DAY1	SUNDAY May 26th, 2019 Venue – Romania National Library, Bulevardul Unirii 22, Bucharest 030833, GPS 44.4256° N, 26.1102° E	DAY 1
14:00	**CLIMA 2019 REGISTRATION OPENING**	14:00
16:30	**CLIMA 2019 - OPENING CEREMONY (PLENARY SESSION 1, Aula Hall)** Chair: Cătălin Lungu, Assoc.Prof.Dr.Eng. - REHVA vicepresident & CLIMA Organising Committee Chair, Technical University for Civil Engineering, ROMANIA	16:30
17:00	**CLIMA Organisers speech: Sorin Burchiu, Prof.Dr.Eng. - CLIMA 2019 & AIIR President, Radu-Sorin Văcăreanu, Prof.Dr.Eng. - UTCB Rector, Stefano Corgnati, Prof.Dr. - REHVA ex-President, Frank Hovorka - REHVA President**	17:00
17:30	**Romanian Officials speech** **Acad. Ioan Dumitrache - Romanian Academy General Secretary** **Acad. Nicolae Zamfir - General Manager ELI-NP project, IFIN-HH Măgurele**	17:30
18:00	**Keynote Lecture: Cătălina Turcu, Prof.Assoc.Dr.Arch. - University College of London, UK;** *Decarbonising the built environment: does it make us healthier and happier?*	18:00
18:40	**Diamond Sponsor Presentation: Hilde Dhont - Department Manager of the Daikin Europe Environment Research Center;** *Daikin Vision 2050*	18:40
19:00	**"Ilie Stepan and friends" CONCERT (Aula Hall)**	19:00
20:00	**CLIMA 2019 EXHIBITION OPENING & WELCOME RECEPTION + "Popa Popas" Surprize** Chair: Ioan-Silviu Doboși, Dr.Eng. - AIIR prim-vicepresident, CLIMA Sponsor & Exhibition Committee Chair, ROMANIA	20:00
23:00	**END OF THE CONGRESS FIRST DAY**	23:00

DAY 2	MONDAY May 27th, 2019 Venue – Romania National Library, Bulevardul Unirii 22, Bucharest 030833, GPS 44.4256° N, 26.1102° E	DAY 2
8:30	**CLIMA 2019 - PLENARY SESSION 2, Aula Hall** Chairs: Frank Hovorka, REHVA President, FRANCE; Jaap Hogeling, Chairperson of CEN/TC371, EPB CENTER, The NETHERLANDS	8:30
8:30	**Keynote Lecture: Jarek Kurnitsky, Prof.Dr.Eng. - REHVA vice-president, Tallinn University of Technology, ESTONIA;** *Nearly zero energy buildings and EPBD implementation*	8:30
9:00	**Keynote Lecture: Shin-ichi Tanabe, Prof.Dr.Arch. - Waseda University, JAPAN;** *Importance of Environment, Social and Governance (ESG) in Building Industries-Toward Zero Energy Building with High Indoor Environment Quality*	8:50
9:40	**Emerald Sponsor Presentation: Erick Melquiond - President/Director of Strategy, Eurovent Certita Certification;** *Third party certification*	9:30
9:50	**Bogdan Rogin - Policy Advisor-Regional Development Committee at European Parliament;** *An initiative about legislation simplification*	9:50
10:00	**COFFEE BREAK**	10:00

ORDINARY SESSION 1	Session 1 A	Session 1 B	Session 1 C	Session 1 D	Session 1 E	Session 1 F	Session 1 G	Session 1 H	Session 1 I	Session 1 J	ORDINARY SESSION 1
	Criteria for thermal environment and ventilation	**HVAC in residential buildings**	**Low energy heating and cooling systems**	**Predicted and real energy performance of buildings**	**High Energy Performance and Sustainable Buildings**	**Life-cycle services, commissioning, operation and maintenance of HVAC systems**	**Simulation models and predictive tools for the buildings HVAC**	**HVAC efficient strategies**	**Big data and machine learning applications in buildings**	**Energy performance requirements, compliance assessment and cost optimality**	
	Chairs: **Risto Kosonen** **Olli Seppänen** **Cristiana Croitoru**	**Chairs:** **Philomena Bluyssen** **Dirk Mueller** **Ilinca Năstase**	**Chairs:** **Atze Boerstra** **Rodica Frunzulică** **Ștefan Stănescu**	**Chairs:** **Francis Allard** **Guangyu Cao** **Ioan Silviu Dobosi**	**Chairs:** **Jarek Kurnitsky** **Milos Lain** **Francesca R. D'Ambrosio**	**Chairs:** **Blake Wenz** **Sebastian Theißen** **Angel Dogeanu**	**Chairs:** **Christian Inard** **Dick van Dijk** **Jaap Hogeling**	**Chairs:** **Dušan Petráš** **Andrei Damian** **Zhang Xu**	**Chairs:** **Gilles Noton** **Sorin Caluianu** **Florin Bode**	**Chairs:** **Livio Mazzarella** **Juan Travesi** **Tiberiu Catalina**	
	Room: A-03-09	**Room: D-05-10**	**Room: D-06-10**	**Room: D-06-13**	**Room: A-03-10**	**Room: G-M-04**	**Room: B-01-26**	**Room: E-M-02**	**Room: E-M-03**	**Room: A-03-08**	
10:30	**Samira Rahnama, Peter Vilhelm Nielsen, Alireza Afshari, Niels Christian Bergsøe, Hicham Johra and Rasmus Lund Jensen** Evaluating the cooling capacity of diffuse ceiling ventilation system – Full-scale experimental study	**Andreas Heinz and Christian Gaber** Combinations of heat pump and photovoltaics for renovated buildings	**Hitomi Igarashi, Takashi Akimoto, Daisuke Hatori, Shun Kato, Hikari Sakakibara and Madoka Kimura** The Effects of an Air Conditioning System using the Coanda Effect on an Indoor Office Environment	**Igor Mojic, Michel Haller, Meta Lehmann and Stefan Van Velsen** ImmoGap - Analysis of the performance gap of apartment buildings	**Kyosuke Hiyama and Liwei Wen** Practical natural ventilation performance metric based on thermal autonomy for sustainable building design	**Cristina Tanasa, Cristina Becchio, Stefano Paolo Corgnati, Valeriu Stoian and Daniel Dan** Calibration of a building energy model using operation conditions derived from monitoring	**Issa Jaffal and Christian Inard** A study of the nonlinearity of a building thermal behavior based on metamodeling	**Xin Zhang, Junjie Liu, Xilei Dai and Jingjing Pei** Experimental Analysis of Residential Ventilation and Dehumidification Strategies in Chongqing	**Anders Overgaard, Carsten Skovmose Kallesøe, Jan Dimon Bendtsen and Brian Kongsgaard Nielsen** Mixing Loop Control using Reinforcement Learning	**Raimo Simson, Endrik Arumägi, Kalle Kuusk and Jarek Kurnitski** Redefining cost-optimal nZEB levels for new residential buildings	10:30
10:45	**Kaiser Ahmed, Kalle Kuusk, Henrik Heininen, Endrik Arumägi, Targo Kalamees, Tero Hasu, Nicola Lolli and Jarek Kurnitski** Indoor Climate and Energy Performance in Nearly Zero Energy Day Care Centers and School Buildings	**Yosuke Watanabe, Yumiko Araki, Mika Saito, Chaichang Chen, Misa Imazu, Shin-Ichi Kagiya, Hiroko Fujimura, Keiko Tsuda and Shin-Ichi Tanabe.** Evaluation Method for Thermal Environment in Residential Houses Using Score on Warmth	**Dragos-Ioan Bogatu, Eleftherios Bourdakis, Ongun Berk Kazanci and Bjarne Olesen** Experimental comparison of radiant ceiling panels and ceiling panels containing phase change material (PCM)	**Arash Rasooli and Laure Itard** Quicker Measurement of Walls' Thermal Resistance Following an Extension to ISO 9869 Average Method	**Diletta Di Lorenzo, Valeria Lupo, Giorgia Peri, Gianfranco Rizzo and Gianluca Scaccianoce** A simple methodology for comparing cost-benefit of traditional, green and cool roofs	**Ryosuke Inomata, Takashi Akimoto, Daisuke Hatori, Shigeaki Takanishi, Shunsuke Nakamura, Yosuke Mochizuki, Nana Araki and Daiki Yamashina** Study on environment conscious technologies in a super tall building: Evaluation of PV performance considering aerological climate	**Delia D'Agostino and Danny Parker** How will climate alter efficiency objectives? Simulated impact of using recent versus historic european weather data for the cost-optimal design of nearly zero energy buildings (NZEBs)	**Alper Mete Genc, Ziya Haktan Karadeniz, Orhan Ekren and Macit Toksoy** A novel sherical packed bed application on decentralized heat recovery ventilation units	**Andrea Costa, Marco Pietrobon and Thomas Messervey** Hit2Gap Project: Highly Innovative building control Tools Tackling the energy performance gap	**Kaiser Ahmed, Gyuyoung Yoon, Makiko Ukai and Jarek Kurnitski** How to Compare Energy Performance Requirements of Japanese and European Office Buildings	10:45
11:00	**Xiaojie Zhou, Sumei Liu, Xuan Liu, Weizhen Zhang, Jian Li, Jiankai Dong, Dayi Lai and Qingyan Chen** Evaluation of Four Models for Predicting Thermal Sensation in Chinese Residential Kitchen	**Max Rohn, Paul Mathis and Dirk Mueller** Experimental investigation of different nozzle designs inside active chilled beams	**Hikari Sakakibara, Takashi Akimoto, Hitomi Igarashi, Shunsuke Nakamura and Madoka Kimura** The Examination of Air Blowing Method and Thermal Comfort of Variable Air Conditioning System using Coanda Effect	**Dmytro Ivanko, Natasa Nord, Åse Lekang Sørensen, Thale Sofie Wester Plesser, Harald Taxt Walnum and Igor Sartori** Identifying typical hourly DHW energy use profiles in a hotel in Norway by using statistical methods	**Jinkyun Cho, Yongdae Jeong and Beungyong Park** Investigation on the energy and air distribution efficiency with improved data centre cooling to support high-density servers	**Sebastian Theißen, Jannick Höper, Michaela Lambertz and Reinhard Wimmer** Importance of building services in ecological building assessments	**Xingwang Zhao and Qingyan Chen** Optimal design of an indoor environment using an adjoint RNG k-ε turbulence model	**Ko Murakami, Kenta Sakai, Daisuke Nakamura, Haruno Ishikawa, Sayana Tsushima and Shin-Ichi Tanabe** A Field Survey on Indoor Air Pollution in School Classrooms with Different Ventilation Methods	**Ke Wen, Ryozo Ooka, Toshiyuki Hino, Mingzhe Liu, Doyun Lee, Wonjun Choi, Shintaro Ikeda and Palasz** Experimental performance analysis of a multiple-source and multiple-use heat pump system utilizing renewable energy: a predictive ANN model of sky-source heat pump winter performance	**Touraj Ashrafian, A. Zerrin Yılmaz and Nazanin Moazzen** A Long-term Strategy for Energy and Cost Performance Improvement of Existing Residential Buildings: Step-by-step Renovation in Turkey	11:00
11:15	**Matjaž Prek, Gorazd Krese and Žiga Lampret** Incorporating cooling and ventilation effects into a single IEQ indicator	**Hansol Lim, Hye-Jin Cho, Seong-Yong Cheon, Soo-Jin Lee and Jae-Weon Jeong.** A numerical model and validation of phase change material integrated thermoelectric radiant cooling panel	**Mingzhe Liu, Ryozo Ooka, Toshiyuki Hino, Ke Wen, Wonjun Choi, Doyun Lee, Shintaro Ikeda and Djafar Palasz.** Experimental performance analysis of a multiple source and multiple use heat pump (MMHP) system utilizing renewable energy: winter field experiment and heating operation performance evaluation	**Hye-Sun Jin, Han-Young Lim, You-Jeong Kim, Soo-Jin Lee, Sung-Im Kim, Jae-Han Lim and Seung-Yeong Song** Analysis of Annual Energy Use Intensities(EUIs) by End-Use in Apartment Units According to Stratification Variables (2017-2018)	**Francesca Becherini, Vilma Ducman, Giovanni Ferrarini, Sergio Tamburini, Constantinos Tsoutis, Antonio Garrido-Marijuán, Giulia Mezzasalma, Leonardo Rossi, Loredana Fodor, Emil Lezak and Adriana Bernardi** Innovative pre-fabricated components including different waste construction materials reducing building energy and minimising environmental impacts (InnoWEE)	**Boggarm Setty and James Woods.** A Cradle-to-Grave Carbon Index (CI) for Design, Construction and Operations of Site-Specific Buildings	**Dick van Dijk and Jaap Hogeling**. The new EN ISO 52000 family of standards to assess the energy performance of buildings put in practice	**Rok Kozelj, Ziga Ahcin, Eva Zavrl and Uros Stritih.** Improved thermal energy storage for heating and cooling of buildings	**Gilles Notton, Cyril Voyant, Alexis Fouilloy, Jean Laurent Duchaud and Marie Laure Nivet.** Forecasting of Three Components of Solar irradiation for Building Applications	**Yantong Li and Gongsheng Huang.** Development of an integrated low-carbon heating system for outdoor swimming pools for winter application	11:15
11:30	**Olli Seppänen, Jorma Säteri and Mervi Ahola**. Finnish Guidelines of Ventilation Rates for non-residential buildings	**Yong-Kwon Kang, Beom-Jun Kim, Soo-Yeol Yoon and Jae-Weon Jeong** Experimental evaluation of phase change material radiant cooling panel integrated thermoelectric modules	**Toshio Yamanaka, Mari Kuranaga, Tatsunori Maeda and Haruto Kitakaze** Cooling performance of Ceiling Radiant Textile Air Conditioning System with Ceiling Cassette Unit of Packaged Air Conditioner	**Enrico Dainese, Shalika Walker, Wim Maassen and Wim Zeiler** Towards zero energy hospital buildings: a polyclinic building as case study	**Byon Yoo-Suk, Hansol Lim, Yong-Kwon Kang, Soo-Yeol Yoon and Jae-Weon Jeong** Passive generation from a novel thermoelectric energy harvesting system model integrated with phase change material	**Cormac Ryan** Certified commissioning: "COPILOT" solutions for commissioning engineers from pre-design to post-delivery	**Tian Yan, Xinhua Xu and Jiajia Gao** Modelling study on pipe-encapsulated PCM wall system for building insulation and active heat removal	**Mohammad Reza Adili** Numerical Investigation of School Stratified Ventilation Systems - A Ventilation Effectiveness Study	**Alessio Cavaterra, Andreas Böttcher and Steven Lambeck** The "HumFlow" Project – Developing a minimal invasive measurement system for estimating energy and humidity transfer processes through building walls	**Ambrose Dodoo** Techno-economic and environmental performances of heating systems for single-family code-compliant and passive houses	11:30
11:45	**Hiroki Takahashi, Mariya Petrova Bivolarova, Athanasia Keli, Jürgen Nickel and Arsen Krikor Melikov.** Non-uniformity in outdoor CO2 concentration in city of Copenhagen	**Daniel Carbonell, Jeremias Schmidli, Daniel Philipen and Michel Haller.** Solar-ice systems for multi-family buildings: hydraulics and weather data analysis	**Seong-Yong Cheon, Soo-Yeol Yoon, Su Liu and Jae-Weon Jeong.** Energy saving potential of dedicated outdoor-air system assisted by vacuum based membrane dehumidifier	**Brendan Banfield** Evaluation of in-depth energy modelling for the design and operation of a net-positive energy Solar Decathlon house	**Tobias Skov Pedersen and Helle Foldbjerg Rasmussen**. Workflow For Coupled Daylight And Energy Simulations	**Ovidiu Noran, Ion Sota and Peter Bernus.** Towards Next Generation Building Management Systems	**Feng-Yi Lin, Ruey-Lung Hwang and Tzu-Ping Lin.** Establish high-resolution hourly weather data for simulating building energy consumption in different regions	**Jana Bartosova and Dušan Petráš.** Energy and economical evaluation of residential buildings in Slovakia	**Marius Ostermeier and Jochen Müller.** Automated investigation, evaluation and optimisation of simple heating circuits in building automation	**Hilde Breesch, Barbara Wauman and Marcus Peeters.** Determination of the most influential and cost-optimal building characteristics on the energy performance of commercial and industrial buildings	11:45
12:00	**Masanari Ukai and Tatsuo Nobe** Human-Oriented Design of an Indoor Thermal Environment	**Alo Mikola, Juhan Rehand and Jarek Kurnitski** Air change efficiency of room ventilation units	**Hye-Won Dong, Hye-Jin Cho and Jae-Weon Jeong** Effect of Desiccant Solution Temperature on Regeneration Performance of a Cross-Flow Regenerator	**Aymeric Novel, Francis Allard and Patrice Joubert.** Metamodeling of building energy consumption focused on climate, operation, space use and users related factors	**Yiğit Yılmaz and Burcu Çiğdem Yılmaz.** An Approach to Improve Energy and Cost Performance of a Social Housing Archetype in Cold Climate Region	**Germán Molina, Michael Donn, Micael-Lee Johnstone and Casimir MacGregor.** Can Green Labels become the new normal?	**Sebastian Wolf, Maria Justo Alonso, Davide Calì, John Krogstie, Hans Martin Mathisen and Henrik Madsen.** CO2-based grey-box model to estimate airflow rate and room occupancy	**Yaw-Shyan Tsay and Chih-Hung Yang.** The influence on Daylight and Energy Consumption of Expanded Metal Mesh Applied on Building Façades	**Sarah Noyé, Unai Saralegui, Raphael Rey, Miguel Angel Anton and Ander Romero.** Energy demand prediction for the implementation of an energy tariff emulator to trigger demand response in buildings	**Zhenyu Yu, Wei Xu, Deyu Sun, Fei Lu, Changping Liu and Jing Zhang** Progress in energy efficiency standards of residential buildings in China's severe cold and cold zones	12:00
12:15	**Weixin Zhao, Risto Kosonen, Simo Kilpeläinen and Sami Lestinen** A review of total volume environment and individually controlled micro-environment	**Jorma Säteri, Olli Seppänen and Mervi Ahola** Finnish design ventilation rates for residential buildings	**Hiroshi Muramatsu and Tatsuo Nobe.** Evaluation of Thermal Behavior of the Skeleton in a Green Building with the Aid of TABS	**Claus Haendel** Heat recovery in ventilation systems - waste heat use or renewable energy	**Aleksi Mäki, Juha Jokisalo and Risto Kosonen** Demand response of space heating using model predictive control in an educational office building	**Timothy Wentz and Blake Wentz** Eliminating the Design-Operation Energy Gap: A Case Study on Developing a University Level Course	**Vasco Zeferina, Christina Birch, Rodger Edwards and Ruth Wood** Sensitivity analysis of peak and annual space cooling load at simplified office dynamic building model	**Stijn Verbeke and Amaryllis Audenaert** Interlinking the effect of thermal mass and temperature control strategies in dwellings	**Jose Joaquin Aguilera, Jørn Toftum and Ongun Berk Kazanci** Predicting personal thermal preferences based on data-driven methods	**Elena-Camelia Tamas** Thermal Zones Modelling for an Energy Efficient Commercial Building – Case Study	12:15
12:30	**Yoshihito Kurazumi, Emi Kondo, Kenta Fukagawa, Yoshiaki Yamato, Kunihito Tobita and Tadahiro Tsuchikawa** Thermal environment mitigation effects in suburban area	**Tatiana Armijos Moya, Dadi Zhang and Philomena Bluyssen** Perceived Air Quality of different sources of smell evaluated by primary school children	**Ziyi Su and Xiaofeng Li** Energy Consumption of the VAC System for Subway Stations: A Model Based on Theoretical Analysis and its Engineering Application	**Taewon Kim, Jinchul Park and Sung Ho Choi** Mock-up Test of Time-lag in Floor Heating System with PCM	**Kuo-Tsang Huang, Yu-Teng Weng and Ruey-Lung Hwang** Identifying suitable general circulation model for future building cooling energy analysis	**Edoardo Cazzaniga, Luigi Colombo and Stefano De Antonellis** Preliminary experimental and numerical analysis of a silica gel packed bed humidification system	**Seok-Hyun Kim, Soo Cho and Young-Hum Cho** A Study on the Simulation Result of Horizontal Shading Installation for Passive Cooling of Building South KOREA	**Lucio Bonaccorsi, Luigi Calabrese, Stefano De Antonellis, Angelo Freni, Cesare Joppolo and Mario Motta** Composite silicone-SAPO-34 foams: experimental characterization for open cycle applications	**Yuchen Shi and Xiaofeng Li** A convenient method to assess air infiltration rate using particle mass balance principle	**Tiberiu Catalina, Daniel Bortis, Andreea Vartires, Catalin Lungu** Glazed balconies impact on energy consumption of multi-story buildings	12:30

12:35	**Akane Odagiri, U Yanagi, Miyoko Endo and Hisato Oda** A study on the actual conditions associated with the presence of Acinetobacter sp. in a hospital waiting room	**Motoya Hayashi, Hoon Kim, Yoshinori Honma and Junichiro Matsunaga** A Feasibility of a Passive Ventilation System with a Thermal Damper - Simulations and measurement results of an experimental house in a mild region of Japan	**Galina Prica, Gratiela Tarlea and Lohengrin Onuțu** Geothermal System Study Case near Bucharest	**Gianny Flamaropol and Elena-Camelia Tamas** Comparative study on the theoretical electrical power consumption versus monitoring for an outdoor ice rink	**Hyuntae Kim** A study on the Contamination of Microbial in a Geothermal Exchanger Pipe by Lab-experiment	**Mizuki Niimura and U Yanagi** Microbiome in an Office Building Using a Cooling Trench as an Outdoor Air Duct	**Yoju Homma and Takashi Kurabuchi** Study on Cross-Ventilation Performance of Residences in the Passive Town Kurobe Model Based on Measurements and CFD	**Naoya Ikemura, Takashi Kurabuchi, Jinya Takeuchi, Hazime Yoshino and Yoshihiro Toriumi** Fundamental Study on a Tracer Gas Experimental Method that uses Dynamic Steady State Concentration and can be Applied to an Air Recirculating System	**Min Hee Chung** Prediction model for day-ahead solar insolation using meteorological data for smart grid	**Valentin Veron Toma, Sebastian Antonie, Tiberiu Catalina** The effects of thermal insulation on the interior noise level during the day. A case study of a 1960 block of flats located in downtown Bucharest	12:35
12:40	**Weiping Hong, Dayi Lai, Junjie Liu and Jingjing Pei** Studies of Subjective Sleep Thermal Comfort and Adaptive Behaviors in Chinese Residential Buildings in Nine Cities	**Yue Qi, Junjie Liu, Xilei Dai, Lei Zhao, Dayi Lai and Shen Wei** Investigation of Ventilation Behaviors in Mechanically Ventilated Residential Buildings in China	**Cem Gulseven and Zeki Yilmazoglu** Heating Water and Tap Water Production with an Air-to-Water Heat Pump by Using the Waste Heat of an Oil-Free Air Compressor	**Ioan Silviu Dobosi, Cristina Tanasa, Nicoleta Elena Kaba, Adrian Retezan and Dragos Mihaila** Building energy modelling for the energy performance analysis of a hospital building in various locations	**Christian A. Hviid, Dessy Wina Harjani and Fabricio Lucchesi** Internal insulation retrofit with ventilated wall and circulation of dry air - focus on airflow distribution and mitigation of noise	**Catalin Bailescu, Tiberiu Catalina, Vlad Iordache** Experimental assesment of acoustic comfort in a passive house	**Stefan Pavel, Ioan-Bogdan Pascu, Bogdan-Ovidiu Taranu, Oana-Alexandra Grad, Romeo Negrea and Ioan-Silviu Dobosi** Aspects regarding the prediction of earth electrode corrosion in the soil of Timisoara	**Vinceriuc Mioara, Tarlea Gratiela and Tarlea Ana** Air-Water-Heat Pump with low GWP refrigerant	**Vlad Iordache, Tiberiu Catalina, Mihai Vlad Ionita, Florin Iordache, Alexandra Ene, Claudiu Stanciu, Marta Cristina Zaharia, Ioana Alexe and Ciprian Ene** Variation of window acoustic attenuation depending on air tightness joints	**Bodale Anca, Sima Catalin and Tiberiu Catalina** Adaptation of buildings to climate change through bioclimatic strategies, in Romania.	12:40
12:45	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	12:45
13:00	**LUNCH**										13:00
14:00	**CLIMA 2019 - PLENARY SESSION 3, Aula Hall** Chairs: Jarek Kurnitsky, Prof.Dr.Eng. - REHVA vice-president, Tallinn University of Technology, ESTONIA; Cătălina Turcu, Prof.Assoc.Dr.Arch. - University College of London, UK										14:00
14:00	**Keynote Lecture: Francis Allard, Professor Emeritus - La Rochelle University, FRANCE;** *Assessing Urban Heat Islands: stakes and recent advances in design solutions and technology*										14:00
14:40	**Emerald Sponsor Presentation: Costin Sandu, AMTEH International;** *Past and Present*										14:40
14:50	**Keynote Lecture: Mika Halttunen - M.Sc.(Eng), Chairman of the Board HALTON GROUP, FINLAND;** *From wellbeing indoors to built environment facing climate change - and beyond*										14:50
15:30	**COFFEE BREAK**										15:30
ORDINARY SESSION 2	**Session 2 A** **Criteria for thermal environment and ventilation** **Chairs:** **Pawel Wargocki** **Arsen Melikov** **Francis Allard** **Room: A-03-09**	**Session 2 B** **HVAC in residential buildings** **Chairs:** **Fabian Ochs** **Martin Ivanov** **Tiberiu Catalina** **Room: D-05-10**	**Session 2 C** **Low energy heating and cooling systems** **Chairs:** **Martin Thalfeldt** **Renars Millers** **Nicolae Antonescu** **Room: D-06-10**	**Session 2 D** **Predicted and real energy performance of buildings** **Chairs:** **Jianlin Wu** **Joaquim Rigola** **Razvan Calota** **Room: D-06-13**	**Session 2 E** **High Energy Performance and Sustainable Buildings** **Chairs:** **Jan Menhert** **Cristoph Kaup** **Wei Liu** **Room: A-03-10**	**Session 2 F** **Building components and double skin facades and energy efficiency** **Chairs:** **Wei Ye** **Sihvan Lee** **Sebastian Hudisteanu** **Room: G-M-04**	**Session 2 G** **Simulation models and predictive tools for the buildings HVAC** **Chairs:** **Christian Inard** **Cătălin TEODOSIU** **Răzvan Popescu** **Room: B-01-26**	**Session 2 H** **Other efficient HVAC systems** **Chairs:** **Vim Maassen** **Jiří Dostál** **Andreea Voight** **Room: E-M-02**	**Session 2 I** **Machine learning and digitalization of buildings** **Chairs:** **Ovidiu Noran** **Ralf Ulmer** **Sorin Caluianu** **Room: B-01-25**	**Session 2 J** **Energy efficient renovation of existing buildings** **Chairs:** **Erick Melquoind** **Raluca Teodosiu** **Ongun Berk Kazanci** **Room: G-M-10**	**ORDINARY SESSION 2**
16:00	**Athanasia Keli, Arsen K. Melikov, Mariya P. Bivolarova and Panu Mustakallio** Impact of room airflow interaction on metabolic CO2 exposure	**Jean Pierre Campana, Matthias Schuss, Ardeshir Mahdavi and Gian Luca Morini** Effects of the room temperature sensor position and radiator sizing on indoor thermal comfort and energy performances	**Szilveszter-Zoltán Geyer Ehrenberg and Adrian Retezan** Optimising the Number of Pumps and Balancing Valves in Chilled Water Distribution Systems	**Arash Rasooli and Laure Itard** Properties of the Triangular Excitation Pulse and the 3D Heat Transfer Effects in the Excitation Pulse Method	**Yuya Suzuki, Misa Imazu, Jun Shinoda, Ryoya Furukawa, Yumiko Araki, Shin-Ichi Tanabe, Kenji Fujino, Daisuke Hatori, Nobuhiro Hirasuga, Shun Kato, Shiori Sasahara and Hiroki Iwata** Efficient Operation of Heat Source using High-temperature Chilled Water in an Advanced Office Building	**Jakub Wladyslaw Dziedzic, Da Yan and Vojislav Novakovic** Framework for a transient energy-related occupant behaviour agent-based model	**Louis Cony, Nouamane Belhaj, Olivier Ramalho and Marc Abadie** Analysis of the need of detailed modelling for the assessment of indoor air quality in residential buildings	**Wim Maassen** Evaluation Dutch preliminary nZEB requirements for hospital and university buildings	**Ardeshir Mahdavi and Dawid Wolosiuk** Integration of operational data in building information modelling: From ontology to application	**Laura Carnieletto, Giuseppe Emmi, Marco Artuzzi, Maria Celeste Piazza, Angelo Zarrella and Michele De Carli** Retrofit solutions for an historic building integrated with geothermal heat pumps	16:00
16:15	**Sheng Zhang, Yong Cheng, Xiaoliang Shao and Zhang Lin** Subzone Control of Air Distribution to Improve Thermal Comfort and Energy Efficiency	**Shaochen Tian, Xing Su and Xu Zhang** Application of heat pump combined two-stage desiccant wheel fresh air system of residential buildings in mixed climate zone	**Alessandro Maccarini, Göran Hultmark, Niels C. Bergsøe and Alireza Afshari** Full-scale operation of a novel two-pipe active beam system for simultaneous heating and cooling of office buildings	**Sergio Morales-Ruiz, Carles Oliet, Jesús Castro, Joaquim Rigola and Assensi Oliva** Minimization procedure of experimental tests for calibration purposes, within HVAC&R energy efficiency framework	**Taro Sasamoto and Makiko Ukai** Measurement Analysis and Evaluation of Desiccant Air Handling Units with Various Heat Source	**Tokimi Kawase, Tatsuo Nobe and Atsushi Hashimoto** Energy Performance Evaluation of Hybrid VRF Systems Based on Japanese Government-Designated Method	**Francesco D'Ettorre, Marcus Brennenstuhl, Anjukan Kathirgamanathan, Mattia De Rosa, Malcolm Yadack, Ursula Eicker and Donal Patrick Finn** A set of comprehensive indicators to assess energy flexibility: a case study for residential buildings	**Ivan Verhaert, Freek Van Riet, Robin Baetens, Margot De Pauw and Michiel Van Erdeweghe** Performance evaluation of different micro-CHP configurations in real life conditions and the influence of part load behaviour	**Maximilian Both, Jochen Müller and Björn Kämper** Development of Industry 4.0 models and their applicability for BIM	**Ondrej Hnilica, Stefan Bichlmair and Josef Plasek** Indoor Climate in Jesuit Church of Holy Name of Jesus in Telc	16:15
16:30	**Christoph Kaup, Jens Knissel** European Study on heat recovery in non-residential buildings	**David Hunt, Naoise Mac Suibhne, Laurentiu Dimache, David McHugh and John Lohan** Thermal performance characterisation of a reverse-flow energy recovery ventilator for a residential building application	**Jun Shinoda, Ongun B. Kazanci, Shin-Ichi Tanabe and Bjarne W. Olesen** Review on the Surface Heat Transfer Coefficients of Radiant Systems	**Huai Li, Zhen Yu, Jianlin Wu, Wei Xu and Shicong Zhang** Discussion of Optimized Operation of a nearly Zero Energy Building's Energy System in China	**Jan Mehnert, Dirk Reiß, Stefan Plesser and Matthias Hannen** An algorithmic module toolkit to support quality management for building performance	**Yuichi Omodaka, Kyosuke Hiyama, Thanyalak Srisamranrungruang, Yutaka Oura and Yukiyasu Asaoka** Application of Dynamic Insulation Technique to Airflow Window System	**Natalia Lastovets, Risto Kosonen, Juha Jokisalo and Simo Kilpeläinen** Dynamic design model of displacement ventilation	**Edward Przydrozny, Aleksandra Przydrozna** Energy-efficient hybrid dual-duct dual-fan systems	**Ralf Ulmer and Jochen Müller** User-oriented verification of automation stations	**Jan Weyr, Richard Kalný and Jiří Hirš** Impact of IPPC Scenarios on internal microclimate of historic buildings	16:30
16:45	**Mervi Ahola, Jorma Säteri and Laura Sariola** Revised Finnish classification of indoor climate 2018	**Fabian Ochs, Toni Calabrese, Dietmar Siegele and Georgios Dermentzis** Compact ventilation and heat pump with recirculation air for renovation of small apartments	**Makiko Ukai and Masaya Okumiya** Comparison of Performance of Desiccant Air Handling Unit with Solar Thermal System under Various Control Methods	**Merve Atmaca and Ayse Zerrin Yilmaz** A Study on Energy and Cost Efficiency for Existing Hotel Buildings in Turkey	**Tiantian Du, Sabine Jansen, Michela Turrin and Andy Van Den Dobbelsteen** Impact of space layout on energy performance of office buildings coupling daylight with thermal simulation	**Daniel Kierdorf, Jakob Hahn and Werner Lang** Climate Change and Building Technologies: Investigations of Future Weather Scenarios on Building Energy Performance	**Jiří Dostál and Tomáš Bäumelt** Model predictive control for buildings with active one-pipe hydronic heating	**Elisa Van Kenhove, Lien De Backer and Jelle Laverge** Optimizing production efficiencies of hot water units using building energy simulations - Trade-off between Legionella pneumophila contamination risk and energy efficiency	**Haoran Li and Natasa Nord** Operation strategies to achieve low supply and return temperature in district heating system	**Martin Kiil, Alo Mikola, Martin Thalfeldt and Jarek Kurnitski** Some aspects of historical monument buildings central heating	16:45
17:00	**Martin Kiil, Alo Mikola, Martin Thalfeldt and Jarek Kurnitski** Thermal comfort and draught assessment in a modern open office building in Tallinn	**Chaelyn Lee, Hyunhwa Lee, Jaehan Lim and Seungyeong Song.** Experimental Evaluation of the Ability of an Auxiliary Heating Device to Reduce the Condensation Risk around Built-in Wardrobes of Apartment Buildings in Winter	**Rana Mahmoud, Mohsen Sharifi, Eline Himpe, Marc Delghust and Jelle Laverge** Estimation of load duration curves from general building data in the building stock using dynamic BES-models	**Essam Khalil and Doaa Elsherif** Energy Efficient Designs of Sustainable Buildings in Urban Environment	**Erika Guolo, Piercarlo Romagnoni, Fabio Raggiotto and Francesca Cappelletti** Environmental impacts for polyurethane panels	**Mcarmen Guerrero Delgado, José Sánchez Ramos, Servando Álvarez Domínguez, José Antonio Tenorio Ríos, Luisa F. Cabeza, Cesar Bartolomé and Mcarmen Pavón Moreno** Innovative solutions of prefabricated facades of concrete with PCMs for nearly zero energy buildings	**Bart Merema, Hilde Breesch and Dirk Saelens** Comparison of model identification techniques for MPC in all-air HVAC systems in an educational building	**Aleksandra Przydrozna and Edward Przydrozny** The influence of external air supply to air-conditioning systems with fan coil units on the design set-points and the energy consumption	**Peter Op T Veld and Ana Tisov** H2020 BIMplement Project - Can BIM be used for smart upskilling professions involved in the construction process?	**Michal Krajčík and Ondřej Šikula.** The possibilities of application of radiant wall cooling in existing buildings as a part of their retrofit	17:00
17:15	**Panu Mustakallio, Risto Kosonen, Mika Ruponen and Natalia Lastovets** Influence of installation of displacement ventilation diffusers above occupied zone on the vertical temperature gradient in simulated office rooms	**Martin Ivanov** Exhaled air speed measurements of respiratory air flow, generated by ten different human subjects, under uncontrolled conditions	**Renars Millers, Aleksandrs Korjakins and Arturs Lesinskis** Thermally Activated Concrete Slabs with Integrated PCM Materials	**Milan Gojak and Tamara Bajc** Thermodynamic sustainability assessment for heating of residential building	**Mikkel Poulsen Rydborg, Michael Lauring and Camilla Brunsgaard** Vulnerabilities and resilience in Danish housing stock: A comparative study of architectural answers to climate change in Danish housing in relation to other oceanic climates	**Sihwan Lee** Numerical study on heat blocking efficiency of non-recirculating air curtain and its optimal discharge velocity	**Wei Liu and Chun Chen** Integration of fast fluid dynamics and Markov chain model for predicting transient particle transport in buildings	**Ivan Verhaert** Design methodology for combined production and distribution for domestic hot water and space heating	**Davide Calì, Ekkart Kindler, Razgar Ebrahimy, Peder Bacher, Kevin Hu, Michelle Lind Østrup, Magnus Bachalarz and Henrik Madsen** climify.org: an online solution for easy control and monitoring of the indoor environment	**Kaoutar Zeghari, Hasna Louahlia, Malo Leguern, Mohamed Boutouil, Hamid Gualous, Michael Marion, Pierre Schaetzel, Steve Goodhew and François Streiff** Annual energy consumption between conventional and cob building	17:15
17:30	**Tim Röder, Paul Mathis and Dirk Müller** Effects on the Ventilation of a Two-Storey Building under Different Thermal Conditions	**Jarek Kurnitski, Martin Thalfeldt, Harry van Weele, Macit Toksoy, Thomas Carlsson, Petra Vladykova Bednarova and Olli Seppänen** Evidence based residential ventilation: sizing procedure and system solutions addressed by REHVA Residential Ventilation Task Force	**Tuule Mall Kull, Martin Thalfeldt and Jarek Kurnitski** Optimal PI control parameters for accurate underfloor heating temperature control	**Răzvan Calotă, Mădălina Nichita, Anica Ilie, Alina Girip and Robert Titi** Comparative analysis for renovation of an air heating and cooling system from a Romanian administrative building	**Wei Liu, Zhen Yu, Jianlin Wu, Huai Li, Caifeng Gao and Hongwei Gong** Influence of Building Air Tightness on Energy Consumption of Ventilation System in Nearly Zero Energy Residential Buildings	**Sebastian Valeriu Hudisteanu and Catalin George Popovici** Numerical analysis of the efficiency and energy production of the building integrated photovoltaics for various configurations	**Mehrdad Rabani, Habtamu Bayera Madessa, Natasa Nord and Peter Schild.** Performance analysis of an active diffuser in mixing ventilation for cell office by using numerical approach	**Martin Šimko, Michal Krajčík and Ondřej Šikula** Radiant wall cooling with pipes arranged in insulation panels attached to facades of existing buildings	**Ruslan Zhuravchak, Natasa Nord and Helge Brattebø** Control strategy for battery-supported photovoltaic systems aimed at peak load reduction	**José Quesada Allerhand, Ongun Berk Kazanci and Bjarne W. Olesen** Energy and thermal comfort performance evaluation of PCM ceiling panels for cooling a renovated office room	17:30
17:45	**Ongun Berk Kazanci, Dolaana Khovalyg, Takayoshi Iida, Yoshitaka Uno, Tomo-Oki Ukiana and Bjarne W Olesen** Human response to the thermal indoor environment created by a radiant, and a combined radiant and convective cooling system	**Petr Zelenský, Martin Barták, Vojtěch Zavřel, Vladimír Zmrhal and Radislav Krupa** Numerical Analysis of Air Flow in a Modular Fan Unit Using CFD Simulation	**Sumei Liu, Xiaojie Zhou, Xuan Liu, Ke Qing, Xiaorui Lin, Weizhen Zhang, Jian Li, Jiankai Dong, Dayi Lai and Qingyan Chen** Assessment of Thermal Environment in a Kitchen with a New Ventilation System	**Christian Friebe, Andreas Hantsch, Sabine Döge and Ralph Krause** Caloric method for the energetic evaluation of decentralised domestic ventilation devices	**Anil Berk Atalar and Murat Cakan** Effect of Cross-Ventilation and Solar Irradiation on IAQ as a function of Roof Angle	**Abdellah Zerroug and Egils Dzelzitis** Analysis of different building exterior walls insulations using eQUEST	**Stephan Kusche and André Badura** Energy Efficient Control of the Dehumidification Process in Heat Exchangers with Air Bypass	**Gregor Cerinsek, Domen Bancic, Dan Podjed, Simona D'Oca, Jure Vetrsek, Slavko Dolinsek and Peter Op't Veld** Boosting affordability, acceptability and attractiveness of deep energy renovations of residential buildings – a people-centred ethnographic approach	**Laura Amaiei and Clarissa Ivan** Certification systems for green buildings in Romania – LEED, BREEAM, green homes & the importance of BIM interdisciplinary collaboration in order to achieve energy-efficient projects	**José Quesada Allerhand, Ongun Berk Kazanci and Bjarne Olesen** Investigation of the influence of operation conditions on the discharge of PCM ceiling panels	17:45
18:00	Spare time / Visit to **House OVER4** - Romanian Representative at SolarDecathlon Hungary 2019										18:00
19:00	**AIIR's PRESIDENT DINNER** **Venue: Building Services Engineering Faculty Campus, Bdul Pache Protopopescu 66, Bucharest 021414, GPS 44.4397° N, 26.1260° E**										19:00
23:00	**END OF THE CONGRESS SECOND DAY**										23:00

TUESDAY May 28th, 2019

Venue – Romania National Library, Bulevardul Unirii 22, Bucharest 030833, GPS 44.4256° N, 26.1102° E

DAY 3 | DAY 3

8:30 **CLIMA 2019 - PLENARY SESSION 4, Aula Hall** 8:30

Chair: Stefano Corgnati, Prof.Dr. - REHVA ex-President, TEBE Research Group, Department of Energy Politecnico di Torino, ITALY; Shin-ichi Tanabe, Prof.Dr.Arch. - Waseda University, JAPAN

8:30 **Diamond Sponsor Presentation: Ion Sandu - General Manager, PAB Romania;** *Green Warehouses* 8:30

8:50 **Keynote Lecture: Hui ZHANG, Dr.Eng. - Center for the Built Environment, University of California at Berkeley, USA;** *Going for Maximum Efficiency in Thermal Comfort* 8:50

9:30 **Emerald Sponsor Presentation: Dr. Kim Hagström - HALTON Finland;** *Enabling User Safety and Wellbeing, and Sustainability?* 9:30

9:40 **Keynote Lecture: Pau Garcia Audi, Policy officer Policy Officer, European Commission, DG Energy, Unit C.3 – Energy Efficiency;** *Trends and future of the HVAC sector in light of the revised EPBD* 9:40

10:00 **COFFEE BREAK** 10:00

ORDINARY SESSION 3	Session 3 A	Session 3 B	Session 3 C	Session 3 D	Session 3 E	Session 3 F	Session 3 G	Session 3 H	Session 3 I	Session 3 J	ORDINARY SESSION 3
	Criteria for thermal environment, comfort and health	**HVAC for special environments**	**Quality of the building use: indoor environment comfort, productivity, safety and health**	**Low and zero energy building case studies**	**User-HVAC-building interaction**	**Heat pumps and refrigeration**	**Simulation models and predictive tools for the buildings HVAC**	**Systems using renewable energy sources**	**From sustainable and smart buildings to sustainable and smart cities & Miscellaneous**	**Energy efficient renovation of existing buildings**	
	Chairs: Cristina Becchio, Hui Zhang, Kemal Gani Bayraktar	**Chairs: Wim Maasen, Quan Jin, Cristiana Croitoru**	**Chairs: Pawel Wargocki, Jarek Kurnitsky, Shin-Ichi Tanabe**	**Chairs: Tuba Bingöl Altıok, Mihaela Dudita, Cătălin Lungu**	**Chairs: Simona D'Oca, Igor Mojic, Andrei Litiu**	**Chairs: Adriana Angelotti, Robert Gavriliuc, Gratiela Târlea**	**Chairs: Francis Allard, Bratislav D. Blagojević, Florin Bode**	**Chairs: Sheila J. Hayter, Pedro Vicente-Quiles, Robert Gavriliuc**	**Chairs: William Bahnfleth, Guangyu Cao, Sorin Caluianu**	**Chairs: Jaap Hogeling, Juha Jokisalo, Mihnea Sandu**	
	Room: A-03-09	**Room: E-M-02**	**Room: E-M-03**	**Room: A-03-10**	**Room: G-M-04**	**Room: B-01-25**	**Room: B-01-26**	**Room: D-05-10**	**Room: D-06-10**	**Room: D-06-13**	
10:30	**Arsen Melikov and Detelin Markov** Validity of CO2 based ventilation design	**Angui Li, Risto Kosonen, Arsen Melikov, Bin Yang, Thomas Olofsson, Bjørn Sørensen, Linhua Zhang, Ping Cui and Ou Han** Ventilation and environmental control of underground spaces: a short review	**Silvia de Lima Vasconcelos, Marcel Sattler, Birgit Müller, Wolfgang Plehn and Wolfgang Horn** The Influence of textile floor coverings on the indoor air quality	**Karl-Villem Võsa, Andrea Ferrantelli and Jarek Kurnitski** Experimental study of radiator, underfloor, ceiling and air heating systems heat emission performance in TUT nZEB test facility	**Akemi Iwaki, Takashi Akimoto, Naho Misumi and Takuya Furuhashi** Verification of the effect of sleeping environment and humidification on middle-aged people in whole-house air-conditioning ventilation system housing	**Manuel Koch and Ralf Dott** Contributions to System Integration of PV and PVT Collectors with Heat Pumps in Buildings	**Marko G. Ignjatović, Bratislav D. Blagojević, Mirko M. Stojiljković, Aleksandar S. Anđelković, Milena B. Blagojević and Dejan M. Mitrović** Energy performance of air conditioned buildings based on short-term weather forecast	**Chunying Li, Haida Tang, Jianhua Ding and Yuanli Lyu** Numerical research on thermal performance of water-flow window as hospital curtain-wall	**Michele De Carli, Amaia Castelruiz Aguirre, Angelo Zarrella, Lucia Cardoso, Sarah Noyé, Robert Gast, Samantha Graci, Giuseppe Emmi, David Bertermann, Johannes Mueller, Antonio Galgaro, Giorgia Dalla Santa, Fabio Poletto, Giulia Mezzasalma, Silvia Contini, Javier Urchueguía, Riccardo Pasquali, Marco Belliardi and Adriana Bernardi** Two software tools for facilitating the choice of ground source heat pumps by stakeholders and designers	**Shima Ebrahimigharehbaghi, Faidra Filippidou, Paula van den Brom, Queena Qian and Henk Visscher** Analysing the Energy Efficiency Renovation Rates in the Dutch Residential Sector	10:30
10:45	**Tereza Snášelová, Mariya Petrova Bivolarova and Arsen Melikov** Passive control of the bed micro-environment by using naturally ventilated mattress	**Haiguo Yin, Angui Li, Linna Li and Rui Wu** Performance Evaluation of An Innovative Column Attachment Ventilation	**Shan Gao, Ryozo Ooka and Wonseok Oh** Effects of ambient temperature, airspeed, and wind direction on heat transfer coefficient for the human body by means of manikin experiments and CFD analysis	**Kyriaki Foteinaki, Rongling Li, Alfred Heller, Morten Herget Christensen and Carsten Rode** Dynamic thermal response of low-energy residential buildings based on in-wall measurements	**Zhipeng Deng and Qingyan Chen** Impact of occupant behavior on energy use of HVAC system in offices	**Martin Knorr, Joachim Seifert, Lars Schinke, Philipp Mehrfeld, Markus Nürenberg and Maximilian Beyer** Using the Hardware-in-the-Loop concept for energetic evaluation of heat generators	**Ahmet Yüksel, Muslum Arici and Hasan Karabay** Investigation of Effect of Window-To-Wall Ratio on the Indoor Temperature by Lumped Capacitance Approach	**F. Mertkan Arslan and Huseyin Gunerhan** Investigation of energetic and exergetic performances of parabolic trough collector with using different heat transfer fluids	**Francesco Causone and Martina Pelle** Building stock simulation to support the development of a district multi-energy grid	**Lorenzo Teso, Tiziano Dalla Mora, Piercarlo Romagnoni and Fabio Peron** European projects on districts energy-renovations and Italian best practices	10:45
11:00	**Qianwen Guo, Ryozo Ooka, Wonseok Oh, Wonjun Choi and Doyun Lee** Effect of insulation on indoor thermal comfort in a detached house with a floor heating system	**Taro Ono, Hideaki Nagano, Suguru Shiratori, Kenjiro Shimano and Shinsuke Kato** Analysis of Defogging Performance, Thermal Comfort, and Energy Saving for HVAC System Optimization in Passenger Vehicles.	**Toshiki Namai, Jun Shinoda, Ryoya Furukawa, Shin-Ichi Tanabe, Kosuke Sato, Eri Kataoka and Kosuke Yoshida** Measurement and Operational Improvement in an Office with Thermo Active Building System	**Mihaela Dudita, Meryem Farchado, Alexander Englert, Dani Carbonell Sanchez and Michel Haller** Heat and Power Storage Using Aluminum for Low and Zero Energy Buildings	**Andrei Vladimir Litiu, Verena Marie Barthelmes, Cristina Becchio, Valentina Fabi, Mariantonietta Tarantini, Giulia Vergerio, Stefano Paolo Corgnati and Ivo Martinac** Graphical visualization of behavioural patterns in relation to indoor environment quality and energy use	**Matteo Dongellini, Agostino Piazzi, Filippo De Biagi and Gian Luca Morini** The modelling of reverse defrosting cycles of air-to-water heat pumps with TRNSYS	**Hyungkeun Kim, Kyungmo Kang, Yun-Gyu Lee and Taeyeon Kim** CFD simulation analysis on integrated operation of range-hood and make-up air supply for cooking-generated particulate matter	**Gilles Notton, Cyril Voyant and Jean-Laurent Duchaud** Difficulties of Solar PV Integration in Island Electrical Networks – Case Study in the French Islands	**Carlea Filip, Raboaca Simona and Filote Constantin** Green Hybrid Energy for Office Building	**Minyoung Kwon, Andy van den Dobbelsteen and Remoy Hilde** User Perception of Indoor Temperature and Preferences in Energy-Efficient Office Renovation Cases in the Netherlands	11:00
11:15	**Reo Sugino, Shin-Ichi Tanabe, Mikio Takahashi, Tomoko Tokumura, Kazuki Wada, Tomohiro Kuroki, Jun Nakagawa, Jun Shinoda and Takuma Shinoyama** Relationship between Attributes of Individual Workers and Concentration at Work	**Essam Khalil, Eslam Abdelghany, Hatem Haridy and Ahmed Ashraf** Numerical analysis for smoke spread in an aircraft hangar	**Tomoyuki Chikamoto and Ryouto Mimura** Influence of Carbon Dioxide Fluctuation and Thermal Environment on Workability, Physiology and Psychology	**Jiale Chai, Pei Huang and Yongjun Sun** Climate change impact on energy balance of net-zero energy buildings in typical climate regions of China	**Nick Van Loy, Griet Verbeeck and Elke Knapen** Potential of spatial use patterns for developing localized conditioning systems to reduce energy consumption	**Adriana Angelotti and Luca Molinaroli** A laboratory apparatus to study Thermal Response Test in the presence of groundwater flow	**Simon Harasty, Steven Lambeck and Andreas Daniel Böttcher** Using Artificial Neural Networks for Indoor Climate Control in the Field of Preventive Conservation	**Dakouo Koita, Catalin-Viorel Popa, Bruno Robert and Catalin Daniel Galatanu** Numerical study of the effect of wind on the cooling of photovoltaic panels	**Ece Kalaycioglu and A. Zerrin Yilmaz** Settlement scale analysis approach to reach nearly zero energy communities	**Zeki Yilmazoglu, Gulsu Ulukavak Harputlugil and Gokhan Unlu** Assessing the reliability of Turkish building energy performance tool (BEP-TR2) by case tests	11:15
11:30	**Cristina Becchio, Marta Carla Bottero, Stefano Paolo Corgnati, Federico Dell'Anna, Valentina Fabi, Carola Lingua, Leonardo Prendin and Micaela Ranieri** Effects on energy savings and occupant health of an antibacterial filter	**Sasan Sadrizadeh** Numerical Investigation of Thermal Comfort in Aircraft Passenger Cabin	**Junta Nakano and Shin-Ichi Tanabe** Thermal Comfort Condition of Passengers in Naturally Ventilated Train Stations	**Henrik N. Knudsen** House owners' experience and satisfaction with Danish low-energy houses - focus on ventilation	**Igor Mojic and Michel Haller** OpEEr - Optimising the energy efficiency of buildings through individual room temperature control	**Elena Fuentes and Jaume Salom** Validation of black-block performance models for a water-to-water heat pump operating under steady state and dynamic loads	**Chun Chen and Ruoyu You** Differentiating between direct and indirect exposure to exhaled particles in indoor environments with mechanical ventilation systems	**Nur Çobanoğlu, Ziya Haktan Karadeniz and Alpaslan Turgut** Carbon-based Nanofluid Applications in Solar Thermal Energy	**Shuji Furui, Rui Fonseca, Ryoh Masuda, Kouichi Nakagawa, Shuuji Fujimoto, Teppei Seguchi, Takuya Nakao and Nobuki Matsui** LISCOOL - Smart airconditioning with cold storage as flexibility provider for automated demand response and virtual power plant supported by cloud based system	**Nazanin Moazzen, Mustafa Erkan Karagüler and Touraj Ashrafian** Life Cycle Energy Assessment of a School Building under Envelope Retrofit: An Approach towards Environmental Impact Reduction	11:30
11:45	**Akihisa Nomoto, Yoshito Takahashi, Yoshiichi Ozeki, Masayuki Ogata and Shin-Ichi Tanabe** Prediction of physiological exertion in hot environments using the JOS-2 thermoregulation model	**Nikolay Ivanov, Evgueni Smirnov, Chang Son and Denis Telnov** CFD Evaluation of Directional Variation Effects of the Air Supply Diffuser for the International Space Station Cabin Atmosphere	**Imrich Sánka, Thomas Schoberer, Werner Stutterecker and Dušan Petráš** Indoor environmental quality evaluation in NZEB	**Karl-Villem Võsa, Andrea Ferrantelli and Jarek Kurnitski** Annual performance analysis of heat emission in radiator and underfloor heating systems in the European reference room	**Simona D'Oca, Dan Podjed, Jure Vetršek, Slavko Dolinsek and Peter Op 'T Veld** Contextual and behavioural factors influencing human-building interaction in university offices: a cross-cultural comparison	**Ji Li** Analysis and Discussion of Baoji "Shigu • Tian Xi Tai", "Shigu • Sun City" Ground Source Heat Pump Energy Station System	**Matthias Eydner** Investigation of a multizone building with hvac system using a coupled thermal and air flow model	**Aslı Birtürk, Orhan Ekren, Sinan Aktakka, Özdem Özel and Macit Toksoy** Solar Powered Mechanical Ventilation: A case study	**Ovidiu Noran** An Adaptive Architecture for Long Term Energy Programme Management	**Juha Jokisalo, Paula Sankelo, Juha Vinha, Kai Sirén and Risto Kosonen** Cost optimal energy performance renovation measures in a municipal service building in a cold climate	11:45
12:00	**Sanjay Kumar, Manoj Kumar Singh and Varun Kumar Gupta** Quantification of indoor environments and study of thermal comfort in naturally hostel buildings in the tropical country, India	**Wenxuan Zhao, Wei Ye, Qianru Zhang and Xu Zhang** Simulations on arrangements of induced jet-fans as auxiliary ventilation for a mechanical ventilated space with openings	**Jun Koyama, Yusuke Doi, Masanari Ukai and Tatsuo Nobe** Study on Cool Chair equipped with warming function	**Javier M. Rey Hernández, Francisco J. Rey Martínez, Ana Tejero González, Sergio L. González González, Eloy Velasco Gómez and Julio F. San José Alonso** Smart energy management of combined ventilation systems in a nZEB	**Lucile Sarran, Morten Herget Christensen, Christian Anker Hviid, Andrea Marin Radoszynski, Carsten Rode and Pierre Pinson** Data-driven study on individual occupant comfort using heating setpoints and window openings in new low-energy apartments – preliminary insights	**David Keogh, Mohammad Saffari, Mattia de Rosa and Donal P. Finn** Energy assessment of hybrid heat pump systems as a retrofit measure in residential housing stock	**Ettore Zanetti, Rossano Scoccia, Marcello Aprile, Mario Motta, Livio Mazzarella, Maurizio Zaglio and Jakub Pluta** Building hvac retrofitting using a pv assisted dc heat pump coupled with a pcm heat battery and optimal control algorithm	**Francisco Aguilar-Valero, Damián Crespí-Llorens and Pedro Vicente-Quiles** Experimental and numerical study of the domestic hot water production with PV panels and a heat pump	**Suzi Mangan, Gul Koclar Oral and Idil Erdemir Kocagil** Impact of urban textures on residential building performances in terms of energy and cost efficiency	**Janne Hirvonen, Juha Jokisalo, Juhani Heljo and Risto Kosonen** Optimization of emission reducing energy retrofits in Finnish apartment buildings	12:00
12:15	**Nikolay Ivanov, Marina Zasimova, Evgueni Smirnov, Alexey Abramov, Detelin Markov and Peter Stankov** Unsteady RANS Simulation of Air Distribution in a Ventilated Classroom with Numerous Jets	**Aleksandra Zarzycka, Wim Maassen and Wim Zeiler** Towards Zero Energy Hospital Buildings: Energy saving opportunities in Operating Theatres, a literature study	**Annemarie Eijkelenboom, Philomena M. Bluyssen and Geke A** Comfort and satisfaction of patients, visitors and staff with patient rooms at inpatient wards, a pilot study	**Catalin Lungu and Florin Baltaretu** Innovative HVAC system using an integrated green house for a virtual low energy office building	**Mingzhe Liu, Hicham Johra, Per Kvols Heiselberg, Ivan Kolev and Kremena Pavlova** Energy flexibility of office buildings – Potential of different building types	**Talpiga Mugurel, Eugen Mandric and Florin Iordache** Numerical approach regarding functional and design optimization for a residential building heating system composed by heat pump and auxiliary source	**Nicolás Ablanque, Santiago Torras, Carles Oliet, Joaquim Rigola and Carlos D. Pérez-Segarra** Dynamic simulation of indirect air conditioning systems with optimized computational time	**Sebastian Valeriu Hudisteanu and Catalin George Popovici** Experimental investigation of the wind direction influence on the cooling of photovoltaic panels integrated in double skin façades	**Joachim Seifert, Paul Seidel, Jens Werner and Andrea Meinzenbach** The Regional Virtual Power Plant – Experiences of a field test	**Soma Sugano, Shingo Yamaguchi, Yugo Tsuneoka, Reina Oki, Jun Nakagawa, Naoya Watanabe, Tatsuhiro Kobayashi, Shin-Ichi Tanabe and Takashi Akimoto** A Renovation Proposal for Zero-Energy Houses: Outline of Building Planning and Evaluation of Thermal Environment	12:15
12:30	**Laurentiu Tacutu** Local and general ventilation system for an operating room with surgeons and patient	**Lars Schinke, André Schlott, Maximilian Beyer, Joachim Seifert and Marcel Fink** Investigations on a hybrid element with cellular metallic material for heating, cooling and ventilation	**Haida Tang, Chunying Li and Jianhua Ding** Field study of indoor environment quality in an open atrium with ETFE membrane in a healthcare facility	**Tiberiu Catalina, Alexandra Ene and Andreea Biro** Visual and acoustic performance of shading devices – real scale laboratory measurements	**Larisa Melita** Aerogel, a high performance material for thermal insulation - A brief overview of the building applications	**Carsten Wemhoener, Simon Buesser and Lukas Rominger** Design and integration of heat pumps for nZEB in IEA HPT Annex 49	**Hayato Kiyosuke** Study on Reproduction of Thermal Plume over a Gas Stove by CFD	**Gheorghe Ilisei, Tiberiu Catalina and Robert Gavriliuc** Sensitivity analysis using simulations for a ground source heat pump – implementation on a solar passive house	**Razvan Stefan Popescu, Lelia Letitia Popescu, Andrei Preda and Karim Limam** Air pollution measurements related to urban traffic in Bucharest	**Piercarlo Romagnoni, Fabio Peron, Paolo Bison, Gianluca Cadelano, Alessandro Bortolin, Giovanni Ferrarini and Antonio Stevan** Indoor monitoring of Scrovegni Chapel Crypt	12:30 12:35 12:40
12:45	**Noriko Umemiya** Summer sleep quality and change of bedroom thermal environment -from the beginning to the end of sleep	**Naoki Kagi, U Yanagi, Kenichi Azuma and Hoon Kim** Field measurement of PM2.5 concentration in office buildings	**Marjolein Overtoom and Philomena Bluyssen** A game to determine preferences and needs for an indoor environment	**Marius Adam** Implementation of an algorithm for determining the effectiveness of ventilation and energy efficiency in industrial ventilation systems	**Hwataik Han and Muhammad Hatta** Comparison of performance of heat recovery ventilator and air purifier in reducing indoor PM10 concentrations in a classroom	**Jose Naveteur** Replacing the existing thermo-frigo-pump (with pistons compressors) by a new thermo-frigo-pump with variable-speed screw resulted in a 50% saving of energy use!	**Ion Zabet and Gratiela Maria Tarlea** Mathematical simulation of the thermodynamic processes associated with the vapour-injected scroll compressor	**Stefan Burchila and Catalin Lungu.** Wind energy and environment	**Sihwan Lee, Takuya Kishi and Yoshiharu Asano** Applicability of the whole-house air conditioning system in cold climate district	**Gratiela Tarlea, Valentin Draghici and Mioara Vinceriuc** A Supermarket Eco-Eficientization	12:45
12:50	**Hoon Kim, Yohei Inaba, Kanae Bekki, Motoya Hayashi, Kenichi Azuma and Naoki Kunugita** SVOC Concentrations in House dust and Residential Environment in Japanese Houses	**Vasile Dogaru** In-process measurement of urban energy-oxygen-pollution for the main residential building areas in Timisoara	**Yoshiaki Yamato, Yoshihito Kurazumi, Keta Fukagawa, Kunihito Tobita and Emi Kondo** Assessment of method for measuring clo value using human body – Assessment of method for measuring clo value that assumes human body temperature adjustment	**Sihwan Lee** Study on energy loss and thermal environment through door open while air conditioner running	**Ronny Mai, Ralph Krause and Christian Friebe** Enhancement of ventilation efficiency in residential buildings by pulsating air-flow	**Hezhi Zhang, Bo Xu and Zhenqian Chen** Study on heat transfer performance of geothermal pile-foundation heat exchanger in GSHP system	**Silviana Brata, Cristina Tanasa, Valeriu Stoian, Dan Stoian, Daniel Dan, Cristian Pacurar and Sorin Brata** Measured and Calculated Energy Saving on Ventilation of a Residential Building equipped with Ground-Air Heat Exchanger	**Calin Sebarchievici** Performance assessment between a ground coupled and air source heat pump used for domestic hot water preparation	**Vasile Dogaru and Ioan Silviu Dobosi** Energy metrics for European residential buildings for cities, towns&suburbs and rural areas – the case of Romania	**Adriana Tokar, Arina Negoiţescu, Marius Adam, Dănuţ Tokar and Dan Negoiţescu** Recovering lost energy an energy efficiency solution for the industrial sector	12:50

12:55	*Debates/Discussions*	*Debates/Discussions*	*Debates/Discussions*	*Debates/Discussions*	*Debates/Discussions*	*Debates/Discussions*	*Debates/Discussions*	*Debates/Discussions*	*Debates/Discussions*	*Debates/Discussions*	12:55
13:00	**LUNCH**										13:00
8:00	**CLIMA 2019 - PLENARY SESSION 5, Aula Hall** Chairs: Atze Boerstra ir., Dr.Eng. - REHVA vice-president, Chair of the Supporters Committee, The NETHERLANDS; Milos LAIN, Prof.Dr.Eng. - Czech Technical University in Prague, Czech Republic										8:00
14:00	**Keynote Lecture: Werner Lutsch, Dr.Eng., AGFW Managing Director & EHP President, GERMANY;** *Clean Energy for all Europeans- What does it mean for DHC/CHP?*										14:00
14:40	**Kavita Sharma, INDIA;** *ISHRAE acrex and Indian development*										14:40
14:50	**Keynote Lecture: Bjarne Olesen, Dr.H.C., R. - International Centre for Indoor Environment and Energy, Department of Civil Engineering, Technical University of DENMARK;** *International Standards for Indoor Environmental Quality: Similarities and Differences*										14:50
15:30	**COFFEE BREAK**										15:30
ORDINARY SESSION 4	**Session 4 A** **Other HVAC systems** **Chairs:** **Ilinca Nastase** **Alireza Afshari** **Razvan Calotă** **Hwataik Han** **Room: B-01-25**	**Session 4 B** **HVAC for special environments** **Chairs:** **Angui Li** **Guangyu Cao** **Hwataik Han** **Room: E-M-02**	**Session 4 C** **Quality of the building use: indoor environment comfort, productivity, safety and health** **Chairs:** **Arsen Melikov** **Leonardo Prendin** **Martin Thalfeldt** **Room: E-M-03**	**Session 4 D** **Low and zero energy building case studies** **Chairs:** **Dušan Petráš** **Merve Atmaca** **Florin Băltăretu** **Room: A-03-10**	**Session 4 E** **User-HVAC-building interaction** **Chairs:** **Cătălin Teodosiu** **Touraj Ashrafian** **Angel Dogeanu** **Room: G-M-04**	**Session 4 F** **Fundamentals & Miscellaneous** **Chairs:** **Birol Kilkis** **Sheila J. Hayter** **Nicolae Antonescu** **Room: A-03-09**	**Session 4 G** **Filtration, air cleaning and air distribution** **Chairs:** **Gilles Notton** **Andrei Damian** **Cristiana Croitoru** **Room: B-01-26**	**Session 4 H** **Low energy heating and cooling systems** **Chairs:** **Philomena Bluyssen** **Mariya Bivolarova** **Ionut Sota** **Room: D-05-10**	**Session 4 I** **ICT-based solutions for systems and building automation** **Chairs:** **Atze Boerstra** **Mihnea Sandu** **Andrei Litiu** **Room: D-06-10**	**Session 4 J** **Energy efficient renovation of existing buildings** **Chairs:** **Gyuyoung Yoon** **Milos Lain** **Horia Petran** **Room: D-06-13**	**ORDINARY SESSION 4**
16:00	**Martin Kremer, Paul Mathis and Dirk Müller** Moisture Recovery - A Dynamic Modelling Approach	**Dahae Seong, R. Sean Norman and Shamia Hoque** Influence of indoor ventilation conditions on microbial diversity and quantity	**Joana Ortiz, Maria Leandra Gonzalez Matterson, Paolo Taddeo and Jaume Salom** Post-Occupancy Evaluation of Indoor Environmental Quality in a nZEB sport hall in a Mediterranean climate	**Pierrick Mandrou, José Naveteur, David Penhouet, René Sauger and Edouard Cereuil** Kergrid: A Low-Carbon Footprint Building in Western France	**Daria Zukowska, Myrto Ananida, Jakub Kolarik, Mandana Sarey Khanie and Toke Rammer Nielsen.** Solar control solutions for reducing overheating risks in retrofitted Danish apartment buildings from the period 1850-1900 – A simulation-based study	**Mihai Baiceanu, Tiberiu Catalina, Catalin Lungu** Parametric simulation study for green roof retrofit over high performance solar house prototype “EFdeN Signature	**Tao Huang, Zhengtao Ai and Arsen Melikov.** Characteristics of airborne transmission under stratum ventilation	**Maximilian Beyer, Lars Schinke, Giulia Alessio, Joachim Seifert and Michele De Carli** Investigations of (local) thermal comfort as a function of radiation asymmetry and vertical air temperature difference	**Hussain Syed Asad, Yuen Richard Kwok Kit and Lee Eric Wai Ming** Energy Modeling with Nonlinear-Autoregressive Exogenous Neural Network	**Neşe Ganiç Sağlam, A. Zerrin Yılmaz and Stefano P. Corgnati** Identification of the Retrofit Actions to Achieve Cost-Optimal and NZEB Levels for Residential Buildings in Istanbul Considering the Remaining Building Lifetime	16:00
16:15	**Şahin Güngör, Levent Aydin, Umut Ceyhan, Büşra Kaya and Ziya Haktan Karadenİz** Analysis of Backward and Forward Effects on a Grooved Co-axial Heat Exchanger by Response Surface Methodology	**Sami Lestinen, Mark Wesseling, Risto Kosonen, Hannu Koskela and Dirk Müller** Airflow characteristics under planar opposed ventilation jets in a controlled indoor environment	**Cristina Becchio, Marta Bottero, Stefano Paolo Corgnati, Federico Dell'Anna, Valentina Fabi, Carola Lingua, Leonardo Prendin and Micaela Ranieri** The effects of indoor and outdoor air pollutants on workers’ productivity in office building	**Kai Corten, Eric Willems, Shalika Walker and Wim Zeiler** Energy performance optimization of buildings using data mining techniques	**Dragana Krstić, Miomir Vasov, Veliborka Bogdanović, Marko Ignjatović and Dušan Ranđelović** Effect of external solar shading usage on energy consumption and thermal comfort in the student dormitory in Niš	**Sheila J. Hayter and Sherry Stout** The Role of Building Codes and Controls in Enhancing Community Resilience	**Morten Sæther Grande and Guangyu Cao** Air quality in sport facilities	**Philomena Bluyssen, Dadi Zhang, Arend-Jan Krooneman and Arno Freeke** The effect of wall and floor colouring on temperature and draught feeling of primary school children	**Yuanchen Wang, Michael Müller, Christian Lodroner and Konstantinos Stergiaropoulos** Monitoring of indoor airflows with a new two-dimensional airflow sensor	**Phan Anh Nguyen, Regina Bokel and Andy van den Dobbelsteen** Facade Refurbishment For Energy Saving In Tube Houses. A case study in Hanoi, Vietnam	16:15
16:30	**George-Madalin Chitaru, Tiberiu Catalina and Andrei Marian Istrate** Numerical analysis of the impact of natural ventilation on the Indoor Air Quality and Thermal Comfort in a classroom	**Essam Khalil, Ahmed Elashray, Abdelmaged Ibrahim and Ismail Elbially** Thermal Comfort Analysis in Naturally-Ventilated Handball Arena Utilizing CFD Techniques	**Yoshito Takahashi, Masayuki Ogata, Jun-Ichi Asaka, Akihisa Nomoto and Shin-Ichi Tanabe** Coupling of a cardiovascular model with a thermoregulation model to predict human blood pressure under unsteady environmental conditions	**Jana Bartosova and Dušan Petráš** Energy and economical evaluation of residential buildings in Slovakia	**Mohammed Khalaf, Touraj Ashrafian and Cem Demirci** Energy Efficiency Evaluation of Different Glazing and Shading Systems in a School Building	**Nikolajs Bogdanovs, Romualds Beļinskis, Ernests Petersons, Andris Krūmiņš and Artūrs Brahmanis** Development of Temperature Process Control Method Using Smith Predictor	**Ayse Fidan Altun and Muhsin Kilic** Utilization of electrostatic precipitators for healthy indoor environments	**Laura Bellia, Francesca Romana d'Ambrosio Alfano, Francesca Fragliasso, Boris Igor Palella and Giuseppe Riccio** Hue-Heat Hypothesis: A Step forward for a Holistic Approach to IEQ	**Atze Boerstra, Arjen Raue and Louie Cheng** Smart monitoring of ventilation system performance with IEQ sensor networks	**Annamaria Belleri, Chiara Dipasquale and Jennifer Adami** A framework for the technical evaluation of residential buildings’ energy retrofit	16:30
16:45	**Clélia Moraes, Edson Melanda and Nilson Roberto de Barros Carneiro** The study of urban climate and traffic: Considerations from the Araraquara case, SP	**Hanna Melsnes Svenneby and Guangyu Cao** Investigation of indoor environment quality in the storage areas of NTNU Gunnerus Library	**Martin Thalfeldt, Anders Skare, Laurent Georges and Øyvind Skreiberg** A Simplified Power Sizing Method for the Correct Building Integration of Wood Stoves	**Gyuyoung Yoon, Kyoko Sugiyama, Saya Yoshioka and Shinji Sakai** Energy Efficiency and Cost Performance of Direct-Current Power Supply Systems in Residential Buildings by 2030s and 2050s	**Tetsushi Ono, Aya Hagishima, Jun Tanimoto, Sheikh Ahmad Zaki and Naja Aqilah Hisham** Statistical analysis of air conditioning peak loads of multiple dwellings	**Laura Carnieletto, Samantha Graci and Michele De Carli** Hypothesis for a more efficient and sustainable development of a district heating in Padova, integrating renewable energies and existing generation plant	**Tin Tai Chow, Wenjing Zhang and Jinliang Wang** Studying the influence of moving vehicle on air pollutant dispersion through environmental chamber	**Dadi Zhang, Martin Tenpierik and Philomena Bluyssen** The effect of acoustical treatment on primary school children’s performance, sound perception, and influence assessment	**Tianyun Gao, Bartosz Boguslawski, Sylvain Marié, Patrick Béguery, Simon Thebault and Stéphane Lecoeuche** Data mining and data-driven modelling for Air Handling Unit fault detection	**Johann Zirngibl, Carolina Mateo-Cecilia and Carlos Espigares-Correa** Alliance for deep renovation in buildings. A step forward to the common European voluntary certification scheme	16:45
17:00	**Evdoxia Paroutoglou, Alireza Afshari, Niels Bergsøe, Peter Fojan and Göran Hultmark** A pcm based cooling system for office buildings: a state of the art review	**Lin Lin, Lingshan Li and Xiaohua Liu** Performance investigation of indoor thermal environment and air handling unit in a hub airport terminal	**Kaho Hashimoto, Zhengtao Ai and Arsen Melikov** Airborne transmission during short-term events under stratum ventilation	**Kaoutar Zeghari, Hasna Louahlia, Malo Leguern, Mohamed Boutouil, Hamid Gualous, Michael Marion, Pierre Schaetzel, Steve Goodhew and François Streiff** Annual energy consumption between conventional and cob building	**Helle Foldbjerg Rasmussen and Tobias Skov Pedersen** An industry perspective on building simulations with solar shading	**Birol Kilkis** Exergy: Game Changer or Game Maker	**Ayşe Fidan Altun and Muhsin Kılıç** Synthesis of knowledge on utilization of adsorption filters for healthy indoor environments	**Sosui Nakamaura, Shin-Ichi Tanabe, Junta Fujisawa, Emi Takai, Sayana Tsushima, Masayuki Ogata, Yugo Tsuneoka, Takayoshi Iida, Yoshitaka Uno, Ryoko Nomura and Tomo-Oki Ukiana** Effects of Wellness-Conscious Buildings on the Well-Being and Comfort of Workers	**Toru Yano and Miho Sako** A field study of space heating control using acceptable set-point temperature estimation: winter experiment in Japan office	**Joao Pedro Panagassi Forte and Vasco Rato** Energy environmental impact of functional units of a university building	17:00
17:15	**Ondřej Zlevor and Jiří Dostál** Demand-oriented Hydronic Heating System and the Active One-pipe System Design Tool	**Takashi Akimoto, Naoya Odagiri, Yoichi Nakashima, Seiji Miyazaki, Takashi Yanai, Takashi Matsumoto, Daiki Yamashina and Nana Araki** Development of HVAC Diffuser Unit for Task and Ambient Air Conditioning Allowing User to Control Built-in Fan — Evaluation of Air Supply Mode by Subjective Experiment and Field Measurement in Office	**Anastácio Silva Junior, Kátia Cordeiro Mendonça, Rogério Vilain, Marcelo Luiz Pereira and Nathan Mendes** On the improvement of thermal comfort in indoor spaces conditioned by split-type systems	**Irina Rotaru** From Sustainable Urban Mobility Plans (SUMPs) to Operational Energy Policies and Measures for the City of Tomorrow	**Loes Visser, Boris Kingma, Eric Willems, Wendy Broers, Marcel Loomans, Henk Schellen, Peter Op 't Veld and Wouter van Marken Lichtenbelt** Occupant behavior and thermal comfort in buildings: Monitoring the end user	**Marco Ortiz, Dadi Zhang and Philomena Bluyssen** Table top surface appraisal by school children under different lighting conditions tested in the SenseLab	**Xian Li, Tengfei Zhang and Shugang Wang** Aerosolization of Aspergillus niger spores from colonies on different positions of a circular tube	**Žiga Lampret, Gorazd Krese and Matjaž Prek** Enhancing cooling performance via airflow temperature fluctuations	**Taha Arghand, Jan-Olof Dalenbäck, Anders Trüschel and Saqib Javed** Some aspects of controlling radiant and convective cooling systems	**Michele De Carli, Laura Carnieletto, Antonino Di Bella, Samantha Graci, Giuseppe Emmi, Angelo Zarrella, Nicola Baseggio, Marco Belliardi, Luciano Mulè Stagno, Borja Badenes, Javier Urchueguía, Burkhard Sanner, Gianluca Cadelano, Adriana Bernardi, Antonio Galgaro and Giorgia Dalla Santa** Archetype definition for analysing retrofit solutions in urban areas in Europe	17:15
17:30	**Yoshihiro Toriumi and Takashi Kurabuchi** Impact of Negative Pressure in a Room Due to Increased Airtightness in Residential Apartment Housing	**Paul-Alexandru Danca, Florin Bode, Angel Dogeanu, Cristiana Croitoru, Mihnea Sandu, Amina Meslem and Ilinca Nastase** Experimental study of thermal comfort in a vehicle cabin during the summer season	**Giulia Alessio, Angelo Zarrella, Antonino Di Bella and Michele De Carli** A new test room for indoor environmental quality analysis	**Dragos Mihaila, Ioan Silviu Dobosi, Stefan Duna, Laura Troi, Daniel Teodorescu and Alexandru Hordila** Special engineering techniques: Ecole des Trefles	**Alzbeta Dederova Kohoutkova, Jana Horváthová, Martin Kny and Ondrej Nehasil** The effect of the heating system on the occupant's thermal comfort and optimum room air temperature	**Ruoyu Zhang, Haichao Wang, Xiaozhou Wu, Xiangli Li and Lin Duanmu** The application of the TES technology in CHP heating system with Chinese demand profiles——A techno-economic feasibility case study	**Qianru Zhang, Chengqiang Zhi, Yixiang Huang, Wei Ye, Jun Gao and Xu Zhang** The effect of the contaminant emission rate on the velocity field and contaminant distribution with the presence of an obstacle in a large space	**Mariya Bivolarova, Arsen Melikov, Tereza Snaselova and Chong Shen** Passive Control Of The Bed Micro-Environment By Quilts	**Andreea Irina Baran, Teodor Dorin Dumitru Mateescu and Razvan Silviu Luciu** Thermal convection analysis of heat pump systems	**Horia Petran, Szabolcs Varga and Noémi Fogas** Experimental Nearly Zero Energy Building with Green Technology – Renovation Pilot through Passive House Expertise	17:30
17:45	**Zeki Yilmazoglu and Cem Gulseven** Ventilation Performance Improvement in a Container with an Extraction Free Cooling System	**Matteo Bilardo, Lorenzo Comba, Paolo Cornale, Andrea Costantino and Enrico Fabrizio** Relation between energy use and indoor thermal environment in animal husbandry: a case study	**Gert-Jan Braun and Wim Zeiler** The CO2 conditions within the baby cots of day care centres	***Debates/Discussions***	**Doru Daniel Sabie, Viorel Fatu and Adrian-Gabriel Ghiaus** Local analysis of airflow distribution in open concept passive houses	**Denis Miček and Jiri Hirs** Energy, economic and environmental analysis of opened natural healing water source	**Bård Venås, Merethe Cecilie Lind and Trond Thorgeir Harsem** Air Flow Door Barrier for Airborne Infection Isolation Rooms	**Heike Erhorn-Kluttig, Hans Erhorn and Micha Illner** Cost-efficient Nearly Zero-Energy Buildings	**Răzvan Bucureșteanu, Mihai Husch, Roxana Apetrei, Monica Ioniță, Ludmila Otilia Cinteză and Lia Mara Dițu** Photocatalytic techniques to prevent and combat healthcare associated infections	**Erika Guolo, Lorenza Pistore and Piercarlo Romagnoni** The role of the reference building in the evaluation of energy efficiency measures for large stocks of public buildings	17:45
18:00	Spare time /Visit to House OVER4 - Romanian Representative at SolarDecathlon Hungary 2019										18:00
19:00	**GALA DINNER** **Venue: Diplomatic Club, Şoseaua Bucureşti-Ploieşti 2B, Bucharest 077190, GPS 44.4852° N, 26.0802°**										19:00
23:00	**END OF THE CONGRESS THIRD DAY**										23:00

DAY 4	**WEDNESDAY May 29th, 2019** **Venue – Romania National Library, Bulevardul Unirii 22, Bucharest 030833, GPS 44.4256° N, 26.1102° E**										**DAY 4**
8:30	**CLIMA 2019 - PLENARY SESSION 6, Aula Hall** Chairs: Hui ZHANG, Dr.Eng. - Center for the Built Environment, University of California at Berkeley, USA; Manuel Gameiro da Silva, Prof.Dr. - REHVA vice-president, Chair of the Education and Training Committee, Universidade de Coimbra, PORTUGAL										8:30
8:30	**Keynote Lecture: William P. Bahnfleth, Prof.Dr. - Pennsylvania State University, USA;** *Current Status and Future Prospects for Infection Control with Optical Radiation*										8:30
9:10	**OVER 4, ROMANIA -** *Romanian Prototype for the Solar Decathlon Europe competition in 2019*										9:10
9:20	**Keynote Lecture: Ovidiu NORAN, Senior Lecturer Dr.Eng. - School of Information and Communication Technology, Griffith University, AUSTRALIA;** *Effective Energy Transition: An Adaptive Architecture View for Sustainable Long-term Management*										9:20
10:00	**COFFEE BREAK**										10:00
ORDINARY	**Session 5 A** **Energy management and distributed energy systems (heat and power generation, district heating and cooling)**	**Session 5 B** **HVAC for special environments**	**Session 5 C** **Quality of the building use: indoor environment comfort, productivity, safety and health**	**Session 5 D** **Other advanced HVAC&R&S system components**	**Session 5 E** **PM and contaminants in outdoors and indoors**	**Session 5 F** **From sustainable and smart buildings to sustainable and smart cities**	**Session 5 G** **Big data and machine learning applications in buildings**	**Session 5 H** **Climate action, environment, resource efficiency and raw materials**	**Session 5 I** **Energy performance requirements, compliance assessment and cost optimality**	**Session 5 J** **Energy efficient renovation of existing buildings**	**ORDINARY**

SESSION 5	Chairs: Werner Lutsch, Natasa Nord, Rodica Frunzulica Room: A-03-09	Chairs: Pawel Wargocki, Silvi Cristiana Croitoru Room: E-M-02	Chairs: William Bahnfleth, Mustafa Mutlu, Florin Bode Room: G-M-10	Chairs: Ralph Krause, Chadi Maalouf, Mihnea Sandu Room: G-M-04	Chairs: Nicolay Ivanov, Tobias Zimmer, Vlad Iordache Room: B-01-25	Chairs: Ovidiu Noran, Atze Boerstra, Dragos Ioan Bogatu Room: A-03-10	Chairs: Ivo Martinac, Kwang Ho Lee, Andreas Hantsch Room: B-01-26	Chairs: Timothy Wentz, Enrico Fabrizio, Adrian Ciutina Room: D-05-10	Chairs: Raluca Teodosiu, Eline Himpe, Silviana Brata Room: D-06-10	Chairs: Targo Kalamees, Margherita Finamore, Ioan-Silviu Dobosi Room: D-06-13	SESSION 5
10:30	**Osamu Kunitomo, Isao Satoh and Masanori Hiroshima** Reduction of Conveyance Power Consumption of District Cooling and Heating Systems using Demand-Supply Coordinated Control Part 2 - Energy Saving Effect of Demand-Supply Coordinated Control System	**Clelia Mendonça De Moraes, Fulvio Vittorino and Fernando Catalano** Aircraft passenger comfort evaluation: sitting and standing passengers in commercial cabin	**Stefan Duna, Ioan Silviu Dobosi, Alexandru Hordila, Daniel Teodorescu, Dragos Mihaila and Laura Troi** The notion of comfort, from word to concept	**Andreas Henne and Nina Kloster** Standardization of building technology on demand via robotic	**Jan Drzymalla and Andreas Henne** Use of low-cost PM-sensors to determine the infiltration of outdoor particles into indoor environments	**Laura Troi, Ioan Silviu Dobosi, Stefan Duna, Dragos Mihaila, Daniel Teodorescu and Alexandru Hordila** Rehabilitation of the utility spaces and boiler room Monnaie Royal Theatre	**Reina Oki, Yugo Tsuneoka, Shingo Yamaguchi, Soma Sugano, Jun Nakagawa, Naoya Watanabe, Tatsuhiro Kobayashi, Shin-Ichi Tanabe, Takashi Akimoto, Yasuhiro Hayashi and Shinji Wakao** Proposal and Evaluation of an Equipment Operating Method Using Solar Radiation Prediction in a Zero Energy House	**Matteo Bilardo, Maria Ferrara and Enrico Fabrizio** Resilient optimal design of multi-family buildings in future climate scenarios	**Mohsen Sharifi, Rana Mahmoud, Eline Himpe and Jelle Laverge** Interaction of GEOTABS and secondary heating and cooling systems in hybridGEOTABS buildings: towards a sizing methodology	**Yue Zhang, Xiaofeng Li, Zheren Song and Bin Wang** Optimal operation strategy for subway HVAC system in transition seasons	10:30
10:45	**Tymofii Tereshchenko, Dmytro Ivanko, Natasa Nord and Igor Sartori** Analysis of energy signatures and planning of heating and domestic hot water energy use in buildings in Norway	**Yuki Shimanuki, Takashi Kurabuchi, Yoshihiro Toriumi and Yasuhisa Asawa** Model of Thermal Plume above Cooking Gas Stove for Designing Ventilation	**Luca Zaniboni, Giovanni Pernigotto, Andrea Gasparella and Ardeshir Mahdavi** Experimental and numerical analysis of indoor environmental conditions in two physiotherapy facilities in Northern Italy	**Ralph Krause, Christian Friebe, Michael Kerscher and Christof Puhle.** Investigations on noise sources on a contra-rotating axial fan with different modifications	**Tobias Zimmer** Comfort IAQ – a new tool to simulate the indoor particulate matter pollution in relation to the chosen supply air filter quality	**Thea Johnsen, Katrine Taksdal, John Clauß, Xingji Yu and Georges Laurent** Influence of thermal zoning and electric radiator control on the energy flexibility potential of Norwegian detached houses	**Shohei Miyata, Yasunori Akashi, Jongyeon Lim and Yasuhiro Kuwahara** Fault detection in HVAC systems using a distribution considering uncertainties	**Adrian Ciutina, Raluca Buzatu and Daniel M. Muntean** Heat transfer vs environmental impact of modern façade systems	**Marcellinus Okafor and Ikechukwu Onyegiri** Relating Forms and Materials of Traditional and Contemporary Building Types to Indoor and Outdoor Air Temperatures for Sustainable Development in Okigwe, Nigeria	**Imrich Sánka and Dušan Petráš** Energy retrofitting of a single-family house	10:45
11:00	**Andrew Lyden and Paul Tuohy** A methodology for designing decentralised energy systems with predictive control for heat pumps and thermal storage	**Bowen Guan, Jun Liu, Xiaohua Liu, Tao Zhang, Liangliang Chen and Xiaoyang Chen** Performance investigation of a novel deep dehumidification process using liquid desiccant	**Silke Verbruggen, Marc Delghust, Jelle Laverge and Arnold Janssens** Inclusion of window opening habits in a window model based on activity and occupancy patterns	**Nitish Perisetla, Purushothaman G, Raghuvar Vijayakumar and Suresh Kumar Ramasamy** Enhancing coefficient of performance of window air-conditioner using heat pipes	.	**Tianyun Gao, Bartosz Boguslawski, Sylvain Marié, Patrick Béguery, Simon Thebault and Stéphane Lecoeuche** Data mining and data-driven modelling for Air Handling Unit fault detection	**Jong Man Lee, Won Hee Kang and Kwang Ho Lee** ANN Based Optimized AHU Discharge Air Temperature Control of Conventional VAV System for Minimized Cooling Energy in an Office Building	**Birol Kilkis** Decarbonization: exergy to the rescue	**Michele De Carli, Antonio Galgaro, Gianluca Cadelano, Francesco Cicolin, Sergio Bobbo, Javier Urchueguía, Giulia Mezzasalma, Riccardo Pasquali, Fabio Poletto, Amaia Castelruiz Aguirre, Amo J. Romanowsky, Davide Poletto, David Bertermann, Robert Gavriliuc, Dimitrios Mendrinos, Davide Righini, Burkhard Sanner, Jacques Vercruysse, Leonardo Rossi, Michele Vavallo, Luciano Mulè Stagno, Marco Belliardi and Adriana Bernardi** The H2020 project GEO4CIVHIC (Most Easy, Efficient and Low Cost Geothermal Systems for Retrofitting Civil and Historical Buildings)	**Imrich Sánka and Dušan Petráš** Energy conservation by retrofitting of dwellings	11:00
11:15	**Tin-Tai Chow, Guangya Zhu and Chun Kwong Lee** System optimization of innovative tri-generation system for distributed power application	**Matei Razvan Georgescu, Ilinca Nastase, Amina Meslem, Mihnea Sandu and Florin Bode** Design of a Small-Scale Experimental Model of the ISS Crew Quarters for a PIV Flow Field Study	**Ardeshir Mahdavi and Christiane Berger** An inquiry into the certification potential of built environments' affordance	**Marie R. Krusaa, Christian Anker Hviid, Jonathan Magnes and Jakub Kolarik** Combined radiant ceiling panels with diffuse ventilation – a numerical parametric study of thermal performance	**Wei Ling, Maho Ichikawa, Kaho Hashimoto, Masayuki Ogata, Hitomi Tsutsumi, Shoichi Morimoto, Shin-Ichi Tanabe and Satoshi Hori** Evaluation of Short-Distance Airborne Infection Risk Using a Cough Generator	**Dragos-Ioan Bogatu, Ongun Berk Kazanci and Bjarne W. Olesen** A preliminary analysis on the night cooling potential of photovoltaic/thermal (PV/T) panels for European cities	**Brian De Keijzer, Pol De Visser, Víctor García Romillo, Víctor Gómez Muñoz, Daan Boesten, Megan Meezen and Tadeo Baldiri Salcedo Rahola** Forecasting residential gas consumption with machine learning algorithms on weather data	**Evangelia Loukou, Mingzhe Liu, Hicham Johra, Per Kvols Heiselberg, Bianca A. Dia and Rógvi K. D. Clementsen** Numerical investigation of the energy flexibility of different heating and cooling systems	**Jayne Garcia, Layane Santos de Souza, Manuela Bazzani Kretzer, Marina Rupp da Silva and Ana Mirthes Hackenberg** Assessment of the energy efficiency of a public university building in Southern Brazil	**Kalle Kuusk, Peep Pihelo and Targo Kalamees** Renovation of apartment buildings with prefabricated modular panels	11:15
11:30	**Emmanuel Shittu, Filippo Paredes, Benedetto Schiavo, Luca Venezia, Sergio Milone, Fabio Montagnino and Maria Kolokotroni** Comparison of operational performance and analytical model of high concentrator photovoltaic thermal (HCPV/T) system at 2000 concentration ratio	**Christoffer Pedersen and Guangyu Cao** Can we meet the requirement for ultra-clean operation room (10CFU/m3) with dilution ventilation?	**Mustafa Mutlu** Effect of Zero Air Change Rate On Particle Dispersion in A Room with Floor Heating	**Djallel Abada, Chadi Maalouf, Tala Moussa, Amel F. Boudjabi, Guillaume Polidori, Djamila Rouag Saffidine, Oualid Sotehi, Zoheir Derghout and Etienne Wurtz** Design of a dew point evaporative cooler for buildings in Mediterranean climate	**Kentaro Morita, Kaho Hashimoto, Masayuki Ogata, Hitomi Tsutsumi, Shin-Ichi Tanabe and Satoshi Hori** Measurement of Face-touching Frequency in a Simulated Train	**Jose Sanchez, M.Carmen Guerrero, M.Carmen Pavón, J.Luis Molina and Servando Alvarez** Sensitivity analysys and potential evaluation using building thermal mass combined with DSM strategies	**Ziwei Xiao, Jiaqi Yuan, Wenjie Gang, Chong Zhang and Xinhua Xu** A NILM method for cooling load disaggregation based on artificial neural network	**Christoph Schellenberg, Laurentiu Dimache and John Lohan** Grid Edge Technology - Exploring the flexibility potential of a heat pump and thermal energy storage system [GET-SMART HEAT]	**Paula van den Brom, Arjen Meijer and Henk Visscher** Parameters that influence the probability on lower-than-expected energy savings - a pre- and post renovation energy consumption analysis of 90,000 renovated houses in the Netherlands	**Fei Lu, Yu Zou, Deyu Sun, Biao Qiao, Ji Li, Zhenyu Yu and Jianlin Wu** A Case Study for large-scale nearly zero energy retrofits of existing office building in Beijing	11:30
11:45	**Jad Al Koussa, Rutger Baeten, Nico Robeyn and Robbe Salenbien** A multipurpose test rig for district heating substations: domestic hot water preparation and keep-warm function comparison	**Jinkyun Cho, Beungyong Park and Yongdae Jeong** Thermal performance evaluation of a high-density data centre for cooling system under fault conditions	**Mustafa Mutlu and Emre Çalışkan** Numerical investigation of air conditioners' control unit position on temperature distribution and energy consumptions of a room	**Tomohiro Kobayashi, Toshiya Nishiumi and Noriko Umemiya** Simplified Prediction Method of Vertical Temperature Distribution for Impinging Jet Ventilation System	**Jie Xiong, Runming Yao and Baizhan Li** Prediction of local particle pollution level based on artificial neural network	**Jihui Yuan, Toshio Yamanaka, Tomohiro Kobayashi, Haruto Kitakaze and Kazuo Emura** Effect of highly reflective building envelopes on outdoor environment temperature and indoor thermal loads using CFD and numerical analysis	**Andreas Hantsch and Sabine Döge** Assessment of micro-organism growth risk on filters with machine learning	**Balázs András-Tövissi, László Kajtár and Pawel Wargocki** The influence of the combined effect of draught and radiant thermal asymmetry on human performance	**Eline Himpe and Arnold Janssens** Identification of Energy Use Time Patterns of Occupied Dwellings using Smart Meter Data	**Margherita Finamore** Double skin suitable for mediterranean climate in school-gym buildings.	11:45
12:00	**Juan Hou, Haoran Li and Natasa Nord** Optimal control of secondary side supply water temperature for substation in district heating systems	**Yunus Emre Cetin, Mete Avci and Orhan Aydin** Effect of Air Exchange Rate on Particle Decay in a Cleanroom: A Numerical Study	**Chenqiu Du, Yongqiang Li, Mengnan Xu and Runming Yao** Validation and improvement of the PHS model based on Chinese worker thermophysiological responses in hot environments	**Yoonjei Hwang, Hanyoung Park and Holim Lee** The evaluation of energy saving performance for the modular design centrifugal chiller	**Klaas De Jonge, Arnold Janssens and Jelle Laverge** Performance assessment of demand controlled ventilation controls concerning indoor VOC exposure based on a dynamic VOC emission model	**Georges Constantine, Chadi Maalouf, Tala Moussa and Guillaume Polidori** Monitoring of a Hemp Lime External Building Insulation	**Andrei Vladimir Litiu, Stijn Verbeke, Jakob Hahn, Davor Stjelja, Ken Dooley, Nejc Brelih-Wasowski, Ivo Martinac, Niklas Lavesson, Jonas Gräslund, Per Ola Isaksson, David Hälleberg and Pär Carling** Mapping digital transformation in building performance assessment and management – commercial activities for the operation phase	**Beungyong Park, Jinkyun Cho and Yongdae Jeong** Development of zero energy flexible unit with no infrastructure for disaster	**Andrei Preda and Popescu Razvan Stefan** New method of increasing building efficiency	**Shima Ebrahimigharehbaghi, Queena Qian, Frits Meijer and Henk Visscher** Homeowners' Decisions Towards Energy Renovations - Critical Stages and Sources of Information	12:00
12:15	**Răzvan Calotă, Alina- Viorica Girip, Mădălina Nichita, Anica Ilie, Sergiu Istrate and Valentin Cubleşan** Aspects regarding the use of recovered energy for air conditioning	**Aleyna Agirman, Yunus Emre Cetin, Mete Avci and Orhan Aydin** Influence of ceiling height on airflow and particle distribution in an operating room	**Catalin Bailescu, Vlad Iordache and Tiberiu Catalina** Optimal cost-efficiency solution of acoustic treatment for a complex meeting room	**Dominika Juhošová and Jana Peráčková** Recovery of waste heat from the sewer system	**Yong Woo Song, Min Young Kim and Jin Chul Park** Mock-up Test for NOx Reduction by Photocatalyst Paint for Indoor Use	**Cornel Muntea** Some aspects of historical monument buildings central heating	**Gabriel Mărcus and Cătălin Lungu** Partial load efficiency analysis of a CCHP plant with RICE and H2O-LiBr absorption chiller	***Debates/Discussions***	**Clélia Moraes** Questionnaire's Elaboration and application to the contribution at knowledge of certificate LEED's application at Brazil with based on case studies.	**Derya Kisla Tekin, Levent Colak and Birol Kilkis** A Decision Making Algorithm for Energo-Economic Sustainability and Efficiency in Buildings: A Case Study in Turkey	12:15
12:30	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	***Debates/Discussions***	12:30
13:00	**LUNCH**										13:00
14:00	**CLIMA 2019 - PLENARY SESSION 7, Aula Hall** Chairs: Sorin Burchiu - CLIMA 2019 & AIIR President; Ioan-Silviu Doboşi - CLIMA Sponsor & Exhibition Committee Chair; Ilinca Năstase - CLIMA 2019 Scientific Committee Chair, Cătălin Lungu - REHVA vicepresident & CLIMA Organising Committee Chair, Frank Hovorka - REHVA President										14:00
14:00	**DAIKIN Award ceremony & presentatiom**										14:00
14:20	**REHVA student competition award ceremony & presentation**										14:30
14:40	**HVAC world student competition award ceremony & presentation**										17:00
15:00	**Awards ceremony, plenary presentations & closure speech**										18:00
15:45	**Closure CONCERT & entertainement**										15:45
16:30	**END OF THE CONGRESS**										16:30
	Departure for the after-congress tours										

					ORAL PRESENTATION	**POSTER PRESENTATION**					