for Preventive Medical Sciences, Chiba University, Japan, *Recent findings on "Sick building syndrome"*

Session	Tuesday, 4 <sup>th</sup> July	13:30 – 14:30
Poster session II		

<b>Session</b>		<b>Tuesday 4<sup>th</sup> July</b>	<b>14:30 – 16:00</b>
<b>Session XX</b>	<b>Room 1</b>	<b>Biological Pollutants Impact of Health and Wellbeing</b>	
Chair:			

- 0185** Impact of mould and dampness on the prevalence of having asthma in European homes  
Gunnar Grün, Susanne Urlaub, Nicolas Galiotto, Peter Foldbjerg, Klaus Peter Sedlbauer
- 0268** Exposure to buildings with elevated MSQPCR reduces health benefits from VIP treatment of CIRS-WDB  
David Lark, Ritchie Shoemaker, James Ryan
- 0227** Microbiomes of the built environment – the state of the science David Butler, Katherine Bowman
- 0126** Respiratory viruses' fate on filters of air handling units  
Victor Bandaly, Pierre Lecann Yves Anes,
- P0153** Cardiopulmonary biomarkers for exposure to indoor cooking oil fumes  
Jun Gao, Bowen Du, Jie Chen, Wei Ye
- P0254** Indoor environmental quality enhancement of sludge dewatering area from a wastewater treatment plant  
Cristiana Croitoru, Ilinca Nastase, Frorin Bode, Mihnea Sandu, Laurentiu Tacutu
- P0261** Experimental identification of thermal-moisture conditions in the indoor swimming pool  
Piotr Ciuman, Barbara Lipska
- P0293** Endocrine agents in indoor air-phthalates  
Joanna Ratajczyk, Lidia Wolska

<b>Session</b>		<b>Tuesday, 4<sup>th</sup> July</b>	<b>14:30 – 16:00</b>
<b>Session XX</b>	<b>Room 2</b>	<b>Thermal Comfort Model and Analysis</b>	
Chair:			

- 0154** A chamber study about the prediction of thermal sensation with short-term thermal experience biomarkers for exposure to indoor cooking oil fumes  
Wenjie Ji, Bin Cao, Yingxin Zhu
- 0116** Validation of local thermal sensation models  
Barbara Koelblen, Agnes Psikuta, Anna Bogdan, Simon Annaheim, René M. Rossi
- 0238** Local air gap thickness model for realistic simulation of thermal effects in clothing  
Agnes Psikuta, Emel Mert, Simon Annaheim, René M Rossi
- 0239** A methodology for the validation of thermo-physiology models for indoor environment research  
Agnes Psikuta, Barbara Koelblen, Anna Bogdan, Simon Annaheim, René Rossi
- 0076** Experimental study of the airflow distribution close to the human body with a downward plane jet  
Marie Steffensen, Amar Aganovic, Guangyu Cao
- 0113** Measurements of local clothing resistances and local area factors under various conditions  
Stephanie Vesela, Agnes Psikuta, Boris RM Kingma, Arjan JH Frijns
- 0294** Olfactory threshold of body odor and equivalent CO<sub>2</sub> concentration  
Toshio Yamanaka, Kaoru Ikeda, Akihisa Takemura, Hisashi Kotani, Yoshihisa Momoi, Kazunobu Sagara, Lisa Yoshimoto, Daisuke Tanaka, Shigehiro Sugiyama, Masashi Inoue



<b>Session</b>		<b>Tuesday 4<sup>th</sup> July</b>	<b>14:30 – 16:00</b>
<b>Session XX</b>	<b>Room 3</b>	<b>School Indoor Environment</b>	
Chair:			

- 0112** Indoor climate in two renovated Danish school: Measurements of electric light, indoor temperature and air quality (CO<sub>2</sub>)  
Jens Christoffersen, Karsten Andersen, Thorbjørn Faering Asmussen
- 0132** Analysis of student thermal perception evolution in a university classroom during class hour  
Lotte Kooij, Marcel Loomans, Asit Kumar Mishra
- 0133** Resolving the influential parameters of thermal comfort perception amidst indoor-outdoor spatial transitions: Case study in a lecture room  
Manon Derks, Marcel Loomans, Asit Kumar Mishra, Helianthe Kort
- 0061** Students' activities based design of classrooms: How to optimize IEQ in classrooms while achieving energy efficient goals?  
Muxi Lei, Stanley Kurvers, David Keyson, Philomena Bluysen
- 0245** A critique of the ventilation system used for public schools around gas flaring sites in the Nigeria  
Uche Ogbonda, Ji Yingchun
- 0303** Classroom carbon dioxide concentration and learning in elementary schools  
Paweł Wargocki, José Alí Porras-Salazar
- P0017** A numerical analysis of diffuse ceiling ventilation performance in a school classroom and auditorium under different operating conditions  
Sasan Saidrizadeh, Alireza Afshari, Ahsan Iqbal
- P0050** Does public-private partnership model lead to better indoor air quality in schools?  
Maija Leppänen, Rauno Holopainen, Kari Salmi, Leena Aalto, Katja Tähtinen, Jari Stengård, Marko Hyttinen, Tapani Ollila, Arto Säämänen, Sanna Lappalainen, Leila Kakko, Pertti Pasanen, Kari Reijula
- P0260** Particulate matters and subjective evaluation of IEQ in primary school  
Silvia Vilcekova, Ludmila Meciarova, Eva Kridlova Burdova, Zoran Iljija Apostoloski
- P0246** Cleaning quality in public-private partnership model schools to maintain better IAQ  
Leila Kakko, Maija Leppänen, Rauno Holopainen

- P0189** Actions to improve indoor air quality in school buildings –  
The InAirQ project  
Anna Kozajda, Anna Páldy, Tamás Pándics, Konrad Rydzyński, Ádám Hoffer,  
Péter Rudnai, Renáta Szentmihályi, Magdalena Suchan, Peter Otorepec, Mojca  
Bevc, Bohumil Kotlik, Helena Kazmarová, Arianna Dongiovanni, Elisabetta De  
Martino, István Ferencsik, Tamás Szigeti
- P0274** Integrated problem solving approaches to ensure children’s health at schools -  
The InAirQ project  
Tamás Szigeti, Tamás Pándics, Anna Páldy, Péter Rudnai, Ádám Hofer, Gyula  
Dura, Renáta Szentmihályi, Anna Kozajda, Konrad Rydzyński, Magdalena  
Suchan, Peter Otorepec, Aneja Kukec, Mojca Bevc, Helena Kazmarová,  
Bohumil Kotlik, Arianna Dongiovanni, Anea Di Maggio, Elisabetta De Martino,  
István Ferencsik

Session		Tuesday 4 <sup>th</sup> July	14:30 – 16:00
Session XX	Room 4	Indoor/ Outdoor Aerosols	
Chair:			

- 0071** Human bodies as a source of indoor air pollutants: a modelling study  
Magdalena Kruza, Alastair Lewis, Nicola Carslaw
- 0122** Numerical investigation of transport & deposition of liquid aerosol particles in indoor environments  
Tunc Askan, Martin Kriegel
- 0127** Online chemical and size distribution analysis of carbonaceous aerosol associated with combustion in a residence  
Douglas Collins, Rachel Hems, Shouming Zhou, Jeffrey Siegel, Jonathan Abbatt
- 0151** Resuspension of solid aerosols from dusty surfaces in indoor environment using a centrifugal method  
Yungshan Cheung, Sau Chung Fu, Chili Wu, Christopher YH Chao
- 0200** Indoor particle exposure comparison of a conventional and an innovative air-conditioning system  
Chandra Sekhar, Ganesh Parshetti, Kwok Wai Tham, David Kok Wai Cheong
- 0224** Prediction of airborne particulate matter concentration in underground stations using a two size class conservation model  
Édouard Walther, Mateusz Bogdan, Rudy Cohen
- P0145** Air pollutants of burning incense in a simulated environment  
Ruey-Yu Chen, Tzu-Ting Yang, Ching-Ying Yeh, Yen-Hao Huang
- P0146** Indoor PM<sub>2.5</sub> in 30 residences in Shanghai, China: the levels, I/O ratios and infiltration factors based on 1-year field monitoring  
Jianbang Xiang, Jingjin Shi, Zhuohui Zhao, Jinhan Mo, Haidong Kan, Yinping Zhang
- P0207** Actual conditions of environmental microbiome in a university's classrooms  
Hatanaka Miku
- P0220** Deposition of airborne particles onto building interior materials as a function of surface roughness  
Naoki Kagi, Mami Aikawa
- P0233** Measurement of exposure to gaseous contaminations  
Wojciech Kierat, Mariya Bivolarova, Eva Zavrl, Zbigniew Popiolek, Arsen Melikov
- P0236** Air exchange rates of 32 students' dorms during winter in Shanghai  
Yinping Zhang, Jianbang Xiang, Lin Fang
- P0300** Impact of room ventilation conditions on concentrations of particles generated by smoking traditional and e-cigarettes  
Bernard Potednik, Aleksandra Połednik, Oleh Hlushko, Taras Yesypchuk

<b>Session</b>		<b>Tuesday, 4 July</b>	<b>14:30 –16:00</b>
<b>REHVA workshop</b>	<b>Room 5</b>	<b>Towards Healthy net Zero Energy Buildings (HEAnZEBs)</b>	

**Moderators:** Atze Boerstra & Jarek Kurnitski

All over Europe example projects have shown that retrofitting existing buildings or the realization of new buildings with an overfocus on just energy performance can lead to problems with indoor air quality, thermal comfort, installation noise and visual comfort. A significant improvement of the energy performance of our dwellings, schools, offices and other buildings is unavoidable (in line with e.g. the EPBD recast package as defined by the EU). And there is no doubt that 20-30 years from now all of us will live and work in nZEBs (net Zero Energy Buildings). But let's make sure that these nZEBs are healthy, comfortable and happy too, let's make sure that they turn out to be HEAnZEBs! (HEA as abbreviation of 'healthy' as it is common in HEA-credits as used in the BREEAM certification system). And to do that we need to identify the IEQ risks that come with an overfocus on energy performance and we need to have a clear picture of measures that should be taken (additionally to energy performance improvement measures) to ensure end-user comfort and health indoors.

Introduction: Atze Boerstra, REHVA & BBA Indoor Environmental Consultancy The Netherlands

Ensuring high IEQ and energy efficiency simultaneously , Jarek Kurnitski, REHVA & Tallinn University of Technology Estonia

Energy retrofits, indoor thermal environment, ventilation and occupant health: results from the EU Insulate project, Ulla Haverinen-Shaughnessy, National Institute for Health and Welfare Finland

Monitoring of indoor environmental quality & energy use: seeing the invisible, Louie Cheng, PureLiving China

<b>Session</b>		<b>Tuesday, 4<sup>th</sup> July</b>	<b>16:30 – 18:00</b>
<b>Session XX</b>	<b>Room 1</b>	<b>Moulds in Indoor Environment</b>	
Chair:			

- 0117** Tackling the knowledge needs of maintenance and operation staff in mouldy housing  
Sirid Bonderup, Lars Gunnarsen
- 0184** Probing indoor microbial VOC emissions with PTR-TOF-MS  
Pawel Misztal, Rachel Adams, Despoina Lymperopoulou, Steve Lindow, John Taylor, Tom Bruns, Yingjun Liu, Jianyin Xiong, Yilin Tian, Caleb Arata, William Nazaroff, Allen Goldstein
- 0279** Evaluation of risk of mold damages based on a novel dust sampling method  
Mari Sand Austigard, Ingeborg Bjorvand Engh
- 0039** Mold infestation in buildings of warm humid climate – case studies Chin Peng Foo, Poh San Tee, Chung Wan Wong
- 0042** Mycological air study in the archives in Warsaw and Ożarów Mazowiecki  
Aleksandra Wójcik, Bogusław Andres
- P0025** Assessment of bioaerosol and microbial volatile organic compounds in a library environment  
Himanshu Lal, Bipasha Ghosh, Arun Srivastava
- P0108** Trial evaluation for home mould contamination in Japan using genetic analysis  
Kenichi Hasegawa, Nobuhiro Kanazawa, Ryoki Asano, Shin-ichi Fuji, Jun Fukushima, Keiju Okano
- P0277** Indoor climate in kindergartens: Bacterial composition of floor dust  
Anders Benteson Nygaard, Colin Charnock
- P0130** State control test procedure of the mycological materials and microclimate emergency in newly constructed buildings  
Dorota Koruba, Robert Piekoszewski, Jerzy Zbigniew Piotrowski, Janusz Wielgus
- P0215** The effect of mycotoxins to other fungus growth characteristics  
Yuriko Shimura, U Yanagi, Naoki Kagi

<b>Session</b>		<b>Tuesday, 4<sup>th</sup> July</b>	<b>16:30 – 18:00</b>
<b>Session XX</b>	<b>Room 2</b>	<b>Chemical Pollutants – Sources and Fates II</b>	
Chair:			

- 0044** Evaluation of ozone-initiated VOC and particle emissions from a carpet deodorizer  
Jolanda Palmisani, Asger Nørgaard, Vivi Kofoed-Sørensen, Per Axel Clausen, Gianluigi de Gennaro, Peder Wolkoff
- 0045** Formaldehyde sources in the indoor and outdoor environment  
Tunga Salthammer
- 0106** Improved models for indoor air chemistry: future needs and achievable goals  
Nicola Carslaw, Glenn Morrison, Michael Waring
- 0171** Emission and sorption of VOCs on building materials: real indoor measurements and modelling approach  
Malak Rizk, Marie Verrielle, Fangfang Guo, Sébastien Dusanter, Stéphane Le Calve, Nadège Blond, Nadine Locoge, Coralie Schoemaeker
- 0175** Emissions of formaldehyde and VOCs from wood-based buildings products  
Janine Richter, Olaf Wilke, Oliver Jann
- P0051** The emission profiles of VOCs emitted from various types of plastic and wood-based indoor materials  
Mariusz Marć, Bożena Zabiegała
- P0240** Steady state and dynamic indoor ozone estimation model with indoor ozone source  
Jialei Shen, Zhi Gao
- P0264** Sensitivity analysis of indoor hydroxyl radical with INCA-Indoor model  
Fangfang Guo
- P0282** Fully automated micro-scale chamber determination of VVOC, VOC and SVOC emissions from building products  
Yunyun Nie, Eike Kleine-Benne, Kurt Thaxton
- P0289** Assessment of polybrominated diphenyl ethers (PBDEs) emission from car vehicle equipment  
Monika Śmiełowska, Bożena Zabiegała
- P0306** The study of aerosols and organic compounds emitted during grave lantern burning  
Bernard Poędnik, Marek Mardarowicz, Paweł Golianek, Adam Piotrowicz, Marzenna Dudzińska

Session		Tuesday 4 <sup>th</sup> July	16:30 – 18:00
Session XX	Room 3	Indoor Thermal Comfort	
Chairs:			

- 0010** Effect of thermal environment on sleep in the bedroom considering sleep stages using polysomnography  
Yuichi Akiyama, Riho Matsuzaki, Akihiro Takimoto, Emika Miyake, Masayuki Ogata, Kazuyo Tsuzuki, Shin-ichi Tanabe
- 0253** Measurement of human response on the combined effect of the hot wall and the draught  
Balázs Anás, László Kajtár
- 0270** Research on indoor thermal environment of stilted buildings in Chongqing, China  
Ya'nan Xu, Zhenjing Yang, Mingxi Peng
- 0012** Thermal comfort of radiant cooling systems in homes under hot and humid climates with different operation methods  
Tianshu Xu, Ayane Shibutani, Jiannan Liu, Shin-Ichi Tanabe, Tadasu Ooishi
- 0070** Evaluating thermal comfort in a Swedish block of flats: A methodological comparison  
Annette Henning, Amir Sattari
- P0136** Analysis of visitors impact on the museum rooms microclimate  
Joanna Ferdyn-Grygierek, Piotr Lubina, Jan Kaczmarczyk
- P0100** Study on indoor thermal environment by heating system in different replacement level of house  
Masato Nakajima, Takashi Kurabuchi, Tatsuo Nagai

<b>Session</b>		<b>Tuesday, 4<sup>th</sup> July</b>	<b>16:30 – 18:00</b>
<b>Session XX</b>	<b>Room 4</b>	<b>Ventilation strategies - Part II</b>	
Chair:			

- 0088** Performance comparison of a ductless personalized ventilation system and an axial fan using CFD simulations  
Hayder Alsaad, Conrad Voelker
- 0098** Ventilation effectiveness in unsteady displacement ventilation  
Eugen Lichtner, Martin Kriegel
- 0204** Thermal comfort investigation of air-conditioning system with variable airflow in office  
Takuya Wakao
- 0026** Diffuse ceiling ventilation, load distribution and ceiling design  
Peter Nielsen, Rasmus Vilsbøll, Li Liu, Rasmus Jensen
- 0115** A new technology for measuring low airflow rate with ultrasonic beam in mechanical ventilation systems  
Samira Rahnama, Alireza Afshari, Goran Hultmark, Niclas Ivarsson
- 0191** Simplified on-site performance evaluation method for VRF systems  
Yasuhiro Sugata, Mitsuhide Yasuda, Masanari Ukai, Tatsuo Nobe
- P0040** Experimental study on contaminant entrainment in air distribution systems with free jets  
Alan Kabanshi, Amir Sattari, Elisabet Linden, Hans Wigö, Mats Sandberg
- P0167** Modelling of vertical temperature gradient with displacement ventilation  
Natalia Lastovets, Risto Kosonen, Panu Mustakallio
- P0248** Model experiments for applying traditional technology of the house to modern architectural design convective airflow inside the cool air pool of traditional house “Kyo-Machiya”  
Reina Chiba
- P0150** Comparison between thermal environmental stabilities of radiant and convective air-conditioning systems  
Masanari Ukai, Tatsuo Nobe
- P0155** Thermal comfort zone of radiant cooling system in residential buildings in hot and humid regions  
Mika Saito, Moeko Tagawa, Chaichang Chen, Yuka Sakurai, Tomoko Matsubasa, Sachiko Kono, Shin-ichi Tanabe



<b>Session</b>		<b>Tuesday, 4<sup>th</sup> July</b>	<b>16:30 – 18:00</b>
<b>SLOAN Session</b>	<b>Room 5</b>	<b>Microbes Indoors: Moving from DNA to Function</b>	
Chair:			

**Moderators:** Cora Young, Memorial University

“Microbes indoors: Moving from DNA to function” will focus on current state-of-the-science issues in the study of indoor microbes. While DNA profiles of microbes present indoors are useful, the next frontier is to determine the function of those microbes and the potential impacts on indoor environments and human health. The session will feature invited talks by leaders in the MoBE community as well as early career scientists working in the discipline.

8.30-10.00

Plenary session IV

10.00 – 10.30 Break: coffee/tea

10.30 – 12.00 Parallel sessions/ workshops

Room 1	Room 2	Room 3	Room 4	Room 5
Energy Efficient HVAC Systems	IEQ, Wellbeing & Productivity: a Progressive Plan for Action and Influence	Indoor Air Quality and Health Effects - Part I	ISIAQ STC 33 meeting – Thermal comfort & personal control	Oxidative Chemistry in Indoor Environments

12.00 – 13.00 Lunch

13.00 – 14.30 Parallel sessions/workshops

Room 1	Room 2	Room 3	Room 4	Room 5
Occupant Behaviour and Energy Needs in Buildings	Civil Engineering & Architectural Issues	Indoor Air Quality and Health Effects - Part II	Technologies for Smart Buildings	Workshop: <i>How to renovate residential buildings efficiently and affordably?</i>

14.30 – 15.30 Closing ceremony

15.50 - ? Coffee/drinks – informal farewell

<b>Session</b>		<b>Wednesday, 5<sup>th</sup> July</b>	<b>8:30 – 10:00</b>
<b>Plenary Session IV</b>	<b>M</b>		
Chair:			

Advancing the Understanding of Air Exposures at Home: Examining the Roles of Dampness and Water-Soluble Organic Gases on Surface Chemistry and Exposures

***Barbara Turpin***

Healthy Houses – Healthy Cities

***Lidia Morawska***

Session		Wednesday, 5 <sup>th</sup> July	10:30 – 12:00
Session XX	Room1	Energy Efficient HVAC Systems	
Chair:			

- 0047** Experimental study on air cleaning effect of clean air heat pump and its impact on ventilation requirement  
Lei Fang, Ying Sheng, Jinzhe Nie
- 0054** Required zonation resolution of a locally controlled underfloor air distribution system in a lecture hall with open rows  
Gerrid Brockmann, Michael Klemke, Martin Kriegel
- 0057** Model validation - prediction of indoor air quality and thermal comfort in partly occupied venues  
Michael Klemke, Gerrid Brockmann, Benjamin Zielke, Martin Kriegel
- 0156** Nominal cooling capacity of radiant ceiling panels in hot and humid regions  
Jun Shinoda, Jiannan Liu, Miki Iijima, Kazuki Furumoto, Riho Matsuzaki, Shin-ichi Tanabe, Hiroki Iwata
- 0159** Full-scale performance assessment of an innovative climate system for a classroom environment  
Johan van der Steen, Marcel G.L.C. Loomans, Noor Schellens, Jan L.M. Hensen
- 0258** Demand control on room level of the supply air temperature in an air heating and ventilation system  
Joanna Polak, Alireza Afshari, Niels Christian Bergsøe, Göran Hultmark
- P0225** Full-scale experimental study of the static pressure reset control strategy for energy-efficient fan operation in a real building  
Samira Rahnama, Alireza Afshari, Niels Christian Bergsøe
- P0027** Preliminary evaluation of the relationship between IAQ and demand controlled ventilation  
Susana Lopez-Aparicio, Matthias Vogt, Claudia Hak, Franck René Dauge, Sverre Holøis, Mads Mysen
- P0203** Thermal performance of ceiling fin cooling system installed in a warehouse  
Junta Nakano, Taichi Murakoshi, Hiroshi Oishi
- P0228** Ventilation and indoor air quality in newly built school with hybrid ventilation  
Camilla Vornanen-Winqvist, Kaiser Ahmed, Sander Toomla, Jarek Kurnitski, Raimo Mikkola, Heidi Salonen
- P0263** The analysis of influence of thermostatic radiator valve on reduction of energy consumption in buildings  
Tomasz Cholewa, Alicja Siuta-Olcha, Rafał Anasiewicz

<b>Session</b>		<b>Wednesday, 5<sup>th</sup> July</b>	<b>10:30 – 12.00</b>
<b>Workshop</b>	<b>Room 2</b>	<b>INDOOR ENVIRONMENT QUALITY, WELLBEING AND PRODUCTIVITY – A Progressive Plan for Action and Influence</b>	
Chair:			

*Dr Vyt Garnys, PhD., Managing Director  
and Principal Consultant – CETEC P/L and  
CETEC Foray Ltd  
M.RACI, M.AusIMM, M.FMA, M.ACA,  
M.ISIAQ, M.AIRAH, Lead Auditor (OHS&E,  
Quality)*

*Pawel Wargocki, Ph.D., Associate  
Professor  
International Centre for Indoor  
Environment and Energy  
DTU Civil Engineering, Technical University  
of Denmark*

The intention of this workshop will be to collaborate and discuss how we can further enhance the importance and financial impact of indoor environment quality for all building stakeholders through its relationship to occupant wellbeing, performance, efficiency and fiscal productivity. It will consolidate the learning from three previous workshops in Europe, America and Australia-Asia. We wish to explore ongoing developments on how IEQ can be part of standard business operations and on the agenda of financial officers, human resources management, and facilities management

<b>Session</b>		<b>Wednesday 5<sup>th</sup> July</b>	<b>10:30 – 12:00</b>
<b>Session XX</b>	<b>Room 3</b>	<b>Indoor Air Quality and Health Effects - Part I</b>	
Chair:			

- 0031** Office light: Window distance and lighting conditions influencing occupational health  
Juliëtte van Duijnhoven, Mariëlle Aarts, Alexander Rosemann, Helianthe Kort
- 0020** Local lighting control in open-plan offices: acceptable or distracting?  
Christel de Bakker, Mariëlle Aarts, Helianthe Kort, Alexander Rosemann
- 0297** Residential indoor thermal environment and cerebrovascular disease  
Hiroshi Yoshino, Kenichi Hasegawa, Tomonobu Goto
- 0152** Resuspension of particles on dusty surfaces in fully developed turbulent channel flow  
Hau Him Lee, Sau Chung Fu, Christopher Yu Hang Chao
- 0177** Indoor dust as a template to assess indoor aerosol bacteria contamination  
Yanis Guenoune, Pierre Le Cann
- 0273** Oxidative potential of PM2.5 in office buildings - Outcomes of the OFFICAIR study  
Tamas Szigeti, Frank J. Kelly
- 0014** Human well-being through plants – placebo effect?  
Vanessa Hoermann, Susanne Schumacher, Klaus-Reinhard Brenske, Elke van der Meer, Christian Ulrichs

Session		Wednesday, 5 <sup>th</sup> July	10:30 –12.00
Workshop	Room 4	ISIAQ STC 33 Workshop – Thermal comfort and personal control	

**Moderators:** Prof. Runa T. Hellwig<sup>1</sup> & Dr. Atze Berstra<sup>2</sup>

<sup>1</sup>*Augsburg University of Applied Sciences, Augsburg, Germany, Vice Chair ISIAQ STC 33 Thermal Comfort*

<sup>2</sup>*BBA Indoor Environmental Consultancy, The Hague, Netherlands, Member ISIAQ STC 33 Thermal Comfort*

As one of the eight Steering Committees (STC) of ISIAQ, STC-33 ‘Thermal Comfort’ holds meetings at ISIAQ conferences i.e. Indoor Air and Healthy Buildings. During these meetings, information about STC-33 activities, e.g. IEA-EBC-Annex-69 is presented.

Personal control is of high relevance to occupant’s satisfaction. Occupant behaviour has considerable consequences for the energy use in buildings. Previous workshops have identified the need to further work on a raised awareness of designers, engineers and researchers on the topic. Furthermore, there is the need for more research in order to fully understand the main contributing factors to personal control over the indoor climate and how these factors can be influenced in the building design process and during operation. The objective of this workshop is to bring together the multidisciplinary knowledge within the area of personal control in indoor environments, to explore new challenges and opportunities and to identify need for action for different stakeholders.

**Both STC-33 members and non-members are welcome to join the meeting and take actively part in the interactive workshop.**

**0058** Effectiveness of operable windows in office environments  
Atze Boerstra, Marcel Loomans, Jan Hensen

Session		Wednesday, 5th July	10:30 –12:00
SLOAN Session	Room 5	Oxidative Chemistry in Indoor Environments	

**Moderators:** Trevor VandenBoer, Memorial University

Oxidative Chemistry in Indoor Environments” will address important oxidants indoors and potential oxidant-driven degradation pathways. Major uncertainties remain in sources of indoor oxidants, as well as oxidative pathways for compounds that are important to indoor chemistry. The session will feature invited talks by leaders and early career scientists working in the fields of indoor chemistry and outdoor chemistry that is relevant to indoor environments.



<b>Session</b>		<b>Wednesday 5<sup>th</sup> July</b>	<b>13:00 – 14:30</b>
<b>Session XX</b>	<b>Room 1</b>	<b>Occupant Behaviour and Energy Needs in Buildings</b>	
Chair:			

- 0048** Evaluation and re-training of two window opening models using an independent dataset  
Sebastian Wolf, Daniel Wölki, Darren Robinson, Christoph van Treeck
- 0221** Higher energy efficiency for higher productivity? Analysis of academic staff and their changing office environments  
Matthew Francis
- 0275** Modelling the impact of installation of heat cost allocators in DH in Croatia  
Danica Maljkovic, Igor Balen,
- P0005** Field survey for environmental performance of public schools gymnasium in urban area  
Daisuke Nakamura, Mari Nagoshi, Moe Matsuda, Tetsuya Sato, Haruno Ishikawa, Shin-ichi Tanabe
- 0021** Introduction to a questionnaire for occupant energy and wellbeing behaviours in homes  
Marco Ortiz, Stanley Kurvers, Philomena Bluysen
- P0129** Effects of reducing internal heat load on the operation of multi-split type air conditioning system in an office  
Sayana Tsushima, Shuhei Takahashi, Emi Takai, Junta Fujisawa, Shin-ichi Tanabe, Hiromasa Tanaka, Hisataka Kitora
- P0183** The influence of intelligent management systems on formation of commercial office buildings  
Kristina Golub

<b>Session</b>		<b>Wednesday 5<sup>th</sup> July</b>	<b>13:00 – 14:30</b>
<b>Session XX</b>	<b>Room 2</b>	<b>Civil Engineering and Architectural Issues - Part II</b>	
Chair:			

- 0120** Circadian house as a vision for healthy and human-centric building design  
Peter Foldbjerg, Per Arnold Andersen, Nicolas Roy, Jens Christoffersen
- 0181** Coupled indoor/outdoor airflow simulation comparing ANSYS Fluent with a GPU-based lattice Boltzmann model for urban environments  
Marco-Felipe King, Amirul Khan, Catherine Noakes
- 0056** Validation of RANS CFD models for contaminant transport in a cross-ventilated isolated building  
Twan van Hooff, Bert Blocken, Yoshihide Tominaga
- 0101** Impact on indoor climate depending on the moisture buffering of building materials  
Kristin Lengsfeld, Martin Krus
- 0077** Aspects influencing the usability of operable façade elements (OFE's) in Dutch offices: Preferences and expectations  
Rolien Wisse, Marco Ortiz, Stanley Kurvers, Atze Boerstra, Philomena Bluysen
- P0085** Numerical study of time-periodic mixing ventilation: effect of amplitude  
Jo-Hendrik Thysen, Twan van Hooff, Bert Blocken, GertJan van Heijst
- P0206** Forecast of exhaust hood capture efficiency in commercial kitchens using the improved k- $\epsilon$  model  
Marie Shimura, Takashi Kurabuchi, Eri Nagashima, Yoshihiro Toriumi, Atsushi Okuda
- P0141** Prediction of exhaust gas stagnation in common corridor of apartments with gas water heater  
Takurou Nakamura, Takashi Kurabuchi
- P0249** St James' Hospital: A CFD case study of façade pressures can inform window design  
Marco-Felipe King, Catherine J Noakes, Ian Clifton, Anew Tunstall

<b>Session</b>		<b>Wednesday 5<sup>th</sup> July</b>	<b>13:00 – 14:30</b>
<b>Session XX</b>	<b>Room 3</b>	<b>Indoor Air Quality and Health Effects - Part II</b>	
Chair:			

- 0008** Evaluation of the risk for infection via three transmission routes using droplet deposition and tracer gas from a cough machine  
Maho Ichikawa, Miki Iijima, Masayuki Ogata, Hitomi Tsutsumi, Shin-ichi Tanabe, Satoshi Hori
- 0032** Dermal uptake of nicotine from air and clothing: Experimental verification  
Gabriel Bekö, Glenn Morrison, Charles J. Weschler, Holger M. Koch, Claudia Pálmke, Tunga Salthammer, Tobias Schripp, Jørn Toftum, Geo Clausen
- 0078** Active house evaluation of indoor climate in two Norwegian detached houses  
Milena Šlipek, Amdi Worm
- 0162** Sensory evaluation of building products and various indoor settings – Results of a research project  
Ana Maria Scutaru, Alexander Mertes, Birgit Müller
- 0137** Effect of a moderately warm environment on salivary cortisol level  
Marika Vellei, Menglei Zhang, Ben J Lee, Sukumar Natarajan
- 0199** The effect of the thermal environment on work efficiency of the fatigue condition  
Ayako Yasuoka, Toshiya Iwamatsu, Tsuyoshi Ueno, Toshiyuki Miyanaga, Kazuyo Tsuzuki, Yuji Takeda
- P0230** Evaluation of the linearity of olfactory perceptions  
Daniela Hegemann, Verena Clemens, Mark Wesseling, Dirk Müller, Silvia de Lima Vasconcelos, Birgit Müller
- P0128** A study on effective control of influenza infection considering energy saving in buildings  
Motoya Hayashi, Kenichi Kobayashi, Michiko Bando, Hoon Kim, Noriko Kaihara, Haruki Osawa
- P0173** Investigation and analysis on the PM2.5 concentration distribution in a campus in Shanghai  
Yan Zhou, Hongwei Tan, Tingting Hu, Jinglin Jiang
- P0198** Influence of Intermittent exposure of odor upon odor intensity and olfactory adaptation  
Hiromi Yamada, Shin-ichi Tanabe, Motoya Hayashi
- P0169** Effects of the housing envelope and living behaviour on body temperature in the elderly: A field survey  
Toyohiro Kurabe, Tanji Hoshi, Yukie Hayashi, Toshiharu Ikaga

**P0222** Experimental study on blood-pressure affected by thermal insulation and flooring in winter  
Takuya Ishiwata, Junichiro Hirata, Yusuke Nakajima, Yukie Hayashi, Toshiharu Ikaga

<b>Session</b>		<b>Wednesday 5<sup>th</sup> July</b>	<b>13:00 – 14:30</b>
<b>Session XX</b>	<b>Room 4</b>	<b>Technologies for Smart Buildings</b>	
Chair:			

- 0143** Effect of ceiling fin cooling system on thermal environment of train station in summer  
Taichi Murakoshi, Junta Nakano, Hiroshi Oishi
- 0149** The method for evaluating the cooling effect by dry mist system in the actual city block  
Masataka Kuno, Takashi Kurabuchi
- 0174** How good are chemical sensors for research and IAQ management?  
Benjamin Hanoune, Alexandre Caron, Nathalie Redon, Patrice Coddeville
- 0216** Optimization of thermal environment in a building with low-exergy radiant systems and glazed facade  
Ema Nemethova, Michal Krajcik, Werner Stutterecker, Dusan Petras
- 0218** New materials for coating and controlling ice formation on heat exchanger's fins  
Maral Rahimi, Alireza Afshari
- 0232** Experimental study of a novel dew point indirect evaporative cooler  
Wenhua Chen, Zhiwei Zhang, Junjie Liu
- P0009** Evaluation of task air conditioning system with convection, conduction, and radiation  
Misa Imazu, Shin-ichi Tanabe, Jiannan Liu, Kazuki Furumoto, Riho Matsuzaki, Miki Iijima, Kenji Fujino, Daisuke Hatori, Nobuhiro Hirasuga, Shun Kato, Shiori Sasahara, Hiroki Iwata
- P0182** The designing of human behavior, thermal comfort and ceiling on energy  
Nakagawa Jun, Kobayashi Keigo, Takaguchi Hiroto, Tanabe Shin-Ichi

Session		Wednesday, 5 <sup>th</sup> July	13:00 –14:30
<b>VELUX Workshop</b>	<b>Room 5</b>	<b>How to renovate residential buildings efficiently and affordably?</b>	

**Moderator:** Pawel Wargocki (Associate Professor, Department of Civil Engineering, DTU)

90% of existing buildings will still be in use in 2050. Unfortunately, most of the European building stock is in poor conditions: 75% of buildings are energy inefficient and 16% of Europeans live in damp buildings. This increases the likelihood of having asthma and other respiratory illnesses when living in such buildings. High cost is often the barrier when owners decide whether to energy renovate or not their houses or apartments. Reducing the cost of renovating is therefore another paramount factor in adding more volume to healthy buildings. Moreover, some co-benefits to energy efficiency such as a better health, comfort and wellbeing of the occupants are key drivers in speeding up the renovation rates. Therefore, the aim of the workshop is to highlight the importance of affordable and healthy renovations by presenting and discussing existing renovation concepts and projects.

Introduction: The Healthy Homes Barometer 2017 and the need for healthy renovations (Dr. Jens Christoffersen, Senior Researcher, Knowledge Centre for Daylight, Energy and Indoor Climate, VELUX A/S)

Presentations:

Renovation of social housing in Denmark - Tenant's experiences and satisfaction with the indoor environment (Dr. Henrik Knudsen, Danish Building Research Institute)

Light and color as part of healthy renovation (Prof. Elzbieta Ryńska, Professor, Laboratory of Planning and Design, Warsaw University of Technology)

The RenovActive concept (Dr. Nicolas Galiotto, Indoor Climate Consultant, Knowledge Centre for Daylight, Energy and Indoor Climate, VELUX A/S)