asem23.org

Tunnelling a Sustainable Way for a New-Normal World

ICTUS23

The 2023 International Conference on Tunnels and Underground Spaces

August 16-18, 2023

GECE, Seoul

Organized by

Korean Tunnelling and Underground Space Association

Endorsed by

ASSOCIATION INTERNATIONALE DES TUNNELS ET DE L'ESPACE SOUTERRAIN AITES | ITA INTERNATIONAL TUNNELLING AND UNDERGROUND SPACE ASSOCIATION

VENUE INFORMATION

Conference Venue-GECE(Seoul National University Gwanak Campus)

Seoul, the capital city of Korea has become a hub of international convention industry with its long historic and cultural heritage, excellent infrastructure and central location in East Asia. The GECE Convention is a professional convention facility in GECE that has the capacity of holding up to 9 sessions and over a 1,000 people. It has the latest facilities and equipment.
For more information about GECE Convention : https://gece.snu.ac.kr/

LOCAL ORGANIZING COMMITTEE

Chair of ICTUS23		Dr. Nag Young Kim(President of KTA)
Chair of LOC		Prof. Jun Kyung Park(Daelim Univ. College)
Vice chair of LOC		Mr. Chang Rim Choi(Sambo Engineering)
General Affairs		Prof. Tae Young Ko(Kangwon Nat'l Univ.)
Treasure		Dr. Sung Yil Koh(Seoha Engineering)
Planning		Prof. Dohyun Kim(Hanbat Nat'l Univ.)
Operation		Dr. Ki Chan Jeon(Modeun Design E&C)
Promotion	General	Dr. Ki Hwan Kim(Sambo Engineering)
	Overseas	Prof. Joon-Shik Moon(Kyungpook Nat'l Univ.)
		Mr. Jeong Hun Yang(Taeyoung E&C)
	Domestic	Dr. Jong-Sik Park(Hanwha E&C)
		Dr. Do hoon Kim(Hyundai engineering & construction)
Technical and Publication		Prof. Seongwon Hong(Korea Nat'l Univ. of Transportation)
		Prof. Changwon Kwak(Inha Tech. College)

REGISTRATION FEE

Registration	Zoom (Live participation)	Online (Video recording)	Online (Poster)	OnSite participation
Participant	USD$400	USD$300	USD$300	USD$600
Accompanying person	-	-	-	USD$150

INVITATION TO ICTUS23

Dear Colleagues:

The Korean Tunnelling and Underground Space Association (KTA) would like to invite all of you to the 2023 International Conference on Tunnels and Underground Spaces to be held at GECE in Seoul National University, Seoul, Korea from August 16 to 18, 2023. The conference is operated under the platform of the ASEM23 congress. ASEM23 is a single platform for various fields of studies including tunnel technologies, and a total of 9 conferences will be held under the platform of ASEM23.

The theme of the conference is "Tunnelling a Sustainable Way for a New-Normal World". An intellectually scientific technical program will be prepared in consistent with the theme of the conference. The conference will provide participants many opportunities to exchange new information and ideas related to tunnelling and underground space construction industry.

Each member of Local Organizing Committee will make sure that the symposium will be fruitful and memorable. Anticipating your continued cooperation and active participation for the forthcoming symposium, we look forward to welcoming you here in Seoul, Korea.

With best regards,

Chair, ICTUS23 Conference

Dr. Nag Young Kim

Chair of LOC

Prof. Jun Kyung Park

Forum Theme

Tunnelling a Sustainable Way for a New-Normal World

Forum Topics

- Innovation in Mechanized Tunnelling
- Developments in Underground Space Technologies
- Improvements in Conventional Tunnelling
- Structural and Hydraulic Interaction in Underground Structures
- Tunnelling and Underground Works in Extreme Conditions
- Resilience and Sustainability in Underground Space

General Program

Time	8/16 (Wed)	8/17 (Thu)	8/18 (Fri)
08:30-09:10	Registration		
09:20-10:30	Opening Ceremony Plenary session	Plenary session	
10:30-10:50	Coffee Break		
10:50-12:20	Concurrent Sessions		
12:20-13:20	Lunch		Conference Tour
13:20-14:50	Concurrent Sessions		
14:50-15:00	Coffee Break		
15:00-16:30	Concurrent Sessions		
16:30-16:40	Coffee Break		
16:40-18:00	Concurrent Sessions		
18:30-20:00	Banquet	Night Excursion	

Keynote Lectures

Prof. Arnold Dix

- Affiliation: President, International Tunnelling and Underground Space Association, Australia
- Title of Conference: The 2023 International Conference on Tunnels and Underground Spaces (ICTUS23)
- Title of Talk: *Resilience and Sustainability in Underground Space - Embracing the United Nations Sustainability Development Goals*

Prof. Seokwon Jeon

- Affiliation: President, International Society for Rock Mechanics and Rock Engineering, Seoul National University, Korea
- Title of Conference: The 2023 International Conference on Tunnels and Underground Spaces (ICTUS23)
- Title of Talk: *Advances in rock fragmentation technologies*

ICTUS23 TECHNICAL PROGRAM

- WEDNESDAY, AUGUST 16, 2023

Live Zoom Session (ID: 972 123 8601, PW: 000111)

08:30-	REGISTRATION	GECE Convention 5F Lobby

09:10-09:20	**Opening Ceremony** Chair: Prof. Jun Kyung Park	**Opening Remarks** - Dr. Chung-Bang Yun (Congress Chair ASEM23)	RoomA, #515
09:20-09:30	**Opening Ceremony** Chair: Prof. Jun Kyung Park	**Opening Remarks** - Dr. Nag Young Kim (Chair ICTUS23/President of KTA)	
09:30-10:00	**Keynote Lectures I (Session W1A)** Chair: Prof. Jun Kyung Park	**Resilience and Sustainability in Underground Space - Embracing the United Nations Sustainability Development Goals**	
10:00-10:30	**Keynote Lectures II (Session W2A)** Chair: Prof. Hangseok Choi	**Advances in rock fragmentation technologies**	
10:30-10:50	Break Time		
10:50-12:20	**Structural and Hydraulic Interaction in Underground Structures** **Session W3A Chair : Prof. Ki-Il Song** **TBM mechanical characteristics for NFGM in mechanized tunnelling** Pill-Bae Hwang*, Beom-Ju Kim, Seok-Won Lee **Experimental study on mechanical properties of diabase fracture-grouting mass** Jun Shen*, Yin Cheng, Dao-Xin Wei, Tian-Jun Yang, Qin-Dong Li **Applicability of an analytical solution for ground settlement induced by circular tunnel** Jun-Beom An*, Gye-Chun Cho **Effect of jet dispersion on the underground excavation in rock using abrasive waterjet** Hyun-Joong Hwang*, Yohan Cha, Joohyun Park, Gye-Chun Cho **Prediction of Group Pile Behavior Due to Adjacent Twin Tunnelling Using Machine Learning** Su-Bin Kim*, Dong-Wook Oh, Hyeon-Jun Cho, Yong-Joo Lee **Effect of lower permeability top layer in shallow seabed for CO_2 hydrate formation** Doyeon Lee*, Chul-Whan Kang, Seok-Jun Kang, Gye-Chun Cho		
12:20-13:20	Lunch		
13:20-14:50	**Developments in Underground Space Technologies** **Session W4A Chair : Prof. Changwon Kwak** **Factors affecting jacking force of square steel pipe-roof in Tsunashima Tunnel: a case study** Bosong YU*, Hideki SHIMADA, Takashi SASAOKA, Akihiro HAMANAKA **Numerical evaluation of face stability of shallow circular tunnels in cohesionless soils** Aman Sharma*, Riya Bhowmik **Study on the use of unlabeled data in crack detection with CycleGAN** Jin Kim*, Seungbo Shim, Gye-Chun Cho **Effect of support systems on behavior of large-diameter circular tunnel through the multi-layered ground** Joohyun Park*, Seok-Jun Kang, Hyun-Joong Hwang, Gye-Chun Cho **Response of Mountain Tunnels subjected to Multiple Earthquakes** Junyoung Lee*, Byungmin Kim, Jae-Kwang Ahn		
14:50-15:00	Break Time		
15:00-16:30	**Improvements in Conventional Tunnelling & Tunnelling and Underground Works in Extreme Conditions** **Session W5A Chair : Prof. Tae Young Ko** **Evaluation of underground structure behavior in liquefiable sand deposit by dynamic model tests** Mintaek Yoo*, Changwon Kwak, Seongwon Hong **Three-dimensional numerical analysis of train-induced vibration in subway tunnel** Changwon Kwak*, Innjoon Park, Mintaek Yoo **Harsh stress level design for accelerated degradation test of concrete structure in HLW repository** Changhee Park*, Hyun-Joong Hwang, Chang-Ho Hong, Sokpheanika Chea, Gye-Chun Cho **Swelling behavior of biopolymer-treated fine soil and possible application** Dong-yeup Park*, Jeong-Uk Bang, Minhyeong Lee, Ilhan Chang, Gye-Chun Cho **Preliminary study of sand-clay mixture strength improvement using crosslinked-induced biopolymer as binder** Jeonguk Bang*, Dong-yeup Park, Minhyeong Lee, Ilhan Chang, Gye-Chun Cho		
16:30-16:40	Break Time		

	Resilience and Sustainability in Underground Space & Innovation in Mechanized Tunnelling	RoomA, #515
16:40-18:00	**Session W6A Chair : Prof. Dohyun Kim** **Performance of a muck pumping system for EPB TBMs in soft ground condition** Ju-Young Oh*, Seokbue Chang **Horizontal Directional Drilling for Geological Investigation in Ultra-Long and Deep-Buried Mountain Tunnel Construction** Sheng-hao Piao*, Bao-song Ma, Sheng Huang, Qiang Zhao, Shi-ji Chen, Hao Zhou **Urban design strategies for long-term residence in the future underground city** Haneul Lee*, Sojung Noh, Seoyeon Nho, Youngchul Kim **Simulation of EPB Tunnelling for Various Grounds in Korea: A Discrete Event Model Approach** Young Jin Shin*, Jae Won Lee, Ju Hui Yim, Han Byul Kang, Jae Hoon Jung, Jun Kyung Park **Influence of Xanthan Gum Treated sandy soil on CO_2 Hydrate Formation: An Experimental Study** Sokpheanika Chea*, Chul-Whan Kang, Gye-Chun Cho	

PRE-RECORDED SESSION - THURSDAY, AUGUST 17, 2023(10:00~12:00)

Live Zoom Session (ID: 972 123 8601, PW: 000111)

10:00-12:00	**Chair : Prof. Changwon Kwak, Prof. Jun Kyung Park** **Remediation of underground cavity using membrane grouting** Seung-Hyun Kim*, Young-Hoon Jung, Jong-Ho Shin **Field Applicability Evaluation of CLSM using Coal ash as Aggregate** Yong-Soo Lee*, Tae-Yeon Kim, Bong-Jik Lee, Seongwon Hong **Estimation of NTNU/SINTEF Drillability Test Indices using Soft Computing Techniques based on Rock Properties** Tae Young Ko* **ML-based predictive model for adfreezing behavior of frozen soil-structure interface** Sangyeong Park*, Chaemin Hwang, Hangseok Choi **Predicting RQD during TBM tunnel construction using machine learning algorithms** Minkyu Kang*, Byeonghyun Hwang, Hangseok Choi, Kibeom Kwon **Data-driven Model for Predicting Surface Settlement during TBM Tunnel Excavation** Kibeom Kwon*, Dongku Kim, Sangyeong Park, Hangseok Choi **Numerical modeling for trapdoor simulation to evaluate loosening earth pressure on tunnel linings** Chaemin Hwang*, Junhyuk Choi, Jee-Hee Jung, Hangseok Choi

POSTER SESSION

- **Analysis of disc cutter wear pattern using multiclass classification model**
  Yun-Hee Kim*, Jae-woo Shin, Bumjoo Kim
- **A hybrid time series model to predict ground conditions ahead of tunnel face using TBM data**
  Jee-Hee Jung*, Byung-Kyu Kim, Kang-Hyun Lee, In-Mo Lee
- **A study on optimal design of tunnel portal with blasting effects**
  Jee-Hee Jung*, Kang-Hyun Lee, SangRae Lee, NagYoung Kim, Ji-Ung Lee
- **Fire Damages on Concrete Slabes under RABT and RWS Curves**
  Nag-young Kim*, Jae-won Shim, Jee-hee Jung, Ji-ung Lee
- **Numerical simulation of electrical resistivity survey at tunnel**
  Kang-Hyun Lee*, Nag-Young Kim, Myeong-Jong Yi, Ji Ung Lee
- **Prediction of geological condition ahead of tunnel face utilizing Electrical resistivity survey**
  Kang-Hyun Lee*, Nag-Young Kim, Myeong-Jong Yi, Ji Ung Lee
- **Improved study for recycling the excavated soil and filter cake of slurry shield TBM**
  Sung-Min Nam*, Joon-Shik Moon
- **Evaluation of disc cutter wear prediction models for shield TBM**
  Jin-Soo Park, Ki-Il Song*
- **Case study on subsidence of the railroad of the existing operation line and countermeasures establishment for non-opencut tunnelling**
  Jun Kyung Park*
- **Investigation on pile behavior in proximity to excavation damage zone (EDZ) induced by TBM excavation**
  Dohyun Kim*
- **Numerical assessment of structural stability of circular tunnel during mechanized excavation**
  Dohyun Kim*
- **Freeze-thawing quantitative evaluation method of mountain tunnel concrete lining in winter season**
  Jai-Wook An*, Joon-Shik Moon, Hong-Kyoon

TOUR PROGRAMS

* The itineraries are subject to change.
** Tour may be cancelled due to low participation.

Night Excursion

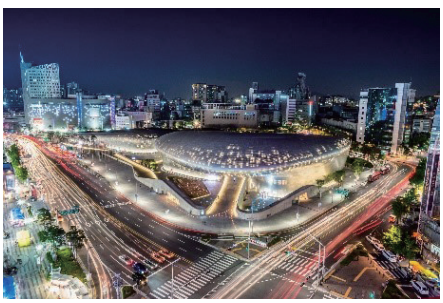
Date	August 17th
Itinerary *	SNU – Lotte World Tower – Lotte World Mall – Coex
Price	Admission tickets for observatories and venues that require entry are available for individual purchase.
Conditions	w/ English speaking guide
Description	The Lotte World Tower Observatory is located at the top of the Lotte World Tower, the world's fifth tallest building standing 123 stories and 555 meters high. It is the only place where you can take in a gorgeous 360-degree view of Seoul, the capital city of South Korea roaring with brilliant history and dynamic modern culture. The Observatory offers a diverse range of unique experience at any time of the year and day. Lotte World Mall located within the Lotte World Tower complex, is a mega shopping, entertainment, and cultural district that includes a department store, shopping streets, restaurants, food courts, cinema, a concert hall, and an aquarium.



Afternoon Tour

Date	August 18th
Itinerary *	SNU – Gwanghwamun Gate (Passing) – Gyeongbokgung Palace – National Folk Museum – Insadong Antique Street – Bukchon Hanok Village –
Price	USD 100/person
Conditions	w/ English speaking guide
Description	Built in 1395, Gyeongbokgung Palace is also commonly referred to as the Northern Palace because its location is furthest north when compared to the neighboring palaces of Changdeokgung (Eastern Palace) and Gyeonghuigung (Western Palace) Palace. Gyeongbokgung Palace is arguably the most beautiful, and remains the largest of all five palaces. Bukchon Hanok Village is home to hundreds of traditional houses, called hanok, that date back to the Joseon Dynasty. The name Bukchon, which literally translates to "northern village," came about as the neighborhood lies north of two significant Seoul landmarks, Cheonggyecheon Stream and Jongno. Today, many of these hanoks operate as cultural centers, guesthouses, restaurants and tea houses, providing visitors with an opportunity to experience, learn and immerse themselves in traditional Korean culture.





SPONSORS

中国铁建 CRCHI
With BL. KOREA LTD.

DAEWOO E&C

DL E&C

Dongbu Corporation

Hanwha Corporation/E&C

HERRENKNECHT
Tunnelling Systems

HJSC

HYUNDAI ENGINEERING & CONSTRUCTION

KCC E&C

KOLON GLOBAL CORP.

KYERYONG

LOTTE E&C

MAPEI®

posco E&C

SANDVIK

TAEYOUNG E&C

GLOBAL SAE-A GROUP
SSANGYONG
Engineering & Construction Co., Ltd.