

# ACUUS

## BELGRADE 2025



19<sup>th</sup> WORLD CONFERENCE OF THE ASSOCIATED  
RESEARCH CENTRES FOR THE URBAN UNDERGROUND SPACE

November 4-7, Belgrade, Serbia

Underground mobility and elevated thinking.  
New opportunities and challenges in the use of underground urban space.

# PROGRAM

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## Organisers



UNIVERSITY OF BELGRADE  
FACULTY OF TRANSPORT AND TRAFFIC ENGINEERING



Институт за архитектуру и урбанизам Србије  
Institute of Architecture and Urban & Spatial Planning of Serbia

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# **19<sup>th</sup> WORLD CONFERENCE OF THE ASSOCIATED RESEARCH CENTRES FOR THE URBAN UNDERGROUND SPACE**

Underground mobility and elevated thinking.  
New opportunities and challenges in the use of  
underground urban space.

## **CONFERENCE PROGRAM**

November 4-7, Belgrade, Serbia

<b>INTRODUCTORY WORDS.....</b>	<b>3</b>
<b>CONFERENCE CHAIR &amp; CHAIR OF THE ORGANIZING COMMITTEE .....</b>	<b>4</b>
<i>Prof. Vladan Djokic .....</i>	<i>4</i>
<i>Prof. Nebojsa Bojovic .....</i>	<i>4</i>
<b>KEYNOTE SPEAKERS .....</b>	<b>5</b>
<i>Prof. Dimitris Kaliampakos.....</i>	<i>5</i>
<i>Prof. Ray Sterling.....</i>	<i>5</i>
<i>Michael Mooney.....</i>	<i>6</i>
<i>Prof. Shuilong Shen.....</i>	<i>6</i>
<i>Sanja Zlatanovic .....</i>	<i>7</i>
<i>Prof. Andreas Benardos .....</i>	<i>8</i>
<b>PANELISTS .....</b>	<b>9</b>
<i>Prof. Takayuki Kishii, PhD .....</i>	<i>9</i>
<i>Yingxin Zhou, PhD.....</i>	<i>9</i>
<i>Prof. Fang-Le Peng, PhD.....</i>	<i>10</i>
<i>Prof. Chris Rogers, PhD.....</i>	<i>10</i>
<i>Marko Stojčić.....</i>	<i>11</i>
<b>SHORT AGENDA.....</b>	<b>12</b>
<b>AGENDA.....</b>	<b>15</b>
Tuesday, 4 November 2025.....	15
Wednesday, 5 November 2025 .....	15
Thursday, 6 November 2025.....	21
Friday, 7 November 2025.....	27
<b>CONFERENCE FLOORPLAN .....</b>	<b>32</b>





Dear participants,

University of Belgrade (UB), the Faculty of Transport and Traffic Engineering of the University of Belgrade (FTTE), the Urban Institute of Belgrade (URBEL) and the Institute of Architecture and Urban & Spatial Planning of the Republic of Serbia (IAUS) organize the ACUUS 2025 BELGRADE Conference, and on their behalf, it would be pleasure to welcoming you to this important event on the planning and future use of Urban Underground Space (UUS).

With this conference, we want to engage with all of you in an open and constructive discussion about the further development and improvement of the use of the UUS and its progress towards its recognition and implementation in the current municipal and legislative systems.

It is certain that an adequately planned and utilized UUS contributes to the creation of a sustainable, resilient and livable urban environment, which can respond to many challenges a modern city would face including the urban population growth, impacts of climate change, environmental issues, and others.

However, fitting everything together and finding the optimal among many angles of observation, is a serious challenge for any researcher and any professional. It is clear a multidisciplinary approach is necessary and the conference will be a place where various disciplines would collaborate. Our invitation extends to engineers, architects, geologists, construction professionals, and transportation and technology experts, and encompasses planners, environmental specialists and lawyers. In other words, academics and researchers who want to contribute and have an innovative idea towards pushing the boundaries of sustainable use of urban space to make our urban habitat future-proof are invited and welcome to attend!

The entire conference is accredited and the best contributions in form of technical papers will be published in Tunneling and Underground Space Technology (TUST) Journal.

Belgrade is the right city for this conference and offers unique experience through rich cultural life, many events and festivals, and plethora of attractive sightseeing including numerous sites of historical significance. It is known as a city whose events calendar attracts an ever-increasing number of domestic and foreign guests.

We are looking forward to an interesting debate!

Best Regards,

**Architect mr. Nemanja Šipetić**

Vice-Chair of the Conference



### **Prof. Vladan Djokic**

PhD, Conference Chair

Studied at the University of Belgrade, Faculty of Architecture, finished his master's at the University of Southern California, School of Architecture in Los Angeles, and PhD at the University of Belgrade. Professor at University of Belgrade, Faculty of Architecture and Dean of the Faculty 2012-2021. Member of Academy of Engineering Sciences of Serbia since 2012. Since 2017. president of the Serbian Network of Urban Morphology. From 2017-2021. member of the Executive Committee of the European Council of Spatial Planners. Exhibited at 10th International Architecture Exhibition, Venice Biennial, 2006. Editor-In-Chief of the international scientific journal of architecture and urbanism Serbian Architectural Journal since 2009. Rector at University of Belgrade since 2021.



### **Prof. Nebojsa Bojovic**

PhD, Chair of Organizing Committee, ACUUS Board Member

Prof. Dr. Nebojsa Bojovic, is a distinguished professor and Dean at the University of Belgrade – Faculty of Transport and Traffic Engineering, the president of the Institute of Architecture and Urban & Spatial Planning of Serbia, Board and a corresponding member of the Academy of Engineering Sciences. He has made significant contributions authoring 3 books and over 140 scientific papers, including more than 40 in SCI-listed journals, with h-index 20 and more than 1.500 citations. He has led numerous scientific and industry-related projects in transportation and communications and has been involved in international collaborations through H2020, IPA, and CARDS programs. Since 2017, he has chaired the Scientific Committee for Transport, Urbanism, and Construction at the Ministry of Education, Science, and Technological Development.



### **Prof. Dimitris Kaliampakos**

PhD, ACUUS President

Wednesday, 5 November 2025

11:00 - 11:30

(Amphitheater)

#### **Shaping the Future Underground: Where We Stand and What's Next**

Dimitris Kaliampakos is a mining engineer and professor in Environmental Mining and the Director of the Laboratory of Mining and Environmental Technology (L.M.E.T) located at the National Technical University of Athens (NTUA). He is also a consultant Dean of the School of Mining and Metallurgical Engineering and Executive Vice-President of the Lavrion Technological and Cultural Park. Prof. Kaliampakos has been involved in the ACUUS conferences since the Torino Conference in 2002. In 2007, he chaired the Organizing Committee of the 11th International Conference, held in Lavrion and was elected Vice President of ACUUS. In 2013, he was elected President of ACUUS. In 2016 he was re-elected President of ACUUS.



### **Prof. Ray Sterling**

PhD, Vice-Chair of Scientific Committee

Wednesday, 5 November 2025

11:30 - 12:00

(Amphitheater)

#### **The Challenges in Achieving Effective and Long-term Approaches to Underground Space Use and its Planning**

Dr. Sterling is Professor Emeritus at Louisiana Tech University where he directed the Trenchless Technology Center from 1995 to 2009. Previously, from 1977 to 1995, he was the founding director of the Underground Space Center at the University of Minnesota. He is a Past President of the ACUUS, Past Chairman of the International Society for Trenchless Technology, a Past-Vice-Chair of the ITA Committee on

Underground Space and a Past Chairman of the U.S. National Committee on Tunneling Technology. He is a former Editor-in-Chief of the journal Tunnelling and Underground Space Technology.



### **Michael Mooney**

PhD, ACUUS Board Member

Wednesday, 5 November 2025

13:30 - 14:00

(Amphitheater)

**How will future AI advance the development of underground space**

Mike is the Grewcock Chair Professor of Underground Construction & Tunneling at Colorado School of Mines and is an ACUUS Director for the Americas. He leads the Center for Underground as well as the post-graduate degree program in Underground Construction & Tunnel Engineering. Mike teaches a wide variety of tunnel, geotechnical, and structural courses. His research involves pressure balance TBM tunneling, large-diameter liner design, AI and the digital underground, and prediction/control of ground and building deformation. Mike was elected to the US National Academy of Construction in 2024. He is a registered Professional Engineer and a consultant on numerous tunneling projects in the US and internationally.



### **Prof. Shuilong Shen**

PhD, Member

Thursday, 6 November 2025

09:00 - 09:30

(Amphitheater)

**Climate Change induced vulnerability evaluation of Urban Underground Space and artificial intelligence solutions**

Prof. Dr. Shen, is the Chair Professor & Dean of the College of Engineering, Shantou University. Non-EU Fellow, European Academy of Sciences; Member, European Academy of Sciences and Arts.

Prof. Dr. Shui-Long Shen received his BSc. and MPhil from Tongji University in 1986 and in 1989. He obtained his Ph.D. from Saga University, Japan, in 1998. His work experiences include Saga University, Japan (lecturer 1998 to 2001). Post-Doctoral Researcher, National Institute for Environmental Studies, Japan (2001 to 2003). Shanghai Jiao Tong University (SJTU) (Professor, 2003-2018; Department Head of DCE-SJTU 2010-2018).

Dr. Shen's research interests focus on the urban underground infrastructural system, smart maintenance of urban underground facilities, and flooding hazards prevention and mitigation by use of intelligent approaches. Dr. Shen published more than 460 technical papers in Journals and International conferences. Dr. Shen's H-Index in Google Scholar is 94, in Scopus is 86, in Web of Science is 84.

Editor-in-chief: Smart Construction and Sustainable Cities, Springer Nature; Editorial board member: Canadian Geotechnical Journal, Geotextiles and Geomembranes (Associate Editor), Computers and Geotechnics, Tunnelling and Underground Space Technology (TUST); Frontiers of Structural and Civil Engineering, Acta Geotechnicae; Marine Georesources and Geotechnology.

Thursday, 6 November 2025

09:30 - 10:00

(Amphitheater)

### **ACUUS Mission and Vision – Forward and Upward – Underground!**

Keynote Speakers: Sanja Zlatanic and Prof. Andreas Benardos, PhD



### **Sanja Zlatanic**

ACUUS Secretary General, Board Member

Sanja Zlatanic is an internationally recognized tunnel and infrastructure engineering expert with over three decades of leadership on the world's most complex underground transportation projects. Graduated at the top of her class from the University of Belgrade, Serbia, in 1988, and established herself in the United States as a strong leader in developing tunneling and underground engineering projects and promoting the industry.

Sanja has directed and delivered all phases of major, multi-billion-dollar tunnel projects across the globe bringing unmatched technical expertise in underground risk management, transportation solutions, and the design and construction of complex tunneling systems beneath urban environments. As chair of the HNTB's national tunnel practice since 2016, Secretary General of the international non-profit non-governmental organization Associated Research Centers for Urban Underground Space (ACUUS), and Vice President of International Tunnel Association (ITA – AITES) she has mentored generations of engineers while fostering innovation, excellence and inclusiveness nationally and internationally. A strong advocate for diversity of viewpoints and technical excellence in engineering, Sanja continues to champion inclusive leadership and collaborative problem-solving as essential to achieving transformative outcomes throughout the transportation and tunneling industry.



### **Prof. Andreas Benardos**

PhD, Member

Dr. Andreas Benardos is a Professor in the School of Mining and Metallurgical Engineering at the National Technical University of Athens, Greece. His research is focused on underground space development and mine design, risk assessment, ventilation, feasibility and project cost estimation as well as on applications of artificial neural networks in geo-engineering. He has participated in more than 25 research projects awarded by European, National bodies and private firms and has published more than 90 papers in scientific journals and international conferences. Additionally, he is Assistant General Manager of ACUUS, member of Board of the Greek Tunnelling Society (GTS), while he has also been co-chair of the Scientific Committee of the 2023 ITA – AITES World Tunnel Congress.



### **Prof. Takayuki Kishii, PhD**

The Urban Underground Space Center of Japan  
ACUUS Board Member

Wednesday, 5 November 2025

14:00 - 15:30

(Amphitheater)

**Tokyo's multi-layered urban form: Governance, Risk Management, and Vertical Zoning**

Dr. Kishii is Professor Emeritus of Nihon University. He acts now as the President of "The Institute of Behavioral Sciences" and the Representative of "The Urban Underground Space Center of Japan" (USJ) which is the founding member of ACUUS in 1997. His research focuses on the Urban Development Theory and Policy. He has held many prominent positions including the Presidencies of the City Planning Institute of Japan, of the Tokyo Metropolitan Government's Landscape Committee, of the "Urban design Center Japan". Furthermore, Dr. Kishii has been the Director of ASIA in ACUUS since 2014.



### **Yingxin Zhou, PhD**

ACUUS Board Member

Wednesday, 5 November 2025

14:00 - 15:30

(Amphitheater)

**Subsurface master planning in Singapore: from land use safeguarding to 3D planning**

Dr. Zhou is the Technical Director with Knights Synergy (S) Pte Ltd. He has 30 years of experience in research, engineering, and teaching in rock engineering and underground space technology. Dr. Zhou is a Fellow of the Academy of Engineering Singapore, a Fellow of the International Society for Rock Mechanics and Engineering (ISRM), and a Board Member of the Associated Research Centers for the



Urban Underground Space. He is also a member of the Advisory Board for the TUST Journal. He has served as Vice President of ACUUS and Vice President (Asia) of ISRM and was the Organizing Chair for both ACUUS 2012 and 2024 in Singapore.



### **Prof. Fang-Le Peng, PhD**

Underground Space Research Center at Tongji University, Shanghai, China  
ACUUS Board Member

Wednesday, 5 November 2025

14:00 - 15:30

(Amphitheater)

### **Institutionalizing underground development in Shanghai: Planning, Policy, and Public Access**

Dr. Fang-Le Peng, who completed his university and postgraduate education at Tongji University in Shanghai, China, and received his Ph.D. from the University of Tokyo, Japan, is currently a full professor and Director of the Underground Space Research Center at Tongji University. He is also the Vice President of ACUUS (2016-present) and the Deputy Director of the Underground Space Committee of the Chinese Society of Urban Science. He has been engaged in teaching and research in urban underground space planning, geotechnical and underground engineering for a long time, and has published more than 300 academic papers in Chinese, English, and Japanese.



### **Prof. Chris Rogers, PhD**

School of Engineering  
University of Birmingham, United Kingdom

Wednesday, 5 November 2025

14:00 - 15:30

(Amphitheater)

### **Underground urbanism in the UK: Institutional Gaps and Strategic Opportunities**

Chris Rogers researches sustainability, resilience and liveability of cities, infrastructure and urban systems, and how systemic changes can be designed and implemented to realise greatest value. With a

particular interest in the 'urban metabolism', he focusses on buried infrastructure and utility services, trenchless technologies, use of underground space and infrastructure systems' interdependencies. A Lead Expert of the UK Government Foresight Future of Cities project, project lead of Mapping and Assessing the Underworld programme and founder member of the UK Collaboratorium for Research on Infrastructure and Cities (UKCRIC), his current research embraces robots for pipeline condition assessment and the ground as an ecosystem service provider.



## **Marko Stojčić**

City Architect of the City of Belgrade

Wednesday, 5 November 2025

14:00 - 15:30

(Amphitheater)

**Panel Session**

Marko Stojčić is the City Architect of the City of Belgrade, born in Belgrade in 1975, graduated Engineer in Architecture (MSc) from the Faculty of Architecture in Belgrade, and a licensed architect, designer and contractor. He is an active member of the Serbian Chamber of Engineers, the Association of Architects of Serbia and of Belgrade, and has the status of a Freelance Artist in the ULUPUDS association.

He is an initiator of the establishment of the Chamber of Architects of Serbia, for which he received the support of the European Commission from Brussels in 2010.

He is the founder and editor-in-chief of the most important regional architectural magazine "*Arhitekt*".

## Short Agenda

### Tuesday, 4 November 2025

- 09:00 - 16:00 **Workshop**  
Underground Space Development: Utilization,  
Innovation, and Urban Sustainability  
(The Palace of Science, Kralja Milana 11, 11000 Belgrade)
- 19:00 - 21:00 **Welcome cocktail reception**  
(Usce Street bb, 11070 Belgrade)

### Wednesday, 5 November 2025

- 09:00 - 10:00 **Registration** (Sava Center)
- 10:00 - 11:00 **OPENING CEREMONY** (Amphitheater)
- 11:00 - 11:30 Keynote Speaker I: **Prof. Dimitris Kaliampakos, PhD**  
(Amphitheater)
- 11:30 - 12:00 Keynote Speaker II: **Prof. Raymond Sterling, PhD**  
(Amphitheater)
- 12:00 - 13:30 Lunch (Atrium)
- 13:30 - 14:00 Keynote Speaker III: **Prof. Michael Mooney, PhD**  
(Amphitheater)
- 14:00 - 15:30 **Panel Session** (Amphitheater)  
**“Integrating Underground Urbanism into Institutional Practice: Strategic Directions, Institutional Preconditions, and Platform Development in Serbia”**
- 15:30 - 15:45 Coffee Break (Atrium)

### 15:45 - 17:00

### PARALLEL SESSIONS

- **Architecture and planning - underground** (Amphitheater)
- **Overcoming challenges in tunneling and underground design and construction** (M9)
- **Underground and climate change: Resilience, sustainability and urban transformation** (M11)
- **Safety, security and human factors** (M13)

- 17:00 - 17:15 Coffee Break (Atrium)

**17:15 - 18:30****PARALLEL SESSIONS**

- **Architecture and planning - underground** (Amphitheater)
- **Overcoming challenges in tunneling and underground design and construction** (M 9)
- **Underground and climate change: resilience, sustainability and urban transformation** (M 11)
- **Safety, security and human factors** (M 13)

Thursday, 6 November 2025

09:00 - 09:30 Keynote Speaker IV: **Prof. Shuilong Shen, PhD**  
(Amphitheater)

09:30 - 10:00 Keynote Speakers V: **Sanja Zlatanovic and Prof. Andreas Benardos, PhD**  
(Amphitheater)

10:00 - 10:30 Coffee Break (Atrium)

**10:30 - 12:00****PARALLEL SESSIONS**

- **Architecture and planning - underground**  
(Amphitheater)
- **Overcoming challenges in tunneling and underground design and construction** (M9)
- **Underground and climate change: resilience, sustainability and urban transformation** (M11)
- **Safety, security and human factors** (M13)

12:00 - 13:30 Lunch (Atrium)

**13:30 - 14:45****PARALLEL SESSIONS**

- **Architecture and planning - underground** (Amphitheater)
- **Overcoming challenges in tunneling and underground design and construction** (M9)
- **Underground and climate change: Resilience, sustainability and urban transformation** (M11)
- **Digitalization and AI toward underground space solutions** (M13)

**15:00 - 16:15****PARALLEL SESSIONS**

- **Architecture and planning - underground** (Amphitheater)
- **Overcoming challenges in tunneling and underground design and construction** (M9)
- **Underground and climate change: Resilience, sustainability and urban transformation** (M11)
- **Digitalization and AI toward underground space solutions** (M13)

16:30 - 18:00 General Assembly (M11)

20:00 - 23:55 Gala dinner with Cultural Performance, includes  
 "History of ACUUS"  
 (Ljubice Luković 5, Belgrade)

Friday, 7 November 2025

**09:00 - 10:15****PARALLEL SESSIONS**

- **Architecture and planning - underground** (Amphitheater)
- **Legal, entrepreneurial, and real estate aspects of underground space** (M9)
- **Advanced technologies and innovative solutions** (M11)
- **Technical Track (Technical Session)** (M13)

**10:30 - 11:45****PARALLEL SESSIONS**

- **Architecture and planning - underground** (Amphitheater)
- **Legal, entrepreneurial, and real estate aspects of underground space** (M9)
- **Advanced technologies and innovative solutions** (M11)
- **Technical Track (Technical Session)** (M13)

11:45 - 13:00 Lunch (Atrium)

13:00 - 13:30 Closing ceremony and transition (Amphitheater)

## Tuesday, 4 November 2025

- 09:00 - 16:00 **Workshop**  
Underground Space Development: Utilization, Innovation, and Urban Sustainability  
(The Palace of Science, Kralja Milana 11, 11000 Belgrade)
- 19:00 - 21:00 **Welcome cocktail reception**  
(Usce Street bb, 11070 Belgrade)

## Wednesday, 5 November 2025

- 09:00 - 10:00 **Registration** (Sava Center)
- 10:00 - 11:00 **OPENING CEREMONY** (Amphitheater)
- Prof. Vladan Djokic, PhD, rector of Belgrade University, Chair of the Conference
  - Prof. Dimitris Kaliampakos, PhD, ACUUS President
  - doc. dr Goran Jeftenić, Engineering Chamber of Serbia
  - Cultural Performance
  - Video of Belgrade
- 11:00 - 11:30 Keynote Speaker I: **Prof. Dimitris Kaliampakos, PhD**  
(Amphitheater)  
**SHAPING THE FUTURE UNDERGROUND: WHERE WE STAND AND WHAT'S NEXT**
- 11:30 - 12:00 Keynote Speaker II: **Prof. Raymond Sterling, PhD**  
(Amphitheater)  
**THE CHALLENGES IN ACHIEVING EFFECTIVE AND LONG-TERM APPROACHES TO UNDERGROUND SPACE USE AND ITS PLANNING**
- 12:00 - 13:30 Lunch (Atrium)
- 13:30 - 14:00 Keynote Speaker III: **Prof. Michael Mooney, PhD**  
(Amphitheater)  
**HOW WILL FUTURE AI ADVANCE THE DEVELOPMENT OF UNDERGROUND SPACE**

14:00 - 15:30 **Panel Session: “Integrating Underground Urbanism into Institutional Practice: Strategic Directions, Institutional Preconditions, and Platform Development in Serbia”**  
 (Amphitheater)  
 Session Chair: Ivana Milenković, Radio Television of Serbia (RTS)

### Panelists:

Speaker 1: **MSc Marko Stojčić**, the City Architect of the City of Belgrade

Topic: Study on the Development of Urban Planning in the Underground Space of the City of Belgrade — current conditions, institutional challenges, and next steps toward systemic integration.

Speaker 2: **Prof. Emeritus Takayuki Kishii, PhD**, The Urban Underground Space Center of Japan, Tokyo, Japan

Topic: Overview of Japan's multi-layered underground planning system — from the Basic Guidelines on Underground Shopping Centers to the Deep Underground Act — and lessons for institutional continuity.

Speaker 3: **Dr. Yingxin Zhou**, Academy of Engineering Singapore, Singapore

Topic: Insights into Singapore's Digital Underground Project and the development of 3D subsurface planning through institutional coordination between URA, SLA, and DSTA.

Speaker 4: **Prof. Fang-Le Peng, PhD**, Underground Space Research Center at Tongji University, Shanghai, China

Topic: Institutional mechanisms for underground development in China — regulatory frameworks, university–government collaboration, and transdisciplinary integration.

Speaker 5: **Prof. Chris Rogers, PhD**, UK Government Foresight Future of Cities project, London, United Kingdom

Topic: Application of Theory of Change and foresight methods in the UK's infrastructure planning — systems thinking, scenario planning, and policy foresight for sustainable underground urbanism.

15:30 - 15:45 Coffee Break (Atrium)



15:45 - 17:00

PARALLEL SESSIONS

**Architecture and planning - underground** (Amphitheater)

Session Chair: Fang-Le Peng, Tongji University

BRINGING URBAN TRANSPORTATION INFRASTRUCTURE  
UNDERGROUND

Petr Pospisil; Bernd Hagenah

EXPLORATION FOR UPGRADING OF URBAN UNDERGROUND SPACE  
PLAN IN CHINA: UNDERGROUND PLANHaoyu Wang; Dongjun Guo; Xingxing Zhao; Jun Huang; Yanhua Wu;  
Yulu ChenUNIVERSALITY IN DESIGN: USER-CENTRIC METHODOLOGY FOR  
INFRASTRUCTURE PROJECTS - BRUSSELS EXPERIENCE

Gordana Micic

RESEARCH ON THE DISTRIBUTION, DEVELOPMENT QUALITY AND  
DRIVING FORCES FOR THE DEVELOPMENT QUALITY OF URBAN  
UNDERGROUND SPACE IN CHINA

Jingwei Zhao; Yu Sun; Haoqi Li; Yingge Zhu

**Overcoming challenges in tunneling and underground design and  
construction** (M9)

Session Chair: Mike Mooney, Colorado School of Mines

STUDY ON THE INFLUENCE OF MECHANICAL PROPERTIES OF FRC ON  
THE MECHANICAL PERFORMANCE OF SHIELD TUNNEL SEGMENTS

Fan Zhang; Wouter De Corte; Xian Liu; Yihai Bao; Luc Taerwe

EXPERIMENTAL CHARACTERIZATION OF JET GROUT USING DIGITAL  
IMAGE CORRELATION TECHNIQUEKsenija Kavarić; Marko Popović; Aleksandar Savić; Sanja Jocković;  
Milena RakovićTOWARDS AN ADVANCED GEOTECHNICAL MODELLING OF BLOCK-  
IN-MATRIX ROCK FOR ROBUST TUNNEL DESIGN AND CONSTRUCTIONKsenija Micić; Novak Joksimović; Miloš Marjanović; Vojkan Jovičić;  
Jelena NinićRESEARCH ON THE HIGH-TEMPERATURE MECHANICAL PROPERTIES OF  
CORRUGATED STEEL-CONCRETE COMPOSITE STRUCTURES IN TUNNEL  
ENGINEERING UNDER FIRE

Bo Lei; Wenqi Ding; Qingzhao Zhang

## **Underground and climate change: Resilience, sustainability and urban transformation (M11)**

Session Chair: Wout Broere, Delft University of Technology

### **LIFE-CYCLE CARBON FOOTPRINT OF UNDERGROUND INFRASTRUCTURE**

Luyuan Long; Wout Broere; Xuehui Zhang

### **THE EVOLVING RESILIENCE OF GLOBAL METRO NETWORKS**

Yun-Hao Dong; Xiao-Wei Luo; Fang-Le Peng; Wout Broere

### **COMBATting MODERN CITY PROBLEMS WITH THE USAGE OF UNDERGROUND SPACE: THE CASE STUDY OF GREECE**

Dimitrios Papadomarkakis

### **INFLUENCING FACTORS ANALYSIS OF BEARING CAPACITY OF DEEP UNDERGROUND SPACE AND EVALUATION METHODS IN A COASTAL SOFT SOIL MEGA CITY: A CASE STUDY OF SHANGHAI**

Jianxiu Wang; Yanxia Long; Tongzhen Cui; Hanmei Wang; Xinlei Huang; Yuanbo Gao; Jianzhong Wu; Weiqiang Pan

## **Safety, security and human factors (M13)**

Session Chair: Prof. Dalibor Pesic, Filip Filipovic, PhD, University of Belgrade - Faculty of Transport and Traffic Engineering

### **IMPLEMENTATION OF SMART SITE SAFETY SYSTEM AND 5G/IOT IN TUNNEL CONSTRUCTION IN HONG KONG – SOLUTION FOR SAFETY CONSTRUCTION**

Yifeng Li; Zhikai Wei; Joseph Hong; Chao Guan

### **EXPERIMENTAL STUDY ON THE SMOKE SPREADING CHARACTERISTICS OF FIRE IN THE MERGING SECTION OF THE ARCH BIFURCATION TUNNEL**

Yunxiao Xin; Yaqiong Wang

### **EFFECTS OF GUIDANCE FACILITIES ON DRIVING SAFETY IN ROAD TUNNELS DURING FOGGY WEATHER**

Liankun Xu; Hehua Zhu; Ruoquan Fang; Yi Shen; Tao Liu; Shouzhong Feng

### **QUANTIFYING THE RESILIENCE CONTRIBUTION OF UNDERGROUND PEDESTRIAN SYSTEMS FOR SOLAR EXPOSURE RISK REDUCTION IN URBAN HEATWAVES**

Zongchao Gu; Toshihiro Osaragi; Haipeng Zhu; Jiawei Leng

17:00 - 17:15 Coffee Break (Atrium)

17:15 - 18:30

PARALLEL SESSIONS

**Architecture and planning - underground** (Amphitheater)

Session Chair: Takayuki Kishii, Urban Underground Space Center of Japan

RESEARCH ON THE IDEAS AND CHALLENGES OF CREATING A WALKABLE PEDESTRIAN NETWORK BY UTILIZING UNDERGROUND SPACE

Daisuke Fukumoto; Sadayasu Aono; Kentaro Hayashi; Takeshi Hirose; Kazuya Masuyama

RESERVOIRS OF ENERGY: A JOURNEY TOWARDS ENERGY AUTONOMY FOR NINE UK EARTH-SHELTERED HOMES

Jerry Harrall; Daniel Kastner; Alvaro Garcia; Max Lee

BUILDING BELOW: ARCHITECTURE BETWEEN FINANCE AND SUBTERRANEAN FUTURES

Danilo Furundžić; Dejan Filipović; Nebojša Bojović

**Overcoming challenges in tunneling and underground design and construction** (M9)

Session Chair: Christopher Rogers, University of Birmingham

CONQUERING CHALLENGES IN THE DESIGN AND CONSTRUCTION OF AN INTEGRATED UNDERGROUND SINGAPORE METRO STATION

Hooi Leng Phua; Maznah Mohd Ali; Michelle Wu; Anand Kumar Pochambavi Pochambavi; Si Thu Aung

UNDERGROUND URBANIZATION AND GEOTHERMAL POTENTIAL IN MODERN INFRASTRUCTURE: THE CASE OF THE MARIBOR CITY TUNNEL

Vojkan Jovičić; Mitja Pečovnik; Samo Medved; Željko Vukelić; Elvir Muhić; Marko Kosovel

EVALUATION OF SEGMENT UPLIFT RISK DURING SHIELD TUNNELLING BASED ON CLOUD MODEL

Haoze Wu; Shuilong Shen; Annan Zhou

EXTRACTION OF INDIVIDUAL ROCK DISCONTINUITIES BASED ON THREE-LAYER CLUSTERING ALGORITHM FROM 3D POINT CLOUDS

Bingyi Pan; Wei Wu; Yong Huang; Baolin Chen; Hehua Zhu

## **Underground and climate change: resilience, sustainability and urban transformation (M11)**

Session Chair: Andreas Benardos, National Technical University of Athens

### **HEAT STORAGE UNDERGROUND: A FEASIBILITY STUDY IN ZURICH'S URBAN CORE**

Antonia Cornaro; Jimi Dellenbag

### **LOW CARBON OPERATION AND MAINTENANCE TECHNOLOGIES AND APPLICATIONS FOR UNDERGROUND WASTEWATER TREATMENT PLANTS**

Jun Huang; Hongling Ji; Ao Li; Fan Gao; Wei Gu

### **FLOOD RISK ASSESSMENT AND RESILIENCE STRATEGIES FOR URBAN METROS UNDER EXTREME RAINFALL**

Shuguang Liu; Weiqiang Zheng; Guihui Zhong; Zhengzheng Zhou

### **UNDERGROUND SMALL MODULAR REACTORS FOR DISTRICT HEATING**

Ilkka Vähäaho; Matti Pentti

## **Safety, security and human factors (M13)**

Session Chair: Prof. Dalibor Pesic, Filip Filipovic, PhD, University of Belgrade - Faculty of Transport and Traffic Engineering

### **THE DYNAMICS OF TRAVELLATORS FOR MOVING PEOPLE IN UNDERGROUND SPACE**

John Zacharias

### **OPTIMIZATION OF TUNNEL VENTILATION SYSTEMS IN FIRE EMERGENCIES**

Andrei Danilov; Vladimir Chizhikov

### **EVACUATION BEHAVIOR AND SAFETY EGRESS ANALYSIS IN TUNNEL FIRES: A VIRTUAL REALITY SIMULATION STUDY**

Vasilis Kotsakis; Christos Froudakis; Anastasios Kallianiotis; Maria Menegaki; Dimitrios Labrakis

### **LIGHT AND HEALTH IN UNDERGROUND PUBLIC SPACES FOR THE WELL-BEING OF ALL**

Marija Jevtic; Gordana Micic

### **ROAD TUNNEL SAFETY EVALUATION AND CRASH ANALYSIS: EXPERIENCES FROM SERBIA**

Dalibor Pešić; Krsto Lipovac; Boris Antić; Emir Smailović; Filip Filipović; Nenad Marković; Jelica Šćekić

## Thursday, 6 November 2025

- 09:00 - 09:30 Keynote Speaker IV: **Prof. Shuilong Shen, PhD**  
(Amphitheater)  
**CLIMATE CHANGE INDUCED VULNERABILITY  
EVALUATION OF URBAN UNDERGROUND SPACE AND  
ARTIFICIAL INTELLIGENCE SOLUTIONS**
- 09:30 - 10:00 Keynote Speakers V: **Sanja Zlatanic and Prof. Andreas Benardos, PhD**  
(Amphitheater)  
**ACUUS MISSION AND VISION – FORWARD AND  
UPWARD – UNDERGROUND!**
- 10:00 - 10:30 Coffee Break (Atrium)

### 10:30 - 12:00

### PARALLEL SESSIONS

#### Architecture and planning - underground

Session Chair: Prof. Nebojsa Bojovic, University of Belgrade  
(Amphitheater)

DEVELOPING A DATA-DRIVEN BAYESIAN NETWORK MODEL FOR  
LAYOUT PLANNING OF URBAN UNDERGROUND COMMERCIAL  
FACILITIES

Yong-Kang Qiao; Ji-Shuai Xiao; Nikolai Bobylev; Fang-Le Peng

EXPLORATION OF IMPLEMENTATION PATHWAYS FOR UNDERGROUND  
SPACE PLANNING IN KEY URBAN AREAS

Jian Sun; Min Wang

PLANNING PUBLIC URBAN UNDERGROUND SPACES: CULTURAL  
AMENITIES IN BELGRADE'S RIVERFRONT PARK

Marija Lalošević, PhD; Milica Hadži Arsenović; Ana Jovović

EVALUATION AND PLANNING OF UNDERGROUND SPACE RESOURCES  
IN COMPLEX BUILT -UP ENVIRONMENT FROM THE PERSPECTIVE OF  
MULTI-DIMENSIONAL VALUES-- TAKING THE CORE AREA OF THE  
CAPITAL IN BEIJING AS AN EXAMPLE

Yiting Zhao, Kejie Wu, Xiaodong Shi, Longqin Lin

## **Overcoming challenges in tunneling and underground design and construction (M9)**

Session Chair: Zoran Gligorić, University of Belgrade - Faculty of Mining and Geology

NORWEGIAN METHOD OF TUNNELLING (NMT) FOR SUSTAINABLE USE OF UNDERGROUND SPACE IN URBAN AREAS

Krishna Kanta Panthi

IDENTIFICATION OF KARST CAVES BASED ON MULTI-SOURCES DATA FUSION DURING SHIELD TUNNELLING

Xin-Hao Min; Yan-Ning Wang; Shuilong Shen

HYBRID EARTH RETAINING SYSTEM FOR THE CONSTRUCTION OF AN UNDERGROUND METRO STATION IN VARIED GROUND

Hool Leng Phua; Shi Hui Tan; Teck Siew Chin; Seng Hou Lim; Edward Lim

CHALLENGES ASSOCIATED WITH PLANNING AND CONSTRUCTION OF A ROAD TUNNEL THROUGH LESSER HIMALAYAN ROCK MASS – A CASE STUDY

Bimala Piya Shrestha; Krishna Kanta Panthi

## **Underground and climate change: resilience, sustainability and urban transformation (M11)**

Session Chair: Yingxin Zhou, Knights Synergy (S) Pte Ltd

THE ROLE OF UNDERGROUND MINES IN ENERGY TRANSITION: A REVIEW

Dimitris Kaliampakos; Athanassios Mavrikos

HYDROGEOLOGICAL INVESTIGATION AND MONITORING ANALYSIS OF WATER-RELATED HAZARDS IN OPERATIONAL HIGHWAY TUNNELS IN WATER-RICH REGIONS

Yubo Luo; Junsheng Yang; Qi He; Zhiheng Zhu; Youcai Tan

TRANSFORMATIVE APPROACHES TO UNDERGROUND INFRASTRUCTURE: ROAD TO NET ZERO AND BEYOND

Kelwalee Jutipanya; Lewis Makana; Aryan Hojjati; Nicole Metje; Dexter VL Hunt; Emma JS Ferranti; Anthony J Hargreaves; Joanne M Leach; Christopher DF Rogers

BENEATH THE SURFACE: UNLOCKING URBAN GEOTHERMAL POTENTIAL FROM LEGACY SUBSURFACE ASSETS

Chrysothemis Paraskevopoulou; Antonia Cornaro

**Safety, security and human factors (M13)**

Session Chair: Yun-Hao Dong, City University of Hong Kong

ENHANCING PSYCHOLOGICAL HEALTH THROUGH BIOPHILIC DESIGN:  
THE INFLUENCE OF SEA VIEWS ON UNDERGROUND OCCUPANTS.

Isabelle Chan; Samuel Twum-Ampofo

ADAPTABLE SAFETY CONCEPTS FOR UNDERGROUND RAIL, TRANSIT,  
AND ROADWAY APPLICATIONS

Bernd Hagenah; Petr Pospisil

AN EXPERIMENTAL STUDY ON VISUAL COMFORT OF TUNNEL PORTALS  
IN VIRTUAL REALITY ENVIRONMENTS

Weihao Zhao; Fang Liu; Weijun Kong

INFLUENCE OF GEOMETRIC PARAMETERS AND VELOCITY OF VENT ON  
HEAVY GAS EXHAUST EFFICIENCY IN TUNNELS

Yuanqing Ma; Tianqi Wang; Ying Zhang; Angui Li

HUMAN PERCEPTION EXPERIMENT IN UNDERGROUND SPACE  
ENHANCED WITH MIXED REALITY

Mingyi Lin; Fang Liu

12:00 - 13:30 Lunch (Atrium)

**13:30 - 14:45****PARALLEL SESSIONS****Architecture and planning - underground (Amphitheater)**

Session Chair: Chen-Xiao Ma, Tongji University

INTEGRATED UNDERGROUND SPACE PLANNING IN BELGRADE: A  
SMART CITY PERSPECTIVE

Milena Grbić; Olivera Stanković; Ksenija Lalović

SENSITIVE INTEGRATION OF UNDERGROUND SPACES IN HELSINKI'S  
URBAN FABRIC: FROM GEOLOGY TO ARCHITECTURE

Laure Bertrand; Cyrielle Rozé

ADVANCING UNDERGROUND URBAN SPACE PLANNING: THE  
POTENTIAL OF FORESIGHT METHODS IN SYSTEMIC PLANNING AND  
TRANSITION MANAGEMENT

Nemanja Sipetic; Vladan Djokic

STRENGTHENING UNDERGROUND SPACE CONNECTIVITY TO  
ENHANCE THE EFFICIENCY OF UNDERGROUND SPACE UTILIZATION: A  
CASE STUDY OF BEIJING PRACTICES

Qin Chen



## Overcoming challenges in tunneling and underground design and construction (M9)

Session Chair: Vojkan Jovičić, Faculty of Civil and Geodetic Engineering, University of Ljubljana

### UNDERGROUND SPACE OPPORTUNITIES AND TUNNELING IN THE PHILIPPINES

Mark Wallace

### ENGINEERING GEOLOGICAL ASSESSMENT AND GROUND BEHAVIOR OF TECTONICALLY DISTURBED ROCKS IN NORTHERN THAILAND. A CASE STUDY OF THE PHAYAO RAILWAY TUNNELS

Supawit Prarom; Pornkasem Jongpradist; Thanet Thongdetsri; Noppadol Phien-wej; Daniel Dias; Sirisin Janrungautai; Damrong Amorndechaphon; Anat Hasap

### LABORATORY LOADING TEST OF TUNNEL SUPPORT WITH YIELDING ELEMENTS IN ISOTROPIC STRESS FIELD

Yota Togashi; Takumi Umetsu; Kentaro Nakai; Fumitaka Mizuno; Kazuo Sakai

### PRELIMINARY NUMERICAL EVALUATION OF RE-USING OIL STORAGE CAVERNS FOR HYDROGEN STORAGE BY USING LINED ROCK CAVERN TECHNOLOGY

Wenjun Luo; Ping Zhang; Charlie Chunlin Li; Yang Zou; Zongze Li

## Underground and climate change: Resilience, sustainability and urban transformation (M11)

Session Chair: Nataša Danilović Hristić, Institute of Architecture and Urban & Spatial Planning of Serbia

### SUBTERRANEAN URBANISM FOR WILDFIRE RESILIENCE: POST-DISASTER PLANNING AND GIS-BASED DESIGN IN TOPANGA–PALISADES, LOS ANGELES (2025)

Mohammad Mahdi Safaee; Hoda Hashemi

### CARBON EMISSION OPTIMIZATION METHOD FOR OPERATING TUNNELS: AN EVOLUTIONARY GAME-BASED ANALYSIS STUDY

Yumeng Song; Hehua Zhu; Yi Shen; Panfeng Guan; Shouzhong Feng

### TOWARDS LOW-CARBON TUNNEL ENGINEERING: A COMPREHENSIVE REVIEW OF EMISSION ESTIMATION AND FORECASTING TECHNIQUES

Caiwei Wang; Mengqi Zhu; Hehua Zhu; Shiqi Dou

**Digitalization and AI toward underground space solutions (M13)**

Session Chair: Mike Mooney, Colorado School of Mines

GEOLOGICAL ASPECTS OF URBAN PERSONAS: A COMPUTATIONAL AI PIPELINE FOR THE MULTIDIMENSIONAL CHARACTERIZATION OF CITY STREETS IN THE PROVINCE OF QUÉBEC.

Michael Doyle

LESSONS FROM BIM AND AI FOR INDOOR ENVIRONMENTAL QUALITY MANAGEMENT: APPLICATIONS TO UNDERGROUND SPACE ENVIRONMENTAL QUALITY RESEARCH

Samuel Twum-Ampofo; Isabelle Chan; Hao Chen

DIGITAL INTELLIGENCE EMPOWERS THE DEVELOPMENT AND UTILIZATION OF UNDERGROUND SPACE IN MEGACITIES

Fan Yiqun; Zhang Li

MODELING OF PUBLIC PERCEPTION IN METRO-LED UNDERGROUND PUBLIC SPACE FOR PLANNING OPTIMIZATION: A CASE STUDY OF HONG KONG

Qi Pan; Yun-Hao Dong; Fang-Le Peng; Shiu-Tong Thomas NG

14:45 - 15:00 Coffee Break (Atrium)

**15:00 - 16:15**

**PARALLEL SESSIONS**

**Architecture and planning - underground (Amphitheater)**

Session Chair: Marija Lalošević, PhD, Institute of Architecture and Urban & Spatial Planning of Serbia

INTEGRATED URBAN REGENERATION OF SUBWAY STATIONS AND URBAN DEVELOPMENT IN CENTRAL TOKYO - THE CASE STUDY OF TORANOMON HILLS STATION TOWER

Maski Kato

EXPLORATION OF URBAN DESIGN CONCEPTS FOR UNDERGROUND PUBLIC SPACES IN RENEWAL AREAS: A CASE STUDY OF BEIJING'S UNDERGROUND SPACE CONSTRUCTION

Lingjun Meng; Yiting Zhao; Kejie Wu; Jing Guo

RESEARCH ON UNDERGROUND SPACE IMAGE AND PRACTICE OF THREE-DIMENSIONAL URBAN DESIGN

Zhou Fang; Huang Zhang; Yifeng Lin

## Overcoming challenges in tunneling and underground design and construction (M9)

Session Chair: Chrysothemis Paraskevopoulou, School of Earth and Environment, University of Leeds

### SIMULATION OF THE SOIL BASE OF A BUILDING FOUNDATION NEAR A DEEP PIT

Ilizar Mirsayapov; Niyaz Aysin

### GEOPHYSICAL IMAGING OF STOCKHOLM'S SUBSURFACE AT A MUNICIPAL SCALE — IMPLICATION FOR USE AND PLANNING OF ITS UNDERGROUND URBAN SPACE

Emmanuel Alofe; Mehrdad Bastani; Ari Tryggvason

### RESEARCH ON SAFE THICKNESS OF ROCK MASS IN NON-COAL STRATUM TUNNEL WITH HIGH-PRESSURE GAS BLAST BASED ON ENERGY METHOD

Peidong Su; Xingling An; Yuben Du; Peng Qiu; Yougui Li

### TRIAXIAL STUDIES OF GRAY CLAYS IN DIFFERENT LOADING MODES AS A FOUNDATION FOR UNDERGROUND CONSTRUCTION.

Irina V. Koroleva

## Underground and climate change: Resilience, sustainability and urban transformation (M11)

Session Chair: Raymond Sterling, Louisiana Tech University

### VULNERABILITY OF METRO SYSTEM DUE FLOODING IN LARGE ASIAN CITIES

Ya-Jie Wang, Shui-Long Shen, Annan Zhou

### UNDERGROUND CIRCULATION OF LOGISTICS AS A STRATEGY FOR LAND OPTIMIZATION AND LOGISTICS EFFICIENCY: A CASE STUDY OF DISTRICT LOGISTICS NETWORK IN JURONG INNOVATION DISTRICT, SINGAPORE

Wang Chung Ngu; Ek Whye Poon; Wang Wei Yang

### ANALYSIS OF CARBON EMISSION CHARACTERISTICS AND REDUCTION POTENTIAL ON TUNNEL LIGHTING

Tao Liu; Hehua Zhu; Yi Shen; Weifeng WU; Liankun Xu; Shouzhong Feng

**Digitalization and AI toward underground space solutions (M13)**

Session Chair: Prof. Dimitris Kaliampakos, School of Mining and Metallurgical Engineering of the NTUA

### INTEGRATION OF GEOGRAPHIC INFORMATION SYSTEMS (GIS) FOR UNDERGROUND SPACE MAPPING ON THE EXAMPLE OF BELGRADE

Luka Krznarić; Staša Milošević; Hristina Jovanović

### BUILDING A NAVIGATION SYSTEM USING DIGITAL TWINS OF INFORMATION FROM ABOVE AND BELOW GROUND

Soichiro Takamine; Suguru Miyazaki

### APPLICATION OF IMPROVED MACHINE LEARNING METHODS TOWARD BETTER ACCURACIES IN PREDICTING TBM PERFORMANCE

Dansheng Yao; Mengqi Zhu; Hehua Zhu

### RESEARCH ON DIGITAL MODELING PATH BASED ON IFC EXTENSION AND BIM LIGHTWEIGHT

Zhaofeng Yang

16:30 - 18:00 General Assembly (M11)

20:00 - 23:55 Gala dinner with Cultural Performance, includes "History of ACUUS" (Ljubice Luković 5, Belgrade)

## Friday, 7 November 2025

09:00 - 10:15

### PARALLEL SESSIONS

#### **Architecture and planning - underground** (Amphitheater)

Session Chair: Marija Lalošević, PhD, Institute of Architecture and Urban & Spatial Planning of Serbia

#### OLD MINES AND INDUSTRIAL TOURISM: THE CASE OF AN ANCIENT MINING GALLERY IN LAVRION, GREECE

Dimitris Kaliampakos; Athanassios Mavrikos; Dimitris Lamprakis

#### CREATING UNDERGROUND SPACE TO IMPROVE THE APPEAL OF THE NIHONBASHI AREA. (THE CASE STUDY ON THE URBAN REDEVELOPMENT PROJECT OF THE NIHONBASHI 1-CHOME CENTRAL DISTRICT)

Kazuo Kiyama; Katsuya Amemiya

## MANAGEMENT OF URBAN UNDERGROUND SPACE DEVELOPMENT IN SHANGHAI: EXPERIENCE AND CHALLENGES

Chen-Xiao Ma; Zi-Jian Li; Fang-Le Peng

## UNDERGROUND NETWORK IN TOKYO TORCH PROJECT

Hayato Tsubota; Mokichi Kuribayashi; Hiroshi Ueda; Hiromi Ban

## **Legal, entrepreneurial, and real estate aspects of underground space** (M9)

Session Chair: Prof. Danilo Furundzic, University of Belgrade

## CLASSIFICATION, CONFLICT MAPPING AND CRITICALITY ASSESSMENT OF UNDERGROUND ASSETS: A HOLISTIC APPROACH FOR INFORMED DECISION MAKERS

Mária Hámor-Vidó; Tamás Hámor; János Kovács

## A CRITICAL REVIEW OF THE EXISTING METHODOLOGIES FOR THE ESTIMATION OF THE VALUE OF UNDERGROUND SPACE

Dimitrios Papadomarkakis

## RESEARCH ON COMPOSITION OF SHOPS IN UNDERGROUND MALL

Yuto Nakamura; Masaharu Oosawa

## ANALYZING CONTRACTUAL PRACTICES IN MAJOR UNDERGROUND INFRASTRUCTURE PROJECTS.

Doris Skenderas; Chrysothemis Paraskevopoulou; Andreas Benardos

## **Advanced technologies and innovative solutions** (M11)

Session Chair: Yi Shen, Tongji University

## FORECASTING THE TBM PERFORMANCE USING GREY-STOCHASTIC SIMULATIONS

Vladimir Krivošić; Luka Crnogorac; Rade Tokalić; Zoran Gligorić; Branko Gluščević

## MULTI-RISK MANAGEMENT FOR UNDERSEA TUNNEL CONSTRUCTION BASED ON Nsga-III Algorithm

Sihan Liu; Hongwei Huang

## FLOOD RISK ASSESSMENT USING A LITERATURE-BASED APPROACH

Wei-Wei Zhao; Shuilong Shen; Annan Zhou; Yanning Wang

**Technical Track (Technical Session) (M13)**

Session Chair: Nemanja Sipetic, University of Belgrade

APPLICATION OF EMBEDDED FIBER OPTIC IN THE WHOLE PROCESS  
MONITORING OF CAVERN DEVELOPMENT PROJECT

Yifeng Li; Zhikai Wei; Joseph Hong; Xuefeng Li

RESEARCH ON CARBON ACCOUNTING AND LOW-CARBON  
CONSTRUCTION PATH FOR A SUPER LARGE CAVERN PROJECT IN  
HONG KONG

Yifeng Li; Juntao Yuan; Wei Li; Zhengqiang Hong; Yingxu Huo

DEVELOPING A STANDARD FOR GEOLOGICAL SUITABILITY  
EVALUATION OF URBAN UNDERGROUND SPACE: A CASE STUDY IN  
BEIJING

Hanhan He; Jing He; Tongming Fang; Fangzhen Li; Yiting Zhao

INTEGRATING "SCAN TO BIM" TECHNOLOGY INTO THE  
CONSTRUCTION OF A CAVERN PROJECT

Hing Shing Lok; Yifeng Li; Zhikai Wei; Joseph zhengqiang Hong

10:15 - 10:30 Coffee Break (Atrium)

**10:30 - 11:45**

**PARALLEL SESSIONS**

**Architecture and planning - underground** (Amphitheater)

Session Chair: Yong-Kang Qiao, Tongji University

REGRESSION ANALYSIS OF THE DEVELOPMENT AREA OF  
UNDERGROUND SPACE IN SHANGHAI

De-Xin Liu; Lei Zhu; Yuan-Qin Liao

INFRASTRUCTURING HERITAGE. NEW PARADIGMS FOR SUBWAY  
STATIONS IN THE ARCHAEOLOGICAL CENTER OF ROME

Filippo Lambertucci

HISTORICAL UNDERGROUND STRUCTURES OF BELGRADE:  
IDENTIFICATION, CLASSIFICATION, AND URBAN POTENTIAL FOR  
SUSTAINABLE CITY DEVELOPMENT

Nemanja Sipetic; Saša Milijić

**Legal, entrepreneurial, and real estate aspects of underground space (M9)**

Session Chair: Prof. Danilo Furundzic, University of Belgrade

SUSTAINABLE URBAN REGENERATION THROUGH "BOUNDARYLESS" UNDERGROUND DEVELOPMENT: INTEGRATION OF UNDERGROUND AND ABOVEGROUND, PUBLIC-PRIVATE PARTNERSHIP, AND CONTINUITY FROM PLANNING TO OPERATION - A CASE STUDY OF SHIBUYA, TOKYO

Taro Fukuda; Kento Yoshino

ENHANCING THE DEVELOPMENT OF UNDERGROUND LAND: ISSUES ON LEGAL, SOCIAL AND ECONOMIC ASPECTS

Ahmad Hamidi Mohamed; Noorfajri Ismail; Kamilah Wati Mohd; Saiful Aman Haji Sulaiman; Noorasiah Sulaiman

**Advanced technologies and innovative solutions (M11)**

Session Chair: Mark Wallace, Arup

A MULTI-FIDELITY DEEP OPERATOR FRAMEWORK WITH GENERATIVE ADVERSARIAL NETWORK FOR LOAD PREDICTION AND DISPLACEMENT RECONSTRUCTION OF TUNNEL STRUCTURES

Chen Xu; Zhen Liu; Ba Trung Cao; Günther Meschke; Yong Yuan; Xian Liu

COMPRESSED AIR ENERGY STORAGE (CAES) SYSTEM IN ARTIFICIAL UNDERGROUND CAVERNS WITHIN THE ROCK SALT FORMATION OF MONOLITHI, IOANNINA, GREECE

Konstantinos Bampousis; Ioannis Vlachogiannis; Andreas Benardos

**Technical Track (Technical Session) (M13)**

Session Chair: Yun-Hao Dong, City University of Hong Kong

RESEARCH OF DRILLING AND BLASTING METHOD BASED ON A SUPER-LARGE CROSS-SECTION CAVERN IN HONG KONG

Yifeng Li; Juntao Yuan; Zhengqiang Hong; Wei Li

TRI-DIMENSIONAL SUSTAINABILITY IN URBAN UNDERGROUND TRANSPORT (INTEGRATING ENVIRONMENTAL, GOVERNANCE, AND RESILIENCE IMPERATIVES)

Ghada Abdulbaqi Al-Ssadah; Mohammed Mokhtar Ali; Yuan Hong; Zoran Đukanović

RESEARCH ON THE PERFORMANCE-DRIVEN SPATIAL INTERFACE DESIGN FOR CLIMATE-ADAPTIVE URBAN UNDERGROUND SPACE

Kai Zhou; Jia-Wei Leng



INNOVATIVE PRACTICES AND SUSTAINABLE DEVELOPMENT FOR  
CAVERN DESIGN AND CONSTRUCTION BASED ON THE Q-SYSTEM AND  
ROCK REINFORCED APPROACH

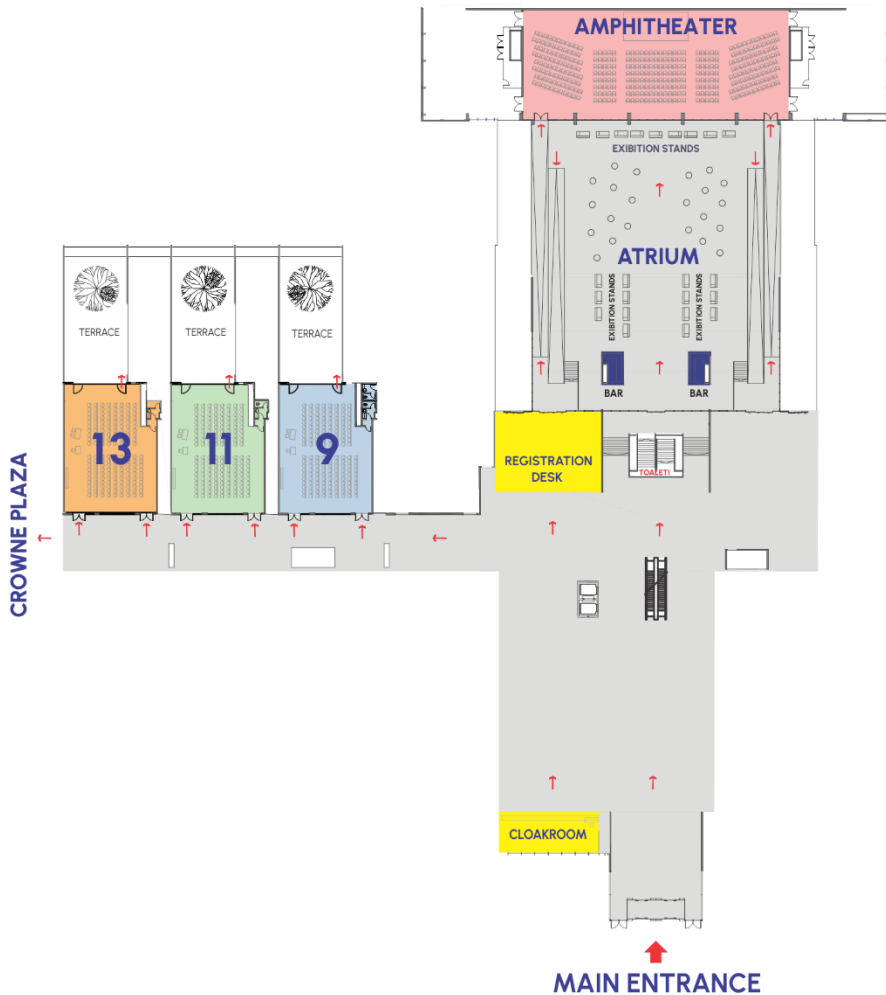
Joseph Z. Hong; Yifeng Li; Zhikai WEI; Xuefeng Li

11:45 - 13:00    Lunch (Atrium)

13:00 - 13:30    Closing ceremony and transition (Amphitheater)

## Conference Floorplan

ACUUS 2025 Conference Floorplan



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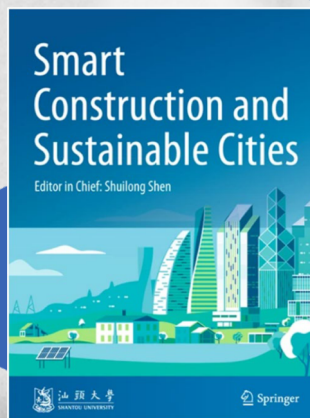
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