

CESBP  **2022**

**5th Central
European
Symposium on
Building Physics
5th - 7th September
2022
Bratislava**



CESBP 2022

WhatsApp SUPPORT



Faculty of Civil Engineering
Slovak University of Technology
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Slovak Academy of Sciences
Institute of Construction and Architecture



SLOVAK UNIVERSITY OF
TECHNOLOGY IN BRATISLAVA
FACULTY OF CIVIL ENGINEERING



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Welcome to Bratislava!

The objective of the symposium is to discuss the results of academic and industrial research and exchange valuable experiences in the field of building physics:

- Heat and mass transfer
- Building materials and components
- Building envelope systems
- Building's energy performance
- Indoor climate and human comfort
- Hygrothermal performance/moisture
- Air flow and pollutants transport
- Daylight and illumination engineering
- Building and room acoustics
- Urban physics
- Environmental impact and life-cycle assessment

We look forward to seeing you!
 Enjoy symposium and your stay in Bratislava!

CSBP2022 Organizing Committee

SYMPOSIUM AGENDA

1 DAY Monday 5th September

8:00 Symposium registration

9:00 OPEN: Opening Session Location:
Auditorium Akademik Bella B101
Chair: Peter Matiasovsky, SAV, Slovak Republic

9:20 Keynote lecture 1: Prof. Jan Carmeliet (ETH Zurich) "Changing urban climate and impact on building physics"
Location: Auditorium Akademik Bella B101
Chair: Peter Matiasovsky, SAV, Slovak Republic

S-1-01: Heat and mass transfer 1
Location: Symposium room BAT 1

Chair: Dariusz Gawin, Lodz University of Technology, Poland

S-1-02: Hygrothermal performance 1
Location: Symposium room BAT 2

Chair: Vasco Peixoto de Freitas ., Porto University - Faculdade de Engenharia, Portugal

10:20 Thermal properties of heat resistant composites based on calcium aluminate cement: The effect of plasticizers
Dana Koňáková, Kateřina Šádková, Eva Vejmelková, Vojtěch Pommer, Robert Černý

Retrofitting Traditional Walls: A Comparative Study on Thermal Renders and More Common Insulation Materials
Maqda Posani, Rosario Veiga, Vasco Freitas

10:40 Thermal conductivity of red clays as a function of temperature: a novel approach for elimination of systematic measurement uncertainties
Vojtěch Pommer, Eva Vejmelková, Jiří Maděra, Václav Kočí

Rain resistance of open-joint façade claddings –Experiences from laboratory measurements
Stig Geving, Tore Kvande, Berit Time

11:00 Heat flux measurement in residential buildings: A method for enhancement of thermopile sensitivity
Jan Kočí, Jiří Maděra

Influence of reduced air pressure on the sorption isotherm and vapor permeability of porous building materials
Mengli Zhou, Zijian Zhu, Xiaolong Li, Chi Feng

11:20 Effect of moisture migration on the thermal conductivity measurement of wet materials during an HFM test
Machhour EL ASSAAD, Thibaut COLINART, Thibaut LECOMPTE

Hygrothermal Assessment of Solid Masonry Walls Internally Insulated with Bio-based Insulation Materials
Nickolaj Feldt Jensen, Eva B. Møller, Kurt Kielsgaard Hansen, Carsten Rode

SYMPOSIUM AGENDA

11:40 Thermo-hydro-mechanical analysis of backfill and buffer in nuclear waste repositories
Jaroslav Kruis, Tomáš Krejčí, Tomáš Koudelka

Influence of Hygrothermal Properties of Bricks on the Heat and Moisture Transport During Freeze-thaw
Yanan LI, Huarong XIE, Yonghui LI, Shuichi HOKOI

12:00 Lunch

S-1-11: Building energy performance 1
Symposium room BAT 1

Chair: Karim Ghazi Wakili, IABP Institute for Applied Building Physics, Switzerland

S-1-12: Hygrothermal performance 2
Symposium room BAT 2

Chair: Stig Geving, SINTEF, Norway

13:00 Increased solar shares from multifunctional building parts
Tillman Gauer, Matthias Pahn

The development of a laboratory centrifuge for the measurement of the moisture storage properties of porous building materials
Daan Deckers, Hans Janssen

13:20 Predicting solar gains based on on-board monitored data: exploring dynamic methods on a full-size building case
Xiang Zhang, Arash Erfani, Dirk Saelens,

Choice of indoor standard in hygrothermal simulations of external walls
Akram Abdul Hamid, Jesper Arfvidsson, Lars-Erik Harderup

13:40 Projected versus actual energy performance improvement due to thermal retrofit of buildings: A case study
Cristian Casian, Christiane Berger, Ardehir Mahdavi, Ulrich Pont, Matthias Schuss

Temperature and moisture conditions in wood windows under natural weathering
Nora Schjøth Bunkholt, Lise Svenning, Petra Rütther, Lars Gullbrekken

14:00 Hygrothermal Performance of AAC Exterior Wall After Additional Insulation with Prefabricated Elements in Estonia
Peep Pihelo, Targo Kalamees

Risk of Mould Growth in Future Climate in Different European Locations for Two Bio-based Insulation Systems for Interior Retrofitting
Nickolaj Feldt Jensen, Eva B. Møller, Kurt Kielsgaard Hansen, Carsten Rode

SYMPOSIUM AGENDA

14:20	Towards large scale Heat Loss Coefficient assessment starting from limited on-board measured data <i>Katia Ritosa, Staf Roels, Dirk Saelens</i>	Non-isothermal cup test for liquid and vapour conductivity curve calibration <i>Paul Klöšeko, Karl Margus, Targo Kalamees</i>
14:40	Outdoor performance assessment of a super-insulated opaque façade panel integrating PV, PCM, and thermal mass activation <i>Stefano Fantucci, Elisa Fenoqlio, Giorgia Autretto, Fabio Favoino, Valentina Serra, Marco Perino</i>	Impact of climate conditions on clustering approaches for hygrothermal material properties in solid masonry constructions <i>Bruno Vanderschelden, Nathan Van Den Bossche</i>
15:00	Coffee break	
	S-1-21: Building energy performance 2 <i>Location: Symposium room BAT 1</i> <i>Chair: Dominique Derome, Université de Sherbrooke, Canada</i>	S-1-22: Hygrothermal performance 3 <i>Location: Symposium room BAT 2</i> <i>Chair: Staf Roels, KU Leuven, Belgium</i>
15:20	Building-related Energy Consulting Practice: An Austrian Perspective <i>Valentina Schöbinger, Ulrich Pont, Ardeshir Mahdavi</i>	Differences in the Risk of Mould Growth in residences in Four Cities in Southeast China <i>Zun ZHU, Huarong XIE, Yonghui LI, Shuichi HOKOI</i>
15:40	Airtightness Development in Large Timber Buildings: Case Study of a Zero-Emission Building in Norway <i>Lise Svenning, Roberta Moschetti, Tore Kvande, Lars Gullbrekken, Berit Time</i>	Vapor permeability of natural based materials on the example of wood wool <i>Piotr Kosiński, Robert Wójcik, Mariusz Kostowicki, Mateusz Rzepski</i>
16:00	Smart Digitized Insulation System for Energy-Efficient Facade <i>Ayman Bishara</i>	Fungal Growth On Concrete Surfaces Of Floors And Walls <i>Nickolaj Feldt Jensen, Birgitte Andersen, Martin Morelli</i>
16:20	Deep refurbishment as a pathway towards decarbonization of the Polish residential building sector <i>Marcin Zygmunt, Dariusz Gawin</i>	A comprehensive framework to select climate data for hygrothermal simulations: application on solid masonry walls in Brussels <i>Isabeau Vandemeulebroucke, Steven Caluwaerts, Nathan Van Den Bossche</i>

SYMPOSIUM AGENDA

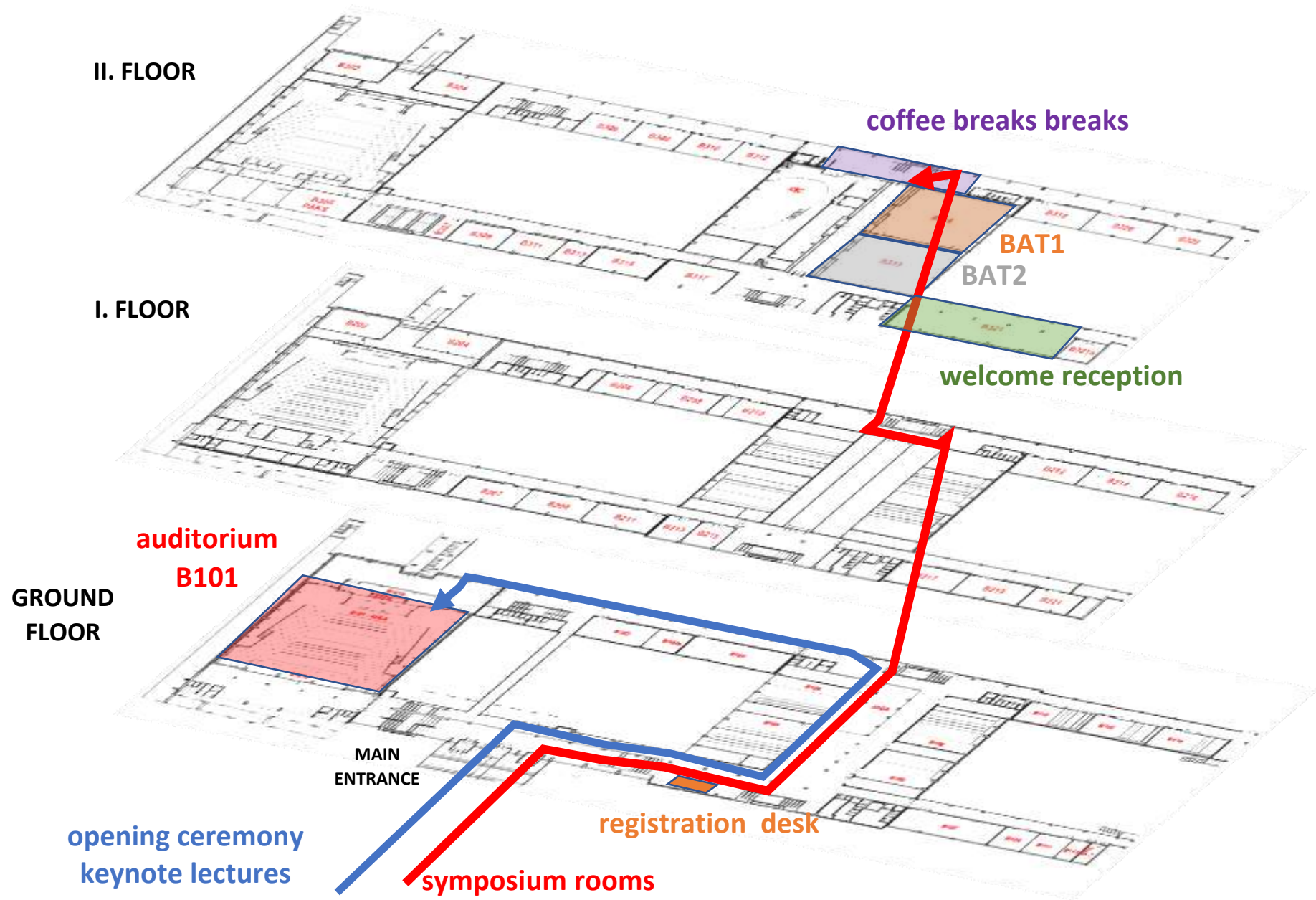
16:40	BIM based hygrothermal evaluation of slab-on-grade constructions <i>Balázs Fürtön, Zsuzsa Szalay, Balázs Nagy</i>	Mould Reliability Analysis Combined with Mould Health Risks for Decision Support <i>Mohsen Bayat Pour, Jonas Niklewski, Eva Frühwald Hansson, Sebastian Thöns</i>
17:00	Reliability of conversion factors in the design values of thermal conductivity parameters. Effect on a mineral-fibrous material <i>Richard Slávik, Lukáš Zelem, Miroslav Čekon</i>	Air leakage locations and crack formation in a crosslaminated timber building related to wetting during the construction phase <i>Kristo Kalbe, Villu Kukk, Targo Kalamees</i>
17:30	Welcome reception Room B321	
19:00	Scientific Committee Dinner St. Hubert restaurant (Dulovo nám. 1, Bratislava)	
2 DAY Tuesday 6th September		
9:00	Keynote lecture 2: Prof. Ardeshir Mahdavi (TU Wien) "The Human Dimension of Building Science" Location: Auditorium Akademik Bella B101 Chair: Peter Matiasovsky, Slovak Academy of Sciences, Slovak Republic	
9:40	Coffee break	
	S-2-01: Heat and mass transfer 2 <i>Location: Symposium room BAT 1</i> <i>Chair: Jan Carmeliet, ETH Zürich, Switzerland</i>	S-2-02: Environmental impact and life cycle assessment 1 <i>Location: Symposium room BAT 2</i> <i>Chair: Carsten Rode, Technical University of Denmark, Denmark</i>
10:00	Evaluation of green roof structure in the Central Europe climate during winter <i>Peter Juras</i>	Comparing the environmental impact of circular and noncircular façade renovation systems through scenarioanalysis <i>Katrien Devos, Seppe Heyde, Lisa Van Gulck, Nathan Van DenBossche, Marijke Steeman</i>
10:20	Semi-quantitative assessment system of expected moisture levels in compact roofs <i>Roberta Moschetti, Alessandro Nocente, Stig Geving, Lars Gullbrekken, Berit Time</i>	Biodegradation of bone glue as an environment-friendly organic adhesive suitable for building materials <i>Klára Kobetičová, Miloš Jerman, Robert Černý</i>
10:40	New method to identify critical locations for moisture damage problems due to wind driven rain in a changing climate. <i>Aytac Kubilay, Dominique Derome, Jan Carmeliet</i>	Risk spots in Buildings - the why, what and how to <i>Fredrik Slappø, Nora Schjøth Bunkholt, Klodian Gradeci</i>

SYMPOSIUM AGENDA

11:00	Do we understand the drying of porous materials? <i>Jianlin Zhao, Linlin Fei, Feifei Qin, Aytaç Kubilay, Jan Carmeliet, <u>Dominique Derome</u></i>	Influence of Methodological Choices on the Environmental Trade-off between Renovation and Reconstruction <i><u>Yanaika Decorte</u>, Marijke Steeman, Nathan Van Den Bossche</i>
11:20	Research on algae growth difference on the surface of stone carvings based on investigation and simulation <i><u>Long Shen</u>, Huarong XIE, Xiaohan CHEN, Shuichi HOKOI, Yonghui LI</i>	Service life assessment of buildings – a new beginning <i><u>Carsten Rode</u>, Ernst Jan de Place Hansen</i>
11:40	Why 1D-simulations can underestimate the risk on moisture damage in timber frame constructions <i><u>Staf Roels</u>, Astrid Tijssens</i>	Evaluation of Bio and Natural-based Thermal Insulation Materials in Visegrad Countries <i><u>Balázs NAGY</u>, Karel STRUHALA, Lukáš BOSÁK, Piotr KOSIŃSKI</i>
12:00	Lunch	
13:00	Transfer to Bratislava Passenger Port (Ososbný prístav Bratislava - GPS: N48°8'24" E17°6'46") <i>Walking transfer (see. route from Symposium venue - Radlinského 11 to Bratislava Passenger Port - Fajnorovo nábrežie 2, duration 20 minutes, 1.6 km distance) Tram transfer (line 1 from STU to Nám. Ľ.Štúra - Ľ.Štúr square, duration 10 minutes then 5 minutes by walk of 0.5km distance)</i>	
13:30	CESBP22 social tour <i>Return Boat trip Bratislava - Devín - Bratislava, drinking refreshment available at boat Currant wine tasting in Devín</i>	
19:00	Symposium dinner Rivers Club (location: Tyršovo nábrežie 12) <i>Arrival of participants for the symposium dinner between 19.00h. -19.30h. Start of the event is at 19.30h. Small cultural performance of the University's ensemble "Technik".</i>	

SYMPOSIUM AGENDA

DAY 3 Wednesday 7th September		
	S-3-01: Indoor climate and thermal comfort 1 <i>Location: Symposium room BAT 1 Chair: Ulrich Pont, TU Wlen, Austria</i>	S-3-02: Building and room acoustics / Daylight and illumination engineering <i>Location: Symposium room BAT 2 Chair: Ardeshir Mahdavi, TU Wien, Austria</i>
9:00	Assessment of the single and integrated models for indoor air quality, moisture performance and thermal comfort <i><u>Seyedmohammadreza Heibati</u>, Wahid Maref, Hamed H. Saber</i>	Acoustic considerations in office conversion projects: a case study <i>Viviane Ferraz Madeira, <u>Helene Teuffl</u>, Ardeshir Mahdavi</i>
9:20	Strategies and combinations of measures for renovations of heritage buildings – a review <i><u>Akram Abdul Hamid</u>, Hans Bagge, Dennis Johansson, Petra Eriksson, Victor Fransson, Jan Kristoffersson</i>	The potential of single layer walls based on autoclaved aerated concrete from the point of view of building physics in housing construction <i><u>Daniel Urbán</u>, Monika Kurucová, Marek Otčenáš, Alena Struhárová</i>
9:40	Adopting real measurements to a simulation model for indoor temperature increase at reduced cooling power to lower power peaks <i><u>Dennis Johansson</u>, Victor Fransson, Björn Eldvall</i>	Determination of Acoustic Performance of Tire-Fluff and Sandwich Gypsum - Tire-Fluff Boards by Means of Acoustic Chambers <i><u>Lukáš Fiala</u>, Petr Konrád, Petr Hotěk, Robert Černý</i>
10:00	Impact of added thermal insulation on cold attics in apartment buildings in temperate climate – a review <i><u>Akram Abdul Hamid</u>, Hans Bagge, Dennis Johansson, Jan Kristoffersson</i>	Daylighting in shaded rooms with loggia <i><u>Stanislav Darula</u>, Michal Czafik, Anna Rajnohova</i>
10:20	Summer Thermal Comfort in Architectural Early Design Workflows <i><u>Isil Kalpkirmaz Rizaoglu</u>, Karsten Voss</i>	Transparent low-emission glass samples - determination and evaluation of spectral light transmittance <i><u>Silvia Bizoňová</u>, Stanislav Darula, Roman Dubnička</i>
10:40	Coffee break	



	<p>S-3-11: Heat and mass transfer 3 Location: Symposium room BAT 1 <i>Chair: Ákos Lakatos, University of Debrecen Faculty of Engineering, Hungary</i></p>	<p>S-3-12: Hygrothermal performance 4 Location: Symposium room BAT 2 <i>Chair: Balázs Nagy, Budapest University of Technology and Economics, Hungary</i></p>
11:00	<p>Measurement of osmosis efficiency of an illite-based ceramics in NaCl solutions <i>Marek Mánik, Igor Medved'</i></p>	<p>Hygrothermal measurements in internally insulated solid masonry wall before and after hydrophobization. <i>Panaqiota Pagoni, Eva Brigitte Møller, Tessa Kvist Hansen</i></p>
11:20	<p>Experimental study on the thermal conductivity of Croatian traditional earthen architecture <i>Ivan Kraus, Mihaela Domazetović, Ana Perić</i></p>	<p>Visitor Pattern Design of Maijishan Grottoes Based on Risk Assessment of Deteriorations Related to Hygrothermal Environment <i>Yu Pei, Ruobin Wu, Huarong Xie, Yan Ma, Yongqiang Yue, Yonghui Li, Hokoi Shuichi</i></p>
11:40	<p>Vapor diffusion calculations through graphite enhanced polystyrene <i>Ákos Lakatos</i></p>	<p>Deriving practical guidelines using poisson-based decision trees: what is the impact of climate change on hygrothermal risks in masonry heritage buildings in Brussels? <i>Kaat Janssens, Isabeau Vandemeulebroucke, Bruno Vanderschelden, Nathan Van Den Bossche</i></p>
12:00	<p>Role of Small and Large Pores in Modeling of Moisture Diffusivity of Ceramic Bricks <i>Igor Medved', Robert Černý</i></p>	<p>Hygrothermal behaviour of experimental timber wall <i>Richard Slávik, Viktor Pluháček, Peter Matiašovský</i></p>

12:20 Lunch

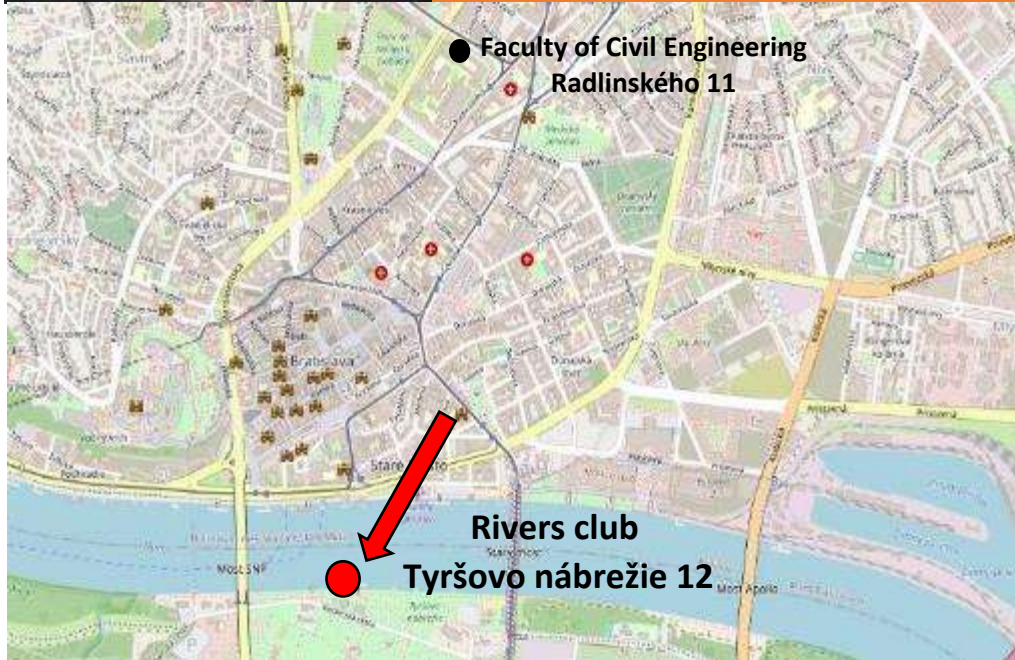
	<p>S-3-21: Indoor climate and thermal comfort 2 Location: Symposium room BAT 1 <i>Chair: Jaroslav Kruis, Czech Technical University in Prague, Faculty of Civil Engineering, Czech Republic</i></p>	<p>S-3-22: Environmental impact and life cycle assessment 2 Location: Symposium room BAT 2 <i>Chair: Eva B. Møller, DTU, Denmark</i></p>
13:20	<p>Comparison and evaluation of the parameters of selected window constructions after the reconstruction of the façade of the laboratory pavilion <i>Marek Bartko, Pavol Durica</i></p>	<p>Integration of Building Physics Expertise In The Building Delivery Process: A Case Study <i>Soledad Di Croche, Ulrich Pont, Ardeshir Mahdavi</i></p>
13:40	<p>Assessment for Hygrothermal properties and Thermal Comfort of raw earth dwelling in Southern China <i>Huarong XIE, Jiasheng PAN, Yu PEI, Yonghui LI, Shuichi HOKOI</i></p>	<p>Laborium Measurements Of Mycelium Based Straw Insulation Composite <i>Maryna Babenko, Igor Medved', Alena Struhárová</i></p>
14:00	<p>The impact of the indoor environment on productivity – case study <i>Natalia Marta Krawczyk</i></p>	<p>Correlation Analysis between Hygrothermal Environment and Mural Diseases Distribution in a Chinese Emperor Tomb <i>Changchang Xia, Diandian Liu, Zhenyi Kong, Huarong Xie, Shuichi Hokoi, Yonghui Li</i></p>
14:20	<p>Assessment of thermal comfort and indoor air quality in the intelligent building – case study <i>Luiza Anna Dębska, Natalia Krawczyk</i></p>	<p>Impact of Climate Change on Heritage: Evaluation of ALARO-0 and REMO Regional Climate Models over Northeastern Iran by Damage Risk Analysis of a Timurid Heritage Using Hygrothermal Modelling <i>Hamed Hedayatnia, Bruno Vanderschelden, Marijke Steeman, Nathan Van Den Bossche</i></p>

14:40 Closing Session
Location: Symposium room BAT 1
Chair: Peter Matiasovsky, Slovak Academy of Sciences, Slovak Republic

Rivers Club is a unique modern multifunctional event space located directly on the Danube with a beautiful view of Bratislava Castle and the Old Town, which was created by transforming the river tugboat Kriváň.



Folklore ensemble Technik STU ranks into the oldest folklore ensembles in Slovakia. The folklore ensemble Technik was established in 1953 in Bratislava. The group focuses on the Slovak national heritage – music, songs and costumes, often influenced by many cultures, as well as by the Hungarian, Czech, Polish or Rumanian.



BOAT TRIP: Bratislava – Devín – Bratislava

Popular boat trip to Devín castle and confluence of rivers Danube and Morava. Cruise starts with views on historic part of Bratislava, its waterfront and Bratislava castle. The cruise continues under the New bridge, bridge Lafranconi and towards the Devín castle. Medieval castle Devín (12. to 16. century) is national cultural monument. It stands on a hill - 212 m above the sea level. It was built on a place of Roman building and Great Moravian fortified settlement. In 864 it was known as Dowina. In 1809 the Napoleonic troops blew up the castle. Today, you can find an archeological museum here.

WINE TASTING – Devinský ríbezľák



The traditional local currant wine made from red and black currants alongside with Devín Castle and Devínska Kobyla has definitely belonged to Devín for many years. The tradition of Devín currant wine has come to life again and that the Devín cellars could for the 3rd time welcome and wine lovers during Small Carpathian Wine Route. To many people in Slovakia the word 'ríbezľák' (Slovak informal name for currant wine) certainly recalls the memories on their grandparents, who used to manufacture this beverage. In the minds of people there is still a tendency the currant wine to be seen as low-class, or at least inferior to wine grapes. This relates in particular because it is produced mostly at home for own consumption, which lacks a professional approach to manufacturing, which is sometimes reflected in the lower price and quality. However, currant wine can surprise!

International Scientific Committee

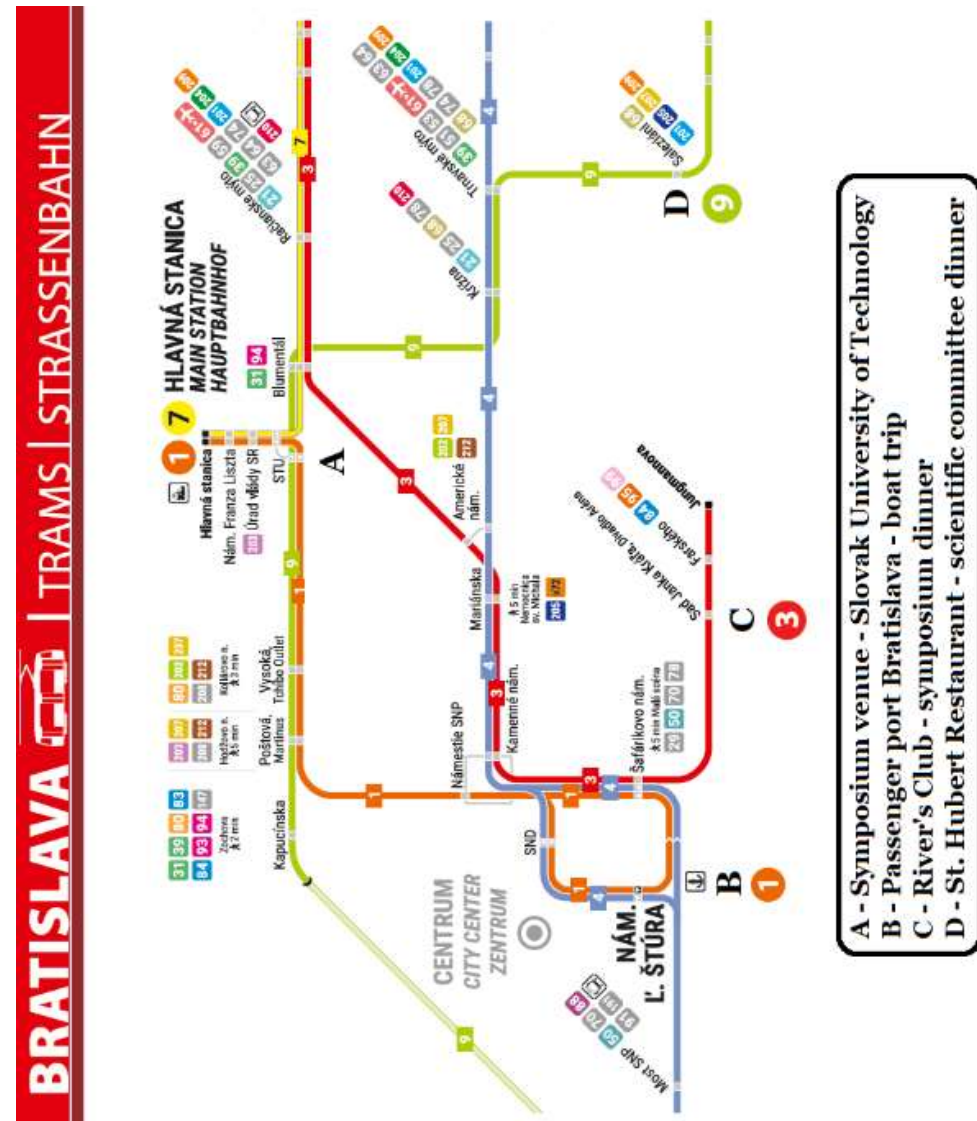
Peter Matiašovský - chair	ICA, Slovak Academy of Sciences, Bratislava, Slovakia
Robert Černý - vice-chair	Czech Technical University in Prague, Czech Republic
Dariusz Gawin - vice-chair	Technical University of Lodz, Poland
John Grunewald - vice-chair	Technische Universität Dresden, Germany
Ardeshir Mahdavi - vice-chair	Vienna University of Technology, Vienna, Austria

Other members of International Scientific Committee

Jesper Arfvidsson, Sweden	Ákos Lakatos, Hungary
Mark Bomberg, Canada	Bob Martens, Austria
Jan Carmeliet, Switzerland	Igor Medved', Slovakia
Vasco Peixoto de Freitas, Portugal	Nathan Mendes, Brazil
Stig Geving, Norway	Leo Pel, Netherlands
Karim Ghazi Wakili, Switzerland	Carsten Rode, Denmark
Carl-Eric Hagentoft, Sweden	Staff Roels, Belgium
Shuichi Hokoi, Japan	Satoru Takada, Japan
Targo Kalamees, Estonia	Juha Vinha, Finland
Jan Kosny, USA	Libor Vozár, Slovakia
Jaroslav Kruis, Czech Republic	

Local Organizing Committee

Peter Matiašovský	ICA, Slovak Academy of Sciences
Igor Medved'	FCE, Slovak University of Technology
Miroslav Čekon	FCE, Slovak University of Technology
Jakub Čurpek	FCE, Slovak University of Technology
Alena Struhárová	FCE, Slovak University of Technology
Richard Slávik	ICA, Slovak Academy of Sciences
Ladislav Kómar	ICA, Slovak Academy of Sciences



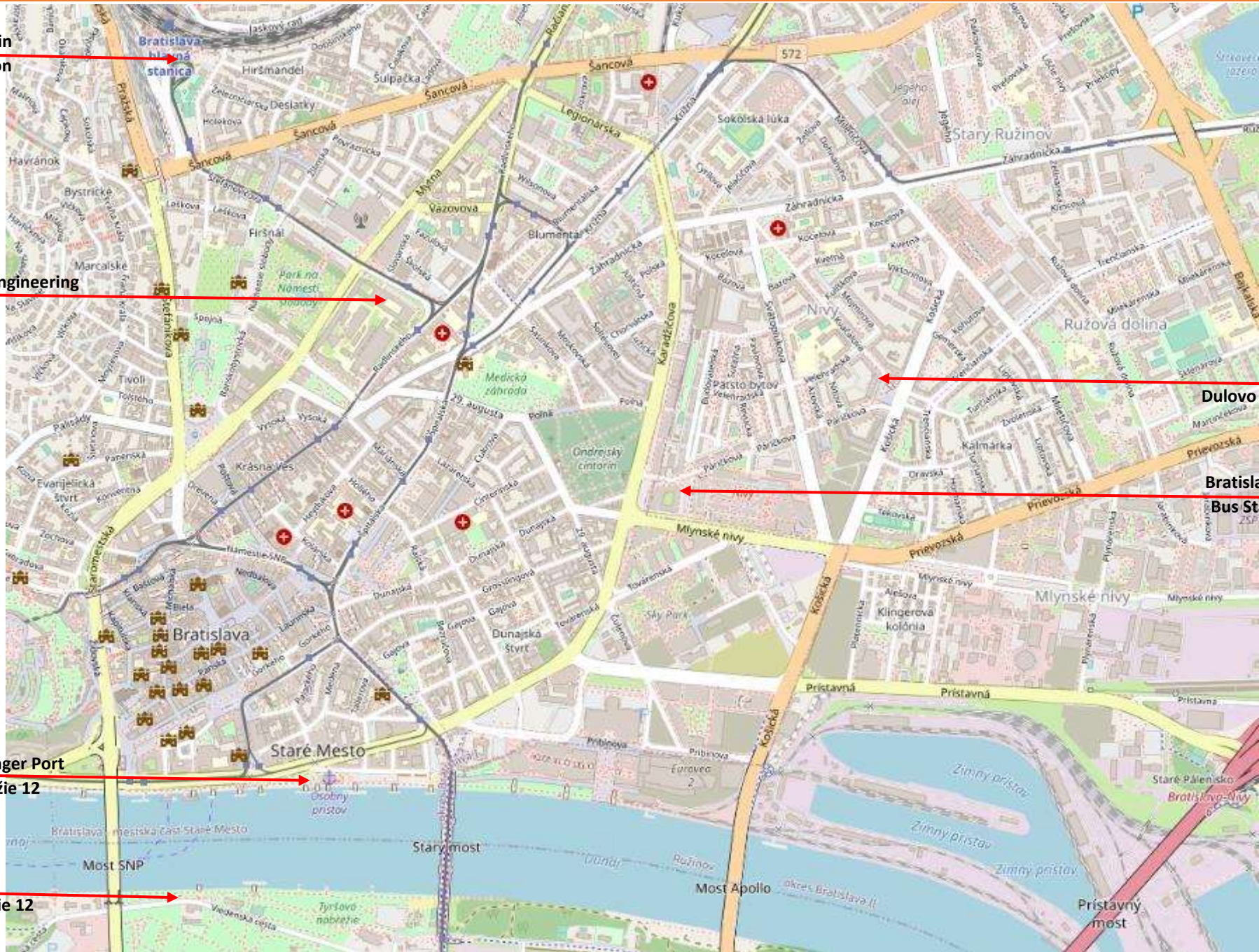
BRATISLAVA MAP

**Bratislava Main
Railway Station**

**Faculty of Civil Engineering
Radlinskeho 11**

**Bratislava Passenger Port
Fajnorovo nábrežie 12**

**River's club
Tyršovo nábrežie 12**



**St. Hubert
Dulovo námestie 1**

**Bratislava Central
Bus Station, Nivy**