

31 Oct 2023					
0900 – 1600	<p style="text-align: center;"><b>ACUUS Training Workshop</b>  <b>@ NUSS Guildhouse, 3 Temasek Blvd, Tower 5, #02-401/402 Suntec City Mall, Singapore 038983</b></p>				
1 Nov 2023					
0830 – 0900	<p style="text-align: center;"><b>OPENING CEREMONY</b>  <b>Chair: Wei Wu</b>  <b>(Room : Summit 2)</b></p> <p style="text-align: center;"><b>Opening Speech by</b>  <b>Guest of Honour: Ms Indraneel Rajah</b>  <b>Minister, Prime Minister's Office</b>  <b>Second Minister for Finance and Second Minister for National Development</b></p>				
0900 – 1030	<p style="text-align: center;"><b>KEYNOTE SESSION 1</b>  <b>Chairpersons: Ray Sterling &amp; Jacques Besner</b>  <b>(Room: Summit 2)</b></p> <p style="text-align: center;"><b>Underground Space as the Next Frontier: A Singapore Perspective</b>  <b>Adele Tan, Chief Planner, URA</b></p> <p style="text-align: center;"><b>Underground Development: Going Down To Move Forward</b>  <b>Dimitris Kaliampakos, Professor, National Technical University of Athens</b></p> <p style="text-align: center;"><b>Adaptive and Resilient to the Crisis of Today and Enabling Humanities Conquest of Time and Space: Underground</b>  <b>Arnold Dix, President, International Tunneling and Underground Space Association</b></p>				
1030 – 1100	<p style="text-align: center;">Refreshment Break  (Room: Summit 1)</p>				
1100 – 1230	<p style="text-align: center;"><b>Architecture 1</b>  <b>Chairpersons: Vladan Djokic</b>  <b>(Room: Summit 2)</b></p>	<p style="text-align: center;"><b>Geospatial &amp; Digital Technologies 1</b>  <b>Chairpersons: Athanassios Mavrikos, He Lei</b>  <b>(Room: 334)</b></p>	<p style="text-align: center;"><b>Resilience &amp; Sustainability 1</b>  <b>Chairpersons: Wout Broere</b>  <b>(Room: 335 + 336)</b></p>	1100 – 1230	<p style="text-align: center;"><b>Special Session:</b>  <b>Renewable Energy and Carbon Storage</b>  <b>Chairpersons: Fredrik Mossmark &amp; Fei Xiao</b>  <b>(Room: 332)</b></p>
1100 - 1115	ID: TT_058: State-of-the-Art on Research of Performance-Driven Architectural Design for Low-Carbon Underground Public Space: Systematic Review and Proposed Design Strategies Zhou Kai	ID: ST_048 (Virtual): Distribution Characteristics of Tunnel Point Cloud Obtained by Terrestrial Laser Scanning Haitong Sui	ID: TT_006: Flood Risk Management and Disaster Preparedness Toward Resilient Urban Metro System He Renfei	1100 - 1120	ID: ST_322: Future Development of Underground Applications Eivind Grøv
1115 - 1130	ID: ST_149: The Role of Worker Satisfaction in the Underground Environment with Job Satisfaction and Turnover Intent Roberts Adam	ID: ST_097: Smart City Project to Enhance the Walkability of Underground Pedestrian Spaces Utilizing Data in the Otemachi-Marunouchi-Yurakucho District Kenta Abe	ID: ST_143: SWOT Analysis of Underground Work Spaces Soh Chee-Kiong	1120 - 1140	ID: ST_278: Use of the Subsurface for the Production and Storage of Renewable Energy Antonia Cornaro
1130 - 1145	ST_238 (Virtual): The Metro Network as a Heritage System for Historic Urban Landscapes: A Critical Review from China to Spain Placido Gonzalez Martinez	ID: ST_146 (Virtual): Machine Learning Methods on Predicting TBM's Penetration Rate in Athens Metro Sioutas Konstantinos	ID: ST_158: A Resilience Evaluation Model for Underground Space Development Considering the Impact of the Surrounding Environment: Towards a Basis for Planning Control Zhou Cong	1140 - 1155	ID: TT_070: Development of Serpentine Carbon Sequestration Foamed Concrete with Self-Carbonation Mechanism Zhang Xiang
1145 - 1200	ID: ST_248: Development of Cultural Landscape and Removal of Urban Visual Pollution Using Underground Architecture Case Study: Tehran Laleh Park Mohammad Mahdi Safaee	ID: TT_088: Digital Underground - Towards a Reliable Map of Subsurface Utilities in Singapore Anna Kumaresh Bharadwaj	ID: ST_163: Evaluation of Underground Facilities Persistence Performance from the Perspective of Disaster: A Case Study in Nanjing Zhang Yi	1155 - 1210	ID: ST_016: Quantitative Analysis of Flow Channeling Effect on the Exploitation of Geothermal Energy and One Possible Counter Method Fei Xiao
1200 - 1215	----	ID: ST_244 (Virtual): A Study on Encoding of Urban Underground Space Facilities Based on Omniclass Zhang Mengxia	ID: ST_299: The Resilience Evaluation Strategy of Underwater Tunnel Based on Knowledge Graphs Zhao Xinyue	1210 - 1230	---
1215 - 1230	----	ID: ST_239: Laboratory Evaluation of Low-Cost MEMS Based Sensor for Inclination and Acceleration Field Monitoring in Real-Time Paganis Antonis	ID: TT_109 (Virtual): Intelligent Identification of Hazard-Causing System, and Disaster Prevention and Control of Water Inrush in Tunnels Zhenhao Xu		
1230 – 1330	<p style="text-align: center;">Lunch  (Room: Summit 1)</p>				
1330 – 1500	<p style="text-align: center;"><b>KEYNOTE SESSION 2</b>  <b>Chairpersons: Leung Chun Fai &amp; Takayuki Kishii</b>  <b>(Room: Summit 2)</b></p> <p style="text-align: center;"><b>State-of-the-art: Development of Urban Rail Transit in Mainland China</b>  <b>Chen Xiang Sheng, Professor, Shenzhen University</b></p> <p style="text-align: center;"><b>Intelligent Detection of Subsurface Risks: Towards Sustainable Urban Underground Development</b>  <b>Wu Wei, Associate Professor, Nanyang Technological University</b></p> <p style="text-align: center;"><b>"Here comes the swarm" ... Robotics and AI in Underground Construction</b>  <b>Jeremy Hammond, Co-CEO, HyperTunnel</b></p>				
1500 – 1530	<p style="text-align: center;">Intermission  (Room : Summit 1)</p>				

Poster Sessions  
@ Summit 1

1530 – 1715	<b>Architecture 2</b> Chairpersons: Tan Fei (Room: Summit 2)	<b>Geospatial &amp; Digital Technologies 2</b> Chairpersons: Xing Li, Mohammad Medhi Safaee (Room: 334)	<b>Resilience &amp; Sustainability 2</b> Chairpersons: (Room: 335 + 336)	1530 – 1650	<b>Special Session: Geothermal Energy</b> Chairpersons: Jonathan Poh & Xu Zhenhao (Room: 332)
1530 - 1545	ID: ST_178 (Virtual): Underground Space Use: Supporting Urban Ecosystem Services Xingxing Zhao	ID: ST_019: Digital Twin Practice for Long Linear Project Management: A Case Study of Nantong Ring Expressway Yongzhi Wang	ID: ST_183: Underground Microgreen Farming in Athens, Greece: Design Concept and Investment Analysis Mavrikos Athanassios	1530 – 1550	ID: TT_093: The First Deep Geothermal Exploratory Slimhole at Admiralty Lane, Singapore Tjiawi Hendrik
1545 - 1600	ID: ST_188: The Potential of Underground Spaces Around Metro Stations as a Form of Special Urban Forms Furundžić Danilo	ID: ST_054: Three- Dimensional Stratigraphic Reconstruction Based on Improved Coupled Markov Chain Jiang Qihao	ID: ST_221 (Virtual): Geothermal Gradient of Underground Structure Subjected to Blast Loads Sunita Mishra	1550 – 1605	ID: TT_094: Geological Perspectives From the First Deep Exploratory Slimhole in Singapore Jonathan Poh
1600 - 1615	ID: TT_073: Future Elevated City: Simulation of Vehicle Exhaust Diversion by Wall- Mounted Air Duct in Traffic Space Zhang Jiaqi	ID: ST_088: Inversion of Rock Strength Parameters Using SVM Based on Monitoring Parameters with Drilling Minglong You	ID: TT_053: How Can Information Technology Contribute to Low-Carbon Tunnels: A Systematic Review Shiqi Dou	1605 – 1620	ID: TT_100: Geothermal Energy-Driven Electricity Generation Model for Singapore Anurag Chidire
1615 - 1630	----	ID: ST_159 (Virtual): An Information Multiplexing Algorithm for Integrating Complex Geological Models Into Numerical Analysis of Engineering Excavations Peng Luyuan	ID: ST_286 (Virtual): Towards Sustainable Tunnelling: An Integrated Framework for Carbon Assessments in TBM Tunnels Xilin Chen	1620 – 1635	ID: TT_097: Heat Extraction Characteristics of Hot Granite in Singapore Dazhao Lu
1630 - 1645	----	ID: ST_192: The Greener the Better? A Virtual Reality Experiment for the Effects of Greenery Types on Underground Space Occupants' Psychophysiological Health and Cognitive Performance Chan Isabelle Yee Shan	ID: ST_242: A Study on the Effectiveness of Surface Protection Methods for Underground Tunnel Structures in Singapore Tan Woan Yi	1635 – 1650	ID: ST_218 (Virtual): Thermal Activation Effect of Heat Pipe on Surrounding Rock in Geothermal Energy Utilization Pingye Guo
1645 - 1700	----	ID: ST_272: Virtual Reality Application to Study Occupants' Behavior in Underground Space Emergency Event Anastasios Kallianiotis	---	1650 – 1705	----
1700 - 1715	----	ID: ST_122 (Virtual): Application of Machine Learning and Linear Regression for Estimating Cutter Life Index (CLI) Hong Ju-Pyo	---	1705 – 1715	----
1715 – 2000	Welcome Reception (Room: Summit 1)				
<b>2 Nov 2023</b>					
0900 – 1030	<b>PANEL DISCUSSION</b> <b>Chairperson: Sanja Zlatanic</b> <b>(Summit 2)</b> <b>Elevated Thinking, Underground—Exploring Sustainable Subsurface Frontier</b> <b>Dimitris Kaliampakos - Raising Awareness and Addressing Growing Urban Issues Through Sustainable Use of Underground Space</b> <b>Arnold Dix – OneITA Point of View: Developing Global Approach to Addressing Sustainability and Resilience</b> <b>Fang-Le Peng – Challenges and Opportunities of Underground Space Development in China – Solutions Through Global Crosspollination</b> <b>Mike Mooney – AI / Machine Learning Applications in Subsurface Exploration and Development – Latest Advancements and Challenges</b> <b>Wout Broere - Climate Change Impacts and Raise of Resilient Cities – Paths and Pitfalls</b>				Technical Tour: Jurong Rock Cavern: 0900 -1100
1030 – 1100	Refreshment Break (Room: Summit 1)				
1100 – 1245	<b>Planning 1</b> Chairpersons: Kin Chun Roy Hung, Paul Munro (Room: Summit 2)	<b>Underground Construction &amp; Infrastructure 1</b> Chairpersons: Zhiqiang Zhang (Room: 334)	<b>Risk, Health and Safety 1</b> Chairpersons: Marilu Melo Zurita (Room: 335 + 336)	1100 – 1245	<b>Special Session:</b> <b>A Retrospective “Lessons Learned”</b> <b>Study of Worldwide Underground</b> <b>Facilities</b> Chairpersons: Dimitris Kaliampakos and Tan Yoong Heng (Room: 332)
1100 - 1115	ID: TT_089: Synergistic Urban Planning Approaches for Integrated Development - Insights from the Collaborative ITACUS - ISOCARP Young Professionals Think Deep Workshop (YPTDP) in Gdansk, Poland (2023) Verloop Rosanne	ID: TT_092: Emerging Patterns and Criteria for Underground Transport Infrastructure in the United States Mooney Michael (Session Keynote) (20min)	ID: ST_009 (Virtual): Analysis and Research on Structural Vulnerability of Utility Tunnels Under Gas Explosion Load Ruida Huang	1100 – 1110	Introduction Ray Sterling
1115 - 1130	ID: ST_010: Planning for Adaptability to the Future, the Case of Underground Space Scenario Planning of Hengli Station and its Adjacent Areas in the Greater Bay Area, China Zhang Yangfei	ID: ST_201: Study on the Actual Situation of Entrances and Exits of Underground Stations Installed on Building Sites and the Application of Urban Development Systems Nakamura Hideo	ID: TT_010: Risk Informed Strategy to Optimize Geotechnical Investigations on Tunnel Projects Gangrade Rajat	1110 – 1130	ID: TT_106: Scandinavian experiences with rock cavern developments: A Summary of Lessons Learned Richard Ting

1130 - 1145	ID: ST_028: Planning Strategies on the Integrated Development of the Station and City in Large All-Underground Transportation Hub Area—Take the Beijing Sub-Center Railway Station as an Example Yiting Zhao	ID: TT_034: National Buried Infrastructure Facility (NBIF) – New Opportunities for Controlled Testing Metje Nicole	ID: TT_032: Costs and Benefits of Reducing Groundwater Drawdown Risks in Tunnelling Johanna Merisalu	1130 – 1145	ID: ST_255: Lessons Learned from Underground Shopping Centers in Two Japanese Cities Kishii Takayuki
1145 - 1200	ID: ST_055: Underground Space Planning in New Urban District Based on the Chinese Modern Garden City Concept: A Case Study of Sub-Central City in Jinan, China Wang Weixi	ID: ST_269: A Conceptual Design of Data Centre in Caverns Suen Hon Man	ID: TT_080: A Computational Framework for Predictive Risk Assessment of Shield Tunnel Construction Zhou Xinhui	1145 – 1200	ID: ST_252: Lessons Learned from 50 Years of Operation for the Azadi Tower Underground Museum in Tehran Mohammad Safaee
1200 - 1215	ID: ST_142: Underground Transit Infrastructure Linked Urban Development Kato Masaki	ID: ST_289: Planning and Implementation of the Joint Cavern Development at Anderson Road Quarry Site Chee L G Regis	ID: ST_279: Spiral TBM Tunnel Construction Safety Risk Knowledge Mapping Construction and Application Huang Feipeng	1200 – 1230	ID: TT_107: Planning and Designing Successful Underground Facilities: A Summary of Lessons Learned from Worldwide Projects Ray Sterling
1215 - 1230	ID: ST_219: Case Study Driven Research to Provide a Foundation for Advancing Planning Practices for the Subsurface by Using Geosystem Services Mossmark Fredrik	ID: ST_302: Numerical Investigation on Anisotropic Deformation Around Gas Storage Cavern in Jointed Rock Mass Rock Mass Wenjun Luo	---		
1230 - 1245	ID: ST_241: Urban Underground Space Planning to Support Cities' Strategic and Climate Plans Bobylev Nikolai	ID: TT_102: Effect of Existing Tunnel on the Evolution of Soil Arching Effect Ruixiao Zhang	---	1230 – 1245	Concluding Remarks Richard Ting Ray Sterling, Kishii Takayuki, Mohammad Safaee
1245 - 1345	Lunch (Room: Summit 1)				
1345 - 1530	<b>Planning 2</b> Chairpersons: Marija Lalošević (Room: 330)	<b>Underground Construction &amp; Infrastructure 2</b> Chairpersons: Xinmei An (Room: 334)	<b>Risk, Health and Safety 2</b> Chairpersons: (Room: 335 + 336)	1345 - 1530	<b>Special Session: Safety and Underground Environment</b> Chairpersons: Angui Li & Oskar Sigl (Room: 332)
1345 - 1400	ID: TT_041: Research on the Refined and Stereoscopic Planning and Control of Underground Space in Key Urban Areas Dominated by Public Underground Space Fang Zhou	ID: ST_099: Ground Fissure Effect on Utility Tunnel in Loess Stratum Zhang Zhiqiang	ID: ST_212 (Virtual): Modelling of Road Tunnel Ventilation System Under Fire Conditions Karagianni Maria	1345 - 1400	Advances to Safety and Underground Environment Angui Li
1400 - 1415	ID: ST_276: Review and Prospect of Urban Underground Space Planning Practices in China Zhu Liangcheng	ID: TT_046: Optimizing Reinforcement for Tunnel Linings Winterberg Ralf	ID: ST_256: Study on the Effect of Makeup Air Supplementation on Fire Smoke Control in Subway Tunnel Lei Wenjun	1400 - 1415	ID: ST_298: Seismic Response of a Ground-Penetrating Ultra-Shallow Embedded Shield Tunnel: Shaking Table Test Wang Qi
1415 - 1430	ID: ST_291: A New Paradigm of Cavern Development Hui Pearl P Y	ID: ST_091: Vlasov Thin-Walled Beam-Based Soil-Tunnel Interaction Model for Rectangular Underground Tunnel Considering Longitudinal Five Degree-of-Freedom Deformation Liu Yingbin	ID: ST_288: Fire Safety Design of the First Cavern Laboratory in Hong Kong: Challenges and Innovations Tsang Steven N.F.	1415 - 1430	ID: ST_262: Feasibility Study on Natural Ventilation of Large Deep Underground Space Yu Fu
1430 - 1445	ID: ST_044: Does Common Infrastructure Planning Support Better Urban Sustainability? Analysis of Mass-Transit Projects on Short-Term and Long-Term Impacts Kondrachova Tamara	ID: TT_095: Early Strength Enhancing Additive for High GGBS Replacement SFRC Segment Tanakadate Yuto	---	1430 - 1445	ID: ST_250: Numerical Study on Flooding of Stairway Inside Subway Station Jia-Peng Deng
1445 - 1500	ID: TT_038: Geosystem Services and Cost-Benefit Analysis to Support Decisions on Subsurface Use Norrman Jenny	ID: ST_129 (Virtual): Drilling Rate Index Estimation via Soft Computing Techniques Hwang Jihye	---	1445 - 1500	ID: ST_094: Experimental Study on Flame Behavior and Maximum Ceiling Temperature in Traffic Merging Section Tunnel Fires Jiangdong Li
1500 - 1515	ID: TT_054: Valuing Sustainability Externalities of Urban Underground Space Use for Planning and Land Administration Yong-Kang Qiao	----	---	1500 - 1515	ID: ST_040 (Virtual): Reliability Analysis and Design for Tunnel Face Stability in Spatially Random Soils Zheming Zhang and Jian Ji
1515 - 1530	ID: TT_091: Underground Urbanism in Africa: Splintered Subterranean Space in Lagos, Nigeria Abidemi Agwor	----	----	1515 - 1530	ID: ST_267 (Virtual): Research on Intelligent Ventilation Systems with Fan Frequency Control During Tunnel Construction Shichao Gao
1530 - 1600	Intermission (Room: Summit 1)				

Poster Sessions  
@ Summit 1

Technical Tour:  
Singapore City Gallery  
- 1430 - 1530

1600 - 1745	<b>Planning 3</b> Chairpersons: Danilo Furundzic, Isabelle Chan (Room: 330)	<b>Underground Construction &amp; Infrastructure 3</b> Chairpersons: Ian Jefferson (Room: 334)	<b>Risk, Health and Safety 3</b> Chairpersons: Jenny Norrman (Room: 335 + 336)	1600 - 1745	<b>Special Session: Reinventing Urban Space: Top Down or Bottom Up?</b> Chairpersons: Chun'an Tang & Xiaoli Ding (Room: 332)	General Assembly of ACUUS 1530 - 1730 (Room: 324)
1600 - 1615	ID: TT_017: Mapping of Geosystem Services to Support Spatial Planning Practices Lundin Frisk Emrik	ID: ST_257: Nonlinear Analysis of Pseudo-Dynamic Active Earth Pressure Considering a Multi-Segment Rotational Failure Mechanism Chen Hui	ID: ST_100 (Virtual): Full Life Cycle Multi-Hazard Scenarios and Structural Response Analysis of Metro Shield Tunnels Yu Tongsheng	1600 - 1605	Introduction Chun'an Tang	
1615 - 1630	ID: TT_019: Research Regarding Formulation of Guidelines for Underground Usage Associated with Urban Development Daisuke Fukumoto	ID: ST_260: Prediction of Fracture Initiation in Cohesive Soils Using a Data-Driven Approach Luo Weiping	ID: ST_101: Semantic Segmentation-Based Visual Detection of Construction Objects on Oversized Excavation Sites Yang Yifeng	1605 - 1625	ID: ST_327: The Floating City—A Conceptual Model for Urban Spatial Development Chun'an Tang	
1630 - 1645	ID: ST_211 (Virtual): Attempt in Establishing a Comprehensive Economic Resilient Spatial Planning Model for Underground Space and Metro Tunnels-Led Development in Subsiding Coastal Megacities of Shanghai and Jakarta by 2035 BaU: with Brief COVID-19 Analysis Muhammad Akmal Hakim Bin Hishammuddin	ID: ST_310 (Virtual): Numerical Study of Hydraulic Fracturing Assisted Rock Breaking Based on Discrete Element Method Xiao-Ping Zhang	ID: ST_133: Experimental Study on the Three-Dimensional Mechanical Response of Buried Pipelines Under Shear Deformation of Non-Cohesive Strata Xin Yunxiao	1625 - 1645	ID: TT_105: Cases of Elevated Cities – from PolyU Campus to a Green Deck Xiaoli Ding	
1645 - 1700	ID: ST_225 (Virtual): Research on Underground Public Space Planning of Metro Station Area Based on the Method of BIM+GIS -- Taking Xietaizi Metro Station in Chongqing City as an Example Yuqing Tang	ID: TT_059: Method for Estimating Three-Dimensional Effects on Braced Excavation in Clay Taishan Lu	ID: ST_151: New Requirements for Tunnel Lighting Environment: A Review on Energy Saving and Visual Comfort Yumeng Song	1645 - 1700	ID: TT_064 (Virtual): How Will Advanced Monitoring Techniques Serve Elevated Urban Development? Tan Dao-Yuan	
1700 - 1715	ID: ST_014 (Virtual): Underground Space Planning and Design of East Square of Zhumadian High Speed Railway West Station in Henan Province of PRC Kang Huang	ID: ST_181: The Effect of a Supporting Fluid on a Pile's Shaft Shear Resistance. Investigation at NBIF Facility Anna Faroqy	ID: TT_082 (Virtual): The Multi-Omics Provides Insight Into the Nasal Mucosal Epithelial and Nasopharyngeal Cancer Cells Lines in Deep Underground Environment Liu JiFeng	1700 - 1715	ID: ST_317 (Virtual): A Study on the Perceptual Evaluation of Public Space Around Elevated Areas from the Perspective of Inventory Renewal Rui Zeng (in China)	
1715 - 1730	ID: ST_102 (Virtual): Research on Last-Mile Delivery System of Underground Logistics Based on Intelligent Level Lu Bin	---	ID: ST_236: Sustainability Aspects for Planning and Operation of Tunnel Safety Equipment in Road and Rail Tunnels Hagenah Bernd	1715 - 1730	ID: ST_315 (Virtual): Study on Urban Spatial Reshaping Using Algorithmic Generation Method Zhang Zihuan (in China)	
1730 - 1745	---	---	---	1730 - 1745	ID: ST_319 (Virtual): Investigating Elevated City Transformations Through the Analysis of Future Urban Scene Components Depicted in Films and Television Works Lyu Zexi (in China)	
1800 – 2100	Conference Dinner (Room: Summit 2)					
<b>3 Nov 2023</b>						
0900 – 1030	<p style="text-align: center;"><b>YOUNG SCHOLARS PLENARY SESSION</b> Chairpersons: Mike Mooney &amp; Fang-le Peng (Summit 2)</p> <p style="text-align: center;">Determining the Optimal Irradiation Spacing for Microwave Fracturing of Hard Rocks Using an Open-ended Antenna Zheng Yanlong - Southeast University</p> <p style="text-align: center;">Utilizing the Subsurface for Sustainable Green Energy Solutions Shi Chao - Nanyang Technological University</p> <p style="text-align: center;">Use of Underground Spaces for Resource-efficient Data Centres: A Case Study of Helsinki, Finland Agrawal Mahak - ITA Committee on Underground Spaces</p> <p style="text-align: center;">Holistic Framework to Determine Structural Fire Performance of Shield Tunnel: Mechanism, Models and Design Shen Yi - Tongji University</p> <p style="text-align: center;">Rethinking the Role of Underground Architecture in Contemporary Japan: Project Trends Observed in Shinkenchiku Magazine (2000 – 2020) Dridi Waddah - Kyoto University</p>					
1030 – 1100	Refreshment Break (Room: Summit 1)					
1100 – 1245	<b>Planning 4</b> Chairpersons: Antonia Cornaro, Mahak Agrawal (Room: Summit 2)	<b>Deep Underground Engineering 1</b> Chairpersons: Chao Shi, Mark Wallace (Room: 334)	<b>Underground Construction &amp; Infrastructure 4</b> Chairpersons: Wen-Chieh Cheng (Room: 335 + 336)	1100 – 1235	<b>Special Session: Underwater Space - Potential Places for Human Activities in the Future</b> Chairpersons: Yuan Weifeng & Francis Lok (Room: 332)	

1100 - 1115	ID: ST_115: Exploration of an Integrated Planning Approach for Acupuncture-Style TOD to Drive the Renewal of Historic and Cultural Districts Lingjun Meng	ID: ST_029: Dynamic Response for Deep Buried Water Diversion Tunnel Under the Action of Near-Filed Disturbance Gongliang Xiang	ID: ST_026: Experimental Study on Mechanical Properties of Surrounding Rock of Railway Tunnel in Operation and Reasons for Tunnel Defects Diyuan Li	1100 – 1120	ID: TT_061: Methods for Underwater Space Creation and Coastal Protection Chu Jian
1115 - 1130	ID: ST_186: Guidelines for Determining the Concept of Institutionalization of Underground Planning in Developing Countries Nemanja Šipetić	ID: ST_167 (Virtual): Dynamic Prediction on Driving Attitude of Tunnel Boring Machine (TBM): An Automated Deep Learning Approach Pan Yue	ID: ST_112: A Fixed End Composed of Long Bolts and Mold Bag Concrete for Prefabricated Inner Support in Foundation Pit and Experimental Investigation on Its Bearing Capacity Shan Yuhan	1120 – 1135	ID: TT_047: Long-Wave Communication Achieved Using Vibrating Beam System Wang Jishuo
1130 - 1145	ID: ST_259: Urban Characteristics of Underground Cities and Extraterrestrial Colonies: Challenges and Opportunities Bhattacharjee Souktik	ID: ST_228 (Virtual): Non-Probabilistic Reliability-Based Design for Spalling Property in Deep Hard Rock Tunnel Using an Info-Gap Method Li Xiang	ID: ST_130: Mechanical Properties of Segment Joints in Subway Shield Tunnels by a Full-Scale Test Li Pengfei	1135 – 1150	ID: TT_057: Hydrophobic Bubble Holders and Underwater Palace Yuan Weifeng
1145 - 1200	ID: TT_035: UNDER: Geosystem Services Underneath for Sustainable Communities and Improved Spatial Planning Practices Norman Jenny	ID: ST_297: A Unified Analytical Solution for Seismic Response of Deep Tunnels Chen Gong	ID: ST_156: Effect of Adjacent Excavation on Existing Tunnels in Spatially Variable Soil Zhang Jinzhang	---	---
1200 - 1215	ID: ST_263: Engineering a New Future of Cavern Development in Hong Kong Chan Ivan H H	ID: ST_092 (Virtual): A Semi-Analytical Solution of Time-Dependent Ground Settlement Induced by Displacement of Retaining Wall in Soft Clay Foundation Pit Ying Hongwei	ID: TT_031: Investigation on Rectangular Tunnel Mechanical Response Under Groundwater Level Fluctuation Based on Model Test and Numerical Simulation Weixin Sun	---	---
1215 - 1230	ID: TT_066: Unravelling the Spatiotemporal Development Regularities of Metro-Led Underground Space in China Based on Multisource Data Yun-Hao Dong	---	ID: ST_313: Multi-Scale Simulation of Fracture Behavior of Underground Concrete Structures Based on Phase Field Theory Ren Bangke	---	---
1230 - 1245	ID: ST_103: Towards a Carbon-neutral City: Responsible Underground Space Use in China Guo Dongjun	---	ID: ST_320: Singapore's Cross Island Line Phase 1 – Developing a Durable and Low-Carbon Fibre Concrete Precast Segmental Tunnel Lining Mix Design in Compliance with ACES-BCA Design Guide for Fibre-Reinforced Concrete Structures to Singapore Standard SS 674: 2021. Gan Cheng Chian	---	---
1245 - 1345	Lunch (Room: Summit 1)				
1345 - 1530	<b>Case Studies 1</b> <b>Chairpersons: Tony Ho, Massimo Marotta</b> <b>(Room: Summit 2)</b>	<b>Deep Underground Engineering 2</b> <b>Chairpersons: James Stabler, Diyuan Li</b> <b>(Room: 334)</b>	<b>Underground Construction &amp; Infrastructure 5</b> <b>Chairpersons: Jianping Sun, Shuilong Shen</b> <b>(Room: 335 + 336)</b>		
1345 - 1400	ID: ST_020: Characterization of Multiple Resource Endowment in Urban Underground: A Case Study of Danyang City Zhou Dankun	ID: ST_068: DEM-Based Numerical Simulation of Rock Cutting Process Using Conical Pick Under Confining Stress Influence Shi Xinlei	ID: ST_027: Forecasting TBM Performance Using Univariate and Multivariate Models by Deep Learning Shan Feng		
1400 - 1415	ID: ST_070 (Virtual): Spatial Distribution and Susceptibility Mapping of Urban Sinkholes in Shenzhen, China You Zhang	ID: TT_033: Performances of Two Inverse Sequencing Excavations in Anisotropic Clay Li Yongqin	ID: ST_045: Investigating Inherent Mechanism of Loess Adhered to Shield Machine Cutting Tools Cheng Wen-Chieh		
1415 - 1430	ID: ST_223: Win-Win Situation Between Urban Developments and Underground Spaces. (The Case Study of Tokyo Mid Town Hibiya) Amemiya Katsuya	ID: TT_104: Differential Mechanical Responses in Coal and Sandstone Under Uniaxial Loading-Unloading: An Insight by Energy Damage and Ultrasonic Characterization Method Anlin Zhang	ID: ST_127: New Sustainable Technologies for Application in the TBM Tunnelling Industry Sposetti Mike		
1430 - 1445	ID: ST_305: Learning to Cope with Endless Growth: Singapore's Political Economy and the Excavation of the Subsurface William Jamieson	ID: TT_098: Stress-Dependent Permeability of Grouted Rock Fractures Zhou Fang	ID: TT_099: Discovery of Rock Burrowing Strategies Inspired by Bio-Erosion Guo Kai		
1445 - 1500	ID: TT_060: Numerical Analyses of an Excavation Case in Thick Soft Clay with the Aid of SCPTU Test Taishan Lu	---	ID: ST_135: Deformation Analysis of Adjacent Structures Caused by Diaphragm Wall Construction Based on Machine Learning Xin Yan		

Poster Sessions  
@ Summit 1

1500 - 1515	ID: ST_025 (Virtual): Induced Seismicity Caused by Sudden Failure of Rock Joints with Different Undulation Dapeng Wang	---	---	
1515 - 1600	Intermission (Room: Summit 1)			
1600 - 1745	<b>Case Studies 2</b> Chairpersons: (Room: Summit 2)	<b>Deep Underground Engineering 3</b> Chairpersons: Shaofeng Wang, Andreas Benardos (Room: 334)	<b>Urban Geology &amp; Urban Geophysics</b> Chairpersons: Chao Zhang (Room: 335 + 336)	
1600 - 1615	ID: ST_022: Case Study of Rainwater Treatment System in a Large Urban Underground Space Complex Project in Xi'an China Quan Lijun	ID: ST_032 (Virtual): Extending Regularity of Acid Fracturing in Deep Fractured-Vuggy Carbonate Rocks- A Case Study of Qixia Formation in Western Sichuan Zhao Zhiqiang	ID: ST_024: Diagnostics of Conditions of Ice Walls, Jet-Grouting Fences and Concrete Slurry Walls After Accidents in Underground Construction of St. Petersburg by Crosshole Sounding Method Arkhipov Aleksei	
1615 - 1630	ID: ST_069 (Virtual): Construction and Service Performance of Waterproof Curtain for Foundation Pit in Water-Rich and Large-Particle Gravel Stratum Bo Liu	ID: ST_230: Developing Mountainous Tunnels in Greece. The Case of the Melissourgou Tunnel Benardos Andreas	ID: ST_096: Explore Propagation and Reflection Characteristics of Tunnel-Blasting Seismic Waves in Rock Mass with a 3D Structure-Geology Model Li Junxin	
1630 - 1645	ID: ST_131: Efforts to Move Railway Tracks Underground in Japan Kenya Nakanishi	ID: ST_157: Multiscale Modelling of Ground Movement and Arching Effect when Tunnelling in Granular Soils Xie Yipeng	ID: ST_213: Quantum Gravity Gradiometers for Urban Underground Mapping Boddice Daniel	
1645 - 1700	ID: ST_138: Change of Stress-Related Characteristics of the Enclosing Rocks in the Service Life of Transport Tunnels Lebedev Mikhail	ID: ST_085 (Virtual): Numerical Simulation on Structural Safety of Deep Buried Railway Tunnel Crossing Hard and Soft Rock in Strong Earthquake Areas Tang Langzhou	ID: TT_051: Multi-Dimensional Detection of Underground Utilities Using a Data Mining Method Zhang Chao	
1700 - 1715	ID: ST_150: Study on Coupling Effect of a Complex Deep Foundation Pit Group Excavation in Soft Soil Area Yu Xiao	---	ID: ST_307: Smart Detection of Underground Anomalies Using Convolutional Neural Network with Sliding Time Window Meng Wenzhao	
1715 - 1730	ID: TT_045: Use of Macro Synthetic Fibre in Segmental Tunnels Winterberg Ralf	---	ID: TT_084: EuroGeoSurveys' Urban Geology Expert Group Brings Geo-Related Knowledge to the Decision Makers Mossmark Fredrik	
1730 - 1745	ID: TT_101: Key Technologies for the Safe Construction of Underwater Super Large Diameter Shield Tunnels: A Case Study Jun Shen	---	---	
1745 - 1815	CLOSING CEREMONY (Room: Summit 2)			
4 Nov 2023				
	Technical Tour: Marina Barrage Sustainable Singapore Gallery 0900-1000	Technical Tour: Geothermal Deep Slimhole Drilling 1000-1100	Technical Tour: The GEAR 1000-1200	