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Under the auspices of

YOUR GUIDE TO

CLIMA 2019
Built environment facing climate change

REHVA 13th HUAC World Congress
26 - 29 May, Bucharest, Romania
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**YOUR GUIDE TO THE REHVAC 13th HVAC WORLD CONGRESS**

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The Venue of the Congress is the Romanian National Library, located on Blvd. Unirii 22, Bucharest.

In order to easily identify the Congress facilities we prepared the map of each floor, highlighting the exhibition areas, the conference rooms, the elevators and other spaces we consider important for the delegates.

Each room has a special encoding. In order to identify it easily, you need to pay attention to the room number written above the door and to the signaling panels.

For example, if you need to find room E-M-03 (E = the zone the building is located, M = the floor MEZZANINE, 03 = the number of the room).

In case you do not manage to reach the desired hall, please come to the registration area at the ground floor and ask for help, someone will assist you.
THE VENUE
General maps

-1 FLOOR

F1, F2, F3, F4 - ELEVATOR TO FLOORS M, 1, 3, 5, 6
C-D-01 - „SIMION MEHEDINȚI“ HALL
THE VENUE
General maps

GROUND FLOOR

- A-P-21- „MIRCEA ELIADE“ Conference HALL
- WARDROBE
- A-P-04- „MIRCEA VULCANESCU“ Conference HALL
- REGISTRATION AREA
- Coffee break & Lunch Area
- EXHIBITION & POSTER AREA
- F1, F2, F3, F4 - ELEVATOR TO FLOORS M, 1, 3, 5, 6
- PANORAMIC ELEVATOR TO FLOORS M, 1, 3
THE VENUE
General maps

FIRST FLOOR

- AULA PLENARY SESSIONS
- B-01-25 - “PROFESSIONAL TRAINING” HALL 1
- B-01-26 - “PROFESSIONAL TRAINING” HALL 2
- F1, F2, F3, F4 - ELEVATOR TO FLOORS M, 3, 5, 6
- PANORAMIC ELEVATOR TO FLOORS M, 3
THE VENUE
General maps

THIRD FLOOR

A-03-08 - LECTURE HALL 1
A-03-09 - LECTURE HALL 2
A-03-10 - LECTURE HALL 3
F1, F2, F3, F4 - ELEVATOR TO FLOORS M, 1, 5, 6
PANORAMIC ELEVATOR TO FLOORS M, 1
THE VENUE
General maps

FIFTH FLOOR

AULA
PLENARY SESSION

D-05-10 - PROFESSIONAL TRAINING HALL
F1, F2, F3, F4 - ELEVATOR TO FLOORS M, 1, 3, 6
THE VENUE
General maps

SIXTH FLOOR

Atrium

D-06-10 - PROFESSIONAL TRAINING HALL 4
D-06-13 - PROFESSIONAL TRAINING HALL 5
F1, F2, F3, F4 - ELEVATOR TO FLOORS M, 1, 3, 5
A special thanks to all members who helped make CLIMA 2019 Congress a success

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Department of Architecture, Waseda University, JAPAN

Dr. Hui Zhang
Center for the Built Environment at UC Berkeley, USA

Professor PhD. Eng. Francis Allard
Université de La Rochelle, FRANCE

Professor PhD. Eng. Bjarne W. Olesen
DTU CIVIL ENGINEERING Department of Civil Engineering,
Technical University, DENMARK

PhD. Eng. Werner R. Lutsch
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GERMANY
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Sustainable Development and Urban Planning The Bartlett, University College London, UK

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Griffith University Australia

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Center Department of Architectural Engineering, USA

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Henk Kranenberg, Daikin Europe
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Ambassadors
KEYNOTE SPEAKERS

Professor PhD. Shin-ichi Tanabe
Department of Architecture
Waseda University, JAPAN

He is an expert in the fields of indoor air quality, thermal comfort, and energy. He graduated from the Department of Architecture, Waseda University in 1982. He has been Professor at the Department of Architecture, Waseda University since 2001. He stayed at the Laboratory of Heating and Air Conditioning, Technical University of Denmark during 1984-1986 and at the Center for Environmental Design Research, University of California, Berkeley during 1992-1993. He was a guest Professor at the International Centre for Indoor Environment and Energy, Technical University of Denmark during 2002-2003. He is a current President of Society of Air-conditioning and Sanitary Engineers, Japan (SHASE), Council Member, Science Council of Japan (SCJ), Fellow ASHRAE and so on.

He also received Ralph. G. Nevins Award from ASHRE in 1989. Pettenkofer Award from ISIAQ, SHASE Technical Award, Prize of Research from Architectural Institute of Japan.

His currently research interests are Zero Energy Building and office workers' productivity. Office workers comfort and satisfaction is a key for smart environment. He is a committee member of energy efficiency under the Ministry of Economic, Trading, and Industry, Japan and one of the chair authors of the Report on Energy Efficiency Technical Strategies in Japan.

"CLIMA 2019 is the conference where the latest achievements of building and HVAC gathered. There are also many participants from Japan. At the conference we are very much looking forward to discussing the latest HVAC technologies, indoor environment, energy, IoT and AI, sustainable city and energy management in the future. Face-to-face discussions of people gathering from all over the world are very important. I am very much looking forward to visit Romania. I participated in the 1st CLIMA 2000 held in Copenhagen in 1985 during my student days. The friends I got there are still irreplaceable for my life."

Dr. Hui Zhang is a researcher at the Center for the Built Environment at UC Berkeley. Her expertise in thermal comfort using energy efficient approaches is well known worldwide. Her work focuses on human thermophysiology and thermal comfort, to support the development of energy-efficient and individually controlled heating and cooling systems for buildings. Her thesis work established a theoretical foundation for personal comfort system (PCS) and holds several PCS-related patents. In 2004 she received the ASHRAE Ralph Nevins Physiology and Human Environment Award for her PhD dissertation "Local Thermal Comfort in Asymmetrical and Transient Environments".

Dr. Hui Zhang has been Principal Investigator for a number of State, Federal, and ASHRAE grants on improving building energy performance and comfort in large buildings systems. She leads a team and has designed and built several types of PCS, performed many laboratory and field studies evaluating a wide range of topics ranging from fundamental physiology to the comfort and energy effectiveness of innovative building practices. She has recently been working on wirelessly linked IOT personal comfort systems and wearable devices (funded by ARPA-E and NSF).

Dr. Zhang has developed a body-part-specific model of human comfort for the evaluation of complex thermal environments, which has been employed in commercial software. She has been actively involved in ASHRAE standard activities, chair of the research subcommittee for ASHRAE Technical Committee 2.1 (Physiology and Human Environment) 2011 – 2015.

She holds a PhD in building science from the Department of Architecture at UC Berkeley, and a M.S and a B.A. in Engineering from Tsinghua University, Beijing, China.

“Air-conditioning typically produces a uniform indoor temperature. However, individuals' thermal differences are large, so the air-conditioning usually satisfies less than 80% of the occupancy. Personal comfort systems (PCS, e.g. ceiling/desk fans, heated/cooled chairs, footwarmers) significantly raise the satisfaction rate (up to 100%) by being able to correct these individual differences. In addition, PCS can dramatically reduce air-conditioning energy by allowing the ambient temperature to float over a wider range, while maintaining superior levels of comfort. Since the built environment plays a large role in climate change, efficient provision of comfort is a key challenge for everyone in this Congress.”

In 1992, F. Allard was nominated at the board of creation of La Rochelle University. He created LEPTAB (Laboratory of Transfer Phenomena applied to Buildings) in 1993 (now LaSIE) and was the first director of the Civil Engineering Department (1993-1997). Director of LEPTAB from 1993 to 2011, F. Allard has been also Dean of the Faculty of Sciences and Technology (1997-2002) and vice rector for research (2008-2012). F. Allard was vice president of REHVA from 2002 to 2008 and president of REHVA for the term 2008-2011.

His main domain of expertise is heat and mass transfer phenomena with application in energy efficiency and indoor environment quality in buildings, and urban microclimate. He published more than 270 articles in international journals, international conferences or books. He is member of various editorial boards of leading international journals in his domain and was member of various scientific committees (CSTB, Fondation Bâtiment Energie, ANR défi6, CoNRS, INRS, CCRRD, ...).

F. Allard has been granted Gold Medal of REHVA in 2015, he is Member of IAIAQ (International Academy of Indoor Air Quality), and Doctor Honoris Causa of UTCB (Romania)

“I am attending CLIMA conferences since Copenhagen in 1985, and it is a real pleasure and a great honor to be invited to present a keynote at CLIMA2019. My keynote talk is focusing on the main topic of CLIMA2019 “built environment facing the climate change” and more specifically on the Urban Heat Island phenomenon, which consequences could be considered as the first perception of the climate change effects. Its effects on pollution, health, comfort, energy supply, and the strategies to mitigate them, could be seen as a first step to increase the resilience of our buildings and promote new strategies to adapt our cities in order to limit the climate change to a sustainable limit.”
Professor PhD. Eng. Bjarne W. Olesen
DTU CIVIL ENGINEERING Department of Civil Engineering,
Technical University, DENMARK


His main research activities are related to thermal comfort, ventilation and radiant heating and cooling systems. Is active in several CEN-ISO standard committees regarding indoor environment and energy performance of buildings and HVAC systems. Has published more than 400 papers including more than 100 in peer reviewed journals.

“My keynote talk will specifically be related to topic 1. of CLIMA2019 - Advanced HVAC&R&S Technology and Indoor Environment Quality. However, the use of International standards for Indoor Environmental Quality is a basic for all 4 topics. Buildings cannot be named High Energy Performance and Sustainable without an acceptable indoor environment. The use of Information and Communication Technologies (ICT) for the Intelligent Building Management should be focused on providing a good indoor environment at a minimum energy use and give feed-back to the user on how to improve the indoor environment and reduce energy use. Finally, by Sustainable Urbanization and Energy System Integration it is important to take into account that in all buildings there are occupants, who always want a healthy, comfortable and productive indoor environment.”
The Clima 2019 takes place at a pivotal moment in the evolution of European energy policy. The clear recognition of the importance of sustainable heating and cooling in the recently finalized Clean Energy for All Europeans Package was an important step forward but much remains to be done. Looking ahead to the upcoming European elections and arrival of a new set of Commissioners later this year, it is vitally important to establish policy frameworks and market conditions at European, national and local level that will foster the uptake of greener and more efficient heating and cooling solutions, including district energy networks.

Werner Lutsch is Managing Director and Chief Executive Officer of AGFW, the German Energy Efficiency Association for District Heating, Cooling and CHP in Frankfurt, Germany which he joined in 2003. AGFW reunites over 500 district energy suppliers and industrial operators of this industry in Germany and represents over 95% of the heat load connected to German district heating systems – the largest scale in Western Europe. He is also President of Euroheat & Power, Brussels, the international association representing the District Heating and Cooling (DHC) and Combined Heat and Power (CHP) sector in Europe and beyond. Werner has over 30 years of experience in energy and process management mainly for the optimization of power plants. He has also expertise in business development for Operation, Maintenance & Management (OM&M) of thermal and hydro power plants as well as systems for transmission and distribution. His prior experience includes service as Consultant and Senior Vice President/Executive of a subsidiary of the FICHTNER Group, Germany, General Manager with VA TECH, Austria and Managing Director/CEO at communa systems, Germany. Werner has a M.Sc. in Production Engineering from the University of Applied Science, Technology and Economics Rosenheim, Germany and a General Manager Degree from the HM Institute, Austria. He is the author of numerous technical papers and articles on energy- and environmental topics and frequent speaker at national and international conferences.

„The Clima 2019 takes place at a pivotal moment in the evolution of European energy policy. The clear recognition of the importance of sustainable heating and cooling in the recently finalized Clean Energy for All Europeans Package was an important step forward but much remains to be done. Looking ahead to the upcoming European elections and arrival of a new set of Commissioners later this year, it is vitally important to establish policy frameworks and market conditions at European, national and local level that will foster the uptake of greener and more efficient heating and cooling solutions, including district energy networks.“
Mika Halttunen
President and Chairman of the Board
Halton Group-FINLAND

He is an owner and the Chairman of Board in Halton Group, a global supplier of high-quality systems to provide productive, sustainable and safe indoor environment for people in buildings. Halton is specializing especially in demanding indoor environments like professional kitchens, hospitals, high-class offices and marine and energy production industries.

He graduated from Helsinki University of Technology in 1988 as a Master of Science in Engineering, majoring in HVAC technologies under Professor Olli Seppänen’s supervision.

After graduation Mika started Halton's Indoor Climate business in the USA. He became the President and CEO of Halton Group in 1992 and the Chairman of the Board in 2002. Halton Group has grown to be the leading company in the world in its' chosen business segments, operating today in 35 countries all over the world. In 2018 Halton Group had global sales of 218 million euros.

Mika was the Conference President for Clima 2007-Wellbeing Indoors, in Helsinki.

He has held board positions in numerous HVAC related associations in Finland. He has worked as the Vice-President and member of the Board at Eurovent since 2016.

Mika plays blues/rock in Ärräpää Orchestra and is the Chairman in FC Lahti.

„I had the pleasure and privilege to serve as the Conference President at the Clima 2007 -Wellbeing Indoors -conference in Helsinki.

These conferences are very important especially because they are a platform of bringing science into practice. In Clima conferences we can see various strategies and applications how good, productive and safe indoor environment can be created while saving world’s resources. These are key themes in improving human wellbeing and battling global climate change.

I am happy to participate in Clima 2019 in Bucharest and look forward to meeting world’s best experts there.“
Catalina Turcu is an architect and social scientist with a PhD from the London School of Economics (2010) and degrees in housing, urban planning and architecture (London School of Economics 2001 and University of Architecture and Urbanism Ion Mincu 1999, 1996). Before joining the academia in 2010, Catalina had practiced architecture and established her own architectural practice. Catalina’s current research focuses on energy, housing, and indicators, and she is particularly interested in the social and political aspects of the built environment in relation to urban sustainability. Catalina has published extensively in academic journals and contributed to edited books, but also worked closely with cities across the UK, Scandinavia and Eastern Europe. She is a scientific adviser to OECD, World Bank and UN-Habitat and a research evaluator for Scandinavian and British research councils. Catalina is currently leading on two major research projects looking at the decarbonisation of the residential sector, and housing development and urban densification.

“I am delighted to be part of the CLIMA 2019 Congress because of its overall emphasis on the relationship between climate change and the built environment, but also its particular focus on the importance of ‘sustainable urbanisation and energy system integration’, which frame important areas of my work. CLIMA events are well known for bringing together engineering and industry expertise from the building and construction sectors and I am keen to engage with them from the wider perspective of the built environment, in order to emphasise the mutual benefits, such as health and wellbeing for example, of working together in mitigating climate change in cities. I am also particularly interested in what that means for Eastern European countries like Romania. Finally, I am extremely proud to be invited back to my home country which has trained me as an architect and to which I hope to give back more in the future.”
Ovidiu Noran is a HVACR engineer and senior lecturer in Enterprise Engineering and Information Technology with Masters and PhD degrees from Griffith University and a Bachelor degree from the Faculty of Installations Engineering within the Technical University of Constructions Bucharest. Before joining the academia in 2000, Ovidiu has been active as HVACR, civil and structural engineer and also as business architecture and management consultant in companies based in Europe and Australia. Currently, he is lecturing Enterprise Architecture, Business Analysis and Systems Analysis and Design at Griffith University. He is a member of several professional bodies such as Engineers Australia, International Association of Business Analysts, Association of Enterprise Architects and is also involved in standardization committees such as ISO/IEC SC7/WG42 (Software Engineering and Architecture) and ISO TC184 SC5/WG1 (Industrial Automation). His seminars, numerous publications and regular involvement in conferences, journals and industry and Defence projects highlight his main research interests in Enterprise Architecture, Systems and Software Engineering, Artificial Intelligence and Serious Games and a preference for Action Research.

“Climate change may be the largest challenge faced by mankind yet. While action is required to deal with its effects (such as maintaining optimal comfort in dwellings), actually slowing down and eliminating climate change demands a move to low or zero carbon emissions energy sources and to more efficient energy production and consumption. Importantly however, this transition must be performed in a strategically planned manner adapted to each particular scenario, in order to ensure that economic, security and environmental sustainability aspects are kept in balance. I have been invited to talk about highlights and challenges in designing such a strategy.”
Dr. Bahnfleth is a professor of Architectural Engineering at The Pennsylvania State University. He holds a PhD in mechanical engineering from the University of Illinois and is a registered professional engineer. He has held previous positions as a Senior Consultant for ZBA and as a Principal Investigator at the US Army Construction Engineering Research Laboratory. At Penn State, Dr. Bahnfleth teaches subjects related to heating, ventilation, and air-conditioning at undergraduate and graduate levels, including graduate courses on indoor air quality and hydronic heating and cooling systems. His research has investigated earth-coupled heat transfer, chilled water system performance, stratified thermal energy storage systems, air contaminant transport in buildings, and bioaerosol control – in particular, use of UVC for air and surface disinfection. He is the author or co-author of nearly 200 publications. Dr. Bahnfleth has been an active member of ASHRAE for more than 30 years. He was Society President in 2013-14. His awards include best paper awards from ASHRAE and ASME, the Penn State Alumni Engineering Society World Class Engineering Faculty Award a 1st place ASHRAE Technology Award and the ASHRAE Exceptional Service, Louise and Bill Holladay Distinguished Fellow, E.K Campbell, and Donald Bahnfleth Environmental Health awards.

"I am honored to present a keynote address to the CLIMA 2019 Congress. The CLIMA series is one of the world’s most significant meetings because of the large group of HVAC industry experts it brings together for high-level technical exchanges. A consequence of climate change may be increased incidence of infectious diseases. Drug resistance is greatly reducing the effectiveness of conventional infection control. My presentation aligns with the Indoor Environmental Quality track of the congress, considering the role of engineering controls in infection transmission risk reduction, focusing on methods employing optical radiation, in particular light in the UVC wavelength band."
CAMFIL is the world leader in air filters and clean air solutions. Camfil is the global industry leader in clean air solutions with 50+ years of experience. Our solutions protect people, processes and the environment to benefit human health, increase performance, and reduce and manage energy consumption. Twenty-three manufacturing plants, six R&D sites and over 65 local sales offices worldwide provide service and support to our customers. The Camfil Group is headquartered in Sweden but more than 95% of sales are international. The Group has around 3,500 employees and sales in the range of SEK 4.9 billion. Today, with more than 50 years of experience, Camfil delivers clean air solutions to customers and local markets all over the world. With high quality products, we are contributing to something that is essential to everyone – clean air for health, performance and well-being.

REHVA is the leading European professional organization whose main activity is to develop and disseminate technology and information for mechanical services of buildings. REHVA is dedicated to the improvement of health, comfort, safety and energy efficiency in all buildings and communities. It encourages the development and application of both energy conservation and renewable energy sources. In these areas, REHVA has a significant impact on national and international strategic planning and research initiatives, as well as on the associated educational and training programmes.
REFLEX WINKELMANN GmbH - Reprezentanța din România
111-113 Soveja, Bucharest, District 1
Phone: 0755 037 000
E-mail: cristian.tudor@reflex-romania.ro
Website: www.reflex-romania.ro

Reflex Winkelmann GmbH - part of the Building + Industry division - is a leader in providing high-quality heating and hot water supply technology. Within its Reflex brand, the company develops, manufactures and markets not only expansion vessels, but also innovative components and integrative solutions for pressure maintenance, water preparation, degassing and water treatment, domestic hot water tanks, heat exchangers, and dispensers hydraulic building and thermal storage components.

The Technical University of Civil Engineering of Bucharest (UTCB) assumes its fundamental mission of being a national center for training new generations of professionals and increasing the transfer of knowledge and technology to the society. More than 600 academic and support staff are dedicated to supporting students developing the right skills and achieving the learning outcomes appropriate to their personal professional goals, making sure the education students receive is as innovative as they are. UTCB provides a wide offer of 4 years undergraduate study programs in Romanian, English and French, leading to the Bachelor degree in engineering (240 ECTS – European Credit Transfer and Accumulation System), 25 Master programs with a duration of 2 years (120 ECTS) and various specializations of PhD studies lasting 3 years (180 ECTS). Having an outstanding scientific research potential, the departments, faculties and the university have focused in the last years on priority areas of high scientific & technological interest and of significant public utility. Scientific research has become an intrinsic component of university activity and a sine qua non condition for university performance. The relevance of research results brings complementary and additional funding to the university and boosts its academic prestige.
Since 2003 the new headquarter is relocated to Ghimbav, in a modern office building with a 3000 m² warehouse. Commercial offices were opened in Bucharest, Bacău and Cluj-Napoca. The main business activity in Romania is the import and distribution of Viessmann Group products (heating boilers, solar panels, heat pumps, hot water cylinders and other accessories for thermal installations). The products are marketed through the national dealers network. After-sales services (commissioning, product warranty, technical support and service inspection) are provided by the service partner companies, which are ISCIIR authorized.

DOSETIMPEX SRL
11 Calea Buziașului, 300714, Timișoara
Phone: +40 256 200368
E-mail: office@dosetimpex.ro
Website: www.dosetimpex.ro

Dosetimpex started its activity in 1994, in Timișoara, as a regional business and has grown simultaneously with the market. Today, the company is present at both national and international levels. One of the main players in the building services entrepreneurial market, Dosetimpex has built an impressive portfolio of works over its 25 years of activity. Performance is one of the goals, which has been achieved by addressing everything that has been done on Building Energy Performance, Comfort, Quality of Built Environment. In 1995, Dosetimpex won the design contract for the new headquarters of the BRD-GSG bank in Timișoara, thus entering the large scale segment for building services. Since 2002, the company has received the ISO certification for the high professional standards demonstrated by the entire team. One of our company's main values is innovation. Dosetimpex aims to implement, through the conception and design phase, the latest scientific ideas and discoveries, respecting the latest national and international norms in the field of building services.
Dosetimpex has been actively involved in the energy efficiency rehabilitation program since its launch in Romania, providing energy audit services and building energy performance calculations. In addition, together with the researchers of the Faculty of Civil Engineering within the "Politehnica" University of Timișoara, the company's specialists have developed the DOSET PEC software. The program is meant to facilitate the calculation of the buildings energy performance and issue the Energy Performance Certificate for Buildings. The software is certified by INCERC Bucharest.

Our team is always present at national and international conferences as well as at scientific events, being an active member of the most important professional associations and organizations in the field: AIIR - Romanian Association for Installations Engineers, REHVA - Federation of European Heating, Ventilation and Air Conditioning Associations, AICVF - Association of Climate Climates, Ventilation and Froid, ASHRAE - American Society of Heating, Refrigeration and Air-Conditioning Engineers.

SC TESTO ROM SRL
247 Calea Turzii, Cluj Napoca
Phone: 264  202 170
E-mail: info@testo.ro
Website: www.testo.ro

Testo SE & Co. KGaA, with its headquarters in Lenzkirch in the Black Forest, is a world market leader in the field of portable and stationary measurement solutions. In 33 subsidiary companies around the world, 2,700 employees research, develop, produce and market for the high-tech company. The measurement technology expert convinces over 650,000 worldwide customers with highly precise measuring instruments and innovative solutions for the measurement data management of tomorrow.

Testo SE & Co. KGaA has a presence on every continent with 33 subsidiaries and more than 80 trade partners. There are around 3,000 employees working for Testo all over the world.
OY HALTON GROUP LTD.
Esteriportti 2, 00240 Helsinki, FINLAND
Phone: +358 (0)20792 200
Website: www.halton.com
Halton Group is the global technology leader in indoor air solutions for demanding spaces. The company was founded in Finland in 1969 and is owned by the Halttunen family and headquartered in Helsinki. We provide solutions for commercial and public premises, healthcare institutions and laboratories, professional kitchens and restaurants as well as energy production environments and marine vessels. We provide our end-users with safe, comfortable and productive indoor environments that are energy-efficient and comply with sustainable principles.

PAB ROMANIA SRL
Industrial Zone Micalaca EST, FN, Arad, Romania
Phone: +40 257 25 33 99
E-mail: office@pab.ro
Website: www.pab.ro
PAB Romania began as a general works contractor in 1993. Over the years, the group has undertaken many challenging projects and accumulated skills and experiences in design and build solutions. Today, PAB Romania takes on the role of main contractor for medium to large size projects and performs project management services to coordinates specialist trades for European industrial/commercial projects. Our goal is to offer our customers a great experience when we are chosen to run projects.

DAIKIN EUROPE N.V.
Zandvoordestraat 300, 8400 Oostende, BELGIUM
Phone: +32 59 55 81 11
E-mail: Kranenberg.h@daikin.nl
Website: www.daikin.nl
Daikin Industries, Ltd. is a Japanese multinational air conditioning manufacturing company headquartered in Osaka. It has operations in Japan, China, Australia, India, Philippines, Southeast Asia, Europe, North America, and South America. Daikin is the inventor of variable refrigerant
volume systems (or VRV by Daikin air conditioning) and an innovator in the split system air conditioning market.

EUROCONS GROUP
Sterijina 19, Vrsac, Serbia
Phone: +381607040808
E-mail: aleksandar.vejin@eurocons.rs
Website: www.eurocons.rs

The Company EUROCONS GROUP is the regional leader in the field of industrial engineering, design and innovative technologies. It offers superior technology solutions in the field of CLEANROOM technology and other industrial areas. The principal activities are consulting, engineering and representation of leading multinational companies. Ambitiously and with utmost competence, he followed his vision of developing a small firm in to a system capable of realization of projects on a “turnkey” basis, from consulting, design, and construction, through installation of equipment produced by renowned manufacturers, to commissioning, servicing and after-sales support. Therefore investments were made, with constant work on expanding business activities in order to achieve the goal.

THE ROMANIAN ASSOCIATION OF BUILDING SERVICES ENGINEERS - AIIR
66 Pache Protopopescu Blvd., Bucharest, District 2, Romania
Phone: + 04-021.252.42.95 / Fax: + 04-021.252.42.95
E-mail: office@aiiro.ro

AIIR – the Romanian Association of Building Services Engineers is a professional association of more than 1700 engineers and architects, and 50 companies. AIIR, as one of the oldest NGO in Romania (51 years old), organized 52 national congresses and more than 110 regional conferences and symposiums. During its existence, AIIR issued in total 200 books with around 9500 technical and scientific articles. Romania is a member of REHVA since 1985, when AGFR - General Association of Romanian Refrigerating Engineers joined the federation. AIIR in partnership with AGFR became member of REHVA in 2003. AIIR is also one of the main founders of the ASHRAE Danube Chapter (American Society of HVAC engineers). AIIR signed memorandum of understanding with the majority of the Romanian professional associations in the constructions field and with some similar European associations.
TECHNICAL UNIVERSITY OF CIVIL ENGINEERING, Bucharest, Romania, Faculty of Building Services Engineering, Department of Electrical Engineering

ROMANIAN NATIONAL LIGHTING COMMITTEE

UNIVERSITY OF BUCHAREST, ROMANIA, Faculty of Biology, Department of Botany and Microbiology

Presentation of the concept “Sanitary comfort for the healthy buildings”

BELIMO AUTOMATION AG
Brunnenbachstrasse 1, 8340 Hinwil, Switzerland
Phone: +41 43 843 61 11
E-mail: info@belimo.ch
Website: www.belimo.ch

Belimo provides Innovations in Comfort, Energy Efficiency, and Safety for Buildings. For over 40 years, Belimo successfully focuses on the heating, ventilation, and air conditioning markets providing quality solutions that will increase energy efficiency; reduce installation cost with the fastest delivery times in the industry. Our innovative products have always been designed to help achieve objectives better, faster and more economically. Investing in new technology is a key to our success, and Belimo will continue to offer products to help businesses succeed.

FRANCE AIR ROMANIA
Chiajna, Ilfov, Soseaua de Centura nr.13, Cladirile Mega 3 si 4
Phone: +40.722.437.937
E-mail: janerik.cardon@france-air.com
Website: www.france-air.com

France Air Romania is a member of France Air group, one of the principal european producers of air treatment systems, known for technical solutions and energetic performances in each activity domain: bureaus, houses, industrial buildings, hospitals, clean rooms and professional kitchens.
KREATIV SRL is the importer of proven pipe systems for heat recovery ventilation from FRANKISCHE. profi-air® pipe system for heat recovery ventilation profi-air is our complete system for heat recovery ventilation and it is suited for all installation situations in both new and existing buildings. Due to the flow-optimised inner surface of the profi-air ventilation pipes, the air flows through the ventilation system with particularly little noise and resistance, which significantly reduces the total energy requirement. In addition, antistatic and antibacterial agents make the products absolutely sterile. The profi-air® classic ventilation pipe is ideal for installation in bare concrete. Thanks to its flexibility, no additional fittings are required even with very narrow bend radii. Depending on the dimensions, the profi-air classic round pipe is also suitable for installation in walls and ceilings. Thanks to its extremely low installation height of only 52 mm, the profi-air® tunnel ventilation pipe is ideally suited for installation on bare concrete. The flat pipe can also be perfectly installed in a wall or on the ceiling. The profi-air® flat manifold 6-fold for heat recovery ventilation allows installation in a great variety of situations. The plastic manifold is a product for each application and installation situation, even for concrete construction.

INNOVA ENGINEERING
104-106 Stirbei Voda, Bucharest
Phone: 0725 019 040
Email: miruna.iliescu@innova.com.ro
Website: www.innova.com.ro

Innova Engineering concentrates their efforts on the design, planning, engineering, construction, maintenance and management of data centers and computer room environments, from both the facility and IT perspectives. Our team always exceeds our customers' expectations. Whether it's IT&C, hardware/software solutions, Data Center design and execution, AC & DC and HVAC infrastructure design, or maintenance services, we’re always offering high-end services nationally.
Climalife, a player in energy performance

For more than a century Climalife has been Europe's specialist in cooling fluids for refrigeration and air conditioning. Its involvement and commitments to quality and protection of the environment has also enabled it to gain cutting-edge expertise in the fields of heating and renewable energy. More than 250 employees are available to share their knowledge on diverse sectors such as: industrial markets (large outlets, local stores, etc.), housing and apartments, and the service sector (offices, hospitals, airports, etc.). They can meet your needs with a range of products and services suitable for any climate control system: refrigerants, secondary refrigerants/heat transfer fluids, lubricant, leak detection, cleaning, analysis, services. Climalife benefits from the structure of the Dehon Group, a key player in performance chemistry, developing innovative solutions and building special partnerships with professionals, particularly producers, manufacturers, industrial firms, and distributors.

Innovative services developed for safety and the environment, regular technical and regulatory information, and high-performance tools complete this comprehensive plan. Climalife offer their products and services worldwide, thanks to a global distribution network made up of 14 subsidiaries (Germany, Belgium, Netherlands, France, United Kingdom, Spain, Hungary, Romania, Switzerland, Scandinavia, Italy, Russia and China) and local representatives (India, Singapore, Malaysia) and an export subsidiary, Climalife-Galco, for the rest of the world. Developing innovative, sustainable solutions for climate control systems.
Hilti makes construction work simpler, faster and safer. With products, systems, software and services that provide clear added value. Hilti stands for quality, innovation and direct customer relationships. All of Hilti’s activities, every day, are aimed at creating enthusiastic customers and building a better future – with sustainable and innovative solutions. The company supports society and environment equally to actively pursue a better future also outside the core business area.

**BOOTH A63**

SC ENSYRO SRL  
10 Orăștie Street, D29-32, Cluj Napoca  
**Phone:** 0723 601 779  
**E-mail:** bogdan@ensy.no  
**Website:** www.ensy.no

Ensyo was founded in 1903, today the Norwegian company provides controlled mechanical ventilation systems with a rotating heat exchanger in Europe. The systems does not require drainage for condensation. They are the only products on the market with these important features:  
- Low energy consumption  
- Low sound levels  
- High operational safety  
- Constant monitoring of environmental humidity

Our units contribute to healthy air (using filters F7/ISO Epm1) in all types of indoor environments: homes, offices, public places, their capacity varies from 200 to 700 mc/hour  
The models are built according to the most advanced technologies, with the best performances compared to our competitors.

**BOOTH B20**

Serbian HVAC&R Society (KGH)  
Union of Mechanical and Electrotechnical Engineers and Technicians (SMEITS)  
Kneza Miloša 7a/II, 11000 Belgrade, Serbia  
**Phone:** +381 11 3230 041, 3031 696  
**Phone/Fax:** 3231 372  
**E-mail:** office@smeits.rs  
**Webmail:** www.kgh-kongres.rs / www.smeits.rs

The idea of founding a special association of engineers from this field was born in 1970 during the preparations for the organization of a seminar on high pressure air-conditioning and automatic control, a technological novelty of that time in Europe. The Serbian Society for Heating, Refrigeration and
Air-Conditioning gathers engineers and technicians from the field of thermal engineering and associated fields who are involved in the implementation of heating, refrigeration and air-conditioning systems within the Serbian Union of Mechanical and Electrical Engineers and Technicians (SMEITS), for the purpose of advancing the profession, improving the quality of life and protecting and preserving the environment. The Serbian Society for Heating, Refrigeration and Air-Conditioning is a member of the European Federation of Heating, Ventilation and Air-Conditioning Associations (REHVA), its members actively participate in the work of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), it is a corporate member of the International Institute of Refrigeration (IIR), a non-governmental organization whereof one of its founders was the Kingdom of Serbia more than 100 years ago (in 1908), and it is a member of UNEP – United Nations Environment Programme. The Serbian Society for Heating, Refrigeration and Air-Conditioning is one of the initiators and founders of the ASHRAE Danube Chapter (2005). The professional activity of the Society is carried out through the following technical committees:
– Technical committee for refrigeration systems, heat pumps and energy efficiency;
– Technical committee for renewable energy sources, and
– Technical committee for district heating and cooling.

**BOOTH B21**

**ISHRAE**

1103-1104, 11th Floor, Chiranjiv Tower, 43, Nehru Place, New Delhi-110019, India

**Phone:** (011)41635655/(011)29234925

**E-mail:** info@ishraehq.in

**Website:** [www.ishrae.in](http://www.ishrae.in)

The Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE), was founded in 1981 at New Delhi by a group of eminent HVAC&R professionals. ISHRAE today has more than 17,736 HVAC&R professionals as members and additionally there are 10,695 Student-members. ISHRAE operates from 41 Chapters and sub Chapters spread all over India, with HQ in Delhi. It works towards its mission of Dissemination of Knowledge by Conducting Technical Seminars, Conferences and Panel Discussions, Developing Standards (e.g. Chillers, VRFs, IEQ, AHUs), Publishing Guidebooks and Handbooks, Promoting Application Oriented Research and organizing industry exhibitions etc. ISHRAE organizes ACREX INDIA, the largest
international exposition in South Asia on the Air-Conditioning, Refrigeration, Ventilation and Building services industry. Held annually, ACREX with nearly 500 exhibitors and more than 30,000 business visitors, is considered to be a major opportunity to showcase the latest technologies/innovations, and provide a platform for buyer-seller meet, for technical & commercial personnel in the HVAC&R field. ISHRAE also organizes country’s largest show on Refrigeration and Cold Chain Industry. More than 10,000 decision makers and innovators from retail, food service, food processing, production, distribution, logistics and transportation attend the event.

ASHRAE
Schumanplein 6 / 5th Floor, B-1040 Brussels, BELGIUM
Phone: +32(0)22346340
Webmail: www.ashrae.org

ASHRAE, founded in 1894, is a global society advancing human well-being through sustainable technology for the built environment. The Society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration and sustainability within the industry. Through research, standards writing, publishing and continuing education, ASHRAE shapes tomorrow's built environment today. ASHRAE was formed as the American Society of Heating, Refrigerating and Air-Conditioning Engineers by the merger in 1959 of American Society of Heating and Air-Conditioning Engineers (ASHAE) founded in 1894 and The American Society of Refrigerating Engineers (ASRE) founded in 1904.

ROBOTERR SEWERAGE CONSTRUCTION SRL
59 Putu cu Salcie, Matasaru, ROMANIA
Phone: +40 752 777 711
Email: office@roboterr.ro
Website: www.roboterr.ro

The first Sewerage Construction Robot, that builds sewerage without workers inside the trench and without trench panels. Obtained 3 gold medals and a trophy at Geneva in 2019.
Man and Machine Romania is the local subsidiary of the German group Mensch und Maschine Software SE, a leading provider of digitalization solutions in the CAD/CAM (Computer Aided Design & Manufacturing) and BIM (Building Information Modelling) areas. With around 50 locations in Germany, Austria, Switzerland, France, Italy, UK, Poland, Romania and Iberia, the M+M group serves the community of engineers with multidisciplinary software solutions and consultancy services of highest quality. At M+M we support our BIM customers with our own developed curricula called BIM Ready based on the Autodesk Revit technology, while our Autodesk Training Centers’ network has presence in 37 cities across Europe. We are Autodesk Platinum Partner and MagiCAD Authorized Reseller, the number one BIM solution for Mechanical, Electrical and Plumbing (MEP) design used by thousands of companies worldwide.

TTMD was founded in 1992 to develop the services given by Mechanical Engineering in heating, refrigerating, ventilating, plumbing, insulation and fire safety fields. Currently, TTMD is one of the biggest non-governmental organizations (NGO) in Turkey having more than 2000 professional members of designers, manufacturers, contractors, academicians, policymakers in the field of energy efficiency and environment. TTMD carry out many co-operations with universities and high schools, industry, research institutes, governmental bodies, NGOs and other professional expert groups for the objectives of creating living areas which are environmentally friendly, utilizing the energy more
efficiently and having more sustainable buildings and installations in it. TTMD represents the Turkish engineers and architects in international platforms and keeps being in contact with international professional associations, following the technological developments and transferring them to its members and society. TTMD is a member of ASHRAE Alliance, REHVA, CLIMAMED, and representing IBPSA in Turkey. In addition to the seminars and courses regularly organized, TTMD organizes also symposium and congresses, publishes journals, books, and manuals containing recent information, develops projects targeting climate change, energy efficiency and nZEB and takes part actively in regulatory and standardization works. The members of TTMD has the privilege of receiving up-to-date information worldwide directly through TTMDs connections. Designers, consultants and contractor companies in the field of energy efficiency sector in Turkey, mostly have members of TTMD, who are highly-skilled professionals.

BOOTH B29
ECOVENT EXPERT SRL
126 – 132 Ghencea Blvd, Bucharest
Phone: 0724677647
E-mail: pranaromania@gmail.com
Website: www.pranaromania.ro

Company PRANA is the author and manufacturer of a number of modern technologies in the field of energy saving. 15 years under the trademark "PRANA" on different continents, integrated energy efficient ventilation solutions bring comfort and save money. Today, PRANA produces the fourth generation of air recuperators on the basis of a copper heat exchanger. Our engineers have our own climate laboratory at their disposal, which allows them to develop and implement newly tested models on the market. Engineers of our company can offer ventilation systems for use in various climatic conditions and in premises of any destination: in offices, schools, medical institutions, shops, industrial enterprises, sports halls and swimming pools, mansions and apartments in multistoried buildings.

BOOTH B30
Shanghai OaseTECH Fluid Technology Co., Ltd.
Room1112, flat 43, no. 1969, Puxing Road, Pujiang Town, Minhang District, Shanghai, China,
Phone: 86-21-34785900,
E-mail: dawn@oasetech.com,
Website: www.oasetech.com
Is the manufacturing enterprise specializing in fluid technology areas and provides technical development, consulting and services about fluid technology. Clear objectives, careful planning and efficient execution are work standards of OaseTech. We have a factory nearly 14,000 square meters area. With the help of R&D from Australia headquarters, we set up the manufacturing industry in China and become one of the global fluid technology and energy industry leaders.

BOOTH B31

EUROVENT CERTITA CERTIFICATION
48-50 rue de la Victorie - 75009 Paris, France
Phone: +33(0) 630 499 146/33 (0) 1 7544-7171
E-mail: m.tamko@eurovent-certification.com
Website: www.eurovent-certification.com
EUROVENT CERTITA CERTIFICATION is a major European certification body providing voluntary 3rd party certification in the field of Heating, Ventilation, Air Conditioning and Refrigeration (HVAC-R), offering its customers a one-stop service solution thanks to the extensive scope of its activities. EUROVENT CERTITA CERTIFICATION certifies the performance ratings of products, according to European and International standards, on the full range of HVAC-R products, whatever their final use, either in residential domestic buildings or in industrial facilities. The value of 3rd party certification is to build up customer confidence by levelling the competitive playing field for all manufacturers and by increasing the integrity and accuracy of the industrial performance ratings.

BOOTH B32

THE PATRONAGE FOR REFRIGERATION AND AIR CONDITIONING OF ROMANIA
66 Pache Protopopescu Blvd., Bucharest – 2
Phone: +40 21 252 3964; +40 745 013 322
E-mail: gratiela.tarlea@gmail.com
President Florin Virlan
Importer and distributor of refrigerants and prestigious companies from the field of Refrigeration and Air Conditioning. The Patronage For Refrigeration And Air Conditioning Of Romania has the following tasks:
• The representation, promotion, support and defense of the economic, technical and juridical interests of its members;
• The elaboration of development strategies in the field of refrigeration and air conditioning;
• The initiation of law projects, of regulations and standards in the field;
• The promotion of the quality management system in the activity of its members and their certification.

Activities:
- National and international cooperation with general associations of refrigeration from all the world;
- Strong cooperation: Romanian General Association for Refrigeration (AGFR) and The Patronage For Refrigeration And Air Conditioning of Romania (PFACR)
- The research team of the AGFR - PFACR and UTCB develops its work in national and international research projects.
- We organized different training levels: Technicians; Graduated (Engineers); Post-graduated; UE legislation-Interim certificates for personnel and companies - (AGFR – PFACR cooperation)

POINT OF SALE TRADITIONAL ROMANIAN OBJECTS

BOOTH B47

BOOTH B48

MATRIX ROM
3 Politehnicii Street, Bl.12, Ap.1, Bucharest
Phone: 0722 343 460
Email: iancu.ilie@matrixrom.ro
Website: www.matrixrom.ro

With over 25 years of continuous activities, MATRIX ROM is the leading publishing house for technical books on the Romanian market. Over 5000 titles published.
GENERAL INFORMATION

REGISTRATION DURING THE CONGRESS

The Registration desk is located both at JW Marriott Grand Hotel and on the GROUND FLOOR of the National Library of Romania and is opened as follows:

**JW Marriott Grand Hotel**

- May 25, 2019 09.00 – 18.00
- May 26, 2019 09.00 – 12.00

**National Library of Romania**

- May 26, 2019 14.00 – 20.00
- May 27, 2019 08.00 – 18.00
- May 28, 2019 08.00 – 18.00
- May 29, 2019 08.00 – 12.00

The registration area will be divided into sections. We strongly recommend all pre-registered participants to use the fast check-in terminals to avoid possible queues at the registration service desk. In case you consider to register on-site or wish to order an additional item to your congress registration or have issues with your pre-registration, we advise to use the DESK served - registration terminals, a hostess will guide you through the process.

Please ensure you stand in the correct queue according to the package you selected!

Accepted payment methods on-site are credit card or cash. Please keep in mind the local currency when paying cash can be in LEI or EURO.

BADGES AND SCANNING

HOW TO GET YOUR BADGE

**STEP 1:** Proceed to the Self Service Check-In Terminals in the registration area (they are located left and right of the main entrance)

**STEP 2:** Prepare your QR code (either on paper or displayed on the screen of your smart device) and place it in front of the scanner

**STEP 3:** The station will then scan your code and automatically print your badge.

Due to safety regulations it is mandatory to always visibly
wear your name badge during the congress (all activities). There will be a badge control scanning at the main entrances of the conference rooms, workshops, coffee breaks & lunch, dinners etc. You will not be allowed to enter the congress area without your badge. We strongly advise you not to forget or lose your badge!

Badges are of different colours:

**BLUE**
- Participants
- Guest Editors
- CLIMA Fellow
- Accompanying

**BURGUNDY**
- Keynote Speakers
- Workshop Chairs
- Sponsors

**ORANGE**
- Organisers / Volunteers

**GREEN**
- Exhibitors

**CONGRESS SHUTTLE**

Daily transportation to the Congress Venue will be provided to participants staying at JW Marriott Grand Hotel and will depart from the Congress Venue following the last session of the daily Scientific Program or following the Congress Social Events. Several mini buses will operate as shuttles from/to the hotel/congress venue as per the timetable and routes below. Transfers are free of charge, you just need to show your badge to the driver / volunteer. Please note space is limited in the Mini buses.

**May 25, 2019 (only for REHVA ANNUAL MEETING)**

*2 Buses, 50 seats*
- Departure from JW Marriott Grand Hotel to Hilton Hotel
  - 18.30, 19.00
- Return to JW Marriott Grand Hotel
  - 22.00, 22.30

**May 26, 2019**

*1 Bus, 50 seats*
- Departure from JW Marriott Grand Hotel to the venue
  - 15.00, 15.30, 16.00, 16.30, 17.00, 17.30, 18.00
- Return to JW Marriott Grand Hotel
  - 21.00, 21.30, 22.00, 22.30, 23.00

**M1 Mini Bus, 19 seats**
- Departure from JW Marriott Grand Hotel to the venue
  - 08.00 am every 30 minutes, last return to JW Marriott Grand Hotel
  - 23.00
**May 27, 2019 and May 28, 2019**

*2 Buses, 50 seats*
Departure from JW Marriott Grand Hotel to the venue 08.00 am, 08.30 am, 09.00 am, 09.30 am, 10.00 am

*M1, M2, M3 Mini Buses, 7 seats*
Departure from JW Marriott Grand Hotel to the venue 08.00 am every 30 minutes, last return to JW Marriott Grand Hotel 18.00

Break: 13.00 – 14.00

*2 Buses, 50 seats*
Departure from JW Marriott Grand Hotel to AllR President Dinner / Gala Dinner 19.00, 20.00
Return to JW Marriott Grand Hotel 22.30, 23.30

**May 29, 2019**

*1 Bus, 50 seats*
Departure from JW Marriott Grand Hotel to the venue 08.00 am, 08.30 am, 09.00 am, 09.30 am, 10.00 am
Return to JW Marriott Grand Hotel 15.00, 16.00, 17.00

*M1, M2 Mini Buses, 7 seats*
Departure from JW Marriott Grand Hotel to the venue 08.00 am every 30 minutes, last return to JW Marriott Grand Hotel 17.00

Break: 13.00 – 14.00

Please understand the schedule might be subject to changes due to traffic or unpredicted events. All changes will be notified to the participants.
The credentials are the same for all areas:

**Password: roCLIMA@2019**

Wireless internet will be available in all meeting rooms. Due to the number of users, please limit your usage to social media such as Facebook, Youtube, streaming Videos other than CLIMA webcast.

The credentials are the same for all areas:

**Network: CLIMA2019**

*Password: roCLIMA@2019*

*network and password are case sensitive*

**PROJECTION ROOM**

The Pre-projection room (Speakers’ Ready Room) will be located on the Ground Floor of the venue. Due to a high number of speakers, the pre-projection room will be very busy, so if you wish to check your presentation, upload it on dropbox, make changes or even print out some pages you are more then welcome, a technician will assist you in the process.

Opening hours for the Pre-projection room will be:

- May 26, 2019 - May 28, 2019: 08:30 – 18:00
- May 29, 2019: 08:30 - 17:00
**CLIMA 2019 APP**

Download the CLIMA 2019 APP for access to content such as meeting agenda, social events, notifications and other interesting features.

Please download the APP from Google Play and App Store and register with an user and password to use the application.

**VIP LOUNGE AREA**

The VIP Lounge is located in the exhibition area and will be available for the comfort of the Keynote Speakers, providing a place to prepare speeches and have small informal meetings. The access in the VIP Lounge Area is allowed to the following color of badges **BURGUNDY** and **ORANGE**. The number of places is limited.

**PHOTO RELEASE**

Pictures will be taken at the CLIMA 2019 Congress. By registering for the Congress, you agree to allow CLIMA organizers to use your photo in any related publications or website.

**WHAT TO WEAR**

Business casual attire is appropriate for the Congress. It is recommended to have a jacket and an umbrella.

**CURRENCY**

The Romanian LEU is the currency of Romania.

1 EUR = 4.76 LEI
1 USD = 4.26 LEI


**WEATHER**

SUN 29/05

- Sunny
- 24°/12°

MON 27/05

- Partly sunny
- 25°/15°

TUE 26/05

- Mostly sunny
- 26°/15°

WED 29/05

- A couple of morning t-storms
- 24°/12°
EMERGENCY SITUATIONS

In case of an emergency dial 112 immediately. This allows for better control over the speed and accuracy of information given to authorities when a timely response is necessary. Security operates from 08.00 am to 20.00 pm. Regularly scheduled patrols of the venue take place. Police, fire, and paramedics will be contacted by venue security when necessary.

In case of a fire, follow the instructions based on your location. It is important not to panic. If a fire emergency does in fact happen, take all cues from security and venue staff. Familiarize yourself with the meeting space and make sure you are aware of the closest emergency exits. In the event of a fire, an alarm will sound. Walk to the nearest exit; learn the route, obstacles, etc. Check the windows to see if they open and how. Examine the area outside your window.

MEALS (COFFEE BREAKS AND LUNCHES)

A light lunch (lunch box) and two coffee breaks are included in the registration fee and will be served in the SCRIPTORIUM area as per the times indicated in the program. Please let the caterer know if you have a special menu. Standing tables will be available but we kindly ask you not to go with food and drinks outside the designated area.

LOST AND FOUND

Items found during the conference should be turned at the Registration Area located at the entrance of the venue ground floor. The CLIMA App also has a Message Board where attendees can be notified about the lost or found items while at the Conference.

SAFETY TIPS (STREET SAFETY, HOTEL SAFETY)

Street Safety

The streets of any city at any time can be unsafe but according to European Statistics, Bucharest is considered to be a safe city. When you leave your hotel to go out during the day, evening, make sure you take off your badge. Wearing a badge is an advertisement that you are a visitor to the city probably unfamiliar with your location. Walk “smart” when you leave the convention site - know your destination and the best way to reach it. Walk along lighted sidewalks at night and don’t walk alone. Trust your instincts—if you’re uncomfortable with a situation, get out of it.
SOCIAL EVENTS & ARTISTIC PROGRAM

WELCOME RECEPTION AND EXHIBITION OPENING - MAY 26, 2019

Location: National Library of Romania, Scriptorium
22 Unirii Blvd.
Time: 20.00 - 22.00
Dress Code: Cocktail Attire
Access: Ticket price 90 EUR

AIIR’S PRESIDENT DINNER - MAY 27, 2019

Location: Faculty for Building Services Engineering
66 Pache Protopopescu Blvd.
Time: 19.00 - 23.00
Dress Code: Casual Attire
Artistic Program: Romanian traditional evening and a lot of surprises
Access: Ticket price 90 EUR

GALA DINNER - MAY 28, 2019

Location: Diplomatic Club
2B Șoseaua București-Ploiești
Time: 19.00 - 23.00
Dress Code: Black Tie
Artistic Program: Concert
Access: Ticket price 95 EUR

OFFICIAL OPENING CEREMONY CONCERT - AULA HALL, 19:00

Ilie Stepan (born in November 24, 1953) is a composer, guitarist, instrumentist (violin, piano, blockflöte, percussion, midi-programming), sound engineer, orchestrator, author and producer of musical projects. Founder and leader of PRO Musica, Stepan Project, Stepan Project Blues Foundation. Initiator, alongside Horea Crisovan, of the project of the acoustic guitar “Anotimpurile ghitării”.

He has performed in over 1000 concerts in his career, in different formulas. For the first time in Romania with PRO Musica, he composed a folk song, Creanga de cireș, the first outdoor rock concert in a psychiatric hospital, Jebel 1980, the first outdoor rock concert in a prison in 2015. He is the first Romanian musician (alongside Vasile Dolga) who on 20th of December 1989 has openly sung against the dictatorial regime of Ceaușescu.

ILIE STEPAN
BERTI BARBERA
Berti Barbera can be categorized as a cosmopolitan musician, even controversial if you take into account the way he approaches certain subjects in art and life. And this is not necessarily because of his origin, but through the way he sees music, through the variety of influences and elements he perceives and produce in the art of interpretation. Like any modern artist, he opens his ears and soul to the stylistic diversity and the many possibilities of playing a musical work.

NICU PATOI
It is quite rare to meet a guitar player like Nicu Patoi. An artist who, through his musical instrument, reveals your character, education, passion and the joy of singing, and at the same time, deliberately provokes the curiosity of trying to find the unseen parts of a complex artist. Despite the young guys’ tendency to live up to extreme technique and digital stunts, Nicu is an artist who uses a multitude of procedures in a subtle, well-proportioned manner, combining the clarity of the accords with the sonorous refinement, speed and feel. A mature performer with an artistic soul, he shines the moment he’s interacting with the guitar.

SPECIAL PROGRAM
ȘTEFAN POPA - POPA’S
Ștefan Popa-Popas is an honorary citizen of 26 cities, where he won over one hundred prizes. He is a member of the Foundation for Science and Art Academy in Rome and a member of the UNESCO Artists. He established the Popa Academy, the school of Romanian cartoons. Ştefan Popa-Popas is publishing his caricatures in the main newspapers and magazines world-wide.

In France, in October 1995, André Baur wrote about Ştefan Popa-Popas that «he is a force of nature... and the only man who is four seconds faster than the computer».
In an article published on October 13, 1995 by Le Canard enchaîné, Alain Grandphre wrote: «Ştefan Popa Popa’s not only draws faster than his shadow, but he «catches» the resemblance like other catch the flu and there is no vaccine that can protect his “victims” from his powerful pencil stroke».

The style of Popa’s Ştefan Popa-Popas draws his caricatures with clear and thin lines, which make his creations fluid and melodious. In spite of the grotesque look of his works, we can discover a certain beauty in his caricatures.

Prizes and awards
TOURISTIC PROGRAM

Following your preferences the following tours will take place during the Congress:

„LA BELLE EPOQUE“ TOUR BY DAY
4 h (May 27)
Departure time: 10.30 am
Starting point: Romanian National Library
The tour includes sightseeing of major objectives, transportation, English speaking guide & entrance to the Parliament Palace or the Village Museum.
Castle.
Group of minimum 15 people.

Onsite registration: 65 EUR

CASTLES TOUR
FULL DAY (May 28)
Departure time: 08.00 am
Starting point: Romanian National Library
The tour includes transportation, English speaking guide, lunch, entrance to Sinaia Monastery, Peles Castle, Bran Castle.
Group of minimum 15 people.

Onsite registration: 115 EUR

POST CONGRESS TOUR
DANUBE DELTA
Three Days (May 29 - 31)
Departure time: 08.00 am
Starting point: Romanian National Library
The tour includes transportation, 2 nights accommodation in double room, all meals, English speaking guide, several boat trips.
Group of minimum 10 people.

Onsite registration: 410 EUR
TECHNICAL TOUR NO. 1
MAY 27, 2019 / 9:00 - 12:30 AM
LOCATION: ELI-NP

EXTREME LIGHT INFRASTRUCTURE - NUCLEAR PHYSICS (ELI-NP)
ELI-NP is going to be the most advanced research facility in the world focusing on the study of photonuclear physics and its applications, comprising a very high intensity laser of two 10PW ultra-short pulse lasers and the most brilliant tunable gamma-ray beam. This unique experimental combination will enable ELI-NP to tackle a wide range of research topics in fundamental physics, nuclear physics and astrophysics, and also applied research in materials science, management of nuclear materials and life sciences. ELI-NP has been selected by the most important science committees in Nuclear Physics in Europe - NuPECC - in the Nuclear Physics Long Range Plan in Europe as a major facility.

Onsite registration: 35 EUR + VAT

TECHNICAL TOUR NO. 3
MAY 29, 2019, 9:00 - 12.30 AM
LOCATION: INCD URBAN-INCERC,
266 PANTELIMON SOS., BUCHAREST - 2

BUILDING KNOWLEDGE HUB ROMANIA @ INCD URBAN-INCERC
The visit consists of a guided tour organized with our specialists to the Practical Training Facility developed within the Building Knowledge Hub (BKH Romania). The visitors will have the opportunity to see full-scale models and mock-ups representing the state-of-the-art technology relevant for practical application of Passive House principles and adequate for an effective implementation of the nearly zero energy buildings (nZEB), being the first centre of its kind in the country. Information and pictures from previous similar events can be found (in Romanian) at: https://www.proznеб.ro/noutati-si-evenimente.html.

Onsite registration: 35 EUR + VAT
REHVA COURSES

REHVA COURSE 1 - NZEB DESIGN: APPROACH, PRINCIPLES AND BEST PRACTICES

Date: May 27, 2019 - ROOM G-M-10
TIME: 10:00-13:00

Teachers:
Stefano Paolo Corgnati, Politecnico di Torino, Department of Energy
Cristina Becchio, Politecnico di Torino, Department of Energy
Cătălin Lungu, Technical University for Civil Engineering, Bucharest

Course description: A clear design approach, starting from the very first conceptual phase, is fundamental to develop the target of a zero energy building, up to a positively active energy building. Nowadays, suitable technologies are well established so the problem is to apply innovative solutions in a systemic way, considering at the same time their energy, environmental and economic effect. The selection of a proper mix of energy technologies is the crucial issue in the design phase, and the cost optimal approach can be a powerful tool to compare solutions and selecting best ones. In this course, the design principles for an nZEB are not only introduced and discussed, but also examined in their applications by analysing successful case studies.

Price for students 35 Eur
Price for non-students 75 Eur

REHVA COURSE 2 - HOW TO DESIGN HYBRIDGEOTABS BUILDINGS’ COMPONENTS

Date: May 28, 2019 - ROOM G-M-10
TIME: 10:00-13:00

Teachers:
Hector Cano, Geoter
Jan Hoogmartens, Viessmann
Qian Wang, Uponor/KTH
Lieve Helsen, KULeuven

Course description: A clear design approach, starting from the very first conceptual phase, is fundamental to develop the target of a zero energy building, up to a positively active energy building. Nowadays, suitable technologies are well established so the problem is to apply innovative solutions in a systemic way, considering at the same time their energy, environmental and economic effect. The selection of a proper mix of energy technologies is the crucial issue in the design phase, and the cost optimal approach can be a powerful tool to compare solutions and selecting best ones.

Price for students 35 Eur
Price for non-students 75 Eur
ASHRAE COURSE - UPDATE ON REFRIGERANTS: PAST, PRESENT AND FUTURE
Date: May 26, 2019 - BRAȘOV HALL, JW MARRIOT GRAND HOTEL
TIME: 09:00-12:00

Presented by: Dr. Eng. Eckhard A. Groll, Purdue University, USA, Reilly Professor of Mechanical Engineering, Associate Dean for Undergraduate and Graduate Education, College of Engineering, Purdue University, Ray W. Herrick Laboratories
West Lafayette, Indiana 47907-2099, USA

Onsite registration 73 Eur

ADAPTATION & MITIGATION OF CLIMATE CHANGE EFFECTS WITH THE SCOPE OF PUBLIC SPACE VALUE IMPROVEMENT
Date: May 28, 2019 - ROOM G-M-10
TIME: 15:30-18:00

Course description: Global climate change impacts Europe in many ways, including: changes in average and extreme temperature and precipitation, warmer oceans, rising sea level and shrinking snow and ice cover on land and at sea. These have led to a range of impacts on ecosystems, socio-economic sectors and human health. The last decade was the warmest since global temperature records became available. Human influence — primarily emissions of greenhouse gases, but also changes in land use — has been the dominant cause of the observed warming since the mid-20th century. In September 2015, United Nations Member States adopted a comprehensive global development agenda: Transforming our world: the 2030 Agenda for Sustainable Development, more commonly known as the Sustainable Development Goals (SDGs). At the same time, the technological revolution that we are currently experiencing has affected every aspect of our everyday life. Rapid technological advances of our society changes with the same rapid rate that is introduce.

Authors:
PhD. arch. Cristina Victoria Ochinciu, University of Architecture and Urbanism „Ion Mincu”
PhD. eng. Iolanda Colda, Technical University of Civil Engineering of Bucharest
PhD Eng. Mihaela Georgescu, University of Architecture and Urbanism „Ion Mincu”
PhD student Stefania Trifan Teodorescu, University of Architecture and Urbanism „Ion Mincu”

Onsite registration 70 Eur + VAT
SUNDAY 26th of May 2019
Venue – Romania National Library, Bulevardul Unirii 22, Bucharest 030833

14:00 – 16:30  CLIMA 2019 REGISTRATION OPENING
16:30 – 17:00  CLIMA 2019 - OPENING CEREMONIE (PLENARY SESSION 1, Aula Hall)
   Chair: Cătălin Lungu, Assoc. Prof. Dr. Eng. - REHVA Vicepresident & CLIMA Organising Committee Chair, Technical University for Civil Engineering, ROMANIA
17:00 – 18:00  CLIMA ORGANIZERS SPEECH
   Prof. Dr. Eng. Sorin Burchiu, CLIMA 2019 & AIIR President
   Prof. Dr. Eng. Radu Văcăreanu, UTCB Rector
   Prof. Dr. Stefano Corgnati, REHVA ex-President
   Frank Hovorka, REHVA President
   Acad. Ioan Dumitrache, Romanian Academy General Secretary
   Acad. Nicolae Zamfir - General Manager ELI-NP project, IFIN-HH Măgurele
18:00 – 18:40  Keynote Lecture: Cătălina Turcu, Prof. Assoc. Dr. Arch. - University College of London, UK
   Decarbonising the built environment: does it make us healthier and happier?
18:40 – 19:00  Diamond Sponsor Presentation: Hilde Dhont - Department Manager of the Daikin Europe Environment Research Center; Daikin Vision 2050
19:00 – 20:00  ”Ilie Stepan and friends” CONCERT (Aula Hall)
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 - Atrium and Scriptorium Halls
20:30 - 23:00  WELCOME RECEPTION
PROGRAM AT A GLANCE

**MONDAY 27th of May 2019**

**08:30 – 09:40** CLIMA 2019 - PLENARY SESSION 2, Aula Hall

**09:40 – 09:50** Emerald Sponsor Presentation: EUROVENT CERTITA

**09:50 – 10:00** Wellcome Speech - Romanian Officials

**10:00 – 10:30** COFFEE BREAK

**10:30 - 13:00**
- Session 1 A - Room: A-03-09
- Session 1 B - Room: D-05-10
- Session 1 C - Room: D-06-10
- Session 1 D - Room: D-06-13
- Session 1 E - Room: A-03-10
- Session 1 F - Room: G-M-04
- Session 1 G - Room: B-01-26
- Session 1 H - Room: E-M-02
- Session 1 I - Room: E-M-03
- Session 1 J - Room: A-03-08

**13:00 – 14:00** LUNCH

**14:00 – 15:30** CLIMA 2019 - PLENARY SESSION 3, Aula Hall

**15:30 – 16:00** COFFEE BREAK

**16:00 – 18:00**
- Session 2 A - Room: A-03-09
- Session 2 B - Room: D-05-10
- Session 2 C - Room: D-06-10
- Session 2 D - Room: D-06-13
- Session 2 E - Room: A-03-10
- Session 2 F - Room: G-M-04
- Session 2 G - Room: B-01-26
- Session 2 H - Room: E-M-02
- Session 2 I - Room: B-01-25
- Session 2 J - Room: G-M-10

**18.00 – 19.00** Spare time / visit to HOUSE OVER4-ROMANIAN REPRESENTATIVE AT SOLAR DECATHLON HUNGARY 2019

**19:00 – 23:00** AIIR’s PRESIDENT DINNER
Building Services Engineering Faculty Campus, Bdul Pache Protopopescu 66
MONDAY 27th of May 2019

Venue – Romania National Library, Bulevardul Unirii 22, Bucharest 030833

CLIMA 2019 - PLENARY SESSION 2, Aula Hall
Chairs: Frank Hovorka, REHVA President, FRANCE; Jaap Hogeling, Chairperson of CEN/TC371, EPB CENTER, The NETHERLANDS

08:30 – 09:00 Keynote Lecture: Jarek Kurnitsky, Prof. Dr. Eng. - REHVA vice-president, Tallinn University of Technology, ESTONIA; Nearly zero energy buildings and EPBD implementation

09:00 – 09:40 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

09:40 – 09:50 Emerald Sponsor Presentation: Erick Melquiond - President/Director of Strategy, Eurovent Certificaon; Third party certification

09:50 – 10:00 Bogdan Rogin - Policy Advisor-Regional Development Committee at European Parliament; An initiative about legislation simplification

10:00 – 10:30 COFFEE BREAK

ORDINARY SESSION 1
Session 1 A
10:30 - 13:00 Criteria for thermal environment and ventilation
Chairs: Risto Kosonen, Olli Seppänen, Cristiana Croitoru

Room: A-03-09
10:30 – 10:45 Evaluating the cooling capacity of diffuse ceiling ventilation system – Full-scale experimental study
Samira Rahnama, Peter Vilhelm Nielsen, Alireza Afshari, Niels Christian Bergsøe, Hicham Johra and Rasmus Lund Jensen

10:45 – 11:00 Indoor Climate and Energy Performance in Nearly Zero Energy Day Care Centers and School Buildings
Kaiser Ahmed, Kalle Kuusk, Henrik Heininen, Endrik Arumägi, Targo Kalamees, Tero Asu, Nicola Lolli and Jarek Kurnitski
11:00 – 11:15  Evaluation of Four Models for Predicting Thermal Sensation in Chinese Residential Kitchen

Hiroki Takahashi, Mariya Petrova

11:15 – 11:30  Incorporating cooling and ventilation effects into a single IEQ indicator

Matjaž Prek, Gorazd Krese and Žiga Lampret

11:30 – 11:45  Finnish Guidelines of Ventilation Rates for non-residential buildings

Olli Seppänen, Jorma Säteri and Mervi Ahola.

11:45 – 12:00  Non-uniformity in outdoor CO2 concentration in city of Copenhagen

Hiroki Takahashi, Mariya Petrova, Bivolarova, Athanasia Keli, Jürgen Nickel and Arsen Krikor Melikov.

12:00 – 12:15  Human-Oriented Design of an Indoor Thermal Environment

Masanari Ukai and Tatsuo Nobe

12:15 – 12:30  A review of total volume environment and individually controlled micro-environment

Weixin Zhao, Risto Kosonen, Simo Kilpeläinen and Sami Lestinen

12:30 – 12:35  Thermal environment mitigation effects in suburban area

Yoshihito Kurazumi, Emi Kondo, Kenta Fukagawa, Yoshiaki Yamato, Kunihiro Tobita and Tadahiro Tsuchikawa

12:35 – 12:40  A study on the actual conditions associated with the presence of Acinetobacter sp. in a hospital waiting room

Akane Odagiri, U Yanagi, Miyoko Endo and Hisato Oda

12:40 – 12:45  Studies of Subjective Sleep Thermal Comfort and Adaptive Behaviors in Chinese Residential Buildings in Nine Cities

Weiping Hong, Dayi Lai, Junjie Liu and Jingjing Pei
ORDINARY SESSION 1

Session 1B

10:30 - 13:00  HVAC in residential buildings
Chairs: Philomena Bluyssen, Dirk Mueller, Ilinca Năstase

Room: D-05-10

10:30 – 10:45  Combinations of heat pump and photovoltaics for renovated buildings
Andreas Heinz and Christian Gaber

10:45 – 11:00  Evaluation Method for Thermal Environment in Residential Houses Using Score on Warmth
Yosuke Watanabe, Yumiko Araki, Mika Saito, Chaichang Chen, Misa Imazu, Shin-Ichi Kagiya, Hiroko Fujimura, Keiko Tsuda and Shin-Ichi Tanabe.

11:00 – 11:15  Experimental investigation of different nozzle designs inside active chilled beams
Max Rohn, Paul Mathis and Dirk Mueller

11:15 – 11:30  A numerical model and validation of phase change material integrated thermoelectric radiant cooling panel
Hansol Lim, Hye-Jin Cho, Seong-Yong Cheon, Soo-Jin Lee and Jae-Weon Jeong.

11:30 – 11:45  Experimental evaluation of phase change material radiant cooling panel integrated thermoelectric modules
Yong-Kwon Kang, Beom-Jun Kim, Soo-Yeol Yoon and Jae-Weon Jeong

11:45 – 12:00  Solar-ice systems for multi-family buildings: hydraulics and weather data analysis
Daniel Carbonell, Jeremias Schmidli, Daniel Philipen and Michel Haller.

12:00 – 12:15  Air change efficiency of room ventilation units
Alo Mikola, Juhan Rehand and Jarek Kurnitski

12:15 – 12:30  Finnish design ventilation rates for residential buildings
Jorma Säteri, Olli Seppänen and Mervi Ahola
ORDINARY SESSION 1

Session 1 C
10:30 - 13:00 Low energy heating and cooling systems

Chairs: Atze Boerstra
Rodica Frunzulică
Ștefan Stănescu

Room: D-06-10

10:30 – 10:45 The Effects of an Air Conditioning System using the Coanda Effect on an Indoor Office Environment
Hitomi Igarashi, Takashi Akimoto, Daisuke Hatori, Shun Kato, Hikari Sakakibara and Madoka Kimura

10:45 – 11:00 Experimental comparison of radiant ceiling panels and ceiling panels containing phase change material (PCM)
Dragos-Ioan Bogatu, Eleftherios Bourdakis, Ongun Berk Kazanci and Bjarne Olesen

11:00 – 11:15 The Examination of Air Blowing Method and Thermal Comfort of Variable Air Conditioning System using Coanda Effect
Hikari Sakakibara, Takashi Akimoto, Hitomi Igarashi, Shunsuke Nakamura and Madoka Kimura
11:15 – 11:30  
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
Mingzhe Liu, Ryozo Ooka, Toshiyuki Hino, Ke Wen, Wonjun Choi, Doyun Lee, Shintaro Ikeda and Djafar Palasz.

11:30 – 11:45  
Cooling performance of Ceiling Radiant Textile Air Conditioning System with Ceiling Cassette Unit of Packaged Air Conditioner
Toshio Yamanaka, Mari Kuranaga, Tatsunori Maeda and Haruto Kitakaze

11:45 – 12:00  
Energy saving potential of dedicated outdoor-air system assisted by vacuum based membrane dehumidifier
Seong-Yong Cheon, Soo-Yeol Yoon, Su Liu and Jae-Weon Jeong.

12:00 – 12:15  
Effect of Desiccant Solution Temperature on Regeneration Performance of a Cross-Flow Regenerator
Hye-Won Dong, Hye-Jin Cho and Jae-Weon Jeong

12:15 – 12:30  
Evaluation of Thermal Behavior of the Skeleton in a Green Building with the Aid of TABS
Hiroshi Muramatsu and Tatsuo Nobe.

12:30 – 12:35  
Energy Consumption of the VAC System for Subway Stations: A Model Based on Theoretical Analysis and its Engineering Application
Ziyi Su and Xiaofeng Li

12:35 – 12:40  
Geothermal System Study Case near Bucharest
Galina Prica, Gratiela Tarlea and Lohengrin Onuțu

12:40 – 12:45  
Heating Water and Tap Water Production with an Air-to-Water Heat Pump by Using the Waste Heat of an Oil-Free Air Compressor
Cem Gulseven and Zeki Yilmazoglu

12:45 – 13:00  
Debates/Discussions

13:00 – 14:00  
LUNCH
ORDINARY SESSION 1
Session 1 D
10:30 - 13:00  Predicted and real energy performance of buildings
Chairs: Francis Allard
        Guangyu Cao
        Ioan Silviu Dobosi

Room: D-06-13
10:30 – 10:45  ImmoGap - Analysis of the performance gap of apartment buildings
               Igor Mojic, Michel Haller, Meta Lehmann and Stefan Van Velsen

10:45 – 11:00  Quicker Measurement of Walls' Thermal Resistance Following an Extension to ISO 9869 Average Method
               Arash Rasooli and Laure Itard

11:00 – 11:15  Identifying typical hourly DHW energy use profiles in a hotel in Norway by using statistical methods
               Dmytro Ivanko, Natasa Nord, Åse Lekang Sørensen, Thale Sofie Wester Plesser,
               Harald Taxt Walnum and Igor Sartori

11:15 – 11:30  Analysis of Annual Energy Use Intensities(EUIs) by End-Use in Apartment Units According to Stratification Variables (2017-2018)
               Hye-Sun Jin, Han-Young Lim, You-Jeong Kim, Soo-Jin Lee, Sung-Im Kim, Jae-Han Lim and Seung-Yeong Song

11:30 – 11:45  Towards zero energy hospital buildings: a polyclinic building as case study
               Enrico Dainese, Shalika Walker, Wim Maassen and Wim Zeiler

11:45 – 12:00  Evaluation of in-depth energy modelling for the design and operation of a net-positive energy Solar Decathlon house
               Brendan Banfield

12:00 – 12:15  Metamodelling of building energy consumption focused on climate, operation, space use and users related factors
               Aymeric Novel, Francis Allard and Patrice Joubert.

12:15 – 12:30  Heat recovery in ventilation systems - waste heat use or renewable energy
               Claus Haendel
12:30 – 12:35  
**Mock-up Test of Time-lag in Floor Heating System with PCM**  
Taewon Kim, Jinchul Park and Sung Ho Choi

12:35 – 12:40  
**Comparative study on the theoretical electrical power consumption versus monitoring for an outdoor ice rink**  
Gianny Flamaropol and Elena-Camelia Tamas

12:40 – 12:45  
**Building energy modelling for the energy performance analysis of a hospital building in various locations**  
Ioan Silviu Dobosi, Cristina Tanasa, Nicoleta Elena Kaba, Adrian Retezan and Dragoș Mihailă

12:45 – 13:00  
Debates/Discussions

13:00 – 14:00  
LUNCH

**ORDINARY SESSION 1**

**Session 1 E**  

10:30 - 13:00  
**High Energy Performance and Sustainable Buildings**

**Chairs:**  
Jarek Kurnitsky  
Milos Lain  
Francesca R. D’Ambrosio

**Room: A-03-10**

10:30 – 10:45  
**Practical natural ventilation performance metric based on thermal autonomy for sustainable building design**  
Kyosuke Hiyama and Liwei Wen

10:45 – 11:00  
**A simple methodology for comparing cost-benefit of traditional, green and cool roofs**  
Diletta Di Lorenzo, Valeria Lupo, Giorgia Peri, Gianfranco Rizzo and Gianluca Scaccianoce

11:00 – 11:15  
**Investigation on the energy and air distribution efficiency with improved data centre cooling to support high-density servers**  
Jinkyun Cho, Yongdae Jeong and Beungyong Park

11:15 – 11:30  
**Innovative pre-fabricated components including different waste construction materials reducing building energy and minimising environmental impacts (InnoWEE)**
Francesca Becherini, Vilma Duman, Giovanni Ferrarini, Sergio Tamburini, Constantinos Tsoutis, Antonio Garrido-Marijuán, Giulia Mezzasalma, Leonardo Rossi, Loredana Fodor, Emil Lezak and Adriana Bernardi

**11:30 – 11:45** Passive generation from a novel thermoelectric energy harvesting system model integrated with phase change material
Byon Yoo-Suk, Hansol Lim, Yong-Kwon Kang, Soo-Yeol Yoon and Jae-Weon Jeong

**11:45 – 12:00** Workflow For Coupled Daylight And Energy Simulations
Tobias Skov Pedersen and Helle Foldbjerg Rasmussen.

**12:00 – 12:15** An Approach to Improve Energy and Cost Performance of a Social Housing Archetype in Cold Climate Region
Yiğit Yılmaz and Burcu Çiğdem Yılmaz.

**12:15 – 12:30** Demand response of space heating using model predictive control in an educational office building
Aleksi Mäki, Juha Jokisalo and Risto Kosonen

**12:30 – 12:35** Identifying suitable general circulation model for future building cooling energy analysis
Kuo-Tsang Huang, Yu-Teng Weng and Ruey-Lung Hwang

**12:35 – 12:40** A study on the Contamination of Microbial in a Geothermal Exchanger Pipe by Lab-experiment
Hyuntae Kim

**12:40 – 12:45** Internal insulation retrofit with ventilated wall and circulation of dry air - focus on airflow distribution and mitigation of noise
Christian A. Hviid, Dessy Wina Harjani and Fabricio Lucchesi

**12:45 – 13:00** Debates/Discussions

**13:00 – 14:00** LUNCH
ORDINARY SESSION 1
Session 1 F
10:30 - 13:00  Life-cycle services, commissioning, operation and maintenance of HVAC systems
Chairs: Blake Wenz  
        Sebastian Theißen  
        Angel Dogeanu
Room: G-M-04
10:30 – 10:45  Calibration of a building energy model using operation conditions derived from monitoring
Cristina Tanasa, Cristina Becchio, Stefano Paolo Corgnati, Valeriu Stoian and Daniel Dan
10:45 – 11:00  Study on environment conscious technologies in a super tall building: Evaluation of PV performance considering aerological climate
Ryosuke Inomata, Takashi Akimoto, Daisuke Hatori, Shigeaki Takanishi, Shunsuke Nakamura, Yosuke Mochizuki, Nana Araki and Daiki Yamashina
11:00 – 11:15  Importance of building services in ecological building assessments
Sebastian Theißen, Jannick Höper, Michaela Lambertz and Reinhard Wimmer
11:15 – 11:30  A Cradle-to-Grave Carbon Index (CI) for Design, Construction and Operations of Site-Specific Buildings
Boggarm Setty and James Woods.
11:30 – 11:45  Certified commissioning: “COPILOT” solutions for commissioning engineers from pre-design to post-delivery
Cormac Ryan
11:45 – 12:00  Towards Next Generation Building Management Systems
Ovidiu Noran, Ion Sota and Peter Bernus.
12:00 – 12:15  Can Green Labels become the new normal?
Germán Molina, Michael Donn, Micael-Lee Johnstone and Casimir MacGregor.
12:15 – 12:30  Eliminating the Design-Operation Energy Gap: A Case Study on Developing a University Level Course
Timothy Wentz and Blake Wentz
12:30 – 12:35  Preliminary experimental and numerical analysis of a silica gel packed bed humidification system  
Edoardo Cazzaniga, Luigi Colombo and Stefano De Antonellis

12:35 – 12:40  Microbiome in an Office Building Using a Cooling Trench as an Outdoor Air Duct  
Mizuki Niimura and U Yanagi

12:40 – 12:45  Experimental assessment of acoustic comfort in a passive house  
Catalin Bailescu, Tiberiu Catalina, Vlad Iordache

12:45 – 13:00  Debates/Discussions

13:00 – 14:00  LUNCH

ORDINARY SESSION 1

Session 1 G
10:30 - 13:00  Simulation models and predictive tools for the buildings HVAC  
Chairs:  Christian Inard, Dick van Dijk, Jaap Hogeling

Room: B-01-26

10:30 – 10:45  A study of the nonlinearity of a building thermal behavior based on metamodeling  
Issa Jaffal and Christian Inard

10:45 – 11:00  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)  
Delia D’Agostino and Danny Parker

11:00 – 11:15  Optimal design of an indoor environment using an adjoint RNG k-ε turbulence model  
Xingwang Zhao and Qingyan Chen

11:15 – 11:30  The new EN ISO 52000 family of standards to assess the energy performance of buildings put in practice  
Dick van Dijk and Jaap Hogeling

11:30 – 11:45  Modelling study on pipe-encapsulated PCM wall system for building insulation and active heat removal  
Tian Yan, Xinhua Xu and Jiajia Gao

11:45 - 12:00  Establish high-resolution hourly weather data for simulating building energy consumption in different regions  
Feng-Yi Lin, Ruey-Lung Hwang and Tzu-Ping Lin.

12:00 – 12:15  CO2-based grey-box model to estimate airflow rate and room occupancy  
Sebastian Wolf, Maria Justo Alonso,
12:15 – 12:30 Sensitivity analysis of peak and annual space cooling load at simplified office dynamic building model
Vasco Zeferina, Christina Birch, Rodger Edwards and Ruth Wood

12:30 – 12:35 A Study on the Simulation Result of Horizontal Shading Installation for Passive Cooling of Building South KOREA
Seok-Hyun Kim, Soo Cho and Young-Hum Cho

12:35 – 12:40 Study on Cross-Ventilation Performance of Residences in the Passive Town Kurobe Model Based on Measurements and CFD
Yoju Homma and Takashi Kurabuchi

12:40 – 12:45 Aspects regarding the prediction of earth electrode corrosion in the soil of Timisoara
Stefan Pavel, Ioan-Bogdan Pascu, Bogdan-Ovidiu Taranu, Oana-Alexandra Grad, Romeo Negrea and Ioan-Silviu Dobosi

12:45 – 13:00 Debates/Discussions

13:00 - 14:00 LUNCH

ORDINARY SESSION 1

 Session 1 H

10:30 - 13:00 HVAC efficient strategies
Chairs: Dušan Petráš
Andrei Damian
Zhang Xu

Room: E-M-02

10:30 – 10:45 Experimental Analysis of Residential Ventilation and Dehumidification Strategies in Chongqing
Xin Zhang, Junjie Liu, Xilei Dai and Jingjing Pei

10:45 – 11:00 A novel spherical packed bed application on decentralized heat recovery ventilation units
Alper Mete Genc, Ziya Haktan Karadeniz, Orhan Ekren and Macit Toksoy

11:00 – 11:15 A Field Survey on Indoor Air Pollution in School Classrooms with Different Ventilation Methods
Ko Murakami, Kenta Sakai, Daisuke Nakamura, Haruno Ishikawa, Sayana Tsushima and Shin-Ichi Tanabe
11:15 – 11:30  Improved thermal energy storage for heating and cooling of buildings
Rok Kozelj, Ziga Ahcin, Eva Zavrl and Uros Strih.

11:30 – 11:45  Numerical Investigation of School Stratified Ventilation Systems - A Ventilation Effectiveness Study
Mohammad Reza Adili

11:45 – 12:00  Energy and economical evaluation of residential buildings in Slovakia
Jana Bartosova and Dušan Petráš.

12:00 – 12:15  The influence on Daylight and Energy Consumption of Expanded Metal Mesh Applied on Building Façades
Yaw-Shyan Tsay and Chih-Hung Yang

12:15 – 12:30  Interlinking the effect of thermal mass and temperature control strategies in dwellings
Stijn Verbeke and Amaryllis Audenaert

12:30 – 12:35  Composite silicone-SAPO-34 foams: experimental characterization for open cycle applications
Lucio Bonaccorsi, Luigi Calabrese, Stefano De Antonellis, Angelo Freni, Cesare Joppolo and Mario Motta

12:35 – 12:40  Fundamental Study on a Tracer Gas Experimental Method that uses Dynamic Steady State Concentration and can be Applied to an Air Recirculating System
Naoya Ikemura, Takashi Kurabuchi, Jinya Takeuchi, Hazime Yoshino and Yoshihiro Toriumi

12:40 – 12:45  Air-Water-Heat Pump with low GWP refrigerant
Vinceriuc Mioara, Tarlea Gratiela and Tarlea Ana

12:45 – 13:00  Debates/Discussions
13:00 – 14:00  LUNCH

ORDINARY SESSION 1
Session 1 I
10:30 - 13:00  Big data and machine learning applications in buildings
Chairs: Gilles Noton
Sorin Caluianu
Florin Bode
Room: E-M-03

10:30 - 10:45  Mixing Loop Control using Reinforcement Learning
Anders Overgaard, Carsten Skovmose Kallesøe, Jan Dimon Bendtsen and Brian Kongsgaard Nielsen

10:45 – 11:00  Hit2Gap Project: Highly Innovative building control Tools Tackling the energy performance gap
Andrea Costa, Marco Pietrobon and Thomas Messervy

11:00 – 11:15  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
Ke Wen, Ryozo Ooka, Toshiyuki Hino, Mingzhe Liu, Doyun Lee, Wonjun Choi, Shintaro Ikeda and Palasz

11:15 – 11:30  Forecasting of Three Components of Solar irradiation for Building Applications
Gilles Notton, Cyril Voyant, Alexis Fouilloy, Jean Laurent Duchaud and Marie Laure Nivet.

11:30 – 11:45  The “HumFlow” Project – Developing a minimal invasive measurement system for estimating energy and humidity transfer processes through building walls
Alessio Cavaterra, Andreas Böttcher and Steven Lambeck

11:45 – 12:00  Automated investigation, evaluation and optimisation of simple heating circuits in building automation
Marius Ostermeier and Jochen Müller.

12:00 – 12:15  Energy demand prediction for the implementation of an energy tariff emulator to trigger demand response in buildings
Sarah Noyé, Unai Saralegui, Raphael Rey, Miguel Angel Anton and Ander Romero.

12:15 – 12:30  Predicting personal thermal preferences based on data-driven methods
Jose Joaquin Aguilera, Jørn Toftum and Ongun Berk Kazanci
12:30 – 12:35 A convenient method to assess air infiltration rate using particle mass balance principle
Yuchen Shi and Xiaofeng Li

12:35 – 12:40 Prediction model for day-ahead solar insolation using meteorological data for smart grid
Min Hee Chung

12:40 – 12:45 Variation of window acoustic attenuation depending on air tightness joints
Vlad Iordache, Tiberiu Catalina, Mihai Vlad Ionita, Florin Iordache, Alexandra Ene, Claudiu Stanciu, Marta Cristina Zaharia, Ioana Alexe and Ciprian Ene

12:45 – 13:00 Debates/Discussions

13:00 – 14:00 LUNCH

ORDINARY SESSION 1

Session 1 J
10:30 - 13:00 Energy performance requirements, compliance assessment and cost optimality
Chairs: Livio Mazzarella
Juan Travesi
Tiberiu Catalina

Room: A-03-08

10:30 – 10:45 Redefining cost-optimal nZEB levels for new residential buildings
Raimo Simson, Endrik Arumägi, Kalle Kuusk and Jarek Kurnitski

10:45 – 11:00 How to Compare Energy Performance Requirements of Japanese and European Office Buildings
Kaiser Ahmed, Gyuyoung Yoon, Makiko Ukai and Jarek Kurnitski

Touraj Ashrafian, A. Zerrin Yılmaz and Nazanin Moazzen

11:15 – 11:30 Development of an integrated low-carbon heating system for outdoor swimming pools for winter application
Yantong Li and Gongsheng Huang

11:30 – 11:45 Techno-economic and environmental performances of heating systems for single-family code-compliant and passive houses
11:45 – 12:00  Determination of the most influential and cost-optimal building characteristics on the energy performance of commercial and industrial buildings
Hilde Breesch, Barbara Wauman and Marcus Peeters

12:00 – 12:15  Progress in energy efficiency standards of residential buildings in China’s severe cold and cold zones
Zhenyu Yu, Wei Xu, Deyu Sun, Fei Lu, Changping Liu and Jing Zhang

12:15 – 12:30  Thermal Zones Modelling for an Energy Efficient Commercial Building – Case Study
Elena-Camelia Tamas

12:30 – 12:35  Glazed balconies impact on energy consumption of multi-story buildings
Tiberiu Catalina, Daniel Bortis, Catalin Lungu

12:35 – 12:40  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
Valentin Veron Toma, Sebastian Antonie, Tiberiu Catalina

12:40 – 12:45  Adaptation of buildings to climate change through bioclimatic strategies, in Romania.
Bodale Anca, Sima Catalin and Tiberiu Catalina

12:45 – 13:00  Debates/Discussions

13:00 – 14:00  LUNCH

**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 – 14:40  Keynote Lecture: Francis Allard, Professor Emeritus - La Rochelle University, FRANCE; Assessing Urban Heat Islands: stakes and recent advances in design solutions and technology

14:40 – 14:50  Emerald Sponsor Presentation: Costin Sandu, AMTEH International; Past and Present
14:50 – 15:30 **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*

15:30 – 16:00 **COFFEE BREAK**

**ORDINARY SESSION 2**

**Session 2 A**

16:00 – 18:00 **Criteria for thermal environment and ventilation**  
*Chairs:* Pawel Wargocki, Arsen Melikov Francis Allard

**Room: A-03-09**

16:00 – 16:15 **Impact of room airflow interaction on metabolic CO2 exposure**  
Athanasia Keli, Arsen K. Melikov, Mariya P. Bivolarova and Panu Mustakallio

16:15 – 16:30 **Subzone Control of Air Distribution to Improve Thermal Comfort and Energy Efficiency**  
Sheng Zhang, Yong Cheng, Xiaoliang Shao and Zhang Lin

16:30- 16:45 **European Study on heat recovery in non-residential buildings**  
Christoph Kaup, Jens Knissel

16:45 – 17:00 **Revised Finnish classification of indoor climate 2018**  
Mervi Ahola, Jorma Säteri and Laura Sariola

17:00 – 17:15 **Thermal comfort and draught assessment in a modern open office building in Tallinn**  
Martin Kiil, Alo Mikola, Martin Thalfeldt and Jarek Kurnitski

17:15 – 17:30 **Influence of installation of displacement ventilation diffusers above occupied zone on the vertical temperature gradient in simulated office rooms**  
Panu Mustakallio, Risto Kosonen, Mika Ruponen and Natalia Lastovets

17:30 – 17:45 **Effects on the Ventilation of a Two-Storey Building under Different Thermal Conditions**  
Tim Röder, Paul Mathis and Dirk Müller
17:45 – 18:00  
Human response to the thermal indoor environment created by a radiant, and a combined radiant and convective cooling system  
Ongun Berk Kazanci, Dolaana Khovalyg, Takayoshi Iida, Yoshitaka Uno, Tomo-Oki Ukiana and Bjarne W Olesen

ORDINARY SESSION 2

Session 2 B
16:00 – 18:00  
HVAC in residential buildings

Chairs:  Fabian Ochs, Tiberiu Catalina, Martin Ivanov

Room: D-05-10

16:00 – 16:15  
Effects of the room temperature sensor position and radiator sizing on indoor thermal comfort and energy performances  
Jean Pierre Campana, Matthias Schuss, Ardeshir Mahdavi and Gian Luca Morini

16:15 – 16:30  
Application of heat pump combined two-stage desiccant wheel fresh air system of residential buildings in mixed climate zone  
Shaochen Tian, Xing Su and Xu Zhang

16:30 – 16:45  
Thermal performance characterisation of a reverse-flow energy recovery ventilator for a residential building application  
David Hunt, Naoise Mac Suibhne, Laurentiu Dimache, David McHugh and John Lohan

16:45 – 17:00  
Compact ventilation and heat pump with recirculation air for renovation of small apartments  
Fabian Ochs, Toni Calabrese, Dietmar Siegele and Georgios Dermentzis

17:00 – 17:15  
Experimental Evaluation of the Ability of an Auxiliary Heating Device to Reduce the Condensation Risk around Built-in Wardrobes of Apartment Buildings in Winter  
Chaelyn Lee, Hyunhwa Lee, Jaehan Lim and Seungyeong Song.

17:15 – 17:30  
Exhaled air speed measurements of respiratory air flow, generated by ten different human subjects, under uncontrolled conditions  
Martin Ivanov
17:30 – 17:45  Evidence based residential ventilation: sizing procedure and system solutions addressed by REHVA Residential Ventilation Task Force  
Jarek Kurnitski, Martin Thalfeldt, Harry van Weele, Macit Toksoy, Thomas Carlsson, Petra Vladykova Bednarova and Olli Seppänen

17:45 – 18:00  Numerical Analysis of Air Flow in a Modular Fan Unit Using CFD Simulation  
Petr Zelenský, Martin Barták, Vojtěch Zavřel, Vladimír Zmrhal and Radislav Krupa

ORDINARY SESSION 2  
Session 2 C  
16:00 - 18:00  Low energy heating and cooling systems  
Chairs: Martin Thalfeldt, Renars Millers Nicolae Antonescu

Room: D-06-10  
16:00 – 16:15  Optimising the Number of Pumps and Balancing Valves in Chilled Water Distribution Systems  
Szilveszter-Zoltán Geyer Ehrenberg and Adrian Retezan

16:15 – 16:30  Full-scale operation of a novel two-pipe active beam system for simultaneous heating and cooling of office buildings  
Alessandro Maccarini, Göran Hultmark, Niels C. Bergsøe and Alireza Afshari

16:30 – 16:45  Review on the Surface Heat Transfer Coefficients of Radiant Systems  
Jun Shinoda, Ongun B. Kazanci, Shin-Ichi Tanabe and Bjarne W. Olesen

16:45 – 17:00  Comparison of Performance of Desiccant Air Handling Unit with Solar Thermal System under Various Control Methods  
Makiko Ukai and Masaya Okumiya

17:00 – 17:15  Estimation of load duration curves from general building data in the building stock using dynamic BES-models  
Rana Mahmoud, Mohsen Sharifi, Eline Himpe, Marc Delghust and Jelle Laverge

17:15 – 17:30  Thermally Activated Concrete Slabs with Integrated PCM Materials  
Renars Millers, Aleksandrs Korjakins and Arturs Lesinskis
17:30 – 17:45  
Optimal PI control parameters for accurate underfloor heating temperature control  
Tuule Mall Kull, Martin Thalfeldt and Jarek Kurnitski

17:45 – 18:00  
Assessment of Thermal Environment in a Kitchen with a New Ventilation System  
Sumei Liu, Xiaojie Zhou, Xuan Liu, Ke Qing, Xiaorui Lin, Weizhen Zhang, Jian Li, Jiankai Dong, Dayi Lai and Qingyan Chen

ORDINARY SESSION 2  
Session 2 D  
16:00 - 18:00

Predicted and real energy performance of buildings  
Chairs: Jianlin Wu, Joaquim Rigola, Razvan Calota

Room: D-06-13

16:00 – 16:15
Properties of the Triangular Excitation Pulse and the 3D Heat Transfer Effects in the Excitation Pulse Method  
Arash Rasooli and Laure Itard

16:15 – 16:30
Minimization procedure of experimental tests for calibration purposes, within HVAC&R energy efficiency framework  
Sergio Morales-Ruiz, Carles Oliet, Jesús Castro, Joaquim Rigola and Assensi Oliva

16:30 – 16:45
Discussion of Optimized Operation of a nearly Zero Energy Building's Energy System in China  
Huai Li, Zhen Yu, Jianlin Wu, Wei Xu and Shicong Zhang

16:45 – 17:00
A Study on Energy and Cost Efficiency for Existing Hotel Buildings in Turkey  
Merve Atmaca and Ayse Zerrin Yilmaz

17:00 – 17:15
Energy Efficient Designs of Sustainable Buildings in Urban Environment  
Essam Khalil and Doaa Elsherif

17:15 – 17:30
Thermodynamic sustainability assessment for heating of residential building  
Milan Gojak and Tamara Bajc
17:30 – 17:45  Comparative analysis for renovation of an air heating and cooling system from a Romanian administrative building
Răzvan Calotă, Mădălina Nichita, Anica Ilie, Alina Girip and Robert Titi

17:45 – 18:00  Caloric method for the energetic evaluation of decentralised domestic ventilation devices
Christian Friebe, Andreas Hantsch, Sabine Döge and Ralph Krause

ORDINARY SESSION 2
Session 2 E
16:00 – 18:00  High Energy Performance and Sustainable Buildings
Chairs: Cristoph Kaup, Jean Menhert, Wei Liu

Room: A-03-10
16:00 – 16:15  Efficient Operation of Heat Source using High-temperature Chilled Water in an Advanced Office Building

16:15 – 16:30  Measurement Analysis and Evaluation of Desiccant Air Handling Units with Various Heat Source
Taro Sasamoto and Makiko Ukai

16:30 – 16:45  An algorithmic module toolkit to support quality management for building performance
Jan Mehnert, Dirk Reiß, Stefan Plessner and Matthias Hannen

16:45 – 17:00  Impact of space layout on energy performance of office buildings coupling daylight with thermal simulation
Tiantian Du, Sabine Jansen, Michela Turrin and Andy Van Den Dobbelsteen

17:00 – 17:15  Environmental impacts for polyurethane panels
Erika Guolo, Piercarlo Romagnoni, Fabio Raggioo and Francesca Cappelletti

17:15 – 17:30  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
Wei Liu, Zhen Yu, Jianlin Wu, Huai Li, Caifeng Gao and Hongwei Gong

17:45 – 18:00  Effect of Cross-Ventilation and Solar Irradiation on IAQ as a function of Roof Angle
Anil Berk Atalar and Murat Cakan

ORDINARY SESSION 2
Session 2 F
16:00 – 18:00  Building components and double skin facades and energy efficiency
Chairs: Sihvan Lee, Wei Ye, Sebastian Hudisteanu

Room: G-M-04
16:00 – 16:15  Framework for a transient energy-related occupant behaviour agent-based model
Jakub Wladyslaw Dziedzic, Da Yan and Vojislav Novakovic

16:15 – 16:30  Energy Performance Evaluation of Hybrid VRF Systems Based on Japanese Government-Designated Method
Tokimi Kawase, Tatsuo Nobe and Atsushi Hashimoto

16:30 – 16:45  Application of Dynamic Insulation Technique to Airflow Window System
Yuichi Omodaka, Kyosuke Hiyama, Thanyalak Srisamranrungruang, Yutaka Oura and Yukiyasu Asaoka

16:45 – 17:00  Climate Change and Building Technologies: Investigations of Future Weather Scenarios on Building Energy Performance
Daniel Kierdorf, Jakob Hahn and Werner Lang

17:00 – 17:15  Innovative solutions of prefabricated facades of concrete with PCMs for nearly zero energy buildings
17:15 – 17:30 Numerical study on heat blocking efficiency of non-recirculating air curtain and its optimal discharge velocity
Sihwan Lee

17:30 – 17:45 Numerical analysis of the efficiency and energy production of the building integrated photovoltaics for various configurations
Sebastian Valeriu Hudisteanu and Catalin George Popovici

17:45 – 18:00 Analysis of different building exterior walls insulations using eQUEST
Abdellah Zerroug and Egils Dzelzitis

ORDINARY SESSION 2
Session 2 G
16:00 – 18:00 Simulation models and predictive tools for the buildings HVAC
Chairs: Christian Inard
Răzvan Popescu
Cătălin Teodosiu

Room: B-01-26
16:00 – 16:15 Analysis of the need of detailed modelling for the assessment of indoor air quality in residential buildings
Louis Cony, Nouamane Belhaj, Olivier Ramalho and Marc Abadie

16:15 – 16:30 A set of comprehensive indicators to assess energy flexibility: a case study for residential buildings
Francesco D’Ettorre, Marcus Brennenstuhl, Anjukan Kathirgamanathan, Mattia De Rosa, Malcolm Yadack, Ursula Eicker and Donal Patrick Finn

16:30 – 16:45 Dynamic design model of displacement ventilation
Natalia Lastovets, Risto Kosonen, Juha Jokisalo and Simo Kilpeläinen

16:45 – 17:00 Model predictive control for buildings with active one-pipe hydronic heating
Jiří Dostál and Tomáš Bäumelt
17:00 – 17:15  Comparison of model identification techniques for MPC in all-air HVAC systems in an educational building
Bart Merema, Hilde Breesch and Dirk Saelens

17:15 – 17:30  Integration of fast fluid dynamics and Markov chain model for predicting transient particle transport in buildings
Wei Liu and Chun Chen

17:30 – 17:45  Performance analysis of an active diffuser in mixing ventilation for cell office by using numerical approach
Mehrdad Rabani, Habtamu Bayera Madessa, Natasa Nord and Peter Schild.

17:45 – 18:00  Energy Efficient Control of the Dehumidification Process in Heat Exchangers with Air Bypass
Stephan Kusche and André Badura

ORDINARY SESSION 2
Session 2 H
16:00 – 23:00  Other efficient HVAC systems
Chairs: Jiří Dostál, Andreea Voight, Wim Maassen

Room: E-M-02
16:00 – 16:15  Evaluation Dutch preliminary nZEB requirements for hospital and university buildings
Wim Maassen

16:15 – 16:30  Performance evaluation of different micro-CHP configurations in real life conditions and the influence of part load behaviour
Ivan Verhaert, Freek Van Riet, Robin Baetens, Margot De Pauw and Michiel Van Erdeweghe

16:30 – 16:45  Energy-efficient hybrid dual-duct dual-fan systems
Edward Przydrozny, Aleksandra Przydrozna

16:45 – 17:00  Optimizing production efficiencies of hot water units using building energy simulations - Trade-off between Legionella pneumophila contamination risk and energy efficiency
Elisa Van Kenhove, Lien De Backer and Jelle Laverge
**17:00 – 17:15**  
The influence of external air supply to air-conditioning systems with fan coil units on the design set-points and the energy consumption  
Aleksandra Przydrozna and Edward Przydrozny

**17:15 – 17:30**  
Design methodology for combined production and distribution for domestic hot water and space heating  
Ivan Verhaert

**17:30 – 17:45**  
Radiant wall cooling with pipes arranged in insulation panels attached to facades of existing buildings  
Martin Šimko, Michal Krajčík and Ondřej Šikula

**17:45 – 18:00**  
Boosting affordability, acceptability and attractiveness of deep energy renovations of residential buildings – a people-centred ethnographic approach  
Gregor Cerinsek, Domen Bancic, Dan Podjed, Simona D’Oca, Jure Vetrsek, Slavko Dolinsek and Peter Op’t Veld

**ORDINARY SESSION 2**

**Session 2 I**

**16:00 – 18:00**  
Machine learning and digitalization of buildings  
Chairs: Ovidiu Noran, Ralph Ulmer, Sorin Căluianu

**Room: B-01-25**

**16:00 – 16:15**  
Integration of operational data in building information modelling: From ontology to application  
Ardeshir Mahdavi and Dawid Wolosiuk

**16:15 – 16:30**  
Development of Industry 4.0 models and their applicability for BIM  
Maximilian Both, Jochen Müller and Björn Kämper

**16:30 – 16:45**  
User-oriented verification of automation stations  
Ralf Ulmer and Jochen Müller

**16:45 – 17:00**  
Operation strategies to achieve low supply and return temperature in district heating system  
Haoran Li and Natasa Nord
17:00 – 17:15  H2020 BIMplement Project - Can BIM be used for smart upskilling professions involved in the construction process?
Peter Op T Veld and Ana Tisov

17:15 – 17:30  climify.org: an online solution for easy control and monitoring of the indoor environment
Davide Calì, Ekkart Kindler, Razgar Ebrahimy, Peder Bacher, Kevin Hu, Michelle Lind Østrup, Magnus Bachalarz and Henrik Madsen

17:30 – 17:45  Control strategy for battery-supported photovoltaic systems aimed at peak load reduction
Ruslan Zhuravchak, Natasa Nord and Helge Brattebø

17:45 – 18:00  Certification systems for green buildings in Romania – LEED, BREEAM, green homes & the importance of BIM interdisciplinary collaboration in order to achieve energy-efficient projects
Laura Amaiei and Clarissa Ivan

ORDINARY SESSION 2
Session 2 J
16:00 – 16:00  Energy efficient renovation of existing buildings
Chairs: Raluca Teodosiu, Erik Melquind, Ongun Berk Kazanci

Room: G-M-10
16:00 – 16:15  Retrofit solutions for an historic building integrated with geothermal heat pumps
Laura Carnieletto, Giuseppe Emmi, Marco Artuzzi, Maria Celeste Piazza, Angelo Zarrella and Michele De Carli

16:15 – 16:30  Indoor Climate in Jesuit Church of Holy Name of Jesus in Telc
Ondrej Hnilica, Stefan Bichlmair and Josef Plasek

16:30 – 16:45  Impact of IPPC Scenarios on internal microclimate of historic buildings
Jan Weyr, Richard Kalný and Jiří Hirš

16:45 – 17:00  Some aspects of historical monument buildings central heating
Martin Kiil, Alo Mikola, Martin Thalfeldt and Jarek Kurnitski
**17:00 – 17:15**  The possibilities of application of radiant wall cooling in existing buildings as a part of their retrofit  Michal Krajčík and Ondřej Šikula.

**17:15 – 17:30**  Annual energy consumption between conventional and cob building  Kaoutar Zeghari, Hasna Louahlia, Malo Leguern, Mohamed Boutouil, Hamid Gualous, Michael Marion, Pierre Schaetzel, Steve Goodhew and François Streiff

**17:30 – 17:45**  Energy and thermal comfort performance evaluation of PCM ceiling panels for cooling a renovated office room  José Quesada Allerhand, Ongun Berk Kazanci and Bjarne W. Olesen

**17:45 – 18:00**  Investigation of the influence of operation conditions on the discharge of PCM ceiling panels  José Quesada Allerhand, Ongun Berk Kazanci and Bjarne Olesen

**18:00 – 19:00**  Spare time / Visit to House OVER4 - Romanian Representative at SolarDecathlon Hungary 2019

**19:00 – 23:00**  AIIR’s PRESIDENT DINNER  Venue: Building Services Engineering Faculty Campus, Bdul Pache Protopopescu 66, Bucharest 021414
# PROGRAM AT A GLANCE

**TUESDAY, 28 May 2019**

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<td>CLIMA 2019 - PLENARY SESSION 4, Aula Hall</td>
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<td>10:00 – 10:30</td>
<td>COFFEE BREAK</td>
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<td>10:30 - 13:00</td>
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<td>Session 3 H - Room: D-05-10</td>
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<td>Session 3 I - Room: D-06-10</td>
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<td>Session 3 J - Room: D-06-13</td>
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<tr>
<td>13:00 – 14:00</td>
<td>LUNCH</td>
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<tr>
<td>14:00 – 15:30</td>
<td>CLIMA 2019 - PLENARY SESSION 5, Aula Hall</td>
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<tr>
<td>15:30 – 16:00</td>
<td>COFFEE BREAK</td>
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<tr>
<td>16:00 – 18:00</td>
<td>Session 4 A - Room: B-01-25</td>
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<td>Session 4 B - Room: E-M-02</td>
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<td>Session 4 C - Room: E-M-03</td>
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<td>Session 4 D - Room: A-03-10</td>
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<td>Session 4 E - Room: G-M-04</td>
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<td>Session 4 F - Room: A-03-09</td>
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<td>Session 4 G - Room: B-01-26</td>
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<td>Session 4 H - Room: D-05-10</td>
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<td>Session 4 I - Room: D-06-10</td>
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<tr>
<td>18.00 – 19.00</td>
<td>Spare time / visit to HOUSE OVER4-ROMANIAN REPRESENTATIVE AT SOLAR DECATHLON HUNGARY 2019</td>
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<td>19:00 – 23:00</td>
<td>GALA DINNER</td>
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<td>Venue: Diplomatic Club Șoseaua București-Ploiești 2B, Bucharest</td>
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TUESDAY, 28 May 2019

08:30 – 18:00
Venue – Romania National Library, Bulevardul Unirii 22, Bucharest 030833

08:30 – 08:50 CLIMA 2019 - PLENARY SESSION 4, Aula Hall
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
Diamond Sponsor Presentation: Ion Sandu - General Manager, PAB Romania; Green Warehouses

08:50 – 09:30 Keynote Lecture: Hui ZHANG, Dr.Eng. - Center for the Built Environment, University of California at Berkeley, USA; Going for Maximum Efficiency in Thermal Comfort

09:30 - 09:40 Emerald Sponsor Presentation: Dr. Kim Hagström - HALTON Finland; Enabling User Safety and Wellbeing, and Sustainability?

09:40 – 10:00 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

10:00 – 10:30 COFFEE BREAK

ORDINARY SESSION 3
Session 3 A
10:30 - 13:00 Criteria for thermal environment, comfort and health
Chairs: Cristina Becchio, Hui Zhang, Kemal Gani Bayraktar
Room: A-03-09
10:30 -10:45 Validity of CO2 based ventilation design
Arsen Melikov and Detelin Markov
10:45 - 11:00 Passive control of the bed micro-environment by using naturally ventilated mattress
Tereza Snášelová, Mariya Petrova Bivolarova and Arsen Melikov
11:00 - 11:15  *Effect of insulation on indoor thermal comfort in a detached house with a floor heating system*
Qianwen Guo, Ryozo Ooka, Wonseok Oh, Wonjun Choi and Doyun Lee

11:15 - 11:30  *Relationship between Attributes of Individual Workers and Concentration at Work*
Reo Sugino, Shin-Ichi Tanabe, Mikio Takahashi, Tomoko Tokumura, Kazuki Wada, Tomohiro Kuroki, Jun Nakagawa, Jun Shinoda and Takuma Shinoyama

11:30 - 11:45  *Effects on energy savings and occupant health of an antibacterial filter*
Cristina Becchio, Marta Carla Bottero, Stefano Paolo Corgnati, Federico Dell'Anna, Valentina Fabi, Carola Lingua, Leonardo Prendin and Micaela Ranieri

11:45 - 12:00  *Prediction of physiological exertion in hot environments using the JOS-2 thermoregulation model*
Akihisa Nomoto, Yoshito Takahashi, Yoshiichi Ozeki, Masayuki Ogata and Shin-Ichi Tanabe

12:00 - 12:15  *Quantification of indoor environments and study of thermal comfort in naturally hostel buildings in the tropical country, India*
Sanjay Kumar, Manoj Kumar Singh and Varun Kumar Gupta

12:15- 12:30  *Unsteady RANS Simulation of Air Distribution in a Ventilated Classroom with Numerous Jets*
Nikolay Ivanov, Marina Zasimova, Evgueni Smirnov, Alexey Abramov, Detelin Markov and Peter Stankov

12:30- 12:45  *Local and general ventilation system for an operating room with surgeons and patient*
Laurentiu Tacutu

12:45- 12:50  *Summer sleep quality and change of bedroom thermal environment from the beginning to the end of sleep*
Noriko Umemiya

12:50- 12:55  *SVOC Concentrations in House dust and Residential Environment in Japanese Houses*
ORDINARY SESSION 3

Session 3 B

10:30 – 13:00  HVAC for special environments

Chairs: Cristiana Croitoru, Quan Jin, Wim Maassen

Room: E-M-02

10:30 - 10:45  Ventilation and environmental control of underground spaces: a short review
Angui Li, Risto Kosonen, Arsen Melikov, Bin Yang, Thomas Olofsson, Bjørn Sørensen, Linhua Zhang, Ping Cui and Ou Han

10:45 - 11:00  Performance Evaluation of An Innovative Column Attachment Ventilation
Haiguo Yin, Angui Li, Linna Li and Rui Wu

11:00 - 11:15  Analysis of Defogging Performance, Thermal Comfort, and Energy Saving for HVAC System Optimization in Passenger Vehicles
Taro Ono, Hideaki Nagano, Suguru Shiratori, Kenjiro Shimano and Shinsuke Kato

11:15 - 11:30  Numerical analysis for smoke spread in an aircraft hangar
Essam Khalil, Eslam Abdelghany, Hatem Haridy and Ahmed Ashraf

11:30 - 11:45  Numerical Investigation of Thermal Comfort in Aircraft Passenger Cabin
Sasan Sadrizadeh

11:45 - 12:00  CFD Evaluation of Directional Variation Effects of the Air Supply Diffuser for the International Space Station Cabin Atmosphere
Nikolay Ivanov, Evgeni Smirnov, Chang Son and Denis Telnov

12:00 - 12:15  Simulations on arrangements of induced jet-fans as auxiliary ventilation for a mechanical ventilated space with openings
Wenxuan Zhao, Wei Ye, Qianru Zhang and Xu Zhang
12:15- 12:30  Towards Zero Energy Hospital Buildings: Energy saving opportunities in Operating Theatres, a literature study  
Aleksandra Zarzycka, Wim Maassen and Wim Zeiler

12:30- 12:45  Investigations on a hybrid element with cellular metallic material for heating, cooling and ventilation  
Lars Schinke, André Schlott, Maximilian Beyer, Joachim Seifert and Marcel Fink

12:45 - 12:50  Field measurement of PM2.5 concentration in office buildings  
Naoki Kagi, U Yanagi, Kenichi Azuma and Hoon Kim

12:50 - 12:55  In-process measurement of urban energy-oxygen-pollution for the main residential building areas in Timisoara  
Vasile Dogaru

12:55 -13:00  Debates/Discussions

13:00 -14:00  LUNCH

ORDINARY SESSION 3  

Session 3 C  
10:30 – 13:00  Quality of the building use: indoor environment comfort, productivity, safety and health  
Chairs: Pawel Wargocki, Jarek Kurnitsky, Shin-Ichi Tanabe  
Room: E-M-03

10:30- 10:45  The Influence of textile floor coverings on the indoor air quality  
Silvia de Lima Vasconcelos, Marcel Sattler, Birgit Müller, Wolfgang Plehn and Wolfgang Horn

10:45 - 11:00  Effects of ambient temperature, airspeed, and wind direction on heat transfer coefficient for the human body by means of manikin experiments and CFD analysis  
Shan Gao, Ryozo Ooka and Wonseok Oh  
Hoon Kim

11:00 - 11:15  Measurement and Operational Improvement in an Office with Thermo Active Building System  
Toshiki Namai, Jun Shinoda, Ryoya Furukawa, Shin-Ichi Tanabe, Kosuke Sato, Eri Kataoka and Kosuke Yoshida
<table>
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<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>11:30 - 11:45</td>
<td>Thermal Comfort Condition of Passengers in Naturally Ventilated Train Stations</td>
<td>Junta Nakano and Shin-Ichi Tanabe</td>
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<tr>
<td>11:45 - 12:00</td>
<td>Indoor environmental quality evaluation in NZEB</td>
<td>Imrich Sánka, Thomas Schoberer, Werner Stutterecker and Dušan Petráš</td>
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<tr>
<td>12:00 - 12:15</td>
<td>Study on Cool Chair equipped with warming function</td>
<td>Jun Koyama, Yusuke Doi, Masanari Ukai and Tatsuo Nobe</td>
</tr>
<tr>
<td>12:15 - 12:30</td>
<td>Comfort and satisfaction of patients, visitors and staff with patient rooms at inpatient wards, a pilot study</td>
<td>Annemarie Eijkelenboom, Philomena M. Bluyssen and Geke A</td>
</tr>
<tr>
<td>12:30 - 12:45</td>
<td>Field study of indoor environment quality in an open atrium with ETFE membrane in a healthcare facility</td>
<td>Haida Tang, Chunying Li and Jianhua Ding</td>
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<tr>
<td>12:45 - 12:50</td>
<td>A game to determine preferences and needs for an indoor environment</td>
<td>Marjolein Overtoom and Philomena Bluyssen</td>
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<tr>
<td>12:50 - 12:55</td>
<td>Assessment of method for measuring clo value using human body – Assessment of method for measuring clo value that assumes human body temperature adjustment</td>
<td>Yoshiaki Yamato, Yoshihito Kurazumi, Keta Fukagawa, Kunihito Tobita and Emi Kondo</td>
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<tr>
<td>12:55 - 13:00</td>
<td>Debates/Discussions</td>
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<td>13:00 - 14:00</td>
<td>LUNCH</td>
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**ORDINARY SESSION 3**

**Session 3 D**

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<tr>
<th>Time</th>
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<th>Speaker(s)</th>
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<tbody>
<tr>
<td>10:30 – 15:30</td>
<td>Low and zero energy building case studies</td>
<td>Mihaela Dudita, Tuba Bighol Altrok</td>
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<td>Catalin Lungu</td>
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**Room: A-03-10**

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<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>10:30 - 10:45</td>
<td>Experimental study of radiator, underfloor, ceiling and air heating systems heat emission performance in TUT nZEB test facility</td>
<td>Karl-Villem Võsa, Andrea Ferrantelli and Jarek Kurnitski</td>
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<tr>
<td>Time</td>
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<td>10:45 - 11:00</td>
<td>Dynamic thermal response of low-energy residential buildings based on in-wall measurements</td>
<td>Kyriaki Foteinaki, Rongling Li, Alfred Heller, Morten Herget Christensen and Carsten Rode</td>
</tr>
<tr>
<td>11:00 - 11:15</td>
<td>Heat and Power Storage Using Aluminum for Low and Zero Energy Buildings</td>
<td>Mihaela Dudita, Meryem Farchado, Alexander Englert, Dani Carbonell Sanchez and Michel Haller</td>
</tr>
<tr>
<td>11:15 - 11:30</td>
<td>Climate change impact on energy balance of net-zero energy buildings in typical climate regions of China</td>
<td>Jiale Chai, Pei Huang and Yongjun Sun</td>
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<tr>
<td>11:30 - 11:45</td>
<td>House owners' experience and satisfaction with Danish low-energy houses - focus on ventilation</td>
<td>Henrik N. Knudsen</td>
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<td>11:45 - 12:00</td>
<td>Annual performance analysis of heat emission in radiator and underfloor heating systems in the European reference room</td>
<td>Karl-Villem Võsa, Andrea Ferrantelli and Jarek Kurnitski</td>
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<tr>
<td>12:00 - 12:15</td>
<td>Smart energy management of combined ventilation systems in a nZEB</td>
<td>Javier M. Rey Hernández, Francisco J. Rey Martínez, Ana Tejero González, Sergio L. González González, Eloy Velasco Gómez and Julio F. San José Alonso</td>
</tr>
<tr>
<td>12:15 - 12:30</td>
<td>Innovative HVAC system using an integrated green house for a virtual low energy office building</td>
<td>Catalin Lungu and Florin Baltaretu</td>
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<td>12:30 - 12:45</td>
<td>Visual and acoustic performance of shading devices – real scale laboratory measurements</td>
<td>Tiberiu Catalina, Alexandra Ene and Andreea Biro</td>
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<td>12:45 - 12:50</td>
<td>Implementation of an algorithm for determining the effectiveness of ventilation and energy efficiency in industrial ventilation systems</td>
<td>Marius Adam</td>
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<td>12:50 - 12:55</td>
<td>Study on energy loss and thermal environment through door open while air conditioner running&lt;br&gt;Simona D’Oca, Igor Mojic, Andrei Liu</td>
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<td>12:55 - 13:00</td>
<td>Debates/Discussions</td>
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**ORDINARY SESSION 3**

**Session 3 E**

10:30 – 13:00  *

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<th>Time</th>
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<tr>
<td>10:30 - 10:45</td>
<td>Verification of the effect of sleeping environment and humidification on middle-aged people in whole-house air-conditioning ventilation system housing&lt;br&gt;Akemi Iwaki, Takashi Akimoto, Naho Misumi and Takuya Furuhashi</td>
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<td>10:45 - 11:00</td>
<td>Impact of occupant behavior on energy use of HVAC system in offices&lt;br&gt;Zhipeng Deng and Qingyan Chen</td>
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<td>11:00 - 11:15</td>
<td>Graphical visualization of behavioural patterns in relation to indoor environment quality and energy use&lt;br&gt;Andrei Vladimir Liu, Verena Marie Barthelmes, Cristina Becchio, Valentina Fabi, Mariantonietta Tarantini, Giulia Vergerio, Stefano Paolo Corgnati and Ivo Martinac</td>
</tr>
<tr>
<td>11:15 - 11:30</td>
<td>Potential of spatial use patterns for developing localized conditioning systems to reduce energy consumption&lt;br&gt;Nick Van Loy, Griet Verbeeck and Elke Knapen</td>
</tr>
<tr>
<td>11:30 - 11:45</td>
<td>OpEEr - Optimising the energy efficiency of buildings through individual room temperature control&lt;br&gt;Igor Mojic and Michel Haller</td>
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<tr>
<td>11:45 - 12:00</td>
<td>Contextual and behavioural factors influencing human-building interaction in university offices: a cross-cultural comparison&lt;br&gt;Simona D’Oca, Dan Podjed, Jure Vetršek, Slavko Dolinsek and Peter Op ’T Veld</td>
</tr>
</tbody>
</table>
12:00 - 12:15  
*Data-driven study on individual occupant comfort using heating setpoints and window openings in new low-energy apartments – preliminary insights*
Lucile Sarran, Morten Herget, Christian Anker Hviid, Andrea Marin Radoszynski, Carsten Rode and Pierre Pinson

12:15 - 12:30  
*Energy flexibility of office buildings – Potential of different building types*
Mingzhe Liu, Hicham Johra, Per Kvols Heiselberg, Ivan Kolev and Kremena Pavlova

12:30 - 12:45  
*Aerogel, a high performance material for thermal insulation - A brief overview of the building applications*
Larisa Melita

12:45 - 12:50  
*Comparison of performance of heat recovery ventilator and air purifier in reducing indoor PM10 concentrations in a classroom*
Hwataik Han and Muhammad Hatta

12:50 - 12:55  
*Enhancement of ventilation efficiency in residential buildings by pulsating air-flow*
Ronny Mai, Ralph Krause and Christian Friibe

12:55 - 13:00  
Debates/Discussions

13:00 - 14:00  
LUNCH

**ORDINARY SESSION 3**

**Session 3 F**

10:30 – 13:00  
*Heat pumps and refrigeration*
Chairs: Adriana Angelotti, Robert Gavriliuc, Gratiela Tarlea

**Room: B-01-25**

10:30 - 10:45  
*Contributions to System Integration of PV and PVT Collectors with Heat Pumps in Buildings*
Manuel Koch and Ralf Dott

10:45 - 11:00  
*Using the Hardware-in-the-Loop concept for energetic evaluation of heat generators*
Martin Knorr, Joachim Seifert, Lars Schinke, Philipp Mehrfeld, Markus Nürenberg and Maximilian Beyer
11:00 - 11:15  The modelling of reverse defrosting cycles of air-to-water heat pumps with TRNSYS
Matteo Dongellini, Agostino Piauzzi, Filippo De Biagi and Gian Luca Morini

11:15 - 11:30  A laboratory apparatus to study Thermal Response Test in the presence of groundwater flow
Adriana Angelotti and Luca Molinaroli

11:30 - 11:45  Validation of black-block performance models for a water-to-water heat pump operating under steady state and dynamic loads
Elena Fuentes and Jaume Salom

11:45 - 12:00  Analysis and Discussion of Baoji "Shigu Tian Xi Tai", "Shigu Sun City" Ground Source Heat Pump Energy Station System Ji Li

12:00 - 12:15  Energy assessment of hybrid heat pump systems as a retrofit measure in residential housing stock
David Keogh, Mohammad Saffari, Mattia de Rosa and Donal P. Finn

12:15 - 12:30  Numerical approach regarding functional and design optimization for a residential building heating system composed by heat pump and auxiliary source
Talpiga Mugurel, Eugen Mandric and Florin Iordache

12:30 - 12:45  Design and integration of heat pumps for nZEB in IEA HPT Annex 49
Carsten Wemhoener, Simon Buesser and Lukas Rominger

12:45 - 12:50  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!
Jose Naveteur

12:50 - 12:55  Study on heat transfer performance of geothermal pile-foundation heat exchanger in GSHP system
Hezhi Zhang, Bo Xu and Zhenqian Chen

12:55 - 13:00  Debates/Discussions

13:00 - 14:00  LUNCH
10:30 – 13:00 Simulation models and predictive tools for the buildings HVAC
Chairs: Francis Allard, Florin Bode, Bratislav D. Blagojevic

Room: B-01-26

10:30 - 10:45 Energy performance of air conditioned buildings based on short-term weather forecast
Marko G. Ignjatović, Bratislav D. Blagojević, Mirko M. Stojiljković, Aleksandar S. Andjelković, Milena B. Blagojević and Dejan M. Mitrović

10:45 - 11:00 Investigation of Effect of Window-To-Wall Ratio on the Indoor Temperature by Lumped Capacitance Approach
Ahmet Yüksel, Muslum Arici and Hasan Karabay

11:00 - 11:15 CFD simulation analysis on integrated operation of range-hood and make-up air supply for cooking-generated particulate matter
Hyungkeun Kim, Kyungmo Kang, Yun-Gyu Lee and Taeyeon Kim

11:15 - 11:30 Using Artificial Neural Networks for Indoor Climate Control in the Field of Preventive Conservation
Simon Harasty, Steven Lambeck and Andreas Daniel Böttcher

11:30 - 11:45 Differentiating between direct and indirect exposure to exhaled particles in indoor environments with mechanical ventilation systems
Chun Chen and Ruoyu You

11:45 - 12:00 Investigation of a multizone building with hvac system using a coupled thermal and air flow model
Matthias Eydner

12:00 - 12:15 Building hvac retrofitting using a pv assisted dc heat pump coupled with a pcm heat battery and optimal control algorithm
Lee and Taeyeon Kim
Ettore Zanetti, Rossano Scoccia, Marcello Aprile, Mario Motta, Livio Mazzarella, Maurizio Zaglio and Jakub Pluta

12:15 - 12:30 Dynamic simulation of indirect air conditioning systems with optimized computational time
Nicolás Ablanque, Santiago Torras, Carles Oliet, Joaquim Rigola and Carlos D. Pérez-Segarra

12:30 - 12:45 Study on Reproduction of Thermal Plume over a Gas Stove by CFD
Hayato Kiyosuke

12:45 - 12:50 Mathematical simulation of the thermodynamic processes associated with the vapour-injected scroll compressor
Ion Zabet and Gratiela Maria Tarlea

12:50 - 12:55 Measured and Calculated Energy Saving on Ventilation of a Residential Building equipped with Ground-Air Heat Exchanger
Silviana Brata, Cristina Tanasa, Valeriu Stoian, Dan Stoian, Daniel Dan, Cristian Pacurar and Sorin Brata

12:55 - 13:00 Debates/Discussions

13:00 - 14:00 LUNCH

ORDINARY SESSION 3

Session 3 H

10:30 – 13:00 Systems using renewable energy sources
Chairs: Pedro Vicente-Quiles, Robert Gavriliuc, Sheila J. Hayter

Room: D-05-10

10:30 - 10:45 Numerical research on thermal performance of water-flow window as hospital curtain-wall
Chunying Li, Haida Tang, Jianhua Ding and Yuanli Lyu

10:45 - 11:00 Investigation of energetic and exergetic performances of parabolic trough collector with using different heat transfer fluids
F. Mertkan Arslan and Huseyin Gunerhan
11:00 - 11:15 
Difficulties of Solar PV Integration in Island Electrical Networks – Case Study in the French Islands  
Gilles Nottin, Cyril Voyant and Jean-Laurent Duchaud

11:15 - 11:30 
Numerical study of the effect of wind on the cooling of photovoltaic panels  
Dakouo Koita, Catalin-Viorel Popa, Bruno Robert and Catalin Daniel Galatanu

11:30 - 11:45 
Carbon-based Nanofluid Applications in Solar Thermal Energy  
Nur Çobanoğlu, Ziya Haktan Karadeniz and Alpaslan Turgut

11:45 - 12:00 
Solar Powered Mechanical Ventilation: A case study  
Aslı Birtürk, Orhan Ekren, Sinan Aktakka, Özdem Özel and Macit Toksoy

12:00 - 12:15 
Experimental and numerical study of the domestic hot water production with PV panels and a heat pump  
Francisco Aguilar-Valero, Damián Crespí-Llorens and Pedro Vicente-Quiles

12:15 - 12:30 
Experimental investigation of the wind direction influence on the cooling of photovoltaic panels integrated in double skin façades  
Sebastian Valeriu Hudisteanu and Catalin George Popovici

12:30 - 12:45 
Sensitivity analysis using simulations for a ground source heat pump – implementation on a solar passive house  
Gheorghe Ilisei, Tiberiu Catalina and Robert Gavriliuc

12:45 - 12:50 
Wind energy and environment  
Stefan Burchila and Catalin Lungu.

12:50 - 12:55 
Performance assessment between a ground coupled and air source heat pump used for domestic hot water preparation  
Calin Sebarchievici

12:55 - 13:00 
Debates/Discussions

13:00 - 14:00 
LUNCH
ORDINARY SESSION 3

Session 3 I

10:30 – 13:00  From sustainable and smart buildings to sustainable and smart cities & Miscellaneous

Chairs: William Bahnfleth, Guangyu Cao, Sorin Caluianu

Room: D-06-10

10:30 - 10:45  Two software tools for facilitating the choice of ground source heat pumps by stakeholders and designers

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 Bellardi and Adriana Bernardi

10:45 - 11:00  Building stock simulation to support the development of a district multi-energy grid

Francesco Causone and Martina Pelle

11:00 - 11:15  Green Hybrid Energy for Office Building

Carlea Filip, Raboaca Simona and Filote Constantin

11:15 - 11:30  Settlement scale analysis approach to reach nearly zero energy communities

Ece Kalaycioglu and A. Zerrin Yilmaz

11:30 - 11:45  LISCOOL - Smart airconditioning with cold storage as flexibility provider for automated demand response and virtual power plant supported by cloud based system

Shuji Furui, Rui Fonseca, Ryoh Masuda, Kouichi Nakagawa, Shuji Fujimoto, Teppei Seguchi, Takuya Nakao and Nobuki Matsui

11:45 - 12:00  An Adaptive Architecture for Long Term Energy Programme Management

Ovidiu Noran
12:00-12:15 Impact of urban textures on residential building performances in terms of energy and cost efficiency
Suzi Mangan, Gul Koclar Oral and Idil Erdemir Kocagil

12:15-12:30 The Regional Virtual Power Plant – Experiences of a field test
Joachim Seifert, Paul Seidel, Jens Werner and Andrea Meinzenbach

12:30-12:45 Air pollution measurements related to urban traffic in Bucharest
Razvan Stefan Popescu, Lelia Letitia Popescu, Andrei Preda and Karim Limam

12:45-12:50 Applicability of the whole-house air conditioning system in cold climate district
Sihwan Lee, Takuya Kishi and Yoshiharu Asano

12:50-12:55 Energy metrics for European residential buildings for cities, towns & suburbs and rural areas – the case of Romania
Vasile Dogaru and Ioan Silviu Dobosi

12:55-13:00 Debates/Discussions

LUNCH

ORDINARY SESSION 3
Session 3 J
10:30–13:00 Energy efficient renovation of existing buildings
Chairs: Jaap Hogeling, Juha Jokisalo, Mihnea Sandu

Room: D-06-13
10:30 - 10:45 Analysing the Energy Efficiency Renovation Rates in the Dutch Residential Sector
Shima Ebrahimigharebaghi, Faidra Filippidou, Paula van den Brom, Queena Qian and Henk Visscher
10:45 - 11:00  European projects on districts energy-renovations and Italian best practices
Lorenzo Teso, Tiziano Dalla Mora, Piercarlo Romagnoni and Fabio Peron

11:00 - 11:15  User Perception of Indoor Temperature and Preferences in Energy-Efficient Office Renovation Cases in the Netherlands
Minyoung Kwon, Andy van den Dobbelsteen and Remoy Hilde

11:15 - 11:30  Assessing the reliability of Turkish building energy performance tool (BEP-TR2) by case tests
Zeki Yılmazoglu, Gulsu Ulukavak Harputlugil and Gokhan Unlu

11:30 - 11:45  Life Cycle Energy Assessment of a School Building under Envelope Retrofit: An Approach towards Environmental Impact Reduction
Nazanin Moazzen, Mustafa Erkan Karagüler and Touraj Ashrafian

11:45 - 12:00  Cost optimal energy performance renovation measures in a municipal service building in a cold climate
Juha Jokisalo, Paula Sankelo, Juha Vinha, Kai Sirén and Risto Kosonen

12:00 - 12:15  Optimization of emission reducing energy retrofits in Finnish apartment buildings
Janne Hirvonen, Juha Jokisalo, Juhani Heljo and Risto Kosonen

12:30 - 12:45  Indoor monitoring of Scrovegni Chapel Crypt
Soma Sugano, Shingo Yamaguchi, Yugo Tsuneoka, Reina Oki, Jun Nakagawa, Naoya Watanabe, Tatsuhiro Kobayashi, Shin-Ichi Tanabe and Takashi Akimoto

12:45 - 12:50  A Supermarket Eco-Efficientization
Gratiela Tarlea, Valentin Draghici and Mioara Vinceriuc

12:50 - 12:55  Recovering lost energy an energy efficiency solution for the industrial sector
Adriana Tokar, Arina Negoițescu, Marius Bison, Gianluca Cadelano, Alessandro Bortolin, Giovanni Ferrarini and Antonio Stevan

12:55 - 13:00  Debates/Discussions

13:00 - 14:00  LUNCH

14:00 - 14:40  CLIMA 2019 - PLENARY SESSION 5, Aula Hall
Chair: 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
Keynote Lecture: Werner Lutsch, Dr.Eng., AGFW Managing Director & EHP President, GERMANY
Clean Energy for all Europeans - What does it mean for DHC/CHP?

14:40 - 14:50  ISHRAE acrex and Indian development
Kavita Sharma, INDIA

14:50 - 15:30  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

15:30 - 16:00  COFFEE BREAK
ORDINARY SESSION 4

Session 4 A

16:00 – 18:00

*Other HVAC systems*

**Chairs:** Ilinca Nastase, Alireza Afshari, Razvan Calota

**Room:** B-01-25

16:00 - 16:15

*Moisture Recovery - A Dynamic Modelling Approach*

Martin Kremer, Paul Mathis and Dirk Müller

16:15 - 16:30

*Analysis of Backward and Forward Effects on a Grooved Co-axial Heat Exchanger by Response Surface Methodology*

Şahin Güngör, Levent Aydin, Umut Ceyhan, Büşra Kaya and Ziya Haktan Karadeniz

16:30 - 16:45

*Numerical analysis of the impact of natural ventilation on the Indoor Air Quality and Thermal Comfort in a classroom*

George-Madalin Chitaru, Tiberiu Catalina and Andrei Marian Istrate

16:45 - 17:00

*The study of urban climate and traffic: Considerations from the Araraquara case, SP*

Clélia Moraes, Edson Melanda and Nilson Roberto de Barros Carneiro

17:00 - 17:15

*A pcm based cooling system for office buildings: a state of the art review*

Evdokia Paroutoglou, Alireza Afshari, Niels Bergsøe, Peter Fojan and Göran Hultmark

17:15 - 17:30

*Demand-oriented Hydronic Heating System and the Active One-pipe System Design Tool*

Ondřej Zlevor and Jiří Dostál

17:30 - 17:45

*Impact of Negative Pressure in a Room Due to Increased Airtightness in Residential Apartment Housing*

Yoshihiro Toriumi and Takashi Kurabuchi

17:45 - 18:00

*Ventilation Performance Improvement in a Container with an Extraction Free Cooling System*

Zeki Yılmazoğlu and Cem Gülsen
ORDINARY SESSION 4
Session 4 B
16:00 – 18:00
HVAC for special environments
Chairs: Guangyu Cao, Angui Li, Hwataik Han
Room: E-M-02

16:00 -16:15 Influence of indoor ventilation conditions on microbial diversity and quantity
Dahae Seong, R. Sean Norman and Shamia Hoque

16:15 - 16:30 Airflow characteristics under planar opposed ventilation jets in a controlled indoor environment
Sami Lestinen, Mark Wesseling, Risto Kosonen, Hannu Koskela and Dirk Müller

16:30 - 16:45 Thermal Comfort Analysis in Naturally-Ventilated Handball Arena Utilizing CFD Techniques
Essam Khalil, Ahmed Elashray, Abdelmaged Ibrahim and Ismail Elbialy

16:45- 17:00 Investigation of indoor environment quality in the storage areas of NTNU Gunnerus Library
Hanna Melsnes Svenneby and Guangyu Cao

17:00 -17:15 Performance investigation of indoor thermal environment and air handling unit in a hub airport terminal
Lin Lin, Lingshan Li and Xiaohua Liu

17:15 - 17:30 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
Takashi Akimoto, Naoya Odagiri, Yoichi Nakashima, Seiji Miyazaki, Takashi Yanai, Takashi Matsumoto, Daiki Yamashina and Nana Araki

17:30- 17:45 Experimental study of thermal comfort in a vehicle cabin during the summer season
Paul-Alexandru Danca, Florin Bode, Angel Dogeanu, Cristiana Croitoru, Mihnea Sandu, Amina Meslem and Ilinca Nastase

17:45 - 18:00 Relation between energy use and indoor thermal environment in animal husbandry: a case study
Matteo Bilardo, Lorenzo Comba, Paolo Cornale, Andrea Costantino and Enrico Fabrizio
ORDINARY SESSION 4  
**Session 4 C**  
**16:00 – 18:00** Quality of the building use: indoor environment comfort, productivity, safety and health  
**Chairs:** Arsen Melikov, Martin Thalfeldt, Leonardo Prendin

**Room: E-M-03**  
**16:00 - 16:15** Post-Occupancy Evaluation of Indoor Environmental Quality in a nZEB sport hall in a Mediterranean climate  
Joana Ortiz, Maria Leandra Gonzalez Matterson, Paolo Taddeo and Jaume Salom  

**16:15 - 16:30** The effects of indoor and outdoor air pollutants on workers’ productivity in office building  
Cristina Becchio, Marta Bottero, Stefano Paolo Corgnati, Federico Dell'Anna, Valentina Fabi, Carola Lingua, Leonardo Prendin and Micaela Ranieri  

**16:30 - 16:45** Coupling of a cardiovascular model with a thermoregulation model to predict human blood pressure under unsteady environmental conditions  
Yoshito Takahashi, Masayuki Ogata, Jun-Ichi Asaka, Akihisa Nomoto and Shin-Ichi Tanabe  

**16:45 - 17:00** A Simplified Power Sizing Method for the Correct Building Integration of Wood Stoves  
Martin Thalfeldt, Anders Skare, Laurent Georges and Øyvind Skreiberg  

**17:00 - 17:15** Airborne transmission during short-term events under stratum ventilation  
Kaho Hashimoto, Zhengtao Ai and Arsen Melikov  

**17:15 - 17:30** On the improvement of thermal comfort in indoor spaces conditioned by split-type systems  
Anastácio Silva Junior, Kátia Cordeiro Mendonça, Rogério Vilain, Marcelo Luiz Pereira and Nathan Mendes  

**17:30 - 17:45** A new test room for indoor environmental quality analysis  
Giulia Alessio, Angelo Zarrella, Antonino Di Bella and Michele De Carli
17:45 - 18:00  The CO2 conditions within the baby cots of day care centres  
Gert-Jan Braun and Wim Zeiler

ORDINARY SESSION 4  
Session 4 D  
16:00 – 18:00  Low and zero energy building case studies  
Chairs: Dušan Petráš, Merve Atmaca, Florin Băltărețu

Room: A-03-10

16:00 - 16:15  A Low-Carbon Footprint Building in Western France  
Pierrick Mandrou, José Naveteur, David Penhouet, René Sauger and Edouard Cereuil Kergrid

16:15 - 16:30  Energy performance optimization of buildings using data mining techniques  
Kai Corten, Eric Willems, Shalika Walker and Wim Zeiler

16:30 - 16:45  Energy and economical evaluation of residential buildings in Slovakia  
Jana Bartosova and Dušan Petráš

16:45 - 17:00  Energy Efficiency and Cost Performance of Direct-Current Power Supply Systems in Residential Buildings by 2030s and 2050s  
Gyuyoung Yoon, Kyoko Sugiyama, Saya Yoshioka and Shinji Sakai

17:00 - 17:15  Annual energy consumption between conventional and cob building  
Kaoutar Zeghari, Hasna Louahlia, Malo Leguern, Mohamed Boutouil, Hamid Gualous, Michael Marion, Pierre Schaeztel, Steve Goodhew and François Streiff

17:15 - 17:30  From Sustainable Urban Mobility Plans (SUMPs) to Operational Energy Policies and Measures for the City of Tomorrow  
Irina Rotaru

17:30 - 17:45  Special engineering techniques: Ecole des Trefles  
Dragos Mihaila, Ioan Silviu Dobosi, Stefan Duna, Laura Troi, Daniel Teodorescu and Alexandru Hordila

17:45 - 18:00  Debates/Discussions
ORDINARY SESSION 4

Session 4 E

16:00 – 18:00 User-HVAC-building interaction
Chairs: Catalin Teodosiu, Touraj Ashrafian
Angel Dogeanu

Room: G-M-04

16:00 - 16:15 Solar control solutions for reducing overheating risks in retrofitted Danish apartment buildings from the period 1850-1900 – A simulation-based study
Daria Zukowska, Myrto Ananida, Jakub Kolarik, Mandana Sarey Khanie and Toke Rammer Nielsen

16:15 - 16:30 Effect of external solar shading usage on energy consumption and thermal comfort in the student dormitory in Niš
Dragana Krsć, Miomir Vasov, Veliborka Bogdanović, Marko Ignjatović and Dušan Randelović

16:30 - 16:45 Energy Efficiency Evaluation of Different Glazing and Shading Systems in a School Building
Mohammed Khalaf, Touraj Ashrafian and Cem Demirci

16:45- 17:00 Statistical analysis of air conditioning peak loads of multiple dwellings
Tetsushi Ono, Aya Hagishima, Jun Tanimoto, Sheikh Ahmad Zaki and Naja Aqilah Hisham

17:00 - 17:15 An industry perspective on building simulations with solar shading
Helle Foldbjerg Rasmussen and Tobias Skov Pedersen

17:15- 17:30 Occupant behavior and thermal comfort in buildings: Monitoring the end user
Loes Visser, Boris Kingma, Eric Willems, Wendy Broers, Marcel Loomans, Henk Schellen, Peter Op ’T Veld and Wouter van Marken Lichtenbelt

17:30 - 17:45 The effect of the heating system on the occupant’s thermal comfort and optimum room air temperature
Alzbeta Dederova Kohoutkova, Jana Horváthová, Martin Kny and Ondrej Nehasil

17:45 - 18:00 Local analysis of airflow distribution in open concept passive houses
Doru Daniel Sabie, Viorel Fatu and Adrian-Gabriel Ghiaus

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ORDINARY SESSION 4
Session 4 F
16:00 – 18:00 Fundamentals & Miscellaneous
Chairs: Birol Kilkis, Sheila J. Haiter,
Nicolae Antonescu

Room: A-03-09
16:00 - 16:15 Parametric simulation study for green roof retrofit over high performance solar house prototype “EFdeN Signature
Mihai Baiceanu, Tiberiu Catalina, Catalin Lungu

16:15 - 16:30 The Role of Building Codes and Controls in Enhancing Community Resilience
Sheila J. Hayter and Sherry Stout

16:30 - 16:45 Development of Temperature Process Control Method Using Smith Predictor
Nikolajs Bogdanovs, Romualds Beļinskis, Ernests Petersons, Andris Krūmiņš and Artūrs Brahmanis

16:45 - 17:00 Hypothesis for a more efficient and sustainable development of a district heating in Padova, integrating renewable energies and existing generation plant
Laura Carnieletto, Samantha Graci and Michele De Carli

17:00- 17:15 Exergy: Game Changer or Game Maker
Birol Kilkis

17:15- 17:30 Table top surface appraisal by school children under different lighting conditions tested in the SenseLab
Marco Ortiz, Dadi Zhang and Philomena Bluyssen

17:30 - 17:45 The application of the TES technology in CHP heating system with Chinese demand profiles——A techno-economic feasibility case study
Ruoyu Zhang, Haichao Wang, Xiaozhou Wu, Xiangli Li and Lin Duanmu

17:45-18:00 Energy, economic and environmental analysis of opened natural healing water source
Denis Miček and Jiri Hirs
ORDINARY SESSION 4

Session 4 G
16:00 – 18:00 Filtration, air cleaning and air distribution
Chairs: Gilles Notton, Andrei Damian, Cristina Croitoru

Room: B-01-26
16:00 - 16:15 Characteristics of airborne transmission under stratum ventilation
Tao Huang, Zhengtao Ai and Arsen Melikov
16:15 - 16:30 Air quality in sport facilities
Morten Sæther Grande and Guangyu Cao
16:30 - 16:45 Utilization of electrostatic precipitators for healthy indoor environments
Ayşe Fidan Altun and Muhsin Kilic
16:45 - 17:00 Studying the influence of moving vehicle on air pollutant dispersion through environmental chamber
Tin Tai Chow, Wenjing Zhang and Jinliang Wang
17:00 - 17:15 Synthesis of knowledge on utilization of adsorption filters for healthy indoor environments
Ayşe Fidan Altun and Muhsin Kilic
17:15- 17:30 Aerosolization of Aspergillus niger spores from colonies on different positions of a circular tube
Xian Li, Tengfei Zhang and Shugang Wang
17:30 - 17:45 The effect of the contaminant emission rate on the velocity field and contaminant distribution with the presence of an obstacle in a large space
Qianru Zhang, Chengqiang Zhi, Yixiang Huang, Wei Ye, Jun Gao and Xu Zhang
17:45- 18:00 Air Flow Door Barrier for Airborne Infection Isolation Rooms
Bård Venås, Merethe Cecilie Lind and Trond Thorgeir Harsem

ORDINARY SESSION 4

Session 4 H
16:00 – 18:00 Low energy heating and cooling systems
Chairs: Mariya Bivolarova, Philomena Bluyssen, Ionuț Sota
Investigations of (local) thermal comfort as a function of radiation asymmetry and vertical air temperature difference
Maximilian Beyer, Lars Schinke, Giulia Alessio, Joachim Seifert and Michele De Carli

The effect of wall and floor colouring on temperature and draught feeling of primary school children
Philomena Bluyssen, Dadi Zhang, Arend-Jan Krooneman and Arno Freeke

Hue-Heat Hypothesis: A Step forward for a Holistic Approach to IEQ
Laura Bellia, Francesca Romana d’Ambrosio Alfano, Francesca Fragliasso, Boris Igor Palella and Giuseppe Riccio

The effect of acoustical treatment on primary school children’s performance, sound perception, and influence assessment
Dadi Zhang, Martin Tenpierik and Philomena Bluyssen

Effects of Wellness-Conscious Buildings on the Well-Being and Comfort of Workers
Sosui Nakamura, Shin-Ichi Tanabe, Junta Fujisawa, Emi Takai, Sayana Tsushima, Masayuki Ogata, Yugo Tsuneoka, Takayoshi Iida, Yoshitaka Uno, Ryoko Nomura and Tomo-Oki Ukiana

Enhancing cooling performance via airflow temperature fluctuations
Žiga Lampret, Gorazd Krese and Matjaž Prek

Passive Control Of The Bed Micro-Environment By Quilts
Mariya Bivolarova, Arsen Melikov, Tereza Snaselova and Chong Shen

Cost-efficient Nearly Zero-Energy Buildings
Heike Erhorn-Klug, Hans Erhorn and Micha Illner
ORDINARY SESSION 4
Session 4 / 16:00 – 18:00  
ICT-based solutions for systems and building automation  
Chairs: Atze Boerstra, Andrei Litiu, Mihnea Sandu

Room: D-06-10

16:00- 16:15  
Energy Modeling with Nonlinear-Autoregressive Exogenous Neural Network  
Hussain Syed Asad, Yuen Richard Kwok Kit and Lee Eric Wai Ming

16:15 -16:30  
Monitoring of indoor airflows with a new two-dimensional airflow sensor  
Yuanchen Wang, Michael Müller, Christian Lodroner and Konstantinos Stergiaropoulos

16:30 - 16:45  
Smart monitoring of ventilation system performance with IEQ sensor networks  
Atze Boerstra, Arjen Raue and Louie Cheng

16:45 - 17:00  
Data mining and data-driven modelling for Air Handling Unit fault detection  
Tianyun Gao, Bartosz Boguslawski, Sylvain Marié, Patrick Béguery, Simon Thebault and Stéphane Lecoeuche

17:00- 17:15  
A field study of space heating control using acceptable set-point temperature estimation: winter experiment in Japan office  
Toru Yano and Miho Sako

17:15 - 17:30  
Some aspects of controlling radiant and convective cooling systems  
Taha Arghand, Jan-Olof Dalenbäck, Anders Trüschel and Saqib Javed

17:30 - 17:45  
Thermal convection analysis of heat pump systems  
Andreea Irina Baran, Teodor Dorin Dumitru Mateescu and Razvan Silviu Luciu

17:45 - 18:00  
Photocatalytic techniques to prevent and combat healthcare associated infections  
Răzvan Bucureşteanu, Mihai Husch, Roxana Apetrei, Monica Ioniță, Ludmila Otilia Cintează and Lia Mara Dițu
ORDINARY SESSION 4

Session 4 J

16:00 - 18:00

Energy efficient renovation of existing buildings
Chairs: Gyuyoung Yoon, Milos Lain, Horia Petran

Room: D-06-13

16:00 - 16:15

Identification of the Retrofit Actions to Achieve Cost-Optimal and NZEB Levels for Residential Buildings in Istanbul Considering the Remaining Building Lifetime
Neşe Ganiç Sağlam, A. Zerrin Yılmaz and Stefano P. Corgnati

16:15 - 16:30

Facade Refurbishment For Energy Saving In Tube Houses. A case study in Hanoi, Vietnam
Phan Anh Nguyen, Regina Bokel and Andy van den Dobbelsteen

16:30 - 16:45

A framework for the technical evaluation of residential buildings' energy retrofit
Annamaria Belleri, Chiara Dipasquale and Jennifer Adami

16:45 - 17:00

Alliance for deep renovation in buildings. A step forward to the common European voluntary certification scheme
Johann Zirngibl, Carolina Mateo-Cecilia and Carlos Espigares-Correa

17:00 - 17:15

Energy environmental impact of functional units of a university building
Joao Pedro Panagassi Forte and Vasco Rato

17:15 - 17:30

Archetype definition for analysing retrofit solutions in urban areas in Europe
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

17:30 - 17:45

Experimental Nearly Zero Energy Building with Green Technology – Renovation Pilot through Passive House Expertise
Horia Petran, Szabolcs Varga and Noémi Fogas

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The role of the reference building in the evaluation of energy efficiency measures for large stocks of public buildings
Erika Guolo, Lorenza Pistore and Piercarlo Romagnoni

Spare time /Visit to House OVER4 - Romanian Representative at SolarDecathlon Hungary 2019

GALA DINNER

Venue: Diplomatic Club, Șoseaua București-Ploiești 2B, Bucharest 077190, GPS 44.4852° N, 26.0802°
Wednesday, 29th May 2019

PROGRAM AT A GLANCE

08:30 – 10:00  CLIMA 2019 - PLENARY SESSION 6, Aula Hall

10:00 – 10:30  COFFEE BREAK

10:30 - 13:00  Session 5 A - Room: A-03-09
               Session 5 B - Room: E-M-02
               Session 5 C - Room: G-M-10
               Session 5 D - Room: G-M-04
               Session 5 E - Room: B-01-25
               Session 5 F - Room: A-03-10
               Session 5 G - Room: B-01-26
               Session 5 H - Room: D-05-10
               Session 5 I - Room: D-06-10
               Session 5 J - Room: D-06-13

13:00 – 14:00  LUNCH

14:00 – 14:20  CLIMA 2019 - PLENARY SESSION 7, Aula Hall
               DAIKIN AWARDS CEREMONY AND PRESENTATION

14.20 – 14.40  REHVA STUDENT COMPETITION AWARD CEREMONY & PRESENTATION

14.40 – 15.00  HVAC WORLD STUDENT COMPETITION AWARD CEREMONY & PRESENTATION

15.00 – 15.45  AWARDS CEREMONY, PLENNARY PREZENTATIONS & CLOSURE SPEECH

15.45 – 16.30  CLOSURE CONCERT & ENTERTAINMENT

16.30  DEPARTURE FOR THE AFTERCONGRESS TOURS
WEDNESDAY, 29 May 2019

DAY 4

08:30 – 16:30

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

08:30 – 09:10 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

Keynote Lecture: William P. BAHNFELTH, Prof. Dr. - Pennsylvania State University, USA; Current Status and Future Prospects for Infection Control with Optical Radiation

09:10 – 09:20 OVER 4, ROMANIA - Romanian Prototype for the Solar Decathlon Europe competition in 2019

09:20 – 10:00 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

10:00 – 10:30 COFFEE BREAK

ORDINARY SESSION 5

Session 5 A

10:30 – 13:00 Energy management and distributed energy systems (heat and power generation, district heating and cooling)

Chairs: Natasa Nord, Werner Lutsch, Rodica Frunzulica

Room: A-03-09

10:30 – 10:45 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

Osamu Kunitomo, Isao Satoh and Masanori Hiroshima
10:45 – 11:00  Analysis of energy signatures and planning of heating and domestic hot water energy use in buildings in Norway
Tymofii Tereshchenko, Dmytro Ivanko, Natasa Nord and Igor Sartori

11:00 – 11:15  A methodology for designing decentralised energy systems with predictive control for heat pumps and thermal storage
Andrew Lyden and Paul Tuohy

11:15 – 11:30  System optimization of innovative tri-generation system for distributed power application
Tin-Tai Chow, Guangya Zhu and Chun Kwong Lee

11:30 – 11:45  Comparison of operational performance and analytical model of high concentrator photovoltaic thermal (HCPV/T) system at 2000 concentration ratio
Emmanuel Shittu, Filippo Paredes, Benedetto Schiavo, Luca Venezia, Sergio Milone, Fabio Montagnino and Maria Kolokotroni

11:45 – 12:00  A multipurpose test rig for district heating substations: domestic hot water preparation and keep-warm function comparison
Jad Al Koussa, Rutger Baeten, Nico Robeyn and Robbe Salenbien

12:00 – 12:15  Optimal control of secondary side supply water temperature for substation in district heating systems
Juan Hou, Haoran Li and Natasa Nord

12:15 – 12:30  Aspects regarding the use of recovered energy for air conditioning
Răzvan Calotă, Alina- Viorica Girip, Mădălina Nichita, Anica Ilie, Sergiu Istrate and Valentin Cubleșan

12:30 – 13:00  Debates/Discussions

13:00 – 14:00  LUNCH
Session 5 B
10:30 – 13:00 HVAC for special environments
Chairs: Pawel Wargocki, Silvi Cristiana Croitoru

Room: E-M-02
10:30 – 10:45 Aircraft passenger comfort evaluation: sitting and standing passengers in commercial cabin
Clelia Mendonça De Moraes, Fulvio Vittorino and Fernando Catalano

10:45 – 11:00 Model of Thermal Plume above Cooking Gas Stove for Designing Ventilation
Yuki Shimanuki, Takashi Kurabuchi, Yoshihiro Toriumi and Yasuhisa Asawa

10:45 – 11:00 Performance investigation of a novel deep dehumidification process using liquid desiccant
Bowen Guan, Jun Liu, Xiaohua Liu, Tao Zhang, Liangliang Chen and Xiaoyang Chen

11:00 – 11:15 Design of a Small-Scale Experimental Model of the ISS Crew Quarters for a PIV Flow Field Study
Matei Razvan Georgescu, Ilinca Nastase, Amina Meslem, Mihnea Sandu and Florin Bode

11:15 – 11:30 Can we meet the requirement for ultra-clean operation room (10CFU/m3) with dilution ventilation?
Christoffer Pedersen and Guangyu Cao

11:30 – 11:45 Thermal performance evaluation of a high-density data centre for cooling system under fault conditions
Jinkyun Cho, Beungyong Park and Yongdae Jeong

11:45 – 12:00 Effect of Air Exchange Rate on Particle Decay in a Cleanroom: A Numerical Study
Yunus Emre Cetin, Mete Avci and Orhan Aydin

12:00 – 12:15 Influence of ceiling height on airflow and particle distribution in an operating room
Aleyna Agirman, Yunus Emre Cetin, Mete Avci and Orhan Aydin

12:15 – 12:30 Debates/Discussions
13:00 – 14:00 LUNCH
Session 5 C
10:30 – 13:00 Quality of the building use: indoor environment comfort, productivity, safety and health
Chairs: William Bahnfleth, Florin Bode, Mustafa Mutlu

Room: G-M-10
10:30 – 10:45 The notion of comfort, from word to concept
Stefan Duna, Ioan Silviu Dobosi, Alexandru Hordila, Daniel Teodorescu, Dragos Mihaila and Laura Troi
10:45 – 11:00 Experimental and numerical analysis of indoor environmental conditions in two physiotherapy facilities in Northern Italy Luca Zaniboni, Giovanni Pernigotto, Andrea Gasparella and Ardeshir Mahdavi
11:00 – 11:15 Inclusion of window opening habits in a window model based on activity and occupancy patterns
Silke Verbruggen, Marc Delghust, Jelle Laverge and Arnold Janssens
11:15 – 11:30 An inquiry into the certification potential of built environments' affordance
Ardeshir Mahdavi and Christiane Berger
11:30 – 11:45 Effect of Zero Air Change Rate On Particle Dispersion in A Room with Floor Heating
Mustafa Mutlu
11:45 – 12:00 Numerical investigation of air conditioners' control unit position on temperature distribution and energy consumptions of a room
Mustafa Mutlu and Emre Çalışkan
12:00 – 12:15 Validation and improvement of the PHS model based on Chinese worker thermophysiological responses in hot environments
Chenqiu Du, Yongqiang Li, Mengnan Xu and Runming Yao
12:15 – 12:30 Optimal cost-efficiency solution of acoustic treatment for a complex meeting room
Catalin Bailescu, Vlad Iordache and Tiberiu Catalina
12:30 – 13:00 Debates/Discussions
13:00 – 14:00 LUNCH
Session 5 D
10:30 – 13:00 Other advanced HVAC&R&S system components
Chairs: Ralph Krause, Chadi Maalouf, Mihnea Sandu

Room: G-M-04
10:30 – 10:45 Standardization of building technology on demand via robotic
Andreas Henne and Nina Kloster
10:45 – 11:00 Investigations on noise sources on a contra-rotating axial fan with different modifications
Ralph Krause, Christian Friebe, Michael Kerscher and Christof Puhle.
11:00 – 11:15 Enhancing coefficient of performance of window air-conditioner using heat pipes
Nitish Perisetla, Purushothaman G, Raghuvan Vijayakumar and Suresh Kumar Ramasamy
11:15 – 11:30 Combined radiant ceiling panels with diffuse ventilation – a numerical parametric study of thermal performance
Marie R. Krusaa, Christian Anker Hviid, Jonathan Magnes and Jakub Kolarik
11:30 – 11:45 Design of a dew point evaporative cooler for buildings in Mediterranean climate
Djallel Abada, Chadi Maalouf, Tala Moussa, Amel F. Boudjabi, Guillaume Polidori, Djamila Rouag Saffidine, Oualid Sotehi, Zoheir Derghout and Etienne Wurtz
11:45 – 12:00 Simplified Prediction Method of Vertical Temperature Distribution for Impinging Jet Ventilation System
Tomohiro Kobayashi, Toshiya Nishiumi and Noriko Umemiya
12:00 – 12:15 The evaluation of energy saving performance for the modular design centrifugal chiller
Yoonjei Hwang, Hanyoung Park and Holim Lee
12:15 – 12:30 Recovery of waste heat from the sewer system
Dominika Juhošová and Jana Peráčková
12:30 – 13:00 Debates/Discussions
13:00 – 14:00 LUNCH
Session 5 E

10:30 – 13:00  PM and contaminants in outdoors and indoors

Chairs: Nicolay Ivanov, Tobias Zimmer, Vlad Iordache

Room: B-01-25

10:30 – 10:45  Use of low-cost PM-sensors to determine the infiltration of outdoor particles into indoor environments

Jan Drzymalla and Andreas Henne

10:45 – 11:00  Comfort IAQ – a new tool to simulate the indoor particulate matter pollution in relation to the chosen supply air filter quality

Tobias Zimmer

11:00 – 11:15  Odor Problems in Toilets with Reduced Ventilation Frequencies

Madoka Kimura, Takashi Akimoto, Nobuhiro Hirasuga, Yu Sakamoto, Sakurako Yamakita and Hikari Sakakibara

11:15 – 11:30  Evaluation of Short-Distance Airborne Infection Risk Using a Cough Generator

Wei Ling, Maho Ichikawa, Kaho Hashimoto, Masayuki Ogata, Hitomi Tsutsumi, Shoichi Morimoto, Shin-Ichi Tanabe and Satoshi Hori

11:30 – 11:45  Measurement of Face-touching Frequency in a Simulated Train

Kentaro Morita, Kaho Hashimoto, Masayuki Ogata, Hitomi Tsutsumi, Shin-Ichi Tanabe and Satoshi Hori

11:45 – 12:00  Mock-up Test for NOx Reduction by Photocatalyst Paint for Indoor Use

Yong Woo Song, Min Young Kim and Jin Chul Park

12:00 – 12:15  Prediction of local particle pollution level based on artificial neural network

Jie Xiong, Runming Yao and Baizhan Li

12:15 – 12:30  Performance assessment of demand controlled ventilation controls concerning indoor VOC exposure based on a dynamic VOC emission model

Klaas De Jonge, Arnold Janssens and Jelle Laverge

12:30 – 13:00  Debates/Discussions

13:00 – 14:00  LUNCH
Session 5 F
10:30 – 13:00 From sustainable and smart buildings to sustainable and smart cities
Chairs: Ovidiu Noran, Dragos Ioan Bogatu, Atze Boerstra

Room: A-03-10
10:30 – 10:45 Rehabilitation of the utility spaces and boiler room Monnaie Royal Theatre
Laura Troi, Ioan Silviu Dobosi, Stefan Duna, Dragos Mihaila, Daniel Teodorescu and Alexandru Hordila

10:45 – 11:00 Influence of thermal zoning and electric radiator control on the energy flexibility potential of Norwegian detached houses
Thea Johnsen, Katrine Taksdal, John Clauß, Xingji Yu and Georges Laurent

11:00 – 11:15 An Adaptive Architecture for Long Term Energy Programme Management
Ovidiu Noran

11:15 – 11:30 A preliminary analysis on the night cooling potential of photovoltaic/thermal (PV/T) panels for European cities
Dragos-Ioan Bogatu, Ongun Berk Kazanci and Bjarne W. Olesen

11:30 – 11:45 Sensitivity analysis on the potential evaluation using building thermal mass combined with DSM strategies
Jose Sanchez, M.Carmen Guerrero, M.Carmen Pavón, J.Luis Molina and Servando Alvarez

11:45 – 12:00 Effect of highly reflective building envelopes on outdoor environment temperature and indoor thermal loads using CFD and numerical analysis
Jihui Yuan, Toshio Yamanaka, Tomohiro Kobayashi, Haruto Kitakaze and Kazuo Emura

12:00 – 12:15 Analysis of different building exterior walls insulations using eQUEST
Abdellah Zerroug and Egils Dzelzis

12:15 – 12:30 Some aspects of historical monument buildings central heating
Cornel Muntea

12:30 – 13:00 Debates/Discussions

13:00 – 14:00 LUNCH
Session 5 G
10:30 – 13:00  Big data and machine learning applications in buildings
Chairs: Kwang Ho Lee, Ivo Martinac, Andreas Hantsch

Room: B-01-26
Reina Oki, Yugo Tsuneoka, Shingo Yamaguchi, Soma Sugano, Jun Nakagawa, Naoya Watanabe, Tatsuhiro Kobayashi, Shin-Ichi Tanabe, Takashi Akimoto, Yasuhiro Hayashi and Shinji Wakao

10:45 – 11:00  Fault detection in HVAC systems using a distribution considering uncertainties
Shohei Miyata, Yasunori Akashi, Jongyeon Lim and Yasuhiro Kuwahara

11:00 – 11:15  ANN Based Optimized AHU Discharge Air Temperature Control of Conventional VAV System for Minimized Cooling Energy in an Office Building
Jong Man Lee, Won Hee Kang and Kwang Ho Lee

11:15 – 11:30  Forecasting residential gas consumption with machine learning algorithms on weather data
Brian De Keijzer, Pol De Visser, Víctor García Romillo, Víctor Gómez Muñoz, Daan Boesten, Megan Meezen and Tadeo Baldiri Salcedo Rahola

11:30 – 11:45  A NILM method for cooling load disaggregation based on artificial neural network
Ziwei Xiao, Jiaqi Yuan, Wenjie Gang, Chong Zhang and Xinhua Xu

11:45 – 12:00  Assessment of micro-organism growth risk on filters with machine learning
Andreas Hantsch and Sabine Döge

12:00 – 12:15  Mapping digital transformation in building performance assessment and management – commercial activities for the operation phase
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
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<th>Time</th>
<th>Session</th>
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<tr>
<td>12:15 – 12:30</td>
<td>Partial load efficiency analysis of a CCHP plant with RICE and H2O-LiBr absorption chiller</td>
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<td>Gabriel Mărcus and Cătălin Lungu</td>
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<td>12:30 – 13:00</td>
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<td>Session 5 H</td>
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<td>10:30 – 13:00</td>
<td>Climate action, environment, resource efficiency and raw materials</td>
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<td>Chairs: Adrian Ciutina, Timothy Wentz, Enrico Fabrizio</td>
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<td>Room: D-05-10</td>
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<td>10:30 – 10:45</td>
<td>Resilient optimal design of multi-family buildings in future climate scenarios</td>
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<td>Matteo Bilardo, Maria Ferrara and Enrico Fabrizio</td>
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<td>10:45 – 11:00</td>
<td>Heat transfer vs environmental impact of modern façade systems</td>
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<td>Adrian Ciutina, Raluca Buzatu and Daniel M. Muntean</td>
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<td>11:00 – 11:15</td>
<td>Decarbonization: exergy to the rescue</td>
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<td>Birol Kilkis</td>
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<td>11:15 – 11:30</td>
<td>Numerical investigation of the energy flexibility of different heating and cooling systems</td>
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<td>Evangelia Loukou, Mingzhe Liu, Hicham Johra, Per Kvols Heiselberg, Bianca A. Dia and Rógví K. D. Clementsen</td>
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<td>11:30 – 11:45</td>
<td>Grid Edge Technology - Exploring the flexibility potential of a heat pump and thermal energy storage system [GET-SMART HEAT]</td>
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<td>Christoph Schellenberg, Laurentiu Dimache and John Lohan</td>
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<td>11:45 – 12:00</td>
<td>The influence of the combined effect of draught and radiant thermal asymmetry on human performance</td>
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<td>Balázs András-Tövissi, László Kajtár and Pawel Wargocki</td>
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<td>12:00 – 12:15</td>
<td>Development of zero energy flexible unit with no infrastructure for disaster</td>
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<td>Beungyong Park, Jinkyun Cho and Yongdae Jeong</td>
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<td>Debates/Discussions</td>
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<td>13:00 – 14:00</td>
<td>LUNCH</td>
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Session 5 I  
10:30 – 13:00  
Energy performance requirements, compliance assessment and cost optimality  
**Chairs:** Raluca Teodosiu, Eline Himpe, Silvana Brata

**Room: D-06-10**

10:30 – 10:45  
Interaction of GEOTABS and secondary heating and cooling systems in hybridGEOTABS buildings: towards a sizing methodology  
Mohsen Sharifi, Rana Mahmoud, Eline Himpe and Jelle Laverge

10:45 – 11:00  
Relating Forms and Materials of Traditional and Contemporary Building Types to Indoor and Outdoor Air Temperatures for Sustainable Development in Okigwe, Nigeria  
Marcellinus Okafor and Ikechukwu Onyegiri

11:00 – 11:15  
The H2020 project GEO4CIVHIC (Most Easy, Efficient and Low Cost Geothermal Systems for Retrofitting Civil and Historical Buildings)  
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 Stango, Marco Belliardi and Adriana Bernardi

11:15 – 11:30  
Assessment of the energy efficiency of a public university building in Southern Brazil  
Jayne Garcia, Layane Santos de Souza, Manuela Bazzani Kretzer, Marina Rupp da Silva and Ana Mirthes Hackenberg

11:30 – 11:45  
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  
Paula van den Brom, Arjen Meijer and Henk Visscher
11:45 – 12:00 Identification of Energy Use Time Patterns of Occupied Dwellings using Smart Meter Data
Eline Himpe and Arnold Janssens

12:00 – 12:15 New method of increasing building efficiency
Andrei Preda and Popescu Razvan Stefan

12:15 – 12:30 Questionnaire’s Elaboration and application to the contribution at knowledge of certificate LEED’s application at Brazil with based on case studies.
Clélia Moraes

12:30 – 13:00 Debates/Discussions

13:00 – 14:00 LUNCH

Session 5 J

10:30 – 13:00 Energy efficient renovation of existing buildings
Chairs: Targo Kalamees, Ioan Silviu Doboși, Margherita Finamore

Room: D-06-13

10:30 – 10:45 Optimal operation strategy for subway HVAC system in transition seasons
Yue Zhang, Xiaofeng Li, Zheren Song and Bin Wang

10:45 – 11:00 Energy retrofitting of a single-family house
Imrich Sánka and Dušan Petráš

11:00 – 11:15 Energy conservation by retrofitting of dwellings
Imrich Sánka and Dušan Petráš

11:15 – 11:30 Renovation of apartment buildings with prefabricated modular panels
Kalle Kuusk, Peep Pihelo and Targo Kalamees

11:30 – 11:45 A Case Study for large-scale nearly zero energy retrofits of existing office building in Beijing
Fei Lu, Yu Zou, Deyu Sun, Biao Qiao, Ji Li, Zhenyu Yu and Jianlin Wu

11:45 – 12:00 Double skin suitable for mediterranean climate in school-gym buildings.
Margherita Finamore

12:00 – 12:15 Homeowners’ Decisions Towards Energy Renovations - Critical Stages and Sources of Information
Shima Ebrahimigharehbaghi, Queena Qian, Frits Meijer and Henk Visscher
12:15 – 12:30  
*A Decision Making Algorithm for Energy-Economic Sustainability and Efficiency in Buildings: A Case Study in Turkey*
Derya Kisla Tekin, Levent Colak and Birol Kilkis

12:30 – 13:00  
*Debates/Discussions*

13:00 – 14:00  
*LUNCH*

14:00 – 14:20  
*CLIMA 2019 - PLENARY SESSION 7, Aula Hall*
Chairs: Sorin Burchiu - CLIMA 2019 & AlIR President; Ioan-Silviu Doboş - CLIMA Sponsor & Exhibition Committee Chair; Ilinca Năstase - CLIMA 2019 Scientific Committee Chair, Cătălin Lungu - REHVA vicepresident & CLIMA Organising Committee Chair, Frank Hovorka - REHVA President
*DAIKIN Award ceremony & presentation*

14:20 – 14:40  
*REHVA student competition award ceremony & presentation*

14:40 – 15:00  
*HVAC world student competition award ceremony & presentation*

15:00 – 15:45  
*Awards ceremony, plenary presentations & closure speech*

15:45 – 16:00  
*Closure CONCERT & entertainment*
**WORKSHOPS, COURSES & STUDENT COMPETITION PROGRAM**

**MONDAY, MAY 27th**

**10:30-13:00 ROOM A-P-04**

**BELIMO, Power of the Cloud**

Chair: Dr. Marc Thuillard, Belimo AUTOMATION AG

**10:30-13:00 ROOM A-P-21**

**EUROVENT CERTITA, Third-party confidence for building projects:**

Eurovent tools to deliver value, How to to derisk projects

Chair: Erick MELQUIOND, EUROVENT CERTITA CERTIFICATION

**10:30-12:00 ROOM C-D-01**

**TRIPLE A RENO & MOBISTYLE,**

Why people matter? User stories for designing successful deep renovations and sustainable human-building interactions

Chair: Dr. Simona D’OCA, Huygens Engineers & Consultants

**10:00-13:00 ROOM G-M-10**

**REHVA course nZEB**

**15:30-18:00 ROOM A-P-21**

**EPB CENTER & REHVA & EPEE & EVIA,**

**SUPPORTING DISSEMINATION AND ROLL-OUT OF THE SET OF ENERGY PERFORMANCE OF BUILDING (EPB) STANDARDS**

Chairs: Jaap Hogeling, Director, EPB Center; Dick van Dijk, Staff, EPB Center

How to implement the EPBD requirements to ensure proper energy savings & indoor environment quality in buildings?

Chairs: Andrea VOIGT, Director General of EPEE; Claus HAENDEL, Technical Secretary of EVIA

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16:00-17:30  **ROOM E-M-03**
Workshop no. 6
UTCB, *Ventilations strategies in healthcare facilities: challenges, good practices and perspective*
*Chairs:* Risto Kosonen Aalto University
Ilinca Nastase Technical University of Civil Engineering of Bucharest
Cristiana Croitoru Technical University of Civil Engineering of Bucharest

16:00-17:30  **ROOM A-03-08**
Workshop no. 7
QUANTUM, *New Standards, Tools and Services for Quality Management of Building Performance*
*Chair:* Dr. Stefan, PLESSERIGS TU Braunschweig/synavision

16:00-17:30  **ROOM A-P-04**
Workshop no. 14
GEOTABS, *Towards optimized performance, design, and comfort in hybridGEOTABS buildings*
*Chair:* Prof. Dr. Lieve HELSEN, KULeuven/EnergyVille

16:00-17:30  **ROOM A-03-08**
Workshop no. 15
CU Hong Kong & TU Denmark,

15:00-17:30  **ROOM G-M-10**
AIIR &UAUIM course,

15:00-17:30  **ROOM C-D-01**
HVAC WORLD STUDENT COMPETITION,
WEDNESDAY, MAY 29TH

10:30-13:00  ROOM E-M-03
Workshop no. 16
IMTECH & ALLBIM.net, The Business and Environmental Value of BIM

Chairs: Ioan Silviu DOBOSI, DOSETIMPEX
Lucian Dan MORARU, ALLBIM NET

10:30-13:00  ROOM A-03-08
Workshop no. 17
TESTO, Advanced HVAC measurement technology and indoor air quality monitoring
Chair: Horațiu Bașa, Testo Romania

10:30-12:00  ROOM C-D-01
Workshop no. 18
ISIAC & REHVA, REHVA-ISIAQ workshop on evidence-based ventilation needs and development process of future standards

Chairs: Jarek Kurnitski, Tallinn University of Technology
Pawel Wargocki, Technical University of Denmark

10:30-13:00  ROOM A-P-21
Workshop no. 19
RCEPB 2019 (UTCB / AIIR / Department City Halls)

10:30-13:00  ROOM A-P-04
Workshop no. 20
DAIKIN Awards Poster Competition,

16:00-17:30  ROOM A-P-04
Workshop no. 8
SHASE & REHVA, REHVA-SHASE workshop on NZEB and ZEB Ready concepts in Europe and Japan

Chairs: Jarek Kurnitski, Tallinn University of Technology
Gyuyoung Yoon, Nagoya City University
TUESDAY, MAY 28th

14:00-18:00  ROOM C-D-01
REHVA STUDENT COMPETITION

10:30-13:00  ROOM A-P-21
Workshop no. 9
HALTON, Indoor Environment Design for Smart Buildings
Chair: Anna Gagneur, Halton Oy

10:30-13:00  ROOM C-D-01
Workshop no. 10
FIT-TO-NZEB + GRUNDFOS + Ibroad, Energy renovation of building stock towards nZEB levels: How to prepare the market for the challenge?
Chairs: Horia Petran, INCD URBAN-INCERC & Cluster Pro-nZEB
Dragomir Tzanev, Eneffect

10:30-12:00  ROOM A-03-08
Workshop no. 11
eu.bac & REHVA, BACS supported performance, technical monitoring and certified commissioning of HVAC systems
Chairs: Atze BOERSTRA, REHVA Vice-President
Peter HUG, eu.bac Managing Director

10:00-11:30  ROOM A-P-04
Workshop no. 12
CCHVAC & REHVA

11:30-13:00  ROOM A-P-04
Workshop no. 13
RHOS, Costs and benefits of antibacterial filter and its effects on energy saving, human health and worker productivity
Chairs: Paolo Stefano Corniati, Rhoss S.p.a.
Micaela Ranieri, Rhoss S.p.a.

10:00-13:00  ROOM G-M-10
REHVA course hybrid GEOTABS,