Tuesday October 15th

5:00 – 6:30 PM – Plenary 1
Are We Putting Enough Energy into Making Buildings Healthy?
William Bahnfleth, Ph.D., P.E., Fellow ASHRAE, ASME Fellow, Pennsylvania State University, 2013–14 ASHRAE president

Wednesday, October 16

8:00 – 9:00 AM – Plenary 2
Do We Know Much about Low Energy Buildings and Health?
Mark J. Mendell, Ph.D., Lawrence Berkeley National Laboratory and California Department of Public Health

Parallel Session 1 (9:10 – 10:50 AM)
Track: Environmental Health in Low Energy Buildings

Indoor Air Quality in High-Performing Building Case Studies: A Wealth of Intent, A Dearth of Data
Kevin Teichman, Ph.D., Andrew Persily, Ph.D., Fellow ASHRAE and Steven Emmerich, Member

Benefits of Improved Residential Regulations on Reducing Outdoor Particulate Matter Indoors in Canada
Zuraimi Sultan, Ph.D., Member, David Alas and Zhongchao Tan, Ph.D., P.E., Member

Natural Ventilation in California Offices: Estimated Health Effects and Economic Consequences
Panel Discussion - Environmental Health in Low Energy Buildings
Mark J. Mendell, Ph.D., Lawrence Berkeley National Laboratory, Kay Kreiss, M.D., National Institute for Occupational Safety and Health, & William J. Fisk, P.E., Lawrence Berkeley National Laboratory

Track: Air Cleaning and Filtration

Assessment of Two Control Strategies for Reducing Human Exposure to Airborne Particles while Sleeping in Low-Energy Homes
Jordan D. Clark, Student Member, Atila Novoselac, Ph.D., Member and Richard L. Corsi, Ph.D., P.E., Member,

Inefficiency of Passive Plant-Based Systems for Indoor Air Cleaning
Benjamin Hanoune, Ph.D., Mélanie Nicolas, Ph.D., Julien Guilhot, Ph.D., Gaëlle Bulteau, Ph.D., Marie-Amélie Cuny, Ph.D. and Damien Cuny, Ph.D.

Stand-Alone Air Filters Improve Indoor Air Quality in a First Nations Community
Gary Mallach, Scott Weichenthal, Rylan Kulka, Amanda Wheeler, Hongyu You, Melissa St-Jean, Andrew Black and Donald Sharp, Ph.D.

Effectiveness of an In-Duct Electrostatic Precipitator in Nanoparticle Removal with Consideration of Ozone Emissions
Donghyun Rim, Ph.D., Dustin Poppendieck, Ph.D., Lance A. Wallace, Ph.D. and Andrew K. Persily, Ph.D., Member

The Relationship between Filter Pressure Drop, Indoor Air Quality, and Energy Consumption in Rooftop HVAC Units
Marwa Zaatari, Student Member, Jeffrey Siegel, Member and Atila Novoselac, Member

Parallel Session 2 (11:10AM – 12:30 PM)

Track: Tools (Models, Measurements and More) (Part 1)

Robust Climate Design Combines Energy Efficiency with Occupant Health and Comfort

Environmental Control and Sick Building Syndrome: A Low Carbon Open Plan vs. a Cellular Plan Workplace
Sally S. Shahzad, Ph.D., John Brennan, P.E. and Dimitris Theodossopoulos, Ph.D., P.E.

Integration of Dynamic Ventilation and Air Cleaning for Healthy Environments in a Low Energy Building
KwangHoon Han, Ph.D., Associate Member and Jensen Zhang, Ph.D., Fellow ASHRAE

Critical Sensible and Latent Effectiveness for Membrane Type Energy Recovery Ventilator (ERV) in Cold Climates
Peng Liu, Hans Martin Mathisen, Dr.Ing. and Maria Justo Alonso

Track: Commercial and Institutional Buildings (Part 1)

Indoor Environmental Quality, Occupants’ Perception, Prevalence of SBS Symptoms and Sick Leave in a Green Mark Platinum versus a Non-Green Mark Rated Building
Kwok Wai Tham, Ph.D., Pawel Wargocki, Ph.D., Member and Sheryl Tan

The IAQ and Energy Impacts of Reducing Formaldehyde Emissions in Commercial Buildings
Lisa C. Ng, Ph.D., Associate Member, Andrew K. Persily, Ph.D., Member, Steven Emmerich, Member and Kevin Teichman, Ph.D.
Formaldehyde Concentrations and Control in Retail Buildings  
Éléna L. Nirlo, Student Member, Neil Crain, Ph.D., Richard Corsi, Ph.D., P.E., Member and Jeffrey A. Siegel, Ph.D., Member

Impact of PM 2.5 on Low Energy Buildings and Indoor Air Quality  
Luke Leung, P.E., Member, Sergio Sadaba, Jason Kirkpatrick, Associate Member and Ray Clark

Parallel Session 3 (1:30 – 3:00 PM)  
Track: Moisture and Health

β-N-acetylhexosaminidase as a Marker of Fungal Cell Biomass  
Ragnar Rylander, M.D. and Thomas Hulander, Dr.Eng., P.Eng.

Comparative Effectiveness of Heat and Energy Recovery Ventilators at Improving Indoor Air Quality and Ventilation Rates in Canadian Single Family Homes with Asthmatic Children  
Daniel G. Aubin, Ph.D., Doyun Won, Ph.D., Hans Schleibinger, Ph.D., Pierre Lajoie, M.D., Denis Gauvin, Member, Veronique Gningrasand Don Fugler, P.Eng.

Fungal Exposure in Homes of Patients with Sarcoidosis and Asthma  
Ragnar Rylander, M.D., Marjeta Tercelj, M.D., Barbara Salobir, M.D., Life Member, Mirjana Zupancic, M.D. and Zoltan Narancsik, M.D.

Indoor Moisture Conditions in Multifamily Dwellings: Measurements and Analysis  
Hans Bagge, Ph.D. and Dennis Johansson, Ph.D.

Track: Commercial and Institutional Buildings (Part 2)

Optimizing Classroom Ventilation Rates: Impact of Substandard Ventilation on Student Academic Achievement  
Ulla P. Haverinen-Shaughnessy, Ph.D. and Richard Shaughnessy, Ph.D.

Low Energy Design and Improved IAQ in Healthcare  
Paul Marmion, P.Eng., Life Member and Ray Pradinuk

Low Carbon vs. Victorian School Design: Indoor Air Quality, Energy and Health Responses  
Lia Chatzidiakou, Dejan Mumovic, Alex J. Summerfield, Ph.D. and Sung Min Hong

ASHRAE/IES Standard 90.1-2013: Changes and Potential Impacts on Indoor Environmental Quality  
John Hogan, P.E., Member

Extra Session 1 (3:10 PM – 6:00 PM)  

Oral Summary Presentations (3:10 PM – 3:55 PM)  

Posters (4:00 PM – 6:00 PM)

Influence of Factors on Microbial Growth on Ventilation Air Filter Media  
Junjie Liu, Ph.D. and Qian Li, Student Member

Predicting the Performance of Gaseous Air Cleaners: Modeling and Validation  
Mitra Bahri, Student Member, Vida Safari, Damon Matthews, Ph.D., Fariborz Haghighat, Ph.D., P.E., Fellow ASHRAE and Ali Gholizadeh Touchaei

Performance of Thermal-catalytic Oxidization Technology for Formaldehyde Removal at Typical Indoor Environment
Xu Han, Student Member, Jingjing Pei, Ph.D., Associate Member, Yi Lu, Student Member and Zhiqiang Wang, Ph.D.

Development and Validation of a Laboratory-Scale Air Handling Unit (AHU) for the Study of Aerosols Behaviour on Prototype Fibrous Filters
Luisa F. González, Aurélie Joubert, Ph.D., Claire Delahaye, P.E., Yves Andrès, Ph.D., Nelsie Berthelot, Ph.D., Xavier Chaucherie, M.D. and Laurence Le Coq, Ph.D.

Health Risk of Formaldehyde and Acetaldehyde Formation in HVAC Integrated UV-PCO Air Cleaner
Donya Farhanian, Student Member and Fariborz Haghighat, Ph.D., Fellow ASHRAE

Modeled Air Quality and Energy Use Impacts of UVGI for Cooling Coil Biofouling Mitigation
Joseph Firrantello, P.E., Associate Member, Jason DeGraw, Ph.D., Associate Member and William Bahnfleth, Ph.D., P.E., Fellow ASHRAE

Energy Savings Potential of Controlling Residential Whole-House Ventilation System Operation Based on Outside Temperature
Michael R. Lubliner, Member

Reducing the Cost of Comfort in K-12 Schools through Computer Simulation
Patrick Wilkinson, P.E., Member, Dean Perry, Member and Helen Lieng, Member

Modeling Gaseous Pollutant Distribution using the Zonal Approach: Case Study of an Office Space
Katia Cordeiro Mendonca, Ph.D., Marc Olivier Abadie and Patrice Blondeau

Sensor Placement for Predicting Airflow Around Buildings to Enhance Natural Ventilation
Maria Papadoiulou, Student Member, Benny Raphael, Ph.D., Chandra Sekhar, Ph.D., Fellow ASHRAE and Ian F.C. Smith, Ph.D.

Effect of Air Distribution Methods on Solid Particle Dispersion in Rooms with Forced Ventilation
Andrius Jurelionis, Lina Seduikyte, Laura Gagyte, Tadas Prasauskas, Edvinas Krugly, Darius Ciuzas and Dainius Martuzevicius

Information Tools to Manage and Improve Laboratory Ventilation Systems
James Coogan, P.E., Member

Manual for Indoor Air Environment and Ventilation in Schools
Asako Hasegawa, Ph.D., Member, Hiroshi Yoshino, Ph.D., Fellow ASHRAE, Satoru Muramatsu, Satoru Nagasawa, Takashi Kurabuchi, Ph.D., Yasushi Kondo, Ph.D., Hiroki Kitayama, Akihiro Nagata, Go Iwashita, Ph.D., Yukari Iino and Tomonobu Goto

A Review of Continuous Indoor Air Quality and Energy Consumption Measurements and Challenges
Jukka-Pekka Skön, Mika Raatikainen and Mikko Kolehmainen

Mika Raatikainen, Jukka-Pekka Skön and Mikko Kolehmainen
Thursday, October 17

8:00 – 9:00 AM — Plenary 3
Building Energy and Reactivity
Richard Corsi, Ph.D., P.E. University of Texas, Austin, Indoor Air 2011 president

Parallel Session 4 (9:10-1050 AM)

Track: Sources and Chemistry

On-site Dynamic Study of Indoor VOCs Emissions from Material in New High Environmental Quality Buildings
Valérie Desauziers Sr., Ph.D., Delphine Bourdin, Christophe Cantau, Ph.D. and Pierre Mocho Sr., Ph.D.

Pollutants Characterization in Low Energy Public Buildings in France
Coralie Schoemaeker, Hanoune Benjamin, Nadine Locoge, Marie Verrière, Nathalie Leclerc and C. Schneider

Phthalates and Polybrominated Diphenyl Ethers in Retail Stores
Ying Xu, Ph.D., Member, Jorge Urquidi, Student Member, Yirui Liang, Student Member and Jeffrey Siegel, Ph.D., Member

Impact of Residential Weatherization on Indoor Secondary Organic Aerosol and Total Organic Aerosol Concentrations
Michael S. Waring, Ph.D., Associate Member

The Influence of Scale on Surface Resistance to Ozone Reactions with Building Surfaces
Dustin Poppendieck, Ph.D.

Track: Tools (Models, Measurements and More) (Part 2)

An Innovative Low Cost IR System for Real-Time Measurement of Human Thermal Comfort
Gian Marco Revel, Ph.D., P.E., Marco Arnesano, Ph.D., P.E. and Filippo Pietroni, Dr.Ing

Tracking Long-Term Occupant IEQ Outcomes: A Longitudinal Survey Tool
Jared Langevin, Student Member, Patrick L. Gurian, Ph.D. and Jin Wen, Ph.D., Member

Sensitive Homes: Remote Sensing and Monitoring Integral to Homes
Loveleen Atwal, Student Member, Rodrigo Mora, Ph.D., Associate Member and Gamal Mustapha

Kevin Teichman, Ph.D., Andrew K. Persily, Ph.D., Member and Steven Emmerich, Member

IEQ Research Needs for Low Energy Homes
Tom Phillips and Hal Levin, Fellow ASHRAE

Parallel Session 5 (11:10 AM-12:30 PM)

Track: Residential Buildings (Part 1)

Building Design and Operational Choices that Impact Indoor Exposures to Outdoor Particulate Matter inside Residences
Brent Stephens, Ph.D., Associate Member, Illinois Institute of Technology, Chicago, IL
Effectiveness of Ventilation Interventions at Improving Indoor Air Quality and Ventilation Rates in Canadian Single Family Homes with Asthmatic Children
Daniel G. Aubin, Ph.D., Doyun Won, Ph.D., Hans Schleibinger, Ph.D., Pierre Lajoie, M.D., Denis Gauvin, Veronique Gingras and Don Fugler, P.Eng.

Environmental Factors Associated with the Winter-Season Microorganisms Found in Single Family Residences
Shelly L. Miller, Ph.D., Member, Patricia B. Keady, Jonathan Awerbuch, Oluwaseun S. Oyatogun, Suraj Prabhu, Noah Fierer, Ph.D., Joanne B. Emerson, Ph.D., Rob Dunn, Ph.D. and Holly Menninger, Ph.D.

Relationships Between Indoor Environmental Quality Parameters and Energy Related Parameters: Measurements from 72 Apartments in Sweden
Dennis Johansson, Ph.D. and Hans Bagge, Ph.D.

Track: Microorganisms and Infection

Dissemination of Exhaled Plumes During the Use of Nasal Cannulae and Simple Oxygen Masks by Healthy Volunteers – Potential Issues for Low Energy Healthcare Institutions
Julian Wei-Tze Tang, M.D., Gerald Koh, M.D., Andre Nicolle, Ph.D., Christian Klettner, Ph.D., Liang De Wang, Ashlynn Y.L. Tan, Muhammad Amin, David Cheong, Ph.D., Member, Chandra Sekhar, Ph.D., Member and Kwok Wai Tham, Ph.D.

CFD Analysis to Assess Performance Variability of In-Duct UV-C Systems
Azael Capetillo, Cath Noakes, Ph.D., P.E., Member and P.A. Sleigh, Dr.Ing.

Optimizing Upper-Room UVGI Systems for Infection Risk and Energy
Catherine Noakes, Ph.D., P.E., Amirul Khan, Ph.D. and Carl Gilkeson, Ph.D.

Parallel Session 6 (1:30-3:00 PM)

Track: IEQ Factor Interactions (Part 1)

The Interaction and Connection between Buildings, HVAC System, and Indoor Environmental Quality
Robert Bean PL(Eng.) R.E.T., Member

Experimental Characterization of the Human Convective Boundary Layer in a Calm Indoor Environment
Dusan Z. Licina, Student Member, Know Wai Tham, Ph.D., Chandra Sekhar, Ph.D., Fellow ASHRAE and Jovan Pantelic, Ph.D.

A Novel Energy Efficient Demand-Based Ventilation System for Critical Contaminant and Overall IAQ Control
Korbaga F. Woldekidan, Student Member, Jianshun Zhang, Ph.D., Fellow ASHRAE and Yan Lu, Ph.D.

Workshop - Low Energy Hospitals – Potential Risks and Solutions for Good Infection Control
Julian Tang (University of Alberta), Yuguo Li (University of Hong Kong), Cath Noakes (University of Leeds), Michael Hodgson (OSHA)
Extra Session 2 (3:10 PM – 6:00 PM)

Oral Summary Presentations (3:10 PM – 3:55 PM)

Posters (4:00 PM – 6:00 PM)

Impacts of Different Air Conditioning Schemes on Indoor Air Quality, Energy Consumption, Environmental Emissions and Economics of a Small Office Building in a Hot-Humid Climate
Ahmed H. Abdel-Salam, Student Member, Mohamed R.H. Abdel-Salam, Melanie T. Fauchoux, Ph.D., Associate Member, Gaoming M. Ge, Ph.D. and Carey J. Simonson, Ph.D., P.E., Member

Human-Environment Interaction: Potential Use of Pupil Size for Visual Environmental Controls
Joon-Ho Choi, Ph.D., Member, Rui Zhu, Student Member and Angella Johnson, Student Member

Proof of Concept Build Tight, Ventilate Right
Jelle Laverge and Arnold Janssens, Ph.D., Member

Energy Savings and IAQ Associated with System Efficiency Improvements in Iowa’s HVAC SAVE Program
Scott W. Yee and J. Baker

Airflow in High-rise Multi-unit Residential Buildings with Respect to Ventilation and IAQ
Lorne Ricketts, Student Member and Graham Finch, P.Eng., Associate Member

Elevated Radon in Concrete Residential Buildings
Henry H. Slack, Member and Janise Palmer

Lina Seduikyte, Jolanta Sadauskiene, Dr.Ing., Valdas Paukstys, Dr.Ing., Andrius Jurelionis, Dr.Ing., Dainius Martuzevicius, Ph.D. and Tadas Prasauskas

Thermal Environment in Panel Residential Buildings After Refurbishment
Hana Pustayova and Dusan Petras, Ph.D., Member

Measured Impact of Ventilation Rate Determination Strategy on IAQ Parameters
Paul W. Francisco, Member, Salvatore Cali, David Jacobs, Ph.D., Member, William B. Rose, Fellow ASHRAE, Zachary Merrin and Loreen Targos

HVAC Ventilation Stops for Building Energy Saving: Consequences on Microbial Air Quality Downstream Lab-scale Filters
Audrey Forthomme, Aurélie C. Joubert, Yves Andrès, Xavier Simon, Philippe Duquenne, Denis Bemer and Le Coq Laurence

Determination of Radon Exhalation Rates from Construction Materials using VOC Emission Test Chambers
Matthias Richter, Dr.Ing. and Oliver Jann, Dr.Ing

A Simulation Tool for Semivolatile Organic Compounds in Buildings
Zhishi Guo, Ph.D., U.S. EPA, Research Triangle Park, NC

Passive Removal of Secondary Pollutants due to Squalene Oxidation in a Primary School: A Mathematic Analysis
Shichao Liu, Student Member and Atila Novoselac, Ph.D., Member

Ensuring Thermal Comfort in Low Energy Buildings with Numerical Simulations
Conrad Voelker, Dr.Ing. and Oliver Kornadt
Friday, October 18

8:00 – 9:00 AM – Plenary 4
What Can Europe Teach Us?
Pawel Wargocki, Ph.D., Danish Technical University, ISIAQ president

Parallel Session 7 (9:10-10:30 AM)

Track: Residential Buildings (Part 2)

Indoor Air Quality and Ventilation in Residential Deep Energy Retrofits
Iain Walker, Ph.D., Fellow ASHRAE and Brennan Less, Student Member

Improving Energy Efficiency of Housing Stock: Demonstration of Impacts on Indoor Environmental Quality and Public Health in Northern Europe
Dainius Martuzevicius, Tadas Prasauskas, Mari Turunen, Virpi Leivo, Anu Aaltonen, Edvinas Krugly, Darius Ciuzas, Maria Pekkonen, Mihkel Kiviste, Lina Seduikyte and Ulla Haverinen-Shaughnessy

Bedroom IAQ: Where Do We Stand?
Jelle Laverge, Marc Delghust and Arnold Janssens, Ph.D., Member

An Investigation of Indoor Air Quality in UK Energy Efficient Homes: A Case Study
Grainne McGill, Student Member, Menghao Qin, Dr.Ing. and Lukumon Oyedele

Track: IEQ Factor Interactions (Part 2)

Advanced Integrated Indoor Air Quality and Thermal Air Movement Strategies
Adams Rackes, Student Member and Michael S. Waring, Ph.D., Associate Member

The Impact of Windows on Thermal Comfort
Brittany Hanam, P.Eng., Associate Member and Susan Hayes, P.Eng., Associate Member

Contaminant Transport in Membrane Based Energy Recovery Ventilators
Ryan Huizing, P.Eng., Hao Chen, Ph.D. and Frankie Wong

ASHRAE IAQ 2013 Closing Session (11:00 AM-12:00 PM)
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